National Transportation Statistics

2001

Bureau of
Transportation
Statistics

U.S. Department of Transportation

Our mission: To lead in developing transportation data and information of high quality and to advance their effective use in both public and private transportation decisionmaking.

Our vision for the future: Data and information of high quality supporting every significant transportation policy decision, thus advancing the quality of life and the economic well-being of all Americans.

All material contained in this report is in the public domain and may be used and reprinted without special permission; citation as to source is required.

Recommended citation

U.S. Department of Transportation
Bureau of Transportation Statistics
National Transportation Statistics 2001
BTS02-06
Washington, DC, U.S. Government Printing Office, July 2002

Acknowledgments

U.S. Department of Transportation

Norman Y. Mineta
Secretary

Michael P. Jackson
Deputy Secretary

Bureau of Transportation Statistics

Ashish K. Sen
Director

Rick Kowalewski
Deputy Director

Susan J. Lapham
Associate Director for Statistical Programs

Jack V. Wells
Chief Economist

Wendell Fletcher
Assistant Director for Transportation Analysis

Project Manager

Long X. Nguyen

Steve Schamberger
(through February 2002)

Editor

Chip Moore

Data Collection

Battelle:
Brian Carpenter
Tyler Fisher
Deepak Copalakrishna
Arthur Greenberg
David Kall
William Mallett
Kenneth Mathews
Melissa Murphy
Lynn Price
KyLynn Slayton

Contributors

Felix Ammah-Tagoe
Duanjie Chen
David Chesser
Bingsong Fang
Xiaoli Han
Elijah Henley
Marcus Mathias
Getachew Mekonnen
Lisa Randall
Deepak Virmani

Table of Contents

INTRODUCTION i

Table A Social and Economic Characteristics of the United States xiii

Chapter 1. The Transportation System

Table SECTION A. PHYSICAL EXTENT . . . . . Page

1-1 System Mileage Within the United States 1-1

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

1-3 Number of U.S. Airports 1-3

1-4 Public Road and Street Mileage in the United States by Type of Surface 1-4

1-5 U.S. Public Road and Street Mileage by Functional System 1-5

1-6 Estimated U.S. Roadway Lane-Miles by Functional System 1-6

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

1-8 U.S. Oil and Gas Pipeline Mileage 1-8

SECTION B. VEHICLE, AIRCRAFT, AND VESSEL INVENTORY

1-9 Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances 1-9

1-10 Sales or Deliveries of New Aircraft, Vehicles, Vessels, and Other Conveyances 1-11

1-11 Active Air Carrier and General Aviation Fleet by Type of Aircraft 1-13

1-12 U.S. Automobile and Truck Fleets by Use 1-15

1-13 Annual U.S. Motor Vehicle Production and Factory (Wholesale) Sales 1-16

1-14 Retail New Passenger Car Sales 1-17

1-15 New and Used Passenger Car Sales and Leases 1-18

1-16 Retail Sales of New Cars by Sector 1-19

1-17 Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Automobiles, Selected Sales Periods. 1-20

1-18 Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Light Trucks, Selected Sales Periods 1-21

1-19 World Motor Vehicle Production, Selected Countries 1-22

1-20 Number and Size of the U.S. Flag Merchant Fleet and Its Share of the World Fleet 1-25

SECTION C. CONDITION

1-21 U.S. Airport Runway Pavement Conditions 1-26

1-22 Median Age of Automobiles and Trucks in Operation in the U.S. 1-27

1-23 Condition of U.S. Roadways by Functional System 1-28

1-24 Condition of U.S. Highway Bridges 1-31

1-25 Average Age of Urban Transit Vehicles 1-32

1-26 Class I Railroad Locomotive Fleet by Year Built 1-33

1-27 Age and Availability of Amtrak Locomotive and Car Fleets 1-34

1-28 U.S. Flag Vessels by Type and Age 1-35

SECTION D. TRAVEL AND GOODS MOVEMENT

1-29 U.S. Vehicle-Miles 1-38
1-30 Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional Class 1-40
1-31 U.S. Passenger-Miles 1-41
1-32 Principal Means of Transportation to Work 1-43
1-33 Long-Distance Travel in the United States by Selected Trip Characteristics:1995 1-44
1-34 Long-Distance Travel in the United States by Selected Traveler Characteristics:1995 1-46
1-35 U.S. Air Carrier Aircraft Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons 1-48
1-36 Passengers Boarded at the Top 50 U.S. Airports 1-49
1-37 Air Passenger Travel Arrivals in the United States from Selected Foreign Countries 1-51
1-38 Air Passenger Travel Departures from the United States to Selected Foreign Countries 1-53
1-39 U.S.-Canadian Border Land-Passenger Gateways: 2000 1-55
1-40 U.S.-Mexican Border Land-Passenger Gateways: 2000 1-56
1-41 U.S. Ton-Miles of Freight 1-57
1-42 Average Length of Haul, Domestic Freight and Passenger Modes 1-58
1-43 Top U.S. Foreign Trade Freight Gateways by Value of Shipments:2000 1-60
1-44 U.S.-Canadian Border, Land-Freight Gateways: 2000 1-61
1-45 U.S.-Mexican Border, Land-Freight Gateways: 2000 1-62
1-46 U.S. Waterborne Freight 1-63
1-47 Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons 1-64
1-48 Growth of Freight Activity in the United States: Comparison of the 1997 and 1993 Commodity Flow Surveys 1-65
1-49 Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments, 1997 1-66
1-50 Value of U.S. Land Exports to and Imports from Canada and Mexico by Mode 1-67
1-51 Crude Oil and Petroleum Products Transported in the United States by Mode 1-68
1-52 U.S. Hazardous Materials Shipments by Mode of Transportation, 1997 1-69
1-53 U.S. Hazardous Materials Shipments by Hazard Class, 1997 1-70
1-54 Worldwide Commercial Space Launches 1-71

SECTION E. PHYSICAL PERFORMANCE

1-55 Passengers Denied Boarding by the Largest U.S. Air Carriers 1-72
1-56 Mishandled-Baggage Reports Filed by Passengers with the Largest U.S. Air Carriers 1-73
1-57 Flight Operations Arriving On Time by the Largest U.S. Air Carriers 1-74
1-58 FAA–Cited Causes of Departure and Enroute Delays 1-75
1-59 Major U.S. Air Carrier Delays, Cancellations, and Diversions 1-76
1-60 Annual Person-Hours of Highway Traffic Delay Per Capita 1-77

1-61 Roadway Congestion Index 1-80
1-62 Annual Highway Congestion Cost 1-83
1-63 Amtrak On-Time Performance Trends and Hours of Delay by Cause 1-85

Chapter 2. Transportation Safety
SECTION A. MULTIMODAL
2-1 Transportation Fatalities by Mode 2-1
2-2 Injured Persons by Transportation Mode 2-3
2-3 Transportation Accidents by Mode 2-5
2-4 Distribution of Transportation Fatalities by Mode 2-7
2-5 Highway-Rail Grade-Crossing Safety and Property Damage Data 2-8
2-6 Hazardous Materials Fatalities, Injuries, Accidents and Property Damage Data 2-9
2-7 Transportation-Related Occupational Fatalities 2-10
2-8 Reporting Thresholds for Property Damage by U.S. Department of Transportation Modal Administrations 2-11

SECTION B. AIR
2-9 U.S. Air Carrier Safety Data 2-12
2-10 U.S. Commuter Air Carrier Safety Data 2-13
2-11 U.S. Air Carrier Fatal Accidents by First Phase of Operation 2-14
2-12 U.S. Commuter Air Carrier Fatal Accidents by First Phase of Operation 2-15
2-13 U.S. On-Demand Air Taxi Safety Data 2-16
2-14 U.S. General Aviation Safety Data 2-17
2-15 Number of Pilot-Reported Near Midair Collisions (NMAC) by Degree of Hazard 2-18
2-16 Airline Passenger Screening Results by Type of Weapons Detected, Persons Arrested, and Bomb Threats Received 2-19

SECTION C. HIGHWAY
2-17 Motor Vehicle Safety Data 2-20
2-18 Motor Vehicle Fatalities, Vehicle-Miles, and Associated Rates by Highway Functional System 2-21
2-19 Occupant Fatalities by Vehicle Type and Nonoccupant Fatalities 2-22
2-20 Occupant and Non-Motorist Fatalities in Crashes by Number of Vehicles and Alcohol Involvement 2-23
2-21 Passenger Car Occupant Safety Data 2-24
2-22 Motorcycle Rider Safety Data 2-25
2-23 Truck Occupant Safety Data 2-26
2-24 Bus Occupant Safety Data 2-28
2-25 Fatalities by Highest Blood Alcohol Concentration (BAC) in Highway Crashes 2-29
2-26 Number of States with Different Types of Anti-DUI/DWI Legislation in Effect as of January 1 of the Listed Year 2-30

2-27 Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions 2-31
2-28 Motor Vehicle Fatal Crashes by Posted Speed Limit 2-32
2-29 Safety Belt and Motorcycle Helmet Use 2-33
2-30 Estimated Number of Lives Saved by Use of Restraints 2-34

SECTION D. TRANSIT
2-31 Transit Safety and Property Damage Data 2-35
2-32 Transit Safety Data by Mode for All Reported Accidents 2-36
2-33 Transit Safety Data by Mode for All Reported Incidents 2-38
2-34 Reports of Violent Crime, Property Crime, and Arrests by Transit Mode . . . 2-40

SECTION E. RAILROAD
2-35 Railroad and Grade-Crossing Fatalities by Victim Class 2-43
2-36 Railroad and Grade-Crossing Injured Persons by Victim Class 2-44
2-37 Train Fatalities, Injuries, and Accidents by Type of Accident 2-45
2-38 Railroad Passenger Safety Data 2-46
2-39 Railroad System Safety and Property Damage Data 2-47
2-40 Fatalities and Injuries of On-Duty Railroad Employees 2-48

SECTION F. WATER
2-41 Waterborne Transportation Safety and Property Damage Data Related to Vessel Casualties 2-49
2-42 Waterborne Transportation Safety Data Not Related to Vessel Casualties . . 2-50
2-43 Recreational Boating Safety, Alcohol Involvement, and Property Damage Data 2-51
2-44 Personal Watercraft Safety Data 2-52
2-45 U.S. Coast Guard Search and Rescue Statistics, Fiscal Year 2-53

SECTION G. PIPELINE
2-46 Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data 2-54

Chapter 3. Transportation and the Economy
SECTION A. TRANSPORTATION AND THE TOTAL ECONOMY
3-1a U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (Current $ billions) 3-1
3-1b U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (Chained 1996 $ billions) 3-2
3-2a U.S. Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand (Current $ billions) 3-3
3-2b U.S. Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand (Chained 1996 $ billions) 3-4
3-3a U.S. Gross Domestic Demand (GDD) Attributed to Transportation-Related Final Demand (Current $ billions) 3-5

3-3b U.S. Gross Domestic Demand (GDD) Attributed to Transportation-Related Final Demand (Chained 1996 $ billions) 3-6
3-4a Contributions to Gross Domestic Product (GDP): Selected Industries (Current $ billions) 3-7
3-4b Contributions to Gross Domestic Product (GDP): Selected Industries (Chained 1996 $ billions) 3-8
3-5 Gross Domestic Product (GDP) by Major Social Function 3-9
3-6 National Transportation and Economic Trends 3-10

SECTION B. TRANSPORTATION AND CONSUMER EXPENDITURE
3-7 Passenger and Freight Transportation Expenditures 3-11
3-8 Sales Price of Transportation Fuel to End-Users 3-12
3-9 Price Trends of Gasoline v. Other Consumer Goods and Services 3-13
3-10 Producer Price Indices for Transportation Services 3-14
3-11 Producer Price Indices for Transportation Equipment 3-15
3-12 Personal Expenditures by Category 3-16
3-13 Personal Consumption Expenditures on Transportation by Subcategory 3-17
3-14 Average Cost of Owning and Operating an Automobile 3-18
3-15a Average Passenger Fares (Current $) 3-19
3-15b Average Passenger Fares (Chained 1996 $) 3-20

SECTION C. TRANSPORTATION REVENUES, EMPLOYMENT, AND PRODUCTIVITY
3-16 Average Passenger Revenue per Passenger-Mile 3-21
3-17 Average Freight Revenue per Ton-Mile 3-22
3-18 Total Operating Revenues 3-23
3-19 Employment in For-Hire Transportation and Selected Transportation-Related Industries 3-24
3-20 Employment in Transportation Occupations 3-26
3-21 Average Wage and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry 3-27
3-22 Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation 3-28
3-23 Total Wage and Salary Accruals by Transportation Industry 3-29
3-24 Labor Productivity Indices for Selected Transportation Industries 3-30

SECTION D. GOVERNMENT FINANCE
3-25a Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Current $ millions) 3-31
3-25b Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Constant 1996 $ millions) 3-32
3-26 Summary of Transportation Revenues and Expenditures From Own Funds and User Coverage, Fiscal Year (Current and constant 1996 $ million) 3-33
3-27a Transportation Revenues by Mode and Level of Government, fiscal year (Current $ millions) 3-34

3-27b Transportation Revenues by Mode and Level of Government, Fiscal Year (Constant 1996 $ millions) 3-35
3-28 Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year ($ millions) 3-36
3-29a Transportation Expenditures by Mode and Level of Government from Own Funds, Fiscal Year (Current $ millions) 3-37
3-29b Transportation Expenditures by Mode and Level of Government from Own Funds, Fiscal Year (Constant 1996 $ millions) 3-38
3-30a Federal Transportation Grants to State and Local Governments by Mode, Fiscal Year (Current $ millions) 3-39
3-30b Federal Transportation Grants to State and Local Government by Mode, Fiscal Year (Constant 1996 $ millions) 3-39

Chapter 4. Transportation, Energy, and the Environment
SECTION A. U.S. AND TRANSPORTATION SECTOR ENERGY CONSUMPTION
4-1 Overview of U.S. Petroleum Production, Imports, Exports, and Consumption 4-1
4-2 U.S. Consumption of Energy from Primary Sources by Sector 4-2
4-3 Domestic Demand for Refined Petroleum Products by Sector 4-3

SECTION B. TRANSPORTATION ENERGY CONSUMPTION BY MODE
4-4 U.S. Energy Consumption by the Transportation Sector 4-4
4-5 Fuel Consumption by Mode of Transportation 4-5
4-6 Energy Consumption by Mode of Transportation 4-7
4-7 Domestic Demand for Gasoline by Mode 4-9
4-8 Certificated Air Carrier Fuel Consumption and Travel 4-10
4-9 Motor Vehicle Fuel Consumption and Travel 4-11
4-10 Estimated Consumption of Alternative and Replacement Fuels for Highway Vehicles 4-12
4-11 Passenger Car and Motorcycle Fuel Consumption and Travel 4-13
4-12 Other 2-Axle 4-Tire Vehicle Fuel Consumption and Travel 4-14
4-13 Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel . . . 4-15
4-14 Combination Truck Fuel Consumption and Travel 4-16
4-15 Bus Fuel Consumption and Travel 4-17
4-16 Transit Industry Electric Power and Primary Energy Consumption and Travel 4-18
4-17 Class I Rail Freight Fuel Consumption and Travel 4-19
4-18 Amtrak Fuel Consumption and Travel 4-20
4-19 U.S. Government Energy Consumption by Agency and Source 4-21

SECTION C. TRANSPORTATION ENERGY INTENSITY AND FUEL EFFICIENCY
4-20 Energy Intensity of Passenger Modes 4-22
4-21 Energy Intensity of Certificated Air Carriers, All Services 4-23
4-22 Energy Intensity of Passenger Cars, Other 2-Axle 4- Tire Vehicles, and Motorcycles 4-24

4-23 Average Fuel Efficiency of U.S. Passenger Cars and Light Trucks 4-25
4-24 Energy Intensity of Transit Motor Buses 4-26
4-25 Energy Intensity of Class I Railroad Freight Service 4-27
4-26 Energy Intensity of Amtrak Services 4-28
4-27 Annual Wasted Fuel Due to Congestion 4-29
4-28 Wasted Fuel per Capita 4-32

SECTION D. AIR POLLUTION
4-29 Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Vehicles 4-34
4-30a Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (CategoryLDT1)(Grams per mile) 4-36
4-30b Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (CategoryLDT2)(Grams per mile) 4-38
4-30c Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (CategoryLDT3)(Grams per mile) 4-40
4-30d Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (CategoryLDT4)(Grams per mile) 4-42
4-31 Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Medium-Duty Passenger Vehicles (MDPV) 4-44
4-32a Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Heavy-Duty Trucks (Grams per brake horsepower-hour) 4-45
4-32b Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Heavy Heavy-Duty Trucks (Grams per brake horsepower-hour) 4-47
4-33 Federal Exhaust Emissions Standards for Newly Manufactured Motorcycles 4-48
4-34 Federal Exhaust Emissions Standards for Newly Manufactured and In-Use Aircraft Engines 4-49
4-35 Federal Exhaust Emissions Standards for Locomotives 4-51
4-36 Federal Exhaust Emissions Standards for Newly Manufactured Marine Spark-Ignition Outboard, Personal Watercraft, and Jet-Boat Engines 4-53
4-37 Tier 2 Federal Exhaust Emissions Standards for Newly Manufactured Commercial Marine Compression-Ignition Engines 4-54
4-38 Estimated National Average Vehicle Emissions Rates by Vehicle Type and Fuel 4-55
4-39 Estimated National Average Vehicle Emissions Rates by Vehicle Type Using Reformulated Gasoline 4-56
4-40 Estimated National Emissions of Carbon Monoxide 4-57
4-41 Estimated National Emissions of Nitrogen Oxides 4-58
4-42 Estimated National Emissions of Volatile Organic Compounds 4-59

4-43 Estimated National Emissions of Particulate Matter (PM-10) 4-60
4-44 Estimated National Emissions of Particulate Matter (PM-2.5) 4-61
4-45 Estimated National Emissions of Sulfur Dioxide 4-62
4-46 Estimated National Emissions of Lead 4-63
4-47 Air Pollution Trends in Selected Metropolitan Statistical Areas 4-64
4-48 Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants 4-66
4-49 U.S. Carbon Dioxide Emissions from Energy Use by Sector 4-68

SECTION E. WATER POLLUTION, NOISE, AND SOLID WASTE
4-50 Petroleum Oil Spills Impacting Navigable U.S. Waterways 4-69
4-51 Leaking Underground Storage Tank Releases and Cleanups 4-70
4-52 Highway Noise Barrier Construction 4-71
4-53 Number of People Residing in High Noise Areas Around U.S. Airports 4-72
4-54 Motor Vehicles Scrapped 4-73

Appendix A. Modal Profiles
Air Carrier Profile A-1
General Aviation Profile A-7
Highway Profile A-9
Automobile Profile A-13
Truck Profile A-16
Bus Profile A-18
Transit Profile A-20
Rail Profile A-24
Water Transport Profile A-26
Oil Pipeline Profile A-29
Natural Gas Pipeline Profile A-30

Appendix B. Metric Conversion Tables
1-lM System Kilometers Within the United States B-1
1-6M Estimated U.S. Roadway Lane-Kilometers by Functional System B-2
1-29M U.S. Vehicle-Kilometers B-3
1-30M Roadway Vehicle-Kilometers Traveled (VKT) and VKT per Lane-Kilometer by Functional Class B-5
1-31M U.S. Passenger-Kilometers B-6
1-41M U.S. Tonne-Kilometers of Freight B-8
1-42M Average Length of Haul, Domestic Freight and Passenger Modes B-9
1-46M U.S. Waterborne Freight B-11
1-51M Crude Oil and Petroleum Products Transported in the United States by Mode B-12
4-3M Domestic Demand for Refined Petroleum Products by Sector B-13
4-5M Fuel Consumption by Mode of Transportation B-14
4-6M Energy Consumption by Mode of Transportation B-16
4-7M Domestic Demand for Gasoline by Mode B-18
4-8M Certificated Air Carrier Fuel Consumption and Travel B-19

4-9M	Motor Vehicle Fuel Consumption and Travel	B-20
4-11M	Passenger Car and Motorcycle Fuel Consumption and Travel	B-21
4-13M	Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel	B-22
4-14M	Combination Truck Fuel Consumption and Travel	B-23
4-15M	Bus Fuel Consumption and Travel	B-24
4-16M	Transit Industry Electric Power and Primary Energy Consumption and Travel	B-25
4-17M	Class I Rail Freight Fuel Consumption and Travel	B-26
4-19M	U.S. Government Energy Consumption by Agency and Source	B-27
4-20M	Energy Intensity of Passenger Modes	B-28
4-21M	Energy Intensity of Certificated Air Carriers, All Services	B-29
4-22M	Energy Intensity of Passenger Cars, Other 2-Axle 4-Tire Vehicles, and Motorcycles	B-30
4-23M	Average Fuel Efficiency of U.S. Passenger Cars and Light Trucks	B-31
4-24M	Energy Intensiveness of Transit Motor Buses	B-32
4-25M	Energy Intensity of Class I Railroad Freight Service	B-33

Appendix C. Source and Accuracy Statements C-1

Table A: Social and Economic Characteristics of the United States

	1980	1985	1990	1995	1996	1997	1998	1999	2000
Total U.S. resident population[a] (thousands)	**[R]226,546**	**237,924**	**248,791**	**262,803**	**265,229**	**267,784**	**270,248**	**272,691**	**281,422**
Age[b] (thousands)									
Under 18	63,754	62,623	63,949	68,555	69,109	69,603	69,903	70,199	72,294
18-24 years	30,022	28,902	26,961	25,112	24,843	24,980	25,476	26,011	27,142
25-34	37,082	41,696	43,174	40,730	40,246	39,559	38,743	37,936	39,892
35-44	25,634	31,691	37,444	42,555	43,365	44,014	44,498	44,813	45,149
45-54	22,800	22,460	25,062	31,100	32,358	33,625	34,575	35,802	37,678
55-64	21,703	22,135	21,116	21,132	21,353	21,816	22,666	23,389	24,275
65 and over	25,550	28,415	31,083	33,619	33,957	34,185	34,385	34,540	34,992
Sex[c] (thousands)									
Male	110,053	116,160	121,284	128,294	129,504	130,783	132,030	133,277	138,054
Female	116,493	122,576	127,507	134,510	135,724	137,001	138,218	139,414	143,368
Metropolitan areas (population in millions)[d]									
Large (over 1 million)	119.0	U	139	147	149	151	153	U	162
Medium (250,000-999,999)	41.0	U	41	44	44	43	43	U	40
Small (less than 250,000)	17.0	U	18	19	[R]19	20	20	U	17
Rural v. urban[e] (thousands)									
Rural	59,495	U	61,656	U	U	U	U	U	U
Urban	167,051	U	187,053	U	U	U	U	U	U
Regions[f] (millions)									
Northeast	49.1	49.9	50.8	51.4	[R]51.5	51.6	51.7	51.8	53.6
South	75.4	81.4	85.5	91.8	[R]92.9	94.2	95.3	96.5	100.2
Midwest	58.9	58.8	59.7	[R]62.0	[R]62.4	[R]62.7	63.0	63.2	64.4
West	43.2	47.8	52.8	[R]57.6	[R]58.4	[R]59.3	60.3	61.2	63.2
Immigrants admitted[g]	**530,639**	**570,009**	**1,536,483**	**720,461**	**915,900**	**798,378**	**660,477**	**U**	**U**
Total area (square miles)[h]	**3,618,770**	**U**	**3,717,796**	**U**	**U**	**U**	**U**	**U**	**U**
Gross domestic product (chained $ 1996 billions)[i]	**4,900.9**	**5,717.1**	**6,707.9**	**7,543.8**	**7,813.2**	**8,159.5**	**8,508.9**	**8,856.5**	**9,224.0**
Agriculture, forestry, fishing	66.5	97.5	118.3	123.1	130.4	143.7	145.5	153.4	166.3
Manufacturing	832.3	987.9	1,102.3	1,284.7	1,316.0	1,387.2	1,444.3	1,532.1	1,594.6
Mining	90.6	96.2	105.8	113.0	113.0	117.0	119.7	112.0	95.2
Construction	249.4	270.5	287.5	299.6	316.4	324.6	348.9	370	379.3
Transportation	154.0	170.9	180.6	225.1	243.4	248.9	257.9	268.6	281.1
Wholesale/retail trade	621.5	822.7	954.6	1,124.4	1,216.7	1,329.4	1463.3	1,532.5	1,614.1
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	1,713.5	1,809.5
Services	928.1	1,103.3	1,361.9	1,510.4	1,564.2	1632.2	1699.0	1774.8	1865.2

continued

Table A *continued*

	1980	1985	1990	1995	1996	1997	1998	1999	2000
Total civilian labor force (thousands)	106,940	115,461	125,840	132,304	133,943	136,297	137,673	139,368	140,863
Participation rate of men	77.4%	76.3%	76.4%	75.0%	74.9%	75.0%	74.9%	74.7%	74.7%
Participation rate of women	51.5%	54.5%	57.5%	58.9%	59.3%	59.8%	59.8%	60.0%	60.2%
Number of households (thousands)	**80,776**	**86,789**	**93,347**	**98,990**	**99,627**	**101,018**	**102,528**	**103,874**	**105,480**
Average size of households	2.76	2.69	2.63	2.65	2.65	2.64	2.62	2.61	2.59
Median household income (chained $ 1996) [j]	**$33,722**	**$34,439**	**$35,945**	**$35,082**	**$35,492**	**$36,175**	**$37,430**	[k]**38,592**	[k]**38,556**
Average household expenditures (chained $ 1996)	**U**	**$34,253**	**$34,070**	**$33,217**	**$33,797**	**$34,038**	**$34,205**	**$34,841**	**U**

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 tabulates area (square miles) data for the decennial census years only. Data for 1990 reflect the inclusion of the Great Lakes, inland water, and coastal water. Data for prior years included inland water only.
[i] Estimates for 1980 and 1985 are shown on the basis of the 1972 Standard Industrial Code (SIC); 1990-96 are based on the 1987 SIC.
[j] Households as of March of following year.
[k] Median Income for 1999-2000 is converted to chained 1996 dollars using the CPI-U-RS price index while previous years use the CPI-U price indices. Comparisons with earlier years should be made with caution.

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: Ibid., 2000 Census of Population and Housing, *Profiles of General Demographic Characteristics 2000,* (Washington DC: May 2001), table DP-1.
Age: 1980-99: Ibid., *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 12.
2000: Ibid., 2000 Census of Population and Housing, *Profiles of General Demographic Characteristics 2000* (Washington DC: May 2001), table DP-1.
Sex: 1980-99: Ibid., *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 10.
2000: Ibid., 2000 Census of Population and Housing, *Profiles of General Demographic Characteristics 2000* (Washington DC: May 2001), table DP-1.
Metropolitan areas: 1980-90, 1998: Ibid., *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 32.
2000: Ibid., 2000 Census of Population and Housing, *Profiles of General Demographic Characteristics 2000* (Washington DC: May 2001), table 2.
Rural/urban: Ibid., *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 37.
Regions:
1990-99: Ibid., Internet site http://www.census.gov/population/estimates/state/st-99-3.txt as of Dec. 29, 1999.
2000: Ibid., 2000 Census of Population and Housing, *Profiles of General Demographic Characteristics 2000* (Washington DC: May 2001), table DP-1.

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.

1997-98: U.S. Department of Justice, Immigration and Naturalization Service, Office of Policy and Planning, Statistics Branch, *Annual Report* , *Legal Immigration, Fiscal Year 1998,* No. 2, May 1999, Internet site http:/www.ins.usdoj.gov/graphics/aboutins/statistics/index.htm as of May 1, 2000.

Total area: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 2000* (Washington, DC:2001), table 1.

Gross domestic product: 1980-90: Ibid., *Survey of Current Business* (Washington, DC: November 1997).

1995-96: Ibid., November 1998.

1997-2000: Ibid., November 2001.

Industry gross domestic products are expressed as chained 1996 dollars using industry-specific chain-type quantity indices from the Bureau of Economic Analysis.

Civilian labor force: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey, Internet site http:/www.bls.gov, specific series data query as of Dec. 20, 2001.

Participation rates: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey, Internet site http:/www.bls.gov, specific series data queries as of Dec. 20, 2001.

Number and average size of households: 1980-97: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 1998* (Washington, DC: 1998), table 69.

1998-1999: Ibid., *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 60.

2000: Ibid., 2000 Census of Population and Housing, *Profiles of General Demographic Characteristics 2000* (Washington DC: May 2001), table DP-1.

Median household income: 1980-1998: Ibid., *Statistical Abstract of the United States 2000* (Washington, DC:2001), table 737.

1999-2000: Ibid., *Money Income in the United States 2000,* (Washington DC: 2001), table A.

Converted to chained 1996 dollars using the chain-type price index for personal consumption expenditures from the Bureau of Economic Analysis.

Average household expenditures: Ibid., U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, Internet site http:/www.bls.gov/csxhome.htm. Converted to chained 1996 dollars using the chain-type price index for personal consumption expenditures from the Bureau of Economic Analysis.

Chapter One

The Transportation System

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
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	[R]3,919,652	[R]3,945,872	[R]3,906,290	3,917,243	3,936,229
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
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
Transit[d]																	
Commuter rail[c]	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	U
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	U
Light rail	N	N	N	N	N	384	483	551	558	537	562	568	638	659	676	802	U
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
Oil pipeline[f]	190,944	210,867	218,671	225,889	218,393	213,605	208,752	203,828	[R]196,545	[R]193,980	[R]190,350	[R]181,912	177,535	179,873	178,648	177,463	U
Gas pipeline[g]	630,950	767,520	913,267	979,263	1,051,774	1,118,875	1,206,894	1,225,358	1,253,924	1,251,095	1,257,971	1,262,152	1,276,315	1,251,199	[R]1,294,262	1,345,381	U

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] The St. Lawrence Seaway is not included in this number because 3 of the 5 subsections are solely in Canadian waters, and the others are in international boundary waters. Of the 26,000 miles of navigable waterways, 10,867 miles are commercially significant shallow-draft inland waterways subject to fuel taxes.

[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 field and gathering, transmission, and distribution mains. See table 1-8 for a more detailed breakout of oil and gas pipeline mileage.

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.

1996-98,2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-20.

1999: Ibid., personal communication, May 2002.

Class I rail:

1960-2000: Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), p. 45.

Amtrak:

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

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

Transit:

1985-99: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues) table 20 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: Waterborne Commerce Statistics Center Databases, personal communication, Aug. 3, 2001.

Oil pipeline:

1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 44.

Gas pipeline:

1960-99: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), table 5-2 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
Air carriers[a]	**N**	**N**	**39**	**36**	**63**	**102**	**70**	**96**	**96**	**96**	**96**	**94**	**91**
Major air carriers	N	N	N	N	N	13	14	11	12	13	13	13	15
Other air carriers	N	N	N	N	N	89	56	85	84	83	83	81	76
Railroads	**607**	**568**	**517**	**477**	**480**	**500**	**530**	**541**	**553**	**550**	**559**	**555**	**560**
Class I railroads	106	76	71	73	39	25	14	11	10	9	9	9	8
Other railroads	501	492	446	404	441	[f]475	516	530	543	541	550	546	552
Interstate motor carriers[b]	[e]	[e]	[e]	[e]	**U**	**U**	**216,000**	**346,000**	**379,000**	**417,000**	**477,486**	**517,297**	**560,393**
Marine vessel operators[c]	**U**	**U**	**U**	**U**	**U**	**U**	**U**	**2,519**	**2,505**	**2,494**	**2,534**	**[R]2,391**	**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**
Hazardous liquid	N	N	N	N	N	[f]222	187	209	215	217	225	216	243
Natural gas transmission	N	N	420	432	474	724	866	974	970	954	880	862	828
Natural gas distribution	N	N	938	[g]1,500	[g]1,932	1,485	1,382	1,444	1,397	1,363	1,366	1,382	1,351

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

[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, many inactive carriers are 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 (MSMIS), 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] This value is for 1986. The number of hazardous liquid pipeline operators is not available for prior years.

[g] 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.

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:

1960-1985: Association of American Railroads, *Railroad Ten-Year Trends* , Vol. 2 (Washington, DC), table I-2.

1986: Ibid., Vol. 3 (Washington, DC), table I-2.

1989-1998: Ibid., Vol. 16 (Washington, DC: 1999), p. 10.

1999: Ibid., *Railroad Facts* (Washington, DC: 2000), p. 3.

2000: Ibid., *Railroad Ten-Year Trends* , Vol. 18 (Washington, DC), p. 9.

Interstate motor carriers:

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

Marine vessel operators:

1995-97: U.S. Army, Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 2, Vessel Company Summary* (New Orleans, LA: Annual issues), source data files obtained by personal communication, Apr. 12, 2000.

1998: Ibid., Internet site: http://www.wrsc.usace.army.mil/ndc/datavess.htm as of Apr. 10, 2000.

1999: Ibid., Internet site: http://www.wrsc.usace.army.mil/ndc/datavess.htm as of Nov. 6, 2001.

Pipeline Operators:

U.S. Department of Transportation, Office of Pipeline Safety, personal communication, Nov. 15, 2001.

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

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
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**	**19,306**
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**	**[R]5,324**	**5,317**	5,315
% with lighted runways	66.2	68.1	71.4	71.9	72.3	72.8	73.5	74.3	74.5	74.6	74.8	[R]76.1	75.9	75.9
% with paved runways	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	74.3
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**	**13,990**
% with lighted runways	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	7.3
% with paved runways	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	32.0
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**	**19,306**
Certificated[b], total	**730**	**700**	**680**	**669**	**664**	**670**	**672**	**667**	**671**	**660**	**660**	**655**	**651**	**635**
Civil	N	N	N	N	N	N	577	572	577	566	566	565	563	562
Civil-Military	N	N	N	N	N	N	95	95	94	94	94	90	88	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**	**18,760**

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

[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:
1980-2000: U.S. Department of Transportation, Federal Aviation Administration, Administrator's Fact Book (Washington, DC: Annual issues), Internet site http://www.atctraining.faa.gov/ as of Aug. 1, 2001.
2001: U.S. Department of Transportation, Federal Aviation Administration, personal communication, May 27, 2002.

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

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**
Paved[b]																	
Low and intermediate type	0.672	0.758	0.897	0.967	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
High-type	0.558	0.696	0.762	0.888	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
Paved 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**	**[R]2.381**	**2.410**	**2.420**	**2.451**	**2.504**
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**

KEY: N = data do not exist.

[a] 1960-1995 data include the 50 states and the District of Columbia; 1996-2000 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, a graded and drained road 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 U.S. DOT Federal Highway Administration (FHWA). Some years contain FHWA estimates for some states.
Numbers may not add 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.
1996-2000: Ibid., *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
Urban mileage											
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
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
Principal arterials, other	51,968	52,515	51,900	52,708	53,110	52,796	52,983	53,223	53,132	53,199	53,312
Minor arterials	74,659	74,795	80,815	86,821	87,857	88,510	89,020	89,185	89,496	89,432	89,789
Collectors	78,254	77,102	82,784	84,854	86,089	87,331	87,790	88,049	88,071	88,005	88,200
Local	520,568	526,139	548,560	559,776	564,609	568,935	574,728	583,973	588,504	592,974	598,421
Total	**744,644**	**749,862**	**785,066**	**805,877**	**813,785**	**819,706**	**826,765**	**836,740**	**841,642**	**846,085**	**852,241**
Rural mileage											
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
Principal arterials, other	83,802	86,747	94,947	96,770	97,175	97,948	98,131	98,257	98,852	98,838	98,911
Minor arterials	144,774	141,795	137,685	137,577	138,120	137,151	137,359	137,497	137,308	137,462	137,574
Major collectors	436,352	436,746	434,072	432,222	431,115	431,712	432,117	432,714	432,408	432,934	433,121
Minor collectors	293,922	293,511	284,504	282,182	282,011	274,081	273,198	272,362	272,140	271,676	271,815
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	2,109,519
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**	**3,083,988**
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**	**3,936,229**

[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.

1996-98, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-20. Available at www.fhwa.dot.gov/ohim/ohimstat.htm as of October 2001.

1999: Ibid., personal communication, May 2002.

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

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	R,d 1998	R 1999	2000
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**	**R 8,242,437**	**8,160,858**	**8,177,983**	**8,223,393**
Urban													
Interstates	48,458	57,295	62,214	62,826	67,266	69,184	70,832	71,377	71,790	R 72,257	73,006	73,293	73,915
Other arterials[b]	333,673	371,649	399,376	402,360	418,208	435,386	442,474	445,828	449,480	R 453,623	454,060	450,411	455,857
Collectors	145,128	162,377	167,770	165,288	176,137	179,653	183,353	185,032	186,923	R 188,850	187,533	186,334	188,568
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	R 1,167,946	1,177,009	1,185,948	1,196,840
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**	**R 1,882,676**	**1,891,608**	**1,895,986**	**1,915,180**
Rural													
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
Other arterials[b]	507,098	510,005	517,342	517,813	526,714	525,906	529,818	530,706	532,856	R 536,989	537,993	539,293	539,918
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	R 1,418,637	1,415,774	1,413,953	1,414,665
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	R 4,270,970	4,182,252	4,194,553	4,219,043
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**	**R 6,359,761**	**6,269,250**	**6,281,997**	**6,308,213**

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).

1996-1998, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-60. Internet address www.fhwa.dot.gov/ohim.ohimstat.htm as of Dec. 27, 2001.

1999: Ibid., personal communication, June 5, 2002.

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
Amtrak	510	503	491	487	498	504	516	523	524	535	540	530	542	516	508	510	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	R2,325	2,391	2,524	R2,567	2,595

KEY: R = revised.

NOTE: Rail transit is sum of commuter rail, heavy rail, and light rail. In several large urban areas, Amtrak and commuter rail stations are shared.

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 20 (for 2000 issue) and similar tables in earlier editions.

Table 1-8: U.S. Oil and Gas Pipeline Mileage

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Oil pipeline																
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	R97,029	92,610	91,523	87,663	86,369
Product lines	49,859	61,443	72,396	80,210	88,562	95,793	89,947	87,968	85,894	86,734	87,073	R84,883	84,925	88,350	90,985	91,094
Total	**190,944**	**210,867**	**218,671**	**225,889**	**218,393**	**213,605**	**208,752**	**203,828**	**196,545**	**193,980**	**190,350**	**R181,912**	**177,535**	**179,873**	**178,648**	**177,463**
Gas pipeline[b]																
Distribution mains	391,400	494,500	594,800	648,200	701,800	753,400	837,300	857,500	883,200	908,300	919,300	936,800	959,500	957,100	R999,000	1,045,919
Transmission pipelines[c]	183,700	211,300	252,200	262,600	266,500	271,200	280,100	281,600	284,500	269,600	268,300	263,900	259,300	251,100	R255,800	263,347
Field and gathering lines	55,800	61,700	66,300	68,500	83,500	94,300	89,500	86,300	86,200	73,100	70,400	60,400	57,500	43,000	R40,200	36,115
Total	**630,950**	**767,520**	**913,267**	**979,263**	**1,051,774**	**1,118,875**	**1,206,894**	**1,225,358**	**1,253,924**	**1,251,095**	**1,257,971**	**1,261,100**	**1,276,315**	**1,251,200**	**R1,295,000**	**1,345,381**

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.

NOTE: For gas pipeline data from 1960-1998, numbers may not add to totals due to rounding because the source provides exact numbers for totals, but rounded mileage for subtotals. Exact subtotals were available for 1999.

SOURCES:
Oil pipeline:
1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 44.
Gas pipeline:
1960-97,1999: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), tables 5-1 and 5-3, and similar tables in earlier editions.
1998: Ibid., personal communications as of Dec. 19, 2001.

Table 1-9 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
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
General aviation[b] (active fleet)	76,549	95,442	131,743	168,475	211,045	210,654	[R]198,000	[R]196,874	[R]185,650	[R]177,120	[R]172,935	[R]188,089	[R]191,129	[R]192,414	204,710	219,464
Highway (registered vehicles)																
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
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
Other 2-axle 4-tire vehicle	N	[g]	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
Truck																
Single-unit 2-axle 6-tire or more truck	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
Combination truck	[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
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
Total highway	**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**
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	[R]72,142	[P]74,228
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	[R]1,220	[P]1,297
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	[P]10,306
Trolley bus	3,826	1,453	1,050	703	823	676	832	752	907	851	877	885	871	859	880	[P]859
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	[R]4,963	[P]4,883
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	[R]29,646	[P]31,884
Other[d]	N	N	N	N	N	867	1,197	1,595	1,853	2,308	2,505	2,809	3,003	3,808	[R]4,703	[P]5,059
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
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
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
Car companies and shippers freight cars	275,090	285,793	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
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
Locomotive	N	N	N	355	419	291	318	316	336	360	338	313	299	332	345	329
Water																
Nonself-propelled vessels[e]	16,777	17,033	19,377	25,515	31,662	33,597	31,209	[i]	30,899	30,785	30,730	31,360	32,811	33,011	33,509	33,387
Self-propelled vessels[f]	6,543	6,083	6,455	6,144	7,126	7,522	8,236	[i]	8,311	8,323	8,334	8,281	8,293	8,408	8,523	8,379
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
Recreational boats[j]	[R]2,450,484	[R]4,138,140	[R]5,128,345	[R]7,303,286	[R]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

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

[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] Included in single-unit truck.

[h] All trucks.

[i] Data for Jan. 1, 1991-June 30, 1991 included in 1990 figure.

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

NOTES: Transit motor bus figure is also included as part of bus in the highway category.
For more detail on oceangoing vessels, see table 1-19.

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.
1995-99: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington DC: 2000/2001), "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.
1990-99: Ibid., *General Aviation and Air Taxi Activity Survey, Calendar Year 1999* (Washington, DC: 2000), 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.
1995-99: 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.
1995-99: 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.
1995-99: 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.
1995-99: 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.
1998-99: Ibid., *Public Transportation Fact Book* (Washington DC:2001), table 46.
Rail (all categories, except Amtrak):
1960-99: Association of American Railroads, *Railroad Facts 2000* (Washington, DC: October 2000), pp. 48, 50.
Amtrak:
Passenger train-cars and locomotives:
1975-80: Amtrak, State and Local Affairs Department, personal communication.
1985-99: Ibid., *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues), p. 47.
Water transportation:
Nonself-propelled vessels and self-propelled vessels:
1960-99: 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:
1960-99: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues).
Recreational boats:
1960-99: U.S. Department of Transportation, U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual issues).

Table 1-10: 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
Civilian aircraft (shipments)																	
Transport [a]	245	233	311	315	387	278	521	589	567	408	309	256	269	374	559	620	490
Helicopters	N	598	482	864	1,366	384	603	571	324	258	308	292	278	346	363	R361	494
General aviation	7,588	11,852	7,283	14,072	11,881	2,029	1,144	1,021	899	964	928	1,077	1,130	1,569	2,213	R2,496	2,795
Highway																	
Passenger car (new retail sales)	6,641,000	9,332,000	8,400,000	8,624,000	8,979,000	11,042,000	9,300,000	8,175,000	8,213,000	8,518,000	8,991,000	8,635,000	8,527,000	8,272,000	R8,142,000	R8,698,000	8,847,000
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	R539,000	U
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
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]
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	R481,200	418,300
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	R11,600,000	11,900,000
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	P6,815	U
Light rail	0	0	0	0	32	63	55	17	35	54	72	38	39	76	80	123	P136
Heavy rail	416	580	308	127	130	441	10	6	163	260	55	72	10	34	120	122	P204
Trolley bus	0	0	0	1	98	0	118	149	0	24	36	3	3	0	54	P0	U
Commuter rail	214	666	302	2,165	152	179	83	187	110	8	47	38	111	198	122	132	P116
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
Locomotive	389	1,387	1,029	772	1,480	522	530	472	321	504	821	928	761	743	889	709	640
Amtrak (deliveries)																	
Passenger train car	N	N	N	109	109	N	58	0	0	0	64	76	92	10	0	0	26
Locomotive	N	N	N	30	17	10	0	0	20	26	18	10	0	111	35	0	4
Water transport																	
Merchant vessel [g]	20	13	13	15	23	14	0	0	3	0	1	1	0	1	4	2	0
Recreational boat [h]	N	N	N	N	642,800	674,600	525,300	448,000	466,750	498,775	576,200	663,760	634,750	610,100	R575,800	R584,900	578,700

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

[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 and canoes. Also includes inflatable boats (until 1992) and sailboards (until 1990).

[i] Included in truck figure.

SOURCES:

Civilian aircraft:

1960-2000: 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).

1998-2000: Ward's Communications, *Motor Vehicle Facts & Figures* , 2001 (Detroit, MI: 2001), p. 21 (passenger car) and p. 6 (truck).

Motorcycles:

1970-99: Motorcycle Industry Council, Inc., *Motorcycle Statistical Annual, 2000* (Irvine, CA: 2001), p. 8 and similar tables in earlier editions.

Buses:

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

1998-2000: 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.

1998-2000: Ward's Communications, *Motor Vehicle Facts & Figures* , 2001 (Detroit, MI: 2001), p. 11.

Bicycles:
1980-2000: National Bicycle Dealers Association, Internet site http://www.nbda.com as of Aug. 7, 2001, and personal communication, Sept. 24, 1996.
Transit:
1960-99: American Public Transit Association 2001, *Public Transportation Fact Book* (Washington, DC: March 2001), table 56 and similar tables in earlier editions.
Class I rail:
1960-2000: Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), 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:
1960-2000: U.S. Department of Transprotation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues).
Recreational boat:
1980-2000: National Marine Manufacturers Association, *Boating 2000* (Chicago, IL: 2001), annual retail unit estimates.

Table 1-11: Active Air Carrier and General Aviation Fleet by Type of Aircraft

	1965	1970	1975	1980	[a]1985	[a]1990	1991	1992	1993	1994	1995	1996	[R]1997	[R]1998	1999
AIR CARRIER[b]	**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**
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**
Turbojet															
Four engine	511	931	602	436	322	432	410	389	410	420	435	440	450	447	441
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
Two engine	41	546	518	743	1,354	2,278	2,381	2,676	2,882	2,980	[R]3,187	3,270	3,434	3,726	4,008
Total turbojet	**725**	**2,136**	**2,114**	**2,526**	**3,164**	**4,148**	**4,167**	**4,446**	**4,584**	**4,636**	**[R]4,832**	**4,922**	**5,108**	**5,411**	**5,630**
Turboprop															
Four engine	215	110	68	92	108	88	75	107	102	87	81	56	45	39	28
Two engine	89	259	192	590	965	1,507	1,523	1,787	1,751	1,695	[R]1,632	[R]1,635	1,596	1,789	1,759
One engine	8	5	N	N	N	N	N	N	15	0	0	5	5	4	1
Total turboprop	**312**	**374**	**260**	**682**	**1,073**	**1,595**	**1,598**	**1,894**	**1,868**	**1,782**	**[R]1,713**	**[R]1,696**	**1,646**	**1,832**	**1,788**
Piston															
Four engine	447	34	37	73	38	31	26	20	22	19	15	18	19	17	19
Three engine	590	110	69	N	4	6	5	5	0	5	1	7	4	3	3
Two engine	30	9	8	522	394	292	252	415	293	335	[R]333	[R]317	298	391	292
One engine	N	N	N	N	N	N	N	407	406	465	399	397	407	340	374
Total piston	**1,067**	**153**	**114**	**595**	**436**	**329**	**283**	**847**	**721**	**824**	**[R]748**	**[R]739**	**728**	**751**	**688**
Helicopter	**21**	**16**	**7**	**2**	**5**	**11**	**6**	**133**	**124**	**128**	**118**	**121**	**134**	**117**	**122**
GENERAL AVIATION (GENERAL FLEET)[c]	**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**
Fixed Wing	**[d]93,130**	**127,934**	**161,570**	**200,097**	**184,700**	**184,500**	**182,585**	**171,671**	**156,936**	**150,158**	**162,342**	**163,691**	**166,854**	**175,203**	**184,723**
Turbojet															
Two engine	N	[e]822	[e]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
Other	N	128	[f]34	441	50	400	263	266	237	262	488	347	539	552	733
Total turbojet	**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**
Turboprop															
Two engine	N	1,287	[e]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
One engine	N	138	33	N	N	N	N	N	650	481	668	719	650	1,033	1,018
Other	N	33	N	123	100	400	526	599	24	7	32	80	29	65	21
Total turboprop	**N**	**1,458**	**2,519**	**4,090**	**5,000**	**5,300**	**4,941**	**4,786**	**4,116**	**4,092**	**4,995**	**5,716**	**5,619**	**6,174**	**5,679**
Piston															
Two engine	[e]11,422	15,835	[e]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
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
Other	N	199	N	212	100	100	131	77	14	51	33	68	79	70	108
Total piston	**92,556**	**125,526**	**157,275**	**193,014**	**175,600**	**175,200**	**173,518**	**162,881**	**149,156**	**142,152**	**152,788**	**153,551**	**156,056**	**162,963**	**171,923**
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**
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
Turbine															
Multiengine	N	N	N	N	N	N	N	N	629	616	733	643	764	843	839
One engine	N	589	N	N	N	N	N	N	2,246	2,485	3,234	3,420	3,762	4,038	4,045
Total turbine	**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**
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**
Gliders	N	N	N	N	N	N	N	N	1,814	2,976	2,182	1,934	2,016	2,105	2,041
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
Experimental	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**10,426**	**12,144**	**15,176**	**16,625**	**14,680**	**16,502**	**20,528**
Amateur Built	N	N	N	N	N	N	N	N	6,171	8,833	9,328	11,566	10,261	13,189	16,858
Exhibition	N	N	N	N	N	N	N	N	1,868	637	2,245	2,094	1,798	1,630	1,999
Other	N	N	N	N	N	N	N	N	2,387	2,674	3,603	2,965	2,620	1,684	1,671

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

[a] Source reported rounded data for general aviation.

[b] 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.

[c] Columns may not add to totals due to estimation procedures. 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.

[d] Total includes 574 turbine aircraft of unspecified subtype.

[e] Multiengine.

[f] Single-engine.

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.

1995-99: Aerospace Industries Association, Aerospace Facts and Figures (Washington DC: 2000/2001), "Active U.S. Air Carrier Fleet."

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 1998, FAA-APO-00-6* (Washington, DC: 2000), table 1.2.

1991-99: Ibid, Internet site http://www.api.faa.gov/GA2001/TABOFCOn.htm as of Mar. 5, 1999.

Table 1-12: U.S. Automobile and Truck Fleets by Use (Thousands)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL automobiles and trucks in fleets						**15,257**	**15,570**	**15,869**	**16,879**	**15,530**	**15,196**
Number of automobiles in fleets of 25 or more (10 or more cars for 1999 and 2000)[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
Government[c]	538	504	516	401	428	1,214	1,209	1,218	1,030	885	883
Utilities	551	544	548	386	382	376	376	377	359	320	317
Police	249	250	264	264	266	269	274	280	289	302	306
Taxi (includes vans)	141	141	140	140	141	139	130	181	190	135	136
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
Number of automobiles in fleets of 4 to 24 (4 to 9 cars for 1999 and 2000)[a]	U	U	U	U	U	4,200	4,250	4,373	4,921	1,172	1,173
Total automobiles in fleets						**9,042**	**9,124**	**9,225**	**9,550**	**7,742**	**7,346**
Number of trucks in fleets of 25 or more (10 or more trucks for 1999 and 2000)[a]											
Business[d]	U	U	1,080	1,378	1,375	1,205	1,275	1,332	1,360	3,016	3,026
Government[c]	U	U	297	632	646	2,221	2,215	2,223	2,010	2,400	2,408
Utilities	U	U	593	493	487	480	482	483	459	499	498
Other (police, taxi, etc.)	U	U	7	7	7	7	7	7	8	8	8
Rental trucks (not vans and SUVs)	U	U	304	308	363	202	197	179	181	213	248
Number of trucks in fleets of 4 to 24 (4 to 9 trucks for 1999 and 2000)[a]	U	U	U	U	U	2,100	2,270	2,420	3,311	1,652	1,662
Total trucks in fleets						**6,215**	**6,446**	**6,644**	**7,329**	**7,788**	**7,850**

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

[a] The data source, Bobit Publishing, changed data collection categories for 1999 and 2000.
[b] Includes driver schools.
[c] Includes military vehicles and federal, state, county, and local government vehicles.
[d] Businesses with 25 or more Class 1-5 trucks including leasing, construction, plumbing, heating, food distribution, pest control, cable TV, etc. (Also applies to 1999 and 2000 data).

SOURCE: Bobit Publishing Co., *Automotive Fleet Fact Book,* 2001.

Table 1-13: 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
Production																	
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
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	7,228
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**	**12,771**
Factory (wholesale) sales																	
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
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
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**

[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 rounding.

SOURCE: 1960-2000: Ward's, *Motor Vehicle Facts & Figures 2001* (Southfield, MI: 2001), p. 3.

Table 1-14: Retail[a] New Passenger Car Sales (Thousands)

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**R8,142**	**8,698**	**8,847**
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**	**R6,762**	**6,979**	**6,831**
Imports															
Japan	313	808	1,906	2,218	1,719	1,500	1,452	1,328	1,239	982	727	726	691	758	863
Germany	750	493	305	424	265	193	201	186	192	207	238	297	367	467	517
Other	217	271	187	196	419	345	284	262	303	317	308	332	R322	494	637
Total	**1,280**	**1,571**	**2,398**	**2,838**	**2,403**	**2,038**	**1,937**	**1,776**	**1,735**	**1,506**	**1,273**	**1,355**	**R1,380**	**1,719**	**2,016**

KEY: R = revised.

[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.

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, 1985-2000: Ward's, *Motor Vehicle Facts & Figures 2001* (Southfield, MI: 2001), p. 21.

Table 1-15: New and Used Passenger Car Sales and Leases (Thousands)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL new and used passenger car sales	**46,830**	**45,465**	**R45,164**	**R46,575**	**R49,131**	**R50,393**	**R49,327**	**R49,512**	**R48,982**	**R49,438**	**50,466**
New passenger car sales[a]	**9,300**	**8,175**	**R8,214**	**8,518**	**R8,990**	**8,635**	**8,526**	**8,272**	**R8,142**	**R8,698**	**8,846**
Used passenger car sales[b]	**37,530**	**37,290**	**36,950**	**38,057**	**40,141**	**41,758**	**R40,801**	**R41,240**	**R40,840**	**R40,740**	**41,620**
Value of transactions ($ billions)	219	230	247	R257	R292	R325	R333	R337	335	R353	363
Average price (current $)	5,830	6,157	R6,693	R6,750	R7,280	R7,776	R8,162	R8,164	R8,213	R8,674	8,715
New passenger car leases[c]	**534**	**667**	**882**	**1,197**	**1,715**	**1,795**	**1,806**	**2,062**	**2,174**	**2,271**	**2,272**

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:

Ward's, *Motor Vehicle Facts & Figures, 2001* (Southfield, MI: 2001), p.15.

Used passenger car sales:

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

Leased passenger cars:

CNW Marketing/Research, personal communication, May 31, 2000, Aug. 13, 2001.

Table 1-16: Retail Sales of New Cars by Sector (Thousands)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	R1999	2000
Total	**6,641**	**9,333**	**8,402**	**8,538**	**8,982**	**10,978**	**9,300**	**8,175**	**8,214**	**8,518**	**8,990**	**8,688**	**8,499**	**8,232**	**8,142**	**8,697**	**8,852**
Sales of new cars																	
Consumer	5,645	7,103	6,252	5,907	6,100	7,092	5,677	4,424	4,566	4,646	4,610	4,341	4,052	3,875	3,988	4,397	4,694
Business	930	2,140	2,056	2,508	2,758	3,754	3,477	3,648	3,529	3,757	4,255	4,203	4,313	4,246	R3,984	4,119	3,989
Government	66	89	94	123	124	132	147	103	119	114	124	144	134	112	R170	181	169
Percentage of total sales																	
Consumer	85.0	76.1	74.4	69.2	67.9	64.6	61.0	54.1	55.6	54.5	51.3	50.0	47.7	47.1	49.0	50.6	53.0
Business	14.0	22.9	24.5	29.4	30.7	34.2	37.4	44.6	43.0	44.1	47.3	48.4	50.7	51.6	R48.9	47.4	45.1

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 1-17: Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Automobiles, Selected Sales Periods[a] (Thousands)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Sales													
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
Minicompact	428	52	77	96	108	84	57	45	34	40	12	13	19
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
Compact	599	3,526	3,156	2,425	2,451	2,655	3,077	3,290	R3,493	2,937	2,309	2,367	2,398
Midsize	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
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
Two-seater	216	374	170	135	83	70	67	53	62	81	101	103	122
Market share, %													
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
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
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
Midsize	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
Large	14.7	13.8	13.9	13.9	14.1	14.2	15.0	15.1	14.6	R14.1	13.0	13.7	14.4
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
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
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
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
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
Midsize	21.3	24.9	25.9	25.9	25.8	25.7	25.6	25.9	26.4	26.3	26.9	R27.0	26.8
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
Two-seater	21.0	27.6	28.0	27.3	25.9	24.8	23.9	24.7	25.4	26.3	25.4	R25.2	25.8

KEY: mpg = miles per gallon; R = revised.

[a] These figures represent only those sales that could be matched to corresponding U.S. Environmental Protection Agency fuel economy values.

NOTE: Numbers and percents 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 20, ORNL-6941 (Oak Ridge, TN: 2000), table 7.5, p. 7-6, and personal communication, Oct. 11, 2001.

Table 1-18: Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Light Trucks, Selected Sales Periods[a] (Thousands)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Sales													
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
Small pickups	516	864	R1,136	R1,004	R1,001	R1,093	R1,160	R1,068	R1,010	R978	R891	R1,111	1,072
Large pickups	1,115	1,691	R1,116	R934	R1,038	R1,117	R1,405	R1,473	R1,607	R1,594	R1,947	R2,022	1,969
Small vans	14	438	R1,012	R948	R1,038	R1,203	R1,350	R1,331	R1,307	R1,298	R1,273	R1,372	1,272
Large vans	328	536	R319	R248	R281	R315	R321	R328	R293	R304	R331	R364	369
Small SUV[R]	52	442	402	349	382	416	433	510	580	350	487	662	756
Medium SUV[R]	152	187	434	493	582	785	916	1,077	1,272	1,448	1,586	1,758	2,167
Large SUV[R]	40	78	94	72	71	126	140	149	168	555	622	713	702
Market share, %													
Small pickups	23.3	20.4	R25.2	R24.8	R22.8	R21.6	R20.3	R18.0	R16.2	R15.0	R12.5	R13.9	12.9
Large pickups	50.3	39.9	R24.7	R23.1	R23.6	R22.1	R24.5	R24.8	R25.8	R24.4	R27.3	R25.3	23.7
Small vans	0.6	10.3	R22.4	R23.4	R23.6	R23.8	R23.6	R22.4	R21.0	R19.9	R17.8	R17.1	15.3
Large vans	14.8	12.7	R7.1	R6.1	R6.4	R6.2	R5.6	R5.5	R4.7	R4.7	R4.6	R4.5	4.4
Small SUV[R]	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
Medium SUV[R]	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
Large SUV[R]	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
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	R 20.0	20.4
Small pickups	25.5	26.8	R24.5	R 24.6	R 23.7	R 23.3	R 24.1	R 24.4	R 24.8	R 24.1	R 24.1	R 22.6	22.0
Large pickups	17.0	19.0	R 17.5	R 17.5	R 17.8	R 18.0	R 18.5	R 17.8	R 17.9	R 18.5	R 18.3	R 18.1	18.7
Small vans	19.6	23.9	R 22.3	R 22.2	R 21.9	R 22.4	R 21.6	R 22.4	R 22.3	R 22.5	R 23.0	R 22.8	23.0
Large vans	16.3	16.4	R 17.1	17.4	R 17.2	R 17.5	R 17.5	R 17.2	R 17.3	R 18.0	18.2	R 17.7	18.2
Small SUV[R]	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
Medium SUV[R]	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
Large SUV[R]	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

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

[a] These figures represent only those sales that could be matched to corresponding U.S. Environmental Protection Agency fuel economy values.

NOTES: Numbers and percents may not add to totals due to rounding.
Fleet sales total cannot be compared with truck sales in table 1-10 for the following reasons: 1) this table includes both domestic and imported trucks, whereas the numbers in table 1-10 are for domestic trucks only; and 2) this table covers only light trucks, whereas the numbers in table 1-10 include heavy trucks.

SOURCE: Light-Duty Vehicle MPG and Market Shares System Database, as cited in Oak Ridge National Laboratory, T*ransportation Energy Data Book,* Edition 20, ORNL-6941 (Oak Ridge, TN: 2000), table 7.6, p. 7-7, and personal communication, Oct. 11, 2001.

Table 1-19: World Motor Vehicle Production, Selected Countries (Thousands)

	Passenger cars[a]										
	1961	1971	1981	1991	1994	1995	1996	1997	1998	1999	2000
TOTAL world	**11,391**	**26,453**	**27,407**	**35,287**	**R35,730**	**36,111**	**37,318**	**38,474**	**37,286**	**38,816**	**40,732**
U.S. % of world	**48%**	**32%**	**23%**	**15%**	**19%**	**18%**	**16%**	**15%**	**15%**	**15%**	**14%**
Argentina	78	193	139	114	338	227	269	366	353	225	239
Australia	182	393	352	269	323	314	303	320	350	294	324
Austria	8	1	7	14	45	59	97	98	91	124	116
Belgium	N	279	216	253	409	386	368	356	319	218	912
Brazil	98	342	406	705	1,248	1,297	1,459	1,680	1,244	1,102	1,348
Canada	328	1,083	803	1,060	1,214	1,337	1,279	1,374	1,122	1,626	1,551
China	N	N	N	81	250	321	382	482	507	570	620
Czech Republic[c]	59	149	181	173	174	208	263	321	368	348	428
France	988	2,694	2,612	3,188	3,175	3,051	3,148	2,259	2,603	2,676	2,883
Germany	1,802	3,829	3,758	4,677	4,094	4,360	4,540	4,678	5,348	5,310	4,803
India	22	42	42	179	237	330	396	410	384	519	514
Italy	694	1,701	1,257	1,633	1,341	1,422	1,318	1,563	1,402	1,410	1,422
Japan	250	3,718	6,974	9,753	7,802	7,611	7,864	8,491	8,056	8,100	8,363
South Korea	N	N	69	1,158	1,806	2,003	2,265	2,308	1,625	2,362	2,602
Malaysia	N	N	N	102	137	164	176	280	126	200	280
Mexico	N	154	355	720	857	699	798	855	953	994	1,130
Netherlands	13	78	78	85	92	100	145	197	243	262	215
Poland	14	86	248	168	349	347	353	295	460	651	533
Portugal	N	N	N	N	38	41	119	186	181	187	191
Romania	N	N	N	84	85	71	76	108	104	88	58
Russia	149	518	1,324	1,308	796	838	868	982	U	946	966
Spain	55	453	855	1,943	1,974	2,131	2,213	2,342	2,217	2,029	2,445
Sweden	110	287	258	269	353	388	368	376	368	385	260
Taiwan	N	N	N	266	291	282	265	268	293	255	265
Turkey	N	13	25	196	213	233	208	243	U	U	297
United Kingdom	1,004	1,742	955	1,237	1,467	1,532	1,686	1,698	1,748	1,787	1,629
United States	5,522	8,584	6,253	5,439	6,614	6,351	6,083	5,927	5,554	5,638	5,542
Yugoslavia, Federal Republic of	15	114	240	213	8	8	9	11	U	U	U

continued

Table 1-19 *continued*

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

continued

Table 1-19 *continued*

	Total										
	1961	**1971**	**1981**	**1991**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
TOTAL world	**15,200**	**33,401**	**37,136**	**47,283**	**49,681**	**50,037**	**51,465**	**53,463**	**52,098**	**54,948**	**57,528**
U.S. % of world	**44%**	**32%**	**21%**	**19%**	**25%**	**24%**	**23%**	**23%**	**23%**	**24%**	**22%**
Argentina	136	253	172	139	409	286	313	446	458	305	340
Australia	231	470	392	284	354	331	322	349	384	311	348
Austria	13	7	15	20	48	68	106	108	103	139	141
Belgium	1	296	257	337	479	468	437	430	406	291	1,033
Brazil	145	516	780	960	1,582	1,629	1,805	2,067	1,573	1,344	1,671
Canada	391	1,360	1,323	1,889	2,320	2,408	2,397	2,571	2,173	3,057	2,962
China	N	N	N	709	1,353	1,435	1,466	1,578	1,628	1,805	2,009
Czech Republic[c]	76	177	230	202	180	216	272	369	411	376	455
France	1,205	3,010	3,020	3,611	3,558	3,475	3,591	2,581	2,954	3,033	3,352
Germany	2,213	4,141	4,116	5,035	4,356	4,667	4,843	5,023	5,727	5,688	5,198
India	54	89	149	355	475	636	762	746	513	780	796
Italy	759	1,817	1,433	1,878	1,534	1,667	1,545	1,817	1,693	1,701	1,738
Japan	1,039	5,811	11,180	13,245	10,554	10,196	10,346	10,975	10,050	9,905	10,145
South Korea	N	N	134	1,498	2,312	2,526	2,813	2,818	1,954	2,832	3,115
Malaysia	N	N	N	102	137	164	176	280	134	205	295
Mexico	N	211	597	989	1,123	935	1,220	1,358	1,453	1,534	1,923
Netherlands	19	91	90	111	115	132	164	218	271	287	267
Poland	36	146	308	193	365	381	401	322	499	695	556
Portugal	N	N	N	26	125	57	132	267	271	252	247
Romania	N	N	N	94	90	93	99	129	127	107	72
Russia	555	1,130	2,198	2,052	1,002	994	1,004	1,174	U	1,172	1,203
Spain	75	532	987	2,082	2,142	2,334	2,412	2,562	2,826	2,672	3,033
Sweden	132	317	313	344	435	490	463	480	483	494	296
Taiwan	N	N	N	382	423	406	366	381	405	350	365
Turkey	N	25	47	242	244	282	277	344	U	U	431
United Kingdom	1,447	2,198	1,185	1,454	1,695	1,765	1,924	1,936	1,981	1,973	1,817
United States	6,653	10,672	7,943	8,811	12,263	11,986	11,799	12,119	12,006	13,025	12,771
Yugoslavia, Federal Republic of	20	132	267	239	9	10	10	14	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] Includes all trucks and buses. Light trucks, such as pickups, sport utility vehicles, and minivans are included under commercial vehicles.
[c] Formerly Czechoslovakia.

NOTES: Prior to 2000, the country of manufacture was recognized as the producing country. To conform with current OICA 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 total due to rounding.

SOURCE: Ward's, *Motor Vehicle Facts & Figures 2001* (Southfield, MI: 2001), p. 12 and similar tables in previous editions.

Table 1-20: 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
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**
U.S. fleet	**2,926**	**2,376**	**1,579**	**857**	**864**	**737**	**636**	**619**	**603**	**565**	**543**	**509**	**495**	**477**	**470**	**463**	**454**
U.S. share of the world fleet	**17%**	**13%**	**8%**	**4%**	**3%**	**3%**	**3%**	**3%**	**3%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**
Freighters, Total	**2,138**	**1,747**	**1,076**	**511**	**471**	**417**	**367**	**359**	**349**	**322**	**308**	**295**	**292**	**288**	**289**	**284**	**286**
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**
General cargo[a]	N	N	N	356	259	209	166	165	182	169	152	142	146	142	140	137	136
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
Containership	N	N	N	109	121	104	92	92	83	87	86	81	83	85	91	89	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
Partial containerships	N	N	N	37	68	63	59	52	30	3	3	3	1	1	N	N	N
DWT (thousands)	N	N	N	510	940	904	836	741	456	57	57	57	17	17	N	N	N
RO/RO	N	N	N	9	23	41	50	50	54	63	67	69	62	60	58	58	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
Tankers, Total	**422**	**341**	**294**	**267**	**308**	**258**	**233**	**226**	**220**	**210**	**200**	**181**	**173**	**161**	**154**	**154**	**142**
DWT (thousands)	**7,815**	**7,561**	**7,739**	**9,711**	**16,152**	**15,534**	**15,641**	**14,993**	**14,180**	**13,048**	**[R]11,945**	**11,028**	**10,378**	**9,696**	**9,289**	**9,373**	**8,447**
Petroleum/chemical[b] ships	N	N	N	N	N	244	219	212	206	196	186	167	159	148	145	146	142
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
Liquefied petroleum/ natural gas ships	N	N	N	N	N	14	14	14	14	14	14	14	14	13	9	8	N
DWT (thousands)	N	N	N	N	N	960	960	960	901	905	905	905	905	839	552	528	N
Combination/ passenger and cargo, Total	**309**	**227**	**171**	**60**	**65**	**37**	**10**	**10**	**11**	**12**	**13**	**13**	**15**	**14**	**12**	**11**	**11**
DWT (thousands)	**2,070**	**1,488**	**1,107**	**388**	**446**	**299**	**91**	**92**	**97**	**104**	**115**	**115**	**139**	**136**	**116**	**99**	**99**
Bulk carriers, Total	**57**	**61**	**38**	**19**	**20**	**25**	**26**	**24**	**23**	**21**	**22**	**20**	**15**	**14**	**15**	**14**	**15**
DWT (thousands)	**805**	**1,107**	**767**	**544**	**607**	**1,152**	**1,270**	**1,014**	**991**	**949**	**1,042**	**925**	**575**	**321**	**604**	**579**	**604**

KEY: DWT = deadweight tons; 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.

SOURCES: 1960-1997: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues), and unpublished revisions.
1998-2000: U.S. Department of Transportation, Maritime Administration, personal communication, Oct. 24, 2001.

Table 1-21: U.S. Airport Runway Pavement Conditions

	1986	1990	1993	1997	1999	2000	2001
NPIAS[a] airports, total	**3,243**	**3,285**	**3,294**	**3,331**	**3,344**	**3,361**	**3,354**
Condition (%)							
Good	61	61	68	72	72	73	73
Fair	28	29	25	23	23	22	22
Poor	11	10	7	5	5	5	5
Commercial service airports[b], total	**550**	**568**	**554**	**566**	**547**	**546**	**546**
Condition (%)							
Good	78	78	79	79	78	79	79
Fair	15	17	18	19	20	19	19
Poor	7	5	3	2	[R]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 100% of all enplanements and serve 91.5% of all aircraft (based on an estimated fleet of 200,000 aircraft). In 1997, there were 14,961 non-NPIAS airports. See table 1-2 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 S*ystems (Washington DC: 1991).

1993: Ibid., *National Plan of Integrated Airport Systems* (Washington DC: 1995).

1997, 1999-2001: Ibid., Office of Airport Planning and Programming, National Planning Division, personal communication, 1997, 2000, Aug. 20, 2001, May 27, 2002.

Total number of airports:

1986-2001: U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Planning and Programming, National Planning Division, personal communication, June 23, 2000, Aug. 20, 2001, May 27, 2002.

Table 1-22: Median Age of Automobiles and Trucks in Operation in the U.S.

	Automobiles	Trucks
1970	4.9	5.9
1975	5.4	5.8
1980	6.0	6.3
1985	6.9	7.6
1990	6.5	6.5
1991	6.7	6.8
1992	7.0	7.2
1993	7.3	7.5
1994	7.5	7.5
1995	7.7	7.6
1996	7.9	7.7
1997	8.1	7.8
1998	8.3	7.6
1999	8.3	7.2
2000	8.3	6.9

KEY: N = data do not exist.

NOTE: The National Personal Transportation Survey conducted by the U.S. Department of Transportation, Federal Highway Administration, estimates the mean age of automobiles, trucks, and vans for several years:

	1969	1977	1983	1990	1995
Automobiles	5.1	5.5	6.7	7.6	8.2
Trucks	N	6.4	7.9	9.0	8.3 (inc. vans)

SOURCE: The R.L. Polk Co., personal communication, Aug. 9, 2001.

Table 1-23: Condition of U.S. Roadways by Functional System

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**
Poor (%)	8.7	7.6	5.2	7.0	6.5	6.3	3.9	3.6	4.1	2.4	2.1
Mediocre (%)	[a]	[a]	14.1	27.7	26.5	20.7	19.1	19.1	16.5	14.0	12.2
Fair (%)	31.9	31.7	17.4	20.9	23.9	22.3	21.7	20.7	17.8	18.1	16.9
Good (%)	[a]	[a]	27.6	36.1	33.2	36.9	38.8	41.0	42.6	44.0	44.8
Very good (%)	59.5	60.7	35.6	8.3	9.9	13.9	16.6	15.7	19.0	21.5	23.9
Unpaved (%)	N	N	N	N	N	N	N	N	N	N	N
Miles not reported	**N**	**N**	**N**	**3,563**	**955**	**1,326**	**1,508**	**1,382**	**2,313**	**153**	**162**
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**	**97,284**
Poor (%)	3.4	3.6	3.3	2.9	2.4	4.4	1.4	1.6	1.4	0.9	0.8
Mediocre (%)	[a]	[a]	5.9	9.2	8.2	7.6	5.8	4.9	4.6	3.7	3.2
Fair (%)	42.6	44.5	34.6	54.8	57.4	51.1	49.1	47.7	43.3	41.5	38.7
Good (%)	[a]	[a]	28.5	26.7	26.6	27.9	34.4	[R]37.2	38.3	40.5	42.9
Very good (%)	53.8	51.9	27.6	6.4	5.4	9.0	9.3	8.6	12.3	13.5	14.4
Unpaved (%)	N	N	N	N	N	N	N	N	N	N	N
Miles not reported	**N**	**N**	**N**	**17,905**	**7,489**	**8,683**	**6,028**	**6,083**	**5,524**	**1,587**	**1,625**
Minor arterials											
Miles reported	**144,735**	**142,866**	**137,637**	**134,837**	**124,877**	**121,443**	**126,381**	**126,525**	**130,591**	**135,192**	**136,092**
Poor (%)	4.6	4.3	3.9	3.9	3.5	3.7	2.3	2.3	1.9	1.7	1.7
Mediocre (%)	[a]	[a]	7.1	9.1	10.5	9.0	8.2	6.7	6.0	5.2	5.3
Fair (%)	48.2	47.3	36.4	53.5	57.9	54.7	50.7	50.4	47.2	47.3	46.2
Good (%)	[a]	[a]	25.3	25.0	23.6	23.9	31.0	33.6	34.3	34.4	35.6
Very good (%)	47.2	48.4	26.8	8.5	4.5	8.7	7.7	7.0	10.6	11.4	11.2
Unpaved (%)	–	–	N	N	N	N	N	N	N	N	N
Miles not reported	**N**	**N**	**N**	**12,740**	**13,294**	**15,708**	**[R]10,978**	**10,978**	**6,664**	**1,968**	**1,227**
Major collectors											
Miles reported	**436,365**	**436,737**	**434,175**	**432,223**	**431,111**	**431,712**	**432,117**	**386,122**	**[R]171,134**	**163,544**	**388,485**
Poor (%)	8.9	7.7	7.8	6.8	6.5	6.5	6.7	7.8	[R]8.8	9.3	8.5
Mediocre (%)	[a]	[a]	11.0	12.4	11.3	11.4	10.3	12.3	[R]13.0	12.1	12.7
Fair (%)	43.8	45.2	32.3	37.7	33.5	30.8	[R]34.4	37.6	[R]33.5	33.2	43.7
Good (%)	[a]	[a]	17.7	16.3	16.1	17.4	20.0	23.0	[R]21.3	20.9	22
Very good (%)	36.2	36.1	20.4	15.9	21.9	23.7	18.4	19.3	[R]23.4	24.5	13.2
Unpaved (%)	11.1	11.0	10.7	10.9	10.7	10.2	10.1	N	N	N	N
Miles not reported[b]	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**2,402**	**[R]217,566**	**U**	**U**

continued

Table 1-23 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**
Poor (%)	8.6	7.7	7.1	10.6	13.0	10.4	8.6	9.0	9.4	7.3	6.5
Mediocre (%)	[a]	[a]	13.2	30.9	29.9	26.8	28.3	27.0	25.5	23.1	21.7
Fair (%)	32.2	32.3	17.0	23.6	24.2	23.8	24.7	24.4	21.8	22.6	21.4
Good (%)	[a]	[a]	28.0	28.3	26.7	27.5	30.7	32.9	32.0	34.9	37.1
Very good (%)	59.1	60.0	34.7	6.5	6.2	11.4	7.6	6.7	11.4	12.0	13.3
Unpaved (%)	N	N	N	N	N	N	N	N	N	N	N
Miles not reported	**N**	**N**	**N**	**2,140**	**788**	**857**	**787**	**771**	**1,040**	**230**	**226**
Other freeways and expressways											
Miles reported	**7,670**	**7,714**	**8,465**	**7,011**	**7,618**	**7,804**	**8,410**	**8,480**	**8,772**	**8,860**	**8,794**
Poor (%)	2.2	2.3	2.6	3.8	5.3	4.8	3.4	3.3	3.2	2.6	2.8
Mediocre (%)	[a]	[a]	5.9	9.4	12.7	9.8	8.7	8.7	8.7	8.0	8.1
Fair (%)	43.9	44.2	32.4	60.6	58.1	54.7	54.7	58.5	54.3	53.6	50.6
Good (%)	[a]	[a]	28.1	22.7	20.9	20.4	26.3	25.2	27.1	30.0	31.6
Very good (%)	53.9	53.5	31.0	3.5	2.9	10.3	6.8	4.2	6.6	6.8	6.8
Unpaved (%)	N	N	N	N	N	N	N	N	N	N	N
Miles not reported	**N**	**N**	**N**	**1,846**	**1,377**	**1,166**	**[R]617**	**579**	**397**	**281**	**355**
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**	**47,797**
Poor (%)	5.9	6.6	6.8	9.2	12.5	12.4	11.8	12.1	12.9	12.5	13.2
Mediocre (%)	[a]	[a]	11.5	13.3	16.3	14.7	14.1	14.6	18.5	18.1	16.8
Fair (%)	49.0	49.1	34.8	55.0	50.8	47.2	48.9	49.5	45.3	45.2	45.1
Good (%)	[a]	[a]	21.4	19.3	16.6	15.9	17.5	17.8	17.6	18.8	19.4
Very good (%)	45.1	44.3	25.3	3.3	3.8	9.7	7.7	6.0	5.8	5.4	5.4
Unpaved (%)	N	N	N	N	N	N	N	N	N	N	N
Miles not reported	**N**	**N**	**N**	**22,498**	**14,492**	**11,352**	**8,485**	**8,209**	**8,246**	**5,154**	**5,518**
Minor arterials											
Miles reported	**74,656**	**74,979**	**80,368**	**86,819**	**87,852**	**88,510**	**89,020**	**88,484**	**[R]45,275**	**43,481**	**88,339**
Poor (%)	8.9	7.4	7.9	7.9	6.7	6.7	6.9	7.2	[R]5.7	5.8	10.0
Mediocre (%)	[a]	[a]	14.3	13.8	12.3	13.6	13.0	13.0	12.2	11.7	16.0
Fair (%)	48.5	49.9	34.1	40.2	38.1	36.9	37.9	37.9	[R]36.0	35.3	39.8
Good (%)	[a]	[a]	19.2	18.4	20.5	20.4	20.7	21.4	[R]22.1	20.5	16.9
Very good (%)	42.1	42.1	24.0	19.4	22.1	22.1	21.1	20.6	[R]24.0	26.8	17.3
Unpaved (%)	0.5	0.6	0.5	0.4	0.3	0.3	0.4	N	N	N	N
Miles not reported[b]	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**374**	**[R]43,435**	**U**	**U**
Collectors											
Miles reported	**78,248**	**77,097**	**82,657**	**84,856**	**86,098**	**87,331**	**87,790**	**86,666**	**[R]53,806**	**52,002**	**86,026**
Poor (%)	16.5	11.2	10.5	10.6	9.8	9.7	9.7	10.6	[R]8.1	9.0	14.7
Mediocre (%)	[a]	[a]	16.9	16.8	16.2	16.8	16.6	16.0	[R]12.8	13.0	17.4
Fair (%)	50.4	53.5	35.2	40.0	40.0	39.0	39.2	39.0	[R]39.4	37.4	35.7
Good (%)	[a]	[a]	17.3	16.1	17.0	17.2	18.2	18.4	[R]18.8	17.2	14.2
Very good (%)	31.7	34.2	19.1	15.5	16.0	16.6	15.4	15.9	[R]20.9	23.4	18
Unpaved (%)	1.3	1.1	1.1	1.0	0.9	0.8	0.9	N	N	N	N
Miles not reported[b]	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**663**	**[R]32,921**	**U**	**U**

KEY: N = data do not exist; R = revised; U = data are not available; – = value too small to report.

[a] Included in row below.

[b] The significant increase in miles not reported can be attributed to the fact that many states are electing to report pavement conditions by the more objective International Roughness Indicator (IRI) rather than by the Present Serviceability Rating (PSR), which has traditionally been used to determine pavement conditions for these systems.

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 1-4 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.

Percents 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.

1993-98, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-63 for rural major collector, urban minor arterial, and urban collector, and table HM-64 for all other categories.

1999: Ibid., personal communication, June 5, 2002.

Table 1-24: Condition of U.S. Highway Bridges

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

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

Functionally deficient bridges: 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 and 1997-99 are as of December of those years; data for 1991, 1994-96 are as of June of those years; data for 1993 is as of September of that year; and data for 2000 is as of August of that year.

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

Table 1-25: Average Age of Urban Transit Vehicles (Years)

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
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
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
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
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
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
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
Full-size	8.1	8.2	8.0	8.3	8.5	9.9	8.7	8.8	8.6	8.5	8.4
Mid-size	5.6	6.6	6.7	6.8	6.4	7.2	6.9	6.3	5.8	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
Trolley	U	10.9	10.3	11.2	12.0	11.1	13.1	14.0	14.7	14.6	15.6
Other											
Vans	3.8	2.8	3.0	3.1	3.1	3.9	3.1	3.1	3.0	2.9	3.1
Ferry boats	U	21.7	19.6	22.7	24.7	23.5	23.4	25.3	25.4	25.8	25.1

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.

SOURCES: 1985-1998: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues), table 28 and similar tables in earlier editions.
1999: Ibid., *National Transit Database* (Washington, DC: Annual issues), table 29.

Table 1-26: Class I Railroad Locomotive Fleet by Year Built (Locomotive units)

Year built [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total	**18,835**	**18,344**	**18,004**	**18,161**	**18,505**	**18,812**	**19,269**	**19,684**	**20,261**	**20,256**	**20,028**
Before 1970	5,117	4,353	4,038	3,766	3,535	[b]	[b]	[b]	[b]	[b]	[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]5196	[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
1980-84	2,837	2,826	2,784	2,730	2,625	2,754	2,735	2,728	2,723	2,581	2,411
1985-89	1,989	1,985	1,970	1,968	1,971	1,890	1,866	1,829	1,830	1,779	1,775
1990	608	605	604	604	599	[d]2,965	[d]2,959	[d]2,958	[d]2,736	[d]2,688	[d]2,648
1991		583	595	595	594	[e]	[e]	[e]	[e]	[e]	[e]
1992			337	340	339	[e]	[e]	[e]	[e]	[e]	[e]
1993				558	602	[e]	[e]	[e]	[e]	[e]	[e]
1994					781	[e]	[e]	[e]	[e]	[e]	[e]
1995						901	945	983	953	951	973
1996							707	696	708	706	697
1997								742	741	743	745
1998									889	890	890
1999										722	713
2000											635

[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.

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

Table 1-27: Age and Availability of Amtrak Locomotive and Car Fleets

	1972	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Locomotives															
% available for service[a]	N	87	83	93	84	86	83	84	85	88	88	88	88	90	89
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
Passenger and other train cars															
% available for service[a]	N	82	77	90	90	92	90	89	88	90	90	91	93	91	91
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	[R]19.8	[R]21.1	[R]22.2	19.4

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

[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).
1985-99: Ibid., *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues).
2000: Ibid., *Amtrak Annual Report* , Statistical Appendix (Washington, DC: Annual issues).

Table 1-28: U.S. Flag Vessels by Type and Age (Number of vessels)

	Vessel type							
Age[a]	Dry cargo	Tanker	Towboat	Passenger[b]	Offshore support/ crewboats[c]	Dry barge	Tank/ liquid barge[d]	Total[e]
1990-91								
<=5	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
Total[e]	**900**	**257**	**5,210**	**721**	**1,168**	**27,110**	**3,874**	**39,342**
1992								
<=5	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
Total[e]	**497**	**249**	**5,203**	**1,201**	**1,205**	**26,981**	**3,864**	**39,313**
1993								
<=5	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
Total[e]	**470**	**205**	**5,219**	**1,243**	**1,197**	**26,982**	**3,970**	**39,306**
1994								
<=5	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
Total[e]	**778**	**202**	**5,179**	**928**	**1,236**	**26,757**	**3,966**	**39,064**
1995								
<=5	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
Total[e]	**726**	**178**	**5,127**	**954**	**1,288**	**27,375**	**3,985**	**39,641**

continued

Table 1-28 *continued*

	Vessel type							
Age[a]	Dry cargo	Tanker	Towboat	Passenger[b]	Offshore support/ crewboats[c]	Dry barge	Tank/ liquid barge[d]	Total[e]
1996								
<=5	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
Total[e]	**713**	**161**	**5,177**	**967**	**1,274**	**28,775**	**4,036**	**41,104**
1997								
<=5	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
Total[e]	**692**	**147**	**5,173**	**1,025**	**1,369**	**29,040**	**3,971**	**41,419**
1998								
<=5	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
Total[e]	**714**	**135**	**5,237**	**1,011**	**1,423**	**29,557**	**3,952**	**42,032**
1999								
<=5	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
Total[e]	**695**	**142**	**5,098**	**970**	**1,470**	**29,414**	**3,973**	**41,766**
2000								
<=5	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
Total[e]	**737**	**135**	**4,995**	**918**	**1,414**	**29,141**	**4,011**	**41,354**

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

[b] Includes passenger excursion/sightseeing, combination passenger and dry cargo vessels, and ferries.

[c] In 1992, offshore supply boats were designated as crewboats.

[d] In 1992, tank barges were designated as liquid barges.

[e] Totals may be greater than sum of columns because of unclassified vessels and vessels of unknown age; figures include vessels available for operation.

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 2000 and similar tables in previous years; also available on Internet site www.wrsc.usace.army.mil/ndc/ as of June 25, 2002.

Table 1-29: U.S. Vehicle-Miles (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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	5,646
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
Highway																	
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	R1,438,294	1,469,854	1,502,556	1,549,577	1,569,100	1,601,914
Motorcycle[b]	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	10,479
Other 2-axle 4-tire vehicle[c]	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	924,018
Truck																	
Single-unit 2-axle 6-tire or more truck	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	70,583
Combination truck	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	135,208
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	7,601
Total highway[c]	**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**	**R2,422,696**	**2,485,848**	**2,561,695**	**2,631,522**	**2,691,056**	**2,749,803**
Transit																	
Motor bus[d]	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	R2,175	P2,276	U
Light rail	75	42	34	24	18	17	24	28	29	28	34	35	38	41	R44	P49	U
Heavy rail	391	395	407	423	385	451	537	527	525	522	532	537	543	558	566	P578	U
Trolley bus	101	43	33	15	13	16	14	14	14	13	14	14	14	14	14	P14	U
Commuter rail	N	N	N	173	179	183	213	215	219	224	231	238	242	251	R260	P266	U
Demand responsive[d]	N	N	N	N	N	247	306	335	364	406	464	507	548	585	R671	P718	U
Ferry boat	N	N	N	N	i	i	2	2	2	3	2	3	2	R3	R3	P3	U
Other	N	N	N	15	15	15	R16	R19	R24	R30	R29	R34	R43	R50	R63	P69	U
Total transit[e]	**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**	**R3,794**	**P3,972**	**U**
Rail																	
Class I freight, train-miles	404	421	427	403	428	347	380	375	390	405	441	458	469	475	475	490	504
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
Intercity/Amtrak[f], train-miles	209	172	93	30	30	30	33	34	34	35	34	32	30	32	33	34	35
Intercity/Amtrak[f], car-miles	2,208	1,775	690	253	235	251	301	313	307	303	304	292	276	288	312	342	368
Total train-miles[g]	**613**	**593**	**520**	**433**	**458**	**377**	**413**	**409**	**424**	**440**	**475**	**490**	**499**	**507**	**508**	**524**	**539**

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] 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 Transporation Statistics by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.

[c] 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.

[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.

[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).
1985-2000: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Air Carrier Traffic Statistics (Washington, DC: Annual December issues), p. 2, line 27 plus line 50.
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.
1995-2000: 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.
1985-2000: 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.
1995-2000: 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.
1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.
Transit:
1960-99: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: 2001), table 42, 84, and similar tables in earlier editions.
Rail:
Class I rail freight train- and car-miles:
1960-2000: Association of American Railroads, *Railroad Facts, 2000* (Washington, DC: 2001), 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.
1975-2000: 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.

Table 1-30: 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
VMT (millions)													
Urban													
Interstate	161,242	216,188	278,901	285,325	303,265	317,399	330,577	R341,528	351,579	361,401	374,622	383,103	393,420
Other arterials[a]	484,189	578,270	699,233	707,518	745,618	773,978	797,899	R815,170	834,623	846,659	862,994	877,796	899,794
Collector	83,043	89,578	106,297	107,281	116,065	117,887	120,088	R126,929	129,310	130,143	131,919	131,549	135,316
Local	126,791	160,062	191,053	188,373	198,106	200,408	200,683	205,907	208,374	222,142	228,530	234,507	235,634
Total	**855,265**	**1,044,098**	**1,275,484**	**1,288,497**	**1,363,054**	**1,409,672**	**1,449,247**	**R1,489,534**	**1,523,886**	**1,560,345**	**1,598,065**	**1,626,955**	**1,664,164**
Rural													
Interstate	135,084	154,357	200,173	205,011	205,557	208,308	215,568	223,382	232,565	240,255	251,520	260,060	268,850
Other arterials[a]	262,774	282,803	330,866	334,755	344,062	349,567	357,329	368,595	378,847	392,058	403,484	413,152	420,398
Collector[b]	189,468	206,669	240,460	245,630	234,910	226,296	230,529	236,148	241,030	254,364	257,858	264,345	267,412
Local	84,704	86,899	97,379	98,157	99,568	102,535	104,915	105,164	107,752	114,673	120,595	125,875	127,859
Total	**672,030**	**730,728**	**868,878**	**883,553**	**884,097**	**886,706**	**908,341**	**933,289**	**960,194**	**1,001,350**	**1,033,457**	**1,063,432**	**1,084,519**
VMT per lane-mile (thousands)													
Urban													
Interstate	3,327	3,773	4,483	4,542	4,508	4,588	4,667	R4,784	4,897	R5,002	R5,131	5,229	5,325
Other arterials[a]	1,451	1,556	1,751	1,758	1,783	1,778	1,803	R1,829	1,857	R1,866	R1,901	1,950	1,977
Collector	572	552	634	649	659	656	655	686	692	R689	R703	706	718
Local	146	168	184	179	181	179	178	181	181	R190	R194	198	197
Total	**613**	**677**	**764**	**766**	**775**	**782**	**794**	**R810**	**820**	**R829**	**R845**	**858**	**869**
Rural													
Interstate	1,031	1,170	1,473	1,502	1,540	1,576	1,642	1,693	1,749	1,804	R1,888	1,939	1,998
Other arterials[a]	518	555	640	646	653	665	674	695	R711	R730	R750	766	779
Collector[b]	132	141	164	167	163	158	161	167	170	179	182	187	189
Local	19	20	23	23	23	24	25	25	25	27	29	30	30
Total	**103**	**113**	**136**	**138**	**139**	**140**	**144**	**148**	**R152**	**157**	**R165**	**169**	**172**

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.

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-202.
1995-1998, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), tables VM-2 and VM-2A.
1999: Ibid., personal communication, June 5, 2002.
Lane-miles:
1980-95: Ibid., Office of Highway Information Management, unpublished data, 1997, table HM-260.
1996-1998, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-60.

Table 1-31: U.S. Passenger-Miles (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Air																	
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	515,367
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	[R]13,100	13,500	U
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**	**501,857**	**U**
Highway																	
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	2,271,310	2,337,068	2,389,064	2,463,827	2,494,870	2,547,044
Motorcycle[b,c]	[g]	[g]	3,277	6,192	12,257	11,812	12,424	11,656	11,946	12,184	12,390	11,560	11,706	11,896	12,134	11,642	11,527
Other 2-axle 4-tire vehicle[c]	[h]	[h]	225,613	363,267	520,774	688,091	999,754	1,116,958	1,201,667	1,252,860	1,269,292	1,295,648	1,339,126	1,395,212	1,423,971	1,432,625	1,469,189
Truck																	
Single-unit 2-axle 6-tire or more truck	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	[R]68,021	70,304	70,583
Combination truck	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	135,208
Bus[d]	N	N	N	N	N	94,925	121,398	121,906	122,496	129,852	135,871	136,104	138,613	145,060	[R]148,558	162,445	161,152
Total[c]	**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**	**3,892,778**	**4,009,484**	**4,132,709**	**[R]4,244,870**	**4,304,270**	**4,394,703**
Transit																	
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	[R]20,360	[P]21,205	U
Light rail	N	N	N	N	381	350	571	662	701	705	833	860	957	1,035	[R]1,128	[P]1,206	U
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	[P]12,902	U
Trolley bus	N	N	N	N	219	306	193	195	199	188	187	187	184	189	182	[P]186	U
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	[R]8,704	[P]8,766	U
Demand responsive[d]	N	N	N	N	N	364	431	454	495	562	577	607	656	754	[R]735	[P]813	U
Ferry boat	N	N	N	N	[i]	[i]	286	282	271	260	260	260	[R]265	[R]294	[R]294	[P]310	U
Other	N	N	N	N	390	439	124	148	182	251	232	273	[R]339	[R]369	[R]441	[P]469	U
Total[e]	**[j]4,197**	**[j]4,128**	**[j]4,592**	**[j]4,513**	**39,854**	**39,581**	**41,143**	**40,703**	**40,241**	**39,384**	**39,585**	**39,808**	**41,378**	**42,339**	**[R]44,128**	**[P]45,857**	**U**
Rail																	
Intercity/Amtrak[f]	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

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

[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 Transporation Statistics by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.
[c] 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.
[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] Ferry boat included in other.
[j] Includes commuter rail figures only.

NOTES: Air carrier passenger-miles are computed by summing of the products of the aircraft-miles flown on each interairport segment multiplied by the number of passengers carried on that segment. Highway passenger-miles 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 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-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).
1985-2000: 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:
1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), pp. 14-15.
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.
1995-2000: 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.
1985-2000: 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.

1985-2000: 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.

1995-2000: 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.

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Transit:

Ferry boat and other:

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

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

All other data:

1960-99: American Public Transit Association, *Transit Fact Book* (Washington, DC: 2001), table 30 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.

1990-2000: Ibid., *Amtrak FY00 Annual Report* Statistical Appendix (Washington, DC: 2001), p. 46.

Table 1-32: Principal Means of Transportation to Work (Thousands)

	1985		1989		1993		1997		1999	
	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
Automobile	86,148	86.5	93,943	88.1	91,301	88.0	101,907	87.5	103,466	87.7
Drives self	72,137	72.4	81,322	76.3	79,449	76.6	90,207	77.5	92,363	78.2
Carpool	14,011	14.1	12,621	11.8	11,852	11.4	11,700	10.0	11,103	9.4
2 person	10,381	10.4	9,708	9.1	9,105	8.8	9,294	8.0	8,705	7.4
3 person	2,024	2.0	1,748	1.6	1,684	1.6	1,526	1.3	1,454	1.2
4+ person	1,606	1.6	1,165	1.1	1,063	1.0	881	0.8	945	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
Taxicab	129	0.1	152	0.1	117	0.1	139	0.1	144	0.1
Bicycle or motorcycle	958	1.0	795	0.7	744	0.7	738	0.6	749	0.6
Walks only	4,032	4.0	3,634	3.4	3,227	3.1	3,869	3.3	3,627	3.1
Other means[b]	286	0.3	491	0.5	474	0.5	867	0.7	987	0.8
Works at home	2,947	3.0	2,736	2.6	3,137	3.0	3,611	3.1	3,288	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.

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

Table 1-33: Long-Distance Travel in the United States by Selected Trip Characteristics: 1995
(Roundtrips of 100 miles or more, one way, U.S. destinations only)

	Household trips (thousands)		Person trips (thousands)		Person-miles (millions)		Personal-use vehicle trips (thousands)		Personal-use vehicle-miles (millions)	
	Number	%	Number	%	Number	%	Number	%	Number	%
TOTAL	**656,462**	**100.0**	**1,001,319**	**100.0**	**826,804**	**100.0**	**505,154**	**100.0**	**280,127**	**100.0**
Principal means of transportation										
Personal-use vehicle	505,154	77.0	813,858	81.3	451,590	54.6	505,154	100.0	280,127	100.0
Airplane	129,164	19.7	161,165	16.1	355,286	43.0	NA	NA	NA	NA
Commercial airplane	124,884	19.0	155,936	15.6	347,933	42.1	NA	NA	NA	NA
Bus	17,340	2.6	20,445	2.0	13,309	1.6	NA	NA	NA	NA
Intercity	2,755	0.4	3,244	0.3	2,723	0.3	NA	NA	NA	NA
Charter or tour	11,890	1.8	14,247	1.4	9,363	1.1	NA	NA	NA	NA
Train	4,200	0.6	4,994	0.5	4,356	0.5	NA	NA	NA	NA
Ship, boat, or ferry	391	0.1	614	0.1	1,834	0.2	NA	NA	NA	NA
Other	213	RZ	243	RZ	429	0.1	NA	NA	NA	NA
Roundtrip distance										
Less than 300 miles	194,098	29.6	306,433	30.6	74,658	9.0	185,418	36.7	45,159	16.1
300-499 miles	174,389	26.6	274,045	27.4	106,007	12.8	159,743	31.6	61,779	22.1
500-999 miles	140,046	21.3	214,006	21.4	146,631	17.7	106,846	21.2	72,114	25.7
1,000-1,999 miles	76,110	11.6	108,331	10.8	153,316	18.5	36,722	7.3	49,952	17.8
2,000 miles or more	71,819	10.9	98,503	9.8	346,192	41.9	16,425	3.3	51,123	18.3
Mean (miles)	872	NA	826	NA	NA	NA	555	NA	NA	NA
Median (miles)	438	NA	425	NA	NA	NA	368	NA	NA	NA
Calendar quarter										
1st quarter	130,963	19.9	200,331	20.0	155,603	18.8	99,549	19.7	50,801	18.1
2nd quarter	168,669	25.7	258,400	25.8	208,256	25.2	130,135	25.8	72,421	25.9
3rd quarter	193,913	29.5	304,542	30.4	261,463	31.6	152,862	30.3	90,558	32.3
4th quarter	162,917	24.8	238,047	23.8	201,471	24.4	122,607	24.3	66,346	23.7
Main purpose of trip										
Business	192,537	29.3	224,835	22.5	212,189	25.7	125,036	24.8	61,929	22.1
Pleasure	372,586	56.8	630,110	62.9	506,971	61.3	305,571	60.5	177,698	63.4
Visit relatives or friends	195,468	29.8	330,755	33.0	264,769	32.0	159,981	31.7	92,190	32.9
Leisure[a]	177,119	27.0	299,355	29.9	242,201	29.3	145,590	28.8	85,508	30.5
Rest or relaxation	65,017	9.9	115,154	11.5	100,838	12.2	53,780	10.6	33,598	12.0
Sightseeing	24,272	3.7	42,649	4.3	50,781	6.1	18,069	3.6	14,654	5.2
Outdoor recreation	39,899	6.1	65,418	6.5	41,620	5.0	35,987	7.1	19,407	6.9
Entertainment	37,456	5.7	58,757	5.9	42,929	5.2	27,920	5.5	14,531	5.2
Personal business	91,319	13.9	146,338	14.6	107,621	13.0	74,532	14.8	40,490	14.5
Other	19	RZ	36	RZ	23	RZ	16	RZ	9	RZ
Vacation or weekend trips										
Vacation trip	301,197	45.9	515,383	51.5	484,144	58.6	236,055	46.7	154,167	55.0
Weekend trip	400,755	61.0	621,948	62.1	475,269	57.5	310,379	61.4	169,309	60.4
1 or 2 nights away from home	240,808	36.7	377,893	37.7	222,418	26.9	199,831	39.6	94,865	33.9
3-5 nights away from home	159,946	24.4	244,055	24.4	252,851	30.6	110,548	21.9	74,444	26.6

continued

Table 1-33 *continued*

	Household trips (thousands)		Person trips (thousands)		Person-miles (millions)		Personal-use vehicle trips (thousands)		Personal-use vehicle-miles (millions)	
	Number	%	Number	%	Number	%	Number	%	Number	%
Travel party type										
One adult, no children under 18	386,479	58.9	386,510	38.6	352,350	42.6	275,034	54.4	144,795	51.7
Two or more adults, no children under 18	155,147	23.6	299,485	29.9	248,762	30.1	133,163	26.4	79,273	28.3
One adult, children under 18	29,436	4.5	67,959	6.8	48,083	5.8	24,879	4.9	13,827	4.9
Two or more adults, children under 18	66,086	10.1	225,875	22.6	158,334	19.2	60,497	12.0	34,759	12.4
No adult, one or more children under 18	19,313	2.9	21,489	2.1	19,275	2.3	11,581	2.3	7,473	2.7
Mean travel party size	1.6	NA	2.2	NA	NA	NA	1.7	NA	NA	NA
Nights away from home										
None	164,032	25.0	239,727	23.9	104,444	12.6	140,914	27.9	49,619	17.7
1-3 nights	321,227	48.9	502,465	50.2	331,504	40.1	259,354	51.3	131,559	47.0
4-7 nights	121,279	18.5	184,766	18.5	243,546	29.5	76,380	15.1	61,318	21.9
8 or more nights	49,924	7.6	74,361	7.4	147,309	17.8	28,506	5.6	37,631	13.4
Mean, excluding none (nights)	4.4	NA	4.3	NA	NA	NA	4.0	NA	NA	NA
Type of lodging at destination										
Friend's or relative's home	211,832	43.6	345,506	45.9	290,428	41.0	170,271	47.3	103,180	45.7
Hotel, motel, or resort	201,264	41.4	282,929	37.6	318,323	44.9	126,160	35.1	82,447	36.5
Rented cabin, condo, or vacation home	20,205	4.2	38,572	5.1	26,269	3.7	18,103	5.0	9,819	4.3
Owned cabin, condo, or vacation home	17,607	3.6	30,648	4.1	31,161	4.4	14,631	4.1	10,809	4.8
Camper, trailer, recreational vehicle, tent	11,944	2.5	22,208	3.0	15,836	2.2	11,663	3.2	8,204	3.6
Other type of lodging	23,452	4.8	32,095	4.3	27,080	3.8	18,917	5.3	11,542	5.1
Nights at destination										
Mean nights at destination	4.20	NA	4.0	NA	NA	NA	3.8	NA	NA	NA
Friend's or relative's home	4.33	NA	4.0	NA	NA	NA	3.6	NA	NA	NA
Hotel, motel, or resort	3.05	NA	3.0	NA	NA	NA	2.8	NA	NA	NA

KEY: RZ = rounds to or represents zero; NA = not applicable.

[a] Includes other leisure purposes not shown separately.

NOTES: Numbers and percentagess may not add to totals due to rounding. See glossary for definitions of categories.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *1995 American Travel Survey Profile,* BTS/ATS95-US (Washington, DC: October 1997).

Table 1-34: Long-Distance Travel in the United States by Selected Traveler Characteristics: 1995
(Roundtrips of 100 miles or more, one way, U.S. destinations only)

	Person trips (thousands)		Person-miles (millions)		Personal-use vehicle trips (thousands)		Personal-use vehicle-miles (millions)	
	Number	%	Number	%	Number	%	Number	%
TOTAL all person trips	**1,001,319**	**100**	**834,676**	**100**	**813,858**	**100**	**454,787**	**100**
Age and sex								
Under 18 years	159,779	16.0	115,869	13.9	139,360	17.1	78,517	17.3
18-24 years	92,129	9.2	67,224	8.1	79,810	9.8	43,821	9.6
25-29 years	80,060	8.0	64,009	7.7	66,510	8.2	35,809	7.9
30-39 years	189,917	19.0	167,583	20.1	146,527	18.0	78,970	17.4
40-49 years	199,991	20.0	170,379	20.4	157,063	19.3	83,046	18.3
50-59 years	137,841	13.8	118,433	14.2	110,208	13.5	61,856	13.6
60-64 years	48,683	4.9	43,574	5.2	40,647	5.0	25,258	5.6
65 years and over	92,919	9.3	87,603	10.5	73,733	9.1	47,512	10.4
Total	**1,001,319**	**100**	**834,676**	**100**	**813,858**	**100**	**454,787**	**100**
Median (years)	38				38			
Female								
Under 18 years	79,580	7.9	58,716	7.0	68,650	8.4	39,122	8.6
18-24 years	42,743	4.3	32,706	3.9	36,161	4.4	19,702	4.3
25-29 years	36,422	3.6	29,473	3.5	29,986	3.7	16,077	3.5
30-39 years	82,471	8.2	70,360	8.4	65,056	8.0	34,606	7.6
40-49 years	84,135	8.4	70,696	8.5	67,855	8.3	36,039	7.9
50-59 years	59,721	6.0	50,449	6.0	48,867	6.0	27,483	6.0
60-64 years	21,310	2.1	19,576	2.3	17,217	2.1	10,942	2.4
65 years and over	44,129	4.4	41,278	4.9	33,409	4.1	20,513	4.5
Total	**450,512**	**45.0**	**373,254**	**44.7**	**367,203**	**45.1**	**204,485**	**45.0**
Median (years)	37				37			
Race								
White	891,443	89.0	739,444	88.6	726,632	89.3	403,045	88.6
Black	59,923	6.0	44,935	5.4	49,175	6.0	28,115	6.2
Asian or Pacific Islander	22,922	2.3	28,690	3.4	15,954	2.0	10,570	2.3
American Indian, Eskimo, or Aleutian	10,707	1.1	8,103	1.0	8,807	1.1	5,233	1.2
Other	16,324	1.6	13,504	1.6	13,290	1.6	7,825	1.7
Total	**1,001,319**	**100**	**834,676**	**100**	**813,858**	**100**	**454,788**	**100**
Ethnicity								
(Hispanic origin)	52,822	5.3	38,177	4.6	44,219	5.4	23,183	5.1
(Not of Hispanic origin)	948,497	94.7	796,499	95.4	769,640	94.6	431,605	94.9
Total	**1,001,319**	**100**	**834,676**	**100**	**813,858**	**100**	**454,788**	**100**

continued

Table 1-34 *continued*

	Person trips (thousands)		Person-miles (millions)		Personal-use vehicle trips (thousands)		Personal-use vehicle-miles (millions)	
	Number	%	Number	%	Number	%	Number	%
Household income								
Less than $25,000	155,555	15.5	112,236	13.4	131,901	16.2	71,556	15.7
$25,000-$39,999	200,981	20.1	148,185	17.8	175,186	21.5	98,074	21.6
$40,000-$49,999	166,699	16.6	125,296	15.0	144,160	17.7	78,294	17.2
$50,000-$59,999	143,946	14.4	118,691	14.2	117,579	14.4	66,363	14.6
$60,000-$74,999	134,348	13.4	118,169	14.2	106,083	13.0	61,169	13.5
$75,000-$99,999	104,698	10.5	102,112	12.2	79,397	9.8	45,406	10.0
$100,000 or more	95,092	9.5	109,987	13.2	59,553	7.3	33,925	7.5
Household type								
Family household	840,438	83.9	693,794	83.1	692,146	85.0	388,534	85.4
Married-couple household	726,982	72.6	606,630	72.7	597,863	73.5	335,980	73.9
With children under 18 years	379,139	37.9	302,958	36.3	313,451	38.5	172,014	37.8
Female householder	76,942	7.7	60,665	7.3	62,583	7.7	35,023	7.7
With children under 18 years	43,389	4.3	31,963	3.8	35,986	4.4	19,421	4.3
Male householder	36,515	3.6	26,499	3.2	31,700	3.9	17,531	3.9
With children under 18 years	13,226	1.3	9,845	1.2	11,207	1.4	6,583	1.4
Nonfamily household	160,881	16.1	140,881	16.9	121,712	15.0	66,254	14.6
Educational attainment (Persons 16 years and over)								
Less than high school graduate	68,338	7.9	48,533	6.6	59,159	8.6	33,428	8.7
High school graduate	219,549	25.5	165,361	22.6	187,762	27.2	105,957	27.6
Some college, no degree	182,146	21.2	146,379	20.0	153,399	22.3	86,304	22.5
Associate's degree	58,431	6.8	46,401	6.3	49,081	7.1	26,264	6.8
Bachelor's degree	193,651	22.5	181,233	24.8	145,438	21.1	79,779	20.8
Some grad school or grad degree	137,513	16.0	144,155	19.7	94,221	13.7	52,678	13.7
Total	**859,629**	**100**	**732,062**	**100**	**689,060**	**100**	**384,409**	**100**
Activity status (Persons 16 years and over)								
Working full time	547,232	63.7	470,855	64.3	428,319	62.2	228,969	59.6
Retired	95,039	11.1	88,837	12.1	77,921	11.3	52,589	13.7
Other	217,357	25.3	172,371	23.5	182,820	26.5	102,851	26.8
Total	**859,629**	**100**	**732,062**	**100**	**689,060**	**100**	**384,409**	**100**

NOTE: This table excludes travel outside the United States. Numbers and percents may not add to totals due to rounding.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, 1995 American Travel Survey data.

Table 1-35: 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
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**
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**
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
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
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
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
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
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
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
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
ENPLANED REVENUE PASSENGERS[b]	**196,782,144**	**281,408,852**	**363,341,497**	**438,544,001**	**428,319,248**	**447,625,988**	**468,313,029**	**508,458,194**	**526,055,483**	**558,183,741**	**568,615,687**	**588,335,318**	**610,628,716**	**638,902,993**
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
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
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
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
ENPLANED REVENUE TONS[c]	**3,661,061**	**5,088,313**	**4,024,470**	**6,298,824**	**6,417,504**	**6,736,309**	**8,203,090**	**8,718,082**	**9,365,017**	**10,333,298**	**13,520,228**	**14,083,769**	**14,911,847**	**14,992,340**
Freight														
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
Medium hubs	358,044	414,325	469,057	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
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
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	647,946
Total freight	**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**	**12,690,673**
Mail														
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
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
Small hubs	48,486	148,116	59,917	108,656	126,070	144,918	152,692	136,111	136,008	157,137	138,818	127,748	126,793	108,582
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
Total mail	**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**

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

[b] The number of persons receiving air transportation from an air carrier for which renumeration 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 2-5.

Table 1-36: Passengers Boarded at the Top 50 U.S. Airports[a]

	Rank	2000 total enplaned passengers	Rank	1990 total enplaned passengers	Percent change 1990-00
Atlanta, GA (Hartsfield Intl.)	1	38,255,778	3	22,665,665	69
Chicago, IL (O'Hare Intl.)	2	30,888,464	1	25,636,383	20
Dallas/Ft. Worth, TX (Dallas/Ft. Worth Intl.)	3	27,841,040	2	22,899,267	22
Los Angeles, CA (Los Angeles Intl.)	4	25,109,993	4	18,438,056	36
Denver, CO (Denver Intl.)	5	17,643,261	6	11,961,839	47
Phoenix, AZ (Phoenix Sky Harbor Intl.)	6	17,239,215	7	10,727,494	61
Detroit, MI (Wayne County)	7	16,929,968	9	9,903,078	71
Las Vegas, NV (McCarran Intl.)	8	16,738,909	18	7,796,218	115
Minneapolis, MN (Minneapolis-St. Paul Intl.)	9	16,710,197	16	8,837,228	89
San Francisco, CA (San Francisco Intl.)	10	16,664,399	5	13,474,929	24
Houston, TX (George Bush Intercontinental)	11	15,814,709	20	7,543,899	110
Newark, NJ (Newark)	12	15,205,447	10	9,853,925	54
St. Louis, MO (Lambert-St.Louis Muni.)	13	15,101,246	13	9,332,091	62
Orlando, FL (Orlando Intl.)	14	13,465,706	19	7,677,769	75
Seattle, WA (Seattle-Tacoma Intl.)	15	13,308,253	21	7,385,594	80
Miami, FL (Miami Intl.)	16	12,654,506	14	9,226,103	37
Boston, MA (Logan Intl.)	17	11,505,983	12	9,549,585	20
New York, NY (La Guardia)	18	11,425,705	8	10,725,465	7
Philadelphia, PA (Philadelphia Intl.)	19	10,973,074	24	6,970,820	57
New York, NY (John F. Kennedy Intl.)	20	10,648,410	11	9,687,068	10
Charlotte, NC (Douglas Muni.)	21	10,377,837	22	7,076,954	47
Cincinnati, OH (Greater Cincinnati)	22	9,962,765	32	3,907,625	155
Baltimore, MD (Baltimore-Washington Intl.)	23	8,979,425	29	4,420,425	103
Salt Lake City, UT (Salt Lake City Intl.)	24	8,700,973	25	5,388,178	61
Honolulu, HI (Honolulu Intl.)	25	8,684,893	15	9,002,217	-4
Pittsburgh, PA (Greater Pittsburgh)	26	8,650,976	17	7,912,394	9
San Diego, CA (San Diego Intl.-Lindbergh)	27	7,624,519	26	5,260,907	45
Tampa, FL (Tampa Intl.)	28	7,430,829	27	4,781,020	55
Miami/Ft. Lauderdale, FL (Ft. Lauderdale-Hollywood Intl.)	29	7,140,518	34	3,875,357	84
Washington, DC (Reagan National)	30	6,983,212	23	7,034,693	-1
Chicago, IL (Midway)	31	6,972,213	37	3,547,040	97
Washington, DC (Dulles Intl.)	32	6,649,323	28	4,448,592	49
Portland, OR (Portland Intl.)	33	6,558,859	42	3,025,345	117
Cleveland, OH (Hopkins Intl.)	34	6,154,094	35	3,836,050	60
San Jose, CA (San Jose Muni.)	35	6,044,278	41	3,128,393	93
Kansas City, MO (Kansas City Intl.)	36	5,748,758	40	3,358,116	71
Oakland, CA (Oakland Metropolitan Intl.)	37	5,126,648	44	2,670,788	92
Memphis, TN (Memphis Intl.)	38	4,977,238	33	3,887,208	28
Raleigh-Durham, NC (Raleigh-Durham)	39	4,838,779	30	4,361,369	11
San Juan, PR (Luis Munoz Marin Intl.)	40	4,834,298	36	3,618,090	34

continued

Table 1-36 *continued*

	Rank	2000 total enplaned passengers	Rank	1990 total enplaned passengers	Percent change 1990-00
New Orleans, LA (New Orleans Intl.)	41	4,822,265	39	3,361,062	43
Nashville, TN (Metropolitan)	42	4,365,127	38	3,404,243	28
Houston, TX (William P. Hobby)	43	4,322,108	31	3,972,327	9
Sacramento, CA (Sacramento International)	44	3,873,003	56	1,737,096	123
Los Angeles, CA (Orange County)	45	3,828,324	51	2,203,700	74
Austin, TX (Robert Muller Muni.)	46	3,635,209	53	2,054,955	77
Indianapolis, IN (Indianapolis Intl.)	47	3,629,716	47	2,601,839	40
Dallas, TX (Love Field)	48	3,594,539	43	2,882,836	25
Hartford/Springfield/Westfield CT (Bradley Intl.)	49	3,508,023	50	2,312,455	52
San Antonio, TX (San Antonio Intl.)	50	3,466,266	48	2,593,896	34
Total top 50		**535,609,278**		**361,953,646**	
All airports		**638,902,993**		**438,544,001**	

[a] Rank order by total enplaned passengers on large certificated U.S. air carriers, 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, intrastate, and foreign-flag air carriers are not included.

NOTES: The following airports appeared in the top 50 ranking in 1990 but were not among the top 50 for 2000: Ontario, CA ranked 45th (2,640,734); West Palm Beach, FL ranked 46th (2,609,138); Albuquerque, NM ranked 49th (2,384,647); and Hartford, CT ranked 50th (2,312,455).

SOURCES:
1990: U.S. Department of Transportation, Federal Aviation Administration and Research and Special Programs Administration, *Airport Activity Statistics of Certificated Route Air Carriers, 12 Months Ending December 31, 1990* (Washington, DC: 1991), tables 3 and 4.
2000: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airport Activity Statistics of Certificated Air Carriers: Summary Tables,Twelve Months Ending December 31, 2000* (Washington, DC: 2001), tables 3 and 4.

Table 1-37: Air Passenger Travel Arrivals in the United States from Selected Foreign Countries (Thousands)

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Flag of carrier													
United States	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
Foreign	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
Total arriving passengers	**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**
Country of embarkation[a]													
Australia	106	227	277	495	561	598	591	551	581	622	618	613	670
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
Barbados	76	135	216	228	197	191	208	196	222	212	203	195	197
Belgium	144	242	281	417	366	357	408	377	379	407	589	715	730
Bermuda	398	497	434	487	430	405	436	447	426	363	425	407	384
Brazil	212	300	352	584	635	645	711	878	1,112	1,176	1,388	1,377	1,154
Canada[b]	N	N	N	6,870	6,263	6,546	6,843	6,812	7,417	8,501	8,895	[R]9,613	9,926
China/Taiwan	50	113	206	325	404	447	606	830	972	1,017	1,068	1,080	1,170
Colombia	173	315	279	286	305	343	389	443	481	499	586	606	649
Denmark	222	267	241	313	279	295	285	267	221	236	252	225	223
Dominican Republic	336	468	606	948	849	951	1,027	1,070	1,136	1,168	1,168	1,251	1,368
France	512	689	955	1,777	1,600	1,926	1,877	2,017	2,045	2,178	2,323	2,523	2,591
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
Grand Cayman	25	121	173	273	256	229	185	294	314	323	328	370	335
Greece	121	208	187	132	83	146	165	201	220	235	186	192	191
Haiti	91	133	192	233	217	154	200	137	314	303	289	293	327
Hong Kong	98	228	270	356	397	437	511	558	658	668	589	592	650
Ireland	220	220	274	448	418	569	582	660	642	721	716	775	950
Israel	84	189	294	204	202	231	293	332	412	483	482	502	547
Italy	431	537	662	792	716	885	903	953	1,007	1,047	1,097	1,078	1,171

continued

Table 1-37 *continued*

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Jamaica	457	429	707	975	907	888	982	1,040	1,124	1,136	1,162	1,219	1,209
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
Korea, Republic of	105	234	390	826	827	971	1,070	1,166	1,335	1,514	1,625	1,184	1,240
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
Netherlands	312	427	583	837	892	1,039	1,297	1,427	1,580	1,774	2,074	2,213	2,318
Netherland Antilles	213	327	407	388	353	290	360	390	339	305	368	382	371
Panama Republic	97	150	180	153	175	177	201	221	225	229	227	267	308
Philippines	108	194	145	246	261	315	318	375	397	379	410	275	331
Spain	306	312	419	558	520	659	600	578	604	618	675	732	734
Switzerland	236	312	452	616	525	549	603	676	733	790	910	1,068	1,026
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
Venezuela	205	533	248	458	510	576	653	702	786	659	709	810	794
Total	**10,988**	**17,588**	**21,129**	**38,377**	**36,798**	**40,205**	**42,379**	**44,248**	**47,448**	**51,294**	**55,232**	**[R]57,099**	**58,739**

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

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

[b] Canadian figure represents 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. Table includes a selected sample of countries of embarkation for passengers arriving in the United States.

Because two different data sources are used, the total number of departing passengers may be less than the total for "country of embarkation" listed here.

SOURCES: 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.

1996-99: 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, Aug. 20, 2001.

Table 1-38: Air Passenger Travel Departures from the United States to Selected Foreign Countries (Thousands)

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Flag of carrier													
United States	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
Foreign	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
Total departing passengers	**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**
Country of debarkation[a]													
Australia	103	245	232	540	581	609	588	522	560	614	606	607	686
Bahama Islands	704	1,006	1,151	1,279	1,128	1,005	1,046	963	1,024	994	983	955	1,027
Barbados	74	126	204	230	199	185	207	208	217	210	200	196	202
Belgium	134	231	249	395	318	355	372	334	340	380	513	622	713
Bermuda	372	467	389	277	237	217	247	242	199	196	215	207	206
Brazil	206	291	322	560	592	659	696	826	1,024	1,135	1,292	1,297	1,134
Canada[b]	N	N	N	6,870	6,263	6,546	6,798	6,764	7,405	8,477	8,890	[R]9,647	9,913
China/Taiwan	41	90	187	337	447	481	616	803	891	945	939	934	975
Colombia	171	299	294	277	294	324	353	415	461	467	567	588	585
Denmark	188	254	254	307	239	266	272	254	229	227	259	217	214
Dominican Republic	322	443	528	896	780	881	949	980	995	1,057	1,070	1,108	1,263
France	470	635	894	1,626	1,523	1,769	1,759	1,896	1,868	2,021	2,147	2,289	2,544
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
Grand Cayman	26	112	161	250	238	196	244	259	264	285	290	305	291
Greece	123	190	210	129	88	150	150	184	194	206	192	181	170
Haiti	81	124	169	201	178	139	180	118	292	288	284	295	315
Hong Kong	59	152	238	310	369	474	477	545	640	651	610	621	621
Ireland	163	212	233	311	263	316	324	380	409	449	488	554	743
Israel	105	186	255	259	249	294	317	367	426	492	499	488	515
Italy	409	495	660	731	694	873	878	918	955	1,006	1,055	1,041	1,101

continued

Table 1-38 *continued*

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Jamaica	416	382	607	888	821	796	887	909	987	988	1,018	1,018	1,086
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
Korea, Republic of	60	186	333	723	759	887	961	1,082	1,252	1,382	1,461	1,032	1,101
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
Netherlands	304	409	562	777	881	965	1,150	1,319	1,444	1,636	1,920	1,933	2,009
Netherland Antilles	184	282	395	377	341	309	347	368	295	288	319	340	335
Panama Republic	100	142	209	183	189	186	194	211	214	221	240	272	299
Philippines	81	160	165	195	194	241	249	228	281	275	306	218	272
Spain	260	273	397	540	513	637	576	553	573	577	615	669	708
Switzerland	224	306	434	600	527	543	593	657	712	760	811	906	983
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
Venezuela	198	518	245	444	488	565	641	686	778	644	698	782	793
Total	**10,381**	**16,722**	**19,764**	**36,361**	**34,946**	**37,842**	**39,669**	**41,280**	**44,204**	**47,862**	**51,549**	**[R]52,933**	**55,811**

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

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

[b] Canadian figure represents 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 departing U.S. airports, and travelers between U.S. ports 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. Table includes a selected sample of countries of debarkation for passengers boarding in the United States. Because two different data sources are used, the total number of departing passengers may be less than the total for "country of debarkation" listed here.

SOURCES: 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.
1996-99: 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, Aug. 20, 2001.

Table 1-39: U.S.-Canadian Border Land-Passenger Gateways: 2000

	Entering the U.S.
All U.S.-Canadian Land Gateways	
All personal vehicle passengers	90,046,948
All personal vehicles	36,915,053
All bus passengers	4,872,943
All pedestrians	585,191
All train passengers	269,502
All buses	189,264
Personal vehicle passengers – top 5 gateways	
Detroit, MI	21,723,936
Buffalo-Niagara Falls, NY	16,523,141
Blaine, WA	8,234,557
Port Huron, MI	6,865,507
Sault Ste. Marie, MI	3,881,423
Personal vehicles – top 5 gateways	
Detroit, MI	8,360,352
Buffalo-Niagara Falls, NY	7,657,846
Blaine, WA	3,332,147
Port Huron, MI	2,332,469
Calias, ME	1,414,327
Bus passengers – top 5 gateways	
Buffalo-Niagara Falls, NY	1,973,016
Detroit, MI	857,607
Blaine, WA	441,320
Champlain-Rouses Point, NY	317,205
Port Huron, MI	155,153
Pedestrians – top 5 gateways	
Buffalo-Niagara Falls, NY	280,941
Sumas, WA	57,222
Calais, ME	51,033
Portland, ME[a]	29,495
International Falls-Ranier, MN	26,456
Train passengers – top 5 gateways	
Buffalo-Niagara Falls, NY	53,603
Blaine, WA	46,343
Port Huron, MI	40,633
Champlain-Rouses Point, NY	38,459
Skagway, AK	35,253
Buses – top 5 gateways	
Buffalo-Niagara Falls, NY	66,771
Detroit, MI	41,234
Blaine, WA	18,104
Champlain-Rouses Point, NY	11,728
Skagway, AK	8,579

[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, August 2001. 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: 2000).

Table 1-40: U.S.-Mexican Border Land-Passenger Gateways: 2000

	Entering the U.S.
All U.S.-Mexican Land Gateways	
All personal vehicle passengers	239,794,552
All personal vehicles	91,156,796
All pedestrians	47,089,642
All bus passengers	3,465,916
All buses	270,792
All train passengers	18,254
Personal vehicle passengers - top 5 gateways	
El Paso, TX	48,420,274
San Ysidro, CA	31,025,343
Hildago, TX	21,947,731
Calexico, CA	20,094,460
Brownsville, TX	19,693,130
Personal vehicles - top 5 gateways	
El Paso, TX	16,697,439
San Ysidro, CA	14,106,704
Hildago, TX	8,779,691
Brownsville, TX	7,877,255
Laredo, TX	7,151,127
Pedestrians - top 5 gateways	
Calexico, CA	8,352,324
San Ysidro, CA	7,542,450
El Paso, TX	5,825,155
Laredo, TX	5,492,769
Nogales, AZ	4,677,819
Bus passengers - top 5 gateways	
Otay Mesa, CA	845,775
San Ysidro, CA	783,762
Hildago, TX	648,751
Laredo, TX	608,184
El Paso, TX	155,493
Buses - top 5 gateways	
San Ysidro, CA	101,244
Otay Mesa, CA	47,683
Laredo, TX	34,529
Hildalgo, TX	31,836
Brownsville, TX	16,073
Train passengers - top 5 gateways	
Eagle Pass, TX	5,792
Nogales, AZ	4,752
Tecate, CA	3,418
El Paso, TX	2,188
Calexico East, CA	1,687

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, August 2001. 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: 2000).

Table 1-41: 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
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**	**[R]13,840**	**14,202**	**14,983**	**13,288**
Intercity truck	**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**	**1,093,000**	**U**	**U**
Class I rail[b]	**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**	**U**
Domestic water transportation																		
Coastwise	U	302,546	359,784	315,846	[d]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	U
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	U
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	U
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	U
Total domestic water transportation[c]	**U**	**489,803**	**596,195**	**565,984**	**[R]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**	**U**
Oil pipeline	**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**	**U**	**U**
TOTAL	**1,562,000**	**1,854,000**	**2,207,000**	**2,285,000**	**2,989,000**	**2,949,000**	**3,196,000**	**3,233,000**	**3,337,000**	**3,364,000**	**3,527,000**	**3,648,000**	**3,725,000**	**3,682,000**	**3,710,000**	**3,814,000**	**U**	**U**

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

[a] Includes freight, express, and mail revenue ton-miles as reported on U.S. DOT Form 41.
[b] Revenue ton-miles.
[c] Excludes intraterritorial traffic, for which ton-miles were not compiled.
[d] 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: Domestic water transportation numbers may not add to totals due to rounding.

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.
1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 2, line 3.
Intercity truck:
1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 12.
Class I rail:
1960-2000: Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), p. 27.
Domestic water transportion:
1965-2000: 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
1980-99: Ibid., *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 1.

Table 1-42: 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
Freight																		
Air carrier	953	943	1,014	1,082	1,052	1,157	1,389	1,346	1,391	R1,347	R1,221	R1,160	R1,181	R1,077	R1,078	1,001	U	U
Truck[a]	272	259	263	286	363	366	391	398	410	407	392	416	426	435	R442	458	U	U
Class I rail	461	503	515	541	616	665	726	751	763	794	817	843	842	851	835	835	843	U
Water																		
Coastwise	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	U
Lakewise	522	494	506	530	536	524	553	535	519	514	508	514	508	507	505	501	506	U
Internal	282	297	330	358	405	435	470	483	479	468	482	494	477	466	472	488	481	U
Intraport	U	U	U	16	17	15	13	13	12	12	16	16	17	15	15	15	16	U
Oil pipeline																		
Crude	325	320	300	633	871	777	R812	R822	R830	R790	R778	R797	779	R781	R767	766	U	U
Petroleum products	269	335	357	516	414	391	R387	R379	R379	R406	R414	R402	R413	R413	R420	418	U	U
Passenger																		
Air carrier, domestic, scheduled	583	614	678	698	736	758	803	806	806	799	787	791	802	817	R812	824	833	842
Bus, intercity	79	94	106	113	125	121	141	143	136	138	138	140	143	144	144	143	U	U
Commuter rail	21	21	22	23	23	24	22	23	23	22	21	24	24	23	R23	23	U	U
Amtrak[b]	N	N	N	236	216	231	273	284	285	281	271	268	257	256	252	248	U	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 the previous table 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, 2000* (Washington, DC: 2001), p. 51.

Class I rail:
Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), 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, 2000* (Washington, DC: 2001), p. 51.
Passenger:
Air carrier:
U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues).
Intercity bus and commuter rail:
Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 50.
Amtrak:
1970-85: Amtrak, corporate communication, Jan. 26, 1999.
1990-99: Amtrak, *Amtrak Annual Report* (Washington, DC: 2000), Statistical Appendix, p. III.

Table 1-43: Top U.S. Foreign Trade Freight Gateways by Value of Shipments: 2000 (current $ billions)

	Rank	Exports	Imports	Total
JFK International Airport, (a)	1	56.0	75.5	131.6
Port of Los Angeles, CA (w)	2	16.7	85.1	101.8
Port of Long Beach, CA (w)	3	16.9	81.3	98.2
Port of Detroit, MI (l)	4	49.5	44.9	94.4
San Francisco Airport, CA (a)	5	41.8	46.9	88.7
Port of Laredo, TX (l)	6	39.2	44.4	83.7
Port of New York, NY and NJ (w)	7	19.7	61.2	80.9
Los Angeles International Airport, CA (a)	8	41.7	35.6	77.3
Port of Buffalo-Niagra Falls, NY (l)	9	36.2	33.9	70.1
Port of Huron, MI (l)	10	18.8	40.9	59.7
Chicago, IL (a)	11	20.4	25.4	45.7
Port of Houston, TX (w)	12	18.7	24.6	43.4
Port of El Paso, TX (l)	13	17.5	21.9	39.4
Port of Seattle, WA (w)	14	5.4	26.9	32.3
New Orleans, LA. (a)	15	16.2	15.9	32.0
Port of Charleston, SC (w)	16	11.3	20.2	31.5
Port of Norfolk Harbor, VA (w)	17	11.1	14.1	25.2
Port of Oakland, CA (w)	18	9.6	15.5	25.1
Cleveland, OH (a)	19	11.8	12.7	24.5
Miami International Airport, FL (a)	20	15.9	7.7	23.6
Anchorage, AK (a)	21	3.5	19.7	23.2
Port of Baltimore, MD (w)	22	5.3	15.3	20.6
Dallas-Fort Worth, TX (a)	23	10.1	10.2	20.4
Port of Tacoma, WA (w)	24	4.4	15.5	19.8
Port of Otay Mesa Station, CA (l)	25	8.1	10.7	18.8
Port of New Orleans, LA (w)	26	7.6	11.2	18.8
Port of Miami, FL (w)	27	8.4	9.1	17.5
Port of Champlain-Rouses Pt., NY (l)	28	6.0	11.3	17.3
Atlanta, GA (a)	29	8.4	8.7	17.2
Port of Savannah, GA (w)	30	5.9	10.5	16.3
Port of Nogales, AZ (l)	31	5.3	8.3	13.6
Port of Hildago, TX (l)	32	6.2	6.4	12.6
Port of Blaine, WA (l)	33	5.6	6.7	12.3
Port of Brownsville-Cameron, TX (l)	34	6.2	5.9	12.1
Port of Alexandria Bay, NY (l)	35	4.6	7.4	12.0
Port of South Louisiana, LA (w)	36	7.1	4.0	11.1
Port of Beaumont, TX (w)	37	1.0	9.6	10.6
Newark N.J. (a)	38	3.9	6.7	10.6
Port of Pembina, ND (l)	39	5.3	5.2	10.6
Port of Port Everglades, FL (w)	40	4.7	5.8	10.5
Port of Portland, OR (w)	41	3.0	7.5	10.5
Port of Corpus Christi, TX (w)	42	1.6	8.7	10.3
Port of Jacksonville, FL (w)	43	1.9	8.4	10.3
Boston Logan Airport, MA (a)	44	5.9	4.4	10.3
Port of Philadelphia, PA (w)	45	0.5	9.5	10.0
Port of Morgan City, LA (w)	46	0.1	9.3	9.4
Seattle-Tacoma International Airport, WA (a)	47	3.7	4.8	8.5
Port of Calexico-East, CA (l)	48	3.5	4.8	8.3
Port of Sweetgrass, MT (l)	49	3.4	4.4	7.8
Port of Highgate Springs-Alburg, VT (l)	50	3.0	4.6	7.6
Total top 50 gateways		618.9	989.1	1,608.1

KEY: a = air; l = land w = water.

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.

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.

Water: Data should be considered preliminary.

Numbers may not add to totals due to rounding.

SOURCES:
(a) Air: U.S. Department of Commerce, Bureau of the Census, Foreign Trade Division, special tabulation, August 2001.
(w) Water: U.S. Department of Transportation, Maritime Administration, Office of Statistical and Economic Analysis, personal communication, Sept. 5, 2001.
(l) Land: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data, 2001.

Table 1-44: U.S.-Canadian Border Land-Freight Gateways: 2000

	Number of truck or railcar crossings
Truck	
Total U.S.-Canadian border	**7,048,128**
Total top 5 gateways	**4,714,339**
Detroit, MI	1,769,389
Buffalo-Niagara Falls, NY	1,198,085
Port Huron, MI	839,200
Blaine, WA	516,829
Champlain-Rouses Point, NY	390,836
Rail	
Total U.S.-Canadian border	**1,594,837**
Total top 5 gateways	**1,169,034**
Port Huron, MI	425,211
Detroit, MI	237,968
Buffalo-Niagara Falls, NY	181,462
International Falls, MN	171,551
Portal, ND	152,842

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, August 2001. 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: 2000).

Table 1-45: U.S.-Mexican Border Land-Freight Gateways: 2000

	Number of truck or railcar crossings
Truck	
Total U.S.-Mexican border	**4,525,579**
Total top 5 gateways	**3,575,207**
Laredo, TX	1,493,073
El Paso, TX	720,406
Otay Mesa/San Ysidro, CA	688,340
Hildago, TX	374,150
Brownsville, TX	299,238
Rail	
Total U.S.-Mexican border	**571,825**
Total top 5 gateways	**562,710**
Laredo, TX	243,369
Brownsville, TX	139,803
Eagle Pass, TX	94,113
Nogales, AZ	50,602
El Paso, TX	34,823

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, August 2001. 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: 2000).

Table 1-46: U.S. Waterborne Freight (Million short tons)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL	**1,099.9**	**1,272.9**	**1,531.7**	**1,695.0**	**1,998.9**	**1,788.4**	**2,163.9**	**2,092.2**	**2,132.1**	**2,128.2**	**2,214.7**	**2,240.4**	**2,284.1**	**2,333.1**	**2,339.5**	**2,322.6**	**2,461.6**
Foreign	339.3	443.7	581.0	748.7	921.4	774.3	1,041.6	1,013.6	1,037.5	R1,060.0	1,115.7	1,147.4	1,183.4	1,220.6	1,245.4	1,260.8	1,391.8
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	976.8
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
Domestic	760.6	829.2	950.7	946.3	1,077.5	1,014.1	1,122.3	1,078.6	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
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
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
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
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	88.7	94.6
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

KEY: R = revised.

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

SOURCES: 1960-2000: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: March 2002). Part 5, tables 1-3 and 1-6.

Table 1-47: Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons[a] (Millions)

	2000		1990		
	Rank	Total tons	Rank	Total tons	% change 1990-2000
South Louisiana, LA	1	217.8	1	194.2	12.1
Houston, TX	2	191.4	3	126.2	51.7
New York, NY and NJ	3	138.7	2	140.0	-1.0
New Orleans, LA	4	90.8	6	62.7	44.7
Corpus Christi, TX	5	83.1	7	62.0	34.0
Beaumont, TX	6	82.7	23	26.7	209.2
Huntington, WV	7	76.9	34	17.3	344.1
Long Beach, CA	8	70.1	10	52.4	33.8
Baton Rouge, LA	9	65.6	5	78.1	-16.0
Texas City, TX	10	61.6	12	48.1	28.1
Plaquemine, LA	11	59.9	8	56.6	5.9
Lake Charles, LA	12	55.5	16	40.9	35.8
Mobile, AL	13	54.2	15	41.1	31.7
Pittsburgh, PA	14	53.9	19	35.5	51.9
Los Angeles, CA	15	48.2	13	46.4	4.0
Valdez, AK	16	48.1	4	96.0	-49.9
Tampa, FL	17	46.5	11	51.6	-9.9
Philadelphia, PA	18	43.9	14	41.8	4.8
Norfolk Harbor, VA	19	42.4	9	53.7	-21.1
Duluth-Superior, MN and WI	20	41.7	17	40.8	2.2
Baltimore, MD	21	40.8	18	39.5	3.3
Portland, OR	22	34.3	21	27.5	25.0
St. Louis, MO and IL	23	33.3	22	27.1	23.0
Freeport, TX	24	31.0	40	14.5	113.8
Portland, ME	25	29.3	51	10.8	172.3
Pascagoula, MS	26	28.7	24	26.5	8.4
Paulsboro, NJ	27	26.9	27	23.3	15.2
Seattle, WA	28	24.2	30	21.6	12.0
Chicago, IL	29	23.9	28	22.5	6.2
Marcus Hook, PA	30	22.6	25	25.9	-12.7
Port Everglades, FL	31	22.5	42	14.1	59.1
Tacoma, WA	32	22.3	31	21.4	4.0
Port Arthur, TX	33	21.4	20	30.7	-30.3
Charleston, SC	34	21.1	54	9.7	117.3
Boston, MA	35	20.8	29	21.9	-5.3
Jacksonville, FL	36	19.7	36	15.1	30.3
Savannah, GA	37	19.7	44	13.6	45.0
Richmond, CA	38	19.5	32	21.2	-8.0
Memphis, TN	39	18.3	47	12.4	47.8
Anacortes, WA	40	18.0	35	15.4	17.1
Detroit, MI	41	17.3	33	17.7	-2.5
Indiana Harbor, IN	42	16.2	37	14.7	10.3
Honolulu, HI	43	15.8	50	11.3	39.3
Cleveland, OH	44	14.4	41	14.4	0.2
Cincinnati, OH	45	14.3	46	12.6	13.6
Lorain, OH	46	14.2	43	14.0	1.5
San Juan, PR	47	13.9	39	14.5	-4.4
Newport News, VA	48	13.8	26	24.9	-44.6
Toledo, OH	49	13.3	38	14.7	-9.2
Two Harbors, MN	50	13.1	48	12.3	6.2
Total top 50		**2,217.3**		**1,877.9**	**18.1**
All ports		**2,461.6**		**2,163.9**	**13.8**

[a] Tonnage totals include both domestic and foreign waterborne trade.

NOTE: In 1990, Grays Harbor, Washington, ranked 45th (12.8).

SOURCES:
1990: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States, Calendar Year 1990, Part 5, National Summaries* (New Orleans, LA: 1993), table 5-2.
2000: Ibid., *Waterborne Commerce of the United States, Calendar Year 2000, Part 5, National Summaries* (New Orleans, LA: 2002), tables 1-1 and 5-2.

Table 1-48: Growth of Freight Activity in the United States: Comparison of the 1997 and 1993 Commodity Flow Surveys

	Value			Tons			Ton-miles		
Mode of transportation	1997 (billion $ 1997)	1993 (billion $ 1997)	Percent change	1997 (millions)	1993 (millions)	Percent change	1997 (billions)	1993 (billions)	Percent change
All modes	**6,944.0**	**6,360.8**	**9.2**	**11,089.7**	**9,688.5**	**14.5**	**2,661.4**	**2,420.9**	**9.9**
Single modes	**5,719.6**	**5,376.3**	**6.4**	**10,436.5**	**8,922.3**	**17.0**	**2,383.5**	**2,136.9**	**11.5**
Truck[a]	4,981.5	4,791.0	4.0	7,700.7	6,385.9	20.6	1,023.5	869.5	17.7
For-hire truck	2,901.3	2,856.1	1.6	3,402.6	2,808.3	21.2	741.1	629.0	17.8
Private truck[b]	2,036.5	1,910.4	6.6	4,137.3	3,543.5	16.8	268.6	235.9	13.9
Rail	319.6	269.2	18.7	1,549.8	1,544.1	0.4	1,022.5	942.6	8.5
Water	75.8	67.1	13.1	563.4	505.4	11.5	261.7	272.0	-3.8
Shallow draft	53.9	44.3	21.7	414.8	362.5	14.4	189.3	164.4	15.2
Great Lakes	1.5	1.3	15.4	38.4	33.0	16.4	13.4	12.4	8.2
Deep draft	20.4	21.5	-4.9	110.2	109.9	0.2	59.0	95.2	-38.0
Air (includes truck and air)	229.1	151.3	51.4	4.5	3.1	42.6	6.2	4.0	55.5
Pipeline[c]	113.5	97.8	16.1	618.2	483.6	27.8	S	S	S
Multiple modes	**945.9**	**720.9**	**31.2**	**216.7**	**225.7**	**-4.0**	**204.5**	**191.5**	**6.8**
Parcel, U.S. Postal Service or courier	855.9	612.8	39.7	23.7	18.9	25.4	18.0	13.2	36.8
Truck and rail	75.7	90.4	-16.3	54.2	40.6	33.5	55.6	37.7	47.5
Truck and water	8.2	10.2	-19.4	33.2	68.0	-51.2	34.8	40.6	-14.4
Rail and water	1.8	4.0	-55.2	79.3	79.2	0.1	77.6	70.2	10.5
Other multiple modes	4.3	3.5	22.0	26.2	18.9	38.6	18.6	S	S
Other/unknown modes	**278.6**	**263.6**	**5.7**	**436.5**	**540.5**	**-19.2**	**73.4**	**92.6**	**-20.7**

KEY: 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.

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

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* (Washington, DC: December 1999), table 1b; the Bureau of Transportation Statistics converted the value of 1993 commodities from 1993 current dollars to 1997 constant dollars using Bureau of Economic Analysis' chain-type price deflators.

Table 1-49: Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments, 1997

SCTG	Commodity description	Value ($billions)	Tons (millions)	Ton-miles (billions)	Value per ton ($)	Average miles per shipment
01	Live animals and live fish	6.2	5.9	1.5	1,042	272
02	Cereal grains	59.6	489.7	200.6	122	125
03	Other agricultural products	102.3	201.7	80.8	508	438
04	Animal feed and products of animal origin (NEC)	66.8	219.7	46.8	304	79
05	Meat, fish, seafood, and their preparations	183.8	79.5	36.4	2,312	137
06	Milled grain products, preparations, and bakery products	109.9	102.7	48.5	1,069	122
07	Other prepared foodstuffs and fats and oils	346.4	396.9	124.1	873	127
08	Alcoholic beverages	87.9	81.1	27.8	1,085	58
09	Tobacco products	56.4	4.1	1.0	13,661	296
10	Monumental or building stone	2.7	15.9	1.5	172	115
11	Natural sands	4.3	442.5	25.5	10	46
12	Gravel and crushed stone	11.5	1,814.8	92.9	6	36
13	Nonmetallic minerals (NEC)	11.3	235.7	52.2	48	174
14	Metallic ores and concentrates	12.6	90.7	47.7	139	303
15	Coal	25.5	1,217.0	542.3	21	81
17	Gasoline and aviation turbine fuel	217.1	962.8	136.6	225	45
18	Fuel oils	94.3	481.7	51.2	196	28
19	Coal and petroleum products (NEC)	74.9	475.1	81.9	158	85
20	Basic chemicals	159.6	296.1	136.8	539	332
21	Pharmaceutical products	224.4	9.9	5.6	22,678	692
22	Fertitizers	27.3	179.1	43.6	153	116
23	Chemical products and preparations (NEC)	209.5	92.0	45.0	2,276	333
24	Plastics and rubber	278.8	130.4	69.1	2,138	451
25	Logs and other wood in the rough	15.1	370.7	28.1	41	85
26	Wood products	126.4	329.1	96.9	384	287
27	Pulp, newsprint, paper, and paperboard	106.6	152.3	83.7	700	194
28	Paper or paperboard articles	98.3	73.5	22.0	1,338	307
29	Printed products	260.3	78.1	22.8	3,335	431
30	Textiles, leather, and articles of textiles or leather	379.2	45.9	24.7	8,266	912
31	Nonmetallic mineral products	109.2	910.1	91.4	120	401
32	Base metal in primary or semifinished forms and in finished basic shapes	285.7	335.9	117.5	851	276
33	Articles of base metal	227.2	106.5	48.7	2,133	403
34	Machinery	417.1	49.9	27.0	8,356	356
35	equipment	869.7	39.6	27.1	21,955	640
36	Motorized and other vehicles (including parts)	571.0	98.1	45.9	5,822	278
37	Transportation equipment (NEC)	129.2	5.5	3.8	23,587	796
38	Precision instruments and apparatus	157.9	2.9	2.2	53,741	840
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	97.3	19.9	11.6	4,885	625
40	Miscellaneous manufactured products	420.9	112.5	39.9	3,741	860
41	Waste and scrap	32.7	177.8	40.1	184	164
43	Mixed freight	230.4	110.3	17.2	2,090	252
	Commodity unknown	36.5	46.2	11.8	791	499

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

NOTE: The 1997 Commodity Flow Survey data reported in this table are based on SCTG code, which differs from the code used in the 1993 CFS. Therefore, data in this table are not directly comparable to the 1993 data reported in the 1998 edition of *National Transportation Statistics.*

SOURCES: U.S. Department of Transportation, Bureau of Trasnportation Statistics, U.S. Department of Commerce, Census Bureau, *1997 Economic Census* , Transportation 1997 C*ommodity Flow Survey (*Washington, DC: December 1999), table 7.

Table 1-50: Value of U.S. Land Exports to and Imports from Canada and Mexico by Mode ($ millions)

	1994	1995	1996	1997	1998	1999	2000
Exports to Canada							
Truck	89,151.1	97,423.4	102,743.0	111,173.8	114,806.1	123,140.0	129,825.3
Rail	13,593.9	15,271.9	15,678.7	13,255.6	12,279.6	11,754.6	12,946.5
Pipeline	133.8	121.3	162.2	180.6	93.4	113.9	161.6
Other[a]	21,753.2	17,010.5	20,467.5	9,336.1	10,559.5	11,360.0	11,913.4
Mail	69.3	57.0	58.3	24.1	6.8	5.6	0.6
Total	**124,701.3**	**129,884.1**	**139,109.7**	**133,970.2**	**137,745.4**	**146,374.1**	**154,847.4**
Exports to Mexico							
Truck	39,066.5	35,914.2	44,091.8	55,592.6	60,432.1	66,923.8	82,389.2
Rail	4,192.0	4,694.4	5,119.2	5,648.0	6,188.8	5,710.6	10,495.8
Pipeline	0.4	1.0	2.3	68.3	73.4	144.2	301.8
Other[a]	3,238.9	2,025.8	2,540.1	2,860.5	3,470.0	3,349.6	3,972.0
Mail[b]	5.5	26.8	–	0.1	0.1	0.7	0.5
Total	**46,503.3**	**42,662.2**	**51,753.4**	**64,169.5**	**70,164.4**	**76,129.0**	**97,158.9**
Imports from Canada							
Truck	79,456.4	88,964.9	98,400.8	99,814.8	108,856.7	118,901.4	127,816.3
Rail	30,322.8	39,996.9	39,811.000	38,293.0	37,374.1	46,255.4	49,699.2
Pipeline	9,728.6	10,606.6	12,796.2	13,879.5	11,120.1	12,055.5	23,117.1
Other[a]	3,991.6	3,888.2	4,968.4	3,572.5	4,575.1	6,386.9	9,571.0
Mail	5.5	5.2	R6.9	0.4	1.7	13.1	4.1
FTZ[c]	U	207.6	223.4	122.4	177.9	111.2	62.8
Total	**123,504.9**	**143,669.4**	**156,206.7**	**155,682.6**	**162,105.7**	**183,723.5**	**210,270.5**
Imports from Mexico							
Truck	35,013.9	43,014.3	48,350.0	56,716.5	65,883.7	76,448.0	88,668.7
Rail	7,769.0	9,137.9	12,297.7	12,646.9	12,029.7	R14,693.4	21,056.1
Pipeline	187.9	27.4	8.1	3.6	2.4	1.5	11.5
Other[a]	643.5	768.9	639.2	668.2	917.8	1,255.8	1,573.9
Mail	1.9	1.3	1.5	0.2	0.2	0.2	0.6
FTZ[c]	U	1,099.2	2,015.6	2,119.6	2,886.7	2,624.4	2,125.7
Total	**43,616.2**	**54,049.0**	**63,312.1**	**72,155.0**	**81,720.3**	**95,023.4**	**113,436.5**

KEY: – = value too small to report; R = revised; 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.
Individual modal totals may not sum to exact export or import totals due to rounding.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data, Internet site www.bts.gov/transborder, 2001.

Table 1-51: Crude Oil and Petroluem Products Transported in the United States by Mode

	1975	1980	1985	1990	1995	1996	1997	1998	1999
Crude Oil									
Ton-miles (billions)									
Pipelines[a]	288.0	362.6	334.4	334.8	335.9	338.3	337.4	334.1	321.1
Water carriers	40.6	[c]387.4	449.2	291.2	247.7	202.4	147.3	117.9	100.0
Motor carriers[b]	1.4	2.5	1.8	1.5	1.7	1.7	1.7	1.6	1.4
Railroads	1.5	0.5	0.8	0.7	0.8	0.8	0.5	0.5	0.5
Total	**331.5**	**753.0**	**786.2**	**628.2**	**586.0**	**543.2**	**486.9**	**454.1**	**423.0**
% of total									
Pipelines[a]	86.9	48.2	42.5	53.3	57.3	62.3	69.3	73.6	75.9
Water carriers	12.2	51.4	57.2	46.4	42.3	37.3	30.3	26.0	23.6
Motor carriers[b]	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Railroads	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Refined Petroleum Products									
Ton-miles (billions)									
Pipelines[a]	219.0	225.6	229.9	249.3	265.2	280.9	279.1	285.7	296.6
Water carriers	257.4	230.4	141.2	157.8	153.2	154.1	148.3	147.1	147.5
Motor carriers[b]	26.2	24.3	26.9	28.2	24.6	28.0	26.0	26.7	27.6
Railroads	12.6	12.0	11.3	13.3	15.9	16.0	16.2	16.2	18.2
Total	**515.2**	**492.3**	**409.3**	**448.6**	**458.9**	**479.0**	**469.6**	**475.7**	**489.9**
% of total									
Pipelines[a]	66.1	30.0	29.2	39.7	45.3	51.7	57.3	62.9	60.5
Water carriers	77.6	30.6	18.0	25.1	26.1	28.4	30.5	31.0	30.1
Motor carriers[b]	7.9	5.0	3.4	4.5	5.3	5.9	5.3	5.9	5.6
Railroads	3.8	1.6	2.7	2.1	2.7	2.9	3.5	3.4	3.7
Combined Crude and Petroleum Products									
Ton-miles (billions)									
Pipelines[a]	507.0	588.2	564.3	584.1	601.1	619.2	616.5	619.8	617.7
Water carriers	298.0	[c]617.8	590.4	449.0	400.9	356.5	295.6	265.0	247.5
Motor carriers[b]	27.6	26.8	28.7	29.7	26.3	29.7	27.7	28.3	29.0
Railroads	14.1	12.5	12.1	14.0	16.6	16.8	16.7	16.7	18.7
Total	**846.7**	**1,245.3**	**1,195.5**	**1,076.8**	**1,044.9**	**1,022.2**	**956.5**	**929.8**	**912.9**
% of total									
Pipelines[a]	59.9	47.2	47.2	54.2	57.5	60.6	64.5	66.7	67.7
Water carriers	35.2	49.6	49.4	41.7	38.4	34.9	30.9	28.5	27.1
Motor carriers[b]	3.3	2.2	2.4	2.8	2.5	2.9	2.9	3.0	3.2
Railroads	1.7	1.0	1.0	1.3	1.6	1.6	1.8	1.8	2.1

[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 petroluem for water transportation to U.S. refineries.

SOURCES: 1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 6.
1980-99: Ibid., *Shifts in Petroleum Transportation* (Washington, DC: Annual issues).

Table 1-52: U.S. Hazardous Materials Shipments by Mode of Transportation, 1997

Mode of Transportation	Value ($ million)	Percent	Tons (thousands)	Percent	Ton-miles (millions)	Percent
Single modes	**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	**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	**7.9**	**1.7**	**17.5**	**1.1**	**1.8**	**0.7**
All modes	**466.4**	**100.0**	**1,565.2**	**100.0**	**263.8**	**100.0**

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 and percents may not add to totals due to rounding.

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

Table 1-53 U.S. Hazardous Materials Shipments by Hazard Class, 1997

Hazard Class and Description	Value ($ billion)	Percent	Tons (thousands)	Percent	Ton-miles (millions)	Percent	Average miles per shipment
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	60.6	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: S = data were not published because of high sampling variability or other reasons; RZ = less than 1 unit of measure or equal to zero.

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

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

Table 1-54: Worldwide Commercial Space Launches

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total 1990-2001
TOTAL space launches	**R15**	**12**	**14**	**R11**	**R15**	**R23**	**R24**	**R38**	**R41**	**R39**	**35**	**16**	**283**
United States													
Athena	0	0	0	0	0	1	0	R1	R1	3	0	0	6
Atlas	R1	2	3	R3	R4	R8	R7	6	R5	R4	3	1	47
Conestoga	0	0	0	0	0	1	0	0	0	0	0	0	1
Delta	R5	4	3	1	1	1	R3	7	11	5	2	1	44
Pegasus	0	0	0	1	0	R1	R1	3	R4	R2	2	0	14
Taurus	0	0	0	0	0	0	0	0	R1	1	0	1	3
Titan	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	**R9**	**6**	**6**	**R5**	**R5**	**R12**	**R11**	**R17**	**R22**	**R15**	**7**	**3**	**118**
Europe													
Ariane 4	5	6	6	6	8	8	9	11	9	8	8	6	90
Ariane 5	0	0	0	0	0	0	0	0	0	0	4	2	6
Total	**5**	**6**	**6**	**6**	**8**	**8**	**9**	**11**	**9**	**8**	**12**	**8**	**96**
Russia													
Cosmos	0	0	0	0	0	0	0	0	0	1	2	0	3
Dnepr	0	0	0	0	0	0	0	0	0	1	1	0	2
Proton	0	0	0	0	0	0	2	6	4	5	6	2	25
Shtil	0	0	0	0	0	0	0	0	1	0	0	0	1
Soyuz	0	0	0	0	0	0	0	0	0	6	3	0	9
Start	0	0	0	0	0	0	0	1	0	0	1	1	3
Total	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**7**	**5**	**13**	**13**	**3**	**43**
Ukraine													
Zenit 2	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
China													
Long March 2C	0	0	0	0	0	0	0	1	4	1	0	0	6
Long March 2E	0	0	2	0	1	3	0	0	0	0	0	0	6
Long March 3	1	0	0	0	1	0	1	0	0	0	0	0	3
Long March 3B	0	0	0	0	0	0	1	2	0	0	0	0	3
Total	**1**	**0**	**2**	**0**	**2**	**3**	**2**	**3**	**4**	**1**	**0**	**0**	**18**
Sea Launch[a]													
Zenit 3SL	0	0	0	0	0	0	0	0	0	R2	3	2	7
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**R2**	**3**	**2**	**7**

KEY: R = revised.

[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.

NOTES: 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.
2000-2001: Ibid., *Commercial Space Transportation: 2001 Year in Review* (Washington, DC: January 2002), Internet site http://ast.faa.gov/launch_info/ as of June 4, 2002.

Table 1-55: Passengers Denied Boarding by the Largest U.S. Air Carriers[a]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Boarded (millions)	421	429	445	449	457	460	481	503	514	523	543	498
Denied boarding[b] (thousands)												
Voluntary	561	599	718	632	771	794	899	1,018	R1,091	1,024	1,062	899
Involuntary	67	47	46	51	53	49	58	54	45	46	57	43
Total	**628**	**646**	**764**	**683**	**824**	**843**	**957**	**1,071**	**R1,136**	**1,070**	**1,120**	**942**
% 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

KEY: R = revised.

[a] Data are for nonstop scheduled service flights between points within the United States (including territories) by the 10 largest U.S. air carriers, i.e., those with at least 1% of total domestic scheduled-service passenger revenues (Alaska, America West, American, Continental, Delta, Northwest, Southwest, TWA, United, and US Airways). 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 April issues).

Table 1-56: 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
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**	**2.22**
Enplaned passengers (domestic) (millions)	395.7	408.5	417.0	407.5	435.7	439.8	464.0	459.8	481.7	499.1	517.4	488.4
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	4.55

[a] Data include nonstop scheduled service between points within the United States (including territories) by the 10 largest U.S. air carriers, i.e., those with at least 1% of the total domestic scheduled service passenger revenues (Alaska, America West, American, Continental, Delta, Northwest, Southwest, TWA, United, and US Airways).

[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 compilation, February).

Table 1-57: Flight Operations Arriving On Time by the Largest U.S. Air Carriers[a] (Percent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
On-time flight operations	79.4	82.5	82.3	81.6	81.5	78.6	74.5	77.7	77.2	76.1	72.6	77.4

[a] Data include nonstop scheduled service between points within the United States (including territories) by the 10 largest U.S. air carriers, i.e., those with at least 1% of the total domestic scheduled service passenger revenues (Alaska, America West, American, Continental, Delta, Northwest, Southwest, TWA, United, and US Airways).

NOTES: 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 compilation, February), table 1a, 12-month column.

Table 1-58: FAA-Cited Causes of Departure and Enroute Delays
(After pushing back from the gate)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	[a]2000
Operations delayed (thousands)	356	338	394	393	298	281	276	248	237	272	245	306	374	450
Cause (%)														
Weather	67	70	57	56	65	65	72	75	72	[R]74	68	74	[R]69	69
Airport terminal volume	11	9	29	35	27	27	22	19	18	18	22	15	[R]12	14
ARTCC volume	13	12	8	2	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
Closed runways/taxiways	4	5	3	3	3	3	3	2	3	3	3	3	[R]5	6
NAS equipment	4	3	2	1	2	2	2	2	3	2	3	2	2	2
Other	1	1	1	4	3	3	2	2	4	2	4	6	[R]13	9

KEY: ARTCC = Air Route Traffic Control Center; NAS = National Airspace System; R = Revised.

[a] Data is preliminary and subject to change.
[b] Delays due to ARTCC volume are included in delays due to terminal volume from 1991.

NOTE: Percentages may not add to 100 due to rounding.

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 www.faa.gov/apa/Delays/atDelays.htm as of Oct. 8, 2001.

Table 1-59: Major U.S. Air Carrier Delays, Cancellations, and Diversions

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	R2000	2001
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**
Late departures	730,712	883,167	753,182	621,509	617,148	661,056	729,960	919,839	1,102,484	944,633	1,014,904	1,091,584	1,319,153	1,180,673
Late arrivals	1,042,452	1,208,470	1,087,774	890,068	902,567	931,437	960,254	1,141,647	1,362,702	1,193,678	1,227,741	1,320,591	1,557,784	1,343,608
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
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

KEY: R = Revised.

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 the 10 largest U.S. air carriers. A cancelled 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.

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

Table 1-60: Annual Person-Hours of Highway Traffic Delay Per Capita[R]

Population group	Urban area	[R]1982	1985	[R]1990	1991	[R]1992	1993	1994	[R]1995	[R]1996	[R]1997	1998	1999	Percent change: Short-term 1995-1999[R] Percent[a]	Short-term 1995-1999[R] Rank[a]	Long-term 1982-1999[R] Percent[a]	Long-term 1982-1999[R] Rank[a]
Med	Albany-Schenectady-Troy, NY	1	2	6	6	6	6	6	6	7	7	8	10	67	9	900	8
Med	Albuquerque, NM	4	7	12	12	14	17	23	25	28	32	32	33	32	31	725	13
Lrg	Atlanta, GA	11	20	25	22	25	32	43	43	49	55	53	53	23	40	382	31
Med	Austin, TX	9	16	20	21	22	26	28	33	35	45	44	45	36	27	400	27
Sml	Bakersfield, CA	1	1	4	4	5	4	4	5	5	6	6	6	20	43	500	20
Lrg	Baltimore, MD	8	13	27	26	25	25	27	30	29	30	30	31	3	60	288	44
Sml	Beaumont, TX	4	6	5	6	7	6	6	7	7	9	7	9	29	34	125	63
Vlg	Boston, MA	12	20	28	28	30	33	34	37	38	39	41	42	14	49	250	46
Sml	Boulder, CO	1	2	2	3	3	4	4	4	4	5	6	5	25	39	400	27
Sml	Brownsville, TX	1	1	2	2	2	2	2	2	2	2	3	3	50	18	200	53
Lrg	Buffalo-Niagara Falls, NY	2	3	4	4	4	4	4	4	4	5	6	8	100	2	300	43
Med	Charlotte, NC	6	14	22	26	23	21	20	22	27	33	32	32	45	21	433	26
Vlg	Chicago, IL-Northwestern, IN	11	17	23	25	25	27	26	28	30	31	34	34	21	42	209	52
Lrg	Cincinnati, OH-KY	4	7	15	15	18	20	23	24	26	29	30	32	33	28	700	14
Lrg	Cleveland, OH	1	2	6	7	8	10	12	15	17	18	18	20	33	28	1,900	1
Sml	Colorado Springs, CO	1	3	3	4	6	7	9	11	12	14	17	20	82	4	1,900	1
Lrg	Columbus, OH	3	4	15	15	17	17	20	21	24	28	28	29	38	26	867	10
Sml	Corpus Christi, TX	3	3	4	5	6	5	5	5	5	5	6	7	40	25	133	61
Lrg	Dallas, TX	8	17	23	25	26	29	30	32	32	38	40	46	44	23	475	23
Lrg	Denver, CO	13	16	20	21	25	29	29	34	36	38	42	45	32	30	246	47
Vlg	Detroit, MI	12	14	32	33	37	39	37	37	40	41	40	41	11	53	242	48
Med	El Paso, TX-NM	2	3	5	7	9	10	11	9	8	9	11	14	56	14	600	16
Sml	Eugene-Springfield, OR	1	2	2	2	3	5	3	4	5	6	7	10	150	1	900	8
Lrg	Fort Worth, TX	5	10	14	13	14	16	18	19	20	23	27	33	74	6	560	17
Med	Fresno, CA	4	5	15	13	12	9	8	10	12	14	15	18	80	5	350	36
Lrg	Fort Lauderdale -Hollywood-Pompano Beach, Fl	7	7	12	15	20	22	20	20	22	25	25	29	45	22	314	42
Med	Hartford-Middletown, CT	6	13	17	16	17	12	12	13	14	16	17	19	46	20	217	51
Med	Honolulu, HI	8	9	17	17	19	19	19	19	19	19	19	19	0	62	138	60
Vlg	Houston, TX	27	38	32	28	27	32	32	31	36	42	49	50	61	13	85	66

continued

Table 1-60 *continued*

Population group	Urban area	R1982	1985	R1990	1991	R1992	1993	1994	R1995	R1996	R1997	1998	1999	Percent change: Short-term 1995-1999R Percent[a]	Short-term 1995-1999R Rank[a]	Long-term 1982-1999R Percent[a]	Long-term 1982-1999R Rank[a]
Lrg	Indianapolis, IN	3	4	9	11	15	25	33	44	44	46	38	37	-16	68	1,133	5
Med	Jacksonville, FL	5	7	20	21	25	26	27	33	30	29	28	30	-9	66	500	20
Lrg	Kansas City, MO-KS	2	3	7	6	8	12	13	14	16	19	19	24	71	7	1,100	6
Sml	Laredo, TX	1	1	1	2	2	2	3	3	4	4	5	5	67	9	400	27
Lrg	Las Vegas, NV	5	9	22	22	17	17	19	20	21	20	20	21	5	59	320	40
Vlg	Los Angeles, CA	31	36	59	57	57	54	52	55	56	55	55	56	2	61	81	67
Med	Louisville, KY-IN	8	8	9	12	17	23	27	25	28	32	35	37	48	19	363	33
Med	Memphis, TN-AR-MS	2	3	10	11	13	14	18	22	23	25	24	22	0	62	1,000	7
Lrg	Miami-Hialeah, FL	17	20	38	37	40	41	42	39	38	41	42	42	8	56	147	59
Lrg	Milwaukee, WI	4	7	11	12	14	17	17	18	19	20	20	22	22	41	450	24
Lrg	Minneapolis-St. Paul, MN	3	7	15	15	18	21	25	27	27	33	35	38	41	24	1,167	4
Med	Nashville, TN	13	13	18	16	15	18	24	27	28	34	34	42	56	14	223	50
Lrg	New Orleans, LA	10	15	15	17	16	15	17	18	17	17	18	18	0	62	80	68
Vlg	New York, NY-Northeastern, NJ	8	10	22	21	21	22	25	27	30	33	33	34	26	38	325	38
Lrg	Norfolk, VA	9	17	20	17	15	15	17	19	23	25	24	24	26	37	167	56
Lrg	Oklahoma City, OK	4	4	6	7	8	8	7	10	12	14	14	17	70	8	325	38
Med	Omaha, NE-IA	3	5	10	11	12	12	15	16	18	17	18	19	19	45	533	18
Lrg	Orlando, FL	10	18	24	29	33	35	33	33	37	40	42	42	27	36	320	40
Vlg	Philadelphia, PA-NJ	8	11	16	18	18	18	20	20	22	24	26	26	30	32	225	49
Lrg	Phoenix, AZ	12	13	23	24	24	25	25	24	29	29	30	31	29	33	158	57
Lrg	Pittsburgh, PA	6	7	11	11	11	11	11	12	12	12	14	14	17	46	133	61
Lrg	Portland-Vancouver, OR-WA	4	7	17	18	22	29	28	30	34	32	32	34	13	50	750	12
Med	Providence-Pawtucket, RI-MA	3	7	17	15	14	16	17	18	21	21	26	28	56	14	833	11
Med	Rochester, NY	1	2	4	5	5	5	6	7	8	8	7	8	14	48	700	14
Lrg	Sacramento, CA	9	13	31	31	27	29	31	30	36	33	32	34	13	50	278	45
Sml	Salem, OR	1	1	6	6	7	9	9	9	11	13	14	14	56	14	1,300	3
Med	Salt Lake City, UT	3	4	8	11	13	15	18	20	21	20	18	18	-10	67	500	20
Lrg	San Antonio, TX	5	9	8	8	10	8	9	13	15	16	18	24	85	3	380	32
Lrg	San Bernardino-Riverside, CA	6	14	31	32	32	34	34	35	37	35	38	38	9	55	533	18
Lrg	San Diego, CA	8	14	33	30	32	31	30	31	31	31	34	37	19	44	363	33
Vlg	San Francisco-Oakland, CA	20	29	42	39	39	39	37	39	40	38	41	42	8	56	110	65
Lrg	San Jose, CA	19	28	41	41	39	37	37	39	39	37	39	42	8	56	121	64

continued

Table 1-60 *continued*

Population group	Urban area	R1982	1985	R1990	1991	R1992	1993	1994	R1995	R1996	R1997	1998	1999	Percent change: Short-term 1995-1999R Percent[a]	Short-term 1995-1999R Rank[a]	Long-term 1982-1999R Percent[a]	Long-term 1982-1999R Rank[a]
Lrg	Seattle-Everett, WA	19	29	48	50	55	49	48	46	47	51	53	53	15	47	179	54
Sml	Spokane, WA	2	3	4	6	5	8	9	6	7	9	9	10	67	9	400	27
Lrg	St. Louis, MO-IL	10	16	18	17	20	35	38	39	40	42	43	44	13	52	340	37
Med	Tacoma, WA	5	8	17	19	19	20	21	21	22	25	26	27	29	34	440	25
Med	Tampa, FL	13	15	26	31	33	33	38	38	36	35	35	35	-8	65	169	55
Med	Tucson, AZ	5	5	11	10	11	14	14	14	16	22	25	23	64	12	360	35
Vlg	Washington, DC-MD-VA	18	27	40	39	41	40	41	42	45	44	45	46	10	54	156	58
	68 Area Average [b]	11	16	26	26	27	28	29	30	32	34	35	36	20		227	
	Very Large Area Average [b]	15	21	33	33	33	33	34	35	38	39	40	41	17		173	
	Large Area Average [b]	8	12	21	21	23	25	26	28	29	31	32	34	21		325	
	Medium Area Average [b]	5	8	14	15	16	17	19	21	22	24	24	26	24		420	
	Small Area Average [b]	2	2	4	4	5	6	6	6	7	8	9	10	67		400	

KEY: R = revised.
Vlg = very large urban areas – over 3 million population.
Lrg = large urban areas – over 1 million and less than 3 million population.
Med = medium urban areas – over 500,000 and less than 1 million population.
Sml = 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.
[b] For the years 1982, 1992, and 1999, the averages were obtained from table A-5 from the Texas Transportation Instutute's *The 2001 Annual Urban Mobility Report* referenced below. For other years, the averages were calculated using data obtained from the web site.

NOTES: The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring the Texas Transportation Institute study on mobility.
The source, for the year 2001, decided to only publish hours of delay per capita, contrary to previous years when the source would publish data for eligible drivers, as well as per capita. To account for this change, the entire table has been updated to reflect the data based on hours of delay per capita.

SOURCE: 1982 - 99: Texas Transportation Institute, *The 2001 Annual Urban Mobility Report* (College Station, TX: 2001) from Internet site http://mobility.tamu.edu accessed on Sept. 14, 2001.

Table 1-61: Roadway Congestion Index

Population group	Urban area	1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Percent change: Short-term 1995-1999[R] Percent[a]	Short-term 1995-1999[R] Rank[a]	Long-term 1982-1999[R] Percent[a]	Long-term 1982-1999[R] Rank[a]
Med	Albany-Schenectady-Troy, NY	[R]0.46	0.51	0.68	0.67	0.69	0.71	0.71	0.72	0.74	0.75	0.75	0.77	7	22	67	61
Med	Albuquerque, NM	[R]0.62	0.69	0.85	0.84	0.87	0.92	0.98	[R]1.02	[R]1.06	[R]1.12	1.12	1.13	11	49	82	68
Lrg	Atlanta, GA	[R]0.77	0.93	[R]0.98	0.97	[R]0.99	1.05	1.13	[R]1.13	1.17	[R]1.24	1.28	1.27	12	59	65	59
Med	Austin, TX	[R]0.73	0.81	[R]0.90	0.90	[R]0.87	0.87	0.90	0.94	[R]0.97	[R]1.02	1.04	1.06	13	60	45	38
Sml	Bakersfield, CA	[R]0.54	0.56	[R]0.64	0.67	[R]0.70	0.68	0.71	0.72	0.74	0.75	0.76	0.77	7	22	43	35
Lrg	Baltimore, MD	[R]0.75	0.80	[R]0.95	0.95	[R]0.97	0.97	1.00	1.03	[R]1.03	1.05	1.06	1.07	4	15	43	36
Sml	Beaumont, TX	[R]0.68	0.72	[R]0.74	0.78	[R]0.83	0.82	0.78	[R]0.80	0.84	[R]0.85	0.85	0.86	7	30	26	14
Vlg	Boston, MA	[R]0.88	0.98	[R]1.09	1.09	[R]1.11	1.17	1.19	[R]1.21	1.22	[R]1.25	1.27	1.28	6	20	45	39
Sml	Boulder, CO	[R]0.55	0.59	[R]0.65	0.66	[R]0.70	0.71	0.72	0.74	[R]0.76	[R]0.81	0.83	0.83	12	58	51	46
Sml	Brownsville, TX	[R]0.54	0.54	0.62	0.62	0.64	0.68	0.69	0.70	[R]0.71	[R]0.73	0.76	0.75	7	25	39	33
Lrg	Buffalo-Niagara Falls, NY	[R]0.53	0.55	[R]0.60	0.62	[R]0.64	0.66	0.68	[R]0.67	[R]0.66	[R]0.68	0.70	0.72	7	29	36	30
Med	Charlotte, NC	[R]0.86	1.02	[R]1.05	1.04	[R]0.98	0.94	0.93	[R]0.95	[R]1.01	[R]1.07	1.09	1.14	20	68	33	22
Vlg	Chicago, IL-Northwestern, IN	[R]0.95	1.02	[R]1.18	1.19	[R]1.17	1.17	1.17	[R]1.22	[R]1.27	[R]1.27	1.31	1.31	7	28	38	31
Lrg	Cincinnati, OH-KY	[R]0.70	0.78	[R]0.92	0.90	0.91	0.95	1.00	1.00	[R]1.04	[R]1.09	1.11	1.12	12	55	60	58
Lrg	Cleveland, OH	[R]0.68	0.65	[R]0.83	0.83	[R]0.85	0.89	0.91	[R]0.92	[R]0.94	[R]0.96	0.98	0.99	8	31	46	40
Sml	Colorado Springs, CO	[R]0.50	0.60	[R]0.62	0.61	[R]0.64	0.66	0.68	[R]0.73	[R]0.76	[R]0.81	0.83	0.85	16	65	70	63
Lrg	Columbus, OH	[R]0.63	0.68	[R]0.86	0.88	[R]0.90	0.92	0.94	[R]0.95	1.00	1.04	1.05	1.05	11	46	67	60
Sml	Corpus Christi, TX	[R]0.57	0.65	[R]0.67	0.66	[R]0.67	0.65	0.64	[R]0.64	[R]0.66	[R]0.70	0.70	0.71	11	50	25	12
Lrg	Dallas, TX	[R]0.78	0.91	0.99	1.01	1.01	0.99	0.97	0.98	1.00	1.04	1.04	1.05	7	25	35	25
Lrg	Denver, CO	[R]0.82	0.86	[R]0.92	0.93	[R]0.97	0.99	1.02	[R]1.07	[R]1.12	[R]1.14	1.18	1.20	12	57	46	41
Vlg	Detroit, MI	[R]0.89	0.91	1.08	1.09	1.16	1.19	1.15	[R]1.16	[R]1.18	1.18	1.18	1.20	3	13	35	26
Med	El Paso, TX-NM	[R]0.62	0.70	[R]0.73	0.78	0.82	0.83	0.85	[R]0.85	[R]0.84	0.86	0.91	0.94	11	48	52	48
Sml	Eugene-Springfield, OR	[R]0.53	0.58	[R]0.68	0.69	[R]0.70	0.74	0.75	0.78	0.82	0.84	0.87	0.91	17	66	72	65
Lrg	Fort Lauderdale -Hollywood-Pompano Beach, FL	[R]0.69	0.75	[R]0.90	0.95	[R]1.03	1.05	1.03	[R]1.05	[R]1.07	[R]1.12	1.12	1.17	11	52	70	62
Lrg	Fort Worth TX	0.73	0.82	0.92	0.89	0.90	0.86	0.87	0.87	0.90	0.91	0.94	0.96	10	44	32	21
Med	Fresno, CA	[R]0.67	0.65	[R]0.89	0.88	[R]0.87	0.85	0.85	0.87	[R]0.89	[R]0.92	0.96	1.00	15	63	49	44
Med	Hartford-Middletown, CT	[R]0.61	0.74	[R]0.85	0.85	[R]0.87	0.84	0.85	[R]0.86	[R]0.87	0.90	0.91	0.94	9	41	54	52
Med	Honolulu, HI	[R]0.79	0.84	[R]1.03	1.03	[R]1.04	1.05	1.07	1.07	1.07	1.06	1.06	1.06	-1	4	34	24
Vlg	Houston, TX	[R]1.03	1.11	[R]1.05	1.00	0.99	1.02	1.00	[R]1.00	[R]1.03	1.07	1.10	1.10	10	43	7	1
Lrg	Indianapolis, IN	[R]0.64	0.69	[R]0.83	0.85	[R]0.91	0.96	1.04	[R]1.11	[R]1.11	[R]1.13	1.12	1.11	0	6	73	66
Med	Jacksonville, FL	[R]0.75	0.81	[R]0.94	0.96	[R]0.98	1.00	1.02	[R]1.04	[R]1.02	[R]1.01	1.01	1.00	-4	1	33	23
Lrg	Kansas City, MO-KS	[R]0.50	0.58	[R]0.63	0.61	[R]0.63	0.69	0.71	0.72	0.75	0.76	0.77	0.79	10	42	58	54
Sml	Laredo, TX	[R]0.55	0.56	[R]0.56	0.57	[R]0.56	0.54	0.54	[R]0.53	0.56	[R]0.60	0.63	0.61	15	64	11	4
Lrg	Las Vegas, NV	[R]0.69	0.78	[R]1.08	1.11	[R]1.08	1.14	1.13	[R]1.12	[R]1.12	[R]1.11	1.13	1.18	5	19	71	64
Vlg	Los Angeles, CA	[R]1.29	1.31	[R]1.59	1.58	[R]1.56	1.54	1.50	[R]1.52	[R]1.56	[R]1.54	1.58	1.58	4	16	22	11

continued

Table 1-61 *continued*

Population group	Urban area	1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Percent change: Short-term 1995-1999[R] Percent[a]	Short-term 1995-1999[R] Rank[a]	Long-term 1982-1999[R] Percent[a]	Long-term 1982-1999[R] Rank[a]
Med	Louisville, KY-IN	[R]0.78	0.78	0.80	0.84	0.89	0.95	0.99	[R]1.00	1.02	[R]1.05	1.08	1.09	9	38	40	34
Med	Memphis, TN-AR-MS	[R]0.71	0.70	[R]0.88	0.88	[R]0.89	0.89	0.94	[R]0.96	[R]0.98	[R]0.98	0.99	0.98	2	10	38	32
Lrg	Miami-Hialeah, FL	[R]0.95	0.99	[R]1.20	1.17	[R]1.20	1.19	1.22	[R]1.25	[R]1.23	[R]1.23	1.22	1.23	-2	3	29	18
Lrg	Milwaukee, WI	[R]0.71	0.80	[R]0.92	0.92	[R]0.92	0.89	0.91	[R]0.94	[R]0.99	1.01	1.02	1.05	12	53	48	43
Lrg	Minneapolis-St. Paul, MN	[R]0.66	0.76	0.89	0.91	0.93	0.98	1.04	1.06	1.08	1.13	1.18	1.20	13	62	82	67
Med	Nashville, TN	[R]0.83	0.81	0.85	0.84	[R]0.85	0.85	0.90	0.93	[R]0.93	[R]0.98	0.97	1.01	9	37	22	10
Lrg	New Orleans, LA	[R]0.92	0.97	[R]0.94	0.96	[R]0.95	0.94	0.99	[R]0.99	[R]0.96	[R]0.97	1.00	0.99	0	6	8	2
Vlg	New York, NY-Northeastern, NJ	[R]0.77	0.84	[R]0.99	0.98	[R]0.97	0.99	1.02	1.04	[R]1.08	[R]1.13	1.14	1.15	11	47	49	45
Lrg	Norfolk, VA	[R]0.89	1.01	[R]0.96	0.90	[R]0.87	0.88	0.91	0.93	0.97	0.97	0.96	0.97	4	17	9	3
Lrg	Oklahoma City, OK	[R]0.65	0.71	0.73	0.74	0.74	0.78	0.77	0.82	0.84	0.85	0.86	0.88	7	27	35	28
Med	Omaha, NE-IA	[R]0.62	0.70	[R]0.75	0.76	[R]0.79	0.80	0.80	[R]0.81	[R]0.84	[R]0.85	0.87	0.90	11	51	45	37
Lrg	Orlando, FL	[R]0.82	0.93	[R]0.95	0.97	[R]0.97	0.97	0.96	[R]0.97	[R]1.00	[R]1.04	1.05	1.05	8	35	28	16
Vlg	Philadelphia, PA-NJ	[R]0.82	0.86	[R]0.94	0.99	0.98	0.96	0.97	[R]0.97	[R]0.98	[R]1.02	1.05	1.06	9	40	29	17
Lrg	Phoenix, AZ	[R]0.95	0.98	[R]1.01	1.03	1.06	1.05	1.04	[R]1.08	[R]1.14	[R]1.12	1.16	1.21	12	56	27	15
Lrg	Pittsburgh, PA	[R]0.70	0.73	0.75	0.75	0.74	0.74	0.74	0.76	0.76	0.76	0.78	0.78	3	11	11	6
Lrg	Portland-Vancouver, OR-WA	[R]0.81	0.90	[R]1.01	1.03	1.07	1.10	1.12	1.15	1.20	1.22	1.22	1.24	8	33	53	51
Med	Providence-Pawtucket, RI-MA	[R]0.70	0.83	[R]0.89	0.88	0.83	0.82	0.82	0.84	0.87	[R]0.89	0.93	0.95	13	61	36	29
Med	Rochester, NY	[R]0.51	0.57	[R]0.69	0.70	[R]0.72	0.72	0.74	[R]0.77	[R]0.77	[R]0.76	0.77	0.78	1	8	53	50
Lrg	Sacramento, CA	[R]0.76	0.88	[R]1.05	1.05	[R]1.07	1.09	1.12	1.12	[R]1.17	1.14	1.18	1.20	7	24	58	53
Sml	Salem, OR	[R]0.56	0.64	[R]0.79	0.81	[R]0.79	0.79	0.79	0.77	[R]0.79	0.82	0.86	0.85	10	45	52	49
Med	Salt Lake City, UT	[R]0.66	0.71	[R]0.84	0.89	0.91	0.95	1.01	1.04	1.05	[R]1.01	1.01	1.00	-4	1	52	47
Lrg	San Antonio, TX	[R]0.69	0.79	[R]0.74	0.74	[R]0.77	0.78	0.81	[R]0.87	0.89	0.92	0.96	1.02	17	67	48	42
Lrg	San Bernardino-Riverside, CA	[R]0.78	0.90	[R]1.15	1.16	1.15	1.14	1.12	1.16	[R]1.18	[R]1.16	1.20	1.24	7	21	59	57
Lrg	San Diego, CA	[R]0.79	0.90	[R]1.19	1.18	[R]1.18	1.16	1.16	[R]1.16	[R]1.16	[R]1.15	1.19	1.25	8	32	58	55
Vlg	San Francisco-Oakland, CA	[R]1.06	1.17	[R]1.35	1.32	1.32	1.33	1.31	1.34	[R]1.35	[R]1.36	1.37	1.39	4	14	31	19
Lrg	San Jose, CA	[R]1.07	1.13	[R]1.24	1.25	[R]1.22	1.18	1.15	[R]1.13	[R]1.11	[R]1.11	1.13	1.19	5	18	11	5
Lrg	Seattle-Everett, WA	[R]1.07	1.17	1.21	1.21	1.17	1.18	1.19	1.20	1.22	[R]1.25	1.26	1.30	8	36	21	9
Sml	Spokane, WA	[R]0.66	0.71	[R]0.74	0.77	[R]0.74	0.73	0.77	0.76	[R]0.78	[R]0.80	0.81	0.83	9	39	26	13
Lrg	St. Louis, MO-IL	[R]0.87	0.94	[R]0.91	0.90	[R]0.92	0.95	0.99	1.00	1.01	[R]1.02	1.01	1.03	3	12	18	7
Med	Tacoma, WA	[R]0.75	0.78	[R]0.91	0.96	[R]1.02	1.08	1.10	1.10	1.11	1.15	1.18	1.19	8	34	59	56
Med	Tampa, FL	0.91	0.87	1.02	1.07	1.09	1.11	1.11	1.11	1.09	[R]1.08	1.08	1.10	-1	5	21	8
Med	Tucson, AZ	[R]0.80	0.76	0.89	0.93	0.93	0.96	0.95	0.94	[R]0.97	1.00	1.04	1.05	12	53	31	20
Vlg	Washington, DC-MD-VA	0.99	1.13	[R]1.24	1.23	[R]1.28	1.31	1.34	1.32	1.32	1.33	1.35	1.34	2	9	35	27

continued

Table 1-61 *continued*

Population group	Urban area	1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Percent change: Short-term 1995-1999[R] Percent[a]	Short-term 1995-1999[R] Rank[a]	Long-term 1982-1999[R] Percent[a]	Long-term 1982-1999[R] Rank[a]
	68 Area Average [b]	0.83	0.90	1.02	1.02	1.03	1.04	1.05	1.07	1.09	1.11	1.13	1.14	7		38	
	Very Large Area Average [b]	0.97	1.04	1.19	1.19	1.18	1.19	1.19	1.21	1.23	1.25	1.27	1.28	6		32	
	Large Area Average [b]	0.75	0.83	0.94	0.94	0.95	0.96	0.99	1.00	1.02	1.05	1.06	1.09	8		44	
	Medium Area Average [b]	0.68	0.74	0.85	0.87	0.88	0.89	0.91	0.93	0.95	0.96	0.98	0.99	7		45	
	Small Area Average [b]	0.56	0.62	0.67	0.68	0.69	0.69	0.70	0.71	0.74	0.77	0.78	0.79	10		39	

KEY: R = revised.
Vlg = very large urban areas – over 3 million population.
Lrg = large urban areas – over 1 million and less than 3 million population.
Med = medium urban areas – over 500,000 and less than 1 million population.
Sml = 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 lowest number corresponding to a rank of 1.
[b] For the years 1982, 1992, and 1999, the average RCI was obtained from table A-17 from the Texas Transportation Instutute's *The 2001 Annual Urban Mobility Report* referenced below. For other years, the average RCI was calculated using data obtained from the web site and the RCI formula in the report.

NOTES: 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 average, on the freeways and principal arterial street system 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 study on mobility.
Due to changes in methodology, data for all years shown were revised. For a detailed explanation of the formulas used, see the source document.

SOURCE: 1982–1999: Texas Transportation Institute, *The 2001 Annual Urban Mobility Report* (College Station, TX: 2001); RCI data and population groups were obtained from Internet site http://mobility.tamu.edu accessed on Sept. 14, 2001.

Table 1-62: Annual Highway Congestion Cost

		Annual congestion cost per capita ($)						Annual congestion cost ($ millions)					
Population group	Urban area	[R]1997 Value	1998 Value	1999 Value	[R]1997 Rank	1998 Rank	1999 Rank	1997 Value	1998 Value	1999 Value	1997 Rank	1998 Rank	1999 Rank
Med	Albany-Schenectady-Troy, NY	110	140	180	60	59	58	55	70	90	59	59	58
Med	Albuquerque, NM	535	530	575	26	28	26	[R]300	300	325	[R]46	46	46
Lrg	Atlanta, GA	910	885	915	2	3	3	[R]2,345	2,475	2,620	[R]7	8	8
Med	Austin, TX	745	740	785	5	6	5	[R]470	475	510	[R]30	32	34
Sml	Bakersfield, CA	105	105	105	62	62	65	40	40	40	61	62	62
Lrg	Baltimore, MD	510	505	530	28	30	32	[R]1,095	1,085	1,150	[R]19	20	20
Sml	Beaumont, TX	110	105	170	60	62	61	[R]15	15	25	[R]65	65	65
Vlg	Boston, MA	645	680	715	13	11	12	[R]1,950	2,045	2,155	[R]9	9	9
Sml	Boulder, CO	90	90	85	64	66	66	10	10	10	66	66	67
Sml	Brownsville, TX	U	35	65	68	68	68	U	5	10	68	68	67
Lrg	Buffalo-Niagara Falls, NY	80	100	135	65	64	62	[R]85	105	145	[R]58	57	56
Med	Charlotte, NC	540	545	550	24	27	30	[R]320	335	345	[R]43	44	44
Vlg	Chicago, IL-Northwestern, IN	510	560	570	28	22	28	[R]4,055	4,505	4,605	3	3	3
Lrg	Cincinnati, OH-KY	490	525	575	30	29	26	[R]625	670	735	[R]26	25	26
Lrg	Cleveland, OH	310	305	350	47	47	46	[R]580	575	655	[R]28	29	28
Sml	Colorado Springs, CO	240	270	330	52	52	49	[R]100	115	145	[R]55	56	56
Lrg	Columbus, OH	465	480	500	33	32	34	[R]470	490	515	[R]30	30	33
Sml	Corpus Christi, TX	80	95	110	65	65	64	25	30	35	63	63	64
Lrg	Dallas, TX	630	675	780	15	13	6	[R]1,465	1,600	1,865	12	12	11
Lrg	Denver, CO	640	695	760	14	9	8	[R]1,150	1,270	1,415	[R]18	17	17
Vlg	Detroit, MI	665	665	700	9	15	16	[R]2,675	2,665	2,810	[R]4	5	5
Med	El Paso, TX-NM	150	190	245	58	57	55	90	120	160	[R]56	55	55
Sml	Eugene-Springfield, OR	95	115	180	63	61	58	20	25	40	[R]64	64	62
Lrg	Fort Lauderdale-Hollywood-Pompano Beach, FL	410	420	500	35	38	34	[R]595	610	735	[R]27	27	26
Lrg	Fort Worth, TX	385	450	570	39	34	28	[R]500	610	780	[R]29	27	25
Med	Fresno, CA	220	255	310	54	53	52	120	140	170	54	54	54
Med	Hartford-Middletown, CT	285	305	335	48	47	48	[R]180	195	215	[R]52	52	52
Med	Honolulu, HI	325	330	345	43	43	47	[R]230	230	240	[R]50	51	51
Vlg	Houston, TX	700	825	850	7	4	4	[R]2,175	2,575	2,665	[R]8	7	7
Lrg	Indianapolis, IN	750	630	635	4	17	20	[R]760	635	645	23	26	29
Med	Jacksonville, FL	490	475	520	30	33	33	[R]405	400	440	[R]37	38	40
Lrg	Kansas City, MO-KS	320	325	410	46	45	40	[R]435	445	570	[R]34	34	30
Sml	Laredo, TX	60	55	85	67	67	66	10	10	15	66	66	66
Lrg	Las Vegas, NV	325	330	370	43	43	45	[R]375	410	465	[R]39	37	37
Vlg	Los Angeles, CA	920	935	1,000	1	1	1	[R]11,290	11,670	12,570	1	1	1
Med	Louisville, KY-IN	530	585	635	27	19	20	[R]440	485	530	[R]33	31	31
Med	Memphis, TN-AR-MS	405	385	375	37	41	44	[R]390	375	365	[R]38	41	43
Lrg	Miami-Hialeah, FL	660	680	705	10	11	14	[R]1,370	1,410	1,485	[R]15	15	16
Lrg	Milwaukee, WI	325	340	380	43	42	43	410	425	480	36	35	36
Lrg	Minneapolis - St. Paul, MN	565	605	670	19	18	19	[R]1,290	1,400	1,565	[R]16	16	14
Med	Nashville, TN	570	575	710	18	21	13	[R]360	365	455	[R]40	43	38
Lrg	New Orleans, LA	275	285	305	49	51	53	[R]305	315	335	[R]45	45	45
Vlg	New York, NY-Northeastern, NJ	545	555	595	23	24	24	[R]8,890	9,095	9,745	2	2	2
Lrg	Norfolk, VA	410	405	415	35	40	39	[R]420	415	430	[R]35	36	41
Lrg	Oklahoma City, OK	235	250	295	53	54	54	235	255	305	49	50	47
Med	Omaha, NE-IA	270	295	330	50	50	49	[R]155	170	195	[R]53	53	53
Lrg	Orlando, FL	650	685	705	12	10	14	[R]695	745	790	[R]25	23	24
Vlg	Philadelphia, PA-NJ	390	425	435	38	37	38	[R]1,775	1,940	1,990	10	10	10
Lrg	Phoenix, AZ	485	495	540	32	31	31	[R]1,160	1,230	1,385	17	18	18
Lrg	Pittsburgh, PA	195	220	235	56	56	56	[R]350	395	420	[R]41	39	42
Lrg	Portland-Vancouver, OR-WA	555	550	610	22	25	22	[R]800	810	910	[R]22	22	22
Med	Providence-Pawtucket, RI-MA	355	435	490	40	36	36	[R]320	395	445	[R]43	39	39
Med	Rochester, NY	145	120	135	59	60	62	[R]90	75	85	[R]56	58	59
Lrg	Sacramento, CA	560	550	605	20	25	23	[R]725	740	830	[R]24	24	23
Sml	Salem, OR	215	235	235	55	55	56	[R]40	45	45	[R]61	61	61
Med	Salt Lake City, UT	335	315	320	42	46	51	[R]295	280	285	47	47	49
Lrg	San Antonio, TX	270	305	410	50	47	40	[R]335	375	510	[R]42	41	34
Lrg	San Bernardino-Riverside, CA	605	645	685	17	16	17	[R]825	905	965	[R]21	21	21
Lrg	San Diego, CA	540	580	675	24	20	18	[R]1,420	1,560	1,820	[R]13	13	13

continued

Table 1-62 *continued*

Population group	Urban area	Annual congestion cost per capita ($)						Annual congestion cost ($ millions)					
		[R]1997 Value	1998 Value	1999 Value	[R]1997 Rank	1998 Rank	1999 Rank	1997 Value	1998 Value	1999 Value	1997 Rank	1998 Rank	1999 Rank
Vlg	San Francisco-Oakland, CA	660	700	760	10	8	8	[R]2,625	2,805	3,055	[R]5	4	4
Lrg	San Jose, CA	620	670	750	16	14	10	[R]1,005	1,105	1,250	20	19	19
Lrg	Seattle-Everett, WA	855	890	930	3	2	2	[R]1,680	1,760	1,860	11	11	12
Sml	Spokane, WA	170	155	180	57	58	58	[R]55	50	60	[R]59	60	60
Lrg	St. Louis, MO-IL	695	720	745	8	7	11	[R]1,385	1,435	1,495	[R]14	14	15
Med	Tacoma, WA	430	445	490	34	35	36	[R]255	265	295	[R]48	49	48
Med	Tampa, FL	560	560	590	20	22	25	[R]465	475	520	[R]32	32	32
Med	Tucson, AZ	355	410	395	40	39	42	[R]230	270	265	50	48	50
Vlg	Washington, DC-MD-VA	725	755	780	6	5	6	[R]2,495	2,610	2,730	[R]6	6	6
	68-Area Average [a]	560	582	625				1,004	1,058	1,145			
	Very Large Area Average [a]	646	675	710				4,214	4,434	4,700			
	Large Area Average [a]	520	538	590				830	875	970			
	Medium Area Average [a]	396	410	445				272	285	315			
	Small Area Average [a]	132	142	170				32	35	43			

KEY: R = revised; U = unavailable.
Vlg = Very Large Urban Areas - over 3 million population.
Lrg = Large Urban Areas - over 1 million and less than 3 million population.
Med = Medium Urban Areas - over 500,000 and less than 1 million population.
Sml = Small Urban Areas - less than 500,000 population.

[a] For the year 1999, data was obtained from table A-9 from the Texas Transportation Instutute's *The 2001 Annual Urban Mobility Report* referenced below. For other years, the averages were calculated using data obtained from the web site.

NOTES: The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring 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.
The source, for the year 2001, decided to only publish congestion cost per capita, contrary to previous years when the source would publish data for eligible drivers, as well as per capita. To account for this change, the entire table has been updated to reflect the data based on congestion cost per capita.

SOURCE: 1997-99: Texas Transportation Institute, *The 2001 Annual Urban Mobility Report* (College Station, TX: 2001) obtained from Internet site http://mobility.tamu.edu accessed on Sept. 14, 2001.

Table 1-63: Amtrak On-Time Performance Trends and Hours of Delay by Cause

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
On-time performance, total % (weighted)	69	81	76	77	77	72	72	76	71	74	79	79	78
Short distance (<400 miles)	71	82	82	82	82	79	78	81	76	79	81	80	81
Long distance (>=400 miles)	64	78	53	59	61	[a]47	49	57	49	53	59	61	56
Hours of delay by cause[a]													
Amtrak[b]	N	N	3,565	5,915	6,433	8,488	8,538	5,527	5,193	5,310	4,796	4,891	20,187
Freight[c]	N	N	4,244	7,743	8,229	12,827	14,319	11,224	11,438	12,904	14,202	16,158	33,718
Other[d]	N	N	4,316	7,426	8,185	11,675	11,871	8,497	8,425	7,611	8,291	8,203	14,718
Total[e]	**N**	**N**	**12,126**	**21,084**	**22,847**	**32,991**	**34,729**	**25,248**	**25,056**	**25,825**	**27,289**	**29,252**	**68,623**

KEY: N = data do not exist.

[a] Beginning in 2000, the significant increase in hours of delay is the result of including the hours of delay from both Amtrak's Northeast Corridor and operations on contract railroads. The data also reflects the addition of several delay categories. Therefore, pre-2000 data may not be comparable to data from 2000 and subsequent years.
[b] Amtrak delays include equipment malfunctions, train servicing in stations, and passenger-related delays.
[c] Freight delays include maintenance of way/slow orders, freight train interference, and signal delays.
[d] Other delays include passenger train interference, waiting for connections, running time, weather-related delays, and miscellaneous.
[e] Numbers may not add to totals due to rounding.

NOTES: All percentages are based on Amtrak's fiscal year (October 1–September 30).
Amtrak trips are considered delayed based on the following chart:

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

SOURCES:
On-time performance:
1980: Amtrak, *National Railroad Passenger Corporation Annual Report* (Washington, DC: 1981).
1985–2000: Ibid., *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues).
Hours of Delay:
1980: Amtrak, *National Railroad Passenger Corporation Annual Report* (Washington, DC: 1981).
1985–99: Ibid., *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues).
2000: Amtrak, personal communication, Dec. 4, 2001.

Chapter Two

Transportation Safety

Table 2-1: Transportation Fatalities by Mode

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL fatalities	**U**	**U**	**U**	**U**	**U**	**U**	**[R]47,347**	**[R]44,320**	**[R]42,032**	**[R]42,810**	**[R]43,553**	**[R]44,527**	**[R]44,798**	**[R]44,444**	**[R]43,909**	**[R]44,036**	**44,190**
Air																	
U.S. air carrier[a]	499	261	146	124	1	526	39	[j]50	33	1	239	168	380	8	1	12	92
Commuter carrier[b]	N	N	N	28	37	37	[R]6	[j]77	21	24	25	9	14	46	0	12	5
On-demand air taxi[c]	N	N	N	69	105	76	51	78	68	42	63	52	63	39	45	38	71
General aviation[d]	787	1,029	1,310	1,252	1,239	956	767	[R]799	[R]867	[R]740	730	[R]735	[R]636	[R]631	624	[R]619	594
Highway																	
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	[R]20,862	20,492
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	[R]2,483	2,862
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	11,418
Large	N	N	N	961	1,262	977	705	661	585	605	670	648	621	723	742	759	741
Bus occupants	N	N	N	53	46	57	32	31	28	18	18	33	21	18	38	[R]59	22
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	[R]4,939	4,739
Pedalcyclists	490	690	760	1,003	965	890	859	843	723	816	802	833	765	814	760	[R]754	690
Other[f]	27,909	36,759	40,637	1,018	669	628	584	590	485	536	516	501	609	573	540	[R]596	857
Total highway 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**	**[k]42,065**	**42,013**	**41,501**	**[R]41,717**	**41,821**
Railroad[g]																	
Highway-rail grade crossing	1,421	1,610	1,440	917	833	582	698	608	579	626	615	579	488	461	431	402	425
Railroad	924	923	785	575	584	454	599	586	591	653	611	567	551	602	577	530	512
Transit[h]	**N**	**N**	**N**	**N**	**N**	**N**	**339**	**300**	**273**	**281**	**320**	**274**	**264**	**275**	**286**	**299**	**295**
Waterborne[i]																	
Vessel-related[i]	N	N	178	243	206	131	85	30	96	[R]114	[R]78	[R]51	[R]52	[R]50	[R]71	[R]57	32
Not related to vessel casualties[i]	N	N	420	330	281	130	101	56	[R]94	[R]95	[R]101	[R]95	[R]95	[R]88	[R]95	[R]86	87
Recreational boating	739	1,360	1,418	1,466	1,360	1,116	865	924	816	800	784	829	709	821	815	734	701
Pipeline				15	19	33	9	14	15	17	22	21	53	10	20	25	38
Hazardous liquid pipeline	N	N	4	7	4	5	3	0	5	0	1	3	5	0	2	4	1
Gas pipeline	N	N	26	8	15	28	6	14	10	17	21	18	48	10	[R]18	[R]21	37

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 stationwagons, 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 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. Fatalties not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.

[j] 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.

[k] Includes 2 fatalities that have not been assigned to a specific vehicle type.

[l] 1992-2000 data come from the Marine Safety Management Information System. Data for prior years may not be directly comparable.

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 fatalitites 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 workshed. 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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation, table 5 as of May 7, 2002.

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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation, table 9 as of May 7, 2002.

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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation, table 9 as of May 7, 2002.

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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation, table 10 as of May 7, 2002.

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 1999* , DOT HS 809 100 (Washington, DC: December 2000), table 4, and personal communication, Nov. 28, 2001.

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.

1991-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), tables 1-1 and 8-13.

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.

1991-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), tables 1-1 and 8-13.

Transit:

1990-99: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics 1999* (Washington, DC: 2001), p. 41.

2000: U.S Department of Transportation, Federal Transit Administration, personal communications, Mar. 19, 2002.

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.

1992-2000: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, Dec. 12, 2001.

Recreational boating:

1960-2000: Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues).

Hazarous liquid and gas pipeline:

1970-2000: 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 July 24, 2001.

Table 2-2: Injured Persons by Transportation Mode

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL injured persons	**U**	**U**	**U**	**U**	**U**	**U**	**U**	**U**	**3,127,000**	**3,202,000**	**3,325,000**	**3,518,000**	**3,532,000**	**R3,398,000**	**R3,242,000**	**3,284,000**	**U**
Air[a]																	
U.S. air carrier[b]	N	N	107	81	19	30	29	26	R22	R19	31	25	77	R43	R30	R58	27
Commuter carrier[c]	N	N	N	N	14	R14	11	31	7	2	R6	R17	2	1	2	2	7
On-demand air taxi[d]	N	N	N	N	43	R44	36	26	19	24	32	14	R22	23	10	14	12
General aviation[e]	N	N	715	769	R681	R501	R409	R432	R408	R385	R415	R396	R365	R350	R327	R322	310
Highway																	
Passenger car occupants	N	N	N	N	N	N	2,376,000	2,235,000	2,232,000	2,265,000	2,364,000	2,469,000	2,458,000	2,341,000	2,201,000	2,138,000	2,052,000
Motorcyclists	N	N	N	N	N	N	84,000	80,000	65,000	59,000	57,000	57,000	55,000	53,000	49,000	50,000	58,000
Truck occupants[f]																	
Light	N	N	N	N	N	N	505,000	563,000	545,000	601,000	631,000	722,000	761,000	755,000	763,000	847,000	887,000
Large	N	N	N	N	N	N	42,000	28,000	34,000	32,000	30,000	30,000	33,000	31,000	29,000	33,000	31,000
Bus occupants	N	N	N	N	N	N	33,000	21,000	20,000	17,000	16,000	19,000	20,000	17,000	16,000	22,000	18,000
Pedestrians	N	N	N	N	N	N	105,000	88,000	89,000	94,000	92,000	86,000	82,000	77,000	69,000	85,000	78,000
Pedalcyclists	N	N	N	N	N	N	75,000	67,000	63,000	68,000	62,000	67,000	58,000	58,000	53,000	51,000	51,000
Other[g]	N	N	N	N	N	N	11,000	15,000	22,000	13,000	13,000	14,000	15,000	17,000	12,000	R11,000	15,000
Total highway	**N**	**N**	**N**	**N**	**N**	**N**	**3,231,000**	**3,097,000**	**3,070,000**	**3,149,000**	**3,266,000**	**3,465,000**	**3,483,000**	**3,348,000**	**3,192,000**	**3,236,000**	**3,189,000**
Railroad[h]																	
Highway-rail grade crossing	3,367	3,725	3,272	3,860	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
Railroad	16,113	21,930	17,934	50,138	58,696	31,617	22,736	21,374	19,408	17,284	14,851	12,546	10,948	10,227	10,156	R10,304	10,424
Transit[i]	**N**	**N**	**N**	**N**	**N**	**N**	**54,556**	**52,125**	**55,089**	**R52,668**	**58,193**	**57,196**	**55,288**	**56,132**	**55,990**	**55,325**	**U**
Waterborne[j]																	
Vessel-related[k]	N	N	105	97	180	172	175	110	R162	R166	R174	145	R223	R121	R135	R131	125
Not related to vessel casualties[k]	N	N	U	U	U	U	U	U	R1,489	R1,448	R1,718	R1,833	R1,327	R1,037	R540	R500	564
Recreational boating	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
Pipeline																	
Hazardous liquid pipeline	N	N	21	17	15	18	7	9	38	10	1,858	11	13	5	6	20	4
Gas pipeline	N	N	233	214	177	108	69	89	80	101	113	53	114	72	R76	R93	77

KEY: N = data do not exist; 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 stationwagons, 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] 1992-2000 data come from the Marine Safety Management Information System. Data for prior years 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).

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

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).

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

General aviation:

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

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

Highway:

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

2000: Ibid., General Estimates System Database and personal communication, Nov. 28, 2001.

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.

1992-2000: U.S. Department of Transportation, Federal Railroad Administration, *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), tables 1-1 and 8-13.

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.

1992-2000: U.S. Department of Transportation, Federal Railroad Administration, *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), tables 1-1 and 8-13.

Transit:

1990-99: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics* (Washington, DC: Annual issues).

Water:

Waterborne transportation:

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.

1992-2000: Ibid., Data Administration Division (G-MRI-1), personal communication, Dec. 12, 2001.

Recreational boating:

1960-2000: Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues).

Hazardous liquid and gas pipeline:

1970-2000: 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 July 24, 2001.

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
TOTAL accidents	**U**	**U**	**U**	**U**	**U**	**U**	**6,517,000**	**[R]6,167,000**	**6,050,000**	**6,155,000**	**6,551,000**	**6,752,000**	**6,820,000**	**[R]6,676,000**	**6,387,000**	**6,330,000**	**U**
Air																	
U.S. air carrier[b]	90	83	55	37	19	21	24	26	18	23	23	36	[R]37	49	50	52	57
Commuter carrier[c]	N	N	N	48	38	18	15	23	23	16	10	12	11	[R]16	8	13	12
On-demand air taxi[d]	N	N	N	152	171	157	107	88	76	69	85	75	90	82	77	[R]73	80
General aviation[e]	4,793	5,196	4,712	3,995	3,590	2,739	[R]2,241	[R]2,197	[R]2,111	[R]2,063	[R]2,022	[R]2,056	[R]1,908	[R]1,845	[R]1,904	[R]1,906	1,836
Highway																	
Passenger car	N	N	N	N	N	N	5,561,000	5,178,000	[R]5,042,000	[R]5,040,000	[R]5,401,000	5,594,000	5,599,000	5,423,000	5,146,000	4,916,000	4,926,000
Motorcycle	N	N	N	N	N	N	103,000	105,000	72,000	[R]75,000	[R]69,000	66,000	66,000	61,000	54,000	57,000	69,000
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
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
Bus	N	N	N	N	N	N	60,000	56,000	[R]50,000	51,000	56,000	[R]59,000	57,000	53,000	53,000	63,000	56,000
Total highway 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**
Rail																	
Highway-rail grade crossing[g,h]	3,195	3,820	3,559	12,076	10,612	6,919	[R]5,715	[R]5,388	4,910	4,892	4,979	4,633	4,257	3,865	3,508	3,489	3,502
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
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**	**[R]23,310**	**U**
Waterborne																	
Vessel-related	N	N	2,582	3,310	4,624	3,439	3,613	2,222	[R]3,238	[R]3,412	[R]3,970	[R]4,298	[R]4,264	[R]4,198	[R]4,374	[R]4,036	3,791
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	[R]7,931	7,740
Pipeline																	
Hazarous liquid pipeline	N	N	351	254	246	183	180	216	212	229	245	188	[R]194	171	[R]153	[R]168	147
Gas pipeline	N	N	1,077	1,338	1,524	334	198	233	177	216	222	161	187	175	[R]236	[R]173	234

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.
[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 stationwagons, 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.

NOTES:

The motor vehicle crash data in this table come from the U.S. Department of Transportation, National Highway Traffic Safety Adminstrations' 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.

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

• most (not all) highway-rail grade-crossing injuries have not been added because most (not all) such accidents involve motor vehicles and, thus, are already included in highway crashes;

• for transit, all commuter rail accidents and motor bus, trolley bus, demand responsive, and van pool accidents have been subtracted because they are counted as railroad, highway, or highway-rail grade-crossing accidents.

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

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 16.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation as of May 8, 2002, table 5.

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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation as of May 8, 2002, table 8.

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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation as of May 8, 2002, table 9.

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.

1985-2000: Ibid., Internet site www.ntsb.gov/aviation as of May 8, 2002, table 10.

Highway:

1990-2000: 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 1, and personal communication, Dec. 18, 2001.

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.

1991-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), 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.

1991-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), table 1-1.

Transit:

1990-99: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics 1998* (Washington, DC: 2000), pp. 51-54.

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, 1999.

1992-2000: Ibid., Data Administration Division (G-MRI-1), personal communication, Dec. 12, 2001.

Recreational boating:

1960-2000: Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues).

Hazardous liquid and gas pipeline:

1970-2000: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, Internet site, http://ops.dot.gov as of June 14, 2002.

Table 2-4: Distribution of Transportation Fatalities by Mode

	2000	%	1999	%
TOTAL of all modes[e]	**44,190**	**100.0**	**[R]44,036**	**100.0**
Passenger car occupants	20,492	46.4	[R]20,862	47.5
Light-truck occupants	11,418	25.8	[R]11,265	25.7
Pedestrians struck by motor vehicles	4,739	10.7	[R]4,939	11.2
Motorcyclists	2,862	6.5	[R]2,483	5.7
Large-truck occupants	741	1.7	[R]759	1.7
Other and unknown motor vehicle occupants	714	1.6	447	1.0
Recreational boating	701	1.6	734	1.7
Pedalcyclists struck by motor vehicles	690	1.6	[R]754	1.7
General aviation	594	1.3	[R]619	1.4
Railroad Trespassers[a] (excluding grade crossings)	463	1.0	[R]479	1.1
Other nonoccupants struck by motor vehicles[b]	143	0.3	149	0.3
Air carriers	92	0.2	12	0.03
Waterborne transportation (nonvessel-related)	87	0.2	[R]86	0.2
Heavy rail transit (subway)	80	0.2	84	0.2
Air taxi	71	0.2	38	0.09
Grade crossings, not involving motor vehicles[c]	64	0.1	57	0.1
Private grade crossings, with motor vehicles	55	0.1	36	0.08
Waterborne transportation (vessel-related)	32	0.07	[R]57	0.1
Light rail transit	30	0.07	17	0.04
Railroad employees on duty and contractors	25	0.06	38	0.09
Bus occupants (school, intercity, and transit)	22	0.05	[R]59	0.1
Gas distribution pipelines	22	0.05	[R]19	0.04
Railroad-related, not otherwise specified	20	0.05	10	0.02
Gas transmission pipelines	15	0.03	2	>0.01
Transit buses, fatalities not related to accidents[d]	8	0.02	[R]12	0.03
Commuter air	5	0.01	12	0.03
Passengers on railroad trains	4	0.01	3	0.01
Hazardous liquid pipelines	1	>0.01	4	0.01
Demand response transit, fatalities not related to accidents[d]	0	0.00	0	0.00
Other counts, redundant with above[f]				
Large-truck occupants and nonoccupants	5,211		5,380	
Public grade crossings, with motor vehicles	306		[R]309	
Commuter rail	87		95	
Transit buses, accident-related fatalities	82		[R]90	
Outside planes in crashes[g]	13		5	
Demand responsive transit, accident-related fatalities	8		1	

KEY: R = revised.

[a] Includes fatalities outside trains, except at grade crossings.
[b] Includes all nonoccupant fatalities, except pedalcyclists and pedestrians.
[c] Public grade-crossing fatalities involving motor vehicles are included in counts for motor vehicles.
[d] Fatalities not related to transit bus and demand responsive transit accidents are not included under highway submodes.
[e] Unless otherwise specified, includes fatalities outside the vehicle.
[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.

SOURCES:
Air data: National Transportation Safety Board, Internet site www.ntsb.gov/aviation as of May 8, 2002.
Highway data: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2000* (DOT HS 809 337) (Washington, DC : December 2001), table 4 and Fatality Analysis Reporting System (FARS) Query, June 5, 2002.
Railroad data: U.S. Federal Railroad Administration, *Railroad Safety Statistics, Annual Report 2000* (Washington, DC: July 2001), table 1-3.
Transit data: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics* (Washington, DC: Annual issues).

Waterborne transportation: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, Dec. 12, 2001.
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 June 4, 2002.

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
Fatalities	[a]1,440	917	833	582	698	608	579	626	615	579	488	461	431	402	425
Injured persons	3,272	3,860	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
Accidents	[a]3,559	12,076	10,612	6,919	[R]5,715	[R]5,388	4,910	4,892	4,979	4,633	4,257	3,865	3,508	3,489	3,502
Property damage ($ millions)															
Railroad vehicles and property	N	N	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

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:
1970–89: 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.
1990–2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: 2001), table 1.1.
Property damage:
1970–96: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Accident/Incident Bulletin* (Washington, DC: Annual issues), table 5.
1997–2000: Ibid., *Railroad Safety Statistics Annual Report* (Washington, DC: Annual issues), table 5.6.

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
Total fatalities	**27**	**19**	**8**	**8**	**10**	**16**	**15**	**11**	**7**	**120**	**12**	**13**	**R7**	**12**
Accident-related	21	14	7	7	10	15	14	11	6	7	10	8	R5	7
Air fatalities	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**110**	**0**	**0**	**0**	**0**
Accident-related	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**	**R7**	**11**
Accident-related	21	12	7	7	10	15	14	11	6	5	10	8	R5	7
Rail fatalities	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**
Accident-related	0	2	0	0	0	0	0	0	0	2	0	0	0	0
Water[a] fatalities	**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
Other[b] fatalities	**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
Total injured persons	**648**	**626**	**253**	**423**	**439**	**604**	**627**	**577**	**400**	**1,175**	**225**	**197**	**R252**	**240**
Accident-related	168	47	16	18	40	98	62	111	18	864	16	15	13	16
Air injured persons	**5**	**8**	**4**	**39**	**31**	**23**	**50**	**57**	**33**	**33**	**24**	**20**	**R12**	**6**
Accident-related	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**	**156**	**153**	**R205**	**152**
Accident-related	156	43	9	9	27	34	61	95	14	22	11	11	13	15
Rail injured persons	**99**	**121**	**53**	**73**	**75**	**116**	**66**	**95**	**71**	**926**	**45**	**22**	**R35**	**82**
Accident-related	12	4	7	9	13	64	1	16	4	842	5	4	0	1
Water[a] injured persons	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**
Accident-related	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**
Accident-related	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**	**R9,311**	**12,830**	**16,087**	**14,743**	**R13,951**	**R13,999**	**R15,350**	**R17,085**	**17,224**
Accident-related	440	486	364	297	303	283	264	295	294	332	R311	316	R292	289
Air incidents	**147**	**223**	**114**	**297**	**299**	**413**	**622**	**929**	**814**	**916**	**R1,028**	**1,380**	**R1,575**	**1,415**
Accident-related	0	0	0	0	0	1	0	0	0	0	1	1	0	1
Highway incidents	**10,063**	**14,161**	**4,752**	**7,296**	**7,644**	**R7,760**	**11,080**	**13,995**	**12,764**	**11,917**	**R11,863**	**R12,970**	**R14,442**	**14,742**
Accident-related	330	347	302	249	249	245	215	R243	244	289	R258	264	R234	226
Rail incidents	**694**	**1,271**	**842**	**1,279**	**1,155**	**1,130**	**1,120**	**1,157**	**1,153**	**R1,112**	**R1,103**	**R989**	**R1,060**	**1,052**
Accident-related	109	134	61	48	54	36	49	52	50	43	52	51	R58	62
Water[a] incidents	**28**	**34**	**7**	**7**	**12**	**8**	**8**	**6**	**12**	**6**	**5**	**11**	**8**	**15**
Accident-related	0	2	0	0	0	1	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**
Accident-related	1	3	1	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**	**35,164**	**22,802**	**44,185**	**30,903**	**46,849**	**R33,450**	**R46,170**	**R33,856**	**57,531**
Accident-related	6,051	6,236	20,268	24,792	30,184	27,644	13,117	25,542	23,516	37,737	R25,125	R36,842	R21,794	47,614
Air property damage	**8.9**	**12.3**	**12.3**	**142**	**77**	**99**	**88**	**178**	**101**	**87**	**336**	**267**	**R286**	**272**
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	42
Highway property damage	**5,584**	**7,324**	**12,690**	**20,190**	**29,650**	**23,920**	**19,849**	**25,243**	**22,144**	**R29,257**	**R24,720**	**R28,525**	**R24,485**	**30,619**
Accident-related	3,694	3,782	10,175	14,132	23,953	18,140	11,200	13,528	16,256	22,277	R17,786	R21,400	R14,610	23,593
Rail property damage	**2,488**	**2,952**	**10,274**	**11,952**	**8,469**	**11,002**	**2,651**	**18,673**	**8,485**	**R17,385**	**R8,356**	**R16,364**	**R9,024**	**26,515**
Accident-related	2,357	2,357	10,094	10,660	6,231	9,378	1,916	12,014	7,260	15,460	7,339	R15,442	R7,184	23,978
Water[a] property damage	**6.1**	**505**	**3.2**	**70**	**154**	**143**	**213**	**92**	**174**	**120**	**38**	**1,015**	**61**	**125**
Accident-related	0	81	0	0	0	125	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**
Accident-related	0.3	15.6	<0.1	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.

NOTES: 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.

1991-2000: Ibid. Internet site http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm as of May 14, 2001.

Table 2-7: Transportation-Related Occupational Fatalities[a]

	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL occupational fatalities	**6,217**	**6,331**	**6,632**	**6,275**	**6,202**	**6,238**	**[R]6,055**	**6,023**
Transportation-related fatalities								
Highway[b]	1,158	1,243	1,343	1,346	1,346	1,393	[R]1,442	1491
Nonhighway[c]	436	392	409	387	374	377	[R]388	353
Aircraft	353	282	426	283	324	261	[R]224	227
Worker struck by vehicle[d]	346	365	391	388	353	367	413	377
Water vehicle[e]	109	120	94	87	119	109	112	102
Railway[f]	65	86	81	82	74	93	60	56
Total transportation-related[g]	**2,484**	**2,501**	**2,762**	**2,587**	**2,601**	**2,605**	**[R]2,645**	**2,613**
% of total occupational fatalities								
Highway	19	20	20	21	22	22	24	25
Nonhighway	7	6	6	6	6	6	6	6
Aircraft	6	4	6	5	5	4	4	4
Worker struck by vehicle	6	6	6	6	6	6	7	6
Water vehicle	2	2	1	1	2	2	2	2
Railway	1	1	1	1	1	1	1	1
Total transportation-related	**40**	**40**	**42**	**41**	**42**	**42**	**44**	**43**

KEY: R = revised.

[a] Based on the 1992 Bureau of Labor Statistics, Occupational Injury and Illness Classification Structures.

[b] 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.

[c] 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.

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

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

[f] Includes collisions between railway vehicles, railway vehicle and other vehicle, railway vehicle and other object, and derailment.

[g] Numbers may not add to totals because transportation categories may include subcategories not shown separately.

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, *News: National Census of Fatal Occupational Injuries,* Internet site www.bls.gov/oshhome.htm as of July 27, 2001. This document is based on the U.S. Department of Labor, Bureau of Labor Statistics, C*ensus of Fatal Occupational Injuries* (Washington, DC: Annual issues), table 1.

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 (FHWA)	None; each state defines its own threshold and FHWA collects state reports.
Federal Railroad Administration	More than $6,600 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 $1,000 to transit vehicles.
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 for recreational boats.

SOURCES:

Federal Aviation Administration: 49 CFR 830.5 (as of Oct. 1, 2000).

Federal Highway Administration:

U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1999* , DOT HS 808 983 (Washington, DC: 2000).

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

Federal Railroad Administration: U.S. Department of Transportation, Federal Railroad Administration, *Railroad Safety Statistics Annual Report 1999* (Washington, DC: July 2000).

Federal Transit Administration: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics (SAMIS) Annual Report 1999* , DOT-FTA-MA-26-5011-00-1 (Washington, DC: 2000).

Research and Special Programs Administration:

Gas pipeline: 49 CFR 191.3 (as of Oct. 1, 2000).

Oil pipeline: 49 CFR 195.50 (as of Oct. 1, 2000).

U.S. Coast Guard:

Commercial shipping: 46 CFR 4.05-1 (as of Oct. 1, 2000).

Recreational boating: 33 CFR 173.55 (as of July 2, 2001).

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
Total fatalities	**499**	**261**	**146**	**124**	**1**	**526**	**39**	**[b]50**	**33**	**1**	**239**	**168**	**380**	**8**	**1**	**12**	**92**
Total seriously injured persons	**N**	**N**	**107**	**81**	**19**	**30**	**29**	**26**	**[R]22**	**[R]19**	**31**	**25**	**77**	**[R]43**	**[R]30**	**[R]58**	**27**
Total accidents	**90**	**83**	**55**	**37**	**19**	**21**	**24**	**26**	**18**	**23**	**23**	**36**	**[R]37**	**49**	**50**	**52**	**57**
Fatal accidents	17	9	8	3	1	7	6	4	4	1	4	3	5	4	1	2	3
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**	**[R]6,697**	**[R]6,737**	**[R]7,102**	**7,521**
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	[R]0.019	4.363	2.971	6.470	[R]0.119	0.015	[R]0.169	1.223
Seriously injured persons	N	N	3.985	3.269	0.650	0.826	0.586	0.539	[R]0.437	[R]0.362	0.566	0.442	1.311	[R]0.642	[R]0.445	[R]0.817	0.359
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	[R]0.630	[R]0.732	[R]0.742	[R]0.732	0.758
Fatal accidents	1.504	0.586	0.298	0.121	0.034	[R]0.193	[R]0.121	0.083	0.079	0.019	0.073	0.053	0.085	0.060	0.015	[R]0.028	0.040
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**	**[R]10,318**	**[R]10,980**	**[R]11,309**	**11,437**
Rates per 100,000 aircraft departures																	
Fatalities	N	N	N	N	0.018	8.340	0.482	0.640	0.419	[R]0.012	2.901	1.987	4.618	0.078	[R]0.009	[R]0.106	0.804
Seriously injured persons	N	N	N	N	0.347	0.476	0.358	0.333	[R]0.279	[R]0.235	0.376	0.296	0.936	[R]0.417	[R]0.273	[R]0.513	0.236
Total accidents	N	N	N	N	0.347	0.333	0.297	0.333	0.228	0.285	0.279	0.426	[R]0.450	[R]0.475	[R]0.455	[R]0.460	0.498
Fatal accidents	N	N	N	N	0.018	0.111	0.074	0.051	0.051	0.012	0.049	0.035	0.061	[R]0.049	[R]0.012	[R]0.024	0.036
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**	**[R]16,813**	**[R]17,555**	**18,295**
Rates per 100,000 flight hours																	
Fatalities	N	5.564	2.257	2.212	0.014	6.039	0.321	0.424	0.267	[R]0.008	1.821	1.244	2.764	[R]0.051	[R]0.006	[R]0.068	0.503
Seriously injured persons	N	N	1.654	1.445	0.269	0.344	0.239	0.221	[R]0.178	[R]0.150	0.236	0.185	0.560	[R]0.271	[R]0.178	[R]0.330	0.148
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	[R]0.269	0.309	[R]0.316	[R]0.328	0.360
Fatal accidents	N	0.192	0.124	0.054	0.014	0.080	0.049	0.034	0.032	[R]0.008	0.030	0.022	0.036	0.025	[R]0.006	[R]0.013	0.019

KEY: N = data do not exist; 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.

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.
1985-2000: National Transportation Safety Board, Internet site www.ntsb.gov/aviation/Table5.htm, as of May 8, 2002.

Serious injuries:

1970-94: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).
1995-2000: Ibid., Analysis and Data Division, personal communications, Aug. 8, 1996; 1997; Mar. 10, 1999; Mar. 28, 2000, and May 7, 2002.

Table 2-10: U.S. Commuter Air Carrier[a] Safety Data

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total fatalities	**37**	**37**	**[R]6**	**[d]77**	**21**	**24**	**25**	**9**	**14**	**46**	**0**	**12**	**5**
Total seriously injured persons	**14**	**[R]14**	**11**	**31**	**7**	**2**	**[R]6**	**[R]17**	**2**	**1**	**2**	**2**	**7**
Total accidents	**38**	**18**	**15**	**23**	**[e]23**	**16**	**10**	**12**	**11**	**16**	**8**	**13**	**12**
Fatal	8	7	[R]3	8	7	4	3	2	1	5	0	5	1
Aircraft-miles (millions)	**192**	**301**	**450**	**434**	**508**	**555**	**594**	**550**	**591**	**[R]246**	**51**	**[R]46**	**39**
Rates per 100 million aircraft-miles													
Fatalities[b]	19.27	12.29	[R]1.33	17.74	4.13	4.32	4.21	1.64	2.37	[R]18.70	0.00	[R]26.09	12.82
Seriously injured persons	7.29	[R]4.65	2.44	7.14	1.38	0.36	[R]1.01	[R]3.09	0.34	[R]0.41	[R]3.92	[R]4.35	17.95
Total accidents[b,c]	19.79	5.98	3.33	5.30	4.53	2.88	1.68	2.18	1.86	[R]6.50	[R]15.69	[R]28.26	30.77
Fatal [b,c]	4.17	2.33	[R]0.67	1.84	1.38	0.72	0.51	0.36	0.17	[R]2.03	0.00	[R]10.87	2.56
Aircraft departures (thousands)	**1,777**	**2,561**	**3,160**	**2,820**	**3,115**	**3,601**	**3,581**	**3,220**	**3,515**	**1,394**	**707**	**[R]672**	**611**
Rates per 100 thousand aircraft departures													
Fatalities[b]	2.08	1.44	[R]0.19	2.73	0.67	0.67	0.70	0.28	0.40	3.30	0.00	[R]1.79	0.82
Seriously injured persons	0.79	[R]0.55	0.35	1.10	0.22	0.06	[R]0.17	[R]0.53	0.06	0.07	0.28	[R]0.30	1.15
Total accidents[c]	2.14	0.70	[R]0.47	0.82	0.74	0.44	0.28	0.37	0.31	1.15	1.13	[R]1.93	1.96
Fatal [c]	0.45	0.27	[R]0.09	0.28	[R]0.22	0.11	0.08	0.06	0.03	0.36	0.00	[R]0.74	0.16
Flight hours (thousands)	**1,176**	**1,737**	**2,342**	**2,292**	**2,335**	**2,638**	**2,784**	**2,628**	**2,757**	**983**	**354**	**[R]343**	**374**
Rates per 100 thousand flight hours													
Fatalities	3.15	2.13	[R]0.26	3.36	0.90	0.91	0.90	0.34	0.51	4.68	0.00	[R]3.50	1.34
Seriously injured persons	1.19	[R]0.81	0.47	1.35	0.30	0.08	[R]0.22	[R]0.65	0.07	0.10	[R]0.56	[R]0.58	1.87
Total accidents[c]	3.23	1.04	0.64	1.00	[R]0.99	0.61	0.36	0.46	0.40	1.63	2.26	[R]3.79	3.21
Fatal [c]	0.68	0.40	[R]0.13	0.35	0.30	0.15	0.11	0.08	0.04	0.51	0.00	[R]1.46	0.27

KEY: 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.
1985-2000: Ibid., Internet site www.ntsb.gov/aviation/Table 8.htm as of May 8, 2002.
Serious injuries:
1980-94: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).
1995-2000: Ibid., Analysis and Data Division, personal communications, 1996; 1997; 1998; Mar. 28, 2000, and May 7, 2002.

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
Total fatal accidents	**6**	**4**	**4**	**1**	**4**	**3**	**5**	**4**	**1**	**2**	**3**
Phase of operation											
Approach/descent/landing	1	2	1	0	2	2	0	0	0	1	1
Taxi/takeoff/climb	3	1	2	0	1	0	3	2	0	0	0
Cruise (inflight)	1	0	0	0	0	0	1	1	0	0	1
Standing (static)	1	1	1	1	0	0	0	1	1	1	1
Maneuvering	0	0	0	0	1	0	0	0	0	0	0
Other/not reported	0	0	0	0	0	1	1	0	0	0	0

[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.

SOURCES:

1990-95: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues), table 18.

1996-2000: Ibid., personal communication, Mar. 10, 1999, Mar. 28, 2000, and July 27, 2001.

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
Total fatal accidents	**[R]3**	**8**	**7**	**4**	**3**	**2**	**1**	**5**	**0**	**5**	**1**
Phase of operation											
Approach/descent/landing	0	3	5	1	2	0	1	2	0	0	1
Taxi/takeoff/climb	0	0	1	1	0	1	0	1	0	2	0
Cruise (in flight)	[R]2	2	1	1	1	0	0	0	0	3	0
Standing (static)	0	1	0	1	0	0	0	0	0	0	0
Maneuvering[b]	1	1	0	0	0	1	0	2	0	0	0
Other/not reported	0	1	0	0	0	0	0	0	0	0	0

KEY: R = revised.

[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.
1997-2000: Ibid., personal communication, Aug. 24, 2001.

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
Total fatalities	**69**	**105**	**76**	**51**	**78**	**68**	**42**	**63**	**52**	**63**	**39**	**[R]45**	**38**	**71**
Total seriously injured persons	**N**	**43**	**[R]44**	**36**	**26**	**19**	**24**	**32**	**14**	**[R]22**	**23**	**10**	**14**	**12**
Total accidents	**152**	**171**	**157**	**107**	**88**	**76**	**69**	**85**	**75**	**90**	**82**	**77**	**[R]73**	**81**
Fatal	**24**	**46**	**35**	**29**	**28**	**24**	**19**	**26**	**24**	**29**	**15**	**[R]17**	**12**	**22**
Flight hours (thousands)	**2,526**	**3,618**	**2,570**	**2,249**	**2,241**	**[R]2,844**	**[R]2,324**	**[R]2,465**	**[R]2,486**	**[R]3,220**	**[R]3,098**	**[R]3,802**	**[R]3,298**	**3,553**
Rates per 100,000 flight hours[b]														
Fatalities	2.73	2.90	2.96	2.27	3.48	[R]2.39	[R]1.81	[R]2.56	[R]2.09	[R]1.96	[R]1.26	[R]1.18	[R]1.15	2.00
Seriously injured persons	N	1.19	[R]1.71	1.60	1.16	[R]0.67	[R]1.03	[R]1.30	[R]0.56	[R]0.68	[R]0.74	[R]0.26	[R]0.42	0.34
Total accidents	6.02	4.73	6.11	4.76	3.93	[R]2.67	[R]2.97	[R]3.45	[R]3.02	[R]2.80	[R]2.65	[R]2.03	[R]2.21	2.28
Fatal	0.95	1.27	1.36	1.29	1.25	[R]0.84	[R]0.82	[R]1.05	[R]0.97	[R]0.90	[R]0.48	[R]0.45	[R]0.36	0.62

KEY: N = data do not exist; 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, accidents, and 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.

1985-00: Ibid. Internet site www.ntsb.gov/aviation/Table9.htm as of May 8, 2002.

Serious injuries:

1980-90: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1995-00: Ibid., Analysis and Data Division, personal communications, 1996; 1997; 1998; Mar. 28, 2000, and May 7, 2002.

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
TOTAL fatalities	**787**	**1,029**	**1,310**	**1,252**	**1,239**	**956**	**767**	**R799**	**R867**	**R740**	**R730**	**R735**	**R636**	**R631**	**R624**	**R619**	**594**
TOTAL seriously injured persons	**N**	**N**	**715**	**769**	**681**	**R501**	**R409**	**R432**	**R408**	**R385**	**R415**	**R396**	**R365**	**R350**	**R327**	**R322**	**310**
TOTAL accidents[b]	**4,793**	**5,196**	**4,712**	**3,995**	**3,590**	**2,739**	**R2,241**	**R2,197**	**R2,111**	**R2,063**	**R2,022**	**R2,056**	**R1,908**	**R1,845**	**R1,904**	**R1,906**	**1,838**
Fatal	**429**	**538**	**641**	**633**	**618**	**498**	**443**	**R438**	**R451**	**R400**	**R404**	**R413**	**R361**	**R350**	**R364**	**R340**	**343**
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**	**R25,591**	**R25,518**	**R29,713**	**29,057**
Rates per 100,000 flight hours[c]																	
Fatalities	6.00	6.15	5.03	4.35	3.40	3.38	2.69	R2.88	R3.50	R3.25	R3.28	2.95	R2.56	R2.47	R2.45	R2.08	2.04
Seriously injured persons	N	N	2.75	2.67	1.87	R1.77	R1.43	R1.56	R1.65	R1.69	R1.87	1.59	R1.47	R1.37	R1.28	R1.08	1.07
Total accidents	36.53	31.05	18.10	13.87	9.86	9.66	R7.86	R7.93	R8.52	R9.05	R9.09	R8.26	7.67	R7.21	R7.46	R6.41	6.33
Fatal	3.27	3.22	2.46	2.20	1.70	1.75	1.55	R1.58	R1.82	R1.75	R1.82	R1.66	1.45	R1.37	R1.43	R1.14	1.18

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 cases included in accidents and fatalities but excluded from accident rates in this table are: 1985 (3 accidents, 2 fatal accidents); 1990 (1,0); 1995 (4,3).

[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, accidents, and 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.

1985-2000: Ibid. Internet site www.ntsb.gov/aviation/Table10.htm as of May 7, 2002.

Serious injuries:

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

1995-2000: Ibid. Analysis and Data Division, personal communications, 1996; 1997; 1998; Mar. 28, 2000, and May 8, 2002.

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
Degree of hazard													
Total	**568**	**758**	**454**	**348**	**311**	**254**	**275**	**238**	**194**	**[R]238**	**[R]211**	**[R]258**	**237**
Critical[a]	118	180	74	52	46	35	47	32	26	31	22	[R]28	27
Potential[b]	319	423	266	197	195	158	139	139	101	105	[R]100	[R]111	123
No hazard[c]	122	133	114	99	70	61	71	63	55	70	[R]53	55	47
Unclassified[d]	9	22	0	0	0	0	18	4	12	[R]32	[R]36	[R]64	40
NMAC involving aircraft operating under 14 CFR 121[e]	U	U	121	101	72	60	63	43	[R]50	81	64	63	74

KEY: 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: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Safety Statistical Handbook Annual Report* (Washington, DC: Annual issues) and personal communication, Aug. 6, 2001.
NMAC involving 121 aircraft: Ibid. Air Traffic Resource Management, personal communications, Mar. 18, 1999, May 22, 2000, and Aug. 6, 2001.

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
Persons screened (millions)	**585**	**993**	**1,145**	**1,015**	**1,111**	**1,150**	**1,261**	**1,263**	**1,497**	**1,660**	**R1,667**	**R1,767**	**1,812**
Type of weapon detected													
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
Long guns	36	90	59	47	105	91	134	160	156	162	114	131	294
Total	**1,914**	**2,913**	**2,843**	**1,644**	**2,608**	**2,798**	**2,994**	**2,390**	**2,155**	**2,067**	**1,515**	**1,552**	**1,937**
Other/other dangerous articles[b]	108	74	304	275	N	N	N	N	N	N	N	N	N
Explosive/incendiary devices	8	12	15	94	167	251	N	N	N	N	N	N	N
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
Giving false information	32	42	18	28	13	31	35	68	131	72	86	58	61
Bomb threats received													
Against airports	1,179	477	448	498	188	304	250	346	N	N	N	N	N
Against aircraft	268	153	338	388	215	248	218	327	N	N	N	N	N

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

[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: Ibid., *Criminal Acts Against Civil Aviation* (Washington, DC: Annual issues).

Table 2-17: Motor Vehicle Safety Data

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**[R]41,717**	**41,821**
Injured persons	**N**	**N**	**N**	**N**	**N**	**N**	**3,231,000**	**3,097,000**	**3,070,000**	**3,149,000**	**3,266,000**	**3,465,000**	**3,483,000**	**3,348,000**	**3,192,000**	**3,236,000**	**3,189,000**
Crashes	**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**
Vehicle-miles (billions)	**719**	**888**	**1,110**	**1,328**	**1,527**	**1,775**	**2,144**	**2,172**	**2,247**	**2,296**	**2,358**	**2,423**	**2,486**	**2,562**	**2,632**	**2,691**	**2,750**
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	[R]1.6	1.5
Injured persons	N	N	N	N	N	N	151	143	137	137	139	143	140	131	121	120	116
Crashes	N	N	N	N	N	N	302	282	267	266	276	277	272	259	241	233	233

KEY: 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.

1975-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2000,* DOT HS 809 337 (Washington, DC: December 2001), table 2.

Injured persons:

1990-2000: Ibid., *Traffic Safety Facts 2000,* DOT HS 809 337 (Washington, DC: December 2001), table 2.

Crashes:

1990-2000: Ibid., *Traffic Safety Facts 2000,* DOT HS 809 337 (Washington, DC: December 2001), 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.

1975-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2000,* DOT HS 809 337 (Washington, DC: December 2001), table 2.

Fatality and injury rates:

1960-1965: Calculated by U.S. Department of Transportation, Bureau of Transportation Statistics.

1970-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2000,* DOT HS 809 337 (Washington, DC: December 2001), 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
Fatalities									
Rural	**29,545**	**24,492**	**25,786**	**23,978**	**24,510**	**24,811**	**24,751**	**25,185**	**23,640**
Interstate	2,263	2,141	2,707	2,675	2,905	3,040	3,105	3,244	3,199
Other arterial	12,268	9,940	9,893	9,947	9,458	9,678	9,594	9,573	8,913
Collector	10,004	8,209	8,852	7,401	7,481	7,643	7,593	7,595	7,147
Local	5,010	4,202	4,334	3,955	4,666	4,450	4,459	4,773	4,381
Urban	**21,546**	**19,333**	**18,813**	**17,839**	**17,555**	**16,758**	**16,143**	**15,970**	**15,695**
Interstate	2,184	2,025	2,252	2,154	2,323	2,292	2,283	2,353	2,388
Other arterial	12,752	12,521	11,742	10,916	10,756	10,239	9,902	9,628	9,442
Collector	2,226	1,696	1,427	1,441	1,290	1,163	1,037	1,031	987
Local	4,384	3,091	3,392	3,328	3,186	3,064	2,921	2,958	2,878
VMT (millions)									
Rural	**672,030**	**730,728**	**868,878**	**933,289**	**960,194**	**1,001,350**	**1,033,457**	**1,062,623**	**1,084,961**
Interstate	135,084	154,357	200,173	223,382	232,565	240,255	251,520	260,166	268,960
Other arterial	262,774	282,803	330,866	368,595	378,847	392,058	403,484	413,320	420,569
Collector	189,468	206,669	240,460	236,148	241,030	254,364	257,858	264,453	267,521
Local	84,704	86,899	97,379	105,164	107,752	114,673	120,595	124,684	127,911
Urban	**855,265**	**1,044,098**	**1,275,484**	**1,489,534**	**1,523,886**	**1,560,345**	**1,598,065**	**1,626,618**	**1,664,842**
Interstate	161,242	216,188	278,901	341,528	351,579	361,401	374,622	382,259	393,580
Other arterial	484,189	578,270	699,233	815,170	834,623	846,659	862,994	878,153	900,161
Collector	83,043	89,578	106,297	126,929	129,310	130,143	131,919	131,603	135,371
Local	126,791	160,062	191,053	205,907	208,374	222,142	228,530	234,603	235,730
Fatality rates per 100 million vehicle miles									
Rural	**4.40**	**3.35**	**2.97**	**2.57**	**2.55**	**2.48**	**2.39**	**2.37**	**2.18**
Interstate	1.68	1.39	1.35	1.20	1.25	1.27	1.23	1.25	1.19
Other arterial	4.67	3.51	2.99	2.70	2.50	2.47	2.38	2.32	2.12
Collector	5.28	3.97	3.68	3.13	3.10	3.00	2.94	2.87	2.67
Local	5.91	4.84	4.45	3.76	4.33	3.88	3.70	3.83	3.43
Urban	**2.52**	**1.85**	**1.47**	**1.20**	**1.15**	**1.07**	**1.01**	**0.98**	**0.94**
Interstate	1.35	0.94	0.81	0.63	0.66	0.63	0.61	0.62	0.61
Other arterial	2.63	2.17	1.68	1.34	1.29	1.21	1.15	1.10	1.05
Collector	2.68	1.89	1.34	1.14	1.00	0.89	0.79	0.78	0.73
Local	3.46	1.93	1.78	1.62	1.53	1.38	1.28	1.26	1.22

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 www.fhwa.dot.gov/ohim/ohimstat.htm as of Oct. 25, 2000.

1996-97: Ibid., *Highway Statistics,* Internet site www.fhwa.dot.gov/ohim/ohimstat.htm as of Oct. 25, 2000, table FI-1.

1998: Ibid., table FI-20.

1999: Ibid., personal communication, June 5, 2002.

2000: Ibid., Internet site http://fhwa.dot.gov/ohim/hs00/re.htm as of October 2001, table FI-20.

Vehicle miles:

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-202.

1995-98: Ibid., *Highway Statistics,* Internet site www.fhwa.dot.gov/ohim/ohimstat.htm as of Oct. 25, 2000, tables VM-2 and VM-2a.

1999: Ibid., personal communication, June 5, 2002.

2000: Ibid., Internet site http://fhwa.dot.gov/ohim/hs00/re.htm as of Oct. 2001, 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
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**	**[R]41,717**	**41,821**
Occupant fatalities by vehicle type														
Passenger car														
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	[R]4,887	4,718
Compact	614	927	2,635	5,310	5,338	5,354	5,707	6,322	6,899	7,288	7,195	6,804	[R]6,942	6,933
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	[R]4,721	5,131
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	[R]2,887	3,143
Unknown	8,812	3,765	1,607	989	632	791	733	648	654	512	509	1,153	[R]1,425	567
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**	**[R]20,862**	**20,492**
Truck[c]														
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	[R]11,265	11,418
Large	961	1,262	977	705	661	585	605	670	648	621	723	742	[R]759	741
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**	**[R]12,024**	**12,159**
Other vehicles														
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	[R]2,483	2,862
Bus	53	46	57	32	31	28	18	18	33	21	18	38	[R]59	22
Other/unknown vehicle type	937	540	544	460	466	387	425	409	392	455	420	409	[R]447	714
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**	**[R]2,989**	**3,598**
Total vehicle occupant fatalities	**35,925**	**41,927**	**36,043**	**37,134**	**34,740**	**32,880**	**33,574**	**34,318**	**35,291**	**35,695**	**35,725**	**35,382**	**[R]35,875**	**36,249**
Nonoccupant fatalities														
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	[R]4,939	4,739
Pedalcyclist	1,003	965	890	859	843	723	816	802	833	765	814	760	[R]754	690
Other	81	129	84	124	124	98	111	107	109	154	153	131	149	143
Total nonoccupant fatalities	**8,600**	**9,164**	**7,782**	**7,465**	**6,768**	**6,370**	**6,576**	**6,398**	**6,526**	**6,368**	**6,288**	**6,119**	**[R]5,842**	**5,572**

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: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1999,* DOT HS 809 100 (Washington, DC: December 2000), table 4, and personal communication, Nov. 28, 2001.
Breakout of passenger car types:
U.S Department of Transportation, National Center for Statistics and Analysis, Fatality Analysis Reporting System Database, 2001.

Table 2-20: Occupant and Non-Motorist Fatalities in Crashes by Number of Vehicles and Alcohol Involvement (AI)

	1985		1990		1991		1992		1993		1994	
	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI
TOTAL FATALITIES	**43,825**	**22,715**	**44,599**	**[R]22,084**	**41,508**	**19,887**	**39,250**	**[R]17,858**	**40,150**	**17,473**	**40,716**	**16,580**
% of total fatalities		52		50		48		45		44		41
OCCUPANTS	**36,043**	**18,791**	**37,134**	**18,442**	**34,740**	**16,588**	**32,880**	**14,814**	**33,574**	**14,404**	**34,318**	**13,746**
Single-vehicle crashes	17,130	10,706	18,159	11,000	17,280	10,086	15,958	8,844	15,932	8,564	15,997	8,084
Two-vehicle crashes	16,467	7,065	16,262	6,429	15,025	5,674	14,449	5,116	15,161	4,998	15,664	4,889
More than two-vehicle crashes	2,446	1,021	2,713	1,013	2,435	828	2,473	854	2,481	842	2,657	773
NON-MOTORISTS	**7,782**	**3,924**	**7,465**	**[R]3,642**	**6,768**	**3,299**	**6,370**	**3,045**	**6,576**	**3,069**	**6,398**	**2,834**
Pedestrians	**6,808**	**3,584**	**6,482**	**3,258**	**5,801**	**2,933**	**5,549**	**2,756**	**5,649**	**2,741**	**5,489**	**2,541**
Single-vehicle crashes	6,342	3,297	5,990	2,971	5,302	2,643	5,099	2,494	5,180	2,477	5,027	2,286
Multiple-vehicle crashes	466	287	492	287	499	290	450	261	469	263	462	254
Pedalcyclists	**890**	**303**	**859**	**332**	**843**	**319**	**723**	**250**	**816**	**295**	**802**	**266**
Single-vehicle crashes	864	291	832	319	815	310	690	234	792	280	781	258
Multiple-vehicle crashes	26	12	27	13	28	9	33	15	24	16	21	8
Others/unknown	**84**	**37**	**124**	**53**	**124**	**47**	**98**	**39**	**111**	**33**	**107**	**27**

	1995		1996		1997		1998		1999		2000	
	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI
TOTAL FATALITIES	**41,817**	**17,247**	**42,065**	**[R]17,218**	**42,013**	**[R]16,189**	**41,501**	**16,020**	**[R]41,717**	**[R]15,976**	**41,821**	**16,653**
% of total fatalities		41		41		39		39		38		40
OCCUPANTS	**35,291**	**14,280**	**35,695**	**14,264**	**35,725**	**13,483**	**35,382**	**13,281**	**[R]35,875**	**[R]13,325**	**36,249**	**14,108**
Single-vehicle crashes	16,732	8,643	16,723	8,572	16,529	8,032	16,666	8,153	[R]17,075	[R]8,266	17,430	8,665
Two-vehicle crashes	15,744	4,794	15,935	4,813	16,218	4,637	15,742	4,363	[R]15,726	[R]4,278	15,714	4,539
More than two-vehicle crashes	2,815	843	3,037	878	2,978	814	2,974	766	[R]3,074	[R]781	3,105	905
NON-MOTORISTS	**6,526**	**2,967**	**[R]6,368**	**[R]2,954**	**6,288**	**[R]2,706**	**6,119**	**2,739**	**[R]5,842**	**[R]2,651**	**5,572**	**2,545**
Pedestrians	**5,584**	**2,627**	**5,449**	**2,615**	**5,321**	**2,384**	**5,228**	**2,429**	**[R]4,939**	**[R]2,336**	**4,739**	**2,241**
Single-vehicle crashes	5,111	2,395	5,024	2,389	4,876	2,151	4,801	2,203	[R]4,516	[R]2,098	4,316	2,016
Multiple-vehicle crashes	474	232	425	227	445	233	427	226	[R]423	[R]238	423	226
Pedalcyclists	**833**	**303**	**765**	**278**	**814**	**268**	**760**	**263**	**[R]754**	**[R]284**	**690**	**257**
Single-vehicle crashes	807	292	739	268	788	259	736	254	[R]718	[R]265	665	247
Multiple-vehicle crashes	26	11	26	11	26	8	24	9	36	19	25	10
Others/unknown	**109**	**37**	**[R]154**	**60**	**153**	**55**	**131**	**47**	**149**	**31**	**143**	**46**

KEY: AI = Alcohol involvement; Fatal = fatalities; R = revised.

NOTES: AI 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.
AI numbers may not equal totals due to rounding.

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, Dec. 11, 2001.

Table 2-21: Passenger Car Occupant Safety Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**[R]20,862**	**20,492**
Injured persons	**N**	**N**	**N**	**2,376,000**	**2,235,000**	**2,232,000**	**2,265,000**	**2,364,000**	**2,469,000**	**2,458,000**	**2,341,000**	**2,201,000**	**[R]2,138,000**	**2,052,000**
Crashes	**N**	**N**	**N**	**[R]5,561,000**	**5,178,000**	**[R]5,042,000**	**[R]5,040,000**	**[R]5,401,000**	**[R]5,594,000**	**5,599,000**	**[R]5,423,000**	**5,146,000**	**[R]4,916,000**	**4,926,000**
Vehicle-miles (billions)	**1,030**	**1,107**	**1,249**	**1,427**	**1,412**	**1,436**	**1,445**	**1,459**	**1,478**	**1,499**	**1,528**	**1,556**	**[R]1,567**	**1,582**
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	[R]1.5	1.4	1.3	1.3
Injured persons	N	N	N	167	158	155	157	162	167	164	153	141	136	130
Crashes	N	N	N	390	367	351	349	370	[R]378	373	[R]355	[R]331	[R]314	311

KEY: 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, *Traffic Safety Facts 1999,* DOT HS 809 100 (Washington, DC: October 2000), table 7 and personal communication, Nov. 28, 2001.

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, Dec. 18, 2001.

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
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**	**[R]2,483**	**2,862**
Injured persons	**N**	**N**	**N**	**84,000**	**80,000**	**65,000**	**59,000**	**57,000**	**57,000**	**55,000**	**53,000**	**49,000**	**50,000**	**58,000**
Crashes	**N**	**N**	**N**	**103,000**	**[R]105,000**	**72,000**	**[R]75,000**	**[R]69,000**	**[R]66,000**	**66,000**	**61,000**	**[R]54,000**	**57,000**	**69,000**
Vehicle-miles (billions)	**5.6**	**10.2**	**9.1**	**9.6**	**9.2**	**9.6**	**9.9**	**10.2**	**9.8**	**9.9**	**10.1**	**10.3**	**10.6**	**10.5**
Rates per 100 million vehicle-miles[a]														
Fatalities	57	50	50	34	31	25	25	23	23	22	21	22	[R]24	27
Injured persons[R]	N	N	N	879	872	680	596	557	582	554	526	477	472	551
Crashes	N	N	N	1,078	[R]1,144	753	[R]757	[R]674	[R]674	[R]665	[R]605	[R]525	[R]539	658

KEY: 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 1999, D* OT HS 809 100 (Washington, DC: December, 2000), table 10, and personal communication, Nov. 28, 2001.

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, Dec. 18, 2001.

Table 2-23: Truck Occupant Safety Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fatalities														
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	[R]11,265	11,418
Large	961	1,262	977	705	661	585	605	670	648	621	723	742	[R]759	741
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**	**[R]12,024**	**12,159**
Injured persons														
Light	N	N	N	505,000	563,000	545,000	601,000	631,000	722,000	761,000	755,000	763,000	847,000	887,000
Large	N	N	N	42,000	28,000	34,000	32,000	30,000	30,000	33,000	31,000	29,000	33,000	31,000
Total	**N**	**N**	**N**	**547,000**	**591,000**	**579,000**	**633,000**	**661,000**	**752,000**	**794,000**	**786,000**	**792,000**	**880,000**	**918,000**
Crashes														
Light	N	N	N	2,152,000	2,200,000	2,191,000	[R]2,407,000	[R]2,574,000	[R]2,750,000	2,881,000	2,901,000	2,867,000	3,080,000	3,208,000
Large	N	N	N	372,000	319,000	363,000	[R]383,000	[R]445,000	[R]363,000	378,000	421,000	392,000	452,000	438,000
Total[a,R]	**N**	**N**	**N**	**2,460,000**	**2,461,000**	**2,489,000**	**2,723,000**	**2,938,000**	**3,039,000**	**3,175,000**	**3,225,000**	**3,168,000**	**3,425,000**	**3,540,000**
Vehicle-miles (billions)														
Light	204	295	389	556	596	642	675	712	750	787	[R]825	[R]862	[R]903	944
Large	81	108	124	146	150	153	160	170	178	183	191	196	[R]203	206
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
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
Injured persons														
Light	N	N	N	91	94	85	89	89	96	[R]97	[R]92	89	94	94
Large	N	N	N	29	19	22	20	18	17	18	16	15	[R]16	15
Crashes														
Light	N	N	N	387	369	341	[R]356	[R]362	[R]367	366	352	333	[R]341	340
Large	N	N	N	[R]254	213	[R]237	[R]240	261	[R]204	207	220	200	[R]223	213

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

[a] Crashes 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 stationwagons, 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, *Traffic Safety Facts 1999,* DOT HS 809 100 (Washington, DC: December 2000), tables 8 and 9, and personal communication, Nov. 28, 2001.

Crashes:

Ibid., National Center for Statistics and Analysis, Fatality Analysis Reporting System Database and General Estimates System Database, personal communication, Dec. 18, 2001.

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
Fatalities	**53**	**46**	**57**	**32**	**31**	**28**	**18**	**18**	**33**	**21**	**18**	**38**	**[R]59**	**22**
Injured persons	**N**	**N**	**N**	**33,000**	**21,000**	**20,000**	**17,000**	**16,000**	**19,000**	**20,000**	**17,000**	**16,000**	**22,000**	**18,000**
Crashes	**N**	**N**	**N**	**60,000**	**56,000**	**[R]50,000**	**51,000**	**56,000**	**[R]59,000**	**57,000**	**[R]53,000**	**53,000**	**63,000**	**56,000**
Vehicle-miles (billions)	**6.1**	**6.1**	**4.5**	**5.7**	**5.8**	**5.8**	**6.1**	**6.4**	**6.4**	**[R]6.6**	**6.8**	**7.0**	**[R]7.7**	**7.6**
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
Injured persons	N	N	N	576	365	346	278	250	[R]296	305	[R]248	[R]228	[R]287	237
Crashes	N	N	N	1,048	974	[R]865	833	874	[R]919	869	[R]775	[R]756	[R]822	737

KEY: 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:
1975-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1999* DOT HS 808 983 (Washington, DC: December 2000), tables 4 and 51, and personal communication, Nov. 28, 2001.
Crashes:
1990-2000: Ibid., General Estimates System Database, personal communication, Dec. 18, 2001.
Vehicle-miles:
1975-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995* (Washington, DC: July 1997), table VM-201A.
1995-2000: 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	R1999	2000
Total fatalities	**43,825**	**44,599**	**41,508**	**39,250**	**40,150**	**40,716**	**41,817**	**42,065**	**42,013**	**41,501**	**41,717**	**41,821**
Fatalities in alcohol-related crashes	**22,716**	**22,084**	**19,887**	**17,858**	**17,473**	**16,580**	**17,247**	**17,218**	**16,189**	**16,020**	**15,976**	**16,653**
Percent	51.8	49.5	47.9	45.5	43.5	40.7	41.2	40.9	38.5	38.6	38.3	39.8
BAC = 0.00												
Number	21,109	22,515	21,621	21,392	22,677	24,136	24,570	24,847	25,824	25,481	25,741	25,168
Percent	48.2	50.5	52.1	54.5	56.5	59.3	58.8	59.1	61.5	61.4	61.7	60.2
BAC = 0.01-0.09												
Number	4,604	4,434	3,957	3,625	3,496	3,480	3,746	3,774	3,480	3,526	3,523	3,761
Percent	10.5	9.9	9.5	9.2	8.7	8.5	9.0	9.0	8.3	8.5	8.4	9.0
BAC = 0.10+												
Number	18,111	17,650	15,930	14,234	13,977	13,100	13,501	13,444	12,710	12,494	12,453	12,892
Percent	41.3	39.6	38.4	36.3	34.8	32.2	32.3	32.0	30.3	30.1	29.6	30.8

KEY: BAC = blood alcohol concentration; R = revised.

NOTES: BAC values have been assigned by U.S. Department of Transportation, National Highway Traffic Safety Administration 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.

SOURCES:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 1999* , DOT HS 808 983 (Washington, DC: December 2000), table 13.

U.S. Department of Transportation, National Highway Traffic Safety Administration, Fatality Analysis Reporting System (FARS) query at http://www.fars.nhtsa.dot.gov as of Oct. 22, 2001.

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
BAC = 0.08 per se laws[a]	2	4	5	10	13	13	15	16	[c]18	[c]20
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
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

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: Ibid. Impaired Driving Division, personal communications, May 22, 2000.
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.

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
TOTAL Fatal crashes	**39,836**	**36,937**	**34,942**	**35,780**	**36,254**	**37,241**	**37,494**	**37,324**	**37,107**	**37,140**	**37,409**
Day of week											
Sunday	16.1	16.2	15.9	15.8	15.9	15.7	15.2	15.8	15.5	[R]15.7	16.1
Monday	11.7	11.5	11.6	12.1	12.4	12.4	12.7	12.1	12.4	12.6	12.4
Tuesday	11.5	11.5	11.5	11.8	11.7	11.8	12.4	11.9	12.4	11.9	12.0
Wednesday	11.5	11.9	12.3	12.0	12.3	11.9	12.2	13.0	12.4	12.5	12.2
Thursday	12.5	12.5	13.2	13.0	12.7	13.0	13.3	13.0	13.5	12.9	13.0
Friday	16.6	16.5	16.1	16.3	16.3	16.6	16.1	16.1	15.8	15.9	16.0
Saturday	19.9	19.9	19.3	19.0	18.6	18.5	[R]18.2	18.0	18.0	18.5	18.5
Unknown	0.02	0.03	0.01	0.02	0.04	0.03	0.04	0.05	0.04	[R]0.01	0.02
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
3 a.m. to 6 a.m.	7.7	7.9	7.4	7.3	7.3	7.5	7.4	7.2	7.3	[R]7.6	8.0
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 a.m. to noon	8.4	8.6	8.8	9.7	9.6	9.4	9.7	9.9	10.2	[R]10.1	9.9
Noon to 3 p.m.	11.5	0.0	12.4	12.5	13.1	12.9	12.7	13.3	13.4	13.2	13.1
3 p.m. to 6 p.m.	15.6	15.7	16.0	16.0	16.6	16.8	16.9	16.6	16.8	16.8	16.7
6 p.m. to 9 p.m.	15.5	15.6	16.5	16.2	15.7	15.9	15.7	15.9	15.6	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
Unknown	0.8	0.8	0.8	0.8	[R]0.9	0.9	0.9	0.9	0.9	[R]0.8	0.9
Atmospheric condition											
Normal	86.7	86.7	85.6	87.0	87.3	[R]86.7	86.3	86.4	87.2	89.0	87.4
Rain	9.3	9.0	10.0	8.7	8.3	[R]8.6	8.4	8.8	8.8	7.3	7.0
Snow/sleet	1.6	1.9	2.0	2.2	1.8	2.4	2.7	2.5	1.7	1.6	2.4
Other/unknown	2.3	2.4	2.3	2.1	2.5	[R]2.3	2.6	2.3	2.3	[R]2.0	3.2
Light condition											
Daylight	45.0	45.4	46.0	47.7	49.5	48.7	49.3	50.3	50.5	50.7	50.1
Dark, but lighted	17.7	17.4	17.4	16.4	15.6	[R]16.0	15.9	15.6	14.9	[R]15.0	15.9
Dark	32.7	33.0	32.4	31.5	30.3	[R]30.7	30.3	29.5	30.0	29.7	29.0
Dawn or dusk	4.2	3.9	3.9	4.2	4.2	4.2	4.2	4.2	4.3	4.3	4.0
Unknown	0.3	0.3	0.3	0.2	[R]0.3	0.4	0.3	[R]0.4	0.3	0.3	1.0

KEY: R = revised.

SOURCES:
1990-1993: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts* (Washington, DC: Annual issues), tables 24 and 25.
1994-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, Fatality Analysis Reporting System (FARS) query at http://www.fars.nhtsa.dot.gov as of Oct. 4, 2001.

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
Under 55 mph														
5,10,15, 20, 25 mph [a]	2,617	2,865	2,504	2,234	2,097	1,911	1,895	1,890	1,893	1,896	1,955	1,873	1,863	1,813
30, 35 mph	6,099	8,527	7,889	7,756	6,908	6,696	6,759	6,565	6,681	6,445	6,383	6,025	5,946	6,011
40, 45 mph	4,276	6,256	6,813	7,092	6,608	6,345	6,454	6,632	6,938	7,096	7,132	7,349	7,245	7,228
50 mph	2,241	2,431	2,072	2,054	1,894	1,875	1,877	1,861	1,927	1,908	1,788	1,771	1,909	1,823
Total	**15,233**	**20,079**	**19,278**	**19,136**	**17,507**	**16,827**	**16,985**	**16,948**	**17,439**	**17,345**	**17,258**	**17,018**	**16,963**	**16,875**
55 mph and above														
55 mph	16,094	20,352	18,862	17,556	16,543	15,444	15,980	16,512	16,753	14,097	12,897	12,522	12,184	12,026
60 mph	N	N	N	18	9	4	9	13	16	523	935	1,073	1,069	1,151
65 mph	N	N	N	2,175	2,078	2,002	2,155	2,173	2,323	3,214	3,311	3,421	3,537	3,671
70 mph	N	N	N	0	0	0	0	0	38	1,282	1,633	1,835	2,079	2,207
Over 70 mph	N	N	N	0	0	0	0	0	10	344	475	482	504	513
Total	**16,094**	**20,352**	**18,862**	**19,749**	**18,630**	**17,450**	**18,144**	**18,698**	**19,140**	**19,460**	**19,251**	**19,333**	**19,373**	**19,568**
Unknown, total	**7,834**	**4,853**	**1,055**	**951**	**800**	**665**	**651**	**608**	**662**	**689**	**815**	**756**	**804**	**[b]966**
TOTAL fatal crashes	**39,161**	**45,284**	**39,195**	**39,836**	**36,937**	**34,942**	**35,780**	**36,254**	**37,241**	**37,494**	**37,324**	**37,107**	**37,140**	**37,409**

KEY: N = data do not exist.

[a] The "No Statutory Limit" speed limit designation is included in this category.

[b] Includes crashes classified as "Blank" speed limit in the source.

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.

SOURCES: 1975-93: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System, personal communications, Oct. 22, 1996, Feb. 1999, and Oct. 4, 1999.

1994-2000: Ibid., Internet data query from Internet site http://www-fars.nhtsa.dot.gov as of Aug. 10, 2001.

Table 2-29: Safety Belt and Motorcycle Helmet Use (percent)

	1994	1996	1998	[c]2000
OVERALL BELT USE	**58**	**61**	**69**	**71**
Drivers	59	62	70	72
Passengers	55	59	65	68
Passenger cars	**63**	**64**	**71**	**74**
Drivers	64	65	72	75
Passengers	59	62	68	70
Light trucks[a]	**50**	**56**	**66**	**68**
Drivers	51	58	67	69
Passengers	49	53	61	65
Helmet Use[b]	**63**	**64**	**67**	**U**
Operators	67	66	64	72
Riders	54	58	84	62

KEY: U = data are not available.

[a] Includes pickup trucks, vans, minivans, and sport utility vehicles.

[b] In 1994, operators and riders were counted as helmeted if wearing any type of helmet. In 1996 and 1998, 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.

[c] The results from the 2000 National Occupant Protection Use Survey were not published to the same degree of precision as previous years' data.

NOTE: Occupants of commercial and emergency vehicles are excluded.

SOURCES:

1994-1998: 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.nhtsa.dot.gov/people/ncsa/98obbelt.html as of Apr. 6, 2000, table 3.

2000: Ibid., Research Note, Observed Safety Belt Use: Fall 2000 National Occupant Protection Use Survey Internet site http://www.nhtsa.dot.gov/people/ncsa/pdf/00-035.pdf as of Aug. 20, 2001, tables 1 and 4. Data are from the National Occupant Protection Use Survey (NOPUS), Moving Traffic Study, 1994, 1996, 1998, and 2000.

Table 2-30: Estimated Number of Lives Saved by Use of Restraints

	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000	Total 1975-2000
Safety belts[a]	**978**	**575**	**2,435**	**6,592**	**9,790**	**10,414**	**10,750**	**11,018**	**11,197**	**11,889**	**135,102**
Air bags	**0**	**0**	**0**	**37**	**470**	**686**	**842**	**1,043**	**1,263**	**1,584**	**6,553**
Motorcycle Helmets	**823**	**871**	**788**	**602**	**506**	**490**	**486**	**500**	**551**	**631**	**17,787**
Age 21 minimum legal drinking age	**412**	**595**	**701**	**1,033**	**851**	**846**	**846**	**861**	**901**	**922**	**20,043**
Child restraints	**36**	**49**	**153**	**222**	**279**	**365**	**312**	**299**	**307**	**315**	**4,815**
Safety seats	33	39	135	193	232	313	266	244	277	282	4,118
Adult safety belts[b]	3	10	18	29	47	52	46	55	30	33	697

[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.

SOURCES:

Motorcycle helmets:

U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Fact Sheet 2000: Motorcycles,* (Washington, DC: 2002) DOT HS 809 326, and personal communication, Apr. 5, 2000.

Minimum drinking age:

Ibid., *Traffic Safety Fact Sheet 2000: Alcohol* , (Washington, DC: 2002) DOT HS 809 323, and personal communication, Apr. 5, 2000.

All other restraint use:

Ibid., *Traffic Safety Fact Sheet 1999: Occupant Protection* , (Washington, DC: 2002) DOT HS 809 327, and personal communication, Apr. 5, 2000.

Table 2-31: Transit Safety and Property Damage Data

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Fatalities[a]	**339**	**300**	**273**	**281**	**320**	**274**	**264**	**275**	**286**	**299**
Injuries[a]	**54,556**	**52,125**	**55,089**	**52,668**	**58,193**	**57,196**	**55,288**	**56,132**	**55,990**	**55,325**
Accidents[b]	**58,002**	**46,467**	**36,380**	**30,559**	**29,972**	**25,683**	**25,166**	**24,924**	**23,937**	**R23,310**
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**
Vehicle-miles (millions)	**2,490**	**2,478**	**2,510**	**2,535**	**2,581**	**2,620**	**2,605**	**2,702**	**2,833**	**2,927**
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
Injuries (all reportable incidents)	2,191	2,103	2,195	2,077	2,254	2,183	2,122	2,078	1,976	1,890
Accidents	2,329	1,875	1,450	1,205	1,161	980	966	922	845	R796
Property damage[d] (current $ millions)	**38.0**	**37.5**	**37.5**	**44.9**	**38.4**	**46.3**	**57.6**	**55.5**	**61.5**	**55.3**

KEY: R = revised.

[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.

NOTES: Data are provided only for transit systems that furnished safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration *Safety Management Information Statistics* (SAMIS) 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 SAMIS covers only directly operated urban transit systems.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics (SAMIS) 1999 Annual Report* (Cambridge, MA: March 2001).

Table 2-32: Transit Safety Data by Mode[a] for All Reported Accidents[b]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	R1999
Fatalities										
Motor bus[c]	92	80	91	79	90	69	82	100	90	91
Light rail	5	11	6	14	10	10	5	3	14	13
Heavy rail	51	59	33	37	41	43	32	28	18	21
Commuter rail	63	63	43	59	82	56	30	52	67	64
Demand responsive	0	2	0	2	2	1	3	2	2	1
Van pool	0	0	0	0	0	0	0	0	0	0
Automated guideway	1	0	0	0	0	0	0	0	1	0
Total	**212**	**215**	**173**	**191**	**225**	**179**	**152**	**185**	**192**	**190**
Injured persons										
Motor bus[c]	18,876	19,016	20,556	20,862	19,663	20,879	21,222	20,145	20,138	20,291
Light rail	465	474	468	361	327	355	680	320	332	427
Heavy rail	296	308	273	365	309	348	431	336	261	286
Commuter rail	84	560	110	210	216	159	213	99	66	54
Demand responsive	286	200	233	224	399	395	379	499	492	632
Van pool	16	36	13	58	24	23	25	52	53	37
Automated guideway	0	0	0	1	1	0	0	1	1	0
Total	**20,023**	**20,594**	**21,653**	**22,081**	**20,939**	**22,159**	**22,950**	**21,452**	**21,343**	**21,727**
Accidents										
Motor bus[c]	55,289	44,467	34,282	28,596	27,754	23,819	23,425	22,995	22,277	21,137
Light rail	699	671	600	449	512	309	341	363	328	300
Heavy rail	144	188	613	662	744	637	346	325	293	396
Commuter rail	175	248	181	208	266	216	201	192	193	215
Demand responsive	1,613	814	668	524	659	647	774	886	664	862
Van pool	81	79	35	119	36	54	78	160	179	130
Automated guideway	1	1	1	1	1	1	1	3	3	0
Total	**58,002**	**46,468**	**36,380**	**30,559**	**29,972**	**25,683**	**25,166**	**24,924**	**23,937**	**23,040**
Vehicle miles (millions)										
Motor bus[c]	1,668	1,661	1,688	1,690	1,702	1,702	1,687	1,719	1,779	1,835
Light rail	24	27	28	27	34	34	37	41	43	48
Heavy rail	529	522	520	518	522	537	543	558	566	578
Commuter rail	187	188	188	206	210	217	203	216	242	249
Demand responsive	74	71	72	77	94	109	108	134	157	167
Van pool	8	8	13	16	18	19	25	33	44	49
Automated guideway	0.6	0.5	1.0	1.0	1.2	1.1	1.4	1.4	1.4	1.4
Total	**2,490**	**2,478**	**2,510**	**2,535**	**2,581**	**2,620**	**2,605**	**2,702**	**2,833**	**2,927**
Rates per 100 million vehicle-miles[d]										
Fatalities										
Motor bus[c]	5.5	4.8	5.4	4.7	5.3	4.1	4.9	5.8	5.1	5.0
Light rail	20.8	40.3	21.2	51.1	29.6	29.0	13.3	7.4	32.3	27.1
Heavy rail	9.6	11.3	6.3	7.1	7.9	8.0	5.9	5.0	3.2	3.6
Commuter rail	33.6	33.4	22.9	28.6	39.0	25.8	14.8	24.1	27.6	25.7
Demand responsive	0	2.8	0	2.6	2.1	0.9	2.8	1.5	1.3	0.6
Van pool	0	0	0	0	0	0	0	0	0	0
Automated guideway	162.0	0	0	0	0	0	0	0	69.0	0
Total	**8.5**	**8.7**	**6.9**	**7.5**	**8.7**	**6.8**	**5.8**	**6.8**	**6.8**	**6.5**
Injured persons										
Motor bus[c]	1,132	1,145	1,218	1,234	1,155	1,227	1,258	1,172	1,132	1,106
Light rail	1,933	1,735	1,654	1,318	968	1,030	1,815	785	767	889
Heavy rail	56	59	52	71	59	65	79	60	46	50
Commuter rail	45	297	59	102	103	73	105	46	27	22
Demand responsive	386	282	324	292	425	361	349	372	313	379
Van pool	208	430	103	363	132	123	101	158	121	75
Automated guideway	0	0	0	104	85	0	0	70	69	0
Total	**804**	**831**	**863**	**871**	**811**	**846**	**881**	**794**	**753**	**742**

continued

Table 2-32 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	R1999
Accidents										
Motor bus[c]	3,315	2,678	2,031	1,692	1,631	1,400	1,389	1,338	1,252	1,152
Light rail	2,906	2,456	2,121	1,639	1,516	897	910	891	758	624
Heavy rail	27	36	118	128	142	119	64	58	52	69
Commuter rail	93	132	96	101	127	100	99	89	80	86
Demand response	2,177	1,147	928	682	702	591	714	661	423	516
Van pool	1,052	944	278	744	198	289	314	485	408	263
Automated guideway	162	204	102	104	85	87	69	209	207	0
Total	**2,329**	**1,875**	**1,450**	**1,205**	**1,161**	**980**	**966**	**922**	**845**	**787**

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 have provided safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics* (SAMIS) annual reports. SAMIS data cover 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.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics (SAMIS) 1999 Annual Report* (Cambridge, MA: March 2001).

Table 2-33: Transit Safety Data by Mode[a] for All Reported Incidents[b]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Fatalities										
Motor bus[c]	110	88	99	83	108	82	101	109	109	102
Light rail	7	13	9	15	13	15	6	3	23	17
Heavy rail	117	103	91	83	85	79	74	77	54	84
Commuter rail	104	93	74	98	112	92	72	79	94	95
Demand responsive	0	3	0	2	2	6	11	7	4	1
Van pool	0	0	0	0	0	0	0	0	0	0
Automated guideway	1	0	0	0	0	0	0	0	2	0
Total	**339**	**300**	**273**	**281**	**320**	**274**	**264**	**275**	**286**	**299**
Injured persons										
Motor bus[c]	40,006	38,619	40,090	38,873	42,195	41,297	39,709	39,181	41,035	41,221
Light rail	1,244	1,251	1,268	982	1,181	1,319	1,604	1,087	1,076	1,271
Heavy rail	10,036	9,285	10,446	10,532	11,673	11,238	11,093	12,285	11,059	9,665
Commuter rail	2,438	2,308	2,546	1,560	2,374	2,374	1,953	2,388	1,677	1,761
Demand responsive	807	622	713	652	731	935	882	1,121	1,064	1,345
Van pool	21	40	19	59	29	25	27	54	67	41
Automated guideway	4	0	7	10	10	8	20	16	12	21
Total	**54,556**	**52,125**	**55,089**	**52,668**	**58,193**	**57,196**	**55,288**	**56,132**	**55,990**	**55,325**
All incidents										
Motor bus[c]	70,437	63,453	52,482	45,580	49,185	42,780	40,456	40,524	41,616	41,094
Light rail	1,465	1,543	1,492	1,136	1,413	1,276	1,350	1,173	1,121	1,182
Heavy rail	12,178	14,102	15,512	15,082	15,869	14,327	13,748	15,151	13,516	12,196
Commuter rail	3,031	2,716	3,160	2,111	3,115	2,847	2,449	3,078	2,410	2,499
Demand responsive	2,965	1,241	1,137	946	1,062	1,173	1,284	1,454	1,221	1,577
Van pool	84	83	40	121	39	58	80	162	194	135
Automated guideway	3	1	8	10	10	10	25	19	16	20
Total	**90,163**	**83,139**	**73,831**	**64,986**	**70,693**	**62,471**	**59,392**	**61,561**	**60,094**	**58,703**
Unlinked passenger trips (millions)[d]										
Motor bus[c]	4,912	4,780	4,728	4,585	4,567	4,539	4,464	4,554	4,712	4,926
Light rail	174	184	187	187	274	249	259	259	273	289
Heavy rail	2,252	2,123	2,119	1,960	2,149	2,034	2,157	2,429	2,393	2,521
Commuter rail	286	274	262	303	318	322	302	311	360	[R]374
Demand responsive	14	13	13	15	17	18	17	48	22	23
Van pool	2	2	3	4	5	5	6	8	9	10
Automated guideway	6	4	5	5	6	6	6	6	6	5
Total	**7,646**	**7,380**	**7,318**	**7,059**	**7,335**	**7,172**	**7,211**	**7,615**	**7,774**	**[R]8,149**
Rates per 100 million unlinked passenger trips (millions)[e]										
Fatalities										
Motor bus[c]	2.2	1.8	2.1	1.8	2.4	1.8	2.3	2.4	2.3	2.1
Light rail	4.0	7.1	4.8	8.0	4.7	6.0	2.3	1.2	8.4	5.9
Heavy rail	5.2	4.9	4.3	4.2	4.0	3.9	3.4	3.2	2.3	3.3
Commuter rail	36.4	33.9	28.3	32.4	35.2	28.6	23.8	25.4	26.1	25.4
Demand responsive	0	22.6	0	13.5	12.0	33.9	65.5	14.6	18.1	4.3
Van pool	0	0	0	0	0	0	0	0	0	0
Automated guideway	17.0	0	0	0	0	0	0	0	32.5	0
All modes	**4.4**	**4.1**	**3.7**	**4.0**	**4.4**	**3.8**	**3.7**	**3.6**	**3.7**	**3.7**
Injured persons										
Motor bus[c]	815	808	848	848	924	910	890	860	871	837
Light rail	715	682	677	524	432	529	620	419	394	440
Heavy rail	446	437	493	537	543	553	514	506	462	383
Commuter rail	853	843	972	516	747	738	646	769	466	471
Demand responsive	5,835	4,678	5,393	4,401	4,390	5,286	5,251	2,336	4,821	5,846
Van pool	1,037	1,721	584	1,398	638	537	[R]459	701	773	411
Automated guideway	68	0	127	194	160	123	317	272	195	389
All modes	**714**	**706**	**753**	**746**	**793**	**798**	**767**	**737**	**720**	**[R]679**

continued

Table 2-33 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
All incidents										
Motor bus[c]	1,434	1,327	1,110	994	1,077	943	906	890	883	834
Light rail	842	841	796	606	516	512	522	452	411	410
Heavy rail	541	664	732	769	738	705	637	624	565	484
Commuter rail	1,060	991	1,207	698	980	885	810	991	670	668
Demand responsive	21,440	9,333	8,600	6,385	6,378	6,632	7,644	3,030	5,532	6,854
Van pool	4,147	3,570	1,229	2,867	858	1,245	[R]1,359	2,104	2,238	1,353
Automated guideway	51	28	145	194	160	154	396	323	260	371
All modes	**1,179**	**1,126**	**1,009**	**921**	**964**	**871**	**824**	**808**	**773**	**[R]720**

KEY: R = revised.

[a] The figures for cable car, inclined plane, jitney, and ferry boat are lumped together and appear in this footnote as follows:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Fatalities:	**2**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**
Injuries:	**378**	**327**	**399**	**383**	**616**	**598**	**354**	**357**	**379**	**1,091**
Incidents:	**186**	**411**	**400**	**411**	**650**	**536**	**301**	**353**	**253**	**1,078**

[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: Data are provided only for transit systems that have provided safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics* (SAMIS) annual reports.
SAMIS data cover only direct-operated urban transit systems.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics (SAMIS) 1999 Annual Report* (Cambridge, MA: March 2001).

Table 2-34: Reports of Violent Crime, Property Crime, and Arrests by Transit Mode

	1995	1996	1997	1998	1999
Reported offenses, violent crime					
Homicide[a]	**19**	**20**	**19**	**51**	**21**
Motor bus	8	9	6	40	7
Commuter rail	1	1	4	1	3
Demand responsive	0	0	0	0	0
Heavy rail	8	9	8	6	11
Light rail	2	1	1	4	0
Other[b]	0	0	0	0	0
Forcible rape[c]	**29**	**38**	**31**	**47**	**27**
Motor bus	11	13	10	16	14
Commuter rail	5	4	7	1	3
Demand responsive	0	0	2	4	1
Heavy rail	13	19	8	24	8
Light rail	0	2	4	2	0
Other[b]	0	0	0	0	1
Robbery[d]	**2,811**	**4,563**	**4,760**	**3,684**	**3,789**
Motor bus	909	871	870	605	764
Commuter rail	181	242	187	133	183
Demand responsive	1	3	0	1	3
Heavy rail	1,490	3,164	3,394	2,686	2,588
Light rail	181	238	222	220	200
Other[b]	49	45	87	39	51
Aggravated assault[e]	**2,701**	**3,084**	**3,105**	**2,314**	**2,448**
Motor bus	1,941	1,677	1,294	1,186	1,268
Commuter rail	133	69	92	80	97
Demand responsive	6	13	13	13	14
Heavy rail	437	1,074	1,051	837	903
Light rail	157	199	143	170	135
Other[b]	27	52	512	28	31
Reported offenses, property crime					
Theft[f]	**10,596**	**13,238**	**14,486**	**11,830**	**12,896**
Motor bus	2,738	3,408	2,920	2,327	2,487
Commuter rail	2,238	2,262	2,345	2,021	1,872
Demand responsive	2	8	40	15	4
Heavy rail	4,625	6,794	8,321	6,807	7,789
Light rail	451	609	479	496	530
Other[b]	542	157	381	164	214
Vehicle theft[g]	**2,182**	**2,261**	**2,276**	**2,225**	**1,876**
Motor bus	263	306	198	208	198
Commuter rail	253	125	262	470	272
Demand responsive	0	1	3	9	28
Heavy rail	1,536	1,694	1,630	1,234	1,203
Light rail	128	135	179	273	156
Other[b]	2	0	4	31	19
Burglary[h]	**1,759**	**1,650**	**1,757**	**491**	**415**
Motor bus	156	104	94	75	86
Commuter rail	178	177	260	217	170
Demand responsive	2	0	4	3	1
Heavy rail	1,367	1,278	1,343	110	91
Light rail	43	78	48	70	42
Other[b]	13	13	8	16	25
Arson[i]	**63**	**96**	**75**	**60**	**53**
Motor bus	29	67	33	21	15
Commuter rail	14	1	21	10	12
Demand responsive	0	0	0	0	0
Heavy rail	14	22	16	27	20
Light rail	6	6	5	2	6
Other[b]	0	0	0	0	0

continued

Table 2-34 *continued*

	1995	1996	1997	1998	1999
Reported offenses, arrests					
Other assaults[j]	**2,991**	**3,088**	**2,697**	**2,787**	**2,641**
Motor bus	1,896	1,571	1,439	1,400	1,217
Commuter rail	144	106	140	122	164
Demand responsive	4	0	16	3	4
Heavy rail	645	932	881	898	888
Light rail	181	330	195	282	269
Other[b]	121	149	26	82	99
Vandalism[k]	**17,228**	**8,627**	**9,539**	**6,571**	**6,895**
Motor bus	13,343	6,167	5,262	3,656	4,178
Commuter rail	1,071	309	659	778	507
Demand responsive	12	17	8	10	16
Heavy rail	1,157	1,339	1,128	1,067	1,222
Light rail	1,505	609	2,084	947	892
Other[b]	140	186	398	113	80
Sex offenses[l]	**664**	**803**	**1,047**	**962**	**1,009**
Motor bus	242	260	363	258	321
Commuter rail	100	41	82	91	85
Demand responsive	5	0	6	2	5
Heavy rail	249	430	517	541	515
Light rail	59	71	79	68	80
Other[b]	9	1	0	2	3
Drug abuse violations[m]	**2,578**	**3,944**	**4,355**	**3,792**	**4,131**
Motor bus	1,037	2,122	1,970	1,414	1,705
Commuter rail	303	393	477	495	303
Demand responsive	1	0	15	21	8
Heavy rail	1,078	1,130	1,530	1,550	1,606
Light rail	151	298	336	271	501
Other[b]	8	1	27	41	8
Driving under the influence[n]	**466**	**129**	**205**	**176**	**204**
Motor bus	91	82	101	101	132
Commuter rail	26	21	22	21	12
Demand responsive	0	0	1	4	0
Heavy rail	52	8	22	21	42
Light rail	292	16	31	21	15
Other[b]	5	2	28	8	3
Drunkenness[o]	**10,479**	**6,921**	**8,632**	**12,643**	**11,487**
Motor bus	6,457	3,936	5,346	3,046	3,609
Commuter rail	71	23	226	156	112
Demand responsive	2	2	46	34	2
Heavy rail	1,511	1,617	1,601	7,340	5,831
Light rail	2,255	1,305	1,258	1,844	1,913
Other[b]	183	38	155	223	20
Disorderly conduct[p]	**22,206**	**26,178**	**25,325**	**15,897**	**15,971**
Motor bus	4,681	5,025	6,978	4,521	5,471
Commuter rail	810	1,085	1,399	1,525	797
Demand responsive	5	8	47	5	5
Heavy rail	15,258	19,183	15,309	8,227	7,856
Light rail	1,164	800	1,177	1,408	1,767
Other[b]	288	77	415	211	75
Trespassing[q]	**3,362**	**3,497**	**7,444**	**6,049**	**3,670**
Motor bus	928	604	1,225	1,283	1,065
Commuter rail	845	674	4,150	2,850	1,080
Demand responsive	0	0	2	2	0
Heavy rail	1,155	1,208	1,398	1,254	1,044
Light rail	400	653	463	443	436
Other[b]	34	358	206	217	45
Fare evasion[r]	**33,903**	**47,873**	**53,406**	**58,856**	**55,194**
Motor bus	3,172	2,372	1,819	1,694	2,388
Commuter rail	140	334	310	204	167
Demand responsive	1	1	2	5	1
Heavy rail	8,247	39,957	46,106	40,350	35,033
Light rail	22,212	1,185	912	12,798	17,320
Other[b]	131	4,024	4,257	3,805	285

continued

Table 2-34 *continued*

	1995	1996	1997	1998	1999
Curfew and loitering laws[s]	**1,878**	**872**	**1,960**	**1,161**	**3,022**
Motor bus	1,201	241	1,112	291	495
Commuter rail	19	27	223	72	172
Demand responsive	0	1	5	0	0
Heavy rail	462	493	530	680	1,789
Light rail	161	95	80	106	509
Other[b]	35	15	10	12	57

[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, and inclined plane.
[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: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database, Data Tables,* Internet site
http://www.fta.dot.gov/fta/library/reference/sec15/1995/htm/ as of May 2, 2000, tables 23-25.
http://www.ntdprogram.com/NTD/NTDData.nsf/Data+Tables/OpenView as of May 2, 2000, tables
1998: Ibid., tables 24-26.
1999: Ibid., tables 25-27.

Table 2-35: Railroad and Grade-Crossing Fatalities by Victim Class

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Passengers on trains	**4**	**3**	**3**	**8**	**3**	**58**	**5**	**0**	**12**	**6**	**4**	**14**	**4**
Railroad only	4	3	3	8	3	58	5	0	12	6	2	3	4
Grade crossing only	0	0	0	0	0	0	0	0	0	0	2	11	0
Employees on duty	**97**	**46**	**40**	**35**	**34**	**47**	**31**	**34**	**33**	**37**	**27**	**31**	**24**
Railroad only	97	44	35	34	32	44	30	32	32	37	23	29	22
Grade crossing only	0	2	5	1	2	3	1	2	1	0	4	2	2
Employees not on duty	**4**	**2**	**0**	**1**	**1**	**4**	**0**	**2**	**0**	**0**	**2**	**0**	**1**
Railroad only	3	2	0	1	1	4	0	2	0	0	2	0	1
Grade crossing only	1	0	0	0	0	0	0	0	0	0	0	0	0
Contractor employees	[a]	[a]	[a]	[a]	**11**	**6**	**3**	**7**	**9**	**11**	**5**	**12**	**3**
Railroad only	[a]	[a]	[a]	[a]	10	6	3	7	9	11	5	11	3
Grade crossing only	[a]	[a]	[a]	[a]	1	0	0	0	0	0	0	1	0
Nontrespassers[b]	**746**	**511**	**554**	**487**	**475**	**489**	**505**	**443**	**365**	**363**	**326**	**[R]305**	**335**
Railroad only	81	14	18	19	12	18	44	32	27	15	9	8	19
Grade crossing only	665	497	536	468	463	471	461	411	338	348	317	[R]297	316
Trespassers	**566**	**474**	**700**	**663**	**646**	**675**	**682**	**660**	**620**	**646**	**644**	**[R]570**	**570**
Railroad only	460	391	543	524	533	523	529	494	471	533	536	479	463
Grade crossing only	106	83	157	139	113	152	153	166	149	113	108	[R]91	107
Volunteer employees	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**0**	**0**	**0**	0
Railroad only	N	N	N	N	N	N	N	N	N	0	0	0	0
Grade crossing only	N	N	N	N	N	N	N	N	N	0	0	0	0
Railroad only	645	454	599	586	591	653	611	567	551	602	577	530	512
Grade crossing only	772	582	698	608	579	626	615	579	488	461	431	402	425
Motor vehicles	N	521	614	535	506	554	542	508	415	419	369	345	361
Nonmotor vehicles	N	61	84	73	73	72	73	71	73	42	62	57	64
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**

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

[a] Prior to 1992, contractor employees were included with nontrespassers. They include 7 in 1980, 4 in 1985, 3 in 1990, and 3 in 1991.

[b] Beginning in 1997, nontresspassers off railroad property are also included.

NOTES: "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).
1995-2000: Ibid. Internet site http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp as of Aug. 9, 2001.

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
Passengers on trains	**593**	**657**	**473**	**382**	**411**	**559**	**497**	**573**	**513**	**601**	**535**	**481**	**658**
Railroad only	569	646	462	360	329	515	413	543	489	558	516	438	648
Grade crossing only	24	11	11	22	82	44	84	30	24	43	19	43	10
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**
Railroad only	56,201	29,667	20,801	19,479	17,598	15,220	12,955	10,654	9,120	8,184	8,276	8,482	8,323
Grade crossing only	130	155	169	147	157	143	125	123	79	111	122	140	100
Employees not on duty	**671**	**419**	**326**	**362**	**310**	**348**	**306**	**252**	**228**	**263**	**219**	**216**	**286**
Railroad only	671	418	324	362	309	347	305	248	226	260	216	215	283
Grade crossing only	0	1	2	0	1	1	1	4	2	3	3	1	3
Contractor employees	[b]	[b]	[b]	[a]	**226**	**262**	**252**	**269**	**208**	**334**	**380**	**384**	**368**
Railroad only	[b]	[b]	[b]	[a]	224	261	251	268	208	333	379	384	367
Grade crossing only	[b]	[b]	[b]	[a]	2	1	1	1	0	1	1	0	1
Nontrespassers[a]	**3,923**	**2,672**	**2,581**	**2,329**	**1,909**	**1,856**	**1,913**	**1,869**	**1,660**	**1,540**	**1,236**	**1,342**	**1,294**
Railroad only	775	394	589	639	408	432	475	372	431	370	243	335	381
Grade crossing only	3,148	2,278	1,992	1,690	1,501	1,424	1,438	1,497	1,229	1,170	993	1,007	913
Trespassers	**728**	**734**	**793**	**769**	**772**	**733**	**764**	**700**	**750**	**728**	**677**	**650**	**606**
Railroad only	480	492	560	534	540	509	452	461	474	516	513	445	414
Grade crossing only	248	242	233	235	232	224	312	239	276	212	164	205	192
Volunteer employees	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**6**	**14**	**5**	**8**
Railroad only	N	N	N	N	N	N	N	N	N	6	13	5	8
Grade crossing only	N	N	N	N	N	N	N	N	N	0	1	0	0
Railroad only	58,696	31,617	22,736	21,374	19,408	17,284	14,851	12,546	10,948	10,227	10,156	[R]10,304	10,424
Grade crossing only	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
Motor vehicles	N	2,561	2,332	2,029	1,891	1,760	1,885	1,825	1,545	1,494	1,257	1,338	1,169
Nonmotor vehicles	N	126	75	65	84	77	76	69	65	46	46	58	50
Total	**62,246**	**34,304**	**25,143**	**23,468**	**21,383**	**19,121**	**16,812**	**14,440**	**12,558**	**11,767**	**11,459**	**[R]11,700**	**11,643**

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

[a] Beginning in 1997, nontresspassers off railroad property are also included.

[b] Prior to 1992, contractor employees were included with nontrespassers: they include 74 in 1980, 110 in 1985, 242 in1990, and 219 in 1991.

NOTES: "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).

1995-2000: Ibid., Internet site http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp as of Aug. 9, 2001.

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
Fatalities													
Derailments	8	2	2	10	2	53	2	2	6	2	1	[R]1	2
Collisions	20	6	8	5	1	14	8	7	16	[R]10	1	[R]7	1
Other	1	0	0	4	3	0	2	5	3	6	2	[R]1	7
Total	**29**	**8**	**10**	**19**	**6**	**67**	**12**	**14**	**25**	**[R]18**	**4**	**9**	**10**
Injuries													
Derailments	286	197	272	174	71	179	120	90	98	111	61	[R]41	121
Collisions	341	223	139	103	59	87	118	151	146	[R]55	32	[R]62	89
Other	38	56	40	49	41	42	24	53	37	[R]19	36	[R]26	65
Total	**665**	**476**	**451**	**326**	**171**	**308**	**262**	**294**	**281**	**[R]185**	**129**	**[R]129**	**275**
Accidents													
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
Collisions	1,201	366	315	261	207	205	240	235	205	202	168	205	238
Other	562	414	418	461	418	476	439	482	422	454	650	602	633
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**

KEY: 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.
1999-2000: Ibid., http://safetydata.fra.dot.gov/officeofsafety/Query/Default.asp as of Aug. 10, 2001.

Table 2-38: Railroad Passenger Safety Data

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Passenger fatalities	**3**	**8**	**3**	**58**	**5**	**0**	**12**	**6**	**4**	**14**	**4**
Injured persons	**473**	**382**	**411**	**559**	**497**	**573**	**513**	**601**	**535**	**481**	**658**
Train-miles, passenger trains (millions)	**72**	**74**	**74**	**75**	**75**	**76**	**77**	**78**	**78**	**[R]82**	**84**
Fatalities per 100 million passenger train-miles	4	11	4	77	7	0	16	8	5	[R]17	5
Injuries per 100 million passenger train-miles	660	520	560	750	660	750	663	770	683	[R]584	781

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:

1990-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: August 2001), 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).

1997-2000: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), 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
Fatalities	**785**	**575**	**584**	**454**	**599**	**567**	**551**	**602**	**577**	**530**	**512**
Injuried Persons	**[d]17,934**	**50,138**	**58,696**	**31,617**	**22,736**	**12,546**	**10,948**	**10,227**	**10,156**	**10,304**	**10,424**
Accidents[a]	**8,095**	**8,041**	**8,205**	**3,275**	**2,879**	**2,459**	**2,443**	**2,397**	**2,575**	**2,768**	**2,983**
Train-miles (millions)[b,c]	**839**	**755**	**718**	**571**	**609**	**670**	**671**	**677**	**683**	**712**	**723**
Rates per 100 million train-miles											
Fatalities	94	76	81	80	98	85	82	89	84	74	71
Injuries	N	6,640	8,180	5,540	3,740	1,870	1,630	1,511	1,487	1,446	1,442
Accidents	970	1,070	1,140	570	470	370	360	354	377	389	413
Property damage (current $ millions)	**121.6**	**177.4**	**267.4**	**179.3**	**198.7**	**189.2**	**212.3**	**[R]210.7**	**[R]233.9**	**[R]245.1**	**263.2**

KEY: 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:

1970-96: 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.

1997-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), tables 1-1 and 3-1.

Train-miles:

1970-90: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues), form 406.

1990-99: U.S. Department of Transportation, Federal Railroad Administration, Internet site http://safetydata.fra.dot.gov/OfficeofSafety/Prelim/1999/r02.htm as of July 10, 2000.

2000: Ibid., Railroad Safety Statistics Annual Report 2000 (Washington, DC: July 2001), table 2-4.

Table 2-40: Fatalities and Injuries of On-Duty Railroad Employees

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Employee fatalities											
Accidents/incidents, total	**40**	**35**	**34**	**47**	**31**	**34**	**33**	**37**	**27**	**31**	**24**
Grade-crossing accidents and incidents	5	1	2	3	1	2	1	0	4	2	2
Train accidents and incidents only (grade-crossing excluded)[R]	35	34	32	44	30	32	32	37	23	29	22
Employees injured											
Accidents/incidents, total	**20,970**	**19,626**	**17,755**	**15,363**	**13,080**	**10,777**	**9,199**	**8,295**	**8,398**	**8,622**	**8,423**
Grade-crossing accidents and incidents	169	147	157	143	126	123	79	111	122	140	100
Train accidents and incidents only (grade-crossing excluded)[R]	20,801	19,479	17,598	15,220	12,954	10,654	9,120	8,184	8,276	8,482	8,323
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**
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
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
Train accidents and incidents only (grade-crossing excluded)[R]	0.06	0.06	0.06	0.08	0.06	0.06	0.06	0.07	0.04	0.06	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
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
Train accidents and incidents only (grade-crossing excluded)[R]	37.6	36.7	34.0	29.3	25.0	20.9	18.1	16.2	16.1	16.6	17.0
Train-miles (millions)[a,b]	**609**	**577**	**594**	**614**	**655**	**670**	**671**	**677**	**683**	**712**	**723**
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
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
Train accidents and incidents only (grade-crossing excluded)[R]	0.06	0.06	0.05	0.07	0.05	0.05	0.05	0.05	0.03	0.04	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
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
Train accidents and incidents only (grade-crossing excluded)[R]	34.2	33.8	29.6	24.8	19.8	15.9	13.6	12.1	12.1	11.9	11.5

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 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 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.

SOURCES:

1990-96: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues).

1997-2000: Ibid., Railroad Safety Statistics Annual Report (Washington, DC: Annual issues), tables 1-3, 2-4, and 3-1.

Table 2-41: Waterborne Transportation Safety and Property Damage Data Related to Vessel Casualties

	1970	1975	1980	1985	1990	1991	R1992	R1993	R1994	R1995	R1996	R1997	R1998	R1999	2000
Fatalities[a]	178	243	206	131	85	30	96	114	78	51	52	50	71	57	32
Injuried persons	105	97	180	172	175	110	162	166	174	145	223	121	135	131	125
Accidents[b]	2,582	3,310	4,624	3,439	3,613	2,222	3,238	3,412	3,970	4,298	4,264	4,198	4,374	4,036	3,791
Vessels[c]	4,063	5,685	7,694	5,694	5,494	3,514	4,789	5,137	6,204	6,724	6,694	6,464	6,400	5,732	5,400
Property damage (current $ millions)	U	U	U	U	U	U	199.5	173.6	263.3	157.8	190.1	156.4	223.3	155.2	146.9

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.

1992-2000 data come from the Marine Safety Management Information System. Data for prior years may not be directly comparable.

SOURCE: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, May 15, 2002.

Table 2-42: Waterborne Transportation Safety Data not Related to Vessel Casualties

	1970	1975	1980	1985	1990	1991	R1992	R1993	R1994	R1995	R1996	R1997	R1998	R1999	2000
Fatalities[a]	420	330	281	130	101	56	94	95	101	95	95	88	95	86	87
Injuries	U	U	U	U	U	U	1,489	1,448	1,718	1,833	1,327	1,037	540	500	564
Vessels[b]	U	321	274	128	98	51	1,592	1,549	1,823	1,941	1,434	1,135	647	593	658

KEY: R = revised; 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).

NOTES: 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, homocides, 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. 1992-2000 data come from the Marine Safety Management Information System. Data for prior years may not be directly comparable.

SOURCE: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, Dec. 12, 2001.

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
Fatalities	739	1,360	1,418	1,466	1,360	1,116	865	924	816	800	784	829	709	821	815	734	[c]701
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
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	[R]7,931	7,740
Vessels involved	[R,d]3,562	[R,d]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
Numbered boats[a] (millions)	2.5	6.4	7.4	7.3	8.6	9.6	11.0	11.1	11.1	11.3	11.4	11.7	11.9	12.3	12.6	12.7	12.8
Rates per 100,000 numbered boats																	
Fatalities	32.8	21.3	19.2	20.1	15.8	11.6	7.8	8.3	7.3	7.1	6.9	7.1	[R]5.9	6.7	6.5	5.8	5.5
Injuries	37.1	14.5	10.5	29.3	30.8	28.7	34.7	35.7	33.2	31.5	35.8	35.4	37.3	37.0	36.6	33.9	34.0
Accidents	109.5	58.6	51.4	86.4	64.1	65.0	58.3	59.8	54.5	56.1	60.6	68.5	67.4	65.4	64.1	62.3	60.5
Accident reports citing alcohol involvement	N	N	N	N	N	279	568	513	504	381	389	472	601	698	704	633	696
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	[R,d]25.9	[R,d]21.5	23.2	29.0	31.0	28.9	34.7

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

[a] Prior to 1975, the count of numbered boats is an estimate.

[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 IG because they found a discrepancy in a review of 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).

[d] U.S. Department of Transportation, U.S. Coast Guard, Office of Boating Safety, personal communication, May 15, 2002.

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).

Table 2-44: Personal Watercraft Safety Data

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total 1987-2000
Fatalities	5	20	20	28	26	34	35	56	68	57	84	78	66	68	645
Injured persons	156	254	402	532	708	730	915	1,338	1,617	1,837	1,812	1,743	1,614	1,580	15,238
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	33,837
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	1,412,000
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	1,078,400	[b]1,475,756

[a] Total vessels involved.

[b] Represents the number of unique personal watercraft used between 1987 and 2000, i.e., the number in use before 1987 plus the number sold between 1987 and 2000.

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.

SOURCES:

Fatalities, Injuries, and Accidents:

U.S. Department of Transportation, United States Coast Guard, Office of Boating Safety, *Boating Statistics - 2000* (Washington, DC: 2001), Internet site http://www.uscgboating.org/saf/pdf/Boating_Statistics_2000.pdf as of Feb. 25, 2001.

Sales:

1987-1990: Personal Watercraft Industry Association, Internet site http://www.pwia.org/Abo_PWC.htm as of June 19, 2000.

1991-2000: Ibid., Internet site http://www.nmma.org/facts/boatingstats/2001/Files/unitsales.asp as of Feb. 25, 2001.

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.

1999-2000: Ibid., Internet site http://www.nmma.org/facts/boatingstats/2001/files/populationestimates.asp as of Feb. 25, 2001.

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
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
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
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
Search and Rescue resource hours[b,R]	U	108,282	109,351	108,639	107,441	102,749	93,984	85,150	80,507	80,116	84,635	80,533
Lives saved	6,497	4,407	5,465	[e]17,543	5,826	[e]23,211	4,453	5,047	3,897	3,194	3,743	3,400
Lives lost before notification[c]	259	622	748	540	800	593	468	611	454	418	353	[f]779
Lives lost after notification[d]	1,076	463	368	399	415	338	304	367	290	188	180	239
Total lives lost	**1,335**	**1,085**	**1,116**	**939**	**1,215**	**931**	**772**	**978**	**744**	**606**	**533**	**1,018**
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
Value of property lost ($ million)	424.3	368.5	213.6	314.5	316.2	435.5	222.6	273.8	414.8	84.3	262.3	415.2
Value of property assisted ($ millions)	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	778.7
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

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] 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.

[f] The Egypt Air (217 fatalities) and Alaska Air (88 fatalities) crashes account for the increase.

SOURCES:

All data except Search and Rescue Resource Hours:

1985-2000: U.S. Department of Transportation, U.S. Coast Guard, Search and Rescue Management Information Systems (SARMIS II) Database.

Search and Rescue Resource Hours:

1985-2000: U.S. Department of Transportation, U.S. Coast Guard, Office of Command and Control Architecture, personal communication, Aug. 30, 2001.

Table 2-46: Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fatalities															
Total hazardous liquid	4	7	4	5	3	0	5	0	1	3	5	0	2	4	1
Total gas	26	8	15	28	6	14	10	17	21	18	48	10	[R]18	[R]21	37
Transmission	U	U	1	6	0	0	3	1	0	2	1	1	1	2	15
Distribution	U	U	14	22	6	14	7	16	21	16	47	9	[R]17	[R]19	22
Injured persons															
Total hazardous liquid	21	17	15	18	7	9	38	10	[a]1,858	11	13	5	6	20	4
Total gas	233	214	177	108	69	89	80	101	113	53	114	72	[R]76	[R]93	77
Transmission	U	U	13	12	17	12	15	17	22	10	5	5	11	8	18
Distribution	U	U	164	96	52	77	65	84	91	43	109	67	[R]65	[R]85	59
Incidents															
Total hazardous liquid	351	254	246	183	180	216	212	229	245	188	[R]194	171	153	[R]168	147
Total gas	1,077	1,338	1,524	334	198	233	177	216	222	161	187	175	[R]236	[R]173	234
Transmission	U	U	389	129	89	71	74	95	81	64	77	73	[R]99	54	80
Distribution	U	U	1,135	205	109	162	103	121	141	97	110	102	[R]137	[R]119	154
Property damage (current $ millions)															
Total hazardous liquid	1.2	2.2	5.7	5.1	15.7	37.8	[R]39.1	28.9	[R]62.2	32.5	[R]81.4	[R]42.8	[R]62.9	[R]87.1	178.1
Total gas	3.3	5.0	10.0	22.9	18.9	19.7	31.4	38.3	98.5	21.0	29.4	24.6	[R]48.8	[R]43.6	41.3
Transmission	U	U	8.8	13.4	11.3	11.9	24.6	23.0	45.2	10.0	13.1	12.1	29.7	17.7	17.9
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

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.

SOURCES: 1970-85: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, personal communication, 1999.
1990-2000: Ibid., Internet site http://ops.dot.gov/stats.htm as of June 13, 2002.

Chapter Three

Transportation and the 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	R1997	R1998	1999	2000
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**	**9,268.6**	**9,872.9**
For-Hire Transportation Services GDP											
Trucking and warehousing	69.4	70.9	74.5	79.2	86.4	89.0	92.1	99.4	114.1	122.0	126.0
Air	45.3	47.0	50.3	56.4	62.5	67.7	70.8	78.6	85.8	90.2	93.0
Railroad	19.8	22.0	21.6	22.0	23.3	23.6	23.4	23.0	24.3	23.2	22.9
Transportation services[a]	18.2	19.5	19.9	20.8	22.6	23.5	25.7	27.1	28.0	29.9	32.3
Local and interurban passenger transit	9.1	10.2	10.9	11.3	11.6	12.4	13.4	14.9	16.8	17.6	18.7
Water	10.0	11.1	10.7	10.7	11.5	11.6	12.2	13.1	13.6	13.7	14.8
Pipelines, except natural gas	5.5	5.5	5.5	5.6	5.5	5.5	5.7	5.8	6.1	6.1	6.2
Total	**177.4**	**186.1**	**193.4**	**206.0**	**223.2**	**233.4**	**243.4**	**261.8**	**288.7**	**302.7**	**313.9**
% of U.S. GDP											
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
Air	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	0.9
Railroad	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
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
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
Water transportation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	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
Total	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**	**3.2**	**3.1**	**3.1**	**3.3**	**3.3**	**3.2**
% 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	40.3	40.1
Air	25.5	25.3	26.0	27.4	28.0	29.0	29.1	30.0	29.7	29.8	29.6
Railroad	11.2	11.8	11.2	10.7	10.4	10.1	9.6	8.8	8.4	7.7	7.3
Transportation services[a]	10.3	10.5	10.3	10.1	10.1	10.1	10.6	10.4	9.7	9.9	10.3
Local and interurban passenger transit	5.1	5.5	5.6	5.5	5.2	5.3	5.5	5.7	5.8	5.8	6.0
Water transportation	5.6	6.0	5.5	5.2	5.2	5.0	5.0	5.0	4.7	4.5	4.7
Pipelines, except natural gas	3.1	3.0	2.8	2.7	2.5	2.4	2.3	2.2	2.1	2.0	2.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

KEY: R = revised.

[a] Defined as services incidental to transportation such as forwarding and packing and arranging passenger travel and freight transportation.

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 rounding.

SOURCE: 1997-2000: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* (Washington, DC, November 2001), table 1 and table 2, available on Internet site http://www.bea.doc.gov/bea/ARTICLES/2001/11november/1101gdpxind.pdf.

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	R1997	R1998	1999	2000
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**	**8,856.5**	**9,224.0**
For-Hire transportation services GDP											
Trucking and warehousing	68.1	71.6	75.7	79.1	85.3	86.6	92.1	90.5	95.5	100.3	105.7
Air	46.9	45.0	49.2	51.9	59.6	62.9	70.8	75.2	76.8	80.9	85.0
Railroad	18.1	20.9	20.8	21.0	22.1	22.7	23.4	22.8	22.8	22.5	23.2
Transportation services[a]	19.5	19.8	19.6	20.4	22.1	23.4	25.7	26.4	27.8	29.8	30.6
Local and interurban passenger transit	12.8	12.5	12.4	12.7	12.8	13.2	13.4	14.7	15.5	16.6	18.2
Water	10.2	10.5	10.3	10.5	11.3	11.3	12.2	13.2	13.2	11.8	11.7
Pipelines, except natural gas	5.7	6.2	5.9	6.0	5.5	5.0	5.7	6.2	6.4	6.4	6.4
Total	**180.6**	**185.9**	**193.6**	**201.2**	**218.6**	**225.1**	**243.4**	**248.9**	**257.9**	**268.6**	**281.1**
% of U.S. GDP											
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
Air	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9
Railroad	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	0.3
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
Water	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	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
Total	**2.7**	**2.8**	**2.8**	**2.8**	**3.0**	**3.0**	**3.1**	**3.1**	**3.0**	**3.0**	**3.0**
% 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	37.6
Air	26.0	24.2	25.4	25.8	27.3	27.9	29.1	30.2	29.8	30.1	30.2
Railroad	10.0	11.2	10.7	10.4	10.1	10.1	9.6	9.2	8.8	8.4	8.3
Transportation services[a]	10.8	10.7	10.1	10.1	10.1	10.4	10.6	10.6	10.8	11.1	10.9
Local and interurban passenger transit	7.1	6.7	6.4	6.3	5.9	5.9	5.5	5.9	6.0	6.2	6.5
Water	5.6	5.6	5.3	5.2	5.2	5.0	5.0	5.3	5.1	4.4	4.2
Pipelines, except natural gas	3.2	3.3	3.0	3.0	2.5	2.2	2.3	2.5	2.5	2.4	2.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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.

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 rounding.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* (Washington, DC, November 2001), table 6, available on Internet site http://www.bea.doc.gov/bea/ARTICLES/2001/11november/1101gdpxind.pdf

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	R1999	2000
Personal consumption of transportation													
Motor vehicles and parts	87.0	175.7	R206.4	R182.8	R200.2	R222.1	R242.3	249.3	256.3	R264.2	R288.8	324.7	346.8
Gasoline and oil	86.7	97.2	R107.3	R102.5	R104.9	R106.6	R109.0	113.3	124.2	R128.1	R114.8	129.5	165.3
Transport services	64.7	100.0	R141.8	R142.8	R155.0	R166.2	R180.9	197.7	214.2	234.4	R246.3	257.4	272.8
Total	**238.4**	**372.9**	**R455.5**	**R428.1**	**R460.1**	**R494.9**	**R532.2**	**560.3**	**594.7**	**R626.7**	**R649.9**	**711.6**	**784.9**
Gross private domestic investment													
Transportation structures	3.7	4.3	3.0	3.2	3.7	4.1	4.3	4.4	5.4	R5.9	R7.0	6.2	5.2
Transportation equipment	48.4	69.7	R75.7	79.5	R86.1	R98.1	R117.8	126.1	138.9	R151.4	R168.2	199.1	195.9
Total	**52.1**	**74.0**	**R78.7**	**82.7**	**R89.8**	**R102.2**	**R122.1**	**130.5**	**144.3**	**R157.3**	**R175.2**	**205.3**	**201.1**
Exports (+)													
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
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	R72.4	75.1	80.2
Passenger fares	2.6	4.4	15.3	15.9	16.6	R16.5	R17.0	18.9	20.4	R20.9	R20.1	19.8	20.7
Other transportation	11.6	14.7	R22.0	R22.6	R21.5	R22.0	R23.8	26.1	26.1	27.0	R25.6	26.9	30.2
Total	**45.7**	**57.5**	**R106.0**	**R115.1**	**R122.8**	**R123.7**	**R130.1**	**132.9**	**142.3**	**163.3**	**R171.6**	**174.7**	**179.2**
Imports (-)													
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
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	R148.7	179.0	195.9
Passenger fares	3.6	6.4	10.5	10.0	10.6	R11.4	R13.1	14.7	15.8	18.1	R20.0	21.3	24.2
Other transportation	11.8	15.6	R25.0	R25.0	R23.8	R24.5	R26.0	27.0	27.4	29.0	R30.4	34.1	41.1
Total	**46.8**	**92.2**	**R134.5**	**R132.4**	**R138.8**	**R149.6**	**R168.7**	**176.2**	**184.8**	**203.5**	**R220.9**	**258.2**	**287.6**
Net exports of transportation-related goods and services[a]	**-1.1**	**-34.7**	**R-28.5**	**R-17.3**	**R-16.0**	**R-25.9**	**R-38.6**	**-43.3**	**-42.5**	**-40.2**	**R-49.3**	**-83.5**	**-108.4**
Government transportation-related purchases													
Federal purchases[b]	7.0	10.0	12.9	14.5	15.3	15.9	17.1	16.3	17.2	17.6	R18.3	18.6	19.5
State and local purchases[b]	48.8	67.5	90.1	93.2	95.6	100.7	106.6	109.8	115.2	R123.6	R130.0	140.7	147.6
Defense-related purchases[c]	4.2	6.2	R8.0	R15.7	R11.4	R9.3	8.2	8.4	8.8	R8.3	R8.3	8.9	8.9
Total	**60.0**	**83.7**	**R111.0**	**R123.4**	**R122.3**	**R125.9**	**131.9**	**134.5**	**141.2**	**R149.5**	**R156.6**	**168.2**	**176.0**
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	R8,318.4	R8,781.5	9,268.6	9,872.9
Total transportation-related final demand[d]	**349.4**	**495.9**	**R616.7**	**R616.9**	**R656.2**	**R697.1**	**R747.6**	**782.0**	**837.7**	**R893.3**	**R932.4**	**1,001.6**	**1,053.6**
Total transportation in GDP (%)	**12.5%**	**11.8%**	**R10.6%**	**R10.3%**	**R10.4%**	**R10.5%**	**R10.6%**	**10.6%**	**10.7%**	**10.7%**	**R10.6%**	**10.8%**	**10.7%**

KEY: R = revised.

[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:
1980-97: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: October 2001), table 3.15.
1998-2000: Ibid., Internet site http://www.bea.doc.gov/ as of Oct. 22, 2001, table 1.1.

GDP:
U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/ as of Oct. 22, 2001, table 1.1.

All other data:
U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/ as of Oct. 22, 2001, tables 1.1, 2.2, 3.10, 4.3, and 5.4.

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	[R]1999	2000
Personal consumption of transportation													
Motor vehicles and parts	142.7	236.9	246.1	211.8	225.7	242.2	255.1	253.4	256.3	[R]264.8	[R]292.0	327.6	348.3
Gasoline and oil	[R]94.8	104.8	[R]113.1	[R]109.4	112.5	[R]115.4	[R]117.4	120.2	124.2	[R]128.1	[R]131.8	136.7	136.6
Transport services	124.7	152.6	[R]173.4	164.7	171.1	[R]176.6	[R]189.0	201.0	214.2	[R]226.4	[R]234.7	244.0	251.3
Total	**[R]362.2**	**494.3**	**[R]532.6**	**[R]485.9**	**509.3**	**[R]534.2**	**[R]561.5**	**574.6**	**594.7**	**[R]619.3**	**[R]658.5**	**708.3**	**736.2**
Gross private domestic investment													
Transportation structures[R]	6.5	5.8	3.7	3.8	4.5	4.5	4.6	4.6	5.4	5.7	6.7	6.1	5.1
Transportation equipment	[R]77.5	93.9	87.4	87.7	92.3	103.4	120.4	128.2	138.9	[R]150.5	[R]168.2	197.6	192.7
Total[R]	**84.0**	**99.7**	**91.1**	**91.5**	**96.8**	**107.9**	**125.0**	**132.8**	**144.3**	**156.2**	**174.9**	**203.7**	**197.8**
Exports (+)													
Civilian aircraft, engines, and parts	26.9	19.5	40.9	[R]42.9	42.9	36.2	33.9	27.2	30.8	40.0	51.1	49.4	43.1
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	[R]71.7	73.9	78.3
Passenger fares	4.5	7.1	19.1	18.0	18.3	17.9	[R]18.0	18.9	20.4	[R]21.6	[R]21.1	19.3	19.7
Other transportation	16.5	18.9	23.9	24.0	22.8	22.9	[R]24.8	26.8	26.1	26.9	26.4	27.6	28.1
Total	**76.2**	**76.0**	**123.7**	**[R]127.4**	**133.0**	**131.3**	**135.8**	**135.4**	**142.3**	**[R]161.9**	**[R]170.3**	**170.2**	**169.2**
Imports (-)													
Civilian aircraft, engines, and parts	6.0	7.7	13.5	[R]13.6	14.3	12.4	12.1	11.2	12.7	16.0	20.7	22.1	23.9
Automotive vehicles, engines, and parts	52.5	[R]95.9	101.6	94.7	99.7	109.5	122.5	124.6	128.9	139.5	[R]148.2	177.2	192.5
Passenger fares	5.5	9.3	12.7	10.9	11.2	12.2	13.9	14.9	15.8	17.1	[R]18.6	19.4	20.7
Other transportation	[R]17.3	19.3	27.2	26.8	25.7	26.3	27.9	27.8	27.4	29.6	[R]31.6	31.8	34.9
Total	**[R]81.3**	**132.2**	**155.0**	**[R]146.0**	**150.9**	**160.4**	**176.4**	**178.5**	**184.8**	**202.2**	**[R]219.1**	**250.5**	**272.0**
Net exports of transportation-related goods and services[a]	**[R]-5.1**	**[R]-56.2**	**-31.3**	**-18.6**	**-17.9**	**-29.1**	**-40.6**	**-43.1**	**-42.5**	**[R]-40.3**	**[R]-48.8**	**-80.3**	**-102.8**
Government transportation-related purchases													
Federal purchases[b,R]	13.3	13.9	16.1	16.4	17.5	17.5	17.3	17.2	17.2	17.9	18.1	18.5	19.4
State and local purchases[b,R]	77.3	83.5	101.1	103.4	105.5	107.0	109.8	112.6	115.2	119.8	123.9	128.7	132.8
Defense-related purchases[c]	5.8	8.1	[R]10.3	[R]17.3	[R]12.7	[R]10.1	8.7	8.7	8.8	[R]8.3	[R]8.2	8.8	8.6
Total[R]	**96.4**	**105.5**	**127.4**	**137.0**	**135.7**	**134.6**	**135.8**	**138.5**	**141.2**	**146.0**	**150.2**	**156.0**	**160.8**
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**	**[R]8,159.5**	**[R]8,508.9**	**8,856.5**	**9,224.0**
Total transportation-related final demand[d,R]	**537.4**	**643.3**	**719.8**	**695.8**	**723.9**	**747.6**	**781.7**	**802.8**	**837.7**	**881.2**	**934.8**	**987.7**	**992.0**
Total transportation in GDP (%)	**11.0%**	**11.3%**	**10.7%**	**10.4%**	**10.5%**	**10.6%**	**10.6%**	**10.6%**	**10.7%**	**10.8%**	**11.0%**	**11.2%**	**10.8%**

KEY: R = revised.

[a] Sum of exports and imports.
[b] Federal and state purchases are the sum of consumptionexpenditures 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, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 15, 2001, 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, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 1, 2001, table 1.2.
All other data:
U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 1, 2001, tables 2.3, 3.11, 5.7, and 5.9.
Imports and Exports:
1990-2000: U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 29, 2001, table 4.4.
Chain-Type Quantity Indices (for computing 1980-1985 values):
U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 29, 2001, tables 7.4, 7.7, 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	R1998	R1999	2000
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**	**R8,407.8**	**8,933.3**	**9,519.4**	**10,236.9**
Total domestic transportation-related final demand[c]	**350.5**	**530.6**	**R645.2**	**R634.2**	**R672.2**	**R723.0**	**R786.2**	**R825.3**	**880.2**	**R933.5**	**981.7**	**1,085.1**	**1,162.0**
Total transportation in GDD (%)	**12.5%**	**12.3%**	**R11.0%**	**R10.6%**	**R10.6%**	**R10.8%**	**R11.0%**	**R11.0%**	**11.1%**	**11.1%**	**11.0%**	**11.4%**	**11.4%**
Personal consumption of transportation													
Motor vehicles and parts	87.0	175.7	R206.4	R182.8	R200.2	R222.1	R242.3	249.3	256.3	R264.2	288.8	324.7	346.8
Gasoline and oil	86.7	97.2	R107.3	R102.5	R104.9	R106.6	R109.0	113.3	124.2	R128.1	114.8	129.5	165.3
Transportation services	64.7	100.0	R141.8	R142.8	R155.0	R166.2	R180.9	197.7	214.2	234.4	246.3	257.4	272.8
Total	**238.4**	**372.9**	**R455.5**	**R428.1**	**R460.1**	**R494.9**	**R532.2**	**560.3**	**594.7**	**R626.7**	**649.9**	**711.6**	**784.9**
Gross private domestic investment													
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	5.2
Transportation equipment	48.4	69.7	R75.7	79.5	R86.1	R98.1	R117.8	126.1	138.9	R151.4	168.2	199.1	195.9
Total	**52.1**	**74.0**	**R78.7**	**82.7**	**R89.8**	**R102.2**	**R122.1**	**130.5**	**144.3**	**R157.3**	**175.2**	**205.3**	**201.1**
Government transportation-related purchases													
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	18.6	19.5
State and local purchases[a]	48.8	67.5	90.1	93.2	95.6	100.7	106.6	109.8	115.2	R123.6	130.0	140.7	147.6
Defense-related purchases[b]	4.2	6.2	R8.0	R15.7	R11.4	R9.3	8.2	8.4	8.8	R8.3	8.3	8.9	8.9
Total	**60.0**	**83.7**	**R111.0**	**R123.4**	**R122.3**	**R125.9**	**131.9**	**134.5**	**141.2**	**R149.5**	**156.6**	**168.2**	**176.0**

KEY: R = revised.

[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, Survey of Current Business (Washington, DC: August 2001), table 1.

Federal, state, and local government purchases:

1980-97: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: October 2001), table 3.15.

1998-2000: Ibid., Internet site http://www.bea.doc.gov/ as of Oct. 22, 2001, table 1.1.

All other data:

U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/ as of Oct. 22, 2001, tables 2.2, 3.10, 5.6, and 5.8, and *Survey of Current Business* (Washington, DC: August 2001), table 1 (p. 121).

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	[R]1998	[R]1999	2000
Personal consumption of transportation													
Motor vehicles and parts	142.7	236.9	246.1	211.8	225.7	242.2	255.1	253.4	256.3	[R]264.8	292.0	327.6	348.3
Gasoline and oil	[R]94.8	104.8	[R]113.1	[R]109.4	112.5	[R]115.4	[R]117.4	120.2	124.2	[R]128.1	131.8	136.7	136.6
Transportation services	124.7	152.6	[R]173.4	164.7	171.1	[R]176.6	[R]189.0	201.0	214.2	[R]226.4	234.7	244.0	251.3
Total	**[R]362.2**	**494.3**	**[R]532.6**	**[R]485.9**	**509.3**	**[R]534.2**	**[R]561.5**	**574.6**	**594.7**	**[R]619.3**	**658.5**	**708.3**	**736.2**
Gross private domestic investment													
Transportation structures	[R]6.5	[R]5.8	3.7	[R]3.8	[R]4.5	4.5	4.6	4.6	5.4	5.7	6.7	6.1	5.1
Transportation equipment	[R]77.5	93.9	87.4	87.7	92.3	103.4	120.4	128.2	138.9	[R]150.5	168.2	197.6	192.7
Total	**[R]84.0**	**[R]99.7**	**91.1**	**[R]91.5**	**[R]96.8**	**107.9**	**125.0**	**132.8**	**144.3**	**[R]156.2**	**174.9**	**203.7**	**197.8**
Government transportation-related purchases													
Federal purchases[a]	[R]13.3	[R]13.9	[R]16.1	[R]16.4	[R]17.5	[R]17.5	[R]17.3	[R]17.2	17.2	[R]17.9	18.1	18.5	19.4
State and local purchases[a]	[R]77.3	[R]83.5	[R]101.1	[R]103.4	[R]105.5	[R]107.0	[R]109.8	[R]112.6	115.2	[R]119.8	123.9	128.7	132.8
Defense-related purchases[b]	5.8	8.1	[R]10.3	[R]17.3	[R]12.7	[R]10.1	8.7	8.7	8.8	[R]8.3	8.2	8.8	8.6
Total	**[R]96.4**	**[R]105.5**	**[R]127.5**	**[R]137.1**	**[R]135.7**	**[R]134.6**	**[R]135.8**	**[R]138.5**	**141.2**	**[R]146.0**	**150.2**	**156.0**	**160.8**
Gross Domestic Demand	**4,890.9**	**5,866.2**	**6,764.4**	**6,692.2**	**6,899.8**	**7,121.7**	**7,434.3**	**7,622.2**	**7,902.1**	**[R]8,272.8**	**8,730.0**	**9,173.3**	**9,623.1**
Total domestic transportation-related final demand[c]	**[R]542.6**	**[R]699.5**	**[R]751.2**	**[R]714.5**	**[R]741.8**	**[R]776.7**	**[R]822.3**	**[R]845.9**	**880.2**	**[R]921.5**	**983.6**	**1,068.0**	**1,094.8**
Total transportation in GDD (%)	**11.1%**	**11.9%**	**11.1%**	**10.7%**	**10.8%**	**10.9%**	**11.1%**	**11.1%**	**11.1%**	**[R]11.1%**	**11.3%**	**11.6%**	**11.4%**

KEY: R = revised.

[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:

U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 15, 2001, tables 3.15 and 7.11 (price indices for federal nondefense and state and local).

All other data:

1980-2000: Ibid., *Survey of Current Business* (Washington, DC: August 2001), table 2A (p. 125), and Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 1, 2001, tables 2.3, 3.11, 5.7, and 5.9.

Chain-Type Quantity Indices (for computing 1980-1985 values):

U.S. Department of Commerce, Bureau of Economic Analysis, Internet site http://www.bea.doc.gov/bea/dn/nipaweb/ as of Nov. 29, 2001, tables 7.4, 7.7, 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	R1997	R1998	1999	2000
GDP by industry											
Services	1,072	1,124	1,219	1,288	1,365	1,462	1,564	1,692	1,830	1,981	2,165
Health care	314	345	378	395	414	433	459	472	491	516	547
Education	40	44	47	49	53	56	58	61	68	72	79
Finance, insurance, and real estate	1,010	1,072	1,141	1,205	1,255	1,347	1,437	1,570	1,709	1,811	1,936
Manufacturing	1,041	1,044	1,082	1,131	1,223	1,289	1,316	1,380	1,432	1,497	1,567
Durable goods	587	576	594	633	694	730	748	791	831	866	902
Nondurable goods	454	468	488	499	529	559	568	588	601	631	665
Government	807	857	894	925	958	990	1,020	1,065	1,103	1,152	1,216
Federal	300	322	334	336	340	342	347	355	360	370	387
State and local	506	535	561	589	618	647	674	710	743	782	830
Retail trade	508	524	552	578	621	647	687	741	790	835	894
Wholesale trade	376	396	415	433	479	501	530	567	608	634	674
Construction	249	233	234	249	275	290	316	338	381	426	464
For-hire transportation	177	186	193	206	223	233	243	262	289	303	314
Electric, gas, and sanitary services	165	177	181	189	197	207	208	206	205	216	230
Communications	148	156	164	179	191	202	215	221	239	259	281
Agriculture, forestry, and fishing	108	103	112	108	119	110	130	130	128	127	136
Mining	112	97	88	88	90	96	113	119	100	103	127
Total GDP	**5,803**	**5,986**	**6,319**	**6,642**	**7,054**	**7,401**	**7,813**	**8,318**	**8,782**	**9,269**	**9,873**
Statistical discrepancy	31	20	44	64	59	27	33	30	-31	-73	-130
% of GDP											
Services	18	19	19	19	19	20	20	20	21	21	22
Health care	5	6	6	6	6	6	6	6	6	6	6
Education	1	1	1	1	1	1	1	1	1	1	1
Finance, insurance, and real estate	17	18	18	18	18	18	18	19	19	20	20
Manufacturing	18	17	17	17	17	17	17	17	16	16	16
Durable goods	10	10	9	10	10	10	10	10	9	9	9
Nondurable goods	8	8	8	8	8	8	7	7	7	7	7
Government	14	14	14	14	14	13	13	13	13	12	12
Federal	5	5	5	5	5	5	4	4	4	4	4
State and local	9	9	9	9	9	9	9	9	8	8	8
Retail trade	9	9	9	9	9	9	9	9	9	9	9
Wholesale trade	6	7	7	7	7	7	7	7	7	7	7
Construction	4	4	4	4	4	4	4	4	4	5	5
For-hire transportation	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
Communications	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
Mining	2	2	1	1	1	1	1	1	1	1	1

KEY: R = revised.

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 the number of significant digits shown.

Numbers may not add to totals due to rounding.

SOURCE: 1990-99: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: July 2001), table 1.

Table 3-4b: Contributions to Gross Domestic Product (GDP): Selected Industries
(Chained 1996 $ billions)

	1990	1991	1992	1993	1994	1995	1996	R1997	R1998	1999	2000
GDP by industry											
Services	1,362	1,352	1,391	1,418	1,458	1,510	1,564	1,632	1,699	1,775	1,865
Health services	423	433	443	437	438	444	459	460	461	471	485
Educational services	50	53	53	55	57	59	58	59	61	62	65
Finance, insurance, and real estate	1,251	1,271	1,297	1,329	1,348	1,393	1,437	1,521	1,622	1,714	1,810
Manufacturing	1,102	1,066	1,085	1,123	1,206	1,285	1,316	1,387	1,444	1,532	1,595
Durable goods	585	559	569	600	657	715	748	813	893	965	1,034
Nondurable goods	520	511	520	525	551	570	568	575	556	574	574
Government	1,008	1,012	1,015	1,013	1,016	1,017	1,020	1,036	1,047	1,061	1,085
Federal	385	385	382	373	367	354	347	347	348	347	353
State and local	624	628	634	640	649	663	674	688	700	714	732
Retail trade	560	555	570	582	617	641	687	745	800	844	906
Wholesale trade	395	417	445	452	482	483	530	584	663	689	708
Construction	291	269	272	279	297	300	316	325	349	370	379
For-hire transportation	181	186	194	201	219	225	243	249	258	269	281
Electric, gas, and sanitary services	190	196	193	193	197	207	208	202	194	213	218
Communications	155	162	169	182	191	202	215	218	231	257	284
Agriculture, forestry, and fishing	119	121	131	123	136	123	130	144	146	153	166
Mining	106	101	96	101	108	113	113	117	120	112	95
Total GDP	**6,708**	**6,676**	**6,880**	**7,063**	**7,348**	**7,544**	**7,813**	**8,160**	**8,509**	**8,857**	**9,224**
Statistical discrepancy[a]	35	22	47	68	61	27	33	29	-30	-70	-123
% of GDP											
Services	20	20	20	20	20	20	20	20	20	20	20
Health services	6	6	6	6	6	6	6	6	5	5	5
Educational services	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
Manufacturing	16	16	16	16	16	17	17	17	17	17	17
Durable goods	9	8	8	8	9	9	10	10	10	11	11
Nondurable goods	8	8	8	7	8	8	7	7	7	6	6
Government	15	15	15	14	14	13	13	13	12	12	12
Federal	6	6	6	5	5	5	4	4	4	4	4
State and local	9	9	9	9	9	9	9	8	8	8	8
Retail trade	8	8	8	8	8	9	9	9	9	10	10
Wholesale trade	6	6	6	6	7	6	7	7	8	8	8
Construction	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
Electric, gas, and sanitary services	3	3	3	3	3	3	3	2	2	2	2
Communications	2	2	2	3	3	3	3	3	3	3	3
Agriculture, forestry, and fishing	2	2	2	2	2	2	2	2	2	2	2
Mining	2	2	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 rounding.

SOURCES:
1990-95: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* (Washington, DC, June 2000), table 6.
1996-97: Ibid., (Washington, DC, December 2000), table 6.
1998-2000: Ibid., (Washington, DC, November 2001), table 6, Internet site http://www.bea.doc.gov/bea/ARTICLES/2001/11november/1101gdpxind.pdf.

Table 3-5: Gross Domestic Product (GDP) by Major Social Function (Current $ billions)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total GDP	**5,986**	**6,319**	**6,642**	**7,054**	**7,401**	**7,813**	**[R]8,318**	**[R]8,782**	**[R]9,269**	**9,873**
Housing	**[R]1,388**	**[R]1,473**	**[R]1,570**	**[R]1,686**	**1,766**	**1,874**	**[R]1,974**	**[R]2,103**	**[R]2,243**	**2,386**
% of total	23	[R]23	24	24	24	24	24	24	24	24
Healthcare	**[R]827**	**[R]903**	**[R]969**	**[R]1,026**	**1,086**	**1,142**	**[R]1,208**	**[R]1,281**	**[R]1,353**	**1,444**
% of total	14	14	15	15	15	15	[R]15	15	15	15
Food	**[R]798**	**[R]828**	**[R]850**	**[R]903**	**926**	**985**	**[R]1,011**	**[R]1,059**	**[R]1,126**	**1,201**
% of total	13	13	13	13	13	13	12	12	12	12
Transportation[a,R]	**613**	**658**	**701**	**755**	**788**	**840**	**898**	**936**	**1,014**	**1,063**
% of total	10	10	11	11	11	11	11	11	11	11
Education	**[R]413**	**[R]432**	**[R]452**	**[R]478**	**511**	**541**	**[R]578**	**[R]614**	**[R]650**	**693**
% of total	7	7	7	7	7	7	7	7	7	7
Other[R]	**1,947**	**2,026**	**2,101**	**2,207**	**2,324**	**2,431**	**2,650**	**2,788**	**2,882**	**3,085**
% of total	33	32	32	[R]31	31	31	32	32	[R]31	31

KEY: R = revised.

[a] Transportation-related final demand.

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

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 October 2001).

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
Passenger-miles (billions)	**1,327**	**1,630**	**2,170**	**2,561**	**2,895**	**3,326**	**3,946**	**3,976**	**4,089**	**4,165**	**4,262**	**4,333**	**4,483**	**4,623**	**4,749**	**4,904**	**U**
Index (1980 = 100)	46	56	75	88	100	115	136	137	141	144	147	150	155	160	164	169	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**	**3,814**	**U**
Index (1980 = 100)	52	62	74	76	100	99	107	108	112	113	118	122	125	123	124	128	U
Population[a] (millions)	**181**	**194**	**205**	**216**	**228**	**238**	**250**	**253**	**255**	**258**	**261**	**263**	**[R]266**	**268**	**270**	**273**	**281**
Index (1980 = 100)	79	85	90	95	100	[R]105	110	111	112	113	114	116	[R]117	118	119	120	123
Industrial Production Index[b]																	
(1992 = 100)	**37**	**50**	**59**	**63**	**80**	**88**	**99**	**97**	**100**	**103**	**109**	**114**	**[R]120**	**[R]128**	**[R]134**	**[R]140**	**U**
Gross Domestic Product																	
Current $ (billions)	527	[R]720	[R]1,040	[R]1,635	[R]2,796	[R]4,213	[R]5,803	[R]5,986	[R]6,319	[R]6,642	[R]7,054	[R]7,401	[R]7,813	[R]8,318	[R]8,782	[R]9,269	9,873
Index (1980 = 100)	19	26	37	[R]58	100	[R]151	[R]208	[R]214	[R]226	[R]238	[R]252	[R]265	[R]279	[R]298	[R]314	332	353
Chained (1996) $ (billions)[R]	2,377	3,029	3,578	4,084	4,901	5,717	6,708	6,676	6,880	7,063	7,348	7,544	7,813	8,160	8,509	8,857	9,224

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

[a] Estimates as of July 1. Includes Armed Forces abroad.

[b] Industrial Production Index covers manufacturing, mining, and utilities.

SOURCES:

Passenger-miles:

1960-1999: Summation of all modes from the passenger-miles table in chapter 1.

Ton-miles:

1960-1999: Summation of all modes from the ton-miles table in chapter 1.

Population:

1960-1999: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States, 2000* (Washington, DC: 2001), table 2.

2000: U.S Department of Commerce, Census Bureau, *USA Statistics in Brief, supplement to Statistical Abstract of the United States* available at Internet site http://www.census.gov/statab/www/part1.html as of Apr. 2001.

Industrial Production Index:

1960-1999: Council of Economic Advisors, *Economic Report of the President* (Washington, DC: February 2001), 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.

1998-2000: Ibid., *Survey of Current Business* (Washington, DC: February 2001), tables 1.1 and 1.2.

Table 3-7: Passenger and Freight Transportation Expenditures (Current $ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL passenger and freight transportation expenditures[R]	**107,461**	**146,523**	**195,871**	**299,221**	**569,879**	**780,232**	**992,946**	**946,924**	**1,001,871**	**1,061,244**	**1,138,127**	**1,201,545**	**1,266,959**	**1,341,638**	**1,396,238**	**1,498,672**
Passenger transportation																
Highway																
Auto purchases and ownership[a, R]	51,610	71,064	94,978	152,238	297,128	426,796	507,308	481,929	514,970	551,558	601,206	631,653	672,416	706,064	722,484	787,407
Local																
Bus and transit[b]	1,337	1,454	1,841	4,697	9,297	13,548	[R]16,721	17,356	[R]18,012	[R]18,794	[R]20,082	[R]21,647	[R]21,318	[R]21,932	[R]21,445	21,702
Taxi	[R]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	5,735	[R]6,355	6,200
School bus	486	707	1,219	[R]2,174	3,833	5,722	8,031	7,879	8,060	7,618	7,847	9,889	[R]9,082	10,353	10,326	10,340
Intercity, bus	559	629	799	1,016	1,709	1,989	1,750	1,875	1,899	1,667	1,410	1,481	[R]1,497	[R]1,642	[R]1,757	1,819
Total highway[R]	**55,099**	**74,967**	**100,577**	**163,025**	**314,722**	**451,825**	**537,840**	**513,069**	**546,971**	**583,977**	**635,195**	**669,630**	**709,738**	**745,726**	**762,367**	**827,468**
Air total[c]	3,555	5,682	10,565	18,851	38,135	50,319	[R]73,045	[R]72,841	[R]73,780	[R]74,123	[R]76,146	[R]81,155	[R]82,331	[R]93,268	[R]97,358	101,750
Rail total[d]	759	598	464	1,212	2,976	3,875	4,521	4,414	4,571	5,278	[R]4,882	6,693	[R]5,895	[R]5,763	[R]5,691	5,611
Water total (includes international)	281	345	287	294	[R]310	[R]601	[R]1,391	[R]1,391	[R]1,469	[R]1,505	[R]1,564	[R]1,716	[R]1,843	[R]1,974	[R]2,029	2,088
Total passenger transportation expenditures[R]	**59,694**	**81,592**	**111,893**	**183,382**	**356,143**	**506,620**	**641,996**	**591,715**	**626,791**	**664,883**	**717,787**	**759,193**	**799,807**	**846,732**	**867,445**	**936,917**
Freight transportation expenditures																
Highway																
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	138,727	144,276	152,067
Intercity																
Bus	42	70	122	156	235	245	126	131	130	128	128	130	132	134	141	151
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	257,807	282,814	304,563
Total highway	**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**	**396,668**	**427,231**	**456,781**
Air total (domestic and international)	354	708	1,171	1,838	4,013	6,817	13,706	14,353	14,950	15,805	[R]17,249	[R]18,755	[R]20,448	[R]22,831	[R]24,222	25,277
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]34,360	35,059	35,349	35,294	35,893
Water total	3,487	3,903	5,257	8,221	15,498	18,448	20,121	20,306	19,895	[R]20,768	[R]21,150	[R]22,709	24,564	[R]21,031	[R]22,503	24,494
Oil pipeline total	895	1,051	1,396	2,220	7,548	8,910	[R]8,506	[R]8,095	[R]8,548	[R]8,470	[R]8,676	[R]9,077	[R]8,637	[R]8,632	8,579	9,067
Other total[e]	1,714	1,869	1,791	2,208	3,488	4,642	7,774	8,071	[R]8,284	[R]8,639	[R]9,408	[R]10,307	[R]9,950	[R]10,554	[R]10,601	10,243
Total freight transportation expenditures[R]	**47,767**	**64,931**	**83,978**	**115,839**	**213,736**	**273,612**	**350,950**	**355,209**	**375,080**	**396,361**	**420,340**	**442,352**	**467,152**	**494,906**	**528,793**	**561,755**

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.

SOURCE:
Passenger and freight:
1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2001* (Washington, DC: 2000), pp. 4-11.

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	P2000
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	126.0
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	R54.3	99.8
Highway fuel													
Gasoline (including taxes)													
Leaded[b]	119	112	115	U	U	U	U	U	U	U	U	U	U
Unleaded premium[b]	N	134	135	132	132	130	131	134	141	142	125	136	169
Unleaded regular[b]	125	120	116	114	113	111	111	115	123	123	106	117	151
All types	122	120	122	120	119	117	117	121	129	129	112	122	156
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	R58.4	99.7
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

KEY: N = data do not exist; P = preliminary; 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, *Annual Energy Review 2000,* DOE/EIA-0384(97) (Washington, DC: August 2001), tables 5.20 and 5.22.
Railroad fuel:
Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), 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
Retail price of regular grade gasoline (¢/gallon)																	
Service station price (excluding taxes)[a]	21.0	20.7	24.6	44.8	105.3	89.5	88.0	81.2	79.1	75.4	72.0	74.3	82.4	[R]82.6	[R]65.0	75.0	108.8
State and federal taxes[b]	10.1	10.5	11.1	12.4	13.8	22.0	26.9	32.8	33.6	35.4	39.2	40.4	40.7	[R]40.8	[R]41.0	41.5	42.2
Service station price (including taxes)																	
Leaded	31.1	31.2	35.7	56.7	119.1	111.5	114.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unleaded	N	N	N	N	124.5	120.2	116.4	114.0	112.7	110.8	111.2	114.7	123.1	123.4	106.0	116.5	151.0
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
Food	30	32	39	60	87	106	132	136	138	141	144	148	153	157	161	164	168
Shelter	25	27	36	49	81	110	140	146	151	156	161	166	171	176	182	187	193
Apparel and upkeep	46	48	59	73	91	105	124	129	132	134	133	132	132	133	133	131	130
Motor fuel[R]	24	25	28	45	97	99	101	99	99	98	99	100	106	106	92	101	129
Medical care	22	25	34	48	75	114	163	177	190	201	211	221	228	235	242	251	261

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

[a] Calculated by subtracting state and federal taxes from service station price (including taxes).
[b] State and federal taxes are weighted averages computed by the American Petroleum Institute, based on gasoline sold in the 50 states.

SOURCES:
Retail price of regular grade gasoline except service station prices (including taxes):
1960-1998: American Petroleum Institute, *Basic Petroleum Data Book* (Washington, DC: Annual issues), section VI, table 5, and similar tables in earlier editions.
1999-2000: American Petroleum Institute, "How Much We pay for Gasoline" (May 2001) table 2.
Service station price (including taxes):
1960-1998: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1998,* DOA/EIA-0384(97) (Washington, DC: July 1999), table 5.22. Also available at Internet site http://www.eia.doe.gov/pub/energy.overview/aer98/txt/aer0522.txt.
1999-2000: American Petroleum Institute, "How Much We Pay for Gasoline" (May 2001) table 3.
Consumer price indices:
Council of Economic Advisors, *Economic Report of the President* (Washington, DC: January 2001), 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
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
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
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
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
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
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
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

KEY: U = data are not available.

NOTES: 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, Internet site www.bls.gov/sahome.htm as of July 10, 2001.

Table 3-11: Producer Price Indices for Transportation Equipment (Base date = 100)

	Base date	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

KEY: NEC = not elsewhere classified.

NOTES: 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/sahome.htm as of July 10, 2001.

Table 3-12: Personal Expenditures by Category (Current $ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	R1999	R2000
Total expenditures	**R332,300**	**R444,300**	**R648,900**	**R1,030,300**	**R1,762,900**	**R2,712,600**	**R3,831,500**	**R3,971,200**	**R4,209,700**	**R4,454,700**	**R4,716,400**	**R4,969,000**	**5,237,500**	**R5,529,300**	**R5,856,000**	**6,250,200**	**6,728,400**
Transportation	42,900	59,100	81,100	130,200	238,400	372,800	R455,400	R428,100	R460,100	R494,900	R532,100	R560,300	594,600	R626,700	R649,900	711,600	784,900
Transportation as a % of total	12.9	13.3	12.5	R12.6	13.5	R13.7	R11.9	R10.8	R10.9	R11.1	R11.3	R11.3	11.4	11.3	11.1	11.4	11.7
Food and tobacco	89,200	108,800	154,600	R238,300	R376,800	R498,500	R677,900	R700,000	R717,300	R742,800	R773,600	R802,500	834,100	R862,000	R906,900	965,500	1,029,500
Clothing, accessories, and jewelry	32,700	41,400	57,600	85,600	132,300	188,300	R261,700	R263,700	R280,900	R294,000	R307,200	R317,300	333,300	R348,000	R367,200	391,000	416,200
Personal care	5,600	8,100	R11,500	R16,100	R25,500	R37,600	R53,700	R54,900	R58,000	R60,100	R63,300	R67,400	71,600	76,100	R79,900	84,400	90,400
Housing	48,200	65,400	94,000	147,000	R255,100	R406,800	R585,600	R616,000	R641,300	R666,500	R704,700	R740,800	772,500	R810,500	R859,700	909,000	958,800
Household operation	46,700	62,100	R85,000	R136,000	R233,800	R344,000	R433,600	R444,300	R463,600	R497,200	R528,200	R555,000	589,200	R617,800	R642,900	676,500	727,400
Medical care	22,100	34,100	60,000	R107,700	R206,500	R367,400	R619,700	R675,000	R741,500	R794,600	R838,100	R888,600	932,300	R984,400	R1,041,700	1,100,500	1,173,900
Personal business	14,600	R20,700	R32,600	R54,000	R103,600	R188,100	R284,700	R316,700	R342,600	R365,900	R381,600	R406,800	435,100	R489,000	R529,800	577,300	638,900
Recreation	18,500	R26,900	43,100	70,500	R116,700	R187,600	R284,900	R295,300	R313,800	R340,100	R368,700	R401,600	429,600	R456,600	R489,100	527,900	574,200
Education and research	R4,400	R7,000	R12,700	R20,600	R33,500	R53,800	R83,700	R89,200	R96,000	R101,200	R107,200	R114,500	122,300	R130,500	R140,200	149,500	159,900
Religious and welfare activities	5,300	R7,800	R12,200	R19,800	R37,200	R60,400	R97,100	R101,800	R112,400	R116,600	R127,900	R134,900	146,800	R149,500	R163,900	173,000	190,300
Foreign travel and other, net	2,100	2,900	4,500	4,400	3,500	7,500	R-6,300	R-13,700	R-18,000	R-19,300	R-16,200	R-20,700	-24,100	-21,800	R-15,100	-16,000	-15,900
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	R5,968,200	R6,355,600	6,618,000	7,031,000
Transportation as a % of DPI	11.7	R11.8	R11.0	R11.0	11.8	12.1	R10.6	R9.6	R9.7	R10.0	R10.3	R10.3	10.5	R10.5	R10.2	10.8	16.7

KEY: R = revised.

SOURCES:

DPI: 1960-2000: 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 Aug. 17, 2001.

All but DPI: 1960-2000: Ibid., *National Income and Product Accounts Tables* , table 2.4, Internet site http://www.bea.doc.gov as of Aug. 17, 2001.

Table 3-13: Personal Consumption Expenditures on Transportation by Subcategory (Current $ millions)

	1960	1965	1970	1975	1980	1985	R1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL transportation	**42,900**	**59,100**	**81,100**	**130,200**	**238,400**	**372,800**	**455,400**	**R428,100**	**R460,100**	**R494,900**	**R532,100**	**R560,300**	**R594,600**	**R626,700**	**R649,900**	**711,600**	**784,900**
User-operated transportation																	
New cars and net purchases of used cars	16,600	25,200	26,800	36,800	57,200	110,700	119,000	R101,200	R109,200	R120,900	R129,500	R132,200	133,300	R135,600	R142,800	155,600	164,100
New and used trucks and RVs	610	1,280	2,700	7,700	11,800	40,800	57,500	R52,200	R60,500	R68,900	R77,700	R80,200	84,300	R89,000	R104,500	124,700	136,500
Tires, tubes, accessories, and parts	2,500	3,500	6,100	10,300	17,900	24,300	29,900	R29,500	R30,500	R32,400	R35,200	R36,900	38,700	R39,600	R41,500	44,400	46,300
Repair and rental	5,500	7,700	12,300	19,800	34,000	60,500	84,900	R81,900	R90,300	R97,600	R110,000	R122,200	134,200	R146,300	R153,600	163,600	173,400
Gasoline and oil	12,000	14,800	21,900	39,700	86,700	97,200	107,300	R102,500	R104,900	R106,600	R109,000	R113,300	124,200	R128,100	R114,800	129,500	165,300
Tolls	310	460	650	820	1,100	1,520	2,300	R2,500	R2,800	R3,100	R3,300	R3,400	3,700	4,000	R4,000	4,200	4,500
Insurance premiums, less claims paid	2,000	2,400	3,800	3,800	9,400	10,000	18,100	R22,800	R25,700	R27,000	R27,800	R29,700	31,800	36,300	R38,000	36,800	37,900
Total	**39,500**	**55,100**	**74,200**	**118,920**	**218,300**	**344,900**	**419,000**	**R392,500**	**R424,000**	**R456,400**	**R492,300**	**R517,800**	**550,200**	**R578,900**	**R599,200**	**658,900**	**727,900**
Purchased intercity transportation																	
Railroad	310	280	210	270	300	480	700	R700	R600	R600	R600	R600	600	700	700	700	800
Intercity bus	290	380	530	740	1,400	1,350	1,300	R1,600	R1,600	R1,600	R1,500	R1,600	1,800	1,800	R1,900	2,000	2,200
Airline	680	1,280	3,100	5,900	12,800	17,600	22,700	R21,400	R21,300	R23,300	R23,700	R25,500	26,200	29,000	R30,800	32,300	35,800
Other	35	54	182	390	910	1,720	3,300	R3,300	R3,600	R3,600	R4,000	R4,300	4,700	4,700	R4,900	5,300	5,100
Total	**1,310**	**2,000**	**4,000**	**7,300**	**15,410**	**21,100**	**28,100**	**R26,900**	**R27,100**	**R29,100**	**R29,800**	**R32,100**	**33,300**	**R36,200**	**R38,400**	**40,300**	**44,000**
Purchased local transportation																	
Mass transit system	1,420	1,450	1,810	2,100	2,900	4,200	5,800	R6,100	R6,500	R6,700	R7,100	R7,100	7,700	R7,800	R8,300	8,600	9,000
Taxi	610	610	1,180	1,970	1,870	2,600	2,600	2,600	2,600	2,800	3,000	3,200	3,500	3,700	R4,100	3,800	3,900
Total	**2,000**	**2,100**	**2,990**	**4,100**	**4,770**	**6,800**	**8,400**	**R8,800**	**R9,000**	**R9,500**	**R10,000**	**R10,400**	**R11,200**	**R11,600**	**R12,300**	**12,400**	**13,000**

KEY: R = revised; RVs = recreational vehicles.

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

SOURCES: 1960–2000: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Account Tables* , Internet site http://www.bea.doc.gov, table 2.4.

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
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	49.1	51.0
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	6.9	7.9
Gas and oil as a % 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	14.1	15.5
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	3.6	3.9
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	1.8
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	7,363	7,654
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	1,829	2,040
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	5,534	5,614

[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 2000 fuel costs are based on a fourth quarter average price of $1.595 per gallon of regular unleaded gasoline, weighted 20% full-serve and 80% self-serve. Insurance figures are based on personal use of vehicles driven less than 10 miles to or from work, with no drivers under 25 years old. 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
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	[R]114.34	113.75
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]20.71	[R]23.00	25.43
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	0.89	0.87	0.90
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	[R]3.29	3.31
Intercity/Amtrak[c]	4.22	3.92	3.19	12.96	17.72	26.15	38.51	40.32	40.19	39.37	38.16	39.03	42.54	44.31	43.98	45.72

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).

1985-99: 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.

1994-99: 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:

1960-99: 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.

1985-99: Amtrak, *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues) (transportation revenues/Amtrak system passenger trips).

Table 3-15b: Average Passenger Fares (Chained 1996 $)[a]

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Air carrier, domestic, scheduled service	123.13	122.52	122.86	120.02	109.15	99.62	104.51	105.61	101.14	100.78	99.78	101.65	110.37	107.56	109.35	109.40
Class I bus, intercity[b]	15.62	16.38	18.05	16.50	19.97	14.44	20.57	21.25	20.23	21.05	19.55	20.49	22.85	20.62	21.72	23.46
Transit, all modesc (unlinked)	1.03	1.00	0.97	0.93	0.70	0.85	0.86	0.86	0.85	0.88	0.96	0.97	0.93	0.87	0.86	0.90
Commuter rail	4.20	4.59	4.61	4.42	3.63	4.66	3.48	3.51	3.56	3.50	3.58	3.33	3.25	3.30	3.22	3.12
Intercity/Amtrak[d]	27.68	25.33	17.50	55.08	45.56	42.80	46.21	47.07	46.26	44.63	42.83	41.58	42.54	44.36	42.99	43.10

[a] All data in this table have been revised using newly available chain-type indexes for transportations 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).

1985-99: 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); A*ir 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.

1994-99: 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:

1960-99: 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.

1985-99: Amtrak, *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues) (transportation revenues/Amtrak system passenger trips).

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
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**	**13.9**	**14.0**	**14.0**	**14.6**
Index (1980 = 100)	53	53	52	67	100	106	117	115	112	119	114	117	120	121	122	121	127
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**	**[R]12.6**	**[R]12.8**	**12.8**	**U**
Index (1990 = 100)	23	25	31	42	63	[R]86	100	[R]104	102	[R]104	101	106	106	[R]109	[R]110	110	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**	**[R]14.7**	**15.0**	**U**
Index (1990 = 100)	22	25	28	34	50	90	100	97	99	107	101	97	102	109	[R]109	111	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**	**U**
Index (1990 = 100)	21	22	28	40	58	80	100	100	100	99	97	103	118	123	124	130	U
Consumer Price Index (1982-84=100)	**30**	**32**	**39**	**54**	**82**	**108**	**131**	**136**	**140**	**145**	**148**	**152**	**157**	**161**	**[c]163**	**[d]167**	**U**

KEY: P = Preliminary; R = revised; U = 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.
1985-2000: 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.
Ibid., *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 2, line 9 (total passenger operating revenues/total revenue passenger-miles).
Intercity class I bus and commuter rail:
1960-1999: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 18.
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.
1985-99: Amtrak. *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues) (transportation revenues/passenger-miles).
Consumer Price Index:
1960-99: Council of Economic Advisors, *Economic Report of the President, 2000* (Washington, DC: 2000), table B-58.

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
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**	**84.1**	**80.9**
Index (1980 = 100)	49	44	47	61	100	105	140	140	138	154	156	165	176	172	182	175
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**
Index (1990 = 100)	26	26	35	48	74	94	100	102	95	102	103	103	107	107	107	107
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**
Index (1990 = 100)	53	48	54	77	108	114	100	97	97	95	94	90	88	90	88	86
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**	**R0.74**	**0.74**	**0.74**
Index (1990 = 100)	N	46	R40	68	R102	R106	100	103	100	100	97	R97	96	R97	98	98
Oil pipeline	**0.32**	**0.28**	**0.27**	**0.37**	**b1.33**	**1.57**	**R1.46**	**1.40**	**R1.45**	**R1.43**	**R1.47**	**1.51**	**R1.40**	**R1.40**	**R1.38**	**1.46**
Index (1990 = 100)	22	19	R19	25	R91	R107	100	R96	R100	R98	R101	R104	R96	R96	R95	100
Producer Price Index (1982 = 100)[c]	**33**	**34**	**39**	**58**	**88**	**105**	**119**	**122**	**123**	**125**	**126**	**128**	**131**	**132**	**131**	**133**

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

[a] General freight common carriers, most of which are LTL (less-than-truckload) carriers.

[b] Reflects entrance of Alaska pipeline moving crude petroleum to U.S. refineries between 1975 and 1980.

[c] Total finished goods.

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).

1985-99: 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:

1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2000), p. 17.

Class I rail:

1960-99: Association of American Railroads, *Railroad Facts* (Washington, DC: 2000), p. 30.

Producer Price Index:

1960-99: Council of Economic Advisors, *Economic Report of the President, 2000* (Washington, DC: August 2001), 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
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	R86,494	90,931
Trucking[f]	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
Class I bus, intercity	463	607	722	955	1,397	1,233	943	981	938	928	870	917	912	R996	R999	1,268
Transit[a]	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	R21,062	P22,220
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	R33151	33,521
Intercity/Amtrak[b]	N	N	N	253	454	832	1,308	R1,347	R1,320	R1,400	R1,409	R1,490	R1,550	R1,669	R2,244	2,011
Water transportation (domestic)[c]	1,722	1,822	2,070	3,293	7,219	7,703	7,940	7,964	7,935	8,028	7,745	7,712	R7,283	R6,940	R6,824	6,795
Oil pipeline[d]	895	1,051	1,396	2,220	7,548	8,910	R8,506	R8,095	R8,548	R8,470	R8,676	R9,077	R8,637	R8,632	R8,579	9,067
Gas pipeline (investor-owned)[e]	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	R57,548	66,320
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	14,097
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	R28,182	29,713
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	R2,974	3,149
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	R16,942	19,361

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

[a] Excludes commuter rail, automated guideway, urban boat, demand responsive, and most rural and smaller systems prior to 1984. Includes operating assistance.

[b] Amtrak began operations in 1971.

[c] Includes foreign traffic moving on domestic inland waterways.

[d] Oil pipeline revenues are much smaller than gas pipeline revenues because oil pipeline companies are common carriers that include transportation costs only.

[e] 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.

[f] 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.

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.

1985-99: 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.

1998-99: Ibid., *Service Annual Survey*, *1999* (Washington, DC: July 2001), table 2.2.

Intercity Class I bus:

1960-93: Interstate Commerce Commission, *Annual Report of the Interstate Commerce Commission* (Washington, DC: Annual issues).

1994-99: U.S. Department of Transportation, Bureau of Transportation Statistics, *Selected Earnings Data, Class 1 Motor Carriers of Passengers* (Washington, DC: Annual issues).

Transit:

1960-99: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2001), table 17, and similar tables in earlier editions of the APTA Transit Fact Book.

Class I rail:

1960-99: Association of American Railroads, *Railroad Facts* (Washington, DC: 2000), p. 12.

Intercity/Amtrak:

1975-80: Amtrak, State and Local Affairs Department and Public Affairs Department, personal communication.

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

Water transportation:

1960-99: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2000), p. 4-7.

Oil pipeline:

1960-99: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2000), p. 4-7.

Gas pipeline:

1960-99: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), tables 12-1, 12-2, 12-3, and 12-4; and similar tables in income accounts section in earlier editions, and personal communication, Dec. 14, 2001.

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
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**	**R125,865**	**R128,916**	**131,759**
For-hire transportation industry																	
45 Air	191	229	352	363	453	522	968	962	964	988	1,023	1,068	1,107	1,134	R1,181	R1,227	1,281
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	R1,744	R1,810	1,856
41 Local and interurban passenger transit																	
413 Intercity and rural bus	41	42	43	40	38	35	26	24	23	22	24	24	24	22	R24	R24	24
411 Local and suburban	U	U	U	69	79	92	141	155	162	176	194	203	218	229	R236	R238	233
415 School bus[c]	N	N	N	65	80	91	111	115	118	122	126	131	132	137	141	R146	147
412 Taxi	121	110	106	85	53	38	32	32	30	30	31	31	31	31	31	R32	32
Other local and interurban[d]	123	118	131	11	16	22	28	28	28	29	30	31	33	34	R36	R38	41
40 Railroad	885	735	634	548	532	359	279	262	254	248	241	238	231	227	231	R235	236
44 Water	N	228	212	194	211	185	177	184	173	168	172	175	174	179	R181	R186	196
46 Liquid pipeline	23	20	18	18	21	19	19	19	19	18	17	15	15	14	14	13	14
492 Natural gas pipeline[e]																	
Distribution	N	N	N	51	52	62	65	63	66	62	62	62	80	75	R71	72	U
Transmission	31	30	32	37	45	46	37	38	46	34	31	28	32	28	28	32	U
Integrated	N	N	N	55	53	43	40	40	35	39	39	36	13	12	R12	6	U
Combination	N	N	N	52	52	53	50	50	50	48	43	42	39	31	R31	28	U
Noninvestor-owned	N	N	N	11	13	12	12	12	12	11	11	11	16	9	R12	12	U
47 Transportation services[f]	N	85	115	134	198	275	336	336	338	352	378	401	418	441	R454	R463	471
Total for-hire transportation	**2,271**	**R2,560**	**2,726**	**2,841**	**3,175**	**3,214**	**3,715**	**3,697**	**3,704**	**3,792**	**3,948**	**4,083**	**R4,199**	**4,278**	**R4,427**	**R4,562**	**U**
37 Equipment manufacturing																	
372 Aircraft and parts	605	601	644	499	633	616	712	669	612	542	482	451	458	501	R525	R496	465
371 Motor vehicles and equipment	724	843	799	792	789	883	812	789	813	837	909	971	967	986	R995	R1,018	1,013
374 Railroad equipment	43	56	51	57	71	33	33	30	29	31	35	38	36	34	37	R38	36
373 Ship and boat building and repairing	141	160	172	194	221	187	188	177	170	159	158	160	159	158	R167	R167	166
301 Tires and inner tubes	105	102	116	124	115	94	84	81	81	82	79	80	80	78	R80	R79	79
Other[g]	155	193	167	157	167	241	244	225	207	188	177	172	165	167	168	R168	169
Total SIC 37 and SIC 301	**1,773**	**1,955**	**1,949**	**1,824**	**1,995**	**2,054**	**2,073**	**1,971**	**1,911**	**1,838**	**1,840**	**R1,870**	**1,864**	**1,923**	**R1,973**	**R1,967**	**1,928**
Related industries																	
553 Automotive and home supply stores	U	U	U	212	261	304	337	332	332	340	357	369	380	392	R397	R404	407
75 Automotive repair, services, and parking	U	U	U	439	571	730	914	882	881	925	968	1,020	1,080	1,120	R1,145	R1,196	1,248
554 Gasoline service stations	461	522	613	622	561	588	647	626	616	617	634	649	669	676	R680	R660	653
161 Highway and street construction	U	U	U	U	U	264	239	218	215	222	226	228	236	243	R257	R280	280
501 Motor vehicles, parts, and supplies	U	U	U	382	434	454	456	448	446	451	471	492	503	513	R517	R524	523
551 New and used car dealers	U	U	U	731	745	856	924	879	875	908	963	996	1,031	1,046	R1,047	R1,080	1,114
Other automotive retail[h]	N	N	N	112	122	140	155	146	143	148	163	176	187	197	R208	R223	238
Total related industries	**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**	**R4,251**	**R4,368**	**4,464**
Government employment[i]																	
U.S. DOT[j]	N	N	104	112	112	100	104	108	110	109	103	101	99	98	99	100	100
State and local highway[k]	532	577	607	604	559	549	569	564	525	541	544	543	[l]N	531	530	R543	546
Total government employment	**532**	**577**	**711**	**716**	**671**	**649**	**673**	**672**	**635**	**650**	**647**	**644**	**99**	**629**	**629**	**R643**	**646**
TOTAL transportation-related labor force	**R5,036**	**R5,614**	**R5,999**	**R7,880**	**R8,535**	**9,252**	**10,133**	**9,872**	**9,758**	**9,892**	**10,217**	**10,527**	**R10,248**	**11,016**	**R11279**	**R11,540**	**U**

KEY: N = data do not exist; R = revised; 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] In 1997, the American Gas Association revised the database that identifies companies by type (e.g., distribution, integrated, or transmission). This reclassification has resulted in additions to the distribution and reductions to the integrated company categories beginning with the revised data in 1996. Additionally, data by company type are not directly comparable from year to year due to acquisitions and mergers.
[f] 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.
[g] The difference between the total of SIC 37 and the sum of 371, 372, 373, and 374.
[h] The difference between the total of SIC 55 and the sum of 551, 553, and 554.

[i] Not all government agencies are included (e.g., the National Transportation Safety Board).
[j] 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.
[k] 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.
[l] 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.

NOTES: 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).
1990-2000: Ibid., Internet site www.bls.gov/datahome.htm, database query for individual series as of Oct. 11, 2001.
Natural gas pipeline:
1975-99: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), table 14-2 and similar tables in earlier editions.
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).
1990-2000: 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.
1992-2000: Ibid., Internet site http://www.census.gov/pub/govs/www/apesstl.html as of Aug. 2, 2001.

Table 3-20: Employment in Transportation Occupations (Thousands)

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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
Total workers in transportation occupations	3,681	4,039	4101.0	4,098	4,250	4,287	4,308	4,451	4,534	4,499	R4,643	4,684
Transportation occupation as % 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
Motor vehicle operators												
Supervisors	51	76	80	87	84	94	87	85	95	88	86	77
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
Drivers-sales workers	214	201	215	184	178	164	158	156	150	159	160	167
Bus drivers	394	443	469	477	506	511	526	512	472	471	490	539
Taxicab drivers and chauffeurs	180	213	197	217	230	238	211	203	248	273	271	280
Parking lot attendants	45	53	53	44	41	49	50	46	46	62	68	60
Motor transportation occupations, NEC	2	5	6	5	7	8	8	4	4	3	11	11
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**
Rail transportation												
Railroad conductors and yardmasters	36	36	38	39	38	38	33	45	48	50	45	48
Locomotive operating occupations	59	46	44	44	45	47	51	49	53	41	45	63
Railroad brake, signal, and switch operators	46	28	27	20	21	19	17	15	14	7	9	11
Rail vehicle operators, NEC	7	8	6	5	4	4	3	7	6	6	7	5
Total	**148**	**118**	**115**	**108**	**108**	**108**	**104**	**116**	**121**	**104**	**106**	**127**
Water transportation												
Ship captains and mates, except fishing boats	32	27	32	26	26	30	33	32	24	22	31	38
Sailors and deckhands	18	18	18	16	24	27	26	25	21	30	16	14
Marine engineers	1	2	4	5	3	6	3	8	2	3	5	2
Bridge, lock, and lighthouse tenders	8	6	7	7	8	5	4	5	5	8	5	3
Total	**59**	**53**	**61**	**54**	**61**	**68**	**66**	**70**	**52**	**63**	**57**	**56**
Air transportation												
Airplane pilots and navigators	77	114	100	96	101	104	114	114	120	113	143	129
Air traffic controllers	34	36	34	23	25	24	30	32	36	26	24	23
Total	**111**	**150**	**134**	**119**	**126**	**128**	**144**	**146**	**156**	**139**	**167**	**152**
Public transportation attendants	**65**	**100**	**86**	**91**	**105**	**104**	**94**	**95**	**115**	**124**	**111**	**127**

KEY: NEC = not elsewhere classified; R = revised.

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:

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.

Ibid., Personal communications: unpublished revisions: Aug. 6, 2001.

Total workers, 16 years and over:

Ibid., *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.

Table 3-21: Average Wage[a] and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (Current $)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	R1997	R1998	R1999	2000
Wages, U.S. labor force	4,822	5,807	7,743	10,808	15,790	21,293	26,257	27,325	28,654	29,417	30,139	30,996	32,040	33,429	35,109	36,675	38,706
Transportation industry	**5,835**	**6,989**	**9,396**	**13,550**	**20,818**	**25,324**	**28,900**	**29,973**	**31,532**	**31,327**	**31,958**	**32,349**	**33,197**	**34,429**	**35,924**	**37,210**	**38,450**
Air	6,929	8,495	12,027	17,035	25,649	32,131	32,747	34,407	35,931	35,660	36,189	36,365	37,238	38,693	40,402	42,523	43,864
Trucking and warehousing	5,396	6,623	8,672	12,765	19,204	22,383	26,180	26,905	28,337	28,302	29,171	29,591	30,351	31,740	32,948	33,970	35,031
Local and interurban passenger transit	4,877	5,553	6,996	9,462	13,530	15,706	17,517	18,088	18,976	19,057	19,639	20,112	20,811	21,201	22,086	22,774	23,781
Railroad	6,241	7,460	10,110	14,987	25,049	36,611	43,614	45,907	50,293	49,642	51,050	51,236	54,706	56,519	59,725	60,616	61,520
Water	6,212	7,402	10,302	14,136	22,746	28,531	33,855	34,703	36,311	36,822	37,335	37,856	38,934	40,524	42,260	43,108	44,724
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	57,867	58,286	59,071	64,923	65,154	66,462
Transportation services[b]	5,380	6,239	8,232	11,430	16,005	20,530	26,058	27,126	28,541	28,783	29,577	30,869	31,523	32,796	34,581	36,178	38,527

KEY: R = revised.

[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] Establishments furnishing services incidental to transportation, such as forwarding and packing services and the arrangement of passenger and freight transportation.

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; 1990-98 data are based on the 1987 SIC codes.

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 as of Aug. 3, 2001.

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
16 years and over, all[a]	**343**	**412**	**426**	**440**	**459**	**467**	**479**	**490**	**503**	**523**	**549**	**576**
Airplane pilots and navigators	738	910	931	884	1,076	1,013	956	1,138	1,079	1,383	1,048	1,283
Public transportation attendants	N	635	N	N	733	452	450	417	521	524	604	568
Motor vehicle operators	343	400	405	415	434	452	475	473	496	503	514	543
Supervisors, motor vehicle operators	N	520	500	494	583	512	549	583	589	595	585	688
Truck drivers	N	N	N	417	442	467	481	481	506	516	527	564
Drivers-sales workers	399	439	458	484	478	461	517	506	524	526	534	558
Bus drivers	344	355	378	400	403	392	419	396	405	428	428	460
Taxicab drivers and chauffeurs	262	307	342	312	312	374	352	374	405	379	427	468
Nonmotor vehicle operators	559	687	716	700	714	631	711	691	761	834	761	816
Rail transportation operators	599	717	774	717	722	701	741	740	814	849	816	863
Water transportation	463	547	576	610	667	582	624	586	641	812	604	778

KEY: N = data do not exist.

[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: 1985–1999: U.S. Department of Labor, Bureau of Labor Statistics, unpublished data, Mar. 1, 1999 and Mar. 11, 1999, and Apr. 25, 2000 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.stats.bls.gov/pdf/cpsaat39.pdf.

Table 3-23: Total Wage[a] and Salary Accruals by Transportation Industry (Current $ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997[R]	1998[R]	1999	2000
TOTAL wage and salary accruals (All industries)	**272,800**	**363,700**	**551,500**	**814,700**	**1,377,600**	**1,995,700**	**2,757,500**	**2,827,600**	**2,970,600**	**3,094,000**	**3,254,000**	**3,441,060**	**3,630,142**	**3,885,977**	**4,192,105**	**4,477,368**	**4,837,192**
Transportation																	
Air	1,268	1,852	4,029	5,894	11,029	15,744	29,440	30,588	31,871	32,843	34,488	36,183	38,839	41,092	45,129	49,284	52,900
Trucking and warehousing	4,592	6,265	9,123	13,786	23,755	29,725	34,715	35,138	37,036	39,085	42,502	44,830	47,074	50,688	54,694	58,632	61,654
Local and interurban passenger transit	1,307	1,427	1,868	2,375	3,423	4,272	5,658	5,969	6,357	6,727	7,286	7,723	8,366	8,862	9,541	10,180	10,868
Railroad	5,498	5,446	6,268	8,108	12,850	11,862	10,729	10,880	11,517	11,219	11,231	11,272	11,543	11,756	12,602	12,790	12,427
Water	1,379	1,584	2,112	2,601	4,572	5,050	5,620	5,969	5,955	6,002	6,235	6,322	6,463	6,889	7,311	7,587	8,095
Pipeline, except natural gas	160	153	183	285	577	709	831	893	979	958	929	868	816	827	844	847	864
Transportation services[b]	425	549	922	1,463	3,041	5,420	8,521	8,816	9,333	9,930	10,973	11,977	12,483	13,643	14,939	15,810	17,260
Total	**14,629**	**17,276**	**24,505**	**34,512**	**59,247**	**72,782**	**95,514**	**98,253**	**103,048**	**106,764**	**113,644**	**119,175**	**125,584**	**133,757**	**145,060**	**155,130**	**164,068**

KEY: R = revised.

[a] Wages do not include compensation (supplements to wages and salaries such as pension, profit-sharing, and other retirement plans, and health, life, and unemployment insurance).

[b] Defined as services incidental to transportation, such as forwarding and packing services and arranging passenger travel and freight transportation.

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 Aug. 3, 2001.

Table 3-24: Labor Productivity Indices for Selected Transportation Industries

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Output per hour[a] worked																
Air[b]	N	N	N	N	N	N	93	93	97	100	106	109	111	112	R111	108
Bus, Class I[c]	106	128	118	107	111	96	R96	R104	R105	R109	R99	R110	R106	R125	R105	136
Railroad	22	32	36	43	55	82	119	128	140	145	150	156	167	170	R173	182
Trucking, except local[b]	N	N	N	N	N	N	111	117	123	127	130	125	131	132	130	132
Petroleum pipelines[c]	31	49	76	91	89	100	103	99	100	104	108	116	131	134	R137	150
Output per employee[d]																
Air	22	35	45	56	71	92	93	93	97	100	106	109	111	112	R111	108
Bus, Class I[c]	108	129	119	103	99	93	R96	R102	R103	R107	R96	R105	R103	R121	R104	134
Railroad	25	36	42	46	55	79	120	125	134	142	153	162	172	177	R176	182
Trucking, except local	48	56	60	64	78	94	111	117	123	127	130	125	131	132	130	132
Petroleum pipelines[c]	30	48	75	89	89	98	102	98	99	104	112	121	139	141	R146	155

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

[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 www.bls.gov/iprhome.htm as of Aug. 3, 2001.
Ibid., personal communication, Aug. 7, 2001 (unpublished data).

Table 3-25a: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Current $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**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	46,756
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	U
Total government expenditures	**56,329**	**77,230**	**100,629**	**108,284**	**114,587**	**116,461**	**125,882**	**130,542**	**133,359**	**138,361**	**145,659**	**154,845**	**U**
State and local expenditures less federal grants[b]	31,592	48,939	69,770	75,334	79,321	79,190	86,214	89,772	92,585	96,596	104,355	110,871	U
Federal grants	14,581	18,146	19,689	20,488	21,349	23,037	23,278	24,950	25,061	26,073	25,125	27,959	32,516
Federal expenditures, less grants	10,156	10,144	11,170	12,462	13,916	14,233	16,390	15,819	15,712	15,693	16,178	16,016	15,885

KEY: U = data are not available.

[a] All data have been revised.

[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.
1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (Washington, DC: forthcoming).

Table 3-25b: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Constant 1996 $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**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
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	U
Total government expenditures	**102,324**	**107,500**	**118,629**	**123,276**	**128,064**	**126,225**	**132,668**	**133,464**	**133,359**	**135,089**	**140,025**	**144,939**	**U**
State and local expenditures less federal grants[b]	58,159	67,905	80,978	84,989	87,861	85,528	90,713	91,820	92,585	94,166	100,072	103,559	U
Federal grants	26,033	25,397	24,022	23,807	24,338	25,155	24,620	25,485	25,061	25,547	24,304	26,309	29,632
Federal expenditures, less grants	18,133	14,198	13,629	14,480	15,864	15,542	17,335	16,159	15,712	15,376	15,649	15,071	14,477

KEY: U = data are not available.

[a] All data have been revised.

[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.
1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (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 3-26: Summary of Transportation Revenues and Expenditures From Own Funds and User Coverage, Fiscal Year (Current and constant 1996 $ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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	46,756
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
Federal expenditures													
Current	24,737	28,291	30,859	32,950	35,266	37,270	39,668	40,769	40,774	41,766	41,303	43,975	48,401
Chained	44,165	39,595	37,651	38,287	40,203	40,697	41,955	41,644	40,774	40,923	39,953	41,380	44,109
Federal user coverage (percent)	42	65	69	79	73	73	69	74	75	75	94	118	97
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	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	U
State and local expenditures													
Current	31,592	48,939	69,770	75,334	79,321	79,190	86,214	89,772	92,585	96,596	104,355	110,871	U
Chained	58,966	67,905	80,978	84,989	87,861	85,528	90,713	91,820	92,585	94,166	100,072	103,559	U
State and local user coverage (percent)	72	69	69	68	69	73	70	71	71	72	69	68	U

KEY: U = data not available.

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

SOURCES:
1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.
1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (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 3-27a: Transportation Revenues by Mode and Level of Government, fiscal year (Current $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**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	46,756
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	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	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**	**U**
Federal: Highway Trust Fund-Highway Account[b]	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
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	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	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**	**U**
Federal: Airport and Airways Trust Fund[c]	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
State	190	299	556	618	650	726	652	695	705	765	768	744	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	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**	**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
State	362	847	1,074	1,123	1,126	1,145	1,218	1,257	1,308	1,339	1,384	1,404	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	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**	**U**
Federal: Water Receipts[d]	391	485	999	1,306	1,544	1,655	1,457	1,644	1,602	1,605	1,611	1,568	1,175
State	249	335	355	382	393	409	434	479	600	590	643	651	U
Local	572	807	1,133	1,152	1,237	1,329	1,351	1,444	1,531	1,509	1,597	1,704	U
Pipeline, total	**RZ**	**RZ**	**10**	**11**	**14**	**15**	**19**	**35**	**31**	**30**	**29**	**30**	**40**
Federal: Pipeline Safety Fund	RZ	RZ	10	11	14	15	19	35	31	30	29	30	40
General support, total	**RZ**	**RZ**	**RZ**	**RZ**	**3**	**10**	**7**	**7**	**7**	**7**	**8**	**8**	**25**
Federal: Emergency Preparedness Fund	RZ	RZ	RZ	RZ	3	10	7	7	7	7	8	8	25

KEY: RZ = no activity or a value of zero; U = data not available.

[a] All data have been revised.

[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] Beginning in 1983, a portion of the fuel tax credited to the Highway Trust Fund is earmarked for transit.

[d] 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.

1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (Washington, DC: forthcoming).

Table 3-27b: Transportation Revenues by Mode and Level of Government, Fiscal Year (Constant 1996 $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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**	**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
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	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	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**	**U**
Federal: Highway Trust Fund-Highway Account[c]	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
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	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	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**	**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
State	349	416	646	697	720	784	686	711	705	745	737	695	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	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**	**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
State	667	1,176	1,247	1,267	1,247	1,237	1,281	1,285	1,308	1,306	1,327	1,312	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	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**	**U**
Federal: Water Receipts[d]	697	678	1,219	1,517	1,760	1,807	1,541	1,679	1,602	1,573	1,558	1,475	1,071
State	458	465	412	431	436	442	457	490	600	576	616	608	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	U
Pipeline, total	**RZ**	**RZ**	**12**	**13**	**16**	**16**	**20**	**36**	**31**	**29**	**28**	**28**	**36**
Federal: Pipeline Safety Fund	RZ	RZ	12	13	16	16	20	36	31	29	28	28	36
General support, total	**RZ**	**RZ**	**RZ**	**RZ**	**3**	**10**	**7**	**7**	**7**	**7**	**8**	**8**	**23**
Federal: Emergency Preparedness Fund	RZ	RZ	RZ	RZ	3	10	7	7	7	7	8	8	23

KEY: RZ = no activity or a value of zero; U = data are not available.

[a] All data have been revised.

[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] Beginning in 1983, a portion of the fuel tax credited to the Highway Trust Fund is earmarked for transit.

[d] 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.
1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (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 3-28: Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year ($ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
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
$ constant 1996	9,473	9,814	17,133	17,508	16,926	13,940	13,106	11,691	7,692	[R]6,256	[R]9,170	11,843
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	19,226
$ constant 1996	[R]19,146	13,692	11,493	11,753	12,580	12,500	8,388	9,691	11,658	[R]12,374	[R]8,301	18,295
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
$ constant 1996	N	3,336	8,540	10,610	10,908	11,517	10,523	9,854	9,525	[R]9,699	[R]9,793	9,281
Harbor Maintenance Trust Fund												
$ current	N	N	30	74	121	305	451	621	865	1,106	1,246	1,736
$ constant 1996	N	N	36	85	135	331	477	639	865	[R]1,088	[R]1,214	1,652
Inland Waterway Trust Fund												
$ current	N	172	281	217	186	180	214	238	275	300	327	357
$ constant 1996	N	227	335	249	207	195	226	245	275	[R]295	319	340
Oil Spill Liability Trust Fund												
$ current	N	N	345	647	866	1,024	993	1,121	1,124	1,110	1,083	1,017
$ constant 1996	N	N	412	742	964	1,111	1,051	1,153	1,124	[R]1,092	[R]1,055	968
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**	**44,535**
$ constant 1996	**[R]28,619**	**27,069**	**37,949**	**40,947**	**41,720**	**39,594**	**33,771**	**33,273**	**31,139**	**[R]30,805**	**[R]29,852**	**42,378**

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.
1995-99: 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
1980-97: U.S. Department of Commerce, Bureau of Economic Analysis, Historical data for chain-type indexes accurate to 3 decimal places, table 7-11, "Chain Type Price Indexes-Federal," Internet site http://www.bea.doc.gov/bea/dn1.htm as of Aug. 14, 2001.
1998-99: U.S. Department of Commerce, Bureau of Economic Analysis, *Interactive Access to National Income and Product Accounts Tables,* table 7-11, "Chain Type Price Indexes-Federal," Internet site http://www.bea.doc.gov/bea/dn/nipaweb as of Aug. 14, 2001.

Table 3-29a: Transportation Expenditures by Mode and Level of Government From Own Funds, Fiscal Year (Current $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL, all modes	**56,329**	**77,230**	**100,629**	**108,284**	**114,587**	**116,461**	**125,882**	**130,542**	**133,359**	**138,361**	**145,659**	**154,845**	**U**
Federal	24,737	28,291	30,859	32,950	35,266	37,270	39,668	40,769	40,774	41,766	41,303	43,975	48,401
State & local	31,592	48,939	69,770	75,334	79,321	79,190	86,214	89,772	92,585	96,596	104,355	110,871	U
Highways, total	**34,553**	**46,604**	**62,563**	**66,526**	**68,954**	**69,991**	**74,531**	**79,309**	**81,550**	**84,212**	**89,454**	**95,494**	**U**
Federal	11,706	15,030	15,452	15,859	16,773	18,081	20,053	20,078	20,622	21,347	20,652	23,589	27,657
State & local	22,847	31,574	47,112	50,667	52,182	51,910	54,478	59,232	60,927	62,865	68,802	71,905	U
Air, total	**5,673**	**7,903**	**12,568**	**13,974**	**15,916**	**17,408**	**17,941**	**16,960**	**17,273**	**18,776**	**19,593**	**21,789**	**U**
Federal	3,762	4,947	7,305	8,282	9,313	10,049	10,146	10,389	10,135	10,137	10,622	10,722	9,556
State & local	1,911	2,955	5,263	5,692	6,604	7,359	7,795	6,571	7,138	8,639	8,971	11,067	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**	**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	5,337
State & 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	U
Water, total	**4,477**	**5,124**	**5,480**	**5,847**	**6,167**	**6,593**	**7,046**	**6,628**	**6,775**	**6,996**	**7,137**	**7,682**	**U**
Federal	3,308	3,642	3,537	3,833	4,304	4,462	4,457	4,380	4,238	4,212	4,384	4,565	4,810
State & 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	U
Rail, total	**2,419**	**1,072**	**541**	**783**	**906**	**819**	**845**	**1,043**	**1,015**	**1,148**	**1,099**	**565**	**U**
Federal	2,395	1,057	534	779	900	811	833	1,034	1,004	1,131	1,076	546	755
State & local	23	15	7	3	6	8	12	9	11	17	23	19	U
Pipeline, total[b]	**RZ**	**8**	**26**	**28**	**32**	**34**	**36**	**43**	**33**	**29**	**32**	**30**	**U**
Federal	RZ	RZ	9	9	12	14	14	19	33	29	32	30	27
State & local	RZ	8	17	19	20	20	22	24	U	U	U	U	U
General support, total[c]	**259**	**187**	**191**	**270**	**289**	**337**	**396**	**396**	**367**	**327**	**236**	**258**	**259**
Federal–general support	259	187	191	270	289	337	396	396	367	327	236	258	259

KEY: RZ = no activity or a value of zero; U = data are not available.

[a] All data have been revised.

[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.
1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (Washington, DC: forthcoming).

Table 3-29b: Transportation Expenditures by Mode and Level of Government From Own Funds, Fiscal Year (Constant 1996 $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL, all modes	**102,324**	**107,500**	**118,629**	**123,276**	**128,064**	**126,225**	**132,668**	**133,464**	**133,359**	**135,089**	**140,025**	**144,939**	**U**
Federal	44,165	39,595	37,651	38,287	40,203	40,697	41,955	41,644	40,774	40,923	39,953	41,380	44,109
State & local	58,159	67,905	80,978	84,989	87,861	85,528	90,713	91,820	92,585	94,166	100,072	103,559	U
Highways, total	**62,960**	**64,845**	**73,532**	**75,588**	**76,920**	**75,808**	**78,530**	**81,091**	**81,550**	**82,200**	**85,955**	**89,361**	**U**
Federal	20,899	21,035	18,853	18,428	19,121	19,744	21,209	20,508	20,622	20,916	19,976	22,197	25,204
State & local	42,060	43,810	54,680	57,160	57,800	56,064	57,321	60,583	60,927	61,284	65,978	67,164	U
Air, total	**10,234**	**11,025**	**15,021**	**16,045**	**17,931**	**18,921**	**18,932**	**17,333**	**17,273**	**18,354**	**18,878**	**20,427**	**U**
Federal	6,717	6,924	8,912	9,623	10,616	10,973	10,731	10,612	10,135	9,932	10,275	10,089	8,709
State & local	3,517	4,100	6,109	6,422	7,314	7,948	8,201	6,721	7,138	8,422	8,603	10,337	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**	**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	4,864
State & 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	U
Water, total	**8,058**	**7,153**	**6,570**	**6,726**	**6,970**	**7,174**	**7,438**	**6,773**	**6,775**	**6,841**	**6,881**	**7,207**	**U**
Federal	5,907	5,098	4,316	4,454	4,907	4,872	4,714	4,474	4,238	4,127	4,241	4,296	4,384
State & 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	U
Rail, total	**4,320**	**1,501**	**659**	**909**	**1,033**	**895**	**893**	**1,066**	**1,015**	**1,124**	**1,063**	**531**	**U**
Federal	4,277	1,480	652	906	1,026	886	881	1,056	1,004	1,108	1,041	514	688
State & local	43	21	8	4	7	9	13	10	11	16	22	18	U
Pipeline, total[b]	**RZ**	**11**	**31**	**32**	**36**	**36**	**38**	**44**	**U**	**U**	**U**	**U**	**U**
Federal	RZ	RZ	11	11	14	15	14	19	33	28	31	28	25
State & local	RZ	11	19	21	22	22	24	25	U	U	U	U	U
General support, total[c]	**462**	**261**	**233**	**314**	**329**	**367**	**419**	**404**	**367**	**320**	**228**	**243**	**236**
Federal–general support	462	261	233	314	329	367	419	404	367	320	228	243	236

KEY: RZ = no activity or a value of zero; U = data are not available.

[a] All data have been revised.
[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.
1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (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)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total	**14,581**	**18,146**	**19,689**	**20,488**	**21,349**	**23,037**	**23,278**	**24,950**	**25,061**	**26,073**	**25,125**	**27,959**	**32,516**
Highway	10,807	14,007	14,695	15,083	16,044	17,158	18,319	18,677	19,039	20,008	19,294	22,127	26,061
Air	590	789	1,220	1,541	1,672	1,931	1,620	1,826	1,655	1,489	1,511	1,565	1,896
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	4,476
Water[b]	RZ	12	26	35	36	37	39	62	40	26	32	21	9
Rail	54	35	16	8	14	19	28	22	25	39	54	44	61
Pipeline	RZ	RZ	4	5	6	7	5	10	11	12	13	14	13

KEY: RZ = no activity or a value of zero.

[a] All data have been revised.

[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.

1985-2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (Washington, DC: forthcoming).

Table 3-30b: Federal Transportation Grants to State and Local Governments by Mode, Fiscal Year (Constant 1996 $ millions)[a]

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total	**26,033**	**25,397**	**24,022**	**23,807**	**24,338**	**25,155**	**24,620**	**25,485**	**25,061**	**25,547**	**24,304**	**26,309**	**29,632**
Highway	19,295	19,604	17,929	17,527	18,290	18,735	19,375	19,077	19,039	19,604	18,664	20,821	23,750
Air	1,054	1,104	1,489	1,790	1,906	2,109	1,713	1,865	1,655	1,459	1,462	1,473	1,728
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	4,079
Water[b]	RZ	17	31	41	41	41	42	63	40	25	31	20	8
Rail	97	49	19	9	16	20	30	22	25	38	52	41	56
Pipeline	RZ	RZ	5	5	7	7	6	10	11	12	13	13	12

KEY: RZ = no activity or a value of zero.

[a] All data have been revised.

[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.

1985–2000: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: FY 1985-2000* (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 Four

Transportation, Energy, and the Environment

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	P2000
Domestic production																	
Crude oil[a]	7.04	7.80	9.64	R8.37	8.60	8.97	7.36	7.42	7.17	6.85	6.66	6.56	R6.46	6.45	6.25	R5.88	5.83
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	R1.85	1.91
Total[b]	**7.96**	**9.01**	**11.30**	**10.05**	**10.21**	**10.64**	**8.99**	**9.17**	**9.00**	**8.84**	**R8.64**	**8.63**	**8.61**	**8.61**	**8.39**	**R8.11**	**8.13**
Gross imports																	
Crude oil[c]	1.02	1.24	1.32	R4.10	5.26	3.20	5.89	5.78	6.08	6.79	7.06	7.23	7.51	8.23	8.71	R8.73	8.93
Petroleum products[d]	0.80	1.23	2.10	1.95	1.65	1.87	2.12	1.84	R1.80	1.83	1.93	1.61	1.97	1.94	2.00	R2.12	2.16
Total	**1.81**	**2.47**	**3.42**	**6.06**	**6.91**	**5.07**	**8.02**	**7.63**	**7.89**	**8.62**	**9.00**	**R8.83**	**9.48**	**10.16**	**10.71**	**R10.85**	**11.09**
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**	**R0.94**	**0.94**	**1.04**
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	R9.91	10.05
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	R17.72	18.31	18.62	18.92	R19.52	19.70
By the transportation sector	5.14	6.04	7.78	8.95	9.55	9.85	10.97	10.80	10.95	11.18	11.49	11.73	11.96	R12.13	R12.48	R12.89	12.99
Transportation petroleum use as % of domestic petroleum production	64.6	67.0	68.8	89.1	93.5	92.6	122.0	117.8	121.7	126.5	R133.0	135.9	R138.9	R140.9	R148.7	R158.9	159.8
Transportation petroleum use as % of domestic petroleum consumption	52.4	52.5	52.9	54.8	56.0	62.6	64.6	64.6	64.3	64.8	64.8	R66.2	65.3	R65.1	R66.0	R66.0	65.9
World petroleum consumption	21.34	31.14	46.81	56.20	63.07	60.10	R65.97	R66.56	R66.76	R67.00	R68.29	R69.88	R71.41	R73.06	R73.64	R74.91	75.54
U.S. petroleum consumption as % of world petroleum consumption	45.9	37.0	31.4	29.0	R27.1	26.2	25.8	25.1	25.5	25.7	25.9	R25.4	25.6	25.5	25.7	R26.1	26.1

KEY: P = preliminary; R = revised.

[a] Includes lease condensate.
[b] Includes crude oil, natural gas plant liquids, and other liquids.
[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:
1960-2000: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000,* DOE/EIA-0384(2000) (Washington, DC: August 2001), tables 5.1 and 5.12c.
World petroleum consumption:
1960-99: Ibid., *Annual Energy Review 2000,* DOE/EIA-0384(2000) (Washington, DC: August 2001), table 11.9.
2000: Ibid., International Energy Database, available at http://www.eia.doe.gov/emeu/international as of Oct. 24, 2001.

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	R1999	2000
Energy consumption																	
Transportation	10.56	12.40	16.06	18.21	19.66	20.02	22.49	22.08	22.42	22.84	23.47	23.92	24.47	24.77	R25.34	26.26	27.04
% of total	24.1	23.5	24.2	R25.3	R25.1	R26.1	R26.7	R26.2	R26.2	R26.2	R26.3	R26.3	R26.0	R26.3	R26.8	27.1	27.3
Industrial	16.26	19.24	21.92	R21.42	R22.64	R19.51	R21.11	R20.75	R21.68	R21.93	R22.64	R22.96	R23.72	R23.89	R23.55	24.05	24.46
% of total	37.1	36.5	33.0	R29.7	R28.9	R25.4	R25.0	R24.6	R25.4	R25.1	R25.4	R25.2	R25.2	R25.3	R24.9	24.8	24.7
Residential and commercial	8.75	10.00	12.14	R12.03	R11.60	R10.70	R10.24	R10.52	R10.75	R10.98	R10.86	R11.02	R11.73	R11.29	R10.38	10.78	11.40
% of total	20.0	19.0	18.3	R16.7	R14.8	R13.9	R12.1	R12.5	R12.6	R12.6	R12.2	R12.1	R12.5	R12.0	R11.0	11.1	11.5
Energy Input at electric utilities	8.19	11.01	16.27	R20.38	R24.54	R26.55	R30.50	R30.94	R30.66	R31.55	R32.25	R33.03	R34.01	R34.39	R35.35	35.77	36.19
% of total	18.7	20.9	24.5	R28.3	R31.3	R34.6	R36.2	R36.7	R35.9	R36.1	R36.1	R36.3	R36.2	R36.5	R37.4	36.9	36.5
Total	**43.80**	**52.68**	**66.43**	**R72.04**	**R78.44**	**R76.78**	**R84.34**	**R84.30**	**R85.51**	**R87.30**	**R89.21**	**R90.94**	**R93.93**	**R94.34**	**R94.61**	**96.85**	**99.08**
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	96.9	97.4	97.1	97.1
Industrial	35.4	35.3	35.5	R38.0	R42.1	R40.0	R39.4	R38.8	R39.8	R38.5	R39.1	R37.5	R38.2	R38.9	R38.7	39.1	37.4
Residential and commercial	39.8	38.6	35.4	R31.6	R26.2	R23.6	R21.2	R20.5	R19.8	R19.5	R19.3	R18.8	R19.1	R19.2	R19.2	19.7	19.4
Electric utilities	6.7	6.7	13.0	R15.5	10.7	4.1	R4.1	R3.8	R3.1	R3.3	R3.0	R2.0	R2.1	R2.4	R3.3	2.6	2.2

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.

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.

1975-2000: Ibid., *Monthly Energy Review*, DOE/EIA-0035(2001/07) (Washington, DC: July 2001), tables 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6.

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
Transportation	10.13	11.87	15.31	17.61	19.01	19.50	21.81	21.46	21.81	22.20	22.76	23.20	23.74	R23.99	R24.68	R25.49	26.25
Industrial	5.75	6.79	7.79	8.15	9.53	7.81	8.32	8.06	8.64	8.45	8.85	8.62	R9.06	R9.29	R9.10	R9.40	9.16
Residential and commercial	3.49	3.87	4.31	3.81	3.04	2.52	2.17	2.15	2.13	2.14	2.09	2.08	R2.24	R2.16	R1.99	R2.13	2.22
Electric utilities	0.55	0.73	2.12	3.17	2.63	1.09	1.25	1.18	0.95	1.05	0.97	0.66	0.73	0.82	1.17	0.94	0.78
Total petroleum demand	**19.92**	**23.26**	**29.53**	**32.73**	**34.20**	**30.92**	**33.55**	**32.85**	**33.53**	**33.84**	**34.67**	**34.55**	**35.76**	**36.27**	**36.93**	**R37.96**	**38.40**
Transportation as % of total	50.9	51.0	51.8	53.8	55.6	63.1	65.0	65.3	65.0	65.6	65.7	67.1	66.4	R66.1	R66.8	R67.2	68.4

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.

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.
1975-00: Ibid., *Monthly Energy Review,* Internet site www.eia.doe.gov/gov/pub/energy.overview/monthly.energy/ as of Aug. 9, 2001, tables, 1.4, 2.2, 2.3, 2.4, 2.5, and 2.6.

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	P2000
Energy consumption (all sectors)R	**45.12**	**54.02**	**67.86**	**72.04**	**78.44**	**76.78**	**84.34**	**84.30**	**85.51**	**87.30**	**89.21**	**90.94**	**93.93**	**94.34**	**94.61**	**96.85**	**98.50**
Total transportation consumption[a]	10.60	12.43	R16.10	18.24	19.70	20.07	22.54	22.13	22.47	22.90	23.52	R23.98	24.52	24.82	R25.39	R26.31	26.64
% of total energy consumptionR	23.5	23.0	23.7	25.3	25.1	26.1	26.7	26.3	26.3	26.2	26.4	26.4	26.1	26.3	26.8	27.2	27.0
Total primary consumption[b]	10.56	12.40	16.06	18.21	19.66	20.02	22.49	22.08	22.42	22.84	23.47	23.92	24.47	24.77	R25.34	R26.26	26.58
Coal	0.074	0.017	0.007	0.001	e	e	e	e	e	e	e	e	e	e	e	e	e
Million short tons	3.0	0.7	0.3	<0.05	e	e	e	e	e	e	e	e	e	e	e	e	e
Natural gas[c]	0.36	0.52	R0.75	0.60	0.65	0.52	0.68	0.62	0.61	0.64	0.71	0.72	0.73	0.78	0.66	R0.76	0.77
Trillion cubic feet	0.35	0.50	0.72	0.58	R0.64	0.50	0.66	0.60	0.59	0.62	0.69	0.70	0.71	R0.75	0.64	R0.74	0.75
Petroleum products[d]	10.13	11.87	15.31	17.61	19.01	R19.51	21.81	21.46	21.81	22.20	22.76	23.20	23.74	R23.99	R24.68	R25.49	25.81
Million barrels	1,881	2,205	2,840	3,267	3,495	3,595	4,004	3,942	4,008	4,081	4,194	4,281	4,377	4,431	E4,552	E4,654	E4754
Electricity	R0.010	0.010	R0.011	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
Electrical system energy losses[f]	R0.026	R0.024	R0.026	R0.025	0.027	0.033	R0.035	0.035	R0.033	R0.034	R0.035	R0.034	R0.034	R0.034	R0.034	R,g0.040	0.041

KEY: Btu = British thermal unit; E = estimated; R = revised; P = preliminary.

[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] From 1980, small amounts of coal consumed for transportation are included in industrial sector consumption.
[f] Incurred in the generation, transmission, and distribution of electricity plus plant use and unaccounted for electrical system energy losses.
[g] There is a discontinuity in this time series between 1998 and 1999; beginning in 1999, nonutility consumption of fossil fuels is included in electric power sector consumption and the calculation of electrical system energy losses.

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:
1960-2000: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000,* DOE/EIA-0384 (2000), (Washington DC: August 2001) table 2.1a, Internet site http://www.eia.doe.gov/aer/contents.html as of October 2001.
Coal:
Btu: Ibid., table 2.1e.
Short tons: Ibid., table 7.3.
Natural gas:
Btu: Ibid., table 2.1e.
Cubic feet: Ibid., table 6.5.
Petroleum products:
Btu: Ibid., table 2.1e.
Barrels: Ibid., table 5.12c. (barrels/day x 365 or 366 for leap years).
Electricity and electrical system energy losses:
Ibid., table 2.1e.

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
Air																	
Certificated carriers [a]																	
Jet fuel (million gallons)	1,954	3,889	7,857	7,558	[R]8,519	[R]10,115	12,429	11,506	11,763	11,959	12,476	12,812	[R]13,187	13,660	13,877	14,402	14,845
General aviation [b]																	
Aviation gasoline (million gallons)	242	292	551	412	520	421	353	354	314	268	[R]266	[R]287	[R]289	[R]292	311	345	337
Jet fuel (million gallons)	N	56	208	453	766	691	663	577	494	454	[R]464	[R]560	[R]608	642	815	967	998
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	[R]71,901	73,495	73,125
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	[R]50,462	52,859	52,832
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	[R]6,817	9,372	9,548
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	[R]25,158	24,537	25,645
Bus	827	875	820	1,053	1,018	834	895	864	878	929	964	968	990	1,027	[R]1040	1,148	1,110
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	[R]5,073	[P]5,237	U
Motor fuel (million gallons)																	
Diesel	208	248	271	365	431	609	651	665	685	679	678	678	693	717	[R]740	[P]763	U
Gasoline and other nondiesel fuels [d]	192	124	68	8	11	46	34	34	37	46	60	61	61	59	[R]53	[P]49	U
Compressed natural gas	N	N	N	N	N	N	N	N	1	2	5	11	15	24	[R]37	[P]44	U
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
Amtrak																	
Electricity (million kWh)	N	N	N	180	254	295	330	303	300	301	309	304	293	282	275	283	350
Distillate/diesel fuel (million gallons)	N	N	N	63	64	65	82	82	82	83	75	66	71	75	75	74	76
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
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
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
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	644,444

KEY: kWh = kilowatt-hour; N = data do not exist; P = preliminary; R = revised.

[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:
1960-2000: 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 Sept. 10, 2001.

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: Ibid., *FAA Aerospace Forecasts Fiscal Years 2000-2011* (Washington, DC: March 2000), table 29.

1995-2000: Ibid., *FAA Aerospace Forecasts Fiscal Years 2002-2013* (Washington, DC: March 2002), table 30.

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 Aug. 2001).

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity/motor fuel/compressed natural gas:

1960-99: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 65, 66, 67, and similar tables in earlier editions.

Rail:

1960-2000: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2000), p. 40.

Amtrak:

1975-2000: Amtrak, State and Local Affairs 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.

1985-2000: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 1 and 2, and similar tables in earlier editions.

Gasoline:

1970-2000: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-2000: U.S. Department of Energy, *Natural Gas Annual 2000,* DOE/EIA-0131(00) (Washington, DC: November 2001), table 95.

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
Air																	
Certificated carriers[a]																	
Jet fuel	264	525	1,061	1,020	1,150	1,366	1,678	1,553	1,588	1,614	1,684	1,730	1,780	1844	1,873	1,944	2,004
General aviation[b]																	
Aviation gasoline	29	35	66	50	63	51	42	43	38	32	32	35	35	35	37	42	40
Jet fuel	N	8	28	61	103	93	90	78	67	61	63	76	82	87	110	131	135
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	R8,988	9,187	9,141
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	R6,308	6,607	6,604
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	R946	1,300	1,324
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	R3,489	3,403	3,557
Bus	115	121	114	146	141	116	124	120	122	129	134	134	137	142	R144	159	154
Transit[c]																	
Electricity	10	9	9	9	8	14	17	17	16	17	17	17	17	17	R17	P18	U
Motor fuel																	
Diesel	29	34	38	51	60	84	90	92	95	94	94	94	96	99	R103	P106	U
Gasoline and other nondiesel fuels[d]	24	16	9	1	1	6	4	4	5	6	8	8	8	7	R7	P6	U
Compressed natural gas	N	N	N	N	N	N	N	N	<1	<1	1	1	2	3	R5	P6	U
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
Amtrak																	
Electricity	N	N	N	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	U
Water																	
Residual fuel oil	592	463	565	608	1,340	687	947	1,014	R983	791	806	881	853	750	841	874	960
Distillate/diesel fuel oil	109	90	114	152	205	236	286	284	308	299	304	324	R345	357	360	336	314
Gasoline	N	N	75	91	132	132	163	214	165	109	R109	133	124	123	120	137	141
Pipeline																	
Natural gas	358	516	745	601	654	519	680	620	606	644	707	722	734	775	655	665	664

KEY: Btu = British thermal unit; kWh = kilowatt-hour; N = data do not exist; P = preliminary; R = revised; U = 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 systems.
[d] Gasoline and all other nondiesel fuels such as liquified 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/gal.
Aviation gasoline = 120,200 Btu/gal.
Automotive gasoline = 125,000 Btu/gal.
Diesel motor fuel = 138,700 Btu/gal.
Compressed natural gas = 138,700 Btu/gal.
Distillate fuel = 138,700 Btu/gal.
Residual fuel = 149,700 Btu/gal.
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:
1960-2000: 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 Sept. 13, 2001.

General aviation:
1960-80: U.S. Department of Transportation, Federal Aviation Administration, Office of Aviation Policy, Plans, and Management Analysis, *FAA Statistical Handbook of Aviation* (Washington, DC: Annual issues).
1985-93: Ibid., *General Aviation and Avionics Survey* (Washington, DC: Annual issues), table 5.1 and similar tables in earlier editions.
1994: Ibid., *FAA Aerospace Forecasts Fiscal Years 2000-2011* (Washington, DC: March 2000), table 29.
1995-2000: Ibid., *FAA Aerospace Forecasts Fiscal Years 2002-2013* (Washington, DC: March 2002), table 30.

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 Aug. 2, 2001).
1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity/motor fuel/compressed natural gas:
1960-99: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 65, 66, 67, and similar tables in earlier editions.

Rail:
1960-99: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2000), p. 40.
2000: Ibid., *Railroad Facts,* (Draft), personal communication.

Amtrak:
1975-99: Amtrak, State and Local Affairs 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.
1985-2000: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2 and 4, and similar tables in earlier editions.

Gasoline:
1970-2000: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:
1960-98: U.S. Department of Energy, *Natural Gas Annual 1999,* DOE/EIA-0131(99) (Washington, DC: October 2000), table 94.
1999-2000: Ibid., *Natural Gas Annual 2000,* DOE/EIA-0131(00) (Washington DC: November 2001), table 95.

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
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**
Nonhighway																	
Agriculture	2,292	1,963	1,932	1,565	1,059	1,081	681	779	806	846	912	927	918	984	907	703	652
Aviation[a]	1,324	501	393	410	413	382	361	339	344	340	364	367	344	335	351	322	296
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
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
Total nonhighway	**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**
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**

[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.

1996-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-21.

Nonhighway: 1960-2000: 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
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**	**U**
Average miles flown per aircraft (thousands)	**487**	**667**	**949**	**932**	**768**	**740**	**776**	**770**	**669**	**701**	**727**	**759**	**783**	**[R]795**	**[R]768**	**[R]788**	**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	[R]4,938	[R]5,039	[R]5,279	5,610
International operations	182	284	475	377	401	415	760	807	904	961	980	998	1,043	[R]1,113	[R]1,188	[R]1,207	1,257
Fuel consumption (million gallons)																	
Domestic operations	1,954	3,889	7,857	7,558	9,096	10,115	12,429	11,506	11,763	11,959	12,476	12,812	13,187	13,660	13,877	[R]14,402	14,845
International operations	566	1,280	2,243	1,949	1,938	2,488	3,963	3,940	4,120	4,113	4,311	4,511	4,658	4,964	5,186	[R]5,250	5,475
Aircraft-miles flown per gallon																	
Domestic operations	0.44	0.29	0.26	0.26	0.28	0.30	0.32	0.33	0.34	0.35	0.35	0.36	0.36	0.36	0.36	[R]0.37	0.38
International operations	0.32	0.22	0.21	0.19	0.21	0.17	0.19	0.20	0.22	0.23	0.23	0.22	0.22	0.22	0.23	0.23	0.23

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.

1998-99: 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.

1985-96: 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.

1997-2000: Ibid., Internet site http://www.bts.gov/programs/oai as of Aug.10, 2001.

Fuel consumption:

1960-2000: 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 Aug. 10, 2001.

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
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
Vehicle-miles traveled (millions)	[R]718,762	[R]887,812	[R]1,109,724	[R]1,327,664	[R]1,527,295	[R]1,774,826	[R]2,144,362	[R]2,172,050	[R]2,247,151	[R]2,296,378	[R]2,357,588	[R]2,422,696	[R]2,485,848	2,561,695	[R]2,631,522	2,691,056	2,749,803
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	[R]155,379	161,411	162,260
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
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	[R]16.9	16.7	16.9
Average fuel consumed per vehicle (gallons)	784	787	830	790	712	685	677	669	683	693	698	700	700	711	[R]721	732	719

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.
1995-2000: 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[R]	2001[PP]
TOTAL fuel consumption[d]	**134,231,000**	**135,913,000**	**140,719,000**	**144,775,000**	**148,180,000**	**151,597,859**	**156,839,186**	**[R]161,247,140**	**161,784,100**	**164,231,341**
Alternative fuels										
Liquefied petroleum gases	208,142	264,655	248,467	232,701	239,158	238,356	241,583	[R]242,141	242,695	243,196
Compressed natural gas	16,823	21,603	24,160	35,162	46,923	65,192	73,251	[R]86,286	97,568	107,476
Liquefied natural gas	585	1,901	2,345	2,759	3,247	3,714	5,343	[R]5,828	6,847	7,566
Methanol, 85%[a]	1,069	1,593	2,340	2,023	1,775	1,554	1,212	[R]1,073	996	918
Methanol, neat	2,547	3,166	3,190	2,150	347	347	449	[R]447	437	406
Ethanol, 85%[a]	21	48	80	190	694	1,280	1,727	[R]2,075	3,344	4,575
Ethanol, 95%[a]	85	80	140	995	2,699	1,136	59	59	54	51
Electricity	359	288	430	663	773	1,010	1,202	[R]1,431	1,819	2,143
Total	**229,631**	**293,334**	**281,152**	**276,643**	**295,616**	**312, 589**	**324,826**	**[R]339,340**	**353,760**	**366,331**
Oxygenates										
Methyl-tertiary-butyl-ether[b]	1,175,000	2,069,200	2,018,800	2,691,200	2,749,700	3,104,200	2,915,600	[R]3,331,000	3,104,200	2,937,500
Ethanol in gasohol	701,000	760,000	845,900	910,700	660,200	830,700	916,000	[R]956,900	1,011,800	1,066,000
Traditional fuels										
Gasoline[c]	110,135,000	111,323,000	113,144,000	115,943,000	117,783,000	119,336,000	122,849,000	[R]125,111,000	124,651,000	126,284,000
Diesel	23,866,000	24,296,630	27,293,370	28,555,040	30,101,430	31,949,270	33,665,360	[R]35,796,800	36,779,340	37,581,010
Total	**134,001,000**	**135,620,000**	**140,437,000**	**144,498,000**	**147,884,000**	**151,285,270**	**156,514,360**	**[R]160,907,800**	**161,430,340**	**163,865,010**

KEY: PP = based on plans or projections; R = revised.

[a] The remaining portion of 85% methanol, 85% ethanol, and 95% ethanol fuels is gasoline. Consumption data include the gasoline portion of the fuel.

[b] Includes a very small amount of other ethers, primarily tertiary-amyl-methyl-ether and ethyl-tertiary-butyl-ether.

[c] Gasoline consumption includes ethanol in gasohol and methyl-tertiary-butyl-ether.

[d] Total fuel consumption is the sum of alternative fuels, gasoline and diesel. Oxygenate consumption is included in gasoline consumption.

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

SOURCE: U.S. Department of Energy, Energy Information Administration, available at www.eia.doe.gov as of Sept. 27, 2001.

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
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
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
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	1,470,000	1,502,556	[R]1,549,577	1,569,100	1,601,914
Motorcycles	[a]	[a]	3,000	5,600	10,200	9,100	9,600	9,200	9,600	9,900	10,200	9,800	9,900	10,081	[R]10,283	10,584	10,479
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	[R]71,695	73,283	72,916
Motorcycles	[a]	[a]	60	113	204	182	191	184	191	198	205	196	198	202	[R]206	212	210
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	11.7	11.8	12.0
Motorcycles	[a]	[a]	1.1	1.1	1.8	1.7	2.2	2.2	2.4	2.5	2.7	2.5	2.6	2.6	2.6	2.5	2.4
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	[R]21.6	21.4	22
Motorcycles	[a]	[a]	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Average fuel consumed per vehicle (gallons)																	
Passenger cars	668	661	760	695	576	559	520	501	517	527	531	530	534	539	[R]544	553	546
Motorcycles	[a]	[a]	21	23	36	33	45	44	47	50	55	50	51	53	53	51	48

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.
1995-2000: 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.
1995-2000: 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.
1995-2000: 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.
1990-2000: 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[R]	1999	2000
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
Vehicle-miles traveled (millions)	123,000	201,000	291,000	391,000	575,000	649,000	707,000	746,000	765,000	790,000	817,000	850,000	868,275	901,022	924,018
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	49,370	50,462	52,859	52,832
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
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	17.5
Average fuel consumed per vehicle (gallons)	866	934	854	735	738	721	717	714	701	694	685	703	707	701	668

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.
1995-2000: 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	R1998	1999	2000
Number registered (thousands)	3,681	4,232	4,374	4,593	4,487	4,481	4,370	4,408	4,906	5,024	R5,266	5,293	5,735	5,763	5,926
Vehicle-miles (millions)	27,100	34,600	39,800	45,400	51,900	52,900	53,900	56,800	61,300	62,705	R64,072	66,893	68,021	70,304	70,583
Fuel consumed (million gallons)	3,968	5,420	6,923	7,399	8,357	8,172	8,237	8,488	9,032	9,216	R9,408	9,576	6,817	9,372	9,548
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
Average miles traveled per gallon	6.8	6.4	5.8	6.1	6.2	6.5	6.5	6.7	6.8	6.8	6.8	7.0	10.0	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	R1,787	1,809	1,189	1,626	1,611

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 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: 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.
1995-2000: 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	R1998	1999	2000
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
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	118,900	124,584	128,359	132,384	135,208
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	R20,301	25,158	24,537	25,645
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	64.5
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
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	R11,342	12,596	12,096	12,232

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.
1995-2000: 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
Number registered (thousands)	272	314	378	462	529	593	627	631	645	654	670	686	695	698	716	729	746
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	6,600	6,842	[R]7,007	7,662	7,601
Fuel consumed (million gallons)	827	875	820	1,053	1,018	834	895	864	878	929	964	968	990	1,027	[R]1,040	1,148	1,110
Average miles traveled per vehicle (thousands)	16.0	14.9	12.0	13.1	11.5	7.5	9.1	9.1	9.0	9.4	9.6	9.4	9.4	9.8	9.8	10.5	10
Average miles traveled per gallon	5.3	5.3	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	7
Average fuel consumed per vehicle (gallons)	3,039	2,784	2,172	2,279	1,926	1,405	1,428	1,369	1,362	1,420	1,438	1,412	1,425	1,471	[R]1,454	1,576	1,488

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.
1995-2000: 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	R1998	P1999
Number of vehicles	65,292	61,717	61,298	62,183	75,388	94,368	92,961	96,399	102,251	107,316	115,943	115,874	122,362	126,360	123,855	128,516
Vehicle-miles traveled	2,143	2,008	1,883	2,176	2,287	2,791	3,242	3,306	3,355	3,435	3,467	3,550	3,650	3,746	3,794	3,972
Electric power consumed (million kWh hours)	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
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
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
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

KEY: Btu = British thermal unit; kWh = kilowatt hour; N = data do not exist; P = preliminary; R = revised.

[a] Prior to 1985, excludes commuter rail, automated guideway, urban ferryboat, demand responsive vehicles, and most rural and smaller systems.
[b] For 1992-96, 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 contiguous between 1991 and 1992.

NOTES: The heat equivalent factors used in Btu conversions are: diesel = 138,700 Btu/gallon; electric = 3,412 Btu/kWh, negating electrical system loses (to include electrical system loses, multiply this conversion factor by approximately three) gasoline = 125,000 Btu/gallon.
In January 2000, the American Public Transit Association changed its name to the American Public Transportation Association (APTA). *The Transit Fact Book* is now referred to as the *Public Transportation Fact Book*.

SOURCE: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 42, 46, 65, 66, 67, and similar tables in earlier editions of the APTA Transit Fact Book.

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
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
Cars[b]	1,965,486	1,800,962	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
Miles traveled (millions)																
Freight train-miles[c]	404	421	427	403	428	347	380	375	390	405	441	458	469	475	475	490
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
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
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
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
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
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
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
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

KEY: N = data do not exist.

[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, and 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: October 2000), pp. 33, 34, 40, 48, 50.
Locomotive unit-miles:
1975-92: Ibid., *Railroad Ten-Year Trends* (Washington,DC: Annual issues).
1993-99: Ibid., *Analysis of Class I Railroads* (Washington, DC: Annual issues), p. 29.

Table 4-18: Amtrak Fuel Consumption and Travel

	1972	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number in use															
Locomotives	185	355	419	291	318	316	336	360	338	313	299	332	345	329	378
Cars	1,569	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
Miles traveled (millions)															
Train-miles	26	30	30	30	33	34	34	35	34	32	30	32	33	34	35
Car-miles	213	253	235	251	301	313	307	303	304	292	276	288	312	342	368
Locomotive fuel consumed															
Electric (million of kWh hours)	N	180	254	295	330	303	300	301	309	304	293	282	275	283	350
Diesel (million gallons)	N	63	64	65	82	82	82	83	75	66	71	75	75	74	76
Average miles traveled per car	136,000	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

KEY: Btu = British thermal unit; kWh = kilowatt hour; N = data do not exist.

NOTE: The heat equivalent factors used in Btu conversions are: diesel = 138,700 Btu/gallon; electric = 3,412 Btu/kWh, negating electrical system loses (to include electrical system loses, multiply this conversion factor by approximately three).

SOURCES:
Number of locomotives and cars:
1972–80: Amtrak, State and Local Affairs Department, personal communication.
1985–2000: Ibid., *Amtrak Annual Report* , Statistical Appendix (Washington, DC: Annual issues).
Miles traveled
Train-miles:
1972–2000: Amtrak, *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues).
Car-miles:
1972: Ibid., *Train Information System Reports* (Washington, DC).
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.
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								
	Motor gasoline	Distillate and residual fuel oil	Jet fuel and aviation gas	Other[a]	Total	Electricity	Natural gas	Coal and other[b]	Total
1990									
Agriculture	4.6	0.8	0.1	0.2	5.7	2.0	1.7	0.1	9.5
Defense	12.5	218.0	723.9	4.4	958.9	120.6	114.5	47.7	1,241.7
Energy	1.2	2.9	0.4	0.2	4.8	19.1	9.6	10.0	43.5
GSA	0.1	0.7	0.0	0.0	0.8	9.1	2.4	1.9	14.2
Health and Human Services	0.0	2.1	0.0	0.0	2.1	3.4	2.2	0.2	8.0
Interior	2.1	1.2	0.3	1.1	4.6	1.4	1.2	.2.	7.4
Justice	1.8	0.4	0.2	0.0	2.5	1.9	2.2	0.4	7.0
NASA	0.2	0.9	1.5	0.0	2.6	6.6	2.8	0.3	12.3
Postal Service	8.9	4.5	0.0	0.2	13.6	11.8	4.6	0.6	30.6
Transportation	1.8	6.5	5.5	0.1	13.8	3.9	1.1	0.1	19.0
Veterans Affairs	0.4	2.3	0.0	0.0	2.7	7.9	13.0	1.2	24.9
Other[c]	3.5	4.2	1.0	0.0	8.7	8.1	2.4	0.5	19.6
Total	**37.2**	**244.5**	**732.9**	**6.3**	**1,020.9**	**195.8**	**157.8**	**63.1**	**1,437.6**
2000[P]									
Agriculture	3.3	0.2	0.0	0.1	3.6	2.0	1.9	0.3	7.8
Defense	13.5	154.4	439.1	1.6	608.6	103.2	81.7	30.9	824.4
Energy	1.0	1.2	0.2	0.1	2.6	15.9	5.9	4.3	28.7
GSA	0.1	0.1	0.0	0.0	0.2	9.8	6.1	1.5	17.6
Health and Human Services	0.4	0.6	0.0	0.1	1.2	2.9	3.3	0.4	7.8
Interior	2.8	0.9	0.2	1.1	5.0	1.7	1.3	0.1	8.1
Justice	4.8	0.4	1.5	0.0	6.7	4.3	5.3	0.5	16.7
NASA	0.2	0.4	1.1	0.0	1.8	6.0	3.1	0.3	11.1
Postal Service	10.4	5.0	0.0	0.0	15.4	18.6	7.4	0.4	41.9
Transportation	0.8	7.3	4.0	0.1	12.1	8.0	0.9	0.0	21.1
Veterans Affairs	1.2	1.2	0.0	0.0	2.4	9.3	14.2	1.5	27.5
Other[d]	2.4	2.8	0.9	0.0	6.2	10.2	3.9	0.6	20.9
Total	**41.1**	**174.4**	**447.1**	**3.3**	**665.9**	**191.8**	**134.9**	**40.9**	**1,033.5**

KEY: Btu = British thermal unit; GSA = General Services Adminstration; NASA = National Aeronautics and Space Administration; P = preliminary.

[a] Includes liquefied petroleum gases.

[b] Includes purchased steam, coal, and other.

[c] 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.

[d] 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.

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 2000, DOE/EIA-0384(2000)* (Washington, DC: August 2001), table 1.13. Internet site http://www.eia.doe.gov/emeu/aer/ as of Aug. 10, 2001.

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
Air[R]																	
Certificated air 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	[R]4,166	4,123	4,049	3,944
International operations	9,199	10,292	10,986	8,465	[R]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
Highway[b]																	
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	[R]3,688	3,657	[R]3,637	3,672	3,578
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	[R]4,538	[R]4,541	[R]4,564	[R]4,569	4,612	4,495
Motorcycle	[a]	[a]	2,500	2,354	2,125	1,896	1,990	1,917	1,990	2,063	2,135	[R]2,274	[R]2,271	[R]2,273	[R]2,273	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	[R]4,133	[P]4,044	U
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

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

[a] Included in passenger car.
[b] 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.

NOTES: 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, and 138,700 Btu/gallon for transit motor bus and Amtrak.

SOURCES:
Air:
Certificated air carriers:
Passenger-miles:
Air Transport Association, Internet site http://www.air-transport.org/public/industry as of Aug. 22, 2001.
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. 22, 2001.
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: March 2001), tables 30 and 65.
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
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	R4,938	R5,039	R5,279	5,610
International operations	182	284	475	377	401	415	760	807	904	961	980	998	1,043	1,114	R1,188	R1,207	1,257
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	R643,893	R649,426	R685,447	711,670
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	216,913	R224,843	R230,922	242,248
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	R444,794	R470,246	R478,586	506,519
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	160,779	163,656	R172,485	184,163
Fuel consumed (million gallons)																	
Domestic operations	1,954	3,889	7,857	7,558	R8,519	10,115	12,429	11,506	11,763	11,959	12,476	12,812	13,187	13,660	13,877	14,402	14,845
International operations	566	1,280	2,243	1,949	R1,747	2,488	3,963	3,940	4,120	4,113	4,311	4,511	4,658	4,964	5,186	5,250	5,475
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	R130.4	R128.9	R129.8	126.9
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	194.7	R189.3	R191.3	192.8
Seat-miles per gallon																	
Domestic operations	27	24	27	32	R41	44	45	47	47	48	47	47	48	47	47	48	48
International operations	24	23	23	32	R50	41	43	44	47	49	46	45	45	44	43	44	44
Energy intensity (Btu/passenger-mile)[b]																	
Domestic operations	8,633	10,118	10,185	7,746	R5,742	5,047	4,932	4,671	4,564	4,558	4,444	4,382	4,183	4,146	R3,984	R4,063	3,956
International operations	9,199	10,292	10,986	8,465	R4,339	5,103	4,546	4,610	4,258	4,099	4,161	4,173	4,108	4,168	4,278	R4,109	4,013
Load factor (%)																	
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	R72.4	69.8	71.2
International operations	62.2	56.8	53.0	54.4	62.8	64.6	69.1	67.3	67.1	67.6	70.6	71.8	73.3	74.1	72.8	R74.7	76.0

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 5, 2000.

1985-2000: 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 July 25, 2001.

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
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	[R]1,550,000	1,569,000	1,602,000
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	[R]868,000	901,000	924,000
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	[R]10,300	10,600	10,500
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	[R]2,464,000	2,495,000	2,547,000
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	[R]1,381,000	1,433,000	1,469,000
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	12,000
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	[R]71,695	73,283	72,916
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	[R]50,462	52,859	52,832
Motorcycle	[b]	[b]	60	113	204	182	191	184	191	198	205	196	198	202	[R]206	212	210
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	[R]3,637	3,671	3,579
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	[R]4,568	4,611	4,496
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	[R]2,341	2,205	2,188

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. Average vehicle occupancy rates are as follows:
passenger car (1960-97): 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;
other 2-axle 4-tire vehicle (1960-97): 1.87, 1.85, 1.83, 1.81, 1.79, 1.76, 1.74, 1.72, 1.70, 1.68, 1.66, 1.64, 1.64, 1.64;
motorcycle (1960-97): 1.1, 1.1, 1.1, 1.1, 1.2, 1.3, 1.3, 1.27, 1.25, 1.23, 1.21, 1.18, 1.18, 1.18.

[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.
Data for vehicle-miles and passenger-miles have been rounded to the nearest billion miles to accommodate the uncertainties associated with these estimates.

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.
1995-2000: 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.
1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:
1970-85: 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.
1990-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Passenger-miles:
1960-97: Vehicle-miles multiplied by vehicle occupancy rates.
1998-2000: 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.
1995-2000: 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
Average U.S. passenger car fuel efficiency (mpg) (calendar year)													
Passenger car[a]	[R]16.0	[R]17.5	[R]20.3	[R]21.2	21.0	[R]20.6	[R]20.8	21.1	21.2	21.5	21.6	21.4	U
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	17.1	U
New vehicle fuel efficiency (mpg)[b] (model year)													
Light-duty vehicle (passenger cars plus light trucks)													
Domestic	21.4	24.0	23.9	24.4	[R]23.8	[R]24.2	[R]23.5	23.8	24.1	23.3	23.3	[d]N	[d]N
Imported	28.6	30.3	28.5	28.4	27.9	28.1	[R]27.8	27.9	27.7	27.5	27.6	[d]N	[d]N
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
Domestic	22.6	26.3	26.9	27.3	27.0	27.8	27.5	27.7	[R]28.1	27.8	[R]28.6	[R]28.0	28.5
Imported	29.6	31.5	29.9	30.1	29.2	29.6	[R]29.7	30.3	[R]29.6	30.1	[R]29.2	[R]29.0	28.3
Light truck (<8,500 lbs GVWR)	18.5	20.7	20.8	21.3	20.8	21.0	20.8	20.5	20.8	20.6	21.1	20.9	21.2
Domestic	16.8	19.6	20.3	20.9	20.5	20.7	20.5	20.3	20.5	20.2	20.5	[d]N	[d]N
Imported	24.3	26.5	23.0	23.0	22.7	22.8	[R]22.0	21.5	22.2	22.1	22.9	[d]N	[d]N
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
Light truck	[c]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

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 harmonic average.

[c] 2 Wheel Drive/4 Wheel Drive. No combined figure available for this year.

[d] Beginning with MY 1999, the total light truck fleet ceased to be categorized by either domestic or import fleets.

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).

1995-99: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

New vehicle fuel efficiency (based on model year production):

1980-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2000,* table II-6, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of Aug. 9, 2001.

CAFE standards:

1980-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2000,* table I-1, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of Aug. 9, 2001.

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
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	2,165	2,307	2,291	2,276
Passenger-miles (millions)	N	N	N	N	21,800	21,200	21,000	21,100	20,300	20,200	18,800	18,800	19,100	20,400	20,603	21,205
Fuel consumed (million gallons diesel)	208	248	271	365	431	518	563	573	592	576	565	564	R578	597	R607	618
Energy intensity (Btu/passenger-mile)	N	N	N	N	2,742	3,389	3,718	3,767	4,045	R3,955	R4,168	4,161	R4,197	4,059	R4,086	4,042

KEY: Btu = British thermal unit; N = data do not exist; R = revised.

NOTES: Heat equivalent factor used for Btu conversion is 138,700 Btu/gallon.
In January 2000, the American Public Transit Association changed its name to the American Public Transportation Association. The *Transit Fact Book* is now refered to as the *Public Transportation Fact Book*.

SOURCE: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 65 and 79, and similar tables in earlier editions of the *Transit Fact Book*.

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
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
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
Tons per car load	44	49	55	61	67	68	67	66	66	64	63	65	67	63	64	63	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
Energy intensity (Btu/revenue freight ton-mile)	839	714	643	672	589	492	418	388	391	386	385	370	366	368	361	359	350
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

KEY: Btu = British thermal unit.

[a] Class I railroads are those that have operating revenues of $255 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 2001), 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
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
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
Electric (millions of kWh)[a]	180	254	295	330	303	300	301	309	304	293	282	275	283	350
Diesel (million gallons)	63	64	65	82	82	82	83	75	66	71	75	75	74	76
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

KEY: Btu = British thermal unit; kWh = kilowatt hour.

[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%.

NOTE: The heat equivalent factors used in Btu conversion are: diesel = 138,700 Btus/gallon; electric = 3,412 Btu/kWh.

SOURCES:
Revenue passenger-miles:
Amtrak, *Amtrak Annual Report,* Statistical Appendix (Washington, DC: Annual issues).
Locomotive fuel consumed:
1975-2000: Ibid., State and Local Affairs Department, personal communication.

Table 4-27: Annual Wasted Fuel Due to Congestion

Population Group	Urban area	Gallons wasted (millions) 1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	% change Short-term 1995-1999 %	Rank	Long-term 1982-1999 %	Rank
Med	Albany-Schenectady-Troy, NY	R1	2	4	4	4	4	4	4	5	5	6	7	75	7	600	26
Med	Albuquerque, NM	2	5	9	9	11	14	18	R20	R24	R27	26	28	40	28	1300	6
Lrg	Atlanta, GA	R28	50	R81	75	R91	117	162	R167	R191	R222	231	239	43	26	754	17
Med	Austin, TX	R6	11	R17	18	20	24	26	R31	R34	R43	44	46	48	21	667	21
Sml	Bakersfield, CA	0	0	2	2	2	2	2	2	3	3	4	3	50	18	NM	61
Lrg	Baltimore, MD	R20	38	R81	80	R80	82	89	R99	R98	R101	101	103	4	56	415	35
Sml	Beaumont, TX	0	1	R1	1	R2	1	1	2	2	2	2	2	0	58	NM	61
Vlg	Boston, MA	R52	82	R129	128	R134	149	154	R167	R170	R176	185	189	13	50	263	45
Sml	Boulder, CO	0	0	0	0	0	0	0	0	0	0	0	0	NM	66	NM	61
Sml	Brownsville, TX	0	0	0	0	0	0	0	0	0	0	0	0	NM	66	NM	61
Lrg	Buffalo-Niagara Falls, NY	3	4	7	7	7	8	8	8	8	R8	9	13	63	13	333	41
Med	Charlotte, NC	R3	7	R16	18	R17	16	17	R19	R23	R29	31	32	68	10	967	10
Vlg	Chicago, IL-Northwestern, IN	R119	175	R267	279	R286	302	298	R323	R357	R367	403	403	25	40	239	50
Lrg	Cincinnati, OH-KY	R7	12	R28	30	R35	40	47	R47	R52	R59	63	68	45	24	871	13
Lrg	Cleveland, OH	4	5	R18	20	23	29	34	R43	R49	R54	54	60	40	28	1400	3
Sml	Colorado Springs, CO	0	2	2	2	R3	4	5	R6	7	R8	11	13	117	2	NM	61
Lrg	Columbus, OH	4	5	R20	22	R26	27	31	R34	R37	R44	45	47	38	30	1075	8
Sml	Corpus Christi, TX	2	2	2	3	R3	2	2	R3	3	3	3	3	0	58	50	60
Lrg	Dallas, TX	R23	52	R74	81	R84	96	103	R112	R115	R138	149	168	50	18	630	24
Lrg	Denver, CO	R26	37	R48	51	R61	70	74	R90	R95	R105	115	124	38	30	377	39
Vlg	Detroit, MI	R69	79	R191	196	R222	236	221	R221	R241	R245	242	248	12	51	259	46
Med	El Paso, TX-NM	2	2	R5	7	R8	9	10	R9	7	9	11	14	56	15	600	26
Sml	Eugene-Springfield, OR	0	0	0	0	0	2	0	1	2	2	2	3	200	64	NM	61
Lrg	Fort Lauderdale - Hollywood - Pompano Beach, FL	R11	13	R25	30	R40	44	40	R43	R48	R54	56	65	51	17	491	32
Lrg	Fort Worth, TX	R8	17	R27	25	R27	30	35	R37	R41	R47	57	70	89	4	775	15
Med	Fresno, CA	2	3	9	9	R9	7	7	8	R9	R11	12	14	75	7	600	26
Med	Hartford-Middletown, CT	R6	11	R16	16	R16	12	11	R13	R14	R17	17	19	46	22	217	52
Med	Honolulu, HI	R6	8	R18	18	R20	20	21	R21	R20	R21	21	21	0	58	250	49
Vlg	Houston, TX	R101	142	R144	128	R126	147	147	R146	R174	R202	236	239	64	12	137	56
Lrg	Indianapolis, IN	R4	5	14	17	R23	37	49	R65	R67	R71	59	58	-11	65	1350	4

continued

Table 4-27 ***continued***

Population Group	Urban area	Gallons wasted (millions) 1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	% change Short-term 1995-1999 %	Rank	Long-term 1982-1999 %	Rank
Med	Jacksonville, FL	[R]5	7	[R]22	23	[R]29	30	33	[R]40	[R]38	[R]37	37	39	-3	62	680	20
Lrg	Kansas City, MO-KS	[R]3	5	[R]12	11	[R]15	23	27	[R]29	[R]34	[R]41	41	51	76	6	1600	1
Sml	Laredo, TX	0	0	0	0	0	0	0	0	0	0	2	2	NM	66	NM	61
Lrg	Las Vegas, NV	3	6	[R]23	24	[R]21	22	28	[R]31	[R]34	[R]34	36	39	26	38	1200	7
Vlg	Los Angeles, CA	[R]473	591	[R]1,004	1,008	[R]1,013	966	949	[R]1,001	[R]1,025	[R]1,010	1,038	1,064	6	55	125	58
Med	Louisville, KY-IN	[R]9	10	12	15	22	30	33	32	[R]37	[R]40	45	48	50	18	433	34
Med	Memphis, TN-AR-MS	[R]2	4	[R]13	14	[R]18	19	26	[R]31	[R]33	[R]36	34	32	3	57	1500	2
Lrg	Miami-Hialeah, FL	[R]41	52	102	101	[R]111	115	118	[R]116	[R]114	[R]122	126	128	10	54	212	53
Lrg	Milwaukee, WI	[R]8	13	22	24	[R]27	33	32	[R]34	[R]37	38	39	43	26	38	438	33
Lrg	Minneapolis-St. Paul, MN	[R]10	20	[R]49	50	[R]58	71	88	[R]98	[R]98	[R]120	130	141	44	25	1310	5
Med	Nashville, TN	[R]10	10	[R]17	15	15	17	23	27	[R]27	[R]34	34	41	52	16	310	42
Lrg	New Orleans, LA	[R]17	25	[R]25	28	[R]26	26	29	[R]30	[R]28	[R]28	29	29	-3	62	71	59
Vlg	New York, NY-Northeastern, NJ	[R]180	239	[R]527	512	[R]511	540	602	[R]664	[R]729	802	819	860	30	36	378	38
Lrg	Norfolk, VA	[R]11	22	[R]28	24	[R]23	23	26	[R]30	[R]36	[R]39	38	39	30	36	255	48
Lrg	Oklahoma City, OK	[R]3	5	[R]8	8	[R]10	10	10	15	20	22	24	28	87	5	833	14
Med	Omaha, NE-IA	[R]2	4	[R]7	8	[R]10	10	12	[R]12	[R]14	[R]14	16	17	42	27	750	18
Lrg	Orlando, FL	[R]9	18	[R]31	39	[R]43	47	45	[R]51	[R]57	[R]63	67	68	33	33	656	22
Vlg	Philadelphia, PA-NJ	[R]49	63	[R]100	118	[R]117	122	133	[R]133	[R]149	[R]161	175	175	32	35	257	47
Lrg	Phoenix, AZ	25	32	[R]64	69	[R]73	77	77	[R]82	[R]102	[R]104	110	120	46	22	380	37
Lrg	Pittsburgh, PA	[R]16	18	28	28	[R]26	27	28	[R]31	[R]31	[R]32	35	37	19	44	131	57
Lrg	Portland-Vancouver, OR-WA	[R]7	12	[R]33	35	[R]44	58	58	[R]63	[R]72	[R]72	74	79	25	40	1029	9
Med	Providence-Pawtucket, RI-MA	4	9	[R]22	20	[R]19	21	23	[R]25	[R]29	[R]29	36	40	60	14	900	12
Med	Rochester, NY	1	2	4	5	6	6	6	[R]7	[R]7	9	7	8	14	47	700	19
Lrg	Sacramento, CA	[R]12	19	[R]52	54	[R]51	55	59	[R]59	[R]70	[R]66	67	72	22	43	500	31
Sml	Salem, OR	0	0	2	2	2	2	2	[R]3	[R]3	3	4	4	33	33	NM	61
Med	Salt Lake City, UT	[R]3	5	[R]11	14	[R]16	20	24	[R]27	[R]29	[R]28	25	26	-4	64	767	16
Lrg	San Antonio, TX	[R]7	15	[R]15	15	19	16	18	[R]24	[R]28	[R]31	35	46	92	3	557	29
Lrg	San Bernardino-Riverside, CA	[R]8	21	[R]56	64	[R]65	69	71	[R]73	[R]77	[R]75	82	83	14	47	938	11
Lrg	San Diego, CA	[R]22	43	[R]122	120	[R]128	125	122	[R]127	[R]127	[R]131	143	158	24	42	618	25

continued

Table 4-27 ***continued***

Population Group	Urban area	Gallons wasted (millions) 1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	% change Short-term 1995-1999 %	Rank	Long-term 1982-1999 %	Rank
Vlg	San Francisco-Oakland, CA	R102	153	R241	229	R231	233	223	R237	R242	R239	254	263	11	52	158	55
Lrg	San Jose, CA	R40	57	R87	92	R89	86	86	R93	R94	R92	100	108	16	46	170	54
Lrg	Seattle-Everett, WA	R44	69	R129	141	R154	143	143	R139	R143	R154	161	162	17	45	268	44
Sml	Spokane, WA	R1	2	2	2	2	4	4	3	R4	R5	5	5	67	11	400	36
Lrg	St. Louis, MO-IL	R29	46	R52	52	R61	102	114	R118	R120	R129	132	135	14	47	366	40
Med	Tacoma, WA	R4	6	R14	16	R16	18	19	R19	R21	R24	24	26	37	32	550	30
Med	Tampa, FL	R11	13	R27	32	R34	35	42	R44	R42	R42	42	44	0	58	300	43
Med	Tucson, AZ	R3	4	R9	9	9	12	13	13	15	R20	24	22	69	9	633	23
Vlg	Washington, DC-MD-VA	R73	120	R185	191	R204	204	217	R219	R234	R229	237	242	11	52	232	51
	68 Area Average	26	37	65	66	69	73	76	81	87	92	96	100[a]	23		285	
	Very Large Area Average	135	183	310	310	316	322	327	346	369	381	399	410[a]	18		204	
	Large Area Average	15	25	45	47	51	57	62	66	71	77	80	85[a]	29		467	
	Medium Area Average	4	6	13	14	16	17	19	21	23	25	26	28[a]	33		600	
	Small Area Average	0	1	1	1	1	2	2	2	2	3	3	4[a]	100		NM	

KEY: NM = not meaningful; R = revised.
Vlg = Very Large Urban Areas - over 3 million population.
Lrg = Large Urban Areas - over 1 million and less than 3 million population.
Med = Medium Urban Areas - over 500,000 and less than 1 million population.
Sml = Small Urban Areas - less than 500,000 population.

[a] The wasted fuel for each urban area category for 1999 was obtained from table A-7 of TTI's *The 2001 Annual Urban Mobility Report* referenced below. The wasted fuel for all other years was calculated using raw data obtained from internet site http://mobility.tamu.edu as of Oct. 17, 2001, where the total annual wasted fuel for each year and urban area was divided by the number of cities in that particular urban area.

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.

Short and Long Term Percentages and Ranks were recalculated using data for 1999, therefore, all data in corresponding columns is revised.

The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring the study.

SOURCE: 1982-99: Texas Transportation Institute, *The 2001 Annual Urban Mobility Report* (College Station, TX: 2001).

Table 4-28: Wasted Fuel per Capita[R]

Population group	Urban area	Gallons wasted [R]1982	1985	[R]1990	1991	[R]1992	1993	1994	[R]1995	[R]1996	[R]1997	1998	1999	% change [R]Short-term 1995-1999 %	Rank	[R]Long-term 1982-1999 %	Rank
Med	Albany-Schenectady-Troy, NY	2	4	8	8	8	8	8	8	10	10	12	14	75	5	600	17
Med	Albuquerque, NM	5	11	18	17	21	26	33	36	43	48	46	50	39	27	900	6
Lrg	Atlanta, GA	17	31	39	35	40	50	68	68	77	86	83	84	24	44	394	28
Med	Austin, TX	16	24	31	32	35	42	44	51	55	68	69	71	39	25	344	33
Sml	Bakersfield, CA	0	0	7	6	6	6	6	6	8	8	10	8	33	30	NM	61
Lrg	Baltimore, MD	12	21	41	40	39	39	42	46	46	47	47	48	4	66	300	43
Sml	Beaumont, TX	0	9	8	8	16	8	8	15	15	15	14	14	-7	74	NM	61
Vlg	Boston, MA	18	30	44	43	45	50	52	56	56	58	61	63	13	58	250	48
Sml	Boulder, CO	0	0	0	0	0	0	0	0	0	0	0	0	NM	66	NM	61
Sml	Brownsville, TX	0	0	0	0	0	0	0	0	0	0	0	0	NM	66	NM	61
Lrg	Buffalo-Niagara Falls, NY	3	4	7	7	7	7	7	7	7	7	8	12	71	6	300	43
Med	Charlotte, NC	9	19	36	39	34	31	31	35	40	49	50	51	46	18	467	22
Vlg	Chicago, IL-Northwestern, IN	17	25	36	37	38	40	39	42	45	46	50	50	19	50	194	54
Lrg	Cincinnati, OH-KY	6	11	25	25	29	32	37	37	41	46	49	53	43	21	783	8
Lrg	Cleveland, OH	2	3	10	11	13	16	19	23	26	29	29	32	39	26	1,500	1
Sml	Colorado Springs, CO	0	7	6	6	9	11	14	16	18	19	26	30	88	2	NM	61
Lrg	Columbus, OH	5	6	24	24	27	28	31	34	37	43	44	46	35	29	820	7
Sml	Corpus Christi, TX	8	8	7	11	11	7	7	10	10	10	10	10	0	68	25	73
Lrg	Dallas, TX	13	28	37	39	40	46	47	50	50	59	63	70	40	24	438	26
Lrg	Denver, CO	19	25	30	32	38	43	44	52	54	58	63	67	29	38	253	47
Vlg	Detroit, MI	18	20	48	49	56	59	55	55	60	61	60	62	13	57	244	49
Med	El Paso, TX-NM	4	4	9	13	14	16	17	15	12	15	17	22	47	16	450	23
Sml	Eugene-Springfield, OR	0	0	5	10	10	10	10	10	15	20	25	40	300	1	NM	61
Lrg	Fort Lauderdale - Hollywood - Pompano Beach, FL	10	11	20	24	31	34	30	31	33	37	38	44	42	23	340	35
Lrg	Fort Worth, TX	7	15	23	21	23	25	28	29	32	36	42	51	76	4	629	13
Med	Fresno, CA	6	8	20	19	18	14	14	15	17	20	22	25	67	10	317	40
Med	Hartford-Middletown, CT	11	19	26	26	26	19	18	21	22	27	27	30	43	22	173	57
Med	Honolulu, HI	11	14	27	27	29	29	30	30	28	30	30	30	0	68	173	57
Vlg	Houston, TX	42	59	50	44	43	50	50	49	57	65	76	76	55	15	81	69
Lrg	Indianapolis, IN	5	6	15	18	24	39	51	66	67	70	58	57	-14	78	1,040	3
Med	Jacksonville, FL	8	11	31	31	38	39	42	50	46	45	44	46	-8	76	475	21
Lrg	Kansas City, MO-KS	3	4	10	9	13	18	20	22	25	30	30	37	68	9	1,133	2
Sml	Laredo, TX	0	0	0	0	0	0	0	0	0	0	11	11	NM	66	NM	61
Lrg	Las Vegas, NV	7	12	32	32	25	25	30	31	32	30	29	31	0	68	343	34
Vlg	Los Angeles, CA	48	56	88	86	86	81	79	83	84	82	83	84	1	67	75	70
Med	Louisville, KY-IN	12	13	15	19	27	37	40	39	45	48	54	57	46	17	375	31
Med	Memphis, TN-AR-MS	3	5	15	16	20	21	29	33	35	38	35	33	0	68	1,000	4
Lrg	Miami-Hialeah, FL	24	29	55	54	58	59	61	58	56	59	61	61	5	65	154	63
Lrg	Milwaukee, WI	7	11	18	20	22	27	26	27	30	30	31	34	26	43	386	30
Lrg	Minneapolis-St. Paul, MN	6	11	24	24	27	34	40	44	44	52	56	61	39	28	917	5
Med	Nashville, TN	20	19	30	26	25	28	37	44	43	54	54	64	45	19	220	50
Lrg	New Orleans, LA	16	23	23	26	24	24	26	27	25	25	26	26	-4	72	63	71
Vlg	New York, NY-Northeastern, NJ	12	16	33	32	32	34	37	41	45	49	50	52	27	39	333	36
Lrg	Norfolk, VA	14	28	30	25	24	24	26	30	36	38	37	38	27	41	171	59
Lrg	Oklahoma City, OK	5	7	11	11	13	12	12	16	20	22	23	27	69	7	440	24
Med	Omaha, NE-IA	4	8	13	15	19	19	22	22	25	25	28	29	32	31	625	14
Lrg	Orlando, FL	15	27	36	44	49	51	47	50	54	59	61	61	22	48	307	41
Vlg	Philadelphia, PA-NJ	12	15	23	27	26	27	29	29	33	35	39	38	31	33	217	52
Lrg	Phoenix, AZ	17	19	34	36	36	37	36	36	44	43	44	47	31	35	176	55
Lrg	Pittsburgh, PA	9	10	16	16	15	15	16	17	17	18	20	21	24	44	133	65
Lrg	Portland-Vancouver, OR-WA	6	10	28	29	35	45	44	47	53	50	50	53	13	55	783	8
Med	Providence-Pawtucket, RI-MA	5	11	26	23	22	24	26	28	32	32	40	44	57	12	780	11
Med	Rochester, NY	2	3	7	8	10	10	10	11	11	15	11	13	18	51	550	19

continued

Table 4-28 *continued*

Population group	Urban area	Gallons wasted R1982	1985	R1990	1991	R1992	1993	1994	R1995	R1996	R1997	1998	1999	% change R Short-term 1995-1999 %	Rank	R Long-term 1982-1999 %	Rank
Med	Nashville, TN	20	19	30	26	25	28	37	44	43	54	54	64	45	19	220	50
Lrg	New Orleans, LA	16	23	23	26	24	24	26	27	25	25	26	26	-4	72	63	71
Vlg	New York, NY-Northeastern, NJ	12	16	33	32	32	34	37	41	45	49	50	52	27	39	333	36
Lrg	Norfolk, VA	14	28	30	25	24	24	26	30	36	38	37	38	27	41	171	59
Lrg	Oklahoma City, OK	5	7	11	11	13	12	12	16	20	22	23	27	69	7	440	24
Med	Omaha, NE-IA	4	8	13	15	19	19	22	22	25	25	28	29	32	31	625	14
Lrg	Orlando, FL	15	27	36	44	49	51	47	50	54	59	61	61	22	48	307	41
Vlg	Philadelphia, PA-NJ	12	15	23	27	26	27	29	29	33	35	39	38	31	33	217	52
Lrg	Phoenix, AZ	17	19	34	36	36	37	36	36	44	43	44	47	31	35	176	55
Lrg	Pittsburgh, PA	9	10	16	16	15	15	16	17	17	18	20	21	24	44	133	65
Lrg	Portland-Vancouver, OR-WA	6	10	28	29	35	45	44	47	53	50	50	53	13	55	783	8
Med	Providence-Pawtucket, RI-MA	5	11	26	23	22	24	26	28	32	32	40	44	57	12	780	11
Med	Rochester, NY	2	3	7	8	10	10	10	11	11	15	11	13	18	51	550	19
Lrg	Sacramento, CA	14	21	47	46	43	46	48	48	56	51	50	53	10	60	279	45
Sml	Salem, OR	0	0	12	12	12	11	11	17	17	16	21	21	24	44	NM	61
Med	Salt Lake City, UT	4	7	14	17	20	25	29	32	34	32	28	29	-9	77	625	14
Lrg	San Antonio, TX	7	15	13	13	16	13	15	20	23	25	28	37	85	3	429	27
Lrg	San Bernardino-Riverside, CA	9	22	48	50	50	52	53	54	57	55	59	59	9	61	556	18
Lrg	San Diego, CA	12	23	53	49	52	49	48	50	50	50	53	59	18	53	392	29
Vlg	San Francisco-Oakland, CA	31	46	66	61	61	61	58	61	62	60	63	65	7	64	110	67
Lrg	San Jose, CA	31	43	62	61	59	56	56	60	59	57	61	65	8	62	110	67
Lrg	Seattle-Everett, WA	31	45	75	77	84	76	75	72	73	79	81	81	13	58	161	61
Sml	Spokane, WA	4	7	7	7	7	13	13	9	13	15	15	15	67	10	275	46
Lrg	St. Louis, MO-IL	16	24	27	26	31	52	58	59	60	65	66	67	14	54	319	39
Med	Tacoma, WA	10	13	27	30	29	32	33	33	36	41	40	43	30	37	330	38
Med	Tampa, FL	20	22	39	45	48	47	55	54	51	51	49	50	-7	75	150	64
Med	Tucson, AZ	7	9	17	16	16	20	21	21	23	31	36	33	57	12	371	32
Vlg	Washington, DC-MD-VA	27	35	60	58	62	60	63	64	68	66	69	69	8	51	156	51
	68-Area Average	11	16	27	27	29	31	33	35	37	39	41	43	24		293	
	Very Large Area Average	25	34	50	49	50	51	51	53	57	58	61	62	16		148	
	Large Area Average	12	18	30	31	33	36	38	40	43	45	46	49	22		326	
	Medium Area Average	8	12	22	22	24	26	28	30	32	36	36	39	27		362	
	Small Area Average	1	3	5	6	7	7	7	8	10	10	13	15	80		1,142	

KEY: NM = not meaningful; R = revised.
Vlg = Very Large Urban Areas - over 3 million population.
Lrg = Large Urban Areas - over 1 million and less than 3 million population.
Med = Medium Urban Areas - over 500,000 and less than 1 million population.
Sml = 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 Texas Transportation Institute, for the year 2001, decided to only publish wasted fuel per capita, contrary to previous years when they would publish data for eligible drivers, as well as per capita. To account for this change, the entire table has been updated with wasted fuel per capita.
The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring the study.

SOURCE: 1982 - 1999: Texas Transportation Institute, *The 2001 Annual Urban Mobility Report* (College Station, TX: 2001) from Internet site http:////mobility.tamu.edu accessed on Sept. 14, 2001.

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,f]		[h]										5 years/50,000 miles		
(full)		5 years/50,000 miles										10 years/100,000 miles		10 years/120,000 miles

KEY: CO = carbon monoxide; 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 degrees F (rather than 75 degrees 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.

SOURCE:

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	Tier 1[k] 1995-2003	Interim Tier 2[k] 2004-2006	Tier 2[k] 2007+
Gasoline																	
HC (total)	11	[i]	2.2	3.4		2.0		1.7		0.80				[j]	[R](0.80)	[j]	
NMHC	[h]	[j]												0.25 (0.31)		[j]	
NMOG	[h]	[j]														0.125 (0.156)	0.100 (0.125)
CO	80	[i]	23	39		20		18		10				3.4 (4.2)			
Cold-temp. CO[d]	[e]	[j]												10 [j]			
NO_x	4	[j]			3.0	3.1		2.3					1.2	0.4 (0.6)			0.14 (0.20)
Particulates	[h]	[j]													0.08 (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)		[j]	
NMHC	[h]	[j]												0.25 (0.31)		[j]	
NMOG	[h]	[j]														[j] (0.156)	0.100 (0.125)
CO	80	[j]					20	18		10				3.4 (4.2)		[j] (4.2)	3.4 (4.2)
NO_x	4	[j]					3.1	2.3					1.2	1.0 (1.25)		[j] (0.6)	0.14 (0.20)
Particulates	[h]	[j]							0.60		0.26				0.08 (0.10)	[j] (0.10)	0.02 (0.02)
Formaldehyde	[h]	[j]														[j] (0.018)	0.015 (0.018)
LDT1 weight critera[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	
(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; 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] 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. PM 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 degrees F (rather than 75 degrees 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.

SOURCE:

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	1976-1978	1979-1981	1982-1983	1984	1985-1986	1987	1988-1990	1991-1993	Tier 1[k] 1994	Tier 1[k] 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)		[j]	
NMHC	[h]	[j]													[j] (0.40)		[j]	
NMOG	[h]	[j]															0.125 (0.156)	0.100 (0.125)
CO	80	[l]	23	39		20		18		10					4.4 (5.5)		3.4 (4.2)	
Cold-temp. CO[d]	[h]	[j]													12.5 [(j)]			
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]														0.08 (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)		[j]	
NMHC	[h]	[j]													0.32 (0.40)		[j]	
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	0.45	0.13		0.08 (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]		[j]													5 years/50,000 miles		5 years/50,000miles	
(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 degrees F (rather than 75 degrees 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 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 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.

SOURCE:

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	1972	1973-1974	1975	1976-1978	1979-1981	1982-1983	1984	1985-1986	1987	1988-1989	1990	1991-1995	Tier 1[k] 1996-2007	Interim Tier 2[k] 2008	Tier 2[k] 2009+
Gasoline																		
HC (total)	11	[l]	2.2	3.4		2.0		1.7		0.80						[j] (0.80)	[j]	
NMHC	[h]	[j]														0.32 (0.46)	[j]	
NMOG	[h]	[j]															0.160 (0.230)	0.125 (0.156)
CO	80	[i]	23	39		20		18		10						4.4 (6.4)		3.4 4.2
Cold-temp. CO[d]	[h]	[j]														12.5 [(j)]		
NO_x	4	[j]			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]														[j] (0.10)	0.08 (0.08)	0.02 (0.02)
Formaldehyde	[h]	[j]															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]	[j]														0.32 (0.46)	[j]	
NMOG	[h]	[j]															[j] (0.230)	0.125 (0.156)
CO	80	[j]					20	18		10						4.4 (6.4)	[j]	3.4 4.2
NO_x	4	[j]					3.1	2.3					2.3	1.7		[j] (0.98)	[j] (0.6)	0.14 (0.20)
Particulates	[h]	[j]							0.60			0.50	0.45		0.13	[j] (0.10)	[j] (0.08)	0.02 (0.02)
Formaldehyde	[h]	[j]															[j] (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)[c,f]		[j]														5 years/50,000 miles		
(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 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 LDT3 vehicles and NOx 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 degrees F (rather than 75 degrees 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 certifcation 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 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 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 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.

SOURCE:

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]	1968-1969	1970-1971	1972	1973-1974	1975	1976-1978	1979-1981	1982-1983	1984	1985-1986	1987	1988-1989	1990	1991-1995	Tier 1[k] 1996-2007	Interim Tier 2[k] 2008	Tier 2[k] 2009+
Gasoline																		
HC (total)	11	[l]	2.2	3.4		2.0		1.7		0.80						[j] (0.80)	[j]	
NMHC	[h]	[j]														0.39 (0.56)	[j]	
NMOG	[h]	[j]															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]	[j]														12.5 [(j)]		
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]														[j] (0.12)	0.08 (0.08)	0.02 (0.02)
Formaldehyde	[h]	[j]															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]	[j]														0.39 (0.56)	[j]	
NMOG	[h]	[j]															[j] (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]	[j]							0.60			0.50	0.45		0.13	[j] (0.12)	[j] (0.08)	0.02 (0.02)
Formaldehyde	[h]	[j]															[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)[c, f]		[j]														5 years/50,000 miles		
(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 degrees F (rather than 75 degrees 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.

SOURCE:

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)

	Interim Tier 2[f]		Tier 2[f]	
Engine type and pollutant	**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			
-diesel	EPA Transient	CVS-75		
Useful life-gasoline (intermediate)[b,e]	5 years/50,000 miles			
(full)	11 years/120,000 miles			
Useful life-diesel (intermediate)[b,e]	[g]		5 years/50,000 miles	
(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; NOx = 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 (catgories 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 degrees F (rather than 75 degrees F) 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 stndards 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 NOx 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+
Gasoline															
HC + NO_x	e	16	10		e										
NO_x + NMHC	e												1.0		e
NMHC	e														0.14
HC	f	e	1.5		1.9	1.1							e		
NO_x	e				10.6			6.0	5.0		4.0		e		0.20
CO	f	40	25		37.1	14.4									
Particulates	e														0.01
Diesel															
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[g]		e	
NMHC	e													0.14	
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 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										
(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) [h,l]

Weight range and pollutant	2005-06	2007	2008+
GVWR 8,500 through 10,000 lbs			
NMOG[i]	0.28		e
NMHC[j]	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 = formaldeyhyde.

[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 NOx 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.

[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

[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+
Gasoline															
HC + NO_x	e	16	10		e										
NOx + NMHC	e												1.0		e
NMHC	e														0.14
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										14.4
Particulates	e														0.01
Diesel															
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	
NOx + NMHC	e											2.4[g]		e	
NMHC														0.14	
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										
(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 NOx 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.

[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.

NOTES: 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, personnal 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+
Gasoline-powered							
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		
Methanol-powered							
Total HC equivalent		50 cc and greater				5.0	
CO		50 cc and greater				12	
Natural gas and LPG-powered							
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.

SOURCES: 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; NOx = 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 otherwised noted, emissions in this table apply to new aircraft engines only.

[b] HC, CO, and NOx 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>=1,000 kW.

[h] Engines manufactured on or after Jan. 1, 1984 and with rO>=26.7 kN. Smoke number may not exceed 50.

[i] Engines with rated output rO>=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.

SOURCES: 40 CFR 87, Subparts A-D (July 1, 2000).
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) [g]	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) [g]	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; NOx = 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.

SOURCES:

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	$(0.917 \times (151 + 557/P^{0.9})) + 2.44$	1 yr for all emissions-related components	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	$(0.583 \times (151 + 557/P^{0.9})) + 4.22$		
2003	155.00	$(0.500 \times (151 + 557/P^{0.9})) + 4.67$		
2004	130.00	$(0.417 \times (151 + 557/P^{0.9})) + 5.11$	2 yr/200 hr for all emissions-related components; 3 yr/200 hr for specified major emissions control components	
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.

SOURCES:

40 CFR 91 July 1, 2000 edition, pp. 301-302, 398.

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	37 kW to < 3,300 kW		8.7	0.50			
	15.0 to < 20.0	3,300 kW and above		9.8	0.50			
	20.0 to < 25.0	37 kW and above		9.8	0.50			
	25.0 to < 30.0	37 kW and above		11.0	0.50			
3	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.

SOURCES:

Federal Register, Vol. 64, No. 249, Dec. 29, 1999, pp 73,299 to 73,373

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	E2001
GASOLINE (assuming zero RFG)												
Light-duty vehicles												
Exhaust HC	2.05	1.92	1.81	1.72	1.66	1.60	1.55	1.51	1.47	1.44	1.42	1.41
Nonexhaust HC	1.04	0.99	0.96	0.93	0.91	0.89	0.87	0.85	0.82	0.79	0.74	0.69
Total HC	3.09	2.91	2.77	2.65	2.57	2.49	2.42	2.36	2.29	2.23	2.16	2.10
Exhaust CO	24.68	23.42	22.40	21.65	21.10	20.52	20.14	19.86	19.52	19.36	19.28	19.23
Exhaust NO_x	1.81	1.76	1.72	1.69	1.67	1.61	1.56	1.51	1.45	1.41	1.38	1.35
Light-duty trucks												
Exhaust HC	3.24	3.03	2.80	2.61	2.46	2.31	2.21	2.13	2.05	1.99	1.95	1.92
Nonexhaust HC	1.44	1.31	1.21	1.16	1.11	1.07	1.03	1.01	0.96	0.94	0.90	0.87
Total HC	4.68	4.34	4.01	3.77	3.57	3.38	3.24	3.14	3.01	2.93	2.85	2.79
Exhaust CO	36.32	34.01	31.78	30.03	28.62	27.41	26.83	26.38	25.69	25.29	24.99	24.79
Exhaust NO_x	2.36	2.25	2.16	2.10	2.04	1.97	1.95	1.92	1.87	1.84	1.80	1.77
Heavy-duty vehicles												
Exhaust HC	7.45	6.79	6.22	5.53	4.92	4.51	4.13	3.73	3.33	3.07	2.82	2.63
Nonexhaust HC	4.44	4.11	3.84	3.71	3.57	3.38	3.17	2.97	2.78	2.63	2.50	2.37
Total HC	11.89	10.90	10.06	9.24	8.49	7.89	7.30	6.70	6.11	5.70	5.32	5.00
Exhaust CO	131.19	120.49	111.05	101.92	93.61	85.10	76.97	69.13	61.07	54.65	48.67	43.65
Exhaust NO_x	6.49	6.28	6.05	5.85	5.69	5.48	5.36	5.25	5.05	4.89	4.72	4.56
Motorcycles												
Exhaust HC	2.31	2.19	2.11	2.05	2.02	1.96	1.93	1.92	1.90	1.89	1.89	1.89
Nonexhaust HC	2.37	2.37	2.37	2.36	2.36	2.37	2.36	2.37	2.37	2.37	2.37	2.37
Total HC	4.68	4.56	4.48	4.41	4.38	4.33	4.29	4.29	4.27	4.26	4.26	4.26
Exhaust CO	20.89	20.61	20.60	20.59	20.59	20.47	20.47	20.47	20.35	20.35	20.35	20.35
Exhaust NO_x	0.85	0.85	0.85	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.83
DIESEL												
Light-duty vehicles												
Exhaust HC	0.73	0.74	0.75	0.75	0.76	0.77	0.76	0.74	0.71	0.67	0.63	0.59
Exhaust CO	1.68	1.71	1.72	1.73	1.74	1.74	1.74	1.71	1.67	1.62	1.57	1.53
Exhaust NO_x	1.65	1.67	1.68	1.68	1.66	1.64	1.60	1.55	1.48	1.40	1.33	1.26
Light-duty trucks												
Exhaust HC	1.08	1.14	1.15	1.14	1.13	1.11	1.09	1.05	0.98	0.91	0.84	0.78
Exhaust CO	2.03	2.10	2.09	2.07	2.04	2.02	1.99	1.95	1.88	1.80	1.73	1.68
Exhaust NO_x	1.97	2.00	1.99	1.97	1.94	1.90	1.85	1.78	1.67	1.56	1.46	1.38
Heavy-duty vehicles												
Exhaust HC	3.30	3.08	2.89	2.75	2.65	2.54	2.44	2.36	2.30	2.25	2.22	2.19
Exhaust CO	13.71	13.38	13.07	12.76	12.50	12.28	12.08	11.93	11.77	11.63	11.53	11.45
Exhaust NO_x	21.05	19.59	18.14	16.89	15.81	14.79	13.96	13.33	12.66	11.93	11.24	10.59
AVERAGE OF ALL VEHICLES, GASOLINE AND DIESEL												
Exhaust HC	2.56	2.40	2.25	2.13	2.03	1.93	1.86	1.80	1.74	1.70	1.67	1.64
Nonexhaust HC	1.18	1.12	1.06	1.02	1.00	0.97	0.94	0.91	0.88	0.84	0.80	0.76
Total HC	3.75	3.52	3.31	3.15	3.02	2.90	2.80	2.71	2.62	2.54	2.47	2.40
Exhaust CO	29.97	28.29	26.81	25.62	24.68	23.75	23.11	22.58	21.94	21.53	21.20	20.95
Exhaust NO_x	3.09	2.99	2.89	2.80	2.73	2.63	2.56	2.50	2.41	2.34	2.27	2.21

KEY: CO = carbon monoxide; E = estimate; HC = hydrocarbon; NO_x = nitrogen oxide; R = revised; 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 MOBILE5b, the U.S. Environmental Protection Agency's (EPA) latest highway vehicle emissions factor model. Interested readers can learn more about the Mobile5b model at the following USEPA Internet site http://www.epa.gov/otaq.

MOBILE5b is undergoing a major revision and is expected to be replaced by MOBILE6 in early 2002. Emissions factors are national averages based on the following assumptions: ambient temperature 75 ºF, daily temperature range 60-84 ºF, average traffic speed 19.6 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 communication, Sept. 13, 2001.

Table 4-39: Estimated National Average Vehicle Emissions Rates by Vehicle Type Using Reformulated Gasoline (Grams per mile)

	1995	1996	1997	1998	1999	2000	E2001
Light-duty vehicles							
Exhaust HC	1.43	1.38	1.34	1.30	1.28	1.16	1.15
Nonexhaust HC	0.69	0.68	0.66	0.64	0.60	0.37	0.33
Total HC	**2.12**	**2.06**	**2.00**	**1.94**	**1.88**	**1.53**	**1.48**
Exhaust CO	16.46	16.14	15.90	15.62	15.48	15.41	15.36
Exhaust NO_x	1.59	1.54	1.49	1.43	1.39	1.29	1.26
Light-duty trucks							
Exhaust HC	2.11	2.02	1.93	1.84	1.78	1.63	1.60
Nonexhaust HC	0.85	0.80	0.78	0.75	0.73	0.47	0.44
Total HC	**2.96**	**2.82**	**2.71**	**2.59**	**2.51**	**2.10**	**2.04**
Exhaust CO	22.15	21.62	21.20	20.59	20.22	19.95	19.77
Exhaust NO_x	1.96	1.93	1.91	1.85	1.82	1.71	1.67
Heavy-duty vehicles							
Exhaust HC	4.40	4.02	3.62	3.22	2.96	2.65	2.46
Nonexhaust HC	2.53	2.38	2.24	2.10	1.99	1.30	1.22
Total HC	**6.93**	**6.40**	**5.86**	**5.32**	**4.95**	**3.95**	**3.68**
Exhaust CO	72.26	65.30	58.59	51.68	46.18	41.04	36.72
Exhaust NO_x	5.47	5.35	5.24	5.04	4.88	4.67	4.51
Motorcycles							
Exhaust HC	1.92	1.89	1.88	1.86	1.86	1.82	1.82
Nonexhaust HC	1.91	1.91	1.91	1.91	1.90	1.43	1.43
Total HC	**3.83**	**3.80**	**3.79**	**3.77**	**3.76**	**3.25**	**3.25**
Exhaust CO	17.46	17.46	17.46	17.36	17.36	17.36	17.36
Exhaust NO_x	0.84	0.84	0.84	0.83	0.83	0.83	0.83
Average of all RFG and diesel vehicles							
Exhaust HC	1.77	1.70	1.64	1.58	1.54	1.41	1.39
Nonexhaust HC	0.75	0.73	0.71	0.68	0.64	0.41	0.38
Total HC	**2.52**	**2.43**	**2.35**	**2.25**	**2.18**	**1.82**	**1.77**
Exhaust CO	19.38	18.83	18.37	17.81	17.45	17.17	16.96
Exhaust NO_x	2.61	2.54	2.48	2.39	2.32	2.19	2.13

KEY: CO = carbon monoxide; E = estimate; HC = hydrocarbon; NOx = nitrogen oxide; R = revised; 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 MOBILE5b, and reflect the introduction of RFG starting in 1995. MOBILE5b is undergoing a major revision and is expected to be replaced by MOBILE6 in early 2002. Emissions factors are national averages based on the following assumptions: ambient temperature 75 ºF, daily temperature range 60 -84 ºF, average traffic speed 19.6 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).
Emissions estimates in this table assume 100% RFG.

SOURCE: U.S. Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory, personal communication, Sept. 7, 2001.

Table 4-40: Estimated National Emissions of Carbon Monoxide (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL all sources	**129.44**	**116.76**	**117.43**	**117.01**	**111.53**	**110.80**	**118.73**	**106.44**	**R99.12**	**R101.80**	**R99.00**	**R99.79**	**R103.71**	**R94.06**	**R101.29**	**R101.46**	**R96.87**	**97.44**
Transportation																		
On-road vehicles	88.03	83.13	78.05	77.39	73.35	71.25	71.08	66.05	R58.44	R63.00	R61.24	R61.83	R62.90	R54.81	R54.39	R53.32	R52.36	49.99
Off-road																		
Aircraft	0.51	0.60	0.74	0.83	0.86	0.89	0.93	0.96	0.90	0.89	0.90	0.91	0.92	0.94	0.95	R0.96	R1.00	1.00
Railroads	0.07	0.08	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.12	0.11	0.11	R0.12	0.12	0.12	0.12
Marine vessels	0.02	0.03	0.06	0.07	0.08	0.08	0.09	0.10	0.13	0.14	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14
Other off-road[a]	2.04	2.17	2.30	2.43	2.43	2.44	2.45	2.46	2.50	2.51	2.52	2.53	2.54	2.56	R3.63	R3.63	R3.64	3.64
Total transportation	**90.67**	**86.01**	**81.25**	**80.83**	**76.83**	**74.77**	**74.67**	**69.69**	**R62.10**	**R66.65**	**R64.92**	**R65.52**	**R66.60**	**R58.55**	**R59.21**	**R58.15**	**R57.25**	**54.89**
Nontransportation																		
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	R6.21	R5.48	R5.08	5.32
Industrial processes[b]	9.84	7.54	6.95	5.28	5.15	5.00	5.23	5.27	4.77	4.62	4.55	4.65	4.61	4.61	R3.64	R3.80	R3.81	3.80
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	1.23	1.19	R1.12	R1.13	R1.14	3.79
Miscellaneous[c]	17.25	15.50	19.63	20.49	20.25	22.21	29.65	22.30	25.66	23.55	22.25	22.79	25.75	23.78	R31.12	R32.89	R29.59	29.64
Total nontransportation	**38.78**	**30.75**	**36.18**	**36.20**	**34.87**	**36.02**	**44.06**	**36.76**	**37.02**	**35.15**	**34.09**	**34.28**	**37.11**	**35.51**	**R42.08**	**R43.31**	**R39.62**	**42.55**

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 comprise 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 non-road sources; 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. 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: 1970-1985,1989-99: 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.

1988: Ibid, *National Air Pollutant Emission Trends: 1900-1998* (EPA-454/R-00-002) (Research Triangle Park, NC: March 2000), table A-1; available at Internet website http://www.epa.gov/ttn/chief/trends/trends98/browse.html as of Sept. 5, 2001.

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.

Table 4-41: Estimated National Emissions of Nitrogen Oxides (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL all sources	**20.93**	**22.63**	**24.38**	**23.20**	**22.81**	**23.07**	**24.12**	**23.89**	**[R]24.17**	**[R]24.34**	**[R]24.73**	**[R]25.11**	**[R]25.47**	**[R]25.05**	**[R]26.05**	**[R]26.35**	**[R]26.02**	**25.39**
Transportation																		
On-road vehicles	7.39	8.65	8.62	8.09	7.77	7.65	7.66	7.68	[R]7.21	[R]7.56	[R]7.76	[R]7.96	[R]8.18	[R]7.96	[R]8.79	[R]8.92	[R]8.82	8.59
Off-road																		
Aircraft	0.07	0.09	0.11	0.12	0.12	0.13	0.13	0.14	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.18
Railroads	0.50	0.59	0.73	0.81	0.83	0.85	0.90	0.92	0.93	0.93	0.95	0.95	0.95	0.99	[R]1.18	[R]1.22	[R]1.22	1.20
Marine vessels	0.17	0.21	0.47	0.56	0.60	0.63	0.70	0.75	0.94	1.00	0.96	0.92	0.93	0.94	[R]0.97	[R]0.99	[R]1.00	1.01
Other off-road[a]	0.04	0.04	0.04	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10
Total transportation	**8.17**	**9.58**	**9.97**	**9.64**	**9.38**	**9.33**	**9.46**	**9.56**	**[R]9.32**	**[R]9.71**	**[R]9.90**	**[R]10.06**	**[R]10.30**	**[R]10.13**	**[R]11.20**	**[R]11.39**	**[R]11.30**	**11.07**
Nontransportation																		
Fuel combustion	10.06	10.49	11.32	10.05	9.87	10.01	10.47	10.54	10.89	[R]10.78	10.93	11.11	11.02	10.83	[R]10.52	[R]10.58	[R]10.40	10.03
Industrial processes[b]	0.78	0.54	0.56	0.80	0.79	0.76	0.78	0.77	0.80	0.72	0.76	0.74	0.77	0.77	[R]0.80	[R]0.84	[R]0.85	0.85
Waste disposal and recycling	0.44	0.16	0.11	0.09	0.09	0.09	0.09	0.08	0.09	0.10	0.10	0.12	0.11	0.10	0.10	0.10	0.10	0.09
Miscellaneous[c]	1.49	1.88	2.43	2.62	2.68	2.88	3.33	2.94	3.07	3.03	3.05	3.08	3.29	3.22	[R]3.42	[R]3.45	[R]3.38	3.35
Total nontransportation	**12.77**	**13.07**	**14.42**	**13.56**	**13.43**	**13.74**	**14.67**	**14.33**	**14.85**	**[R]14.63**	**14.84**	**15.05**	**15.19**	**14.92**	**[R]14.85**	**[R]14.96**	**[R]14.72**	**14.32**

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; 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. 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: 1970-1985,1989-1999: 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-4; available at Internet website http://www.epa.gov/oar/aqtrnd99/toc.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.

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.

Table 4-42: Estimated National Emissions of Volatile Organic Compounds (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL all sources	**30.98**	**26.08**	**[R]26.33**	**24.43**	**23.62**	**23.47**	**24.31**	**22.51**	**[R]21.07**	**[R]21.26**	**[R]20.88**	**[R]21.11**	**[R]21.70**	**[R]20.93**	**[R]19.47**	**[R]19.75**	**[R]18.63**	**18.14**
Transportation																		
On-Road vehicles	12.97	10.55	8.98	9.38	8.87	8.48	8.29	7.19	[R]6.44	[R]6.66	[R]6.29	[R]6.35	[R]6.56	[R]5.82	[R]5.54	[R]5.44	[R]5.44	5.30
Off-Road																		
Aircraft	0.10	0.12	0.15	0.17	0.17	0.18	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Railroads	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Marine vessels	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	[R]0.03	0.03
Other off-road[a]	0.87	0.93	0.98	1.03	1.02	1.01	1.01	0.96	0.92	0.92	0.91	0.91	0.92	0.93	[R]1.11	[R]1.12	[R]1.12	1.12
Total transportation	**13.97**	**11.64**	**10.16**	**10.64**	**10.12**	**9.74**	**9.56**	**8.41**	**[R]7.63**	**[R]7.85**	**[R]7.46**	**[R]7.52**	**[R]7.75**	**[R]7.00**	**[R]6.91**	**[R]6.82**	**[R]6.83**	**6.68**
Nontransportation																		
Fuel combustion	0.72	0.66	1.05	1.57	1.40	1.28	1.36	1.37	1.01	1.08	1.12	0.99	0.99	1.07	[R]1.07	[R]0.94	[R]0.86	0.90
Industrial processes[b]	12.33	11.10	12.10	9.50	9.35	9.58	9.90	9.81	9.01	9.18	9.37	9.53	9.69	9.71	[R]8.12	[R]8.34	[R]7.88	7.41
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	0.42	[R]0.42	0.43	0.59
Miscellaneous[c]	1.98	1.71	[R]2.26	1.75	1.78	1.92	2.54	1.97	[R]2.43	[R]2.16	[R]1.92	[R]2.02	[R]2.22	[R]2.08	[R]2.95	[R]3.23	[R]2.64	[d] 2.56
Total nontransportation	**17.02**	**14.45**	**[R]16.17**	**13.80**	**13.50**	**13.73**	**14.76**	**14.09**	**13.44**	**[R]13.42**	**13.42**	**13.59**	**13.95**	**13.93**	**[R]12.56**	**[R]12.93**	**[R]11.80**	**11.46**

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.

[d] Miscellaneous data for 1999 does not include emissions from geogenic sources, because the data was not estimated in 1999. The methodologies used for obtaining geogenic emission data are still being improved and current estimates will be revised at a later date.

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. 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: 1970-1985, 1989-1999: 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-5; available at Internet website http://www.epa.gov/oar/aqtrnd99/toc.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-3; available at Internet website http://www.epa.gov/ttn/chief/trends/trends98/browse.html as of Sept. 5, 2001.

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.

Table 4-43: Estimated National Emissions of Particulate Matter (PM-10)[a] (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL all sources	**13.04**	**7.67**	**7.12**	**45.45**	**50.94**	**42.46**	**61.07**	**53.06**	**[R]29.97**	**29.56**	**29.47**	**28.01**	**30.91**	**[R]27.08**	**[R]30.00**	**[R]31.21**	**[R]31.35**	**N**
Transportation																		
On-road vehicles	0.44	0.47	0.40	0.36	0.36	0.36	0.37	0.37	[R]0.35	0.35	[R]0.35	[R]0.33	0.32	[R]0.30	[R]0.35	[R]0.33	[R]0.31	0.30
Off-road																		
Aircraft	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Railroads	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.03	0.03	0.03	0.03
Marine vessels	0.01	0.01	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.04	[R]0.05	0.05
Other off-road[b]	<0.01	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	[R]0.05	[R]0.05	[R]0.05	0.05
Total transportation-fuel-related	**[R]0.50**	**0.57**	**0.52**	**0.50**	**0.51**	**0.51**	**0.54**	**0.54**	**[R]0.53**	**0.53**	**0.53**	**[R]0.50**	**0.49**	**[R]0.45**	**[R]0.50**	**[R]0.49**	**[R]0.47**	**0.46**
Transportation-related fugitive dust																		
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	[R]9.07	[R]9.46	[R]9.33	9.36
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	[R]2.40	[R]2.60	[R]2.66	2.73
Total transportation	**[R]0.50**	**0.57**	**0.52**	**17.22**	**17.44**	**17.15**	**18.82**	**18.11**	**[R]14.01**	**14.14**	**13.87**	**[R]14.39**	**14.40**	**[R]13.22**	**[R]11.98**	**[R]12.55**	**[R]12.46**	**12.54**
Nontransportation																		
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	[R]1.16	[R]1.08	[R]1.00	1.03
Industrial processes[c]	7.67	3.70	2.75	1.06	1.05	1.02	1.03	1.03	1.04	0.99	0.99	0.91	0.91	0.95	[R]0.65	[R]0.67	[R]0.67	0.68
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	0.30	0.31	0.31	0.59
Miscellaneous[d]	1.00	0.78	1.13	25.34	30.76	22.69	39.59	32.31	[R]13.46	[R]13.01	13.15	[R]11.25	14.18	11.45	[R]15.91	[R]16.61	[R]16.90	[e]8.84
Total nontransportation	**12.54**	**7.10**	**6.60**	**28.22**	**33.50**	**25.31**	**42.26**	**34.97**	**[R]15.97**	**[R]15.43**	**15.60**	**13.62**	**16.51**	**13.87**	**[R]18.02**	**[R]18.66**	**[R]18.88**	**N**

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 comprise 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.

[e] Miscellaneous data for 1999 does not include emissions from geogenic sources because the data was not estimated in 1999. The methodologies used for obtaining geogenic emission data are still being improved and current estimates will be revised at a later date.

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. 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: 1970-1985, 1989-1999: U.S. Environmental Protection Agency, *National Air Quality and Emissions Trends* 1988: Ibid., *National Air Pollutant Emission Trends: 1900-1998* (EPA-454/R-00-002) (Research Triangle Park, NC: March 2000), table A-5; available at Internet website http://www.epa.gov/ttn/chief/trends/trends98/browse.html as of Sept. 5, 2001.
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.

Table 4-44 : Estimated National Emissions of Particulate Matter (PM-2.5)[a] (Million short tons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL all sources	**7.96**	**7.74**	**7.65**	**7.33**	**7.98**	**7.18**	**[R]7.70**	**[R]8.06**	**[R]7.86**	**N**
Transportation										
On-road vehicles	[R]0.29	0.29	0.28	0.26	0.26	[R]0.24	[R]0.28	[R]0.26	[R]0.25	0.23
Aircraft	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Railroads	0.05	0.05	0.05	0.05	0.05	0.03	[R]0.03	0.03	0.03	0.03
Marine vessels	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
Other off-road[b]	0.03	0.03	0.03	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	[R]1.37	[R]1.43	[R]1.41	1.41
Paved roads	0.56	0.60	0.61	0.62	0.63	0.59	0.60	[R]0.65	[R]0.67	0.68
Total transportation	[R]2.68	**2.71**	**2.67**	**2.75**	**2.75**	**[R]2.50**	**[R]2.38**	**[R]2.48**	**[R]2.46**	**2.46**
Nontransportation										
Fuel combustion	0.91	0.89	0.93	0.85	0.84	0.90	[R]0.85	[R]0.78	[R]0.74	0.77
Industrial processes[c]	0.56	0.57	0.58	0.50	0.50	0.50	[R]0.37	[R]0.38	0.39	0.39
Waste disposal and recycling	0.23	0.24	0.24	0.29	0.27	0.25	0.23	0.24	0.24	0.53
Miscellaneous[d]	3.59	3.32	3.22	2.95	3.62	3.04	[R]3.87	[R]4.19	[R]4.05	[e]2.63
Total nontransportation	**5.29**	**5.02**	**4.97**	**4.59**	**5.23**	**4.69**	**[R]5.33**	**[R]5.59**	**[R]5.41**	**N**

KEY: N = data do not exist; 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 comprise 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).

[e] Miscellaneous data for 1999 does not include emissions from geogenic sources because the data was not estimated in 1999. The methodologies used for obtaining geogenic emission data are still being improved and current estimates will be revised at a later date.

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. 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.

SOURCES: 1990-99: 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-9; available at Internet website http://www.epa.gov/oar/aqtrnd99/toc.html, as of Sept. 5, 2001.

Table 4-45: Estimated National Emissions of Sulfur Dioxide (Million short tons)

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Transportation														
On-road vehicles	0.41	0.50	0.52	0.52	R0.56	0.57	0.59	0.53	0.31	R0.31	R0.34	R0.35	R0.36	0.36
Off-road														
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
Railroads	0.04	0.04	0.05	0.06	0.12	0.12	0.13	0.12	0.11	0.11	0.11	0.12	0.11	0.11
Marine vessels	0.04	0.05	0.12	0.14	0.25	0.26	0.26	0.25	0.25	0.24	0.24	0.25	0.26	0.27
Total transportation	**0.49**	**0.59**	**0.70**	**0.73**	**R0.94**	**0.96**	**0.98**	**0.90**	**0.68**	**R0.67**	**R0.70**	**R0.72**	**R0.74**	**0.76**
Nontransportation														
Fuel combustion	23.46	22.66	21.39	20.02	20.29	19.80	19.49	19.25	18.89	16.23	R16.23	R16.65	R16.75	16.36
Industrial processes[a]	7.09	4.68	3.77	2.43	1.86	1.68	1.72	1.65	1.62	1.59	R1.38	R1.43	R1.43	1.43
Waste disposal and recycling	0.01	0.05	0.03	0.03	0.04	0.04	0.04	0.07	0.06	0.05	0.04	0.04	0.04	0.04
Miscellaneous[b]	0.11	0.02	0.01	0.44	0.55	0.56	0.58	0.61	0.63	0.65	R0.51	R0.52	R0.53	0.55
Total nontransportation	**30.67**	**27.41**	**25.20**	**22.92**	**22.74**	**22.08**	**21.83**	**21.57**	**21.19**	**18.52**	**R18.16**	**R18.64**	**R18.75**	**18.38**
TOTAL all sources	**31.16**	**28.01**	**25.91**	**23.66**	**R23.68**	**23.04**	**22.81**	**22.48**	**21.88**	**R19.19**	**R18.86**	**R19.36**	**R19.49**	**19.14**

KEY: R = revised.

[a] Industrial processes comprise 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, 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. 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 methodology changes have occurred.

Numbers may not add to totals due to rounding.

SOURCES: 1970-85, 1989-99: 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-8; available at Internet website http://www.epa.gov/oar/aqtrnd99/toc.html, as of Sep. 5, 2001.

1988: Ibid, *National Air Pollutant Emission Trends: 1900-1998* (EPA-454/R-00-002) (Research Triangle Park, NC: March 2000), table A-4; available at Internet website http://www.epa.gov/ttn/chief/trends/trends98/browse.html, as of Sep. 5, 2001.

1986-87: Ibid, National Emission Trends source reports database, available at Internet website www.epa.gov/air/data/nettier.html, as of Sep. 5, 2001.

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
TOTAL all sources	**220.87**	**159.66**	**74.15**	**22.89**	**14.76**	**7.68**	**7.05**	**5.47**	**4.98**	**4.17**	**3.81**	**3.92**	**4.05**	**3.93**	**[R]4.08**	**[R]4.14**	**[R]4.06**	**4.20**
Transportation																		
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
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
Total transportation	**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**	**0.53**	**0.52**	**0.52**	**0.54**
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	[R]0.50	0.49	0.49	[R]0.49	[R]0.49	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	[R]2.24	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	[R]0.79	[R]0.80	[R]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
Total nontransportation	**47.52**	**28.34**	**12.77**	**4.15**	**3.71**	**3.73**	**3.81**	**3.85**	**3.94**	**3.58**	**3.22**	**[R]3.37**	**3.50**	**[R]3.37**	**[R]3.55**	**[R]3.61**	**[R]3.54**	**3.66**

KEY: R = Revised.

[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 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: 1970-85, 1989-99**:** 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-3; available at Internet website http://www.epa.gov/oar/aqtrnd99/toc.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-7; available at Internet website http://www.epa.gov/ttn/chief/trends/trends98/browse.html as of Sept. 5, 2001.
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.

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 monitoring sites)

	All sites		Trend sites										
	Total number of sites	AQI days > 100 (1999)	Number of trend sites	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Akron, OH	6	[R]20	5	9	30	8	10	8	12	11	6	14	20
Albany-Schenectady-Troy, NY	[R]10	[R]6	[R]10	4	9	5	5	6	3	4	3	2	6
Albuquerque, NM	[R]21	[R]2	21	8	5	0	0	1	0	0	0	0	1
Allentown-Bethlehem-Easton, PA	9	[R]23	[R]5	10	14	3	6	[R]3	[R]9	6	13	18	20
Atlanta, GA	18	[R]69	[R]10	42	23	[R]20	[R]36	[R]15	[R]35	[R]25	[R]31	[R]50	61
Austin-San Marcos, TX	[R]3	[R]19	[R]1	4	3	1	2	4	[R]10	0	0	5	8
Bakersfield, CA	[R]14	[R]94	[R]8	[R]99	[R]113	100	97	98	[R]105	109	55	[R]76	88
Baltimore, MD	[R]20	[R]40	[R]17	29	50	23	48	41	36	28	30	51	40
Baton Rouge, LA	10	[R]26	[R]7	28	11	5	[R]6	7	15	7	8	14	17
Bergen-Passaic, NJ	[R]7	0	[R]7	8	11	2	3	5	11	3	5	0	0
Birmingham, AL	[R]14	[R]27	[R]14	28	5	12	10	6	32	15	8	23	27
Boston, MA-NH	[R]24	9	[R]24	7	13	9	6	10	8	2	8	7	5
Buffalo-Niagara Falls, NY	[R]20	[R]8	[R]20	[R]7	9	3	1	4	6	3	1	13	8
Charleston-North Charleston, SC	9	[R]5	9	1	2	0	2	2	1	3	3	3	5
Charlotte-Gastonia-Rock Hill, NC-SC	[R]24	[R]42	[R]12	31	12	11	23	9	13	18	26	48	34
Chicago, IL	[R]51	[R]12	[R]45	4	22	4	3	8	21	6	9	7	12
Cincinnati, OH-KY-IN	23	[R]27	[R]19	[R]12	[R]19	[R]1	[R]6	[R]16	[R]19	[R]10	11	14	12
Cleveland-Lorain-Elyria, OH	40	[R]23	[R]27	10	23	11	13	23	24	[R]18	[R]11	20	18
Columbus, OH	12	[R]25	[R]9	4	17	5	7	10	15	16	8	19	20
Dallas, TX	[R]9	[R]35	[R]9	24	2	[R]12	[R]14	[R]27	36	12	[R]20	[R]28	23
Dayton-Springfield, OH	13	[R]20	10	13	12	2	11	14	11	18	9	19	19
Denver, CO	[R]28	[R]5	[R]22	9	6	[R]11	3	1	2	0	0	5	1
Detroit, MI	[R]29	[R]15	[R]29	11	28	8	5	[R]11	14	13	12	17	15
El Paso, TX	[R]24	[R]7	[R]19	19	7	10	7	11	[R]8	7	[R]4	[R]6	6
Fort Lauderdale, FL	18	1	[R]15	1	0	2	4	1	1	1	0	1	1
Fort Worth-Arlington, TX	[R]5	[R]19	[R]5	16	20	7	9	31	28	14	14	17	19
Fresno, CA	15	[R]83	[R]12	62	83	69	59	55	61	70	75	67	81
Gary, IN	[R]18	[R]12	[R]15	2	8	5	0	6	17	11	12	9	10
Grand Rapids-Muskegon-Holland, MI	[R]9	[R]21	8	10	26	6	3	12	17	7	8	13	20
Greensboro-Winston-Salem-High Pt, NC	[R]15	[R]29	[R]9	12	5	2	20	7	6	6	13	25	20
Greenville-Spartanburg-Anderson, SC	7	[R]19	5	2	3	5	9	5	8	7	10	[R]28	19
Harrisburg-Lebanon-Carlisle, PA	[R]6	[R]17	[R]6	10	21	1	15	12	13	3	9	22	17
Hartford, CT	15	[R]18	15	13	23	15	14	18	14	5	16	10	18
Honolulu, HI	14	0	[R]10	0	0	0	0	0	0	0	0	0	0
Houston, TX	[R]23	[R]54	[R]23	[R]51	[R]36	32	28	[R]38	66	[R]26	47	38	50
Indianapolis, IN	[R]32	[R]26	[R]27	9	12	7	9	22	19	13	12	19	21
Jacksonville, FL	[R]14	[R]3	[R]14	3	0	2	3	2	1	1	4	10	3
Jersey City, NJ	7	[R]17	7	15	[R]26	[R]11	19	[R]17	[R]18	5	9	7	17
Kansas City, MO-KS	[R]21	[R]5	21	2	11	1	4	10	22	10	18	15	5
Knoxville, TN	18	[R]62	[R]15	23	10	7	[R]25	[R]16	[R]24	[R]20	36	[R]54	59
Las Vegas, NV-AZ	[R]26	[R]7	[R]5	[R]4	[R]0	[R]1	[R]2	[R]2	[R]0	[R]2	0	0	0
Little Rock-North Little Rock, AR	7	[R]6	7	1	3	0	2	2	7	1	1	2	6
Los Angeles-Long Beach, CA	38	[R]27	38	173	[R]168	175	134	139	113	94	60	56	27
Louisville, KY-IN	26	[R]44	[R]20	10	15	2	[R]23	27	[R]22	[R]11	[R]14	[R]27	40
Memphis, TN-AR-MS	14	[R]36	[R]12	24	9	14	15	10	21	19	17	27	36
Miami, FL	12	[R]5	[R]12	1	1	3	6	1	2	1	3	8	5
Middlesex-Somerset-Hunterdon, NJ	[R]5	[R]26	[R]3	24	24	8	13	9	16	8	18	21	23
Milwaukee-Waukesha, WI	22	[R]18	18	8	24	3	4	9	14	5	4	10	13
Minneapolis-St. Paul, MN-WI	[R]36	[R]0	[R]20	4	2	[R]1	0	[R]2	[R]5	[R]0	0	[R]1	0
Monmouth-Ocean, NJ	4	[R]27	[R]4	21	20	[R]11	[R]24	[R]13	[R]20	[R]17	[R]21	[R]31	27

continued

Table 4-47 *continued*

	All sites		Trend sites											
	Total number of sites	AQI days > 100 (1999)	Number of trend sites	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Nashville, TN	21	[R]45	[R]16	[R]29	[R]12	6	18	21	[R]26	[R]22	20	30	33
Nassau-Suffolk, NY	[R]7	[R]18	[R]7	20	25	[R]7	[R]17	[R]15	[R]10	[R]8	[R]12	[R]11	18
New Haven-Meriden, CT	[R]9	[R]16	[R]9	17	29	10	17	14	14	8	19	10	16
New Orleans, LA	[R]10	[R]18	[R]10	6	2	5	6	8	20	8	7	7	18
New York, NY	[R]30	[R]27	29	36	49	10	19	21	19	15	23	17	24
Newark, NJ	12	[R]21	12	23	35	10	13	13	20	12	13	23	21
Norfolk-VA Beach-Newport News, VA-NC	12	[R]16	[R]10	8	7	8	19	6	6	4	17	15	16
Oakland, CA	29	[R]6	[R]18	4	4	3	4	3	12	11	0	11	5
Oklahoma City, OK	[R]10	[R]6	10	4	4	2	2	5	13	2	4	7	6
Omaha, NE-IA	12	5	9	1	0	0	1	1	1	1	0	5	5
Orange County, CA	[R]12	[R]1	11	45	35	35	25	15	9	9	3	6	1
Orlando, FL	13	[R]4	[R]11	4	1	4	4	3	1	1	4	11	4
Philadelphia, PA-NJ	44	[R]32	36	39	49	24	51	26	30	22	32	37	32
Phoenix-Mesa, AZ	[R]51	37	[R]25	12	11	13	16	10	22	17	12	17	12
Pittsburgh, PA	[R]42	[R]26	[R]42	19	21	9	13	19	25	11	[R]21	39	23
Ponce, PR	1	0	1	0	0	0	0	0	0	0	0	0	0
Portland-Vancouver, OR-WA	[R]15	[R]2	[R]15	11	[R]9	6	0	2	2	6	0	3	2
Providence-Fall River-Warwick, RI-MA	[R]12	[R]13	[R]9	13	20	5	7	7	11	4	10	4	7
Raleigh-Durham-Chapel Hill, NC	[R]17	[R]29	[R]5	15	5	0	11	2	1	1	13	21	26
Richmond-Petersburg, VA	11	[R]25	[R]11	6	18	8	30	13	19	5	21	28	25
Riverside-San Bernardino, CA	[R]47	[R]97	[R]36	[R]159	154	174	168	149	124	119	[R]105	[R]95	93
Rochester, NY	8	[R]9	8	5	16	2	0	1	6	0	6	4	9
Sacramento, CA	33	[R]48	[R]20	[R]61	[R]46	[R]51	[R]20	[R]36	[R]41	[R]42	[R]15	[R]27	38
St. Louis, MO-IL	[R]55	[R]29	[R]55	23	32	15	9	32	34	20	15	23	29
Salt Lake City-Ogden, UT	[R]24	[R]5	[R]13	5	20	9	5	[R]12	4	8	1	12	2
San Antonio, TX	[R]4	[R]9	[R]4	4	3	1	3	4	18	3	3	6	9
San Diego, CA	[R]27	[R]17	23	96	67	66	58	46	48	31	14	33	16
San Francisco, CA	11	0	9	0	0	0	0	0	2	0	0	0	0
San Jose, CA	[R]9	[R]4	8	7	11	3	4	2	10	7	0	5	2
San Juan-Bayamon, PR	[R]21	[R]3	[R]11	0	0	0	0	0	0	1	2	1	1
Scranton-Wilkes Barre-Hazleton, PA	11	[R]12	11	9	17	3	10	7	12	4	11	7	12
Seattle-Bellevue-Everett, WA	[R]24	[R]1	[R]17	9	4	3	0	3	0	6	1	3	1
Springfield, MA	13	[R]10	13	13	15	12	13	12	9	5	10	7	10
Syracuse, NY	[R]7	[R]4	[R]7	1	[R]12	2	4	[R]1	[R]5	0	[R]2	[R]3	4
Tacoma, WA	9	[R]0	[R]8	5	1	2	0	2	0	1	0	4	0
Tampa-St. Petersburg-Clearwater, FL	[R]40	[R]9	[R]26	6	1	[R]2	1	3	2	3	4	11	9
Toledo, OH	6	[R]9	[R]5	3	6	2	7	9	9	11	4	5	4
Tucson, AZ	[R]21	[R]2	20	1	0	1	1	[R]0	3	0	1	0	2
Tulsa, OK	11	[R]14	11	16	12	1	4	12	21	14	7	9	14
Ventura, CA	15	[R]23	12	70	87	54	[R]43	63	[R]66	62	[R]45	29	22
Washington, DC-MD-VA-WV	[R]42	[R]39	[R]40	25	48	14	[R]52	20	29	18	29	[R]47	39
West Palm Beach-Boca Raton, FL	[R]7	[R]1	6	0	0	0	3	0	0	0	0	2	1
Wilmington-Newark, DE-MD	10	[R]21	[R]9	9	12	[R]12	[R]29	[R]24	[R]27	[R]13	[R]21	[R]24	21
Youngstown-Warren, OH	15	[R]13	[R]14	3	14	[R]10	[R]10	[R]5	[R]12	[R]8	[R]10	[R]22	12

KEY: 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) 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 unhealthful range on that day. In 1999, 4,184 monitoring sites reported air quality data. Air quality monitoring sites are selected as "trend sites" if they have complete data for at least 8 of the 10 years between 1990 and 1999.

SOURCE: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1999* (Research Triangle Park, NC: 2001), table A-17.

Table 4-48: Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants (Condensed nonattainment area list as of September 2000)

Ref. no.	States	Consolidated nonattainment area name [a]	Number of areas in nonattainment [c,d]						Area population, in 1000s [k]					
			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	.	.		222		170		222
2	AK	Fairbanks	.	1	.	.	.	.		30				30
3	AK	Juneau	.	.	.	1	.	.				12		12
4	AL	Birmingham	1	.	.	.	.	.	751					751
5	AZ	Ajo	.	.	1	1	.	.			6	6		6
6	AZ	Bullhead City	.	.	.	1	.	.				5		5
7	AZ	Douglas	.	.	1	1	.	.			13	13		13
8	AZ	Miami-Hayden	.	.	2	1	.	.			3	3		3
9	AZ	Morenci	.	.	1	.	.	.			8			8
10	AZ	Nogales	.	.	.	1	.	.				19		19
11	AZ	Paul Spur	.	.	.	1	.	.				1		1
12	AZ	Payson	.	.	.	1	.	.				8		8
13	AZ	Phoenix	1	1	.	1	.	.	2,092	2,006		2,122		2,122
14	AZ	Rillito	.	.	.	1	.	.				0		0
15	AZ	San Manuel	.	.	1	.	.	.			5			5
16	AZ	Yuma	.	.	.	1	.	.				54		54
17	CA	Imperial Valley	.	.	.	1	.	.				92		92
18	CA	Los Angeles-South Coast Air Basin	1	1	.	1	.	.	13,000	13,000		13,000		13,000
19	CA	Mono Basin (in Mono Co.)	.	.	.	1	.	.				0		0
20	CA	Owens Valley	.	.	.	1	.	.				18		18
21	CA	Sacramento Metro	1	.	.	1	.	.	1,639			1,041		1,639
22	CA	San Diego	1	.	.	.	.	.	2,498					2,498
23	CA	San Francisco-Oakland-San Jose	1	.	.	.	.	.	5,815					5,815
24	CA	San Joaquin Valley	1	.	.	1	.	.	2,742			2,742		2,742
25	CA	Santa Barbara-Santa Maria-Lompoc	1	.	.	.	.	.	370					370
26	CA	Searles Valley	.	.	.	1	.	.				30		30
27	CA	Southeast Desert Modified AQMA	1	.	.	2	.	.	384			349		384
28	CA	Ventura Co.	1	.	.	.	.	.	669					669
29	CO	Aspen	.	.	.	1	.	.				5		5
30	CO	Denver-Boulder	.	1	.	1	.	.		1,800		1,836		1,836
31	CO	Fort Collins	.	1	.	.	.	.		106				106
32	CO	Lamar	.	.	.	1	.	.				8		8
33	CO	Pagosa Springs	.	.	.	1	.	.				1		1
34	CO	Steamboat Springs	.	.	.	1	.	.				6		6
35	CO	Telluride	.		.	1	.	.				1		1
36	CT	Greater Connecticut	1	.	.	1	.	.	2,470			126		2,470
37	DC-MD-VA	Washington	1	.	.	.	.	.	3,923					3,923
38	GA	Atlanta	1	.	.	.	.	.	2,653					2,653
39	GU [b]	Piti Power Plant	.	.	1	.	.	.			0			0
40	GU [b]	Tanguisson Power Plant	.	.	1	.	.	.			0			0
41	ID	Bonner Co.(Sandpoint)	.	.	.	1	.	.				26		26
42	ID	Fort Hall Indian Reservation	.	.	.	1	.	.				1		1
43	ID	Portneuf Valley	.	.	.	1	.	.				74		74
44	ID	Shoshone Co.	.	.	.	2	.	.				13		13
45	IL-IN	Chicago-Gary-Lake County	1	.	1	3	.	.	7,887		475	625		7,887
46	KY	Boyd Co. (Ashland)	.	.	[g]1	.	.	.			51			51
47	KY-IN	Louisville	1	.	.	.	.	.	834					834
48	LA	Baton Rouge	1	.	.	.	.	.	559					559
49	MA	Springfield (W. Mass)	1	.	.	.	.	.	812					812
50	MD	Baltimore	1	.	.	.	.	.	2,348					2,348
51	MD	Kent and Queen Anne Cos.	1	.	.	.	.	.	52					52
52	MN	Minneapolis-St. Paul	.	.	.	1	.	.				272		272
53	MN	Olmsted Co. (Rochester)	.	.	1	.	.	.			71			71
54	MO	Dent	.	.	.	.	1	.					3	3
55	MO	Liberty-Arcadia	.	.	.	.	1	.					2	2
56	MO-IL	St. Louis	1	.	.	.	[h]1	.	2,390				2	2,390
57	MT	Butte	.	.	.	1	.	.				33		33
58	MT	Columbia Falls	.	.	.	1	.	.				3		3
59	MT	Kalispell	.	.	.	1	.	.				12		12
60	MT	Lame Deer	.	.	.	1	.	.				1		1
61	MT	Lewis & Clark (E. Helena)	.	.	1	.	[i]1	.			2		2	2
62	MT	Libby	.	.	.	1	.	.				3		3
63	MT	Missoula	.	1	.	1	.	.		43		43		43
64	MT	Polson	.	.	.	1	.	.				3		3
65	MT	Ronan	.	.	.	1	.	.				2		2
66	MT	Thompson Falls	.	.	.	1	.	.				1		1
67	MT	Whitefish	.	.	.	1	.	.				3		3
68	MT	Yellowstone Co. (Laurel)	.	.	1	.	.	.			5			5
69	NE	Douglas Co. (Omaha)	.	.	.	.	1	.					1	1

continued

Table 4-48 *continued*

Ref. no.	States	Consolidated nonattainment area name [a]	Number of areas in nonattainment [c,d]						Area population, in 1000s [k]					
			O_3 [e]	CO	SO_2	PM-10	Pb	NO_2	O_3	CO	SO_2	PM-10	Pb	Total exposed
70	NM	Anthony	.	.	.	1	.	.				2		2
71	NM	Grant Co.	.	.	1	.	.	.			28			28
72	NM	Sunland Park	[f]1	.	.	.	.	.	8					8
73	NV	Central Steptoe Valley	.	.	1	.	.	.			2			2
74	NV	Las Vegas	.	1	.	1	.	.		258		741		741
75	NV	Reno	.	1	.	1	.	.		134		254		254
76	NY-NJ-CT	New York-N. New Jersey-Long Island	1	1	.	1	.	.	17,943	12,338		1,488		17,943
77	OH	Cleveland-Akron-Lorain	.	.	1	1	.	.			1,412	1,412		1,412
78	OH	Jefferson Co. (Steubenville)	.	.	.	1	.	.				4		4
79	OH	Lucas Co. (Toledo)	.	.	1	.	.	.			462			462
80	OR	Grants Pass	.	1	.	1	.	.		17		17		17
81	OR	Klamath Falls	.	1	.	1	.	.		18		18		18
82	OR	LaGrande	.	.	.	1	.	.				12		12
83	OR	Lakeview	.	.	.	1	.	.				3		3
84	OR	Medford	.	1	.	1	.	.		62		63		63
85	OR	Oakridge	.	.	.	1	.	.				3		3
86	OR	Springfield-Eugene	.	.	.	1	.	.				157		157
87	PA	Lancaster	1	.	.	.	.	.	423					423
88	PA	Pittsburgh-Beaver Valley	1	.	2	1	.	.	2,468		446	75		2,468
89	PA	Warren Co	.	.	2	.	.	.			22			22
90	PA-DE-NJ-MD	Philadelphia-Wilmington-Trenton	1	.	.	.	.	.	6,010					6,010
91	PA-NJ	Allentown-Bethlehem		.	1						91			91
92	PR	Guaynabo Co.	.	.	.	1	.	.				85		85
93	TN	Shelby Co. (Memphis)	.	.	.	.	[j]1	.					826	826
94	TX	Beaumont-Port Arthur	1	.	.	.	.	.	361					361
95	TX	Dallas-Fort Worth	1	.	.	.	.	.	3,561					3,561
96	TX	El Paso	1	1	.	1	.	.	592	54		515		592
97	TX	Houston-Galveston-Brazoria	1	.	.	.	.	.	3,731					3,731
98	UT	Ogden	.	1	.	1	.	.		63		63		63
99	UT	Salt Lake City	.	.	1	1	.	.			725	725		725
100	UT	Tooele Co.	.	.	1	.	.	.			26			26
101	UT	Utah Co. (Provo)	.	1	.	1	.	.		85		263		263
102	WA	Olympia-Tumwater-Lacey	.	.	.	1	.	.				63		63
103	WA	Seattle-Tacoma	.	.	.	3	.	.				730		730
104	WA	Spokane	.	1	.	1	.	.		279		177		279
105	WA	Wallula	.	.	.	1	.	.				47		47
106	WA	Yakima	.	.	.	1	.	.				54		54
107	WI	Manitowoc Co.	1	.	.	.	.	.	80					80
108	WI	Marathon Co. (Wausau)	.	.	1	.	.	.			115			115
109	WI	Milwaukee-Racine	1	.	.	.	.	.	1,735					1,735
110	WI	Oneida Co. (Rhinelander)	.	.	1	.	.	.			31			31
111	WV	Follansbee	.	.	.	1	.	.				3		3
112	WV	New Manchester Gr. (in Hancock Co)	.	.	1	.	.	.			10			10
113	WV	Wier.-Butler-Clay (in Hancock Co)	.	.	1	1	.	.			25	22		25
114	WY	Sheridan	.	.	.	1	.	.				13		13
National totals (114 areas)[c]			31	17	28	76	6	0	90,800	30,515	[R]4,034	29,792	836	100,593

KEY: CO = carbon monoxide; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; PM-10 = particulate matter smaller than 10 microns; SO_2 = sulfur dioxide; . = all areas in attainment for a partical 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.
Note that there are no areas in nonattainment for NO_2.

[e] 1-hour ozone standard.

[f] Ozone nonattainment area is a portion of Dona Ana County, New Mexico.

[g] SO_2 nonattainment area is a portion of Boyd County, Kentucky.

[h] Lead nonattainment area is Herculaneum, Missouri in Jefferson County.

[I] Lead nonattainment area is a portion of Lewis and Clark County, Montana.

[J] Lead nonattainment area is a portion of Shelby County, Tennessee.

[k] Population figures were obtained from the 1990 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 1-114 do not indicate ranking.

SOURCE: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1999* (Research Triangle Park, NC: 2001), table A-19. Internet website http://www.epa.gov/airs/nonattn.html as of Aug. 7, 2001.

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[P]
Industrial[R]	**452.7**	**439.8**	**455.1**	**452.9**	**463.3**	**461.1**	**476.1**	**481.5**	**469.5**	**465.8**	**465.7**
Residential[R]	**257.0**	**261.6**	**261.8**	**278.4**	**275.8**	**277.9**	**293.9**	**292.8**	**293.7**	**298.8**	**313.4**
Commercial[R]	**210.3**	**210.4**	**210.8**	**217.2**	**220.4**	**224.6**	**233.1**	**245.4**	**250.4**	**253.1**	**267.8**
Transportation	**431.8**	**[R]424.2**	**431.1**	**436.4**	**[R]449.3**	**[R]457.8**	**[R]468.9**	**473.6**	**[R]481.5**	**[R]499.4**	**514.8**
Motor Gasoline	[R]260.5	259.2	[R]263.0	268.9	273.3	279.0	284.0	286.5	[R]292.5	[R]299.7	301.5
Liquid Petroleum Gas	0.4	0.3	0.3	0.3	0.6	0.3	0.3	0.2	[R]0.3	[R]0.2	0.2
Jet Fuel	60.1	58.1	57.6	58.1	60.4	60.0	62.7	63.3	64.2	66.3	68.5
Distillate Fuel	75.7	72.6	75.3	77.3	82.5	85.1	89.7	93.5	96.4	[R]101.9	106.6
Residual Fuel	21.9	22.0	23.0	19.4	19.1	19.7	18.4	15.5	15.2	[R]17.0	23.1
Lubricants	1.8	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.8	1.8	1.8
Aviation Gas	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total Petroleum	*421.2*	*414.6*	*421.6*	*426.4*	*438.2*	*446.5*	*457.4*	*461.5*	*[R]471.2*	*[R]487.6*	*502.5*
Natural Gas	*9.8*	*9.0*	*8.8*	*9.3*	*10.2*	*10.4*	*10.6*	*[R]11.3*	*9.5*	*[R]11.0*	*11.4*
Electricity	*0.7*	*0.7*	*0.7*	*0.7*	*0.9*	*0.8*	*0.8*	*0.8*	*0.9*	*[R]0.9*	*0.9*
Total CO_2 Emissions from End-Use Sector Energy Consumption[R]	**1,351.7**	**1,336.0**	**1,358.7**	**1,384.8**	**1,408.8**	**1,421.3**	**1,471.9**	**1,493.3**	**1,495.2**	**1,517.1**	**1,561.7**
Total U.S. CO_2 Emissions[R]	**1,355.3**	**1,341.2**	**1,367.2**	**1,399.2**	**1,424.8**	**1,438.2**	**1,487.7**	**1,509.0**	**1,510.9**	**1,535.7**	**1,583.3**

KEY: R = revised, P = preliminary.

NOTES: Electric utility emissions are distributed across end-use sectors. Previously, the emissions due to nonutility electricity consumption used to be allocated to the industrial sector. Starting in 2000, the nonutility electric emissions were distributed across sectors for all the years reported.

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 2000,* personal communication.

Table 4-50: Petroleum Oil Spills Impacting Navigable U.S. Waterways

	1985		1990		1995		1996		1997		1998		1999		2000	
Source	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**	**Incidents**	**Gallons spilled**
Vessel sources																
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
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
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
Total vessel sources	**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**
Nonvessel sources																
Offshore pipelines	23	17,977	73	46,228	7	1,143	4	386	13	810	10	843	5	35,707	4	17
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
Other[b]	2,417	2,473,212	2,435	1,091,544	1,086	946,328	1,061	429,911	1,324	R277,143	1,508	198,853	1,590	515,241	1,620	356,740
Total nonvessel sources	**2,802**	**3,250,229**	**2,584**	**1,408,472**	**1,116**	**958,222**	**1,078**	**1,408,303**	**1,356**	**R501,265**	**1,553**	**246,716**	**1,615**	**551,381**	**1,645**	**373,761**
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**
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**	**R942,574**	**8,315**	**885,303**	**8,539**	**1,172,449**	**8,354**	**1,431,370**

KEY: R = revised.

[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 facilties, 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 2000, personal communication, Sept. 12, 2001.

Table 4-51: Leaking Underground Storage Tank Releases and Cleanups

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total confirmed releases	**87,528**	**127,195**	**184,457**	**237,022**	**270,567**	**303,635**	**317,488**	**341,773**	**371,387**	**397,821**	**412,392**
Cleanups initiated	51,770	79,506	129,074	171,082	209,797	238,671	252,615	292,446	314,965	346,300	367,603
Cleanups not initiated	35,758	47,689	55,383	65,940	60,770	64,964	64,873	49,327	[R]56,422	51,521	44,789
Cleanups completed	16,905	26,666	55,444	87,065	107,448	131,272	152,683	178,297	203,247	228,925	249,759
Releases not cleaned up	70,623	100,529	129,013	149,957	163,119	172,363	164,805	163,476	[R]168,140	168,896	162,633

NOTES:
All numbers are cumulative.
Data represents fiscal year, October 1 through September 30.

SOURCES:
1990-97: U.S. Environmental Protection Agency, Office of Underground Storage Tanks, personal communications, November 17 and November 18, 1998.
1998-00: Ibid., Internet site http://www.epa.gov/swerust1/cat/camarchv.htm as of Aug. 14, 2001.

Table 4-52: Highway Noise Barrier Construction (Miles)

	Unknown	1970-79	1980-89	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total 1970-98
Type I barriers[a]	[d]6	102	419	44	78	113	62	48	87	34	47	114	[R]1,147
Type II barriers[b]	0	70	128	19	18	18	22	16	32	15	31	22	391
All other types[c]	N	2	28	0	U	U	U	U	6	0	1	1	79
Total length	**6**	**175**	**575**	**63**	**96**	**131**	**84**	**64**	**125**	**49**	**78**	**137**	**1,623**
Cost (1998 $ millions)	N	134	656	89	144	186	118	112	152	60	111	169	1,931

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

[a] A Type I barrier is built on a highway project to construct a new highway or to physically alter an 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: Miles have been converted from kilometers.
Totals may not match the sum of yearly estimates due to rounding and converting from metric. 24 miles of barriers, while assigned a year of construction, cannot be assigned a cost. Data are produced on a 3-year cycle.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Environment *a*nd Planning, *HighwayTraffic Noise Barrier Construction Trends* (Washington, DC: 2000), 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)

	Exposure		
Year	People (millions)	Percent of U.S. resident population	U.S. resident population (millions)
1975	7.0	3.2	215.5
1980	5.2	2.3	227.2
1985	3.4	1.4	237.9
1990	2.7	1.1	249.4
1995	1.7	0.6	262.8
1996	1.6	0.6	265.2
1998	[R]0.7	[R]0.3	[R]270.2
1999	0.6	0.2	272.7

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 FNL 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. 1980–99 estimates were made by FAA. See the source and accuracy statement for more details on how exposure estimates are made.

SOURCES:

Exposure:

U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy (AEE-12), personal communication, Nov. 15, 2001.

Population:

U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 2.

Table 4-54: Motor Vehicles Scrapped[a] (Thousands)

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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
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
Total motor vehicles	**8,298**	**6,577**	**10,137**	**9,829**	**11,074**	**10,849**	**12,781**	**8,414**	**12,369**	**10,332**	**10,811**	**12,509**	**11,665**	**11,664**	**14,299**

[a] Data are for the period July 1 to June 30 of the given year.

NOTE: Figures represent vehicles that are not re-registered.

SOURCE: The Polk Co., personal communication, Aug. 20, 2001.

Appendix A

Modal Profiles

Air Carrier Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	[R]1999	[P]2000
Operating revenues (thousand dollars)											
Domestic total[a,b]	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	98,689,586
Majors, all services	[f]1,942,635	[f]6,272,775	[g]23,012,073	[i]53,333,552	[i]59,846,676	[i]64,317,169	[i]70,036,709	[i]74,942,391	[i]77,650,810	[i]82,615,015	[i]89,103,057
Nationals, all services	146,481	736,831	3,182,418	[j]4,167,552	[j]5,465,021	[j]5,935,773	[j]5,990,391	[j]6,163,458	[j]8,113,690	[j]7,789,636	[j]9,016,171
Large regionals, all services	N	N	245,806	[k]459,404	[k]637,296	[k]632,108	[k]863,426	[k]1,143,719	[k]729,289	[k]526,828	[k]570,359
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	30,773,164
Majors, all services	705,938	2,109,497	[h]5,976,221	[i]16,761,376	[i]19,222,842	[i]19,892,111	[i]21,524,274	[i]23,608,853	[i]23,356,233	[i]24,671,152	[i]27,532,228
Nationals, all services	N	N	465,923	[j]901,352	[j]2,697,137	[j]3,282,606	[j]3,326,467	[j]3,376,014	[j]3,161,212	[j]3,142,217	[j]2,853,515
Large regionals, all services	N	N	N	[k]327,627	[k]444,450	[k]258,766	[k]196,079	[k]333,166	[k]453,844	[k]293,604	[k]387,420
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	129,462,750
Operating expenses (thousand dollars)											
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	93,111,990
Majors, all services	1,907,785	6,256,039	[g]23,150,527	[i]54,209,401	[i]57,824,115	[i]59,721,080	[i]64,793,763	[i]68,307,270	[i]70,114,852	[i]76,506,077	[i]83,784,507
Nationals, all services	144,309	745,629	3,058,289	[j]4,297,823	[j]5,285,783	[j]5,750,372	[j]5,847,797	[j]6,163,923	[j]7,500,451	[j]7,299,934	[j]8,726,001
Large regionals, all services	N	N	257,183	[k]445,862	[k]648,039	[k]648,247	[k]931,513	[k]1,260,021	[k]773,212	[k]522,309	[k]601,482
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	29,276,999
Majors, all services	665,660	2,065,605	[h]6,171,366	[i]17,746,006	[i]18,875,302	[i]19,061,258	[i]20,807,517	[i]21,688,642	[i]22,321,441	[i]23,218,938	[i]26,268,247
Nationals, all services	N	N	470,729	[j]853,361	[j]2,503,462	[j]3,025,707	[j]3,166,097	[j]3,253,249	[j]3,014,282	[j]2,815,341	[j]2,609,008
Large regionals, all services	N	N	N	[k]315,113	[k]463,257	[k]248,292	[k]181,589	[k]307,702	[k]413,029	[k]272,819	[k]399,744
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	122,388,989
Inventory[c]											
Number of carriers[e]											
Total domestic and international[l]	55	39	66	59	80	89	90	82	[R]80	82	75
Majors	N	N	14	12	11	11	12	13	13	13	14
Nationals	N	N	18	15	23	27	31	31	[R]27	31	32
Regionals	N	N	34	32	46	51	47	38	40	38	29
Number of aircraft available for service											
Total domestic and international[m]	2,135	2,690	2,818	4,727	5,221	5,567	5,961	5,770	6,144	6,254	6,522
Majors	N	N	2,071	3,854	4,085	4,039	4,422	4,352	4,605	4,711	5,118
Nationals	N	N	432	650	819	1,143	1,167	967	1,113	1,319	1,182
Regionals	N	N	315	223	317	385	372	451	426	224	222
Number of employees											
Total domestic and international[l]	169,872	304,690	354,264	588,926	585,427	610,363	634,866	656,243	[R]696,408	728,495	732,049
Majors	118,189	214,021	318,973	549,100	526,379	533,313	564,631	597,953	623,389	650,267	672,294
Nationals	12,470	24,913	29,922	32,077	46,670	59,444	56,586	47,662	[R]59,620	68,138	56,056
Regionals	N	N	5,369	7,749	12,378	17,606	13,649	10,628	13,399	10,090	3,699

continued

Air Carrier Profile *continued*

Performance	1960	1970	1980	1990	1994	1995	1996	1997	1998	[R]1999	[P]2000
Aircraft revenue-miles (thousands)											
Domestic[b]											
Certificated, all services[a]	[n]858,451	[n]2,067,598	[o]2,523,375	[p]3,963,263	[p]4,379,830	[p]4,629,394	[p]4,811,453	[p]4,910,948	[p]5,034,691	[p]5,332,483	[p]5,645,804
Major, all services[a]	716,961	1,778,065	2,113,669	[q]3,547,339	[q]3,760,064	[q]3,953,287	[q]4,083,664	[q]4,191,113	[q]4,260,052	[q]4,598,092	[q]4,784,789
Nationals, all services[a]	94,794	247,055	330,528	[r]351,946	[r]519,312	[r]569,641	[r]614,519	[r]594,241	[r]702,913	[r]668,646	[r]796,777
Large regionals, all services[a]	N	N	56,995	[s]60,542	[s]78,573	[s]85,363	[s]96,573	[s]112,682	[s]51,199	[s]47,438	[s]45,651
International											
Certificated, all services[a]	181,605	474,666	[t]400,971	[u]760,338	[u]979,765	[u]997,658	[u]1,043,313	[u]1,113,816	[u]1,192,489	[u]1,225,218	[u]1,272,885
Major, all services[a]	N	N	330,391	[v]666,231	[v]809,242	[v]822,283	[v]859,483	[v]917,109	[v]1,003,726	[v]1,053,219	[v]1,115,278
Nationals, all services[a]	N	N	66,499	[w]48,812	[w]119,839	[w]141,870	[w]150,147	[w]145,821	[w]145,494	[w]138,135	[w]125,806
Large regionals, all services[a]	N	N	2,948	[x]60,542	[x]41,067	[x]27,761	[x]22,519	[x]47,138	[x]40,398	[x]29,474	[x]27,520
Medium regionals, all services, Domestic and international[a]	N	N	23,204	[y]9,017	[y]31,500	[y]28,847	[y]27,861	[y]16,660	[y]21,024	[y]22,697	[y]22,868
Total certificated[a]	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	6,918,689
Aircraft revenue-hours											
Domestic[b]											
Certificated, all services[a]	3,672,900	5,133,161	[o]6,247,795	[p]9,717,375	[p]10,721,374	[p]11,378,134	[p]11,871,886	[p]12,060,253	[p]12,445,483	[p]13,091,273	[p]13,839,361
Major, all services[a]	2,802,317	4,066,480	4,941,327	[q]8,524,236	[q]8,864,840	[q]9,257,260	[q]9,584,525	[q]9,828,418	[q]9,957,390	[q]10,863,178	[q]11,309,022
Nationals, all services[a]	606,146	908,935	919,187	[r]1,016,491	[r]1,579,771	[r]1,839,835	[r]1,981,219	[r]1,882,975	[r]2,299,916	[r]2,053,335	[r]2,373,156
Large regionals, all services[a]	N	N	267,522	[s]167,826	[s]223,951	[s]223,007	[s]260,985	[s]315,506	[s]143,197	[s]126,602	[s]110,686
International											
Certificated, all services[a]	608,736	977,325	[t]819,518	[u]1,556,760	[u]1,978,381	[u]2,021,060	[u]2,113,467	[u]2,235,441	[u]2,394,095	[u]2,456,726	[u]2,574,483
Major, all services[a]	N	N	668,199	[v]1,351,349	[v]1,607,155	[v]1,634,465	[v]1,712,416	[v]1,819,583	[v]1,992,776	[v]2,090,817	[v]2,223,900
Nationals, all services[a]	N	N	140,329	[w]101,533	[w]251,902	[w]314,066	[w]329,311	[w]309,948	[w]311,540	[w]290,582	[w]283,008
Large regionals, all services[a]	N	N	7,583	[x]88,641	[x]97,967	[x]59,572	[x]48,619	[x]97,304	[x]83,437	[x]62,658	[x]58,565
Medium regionals, all services, Domestic and international[a]	N	N	123,411	[y]24,059	[y]74,169	[y]70,989	[y]68,278	[y]41,960	[y]51,322	[y]60,827	[y]55,507
Total certificated[a]	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	16,413,844
Revenue passenger-miles (thousands)											
Domestic[b]											
Certificated, all services	31,098,944	108,441,978	[o]204,367,599	[p]34,872,950	[p]388,398,689	[p]403,887,802	[p]434,651,687	[p]450,612,482	[p]463,262,198	[p]488,356,869	[p]515,367,414
Majors, all services	29,430,428	99,903,229	182,984,795	[q]327,112,620	[q]352,063,855	[q]368,701,100	[q]395,099,254	[q]410,906,050	[q]421,217,665	[q]451,399,646	[q]472,284,794
Nationals, all services	1,170,779	7,642,071	20,466,712	[r]16,756,818	[r]31,339,182	[r]29,255,179	[r]33,000,546	[r]33,241,082	[r]37,699,063	[r]33,267,469	[r]39,335,123
Large regionals, all services	N	N	711,868	[s]1,752,615	[s]3,757,414	[s]4,381,267	[s]5,443,071	[s]5,778,338	[s]3,124,802	[s]2,627,816	[s]2,729,491

continued

Air Carrier Profile *continued*

Performance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	R1999	P2000
International											
Certificated, all services	[n]8,950,672	[n]39,695,392	[t]63,354,387	[u]126,362,697	[u]149,107,689	[u]154,869,249	[u]161,512,010	[u]169,356,100	[u]172,255,197	[u]180,269,038	[u]192,611,975
Majors, all services	N	N	54,318,160	[v]118,268,507	[v]133,299,897	[v]137,986,520	[v]145,330,811	[v]153,564,956	[v]157,398,986	[u]168,175,060	[v]181,585,899
Nationals, all services	N	N	8,659,592	[w]6,794,533	[w]13,459,194	[w]16,128,695	[w]14,681,127	[w]13,616,245	[w]13,471,798	[w]9,649,710	[w]7,793,324
Large regionals, all services	N	N	330,288	[x]1,219,706	[x]1,964,944	[x]676,925	[x]505,337	[x]2,148,486	[x]1,097,330	[x]2,145,931	[x]3,035,864
Medium regionals, all services, Domestic and international[a]	N	N	250,571	[y]330,848	[y]1,621,892	[y]1,627,365	[y]2,103,551	[y]713,425	[y]1,507,751	[y]1,360,275	[y]1,214,894
Total certificated[a]	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	707,979,389
Average passenger revenue/passenger-mile (Domestic, scheduled service)	6.09	6.00	11.49	13.43	13.12	13.48	13.76	13.97	14.08	13.72	14.37
Average passenger fare (Domestic, scheduled service)	30.01	40.65	84.60	107.86	103.21	106.66	110.37	114.10	114.34	113.75	120.24
Revenue passenger enplanements (thousands)											
Domestic[b]											
Certificated, all services[a]	[n]56,352	[n]153,662	[o]275,182	[p]428,767	[p]489,351	[p]506,789	[p]538,394	[p]548,735	[p]566,951	[p]589,170	[p]615,771
Major, all services[a]	48,678	122,866	223,237	[q]393,927	[q]428,328	[q]441,650	[q]466,743	[q]478,253	[q]486,903	[q]519,760	[q]537,394
Nationals, all services[a]	5,949	26,726	47,145	[r]32,015	[r]53,361	[r]55,656	[r]62,183	[r]61,316	[r]74,281	[r]65,072	[r]74,606
Large regionals, all services[a]	N	N	3,748	[s]2,566	[s]6,138	[s]7,136	[s]7,887	[s]8,203	[s]4,352	[s]3,152	[s]2,448
International											
Certificated, all services[a]	5,904	16,620	[t]26,514	[u]46,126	[u]51,330	[u]52,864	[u]54,515	[u]56,767	[u]57,759	[u]57,702	[u]60,729
Major, all services[a]	N	N	23,949	[v]42,207	[v]42,702	[v]44,155	[v]46,302	[v]48,614	[v]49,610	[v]50,604	[v]53,151
Nationals, all services[a]	N	N	2,343	[w]2,632	[w]6,608	[w]8,114	[w]7,401	[w]6,896	[w]7,038	[w]5,446	[w]5,272
Large regionals, all services[a]	N	N	149	[x]1,246	[x]1,741	[x]556	[x]405	[x]1,231	[x]940	[x]1,404	[x]2,061
Medium regionals, all services, Domestic and international[a]	N	N	1,125	[y]300	[y]1,803	[y]2,386	[y]1,988	[y]989	[y]1,586	[y]1,434	[y]1,568
Total certificated[a]	62,256	169,922	302,821	475,193	540,681	559,653	592,909	605,502	624,710	646,872	676,500
Revenue passenger Load factor (%) (scheduled service)											
Domestic[b]											
Certificated	58.5	48.9	[o]58.0	[p]60.4	64.7	[p]65.4	[p]67.9	[p]69.1	[p]70.0	[p]69.8	[p]71.2
Majors	59.5	49.3	58.1	[q]60.6	65.0	[q]65.7	[q]68.5	[q]69.7	[q]70.4	[q]70.3	[q]71.6
Nationals	41.9	43.6	58.4	[r]56.6	62.6	[r]61.9	[r]61.5	[r]63.2	[r]65.1	[r]64.7	[r]66.5
Large regionals	N	N	47.7	[s]48.7	60.0	[s]56	[s]60.4	[s]60.7	[s]58.8	[s]42.4	[s]47.4
International											
Certificated	62.2	53.0	[t]62.8	[u]69.1	70.6	[u]71.8	[u]73.3	[u]74.1	[u]72.8	[u]74.4	[u]76.0
Majors	N	N	62.8	[v]69.1	70.8	[v]72.1	[v]73.7	[v]74.4	[v]72.9	[v]74.5	[v]76.1
Nationals	N	N	65.5	[w]73.4	68.2	[w]67.7	[w]67.8	[w]69.6	[w]70.9	[w]73.7	[w]73.4
Large regionals	N	N	73.9	[x]66.5	46.8	[x]44.5	[x]0.0	[x]64.9	[x]46.0	[x]U	[x]58.0
Medium regionals, all services, Domestic and international[a]	N	N	[y]46.7	[y]0.0	53.8	[y]59.3	[y]66.7	[y]49.7	[y]58.2	[y]58.3	[y]50.8

continued

Air Carrier Profile *continued*

Performance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	[R]1999	[P]2000
U.S. international passenger travel											
Total passenger-arrivals (thousands)											
Flag of carrier											
United States	[z]1,332	[z]5,531	[AA]10,031	[AA]19,145	23,291	[BB]24,582	[AA]25,148	[AA]26,744	[AA]27,390	[AA]27,462	[AA]29,837
Foreign	1,234	4,343	10,231	17,269	20,527	22,328	24,704	27,571	28,791	30,324	32,380
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
Foreign	1,136	4,147	9,886	16,418	18,993	20,795	22,884	25,382	26,350	28,399	30,068
Total revenue ton-miles (thousands)[d]											
Domestic[b]											
Certificated, all services	[n]3,732,949	[n]13,876,802	[o]24,964,907	[p]43,651,162	50,631,589	[p]52,910,081	[p]56,326,750	[p]58,658,887	[p]60,199,459	[p]63,032,722	[p]66,297,278
Majors, all services	3,332,483	12,589,057	21,427,534	[q]39,107,033	44,952,734	[q]47,015,642	[q]50,096,661	[q]52,254,323	[q]53,424,349	[q]56,696,427	[q]59,179,586
Nationals, all services	121,157	850,477	3,336,057	[r]3,561,283	4,510,285	[r]4,996,345	[r]231,398	[r]5,317,576	[r]6,012,665	[r]5,705,158	[r]6,429,167
Large regionals, all services	N	N	180,042	[s]945,929	1,002,552	[s]718,659	[s]863,449	[s]971,942	[s]508,172	[s]507,053	[s]571,773
International											
Certificated, all services	1,291,336	6,308,701	[t]9,689,067	[u]19,975,915	24,879,791	[u]26,295,684	[u]28,177,721	[u]30,944,299	[u]31,481,513	[u]32,810,136	[u]34,723,712
Majors, all services	N	N	7,377,733	[v]17,803,825	20,681,991	[v]21,517,789	[v]22,880,295	[v]24,971,379	[v]25,794,344	[v]27,949,876	[v]30,601,951
Nationals, all services	N	N	2,261,534	[w]1,229,849	3,201,089	[w]4,116,380	[w]4,603,920	[w]4,657,365	[w]4,376,654	[w]4,257,520	[w]3,513,451
Large regionals, all services	N	N	44,438	[x]835,701	862,184	[x]513,476	[x]396,142	[x]1,240,303	[x]1,269,602	[x]566,689	[x]576,046
Medium regionals, all services											
Domestic and international[a]	N	N	28,178	[y]143,457	300,545	[y]327,474	[y]432,606	[y]190,298	[y]265,186	[y]160,135	[y]149,016
Total certificated[a]	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	101,020,990
Revenue ton-miles of freight (thousands)											
Domestic[b]											
Certificated, all services	552,756	2,708,900	[o]4,528,316	[p]9,063,864	11,802,778	[p]12,520,057	[p]12,860,845	[p]13,601,412	[p]13,839,605	[p]14,201,933	[p]14,759,988
Majors, all services	321,176	U	3,129,087	[q]6,395,767	9,746,354	[q]10,145,537	[q]10,586,741	[q]11,163,518	[q]11,302,583	[q]11,556,463	[q]11,951,106
Nationals, all services	3,850	U	1,289,510	[r]1,885,600	1,387,322	[r]2,070,570	[r]1,931,201	[r]1,993,498	[r]2,239,140	[r]2,378,206	[r]2,495,453
Large regionals, all services	N	N	108,864	[s]770,670	626,842	[s]280,512	[s]318,542	[s]398,153	[s]195,791	[s]249,706	[s]298,820
International											
Certificated, all services	[n]268,156	[n]1,566,105	[t]3,353,371	[u]7,339,660	9,970,189	[u]10,854,620	[u]12,031,634	[u]14,008,685	[u]14,262,373	[u]14,782,231	[u]15,461,273
Majors, all services	N	N	1,945,660	[v]5,976,973	7,351,998	[v]7,719,138	[v]8,347,214	[v]9,614,881	[v]10,054,448	[v]11,132,370	[v]12,443,364
Nationals, all services	N	N	1,395,575	[w]550,409	1,855,167	[w]2,549,371	[w]3,140,921	[w]3,295,738	[w]3,035,853	[w]3,291,549	[w]2,734,118
Large regionals, all services	N	N	11,409	[x]713,733	666,863	[x]445,783	[x]345,609	[x]1,025,455	[x]1,159,869	[x]352,095	[x]271,216
Medium regionals, all services,											
Domestic and international[a]	N	N	3,124	[y]110,372	138,421	[y]163,766	[y]222,251	[y]118,854	[y]114,294	[y]23,775	[y]27,184
Total certificated[a]	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	30,221,261

continued

Air Carrier Profile *continued*

Safety	1960	1970	1980	1990	1994	1995	1996	1997	1998	R1999	P2000
Air carrier fatalities											
Operating under 14 CFR 121 (airlines)											
Scheduled services	N	N	CC0	CC39	239	CC166	CC342	CC3	1	12	CC92
Nonscheduled services	N	N	1	0	0	2	38	5	0	0	0
Operating under 14 CFR 135											
Scheduled services (commuters)	N	N	37	7	25	9	14	46	0	12	5
Nonscheduled services (on–demand air taxis)	N	N	105	51	63	52	63	39	R45	38	71
Total[a]	DD499	DD146	143	58	327	229	457	93	R46	62	168
Air carrier accidents											
Operating under 14 CFR 121 (airlines)											
Scheduled services	N	N	15	22	19	34	32	44	43	48	49
Nonscheduled services	N	N	4	2	4	2	R5	5	7	4	5
Operating under 14 CFR 135											
Scheduled services (commuters)	N	N	38	15	10	12	11	R16	8	13	12
Nonscheduled services (on–demand air taxis)	N	N	171	107	85	75	90	82	77	73	80
Total[a]	DD90	DD55	R228	146	118	123	R138	R147	135	138	146
Fatal air carrier accidents											
Operating under 14 CFR 121 (airlines)											
Scheduled services	N	N	0	6	4	2	3	3	1	2	3
Nonscheduled services	N	N	1	0	0	1	2	1	0	0	0
Operating under 14 CFR 135											
Scheduled services (commuters)	N	N	8	4	3	2	1	5	0	5	1
Nonscheduled services (on–demand air taxis)	N	N	46	29	26	24	29	15	R17	12	22
Total[a]	DD17	DD8	55	39	33	29	35	24	R18	19	26

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

[a] Totals include data not in table; thus totals may not be sum of table data.
[b] 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.
[c] 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.
[d] Total Revenue Ton–Miles includes Passenger, Freight, Express, and Mail.
[e] Total includes only those carriers whose report employment statistics to BTS' Office of Airline Information.

SOURCES: Unless otherwise noted, refer to chapter tables for sources.
[f] Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), pp. 69, 71.
[g] Ibid., *Air Carrier Financial Statistics*, December 1981 (Washington, DC), pp. 3/28, 44.
[h] Ibid., pp. 42, 44.
[i] 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. 3.
[j] Ibid., p. 37 and similar pages in earlier editions.
[k] Ibid., pp. 75-76 and similar pages in earlier editions.
[l] U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, http://www.bts.gov/oai/employees/employcov.html as of Aug. 15, 2001.

[m] Ibid., personal communication, Aug. 17, 2001.
[n] Civil Aeronautics Board, *Handbook of Airline Statistics, 1973,* (Washington, DC), Part III, Tables 2, 4, 7, 13.
[o] Ibid., *Air Carrier Traffic Statistics,* December 1981 (Washington, DC), pp. 2, 5, 46, 84.
[p] 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. 2.
[q] Ibid., p. 5.
[r] Ibid., p. 64 and similar pages in earlier editions.
[s]
[t] Civil Aeronautics Board, *Air Carrier Traffic Statistics,* December 1981 (Washington, DC), pp. 3, 6, 85, 115.
[u] 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.
[v] Ibid., p. 6
[w] Ibid., p. 65 and similar pages in earlier editions.
[x] Ibid., p. 146 and similar pages in earlier editions.
[y] Ibid., p. 190 and similar pages in earlier editions.
[z] U.S. Department of Justice, Immigration and Naturalization Service, *Report of Passenger Travel Between the U.S. and Foreign Countries,* 1960, 1970 (Washington, DC).
[AA] U.S. Department of Transportation, Research and Special Programs Administration, *U.S. International Air Travel Statistics* (Washington, DC: Annual issues), tables IIa and IId.
[BB] U.S. Department of Commerce, International Trade Administration, *U.S. International Air Passenger Statistics Report,* Calendar Year 1995, (Washington, DC), tables IIa, IId.
[CC] National Transportation Safety Board, Internet site http://www.ntsb.gov/aviation/stats.htm as of Aug. 2001, tables 6 through 9.
[DD] Ibid., personal communication.

General Aviation Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Expenditures ($ millions)										
Aircraft [j]	202	339	2,853	3,398	3,910	4,260	[R]5,298	7,174	[R]9,573	11,262
Operating costs	693	1,696	5,200	[R]6,509	[R]5,422	[R]6,119	[R]6,307	[R]6,623	[R]6,799	6,291
Total	**895**	**2,035**	**8,053**	**[R]9,907**	**[R]9,332**	**[R]10,379**	**[R]11,605**	**[R]13,797**	**[R]16,372**	**17,553**
Inventory										
Number of active aircraft by primary use										
Corporate [k]	N	6,835	14,860	10,100	9,400	9,800	9,300	10,411	11,250	10,804
Business	N	26,900	49,391	33,100	26,500	26,200	28,200	27,716	32,611	24,543
Instructional	N	10,727	14,862	18,600	15,000	14,800	14,300	14,663	11,375	16,081
Personal	N	65,398	96,222	112,600	102,500	109,300	109,600	115,630	124,347	147,085
Aerial application	N	5,455	7,294	6,200	4,300	5,100	5,400	4,858	4,550	4,254
Aerial observation	N	N	N	4,900	5,100	4,700	3,200	3,311	3,242	3,240
External load	N	N	N	N	100	200	400	186	313	190
Other work [a]	N	2,054	2,813	1,400	1,200	1,100	1,100	579	1,116	2,363
Air taxi/air tours [b]	N	N	N	5,800	3,800	4,100	3,900	4,948	5,190	4,569
Sight seeing [c]	N	N	N	N	1,300	900	900	677	679	832
Other [h]	N	8,249	17,045	4,100	4,200	6,300	6,700	5,250	6,010	1,200
Public use	N	N	N	N	N	N	4,200	4,130	4,029	4,138
Total	**76,549**	**131,743**	**211,045**	**196,800**	**172,400**	**188,100**	**191,100**	**192,400**	**204,710**	**219,464**
Performance										
Number of flight hours by actual use (thousands)										
Corporate [m]	N	N	5,332	2,913	2,486	2,869	2,718	2,878	3,213	3,616
Business	[m]5,699	[m]7,204	8,434	4,417	3,012	3,191	3,152	3,006	3,523	3,598
Instructional	1,828	6,791	5,748	7,244	4,156	4,106	4,425	4,956	3,961	5,893
Personal	3,172	6,896	8,894	9,276	8,248	9,320	8,893	9,644	9,781	11,294
Aerial application	N	N	2,044	1,872	1,364	1,557	1,787	1,562	1,306	1,415
Aerial observation	N	N	N	1,745	1,746	1,385	1,036	1,261	812	1,243
External load	N	N	N	N	135	118	203	112	153	128
Other work [a]	N	N	1,053	572	241	268	262	139	286	613
Air taxi/air tours [b]	N	N	N	2,249	1,545	1,527	1,773	2,120	2,583	2,043
Sight seeing [c]	N	N	N	N	309	206	186	127	169	220
Other [h]	2,422	5,139	4,925	475	622	1,121	644	819	940	581
Public use [d]	N	N	N	N	N	N	1,021	1,096	1,373	1,111
Total	**13,121**	**26,030**	**36,430**	**30,763**	**24,092**	**25,667**	**26,100**	**27,713**	**28,100**	**31,756**
Vehicle-miles[e] (millions)	[m]1,769	[m]3,207	[m]5,204	[m]4,548	[m]3,358	[m]3,795	[m]3,524	[m]3,877	U	U
Passenger-miles[e,j] (millions)	2,300	9,100	14,700	13,000	9,800	10,800	12,000	12,500	[R]13,100	13,500
Fuel consumed[e] (million gallons)	[n]242	[n]759	[n]1,286	[n]1,016	[s]731	[s]847	[s]896	[s]934	[s]1,126	[s]1,313
Aviation gasoline	242	551	520	353	266	287	289	292	311	345
Jet fuel	N	208	766	663	464	560	608	642	815	967
Safety										
Fatalities [f]										
Corporate	N	[o]28	[p]66	[p]21	[r]5	[p]15	[p]20	[r]3	[r]0	[r]30
Business	N	148	126	80	[R]64	73	44	[R]45	42	55
Instructional	N	93	73	62	47	44	40	38	[R]38	38
Personal	N	726	808	492	[R]472	488	413	[R]432	[R]432	385
Aerial application	N	41	32	17	17	15	10	[R]17	6	14
Other	N	174	134	95	[R]132	99	105	[R]106	[R]116	113
Total	**[o]787**	**1,310**	**1,239**	**767**	**[R]725**	**734**	**632**	**[R]641**	**[R]631**	**630**
Accidents										
Fatal [q]	429	641	618	443	403	412	360	[R]352	[R]368	342
Total	**4,793**	**4,712**	**3,590**	**2,215**	**1,994**	**2,053**	**[R]1,909**	**[R]1,851**	**1,909**	**1,913**
Accident rate [g,i]										
(per 100,000 flight hours)										
Fatal	3.3	2.5	1.7	[R]1.4	[R]1.7	1.6	[R]1.4	[R]1.3	[R]1.3	1.1
Total	**36.5**	**18.1**	**9.9**	**[R]7.2**	**[R]8.3**	**[R]8.0**	**[R]7.3**	**[R]6.7**	**[R]6.8**	**6.0**

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

[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 sight seeing done under 14 CFR 91: general operating and flight rules.

[d] Federal, state or local Government-owned or leased aircraft used for the purpose of fulfilling a government position.

[e] Includes air taxi operations. Nautical miles in source multiplied by 1.151 to convert from nautical miles.

[f] Sum of fatalities does not necessarily equal total. Differences are due to methodology used to count collisions involving aircraft in different categories.

[g] Suicide/sabotage cases are included in accidents and fatalities data but are excluded from accident rates.

[h] Significant decrease in "Other" can be attributed to a redefining of the category to only include "Aerial Other" and "Medical Use."

[i] Accident rates are calculated by BTS using the formula: Accident Rates (per 100,000 flight hours) = Fatalities/Flight Hours*100.

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.

[j] Eno Transportation Foundation, Inc., Transportation in America, Annual Issues (Washington, DC), pp. 8-11, 14-15.

[k] United States. Federal Aviation Administration, General Aviation and Air Taxi Activity and Avionics Survey (Washington, DC: 1990-1999 issues), table 1.1.

[l] Ibid., table 1.6 and similar tables in earlier editions.

[m] Ibid., table 3.3 and similar tables in earlier editions.

[n] Ibid., table 5.1.

[o] National Transportation Safety Board, RE-50, personal communication.

[p] 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.

[q] Ibid., Internet site http://www.ntsb.gov/aviation/ as of Sept. 27, 2001, table 10.

[r] Ibid., personal communication, Oct. 2, 2001.

[s] U.S. Department of Transportation, Federal Aviation Administration, *FAA Aerospace Forecasts, Fiscal Years 2001-2012* (Washington, DC: March 2001), table 30.

Highway Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000
Government receipts ($ millions)											
Total federal	2,771	6,160	9,949	14,576	17,854	19,851	23,196	21,648	24,509	26,008	31,050
Highway trust fund [a]	[j]2,531	[j]5,464	[j]7,615	[j]13,380	[j]16,582	[k]18,835	[k]22,036	[k]20,500	[k]23,396	[k]25,085	[k]29,701
Other	240	696	2,334	1,196	1,272	1,016	1,160	1,148	1,113	923	1,349
State and local total											
State and D.C.	6,055	11,737	19,666	40,026	47,699	50,064	52,808	58,087	58,806	63,274	66,441
Local	2,367	3,866	10,219	20,842	25,759	26,432	26,767	27,686	28,266	32,368	31,254
Total	11,193	21,763	39,834	75,444	91,312	96,347	102,771	107,421	111,581	121,650	128,745
Government expenditures ($ millions)											
Total federal	197	425	874	664	1,306	1,402	1,598	1,315	[R]1,375	1,428	2,277
Highway trust fund [a]	27	83	315	358	965	1,092	1,384	1,103	[R]1,170	1,249	1,881
Other [b]	170	342	559	306	341	310	214	212	[R]205	179	396
State and local total											
State and D.C.	7,125	14,100	25,936	45,609	55,569	56,981	59,709	61,534	65,507	71,415	77,899
Local	3,435	6,304	14,953	29,135	33,317	35,095	36,775	39,104	41,093	43,168	47,283
Total	10,757	20,829	41,763	75,408	90,192	93,478	98,082	101,953	[R]107,975	116,011	127,459
State highway user tax revenues [c] ($ millions)											
Motor fuel tax	[l]3,374	[l]6,433	[l]9,485	[l]19,658	[l]25,860	[l]26,881	[m]27,555	[m]28,477	[m]29,803	[m]30,753	[m]31,291
Other motor fuel receipts [d]	22	44	92	220	101	108	63	55	58	134	179
Motor vehicle registration fees	[n]1,514	[n]2,873	[n]5,173	[n]10,257	[n]12,388	[n]11,942	[o]13,234	[o]13,631	[o]14,552	[o]14,882	[o]13,704
Other motor vehicle fees [e]	235	577	1,490	3,353	4,505	4,416	4,689	4,704	5,068	5,350	5,696
Motor carrier taxes [f]	110	176	323	695	875	770	726	729	861	740	784
Miscellaneous fees	68	181	615	1,761	2,708	3,307	3,489	3,785	4,165	4,410	4,800
Total	5,323	10,284	17,177	35,944	46,437	47,424	49,756	51,381	54,507	56,269	56,454
Inventory	**1960**	**1970**	**1980**	**1990**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Rural/urban mileage by ownership											
Rural mileage											
Under state control	[p]658,896	[p]707,002	[q]750,479	[q]702,486	[q]690,372	[q]690,924	[r]691,156	[r]692,767	[r]660,834	[r]660,682	[r]661,798
Under federal control [g]	111,912	187,696	246,130	178,188	173,650	170,568	168,938	167,369	118,369	116,846	116,698
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
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
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
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
Total rural mileage	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

continued

Highway Profile *continued*

Inventory (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000
Urban mileage											
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
Under federal control [g]	N	N	1,495	1,024	1,484	1,509	1,470	1,464	1,485	1,503	1,484
Under local control	N	N	530,119	647,842	702,354	706,431	713,371	722,418	730,152	734,605	740,562
County roads	N	N	71,357	95,929	115,388	117,518	117,181	117,487	117,016	117,105	116,918
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
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
Total urban mileage	429,568	560,670	628,901	744,644	813,785	819,706	826,765	836,108	841,654	846,064	852,241
Total rural and urban mileage	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
Rural/urban mileage											
by functional system											
Rural mileage											
Interstate	N	N	[s]31,905	[R,s]33,547	[s]32,457	[s]32,580	[t]32,820	[t]32,817	[t]32,813	[t]32,974	[t]33,048
Other principal arterial	N	N	82,569	83,802	97,175	97,948	98,131	98,257	98,852	98,856	98,911
Minor arterial	N	N	149,057	144,774	138,120	137,151	137,359	137,497	137,308	137,463	137,574
Major collector	N	N	439,000	436,352	431,115	431,712	432,117	432,714	432,408	432,954	433,121
Minor collector	N	N	299,613	293,922	282,011	274,081	273,198	272,362	272,140	271,690	271,815
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
Total rural mileage	[u]3,116,125	[u]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
Urban mileage											
Interstate	N	N	9,215	11,527	13,126	13,164	13,217	13,247	13,312	13,343	13,379
Other freeways and expressways	N	N	6,774	7,668	8,994	8,970	9,027	9,063	9,127	9,125	9,140
Other principal arterial	N	N	44,155	51,968	53,110	52,796	52,983	53,223	53,132	53,206	53,312
Minor arterial	N	N	66,377	74,659	87,857	88,510	89,020	89,195	89,496	89,399	89,789
Collector	N	N	68,387	78,254	86,089	87,331	87,790	88,049	88,071	88,008	88,200
Local	N	N	433,993	520,568	564,609	568,935	574,728	583,973	588,504	592,978	598,421
Total urban mileage	429,568	560,670	628,901	744,644	813,785	819,706	826,765	836,740	841,642	846,059	852,541
Total rural and urban mileage	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
U.S. roads and streets by surface											
Paved mileage											
Rural	919,082	1,188,080	[u]1,490,050	[u]1,550,283	[u]1,561,649	[u]1,591,334	[v]1,582,166	[v]1,605,804	[v]1,612,251	[v]1,641,877	[v]1,684,922
Urban	311,387	470,341	582,642	704,539	780,530	786,934	798,484	804,131	808,093	809,549	819,572
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
Percent paved	34.7%	44.5%	53.7%	58.3%	60.0%	60.8%	60.5%	60.9%	61.3%	62.4%	63.4%
Unpaved mileage											
Rural	[u]2,197,043	[u]1,981,332	[u]1,740,886	[u]1,571,999	[u]1,531,161	[u]1,501,186	[v]1,518,310	[v]1,510,330	[v]1,490,488	[v]1,436,969	[v]1,406,508
Urban	118,181	90,329	46,259	40,105	33,255	32,772	35,227	38,019	38,061	42,008	39,040
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
Percent unpaved	65.3%	55.5%	46.3%	41.7%	40.0%	39.2%	39.5%	39.1%	38.7%	37.6%	36.6%

continued

Highway Profile *continued*

Inventory (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000
Number of employees											
State and local govt. streets and highways [w]	532,000	607,000	559,000	569,000	544,000	[R]543,000	U	[R]531,000	[R]530,000	543,000	546,000
Highway and street construction [x]	U	U	U	238,700	226,100	227,900	236,100	242,800	256,500	280,000	280,000
Performance											
Vehicle-miles of travel by functional system (millions) [i]											
Rural mileage											
Interstate	[y]10,514	[y]79,516	[y]135,084	[y]200,173	[y]215,568	[z]223,382	[z]232,565	[z]240,255	[z]251,520	260,204	268,960
Other principal arterial	N	N	132,958	175,133	207,569	215,567	221,403	228,716	237,704	243,950	248,686
Minor arterial	N	N	129,816	155,733	149,760	153,028	157,444	163,342	165,780	169,378	171,883
Major collector	N	N	150,186	190,512	182,000	186,212	190,923	201,790	203,580	206,936	209,561
Minor collector	N	N	39,282	49,948	48,529	49,936	50,107	52,574	54,278	57,617	57,960
Local	N	N	84,704	97,379	104,915	105,164	107,752	114,673	120,595	125,545	127,911
Total rural	400,463	539,472	672,030	868,878	908,341	933,289	960,194	1,001,350	1,033,457	1,063,630	1,084,961
Urban											
Interstate	13,365	81,532	161,242	278,901	330,577	341,515	351,579	361,401	374,622	382,986	393,580
Other freeways and expressways	N	N	79,690	127,465	147,534	151,509	157,502	159,622	166,626	171,563	177,142
Other principal arterial	N	N	229,469	335,543	364,200	370,365	377,776	385,125	388,073	392,721	398,652
Minor arterial	N	N	175,030	236,225	286,165	293,228	299,345	301,912	309,295	313,936	324,367
Collector	N	N	83,043	106,297	120,088	126,883	129,310	130,143	131,919	131,613	135,371
Local	N	N	126,791	191,053	200,683	205,907	208,374	222,142	228,530	234,886	235,730
Total urban	318,299	570,252	855,265	1,275,484	1,449,247	1,489,407	1,523,886	1,560,345	1,598,065	1,627,705	1,664,842
Total rural and urban	718,762	1,109,724	1,527,295	2,144,362	2,357,588	2,422,696	2,484,080	2,561,695	2,631,522	2,691,335	2,749,803
Highway demand for petroleum (thousand barrels)											
Motor fuel	[AA]1,378,095	[AA]2,198,310	[AA]2,737,143	[AA]3,113,214	[BB]3,353,320	[BB]3,424,616	[BB]3,492,285	[BB]3,580,620	[R,BB]3,699,500	[BB]3,843,128	[BB]3,863,338
Asphalt and road oil	[CC]110,000	[CC]163,000	[CC]145,000	[DD]176,340	[DD]176,751	[DD]177,543	[DD]177,206	[DD]184,383	[DD]190,258	[DD]199,580	[DD]192,236
Total	1,488,095	2,361,310	2,882,143	3,289,554	3,530,071	3,602,159	3,669,491	3,765,003	[R]3,889,758	4,042,708	4,055,574
Safety	**1960**	**1970**	**1980**	**1990**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Fatalities	[EE]36,399	[EE]52,627	[EE]51,091	[FF]44,599	[FF]40,716	[FF]41,817	[FF]42,065	[FF]42,013	[FF]41,501	[FF]41,717	[FF]41,821
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
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

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

[a] 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.

[b] Figures obtained by addition/subtraction and may not appear directly in data source.

[c] 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] 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.
[j] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table HF-210.
[k] Ibid., *Highway Statistics* (Washington, DC: 1996, 1997, 1998, 1999, 2000), tables HF-10A and HF-10.
[l] Ibid., *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table MF-201.
[m] Ibid., *Highway Statistics* (Washington, DC: 1996, 1997, 1998, 1999, 2000), table MF-1.
[n] Ibid., *Highway Statistics, Summary to 1995* , FHWA-PL-97-009 (Washington, DC: July 1997), table MV-202.
[o] Ibid., *Highway Statistics* (Washington, DC: 1996, 1997, 1998, 1999, 2000) table MV-2.
[p] Ibid., *Highway Statistics, Summary to 1985,* FHWA-PL-97-009 (Washington, DC: July 1997), table M-203.
[q] Ibid., *Highway Statistics, Summary to 1995* , FHWA-PL-97-009 (Washington, DC: July 1997), table HM-210.
[r] Ibid., *Highway Statistics* (Washington, DC: 1996, 1997, 1998, 1999, 2000), table HM-10.
[s] Ibid., *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table HM-220.
[t] Ibid., *Highway Statistics* (Washington, DC: 1996, 1997, 1998, 1999, 2000), table HM-20.
[u] Ibid., *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table HM-212.
[v] Ibid., *Highway Statistics* (Washington, DC: 1996, 1997, 1998, 1999, 2000), table HM-12.
[w] U.S. Department of Commerce, *Statistical Abstract of the United States* , various years, State and Local Government Section.
[x] Ibid., Internet site http://stats.bls.gov/sahome.html as of Aug. 2, 2001.
[y] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1985* (Washington, DC: April 1987), table VM-201.
[z] Ibid., *Highway Statistics* (Washington, DC: Various years), table VM-2, VM-2A.
[AA] 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).
[BB] Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1(total fuel consumed in thousands of gallons divided by 42).
[CC] U.S. Department of Energy, Energy Information Administration, *State Energy Data Report, 1960-1980* (Washington, DC), p. 13.
[DD] Ibid., *Petroleum Supply Annual* (Washington, DC: Annual issues), table 2.
[EE] U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, NRD-30, personal communication.
[FF] Ibid., *Traffic Safety Facts 2000* (Washington, DC: 2001).

Automobile Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000
Personal auto expenditures ($ millions)											
New and used cars [a,h]	[R]16,600	[R]26,700	[R]57,200	119,000	129,500	132,200	133,300	135,600	[R]142,800	155,600	164,100
Tires, tubes, accessories, and parts [h]	[R]2,500	[R]6,100	[R]17,900	29,900	35,200	36,900	38,700	39,600	[R]41,500	44,400	46,300
Gasoline and oil [h]	[R]12,000	[R]21,900	[R]86,700	107,300	109,000	113,300	124,200	128,100	[R]114,800	129,500	165,300
Tolls [h]	[R]300	[R]700	[R]1,100	2,300	3,300	3,400	3,700	4,000	[R]4000	4,200	4,500
Insurance premiums less claims paid [h]	[R]2,000	[R]3,800	[R]9,400	18,100	27,800	29,700	31,800	36,300	38,000	36,800	37,900
Repair, greasing, washing, parking, storage, rental, and leasing [h]	[R]5,500	[R]12,300	[R]34,000	84,900	110,000	122,200	134,200	146,300	[R]153,600	163,600	173,400
Auto registration fees	[i]867	[i]1,668	[i]2,893	[i]6,054	[i]7,423	[i]7,043	[j]7,698	[j]8,163	[j]8,630	[j]8,625	[j]7,607
Driver's license fees	[i]119	[i]222	[i]370	[i]638	[i]823	[i]823,325	[j]893	[j]865	[j]917	[j]904	[j]745
Total [a]	[R]39,886	[R]73,390	[R]209,563	368,192	423,046	[R]445,566	474,491	498,928	[R]504,247	543,629	599,852
Taxi expenditures ($ millions) [h]	[R]600	[R]1,200	[R]1,900	2,600	3,000	3,200	3,500	3,700	4,100	3,800	3,900
Inventory											
Number of vehicle registrations											
Passenger car and motorcycle	[k]62,245,422	[k]92,067,655	[k]127,294,783	[k]137,959,958	[R,k]131,640,024	[l]132,283,966	[l]133,599,940	[l]133,575,077	[l]135,717,988	[l]136,584,477	[l]137,967,488
Other 2-axle 4-tire vehicle	[k]e	[k]14,210,591	[k]27,875,934	[k]48,274,555	[R,k]62,903,589	[l]65,738,322	[l]69,133,913	[l]70,224,082	[l]71,330,205	[l]75,356,376	[l]79,084,979
Motorcycle	[q]574,032	[q]2,824,098	[q]5,693,940	[q]4,259,462	[R,q]3,756,555	[l]3,897,191	[l]3,871,599	[l]3,826,373	[l]3,879,450	[l]4,152,433	[l]4,346,068
Motor vehicle licensed drivers	[r]87,252,563	[r]11,1542,787	[r]145,295,036	[r]167,015,250	[r]175,403,465	[r]176,628,482	[m]179,539,340	[m]182,709,204	[R,m]184,860,969	[m]187,170,420	[m]190,625,023
Number of employees											
Taxicabs [n]	120,700	106,400	52,500	32,400	30,800	30,700	30,500	30,600	31,200	31,600	32,300
Automotive dealers and service stations [n]	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	2,412,200
Motor vehicles, parts, and supplies [n]	N	N	434,300	456,000	471,400	492,100	502,800	513,000	516,600	523,700	523,300
Auto repair, services, and parking [n]	N	N	570,900	913,700	968,300	1,020,100	1,080,000	1,119,600	1,145,200	1,196,400	1,248,400
Performance											
Vehicle-miles (millions)											
Passenger car and motorcycle											
Rural highway											
Rural interstate	N	[o]62,342	[o]89,488	[o]117,519	[o]114,002	[l]115,991	[l]120,323	[l]121,095	[l]128,447	[l]131,956	[l]136,024
Rural other arterial	[o]233,452	[o]182,213	[o]180,857	[o]211,066	[o]207,540	[l]212,063	[l]217,559	[l]221,732	[l]230,435	[l]232,779	[l]236,406
Other rural roads	[o]80,171	[o]179,533	[o]180,314	[o]219,325	[o]196,879	[l]199,878	[l]203,147	[l]212,400	[l]220,376	[l]224,478	[l]226,451
All rural	[o]313,623	[R,o]424,088	[R,o]450,659	[R,o]547,910	[R,o]518,421	[l]527,932	[l]541,029	[l]555,227	[l]579,258	[l]589,213	[l]598,881
Urban highway [b]											
Urban interstate	N	[o]69,369	[o]124,480	[o]184,783	[o]199,588	[l]205,489	[l]211,817	[l]215,525	[l]222,066	[l]225,822	[l]232,270
Other urban	N	[o]426,222	[o]546,671	[o]685,129	[o]698,321	[l]714,670	[l]726,928	[l]741,885	[l]758,536	[l]764,649	[l]781,242
All urban	[o]273,389	[o]495,591	[o]671,151	[o]869,912	[o]897,909	[l]920,159	[l]938,745	[l]957,410	[l]980,602	[l]990,471	[l]1,013,512
Total rural and urban highway	[o]587,012	[R,o]919,679	[R,o]1,121,810	[R,o]1,417,822	[R,o]1,416,329	[l]1,448,091	[R,l]1,479,774	[l]1,512,637	[l]1,559,860	[l]1,579,684	[l]1,612,393

continued

Automobile Profile *continued*

Performance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000
Other 2-axle 4-tire vehicle											
Rural highway											
Rural interstate	[o]e	[o]6,766	[o]19,952	[o]46,298	[R,o]60,849	[l]63,329	[l]65,779	[l]69,030	[R,l]72,343	[l]76,190	[l]79,318
Rural other arterial	[o]e	[o]29,808	[o]56,137	[o]87,474	[R,o]113,595	[l]118,305	[l]122,212	[l]129,890	[l]132,043	[l]138,475	[l]141,247
Other rural roads	[o]e	[o]37,017	[o]73,471	[o]94,059	[o]110,881	[l]113,838	[l]119,504	[l]128,396	[l]130,420	[l]136,993	[l]140,386
All rural	[o]e	[o]73,591	[o]149,560	[o]227,831	[R,o]285,325	[l]295,472	[l]307,495	[l]327,316	[l]334,806	[l]351,658	[l]360,951
Urban highway [c]											
Urban interstate	[o]e	[o]6,252	[o]23,067	[o]71,500	[R,o]105,317	[l]109,807	[l]112,908	[l]116,680	[l]121,700	[l]124,399	[l]128,328
Other urban	[o]e	[o]43,443	[o]118,308	[o]275,239	[R,o]373,991	[l]384,750	[l]396,137	[l]406,743	[l]411,769	[l]424,965	[l]434,739
All urban	[o]e	[o]49,695	[o]141,375	[o]346,739	[R,o]479,308	[l]494,557	[l]509,045	[l]523,423	[l]533,469	[l]549,364	[l]563,067
Total rural and urban highway	[o]e	[o]123,286	[o]290,935	[R,o]574,571	[R,o]764,634	[l]790,029	[l]816,540	[l]850,739	[l]868,275	[l]901,022	[l]924,018
Vehicle-miles (millions)											
Passenger cars [R]	[k]587,012	[k]919,679	[k]1,121,810	[k]1,417,823	[g,k]1,416,329	[R,l]1,438,294	[R,l]1,469,854	[R,l]1,502,556	[R,l]1,549,577	[l]1,569,100	[l]1,601,914
Other 2-axle 4-tire vehicle	[k]e	[k]123,286	[k]290,935	[k]574,571	[k]764,634	[l]790,029	[l]816,540	[l]850,739	[l]868,275	[l]901,022	[l]924,018
Motorcycle	[k]f	[k]f	[k]f	[k]f	[E,l]10,240	[l]9,797	[l]9,920	[l]10,081	[l]10,283	[l]10,584	[l]10,479
Total	[k]587,012	[k]1,042,965	[k]1,412,745	[k]1,992,394	2,180,963	[R,l]2,238,120	[l]2,296,314	[l]2,363,376	[l]2,428,135	[l]2,480,706	[l]2,536,411
Passenger-miles [c] (millions)											
Passenger cars [R]	[a,k]1,145,000	[a,k]1,754,174	[a,k]2,024,246	[R,k]2,140,913	[R,g,k]2,600,050	[R,l]2,286,887	[R,l]2,337,068	[R,l]2,389,065	[R,l]2,463,828	[l]2,494,870	[l]2,547,044
Other 2-axle 4-tire vehicle	[k]e	[k]225,613	[k]520,774	[R,k]896,331	[R,k]1,012,050	[R,l]1,256,146	[R,l]1,298,299	[R,l]1,352,675	[R,l]1,380,557	[l]1,432,625	[l]1,469,189
Motorcycle	[k]f	[k]f	[k]f	[k]f	[E,R,l]11,264	[R,l]10,777	[R,l]10,912	[R,l]11,089	[R,l]11,311	[l]11,642	[l]11,527
Total	[k]1,145,000	[k]1,979,787	[k]2,545,020	[R,k]3,037,244	[R]3,612,100	[R,l]3,553,810	[R,l]3,646,279	[R,l]3,752,829	[R,l]3,855,696	[l]3,939,137	[l]4,027,760
Average miles traveled per vehicle											
Passenger car [R]	[R,k]9,518	[k]9,989	[k]8,813	[k]10,277	[R,g,k]10,759	[R,l]11,203	[R,l]11,330	[R,l]11,581	[R,l]11,754	[l]11,848	[l]11,988
Other 2-axle 4-tire vehicle	[k]e	[k]8,676	[k]10,437	[k]11,902	[R,k]12,156	[l]12,018	[R,l]11,811	[l]12,115	[l]12,173	[l]11,957	[l]11,684
Motorcycle	[k]f	[k]f	[k]f	[k]f	[E,l]2,726	[l]2,514	[l]2,562	[l]2,635	[l]2,651	[l]2,549	[l]2,411
Fuel consumed (million gallons)											
Passenger cars [R]	[k]41,171	[k]67,879	[k]70,186	[k]69,759	[R,g,k]68,079	[R,l]68,072	[R,l]69,221	[R,l]69,892	[R,l]71,695	[l]73,283	[l]72,916
Other 2-axle 4-tire vehicle	[k]e	[k]12,313	[k]23,796	[k]35,611	[R,k]44,112	[l]45,605	[l]47,354	[R,l]49,388	[l]50,462	[l]52,859	[l]52,832
Motorcycle	[k]f	[k]f	[k]f	[k]f	[E,l]205	[l]196	[l]198	[l]202	[R,l]206	[l]212	[l]210
Average fuel consumption per vehicle (gallons)											
Passenger cars [R]	[k]668	[k]737	[k]551	[k]506	[R,g,k]517	[R,l]530	[R,l]534	[R,l]539	[R,l]544	[l]553	[l]546
Other 2-axle 4-tire vehicle	[k]e	[k]866	[k]854	[k]738	[R,k]701	[l]694	[l]685	[l]703	[l]707	[l]701	[l]668
Motorcycle	[k]f	[k]f	[k]f	[k]f	[E,l]55	[l]50	[l]51	[l]53	[l]53	[l]51	[l]48
Average miles traveled per gallon of fuel consumed											
Passenger cars [R]	[k]14.3	[k]13.5	[k]16	[k]20.3	[R,g,k]20.8	[R,l]21.1	[R,l]21.2	[R,l]21.5	[R,l]21.6	[l]21.4	[l]22
Other 2-axle 4-tire vehicle	[k]e	[k]10	[k]12.2	[k]16.1	[R,k]17.3	[l]17.3	[R,l]17.2	[l]17.2	[R,l]17.2	[l]17	[l]17.5
Motorcycle	[k]f	[k]f	[k]f	[k]f	[E,l]50.0	[l]50	[l]50	[l]50	[l]50	[l]50	[l]50

continued

Automobile Profile *continued*

Safety	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000
Number of occupants and nonoccupant fatalities											
Passenger car [p]	N	N	27,449	24,092	21,997	22,423	22,505	22,199	[p]21,194	[p]20,862	[p]20,492
Motorcycle [p]	790	2,280	5,144	3,244	2,320	2,227	2,161	2,116	[p]2,294	[p]2,483	[p]2,862
Bicycle [d,p]	490	760	965	859	802	833	765	814	[p]760	[p]754	[p]690
Pedestrian [d,p]	7,210	8,950	8,070	6,482	5,489	5,584	5,449	5,321	[p]5,228	[p]4,939	[p]4,739
Occupant fatality rates											
Per 100 million vehicle-miles											
Passenger car [p]	4.7	3.8	2.5	1.7	1.5	1.5	1.5	1.5	[p]1.4	[p]1.3	[p]1.3
Motorcycle [p]	N	76.5	50.4	33.9	22.7	22.7	21.8	21.0	[p]22.3	[p]23.5	[p]27.3
Per 10,000 registered vehicles											
Passenger car [p]	5.1	3.9	2.6	1.8	[R]1.8	[R]1.8	[R]1.8	1.8	[p]1.7	[p]1.6	[p]1.6
Motorcycle [p]	13.8	8.1	9.0	7.6	6.2	5.7	5.6	5.5	[p]5.9	[p]6	[p]6.6
Vehicle involvement rate (fatal crashes)											
Per 100 million vehicle-miles											
Passenger car [p]	N	5.6	3.5	2.4	2.1	2.1	2.0	2.0	[p]1.9	[p]1.8	[p]1.7
Motorcycle [p]	N	22.9	50.9	34.3	22.8	23.1	21.9	21.4	[p]22.7	[p]23.8	[p]28.1
Per 10,000 registered vehicles											
Passenger car [p]	N	5.6	3.7	2.8	2.5	2.5	2.5	2.4	[p]2.3	[p]2.2	[p]2.2
Motorcycle [p]	N	8.2	9.1	7.7	6.2	5.8	5.6	5.6	[p]6	[p]6.1	[p]6.8

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

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] Included in passenger cars.

[g] Includes motorcycle data.

SOURCES: Unless otherwise noted, refer to chapter tables for sources.

[h] U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables,* table 2.4 available at http://www.bea.doc.gov/bea/dn/nipaweb/AllTables.asp as of Dec. 9, 2001.

[i] U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics, Summary to 1995,* FHWA-97-009 (Washington, DC: July 1997), table MV-202.

[j] Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MV-2, (revised tables used when applicable).

[k] Ibid., *Highway Statistics* Summary to 1995, FHWA-97-009 Washigton, DC: July 1997), table VM–201A, table revised in June 1999.

[l] Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1, (revised tables used when applicable).

[m] Ibid., *Highway Statistics* (Washington, DC: Annual issues), table DL-22, (revised tables used when applicable).

[n] U.S. Department of Labor, Bureau of Labor Statistics, *BLS Database,* Internet site http://www.bls.gov/data/sa.htm as of Dec. 9, 2001; codes “414120 Taxicabs,” “605500 Automotive Dealers and Service Stations,” “525010 Motor Vehicle Parts, and Supplies” and “807500 Auto Repair, Services and Parking."

[o] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201.

[p] U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), *Traffic Safety Facts 1999,* DOT HS 809 100, (Washington, DC: December 2000), tables 3, 4, 7, and 10, and personal communication, Dec. 12, 2001.

[q] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.

[r] Ibid., *Highway Statistics, Summary to 1995,* FHWA-Pl-97-009 (Washington, DC: July 1997), table DL-201.

Truck Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Operating revenues, total [a,g] (based on SIC)										
($ millions)	N	N	N	127,314	155,713	161,806	172,743	183,153	N	N
Local trucking	N	N	N	31,397	40,903	43,830	46,589	49,972	N	N
Trucking, except local	N	N	N	74,465	89,369	91,675	97,586	103,847	N	N
Local trucking with storage	N	N	N	4,115	4,757	5,154	5,502	5,860	N	N
Courier services, except by air	N	N	N	17,337	20,684	21,147	23,066	23,474	N	N
Operating expenses, total [a] (based on SIC)										
($ millions)	N	N	N	118,968	145,216	151,628	162,825	170,998	N	N
Local trucking	N	N	N	28,049	36,455	38,695	41,325	43,871	N	N
Trucking, except local	N	N	N	70,965	84,682	88,061	94,390	98,570	N	N
Local trucking with storage	N	N	N	3,885	4,543	4,817	5,121	5,439	N	N
Courier services, except by air	N	N	N	16,069	19,536	20,055	21,989	23,118	N	N
Operating revenues, total [f,h] (based on NAICS)										
($ millions)	N	N	N	N	N	N	N	N	195,706	209,438
Truck transportation	N	N	N	N	N	N	N	N	150,816	162,083
Couriers messengers	N	N	N	N	N	N	N	N	44,890	47,355
Truck highway-user										
taxes ($ millions)										
State [i]	1,709	3,429	6,731	12,691	13,157	13,844	U	15,750	15,611	16,266
Federal	1,121	2,203	3,157	6,665	10,679	11,273	U	12,260	13,086	14,236
Total [b]	2,830	5,632	9,888	19,356	23,836	[R]25,117	U	28,010	28,697	30,502
Inventory										
Number of truck registrations										
Single-unit truck	N	[j]3,681,405	[j]4,373,784	[j]4,486,981	[j]4,906,385	[k]5,023,670	[k]5,266,029	[k]5,293,358	[k]5,734,925	[k]5,762,864
Combination truck	N	905,082	1,416,869	1,708,895	1,681,500	1,695,751	1,746,586	1,789,968	1,997,345	2,028,562
Total	[o]11,914,249	905,082	1,416,869	1,708,895	1,681,500	1,695,751	7,012,615	1,789,968	1,997,345	7,791,426
Number of employees										
Trucking and courier services, except air	N	[l]998,500	[l]1,182,000	[l]1,273,900	[m]1,384,200	[m]1,440,000	[R,m]1,482,100	[m]1,514,200	[m]1,568,800	[m]1,613,700
Truck drivers and deliverymen [n]	1,477,000	1,565,000	1,931,000	2,148,000	2,321,000	2,861,000	2,542,000	2,602,000	[R]3,012,000	3,116,000
Number of trucking and										
courier establishments [a,o]	N	64,756	69,796	90,709	108,971	112,887	116,861	121,111	U	U
Performance										
Vehicle-miles (millions)										
Rural highway										
Rural interstate	N	[p]10,069	[p]25,111	[p]35,789	[p]40,034	[k]43,351	[k]45,721	[k]49,336	[k]49,896	[k]51,049
Rural other arterial	N	17,625	24,789	31,331	35,040	37,056	37,875	39,193	39,724	40,691
Other rural roads	N	11,550	18,876	22,572	25,791	25,624	25,884	26,169	25,522	26,201
All rural roads	[p]84,508	29,175	43,665	53,903	60,831	62,680	109,480	114,698	115,142	117,941
Urban highway [c]										
Urban interstate	N	5,634	13,135	22,163	25,045	25,639	26,256	28,549	30,193	32,286
Other urban streets	N	17,337	26,580	34,387	44,306	46,486	47,235	48,230	51,045	52,461
All urban streets	42,896	22,971	39,715	56,550	69,351	72,125	73,491	76,779	81,238	84,747
Total rural and urban highway	127,405	52,146	83,380	110,453	130,182	134,805	182,971	191,477	196,380	202,688
Passenger-miles [e] (millions)										
Single-unit truck [d]	98,551	27,081	39,813	51,901	61,284	62,705	64,072	66,893	68,021	70,304
Combination truck	28,854	35,134	68,678	94,341	108,932	115,451	118,899	124,584	128,359	132,384
All trucks	127,405	62,215	108,491	146,242	170,216	178,156	182,971	191,477	[R]196,380	202,688
Ton-miles, intercity [q] (millions)	285,000	412,000	555,000	735,000	908,000	921,000	972,000	996,000	1,027,000	1,093,000
Fuel consumed (million gallons)										
Single-unit truck	N	[j]3,968	[j]6,923	[j]8,357	[j]9,032	[k]9,216	[k]9,409	[k]9,576	[k]6,817	[k]9,372
Combination truck	N	7,348	13,037	16,133	18,653	19,777	20,192	20,302	25,158	24,537
All trucks	[j]15,882	11,316	19,960	24,490	18,653	28,993	29,601	29,878	31,975	33,909
Average fuel consumption										
per vehicle (gallons)										
Single-unit truck	N	1,078	1,583	1,862	1,841	1,835	1,787	1,809	1,189	1,626
Combination truck	N	8,119	9,201	9,441	11,093	11,663	11,561	11,342	12,596	12,096
All trucks	1,333	2,467	3,447	3,953	4,202	4,315	4,221	4,218	4,135	4,352
Average miles traveled per										
gallon of fuel consumed										
Single-unit truck	N	6.8	5.8	6.2	6.8	6.8	6.8	7.0	10.0	7.5
Combination truck	N	4.8	5.3	5.8	5.8	5.8	5.9	6.1	5.1	5.4
All trucks	8.0	5.5	5.4	6.0	6.1	6.1	6.2	6.4	6.1	6.0
Average miles traveled per vehicle										
Single-unit truck	N	7,356	9,103	11,567	12,491	12,482	[R]12,167	[R]12,637	11,861	12,199
Combination truck	N	38,819	48,472	55,206	64,783	68,083	[R]68,075	[R]69,601	64,265	65,260
All trucks	10,693	13,565	18,736	23,603	25,838	26,514	[R]26,092	[R]27,032	25,397	26,014
Average length of haul										
(domestic freight) [r] (miles)	272	263	363	391	392	416	426	435	[R]442	458

continued

Truck Profile *continued*

Safety	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Occupant fatalities										
Light truck [s]	N	N	7,486	8,601	8,904	9,568	9,932	10,249	10,705	11,265
Large truck	N	N	1,262	705	670	648	621	723	742	759
All trucks	N	N	8,748	9,306	9,574	10,216	10,553	10,972	11,447	12,024
Occupant fatality rate										
Per 100 million vehicle-miles										
Light truck	N	N	2.5	1.5	1.3	1.3	1.3	1.2	1.2	1.2
Large truck	N	N	1.2	0.5	0.4	0.4	0.3	0.4	0.4	0.4
All trucks	N	N	2.2	1.3	1.1	1.1	1.1	1.1	1.1	1.1
Per 10,000 registered vehicles										
Light truck	N	N	2.5	1.7	1.5	1.5	1.5	1.5	1.5	1.5
Large truck	N	N	2.2	1.1	1.0	1.0	0.9	1.0	1.0	1.0
All trucks	N	N	2.4	1.7	1.4	1.5	1.5	1.5	1.5	1.5
Vehicle involvement rate (fatal crashes)										
Per 100 million vehicle-miles										
Light truck	N	N	4.3	2.8	2.3	2.3	2.3	2.3	2.2	2.2
Large truck	N	N	5.0	3.3	2.7	2.5	2.6	2.6	2.5	2.4
All trucks	N	N	4.5	2.9	2.4	2.4	2.4	2.3	2.3	2.2
Per 10,000 registered vehicles										
Light truck	N	N	4.2	3.1	2.7	2.8	2.8	2.8	2.8	2.7
Large truck	N	N	9.3	7.7	7.0	6.7	6.8	6.9	6.4	6.3
All trucks	N	N	5.0	3.6	3.2	3.2	3.2	[R]3.2	[R]3.2	3.1

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] Numbers may not equal totals due to rounding.
[c] Urban consists of travel on all roads and streets in urban places of 5,000 or greater population.
[d] Includes other 2-axle 4-tire vehicle in 1960.
[e] 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.
[f] **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 primilarily engaged in furnishing local messenger and delivery services of small items within a single metropolitan area or urban center.

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.
[g] U.S. Census Bureau, *Transportation Annual Survey* (Washington, DC: December 1998), table 1.
[h] Ibid., *Service Annual Survey, 1999* (Washington, DC: July 2001), table 2.2.
[i] American Trucking Association, American Trucking Trends (Washington, DC: Annual issues).
[j] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
[k] Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.
[l] U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994), SIC 421.
[m] Ibid., Internet site www.bls.gov as of Aug. 17, 2001. (Code: 414210).
[n] Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 35.
[o] U.S. Bureau of the Census, *County Business Patterns* (Washington, DC: Annual issues), table 1b (SIC 421).
[p] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201.
[q] Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 12.
[r] Ibid., p. 51.
[s] U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1999,* DOT HS 809 100 (Washington, DC: December 2000), tables 3, 8, and 9.

Bus Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Expenditures ($ thousands)										
School bus	[c] 486,000	[c] 1,219,000	[c] 3,833,000	[c] 8,031,000	[c] 7,847,000	[c] 9,889,000	[R,c] 9,082,000	[c] 10,353,000	[c] 10,326,000	[c] 10,340,000
Operating revenues ($ thousands)										
Intercity bus, class I	[d] 463,100	[d] 721,700	[d] 1,397,378	[d] 943,268	[R,e] 1,161,479	[R,e] 1,189,235	[R,e] 1,191,273	[R,e] 1,080,083	[R,e] 1,074,582	[e] 1,326,909
Operating expenses ($ thousands)										
Intercity bus, class I	405,400	639,000	1,318,372	1,026,213	[R] 1,289,834	[R] 1,253,537	[R] 1,228,092	[R] 1,022,680	[R] 1,016,208	1,313,900
Inventory										
Number of operating companies										
Intercity bus, class I	143	71	61	31	[R] 26	[R,e] 24	[R,e] 20	[R] 22	[R,e] 20	[e] 18
Number of vehicles										
All buses	[f] 272,129	[f] 377,562	[f] 528,789	[f] 626,987	[f] 670,423	[f] 685,503	[f] 694,781	[f] 697,548	[f] 715,540	[f] 728,777
Number of employees										
Intercity and rural bus	[g] 40,500	[g] 43,400	[g] 37900	[g] 26,100	[h] 23,600	[h] 23,800	[h] 23,800	[h] 22,200	[h] 24,400	[h] 23,800
School bus	N	N	79,900	111,200	125,900	131,100	132,200	136,500	141,000	146,100
Performance										
Vehicle-miles (millions)										
All buses										
Rural highway										
Interstate rural	N	[j] 339	[j] 533	[j] 567	[j] 683	[i] 711	[i] 742	[i] 794	[i] 834	[i] 971
Other arterial rural	N	944	991	995	1,154	[R] 1,171	[R] 1,186	1,243	1,282	1,375
Other rural	N	1,266	1,511	1,882	1,893	1,972	[R] 2,005	2,072	2,135	2,322
All rural	[j] 2,332	2,549	3,035	3,444	3,730	[R] 3,854	[R] 3,933	4,109	4,251	4,668
Urban highway [a]										
Interstate urban	N	277	560	455	627	580	598	647	663	751
Other urban	N	1,718	2,464	1,828	2,052	1,986	2,007	2,086	2,093	2,244
All urban	2,014	1,995	3,024	2,283	2,679	2,566	2,605	2,733	2,756	2,995
Total rural and urban highway	4,346	4,544	6,059	5,726	6,409	[R] 6,420	[R] 6,538	6,842	7,007	7,663
Passenger-miles (millions)										
All buses	N	N	N	[R] 121,398	135,871	136,104	138,613	145,060	148,558	162,466
Number of revenue passengers (thousands)										
Intercity bus, total	[c] 366,000	[c] 401,000	[c] 370,000	[c] 334,000	[c] 343,200	[c] 366,500	[c] 347,900	[c] 350,600	[c] 357,600	[c] 358,900
Average miles traveled per vehicle										
All buses	[i] 15,970	[i] 12,035	[i] 11,458	[i] 9,133	[i] 9,560	[i] 9365	[R,i] 9,386	[i] 9,809	[i] 9,793	[i] 10,515
Fuel consumed (million gallons)										
All buses	827	820	1,018	895	964	968	[R] 985	1,027	1,040	1,146
Average fuel consumption per vehicle (gallons)										
All buses	3,039	2,172	1,925	1,427	1,438	1,412	[R] 1,414	1,472	1,454	1,573
Average miles traveled per gallon of fuel consumed										
All buses	5.3	5.5	6.0	6.4	6.6	6.6	6.6	6.7	6.7	6.7
Average revenue per passenger-mile (cents) (intercity)	[c] 2.71	[c] 3.60	[c] 7.26	[c] 11.55	[c] 11.61	[c] 12.19	[c] 12.30	[R,c] 12.56	[R,c] 12.75	[c] 12.76
Safety										
Number of fatalities										
School bus-related	N	N	[k] 150	[k] 115	[k] 105	[k] 123	[k] 136	[k] 131	[k] 128	[l] 167
School bus										
Occupants	N	N	9	11	3	13	10	8	6	10
Other vehicle										
Occupants	N	N	88	64	64	72	101	99	91	127
Nonoccupants	N	N	53	40	38	38	25	24	31	30
Occupant fatalities										
All buses	N	N	46	32	18	33	21	18	38	[m] 59
School buses	N	N	14	13	2	12	10	8	6	8
Cross country buses	N	N	23	2	7	6	3	5	13	32
Transit buses	N	N	6	3	6	1	5	3	2	6
Other and unknown	N	N	3	14	6	14	3	2	17	13
Fatalities in vehicular accidents [b]										
All buses	N	N	[n] 390	[n] 340	[n] 286	[R,n] 311	[R,n] 367	[R,n] 339	[R,n] 328	[n] 373
Occupant fatality rate										
Per 100 million vehicle-miles										
All buses	N	N	0.8	0.6	0.3	0.5	0.3	0.3	0.5	0.8
Per 10,000 registered vehicles										
All buses	N	N	0.9	0.5	0.3	0.5	0.3	0.3	0.5	0.8
Vehicle involvement rate										
Per 100 million vehicle-miles										
All buses	N	N	6.4	5.9	[R] 4.5	[R] 4.8	[R] 5.6	[R] 5.0	[R] 4.7	4.1
Per 10,000 registered vehicles										
All buses	N	N	7.4	5.4	[R] 4.3	[R] 4.5	[R] 5.3	[R] 4.9	[R] 4.6	4.4

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

[a] Urban consists of travel on all roads and streets in urban places of 5,000 or greater population.
[b] 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.
[c] Eno Transportation Foundation, Inc., *Transportation In America, 2000* (Washington, DC: 2001), p. 11, 16, 18.
[d] Interstate Commerce Commission, *Annual Report of the ICC* (Washington, DC: Annual issues), Appendix F, tables 1, 6.
[e] U.S. Department of Transportation, Bureau of Transportation Statistics, *Selected Earnings Data, Class I Motor Carriers of Passengers* (Washington, DC: Annual issues).
[f] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (*W*ashington, DC: Annual issues), table MV-10.
[g] U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994), SIC codes 413, 415.
[h] Ibid., Internet site www.bls.gov as of Aug. 20, 2001.
[i] Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.
[j] Ibid., *Highway Statistics, Summary to 1995,* FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
[k] Ibid., National Highway Traffic Safety Administration, *Traffic Safety Facts 1998,* DOT HS 808 983 (Washington, DC: October 1999), Tables 74, 93.
[l] Ibid., National Highway Traffic Safety Administration, *2000 Traffic Safety Fact Sheets* , DOT HS 809 332 (Washington, DC: December 2001)
[m] Ibid., National Highway Traffic Safety Administration, personal communication, May 2002.
[n] Ibid., Fatality Analysis Reporting System (FARS) Query, Internet site, http://www-fars.nhtsa.dot.gov as of Sept. 6, 2001

Transit Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	[P]1999
Passenger operating revenues ($ millions)										
Passenger fares [m]	1,335	1,639	2,556	5,891	6,756	6,801	7,416	7,546	[R]7,970	8,282
Motor bus	N	N	N	2,967	3,250	3,287	3,515	3,558	[R]3,991	4,175
Heavy rail	N	N	N	1,741	1,976	2,018	2,322	2,351	2,297	2,323
Light rail	N	N	N	83	135	127	144	139	150	164
Trolley bus	N	N	N	46	55	54	55	57	55	60
Demand responsive	N	N	N	41	171	146	157	170	[R]142	159
Ferry boat [a]	N	N	N	56	41	60	54	51	[R]41	48
Commuter rail	N	N	N	952	1,083	1,078	1,146	1,178	1,255	1,309
Other [b]	N	N	N	26	45	46	24	42	[R]38	46
Other operating revenue [y]	72	68	248	895	2,271	2,812	2,928	3,308	[R]3,685	3,648
Total operating revenues	1,407	1,707	2,805	6,786	9,027	9,613	10,345	10,854	[R]11,654	11,930
Operating assistance [d]										
State and local	N	N	2,611	8,297	8,026	7,811	8,210	8,014	[R]8,656	9,418
Federal	N	N	1,093	970	916	817	596	647	[R]751	872
Total operating assistance	N	N	3,705	9,267	8,941	8,628	8,807	8,661	[R]9,408	10,290
Total revenues	1,407	1,707	6,510	16,053	17,968	18,241	19,151	19,515	[R]21,062	22,220
Operating expenses ($ millions)										
Motor bus [k]	N	N	N	8,903	10,144	10,321	10,575	10,944	[R]11,429	11,714
Heavy rail	N	N	N	3,825	3,786	3,523	3,402	3,474	3,530	3,693
Light rail	N	N	N	237	413	376	442	473	[R]500	546
Trolley bus	N	N	N	109	133	139	135	140	147	167
Demand responsive	N	N	N	518	943	1,000	1,187	1,285	[R]1,405	1,419
Ferry boat [a]	N	N	N	171	200	210	183	221	[R]214	238
Commuter rail	N	N	N	1,939	2,228	2,211	2,294	2,278	[R]2,361	2,575
Other [b]	N	N	N	41	73	67	124	122	[R]154	160
Total operating expenses [e]	N	N	6,247	15,742	17,920	17,849	18,341	18,936	[R]19,739	20,512
Depreciation and amortization [l]	N	N	278	1,593	2,769	2,601	2,885	3,106	[R]3,435	3,692
Other reconciling items	N	N	186	644	964	1,091	1,034	1,117	[R]1,145	1,333
Total expenses	1,377	1,996	6,711	17,979	21,653	21,540	22,260	23,159	[R]24,318	25,538
Average passenger revenue per passenger-mile ($)										
Motor bus [j]	N	N	N	0.14	0.17	0.17	0.18	0.18	[R]0.20	0.20
Heavy rail	N	N	N	0.15	0.19	0.19	0.20	0.20	0.19	0.18
Light rail	N	N	N	0.15	0.18	0.15	0.15	0.13	0.13	0.14
Trolley bus	N	N	N	0.24	0.29	0.29	0.30	0.30	0.30	0.32
Demand responsive	N	N	N	0.10	0.30	0.29	0.24	0.23	[R]0.19	0.20
Ferry boat [a]	N	N	N	0.20	0.14	0.23	0.21	0.17	[R]0.14	0.16
Commuter rail	N	N	N	0.14	0.14	0.13	0.14	0.15	0.14	0.15
Other [b]	N	N	N	0.21	0.23	0.17	0.07	0.11	0.09	0.10
All modes	N	N	N	0.14	0.17	0.17	0.18	0.18	0.18	0.18
Average passenger fare, per unlinked trip ($)										
Motor bus [n]	N	N	N	0.52	0.62	0.66	0.70	0.70	[R]0.74	0.74
Heavy rail	N	N	N	0.74	0.90	0.99	1.08	0.97	0.96	0.92
Light rail	N	N	N	0.47	0.66	0.50	0.55	0.53	[R]0.54	0.56
Trolley bus	N	N	N	0.36	0.47	0.45	0.47	0.47	0.47	0.50
Demand responsive	N	N	N	0.60	2.04	2.26	2.21	1.83	[R]1.49	1.59
Ferry boat [a]	N	N	N	1.11	0.87	1.31	1.12	0.99	[R]0.80	0.91
Commuter rail	N	N	N	2.90	3.19	3.13	3.24	3.30	[R]3.29	3.31
Other [b]	N	N	N	0.90	1.28	1.57	1.33	0.66	[R]1.02	0.76
All modes	0.14	0.22	0.30	0.67	0.85	0.87	0.93	0.89	[R]0.91	0.90

continued

Transit Profile *continued*

Inventory	1960	1970	1980	1990	1994	1995	1996	1997	1998	[P]1999
Number of systems										
Motor bus [o]	1,236	1,075	1,022	2,685	2,250	2,250	2,250	2,250	2,262	2,262
Heavy rail	31	15	11	12	14	14	14	14	14	14
Light rail	~	~	9	17	22	22	22	22	23	24
Trolley bus	19	6	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
Ferry boat [a]	N	N	16	27	25	25	25	25	28	30
Commuter rail	N	N	18	14	16	16	16	18	18	20
Other [b]	N	N	5	35	69	69	69	70	72	81
Total [f]	1,286	1,096	1,055	5,078	5,973	5,973	5,973	5,975	6,000	6,000
Number of vehicles										
Motor bus [p]	49,600	49,700	59,411	58,714	68,123	67,107	71,678	72,770	[R]72,142	74,228
Heavy rail	9,010	9,286	9,641	10,419	10,138	10,157	10,201	10,242	10,301	10,306
Light rail	2,856	1,262	1,013	913	1,054	999	1,140	1,229	[R]1,220	1,297
Trolley bus	3,826	1,050	823	832	877	885	871	859	880	859
Demand responsive	N	N	N	16,471	28,729	29,352	30,804	32,509	[R]29,646	31,884
Ferry boat [a]	N	N	N	108	110	110	109	134	[R]113	112
Commuter rail	N	N	4,500	4,415	4,517	4,565	4,665	4,943	[R]4,963	4,883
Other [b]	N	N	N	1,089	2,395	2,699	2,894	3,674	[R]4,590	4,947
Total	65,292	61,298	75,388	92,961	115,943	115,874	122,362	126,360	[R]123,855	128,516
Number of employees [g]										
Motor bus [q]	121,300	101,598	N	162,189	174,373	181,973	190,152	196,861	[R]198,644	204,179
Heavy rail	35,100	36,442	N	46,102	51,062	45,644	45,793	45,935	[R]45,163	46,311
Light rail	+	+	N	4,066	5,140	4,935	5,728	5,940	[R]6,024	6,058
Trolley bus	+	+	N	1,925	1,848	1,871	2,084	2,037	[R]2,053	2,140
Demand responsive	N	N	N	22,740	35,450	39,882	44,667	44,029	[R]48,406	51,186
Ferry boat [a]	N	N	N	2,813	2,764	2,697	2,830	3,166	[R]3,894	4,024
Commuter rail	N	N	N	21,443	22,596	22,320	22,604	21,651	[R]22,488	22,896
Other [b]	N	N	N	898	854	1,169	1,086	1,140	[R]1,080	1,091
Total	156,400	138,040	189,300	262,176	294,087	300,491	314,944	320,759	[R]327,752	337,885
Peformance										
Vehicle-miles (millions)										
Motor bus [r]	1,576	1,409	1,677	2,130	2,162	2,184	2,221	2,245	[R]2,175	2,276
Heavy rail	391	407	385	537	532	537	543	558	566	578
Light rail	75	34	18	24	34	35	38	41	[R]44	49
Trolley bus	101	33	13	14	14	14	14	14	14	14
Demand responsive	N	N	N	306	464	507	548	585	[R]671	718
Ferry boat [a]	N	N	2	2	2	3	3	3	[R]3	3
Commuter rail	N	N	179	213	231	238	242	251	[R]260	266
Other [b]	N	N	13	16	30	33	43	50	[R]63	69
Total	2,143	1,883	2,287	3,242	3,468	3,550	3,650	3,746	[R]3,794	3,972
Unlinked passenger trips (millions)										
Motor bus [s]	N	5,034	5,837	5,677	4,871	4,848	4,887	5,013	[R]5,399	5,648
Heavy rail	N	1,881	2,108	2,346	2,169	2,033	2,157	2,430	2,393	2,521
Light rail	N	124	133	175	284	251	261	262	[R]276	292
Trolley bus	N	182	142	126	118	119	117	121	117	120
Demand responsive	N	N	N	68	[R]88	88	93	99	95	100
Ferry boat [a]	N	N	63	50	47	47	48	51	[R]52	53
Commuter rail	N	N	280	328	339	344	352	357	[R]381	396
Other [b]	N	N	4	29	33	33	33	41	[R]37	38
Total	N	7,332	8,567	8,799	7,949	7,763	7,948	8,374	[R]8,750	9,168
Passenger-miles (millions)										
Motor bus [z]	N	N	21,790	20,981	18,832	18,818	19,096	19,604	[R]20,360	21,205
Heavy rail	N	N	10,558	11,475	10,668	10,559	11,530	12,056	12,284	12,902
Light rail	N	N	381	571	833	860	957	1,035	[R]1,128	1,206
Trolley bus	N	N	219	193	187	187	184	189	182	186
Demand responsive	N	N	N	431	577	607	656	754	[R]735	813
Ferry boat [a]	N	N	N	286	260	260	256	294	[R]294	310
Commuter rail	N	N	6,516	7,082	7,996	8,244	8,351	8,038	[R]8,704	8,766
Other [b]	N	N	390	124	232	273	348	369	[R]441	469
Total	N	N	39,854	41,143	39,585	39,808	41,378	42,339	[R]44,128	45,857

continued

Transit Profile *continued*

Peformance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	[P]1999
Average trip length (miles)										
Motor bus [l]	N	N	N	N	4	4	4	4	4	4
Heavy rail	N	N	N	N	5	5	5	5	5	5
Light rail	N	N	N	N	4	3	4	4	4	4
Trolley bus	N	N	N	N	2	2	2	2	2	2
Demand responsive	N	N	N	N	7	8	9	10	[R]8	8
Ferry boat [a]	N	N	N	N	6	6	5	6	6	6
Commuter rail	N	N	N	N	24	24	24	23	23	22
Vanpool	N	N	N	N	32	35	34	33	36	34
Other [c]	N	N	N	N	1	1	1	1	1	1
All modes	N	N	N	N	5	5	5	5	5	5
Average vehicle speed (miles per hour)										
Motor bus [u]	N	N	N	N	13	13	13	13	13	13
Heavy rail	N	N	N	N	21	21	21	21	21	21
Light rail	N	N	N	N	14	14	14	16	16	15
Trolley bus	N	N	N	N	8	8	8	8	8	7
Demand responsive	N	N	N	N	14	15	15	15	17	15
Ferry boat [a]	N	N	N	N	8	6	7	7	8	8
Commuter rail	N	N	N	N	34	34	33	34	32	33
Vanpool	N	N	N	N	33	35	37	36	37	38
Other [c]	N	N	N	N	6	6	7	7	7	7
All modes	N	N	N	N	15	15	15	15	15	15
Energy consumption, diesel (million gallons)										
Motor bus [v]	N	N	N	563	565	564	578	598	[R]607	618
Heavy rail	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Light rail	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trolley bus	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Demand responsive	N	N	N	15	30	29	31	32	[R]38	43
Ferry boat [a]	N	N	N	20	21	22	22	24	[R]25	29
Commuter rail	N	N	N	53	62	63	62	63	[R]69	73
Other [b]	N	N	N	<1	< 1	< 1	< 1	< 1	<1	<1
Total	[v]208	[v]271	[v]431	651	678	678	693	717	[R]740	763
Energy Consumption, other (million gallons)										
Gasoline and other nondiesel fuels [h,w]	192	68	11	33	60	61	61	59	[R]53	49
Compressed natural gas	U	U	U	U	5	11	15	24	[R]37	44
Total	192	69	11	34	65	71	76	83	[R]90	93
Energy consumption (million kWh)										
Motor bus	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heavy rail [x]	N	N	N	3,284	3,431	3,401	3,332	3,253	3,280	3,385
Light rail	N	N	N	239	282	288	321	361	[R]381	416
Trolley bus	N	N	N	69	103	100	69	78	74	75
Demand responsive	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ferry boat [a]	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	[R]1,299	1,322
Other [b]	N	N	N	19	21	26	30	26	[R]39	39
Total	[x]2,908	[x]2,561	[x]2,446	4,837	5,081	5,068	5,007	4,988	[R]5,073	5,237
Safety [l]										
Fatalities, all modes	N	N	N	339	320	274	264	275	286	299
Injured persons, all modes	N	N	N	54,556	58,193	57,196	55,288	56,132	55,990	55,325
Incidents, all modes	N	N	N	90,163	70,693	62,471	59,392	61,561	60,094	58,703

KEY: ~ = included in heavy rail figure; + = included in motor bus figure; N = data do not exist; NA = not applicable; P = preliminary; R = revised.

[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] Includes cable car, inclined plane, aerial tramway, monorail, and automated guideway.

[d] 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.

[e] Included in other.

[f] 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.

[g] Based on employee equivalents of 2,080 hours equals one employee; beginning in 1993, based on number of actual employees.

[h] Liquefied natural gas, liquefied petroleum gas, methanol, propane, and other nondiesel fuels, except compressed natural gas.

SOURCES: Unless otherwise noted, refer to chapter tables for sources.

[i] U.S. Department of Transportation, Federal Transit Administration.Safety Management Information Statistics (SAMIS), (Washington, DC: Annual reports).

[j] American Public Transit Association, *2001 Transportation Fact Book* (Washington, DC: 2001), tables 18, 30, and 84, and similar tables for prior years.

[k] Ibid., 2001 edition tables 25 and 84, and similar tables in earlier years.

[l] Ibid., 2001 edition table 23, and similar tables in earlier years.

[m] Ibid., 2001 edition tables 18 and 84, and similar tables in earlier years.

[n] Ibid., 2001 edition table 20, and similar tables in earlier years.

[o] Ibid., 2001 edition table 1, and similar tables in earlier years.

[p] Ibid., 2001 edition tables 46 and 84, and similar tables in earlier years.

[q] Ibid., 2001 edition tables 62 and 84, and similar tables in earlier years.

[r] Ibid., 2001 edition tables 42 and 84, and similar tables in earlier years.

[s] Ibid., 2001 edition tables 26 and 84, and similar tables in earlier years.

[t] Ibid., 2001 edition table 39, and similar tables in earlier years.

[u] Ibid., 2001 edition table 44, and similar tables in earlier years.

[v] Ibid., 2001 edition table 65, and similar tables in earlier years.

[w] Ibid., 2001 edition table 66, and similar tables in earlier years.

[x] Ibid., 2001 edition table 67, and similar tables in earlier years.

[y] Ibid., 2001 edition table 17, and similar tables in earlier years.

[z] Ibid., 2001 edition tables 30 and 84, and similar tables in earlier years.

Rail Profile

Financial	1960	1970[a]	1980	1990	1994	1995	1996	1997	1998	1999
Class I [b]										
Operating revenues ($ millions)										
Passenger [f]	640	421	446	94	88	89	59	60	61	61
Freight	8,025	10,922	26,350	27,471	29,931	31,356	31,889	32,322	32,247	32,680
Other	849	649	1,462	805	790	835	745	736	843	780
Total	9,514	11,992	28,258	28,370	30,809	32,279	32,693	33,118	33,151	33,521
Operating expenses ($ millions)[c]	8,775	11,478	26,355	24,652	25,511	27,897	26, 331	27,291	27,916	28,011
Amtrak										
Total revenue ($ millions)	N	162	429	[h]1308.4	[R]1,409	[R,h]1,490	[R,h]1,550	[R,h]1,669	[R,h]2,244	[h]2,011
Total expenses ($ millions)	N	301	1,103	2,012	[R]2,367	[R]2,257	[R]2,258	[R]2,359	[R]2,548	2,660
Inventory										
Class I [b]										
Number of vehicles										
Class I freight cars	1,658,292	[f]1,423,921	[f]1,168,114	[f]658,902	[f]590,930	[f]583,486	[f]570,865	[f]568,493	[f]575,604	[f]579,140
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
Freight cars, 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
Locomotives	29,031	27,077	28,094	18,835	18,505	18,812	19,269	19,684	20,261	20,256
Number of companies	106	71	38	14	12	11	10	9	9	9
Number of employees	780,494	566,282	458,994	216,424	189,962	188,215	181,809	177,981	178,222	177,557
Miles of road owned	207,334	196,479	164,822	119,758	109,332	108,264	105,779	102,128	100,570	99,430
Amtrak										
Number of vehicles										
Passenger										
Train-cars	N	[g]1,569	[g]2,128	[h]1,863	[h]1,852	[h]1,722	[h]1,730	[h]1,728	[h]1,962	[h]1,992
Locomotives	N	185	419	318	338	313	299	332	345	329
Number of employees	N	[i]1,500	[i]21,416	[i]24,000	25,049	23,646	[g]23,278	[g]23,555	[f]24,528	[f]25,291
System route mileage	N	N	[j]24,000	[j]24,000	25,000	24,000	[h]25,000	[h]25,000	[h]22,000	[h]23,000
Performance										
Class I[b]										
Car mileage, freight (thousands) [f]	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
Train mileage, freight (thousands)	404,464	427,065	428,498	379,582	440,896	458,271	468,792	474,954	474,947	490,442
Locomotive mileage (thousands)										
Freight [k]	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
Train and yard switching	N	N	212,040	135,806	143,224	150,840	153,798	141,461	153,997	154,367
Total	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
Revenue ton-miles of freight (millions) [f]	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
Average length of haul, freight (miles)	461	515	616	726	817	843	842	851	835	835
Fuel consumed in freight service (million gallons)	3,463	3,545	3,904	3,115	3,334	3,480	3,579	3,575	3,583	3,715
Average miles traveled per vehicle										
Locomotive	N	N	54,497	67,978	75,925	76,796	76,037	72,304	71,058	74,247
Car	14,332	16,753	17,113	21,579	23,889	24,926	25,565	24,921	24,822	24,730
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
Car	8.13	8.43	7.50	8.40	8.54	8.73	8.86	8.86	9.11	9.11
Amtrak										
Passenger train car-miles (millions)	N	[l]213	[l]235	[l]301	304	[o]292	[o]276	[o]288	[o]312	[o]342
Passenger train-miles (millions)	N	26	30	33	[R]34	32	30	32	33	34
Passenger locomotive-miles (millions)	N	N	41	49	51	48	U	U	U	U
Revenue passengers carried (millions)	N	17	21	22	21	21	20	20	21	22
Revenue passenger-miles (millions)	N	3,039	4,503	[h]6,057	[h]5,921	[h]5,545	[h]5,050	[h]5,166	[h]5,304	[h]5,330
Average passenger fare (dollars)	N	[m]8.3	17.7	38.5	38.2	39.0	42.5	44.3	44.0	45.7
Average passenger revenue/passenger-mile (cents)	N	4.5	8.2	14.1	13.7	14.6	16.6	17.3	17.5	18.4
Average passenger trip length (miles)	N	182.6	217.0	273.0	271.1	267.6	256.9	255.8	251.5	247.8
Locomotive fuel consumed										
Diesel (million gallons)	N	N	64	82	U	[p]66	[p]71.2	[p]75	[p]75	[p]74
Electric kWh (millions)	N	N	254	330	U	304	293	282	275	283
Safety [d,n]										
Number of fatalities, railroads and grade crossings										
Passenger on trains	34	10	4	3	5	0	12	6	4	14
Employees on duty	215	179	97	40	31	34	33	37	27	31
Employees not on duty	N	N	4	0	0	2	0	0	2	0
Trespassers	637	607	566	700	682	660	620	646	644	572
Nontrespassers	1,459	1,535	[R]746	[R]554	505	443	365	363	326	303
Contractor employees	N	N	7	3	3	7	9	11	5	12
Railroad and grade crossing, total	2,345	2,225	1,417	1,297	1,226	1,146	1,039	1,063	1,008	932
Grade crossing only	1,421	1,440	[R]772	698	615	579	488	461	431	402
Railroad only [e]	924	785	[R]645	599	611	567	551	602	577	530

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

[a] Amtrak data in this column are for 1972, Amtrak's first full year of operation.

[b] Excluding Amtrak and all non-Class I railroads, except for Section IV.

[c] Operating expenses include equipment, joint facility rents, leased roads and equipment, and all taxes except Federal income.

[d] Safety figures from U.S. Department of Transportation, Federal Railroad Administration are for all railroads.

[e] Figures may not appear directly in data source.

NOTE: Amtrak figures are based on Amtrak fiscal year (October 1-September 30).

SOURCES: Unless otherwise noted, refer to chapter tables for sources.

[f] Association of American Railroads (AAR), *Railroad Facts,* Annual issues, 1990-1999, pp. 3, 10, 12, 13, 14, 27, 33, 34, 36, 40, 44, 48, 50, 77.

[g] Amtrak, *National Railroad Passenger Corporation Annual Report*, 1972, 1980, 1990, 1993-95.

[h] Ibid., *Statistical Appendix to Amtrak Annual Report,* Annual issues.

[i] Ibid., Public Affairs, personal communication.

[j] Ibid., Route Miles by Railroad, Corp. Planning & Development.

[k] Association of American Railroads (AAR), *Analysis of Class 1 Railroads,* Annual issues.

[l] Amtrak, *Train Information System Reports* .

[m] Ibid., *Train Earnings Reports* .

[n] 1960-80: U.S. Department of Transportation, Federal Railroad Administration, Systems Support Division, RRS-22, personal communication.

1990-94: Ibid., *Accident/Incident Bulletin,* annual issues, tables 7 and 9.

1995-99: Ibid., *Railroad Safety Statistics, Annual Report 2000,* table 1-3.

[o] Amtrak Corporate Reporting, Route Profitability System, Washington D.C., personal communication, August 2001.

[p] Amtrak General Acounting, Pennsylvania, personal communication, June 1999.

Water Transport Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Operating revenues ($ millions)										
Domestic freight [k]	1,722	2,070	7,219	7,940	7,745	7,712	[R]7,283	[R]6,940	[R]6,824	6,795
Coastal waterways	747	834	3,155	3,066	2,929	2,774	[R]2,571	2,169	[R]1,952	1,828
Inland waterways	461	621	2,395	2,956	2,868	2,964	[R]2,861	[R]2,899	[R]2,904	2,811
Great Lakes	227	239	513	615	577	585	[R]572	615	[R]610	549
Locks, channels	287	376	1,156	1,303	1,371	1,389	1,279	1,257	1,358	1,607
International freight[h]	1,765	3,187	8,279	12,181	13,405	[R]14,997	17,281	14,091	15,679	17,699
Passenger, total	281	287	[R]310	[R]1,391	[R]1,564	[R]1,716	[R]1,843	[R]1,974	[R]2,029	2,088
Domestic passenger, intercity	14	12	[R]27	[R]100	[R]121	129	[R]140	141	[R]146	152
International passenger[a]	267	275	283	[R]1,291	[R]1,443	[R]1,587	[R]1,703	[R]1,833	[R]1,883	1,936
Revenues of U.S. commercial fishing fleet (domestic landings) ($ millions)[l]	354	613	2,237	3,522	3,809	3,770	3,487	3,448	3,128	3,467
Inventory										
Number of domestic inland vessel operators[b,m]	228	380	403	565	555	557	554	U	U	U
Number of employees										
Ships, boat building, and repairing	[n]141,200	[n]171,800	[n]220,500	[o]187,700	[p]158,200	[p]159,600	[p]158,800	[p]158,300	[R,p]166,600	[p]167,400
Water transportation[c]	N	212,300	211,200	176,600	172,400	174,500	174,100	178,700	[R]181,300	185,500
Number of employees[d,j]										
Passenger/combo[q]	8,560	2,178	618	642	642	642	321	321	321	321
Cargo	28,668	22,257	9,878	7,019	6,056	5,400	4,964	4,831	4,924	4,757
Tankers	12,053	10,567	8,722	4,471	4,626	4,261	3,965	3,785	3,711	3,958
Total	49,281	35,000	19,218	12,132	11,324	10,303	9,250	8,937	8,956	9,036
Mileage of commercially navigable channels[k]	25,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000
Number of vessels										
Total nonself-propelled	[r]16,777	[r]19,377	[r]31,662	[r]31,209	[r]30,730	[r]31,360	[r]32,811	[r]33,011	[r]33,509	[w]33,387
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
Tankers	2,429	3,281	4,166	3,913	3,966	3,985	4,036	3,971	3,952	3,973
Railroad car floats	323	206	70	13	34	33	32	34	31	31
Total self-propelled	6,543	6,455	7,126	8,236	8,334	8,281	8,293	8,408	8,523	8,379
Dry cargo/passenger	1,796	1,761	2,036	2,678	2,785	2,804	2,782	2,905	2,938	2,910
Ferries, railroad car	31	17	67	135	175	172	173	183	213	229
Tankers	489	421	330	213	195	178	161	147	135	142
Towboats/tugs	4,203	4,248	4,693	5,210	5,179	5,127	5,177	5,173	5,237	5,098
U.S. merchant marine ships (over 1,000 gross tons)										
Total U. S. flag[s]	2,926	1,579	864	636	543	509	495	477	470	463
Passenger/cargo	309	171	65	10	13	13	15	14	12	11
Freighters	2,138	1,076	471	367	308	295	292	288	289	284
Bulk carriers	57	38	20	26	22	20	15	14	15	14
Tankers	422	294	308	233	200	181	173	161	154	154
Privately owned	1,008	U	578	408	354	319	302	285	281	277
Government owned	1,918	U	286	228	189	190	193	192	189	186
Number of recreational boats (thousands)[e,t]	2,500	7,400	8,905	10,996	11,430	11,735	11,878	12,313	[R]12,566	12,738
Performance										
Ton-miles (thousands)[f]										
Domestic water freight										
Coastwise[u]	N	359,784,000	[R]631,149,200	479,133,600	[R]457,600,700	440,345,100	408,086,100	349,843,000	314,863,900	292,730,000
Internal	N	155,816,000	[R]227,343,000	292,393,300	[R]297,762,400	306,329,100	296,790,600	294,023,000	294,896,400	304,724,100
Lakewise	N	79,416,000	[R]61,747,100	60,929,900	[R]58,263,400	59,703,800	58,335,300	62,165,900	61,654,300	57,045,200
Intraport	N	1,179,000	[R]1,596,400	1,087,000	[R]1,292,700	1,349,600	1,474,500	1,378,100	1,380,700	1,362,200
Total	N	596,195,000	[R]921,835,800	853,543,800	[R]814,919,200	[R]807,727,700	[R]764,686,500	707,409,900	[R]672,795,300	655,861,500
Tons of freight hauled (thousands)										
Domestic										
Coastwise	209,197	238,440	329,609	298,637	277,029	266,612	267,389	263,146	249,633	228,802
Internal	291,057	472,123	534,979	622,595	618,409	620,324	622,081	630,558	625,028	624,575
Lakewise	155,109	157,059	115,124	110,159	114,777	116,127	114,870	122,734	122,156	113,887
Intraport	104,193	81,475	94,184	86,378	82,870	83,104	89,011	89,816	90,077	88,650
Intraterritory	1,017	1,630	3,588	4,529	5,926	6,868	7,327	6,273	7,217	5,873
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
Exports										
Great Lakes ports	23,150	35,932	45,077	32,898	27,108	32,968	31,855	33,209	36,876	40,233
Coastal ports	104,810	205,698	358,806	408,688	369,138	441,732	418,940	399,104	367,831	359,763
Total	127,961	241,629	403,883	441,586	369,246	474,700	450,794	432,313	404,708	399,996
Imports										
Great Lakes ports	12,851	26,406	15,515	[R]17,558	23,028	18,897	24,503	24,532	25,558	22,196
Coastal ports	198,466	312,934	502,006	582,412	696,469	653,760	708,090	763,771	815,122	838,579
Total	211,316	339,340	517,521	599,970	719,497	672,657	732,593	788,303	840,680	860,775

continued

Water Transport Profile *continued*

Performance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Average haul, domestic system (miles)[f]										
Coastwise	1,496	1,509	1,915	1,604	1,652	1,652	1,526	1,330	1,261	1,279
Internal	282	330	405	470	482	494	477	466	472	488
Lakewise	522	506	536	553	508	514	508	507	505	501
Cargo capacity (short tons)										
Total nonself-propelled vessels	[r]16,355,657	[r]24,026,024	[r]44,875,116	[r]48,946,785	[r]49,708,960	[r]51,140,530	[r]54,086,973	[r]54,974,961	[r]55,999,952	[w]56,566,140
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
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
Total self-propelled vessels	15,905,881	19,284,050	23,906,346	19,723,788	16,867,458	15,783,399	14,850,253	14,161,739	12,970,167	13,892,574
Dry cargo/passenger	12,188,956	10,815,977	8,011,587	7,042,263	7,118,193	6,484,707	6,208,011	6,685,719	6,371,425	6,928,684
Tankers	3,716,925	8,468,073	15,894,753	12,681,525	9,749,265	9,298,692	8,642,242	7,476,020	6,598,742	6,963,890
Fuel consumption (thousand barrels)										
Diesel fuel and distillate[k]	18,730	19,503	35,201	52,310	48,260	47,098	51,848	50,180	50,609	49,157
Residual fuel oil	94,084	89,850	213,131	148,764	141,544	153,125	[R]138,214	114,044	110,480	133,301
Gasoline	9,200	14,238	25,048	30,962	[R]20,846	[R]25,247	23,659	[R]23,505	22,767	26,146
Total	122,014	123,591	273,380	232,036	[R]210,650	[R]225,470	[R]213,721	[R]187,729	183,856	208,604
Safety										
Fatalities in waterborne transport (vessel casualties only)[j]										
Freight ship	N	[v]30	[v]8	[v]0	[R,x]0	[R,x]0	[R,x]1	[R,x]2	[R,x]2	[x]0
Tank ship	N	4	4	5	[R]3	[R]0	[R]0	[R]0	[R]1	0
Passenger vessel	N	1	5	3	[R]4	[R]4	[R]8	[R]1	[R]3	14
Tug/towboat	N	22	14	13	[R]1	[R]1	[R]1	[R]3	[R]0	6
Offshore supply	N	N	N	2	[R]1	[R]2	[R]2	[R]0	[R]6	0
Fishing vessel	N	77	60	47	[R]48	[R]23	[R]37	[R]22	[R]33	25
Recreational vessel	N	N	N	3	[R]13	[R]22	[R]3	[R]7	[R]7	9
MODU[g]	N	N	N	0	[R]0	[R]0	[R]0	[R]4	[R]0	0
Platform	N	N	N	1	U	U	U	U	U	U
Freight barge	N	N	N	0	[R]2	[R]0	[R]0	[R]2	[R]1	0
Tank barge	N	H	N	0	[R]0	[R]0	[R]0	[R]0	[R]0	1
Miscellaneous	N	44	56	11	[R]5	[R]0	[R]3	[R]7	[R]14	3
Total[j]	N	178	206	85	[R]77	[R]52	[R]55	[R]48	[R]67	58
Injuries in waterborne transport										
Freight ship	N	14	8	10	[R]6	[R]1	[R]7	[R]3	[R]3	2
Tank ship	N	19	9	13	[R]10	[R]8	[R]1	[R]5	[R]6	1
Passenger vessel	N	10	10	51	[R]43	[R]47	[R]142	[R]36	[R]39	76
Tug/towboat	N	10	27	19	[R]19	[R]19	[R]16	[R]21	[R]12	15
Offshore supply	N	N	N	9	[R]2	[R]10	[R]7	[R]3	[R]5	1
Fishing vessel	N	13	28	31	[R]55	[R]41	[R]36	[R]25	[R]35	25
Recreational vessel	N	N	N	2	[R]17	[R]20	[R]9	[R]6	[R]9	12
MODU[g]	N	N	N	13	[R]0	[R]0	[R]0	[R]3	[R]0	2
Platform	N	N	N	9	U	U	U	U	U	U
Freight barge	N	N	N	3	[R]4	[R]0	[R]0	[R]5	[R]1	1
Tank barge	N	N	N	3	[R]3	[R]5	[R]2	[R]0	[R]0	1
Miscellaneous	N	N	98	12	[R]21	[R]1	[R]9	[R]12	[R]20	9
Total[j]	N	105	180	175	[R]180	[R]152	[R]229	[R]119	[R]130	145
Fatalities in recreational boating (vessel casualties only)										
Air thrust[t]	N	N	N	N	N	4	1	6	11	2
Propeller	N	N	N	N	N	475	363	436	462	421
Inboard	N	[t]119	[t]100	[t]50	[t]36	N	N	N	N	50
Outboard	N	774	609	454	341	N	N	N	N	326
Inboard/outboard	N	28	47	53	49	N	N	N	N	35
Jet	N	N	10	25	58	68	61	83	82	75
Sail	N	44	43	20	13	4	8	15	5	7
Manual (oars, paddle)	N	205	272	182	140	148	109	150	151	114
Other	N	29	14	5	12	8	8	10	0	N
Propulsion unknown	N	219	265	76	135	122	159	121	104	115
Total	[t]739	1,418	1,360	865	748	829	709	821	815	734

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

[a] Revenues paid by American travelers to U.S. and foreign flag carriers.
[b] Does not include vessel operators whose primary area of operation is fishing, towing, passenger transport, ferrying, or crew boat utility service.
[c] Includes commercial port, marina, and other employees; excludes employees of not-for-hire private
[d] 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.
[e] 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.
[f] Does not include intraterritorial traffic (traffic between ports in Puerto Rico and the Virgin Islands, which are considered a single unit).
[g] Mobile Offshore Drilling Units.

[h] 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.

[i] 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.

[j] 1992-2000 data come from the Marine Safety Management Information System. Data for prior years may not be directly comparable.

SOURCES: Unless otherwise noted, refer to chapter tables for sources.

[k] Eno Transportation Foundation Inc., *Transportation in America, 2000* (Washington, DC: 2001), pp. 7, 10-11,

[l] 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.

[m] U.S. Department of Transportation, Maritime Administration, MAR-450, personal communication.

[n] U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994), SICs 373 and 44.

[o] Ibid., *Employment, Hours and Earnings, 1988-1996* (Washington, DC: August 1996), SICs 373 and 44.

[p] Ibid., Internet website www.bls.gov as of Aug. 21, 2001.

[q] U.S. Department of Transportation, Maritime Administration, *U.S. Merchant Marine Data Sheet* (Washington,

[r] U.S. Army, Corps of Engineers, *Summary of U.S. Flag Passenger & Cargo Vessels* (New Orleans, LA: Annual issues).

[s] U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues).

[t] U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual issues).

[u] 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

[v] U.S. Coast Guard, Office of Investigations and Analysis, G-MAO-2, personal communication.

[w] U.S. Army Corps of Engineers, *Waterborne Transportation Lines of the United States* (New Orleans, LA: Annual issues) part 1, section 1, table 1.

[x] U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, Feb. 13, 2002.

Oil Pipeline Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Operating revenues ($ millions)										
FERC-regulated	[d]770	[d]1,188	[d]6,340	[R,d]7,164	[R,d]7,353	[R]7,751	[R]7,310	[R,d]7,278	[R,d]7,212	[d]7,645
Nonregulated	125	208	1,208	1,342	1,323	[R]1,326	[R]1,327	[R]1,354	[R]1,367	1,422
Total	895	1,396	7,548	[R]8,506	[R]8,676	[R]9,077	[R]8,637	[R]8,632	[R]8,579	9,067
Inventory										
Number of FERC-regulated companies	[e]87	[e]101	[e]130	[e]150	[e]158	[e]161	[e]160	U	U	[f]184
Number of employees, pipeline companies [a]	[g]23,100	[g]17,600	[g]21,300	[h]18,500	[h]17,100	[R,i]15,100	[i]14,500	[i]14,200	[i]13,800	[j]13,060
Miles of pipeline (statute miles) [b]										
Crude lines [k]	141,085	146,275	129,831	118,805	[R]103,277	[R]97,029	92,610	91,523	87,663	86,369
Product lines	49,859	72,396	88,562	89,947	[R]87,073	[R]84,883	84,925	88,350	90,985	91,094
All lines	190,944	218,671	218,393	208,752	[R]190,350	[R]181,912	177,535	179,873	178,648	177,463
Performance										
Intercity ton-miles (millions)										
Crude oil [l]	N	N	362,600	334,800	322,600	335,900	338,300	337,400	334,100	336,200
Petroleum products	N	N	225,600	249,300	268,800	265,200	280,900	279,100	285,700	286,800
Total	[m]229,000	[m]431,000	588,200	584,100	591,400	601,100	619,200	616,500	619,800	623,000
Tons transported (millions)	[R,l]468	[R,l]790.2	[R]921	1,057.4	[R]1,063.6	[R]1,080.6	[R]1,114.1	[R]1,108.0	[R]1,116.3	1,125.20
Average length of haul (statute miles)										
Crude oil	[n]325	[n]300	[o]871	[R,o]812	[R,o]778	[R,o]797	[o]779	[R,o]781	[R,o]767	[o]766
Petroleum products	269	357	414	[R]387	[R]414	[R]402	[R]413	[R]413	[R]420	418
Safety										
Fatalities [p]	N	4	4	3	1	3	5	0	2	4
Injuried Persons	N	21	15	7	[c]7	11	13	5	6	20
Incidents	N	351	246	180	[R]245	188	[R]194	171	153	168

KEY: FERC = Federal Energy Regulatory Commission; N = data do not exist; R = revised; 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: Unless otherwise noted, refer to chapter tables for sources.
[d] Eno Transportation Foundation, Inc., *Transportation In America 2000,* with historical compendium 1939-1999 (Washington, DC: 2000), pp. 4-7.
[e] Federal Energy Regulatory Commission, personal communication.
[f] Federal Energy Regulatory Commission, Internet site www.ferc.fed.us/oil/oil_list.htm as of June 21, 2001.
[g] U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States,* 1909-94 (Washington, DC: September 1994), SIC 46.
[h] Ibid., *Employment, Hours and Earnings, United States, 1988-1996* (Washington, DC: July 1996), SIC 46.
[i] Ibid., Internet site www.bls.gov as of Apr. 19, 1999.
[j] Ibid., Internet site http://www.bls.gov/oes/1999/oesi2_46.htm as of July 3, 2001.
[k] Eno Transportation Foundation, Inc., *Transportation In America 2000, with historical compendium 1939-1999* (Washington, DC: 2000), p. 44.
[l] Ibid., pp. 28, 29.
[m] Ibid., *Transportation in America,* 1998 (Washington, DC: 1998), p. 44 and *Transportation in America, Supplement, 1999* (Washington, DC: 1999).
[n] Ibid., p. 71.
[o] Eno Transportation Foundation, Inc., *Transportation In America 2000, with historical compendium 1939-1999* (Washington, DC: 2000), p. 51.
[p] U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, available at Internet site http://ops.dot.gov/stats/lq_sum.htm as of May 31, 2002.

Natural Gas Pipeline Profile

Financial ($ millions)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Transmission pipeline companies										
Total operating revenues[a]	[e] 3,190	[e] 5,928	[f] 41,604	[f] 21,756	[f] 13,841	[f] 12,092	[f] 12,050	[f] 10,339	[f] 9,450	[f] 14,097
Total operating expenses[a]	2,698	5,088	39,709	19,484	11,333	9,534	9,603	7,862	[R] 6,875	10,176
Operation and maintenance	2,095	4,203	36,480	17,058	8,389	6,680	6,802	5,381	4,260	6,120
Operation expenses	2,031	4,094	36,075	16,429	7,811	6,121	6,314	4,975	3,909	5,640
Maintenance expenses	64	109	405	629	578	558	488	406	351	480
Taxes (federal, state, local)[b]	319	376	1,991	1,245	1,757	1,582	1,643	1,531	[R] 1,560	2,427
Federal taxes	223	202	1,327	768	1,172	1,048	1,085	1,076	1,035	5,329
State and local taxes	96	174	664	477	585	534	558	455	525	791
Distribution pipeline companies										
Total operating revenues[a]	N	N	[e] 14,013	[g] 18,750	[g] 20,911	[g] 19,421	[g] 30,407	[R, g] 30,864	[R, g] 28,182	[g] 29,713
Total operating expenses[a]	N	N	13,263	17,125	19,025	17,402	27,917	27,445	[R] 25,668	25,941
Operation and maintenance	N	N	11,791	14,544	15,868	14,170	23,301	23,155	[R] 21,396	21,360
Operation expenses	N	N	11,539	14,020	15,279	13,575	22,433	22,388	20,710	19,295
Maintenance expenses	N	N	252	524	589	596	868	767	687	2,066
Taxes (federal, state, local)[b]	N	N	1,136	1,625	1,917	1,888	2,668	2,415	[R] 2,524	2,488
Federal taxes	N	N	351	581	703	720	1,041	849	1,250	934
State and local taxes	N	N	785	1,045	1,228	1,168	1,627	1,566	1,274	1,554
Investor-owned, total industry[c]										
Total operating revenues	N	N	[h] 85,918	[h] 66,027	[h] 63,446	[h] 58,434	[h] 63,600	[i] 62,660	[R, j] 57,548	[j] 66,320
Total operating expenses[a]	N	N	81,789	60,137	56,789	50,800	56,695	55,422	[R] 51,075	56,967
Operation and maintenance	N	N	74,508	51,628	45,593	40,041	45,785	44,851	[R] 41,360	45,368
Operation expenses	N	N	73,288	49,718	43,879	37,998	43,742	43,258	39,971	42,423
Maintenance expenses	N	N	1,220	1,910	2,074	2,043	2,043	1,593	1,390	2,946
Taxes (federal, state, local)[b]	N	N	4,847	4,957	6,613	6,186	6,362	6,384	[R] 5,293	6,594
Federal taxes	N	N	2,327	2,038	3,112	2,723	2,932	3,066	2,631	3,233
State and local taxes	N	N	2,520	2,919	3,491	3,463	3,430	3,318	2662	3,361
Inventory										
Pipeline mileage										
Transmission	[k] 183,700	[k] 252,200	[l] 266,500	[l] 280,100	[l] 268,300	[l] 268,300	[l] 259,300	[l] 251,100	[R, l] 255,800	[l] 263,300
Distribution	391,400	594,800	701,800	837,300	919,300	936,800	959,500	957,100	[R] 999,000	1,045,900
Field and gathering	55,800	66,300	83,500	89,500	70,400	60,400	57,500	43,000	[R] 40,200	36,100
Total	630,950	913,267	1,051,774	1,206,894	1,257,971	1,262,152	1,276,315	1,251,200	[R] 1,295,000	1,345,400
Number of employees										
Gas utility industry totals[d]	[m] 206,400	[m] 211,700	[m] 215,400	[n] 204,200	[n] 187,200	[n] 179,000	[n] 179,000	[n] 154,600	[R, n] 154,200	[n] 149,400
Investor-owned companies[d]	N	N	202,700	192,100	175,800	168,100	163,500	145,400	[R] 142,400	137,600
Transmission pipeline companies	31,400	32,400	45,200	37,400	31,000	28,000	32,300	27,500	28,400	32,300
Distribution pipeline companies	N	N	52,100	64,700	62,400	61,600	79,700	75,000	[R] 71,300	71,500
Integrated pipeline companies	N	N	53,200	39,900	39,400	36,400	12,700	12,300	[R] 12,000	6,300
Combination pipeline companies	N	N	52,200	50,100	42,900	42,100	38,700	30,600	[R] 30,700	27,500

continued

Natural Gas Pipeline Profile *continued*

Inventory (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999
Number of interstate natural gas pipeline companies	[o] 87	[o] 89	[o] 91	[o] 132	[p] 150	[p] 133	[p] 138	[q] 86	[q] 86	[r] 184
Performance (million cubic ft.)										
Marketed production, total	[s] 12,771,038	[s] 21,920,642	[s] 20,179,724	[s] 18,593,792	[s] 19,709,525	[s] 19,506,474	[t] 19,812,241	[t] 19,866,093	[R, t] 19,961,348	[t] 19,804,848
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	20,004,012	19,469,047	19,895,308
Consumed, total	11,966,537	21,139,386	19,877,293	18,715,090	20,707,717	21,580,665	21,966,616	21,958,660	[R] 21,277,205	21,619,616
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
Safety										
Fatalities[u]	N	26	15	6	21	18	48	10	[R] 18	19
Injured persons	N	233	177	69	113	53	114	72	[R] 76	93
Incidents	N	1,077	1,524	198	222	161	187	175	[R] 236	173

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

[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, tranmission, integrated and combination companies.

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

Gas utility industry totals include employees in privately owned companies.

SOURCES:

[e] American Gas Association, *Gas Facts,* 1979 (Arlington, VA), table 134.

[f] Ibid., *Gas Facts,* (Arlington, VA: Annual issues), table 12-2, and similar tables in earlier editions.

[g] Ibid., table 12-1, and similar tables in earlier editions.

[h] Ibid., table 12-1.

[i] Ibid., Unpublished data and personal communication, Aug. 17, 2000.

[j] Ibid., *Gas Facts,* 2000, table 12-1,12-2,12-3, and 12-4.

[k] Ibid., *Gas Facts,* 1979 (Arlington, VA), table 44.

[l] Ibid., *Gas Facts,* (Arlington, VA: Annual issues), table 5-1, table 5-2, and similar tables in earlier editions.

[m] Ibid., *Gas Facts,* 1979 (Arlington, VA), table 153.

[n] Ibid., *Gas Facts,* (Arlington, VA: Annual issues), table 14–2, and similar tables in earlier editions.

[o] U.S. Department of Energy, Energy Information Administration, *Statistics of Interstate Natural Gas Pipeline Companies* (Washington, DC: Annual issues), preface.

[p] Federal Energy Regulatory Commission, personal communication.

[q] American Gas Association, personal communication, Aug. 17, 2000.

[r] Federal Energy Regulatory Commission, http://www.ferc.gov/gas/pipecomp.htm as of Jan. 2, 2002.

[s] U.S. Department of Energy, Energy Information Administration, *Natural Gas Annual, 1998* (Washington, DC: October 1999), table 98. Internet site http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/natural_gas_annual/nga.html as of Aug. 9, 2000.

[t] Ibid., *Natural Gas Annual 2000,* table 1.

[u] U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, DPS-35, Internet site http://ops.dot.gov/stats.htm as of Jan. 2, 2002.

Appendix B

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
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	R6,308,068	R6,350,265	R6,286,564	6,304,192	6,334,747
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	194,082
Amtrak[c]	N	N	N	N	38,624	38,624	38,624	40,234	40,234	40,234	40,234	38,624	40,234	40,234	35,406	37,015	37,015
Transit[d]																	
Commuter rail[c]	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	U
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	U
Light rail	N	N	N	N	N	618	777	887	898	865	904	913	1,027	1,061	1,088	1,291	U
Navigable channels[e]	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
Oil pipeline[f]	307,295	339,358	351,917	363,533	351,469	343,764	335,954	328,029	R316,309	R312,181	R306,339	R292,759	285,715	289,478	287,506	285,599	U
Gas pipeline[g]	1,015,416	1,235,204	1,469,761	1,575,971	1,692,666	1,800,655	1,942,308	1,972,023	2,017,995	2,013,442	2,024,508	2,031,237	2,054,030	2,013,610	R2,082,913	2,165,181	U

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

[a] All public road and street kilometers in the 50 states and the District of Columbia. For years prior to 1980, some kilometers of nonpublic roadways are included. No consistent data on private road kilometers are available. Beginning in 1998, approximately 69,200 kilometers of Bureau of Land Management Roads are excluded.
[b] Data represent kilometers 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 kilometers of track operated.
[d] Transit system kilometers is measured in directional route-kilometers. A directional route-kilometer is the kilometer in each direction over which public transportation vehicles travel while in revenue service. Directional route-kilometers 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] The St. Lawrence Seaway is not included in this number because 3 of the 5 subsections are solely in Canadian waters, and the others are in international boundary waters. Of the 41,800 kilometers of navigable waterways, 17,500 kilometers are commercially significant shallow-draft inland waterways subject to fuel taxes.
[f] Includes trunk and gathering lines for crude-oil pipeline.
[g] Excludes service pipelines. Data not adjusted to common diameter equivalent. Kilometers as of the end of each year. Includes field and gathering, transmission, and distribution mains. See table 1-8 for a more detailed breakout of oil and gas pipeline kilometers.

NOTE: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used. 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.
1996-98, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-20.
1999: Ibid., personal communication, May 2002.
Class I rail:
1960-99: Association of American Railroads, *Railroad Facts* (Washington, DC: 2000), p. 44.
2000: Ibid., *Railroad 10-Year Trends,* personal communications, Sept. 19, 2001.
Amtrak:
1980: Amtrak, Corporate Planning and Development, personal communication (Washington, DC).
1985-2000: Amtrak, Corporate Planning and Development, *Amtrak Annual Report, Statistical Appendix* (Washington, DC: Annual issues).
Transit:
1985-99: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues) table 20 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: Waterborne Commerce Statistics Center Databases, personal communication, Aug. 3, 2001.
Oil pipeline:
1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 44.
Gas pipeline:
1960-99: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), table 5-2 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	R,[d]1998	R1999	2000
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**	**R13,264,917**	**13,133,628**	**13,161,180**	**13,234,268**
Urban													
Interstates	77,986	92,207	100,124	101,109	108,254	111,341	113,993	114,870	115,535	R116,286	117,492	117,957	118,955
Other arterials[b]	536,995	598,111	642,733	647,536	673,041	700,686	712,093	717,491	723,368	R730,035	730,739	724,741	733,631
Collectors	233,561	261,320	270,000	266,005	283,465	289,123	295,078	297,780	300,823	R303,925	301,805	299,898	303,471
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	R1,879,627	1,894,212	1,908,606	1,926,127
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**	**R3,029,873**	**3,044,248**	**3,051,202**	**3,082,183**
Rural													
Interstates	210,792	212,284	218,663	219,680	214,794	212,655	211,252	212,298	213,983	214,308	214,415	215,974	216,597
Other arterials[b]	816,095	820,773	832,581	833,339	847,664	846,364	852,659	854,089	857,549	R864,200	865,816	867,977	868,914
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	R2,283,075	2,278,467	2,275,643	2,276,683
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	R6,873,460	6,730,682	6,750,384	6,789,892
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**	**R10,235,043**	**10,089,380**	**10,109,978**	**16,338,197**

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 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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES: 1980-95: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, table HM-260 (unpublished).
1996-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-60. Internet address www.fhwa.dot.gov/ohim.ohimstat.htm as of Dec. 27, 2001.

Table 1-29M: U.S. Vehicle-Kilometers (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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	9,086
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
Highway																	
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	R2,314,710	2,365,501	2,418,129	2,493,802	2,525,222	2,578,031
Motorcycle[b]	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	16,864
Other 2-axle 4-tire vehicle[c]	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	1,487,063
Truck																	
Single-unit 2-axle 6-tire or more truck	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	113,592
Combination truck	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	217,596
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	12,233
Total highway[c]	**1,156,737**	**1,428,793**	**1,785,928**	**2,136,668**	**2,457,943**	**2,856,307**	**3,451,016**	**3,495,576**	**3,616,439**	**3,695,662**	**3,794,170**	**R3,898,951**	**4,000,585**	**4,122,648**	**4,235,024**	**4,330,835**	**4,425,379**
Transit																	
Motor bus[d]	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	3,613	R3,500	P3,663	U
Light rail	120	67	54	38	28	27	39	44	46	45	55	56	61	66	R71	P79	U
Heavy rail	629	636	655	681	619	725	864	848	846	840	856	865	874	898	910	P930	U
Trolley bus	162	69	53	25	21	25	22	22	22	21	22	22	22	23	22	P23	U
Commuter rail	N	N	N	278	288	295	342	346	352	360	371	383	389	404	R418	P428	U
Demand responsive[d]	N	N	N	N	N	398	492	539	585	653	746	815	882	941	R1,080	P1,156	U
Ferry boat	N	N	N	N	i	i	4	4	4	4	3	5	4	R5	R5	P5	U
Other	N	N	N	24	25	24	R26	R31	R39	R48	R47	R55	R69	R80	R101	P111	U
Total transit[e]	**3,449**	**3,232**	**3,030**	**3,502**	**3,681**	**4,492**	**5,217**	**5,321**	**5,399**	**5,528**	**5,580**	**5,713**	**5,874**	**6,028**	**R6,106**	**P6,392**	**U**
Rail																	
Class I freight, train-kilometers	650	678	687	649	689	558	612	604	628	653	710	737	754	764	764	789	811
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
Intercity/Amtrak[f], train-kilometers	336	277	150	48	48	48	53	55	55	56	55	51	48	51	53	55	56
Intercity/Amtrak[f], car-kilometers	3,554	2,857	1,110	407	378	404	484	504	494	488	489	470	444	463	502	550	U
Total train-miles[g]	**987**	**954**	**837**	**697**	**737**	**607**	**665**	**658**	**682**	**709**	**764**	**789**	**803**	**816**	**818**	**843**	U

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. Data is then converted to kilometers.

[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 Transporation Statistics by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.

[c] 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.

[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.

[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: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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).

1985-2000: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Air Carrier Traffic Statistics (Washington, DC: Annual December issues), p. 2, line 27 plus line 50.

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.

1995-2000: 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.

1985-2000: 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.

1995-2000: 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.

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Transit:

1960-99: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: 2001), table 42, 84, and similar tables in earlier editions.

Rail:

Class I rail freight train- and car-miles:

1960-2000: Association of American Railroads, *Railroad Facts, 2000* (Washington, DC: 2001), 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.

1975-2000: 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.

1980-99: Amtrak, Amtrak Corporate Reporting, Route Profitability System, personal communication, 2000.

Table 1-30M: 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
VKT (millions)													
Urban													
Interstate	259,494	347,921	448,848	459,186	488,058	510,804	532,012	R549,636	565,812	581,619	602,896	616,545	633,148
Other arterials[a]	779,227	930,635	1,125,306	1,138,640	1,199,956	1,245,597	1,284,094	R1,311,889	1,343,196	1,362,566	1,388,854	1,412,675	1,448,078
Collector	133,645	144,162	171,068	172,652	186,789	189,721	193,263	R204,272	208,104	209,445	212,303	211,708	217,770
Local	204,051	257,595	307,470	303,157	318,821	322,525	322,968	R331,375	335,345	357,503	367,783	377,403	379,216
Total	**1,376,417**	**1,680,313**	**2,052,693**	**2,073,635**	**2,193,623**	**2,268,647**	**2,332,337**	**R2,397,173**	**2,452,457**	**2,511,132**	**2,571,836**	**2,618,331**	**2,678,212**
Rural													
Interstate	217,397	248,414	322,147	329,933	330,812	335,239	346,923	359,498	374,277	386,653	404,782	418,526	432,673
Other arterials[a]	422,894	455,127	532,477	538,736	553,714	562,574	575,065	593,196	609,695	630,956	649,345	664,903	676,564
Collector[b]	304,919	332,602	386,983	395,303	378,051	364,188	371,000	380,043	387,900	409,359	414,982	425,423	430,358
Local	136,318	139,850	156,716	157,968	160,239	165,014	168,844	169,245	173,410	184,548	194,079	202,576	205,769
Total	**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**	**1,611,517**	**1,663,188**	**1,711,428**	**1,745,364**
VKT per lane-kilometers (thousands)													
Urban													
Interstate	3,327	3,773	4,483	4,542	4,508	4,588	4,667	R4,784	4,897	R5,002	R5,131	5,229	5,325
Other arterials[a]	1,451	1,556	1,751	1,758	1,783	1,778	1,803	R1,829	1,857	R1,866	R1,901	1,950	1,977
Collector	572	552	634	649	659	656	655	686	692	R689	R703	706	718
Local	146	168	184	179	181	179	178	181	292	R190	R194	198	197
Total	**613**	**677**	**764**	**766**	**775**	**782**	**794**	**R810**	**820**	**R829**	**R845**	**858**	**869**
Rural													
Interstate	1,031	1,170	1,473	1,502	1,540	1,576	1,642	1,693	1,749	1,804	R1,888	1,939	1,998
Other arterials[a]	518	555	640	646	653	665	674	695	R711	R730	R750	766	779
Collector[b]	132	141	164	167	163	158	161	167	274	179	182	187	189
Local	19	20	23	23	23	24	25	25	25	27	29	30	30
Total	**103**	**113**	**136**	**138**	**139**	**140**	**144**	**148**	**R152**	**157**	**R165**	**169**	**172**

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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used. 1 mile = 1.609344 kilometers.

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-202.
1995-1998, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), tables VM-2 and VM-2A.
1999: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, personal communication, June 5, 2002.
Lane-kilometers:
1980-95: Ibid., Office of Highway Information Management, unpublished data, 1997, table HM-260.
1996-1998, 2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-60.
1999: Ibid., personal communication, June 5, 2002.

Table 1-31M: U.S. Passenger-Kilometers (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Air																	
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	829,403
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	[R]21,082	21,726	U
Highway																	
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	3,655,319	3,761,146	3,844,826	3,965,145	4,015,104	4,099,070
Motorcycle[b,c]	[g]	[g]	5,274	9,965	19,725	19,009	19,995	18,759	19,226	19,609	19,940	18,604	18,839	19,145	19,528	18,736	18,551
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	2,085,143	2,155,114	2,245,376	2,291,659	2,305,586	2,364,431
Truck																	
Single-unit 2-axle 6-tire or more truck	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	[R]109,469	113,143	113,592
Combination truck	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	217,596
Bus[d]	N	N	N	N	N	152,767	195,371	196,189	197,138	208,977	218,663	219,038	223,076	233,451	[R]239,081	261,430	259,349
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**	**6,264,819**	**6,452,639**	**6,650,950**	**[R]6,831,456**	**6,927,051**	**7,072,589**
Transit																	
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	[R]32,766	[P]34,126	U
Light rail	N	N	N	N	613	563	919	1,065	1,128	1,135	1,341	1,384	1,540	1,666	[R]1,815	[P]1,941	U
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	[P]20,764	U
Trolley bus	N	N	N	N	352	492	311	314	320	303	301	301	296	304	293	[P]299	U
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	[R]14,008	[P]14,108	U
Demand responsive[d]	N	N	N	N	N	586	694	731	797	904	929	977	1,056	1,213	[R]1,183	[P]1,308	U
Ferry boat	N	N	N	N	[i]	[i]	460	454	436	418	418	418	[R]426	[R]473	[R]473	[P]499	U
Other	N	N	N	N	628	707	200	238	293	404	373	439	[R]546	[R]594	[R]710	[P]755	U
Total[e]	**[j]6,754**	**[j]6,643**	**[j]7,390**	**[j]7,263**	**64,139**	**63,699**	**66,213**	**65,505**	**64,762**	**63,382**	**63,706**	**64,065**	**66,591**	**68,138**	**[R]71,017**	**[P]73,800**	U
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

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 Transporation 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] Ferry boat included in other.
[j] Includes commuter rail figures only.

NOTES: Air carrier passenger-kilometers are computed by summing of the products of the aircraft-kilometers flown on each interairport segment multiplied by the number of passengers carried on that segment. Highway passenger-kilometers 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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.
1 mile = 1.609344 kilometers

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).
1985-2000: 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:
1960-99: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), pp. 14-15.
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.
1995-2000: 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.

1985-2000: 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.

1995-2000: 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.

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Transit:

Ferry boat and other:

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

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

All other data:

1960-99: American Public Transit Association, *Transit Fact Book* (Washington, DC: 2001), table 30 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.

1990-2000: Ibid., *Amtrak FY00 Annual Report* Statistical Appendix (Washington, DC: 2001), p. 46.

Table 1-41M: U.S. Tonne-Kilometers of Freight (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
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**	**R20,206**	**20,735**	**21,875**	**19,400**
Intercity truck	**416,092**	**524,130**	**601,509**	**662,827**	**810,285**	**890,583**	**1,073,080**	**1,106,659**	**1,189,877**	**1,257,036**	**1,325,655**	**1,344,634**	**1,419,093**	**1,454,132**	**1,499,392**	**1,595,750**	**U**	**U**
Class I rail[b]	**835,555**	**1,018,883**	**1,116,600**	**1,101,187**	**1,341,653**	**1,280,372**	**1,509,566**	**1,516,729**	**1,557,471**	**1,619,560**	**1,752,990**	**1,906,268**	**1,979,686**	**1,969,395**	**2,010,093**	**2,092,813**	**2,140,261**	**U**
Domestic water transportation																		
Coastwise	U	441,708	525,275	461,126	[d]921,460	892,009	699,522	733,100	733,360	654,658	668,084	642,891	595,794	510,761	459,693	427,378	414,445	U
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	83,284	84,502	U
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	444,889	441,727	U
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	1,988	2,176	U
Total domestic water transportation[c]	**U**	**715,099**	**870,428**	**826,321**	**R1,345,855**	**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**	**957,540**	**942,849**	**U**
Oil pipeline	**334,334**	**446,752**	**629,248**	**740,206**	**858,756**	**823,862**	**852,770**	**844,594**	**859,632**	**865,618**	**863,428**	**877,589**	**904,015**	**900,073**	**904,891**	**901,825**	**U**	**U**
TOTAL	**2,280,477**	**2,706,789**	**3,222,159**	**3,336,037**	**4,363,857**	**4,305,458**	**4,666,071**	**4,720,090**	**4,871,927**	**4,911,347**	**5,149,322**	**5,325,979**	**5,438,397**	**5,375,618**	**5,416,497**	**5,568,334**	**U**	**U**

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

[a] Includes freight, express, and mail revenue tonne-kilometers as reported on U.S. DOT Form 41.
[b] Revenue tonne-kilometers.
[c] Excludes intraterritorial traffic, for which tonne-kilometers were not compiled.
[d] 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: Domestic water transportation numbers may not add to totals due to rounding.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.
1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 2, line 3.
Intercity truck:
1960-98: Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p.
Class I rail:
1960-99: Association of American Railroads, *Railroad Facts* (Washington, DC: 2000), p. 27.
Domestic water transportation:
1965-99: 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.
1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC: Annual issues),
1980-99: Ibid., *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 1.

Table 1-42M: 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
Freight																
Air carrier	1,534	1,518	1,632	1,741	1,693	1,862	2,235	2,166	2,239	R2,168	R1,965	R1,867	R1,901	R1,733	R1,735	1,611
Truck[a]	438	417	423	460	584	589	629	641	660	655	631	669	686	700	R711	737
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
Water																
Coastwise	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
Lakewise	840	795	814	853	863	843	890	861	835	827	818	827	818	816	813	806
Internal	454	478	531	576	652	700	756	777	771	753	776	795	768	750	760	785
Intraport	U	U	U	26	27	24	21	21	19	19	26	26	27	24	24	24
Oil pipeline																
Crude	523	515	483	1,019	1,402	1,250	R1,307	R1,323	R1,336	R1,271	R1,252	R1,283	1,254	R1,257	R1,234	1,233
Petroleum products	433	539	575	830	666	629	R623	R610	R610	R653	R666	R647	R665	R665	R676	673
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	R1,307	1,326
Bus, intercity	127	151	171	182	201	195	227	230	219	222	222	225	230	232	232	230
Commuter rail	33	34	36	37	37	38	35	37	37	35	34	39	39	37	R37	37
Amtrak[b]	N	N	N	380	348	372	439	457	459	452	436	431	414	412	406	399

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 tonne-kilometers in the previous table 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-kilometers by revenue passenger enplanements; for commuter rail, intercity bus, and Amtrak it is calculated by dividing passenger-kilometers by number of passengers.

Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES:

Freight:

Air carrier, truck:

Eno Transportation Foundation, Inc., *Transportation In America, 2000* (Washington, DC: 2001), p. 51.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: 2000), 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, 2000* (Washington, DC: 2001), p. 51.

Passenger:

Air carrier:

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

Intercity bus and commuter rail:

Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 50.

Amtrak:

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

1990-99: Amtrak, *Amtrak Annual Report* (Washington, DC: 2000), Statistical Appendix, p. III.

Table 1-46M: U.S. Waterborne Freight (Million metric tons)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL	**997.8**	**1,154.8**	**1,389.5**	**1,537.7**	**1,813.4**	**1,622.4**	**1,963.0**	**1,898.0**	**1,934.2**	**1,930.7**	**2,009.1**	**2,032.5**	**2,072.1**	**2,116.6**	**2,122.4**	**2,107.0**	**2,233.1**
Foreign	307.8	402.5	527.0	679.2	835.9	702.5	944.9	919.5	941.2	R961.6	1,012.1	1,040.9	1,073.6	1,107.3	1,129.8	1,143.8	1,262.6
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	886.1
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
Domestic	690.0	752.2	862.5	858.5	977.5	920.0	1,018.1	978.5	993.0	969.1	997.0	991.6	998.5	1,009.3	992.6	963.2	970.5
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
Coastal	189.8	182.8	216.3	210.4	299.0	281.0	270.9	267.2	258.6	246.5	251.3	241.9	242.6	238.7	226.4	207.6	205.8
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	110.9	103.3	103.8
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	80.5	85.8
Intraterritory	0.9	1.3	1.5	2.6	3.3	3.1	4.1	4.2	3.8	4.5	5.4	6.2	6.6	5.7	6.5	5.4	5.0

KEY: R = revised.

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

SOURCES: 1960-2000: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: March 2002). Part 5, tables 1-3 and 1-6.

Table 1-51M: Crude Oil and Petroluem Products Transported in the United States by Mode

	1975	1980	1985	1990	1995	1996	1997	1998	1999
Crude Oil									
Tonne-kilometers (billions)									
Pipelines[a]	420.5	529.4	488.2	488.8	490.4	493.9	492.6	487.8	468.8
Water carriers	59.3	[c]565.6	655.8	425.1	361.6	295.5	215.1	172.1	146.0
Motor carriers[b]	2.0	3.6	2.6	2.2	2.5	2.5	2.5	2.3	2.0
Railroads	2.2	0.7	1.2	1.0	1.2	1.2	0.7	0.7	0.7
Total	**484.0**	**1099.4**	**1147.8**	**917.2**	**855.7**	**793.1**	**710.9**	**663.0**	**617.6**
% of total									
Pipelines[a]	86.9	48.2	42.5	53.3	57.3	62.3	69.3	73.6	75.9
Water carriers	12.2	51.4	57.2	46.4	42.3	37.3	30.3	26.0	23.6
Motor carriers[b]	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Railroads	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Refined Petroleum Products									
Tonne-kilometers (billions)									
Pipelines[a]	319.7	329.4	335.6	364.0	387.2	410.1	407.5	417.1	433.0
Water carriers	375.8	336.4	206.1	230.4	223.7	225.0	216.5	214.8	215.3
Motor carriers[b]	38.3	35.5	39.3	41.2	35.9	40.9	38.0	39.0	40.3
Railroads	18.4	17.5	16.5	19.4	23.2	23.4	23.7	23.7	26.6
Total	**752.2**	**718.7**	**597.6**	**654.9**	**670.0**	**699.3**	**685.6**	**694.5**	**715.2**
% of total									
Pipelines[a]	66.1	30.0	29.2	39.7	45.2	51.7	57.3	62.9	60.5
Water carriers	77.6	30.6	18.0	25.1	26.1	28.4	30.5	31.0	30.1
Motor carriers[b]	7.9	5.0	3.4	4.5	5.3	5.9	5.3	5.9	5.6
Railroads	3.8	1.6	2.7	2.1	2.7	2.9	3.5	3.4	3.7
Combined Crude and Petroleum Products									
Tonne-kilometers (billions)									
Pipelines[a]	740.2	858.8	823.9	852.8	877.6	904.0	900.1	904.9	901.8
Water carriers	435.1	[c]902.0	862.0	655.5	585.3	520.5	431.6	386.9	361.3
Motor carriers[b]	40.3	39.1	41.9	43.4	38.4	43.4	40.4	41.3	42.3
Railroads	20.6	18.2	17.7	20.4	24.2	24.5	24.4	24.4	27.3
Total	**1,236.2**	**1,818.1**	**1,745.4**	**1,572.1**	**1,525.5**	**1,492.4**	**1,396.5**	**1,357.5**	**1,332.8**
% of total									
Pipelines[a]	59.9	47.2	47.2	54.2	57.5	60.6	64.5	66.7	67.7
Water carriers	35.2	49.6	49.4	41.7	38.4	34.9	30.9	28.5	27.1
Motor carriers[b]	3.3	2.2	2.4	2.8	2.5	2.9	2.9	3.0	3.2
Railroads	1.7	1.0	1.0	1.3	1.6	1.6	1.8	1.8	2.1

[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 petroluem for water transportation to U.S. refineries.

NOTE: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES: 1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 6.
1980-99: Ibid., *Shifts in Petroleum Transportation* (Washington, DC: Annual issues).

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
Transportation	10,688	12,524	16,153	18,580	20,057	20,574	23,011	22,642	23,011	23,422	24,013	24,477	25,047	R25,311	R26,039	R26,893	27,696
Industrial	6,067	7,164	8,219	8,599	10,055	8,240	8,778	8,504	9,116	8,915	9,337	9,095	R9,559	R9,802	R9,601	R9,918	9,663
Residential and commercial	3,682	4,083	4,547	4,020	3,207	2,659	2,289	2,268	2,247	2,258	2,205	2,195	R2,363	R2,279	R2,100	R2,247	2,337
Electric utilities	579	771	2,237	3,346	2,770	1,155	1,323	1,245	1,002	1,106	1,023	694	770	865	1234	992	822
Total petroleum demand	**21,016**	**24,541**	**31,156**	**34,544**	**36,088**	**32,627**	**35,402**	**34,659**	**35,376**	**35,701**	**36,579**	**36,460**	**37,739**	**38,257**	**38,963**	**R40,050**	**40,519**
Transportation as % of total	51	51	52	54	56	63	65	65	65	66	66	67	66.4	R66.1	R66.8	R67.2	68.4

KEY: R = revised.

NOTES: 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 petajoule content per unit volume. Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.
1975-2000: Ibid., *Monthly Energy Review,* Internet site www.eia.doe.gov/gov/pub/energy.overview/monthly.energy/ as of Aug. 9, 2001, tables, 1.4, 2.2, 2.3, 2.4, 2.5, and 2.6.

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
Air																	
Certificated carriers [a]																	
Jet fuel (million liters)	7,397	14,721	29,742	28,610	[R]32,248	[R]38,289	47,050	43,557	44,527	45,268	47,225	48,498	[R]49,918	51,707	52,530	54,518	56,193
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	[R]1,007	[R]1,086	[R]1,094	[R]1,105	1,178	1,307	1,275
Jet fuel (million liters)	N	212	787	1,715	2,900	2,616	2,510	2,184	1,870	1,719	[R]1,756	[R]2,120	[R]2,302	2,430	3,084	3,662	3,778
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	[R]272,175	278,207	276,809
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	[R]191,019	200,093	199,991
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	[R]25,805	35,477	36,144
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	[R]95,233	92,884	97,077
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	[R]3,937	4,347	4,203
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	[R]5,073	[P]5,237	U
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	[R]2,801	[P]2,888	U
Gasoline and other nondiesel fuels [d]	727	469	257	30	42	174	129	129	141	173	227	230	232	225	[R]201	[P]185	U
Compressed natural gas	N	N	N	N	N	N	N	N	4	6	18	41	57	90	[R]140	[P]167	U
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
Amtrak																	
Electricity (million kWh)	N	N	N	180	254	295	330	303	300	301	309	304	293	282	275	283	350
Distillate/diesel fuel (million liters)	N	N	N	238	242	246	310	310	310	314	284	250	269	284	284	280	288
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
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	8,559
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	4,255
Pipeline																	
Natural gas (million cubic meters)	9,828	14,173	20,450	16,508	17,971	14,265	18,684	17,027	16,642	17,679	19,407	19,831	20,146	21,279	17,995	18,273	18,249

KEY: kWh = kilowatt-hour; N = data do not exist; P = preliminary; R = revised.

[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 smaller 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: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES:
Air:
Certificated air carriers:
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 September 2001.

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: Ibid., *FAA Aerospace Forecasts Fiscal Years 2000-2011* (Washington, DC: March 2000), table 29.

1995-2000: Ibid., *FAA Aerospace Forecasts Fiscal Years 2002-2013* (Washington, DC: March 2002), table 30.

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 Aug. 2001).

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity/motor fuel/compressed natural gas:

1960-99: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 65, 66, 67, and similar tables in earlier editions.

Rail:

1960-2000: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2000), p. 40.

Amtrak:

1975-2000: Amtrak, State and Local Affairs 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.

1985-2000: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 1 and 2, and similar tables in earlier editions.

Gasoline:

1970-2000: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-2000: U.S. Department of Energy, *Natural Gas Annual 2000,* DOE/EIA-0131(00) (Washington, DC: November 2001), table 95.

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
Air																	
Certificated carriers[a]																	
Jet fuel	278	554	1,119	1,077	1,213	1,441	1,770	1,639	1,675	1,703	1,777	1,825	1,878	1946	1,977	2,051	2,114
General aviation[b]																	
Aviation gasoline	31	37	70	52	66	53	45	45	40	34	34	36	37	37	39	44	43
Jet fuel	N	8	30	65	109	98	94	82	70	65	66	80	87	91	116	138	142
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	R9,483	9,693	9,644
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	R6,655	6,971	6,968
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	R998	1,371	1,397
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	R3,681	3,591	3,753
Bus	121	128	120	154	149	122	131	126	128	136	141	142	145	150	R152	168	162
Transit[c]																	
Electricity	10	9	9	10	9	15	17	17	17	18	18	18	18	18	R18	P19	U
Motor fuel																	
Diesel	30	36	40	53	63	89	95	97	100	99	99	99	101	105	R109	P112	U
Gasoline and other nondiesel fuels[d]	25	16	9	1	1	6	4	4	5	6	8	8	8	8	R7	P6	U
Compressed natural gas	N	N	N	N	N	N	N	N	1	1	1	2	2	3	R5	P6	U
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
Amtrak																	
Electricity	N	N	N	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	U
Water																	
Residual fuel oil	624	489	596	641	1,414	725	999	1,070	R1,037	834	851	930	900	791	888	922	1,012
Distillate/diesel fuel oil	115	95	120	161	216	249	302	299	325	315	320	342	R364	377	380	354	331
Gasoline	N	N	79	96	139	139	171	226	174	115	R115	140	131	130	126	145	148
Pipeline																	
Natural gas	378	544	786	634	690	548	718	654	639	679	746	762	774	817	691	702	701

KEY: kWh = kilowatt-hour; N = data do not exist; P = preliminary; R = revised; U = 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 systems.
[d] Gasoline and all other nondiesel fuels such as liquified 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
Aviation gasoline = 33,501,698 joules/liter
Automotive gasoline = 34,839,537 joules/liter
Diesel motor fuel = 38,657,950 joules/liter
Compressed natural gas = 38,657,950 joules/liter
Distillate fuel =38,655,829 joules/liter
Residual fuel = 41,723,829 joules/liter
Natural gas = 38,413,974 joules/m^3

Electricity 1kWh = 3,600,000 joules/kWh, negating electrical system losses. To include approximate electrical system losses, multiply this conversion factor by 3.

Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES:

Air:

Certificated air carriers:

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 Sept. 13, 2001.

General aviation:

1960-80: U.S. Department of Transportation, Federal Aviation Administration, Office of Aviation Policy, Plans, and Management Analysis, *FAA Statistical Handbook of Aviation* (Washington, DC: Annual issues).

1985-93: Ibid., *General Aviation and Avionics Survey* (Washington, DC: Annual issues), table 5.1 and similar tables in earlier editions.

1994: Ibid., *FAA Aerospace Forecasts Fiscal Years 2000-2011* (Washington, DC: March 2000), table 29.

1995-2000: Ibid., *FAA Aerospace Forecasts Fiscal Years 2002-2013* (Washington, DC: March 2002), table 30.

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 Aug. 2, 2001).

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity/motor fuel/compressed natural gas:

1960-99: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 65, 66, 67, and similar tables in earlier editions.

Rail:

1960-99: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2000), p. 40.

2000: Ibid., *Railroad Facts,* (Draft), personal communication.

Amtrak:

1975-99: Amtrak, State and Local Affairs 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.

1985-2000: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2 and 4, and similar tables in earlier editions.

Gasoline:

1970-2000: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-98: U.S. Department of Energy, *Natural Gas Annual 1999,* DOE/EIA-0131(99) (Washington, DC: October 2000), table 94.

1999-2000: Ibid., *Natural Gas Annual 2000,* DOE/EIA-0131(00) (Washington DC: November 2001), table 95.

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
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**
Nonhighway																	
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
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
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
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
Total nonhighway	**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**
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**

[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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES: Highway: 1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* , *Summary to 1995* (Washington, DC: 1996), table MF-221.
1996-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-21.
Nonhighway: 1960-2000: 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
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**	**U**
Average kilometers flown per aircraft (thousands)	**784**	**1,074**	**1,528**	**1,408**	**1,236**	**1,191**	**1,250**	**1,239**	**1,077**	**1,129**	**1,170**	**1,222**	**1,260**	**[R]1,279**	**[R]1,236**	**[R]1,268**	**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	[R]7,947	[R]8,109	[R]8,496	9,028
International operations	293	457	764	607	645	668	1,223	1,299	1,455	1,547	1,577	1,606	1,679	[R]1,791	[R]1,912	[R]1,942	2,023
Fuel consumption (million liters)																	
Domestic operations	7,397	14,721	29,742	28,610	34,432	38,289	47,049	43,555	44,528	45,270	47,227	48,499	49,918	51,709	52,530	[R]54,518	56,194
International operations	2,143	4,845	8,491	7,378	7,336	9,418	15,002	14,915	15,596	15,569	16,319	17,076	17,632	18,791	19,631	[R]19,873	20,725
Aircraft-kilometers flown per liter																	
Domestic operations	0.19	0.12	0.11	0.11	0.12	0.13	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.15	0.15	[R]0.18	0.08
International operations	0.14	0.09	0.09	0.08	0.09	0.07	0.08	0.09	0.09	0.10	0.10	0.09	0.10	0.09	0.10	0.10	0.10

KEY: R = revised; U = data are unavailable.

[a] Aircraft operating under 14 CFR 121 and 14 CFR 135.

NOTES: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.

1998-99: 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.

1985-96: 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.

1997-2000: Ibid., Internet site http://www.bts.gov/programs/oai as of Aug.10, 2001.

Fuel consumption:

1960-2000: 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 Aug. 10, 2001.

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
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
Vehicle-kilometers traveled (millions)	[R]1,156,735	[R]1,428,795	[R]1,785,928	[R]2,136,668	[R]2,457,943	[R]2,856,306	[R]3,451,016	[R]3,495,576	[R]3,616,439	[R]3,695,662	[R]3,794,170	[R]3,898,951	[R]4,000,585	4,122,648	[R]4,235,024	4,330,835	4,425,379
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	[R]588,174	611,007	614,221
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
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	[R]7.2	7.1	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	[R]2,729	2,771	2,720

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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used. 1.609344 kilometers = 1 mile, 3.785412 gallons = 1 liter.

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.
1995-2000: 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
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
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
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	2,365,736	2,418,129	[R]2,493,802	2,525,222	2,578,031
Motorcycles	[a]	[a]	4,828	9,012	16,415	14,645	15,450	14,806	15,450	15,933	16,415	15,772	15,933	16,224	[R]16,549	17,033	16,864
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	264,570	[R]271,395	277,406	276,015
Motorcycles	[a]	[a]	227	428	772	689	723	697	723	750	776	742	750	765	[R]780	803	793
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	18.8	19.1	19.3
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	4.2	4.1	3.9
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	[R]9.2	9.1	9.3
Motorcycles	[a]	[a]	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
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	[R]2,059	2,095	2,066
Motorcycles	[a]	[a]	80	86	136	127	170	167	178	188	207	190	194	200	201	193	183

KEY: R = revised.

[a] Included in passenger car.

NOTES:

Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.
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.

1995-2000: 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. Data was then converted to kilometers.

1995-2000: 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.

1995-2000: 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.

1990-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Average kilometers traveled per vehicle, average kilometers traveled per liter, average fuel consumed per vehicle: derived by calculation.

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	R1998	1999	2000
Number registered (thousands)	3,681	4,232	4,374	4,593	4,487	4,481	4,370	4,408	4,906	5,024	R5,266	5,293	5,735	5,763	5,926
Vehicle-kilometers (millions)	43,613	55,683	64,052	73,064	83,525	85,134	86,744	91,411	98,653	100,914	R103,114	107,654	109,469	113,143	113,592
Fuel consumed (million liters)	15,021	20,517	26,206	28,008	31,635	30,934	31,180	32,131	34,190	34,886	R35,613	36,249	25,805	35,477	36,143
Average kilometers traveled per vehicle (thousands)	11.8	13.2	14.6	15.9	18.6	19.0	19.8	20.7	20.1	20.1	19.6	20.3	19.2	19.6	19.2
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	4.3	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	R6,765	6,848	4,501	6,155	6,098

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 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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.
1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-14M: Combination Truck Fuel Consumption and Travel [a]

	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	R1998	1999	2000
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
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	191,351	200,499	206,574	213,051	217,596
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	76,439	R76,848	95,233	92,883	97,077
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	109.5	112.0	103.5	105.1	103.8
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	2.3
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	43,754	R42,934	47,688	45,778	46,293

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.

NOTE: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.
1995-2000: 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
Number registered (thousands)	272	314	378	462	529	593	627	631	645	654	670	686	695	698	716	729	746
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	10,622	11,011	[R]11,277	12,331	12,233
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	3,748	3,888	[R]3,937	4,346	4,202
Average kilometers traveled per vehicle (thousands)	25.7	24.0	19.4	21.1	18.4	12.1	14.6	14.6	14.4	15.1	15.4	15.1	15.1	15.8	15.8	16.9	16.4
Average kilometers traveled per liter	2.2	2.3	2.4	2.4	2.5	2.3	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9
Average fuel consumed per vehicle (liters)	11,504	10,539	8,221	8,627	7,291	5,319	5,406	5,181	5,155	5,374	5,443	5,345	5,394	5,568	[R]5,504	5,966	5,633

KEY: R = revised.

NOTES: Includes both publicly and privately owned school, transit, and other commercial buses. Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.
1995-2000: 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	R1998	P1999
Number of vehicles	65,292	61,717	61,298	62,183	75,388	94,368	92,961	96,399	102,251	107,316	115,943	115,874	122,362	126,360	123,855	128,516
Vehicle-kilometers traveled	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
Electric power consumed (million kWh hours)	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
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
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
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

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

[a] Prior to 1985, excludes commuter rail, automated guideway, urban ferryboat, demand responsive vehicles, and most rural and smaller systems.
[b] For 1992-96, 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 contiguous between 1991 and 1992.

NOTES: The heat equivalent factors used in Btu conversions are: diesel = 38,657,950 joules/liter; electric = 3,600,000 joules/kWh, negating electrical system loses (to include electrical system loses, multiply this conversion factor by approximately three) gasoline = 34,839,537 joules/liter.
In January 2000, the American Public Transit Association changed its name to the American Public Transportation Association (APTA). *The Transit Fact Book* is now referred to as the *Public Transportation Fact Book*.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCE: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 42, 46, 65, 66, 67, and similar tables in earlier editions of the APTA Transit Fact Book.

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
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
Cars[b]	1,965,486	1,800,962	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
Kilometers traveled (millions)																
Freight train-kilometers[c]	650	677	687	648	689	559	611	604	628	652	710	738	754	764	764	789
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
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
Average kilometers traveled per vehicle (thousands)																
Locomotives	N	N	N	85.5	87.7	87.6	109.4	108.6	114.2	72.7	122.2	123.6	122.4	116.3	114.4	119.5
Cars	23.1	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
Average kilometers traveled per liters																
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
Cars	3.46	3.47	13.57	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
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
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

KEY: N = data do not exist.

[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, and car companies and shippers.
[c] Based on the distance run between terminals and/or stations; does not include yard or passenger train-kilometers.

NOTE: Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES:
All data except for locomotive unit-kilometers:
Association of American Railroads, *Railroad Facts* (Washington, DC: October 2000), pp. 33, 34, 40, 48, 50.
Locomotive unit-kilometers:
1975-92: Ibid., *Railroad Ten-Year Trends* (Washington,DC: Annual issues).
1993-99: Ibid., *Analysis of Class I Railroads* (Washington, DC: Annual issues), p. 29.

Table 4-19M: U.S. Government Energy Consumption by Agency and Source (Petajoules)

	Petroleum								
	Motor gasoline	Distillate and residual fuel oil	Jet fuel and aviation gas	Other[a]	Total	Electricity	Natural gas	Coal and other[b]	Total
1990									
Agriculture	4.9	0.8	0.1	0.2	6.0	2.1	1.8	0.1	9.5
Defense	13.2	230.0	763.8	4.6	1,011.7	127.2	120.8	50.3	1,241.7
Energy	1.3	3.1	0.4	0.2	5.1	20.2	10.1	10.6	43.5
GSA	0.1	0.7	0.0	0.0	0.8	9.6	2.5	2.0	14.2
Health and Human Services	0.0	2.2	0.0	0.0	2.2	3.6	2.3	0.2	8.0
Interior	2.2	1.3	0.3	1.2	4.9	1.5	1.3	2.1	7.4
Justice	1.9	0.4	0.2	0.0	2.6	2.0	2.3	0.4	7.0
NASA	0.2	0.9	1.6	0.0	2.7	7.0	3.0	0.3	12.3
Postal Service	9.4	4.7	0.0	0.2	14.3	12.4	4.9	0.6	30.6
Transportation	1.9	6.9	5.8	0.1	14.6	4.1	1.2	0.1	19.0
Veterans Affairs	0.4	2.4	0.0	0.0	2.8	8.3	13.7	1.3	24.9
Other[c]	3.7	4.4	1.1	0.0	9.2	8.5	2.5	0.5	19.6
Total	**39.2**	**258.0**	**773.3**	**6.6**	**1,077.1**	**206.6**	**166.5**	**66.6**	**1,516.7**
2000[P]									
Agriculture	3.5	0.2	0.0	0.1	3.8	2.1	2.0	0.3	8.7
Defense	14.2	162.9	463.3	1.7	642.1	108.9	86.2	32.6	917.7
Energy	1.1	1.3	0.2	0.1	2.7	16.8	6.2	4.5	31.9
GSA	0.1	0.1	0.0	0.0	0.2	10.3	6.4	1.6	19.6
Health and Human Services	0.4	0.6	0.0	0.1	1.3	3.1	3.5	0.4	8.7
Interior	3.0	0.9	0.2	1.2	5.3	1.8	1.4	0.1	9.0
Justice	5.1	0.4	1.6	0.0	7.1	4.5	5.6	0.5	18.6
NASA	0.2	0.4	1.2	0.0	1.9	6.3	3.3	0.3	12.4
Postal Service	11.0	5.3	0.0	0.0	16.2	19.6	7.8	0.4	46.6
Transportation	0.8	7.7	4.2	0.1	12.8	8.4	0.9	0.0	23.5
Veterans Affairs	1.3	1.3	0.0	0.0	2.5	9.8	15.0	1.6	29.0
Other[d]	2.5	3.0	0.9	0.0	6.5	10.8	4.1	0.6	22.1
Total	**43.4**	**184.0**	**471.7**	**3.5**	**702.6**	**202.4**	**142.3**	**43.2**	**1,090.4**

KEY: GSA = General Services Adminstration; NASA = National Aeronautics and Space Administration; P = preliminary.

[a] Includes liquefied petroleum gases.

[b] Includes purchased steam, coal, and other.

[c] 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.

[d] 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.

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.

Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCE: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000, DOE/EIA-0384(2000)* (Washington, DC: August 2001), table 1.13. Internet site http://www.eia.doe.gov/emeu/aer/ as of Aug. 10, 2001.

Table 4-20M: Energy Intensity of Passenger Modes
(Kilojoules per passenger-kilometer)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Air[R]																	
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	[R]2,731	2,703	2,655	2,585
International operations	6,031	6,748	7,202	5,550	[R]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[b]																	
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	[R]2,418	2,397	[R]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	[R]2,975	[R]2,977	[R]2,992	[R]2,995	3,024	2,947
Motorcycle	[a]	[a]	1,639	1,543	1,393	1,243	1,305	1,257	1,305	1,352	1,400	[R]1,491	[R]1,489	[R]1,490	[R]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	[R]2,710	[P]2,651	U
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 = unavailable.

[a] Included in passenger car.
[b] For 1995 and subsequent years, highway passenger-kilometers were taken directly from *Highway Statistics* rather than derived from vehicle-kilometers and average occupancy, as is the case for 1960-1994.

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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCES:
Air:
Certificated air carriers:
Passenger-miles:
Air Transport Association, Internet site http://www.air-transport.org/public/industry as of Aug. 22, 2001.
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. 22, 2001.
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: March 2001), tables 30 and 65.
Amtrak:
Amtrak, State and Local Affairs Department, personal communications.

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
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	R7,947	R8,109	R8,496	9,028
International operations	293	457	764	607	645	668	1,223	1,299	1,455	1,547	1,577	1,606	1,679	1,793	R1,912	R1,942	2,023
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	R1,036,245	R1,045,150	R1,103,120	1,145,322
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	349,088	R361,850	R371,633	389,860
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	R715,827	R756,788	R770,210	815,163
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	258,749	263,379	R277,588	296,382
Fuel consumed (million liters)																	
Domestic operations	7,397	14,721	29,742	28,610	R32,248	38,289	47,049	43,555	44,528	45,270	47,227	48,499	49,918	51,709	52,530	54,518	56,194
International operations	2,143	4,845	8,491	7,378	R6,613	9,418	15,002	14,915	15,596	15,569	16,319	17,076	17,632	18,791	19,631	19,873	20,725
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	R130.4	R128.9	R129.8	126.9
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	194.7	R189.3	R191.3	192.8
Seat-miles per gallon																	
Domestic operations	11	10	12	14	R17	19	19	20	20	20	20	20	20	20	20	20	20
International operations	10	10	10	13	R21	17	18	19	20	21	20	19	19	19	18	19	19
Energy intensity (Kilojoules/passenger-kilometer)[b]																	
Domestic operations	5,659	6,633	6,677	5,078	R3,764	3,308	3,233	3,062	2,992	2,988	2,913	2,873	2,742	2,718	R2,612	R2,664	2,593
International operations	6,031	6,748	7,202	5,550	R2,845	3,345	2,980	3,022	2,792	2,687	2,728	2,735	2,693	2,733	2,805	R2,694	2,631
Load factor (%)																	
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	R72.4	69.8	71.2
International operations	62.2	56.8	53.0	54.4	62.8	64.6	69.1	67.3	67.1	67.6	70.6	71.8	73.3	74.1	72.8	R74.7	76.0

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 joules conversion is 37,626,700 joules/liter.

Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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 5, 2000.

1985-2000: 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 July 25, 2001.

Seats per aircraft, seat-kilometers per liter, and energy intensiveness: 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
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	R2,494,483	2,525,061	2,578,169
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	R1,396,911	1,450,019	1,487,034
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	R16,576	17,059	16,898
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	R3,965,424	4,015,313	4,098,999
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	R2,222,504	2,306,190	2,364,126
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	19,312
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	R271,395	277,406	276,017
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	R191,019	200,093	199,991
Motorcycle	b	b	227	428	772	689	723	697	723	750	776	742	750	765	R780	801	795
Energy intensity (kilojoules/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	R2,384	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	2,990	2,991	R2,995	3,023	2,947
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	R1,535	1,446	1,434

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. Average vehicle occupancy rates are as follows:
passenger car (1960-97): 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;
other 2-axle 4-tire vehicle (1960-97): 1.87, 1.85, 1.83, 1.81, 1.79, 1.76, 1.74, 1.72, 1.70, 1.68, 1.66, 1.64, 1.64, 1.64;
motorcycle (1960-97): 1.1, 1.1, 1.1, 1.1, 1.2, 1.3, 1.3, 1.27, 1.25, 1.23, 1.21, 1.18, 1.18, 1.18.

[b] Included in passenger car.

[c] Energy Intensity (kilojoule/passenger-kilometer) is calculated by converting the fuel consumption in gallons to the energy equivalent kilojoule units 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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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.
1995-2000: 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.
1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.
Motorcycle:
1970-85: 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. Data was then converted to kilometers.
1990-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.
Passenger-kilometers:
1960-97: Vehicle-miles multiplied by vehicle occupancy rates.
1998-2000: 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. Data was then converted to kilometers
1995-2000: 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
Average U.S. passenger car fuel efficiency (kmpl) (calendar year)													
Passenger car[a]	[R]6.8	[R]7.4	[R]8.6	[R]9.0	8.9	[R]8.8	[R]8.8	9.0	9.0	9.1	9.2	9.1	U
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	7.3	U
New vehicle fuel efficiency (kmpl)[b] (model year)													
Light-duty vehicle (passenger cars plus light trucks)													
Domestic	9.1	10.2	10.2	10.4	[R]10.1	[R]10.3	[R]10.0	10.1	10.2	9.9	9.9	[d]N	[d]N
Imported	12.2	12.9	12.1	12.1	11.9	11.9	[R]11.8	11.9	11.8	11.7	11.7	[d]N	[d]N
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
Domestic	9.6	11.2	11.4	11.6	11.5	11.8	11.7	11.8	[R]11.9	11.8	[R]12.2	[R]11.9	12.1
Imported	12.6	13.4	12.7	12.8	12.4	12.6	[R]12.6	12.9	[R]12.6	12.8	[R]12.4	[R]12.3	12.0
Light truck (<8,500 lbs GVWR)	7.9	8.8	8.8	9.1	8.8	8.9	8.8	8.7	8.8	8.8	9.0	8.9	9.0
Domestic	7.1	8.3	8.6	8.9	8.7	8.8	8.7	8.6	8.7	8.6	8.7	[d]N	[d]N
Imported	10.3	11.3	9.8	9.8	9.7	9.7	[R]9.4	9.1	9.4	9.4	9.7	[d]N	[d]N
CAFE standards (kmpl)[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
Light truck	[c]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

KEY: CAFE = Corporate Average Fuel Economy; GVWR = gross vehicle weight rating; kmpl = 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-kilometers. The source calculated average kilometers per liter for light-duty vehicles by taking the reciprocal of the sales-weighted average of liters per kilometer. This is called the harmonic average.

[c] 2 Wheel Drive/4 Wheel Drive. No combined figure available for this year.

[d] Beginning with MY 1999, the total light truck fleet ceased to be categorized by either domestic or import fleets.

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.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

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).
1995-99: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

New vehicle fuel efficiency (based on model year production):
1980-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2000,* table II-6, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of Aug. 9, 2001.

CAFE standards:
1980-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2000,* table I-1, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of Aug. 9, 2001.

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
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	3,484	3,713	3,687	3,663
Passenger-kilometers (millions)	N	N	N	N	35,084	34,118	33,796	33,957	32,670	32,509	30,256	30,256	30,738	32,831	33,157	34,126
Fuel consumed (million liters diesel)	787	939	1,026	1,382	1,632	1,961	2,131	2,169	2,241	2,180	2,139	2,135	R2,188	2,260	R2,298	2,339
Energy intensity (Kilojoules/passenger-kilometer)	N	N	N	N	1,798	2,222	2,438	2,469	2,652	R2,593	R2,732	2,728	R2,751	2,661	R2,679	2,650

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

NOTES: Heat equivalent factor used for joules conversion is 38,657,950 joules/liter.
In January 2000, the American Public Transit Association changed its name to the American Public Transportation Association. The *Transit Fact Book* is now refered to as the *Public Transportation Fact Book.*
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCE: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2001), tables 65 and 79, and similar tables in earlier editions of the *Transit Fact Book.*

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
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
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
Tonnes per car load	40	44	50	55	61	61	60	60	60	58	58	59	60	57	58	57	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
Energy intensity (Kilojoules/revenue freight tonne-kilometer)	606	516	465	486	426	355	302	280	282	279	278	267	265	266	261	260	253
Energy intensity (Kilojoules/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

[a] Class I railroads are those that have operating revenues of $255 million or more.

NOTES: The heat equivalent factor used for joules conversion is 38,655,900 joules/liter.
Numbers may differ slightly from previous year's metric tables because a higher precision conversion factor was used.

SOURCE: Association of American Railroads, *Railroad Facts* (Washington, DC: November 2001), pp. 34, 37, and 40.

Appendix C

Source and Accuracy Statements

Appendix C
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 trackage 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 because of independent rounding of this series by AAR.

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. Measurement errors are unknown, but the difficulty of collecting some of the data items is well known. 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 insure 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.

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.

Transit

These figures are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database. Section 15 of the Federal Transit Act requires federally funded transit agencies to provide detailed 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 federal 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 1-3. 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. 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 1-2. 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 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.

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 1-9. Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances

TABLE 1-11. 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 2000/2001*. 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 flow, 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 non-response 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 nonsampling 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 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.

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 Nonself-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 nonpowered 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 1-10. 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 2000 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 shipowners 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 1-12. 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 1-13. Annual U.S. Motor Vehicle Production and Factory (Wholesale) Sales

TABLE 1-14. Retail New Passenger Car Sales

TABLE 1-15. New and Used Passenger Car Sales and Leases

TABLE 1-19. 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 1-16. 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 1-17 and 1-18. 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 1-20. 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 shipowners 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 1-21. 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 1-22. 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 1-23. 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 1-24. 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 1-25. 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. Section 15 of the Federal Transit Act requires federally funded transit agencies to provide detailed financial and operating data, including vehicle inventories. Transit operators that do not report to FTA are those that do not receive federal 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 1-26. 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 1-27. 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 1-28. 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 1-29. U.S. Vehicle-Miles

TABLE 1-30. Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional Class

TABLE 1-31. 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 judgement. 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 1-33. Long-Distance Travel in the United States by Selected Trip Characteristics: 1995

TABLE 1-34. 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 1-35. 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 Transportation, 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.

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 1-36. Passengers Boarded at the Top 50 U.S. Airports

The Airport Activity Statistics of Certificated Air Carriers (AAS), is the source of these data. Data for 1999 are from the U.S. Department of Transportation (USDOT), Federal Aviation Administration’s Statistical Handbook of Aviation. 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 1-37. Air Passenger Travel Arrivals in the United States from Selected Foreign Countries

TABLE 1-38. 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 1-41. 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 certificated 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 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.

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 coverts 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 1-42. 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 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.

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 passenger

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 1-43. Top U.S. Foreign Trade Freight Gateways by Value of Shipments: 2000

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 America 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 1-46. 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 1-47. 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 1-43. Modal Shares of Freight Shipments within the United States by Domestic Establishments: 1993 and 1997

TABLE 1-49. Value, Tons, and Ton- Miles of Freight Shipments within the United States by Domestic Establishment, 1997

TABLE 1-52. U.S. Hazardous Materials Shipments by Mode of Transportation, 1997

TABLE 1-53. 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 1-50. 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 merchandise 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 1-51. 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 coverts 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 1-54. 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 1-55. Passengers Denied Boarding by the Largest U.S. Air Carriers

TABLE 1-56. Mishandled-Baggage Reports Filed by Passengers with the Largest U.S. Air Carriers

TABLE 1-57. 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 nonstop 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 1-58. 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 1-59. 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 1-60. Annual Person-Hours of Delay Per Eligible Drive

TABLE 1-61. Roadway Congestion Index

TABLE 1-62. Congestion Index and Cost Values

The Texas Transportation Institute's (TTI) Urban Roadway Congestion Annual Report provided figures for tables 1-54 through 56.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/study/index.stm.

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 websitehttp://mobility.tamu.edu/study/numbers.stm .

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 $12.00 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 1999 estimates now vary by urban area anywhere from 21 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 1999. Previous editions classified congested travel when areawide traffic levels reached 13,000 vehicles per lane per day on highways and 5,000 vehicles per lane per day on principal arterial streets. These thresholds were raised in the latest report to 14,000 and 5,500 vehicles per lane per day respectively. Comparisons across time will be questionable due to these changes. For instance, TTI applied the new methodology to 1996 data that resulted in lower congestion levels. Readers should refer to the TTI Internet site for more detailed algorithms and estimation procedures at http://mobility.tamu.edu/estimating_mobility.

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 1-63. 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, nonscheduled 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 midair 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 A Method for Estimating Posterior BAC Distributions for Persons Involved in Fatal Traffic Accidents, DOT HS 807 094 (Washington, DC: July 1986).

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, 1999, DOT HS 809 100 (Washington, DC: December 2000), 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). 1,444 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 1999, 587 agencies reported to the NTD. Of that total, 64 transit agencies received exemptions from detailed reporting because they operated 9 or fewer vehicles, and 7 were deleted because their data were incomplete. Thus, 516 individual reporters were included in the NTD, accounting for 90 to 95 percent of passenger-miles traveled on transit. Of the transit agencies reporting, 56.5 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 1998, the number of agencies reporting to this database was 575.Of that, 60 transit agencies received exemptions from detailed reporting because they operated nine or fewer vehicles, and six were deleted because their data were incomplete. Thus, 509 individual reporters are included in the full database in 1998.Of the transit agencies reporting, 56.2 percent contract for some or all of their transportation from private or public companies or organizations.

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 workshed. 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).

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.

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 form the second tier of GDP data and emanate form 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 3) 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 non-commercial trailers. 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) Annual Review 2000, tables 5.20 and 5.21, 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 nonresponse, 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 nonresponse), 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 1998 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/opub/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 is 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/opub/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 point 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 non-response. 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 procedure 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 imputes 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 GL, and

3. A 1999 Mercury Grand Marquis GS.

Thus, the estimates are not reliable estimates for all cars.

Fuel costs were based on an average price of $1.34 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 report published by the USDOT, Federal Transit Administration (FTA).Section 15 of the Federal Transit Act requires federally funded transit agencies to provide detailed 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 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 comprise only 2 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.
Non-sampling 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 estimates 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 government. 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/oeshome.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 disbursed 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).

[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).

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 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 weigh 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.[2]

[2] Public Law 101-508, 104 Stat. 1388 (November 5, 1990).

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.

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.[3]

[3] 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.

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).

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.

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 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.

REFERENCES

Corrado, C., C. Gilbert, et al. (1997). "Industrial production and capacity utilization: historical revision and recent developments." Federal Reserve Bulletin 83(2): 67.

Korn, E.L. and B.I. Graubard.1991."A Note on the Large Sample Properties of Linearization, Jackknife and Balanced Repeated Replication Methods for Stratified Samples." The Annals of Statistics 19 (4):2275-2279.

Krewski, D. and J.N. K. Rao.1981."Inference from Stratified Samples: Properties of Linearization, Jackknife and Balanced Repeated Replication Methods." The Annals of Statistics 9(5):1010-1019.

Kunze, K. and M. Jablonski (1998). Productivity in service-producing industries. Brookings Workshop on New Service-Sector Data, Washington, DC.

Landerfeld, J. S. and R. P. Parker (1997). "BEA's chain indexes, time series, and measures of long-term economic growth." Survey of Current Business 77(5): 58.

Moulton, B.R. and Seskin, E.P. (1999)."A preview of the 1999 comprehensive revision of the National Income and Product Accounts:statistical changes."Survey of Current Business 79 (October 1999): 6-17.

Parker, R. P. and J. E. Triplett (1996). "Chain-type measures of real output and prices in the U.S. national income and product accounts: an update." Business Economics 31(4): 37.

Ritter, J.A. (2000)."Feeding the national accounts." Federal Reserve Bank of St. Louis Review. March/April:11-20

SCB (1991). "Gross Domestic Product as a measure of U.S. Production." Survey of Current Business.

Seskin, E. P. and R. P. Parker (1998). "A guide to the NIPA's." Survey of Current Business 78(3):26.

U.S. Department of Labor, Bureau of Labor Statistics.1997.Measurement Issues in the Consumer Price Index.Referenced at http://stats.bls.gov/cpigm697.htm on May 13, 1999.

Valliant, R.1993. "Poststratification and Conditional Vairance Estimation."Journal of the American Statistical Association 88 (421):89-96.

Young, A. H. (1993). "Reliability and accuracy of the quarterly estimates of GDP." Survey of Current Business 73(10): 29.

Young, A. H. and H. S. Tice (1985). "An introduction to national economic accounting." Survey of Current Business 65: 59.

Yuskavage, R. E. (1996). "Improved estimates of gross product by industry, 1959-94." Survey of Current Business 76(8): 133.

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 nonpetroleum 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 rank-orders 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 4-1.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 4-1.
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

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 4-2 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 4-2.
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 1998, FHWA reported 124.7 billion gallons of gasoline sold nationally for highway use. EIA's table 5.12b of the Annual Energy Review 1999 lists 8.13 mmbd of gasoline supplied for the transportation sector, the same as 124.7 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 7.94 mmbd in 1999, which is probably accurate to the first decimal place and maybe a little better. The transportation sector's 8.13 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 that contains information for directly operated services by federally funded transit agencies. Section 15 of the Federal Transit Act requires that these agencies provide detailed financial and operating information, 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 1997, a sample of 29,954 aircraft was identified and surveyed from an approximate population of 251,571 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 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 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 table4-19 (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 accurate. 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 1998, the adjusted threshold for Class I railroads was $259.4 million. Although Class I railroads represent only 2 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 Data Base. 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 91.3 percent response rate for the 1999 survey. The EIA also provides estimates of the sampling error for geographic areas and U.S. averages are 1.3 for residential distillate fuel oil, 0.9 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 1999, the adjusted threshold for Class I railroads was $258.5 million. Although Class I railroads comprise only 2 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/study/index.stm.

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/study/numbers.stm.

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 1997 estimates now vary by urban area anywhere from 21 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 13,000 vehicles per lane per day on highways and 5,000 vehicles per lane per day on principal arterial streets. These thresholds were raised in the latest report to 14,000 and 5,500 vehicles per lane per day respectively. Comparisons across time will be questionable due to these changes. For example, TTI applied the new methodology to 1996 data that resulted in lower congestion levels. Readers should refer to the TTI website for more detailed information on its estimation procedures http://mobility.tamu.edu/estimating_mobility.

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 (NOx), and Volatile Organic Compounds (VOCs)

Highway vehicle emissions of CO, NOx, 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 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.

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. Environments 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 non-highway 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 CO2emissions 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 CO2emitted 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 CO2emissions, 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 pre-designated 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.[4] These data may be affected by general accounting errors, some of which have changed semiannual counts by as many as 2,000 actions.

[4] Public Law 94-580, 90 Stat. 2795 (October 21, 1976).

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 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 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 and 1999 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.

REFERENCES

U.S. Department of Energy, Energy Information Administration. 1994. Accuracy of Petroleum Supply Data. Tammy G. Heppner and Carol L. French, eds.Washington, DC.

U.S. Department of Energy, Energy Information Administration. 1990. Energy Consumption by End-Use Sector, A Comparison of Measures by Consumption and Supply Surveys, DOE/EIA-0533.Washington, DC.

U.S. Environmental Protection Agency, Office of Mobile Sources. 1998.MOBILE5 Information Sheet #7: NOx Benefits of Reformulated Gasoline Using MOBILE5a. Ann Arbor, MI. September 30.

U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards.1998.National Air Pollutant Emission Trends, Procedure Document, 1900-1996. EPA-454/R-98-008.Research Triangle Park, NC.May.

U.S. Environmental Protection Agency, Office of Mobile Sources. 1996.Memorandum on Release of MOBILE5b.(Revised Chapter 2 for the Users Guide to MOBILE5).October 11.

U.S. Environmental Protection Agency, Office of Air Quality and Standards, Emission Factor and Inventory Group.1995.Compilation of Air Pollutant Emission Factors AP-42, Volume II: Mobile Sources. Appendix H. Fifth ed.June 30.

U.S. Environmental Protection Agency, Office of Mobile Sources (OMS). 1995. Draft User's Guide to PART5:A Program for Calculating Particle Emissions from Motor Vehicles, EPA-AA-AQAB-94-2.Ann Arbor, MI.February.

U.S. EPA, Office of Mobile Sources.1994.Users Guide to MOBILE5 (Mobile Source Emission Factor Model),EPA-AA-TEB-94-01.Ann Arbor, MI.May.

U.S. Environmental Protection Agency, Office of Air and Radiation. 1992.Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, EPA-450/4-81-026d (Revised).

Appendix D

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 nonscheduled 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.

GLUTEUS MAXIMUS: The most gluteus that will fit in a seat without spilling into adjacent seating.

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.

LAKEWISE 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) Nontransportation 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 stations wagons.

PASSENGER-MILE: 1) Air: One passenger transported 1 mile; passenger-miles for one interairport flight are calculated by multiplying aircraft miles flow 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, rollerskates, 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 com-

muter 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.

Appendix E

Acronyms and Initialisms

AAA	American Automobile Association
AADT	Annual Average Daily Traffic
AAMA	American Automobile Manufacturers Association
AAR	Association of American Railroads
AAS	Air Activity Statistics of Certificated Air Carriers
AGA	American Gas Association
AI	Alcohol Involvement
AIA	Aerospace Industries Association
ALVW	Adjusted Loaded Vehicle Weight
AMIO	Alien Migrant Interdiction Operations
AOPL	Association of Oil Pipelines
APTA	American Public Transit Association
ATS	American Travel Survey
ATV	All-Terrain Vehicle
BAC	Blood Alcohol Concentration
BEA	Bureau of Economic Analysis
BMA	Bicycle Manufacturer's Association
BTS	Bureau of Transportation Statistics
Btu	British Thermal Unit
CFR	U.S. Code of Federal Regulation
CFS	Commodity Flow Survey
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CVS	Certification Vehicle Standard
dB	Decibels
DNL	Day Night Sound Level
dwt	Deadweight Tons
EPA	U.S. Environmental Protection Agency
EIA	Energy Information Administration
FAA	Federal Aviation Administration
FARS	Fatality Analysis Reporting System Database
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FRA	Federal Railway Administration
FTA	Federal Transit Administration
FTP	Federal Test Procedure
FTZ	Foreign Trade Zone
GAATA	General Aviation and Air Taxi Activity
GAMA	General Aviation Manufacturers Association
GES	General Estimates System
GIS	Geographic Information System
g/mi	Grams Per Mile
GVWR	Gross Vehicle Weight Rating
HC	Hydrocarbon
HPMS	Highway Performance Monitoring System
ICC	Interstate Commerce Commission
INM	Integrated Noise Model
IO	Investigative Officer
IRI	International Roughness Index
LDT	Light-Duty Truck
LMIS	Lloyd's Maritime Information System
LPG	Liquefied Petroleum Gas
LR	Lloyd's Register
LVW	Loaded Vehicle Weight
MARAD	Maritime Administration
MCMIS	Motor Carrier Management Information System

MIC	Motorcycle Industry Council, Inc.
mmbd	Million Barrels Per Day
MOBILE	Mobile Source Emissions Factor Model
MDPV	Medium-Duty Passenger Vehicles
mpg	Miles Per Gallon
MSIS	Marine Safety Information System
MTBE	Methyl Tributyl Ether
MVMA	Motor Vehicle Manufacturers Association
NANIM	Nationwide Airport Noise Impact Model
NBDA	National Bicycle Dealers Association
NDC	Navigation Data Center
NHS	National Highway System
NHTSA	National Highway Traffic Safety Administration
NMAC	Near Mid-Air Collision
NO_X	Nitrogen Oxides
NOPS	National Operations Center
NOPUS	National Occupant Protection Use Survey
NPIAS	National Plan of Integrated Airport Systems
NPTS	Nationwide Personal Transportation Survey
NTD	National Transit Database
NTS	National Transportation Statistics
NTSB	National Transportation Safety Board
OAI	Office of Airline Information
OAG	Official Airline Guide
OIG	Office of the Inspector General
OPS	Office of Pipeline Safety
ORNL	Oak Ridge National Laboratory
OST	Office of the Secretary of Transportation
PAR	Police Accident Report
PIRS	Pollution Incident Reporting System
PMT	Passenger Miles of Travel
PSI	Pollutant Standard Index
PSR	Present Serviceability Rating
RFG	Reformulated Gasoline
RO/RO	Roll-On/Roll-Off
RSPA	Research and Special Programs Administration
RTECS	Residential Transportation Energy Consumption Survey
RVP	Reid Vapor Pressure
SAMIS	Safety Management Information Statistics
SEC	Securities and Exchange Commission
SHA	State Highway Agencies
SO2	Sodium Dioxide
STB	Surface Transportation Board
TMG	Traffic Monitoring Guide
TIUS	Truck Inventory and Use Survey
TSFD	Transborder Surface Freight Data
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDOC	U.S. Department of Commerce
USDOD	U.S. Department of Defense
USDOT	Department of Transportation
USSR	Union of Soviet Social Republic
TAF	Terminal Area Forecast
TIUS	Truck Inventory and Use Survey
TMG	Traffic Monitoring Guide
TRFD	Transportation-Related Final Demand
TTI	Texas Transportation Institute