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National Transportation Statistics 2021

50th Anniversary Edition

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U.S. Department of Transportation

Bureau of Transportation Statistics

<https://www.bts.gov/topics/national-transportation-statistics>

<https://doi.org/10.21949/1523389>

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Special Thanks

Many individuals from the Office of the Assistant Secretary for Transportation Policy and International Affairs, the Massachusetts Institute of Technology, the Volpe National Transportation Systems Center, and the Bureau of Transportation Statistics contributed to *National Transportation Statistics* and its supplemental volumes over the last 50 years. These contributors are listed in the individual editions that appear on the following pages.

EDITION	PRODUCED BY	WEB LOCATION
Summary of National Transportation Statistics, 1971	MIT	https://doi.org/10.21949/1523418
Summary of National Transportation Statistics, 1972	MIT	https://doi.org/10.21949/1523419
Summary of National Transportation Statistics, 1973	TSC	https://doi.org/10.21949/1523426
National Transportation Statistics Energy supplement [1973]	TSC	https://doi.org/10.21949/1523420
Summary of National Transportation Statistics, 1974	TSC	https://doi.org/10.21949/1523425
National Transportation Statistics Energy supplement [1974]	TSC	https://doi.org/10.21949/1523421
Summary of National Transportation Statistics, 1975	TSC	https://doi.org/10.21949/1523424
National Transportation Statistics Energy supplement [1975]	TSC	https://doi.org/10.21949/1523422
National Transportation Statistics Annual Report, 1976	TSC	https://doi.org/10.21949/1523423
National Transportation Statistics Energy supplement [1976]	TSC	https://doi.org/10.21949/1523427
National Transportation Statistics Annual Report, 1977	TSC	https://doi.org/10.21949/1523428
National Transportation Statistics Annual Report, 1978	TSC	https://doi.org/10.21949/1523430
National Transportation Statistics Annual Report, 1979	TSC	https://doi.org/10.21949/1523429
National Transportation Statistics Annual Report, 1980	TSC	https://doi.org/10.21949/1523431
Transportation Safety Information Report: 1980	TSC	https://doi.org/10.21949/1523432
National Transportation Statistics Annual Report, 1981	TSC	https://doi.org/10.21949/1523433
Transportation Safety Information Report: 1981	TSC	https://doi.org/10.21949/1523434
National Transportation Statistics Annual Report, 1982	TSC	https://doi.org/10.21949/1523435
Transportation Safety Information Report: 1982	TSC	https://doi.org/10.21949/1523436
National Transportation Statistics Annual Report, 1983	TSC	https://doi.org/10.21949/1523437
Transportation Safety Information Report: 1983	TSC	https://doi.org/10.21949/1523438
National Transportation Statistics Annual Report, 1984	TSC	https://doi.org/10.21949/1524171
Transportation Safety Information Report: 1st Quarter 1984	TSC	https://doi.org/10.21949/1523439
Transportation Safety Information Report: 2nd Quarter 1984	TSC	https://doi.org/10.21949/1523440
Transportation Safety Information Report: 3rd Quarter 1984	TSC	https://doi.org/10.21949/1523460
Transportation Safety Information Report: 1984	TSC	https://doi.org/10.21949/1523441
National Transportation Statistics Annual Report, 1985	TSC	https://doi.org/10.21949/1523442
Transportation Safety Information Report: 1st Quarter 1985	TSC	https://doi.org/10.21949/1523461
Transportation Safety Information Report: 2nd Quarter 1985	TSC	https://doi.org/10.21949/1523443
Transportation Safety Information Report: 3rd Quarter 1985	TSC	https://doi.org/10.21949/1523444
Transportation Safety Information Report: 1985	TSC	https://doi.org/10.21949/1523445
National Transportation Statistics Annual Report, 1986	TSC	https://doi.org/10.21949/1523446
Transportation Safety Information Report: 1st Quarter 1986	TSC	https://doi.org/10.21949/1523447
Transportation Safety Information Report: 3rd Quarter 1986	TSC	https://doi.org/10.21949/1523448
Transportation Safety Information Report: 1986	TSC	https://doi.org/10.21949/1523449
National Transportation Statistics Annual Report, 1987	TSC	https://doi.org/10.21949/1523450
Transportation Safety Information Report: 1st 6 months 1987	TSC	https://doi.org/10.21949/1523451
Transportation Safety Information Report: 1987	TSC	https://doi.org/10.21949/1523452
National Transportation Statistics Annual Report, 1988	TSC	https://doi.org/10.21949/1523453
Transportation Safety Information Report: 1988	TSC	https://doi.org/10.21949/1523454
National Transportation Statistics Annual Report, 1989	TSC	https://doi.org/10.21949/1523455
Transportation Safety Information Report: 1989	Volpe	https://doi.org/10.21949/1523456
National Transportation Statistics Annual Report, 1990	TSC	https://doi.org/10.21949/1523457
Transportation Safety Information Report: 1991	Volpe	https://doi.org/10.21949/1523458
National Transportation Statistics Annual Report, 1992	Volpe	https://doi.org/10.21949/1523459

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EDITION	PRODUCED BY	WEB LOCATION
National Transportation Statistics Historical Compendium 1960-1992 [1993]	Volpe	https://doi.org/10.21949/1501578
National Transportation Statistics 1995	Volpe	https://doi.org/10.21949/1501620
National Transportation Statistics 1996	Volpe	https://doi.org/10.21949/1501621
National Transportation Statistics 1997	Volpe	https://doi.org/10.21949/1501622
National Transportation Statistics 1998	BTS	https://web.archive.org/web/19981202175946/http://www.bts.gov/btsprod/nts/
National Transportation Statistics 1999	BTS	https://doi.org/10.21949/1501025
National Transportation Statistics 2000	BTS	https://doi.org/10.21949/1501671
National Transportation Statistics 2001	BTS	https://doi.org/10.21949/1501028
National Transportation Statistics 2002	BTS	https://doi.org/10.21949/1501096
National Transportation Statistics 2003	BTS	https://doi.org/10.21949/1501097
National Transportation Statistics 2004	BTS	https://doi.org/10.21949/1501098
National Transportation Statistics 2005	BTS	https://doi.org/10.21949/1501099
National Transportation Statistics 2006	BTS	https://doi.org/10.21949/1501100
National Transportation Statistics 2007	BTS	https://doi.org/10.21949/1501675
National Transportation Statistics 2008	BTS	https://doi.org/10.21949/1501569
National Transportation Statistics 2009	BTS	https://doi.org/10.21949/1501568
National Transportation Statistics 2010	BTS	https://doi.org/10.21949/1501453
National Transportation Statistics 2011	BTS	https://doi.org/10.21949/1501124
National Transportation Statistics 2012	BTS	https://doi.org/10.21949/1523413
National Transportation Statistics 1st Quarter 2013	BTS	https://doi.org/10.21949/1523412
National Transportation Statistics 2nd Quarter 2013	BTS	https://doi.org/10.21949/1524127
National Transportation Statistics 3rd Quarter 2013	BTS	https://doi.org/10.21949/1523411
National Transportation Statistics 4th Quarter/Annual 2013	BTS	https://doi.org/10.21949/1523416
National Transportation Statistics 1st Quarter 2014	BTS	https://doi.org/10.21949/1523410
National Transportation Statistics 2nd Quarter 2014	BTS	https://doi.org/10.21949/1524069
National Transportation Statistics 3rd Quarter 2014	BTS	https://doi.org/10.21949/1523409
National Transportation Statistics 4th Quarter/Annual 2014	BTS	https://doi.org/10.21949/1523417
National Transportation Statistics 1st Quarter 2015	BTS	https://doi.org/10.21949/1523408
National Transportation Statistics 2nd Quarter 2015	BTS	https://doi.org/10.21949/1523407
National Transportation Statistics 3rd Quarter 2015	BTS	https://doi.org/10.21949/1523406
National Transportation Statistics 4th Quarter/Annual 2015	BTS	https://doi.org/10.21949/1523414
National Transportation Statistics 1st Quarter 2016	BTS	https://doi.org/10.21949/1523405
National Transportation Statistics 2nd Quarter 2016	BTS	https://doi.org/10.21949/1524068
National Transportation Statistics 3rd Quarter 2016	BTS	https://doi.org/10.21949/1523404
National Transportation Statistics 4th Quarter/Annual 2016	BTS	https://doi.org/10.21949/1523415
National Transportation Statistics 1st quarter 2017	BTS	https://doi.org/10.21949/1502518
National Transportation Statistics 2nd quarter 2017	BTS	https://doi.org/10.21949/1523403
National Transportation Statistics 3rd quarter 2017	BTS	https://doi.org/10.21949/1523402
National Transportation Statistics 4th Quarter/Annual 2017	BTS	https://doi.org/10.21949/1502519
National Transportation Statistics 1st Quarter 2018	BTS	https://doi.org/10.21949/1523401
National Transportation Statistics 2nd Quarter 2018	BTS	https://doi.org/10.21949/1523400
National Transportation Statistics 3rd Quarter 2018	BTS	https://doi.org/10.21949/1523399
National Transportation Statistics 4th Quarter/Annual 2018	BTS	https://doi.org/10.21949/1502517
National Transportation Statistics 50th edition 2021	BTS	https://doi.org/10.21949/1523389

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Foreword

National Transportation Statistics is a tabular summary of trends in transportation, first published 50 years ago by the U.S. Department of Transportation (USDOT). USDOT was less than 5 years old in 1971 when the Office of Systems Analysis and Information, under the Assistant Secretary for Policy and International Affairs, worked with the Massachusetts Institute of Technology (MIT) to assemble a “compendium of national transportation statistics ... for those wanting a brief quantitative perspective of transportation.” MIT also assembled the second edition in 1972, after which production of the report moved nearby to USDOT’s Transportation Systems Center, now named for Secretary John A. Volpe (1969-1973). The Volpe Center expanded, compiled, and printed *National Transportation Statistics* under the sponsorship of the Office of the Assistant Secretary for Policy and International Affairs through 1991, of the Federal Highway Administration in 1992, and of the Bureau of Transportation Statistics (BTS) in 1993 through 1997. After a brief transition in 1998, BTS assumed full responsibility for preparing and publishing *National Transportation Statistics*. BTS began updating selected tables on a quarterly basis in 2013, and now updates tables whenever data become available.

National Transportation Statistics has grown to over 200 tables in part by incorporating material from two related series of compilations. The Volpe Center produced a special energy supplement in 1973 through 1976, when USDOT was a principal source of statistics during the first energy crisis until creation of the U.S. Department of Energy in 1977. The Volpe Center also produced compilations of safety statistics in the *Transportation Safety Information Report* from 1980 through 1991.

National Transportation Statistics also includes government transportation financial statistics developed initially by the Office of the Assistant Secretary for Policy and International Affairs and produced since the 1990s by BTS.

The publication has evolved from its first edition, a printed annual report with 19 displays, tables, and modal profiles, to an digital product with 230 tables and modal profiles, each updated as soon as data are available and made publicly accessible at www.bts.gov/nts. This 50th edition and its predecessors, including the energy supplements and the *Transportation Safety Information Reports*, are available through the BTS National Transportation Library at <https://rosap.ntl.bts.gov/>.

BTS welcomes comment on *National Transportation Statistics* and the Bureau’s other products. Comments, questions, and requests for printed copies of this 50th edition should be sent to bts@dot.gov or to the Bureau of Transportation Statistics, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Washington DC, 20590.

Rolf R. Schmitt, Deputy Director
Bureau of Transportation Statistics



I extend my personal congratulations to the Bureau of Transportation Statistics (BTS) and the Volpe National Transportation Systems Center for producing *National Transportation Statistics* over the past half century. BTS and the Volpe Center are major components of the Office of the Assistant Secretary for Research and Technology, and *National Transportation Statistics* demonstrates how we work together to advance research and statistics for the national and global transportation community. I look forward to the future evolution of this vital resource.

Robert C. Hampshire, PhD
Deputy Assistant Secretary of Research and Technology and Chief Science Officer
U.S. Department of Transportation

The Bureau of Transportation Statistics is delighted to publish the 50th edition of *National Transportation Statistics*. This product is a unique source of tabular data covering all modes of transportation, with many time series going back to the 1960s. This product responds to the Bureau’s mandate to “collect, compile, analyze, and publish a comprehensive set of transportation statistics on the performance and impacts of the national transportation system” in more than 10 major subject areas specified in Title 49 of the United States Code.¹ We take care when combining statistics from individual modes of transportation to remove double-counting, and the sources of our information are thoroughly documented in all tables.

National Transportation Statistics is the foundation for a family of products that provide basic statistical references for anyone interested in transportation in the United States. For greater geographic detail, we produce *State Transportation Statistics* and *County Transportation Profiles*. For greater temporal detail, we produce *Monthly Transportation Statistics* and *The Week in Transportation*. All products are available at www.bts.gov. We look forward to continuing the development of these products to inform public agencies, the private sector, and the public about transportation.

Patricia S. Hu, Director
Bureau of Transportation Statistics



The John A. Volpe National Transportation Systems Center is proud to be part of this landmark 50th edition of *National Transportation Statistics*. This publication was one of the Volpe Center’s earliest products for the Department of Transportation and was a key element of our support to the newly established Bureau of Transportation Statistics (BTS) in the 1990s. *National Transportation Statistics* represents the wide range of multimodal, cross-cutting issues that Volpe analyzes for the Department and our dedication to understanding all forms of transportation and logistics. We are proud to have been the home for *National Transportation Statistics* through its first quarter century, and we look forward to continuing to work with BTS and the Department to improve the Nation’s transportation system and to advance transportation innovation for the public good.

Anne Aylward, Director
Volpe National Transportation Systems Center

¹ 49 USC §6302(b)(3)(B)(vi)

Table of Contents

Foreword	vii
Introduction	xix
Table A - Social and Economic Characteristics of the United States	xx

Chapter 1. The Transportation System

Section A - Physical Extent

Table 1-1 - System Mileage Within the United States.....	1
Table 1-2 - Number of Air Carriers, Railroads, Interstate Motor Carriers, Marine Vessel Operators, and Pipeline Operators	2
Table 1-3 - Number of U.S. Airports	3
Table 1-4 - Public Road and Street Mileage in the United States by Type of Surface	4
Table 1-5 - Public Road and Street Mileage in the United States by Functional System.....	5
Table 1-6 - Estimated U.S. Roadway Lane-Miles by Functional System	6
Table 1-7 - Number of Stations Served by Amtrak and Rail Transit, Fiscal Year	7
Table 1-8 - ADA Lift- or Ramp-Equipped Transit Buses	8
Table 1-9 - ADA-Accessible Rail Transit Stations by Agency	9
Table 1-10 - U.S. Oil and Gas Pipeline Mileage	11

Section B - Vehicle, Aircraft, and Vessel Inventory

Table 1-11 - Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances.....	14
Table 1-12 - U.S. Sales or Deliveries of New Aircraft, Vehicles, Vessels, and Other Conveyances	15
Table 1-13 - Active U.S. Air Carrier and General Aviation Fleet by Type of Aircraft	16
Table 1-14 - U.S. Automobile and Truck Fleets by Use	18
Table 1-15 - Annual U.S. Motor Vehicle Production and Domestic Sales	19
Table 1-16 - Retail New Passenger Car Sales.....	20
Table 1-17 - New and Used Passenger Car and Light Truck Sales	21
Table 1-18 - Retail Sales of New Cars by Sector	22
Table 1-19 - Hybrid-Electric, Plug-in Hybrid-Electric and Electric Vehicle Sales	23
Table 1-20 - Productions, Production Shares, and Production-Weighted Fuel Economies of New Domestic and Imported Automobiles	24
Table 1-21 - Table has been discontinued	
Table 1-22a - Number of Trucks by Weight	25
Table 1-22b - Number of U.S. Truck Registrations by Type	26
Table 1-23 - World Motor Vehicle Production, Selected Countries	27
Table 1-24 - Number and Size of the U.S. Flag Merchant Fleet and Its Share of the World Fleet	32

Section C - Condition

Table 1-25 - U.S. Airport Runway Pavement Conditions.....	34
---	----

Table 1-26 - Average Age of Automobiles and Trucks in Operation in the United States	35
Table 1-27 - Condition of U.S. Roadways by Functional System	36
Table 1-28 - Condition of U.S. Highway Bridges	39
Table 1-29 - Average Age of Urban Transit Vehicles	41
Table 1-30 - Condition of Urban Bus and Rail Transit Maintenance Facilities	42
Table 1-31 - Condition of Rail Transit Infrastructure	43
Table 1-32 - Class I Railroad Locomotive Fleet by Year Built.....	44
Table 1-33 - Age and Availability of Amtrak Locomotive and Car Fleets	45
Table 1-34 - U.S. Flag Vessels by Type and Age	46

Section D - Travel and Goods Movement

Table 1-35 - U.S. Vehicle-Miles	50
Table 1-36 - Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional System	51
Table 1-37 - U.S. Air Carrier Aircraft Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons	52
Table 1-38 - Average Length of Haul, Domestic Freight and Passenger Modes	53
Table 1-39 - Worldwide Commercial Space Launches.....	54
Table 1-40 - U.S. Passenger-Miles	55
Table 1-41 - Principal Means of Transportation to Work	56
Table 1-42 - Average Annual PMT, VMT Person Trips and Trip Length by Trip Purpose.....	57
Table 1-43 - Summary Statistics on Demographic Characteristics and Total Travel	58
Table 1-44 - Passengers Boarded at the Top 50 U.S. Airports.....	59
Table 1-45 - Air Passenger Travel Arrivals in the United States from Selected Foreign Countries	60
Table 1-46 - Air Passenger Travel Departures from the United States to Selected Foreign Countries	62
Table 1-47 - U.S.-Canadian Border Land-Passenger Gateways: Entering the United States	64
Table 1-48 - U.S.-Mexican Border Land-Passenger Gateways: Entering the United States	67
Table 1-49 - Table has been discontinued	
Table 1-50 - U.S. Ton-Miles of Freight	70
Table 1-51 - Top U.S. Foreign Trade Freight Gateways by Value of Shipments.....	71
Table 1-52 - U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings	72
Table 1-53 - U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Train Crossings	73
Table 1-54 - U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings	74

Table 1-55 - U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck and Train Crossings	75
Table 1-56 - U.S. Waterborne Freight.....	76
Table 1-57 - Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons	77
Table 1-58 - Freight Activity in the United States	79
Table 1-59 - Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments	81
Table 1-60a - Value of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode.....	83
Table 1-60b - Weight of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode.....	85
Table 1-61 - Crude Oil and Petroleum Products Transported in the United States by Mode	86
Table 1-62 - U.S. Hazardous Materials Shipments by Transportation Mode	87
Table 1-63 - U.S. Hazardous Materials Shipments by Hazard Class	88

Section E - System Performance

Table 1-64 - Passengers Boarded and Denied Boarding by the Largest U.S. Air Carriers.....	90
Table 1-65 - Baggage Mishandled by Marketing U.S. Air Carriers	91
Table 1-66 - Flight Operations Arriving On Time by the Largest U.S. Air Carriers	92
Table 1-67 - FAA-Cited Causes of Departure and En Route Delays	93
Table 1-68 - Major U.S. Air Carrier Delays, Cancellations, and Diversions.....	94
Table 1-69 - Annual Person-Hours of Highway Traffic Delay per Auto Commuter	95
Table 1-70 - Travel Time Index	97
Table 1-71 - Annual Roadway Congestion Index.....	99
Table 1-72 - Annual Highway Congestion Cost	101
Table 1-73 - Amtrak On-Time Performance Trends and Hours of Delay by Cause.....	107

Chapter 2. Transportation Safety

Section A - Multimodal Safety

Table 2-1 - Transportation Fatalities by Mode.....	111
Table 2-2 - Injured Persons by Transportation Mode	114
Table 2-3 - Transportation Accidents by Mode	116
Table 2-4 - Distribution of Transportation Fatalities by Mode.....	117
Table 2-5 - Highway-Rail Grade-Crossing Safety.....	118
Table 2-6 - Hazardous Materials Fatalities, Injuries, Accidents, and Property Damage Data	119
Table 2-7 - Transportation-Related Occupational Fatalities	121
Table 2-8 - Reporting Thresholds for Property Damage by U.S. Department of Transportation Modal Administrations.....	122

Section B - Air Safety

Table 2-9 - U.S. Air Carrier Safety Data.....	123
---	-----

Table 2-10 - U.S. Commuter Air Carrier Safety Data	126
Table 2-11 - U.S. Air Carrier Fatal Accidents by Defining Event of Operation	127
Table 2-12 - U.S. Commuter Air Carrier Fatal Accidents by Defining Event of Operation	128
Table 2-13 - U.S. On-Demand Air Taxi Safety Data	129
Table 2-14 - U.S. General Aviation Safety Data	130
Table 2-15 - Number of Pilot-Reported Near Midair Collisions (NMAC) by Degree of Hazard	131
Table 2-16 - Prohibited Items Intercepted at Airport Screening Checkpoints	132

Section C - Highway Safety

Table 2-17 - Motor Vehicle Safety Data	134
Table 2-18 - Motor Vehicle Fatalities, Vehicle-Miles, and Associated Rates by Highway Functional System	135
Table 2-19 - Occupant Fatalities by Vehicle Type and Nonoccupant Fatalities	136
Table 2-20 - Occupant and Non-Motorist Fatalities in Crashes by Number of Vehicles and Alcohol Involvement	137
Table 2-21a - Passenger Car Occupant Safety Data	138
Table 2-21b - Work Zone Safety Data	139
Table 2-22 - Motorcycle Occupant Safety Data	140
Table 2-23 - Truck Occupant Safety Data	141
Table 2-24 - Bus Occupant Safety Data	142
Table 2-25 - State Laws on Distracted Driving - Ban on Hand-Held Devices and Texting While Driving	143
Table 2-26 - Fatalities by Highest Blood Alcohol Concentration (BAC) in Highway Crashes	144
Table 2-27 - Number of States with Different Types of Anti-DUI/DWI Legislation in Effect as of January 1 of the Listed Year	145
Table 2-28 - Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions	146
Table 2-29 - Motor Vehicles and Occupants Involved in Fatal Crashes by Posted Speed Limit	147
Table 2-30 - Safety Belt and Motorcycle Helmet Use	148
Table 2-31 - Estimated Number of Lives Saved by Occupant Protection, Motorcycle Helmets, and Drinking Age Law	149

Section D - Transit Safety

Table 2-32 - Transit Safety and Property Damage Data	152
Table 2-33 - Transit Safety Data by Mode for All Reported Accidents	153
Table 2-34 - Transit Safety Data by Mode for All Reported Incidents	155
Table 2-35 - Transit and Grade-Crossing Fatalities by Rail Transit Mode	157
Table 2-36 - Transit and Grade-Crossing Injuries by Rail Transit Mode	158
Table 2-37 - Transit and Grade-Crossing Incidents by Rail Transit Mode	159

Table 2-38 - Security Events of Crime by Transit Mode	160
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Section E - Railroad Safety

Table 2-39 - Railroad and Grade-Crossing Fatalities by Victim Class.....	164
Table 2-40 - Railroad and Grade-Crossing Injured Persons by Victim Class.....	165
Table 2-41 - Train Fatalities, Injuries, and Accidents by Type of Accident.....	166
Table 2-42 - Railroad Passenger Safety Data	167
Table 2-43 - Railroad System Safety and Property Damage Data.....	168
Table 2-44 - Fatalities and Injuries of On-Duty Railroad Employees	169

Section F - Water Safety

Table 2-45 - Waterborne Transportation Safety and Property Damage Data Related to Vessel Casualties.....	172
Table 2-46 - Waterborne Transportation Safety Data not Related to Vessel Casualties	173
Table 2-47 - Recreational Boating Safety, Alcohol Involvement, and Property Damage Data	174
Table 2-48 - Personal Watercraft Safety Data.....	175
Table 2-49 - U.S. Coast Guard Search and Rescue Statistics	176

Section G - Pipeline Safety

Table 2-50 - Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data	178
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Chapter 3. Transportation and the Economy

Section A - Transportation and the Economy

Table 3-1 - U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (current dollars).....	181
Table 3-2 - U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (chained 2012 dollars).....	182
Table 3-3 - U.S. Gross Domestic Product (GDP) Attributed to Transportation Functions (current dollars).....	183
Table 3-4 - U.S. Gross Domestic Product (GDP) Attributed to Transportation Functions (chained 2012 dollars).....	184
Table 3-5 - Table has been discontinued	
Table 3-6 - Table has been discontinued	
Table 3-7 - Contributions to U.S. Gross Domestic Product (GDP): Selected Industries (current dollars)	185
Table 3-8 - Contributions to U.S. Gross Domestic Product (GDP): Selected Industries (chained 2012 dollars)	186
Table 3-9 - U.S. Gross Domestic Product (GDP) by Major Social Function (current dollars)	187
Table 3-10 - National Transportation and Economic Trends.....	188

Section B - Transportation and Consumer Expenditures

Table 3-11 - Sales Price of Transportation Fuel to End-Users.....	190
Table 3-12 - Price Trends of Gasoline v. Other Consumer Goods and Services	191
Table 3-13 - Producer Price Indices for Transportation Services and Warehousing Services (NAICS)	192
Table 3-14 - Producer Price Indices for Transportation Equipment (NAICS)	194
Table 3-15 - Personal Expenditures by Category	196
Table 3-16 - Personal Consumption Expenditures on Transportation by Subcategory	197
Table 3-17 - Average Cost of Owning and Operating an Automobile.....	198
Table 3-18 - Average Passenger Fares (current dollars)	199
Table 3-19 - Average Passenger Fares (chained 2012 dollars)	200

Section C - Transportation Revenues, Employment, and Productivity

Table 3-20 - Average Passenger Revenue per Passenger-Mile	202
Table 3-21 - Average Freight Revenue per Ton-Mile	203
Table 3-22 - Total Operating Revenues	204
Table 3-23 - Employment in For-Hire Transportation and Selected Transportation-Related Industries (NAICS)	205
Table 3-24 - Employment in Transportation and Transportation-Related Occupations	207
Table 3-25 - Average Wage and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (NAICS).....	210
Table 3-26 - Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation (SOC).....	211
Table 3-27 - Total Wage and Salary Accruals by Transportation Industry (NAICS).....	213
Table 3-28 - Labor Productivity Indices for Selected Transportation Industries (NAICS).....	214

Section D - Government Finance

Table 3-29 - Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (current dollars).....	216
Table 3-30 - Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (chained 2012 dollars).....	217
Table 3-31 - Summary of Transportation Revenues and Expenditures from Own Funds and User Coverage, Fiscal Year	218
Table 3-32 - Transportation Revenues by Level of Government and Mode, Fiscal Year (current dollars)	219
Table 3-33 - Transportation Revenues by Level of Government and Mode, Fiscal Year (chained 2012 dollars)	220
Table 3-34 - Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year.....	221
Table 3-35 - Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (current dollars)	222
Table 3-36 - Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (chained 2012 dollars).....	223

Table 3-37 - Federal Transportation Transfers to State and Local Governments by Mode, Fiscal Year (current dollars)	224
Table 3-38 - Federal Transportation Transfers to State and Local Governments by Mode, Fiscal Year (chained 2012 dollars)	225

Chapter 4. Transportation, Energy, and the Environment

Section A - U.S. Transportation Section Energy Consumption

Table 4-1 - Overview of U.S. Petroleum Production, Imports, Exports, and Consumption	229
Table 4-2 - U.S. Consumption of Energy from Primary Sources by Sector	230
Table 4-3 - Domestic Demand for Refined Petroleum Products by Sector	231

Section B - Transportation Energy Consumption by Mode

Table 4-4 - U.S. Energy Consumption by the Transportation Sector	234
Table 4-5 - Fuel Consumption by Mode of Transportation in Physical Units	235
Table 4-6 - Energy Consumption by Mode of Transportation	236
Table 4-7 - Domestic Demand for Gasoline by Mode	237
Table 4-8 - Certificated Air Carrier Fuel Consumption and Travel	238
Table 4-9 - Motor Vehicle Fuel Consumption and Travel	239
Table 4-10 - Estimated Consumption of Alternative Fuels for Federal and State Governments, Transit Agencies, and Fuel Providers Vehicles	240
Table 4-11 - Light Duty Vehicle, Short Wheel Base and Motorcycle Fuel Consumption and Travel	241
Table 4-12 - Light Duty Vehicle, Long Wheel Base Fuel Consumption and Travel	242
Table 4-13 - Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel	243
Table 4-14 - Combination Truck Fuel Consumption and Travel	244
Table 4-15 - Bus Fuel Consumption and Travel	245
Table 4-16 - Transit Industry Electric Power and Primary Energy Consumption and Travel	246
Table 4-17 - Class I Rail Freight Fuel Consumption and Travel	247
Table 4-18 - Amtrak Fuel Consumption and Travel	248
Table 4-19 - U.S. Government Energy Consumption by Agency and Source	249

Section C - Transportation Energy Intensity and Fuel Efficiency

Table 4-20 - Energy Intensity of Passenger Modes	254
Table 4-21 - Energy Intensity of Certificated Air Carriers, All Services	255
Table 4-22 - Energy Intensity of Light Duty Vehicles and Motorcycles	256
Table 4-23 - Average Fuel Efficiency of U.S. Light Duty Vehicles	257
Table 4-24 - Energy Intensity of Transit Motor Buses	258
Table 4-25 - Energy Intensity of Class I Railroad Freight Service	259
Table 4-26 - Energy Intensity of Amtrak Services	260
Table 4-27 - Energy Intensity of Amtrak Services (Loss-adjusted conversion factors)	261
Table 4-28 - Annual Wasted Fuel Due to Congestion	262
Table 4-29 - Annual Wasted Fuel per Person	264

Section D - Air Pollution

Table 4-30 - Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Vehicles	268
Table 4-31 - Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (category LDT1)	269
Table 4-32 - Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (category LDT2)	270
Table 4-33 - Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (category LDT3)	271
Table 4-34 - Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (category LDT4)	272
Table 4-35 - Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Medium-Duty Passenger Vehicles (MDPV).....	273
Table 4-36 - Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Heavy-Duty Trucks.....	274
Table 4-37 - Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Heavy Heavy-Duty Trucks	275
Table 4-38 - Federal Exhaust Emissions Standards for Newly Manufactured Motorcycles	276
Table 4-39 - Federal Exhaust Emissions Standards for Newly Manufactured and In-Use Aircraft Engines	277
Table 4-40 - Federal Exhaust Emissions Standards for Locomotives	278
Table 4-41 - Federal Exhaust Emissions Standards for Marine Spark-Ignition Engines and Vehicles	279
Table 4-42 - Tier 2 Federal Exhaust Emissions Standards for Newly Manufactured Commercial Marine Compression-Ignition Engines	280
Table 4-43 - Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel.....	281
Table 4-44 - Table has been discontinued	
Table 4-45 - Estimated National Emissions of Carbon Monoxide	283
Table 4-46 - Estimated National Emissions of Nitrogen Oxides.....	284
Table 4-47 - Estimated National Emissions of Volatile Organic Compounds.....	285
Table 4-48 - Estimated National Emissions of Particulate Matter (PM-10).....	286
Table 4-49 - Estimated National Emissions of Particulate Matter (PM-2.5).....	287
Table 4-50 - Estimated National Emissions of Sulfur Dioxide	288
Table 4-51 - Air Pollution Trends in Selected Metropolitan Statistical Areas.....	289
Table 4-52 - Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants	292
Table 4-53 - U.S. Carbon Dioxide Emissions from Energy Use by Sector	295

Section E - Water Pollution, Noise, and Solid Waste

Table 4-54 - Petroleum Oil Spills Impacting Navigable U.S. Waters.....	298
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Table 4-55 - Leaking Underground Storage Tank Releases and Cleanups.....	299
Table 4-56 - Highway Noise Barrier Construction.....	300
Table 4-57 - Number of People Residing in Areas of Significant Noise Exposure Around U.S. Airports	301
Table 4-58 - Motor Vehicles Scrapped.....	302

Appendix A - Metric Conversion Tables

Table 1-1M - System Kilometers Within the United States.....	304
Table 1-4M - Kilometers of Public Roads and Streets in the United States by Type of Surface	305
Table 1-6M - Estimated U.S. Roadway Lane-Kilometers by Functional System	306
Table 1-35M - U.S. Vehicle-Kilometers	307
Table 1-36M - Roadway Vehicle-Kilometers Traveled (VKT) and VKT per Lane-Kilometers by Functional System	308
Table 1-38M - Average Length of Haul, Domestic Freight and Passenger Modes	309
Table 1-40M - U.S. Passenger-Kilometers	310
Table 1-49M - Table has been discontinued	
Table 1-50M - U.S. Tonne-Kilometers of Freight	311
Table 1-56M - U.S. Waterborne Freight	312
Table 1-61M - Table has been discontinued	
Table 4-2M - U.S. Consumption of Energy from Primary Sources by Sector	313
Table 4-3M - Domestic Demand for Refined Petroleum Products by Sector.....	314
Table 4-4M - U.S. Energy Consumption by the Transportation Sector.....	315
Table 4-5M - Fuel Consumption by Mode of Transportation.....	316
Table 4-6M - Energy Consumption by Mode of Transportation	317
Table 4-7M - Domestic Demand for Gasoline by Mode	318
Table 4-8M - Certificated Air Carrier Fuel Consumption and Travel.....	319
Table 4-9M - Motor Vehicle Fuel Consumption and Travel.....	320
Table 4-11M - Light Duty Vehicle, Short Wheel Base and Motorcycle Fuel Consumption and Travel.....	321
Table 4-12M - Light Duty Vehicle, Long Wheel Base Fuel Consumption and Travel	322
Table 4-13M - Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel.....	323
Table 4-14M - Combination Truck Fuel Consumption and Travel	324
Table 4-15M - Bus Fuel Consumption and Travel	325
Table 4-16M - Transit Industry Electric Power and Primary Energy Consumption and Travel	326
Table 4-17M - Class I Rail Freight Fuel Consumption and Travel	327
Table 4-18M - Amtrak Fuel Consumption and Travel.....	328
Table 4-19M - U.S. Government Energy Consumption by Agency and Source	329
Table 4-20M - Energy Intensity of Passenger Modes.....	333
Table 4-21M - Energy Intensity of Certificated Air Carriers, All Services	334
Table 4-22M - Energy Intensity of Light Duty Vehicles and Motorcycles.....	335

Table 4-23M - Average Fuel Efficiency of U.S. Light Duty Vehicles	336
Table 4-24M - Energy Intensity of Transit Motor Buses.....	337
Table 4-25M - Energy Intensity of Class I Railroad Freight Service	338
Appendix B - Glossary	340
Appendix C - List of Acronyms and Initialisms	358
Appendix D - Modal Profiles	
Air Carrier Profile	362
General Aviation Profile.....	366
Highway Profile	368
Automobile Profile.....	371
Truck Profile	374
Bus Profile	376
Transit Profile.....	378
Rail Profile	383
Water Transport Profile.....	385
Oil Pipeline Profile	388
Natural Gas Pipeline Profile	389
Appendix E - Data Source and Accuracy Statements.....	392
Appendix F - Sources	480

Introduction

Compiled and published by the U.S. Department of Transportation's Bureau of Transportation Statistics (BTS), *National Transportation Statistics* presents information on the U.S. transportation system, including its physical components, safety record, economic performance, energy use, and environmental impacts. *National Transportation Statistics* is a companion document to the *Transportation Statistics Annual Report*, which analyzes some of the data presented here, and *State Transportation Statistics*, which presents statelevel data on many of the same topics presented here.

The report has four chapters:

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

Appendix A contains metric conversions of select tables. BTS obtained the data in this report from many sources, including federal government agencies, private industry, and associations. Documents cited as sources for the tables provide detailed information about definitions, methodologies, and statistical reliability. Some of the data are based on samples and are subject to sampling variability. *National Transportation Statistics* is updated monthly at www.bts.gov.

Table A: Social and Economic Characteristics of the United States

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL U.S. resident population^a (thousands)	227,225	249,464	282,162	309,322	311,557	313,831	315,994	318,301	320,635	322,941	324,986	326,688	328,240	332,599
Population by age (thousands)														
Under 18	63,683	64,177	72,376	74,121	73,908	73,697	73,589	73,564	73,618	73,649	73,585	73,319	73,039	74,660
18-24 years	30,103	26,835	27,315	30,762	31,079	31,371	31,488	31,416	31,131	30,802	30,520	30,373	30,219	30,220
25-34	37,429	43,148	39,804	41,211	41,794	42,291	42,834	43,448	44,038	44,732	45,263	45,610	45,940	45,866
35-44	25,805	37,777	45,169	40,980	40,633	40,511	40,445	40,401	40,438	40,469	40,757	41,213	41,659	42,935
45-54	22,743	25,194	37,999	44,986	44,726	44,256	43,760	43,331	43,016	42,707	42,232	41,578	40,875	41,356
55-64	21,764	21,093	24,429	36,783	38,068	38,574	39,278	39,983	40,744	41,390	41,875	42,224	42,449	43,259
65 and over	25,707	31,241	35,070	40,478	41,350	43,130	44,629	46,157	47,651	49,202	50,763	52,369	54,058	54,303
Population by sex^a (thousands)														
Male	110,399	121,626	138,443	152,075	153,200	154,374	155,482	156,654	157,856	159,022	160,046	160,886	161,657	164,771
Female	116,826	127,838	143,719	157,247	158,357	159,457	160,512	161,647	162,779	163,920	164,940	165,802	166,582	167,826
Population in metropolitan areas^{b,c} (thousands)	177,000	198,000	233,791	263,660	265,915	268,257	270,477	272,833	275,213	277,549	279,600	281,283	282,829	U
Large (over 1 million)	119,000	139,000	149,757	245,112	248,445	250,861	253,141	256,465	258,742	260,849	262,613	263,855	264,963	U
Medium (250,000-999,999)	41,000	41,000	56,190	71,528	71,041	71,271	71,976	71,476	72,502	73,339	74,129	74,856	75,320	U
Small (less than 250,000)	17,000	18,000	27,843	28,330	28,465	28,871	28,742	28,876	28,510	28,369	28,270	28,153	28,249	U
Population in micropolitan areas^b (thousands)	NA	NA	29,189	27,158	27,177	27,181	27,174	27,174	27,177	27,188	27,200	27,221	27,253	U
Population in rural / urban^d areas (thousands)														
Rural	59,495	61,656	44,775	75,298	76,264	60,020	59,984	60,358	60,697	60,870	61,815	62,691	63,763	U
Urban	167,051	187,053	236,649	234,052	235,328	253,894	256,145	258,499	260,721	262,257	263,904	264,476	264,477	U
Population in regions^a (thousands)														
Northeast	49,183.0	50,875.6	53,667.5	55,380.1	55,604.2	55,775.2	55,901.8	56,006.0	56,034.7	56,042.3	56,069	56,047	55,983	U
South	75,721.0	85,731.7	100,559.9	114,866.7	116,006.5	117,241.2	118,364.4	119,624.0	120,997.3	122,351.8	123,542	124,569	125,580	U
Midwest	58,901.2	59,765.4	64,494.0	66,974.4	67,157.8	67,336.7	67,560.4	67,745.2	67,860.6	67,987.5	68,127	68,237	68,329	U
West	43,419.4	53,091.6	63,450.6	72,100.4	72,788.3	73,477.8	74,167.1	74,925.8	75,742.6	76,559.7	77,257	77,835	78,347	U
Number of immigrants admitted^e	524,295	1,535,872	841,002	1,042,625	1,062,040	1,031,631	990,553	1,016,518	1,051,031	1,183,505	1,127,167	1,096,611	1,031,765	U
Total area^f (square miles)	3,618,770	3,717,796	3,794,083	3,796,742	3,795,951	U	U	U	U	U	U	3,809,525	3,809,525	3,809,525
Gross domestic product (billions of chained 2012 dollars)^g	6,759.2	9,365.5	13,131.0	15,598.8	15,840.7	16,197.0	16,495.4	16,912.0	17,432.2	17,730.5	18,144.1	18,687.8	19,091.7	18,426.1
Government, total	U	U	1,977.6	2,182.4	2,175.6	2,159.5	2,144.3	2,139.4	2,142.1	2,163.2	2,186.1	2,208.3	2,229.5	2,183.1
Private industry, total	U	U	11,384.0	13,467.3	13,697.4	14,037.5	14,302.3	14,716.0	15,233.0	15,511.0	15,902.1	16,415.5	16,804.2	16,186.2
Agriculture, forestry, fishing, and hunting	U	U	161.8	183.9	186.4	179.6	209.4	211.8	227.2	238.8	233.7	243.4	243.6	257.2
Mining	U	U	236.2	309.3	320.8	358.8	372.9	413.8	451.8	427.1	431.0	452.2	504.3	447.1
Utilities	U	U	260.8	265.8	276.0	279.7	276.6	266.0	266.2	279.6	280.6	282.1	285.7	295.9
Construction	U	U	783.3	547.5	538.7	553.4	567.2	577.7	604.2	627.2	646.8	664.8	664.6	652.1
Manufacturing	U	U	1,678.8	1,932.6	1,939.8	1,927.1	1,986.2	2,020.2	2,048.4	2,034.2	2,084.3	2,172.7	2,215.3	2,152.6
Wholesale trade	U	U	809.1	947.9	965.4	997.4	1,020.2	1,059.2	1,104.8	1,091.2	1,109.2	1,115.8	1,092.5	1,049.1
Retail trade	U	U	820.4	900.2	901.8	908.4	936.7	953.9	989.6	1,026.3	1,062.8	1,090.7	1,118.3	1,087.3
Transportation and warehousing	U	U	424.8	460.7	469.0	472.0	478.8	493.6	507.2	515.4	535.4	558.2	575.9	502.1
Information	U	U	422.0	750.3	761.0	759.0	828.0	848.6	937.6	1,019.5	1,065.3	1,161.4	1,244.0	1,283.5
Finance, insurance, real estate, rental, and leasing	U	U	2,454.0	3,064.3	3,127.4	3,261.0	3,321.6	3,327.9	3,414.9	3,469.8	3,513.8	3,584.1	3,634.9	3,645.1
Professional and business services	U	U	1,451.2	1,807.2	1,879.4	1,964.7	1,990.1	2,080.7	2,151.7	2,195.8	2,293.5	2,410.3	2,518.9	2,463.0
Educational services, health care, and social assistance	U	U	987.8	1,361.1	1,384.4	1,407.4	1,425.5	1,451.0	1,505.8	1,548.7	1,571.2	1,614.6	1,659.7	1,564.0
Arts, entertainment, recreation, accommodation, and food services	U	U	562.8	586.2	606.8	621.4	634.6	657.7	678.2	687.9	702.9	717.7	728.4	526.6

Table A cont'd: Social and Economic Characteristics of the United States

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Other services, except government		U	4,31.5	345.9	342.8	348.0	345.4	355.4	357.5	354.4	357.3	369.0	374.0	326.8
Total civilian labor force (thousands)	106,940	125,840	142,583	153,889	153,617	154,975	155,389	155,921	157,130	159,187	160,320	162,074	163,539	160,742
Participation rate of men (percent)	77.4	76.4	74.8	71.2	70.5	70.2	69.7	69.2	69.1	69.2	69.1	69.1	69.2	67.7
Participation rate of women (percent)	51.5	57.5	59.9	58.6	58.1	57.7	57.2	57.0	56.7	56.8	57.0	57.1	57.4	56.2
Number of households (thousands)	80,776	93,347	104,705	117,538	118,682	121,084	122,459	123,229	124,587	125,819	126,224	127,586	128,579	128,451
Average size of households	2.76	2.63	2.62	2.59	2.58	2.55	2.54	2.54	2.54	2.53	2.54	2.53	2.52	2.53
Median household income^b (constant 2012 dollars)	47,027	51,065	56,036	51,906	51,114	51,017	52,803	51,993	54,669	56,382	57,377	57,661	61,586	59,780
Mean household income^b (constant 2012 dollars)	55,930	63,787	76,247	70,988	71,153	71,274	74,097	73,389	76,673	79,402	80,607	82,158	87,927	85,903
Average household expenditures^b (constant 2012 dollars)	U	48,401	50,771	50,677	50,757	51,442	50,354	51,836	54,149	54,732	56,150	55,876	56,506	54,303

KEY: NA = not applicable; U = data are not available.

^a Estimates are as of July 1 for each year. The numbers for each sub-category in each year may not add up to the total population due to rounding.

^b New metropolitan area definitions were published by the Office of Management and Budget (OMB) in 2003. These definitions were applied to population data by the Census Bureau beginning with the data from the 2000 Census. A new term, core based statistical areas (CBSAs), collectively refers to metropolitan and micropolitan statistical areas. A micropolitan statistical area is defined as having at least one urban cluster of more than 10,000 but less than 50,000 inhabitants. All geographic boundaries for the July 1, 2009 population estimates series are defined as of January 1, 2009. The Office of Management and Budget's statistical area definitions for metropolitan and micropolitan statistical areas, as well as metropolitan divisions, are those issued by that agency in November 2008. The estimates for 2010-12 are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program and geographic program revisions. The Office of Management and Budget's statistical area delineations for metropolitan and micropolitan statistical areas, as well as micropolitan divisions, are those issued by that agency in February 2013.

^c Numbers prior to 1999 are estimated to the nearest million.

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

^e Fiscal year ending September 30.

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

^g Sums of chained-dollar estimates for individual industries do not add to national totals because the chain-type indices used to derive them are based on weights of more than one period.

^h Converted to constant 2012 dollars by the Bureau of Transportation Statistics using the CPI-U-RS price index.



CHAPTER 1

The Transportation System

Section A: Physical Extent

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

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Highway ^a	3,545,693	3,730,082	3,859,837	3,866,926	3,936,222	4,067,077	4,077,756	4,092,730	4,115,462	4,177,073	4,154,727	4,140,108	4,165,349	4,176,915	4,171,125	U
Class I rail ^{b,c}	207,334	196,479	164,822	119,758	99,250	95,700	95,514	95,391	95,235	94,372	93,628	93,339	93,150	92,837	92,282	U
Amtrak ^c	N	N	24,000	24,000	23,000	21,178	21,225	21,334	21,356	21,356	21,358	21,358	21,407	21,407	21,407	U
Transit ^d																
Commuter rail ^c	N	N	N	4,132	5,209	7,630	7,576	7,722	7,731	7,795	7,697	7,745	7,815	7,902	7,901	7,930
Heavy rail	N	N	N	1,351	1,558	1,617	1,617	1,622	1,622	1,622	1,643	1,646	1,653	1,660	1,661	1,663
Light rail ^e	N	N	N	483	834	1,497	1,740	1,724	1,836	1,877	1,893	1,958	2,030	2,045	2,088	2,096
Navigable channels ^f	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Oil pipeline ^g	N	N	N	N	N	N	181,986	183,575	186,221	192,412	199,795	208,622	212,164	216,052	219,137	225,024
Gas pipeline ^h	N	N	N	1,871,286	2,114,618	2,426,914	2,445,692	2,457,927	2,470,078	2,488,726	2,509,202	2,529,738	2,544,869	2,558,230	2,583,014	2,603,723

KEY: N = data do not exist; 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. 2010 Missouri and Wyoming's data are 2009.

^b Data represent miles of road owned (aggregate length of road, excluding yard tracks, sidings, and parallel lines) and includes a 328 mile state-owned rail line and a small amount, approximately 100 miles, of road owned in Canada.

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

^d *Transit* system length is measured in directional route-miles. Directional route-miles are the distance 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. Beginning in 2002, directional route-mileage data for the *Commuter* and *Light rail* modes include purchased transportation. 2005 and later years directional route-mileage data for the *Heavy rail* mode include purchased transportation.

^e Beginning in 2011, *Light rail* includes Light Rail, Street Car Rail, and Hybrid Rail.

^f These are estimated sums of all domestic waterways which include rivers, bays, channels, and the inner route of the Southeast Alaskan Islands, but does not include the Great Lakes or deep ocean traffic. The Waterborne Commerce Statistics Center monitored 12,612 miles as commercially significant inland shallow-draft waterways in 2001. Beginning in 2007, waterways connecting lakes and the Great Lakes St.

^g Includes trunk and gathering lines for crude-oil pipeline and Highly Volatile Liquid (HVL), Carbon Dioxide, and other hazardous liquid systems.

^h Data not adjusted to common diameter equivalent. Mileage as of the end of each year. Data includes gathering, transmission, service, and distribution mains. Prior to 1985 data also include field lines. See table 1-10 for a more detailed breakout of *Oil and Gas pipeline* mileage. Length data reported in *Gas Facts* prior to 1985 was taken from the American Gas Association's member survey, the Uniform Statistical Report, supplemented with estimates for companies that did not participate. *Gas Facts* length data is now based on information reported to the U.S. Department of Transportation on Form 7100. Since data for 1985 and later years are obtained from the Pipeline and Hazardous Material Safety Administration, data for these years are not comparable with prior years or with numbers published in the previous NTS reports.

NOTE

Eno Transportation Foundation has discontinued its oil pipeline data for years prior to 2001.

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

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air carriers^a	N	39	63	70	91	85	77	76	73	71	67	63	64	64	61	59	59
Major air carriers	N	N	N	14	15	17	21	19	18	20	20	18	18	17	18	17	18
Other air carriers	N	N	N	56	76	68	56	57	55	51	47	45	46	47	43	42	41
Railroads^b	607	517	480	530	560	560	565	567	574	U	U	U	U	U	613	U	U
Class I railroads	106	71	39	14	8	7	7	7	7	7	7	7	7	7	7	7	7
Other railroads	501	446	441	516	552	553	558	560	567	U	U	U	U	606	U	U	U
Interstate motor carriers^b	U	U	U	216,000	560,393	679,744	739,421	742,762	759,612	771,168	720,764	746,142	510,016	528,543	532,245	567,467	601,095
Marine vessel operators^c	U	U	U	U	1,114	733	603	584	570	553	532	1,189	1,132	508	490	460	U
Pipeline operators^d	N	1,123	2,243	2,198	2,157	2,332	2,393	2,462	2,543	2,613	2,666	2,675	2,720	2,764	2,793	2,795	2,798
Hazardous liquid ^e	N	N	N	171	220	308	380	394	414	442	460	486	519	536	547	546	551
Natural gas transmission ^f	N	420	474	866	844	976	1,045	1,101	1,139	1,175	1,209	1,221	1,234	1,257	1,288	1,315	1,313
Natural gas distribution ^g	N	938	1,932	1,382	1,363	1,390	1,338	1,352	1,375	1,389	1,386	1,371	1,379	1,386	1,374	1,356	1,346

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

^a Carrier groups are categorized based on their annual operating revenues as major, national, large regional, and medium regional. The thresholds were last adjusted July 1, 1999, and the threshold for *Major air carriers* is currently \$1 billion. The *Other air carrier* category contains all national, large regional, and medium regional air carriers. Beginning in 2003, regional air carriers are not required to report financial data which may result in under reporting of *Other carriers* in this table.

^b 1960-2005 figures are for the fiscal year, October through September. 2010 figure is the U.S. DOT number of active interstate motor carriers as of the end of December 2010. The numbers of *Interstate motor carriers* are based on 'active' U.S. DOT Numbers. 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. However, some companies may go out of business without de-activating their U.S. DOT Number. As a result, inactive carriers may be included in the MCMIS. 2011-19 figures are snapshots dated Dec. 16, 2011; Dec. 14, 2012; Dec. 19, 2013; Dec. 27, 2013; Dec. 19, 2014; Dec. 28, 2015; Dec. 30, 2016; Dec. 29, 2017; Mar. 30, 2018, and Dec. 27, 2019.

^c Marine operators are counted if they have at least one vessel listed on a Vessel Operating Report submitted to USACE for that year.

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

^e The value given for 1985 is actually for 1986. The number of *Hazardous liquid pipeline operators* is not available for prior years.

^f *Natural gas transmission* numbers also include gas gathering counts as well.

^g In 1980, *Natural gas distribution* 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.

^h AAR did not have enough people in the department to conduct the survey necessary to have data for the non-Class I railroads for 2013 to 2016 and 2018 and 2019.

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

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015 ^f	2016	2017	2018	2019	2020
TOTAL airports^b	15,161	17,490	19,281	19,854	19,802	19,782	19,711	19,457	19,299	U	19,536	19,655	19,627	19,636	19,919
Public use, total	4,814	5,589	5,317	5,270	5,175	5,172	5,171	5,155	5,145	U	5,136	5,104	5,099	5,080	5,217
Lighted runways, percent	66.2	71.4	75.9	76.8	U	U	U	U	U	U	U	U	U	U	U
Paved runways, percent	72.3	70.7	74.3	74.8	U	U	U	U	U	U	U	U	U	U	U
Private use, total	10,347	11,901	13,964	14,584	14,353	14,339	14,269	14,009	13,863	U	14,112	14,263	14,528	14,556	14,702
Lighted runways, percent	15.2	7.0	7.2	9.2	U	U	U	U	U	U	U	U	U	U	U
Paved runways, percent	13.3	31.5	32.0	33.2	U	U	U	U	U	U	U	U	U	U	U
Military^c	U	U	U	U	274	271	271	289	286	U	288	288	305	308	312
TOTAL airports	15,161	17,490	19,281	19,854	19,802	19,782	19,711	19,457	19,299	U	19,536	19,655	19,627	19,636	19,919
Certificated^d, total	730	680	651	575	551	547	542	542	537	U	531	526	523	522	519
Civil	U	U	563	U	U	U	U	U	U	U	U	U	U	U	U
Military	U	U	88	U	U	U	U	U	U	U	U	U	U	U	U
General aviation^e, total	14,431	16,810	18,630	19,279	19,251	19,235	19,169	18,915	18,762	U	19,005	19,129	19,116	19,117	19,395

KEY: U = data are not available.

^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. Sole-use military airports are included beginning in 2007.

^b Total airports (Landing Areas) includes airports, heliports, seaplane bases, gliderports, balloonports, and ultralights.

^c Military includes public use and private use and are included in appropriate public or private use numbers.

^d *Certificated* airports (active): airports serving passenger-carrying operations of an air carrier certificated under Part 121 and Part 380. Beginning in 2005, the Federal Aviation Administration (FAA) no longer certifies military airports.

^e Total *general aviation* commercial service airports excluded in this total but include in public-use.

^f 2015 data are not available.

NOTE

Details may not add up to totals due to rounding by the source.

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

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL paved and unpaved	3,546	3,730	3,860	3,867	3,950	4,010	N	3,981	4,064	4,071	4,165	4,127	4,113	4,146	4,161	4,125
Paved^b, total	1,230	1,658	2,073	2,255	2,504	2,601	N	2,605	2,646	2,678	2,744	2,735	2,750	2,780	2,844	2,906
Low and intermediate type ^c	672	897	1,041	1,025	N	N	N	N	N	N	N	N	N	N	N	N
High-type ^c	558	762	1,032	1,230	N	N	N	N	N	N	N	N	N	N	N	N
Unpaved^d, total	2,315	2,072	1,787	1,612	1,446	1,409	N	1,375	1,418	1,394	1,421	1,392	1,362	1,366	1,317	1,219

KEY: N = data do not exist.

^a 1960-90 data includes the 50 states and the District of Columbia; 2000-08 data includes the 50 states, District of Columbia, and Puerto Rico; 2011-16 data includes the 50 states and the District of Columbia; 2017 and later data includes the 50 states, Puerto Rico (data may be incomplete), and the District of Columbia.

^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 Beginning in 1997, data is no longer available for paved minor collectors and local public roads.

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

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 is available (although prior to 1980 some nonpublic roadway mileage is included). Most data is provided by the states to the US DOT Federal Highway Administration (FHWA). Some years contain FHWA estimates for some states. Numbers may not add to totals due to rounding.

Table 1-5: Public Road and Street Mileage in the United States by Functional System^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL urban and rural mileage	3,859,837	3,866,926	3,936,222	3,995,635	4,067,076	4,077,756	4,092,730	4,115,462	4,177,073	4,154,727	4,140,108	4,165,349	4,176,915	4,171,125
Urban mileage, total	628,901	744,644	852,243	1,009,839	1,089,700	1,095,373	1,113,018	1,177,986	1,201,719	1,209,214	1,212,054	1,219,844	1,225,434	1,238,354
Principal arterials, Interstates	9,215	11,527	13,379	15,703	16,682	16,704	16,910	17,896	18,567	19,063	19,058	19,092	19,160	19,177
Other freeways, and expressways	6,774	7,668	9,140	10,560	11,319	11,495	11,469	11,602	11,784	12,038	12,255	12,152	12,100	12,050
Principal arterials, other	44,155	51,968	53,314	61,803	65,105	64,982	65,193	66,510	66,761	66,855	66,137	66,316	66,453	66,367
Minor arterials	66,377	74,659	89,789	101,673	107,366	107,292	108,328	111,028	112,288	113,592	112,384	112,569	112,468	112,230
Major collectors	68,387	78,254	88,200	106,109	114,450	114,456	115,698	121,389	127,809	129,677	129,173	129,031	129,085	130,165
Minor collectors	U	U	U	U	3,146	3,304	3,588	5,112	11,754	13,885	16,961	17,631	17,852	21,218
Local	433,993	520,568	598,421	713,991	771,632	777,142	791,832	844,448	852,755	854,104	856,085	863,054	868,317	877,147
Rural mileage, total	3,230,936	3,122,282	3,083,979	2,985,796	2,977,376	2,982,383	2,979,711	2,937,476	2,975,354	2,945,513	2,928,054	2,945,505	2,951,481	2,932,771
Principal arterials, Interstates	31,905	33,547	33,048	30,905	30,218	30,256	30,522	29,678	29,095	28,990	29,133	29,162	29,280	29,305
Other freeways and expressways	U	U	U	U	3,299	4,224	4,395	4,842	5,466	5,948	6,378	6,589	6,504	6,580
Principal arterials, other	82,569	83,802	98,919	95,156	92,089	91,280	91,420	90,405	90,272	89,618	89,728	89,766	90,161	90,313
Minor arterials	149,057	144,774	137,575	135,408	135,450	135,650	135,097	132,845	132,672	133,016	133,809	134,075	133,746	134,602
Major collectors	439,000	436,352	433,121	419,999	418,604	420,136	419,109	414,816	410,287	409,676	407,650	407,906	407,859	407,231
Minor collectors	299,613	293,922	271,803	264,387	263,026	263,053	262,190	262,490	258,513	257,993	258,477	261,324	259,789	256,504
Local	2,228,792	2,129,885	2,109,513	2,039,941	2,034,690	2,037,783	2,036,976	2,002,399	2,049,049	2,020,272	2,002,878	2,016,682	2,024,142	2,008,237

KEY: U = data are not available.

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

NOTES

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 is available. For more detailed information, including breakdowns of mileage by ownership and type of surface, see the source document.

From 2005 to 2009, approximately 4,394 miles of federal agency and local government owned roads are excluded; 71 miles of other non-Federal agency owned roads are excluded; and 274 miles of miscoded non-Interstate functional system length or rural/urban categorization or both are included.

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

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL lane-miles	7,922,174	8,051,081	8,224,245	8,371,718	8,582,261	8,567,618	8,606,003	8,656,070	8,766,049	8,736,587	8,711,076	8,765,578	8,794,569	8,785,398
Urban, total	1,395,245	1,670,496	1,915,503	2,263,360	2,464,261	2,460,509	2,502,362	2,640,861	2,679,696	2,710,533	2,718,635	2,737,197	2,753,429	2,780,284
Interstate	48,458	62,214	73,912	85,986	92,254	92,714	94,096	98,934	102,541	104,738	105,229	105,745	106,741	107,002
Other arterial ^b	333,673	399,376	456,181	523,838	570,046	561,471	568,448	581,899	573,545	589,559	587,004	590,057	594,479	594,453
Collector ^c	145,128	167,770	188,570	225,548	257,197	252,041	256,154	271,131	298,099	308,028	314,231	315,287	315,574	324,536
Local	867,986	1,041,136	1,196,840	1,427,988	1,544,764	1,554,283	1,583,665	1,688,897	1,705,510	1,708,209	1,712,171	1,726,107	1,736,635	1,754,294
Rural, total	6,526,929	6,380,585	6,308,742	6,108,358	6,118,000	6,107,109	6,103,641	6,015,209	6,086,353	6,026,054	5,992,440	6,028,381	6,041,140	6,005,113
Interstate	130,980	135,871	134,587	125,564	123,671	123,835	124,766	120,863	118,688	118,252	118,989	119,193	119,885	120,127
Other arterial ^b	507,098	517,342	540,457	529,555	542,805	538,283	538,309	530,579	528,933	529,015	532,187	534,193	534,482	537,882
Collector ^c	1,431,267	1,467,602	1,414,667	1,373,348	1,382,250	1,369,424	1,366,614	1,358,968	1,340,635	1,338,243	1,335,508	1,341,630	1,338,490	1,330,630
Local	4,457,584	4,259,770	4,219,031	4,079,891	4,069,274	4,075,567	4,073,952	4,004,799	4,098,098	4,040,544	4,005,756	4,033,365	4,048,283	4,016,474

^a Includes the 50 States and the District of Columbia.

^b *Urban other arterial* include other freeways and expressways, other principal arterial, and minor arterial. *Rural other arterial* includes other principal arterial and minor arterial prior to 2009 and other freeways and expressways, other principal arterial and minor arterial after 2009.

^c *Collector* is the sum of major and minor collectors.

NOTES

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

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

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Amtrak	516	515	531	512	511	512	516	518	521	525	527	526	526	526
Rail transit	2,169	2,595	2,946	3,124	3,165	3,216	3,227	3,355	3,301	3,381	3,399	3,448	3,630	3,663
Commuter rail	U	983	1,164	1,225	1,219	1,234	1,232	1,245	1,246	1,261	1,262	1,280	1,300	1,311
Heavy rail	U	1,009	1,042	1,041	1,041	1,044	1,044	1,130	1,051	1,051	1,054	1,054	1,055	1,057
Light rail	U	603	730	848	895	928	941	969	993	1,058	1,072	1,106	1,267	1,287

KEY: U = data are not available.

NOTES

Rail transit is the sum of Alaska Railroad, Commuter Rail, Heavy Rail, and Light Rail. In several large urban areas, Amtrak and commuter rail stations are shared. Starting in 2001, stations serving the Alaska Railroad are included in the rail transit total. Stations serve for Street Car and Hybrid Rail are included in the light rail total from 2011.

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

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

Year	Small buses			Medium buses			Large buses			Articulated buses			Total buses ^a		
	Number	Equipped	Percent	Number	Equipped	Percent	Number	Equipped	Percent	Number	Equipped	Percent	Number	Equipped	Percent
2000	10,531	9,681	91.9	7,674	6,946	90.5	49,693	37,553	75.6	2,078	1,712	82.4	69,976	55,892	79.9
2005	11,118	10,846	97.6	10,631	10,499	98.8	45,524	43,479	95.5	2,231	2,225	99.7	69,504	67,049	96.5
2010	15,170	14,930	98.4	12,082	11,974	99.1	44,057	43,481	98.7	4,158	4,158	100.0	75,467	74,543	98.8
2011	15,097	14,835	98.3	12,013	11,879	98.9	42,888	42,354	98.8	4,158	4,158	100.0	74,156	73,226	98.7
2012	N	N	97.7	N	N	98.8	N	N	99.0	4,099	4,038	98.5	78,451	77,346	98.6
2013	N	N	97.4	N	N	98.5	N	N	99.2	4,521	4,506	99.7	80,810	79,581	98.5
2014	N	N	N	N	N	N	N	N	N	4,886	4,885	100.0	79,552	78,667	98.9
2015	N	N	N	N	N	N	N	N	N	5,272	5,272	100.0	76,789	75,712	98.6
2016	N	N	N	N	N	N	N	N	N	5,522	5,500	99.6	74,177	73,173	98.6
2017	N	N	N	N	N	N	N	N	N	5,568	5,512	99.0	73,030	71,789	98.3
2018	N	N	N	N	N	N	N	N	N	5,670	5,609	98.9	68,528	66,989	97.8
2019	N	N	N	N	N	N	N	N	N	6,008	5,937	98.8	69,008	67,317	97.5
2020	N	N	N	N	N	N	N	N	N	6,016	5,962	99.1	67,652	65,950	97.5

KEY: ADA = Americans with Disabilities Act of 1992; N = data do not exist.

^a From 2012 includes articulated bus, bus, double decker bus, over-the-road bus, school bus, trolleybus and vintage trolley.

NOTES

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

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

Data from 2012 and after are not comparable to the data for earlier years or to the data published in previous editions of the report due to different data sources used.

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

Type of rail transit / agency	Number of stations													Percent of stations not ADA-accessible												
	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
Dallas Area Rapid Transit	20	39	55	58	61	62	62	62	64	64	64	64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Denver Regional Transportation District	20	36	36	36	46	46	46	46	54	54	57	57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Hampton Roads Transit (HRT)	N	N	N	11	11	11	11	11	11	11	11	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Hillsborough Area Regional Transit Authority	N	8	N	N	N	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Island Transit	N	N	N	N	N	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Kenosha Transit	1	2	N	N	N	N	N	N	N	N	N	N	100.0	50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
King County Department of Transportation	9	11	N	N	N	N	N	N	N	N	N	N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Los Angeles County Metropolitan Transportation Authority	36	53	53	66	66	66	66	66	79	79	79	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Maryland Transit Administration	32	33	33	33	33	33	33	33	33	33	33	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Massachusetts Bay Transportation Authority	95	74	74	74	74	74	74	74	74	74	74	74	87.4	51.4	51.4	51.4	51.4	48.6	48.6	48.6	47.3	47.3	47.3	45.9		
Memphis Area Transit Authority	28	7	N	N	N	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Metro Transit	N	19	19	19	19	37	37	37	37	37	37	37	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Metropolitan Transit Authority of Harris County	N	16	16	16	16	24	39	39	39	63	63	63	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
New Jersey Transit Corporation	11	60	41	41	38	38	83	96	38	41	41	41	100.0	10.0	14.6	14.6	15.8	15.8	7.2	6.3	0.0	14.6	9.8	14.6		
New Orleans Regional Transit Authority	9	9	N	N	N	N	N	N	N	N	N	N	0.0	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Niagara Frontier Transportation Authority	14	15	15	15	14	14	14	14	14	14	14	14	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
North County Transit District	N	15	N	N	N	N	N	N	N	N	N	N	NA	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Port Authority of Allegheny County	13	23	23	26	26	26	26	26	30	30	30	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Sacramento Regional Transit District	29	48	48	50	38	38	38	41	41	43	43	43	0.0	2.1	2.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
San Diego Trolley, Inc.	49	N	53	53	53	53	53	53	53	54	54	54	0.0	U	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
San Francisco Municipal Railway	11	9	9	9	9	9	9	9	9	9	9	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Santa Clara Valley Transportation Authority	47	65	65	65	65	65	65	64	64	64	64	64	55.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Southeastern Pennsylvania Transportation Authority	64	45	N	N	N	N	N	N	N	N	N	N	100.0	95.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
The Greater Cleveland Regional Transit Authority	34	34	34	34	34	34	34	34	34	34	34	34	79.4	73.5	73.5	70.6	70.6	70.6	70.6	64.7	64.7	55.9	50.0	50.0		
Tri-County Metropolitan Transportation District of Oregon	47	38	36	36	37	37	37	44	44	44	44	44	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Utah Transit Authority	16	28	42	50	56	56	56	56	56	56	56	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Valley Metro Rail	N	33	33	33	33	33	33	40	40	40	43	43	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

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

NOTE

Rail transit data for 2002 and beyond include both directly operated and purchased transportation. Prior to 2002, the data include directly operated service only. Stations for U.S. territories are excluded.

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

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Oil pipeline, total	N	N	N	N	N	166,760	181,986	183,575	186,221	192,412	199,795	208,622	212,164	216,052	219,095	224,982	228,102
Crude lines	N	N	N	N	N	48,732	54,631	56,100	57,463	61,087	66,943	73,057	75,764	79,268	80,847	84,068	84,405
Product lines	N	N	N	N	N	62,899	64,800	64,124	64,042	63,351	61,768	62,634	62,461	62,370	62,721	63,117	64,317
Gas pipeline^a, total	630,900	913,300	1,051,800	1,270,295	1,377,320	1,489,242	1,554,377	1,563,638	1,567,477	1,575,707	1,585,809	1,594,501	1,603,982	1,615,764	1,627,252	1,638,999	1,647,688
Distribution mains	391,400	594,800	701,800	945,964	1,050,802	1,165,020	1,229,946	1,239,292	1,247,552	1,255,451	1,266,456	1,275,553	1,285,765	1,296,933	1,307,736	1,318,909	1,328,465
Transmission pipelines	183,700	252,200	266,500	291,925	298,957	300,468	304,810	305,069	303,393	302,880	301,823	301,165	300,352	300,734	301,625	302,340	301,922
Gathering lines ^b	55,800	66,300	83,500	32,406	27,561	23,754	19,621	19,277	16,532	17,377	17,530	17,783	17,865	18,097	17,891	17,750	17,301

KEY: N = data do not exist.

^a Excludes service pipeline. Data are not adjusted to common diameter equivalent. Mileage as of the end of each year.^b Before 1985, data include field line mileage.**NOTES**

Mileage data reported in Gas Facts, prior to 1985, is taken from the American Gas Association's member survey, the Uniform Statistical Report, supplemented with estimates for companies that did not participate. Source for Oil pipeline data was changed to be more consistent with other data sources and tables.

Chapter 1

Section B:

Vehicle, Aircraft, and Vessel Inventory

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

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air																
Air carrier ^a	2,135	2,679	3,808	6,083	7,826	7,185	7,168	6,914	6,740	6,761	6,876	7,077	7,196	7,475	7,628	5,882
General aviation ^b (active fleet)	76,549	131,743	211,045	198,000	217,533	223,370	220,463	209,034	199,927	204,408	210,031	211,794	211,757	211,749	210,981	204,980
Highway, total (registered vehicles)	73,857,768	111,242,295	161,490,159	193,057,376	225,821,241	250,070,048	253,215,681	253,639,386	255,876,822	260,350,938	263,610,219	268,799,083	272,480,899	273,602,100	276,491,174	U
Light duty vehicle, short wheel base ^{c,d}	61,671,390	92,067,655	127,294,783	137,959,968	133,621,420	190,202,782	183,522,635	183,171,882	184,487,490	187,554,928	189,618,308	192,774,508	193,672,370	192,866,211	194,348,815	U
Motorcycle ^e	U	U	U	U	4,346,068	8,009,503	8,437,502	8,454,939	8,404,687	8,417,718	8,600,936	8,679,380	8,715,204	8,666,185	8,596,314	U
Light duty vehicle, long wheel base ^f	U	14,210,591	27,875,934	48,274,555	79,084,979	40,241,658	50,318,787	50,588,676	51,512,740	52,600,309	53,298,884	54,870,473	56,980,878	57,853,642	59,465,389	U
Truck, single-unit 2-axle 6-tire or more	U	3,681,405	4,373,784	4,486,981	5,925,030	8,217,189	7,819,055	8,190,286	8,126,007	8,328,759	8,456,302	8,746,518	9,336,998	10,327,899	10,160,433	U
Truck, combination ^g	11,914,249	905,082	1,416,869	1,708,895	2,096,619	2,552,865	2,451,638	2,469,094	2,471,349	2,577,197	2,746,882	2,752,043	2,892,218	2,906,011	2,925,210	U
Bus	272,129	377,562	528,789	626,987	746,125	846,051	666,064	764,509	864,549	877,027	888,907	976,161	983,231	992,152	995,033	U
Transit^h																
Motor bus ⁱ	49,600	49,700	59,411	58,714	58,578	63,108	61,127	61,245	66,823	62,449	63,573	63,270	63,759	63,284	64,000	U
Light rail cars ⁿ	2,856	1,262	1,013	910	1,306	2,096	2,284	2,348	2,842	2,444	2,478	2,553	2,557	2,729	2,811	U
Heavy rail cars	9,010	9,338	9,641	10,567	10,311	11,510	14,942	10,469	10,380	10,551	10,737	10,775	10,705	10,763	11,198	U
Trolley bus	3,826	1,050	823	610	682	571	479	570	560	537	611	601	539	571	572	U
Commuter rail cars and locomotives	N	N	N	4,500	4,982	6,768	6,971	6,938	7,150	7,150	7,177	7,151	7,190	7,129	7,023	7,144
Demand responsive	N	N	N	16,471	22,087	32,696	31,846	31,929	31,433	31,359	32,490	33,225	33,012	33,253	34,613	U
Other ^o	N	N	N	N	1,176	18,066	18,965	16,996	17,793	17,994	18,601	17,042	18,104	17,803	17,491	U
Rail																
Class I, freight cars	1,658,292	1,423,921	1,168,114	658,902	560,154	397,730	380,699	380,641	373,838	371,642	330,996	315,227	306,268	293,742	270,378	U
Class I, locomotive	29,031	27,077	28,094	18,835	20,028	23,893	24,250	24,707	25,033	25,916	26,574	26,716	26,547	26,086	24,597	U
Nonclass I freight cars	32,104	29,787	102,161	103,527	132,448	101,755	95,972	92,742	88,122	U	U	U	U	U	U	U
Car companies and shippers freight cars	275,090	330,473	440,552	449,832	688,194	809,544	806,554	842,802	873,679	U	U	U	U	U	U	U
Amtrak, passenger train car	N	N	2,128	1,863	1,894	1,274	1,301	2,090	1,447	1,419	1,428	1,402	1,405	1,403	1,415	U
Amtrak, locomotive	N	N	419	318	378	282	287	485	418	428	423	434	419	431	403	U
Water																
Nonself-propelled vessels ^k	16,777	19,377	31,662	33,597	31,372	30,265	30,987	32,394	32,047	32,275	31,748	33,212	32,808	33,266	33,329	U
Self-propelled vessels ^l	6,543	6,455	7,126	8,236	9,293	9,618	9,558	10,139	9,921	10,187	9,043	9,462	9,344	9,904	9,928	U
Oceangoing self-propelled vessels (1,000 gross tons and over) ^{m,o}	2,926	1,579	864	636	282	221	214	198	187	179	170	169	176	182	182	180
Recreational boats ⁿ	2,450,484	5,128,345	8,577,857	10,996,253	12,782,143	12,438,926	12,173,935	12,101,936	12,013,496	11,804,002	11,867,049	11,861,911	11,961,568	11,852,969	11,878,542	11,838,188

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

^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 Beginning in 2004, commuter activity is excluded from all estimates. Commuter activity was included in the air taxi use category prior to 2003.

^c Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category *Passenger car* and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces *Other 2-axle, 4-tire vehicle* and includes large passenger cars, vans, pickup trucks, and sport utility vehicles with wheelbases (WB) larger than 121 inches. Data for 1990-2006 are not comparable to data for 2007 and later. This edition of table 1-11 is not comparable to those before the 2019 edition.

^d 1960-1990 Motorcycle data is included in Light duty vehicle, short wheel base.

^e In 1960, this category includes all Trucks and Light duty vehicle, long wheel base.

^f 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. Includes vehicles available at maximum service.

^g Beginning in 2011, Motor bus includes Bus, Bus Rapid Transit, and Commuter Bus.

^h Beginning in 2011, Light rail cars includes Light Rail, Street Car Rail, and Hybrid Rail.

ⁱ Other includes Alaska railroad, automated guideway transit, cable car, ferry boat, inclined plane, monorail, public, and vanpool.

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

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

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

^m 1960-2000 data includes private and government owned vessels of 1,000 gross tons and over. Beginning in 2007, data are reported only for privately-owned vessels of 1,000 gross tons and over. All the data are year-end data.

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

^o Fleet is as of January of each year.

NOTES

Transit/Motor bus figure is also included as part of bus in the Highway category.

Bus and Demand responsive/paratransit in these tables refer to a mode of service, not to a specific vehicle type. Demand responsive service, defined as roadway service directly from an origin to a destination determined by the rider and not following a fixed-route, is usually provided by vans, small buses and in a limited number of cases by large buses. Bus service is a variety of roadway services that share the characteristic of being entirely or partially fixed routes. Bus service includes local service, express service, subscription service, diversionary route service, loop service, and other types. Although Bus service is normally provided by buses, it can be provided by smaller vehicles that may be considered large vans.

For more detail on oceangoing vessels, see table 1-23.

Association of American Railroad changed the equipment reporting style from Railroad Facts 2015 edition. Nonclass I freight cars and Car companies and shippers freight cars data will no longer be provided by AAR.

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

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of civilian aircraft (shipments)																
Transport ^a	245	311	387	521	485	462	477	601	648	723	762	748	763	U	U	U
Helicopters	N	482	1,366	603	493	339	435	756	826	592	571	372	449	455	U	U
General aviation	7,588	(R) 7,292	(R) 11,860	1,144	2,816	1,334	1,465	1,518	(R) 1,617	1,631	1,592	1,531	(R) 1,599	1,746	1,771	1,555
Highway																
Passenger car (new retail sales)	6,641,000	8,321,033	8,948,755	9,301,206	8,777,723	5,635,739	6,092,861	7,245,169	7,586,334	7,708,000	7,528,626	6,883,346	6,089,203	5,310,277	4,719,710	3,401,838
Motorcycle (new retail sales) ^b	N	1,125,000	1,070,000	303,000	710,000	439,678	440,899	459,298	465,783	483,526	500,695	487,144	469,730	457,373	467,780	780,000
Truck (new retail sales) ^{c,d}	1,194,475	1,873,413	2,510,432	4,846,163	9,033,950	6,136,787	6,955,525	7,534,315	8,296,378	9,151,843	10,328,798	10,994,961	11,475,924	12,402,527	12,768,444	11,479,518
Bus; includes school bus (factory sales) ^d	NA	31,994	34,385	32,731	N	N	N	N	N	N	N	N	N	N	N	N
Recreational vehicle (shipments)	N	380,300	178,500	347,300	418,300	242,300	252,300	285,780	321,127	356,735	374,246	430,691	504,599	483,672	406,070	430,412
Bicycle^e	N	N	9,000,000	10,800,000	20,900,000	19,828,000	15,756,000	18,720,203	16,235,223	18,007,577	17,414,761	17,291,395	15,894,313	17,863,739	13,557,017	U
Transit cars (deliveries)																
Motor bus ^f	2,806	1,424	4,572	5,728	11,916	10,264	10,256	9,861	9,328	11,762	10,065	11,794	11,680	5,797	6,261	U
Light rail	0	0	32	55	136	49	140	26	34	25	80	7	83	31	46	U
Heavy rail	416	308	130	10	204	404	0	25	215	321	196	212	314	136	235	U
Trolley bus	0	0	98	118	7	7	0	0	0	5	174	0	58	0	44	U
Commuter rail	N	N	N	83	116	7	116	170	221	160	67	39	33	2	19	U
Class I rail (deliveries)																
Freight car ^g	57,047	66,185	85,920	32,063	55,791	16,552	41,814	53,632	49,954	63,360	76,732	58,907	43,749	47,856	51,876	U
Locomotive	389	1,029	1,480	530	640	259	473	658	665	1,073	855	584	236	128	228	U
Amtrak (deliveries)																
Passenger train car ^h	N	N	109	58	65	0	0	2	10	45	12	0	11	14	11	12
Locomotive ^h	N	N	17	0	32	0	0	0	0	5	26	29	10	0	0	0
Water transport																
Merchant vessel ⁱ	20	13	23	0	0	N	N	N	N	N	N	N	N	N	N	N
Recreational boat ^j	N	N	569,700	494,700	576,800	517,745	527,005	546,395	532,170	534,500	238,000	247,800	262,000	281,800	280,000	318,550

KEY: N = data do not exist; NA = not applicable; 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. 2008 and later data are real counts based on reporting manufacturers. Previous years' data are estimates by the Motorcycle Industry Council that include nonreporting manufacturers.

^c Before 1999 includes large passenger or utility vehicles that may be considered cars in other tables.

^d Truck sales for 1960 includes Buses.

^e Includes domestic and imported bicycles. Data from 1985-1991 include only wheel sizes 20 inches and over. Data from 1997 onwards are projections.

^f Buses or bus-type vehicles only. Includes demand response beginning from 1985. Excludes vanpool vans and most rural and smaller systems prior to 1984. Motor bus numbers in this table are not comparable to the numbers reported in earlier editions due to changes in the methodology by the American Public Transit Association. Transit motor bus figure is also included as part of the bus total in the highway category. Data for Bus and Paratransit are not continuous from 2006 to 2007, please see Methodology, Page iv in 2009 Public Transportation Fact Book Appendix A: Historical Tables for details.

^g Includes all railroads and private car owners.

^h Data from 1985 to 1998 are actual deliveries. Data from 1999-2009 are estimates of deliveries given by active equipment by date of manufacture, a close proxy. Data from 1999-2009 exclude non-passenger cars such as auto carriers and switch engines.

ⁱ Self-propelled, 1,000 or more gross tons.

^j Retail unit estimates. Includes outboard, inboard, and sterndrive boats, jet boats (since 1995), personal watercraft (since 1991), canoes, and kayaks (2001-2015), inflatable boats (except 1992 to 2002) and sailboards (1960-1990, 2001-present). Source changed data providers as of 2015 data for powerboat and personal watercraft retail sales data, data after 2014 are not comparable with the previous data.

Table 1-13: Active U.S. Air Carrier and General Aviation Fleet by Type of Aircraft (number of carriers)

AIR CARRIER ^a	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fixed Wing, total	2,679	3,805	6,083	7,826	7,686	7,185	7,168	6,914	6,740	6,761	6,876	7,077	7,196	7,475	7,628	5,882
Turbojet, total	2,663	3,803	6,072	8,010	8,182	U	U	U	U	U	U	U	U	U	U	U
Four engine	2,136	2,526	4,148	5,956	6,839	U	U	U	U	U	U	U	U	U	U	U
Three engine	931	436	432	432	310	U	U	U	U	U	U	U	U	U	U	U
Two engine	659	1,347	1,438	1,061	540	U	U	U	U	U	U	U	U	U	U	U
Turboprop, total	546	743	2,278	4,463	5,989	U	U	U	U	U	U	U	U	U	U	U
Four engine	374	682	1,595	1,469	889	U	U	U	U	U	U	U	U	U	U	U
Three engine	110	92	88	29	7	U	U	U	U	U	U	U	U	U	U	U
One engine	259	590	1,507	1,440	880	U	U	U	U	U	U	U	U	U	U	U
Piston, total	153	595	329	585	454	U	U	U	U	U	U	U	U	U	U	U
Four engine	34	73	31	17	20	U	U	U	U	U	U	U	U	U	U	U
Three engine	110	U	6	3	2	U	U	U	U	U	U	U	U	U	U	U
Two engine	9	522	292	255	126	U	U	U	U	U	U	U	U	U	U	U
One engine	U	U	U	310	306	U	U	U	U	U	U	U	U	U	U	U
Helicopter	16	2	11	39	43	U	U	U	U	U	U	U	U	U	U	U
GENERAL AVIATION (GENERAL FLEET)^b	161,743	211,043	198,000	217,533	224,352	223,370	220,453	209,034	199,927	204,408	210,030	211,793	211,757	211,749	210,981	204,980
Fixed Wing, total	127,934	200,094	184,500	183,276	185,373	176,272	173,770	165,257	158,911	161,321	164,293	166,168	167,082	167,561	166,526	165,765
Turbojet, total	950	2,992	4,100	7,001	9,823	11,484	11,650	11,793	11,637	12,362	13,440	13,751	14,217	14,596	14,888	15,245
Two engine ^c	822	2,551	3,700	6,215	9,097	U	U	U	U	U	U	U	U	U	U	U
Other	128	441	400	786	727	U	U	U	U	U	U	U	U	U	U	U
Turboprop, total	1,458	4,089	5,300	5,762	7,942	9,369	9,523	10,304	9,619	9,777	9,712	9,779	9,949	9,925	10,242	10,205
Two engine ^c	1,287	3,966	4,900	5,040	5,307	5,155	U	5,215	5,140	5,188	5,321	5,212	5,149	5,005	5,131	U
One engine	138	U	U	678	2,595	4,214	U	5,090	4,478	4,590	4,391	4,566	4,800	4,919	5,111	U
Other	33	123	400	45	40	U	U	U	U	U	U	U	U	U	U	U
Piston, total	125,526	193,013	175,200	170,513	167,608	155,419	152,597	143,160	137,655	139,182	141,141	142,638	142,916	143,040	141,396	140,315
Two engine ^c	15,835	24,366	21,100	20,951	19,412	15,900	15,702	14,313	13,257	13,146	13,254	12,986	13,083	12,861	12,470	12,395
One engine	109,492	168,435	154,000	149,422	148,101	139,519	136,895	128,847	124,398	126,036	127,887	129,652	129,833	130,179	128,926	127,920
Other	199	212	100	140	U	U	U	U	U	U	U	U	U	U	U	U
Rotorcraft, total	2,255	6,001	6,900	7,150	8,728	10,102	10,082	10,055	9,765	9,966	10,506	10,577	10,511	9,990	10,199	10,155
Piston	1,666	2,794	3,200	2,680	3,039	3,588	3,411	3,292	3,137	3,154	3,286	3,344	3,270	3,082	3,089	3,065
Turbine, total	589	3,207	3,700	4,470	5,689	6,514	6,671	6,763	6,628	6,812	7,220	7,233	7,241	6,907	7,109	7,090
Multiengine	U	U	U	694	1,151	1,502	U	1,663	1,596	1,685	1,762	1,766	1,861	1,697	1,847	U
One engine	589	U	U	3,776	4,537	5,012	U	5,100	5,032	5,127	5,458	5,467	5,380	5,210	5,262	U
Other Aircraft, total	1,554	4,945	6,600	6,700	6,454	5,684	5,681	5,006	4,277	4,689	4,941	4,986	4,692	4,114	4,133	2,460
Gliders	U	U	U	2,041	2,074	1,899	U	1,820	1,594	1,791	1,870	1,789	1,747	1,772	1,517	U
Lighter-than-Air	U	U	U	4,660	4,380	3,785	U	3,186	2,684	2,908	3,071	3,197	2,945	2,343	2,617	U

Table 1-13 cont'd: Active U.S. Air Carrier and General Aviation Fleet by Type of Aircraft (number of carriers)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Experimental, total	U	U	U	20,407	23,627	29,662	24,275	26,715	24,918	26,191	27,922	27,585	26,921	27,531	27,449	24,455
Amateur Built	U	U	U	16,739	19,817	21,270	U	18,843	17,503	18,873	21,195	20,490	20,434	21,216	21,591	U
Exhibition	U	U	U	1,973	2,120	2,029	U	1,923	1,908	1,893	1,966	2,015	1,969	1,979	1,998	U
Other	U	U	U	1,694	1,691	1,485	U	1,317	1,350	1,221	820	816	776	755	676	U

KEY: U = data are not available.

^a *Air carrier* aircraft are aircraft carrying passengers or cargo for hire under 14 CFR 121 (large aircraft-more than 30 seats) and 14 CFR 135 (small aircraft-30 seats or less). This definition is more encompassing than that in the Federal Aviation Administration (FAA) Aviation Forecast- jet aircraft, 60 seats or more carrying passengers or cargo for hire. Beginning in 1990, the number of aircraft is the monthly average reported in use for the last year. Details may not add to totals due to estimation procedures and rounding. Beginning in 1993, excludes commuters. Prior to 1993, single-engine turboprops were included in *Turboprop*, *Other*; single and multiengine turbine rotorcraft were not shown separately; *Glider*s 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 *Piston, One engine* 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.

^c For 1970 this category includes multiengine aircraft.

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.

Details may not add up to totals due to rounding in the source.

Estimates from the 2011 GA Survey are currently not available. The FAA is engaged in re-calibration efforts. 2011 data on the table are from FAA's Aviation Forecast estimates.

Beginning in 2005, commuter activity is excluded from all estimates.

Prior to 2012, estimates for experimental light-sport aircraft were not included in the experimental category. In 2010, the totals shown for experimental aircraft were manually calculated by summing the figures from amateur, exhibition, experimental light-sport, and other experimental. Due to the manual summation of experimental total, the percent standard error cannot be calculated.

From 2000 to 2005, numbers for active fleet under air carrier may not add to totals due to different sources.

Subcategories data under air carrier are no longer provided by the FAA after 2008.

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

	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL automobiles and trucks in fleets^f	N	15,196	10,865	11,550	11,777	11,744	8,766	9,192	9,566	8,563	8,628	8,472	8,140
Automobiles in fleets, total^f	5,358	7,346	4,804	5,291	5,484	5,413	4,443	4,620	4,757	3,836	3,669	3,632	3,424
Automobiles in fleets of 15 or more (10 or more cars for 2000)^a													
Business ^b	2,889	2,950	741	804	835	728	689	659	685	628	613	635	626
Government ^c	538	883	1,352	1,330	1,240	1,290	1,245	1,325	1,340	1,278	1,236	1,217	1,168
Utilities	551	317	U	U	U	U	U	U	U	U	U	U	U
Police	249	306	417	424	408	416	430	441	441	U	U	U	U
Taxi (includes vans)	141	136	159	155	148	155	159	155	135	U	U	U	U
Rental (includes vans and SUVs)	990	1,581	1,175	1,553	1,745	1,850	1,920	2,040	2,156	1,930	1,820	1,780	1,630
Automobiles in fleets of 4 to 14 (4 to 9 cars for 2000 and 5 to 14 cars for 2010-13)^{a,e}	N	1,173	960	1,025	1,108	975	N	N	N	N	N	N	N
Trucks in fleets, total^f	N	7,850	6,061	6,259	6,293	6,331	4,323	4,572	4,809	4,727	4,958	4,840	4,716
Trucks in fleets of 15 or more (25 or more trucks for 1990 and 10 or more trucks for 2000)^a													
Business ^b	N	3,026	1,999	2,136	2,237	2,187	2,136	2,232	2,340	2,378	2,564	2,587	2,445
Government ^c	N	2,408	1,751	1,684	1,512	1,560	1,632	1,727	1,810	1,807	1,898	1,778	1,746
Utilities	N	498	U	U	U	U	U	U	U	U	U	U	U
Other (police, taxi, etc.)	N	8	55	58	62	67	75	77	77	U	U	U	U
Rental trucks (not including vans and SUVs)	N	248	380	391	417	465	480	535	582	542	496	475	525
Trucks in fleets of 4 to 14 (4 to 9 trucks for 2000 and 5 to 14 cars from 2010-13)^{a,e}	N	1,662	1,875	1,990	2,065	2,053	N	N	N	N	N	N	N

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

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

^b Includes driver schools.

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

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

^e After 2013, fleets of 4 to 14 vehicles are considered non-fleet.

^f Fleet totals don't include fleets less than 15 after 2013 or before 1994.

NOTES

Starting in 2001, data do not include employee-owned fleet information as the source has stopped publishing the data.

Business and Utilities have been combined starting in the 2001 issue of the *Automotive Fleet Fact Book*.

The data source, Bobit Publishing, stopped publishing Police and Taxi data after 2016.

Data after 2008 are as of Jan. 1st.

Table 1-15: Annual U.S. Motor Vehicle Production and Domestic Sales (thousands of units)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Production, total	7,894	8,263	8,011	9,767	12,774	11,947	7,744	8,662	10,336	11,067	11,661	12,106	12,179	11,179	11,297	10,893	8,821
Passenger cars	6,696	6,546	6,372	6,078	5,471	4,266	2,732	2,978	4,109	4,369	4,253	4,163	3,917	3,033	2,785	2,512	1,924
Commercial vehicles ^a	1,198	1,717	1,638	3,690	7,303	7,681	5,012	5,685	6,227	6,698	7,408	7,943	8,263	8,146	8,512	8,381	6,897
Domestic sales, total^b	N	8,849	8,594	11,134	14,923	14,021	9,020	10,109	11,582	12,479	13,389	14,128	13,969	13,644	13,711	13,677	11,571
Passenger cars	N	7,112	6,580	6,917	6,762	5,473	3,791	4,146	5,120	5,433	5,610	5,595	5,146	4,593	4,087	3,544	2,560
Commercial vehicles ^a	N	1,737	2,015	4,217	8,161	8,547	5,229	5,963	6,462	7,046	7,779	8,532	8,824	9,051	9,624	10,133	9,011

KEY: N = data do not exist.^a Includes trucks under 10,000 pounds GVWR, such as compact and conventional pickups, sport utility vehicles, minivans and vans, and trucks and buses over 10,000 pounds GVWR.^b Domestic Sales includes U.S. sales of cars produced in U.S., Canada, and Mexico. Sales from previous year's inventory can also contribute to sales numbers exceeding production.

Table 1-16: Retail^a New Passenger Car Sales (thousands of units)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total new passenger car sales	8,321	8,949	9,301	8,778	7,660	5,636	6,093	7,245	7,586	7,708	7,529	6,883	6,089	5,310	4,720	3,402
Domestic^b	7,112	6,580	6,917	6,762	5,473	3,791	4,146	5,120	5,433	5,610	5,595	5,146	4,593	4,087	3,544	2,560
Imports	1,209	2,369	2,384	2,016	2,187	1,844	1,947	2,125	2,153	2,098	1,933	1,738	1,496	1,223	1,176	842
Japan	313	1,894	1,719	863	923	799	789	905	897	820	731	619	477	340	388	290
Germany	750	292	263	517	534	482	522	545	566	546	477	417	419	374	325	235
Other	217	184	402	637	729	563	636	676	690	732	726	702	600	509	464	317

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

^b Includes cars produced in Canada and Mexico.

NOTE

Numbers may not add to totals due to rounding or updated totals.

Table 1-17: New and Used Passenger Car and Light Truck Sales (thousands of vehicles)

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total, vehicle sales and leases	51,420	56,458	59,030	61,128	48,500	49,699	52,077	51,368	52,758	54,727	56,162	56,435	57,545	57,865	U
New vehicle sales and leases^a	13,890	14,700	17,410	16,990	11,589	12,778	14,494	15,592	16,516	17,472	17,559	17,231	17,312	17,059	14,555
Passenger cars	9,300	8,500	9,000	8,020	5,724	6,128	7,245	7,583	7,695	7,532	6,882	6,104	5,326	4,733	3,426
Light trucks	4,590	6,200	8,410	8,970	5,865	6,650	7,249	8,010	8,821	9,940	10,677	11,127	11,986	12,326	11,129
New vehicle sales	12,826	11,320	12,120	13,492	9,610	10,521	11,923	12,364	12,944	13,473	13,251	13,048	13,077	12,817	11,014
Passenger cars	8,320	6,270	6,290	6,098	4,515	4,812	5,692	5,712	5,751	5,559	4,981	4,479	4,005	3,506	2,511
Light trucks	4,506	5,050	5,830	7,394	5,095	5,709	6,231	6,653	7,193	7,914	8,270	8,568	9,072	9,311	8,502
New vehicle leases	1,064	3,380	5,290	3,498	1,979	2,256	2,571	3,228	3,572	3,999	4,308	4,183	4,234	4,242	3,541
Passenger cars	980	2,230	2,710	1,922	1,209	1,316	1,553	1,871	1,944	1,973	1,901	1,624	1,320	1,227	915
Light trucks	84	1,150	2,580	1,576	770	941	1,018	1,357	1,628	2,026	2,407	2,559	2,914	3,015	2,626
Used vehicle sales^b	37,530	41,758	41,620	44,138	36,911	36,921	37,583	35,776	36,242	37,255	38,602	39,204	40,233	40,807	U
Value (billions of dollars)^c															
Total, new and used vehicle sales	447	611	736	776	945	1,008	1,074	1,103	1,176	1,273	1,340	1,371	1,435	1,477	U
New vehicle sales	227	292	380	421	347	391	446	495	535	580	599	606	626	636	571
Used vehicle sales	220	319	356	355	598	617	628	608	641	693	741	764	809	841	U
Average price (current dollars)^p															
New and used vehicle sales	8,691	10,818	12,469	12,695	25,809	26,167	25,770	26,184	26,600	27,506	28,044	28,329	28,757	29,302	U
New vehicle sales	16,350	19,819	21,850	24,796	35,417	35,635	34,839	35,368	35,500	36,412	36,888	37,158	37,414	38,003	39,251
Used vehicle sales	5,857	7,644	8,547	8,036	16,200	16,700	16,700	17,000	17,700	18,600	19,200	19,500	20,100	20,600	U

KEY: U = data are not available.

^a New vehicle leases are sold by the dealer to a finance company that manages the lease, causing them to be included by default in most car sales figures.^b Used vehicle sales include sales from franchised dealers, independent dealers, and casual sales.^c Includes leased vehicles.**NOTES**

Prior to 2010, Average price cannot be calculated from the data presented in this table because the vehicle sales and value of sales are from different sources. Components may not add to totals due to rounding.

Years 2010 and later may not be comparable to previous years, due to different sources.

Light truck or light-duty truck is a US classification for trucks or truck-based vehicles with a gross vehicle weight rate (GVWR) up to 8,500 lbs and a payload capacity up to 4,000 lbs. This includes vans, minivans, sport utility vehicles(SUVs), and pickup trucks.

Leases include private and retail figures, corporate or government fleet leases are not included.

Edmunds sales include vehicles up to class 5 with GVWR 19,500

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

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total sales of new cars	8,403	8,982	9,300	8,778	7,660	5,636	6,093	7,245	7,586	7,708	7,529	6,883	6,089	5,310	4,720	3,402
Consumer	6,252	6,100	5,677	4,639	4,293	2,889	3,261	3,853	3,912	3,848	3,508	3,125	2,873	2,612	2,399	1,582
Business	2,056	2,758	3,477	3,914	3,150	2,590	2,680	3,273	3,552	3,710	3,895	3,643	3,103	2,600	2,222	1,755
Government	94	124	147	224	216	157	152	120	122	150	126	115	112	98	99	65
Percentage of total sales																
Consumer	74.4	67.9	61.0	52.9	56.1	51.3	53.5	53.2	51.6	49.9	46.6	45.4	47.2	49.2	50.8	46.5
Business	24.5	30.7	37.4	44.6	41.1	46.0	44.0	45.2	46.8	48.1	51.7	52.9	51.0	49.0	47.1	51.6
Government	1.1	1.4	1.6	2.6	2.8	2.8	2.5	1.7	1.6	1.9	1.7	1.7	1.8	1.8	2.1	1.9

NOTES

This table includes imported cars, but not vans, trucks, or sport utility vehicles.

Numbers may not add to totals due to rounding.

Annual numbers are calculated by averaging monthly data.

Government sales are determined by subtracting the consumer and business sales from total sales.

The data is seasonally adjusted at annual rates.

Table 1-19: Hybrid-Electric, Plug-in Hybrid-Electric, and Electric Vehicle Sales

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Hybrid electric	9,350	205,876	274,648	268,749	434,648	495,535	452,172	384,400	346,949	362,868	338,083	380,794	454,890
Plug-in hybrid-electric	Z	Z	326	7,671	38,584	49,008	55,357	42,959	72,885	91,188	123,883	85,791	66,157
Electric	Z	Z	Z	10,092	14,587	48,094	63,525	71,064	86,731	104,487	207,062	233,822	240,053

KEY: Z = a value of zero, or value too small to report.

NOTES

Includes the new sales of light duty vehicles certified for highway use including hybrid-electric vehicles (HEV), plug-in hybrid-electric vehicles (PHEV), and electric vehicles (EV). Plug-in hybrid electric vehicles include plug-in hybrid and extended range EVs but do not include neighborhood electric vehicles, low speed electric vehicles, or two-wheeled electric vehicles. A hybrid electric vehicle is a vehicle powered by a combination of battery-electric motor(s) and an internal combustion engine. Hybrid vehicle sales began in 1999 and plug-in electric vehicle sales began in 2010. Hybrids captured 3.2% of the light vehicle market in 2013 and again in 2020. All-electric vehicles accounted for 1.7% of the light vehicle market in 2020.

Table 1-20: Productions, Production Shares, and Production-Weighted Fuel Economies of New Domestic and Imported Automobiles (thousands of vehicles)

	1980	1985	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL productions	11,306	14,460	12,615	15,145	16,571	15,892	11,116	12,018	13,449	15,198	15,512	16,739	16,278	17,016	16,259	16,139	U
Car	9,443	10,791	8,810	9,396	9,125	8,027	6,061	5,743	7,393	8,226	7,639	7,899	7,131	6,979	5,962	5,279	U
Car SUV	0	88	65	220	617	813	915	1,207	1,265	1,514	1,566	1,701	1,870	1,975	1,838	1,891	U
Pickup truck	1,437	2,078	1,835	2,271	2,612	2,300	1,276	1,479	1,357	1,577	1,929	1,786	1,907	2,054	2,259	2,521	U
Van	242	855	1,262	1,662	1,691	1,481	559	521	662	571	672	655	630	617	508	555	U
Truck SUV	184	648	643	1,596	2,526	3,272	2,305	3,069	2,771	3,310	3,706	4,697	4,741	5,391	5,692	5,893	U
Production share, percent																	
Car	83.5	74.6	69.8	62.0	55.1	50.5	54.5	47.8	55.0	54.1	49.2	47.2	43.8	41.0	36.7	32.7	33.3
Car SUV	0.0	0.6	0.5	1.5	3.7	5.1	8.2	10.0	9.4	10.0	10.1	10.2	11.5	11.6	11.3	11.7	9.5
Pickup truck	12.7	14.4	14.5	15.0	15.8	14.5	11.5	12.3	10.1	10.4	12.4	10.7	11.7	12.1	13.9	15.6	13.7
Van	2.1	5.9	10.0	11.0	10.2	9.3	5.0	4.3	4.9	3.8	4.3	3.9	3.9	3.6	3.1	3.4	2.6
Truck SUV	1.6	4.5	5.1	10.5	15.2	20.6	20.7	25.5	20.6	21.8	23.9	28.1	29.1	31.7	35.0	36.5	40.8
Fuel economy, mpg																	
Car	20.0	23.0	23.3	23.4	22.9	23.5	26.2	25.8	27.6	28.4	28.4	29.0	29.2	30.2	30.8	30.9	32.0
Car SUV	14.6	20.1	18.8	17.8	17.9	20.2	23.0	23.5	23.3	24.3	24.4	25.1	26.2	26.1	27.3	27.5	29.5
Pickup truck	16.5	18.2	17.4	16.9	16.7	15.8	16.9	17.2	17.2	17.5	18.0	18.8	18.9	18.9	19.1	19.0	19.5
Van	14.1	16.5	17.8	18.1	18.6	19.3	20.1	20.9	21.3	21.1	21.3	21.8	21.7	22.2	22.8	22.4	23.0
Truck SUV	13.2	16.5	16.4	16.0	16.0	16.7	19.7	19.8	20.0	20.8	21.6	21.9	22.2	22.3	23.1	23.5	23.9

KEY: mpg = miles per gallon; SUV = sport utility vehicle; U = data are not available.

NOTES

Numbers may not add to totals due to rounding.

This table is not comparable to previous publication's tables due to changes in the source data.

Data includes production of all vehicle fuel types, gas and diesel as well as alternative fuels (compressed natural gas (CNG), Electric, E85 (85% ethanol), Hydrogen, liquefied petroleum gas (LPG), etc.).

The Environmental Protection Agency changed the vehicle classifications, combining wagons with the rest of the cars and dropping the small, medium, large categories of cars, pickups, sport-utilities, and vans. The fuel economy displayed in those tables has been adjusted to provide the best estimate of real-world performance.

Vehicles that weigh more than 6,000 pounds gross vehicle weight (GVW) or have four-wheel drive and meet various off-road requirements, such as ground clearance, qualify as trucks (pickup truck, Van, Truck SUV). Car (Car, Car SUV) includes vehicles under 6,000 pounds GVW; minicompact, subcompact, compact, midsize, large, and two-seater cars, hatchbacks, and station wagons. Based on the Corporate Average Fuel Economy (CAFE) and greenhouse gas (GHG) regulatory definitions: all two-wheel drive SUVs under 6,000 pounds GVW are classified as cars, while most SUVs that have four-wheel drive or are above 6,000 pounds GVW are considered trucks. SUV models that are less than 6,000 pounds GVW can have both car and truck variants, with two-wheel drive versions classified as cars and four-wheel drive versions classified as trucks.

Release of *Total productions* data do not occur until the yearly edition following *Production share* and *Fuel economy*.

Table 1-22a: Number of Trucks by Weight

	Thousands of trucks			Percent change	Percent change
	1992	1997	2002	1992-1997	1992-2002
ALL trucks	59,200.8	72,800.3	85,174.8	23.0	43.9
Light trucks				0.0	0.0
Less than 6,001 lb	50,545.7	62,798.4	62,617.3	24.2	23.9
6,001 to 10,000 lb	4,647.5	5,301.5	17,142.3	14.1	268.8
Medium trucks				0.0	0.0
10,001 to 14,000 lb	694.3	818.9	1,142.1	17.9	64.5
14,001 to 16,000 lb	282.4	315.9	395.9	11.9	40.2
16,001 to 19,500 lb	282.3	300.8	376.1	6.6	33.2
Light-heavy trucks				0.0	0.0
19,501 to 26,000 lb	732.0	729.3	910.3	-0.4	24.4
Heavy trucks				0.0	0.0
26,001 to 33,000 lb	387.3	427.7	436.8	10.4	12.8
33,001 to 40,000 lb	232.6	256.7	228.8	10.4	-1.6
40,001 to 50,000 lb	338.6	399.9	318.4	18.1	-6.0
50,001 to 60,000 lb	226.7	311.4	326.6	37.4	44.1
60,001 to 80,000 lb	781.1	1,069.8	1,178.7	37.0	50.9
80,001 to 100,000 lb	33.3	46.3	68.9	39.0	106.9
100,001 to 130,000 lb	12.3	17.9	26.4	45.5	114.6
130,000 lb or more	4.6	5.9	6.3	28.3	37.0
Not reported	<50	<50	N	N	N

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

NOTES

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

Excludes vehicles owned by Federal, state, or local governments; ambulances; buses; motor homes; farm tractors; unpowered trailer units; and trucks reported to have been sold, junked, or wrecked prior to July 1 of the year preceding the 1992 and 1997 surveys and January 1, 2002 for the 2002 survey.

Table 1-22b. Number of U.S. Truck Registrations by Type

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total trucks	64,778,472	87,107,628	103,818,838	110,322,256	118,455,587	133,130,032	132,931,240	137,531,011	141,256,148	146,182,276	151,605,435	152,701,631	158,352,117
Pickups	28,200,171	38,216,835	39,987,802	40,980,641	40,850,084	45,411,976	44,958,268	45,678,808	46,844,188	46,941,851	47,864,139	47,130,838	48,320,784
Vans	11,557,118	17,250,102	18,905,038	17,549,297	47,070,170	20,183,007	18,394,510	17,415,020	16,917,823	16,577,778	16,222,359	15,389,921	15,075,377
Sport utilities	7,440,984	21,466,592	34,136,890	43,732,613	17,202,408	55,036,982	57,090,992	61,501,944	64,703,676	69,112,824	73,581,210	75,758,440	80,511,102
Other light ^a	9,590,256	863,298	1,129,648	439,770	448,617	214,983	78,790	84,837	86,862	83,218	81,238	77,399	75,515
Farm trucks	1,838,743	1,885,170	1,876,119	1,915,941	1,475,021	1,543,985	N	N	N	N	N	N	N
Truck tractors	1,335,465	1,587,611	1,871,991	1,889,166	2,421,296	2,581,245	2,443,433	2,617,189	2,654,584	2,582,751	2,731,407	2,745,265	2,758,682
Other medium/heavy ^b	4,815,735	5,838,020	5,911,350	3,814,828	8,987,991	8,157,854	9,965,247	10,233,213	10,049,015	10,883,854	11,125,081	11,599,768	11,610,658

KEY: N = data do not exist.

^a Other light includes all trucks under 10,000 pounds gross vehicle weight excluding any listed Pickups, Vans and Sport utilities.
^b Other medium/heavy includes all trucks over 10,000 pounds gross vehicle weight excluding any listed Farm trucks and Truck tractors.

NOTES

Sums may not equal to total due to rounding.
 Data for Farm trucks is no longer being collected as of 2013.
 Data for Pickups, Vans, Sport utilities, and Other Light Trucks are for vehicles 10,000 pounds or less gross vehicle weight.

Table 1-23: World Motor Vehicle Production, Selected Countries (thousands of vehicles)

	1961	1971	1981	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total world	11,391	26,453	27,407	40,732	44,892	50,938	51,998	55,220	56,432	56,417	55,770	56,553	56,939	55,245	51,428	40,942
U.S. percent of world	48.5	32.5	22.8	13.4	9.5	5.4	5.7	7.4	7.7	7.5	7.5	6.9	5.3	5.0	4.9	4.7
Argentina	78	193	139	239	183	516	577	497	507	364	309	241	204	209	108	93
Australia	182	393	352	324	320	205	190	190	181	150	153	143	88	Z	Z	Z
Austria	8	1	7	116	231	86	130	124	147	135	104	75	81	144	158	110
Belgium	U	279	216	912	895	528	566	507	480	481	368	354	335	267	247	237
Brazil	98	342	406	1,348	2,009	2,828	2,340	2,626	2,745	2,317	1,990	1,781	2,303	2,387	2,449	1,609
Canada	328	1,083	803	1,551	1,407	967	990	1,040	965	914	889	803	751	656	461	328
China	U	U	U	620	3,586	9,494	10,053	10,705	12,059	12,500	11,991	13,129	13,257	12,534	11,167	10,149
Czech Republic ^p	59	149	181	428	599	1,070	1,192	1,172	1,127	1,244	1,297	1,344	1,414	1,437	1,428	1,153
Finland	U	U	U	U	U	U	U	U	U	46	80	48	92	112	115	86
France	988	2,694	2,612	2,883	3,113	1,914	1,914	1,683	1,479	1,503	1,570	1,626	1,748	1,763	1,642	920
Germany	1,802	3,829	3,758	4,803	5,350	5,552	5,872	5,388	5,440	5,604	5,708	5,747	5,646	5,120	4,664	3,515
India	22	42	42	514	999	2,317	2,479	2,520	2,370	2,384	2,545	2,621	2,751	2,761	2,317	1,707
Italy	694	1,701	1,257	1,422	726	573	486	397	388	401	663	713	743	673	542	452
Japan	250	3,718	6,974	8,363	9,017	8,307	7,159	8,554	8,189	8,277	7,831	7,874	8,348	8,358	8,326	6,960
Malaysia	U	U	U	280	U	U	U	U	U	U	U	U	U	U	U	U
Mexico	U	154	355	1,130	846	1,386	1,657	1,810	1,772	1,916	1,968	1,993	1,900	1,581	1,382	951
Netherlands	13	78	78	215	115	48	41	0	0	29	57	88	169	214	176	127
Poland	14	86	248	533	527	799	722	534	475	471	535	554	515	452	435	279
Portugal	U	U	U	191	138	115	142	116	110	118	115	99	126	234	282	211
Romania	U	U	U	58	U	U	U	U	U	U	U	U	U	U	U	U
Russia	149	518	1,324	966	1,068	1,208	1,738	1,969	1,920	1,693	1,216	1,125	1,348	1,560	1,519	1,257
Slovakia	U	U	U	U	218	563	586	844	906	902	957	973	974	1,093	1,132	970
South Africa	U	U	U	U	325	295	312	275	265	277	344	333	327	317	345	238
South Korea	U	U	69	2,602	2,195	2,792	2,902	2,868	2,639	2,515	2,375	2,092	1,810	1,616	1,422	1,148
Spain	55	453	855	2,445	2,174	1,951	1,868	1,595	1,755	1,898	2,219	2,354	2,291	2,267	2,248	1,801
Sweden	110	287	258	260	289	177	189	163	161	154	189	205	226	290	279	249
Taiwan	U	U	U	265	324	U	U	U	U	U	U	U	U	U	U	U

Continued next page

Table 1-23 cont'd: World Motor Vehicle Production, Selected Countries (thousands of vehicles)

	1961	1971	1981	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Turkey	U	13	25	297	454	603	640	577	634	733	791	951	1,121	1,026	983	855
United Kingdom	1,004	1,742	955	1,629	1,596	1,274	1,344	1,464	1,509	1,528	1,588	1,670	1,626	1,475	1,260	890
United States	5,522	8,584	6,253	5,471	4,266	2,731	2,976	4,106	4,369	4,253	4,162	3,917	3,033	2,785	2,512	1,924
Venezuela	U	U	U	95	61	58	54	54	34	7	5	0	0	Z	Z	Z
Yugoslavia, Federal Republic of ^c	15	114	240	N	N	N	N	N	N	N	N	N	N	N	N	N
Commercial vehicles^d																
Total world	3,809	6,948	9,729	16,799	21,193	25,211	26,398	26,399	30,522	32,335	34,405	37,478	39,227	40,361	39,318	35,397
U.S. percent of world	29.7	30.1	17.4	43.5	36.2	19.9	21.5	23.6	21.9	22.9	23.1	22.0	20.8	21.1	21.3	19.5
Argentina	58	60	33	101	137	208	252	267	284	254	235	251	293	282	230	181
Australia	49	77	40	25	69	34	30	31	30	25	15	13	Z	Z	Z	Z
Austria	5	6	8	25	23	19	22	19	20	16	17	17	18	20	20	16
Belgium	1	17	41	121	31	26	34	33	34	35	40	45	43	43	39	30
Brazil	47	174	374	323	519	820	804	745	1,023	853	464	394	445	507	503	411
Canada	63	277	520	1,411	1,281	1,101	1,145	1,423	1,415	1,481	1,395	1,567	1,443	1,370	1,455	1,048
China	U	U	U	1,389	2,082	8,771	8,366	8,567	10,058	11,223	12,512	14,990	15,759	15,275	14,553	15,076
Czech Republic ^b	17	28	49	27	5	7	8	7	6	7	6	6	6	5	(R)6	6
Finland	U	U	U	U	U	U	U	U	U	0	40	Z	Z	Z	Z	Z
France	217	316	408	469	436	305	363	328	302	347	45	507	531	566	577	452
Germany	411	312	358	395	408	354	439	409	437	447	478	464	425	434	413	318
India	32	47	107	282	643	1,237	1,461	1,629	1,526	1,481	1,606	1,868	2,032	2,414	2,199	1,687
Italy	65	116	176	316	313	263	305	275	437	297	351	390	400	389	373	325
Japan	789	2,093	4,206	1,781	1,783	1,319	1,240	1,388	1,442	1,497	1,448	1,331	1,342	1,370	1,356	1,108
Malaysia	U	U	U	15	U	U	U	U	U	U	U	U	U	U	U	U
Mexico	U	57	242	792	838	956	1,024	1,192	1,283	1,452	1,597	1,607	2,170	2,520	2,611	2,208
Netherlands	6	13	12	52	65	46	70	66	68	66	76	78	82	89	89	63
Poland	22	60	60	24	85	96	113	111	113	118	121	122	170	208	215	162
Portugal	U	U	U	56	83	44	50	48	44	44	41	44	49	60	64	53
Romania	U	U	U	14	U	U	U	U	U	U	U	U	U	U	U	U
Russia	406	612	874	237	285	195	251	263	256	194	163	179	203	204	196	175

Table 1-23 cont'd: World Motor Vehicle Production, Selected Countries (thousands of vehicles)

	1961	1971	1981	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Slovakia	U	U	U	U	0	0	0	0	0	0	0	Z	Z	Z	Z	Z
South Africa	U	U	U	U	192	177	220	265	281	289	248	245	255	278	271	209
South Korea	U	U	U	65	513	1,480	1,755	1,690	1,882	2,010	2,181	2,137	2,305	2,413	2,528	2,359
Spain	20	79	132	587	578	437	486	384	409	505	514	532	557	552	574	468
Sweden	22	30	55	36	35	31	43	38	38	34	41	48	50	50	50	36
Taiwan	U	U	U	U	100	123	U	U	U	U	U	U	U	U	U	U
Turkey	U	12	22	133	426	491	549	78	492	437	568	535	553	524	479	443
United Kingdom	443	456	230	189	207	119	120	112	87	71	94	146	123	130	122	97
United States	1,131	2,088	1,690	7,303	7,681	5,012	5,679	6,227	6,698	7,408	7,943	8,261	8,157	8,512	8,381	6,897
Venezuela	U	U	U	U	60	44	44	50	38	13	14	2	1	Z	Z	Z
Yugoslavia, Federal Republic of ^c	5	18	27	N	N	N	N	N	N	N	N	N	N	N	N	N
Total passenger cars^a and commercial vehicles^d																
Total world^e	15,200	33,401	37,136	58,946	66,085	76,148	78,396	81,619	86,953	88,752	90,175	94,031	96,166	95,606	90,746	76,339
U.S. percent of world	43.8	32.0	21.4	21.7	18.1	10.2	11.0	12.7	12.7	13.1	13.4	13.0	11.6	11.8	12.0	11.6
Argentina	136	253	172	340	320	724	829	764	791	617	543	493	496	491	338	274
Australia	231	470	392	348	389	239	219	221	211	175	168	156	Z	Z	Z	Z
Austria	13	7	15	141	253	105	153	143	167	151	121	92	99	164	178	125
Belgium	1	296	257	1,033	927	555	601	540	514	516	409	399	378	309	286	267
Brazil	145	516	780	1,671	2,528	3,648	3,144	3,371	3,768	3,170	2,454	2,175	2,749	2,894	2,951	2,020
Canada	391	1,360	1,323	2,962	2,688	2,068	2,135	2,463	2,380	2,394	2,283	2,371	2,194	2,026	1,917	1,376
China	U	U	U	2,009	5,668	18,265	18,419	19,272	22,117	23,723	24,503	28,119	29,016	27,809	25,721	25,225
Czech Republic ^p	76	177	230	455	605	1,076	1,200	1,179	1,133	1,251	1,304	1,350	1,420	1,443	1,434	1,159
Finland	U	U	U	U	U	U	U	U	U	46	80	48	92	112	115	86
France	1,205	3,010	3,020	3,352	3,549	2,219	2,278	2,011	1,781	1,851	2,015	2,133	2,279	2,329	2,219	1,371
Germany	2,213	4,141	4,116	5,198	5,758	5,906	6,311	5,797	5,877	6,051	6,186	6,211	6,070	5,554	5,076	3,834
India	54	89	149	796	1,642	3,554	3,940	4,149	3,896	3,865	4,150	4,489	4,783	5,175	4,516	3,393
Italy	759	1,817	1,433	1,738	1,038	836	790	672	658	698	1,014	1,103	1,142	1,062	915	777
Japan	1,039	5,811	11,180	10,145	10,800	9,626	8,399	9,943	9,630	9,775	9,278	9,204	9,690	9,729	9,682	8,068
Malaysia	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Table 1-23 cont'd: World Motor Vehicle Production, Selected Countries (thousands of vehicles)

	1961	1971	1981	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mexico	U	211	597	1,923	1,684	2,342	2,681	3,002	3,051	3,368	3,565	3,600	4,070	4,101	3,992	3,159
Netherlands	19	91	90	267	181	94	110	66	68	95	133	165	251	303	265	190
Poland	36	146	308	556	612	895	835	645	588	589	656	676	685	660	650	441
Portugal	U	U	U	247	221	159	192	164	154	162	157	143	176	294	346	264
Romania	U	U	U	72	U	U	U	U	U	U	U	U	U	U	U	U
Russia	555	1,130	2,198	1,203	1,353	1,404	1,989	2,232	2,176	1,887	1,379	1,304	1,551	1,764	1,715	1,432
Slovakia	U	U	U	U	218	563	586	844	906	902	957	973	974	1,093	1,132	970
South Africa	U	U	U	U	516	472	533	539	546	566	592	578	581	595	616	447
South Korea	U	U	134	3,115	3,699	4,272	4,657	4,558	4,522	4,525	4,556	4,229	4,115	4,029	3,951	3,507
Spain	75	532	987	3,033	2,753	2,388	2,354	1,979	2,163	2,403	2,733	2,886	2,848	2,820	2,822	2,268
Sweden	132	317	313	296	324	208	232	200	199	188	230	254	276	340	329	285
Taiwan	U	U	U	365	446	U	U	U	U	U	U	U	U	U	U	U
Turkey	U	25	47	431	879	1,095	1,189	1,073	1,126	1,170	1,359	1,486	1,674	1,550	1,461	1,298
United Kingdom	1,447	2,198	1,185	1,817	1,803	1,393	1,464	1,576	1,597	1,599	1,682	1,817	1,749	1,604	1,381	987
United States	6,653	10,672	7,943	12,774	11,947	7,743	8,655	10,333	11,066	11,661	12,105	12,178	11,190	11,297	10,893	8,821
Venezuela	U	U	U	U	155	104	102	104	72	20	18	3	Z	Z	Z	Z
Yugoslavia, Federal Republic of ^e	20	132	267	N	N	N	N	N	N	N	N	N	N	N	N	N

KEY: N = data do not exist; U = data are not available; Z = no activity, or a value of zero, or value too small to report.

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

^b Formerly Czechoslovakia and Ward's does not report a number for Slovakia before 2005.

^c *Yugoslavia* no longer exists and Ward's does not report numbers for countries that were previously a part of *Yugoslavia*.

^d Includes all trucks and buses. Light trucks, such as pickups, sport utility vehicles, and minivans are included under *Commercial vehicles*.

^e The 2000 and 2005-2009 figures for Total passenger cars and commercial vehicles are revised by the source. However, the detailed information for each component in 2000 is not available, thus the details are not revised in this table and will not add up to the total for this year.

Table 1-23 cont'd: World Motor Vehicle Production, Selected Countries (thousands of vehicles)**NOTES**

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

Numbers may not add to totals due to rounding. Also numbers may not add to totals due to the inclusion of small countries in the total.

Beginning in 1998, some smaller countries not listed in this table are included in the world totals.

Table 1-24: Number and Size of the U.S. Flag Merchant Fleet and Its Share of the World Fleet (Oceangoing self-propelled, cargo-carrying vessels of 1,000 gross tons and above)

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
World fleet	17,317	19,980	24,867	23,596	28,318	33,586	34,987	36,000	36,307	38,496	40,931	41,674	42,784	43,779	44,779
U.S. fleet	2,926	1,579	864	636	282	221	214	198	187	179	170	169	176	182	182
U.S. percentage of the world fleet	16.9	7.9	3.5	2.7	1.0	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Freighters, total	2,138	1,076	471	367	142	138	138	139	131	122	112	108	111	112	114
DWT (thousands)	21,877	11,733	6,885	7,265	4,406	4,584	4,528	4,528	4,288	4,140	3,976	3,754	3,751	3,733	3,939
General Cargo	N	N	259	166	22	18	20	22	22	21	16	17	20	21	21
DWT (thousands)	N	N	3,329	2,605	555	174	191	224	239	231	161	179	167	178	179
Container	N	N	121	92	81	80	79	80	75	69	67	63	63	62	65
DWT (thousands)	N	N	2,289	2,856	3,004	3,596	3,537	3,554	3,357	3,257	3,230	2,998	3,009	2,958	3,166
Partial containerships	N	N	68	59	N	N	N	N	N	N	N	N	N	N	N
DWT (thousands)	N	N	940	836	N	N	N	N	N	N	N	N	N	N	N
Ro-Ro	N	N	23	50	39	40	39	37	34	32	29	28	28	29	28
DWT (thousands)	N	N	327	968	847	814	799	751	692	652	585	577	575	597	594
Tankers, total	422	294	308	233	117	62	60	49	48	49	50	53	60	65	63
DWT (thousands)	7,815	7,739	16,152	15,641	6,854	4,104	4,016	3,326	3,340	3,386	3,504	3,768	4,035	4,284	4,109
Petroleum/chemical ships	N	N	N	219	117	62	60	49	48	49	50	53	60	65	63
DWT (thousands)	N	N	N	14,681	6,854	4,104	4,016	3,326	3,340	3,386	3,504	3,768	4,035	4,284	4,109
Liquefied petroleum/natural gas ships	N	N	N	14	N	N	N	N	N	N	N	N	N	N	N
DWT (thousands)	N	N	N	960	N	N	N	N	N	N	N	N	N	N	N
ITB, total	309	171	65	10	12	9	4	2	2	2	2	2	0	0	0
DWT (thousands)	2,070	1,107	446	91	462	324	99	15	15	15	15	15	0	0	0
Dry bulk, total	57	38	20	26	11	12	12	8	6	6	6	6	5	5	5
DWT (thousands)	805	767	607	1,270	685	533	533	388	260	260	260	260	226	226	226

KEY: DWT = deadweight tons; N = data do not exist; RO/RO = roll-on/roll-off vessels; U = data are not available.

NOTES

Excludes non-merchant 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 yearly counts are from January of that year.

MARAD has recently reverted back to regarding the merchant fleet as vessels of 1,000 gross tons and greater. They will no longer publish the fleet using "10,000 DWT and greater" as a criterion. Therefore, this report is not comparable with the previous issues.

The vessel categories used for this report include the following types:

Tankers: Petroleum Tankers, Chemical Carriers, LNG Carriers, LNG/LPG Carriers, LPG Carriers.

Container: Fully Cellular Containerships.

Dry Bulk: Bulk Vessels, Bulk Containerships, Cement Carriers, Wood Chip Carriers, Ore/Bulk/Oil Carriers, Bulk/Oil Carriers.

Ro-Ro: Ro-Ro Vessels, Ro-Ro/Containerships, Vehicle Carriers.

General Cargo: General Cargo Carriers, Partial Containerships, Refrigerated Ships.

ITB: Integrated Tug/Barge

Section C:
Condition

Table 1-25: U.S. Airport Runway Pavement Conditions

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
NPIAS^a airports, number	3,285	3,361	3,357	3,332	3,349	3,330	3,330	3,331	3,330	3,332	3,321	3,317	3,311	3,310
Good condition (percent)	61	73	75	79	80	80	81	80	80	80	80	80	80	79
Fair condition (percent)	29	22	21	18	18	18	17	17	18	18	18	18	18	19
Poor condition (percent)	10	5	4	3	2	2	2	2	2	2	2	2	2	2
Commercial service airports^b, number	568	546	517	503	512	499	511	514	506	510	503	511	511	511
Good condition (percent)	78	79	79	82	82	83	83	83	84	84	83	83	85	85
Fair condition (percent)	17	19	19	16	16	15	15	15	15	15	15	16	13	13
Poor condition (percent)	5	2	2	2	2	2	2	2	1	1	2	1	1	1

KEY: NPIAS = National Plan of Integrated Airport Systems.

^a The U.S. Department of Transportation, Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems is composed of all commercial service airports, all reliever airports, and selected general aviation airports. It does not include over 1,000 publicly owned public-use landing areas, privately owned public-use airports, and other civil landing areas not open to the general public. NPIAS airports account for almost all enplanements. In 2005, there were approximately 16,500 non-NPIAS airports. See table 1-3 for more detail on airports.

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

NOTES

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

Good: All cracks and joints are sealed.

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

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

Table 1-26: Average Age of Automobiles and Trucks in Operation in the United States

Year	Passenger cars	Light trucks	All light vehicles
1995	8.4	8.3	8.4
2000	9.1	8.4	8.9
2005	10.1	9.5	9.8
2010	10.8	10.5	10.6
2011	11.1	10.8	10.9
2012	11.3	11.1	11.2
2013	11.4	11.3	11.4
2014	11.4	11.4	11.4
2015	11.5	11.5	11.5
2016	11.6	11.6	11.6
2017	U	U	11.7
2018	U	U	11.7
2019	U	U	11.8
2020	U	U	11.9

Average age of household vehicles for several years^a

	Automobile	Van	Sport utility	Pickup	Other truck	RV/motor home
1969	5.1	U	U	U	U	U
1977	5.5	6.4	U	7.3	11.6	4.5
1983	7.2	8.5	U	8.5	12.4	10.7
1990	7.6	5.9	U	8.4	14.5	10.4
1995	8.2	6.7	6.6	9.7	14.9	13.2
2001	9.0	7.6	6.4	10.1	17.7	13.5
2009	9.5	8.7	7.1	11.2	17.8	16.0
2017	10.1	10.7	8.3	13.1	17.3	15.8

KEY: RV = recreational vehicle; U = data are not available.

^a The 1969, 1977, 1983, and 1990 surveys do not include a separate category for sports utility vehicles (SUV), while the 1995, 2001, 2009 and 2017 surveys do. In 1990, most SUVs were classified as automobiles.

NOTE

Data for average age of automobiles are as of July 1 of each year.

Table 1-27: Condition of U.S. Roadways by Functional System

International Roughness Index (IRI)	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
RURAL													
Interstates miles reported	31,254	32,888	30,802	U	29,349	30,204	29,385	28,783	28,657	28,819	28,957	29,188	29,231
IRI >220, percent of miles	1.8	0.4	0.5	U	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5
IRI 171-220, percent of miles	4.5	1.8	1.3	U	1.3	1.3	1.4	1.5	1.4	1.5	1.5	1.5	1.5
IRI 95-170, percent of miles	43.0	29.2	23.1	U	18.6	17.1	15.8	15.4	14.7	14.5	14.5	13.8	14.0
IRI 60-94, percent of miles	36.9	44.8	47.0	U	42.6	41.7	38.6	37.7	35.3	34.0	32.5	31.1	30.6
IRI <60, percent of miles	13.9	23.9	28.1	U	37.0	39.4	43.6	44.8	48.2	49.6	51.0	53.1	53.4
Miles not reported	1,326	162	92	U	907	318	294	312	333	314	205	92	73
Other principal arterials miles reported	89,265	97,297	94,216	U	87,830	89,700	88,550	87,270	88,155	86,113	88,616	86,992	89,287
IRI >220, percent of miles	4.4	0.8	0.8	U	0.8	0.9	1.3	1.2	1.4	1.4	1.2	1.2	1.2
IRI 171-220, percent of miles	7.6	3.2	2.8	U	2.5	2.6	2.6	2.6	3.0	3.0	2.9	2.8	2.7
IRI 95-170, percent of miles	51.1	38.7	33.5	U	28.5	28.3	26.6	27.6	26.7	26.8	25.8	25.2	25.2
IRI 60-94, percent of miles	27.9	42.9	45.8	U	45.8	45.1	42.8	42.3	41.5	41.1	41.1	40.9	40.8
IRI <60, percent of miles	9.0	14.4	17.1	U	22.5	23.1	26.8	26.3	27.4	27.7	29.0	29.8	30.1
Miles not reported	8,683	1,619	946	U	3,450	1,720	1,855	3,003	1,463	3,615	1,150	1,249	1,026
Minor arterials miles reported	121,443	136,096	134,358	U	122,863	129,959	121,097	123,840	125,503	112,786	112,993	110,508	125,435
IRI >220, percent of miles	3.7	1.7	1.4	U	2.0	1.9	2.3	2.1	2.6	2.5	2.5	2.5	2.2
IRI 171-220, percent of miles	9.0	5.3	4.0	U	4.6	4.3	5.1	4.9	5.3	5.5	5.5	5.6	5.1
IRI 95-170, percent of miles	54.7	46.2	42.0	U	41.0	38.2	38.1	38.8	36.4	37.3	37.5	35.7	35.7
IRI 60-94, percent of miles	23.9	35.6	41.6	U	39.3	41.2	38.6	38.0	39.0	39.5	38.8	39.3	39.2
IRI <60, percent of miles	8.7	11.2	11.0	U	13.1	14.3	15.9	16.2	16.8	15.2	15.6	16.9	17.8
Miles not reported	15,708	1,436	1,049	U	12,422	5,818	4,617	7,481	1,387	1,427	1,072	2,472	1,515
Major collectors miles reported	N	229,294	269,022	U	274,449	283,044	249,934	264,387	249,845	233,130	251,943	247,760	282,028
IRI >220, percent of miles	N	9.0	5.6	U	6.7	6.8	7.9	7.7	10.1	10.2	10.3	9.3	7.9
IRI 171-220, percent of miles	N	13.1	10.5	U	11.9	12.3	11.7	12.5	11.5	11.7	11.8	11.1	10.7
IRI 95-170, percent of miles	N	51.9	52.7	U	48.6	48.3	46.3	45.9	42.9	44.2	42.7	42.9	44.9
IRI 60-94, percent of miles	N	21.9	26.1	U	25.1	26.1	27.1	26.5	27.5	27.0	27.1	27.7	29.0
IRI <60, percent of miles	N	4.1	5.0	U	7.7	6.5	7.0	7.3	8.0	6.8	8.1	9.0	7.5
Miles not reported	N	N	N	U	N	N	N	N	N	N	N	N	N

Table 1-27 cont'd: Condition of U.S. Roadways by Functional System

International Roughness Index (IRI)	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
URBAN													
Interstates miles reported	12,307	13,139	15,544	U	15,994	16,383	17,630	17,699	18,742	18,515	18,861	19,172	19,080
IRI >220, percent of miles	1.8	1.4	1.5	U	1.5	1.4	1.7	1.6	1.5	1.6	1.5	1.6	1.5
IRI 171-220, percent of miles	8.6	5.1	4.5	U	3.7	3.6	3.7	3.7	3.5	3.7	3.7	3.7	3.5
IRI 95-170, percent of miles	50.7	43.1	35.4	U	29.4	27.3	25.3	24.8	23.2	23.6	22.7	22.8	22.3
IRI 60-94, percent of miles	27.5	37.1	42.0	U	40.7	39.8	39.1	38.6	36.5	35.4	34.0	33.0	32.6
IRI <60, percent of miles	11.4	13.3	16.6	U	24.7	28.0	30.2	31.3	35.3	35.8	38.1	38.9	40.1
Miles not reported	857	226	157	U	711	526	267	868	321	544	232	139	97
Other freeways and expressway miles report	7,804	8,796	10,443	U	10,730	10,896	11,266	11,070	11,777	11,633	11,816	11,947	11,885
IRI >220, percent of miles	4.8	2.8	1.9	U	2.2	2.2	2.4	2.5	2.8	2.8	2.7	2.5	2.3
IRI 171-220, percent of miles	9.8	8.1	6.0	U	5.6	5.3	5.4	5.7	5.4	5.6	5.2	5.0	4.8
IRI 95-170, percent of miles	54.7	50.7	44.7	U	39.0	36.1	35.1	33.4	31.0	31.7	30.6	30.1	29.7
IRI 60-94, percent of miles	20.4	31.6	39.6	U	39.1	39.4	38.8	38.6	38.7	37.4	37.6	37.4	37.6
IRI <60, percent of miles	10.3	6.8	7.9	U	14.1	17.1	18.2	19.8	22.1	22.4	23.9	25.1	25.6
Miles not reported	1,166	353	108	U	765	573	337	714	261	622	336	206	165
Other principal arterials miles reported	41,444	47,890	59,743	U	58,419	60,235	61,386	60,483	64,099	62,467	64,189	64,008	64,158
IRI >220, percent of miles	12.4	13.2	11.8	U	13.0	12.7	13.8	13.5	15.4	14.1	14.1	14.1	13.6
IRI 171-220, percent of miles	14.7	16.8	15.7	U	15.1	13.9	13.6	12.6	12.2	12.7	12.6	12.5	12.2
IRI 95-170, percent of miles	47.2	45.1	47.2	U	42.7	42.2	40.1	39.1	38.0	38.9	38.1	37.8	37.9
IRI 60-94, percent of miles	15.9	19.4	20.1	U	22.3	23.3	23.6	25.1	24.3	24.4	24.8	24.9	25.4
IRI <60, percent of miles	9.7	5.4	5.3	U	6.9	7.9	8.9	9.7	10.0	9.9	10.3	10.6	10.9
Miles not reported	11,352	5,426	2,064	U	6,563	4,957	5,124	6,278	2,756	3,670	2,127	2,604	2,210
Minor arterials miles reported	N	43,830	58,699	U	66,929	64,770	67,154	71,995	77,939	71,938	77,978	78,767	82,079
IRI >220, percent of miles	N	14.3	15.6	U	18.3	18.6	19.3	17.5	21.5	19.1	19.6	17.4	16.5
IRI 171-220, percent of miles	N	19.3	18.0	U	19.0	19.0	18.7	18.1	16.9	17.0	17.3	17.2	15.2
IRI 95-170, percent of miles	N	45.9	45.0	U	45.7	45.9	44.0	42.7	41.3	42.4	42.0	42.0	43.1
IRI 60-94, percent of miles	N	12.6	14.5	U	14.4	13.7	14.5	17.5	16.3	17.5	17.1	18.9	20.6
IRI <60, percent of miles	N	7.8	6.9	U	2.6	2.8	3.6	4.2	4.0	4.0	4.0	4.6	4.7
Miles not reported	N	N	N	U	N	N	N	N	N	N	N	N	N

Continued next page

Table 1-27 cont'd: Condition of U.S. Roadways by Functional System

International Roughness Index (IRI)	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Collectors miles reported	N	29,726	45,210	U	65,043	61,706	62,279	71,581	79,534	82,663	86,085	89,568	117,176
IRI >220, percent of miles	N	28.8	28.4	U	31.3	30.9	31.9	28.2	32.1	30.5	30.0	28.9	26.2
IRI 171-220, percent of miles	N	23.5	21.3	U	22.4	21.3	21.6	21.3	20.1	20.3	19.7	18.8	18.9
IRI 95-170, percent of miles	N	34.1	37.0	U	37.3	38.6	37.3	39.0	36.8	37.5	38.3	39.0	40.6
IRI 60-94, percent of miles	N	5.7	7.9	U	7.9	8.0	8.0	10.2	9.6	10.4	10.5	11.6	12.5
IRI <60, percent of miles	N	7.9	5.3	U	1.1	1.2	1.2	1.3	1.4	1.3	1.5	1.7	1.9
Miles not reported	N	N	N	U	N	N	N	N	N	N	N	N	N

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

NOTES

Numbers may not add to totals due to rounding.

Data is reported as the International Roughness Index (IRI) in inches per mile. Lower IRI represents smoother riding roadways. For more information on the rating system, refer to National Cooperative Highway Research Program (NCHRP) report 20-24(37)G, *Technical Guidance for Deploying National Level Performance Measurements*, available at [http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-24\(37\)G_FR.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-24(37)G_FR.pdf) as of June 2015.

Table 1-28: Condition of U.S. Highway Bridges

	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL bridge count	607,380	607,751	610,749	611,845	614,387	615,002	616,096	617,084	618,456
Urban	160,605	163,220	166,292	168,753	170,776	172,252	174,262	178,267	179,994
Rural	446,773	444,488	444,457	443,092	443,610	442,726	441,834	438,816	438,462
TOTAL bridge deck area (SqM)	358,547,072	362,428,004	365,542,771	369,109,088	371,463,919	374,362,285	390,438,601	393,265,002	396,244,439
Urban	202,093,777	205,658,627	209,885,932	213,036,399	215,850,143	218,379,340	226,200,289	230,832,949	233,571,868
Percent urban	56.4	56.7	57.4	57.7	58.1	58.3	57.9	58.7	58.9
Rural	156,452,994	156,764,398	155,655,339	156,072,689	155,613,776	155,965,013	164,238,312	162,431,867	162,672,571
Percent rural	43.6	43.3	42.6	42.3	41.9	41.7	42.1	41.3	41.1
Bridge counts in GOOD condition	287,194	287,581	287,701	289,158	291,412	288,030	283,316	279,582	278,433
Urban	75,459	76,772	77,867	80,246	82,571	82,544	81,282	81,886	81,914
Rural	211,733	210,794	209,834	208,912	208,841	205,467	202,034	197,695	196,519
Deck area in GOOD condition (SqM)	160,127,599	162,033,650	163,416,898	167,782,612	172,584,754	172,484,743	176,892,746	174,285,840	173,825,243
Percent good	44.7	44.7	44.7	45.5	46.5	46.1	45.3	44.3	43.9
Urban	85,108,212	86,449,841	88,372,970	92,344,585	96,711,401	97,506,881	98,785,914	98,481,688	98,650,861
Percent urban in good condition	53.2	53.4	54.1	55.0	56.0	56.5	55.8	56.5	56.8
Rural	75,019,086	75,581,056	75,043,928	75,438,028	75,873,353	74,963,595	78,106,832	75,803,965	75,174,382
Percent rural in good condition	46.8	46.6	45.9	45.0	44.0	43.5	44.2	43.5	43.2
Bridge counts in FAIR condition	262,878	265,456	269,734	271,690	274,306	279,270	285,676	291,339	294,992
Urban	73,780	75,569	77,682	78,418	78,659	80,408	83,557	86,948	88,987
Rural	189,098	189,871	192,052	193,272	195,646	198,857	202,119	204,391	206,005
Deck area in FAIR condition (SqM)	169,625,957	173,820,990	176,609,648	177,758,745	176,764,943	180,767,814	192,276,900	197,533,493	201,819,504
Percent fair	47.3	48.0	48.3	48.2	47.6	48.3	49.2	50.2	50.9
Urban	100,241,186	103,948,796	106,944,195	107,388,439	106,276,566	108,722,097	115,286,259	119,784,687	123,001,453
Percent urban in fair condition	59.1	59.8	60.6	60.4	60.1	60.1	60.0	60.6	60.9
Rural	69,384,770	69,870,769	69,665,453	70,370,306	70,488,377	72,042,052	76,990,640	77,748,806	78,818,051
Percent rural in fair condition	40.9	40.2	39.4	39.6	39.9	39.9	40.0	39.4	39.1

Table 1-28 cont'd: Condition of U.S. Highway Bridges

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bridge counts in POOR condition	57,049	54,492	52,905	50,917	48,559	47,619	47,054	46,163	45,031
Urban	11,277	10,818	10,480	10,063	9,520	9,281	9,415	9,433	9,093
Rural	45,772	43,662	42,425	40,854	39,039	38,338	37,639	36,730	35,938
Deck area in POOR condition (SqM)	27,892,654	26,380,569	24,626,117	23,454,139	22,084,898	21,084,089	21,255,232	21,445,669	20,599,692
Percent poor	7.8	7.3	6.7	6.4	5.9	5.6	5.4	5.5	5.2
Urban	16,368,428	15,174,554	13,902,830	13,249,060	12,848,592	12,134,505	12,122,600	12,566,574	11,919,554
Percent urban in poor condition	58.7	57.5	56.5	56.5	58.2	57.6	57.0	58.6	57.9
Rural	11,524,226	11,205,213	10,723,287	10,205,079	9,236,307	8,949,585	9,132,632	8,879,095	8,680,138
Percent rural in poor condition	41.3	42.5	43.5	43.5	41.8	42.4	43.0	41.4	42.1

KEY: SqM = square meters.

NOTES

Explanations for the terms *Good*, *Fair*, *Poor*, and *Bridge Deck Area* can be found at <https://www.fhwa.dot.gov/bridge/britab.cfm>.

U.S. totals include the 50 states, the District of Columbia and Puerto Rico for 2012-2017. For 2018, U.S. totals include the 50 states, the District of Columbia, Guam and Puerto Rico. For 2019 and later, U.S. totals include the 50 states, the District of Columbia, Guam, Puerto Rico, and U.S. Virgin Islands.

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

Subcategories may not add to total due to source not coding some bridges as Urban or Rural.

Table 1-29: Average Age of Urban Transit Vehicles (years)

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Transit rail														
Commuter rail locomotives ^a	15.7	13.4	16.5	19.4	17.6	17.8	18.7	19.4	19.3	19.7	20.0	20.7	21.5	22.2
Commuter rail passenger coaches	17.6	16.9	18.6	18.9	19.4	20.0	20.8	18.8	19.5	20.2	21.0	21.8	22.5	24.3
Commuter rail self-propelled passenger cars	15.9	25.4	19.4	19.5	19.7	18.5	17.5	17.2	17.2	16.2	17.1	17.8	18.2	17.9
Heavy-rail passenger cars	16.2	22.9	20.8	18.7	19.2	19.8	20.2	20.4	22.1	22.8	23.0	23.4	23.6	22.8
Light rail vehicles (streetcars)	15.2	16.1	14.5	16.8	16.5	16.2	16.4	16.7	17.3	18.0	18.5	16.9	16.2	18.9
Transit bus^b														
Articulated	7.6	6.5	4.8	6.5	6.5	7.0	7.3	7.4	7.4	7.2	7.3	6.9	6.7	6.9
Full-size	8.2	8.1	7.6	7.9	8.0	8.0	8.1	N	N	N	N	N	N	N
Mid-size	6.6	5.6	5.8	7.0	6.5	6.5	6.7	N	N	N	N	N	N	N
Small	3.9	4.1	4.1	4.5	4.4	4.4	4.4	N	N	N	N	N	N	N
Double Decker	N	46.0	24.3	4.9	5.9	6.9	7.9	8.9	9.9	10.4	8.6	8.6	7.5	6.8
Trolley	10.9	16.4	9.4	10.4	11.4	12.4	13.2	14.3	12.7	11.4	9.8	9.9	6.1	4.5
Other														
Service automobiles	N	3.3	2.6	3.3	3.5	4.3	3.9	3.8	3.3	4.2	7.3	5.0	5.6	6.0
Vans	2.8	3.1	3.4	3.4	3.5	3.6	3.5	3.5	3.4	3.9	4.0	4.0	4.0	4.4
Cutaways	N	N	N	N	N	N	N	3.9	4.2	4.8	4.8	4.9	4.8	4.8
Minivan	N	N	N	N	N	N	N	2.5	2.5	4.4	4.5	4.1	3.9	4.3
Ferry boats	21.7	25.6	25.6	20.5	20.3	21.0	21.4	23.8	22.8	23.2	22.3	21.7	21.5	20.2

KEY: N = data do not exist.^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.**NOTE**

Cutaways are defined as service vehicles in which a bus body is mounted on the chassis of a van or light-duty truck. The original van or light-duty truck chassis may be reinforced or extended. Cutaways typically seat 15 or more passengers, and typically may accommodate some standing passengers.

Table 1-30: Condition of Urban Bus and Rail Transit Maintenance Facilities

	1995	1997	2000	2002	2004	2006	2009	2010	2012	2014	2018	2019
Bus, number of facilities^{a,b}	484	503	497	1,219	1,207	1,280	1,330	1,316	1,451	1,471	1,021	1,127
Excellent	102	13	46	83	208	210	163	131	154	158	107	105
Good	257	86	41	68	62	69	73	66	91	87	390	439
Adequate	34	285	266	672	551	536	575	575	706	678	378	434
Substandard	29	93	121	387	379	344	460	510	436	473	114	121
Poor	63	26	23	10	6	121	59	34	64	75	32	28
Rail, number of facilities^c	U	U	150	152	152	201	210	211	214	214	537	743
Excellent	U	U	0	27	40	42	23	27	24	30	36	32
Good	U	U	32	18	26	19	14	11	10	9	143	189
Adequate	U	U	64	76	74	87	114	96	68	87	201	281
Substandard	U	U	36	27	10	51	56	75	111	75	106	163
Poor	U	U	18	3	2	2	3	2	1	12	51	78

KEY: U = data are not available.

^a These data are derived from the Transit Economic Requirements Model (TERM). TERM uses statistically determined decay curves to simulate the deterioration of the Nation's transit vehicles, facilities, and other infrastructure components. National Transit Database (NTD) data are applied to these decay curves to estimate conditions. Only the condition of directly operated facilities are provided for 1995, 1997 and 2000. The NTD began gathering information on facilities owned by bus systems providing services under contract in 1999 (known as purchased transportation), however, TERM did not base condition estimates on this full set of facilities until 2002.

^b Beginning in 2018, data include facilities for Commuter Bus, Motorbus, Bus Rapid Transit and Trolleybus served as primary mode.

^c Beginning in 2018, data include facilities for Commuter Rail, Heavy Rail, Light Rail, Streetcar Rail and Hybrid Rail served as primary mode.

NOTES

Numbers may not add to totals due to rounding.

Transit Maintenance Facilities data for 2018 and later years are obtained from the National Transit Database and cannot be compared with data for earlier years. Facility types include Combined Administrative and Maintenance facility; General Purpose Maintenance facility/depot; Heavy Maintenance & overhaul facility; Maintenance facility (Service and Inspection), and Other, Administrative & Maintenance facility.

Table 1-31: Condition of Rail Transit Infrastructure (percent)

	1995	1997	2000	2002	2004	2006	2009	2010	2012	2014
Stations										
Excellent	14.0	11.0	1.0	3.0	7.0	12.7	3.4	2.7	3.7	2.6
Good	47.0	46.0	33.0	22.0	28.0	12.2	28.7	29.2	16.6	13.9
Adequate	12.0	15.0	50.0	18.0	14.0	40.8	42.1	39.8	27.1	26.1
Substandard	12.0	13.0	16.0	26.0	51.0	31.3	24.2	26.5	50.6	44.8
Poor	15.0	15.0	0.0	30.0	0.0	3.0	1.6	1.8	2.0	12.7
Communication systems										
Excellent	N	0.0	0.0	7.4	12.1	14.0	0.8	1.4	0.2	0.2
Good	N	61.0	62.0	68.6	62.7	30.5	24.1	27.4	3.0	1.6
Adequate	N	16.0	12.1	9.7	25.2	54.8	74.3	68.9	96.4	97.4
Substandard	N	12.0	14.0	6.0	0.0	0.6	0.0	0.4	0.2	0.5
Poor	N	10.0	11.9	8.3	0.0	0.0	0.7	1.8	0.2	0.3
Train control systems										
Excellent	N	9.0	7.2	5.5	0.3	2.2	0.4	0.5	1.1	3.3
Good	N	52.0	56.0	65.9	44.6	37.0	36.8	34.1	27.1	21.6
Adequate	N	16.0	16.9	11.1	29.0	41.0	41.0	42.6	46.5	41.0
Substandard	N	11.0	10.3	9.7	14.1	14.4	15.4	16.2	16.6	21.7
Poor	N	13.0	9.5	7.8	12.0	5.5	6.5	6.7	8.7	12.4
Traction power systems										
Excellent	N	25.0	20.7	37.0	7.6	7.0	3.6	3.9	5.7	3.8
Good	N	44.0	54.5	45.0	46.5	35.0	29.9	27.1	29.5	28.9
Adequate	N	10.0	10.6	10.8	44.5	46.5	51.4	54.8	50.1	48.4
Substandard	N	7.0	6.9	2.9	1.4	7.2	10.3	11.3	9.0	12.2
Poor	N	14.0	7.3	4.2	0.0	4.2	4.9	2.9	5.7	6.7
Revenue collection systems										
Excellent	N	27.0	29.5	33.5	25.8	28.9	12.5	11.4	4.3	3.4
Good	N	33.0	31.0	56.4	53.7	30.0	35.0	42.0	44.8	30.5
Adequate	N	18.0	17.6	2.4	9.5	10.7	10.1	7.3	6.5	7.2
Substandard	N	10.0	18.1	6.9	8.0	8.8	11.7	9.7	4.1	6.9
Poor	N	12.0	3.8	0.8	3.0	21.5	30.7	29.6	40.1	52.0
Elevated structures										
Excellent	1.0	0.0	2.0	5.1	3.1	4.6	5.6	3.9	5.0	2.8
Good	56.0	59.0	59.0	82.8	77.2	68.5	68.1	71.9	62.1	63.5
Adequate	16.0	12.0	16.0	2.5	4.1	11.7	9.7	2.6	2.9	2.7
Substandard	20.0	29.0	22.0	7.3	13.9	7.9	6.3	12.5	12.4	9.8
Poor	7.0	1.0	2.0	2.3	1.7	7.3	10.3	9.0	17.6	21.2
Underground tunnels										
Excellent	9.0	7.0	12.0	34.2	26.4	18.2	15.3	15.3	3.8	4.1
Good	59.0	47.0	46.0	36.7	48.2	41.1	44.6	42.4	15.5	16.0
Adequate	13.0	18.0	19.0	13.0	12.4	10.5	9.3	9.2	23.6	14.6
Substandard	11.0	19.0	11.0	8.6	5.6	15.4	15.4	16.6	27.4	20.7
Poor	7.0	9.0	12.0	7.5	7.4	14.8	15.4	16.5	29.7	44.7

KEY: N = data do not exist.

NOTE

Percents may not add to 100 due to rounding.

Table 1-32: Class I Railroad Locomotive Fleet by Year Built (locomotive units)

Year built ^a	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total	18,835	20,028	22,779	23,893	24,250	24,707	25,033	25,916	26,574	26,716	26,547	26,086	24,597
Before 1970	5,117	f	j	n	n	n	n	n	s	s	s	s	s
1970-74	3,852	f	j	n	n	n	n	n	s	s	s	s	s
1975-79	4,432	^g 8,541	j	n	n	n	n	n	s	s	s	s	s
1980-84	2,837	2,411	^k 8,705	n	n	n	n	n	s	s	s	s	s
1985-89	1,989	1,775	1,786	^o 8,420	^o 8,304	^o 8,145	^o 7,901	^o 7,737	s	s	s	s	s
1990	608	^d 2,648	^d 2,783	^d 2,384	^d 2,365	^d 2,368	^d 2,363	^d 2,259	s	s	s	s	s
1991		e	e	e	e	e	e	e	s	s	s	s	s
1992		e	e	e	e	e	e	e	s	s	s	s	s
1993		e	e	e	e	e	e	e	s	s	s	s	s
1994		e	e	e	e	e	e	e	^r 9,808	^r 9,373	^r 9,027	^r 8,671	^r 7,668
1995		973	^h 4,348	ⁿ 4,467	ⁿ 4,461	ⁿ 4,411	ⁿ 4,382	ⁿ 4,458	ⁿ 4,439	ⁿ 4,441	ⁿ 4,470	ⁿ 4,352	ⁿ 3,954
1996		697	i	i	i	i	i	i	i	i	i	i	i
1997		745	i	i	i	i	i	i	i	i	i	i	i
1998		890	i	i	i	i	i	i	i	i	i	i	i
1999		713	i	i	i	i	i	i	i	i	i	i	i
2000		635	^l 4,350	^l 4,265	^l 4,268	^l 4,262	^l 4,258	^l 4,267	^l 4,272	^l 4,271	^l 4,190	^l 4,171	^l 4,150
2001			m	m	m	m	m	m	m	m	m	m	m
2002			m	m	m	m	m	m	m	m	m	m	m
2003			m	m	m	m	m	m	m	m	m	m	m
2004			m	m	m	m	m	m	m	m	m	m	m
2005			807	^p 4,098	^p 4,091	^p 4,087	^p 4,039	^p 4,028	^p 4,030	^p 4,024	^p 4,006	^p 3,976	^p 3,741
2006				q	q	q	q	q	q	q	q	q	q
2007				q	q	q	q	q	q	q	q	q	q
2008				q	q	q	q	q	q	q	q	q	q
2009				q	q	q	q	q	q	q	q	q	q
2010				259	256	256	253	252	^t 3,248	^t 3,247	^t 3,259	^t 3,194	^t 3,134
2011					503	498	495	495	u	u	u	u	u
2012						683	693	692	u	u	u	u	u
2013							649	688	u	u	u	u	u
2014								1,040	u	u	u	u	u
2015									777	784	809	808	808
2016										576	607	607	607
2017											179	179	179
2018												128	128
2019													228

^a Disregards year of rebuilding.

^d Includes locomotives built between 1990-94.

^e Included in 1990 category.

^f Included in 1975-79 category.

^g Includes all locomotives built before 1980.

^h Includes locomotives built between 1995-99.

ⁱ Included in 1995 category.

^j Included in 1980-84 category.

^k Includes all locomotives built before 1985.

^l Includes locomotives built between 2000-04.

^m Included in 2000 category.

ⁿ Included in 1985-89 category.

^o Includes all locomotives built before 1990.

^p Includes locomotives built between 2005-09.

^q Included in 2005 category.

^r Includes all locomotives built before 1995.

^s Included in 1994 category.

^t Includes locomotives built between 2010-14.

^u Included in 2010 category.

Table 1-33: Age and Availability of Amtrak Locomotive and Car Fleets

	1972	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Locomotives																
Percent available for service ^a	U	83.0	84.0	89.0	83.4	85.5	84.2	83.7	80.3	82.5	82.0	U	U	U	U	U
Average age (years) ^b	22.3	7.4	12.0	11.2	16.5	19.1	20.0	21.0	21.9	21.5	21.1	20.3	19.3	19.9	18.3	19.1
Passenger and other train cars																
Percent available for service ^a	U	77.0	90.0	91.0	84.4	88.5	87.7	88.7	89.1	89.1	88.8	U	U	U	U	U
Average age (years) ^b	22.0	14.3	20.0	19.4	21.5	25.6	26.5	27.7	28.6	29.6	30.7	31.3	30.6	31.3	32.7	33.6

KEY: U = data are not available.

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

^b Fiscal Year-end average. Fiscal Year ends Sept. 30th of stated year. Since 2001, only passenger car data are included in the *Passenger and other train cars* category.

NOTES

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

Roadrailleurs are not considered train cars for the purpose of our calculations.

Table 1-34: U.S. Flag Vessels by Type and Age (number of vessels)

Age ^a	Vessel type							Total
	Dry cargo	Tanker	Towboat	Passenger	Offshore support / crewboats	Dry barge	Tank / liquid barge	
1990–91, total	900	257	5,210	721	1,168	27,110	3,874	39,342
<6	80	6	132	151	85	2,335	162	2,951
6–10	161	38	706	120	318	4,570	316	6,229
11–15	212	50	1,029	110	474	7,639	829	10,343
16–20	141	35	844	80	144	6,374	750	8,368
21–25	82	38	750	65	84	2,607	759	4,385
>25	196	86	1,718	188	51	3,372	1,049	6,660
2000, total	737	135	4,995	918	1,414	29,141	4,011	41,354
<6	66	11	325	134	246	6,721	582	8,085
6–10	50	4	143	118	106	3,051	329	3,802
11–15	113	8	142	178	58	1,565	48	2,112
16–20	136	34	929	124	454	5,846	602	8,125
21–25	105	30	954	90	332	5,365	712	7,588
>25	263	48	2,497	271	214	6,461	1,714	11,470
2005, total	969	100	5,290	841	1,768	27,901	4,151	41,028
<6	115	11	336	62	244	4,140	743	5,651
6–10	106	13	321	96	262	5,611	512	6,921
11–15	74	4	157	114	107	3,120	333	3,911
16–20	137	3	155	150	59	1,507	43	2,054
21–25	116	30	907	98	464	5,174	535	7,324
>25	419	39	3,406	321	629	8,113	1,985	14,918
2010, total	875	77	5,466	843	1,817	26,848	4,564	40,512
<6	61	17	573	27	271	5,391	1,170	7,511
6–10	110	7	303	59	212	3,398	548	4,640
11–15	111	9	330	92	231	5,587	511	6,874
16–20	63	3	145	114	101	2,764	329	3,520
21–25	109	3	147	155	50	1,214	36	1,715
>25	421	38	3,964	395	949	8,184	1,969	15,933
2011, total	851	77	5,458	1,784	1,772	26,996	4,502	40,521
<6	59	17	632	258	248	6,213	1,200	8,400
6–10	106	7	290	194	194	2,730	628	4,022
11–15	101	9	355	239	239	6,038	496	7,324
16–20	66	3	163	100	100	2,702	373	3,510
21–25	111	3	132	51	51	1,583	77	2,113
>25	408	38	3,881	940	940	7,460	1,720	14,865

Table 1-34 cont'd: U.S. Flag Vessels by Type and Age (number of vessels)

Age ^a	Vessel type							Total
	Dry cargo	Tanker	Towboat	Passenger	Offshore support / crewboats	Dry barge	Tank / liquid barge	
2012, total	833	66	5,499	861	1,668	26,923	4,627	40,530
<6	56	17	649	29	241	6,213	1,432	8,569
6–10	92	12	304	47	184	2,969	655	4,273
11–15	100	9	368	77	237	5,515	480	6,792
16–20	82	3	183	108	84	3,474	412	4,352
21–25	90	0	144	157	68	1,851	155	2,475
>25	413	25	3,850	443	853	6,792	1,490	13,918
2013, total	844	65	5,473	833	1,645	26,387	4,694	39,999
<6	57	16	617	34	217	5,334	1,420	7,717
6–10	89	14	349	49	202	3,391	737	4,847
11–15	105	8	363	65	243	4,463	487	5,736
16–20	85	2	218	94	110	4,531	387	5,437
21–25	74	2	155	143	77	2,371	246	3,076
>25	422	21	3,767	447	792	6,106	1,415	13,028
2014, total	846	61	5,476	853	1,692	26,387	4,869	40,082
<6	55	17	566	27	198	4,749	1,447	7,093
6–10	74	15	452	51	206	3,979	883	5,676
11–15	107	7	328	65	201	3,743	510	4,963
16–20	94	5	273	99	170	4,991	429	6,079
21–25	438	2	155	143	77	2,615	286	3,341
>25	439	15	3,696	493	821	5,927	1,313	12,852
2015, total	192	63	5,565	852	1,724	26,336	4,897	40,186
<6	10	11	535	20	201	4,896	1,412	7,132
6–10	23	20	532	45	232	4,124	957	5,966
11–15	21	9	303	66	178	3,237	553	4,445
16–20	20	6	337	90	199	5,421	491	6,632
21–25	8	3	136	107	88	2,528	324	3,238
>25	110	14	3,720	524	826	6,121	1,159	12,780
2016, total	197	65	5,603	840	1,713	27,309	5,045	41,328
<6	15	8	566	24	195	5,083	1,450	7,374
6–10	24	23	548	33	232	4,865	924	6,686
11–15	25	13	295	66	165	2,552	639	3,829
16–20	15	6	359	89	213	5,860	482	7,089
21–25	12	3	156	94	86	2,501	375	3,269
>25	106	12	3,679	534	822	6,444	1,175	13,077

Continued next page

Table 1-34 cont'd: U.S. Flag Vessels by Type and Age (number of vessels)

Age ^a	Vessel type							Total
	Dry cargo	Tanker	Towboat	Passenger	Offshore support / crewboats	Dry barge	Tank / liquid barge	
2017, total	217	79	5,844	928	1,774	27,786	5,181	42,539
<6	19	21	548	29	191	4,583	1,454	6,880
6–10	20	22	596	33	215	5,132	995	7,065
11–15	30	14	308	58	172	2877	662	4,201
16–20	17	7	381	90	246	5,427	478	6,740
21–25	13	3	188	104	84	3,383	403	4,243
>25	118	12	3,820	614	866	6,384	1,189	13,412
2018, total	220	78	5,820	928	1,693	27,476	5,183	42,138
<6	17	19	480	27	138	3,881	1,276	5,863
6–10	19	21	603	31	181	5,003	1074	6,995
11–15	31	14	371	54	180	3318	748	4,798
16–20	21	9	369	83	238	4,396	471	5,686
21–25	14	2	227	97	106	4,431	377	5,325
>25	118	13	3,767	635	850	6,447	1,237	13,500
2019, total	217	76	6,203	1149	1,711	27,781	5,377	43,254
<6	16	17	555	66	102	3,473	1,123	5,407
6–10	18	19	582	45	180	4,641	1125	6,709
11–15	29	15	544	80	191	4044	923	5,915
16–20	25	8	354	107	197	3,807	492	5,111
21–25	11	4	297	116	167	4,935	422	6,050
>25	118	13	3,871	735	874	6,881	1,292	14,331

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

NOTES

Figures include vessels available for operation.

Totals may be greater than sum because of unclassified vessels and vessels of unknown age.

Chapter 1

Section D:

Travel and Goods Movement

Table 1-35: U.S. Vehicle-Miles (millions)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Air																
Air carrier, domestic, all services	858	2,068	2,276	3,963	5,662	6,716	5,976	6,005	5,966	5,965	5,947	6,046	6,227	6,338	6,609	6,811
General aviation ^a	1,769	3,207	5,204	4,548	N	N	N	N	N	N	N	N	N	N	N	N
Highway total	718,762	1,109,724	1,527,295	2,144,362	2,746,925	2,989,430	2,967,266	2,950,402	2,969,433	2,988,280	3,025,656	3,095,373	3,174,408	3,212,347	3,240,327	3,261,772
Light duty vehicle, short wheel-base ^{b,c}	587,012	916,700	1,111,596	1,408,266	1,600,287	1,708,421	2,025,745	2,046,282	2,062,828	2,074,423	2,072,071	2,147,840	2,191,764	2,220,801	2,232,588	2,254,309
Motorcycle ^{c,d}	U	2,979	10,214	9,557	10,469	10,454	18,513	18,542	21,385	20,366	19,970	19,606	20,445	20,149	20,076	19,688
Light duty vehicle, long wheel-base ^{b,c}	U	123,286	290,935	574,571	923,059	1,041,051	622,712	604,175	601,232	603,307	638,484	631,852	657,954	656,578	664,495	669,744
Truck, single-unit 2-axle 6-tire or more ^e	98,551	27,081	39,813	51,901	70,500	78,496	110,738	103,803	105,605	106,582	109,301	109,597	113,338	116,102	120,699	124,746
Truck, combination	28,854	35,134	68,678	94,341	135,020	144,028	175,789	163,791	163,602	168,436	169,830	170,246	174,557	181,490	184,165	175,305
Bus ^a	4,346	4,544	6,059	5,726	7,590	6,980	13,770	13,807	14,781	15,167	15,999	16,230	16,350	17,227	18,303	17,980
Transit^f total	2,143	1,883	2,287	3,242	3,605	4,054	4,400	4,331	4,347	4,413	4,429	4,495	4,545	4,574	4,592	4,628
Motor bus ^d	1,576	1,409	1,677	2,130	2,041	2,192	2,229	2,109	2,071	1,996	2,012	2,038	2,069	2,086	2,109	2,130
Light rail ^g	75	34	18	24	52	69	93	96	101	109	114	117	124	130	131	136
Heavy rail	391	407	385	537	595	646	666	655	656	674	676	695	696	704	705	719
Trolley bus	101	33	13	14	15	13	12	12	12	12	11	11	12	11	11	10
Commuter rail	N	N	179	213	271	303	342	339	344	355	367	369	372	374	375	377
Demand response ^d	N	N	N	N	532	683	807	804	808	817	824	842	838	843	836	831
Ferry boat ^h	N	N	N	U	2	3	3	3	3	3	3	4	4	4	4	5
Other ^{g,h}	N	N	15	16	97	144	248	313	350	447	422	419	431	423	420	419
Rail																
Class I freight, train-miles	404	427	428	380	504	548	476	493	500	504	518	495	453	465	477	445
Class I freight, car-miles	28,170	29,890	29,277	26,159	34,590	37,712	35,541	36,649	36,525	35,253	37,193	35,853	32,572	34,065	35,018	33,242
Intercity/Amtrak ⁱ , train-miles	209	93	30	33	35	36	37	37	38	38	38	38	38	38	38	38
Intercity/Amtrak ⁱ , car-miles	2,208	690	235	301	368	265	295	296	319	325	325	319	316	316	273	279
Total train-miles^j	613	520	458	413	539	584	513	530	538	542	556	532	491	503	514	483

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

^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 Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^c 1960. Motorcycle data are included in Light duty vehicle, short wheel base, and Light duty vehicle, long wheel base data are included in Truck, single-unit 2-axle 6-tire or more.

^d Motor bus and Demand response figures are also included in the Bus figure for Highway.

^e Prior to 1985, excludes Demand response 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 Beginning in 2011, Light rail includes Light Rail, Street Car Rail, and Hybrid Rail.

^g Ferry boat included with Other under Transit for 1980 and 1985.

^h Other includes Aerial Tramway, Alaska Railroad, Bus Rapid Transit, Cable Car, Commuter Bus, Demand Response - Taxi, Inclined Plane, Monorail/Automated Guideway, Publico and Vanpool.

ⁱ National Passenger Railroad Corporation (Amtrak) began operations in 1971.

^j Although both Train-miles and Car-miles are shown for rail, only Train-miles 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.

NOTES

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

Numbers may not add to totals due to rounding.

Transit data from 1996 and after are not comparable to the data for earlier years.

Table 1-36: Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional System^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Urban VMT, total (millions)	855,265	1,275,484	1,663,773	1,957,004	1,982,358	1,972,094	1,992,191	2,046,369	2,104,728	2,166,468	2,224,863	2,249,142	2,261,525	2,277,919
Interstate	161,242	278,901	393,465	470,925	477,693	476,704	484,547	505,309	519,843	541,186	558,388	567,210	571,415	575,753
Other arterial ^b	484,189	699,233	900,392	1,051,088	1,052,572	1,044,104	1,052,184	1,068,927	1,085,036	1,108,786	1,137,848	1,144,086	1,154,156	1,156,585
Collector ^c	83,043	106,297	135,372	170,265	180,565	178,778	179,513	188,547	205,053	213,425	222,207	223,350	229,608	240,037
Local	126,791	191,053	234,544	264,726	271,528	272,507	275,946	283,585	294,796	303,071	306,421	314,495	306,346	305,544
Rural VMT, total (millions)	672,030	868,878	1,083,152	1,032,426	984,148	974,038	976,624	941,912	920,928	928,905	949,545	963,206	978,802	963,853
Interstate	135,084	200,173	268,180	256,642	245,647	243,587	245,872	234,303	231,372	235,766	246,716	252,550	257,240	261,644
Other arterial ^b	262,774	330,866	420,599	396,455	376,413	373,099	371,954	368,762	355,119	357,431	367,605	372,393	379,531	383,808
Collector ^c	189,468	240,460	267,231	250,701	229,357	227,754	228,771	221,223	208,689	208,685	207,590	205,100	208,153	206,767
Local	84,704	97,379	127,142	128,628	132,731	129,597	130,027	127,623	125,747	127,024	127,634	133,162	133,878	131,633
Urban VMT per lane-mile, total (thousands)	613	764	869	865	804	801	796	775	785	799	818	822	821	819
Interstate	3,327	4,483	5,323	5,477	5,178	5,142	5,150	5,108	5,070	5,167	5,306	5,364	5,353	5,381
Other arterial ^b	1,451	1,751	1,974	2,007	1,846	1,860	1,851	1,837	1,892	1,881	1,938	1,939	1,941	1,946
Collector ^c	572	634	718	755	723	731	701	695	688	693	707	708	728	740
Local	146	184	196	185	176	175	174	168	173	177	179	182	176	174
Rural VMT per lane-mile, total (thousands)	103	136	172	169	161	159	160	157	151	154	158	160	162	164
Interstate	1,031	1,473	1,993	2,044	1,986	1,967	1,971	1,939	1,949	1,994	2,073	2,119	2,146	2,178
Other arterial ^b	518	640	778	749	714	714	691	676	671	676	691	697	710	714
Collector ^c	132	164	189	183	166	166	167	163	156	156	155	153	156	155
Local	19	23	30	32	33	32	32	32	31	31	32	33	33	33

^a Includes the 50 States and the District of Columbia.

^b *Urban other arterial* includes other freeways and expressways, other principal arterial, and minor arterial. *Rural other arterial* includes other principal arterial and minor arterial prior to 2009, and includes other freeways and expressways, other principal arterial and minor arterial for 2009.

^c *Collector* is the sum of major and minor collectors.

NOTES

See table 1-6 for estimated highway *Lane-miles* by functional system. Component values may not add to totals due to rounding.

Table 1-37: U.S. Air Carrier Aircraft Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons

	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AIRCRAFT DEPARTURES														
Total performed ^a	5,156,848	6,641,681	8,928,902	8,450,987	8,440,485	8,328,338	8,273,972	8,096,255	8,075,113	8,210,517	8,263,525	8,431,304	8,637,164	5,464,443
Total scheduled	5,204,564	6,758,571	8,687,859	8,515,359	8,473,404	8,271,104	8,262,781	8,144,034	8,095,087	8,199,224	8,279,271	8,399,298	8,597,995	5,544,056
Large hubs														
Performed	2,887,239	4,167,868	5,561,871	5,116,388	5,244,299	5,232,334	5,239,221	5,172,067	5,184,816	5,252,341	5,256,956	5,261,970	5,339,730	97,453
Scheduled	2,905,923	4,237,466	5,439,692	5,206,101	5,306,153	5,220,743	5,266,740	5,220,225	5,215,655	5,278,394	5,297,641	5,289,702	5,374,442	104,380
Medium hubs														
Performed	1,048,726	1,394,833	1,826,998	1,748,793	1,652,936	1,577,529	1,534,939	1,370,809	1,451,332	1,502,287	1,537,223	1,717,651	1,770,533	855,539
Scheduled	1,058,438	1,417,762	1,768,404	1,754,154	1,657,888	1,575,290	1,522,600	1,371,094	1,444,853	1,488,382	1,525,225	1,688,349	1,738,026	893,804
Small hubs														
Performed	598,559	669,450	780,852	985,885	952,803	948,737	944,183	998,843	919,517	938,670	931,440	883,781	977,113	1,680,492
Scheduled	608,738	679,103	761,348	991,263	953,045	937,711	941,650	1,008,684	928,365	939,016	939,620	881,690	975,762	1,759,616
Nonhubs														
Performed	622,324	409,530	696,291	571,456	562,522	542,695	529,086	526,303	486,690	482,968	503,034	536,044	514,968	2,112,575
Scheduled	631,465	424,240	673,584	544,646	537,134	519,528	514,211	523,094	481,049	468,867	491,722	517,869	487,443	2,204,160
ENPLANED REVENUE PASSENGERS^b	281,408,852	438,544,001	639,707,419	660,884,123	672,313,286	679,479,939	685,713,647	704,526,900	738,709,390	762,873,095	785,764,257	819,250,485	853,274,530	349,237,677
Large hubs	197,679,376	317,595,099	459,558,634	458,504,180	475,276,034	483,156,286	489,666,266	504,060,131	530,081,231	545,883,494	558,593,505	569,190,669	588,268,143	11,948,542
Medium hubs	51,664,627	80,466,373	121,321,881	128,832,437	122,278,846	119,132,112	117,108,174	116,227,491	123,896,419	130,408,723	137,034,606	159,280,740	167,314,877	85,716,575
Small hubs	23,393,324	30,771,383	40,365,305	54,404,550	54,482,231	56,621,542	57,580,965	61,315,174	62,883,972	64,395,630	66,116,559	64,654,709	72,738,099	123,924,401
Nonhubs	8,671,525	9,711,146	18,364,860	19,044,845	20,188,937	20,474,041	21,277,540	22,839,678	21,794,603	22,097,692	23,926,550	26,055,035	24,872,179	124,788,231
ENPLANED REVENUE TONS^c	5,088,313	6,298,824	15,103,546	12,441,487	12,293,358	12,188,582	12,235,666	12,566,433	12,826,635	13,299,428	14,219,520	14,954,600	15,192,768	16,342,957
Freight, total	3,562,187	4,732,726	12,768,706	11,936,668	11,783,201	11,692,218	11,736,495	12,066,041	12,250,247	12,774,959	13,605,357	14,349,029	14,594,401	15,748,219
Large hubs	3,008,311	3,001,217	6,110,283	4,068,007	4,089,717	4,044,609	3,968,843	4,062,234	4,131,279	4,290,456	4,627,493	4,598,627	4,654,942	26,369
Medium hubs	414,325	1,446,744	4,743,228	5,135,044	4,974,768	5,032,586	5,132,960	2,936,281	5,372,098	5,589,577	5,898,096	6,610,677	6,640,382	250,128
Small hubs	73,795	191,358	948,867	1,968,190	1,971,395	1,994,791	2,061,269	4,488,470	2,129,980	2,184,983	2,258,212	2,232,877	2,337,477	258,429
Nonhubs	65,756	93,407	711,964	535,645	501,481	440,924	429,698	438,417	453,186	488,241	569,237	646,029	671,973	304,811
Mail, total	1,526,125	1,566,098	2,334,840	504,819	510,157	496,364	499,171	500,392	576,388	524,469	614,163	605,571	598,367	594,738
Large hubs	1,091,059	1,146,589	1,642,412	345,144	353,777	345,266	347,963	342,604	404,497	368,290	431,545	407,400	392,021	10,289
Medium hubs	255,929	292,899	485,562	86,473	84,374	81,877	87,203	87,103	99,622	87,170	99,832	118,184	116,486	93,324
Small hubs	148,116	108,656	109,283	54,697	54,760	52,326	48,337	56,040	57,372	57,098	70,908	67,467	67,991	96,234
Nonhubs	31,021	17,954	36,563	13,740	13,089	12,983	12,627	11,481	11,783	9,773	10,026	10,808	19,304	70,322

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

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

^c The number of short tons transported on a flight by an air carrier.

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 U.S. territories. 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, air taxi, small-certificated, and foreign-flag air carriers are not included. Airport hub 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 and at least 2,500 passenger boardings = nonhub.

Table 1-38: Average Length of Haul, Domestic Freight and Passenger Modes (miles)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Freight																		
Air carrier	U	U	U	U	1,077	1,218	1,157	1,150	1,174	1,153	1,161	1,165	1,166	1,202	1,217	1,212	1,270	
Class I rail	461	515	616	726	843	893	914	917	973	990	1,006	1,020	1,021	1,033	1,046	1,032	U	
Coastwise (water)	1,496	1,509	1,915	1,605	1,251	1,233	1,169	1,119	1,032	993	1,003	1,003	1,018	1,073	1,084	1,065	U	
Lakewise (water)	522	506	536	553	506	540	563	558	568	570	564	553	555	580	585	573	U	
Internal (water)	282	330	405	470	481	440	466	483	472	444	471	474	479	493	515	486	U	
Intraport (water)	U	U	17	13	16	17	16	16	16	15	17	16	15	15	14	14	U	
Crude (oil pipeline)	325	300	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Petroleum products (oil pipeline)	269	357	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Passenger																		
Air carrier, domestic, scheduled	583	678	736	803	834	866	878	883	885	895	898	906	917	922	927	928	905	
Commuter rail	U	U	23	22	23	22	23	25	24	25	24	24	24	25	25	25	U	
Amtrak ^a	NA	NA	216	273	244	215	220	213	218	218	218	213	208	205	200	198	U	

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

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

NOTES

Average length of haul for *freight* is calculated by dividing ton-miles 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* and *Amtrak* it is calculated by dividing passenger-miles by number of passengers.

Eno Transportation Foundation has discontinued some data series years prior to 1990. Detail may not add to totals due to rounding.

Table 1-39: Worldwide Commercial Space Launches

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL 1990-2017
TOTAL space launches	15	35	18	23	18	20	23	23	21	21	33	635
United States, total	9	7	1	4	0	2	6	11	8	11	22	214
Antares	0	0	0	0	0	0	0	3	0	1	1	5
Athena	0	0	0	0	0	0	2	0	0	0	0	8
Atlas	1	3	1	0	0	0	0	1	2	3	1	70
Conestoga	0	0	0	0	0	0	0	0	0	0	0	1
Delta	5	2	0	2	0	0	0	1	0	0	0	57
Dragon	0	0	0	0	0	0	0	0	0	0	0	0
Electron	0	0	0	0	0	0	0	0	0	0	1	1
Falcon	0	0	0	2	0	2	3	6	6	7	17	46
Minotaur	0	0	0	0	0	0	1	0	0	0	2	3
Pegasus	0	2	0	0	0	0	0	0	0	0	0	16
Taurus	0	0	0	0	0	0	0	0	0	0	0	4
Titan	3	0	0	0	0	0	0	0	0	0	0	3
Europe, total	5	12	5	6	4	6	4	6	6	8	6	183
Ariane 4	5	8	0	0	0	0	0	0	0	0	0	98
Ariane 5	0	4	5	6	4	6	3	4	6	6	5	79
Soyuz 2	0	0	0	0	0	0	1	2	0	0	0	3
Vega	0	0	0	0	0	0	0	0	0	2	1	3
Russia, total	0	13	8	13	10	7	12	4	5	2	5	169
Cosmos	0	2	1	0	0	0	0	0	0	0	0	8
Dnepr	0	1	0	3	1	0	2	2	1	0	0	20
Kosmos	0	0	0	0	0	0	0	0	0	0	0	3
Proton	0	6	4	8	7	7	7	2	4	2	3	100
Rocket	0	0	1	1	0	0	1	0	0	0	0	9
Shtil	0	0	0	0	0	0	0	0	0	0	0	1
Soyuz	0	3	1	0	0	0	0	0	0	0	0	12
Soyuz 2	0	0	0	1	2	0	1	0	0	0	2	10
Start	0	1	0	0	0	0	0	0	0	0	0	4
Volna	0	0	1	0	0	0	0	0	0	0	0	1
Zenit 3SLB	0	0	0	0	0	0	1	0	0	0	0	1
Ukraine, total	0	0	0	0	0	0	0	0	0	0	0	1
Zenit 2	0	0	0	0	0	0	0	0	0	0	0	1
China, total	1	0	0	0	2	2	0	0	0	0	0	23
Long March 2C	0	0	0	0	0	0	0	0	0	0	0	6
Long March 2E	0	0	0	0	0	0	0	0	0	0	0	6
Long March 3	1	0	0	0	0	0	0	0	0	0	0	3
Long March 3B	0	0	0	0	2	1	0	0	0	0	0	7
Long March 2D	0	0	0	0	0	1	0	0	0	0	0	1
India, total	0	0	0	0	0	0	0	1	2	0	0	4
PSLV	0	0	0	0	0	0	0	1	2	0	0	4
Sea Launch^a, total	0	3	4	0	2	3	1	1	0	0	0	41
Zenit 3SL	0	3	4	0	2	3	1	1	0	0	0	41

^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. *Sea Launch* filed for Chapter 11 bankruptcy protection in June 2009 and thus had no launches in the second half of the year.

NOTE

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

Table 1-40: U.S. Passenger-Miles (millions)

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air																
U.S. air carrier, certificated, domestic, all services	31,099	108,442	190,766	337,215	500,432	554,711	565,614	570,438	579,461	597,005	632,155	661,478	685,472	722,415	754,450	304,253
General aviation	2,300	9,100	14,700	13,000	15,200	N	N	N	N	N	N	N	N	N	N	N
Highway, total	1,272,078	2,042,002	2,653,510	3,539,603	4,370,489	5,009,806	4,997,049	5,046,332	5,083,123	5,158,161	5,282,710	5,411,828	5,482,190	5,545,845	5,579,126	U
Light duty vehicle, short wheel base ^{a,b}	1,144,673	1,750,897	2,011,989	2,281,391	2,544,457	3,423,996	3,464,405	3,490,438	3,507,723	3,502,001	3,628,379	3,699,794	3,709,919	3,729,610	3,765,896	U
Motorcycle ^c	U	3,277	12,257	12,424	11,516	21,483	21,517	24,816	23,633	23,173	22,752	23,725	23,382	23,297	22,846	U
Light duty vehicle, long wheel base ^b	U	225,613	520,774	999,754	1,467,664	1,001,456	972,382	970,669	977,477	1,037,129	1,028,774	1,075,234	1,106,303	1,119,644	1,128,489	U
Truck, single-unit 2-axle 6-tire or more ^b	98,551	27,081	39,813	51,901	70,500	110,738	103,803	105,603	106,582	109,301	109,597	113,338	116,102	120,699	124,746	U
Truck, combination	28,854	35,134	68,678	94,341	135,020	175,789	163,791	163,602	168,436	169,830	170,246	174,557	181,490	184,165	175,305	U
Bus ^{a,e}	U	U	U	99,792	141,332	270,344	271,151	291,202	299,273	316,726	322,963	325,180	344,993	368,430	361,844	U
Transit^f, total	N	N	39,854	41,143	45,100	52,627	54,328	55,169	56,467	57,012	55,698	56,322	54,826	53,830	54,097	U
Motor bus ^{e,g}	N	N	21,790	20,981	18,807	20,570	19,905	20,130	18,927	18,965	18,506	18,150	17,076	16,584	16,387	U
Commuter bus ^h	N	N	U	U	U	U	653	1,012	2,331	2,464	1,587	2,261	2,148	2,040	1,980	U
Light rail ⁱ	N	N	381	571	1,339	2,173	2,363	2,489	2,565	2,675	2,678	2,756	2,776	2,728	2,693	U
Heavy rail	N	N	10,558	11,475	13,844	16,407	17,317	17,516	18,005	18,339	18,283	18,357	17,591	16,914	17,366	U
Trolley bus ^c	N	N	219	193	192	159	160	162	156	158	146	154	140	126	126	U
Commuter rail	4,197	4,592	6,516	7,082	9,400	10,774	11,314	11,121	11,736	11,600	11,687	11,768	12,251	12,610	12,707	U
Demand response ^d	N	N	U	431	588	841	846	851	852	864	871	865	864	851	839	U
Ferry boat ^g	N	N	U	286	298	389	389	402	402	414	451	489	486	520	547	U
Other ^{h,i}	N	N	390	124	632	1,315	1,379	1,486	1,495	1,534	1,488	1,522	1,495	1,456	1,453	U
Intercity/Amtrak^j	17,064	6,719	4,503	6,057	5,574	6,420	6,568	6,804	6,810	6,675	6,536	6,520	6,563	6,361	6,487	3,450
Walking ^k	N	N	N	11,418	N	N	N	N	N	N	N	N	N	N	N	N
Cycling ^l	N	N	N	3,471	N	N	N	N	N	N	N	N	N	N	N	N

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

^a Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category *Passenger car* and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport utility vehicles with wheelbases (WB) larger than 121 inches.

^b 1960, *Motorcycle* data are included in *Light duty vehicle, short wheel base*, and *Long duty vehicle*, and *Long duty vehicle* (commonly called "paratransit" service) counts have been subtracted from *Highway, total* and *Bus* because such miles are included under *Transit*.

^c To reduce double counting *Motor bus, Trolley bus*, and *Demand response* (commonly called "paratransit" service) counts have been subtracted from *Highway, total* and *Bus* because such miles are included under *Transit*.

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

^e *Motor bus* category includes motor bus and bus rapid transit. *Commuter bus* included with *Motor bus* for 1980 to 2010.

^f *Light rail* includes Light Rail, Street Car, Rail, and Hybrid Rail.

^g *Ferry boat* included with *Other* under *Transit* for 1980 and 1985.

^h *Other* includes Aerial Tramway, Alaska Railroad, Cable Car, Demand Response - Taxi, Inclined Plane, Monorail/Automated Guideway, Publico and Vampool.

ⁱ National Passenger Railroad Corporation (Amtrak) began operations in 1971. Does not include contract commuter passengers. Data may include some Canadian Amtrak stations.

^j National Household Travel Survey (NHTS) includes an inventory of all trips taken within a 24-hour period by all household members aged 5 or older. For each trip, respondents report trip purpose, mode of transportation (cycling, walking, etc.) and other trip characteristics. Reported trips that did not meet the definition of a trip were removed (e.g. a loop walk trip for exercise or for walking the dog, walk trips to access or egress from public transit). Additional information can be found at <https://nhts.omni.gov/>.

NOTES

Caution must be exercised in comparing passenger miles across modes because significantly different definitions are used. Modes that do not have a total are not meant to be totaled. Total of all modes together is not an accurate representation of total U.S. passenger miles due to double counting across modes.

Air carrier passenger-miles are computed by summing the products of the aircraft-miles flown on each inter airport segment multiplied by the number of passengers carried on that segment. *Highway* passenger-miles from 1960 to 1990 are calculated by multiplying vehicle-miles of travel as cited by FHWA by the average number of occupants for each vehicle type. Average vehicle occupancy rates are based on various sources, such as the National Household Travel Survey, conducted by the Federal Highway Administration, and the Vehicle Inventory and Use Survey, conducted by the Bureau of the Census. *Transit* passenger-miles are the cumulative sum of the distances ridden by each passenger. *Rail* passenger-miles represent the movement of 1 passenger for 1 mile.

In July 1997, the U.S. Department of Transportation, Federal Highway Administration 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 National Transportation Survey (1977, 1983, and 1995) and the National Household Travel Survey.

In 2011, FHWA developed a new methodology. This methodology takes advantage of additional and improved information available beginning in 2007 when states were first required to report motorcycle data—before that time, the reporting was not mandatory and the data were missing for a few states. Also, the new methodology does not rely on data from the Vehicle Inventory and Use Survey which provided critical data for the original methodology (The last VIUS was carried out in 2002). The data are revised with the new methodology back to the year 2007, so the data from 1980-2000 are not comparable.

The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data, vehicle registration data, and a host of modeling techniques. Vehicle occupancy is estimated by the FHWA from the National Household Travel Survey (NHTS) and the annual R.L. Polk Vehicle data, and a host of modeling techniques.

1995-2000 from 1995 Nationwide Personal Transportation Survey (NPTS), and before 1995 from NPTS, Vehicle Inventory and Use Survey (VIUS) and Transportation Statistics Annual Report (TSAR). For single unit trucks and combination trucks, 1 motor vehicle miles traveled = 1 person-miles traveled.

2007 data for Bus, Demand responsive (Paratransit), and Other are not comparable to earlier years due to change in the method of data collection and estimation by the American Public Transportation Association (APTA).

Transit data from 1996 and after are not comparable to the data for earlier years or to the data published in previous editions of the report due to different data sources used.

Table 1-41: Principal Means of Transportation to Work (thousands)

	1989		2001		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All workers	106,630	100.0	119,896	100.0	136,941	100.0	138,270	100.0	140,863	100.0	142,962	100.0	145,871	100.0	148,324	100.0	150,377	100.0	152,803	100.0	154,609	100.0	156,941	100.0
Automobile, total	93,943	88.1	105,450	88.0	118,124	86.3	119,027	86.1	121,136	86.0	122,664	85.8	125,007	85.7	126,924	85.6	128,348	85.4	130,341	85.3	131,850	85.3	133,054	84.8
Drives self	81,322	76.3	93,819	78.3	104,858	76.6	105,639	76.4	107,460	76.3	109,277	76.4	111,525	76.5	113,576	76.6	114,771	76.3	116,737	76.4	117,948	76.3	119,153	75.9
Carpool, total	12,621	11.8	11,631	9.7	13,266	9.7	13,388	9.7	13,676	9.7	13,387	9.4	13,481	9.2	13,348	9.0	13,577	9.0	13,604	8.9	13,902	9.0	13,901	8.9
2-person	9,708	9.1	9,012	7.5	10,294	7.5	10,382	7.5	10,548	7.5	10,266	7.2	10,348	7.1	10,234	6.9	10,368	6.9	10,308	6.7	10,502	6.8	10,470	6.7
3-person	1,748	1.6	1,642	1.4	1,733	1.3	1,759	1.3	1,830	1.3	1,824	1.3	1,840	1.3	1,830	1.2	1,902	1.3	1,924	1.3	1,981	1.3	1,982	1.3
4+ person ^a	1,165	1.1	977	0.8	1,239	0.9	1,246	0.9	1,298	0.9	1,297	0.9	1,293	0.9	1,283	0.9	1,307	0.9	1,372	0.9	1,418	0.9	1,449	0.9
Public transportation ^b	4,880	4.6	5,602	4.7	6,789	4.9	6,956	5.0	7,053	5.0	7,393	5.2	7,600	5.2	7,761	5.2	7,849	5.1	7,637	5.0	7,615	4.9	7,778	5.0
Taxicab	152	0.1	133	0.1	151	0.1	165	0.1	162	0.1	161	0.1	166	0.1	188	0.1	227	0.2	303	0.2	359	0.2	386	0.2
Bicycle ^c	NA	NA	NA	NA	731	0.5	778	0.6	865	0.6	882	0.6	904	0.6	885	0.6	864	0.6	837	0.5	821	0.5	806	0.5
Motorcycle	795	0.7	846	0.7	267	0.2	288	0.2	325	0.2	296	0.2	285	0.2	266	0.2	251	0.2	239	0.2	220	0.1	222	0.1
Walks only	3,634	3.4	3,405	2.8	3,797	2.8	3,888	2.8	3,969	2.8	4,000	2.8	4,011	2.7	4,114	2.8	4,086	2.7	4,055	2.7	4,026	2.6	4,153	2.6
Other means ^d	491	0.5	1,052	0.9	1,178	0.9	1,175	0.8	1,209	0.9	1,337	0.9	1,354	0.9	1,343	0.9	1,360	0.9	1,397	0.9	1,466	0.9	1,571	1.0
Works at home	2,736	2.6	3,409	2.8	5,924	4.3	5,994	4.3	6,144	4.4	6,229	4.4	6,543	4.5	6,843	4.6	7,592	5.0	7,994	5.2	8,252	5.3	8,971	5.7

KEY: NA = not applicable.

^a From 2004 onward, the Carpool categories are 2-person and 3+ person; 4+ person is the sum of 4-person, 5-6 persons, and 7+ persons from the source data.

^b Public transportation refers to bus, streetcar, subway, railroad, and elevated trains for years 1989-2001, and includes ferries from 2002-14.

^c From 1989 to 2001, Bicycle data are included under Motorcycle.

^d Other means include ferries, surface trains, and van service and other means not classified for years 1989-2001, and excludes ferries from 2002-14.

NOTES

Principal means of transportation to work refers to the mode of travel used to get from home to work most frequently. If more than one means of transportation was used each day, those surveyed were asked to specify the one used for the longest distance during the trip from home to work.

Component values may not add to totals due to rounding.

Table 1-42 Average Annual PMT, VMT Person Trips and Trip Length by Trip Purpose

Trip purpose	1983	1990	1995	2001	2009	2017	1983	1990	1995	2001	2009	2017
	Average annual PMT per household						Average annual VMT per household					
All purposes	22,802	30,316	34,459	35,244	33,004	33,587	11,739	18,161	20,895	21,187	19,850	17,815
To/from work	4,586	5,637	7,740	6,706	6,256	6,259	3,538	4,853	6,492	5,724	5,513	5,379
Work related business	1,354	1,043	1,987	2,987	2,078	1,326	U	U	U	U	U	564
Shopping	2,567	3,343	4,659	4,887	4,620	4,122	1,567	2,178	2,807	3,062	2,979	2,618
Other family/personal errands	3,311	7,167	7,381	6,671	5,134	3,738	1,816	4,250	4,307	3,956	3,515	2,556
School/church	1,522	1,599	1,973	2,060	2,049	2,189	U	U	U	U	U	963
Social and recreational	8,964	11,308	10,571	10,586	9,989	5,291	3,534	5,359	4,764	5,186	4,842	2,597
Other	500	214	131	1,216	2,878	6,666	U	U	U	U	U	1,140
	Average annual person trips per household						Average annual vehicle trips per household					
All purposes	2,628	3,262	3,828	3,581	3,466	3,140	1,486	2,077	2,321	2,171	2,068	1,865
To/from work	537	539	676	565	541	546	414	448	553	479	457	450
Work related business	62	38	100	109	106	51	U	U	U	U	U	37
Shopping	474	630	775	707	725	580	297	431	501	459	468	372
Other family/personal errands	456	854	981	863	748	551	272	579	626	537	500	389
School/church	310	304	337	351	333	341	U	U	U	U	U	98
Social and recreational	728	874	953	952	952	609	335	460	427	441	436	295
Other	61	22	6	30	61	178	U	U	U	U	U	72
	Average person trip length (miles)						Average vehicle trip length (miles)					
All purposes	8.7	9.5	9.1	10.0	9.7	10.7	7.9	8.9	9.1	9.9	9.7	9.6
To/from work	8.5	10.7	11.6	12.1	11.8	11.5	8.6	11.0	11.8	12.1	12.2	12.0
Work related business	21.8	28.2	20.3	28.3	20.0	25.9	U	U	U	U	U	15.2
Shopping	5.4	5.4	6.1	7.0	6.5	7.1	5.3	5.1	5.6	6.7	6.4	7.0
Other family/personal errands	7.3	8.6	7.6	7.8	7.0	6.8	6.7	7.4	6.9	7.5	7.1	6.6
School/church	4.9	5.4	6.0	6.0	6.3	6.4	U	U	U	U	U	9.9
Social and recreational	12.3	13.2	11.3	11.4	10.7	8.7	10.6	11.8	11.2	11.9	11.2	8.8
Other	8.2	10.3	22.8	43.1	51.5	37.5	U	U	U	U	U	15.9

KEY: PMT = Person Miles of Travel; VMT = Vehicle Miles of Travel; U = data are not available.

NOTES

Children aged 0-4 are excluded from 2001 NHTS.

All tables reporting totals could include some unreported characteristics.

MOE is Margin of Error. CI is Confidence Interval. Margin of Error calculated using jackknife method and replicate weights.

1990 person and vehicle trips were adjusted to account for survey collection method changes (see 2001 Summary of Travel Trends Appendix 2). The survey collection method was changed from a one-stage survey in 1990 (with retrospective collection of travel day trips) to a two-stage survey with a travel diary in 1995 and later. The result of this improvement was to increase the accuracy and number of trips reported and to decrease the survey response rate.

Table 1-43 Summary Statistics on Demographic Characteristics and Total Travel

	1969	1977	1983	1990	1995	2001	2009	2017
Households (thousands)	62,504	75,412	85,371	93,347	98,990	107,365	113,101	118,208
1 person	10,980	16,214	19,354	22,999	24,732	27,718	31,741	32,952
2 persons	18,448	22,925	27,169	30,114	31,834	35,032	37,728	40,056
3 persons	10,746	13,046	14,756	16,128	16,827	17,749	18,104	18,521
4+ persons	22,330	23,227	24,092	24,106	25,597	26,867	25,528	26,680
Persons (thousands)	197,213	213,141	229,453	239,416	259,994	257,577	283,054	300,650
Under 16	60,100	54,958	53,682	54,303	61,411	44,985	44,724	45,331
16-19	14,598	16,552	15,268	13,851	14,074	14,296	19,414	17,697
20-34	40,060	52,252	60,788	59,517	59,494	57,680	50,844	64,873
35-64	62,982	66,988	75,353	82,480	93,766	103,296	129,202	126,028
65+	19,473	22,391	24,362	26,955	31,249	32,884	38,870	47,580
All 16+	137,113	158,183	175,771	182,803	198,583	208,155	238,330	255,371
All male	94,465	102,521	111,514	114,441	126,553	125,321	139,257	147,505
All male 16+	66,652	74,542	83,645	86,432	95,627	100,308	116,421	124,489
All female	102,748	110,620	117,939	124,975	133,441	132,240	143,797	153,145
All female 16+	73,526	83,721	92,080	96,371	102,956	107,847	121,908	130,882
All 5+	NA	198,434	212,932	222,101	241,675	257,576	283,054	300,649
All male 5+	NA	95,050	102,633	106,209	117,636	125,321	139,257	147,508
All female 5+	NA	103,384	110,299	115,892	124,039	132,239	143,797	153,144
Licensed drivers (thousands)	102,986	127,552	147,015	163,025	176,330	190,425	212,309	223,277
Male	57,981	66,199	75,639	80,289	88,480	94,651	106,813	111,024
Female	45,005	61,353	71,376	82,707	87,851	95,773	105,496	112,038
Workers (thousands)	75,758	93,019	103,244	118,343	131,697	145,272	151,373	156,988
Male	48,487	55,625	58,849	63,996	71,105	78,264	81,939	83,484
Female	27,271	37,394	44,395	54,334	60,593	67,007	69,434	73,353
Household vehicles (thousands)	72,500	120,098	143,714	165,221	176,067	201,308	210,778	222,579
Household vehicle trips (millions)	87,284	108,826	126,874	193,916	229,745	233,030	233,849	220,430
Household VMT (millions)	775,940	907,603	1,002,139	1,695,290	2,068,368	2,274,769	2,245,111	2,105,882
Person trips (millions)	145,146	211,778	224,385	304,471	378,930	384,485	392,023	371,152
Person miles of travel (millions)	1,404,137	1,879,215	1,946,662	2,829,936	3,411,122	3,783,979	3,732,791	3,970,287

KEY: NA = not applicable.

NOTES

Children aged 0-4 are excluded from 2001 NHTS.

All tables reporting totals could include some unreported characteristics.

MOE is Margin of Error. CI is Confidence Interval. Margin of Error calculated using jackknife method and replicate weights.

1990 person and vehicle trips were adjusted to account for survey collection method changes (see 2001 Summary of Travel Trends Appendix 2). The survey collection method was changed from a one-stage survey in 1990 (with retrospective collection of travel day trips) to a two-stage survey with a travel diary in 1995 and later. The result of this improvement was to increase the accuracy and number of trips reported and to decrease the survey response rate.

**Table 1-44: Passengers Boarded at the Top 50 U.S. Airports
(Ranked by passenger enplanements in 2020)**

Airport	Code	2010		2019		2020		Percent change 2010-2020	Percent change 2019-2020
		Rank	Total enplaned passengers	Rank	Total enplaned passengers	Rank	Total enplaned passengers		
Atlanta, GA (Hartsfield-Jackson Atlanta International)	ATL	1	43,132,110	1	53,505,357	1	20,559,853	-52.3	-61.6
Dallas/Fort Worth, TX (Dallas/Fort Worth International)	DFW	4	27,100,907	4	35,785,318	2	18,595,214	-31.4	-48.0
Denver, CO (Denver International)	DEN	5	25,242,113	5	33,592,591	3	16,243,216	-35.7	-51.6
Chicago, IL (Chicago O'Hare International)	ORD	2	32,172,478	3	40,887,890	4	14,613,209	-54.6	-64.3
Los Angeles, CA (Los Angeles International)	LAX	3	28,856,870	2	42,965,654	5	14,057,650	-51.3	-67.3
Charlotte, NC (Charlotte Douglas International)	CLT	11	18,629,119	11	24,199,255	6	12,954,907	-30.5	-46.5
Las Vegas, NV (McCarran International)	LAS	9	18,929,932	10	24,578,202	7	10,564,005	-44.2	-57.0
Phoenix, AZ (Phoenix Sky Harbor International)	PHX	10	18,897,123	13	22,452,649	8	10,531,432	-44.3	-53.1
Orlando, FL (Orlando International)	MCO	12	17,032,505	9	24,583,147	9	10,467,720	-38.5	-57.4
Seattle, WA (Seattle/Tacoma International)	SEA	17	15,406,461	8	25,001,725	10	9,462,173	-38.6	-62.2
Miami, FL (Miami International)	MIA	13	17,020,490	15	21,456,353	11	8,785,993	-48.4	-59.1
Houston, TX (George Bush Intercontinental/Houston)	IAH	7	19,525,011	14	21,907,940	12	8,682,555	-55.5	-60.4
New York, NY (John F. Kennedy International)	JFK	6	22,934,797	6	31,123,436	13	8,286,326	-63.9	-73.4
Fort Lauderdale, FL (Fort Lauderdale-Hollywood International)	FLL	23	10,839,685	19	17,957,960	14	8,016,052	-26.0	-55.4
Newark, NJ (Newark Liberty International)	EWR	14	16,570,545	12	23,172,148	15	7,992,494	-51.8	-65.5
San Francisco, CA (San Francisco International)	SFO	8	19,345,736	7	27,715,305	16	7,745,900	-60.0	-72.1
Minneapolis, MN (Minneapolis-St Paul International)	MSP	16	15,512,324	17	19,194,639	17	7,069,881	-54.4	-63.2
Detroit, MI (Detroit Metro Wayne County)	DTW	15	15,631,593	18	18,142,976	18	6,822,648	-56.4	-62.4
Boston, MA (Logan International)	BOS	19	13,562,287	16	20,706,281	19	6,035,944	-55.5	-70.8
Salt Lake City, UT (Salt Lake City International)	SLC	24	9,910,095	23	12,840,391	20	5,981,029	-39.6	-53.4
Philadelphia, PA (Philadelphia International)	PHL	18	14,950,559	20	16,013,208	21	5,754,547	-61.5	-64.1
Baltimore, MD (Baltimore/Washington International Thurgood Marshall)	BWI	22	10,848,446	22	13,291,553	22	5,451,318	-49.8	-59.0
Tampa, FL (Tampa International)	TPA	29	8,136,963	27	10,940,898	23	4,966,758	-39.0	-54.6
San Diego, CA (San Diego International)	SAN	28	8,430,057	24	12,648,162	24	4,637,851	-45.0	-63.3
Chicago, IL (Chicago Midway International)	MDW	27	8,518,044	28	10,080,647	25	4,236,584	-50.3	-58.0
New York, NY (LaGuardia)	LGA	20	12,011,317	21	15,393,464	26	4,147,169	-65.5	-73.1
Nashville, TN (Nashville International)	BNA	38	4,431,195	31	8,935,027	27	4,013,908	-9.4	-55.1
Washington, DC (Washington Dulles International)	IAD	21	11,276,628	25	11,893,911	28	3,896,928	-65.4	-67.2
Dallas, TX (Dallas Love Field)	DAL	49	3,782,978	33	8,079,382	29	3,669,907	-3.0	-54.6
Washington, DC (Ronald Reagan Washington National)	DCA	25	8,737,165	26	11,595,425	30	3,573,489	-59.1	-69.2
Portland, OR (Portland International)	PDX	30	6,581,829	30	9,796,991	31	3,455,870	-47.5	-64.7
Austin, TX (Austin - Bergstrom International)	AUS	43	4,200,771	32	8,506,822	32	3,141,496	-25.2	-63.1
Houston, TX (William P Hobby)	HOU	40	4,357,508	36	7,068,929	33	3,127,156	-28.2	-55.8
Honolulu, HI (Honolulu International)	HNL	26	8,725,506	29	9,983,928	34	3,123,203	-64.2	-68.7
St. Louis, MO (Lambert-St. Louis International)	STL	31	6,044,620	34	7,759,588	35	3,035,469	-49.8	-60.9
Fort Myers, FL (Southwest Florida International)	RSW	51	3,714,028	43	5,043,822	36	2,947,134	-20.6	-41.6
Sacramento, CA (Sacramento International)	SMF	39	4,424,300	40	6,454,573	37	2,710,342	-38.7	-58.0
New Orleans, LA (Louis Armstrong New Orleans International)	MSY	44	4,087,786	38	6,873,707	38	2,632,602	-35.6	-61.7
San Juan, PR (Luis Munoz Marin International)	SJU	42	4,243,475	48	4,562,453	39	2,356,934	-44.5	-48.3
Raleigh/Durham, NC (Raleigh-Durham International)	RDU	37	4,465,881	37	6,919,021	40	2,338,451	-47.6	-66.2
San Jose, CA (Norman Y. Mineta San Jose International)	SJC	45	4,055,852	35	7,687,138	41	2,283,184	-43.7	-70.3
Oakland, CA (Metropolitan Oakland International)	OAK	35	4,673,039	39	6,666,077	42	2,271,243	-51.4	-65.9
Kansas City, MO (Kansas City International)	MCI	32	4,946,136	41	5,759,429	43	2,167,605	-56.2	-62.4
Cleveland, OH (Cleveland-Hopkins International)	CLE	36	4,590,951	45	4,894,345	44	1,992,351	-56.6	-59.3
Indianapolis, IN (Indianapolis International)	IND	50	3,728,731	47	4,709,061	45	1,989,105	-46.7	-57.8
San Antonio, TX (San Antonio International)	SAT	47	3,920,864	44	5,036,738	46	1,919,955	-51.0	-61.9
Santa Ana, CA (John Wayne Airport-Orange County)	SNA	41	4,278,208	42	5,197,866	47	1,824,836	-57.3	-64.9
Pittsburgh, PA (Pittsburgh International)	PIT	46	4,006,684	46	4,714,582	48	1,742,621	-56.5	-63.0
Cincinnati, OH (Cincinnati/Northern Kentucky International)	CVG	48	3,906,942	49	4,413,433	49	1,730,270	-55.7	-60.8
Columbus, OH (Port Columbus International)	CMH	52	3,145,899	50	4,171,340	50	1,577,580	-49.9	-62.2
Top 50 U.S. airports, total^a			592,306,377		786,860,737		306,184,067	-48.3	-61.1
All U.S. airports^b			712,759,271		935,281,452		368,712,023	-48.3	-60.6

^aThe 2010 and 2019 totals for the top 50 airports may not sum from the individual airports because some top 50 airports in 2020 were not in the top 50 in earlier years.^bAll U.S. airports consists of 1,242 airports as of 2020 and includes Puerto Rico, U.S. Virgin Islands and U.S. Pacific Trust Territories and Possessions.**NOTE**

Beginning in October 2002, data reports were expanded to include data for carriers that fly aircraft with 60 seats or less or having a payload capacity of 18,000 lbs. or less.

Table 1-45: Air Passenger Travel Arrivals in the United States from Selected Foreign Countries (thousands of passengers)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
TOTAL arriving passengers	20,262	42,712	72,206	75,593	80,817	83,865	87,439	91,787	96,415	102,562	108,285	113,959	119,957	122,563	32,223	
United States carriers	10,031	21,960	35,287	41,043	45,219	46,339	47,285	48,719	50,183	51,707	52,460	54,297	56,051	57,863	17,601	
Foreign carriers	10,231	20,752	36,919	34,550	35,598	37,526	40,154	43,068	46,232	50,855	55,825	59,663	63,905	64,701	14,622	
Selected countries of embarkation^a																
Canada		N	6,733	9,176	10,352	11,080	11,590	12,089	12,780	13,410	13,778	14,209	14,935	15,829	15,972	3,075
Mexico		2,886	4,735	7,928	9,523	9,076	9,190	9,592	10,414	11,106	12,759	13,818	14,849	15,339	15,397	3,744
United Kingdom		2,973	5,229	9,485	9,072	7,855	8,340	8,494	8,566	8,702	9,115	9,423	9,769	10,443	10,597	1,511
China/Taiwan		113	360	1,548	1,891	2,308	2,549	2,795	3,161	3,627	4,219	5,133	5,505	5,794	5,819	755
Germany		1,175	2,321	3,904	4,261	4,765	4,816	4,935	5,134	5,137	5,153	5,269	5,473	5,234	5,519	867
Japan		1,624	5,416	7,679	6,834	5,453	5,166	5,833	5,942	5,742	5,545	5,570	5,399	5,295	5,448	1,073
France		689	1,746	3,212	3,187	2,983	3,148	3,107	3,254	3,300	3,494	3,480	3,767	4,095	4,397	638
Dominican Republic		468	878	1,578	2,026	2,336	2,313	2,548	2,703	3,029	3,336	3,432	3,449	3,737	3,895	847
Netherlands		427	903	2,403	2,345	2,172	2,244	2,250	2,376	2,367	2,470	2,491	2,657	2,903	3,105	500
South Korea		234	849	1,454	1,448	1,911	2,101	2,300	2,496	2,664	2,851	3,048	3,371	3,323	3,075	616
Spain		312	584	939	867	1,328	1,460	1,390	1,321	1,381	1,494	1,618	1,816	2,148	2,450	321
Brazil		300	635	1,369	1,128	1,736	1,991	2,214	2,482	2,688	2,709	2,267	2,263	2,551	2,304	500
Italy		537	745	1,511	1,331	1,370	1,332	1,282	1,303	1,490	1,586	1,654	1,739	2,003	2,244	173
Jamaica		429	991	1,313	1,361	1,493	1,555	1,561	1,564	1,634	1,729	1,828	1,932	2,053	2,227	518
Colombia		315	297	699	723	1,149	1,127	1,245	1,400	1,467	1,583	1,673	1,683	1,915	2,052	451
Ireland		220	349	847	914	878	898	912	1,042	1,125	1,250	1,423	1,613	1,847	1,887	233
Panama		150	199	384	442	772	856	1,048	1,181	1,370	1,428	1,517	1,620	1,829	1,874	392
Hong Kong		228	348	709	987	1,148	1,168	1,210	1,191	1,407	1,500	1,643	1,688	1,968	1,827	217
Australia		227	456	808	796	1,111	1,187	1,261	1,360	1,360	1,447	1,501	1,551	1,635	1,661	343
The Bahamas		1,123	1,033	1,281	1,565	1,303	1,223	1,327	1,246	1,296	1,302	1,325	1,353	1,531	1,659	346
Switzerland		312	617	1,067	715	923	972	1,002	1,030	998	1,034	1,085	1,139	1,245	1,255	191
Israel		189	148	513	529	740	714	697	710	698	703	696	737	800	878	189
Philippines		194	224	348	404	457	427	417	417	414	407	478	518	523	626	216
Cayman Islands		121	145	365	200	334	349	351	376	403	415	419	449	505	546	130
Denmark		267	326	225	309	335	302	265	308	430	435	533	535	527	504	57
Belgium		242	469	752	379	556	569	546	565	602	615	426	461	482	474	78
Haiti		133	244	296	283	413	486	547	517	562	594	610	616	616	465	85

Table 1-45 cont'd: Air Passenger Travel Arrivals in the United States from Selected Foreign Countries (thousands of passengers)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bermuda	497	482	382	338	307	302	294	302	284	283	315	334	351	339	41
Greece	208	117	194	133	158	137	88	61	77	104	141	214	252	304	16
Barbados	135	270	214	257	219	223	212	202	193	225	256	277	280	293	66
Venezuela	533	411	806	661	537	589	657	736	499	428	463	373	319	60	0
Netherlands Antilles	327	366	324	416	384	0	0	0	0	0	0	0	0	0	0

KEY: N = data do not exist.

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

NOTES

Data includes passengers on international commercial flights arriving at U.S. airports and only from foreign ports to U.S. ports and, Puerto Rico, Guam, or the Virgin Islands, and other U.S. territories.

Data compiled from flight reports required by the U.S. Department of Transportation.

Total arriving passengers for 1980 does not include Canada.

Numbers may not add to totals due to independent rounding.

Table 1-46: Air Passenger Travel Departures from the United States to Selected Foreign Countries (thousands of passengers)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL departing passengers	19,256	42,183	71,547	75,457	80,385	83,626	87,024	91,266	95,888	101,842	107,473	113,331	119,627	122,081	32,107
United States carriers	9,369	21,599	35,032	40,975	45,071	46,349	47,315	48,713	50,224	51,740	52,540	54,315	56,217	58,058	17,520
Foreign carriers	9,886	20,584	36,515	34,482	35,314	37,277	39,709	42,553	45,664	50,102	54,932	59,016	63,410	64,024	14,587
Selected countries of debarkation^a															
Canada	N	6,686	9,076	10,296	11,110	11,577	12,117	12,782	13,444	13,777	14,246	14,998	15,846	16,025	3,267
Mexico	2,886	4,919	8,370	9,872	9,119	9,282	9,612	10,448	11,129	12,868	13,943	14,974	15,443	15,449	3,419
United Kingdom	2,840	5,205	9,485	9,089	7,893	8,387	8,460	8,587	8,740	9,163	9,498	9,907	10,621	10,891	1,537
China/Taiwan	90	352	1,514	1,902	2,228	2,500	2,770	3,135	3,593	4,194	5,109	5,474	5,760	5,759	672
Germany	1,178	2,337	3,847	4,229	4,728	4,765	4,878	5,063	5,091	5,074	5,167	5,394	5,174	5,445	837
Japan	1,602	5,290	7,569	6,703	5,320	5,034	5,707	5,797	5,573	5,452	5,473	5,293	5,198	5,361	1,022
France	635	1,756	3,143	3,171	2,981	3,145	3,108	3,248	3,304	3,506	3,523	3,785	4,118	4,420	631
Dominican Republic	443	826	1,553	1,992	2,273	2,287	2,519	2,685	3,020	3,287	3,355	3,402	3,705	3,839	727
South Korea	186	755	1,395	1,430	1,936	2,120	2,238	2,443	2,615	2,783	2,977	3,318	3,296	2,993	611
Netherlands	409	866	2,384	2,314	2,165	2,241	2,232	2,330	2,322	2,395	2,419	2,629	2,894	3,108	518
Brazil	291	588	1,294	1,124	1,743	2,012	2,227	2,474	2,666	2,691	2,242	2,203	2,496	2,286	548
Spain	273	568	949	856	1,350	1,487	1,398	1,300	1,353	1,479	1,619	1,807	2,146	2,452	306
Italy	495	693	1,485	1,304	1,353	1,327	1,263	1,267	1,456	1,553	1,617	1,698	1,975	2,235	167
Jamaica	382	963	1,277	1,344	1,481	1,543	1,549	1,546	1,610	1,703	1,797	1,908	2,027	2,214	457
Hong Kong	152	319	751	938	1,134	1,174	1,233	1,220	1,392	1,488	1,643	1,726	2,000	1,802	193
Ireland	212	344	835	928	863	873	890	1,023	1,102	1,230	1,374	1,587	1,828	1,874	228
Colombia	299	277	615	731	1,158	1,112	1,232	1,388	1,461	1,576	1,615	1,645	1,872	2,006	422
Panama	142	222	368	440	766	843	1,034	1,186	1,361	1,420	1,488	1,601	1,808	1,833	379
Australia	245	447	794	791	1,091	1,178	1,239	1,336	1,335	1,419	1,492	1,555	1,634	1,661	360
The Bahamas	1,006	956	1,283	1,557	1,290	1,213	1,318	1,237	1,286	1,282	1,305	1,343	1,527	1,640	317
Switzerland	306	617	1,054	716	921	966	1,025	1,033	1,010	1,043	1,096	1,152	1,249	1,264	194
Israel	186	214	528	526	744	721	699	711	690	704	700	739	800	874	173
Haiti	124	235	273	272	403	482	524	503	548	563	580	595	595	433	78
Denmark	254	329	220	314	331	303	263	307	429	433	525	542	525	495	59
Philippines	160	191	317	368	427	406	394	396	393	391	468	499	518	573	183
Cayman Islands	112	144	365	204	332	352	350	378	400	411	421	456	508	549	118
Belgium	231	398	741	374	556	569	543	549	580	600	416	459	480	477	76

Table 1-46 cont'd: Air Passenger Travel Departures from the United States to Selected Foreign Countries (thousands of passengers)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bermuda	467	484	378	337	306	303	294	303	284	283	314	335	351	339	42
Barbados	126	279	219	257	220	226	215	204	197	227	257	277	286	295	62
Greece	190	129	188	127	157	138	88	63	76	104	139	209	248	302	14
Venezuela	518	404	784	661	532	592	642	716	486	374	421	301	273	63	0
Netherlands Antilles	282	350	346	413	373	0	0	0	0	0	0	0	0	0	0

KEY: N = data do not exist.

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

NOTES

Data includes passengers on international commercial flights traveling to foreign airports from U.S. airports and airports in Puerto Rico, Guam, or the Virgin Islands, and other U.S. territories.

Data compiled from flight reports required by the U.S. Department of Transportation.

Total arriving passengers for 1980 does not include Canada.

Numbers may not add to totals due to independent rounding.

Table 1-47: U.S.-Canadian Border Land-Passenger Gateways: Entering the United States

	1996	2000	2005	2010	2011				
All U.S.-Canadian land gateways									
All personal vehicle passengers	101,070,734	All personal vehicle passengers	90,046,948	All personal vehicle passengers	62,501,376	All personal vehicle passengers	56,788,870	All personal vehicle passengers	59,191,636
All personal vehicles	39,631,000	All personal vehicles	36,915,053	All personal vehicles	30,351,683	All personal vehicles	28,884,267	All personal vehicles	31,595,769
All bus passengers	3,870,081	All bus passengers	4,872,943	All bus passengers	3,854,858	All bus passengers	2,451,226	All bus passengers	2,452,429
All pedestrians	607,987	All pedestrians	587,516	All pedestrians	613,820	All pedestrians	390,745	All pedestrians	398,599
All train passengers	213,596	All train passengers	269,502	All train passengers	235,502	All train passengers	254,536	All train passengers	276,730
All buses	173,279	All buses	189,264	All buses	153,454	All buses	116,064	All buses	113,932
Personal vehicle passengers — top 5 gateways									
Detroit, MI	24,152,184	Detroit, MI	21,723,936	Buffalo-Niagara Falls, NY	13,224,477	Buffalo-Niagara Falls, NY	11,917,742	Buffalo-Niagara Falls, NY	12,687,201
Buffalo-Niagara Falls, NY	16,516,951	Buffalo-Niagara Falls, NY	16,523,141	Detroit, MI	10,655,076	Detroit, MI	7,217,693	Blaine, WA	8,312,888
Blaine, WA	11,387,402	Blaine, WA	8,234,557	Blaine, WA	4,868,308	Blaine, WA	6,996,337	Detroit, MI	7,202,633
Port Huron, MI	5,391,721	Port Huron, MI	6,865,507	Port Huron, MI	4,001,589	Port Huron, MI	3,442,631	Port Huron, MI	3,768,493
Sault Sainte Marie, MI	5,325,033	Sault Sainte Marie, MI	3,881,423	Champlain-Rouses Point, NY	2,921,118	Champlain-Rouses Point, NY	2,238,864	Champlain-Rouses Point, NY	2,402,487
Personal vehicles — top 5 gateways									
Detroit, MI	8,251,853	Detroit, MI	8,360,352	Detroit, MI	6,035,004	Buffalo-Niagara Falls, NY	5,477,863	Buffalo-Niagara Falls, NY	5,912,282
Buffalo-Niagara Falls, NY	7,312,581	Buffalo-Niagara Falls, NY	7,657,846	Buffalo-Niagara Falls, NY	6,034,398	Detroit, MI	4,051,434	Blaine, WA	4,288,924
Blaine, WA	4,488,131	Blaine, WA	3,332,147	Blaine, WA	2,482,065	Blaine, WA	3,365,754	Detroit, MI	4,174,337
Port Huron, MI	2,014,668	Port Huron, MI	2,332,469	Port Huron, MI	1,953,413	Port Huron, MI	1,651,107	Port Huron, MI	1,842,632
Sault Sainte Marie, MI	1,592,413	Calais, ME	1,414,327	Calais, ME	1,174,011	Calais, ME	1,054,681	Point Roberts, WA	1,093,910
Bus passengers — top 5 gateways									
Buffalo-Niagara Falls, NY	1,418,075	Buffalo-Niagara Falls, NY	1,973,016	Buffalo-Niagara Falls, NY	1,367,283	Buffalo-Niagara Falls, NY	744,789	Buffalo-Niagara Falls, NY	729,403
Detroit, MI	564,349	Detroit, MI	857,607	Detroit, MI	931,100	Champlain-Rouses Point, NY	368,763	Champlain-Rouses Point, NY	395,680
Blaine, WA	479,278	Blaine, WA	441,320	Champlain-Rouses Point, NY	296,390	Blaine, WA	332,445	Blaine, WA	328,179
Champlain-Rouses Point, NY	288,043	Champlain-Rouses Point, NY	317,205	Blaine, WA	294,564	Detroit, MI	268,622	Detroit, MI	254,712
Sault Sainte Marie, MI	121,902	Port Huron, MI	155,153	Skagway, AK	134,204	Skagway, AK	144,994	Skagway, AK	143,706
Pedestrians — top 5 gateways									
Buffalo-Niagara Falls, NY	263,872	Buffalo-Niagara Falls, NY	280,941	Buffalo-Niagara Falls, NY	370,295	Buffalo-Niagara Falls, NY	258,868	Buffalo-Niagara Falls, NY	282,815
Sumas, WA	57,907	Sumas, WA	57,222	Calais, ME	44,238	Sumas, WA	28,172	Sumas, WA	26,527
Calais, ME	41,978	Calais, ME	51,033	Sumas, WA	33,769	International Falls-Ranier, MN	21,697	International Falls-Ranier, MN	18,582
International Falls-Ranier, MN	33,990	Portland, ME*	29,495	International Falls-Ranier, MN	24,497	Point Roberts, WA	14,265	Point Roberts, WA	16,717
Port Huron, MI	33,099	International Falls-Ranier, MN	26,456	Point Roberts, WA	22,440	Aracortes, WA	14,251	Detroit, MI	12,827
Train passengers — top 5 gateways									
Blaine, WA	40,293	Buffalo-Niagara Falls, NY	53,603	Skagway, AK	67,462	Skagway, AK	71,970	Blaine, WA	75,482
Buffalo-Niagara Falls, NY	31,857	Blaine, WA	46,343	Buffalo-Niagara Falls, NY	35,951	Blaine, WA	60,680	Skagway, AK	73,307
Port Huron, MI	28,973	Port Huron, MI	40,633	Blaine, WA	35,454	Champlain-Rouses Point, NY	41,625	Champlain-Rouses Point, NY	47,855
Champlain-Rouses Point, NY	27,686	Champlain-Rouses Point, NY	38,459	Champlain-Rouses Point, NY	29,831	Buffalo-Niagara Falls, NY	31,432	Buffalo-Niagara Falls, NY	30,702
Skagway, AK	23,068	Skagway, AK	35,253	Port Huron, MI	19,032	Port Huron, MI	8,228	Detroit, MI	8,550
Buses — top 5 gateways									
Buffalo-Niagara Falls, NY	54,173	Buffalo-Niagara Falls, NY	66,771	Buffalo-Niagara Falls, NY	45,289	Detroit, MI	28,868	Detroit, MI	27,708
Detroit, MI	40,201	Detroit, MI	41,234	Detroit, MI	37,244	Buffalo-Niagara Falls, NY	26,217	Buffalo-Niagara Falls, NY	25,731
Blaine, WA	19,098	Blaine, WA	18,104	Blaine, WA	12,720	Blaine, WA	15,768	Blaine, WA	15,502
Champlain-Rouses Point, NY	10,827	Champlain-Rouses Point, NY	11,728	Skagway, AK	10,257	Skagway, AK	10,303	Skagway, AK	10,540
Sault Sainte Marie, MI	10,022	Skagway, AK	8,579	Sault Sainte Marie, MI	10,243	Champlain-Rouses Point, NY	8,980	Champlain-Rouses Point, NY	9,544

Table 1-47 cont'd: U.S.-Canadian Border Land-Passenger Gateways: Entering the United States

All U.S.-Canadian land gateways	2012			2013			2014			2015			2016			
	All personal vehicle passengers	All personal vehicles	All bus passengers	All personal vehicle passengers	All personal vehicles	All bus passengers	All personal vehicle passengers	All personal vehicles	All bus passengers	All personal vehicle passengers	All personal vehicles	All bus passengers	All personal vehicle passengers	All personal vehicles	All bus passengers	
Personal vehicle passengers — top 5 gateways																
Buffalo-Niagara Falls, NY	62,008	778	62,347,059	62,347,059	All personal vehicle passengers	59,681,417	All personal vehicle passengers	52,122,219	All personal vehicle passengers	10,488,584	Buffalo-Niagara Falls, NY	4,791,851	4,902,293	Buffalo-Niagara Falls, NY	4,791,851	
Blaine, WA	33,083,636	All personal vehicles	33,273,388	All personal vehicles	31,979,736	All personal vehicles	28,544,860	All personal vehicles	27,319,904	8,153,216	Blaine, WA	7,671,886	4,234,824	Detroit, MI	4,040,990	
All bus passengers	2,435,608	All bus passengers	2,375,944	All bus passengers	2,243,782	All bus passengers	2,039,220	All bus passengers	1,939,294	6,916,029	Detroit, MI	6,788,976	4,046,472	Blaine, WA	3,900,537	
All pedestrians	424,570	All pedestrians	433,668	All pedestrians	439,797	All pedestrians	444,523	All pedestrians	461,520	3,884,165	Port Huron, MI	3,033,805	1,616,685	Port Huron, MI	1,561,932	
All train passengers	269,048	All train passengers	279,477	All train passengers	283,213	All train passengers	286,090	All train passengers	287,188	2,561,398	Champlain-Rouses Point, NY	2,254,144	1,030,395	Champlain-Rouses Point, NY	1,012,208	
All buses	108,021	All buses	106,152	All buses	103,748	All buses	95,833	All buses	88,234							
Personal vehicle passengers — top 5 gateways																
Buffalo-Niagara Falls, NY	13,062,312	Buffalo-Niagara Falls, NY	12,563,665	Buffalo-Niagara Falls, NY	11,617,483	Buffalo-Niagara Falls, NY	10,488,584	Buffalo-Niagara Falls, NY	10,246,670							
Blaine, WA	9,121,154	Blaine, WA	9,736,188	Blaine, WA	9,711,226	Blaine, WA	9,711,226	Blaine, WA	7,671,886							
Detroit, MI	7,326,327	Detroit, MI	7,315,039	Detroit, MI	7,049,603	Detroit, MI	7,049,603	Detroit, MI	6,788,976							
Port Huron, MI	3,946,252	Port Huron, MI	4,018,331	Port Huron, MI	3,884,165	Port Huron, MI	3,209,591	Port Huron, MI	3,033,805							
Champlain-Rouses Point, NY	2,581,591	Champlain-Rouses Point, NY	2,635,060	Champlain-Rouses Point, NY	2,561,398	Champlain-Rouses Point, NY	2,316,270	Champlain-Rouses Point, NY	2,254,144							
Personal vehicles — top 5 gateways																
Buffalo-Niagara Falls, NY	6,072,382	Buffalo-Niagara Falls, NY	5,847,483	Buffalo-Niagara Falls, NY	5,446,904	Buffalo-Niagara Falls, NY	4,902,293	Buffalo-Niagara Falls, NY	4,791,851							
Blaine, WA	4,730,705	Blaine, WA	4,977,947	Blaine, WA	4,873,847	Blaine, WA	4,234,824	Detroit, MI	4,040,990							
Detroit, MI	4,166,732	Detroit, MI	4,129,032	Detroit, MI	4,027,427	Detroit, MI	4,046,472	Blaine, WA	3,900,537							
Port Huron, MI	1,981,177	Port Huron, MI	2,037,430	Port Huron, MI	1,975,750	Port Huron, MI	1,616,685	Port Huron, MI	1,561,932							
Point Roberts, WA	1,169,632	Sumas, WA	1,234,184	Point Roberts, WA	1,190,183	Champlain-Rouses Point, NY	1,030,395	Champlain-Rouses Point, NY	1,012,208							
Bus passengers — top 5 gateways																
Buffalo-Niagara Falls, NY	687,530	Buffalo-Niagara Falls, NY	626,145	Buffalo-Niagara Falls, NY	590,406	Buffalo-Niagara Falls, NY	521,945	Buffalo-Niagara Falls, NY	500,935							
Champlain-Rouses Point, NY	410,941	Champlain-Rouses Point, NY	387,263	Champlain-Rouses Point, NY	332,621	Champlain-Rouses Point, NY	309,236	Champlain-Rouses Point, NY	338,146							
Blaine, WA	324,371	Detroit, MI	330,329	Blaine, WA	305,850	Blaine, WA	298,495	Blaine, WA	285,904							
Detroit, MI	265,757	Blaine, WA	314,526	Detroit, MI	280,497	Detroit, MI	229,636	Skagway, AK	177,498							
Skagway, AK	155,359	Skagway, AK	151,927	Skagway, AK	184,949	Skagway, AK	161,821	Detroit, MI	162,548							
Pedestrians — top 5 gateways																
Buffalo-Niagara Falls, NY	290,987	Buffalo-Niagara Falls, NY	280,260	Buffalo-Niagara Falls, NY	274,680	Buffalo-Niagara Falls, NY	305,675	Buffalo-Niagara Falls, NY	340,674							
Sumas, WA	36,565	Sumas, WA	46,761	Sumas, WA	59,350	Sumas, WA	46,407	Sumas, WA	33,531							
Point Roberts, WA	20,613	Point Roberts, WA	22,360	Point Roberts, WA	20,143	Point Roberts, WA	21,311	Point Roberts, WA	27,233							
International Falls-Ranier, MN	16,202	Calais, ME	21,180	Calais, ME	18,733	Detroit, MI	16,376	Detroit, MI	15,011							
Calais, ME	15,564	Detroit, MI	16,574	Detroit, MI	16,192	International Falls-Ranier, MN	13,662	International Falls-Ranier, MN	12,127							
Train passengers — top 5 gateways																
Skagway, AK	74,844	Skagway, AK	81,526	Skagway, AK	81,393	Skagway, AK	84,849	Skagway, AK	88,373							
Blaine, WA	64,175	Blaine, WA	72,915	Blaine, WA	75,527	Blaine, WA	77,015	Blaine, WA	83,566							
Champlain-Rouses Point, NY	49,498	Champlain-Rouses Point, NY	50,146	Champlain-Rouses Point, NY	49,754	Champlain-Rouses Point, NY	45,672	Champlain-Rouses Point, NY	40,973							
Buffalo-Niagara Falls, NY	27,009	Buffalo-Niagara Falls, NY	22,987	Buffalo-Niagara Falls, NY	22,441	Buffalo-Niagara Falls, NY	20,792	Buffalo-Niagara Falls, NY	20,756							
Detroit, MI	9,122	Detroit, MI	9,303	Port Huron, MI	10,001	Port Huron, MI	9,051	Warroad, MN	8,004							
Buses — top 5 gateways																
Buffalo-Niagara Falls, NY	23,959	Detroit, MI	23,295	Detroit, MI	21,247	Detroit, MI	19,877	Buffalo-Niagara Falls, NY	18,100							
Detroit, MI	22,865	Buffalo-Niagara Falls, NY	22,222	Buffalo-Niagara Falls, NY	20,292	Buffalo-Niagara Falls, NY	18,468	Blaine, WA	14,961							
Blaine, WA	15,988	Blaine, WA	15,078	Blaine, WA	15,284	Blaine, WA	14,888	Detroit, MI	14,513							
Skagway, AK	11,715	Skagway, AK	12,063	Skagway, AK	12,769	Skagway, AK	11,148	Skagway, AK	11,747							
Champlain-Rouses Point, NY	9,935	Champlain-Rouses Point, NY	10,224	Champlain-Rouses Point, NY	9,838	Champlain-Rouses Point, NY	9,513	Champlain-Rouses Point, NY	8,498							

Continued next page

Table 1-47 cont'd: U.S.-Canadian Border Land-Passenger Gateways: Entering the United States

All U.S.-Canadian land gateways	2017		2018		2019		2020	
	2017	2018	2018	2019	2019	2020	2020	2020
All personal vehicle passengers	50,145	51,460	51,460	51,460	51,460	51,460	51,460	51,460
All personal vehicles	26,759	26,904	26,904	26,904	26,904	26,904	26,904	26,904
All bus passengers	1,864	1,795	1,795	1,795	1,795	1,795	1,795	1,795
All pedestrians	442	486	486	486	486	486	486	486
All train passengers	284	289	289	289	289	289	289	289
All buses	84	77	77	77	77	77	77	77
Personal vehicle passengers — top 5 gateways								
Buffalo-Niagara Falls, NY	10,416	10,676	10,676	10,676	10,676	10,676	10,676	10,676
Blaine, WA	7,781	8,134	8,134	8,134	8,134	8,134	8,134	8,134
Detroit, MI	6,711	6,717	6,717	6,717	6,717	6,717	6,717	6,717
Port Huron, MI	3,068	3,086	3,086	3,086	3,086	3,086	3,086	3,086
Champlain-Rouses Point, NY	2,258	2,284	2,284	2,284	2,284	2,284	2,284	2,284
Personal vehicles — top 5 gateways								
Buffalo-Niagara Falls, NY	4,861	4,972	4,972	4,972	4,972	4,972	4,972	4,972
Detroit, MI	4,018	4,132	4,132	4,132	4,132	4,132	4,132	4,132
Blaine, WA	3,850	4,012	4,012	4,012	4,012	4,012	4,012	4,012
Port Huron, MI	1,579	1,524	1,524	1,524	1,524	1,524	1,524	1,524
Champlain-Rouses Point, NY	1,011	1,019	1,019	1,019	1,019	1,019	1,019	1,019
Bus passengers — top 5 gateways								
Buffalo-Niagara Falls, NY	496	467	467	467	467	467	467	467
Champlain-Rouses Point, NY	333	333	333	333	333	333	333	333
Blaine, WA	275	272	272	272	272	272	272	272
Skagway, AK	183	204	204	204	204	204	204	204
Detroit, MI	116	89	89	89	89	89	89	89
Pedestrians — top 5 gateways								
Buffalo-Niagara Falls, NY	333	358	358	358	358	358	358	358
Sumas, WA	30	47	47	47	47	47	47	47
Point Roberts, WA	25	26	26	26	26	26	26	26
Detroit, MI	15	13	13	13	13	13	13	13
International Falls-Ranier, MN	11	10	10	10	10	10	10	10
Train passengers — top 5 gateways								
Skagway, AK	93	102	102	102	102	102	102	102
Blaine, WA	88	89	89	89	89	89	89	89
Champlain-Rouses Point, NY	37	36	36	36	36	36	36	36
Buffalo-Niagara Falls, NY	19	19	19	19	19	19	19	19
Port Huron, MI	7	7	7	7	7	7	7	7
Buses — top 5 gateways								
Buffalo-Niagara Falls, NY	18	16	16	16	16	16	16	16
Blaine, WA	14	14	14	14	14	14	14	14
Skagway, AK	12	11	11	11	11	11	11	11
Detroit, MI	11	8	8	8	8	8	8	8
Champlain-Rouses Point, NY	8	7	7	7	7	7	7	7

* 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.

Table 1-48: U.S.-Mexican Border Land-Passenger Gateways: Entering the United States

	2000		2005		2010		2011	
All U.S.-Mexican land gateways								
All personal vehicle passengers	171,522,486	All personal vehicle passengers	239,794,552	All personal vehicle passengers	186,067,448	All personal vehicle passengers	125,749,521	All personal vehicle passengers
All personal vehicles	62,429,373	All personal vehicles	92,287,520	All personal vehicles	91,556,319	All personal vehicles	64,044,852	All personal vehicles
All pedestrians	34,109,364	All pedestrians	47,089,642	All pedestrians	45,829,612	All pedestrians	39,914,981	All pedestrians
All bus passengers	1,943,697	All bus passengers	3,465,916	All bus passengers	3,169,779	All bus passengers	2,679,707	All bus passengers
All buses	119,510	All buses	270,792	All buses	256,396	All buses	218,754	All buses
All train passengers	11,285	All train passengers	18,254	All train passengers	17,833	All train passengers	3,283	All train passengers
Personal vehicle passengers — top 5 gateways								
El Paso, TX	41,483,220	El Paso, TX	48,420,274	San Ysidro, CA	32,265,477	San Ysidro, CA	23,600,605	San Ysidro, CA
Hidalgo, TX	21,070,912	San Ysidro, CA	31,025,343	El Paso, TX	29,180,824	El Paso, TX	17,919,814	El Paso, TX
Calexico, CA	18,296,272	Hidalgo, TX	21,947,731	Brownsville, TX	14,614,745	Laredo, TX	10,857,512	Hidalgo, TX
Laredo, TX	16,932,272	Calexico, CA	20,094,460	Laredo, TX	14,017,324	Hidalgo, TX	10,691,969	Laredo, TX
Brownsville, TX	15,184,067	Brownsville, TX	19,693,130	Hidalgo, TX	13,969,453	Brownsville, TX	9,291,617	Brownsville, TX
Personal vehicles — top 5 gateways								
El Paso, TX	15,095,553	El Paso, TX	16,697,439	San Ysidro, CA	17,208,106	San Ysidro, CA	13,348,364	San Ysidro, CA
Laredo, TX	6,792,925	San Ysidro, CA	15,237,428	El Paso, TX	15,971,739	El Paso, TX	9,967,959	El Paso, TX
Calexico, CA	6,138,688	Hidalgo, TX	8,779,691	Brownsville, TX	7,103,553	Hidalgo, TX	5,604,124	Hidalgo, TX
Hidalgo, TX	6,098,540	Brownsville, TX	7,877,255	Hidalgo, TX	6,969,846	Laredo, TX	4,863,814	Laredo, TX
Brownsville, TX	6,073,623	Laredo, TX	7,151,127	Olay Mesa, CA	6,672,994	Brownsville, TX	4,640,465	Olay Mesa, CA
Pedestrians — top 5 gateways								
Calexico, CA	7,373,815	Calexico, CA	8,352,324	San Ysidro, CA	8,156,350	El Paso, TX	6,930,357	San Ysidro, CA
Nogales, AZ	4,417,030	San Ysidro, CA	7,542,450	El Paso, TX	7,613,546	San Ysidro, CA	6,439,952	El Paso, TX
El Paso, TX	4,405,140	El Paso, TX	5,825,155	Nogales, AZ	6,930,198	Calexico, CA	4,586,846	Calexico, CA
Brownsville, TX	3,801,203	Laredo, TX	5,492,769	Calexico, CA	4,481,014	Nogales, AZ	3,971,040	Nogales, AZ
Laredo, TX	3,713,397	Nogales, AZ	4,677,819	Laredo, TX	4,356,041	Laredo, TX	3,587,763	Laredo, TX
Bus passengers — top 5 gateways								
Hidalgo, TX	804,442	Olay Mesa, CA	845,775	San Ysidro, CA	995,337	Laredo, TX	902,023	Laredo, TX
Laredo, TX	531,402	San Ysidro, CA	783,762	Laredo, TX	826,679	San Ysidro, CA	550,301	El Paso, TX
Olay Mesa, CA	216,287	Hidalgo, TX	648,751	Hidalgo, TX	369,443	El Paso, TX	400,311	San Ysidro, CA
Brownsville, TX	111,400	Laredo, TX	608,184	El Paso, TX	276,381	Hidalgo, TX	310,943	Hidalgo, TX
El Paso, TX	105,757	El Paso, TX	155,493	Olay Mesa, CA	251,614	Nogales, AZ	167,047	Olay Mesa, CA
Buses — top 5 gateways								
Hidalgo, TX	40,277	San Ysidro, CA	101,244	San Ysidro, CA	105,930	San Ysidro, CA	70,548	San Ysidro, CA
Laredo, TX	25,498	Olay Mesa, CA	47,683	Olay Mesa, CA	39,203	Laredo, TX	44,121	Laredo, TX
Olay Mesa, CA	19,921	Laredo, TX	34,529	Laredo, TX	35,841	Olay Mesa, CA	34,630	Olay Mesa, CA
Del Rio, TX	7,062	Hidalgo, TX	31,836	Hidalgo, TX	27,964	El Paso, TX	22,852	El Paso, TX
Brownsville, TX	5,570	Brownsville, TX	16,073	El Paso, TX	15,993	Hidalgo, TX	20,031	Hidalgo, TX
Train passengers — top 5 gateways								
Eagle Pass, TX	5,336	Eagle Pass, TX	5,792	El Paso, TX	7,637	Nogales, AZ	2,408	Nogales, AZ
Tecate, CA	3,371	Nogales, AZ	4,752	Eagle Pass, TX	7,248	Olay Mesa, CA	452	Olay Mesa, CA
Calexico, CA	1,728	Tecate, CA	3,418	Calexico East, CA	1,239	Calexico East, CA	423	Calexico East, CA
Olay Mesa, CA	480	El Paso, TX	2,188	Nogales, AZ	952			
Presidio, TX	370	Calexico East, CA	1,687	Olay Mesa, CA	478			

Continued next page

Table 1-48 cont'd: U.S.-Mexican Border Land-Passenger Gateways: Entering the United States

	2012		2013		2014		2015		2016	
All U.S.-Mexican land gateways										
All personal vehicle passengers	115,049,565	All personal vehicle passengers	122,124,951	All personal vehicle passengers	129,243,838	All personal vehicle passengers	137,537,486	All personal vehicle passengers	140,702,408	
All personal vehicles	62,702,603	All personal vehicles	66,547,669	All personal vehicles	69,623,693	All personal vehicles	74,158,801	All personal vehicles	75,625,000	
All pedestrians	41,141,640	All pedestrians	41,198,935	All pedestrians	41,223,292	All pedestrians	41,179,967	All pedestrians	42,169,228	
All bus passengers	2,866,637	All bus passengers	2,822,956	All bus passengers	2,762,895	All bus passengers	2,554,064	All bus passengers	2,269,415	
All buses	212,211	All buses	210,200	All buses	213,780	All buses	202,682	All buses	178,288	
All train passengers	3,319	All train passengers	4,199	All train passengers	10,578	All train passengers	9,669	All train passengers	14,462	
Personal vehicle passengers – top 5 gateways										
San Ysidro, CA	19,944,913	San Ysidro, CA	19,887,054	San Ysidro, CA	21,116,089	San Ysidro, CA	25,646,073	San Ysidro, CA	24,014,192	
El Paso, TX	15,908,404	El Paso, TX	17,545,433	El Paso, TX	19,134,740	El Paso, TX	19,982,407	El Paso, TX	20,767,737	
Hidalgo, TX	9,484,335	Olay Mesa, CA	10,884,910	Olay Mesa, CA	12,040,318	Olay Mesa, CA	12,225,410	Olay Mesa, CA	13,583,328	
Olay Mesa, CA	9,297,601	Hidalgo, TX	9,608,966	Laredo, TX	10,335,481	Laredo, TX	10,985,281	Laredo, TX	10,745,977	
Laredo, TX	8,767,939	Laredo, TX	9,588,200	Hidalgo, TX	9,252,030	Hidalgo, TX	9,271,544	Hidalgo, TX	9,635,092	
Personal vehicles – top 5 gateways										
San Ysidro, CA	11,481,951	San Ysidro, CA	11,346,966	San Ysidro, CA	11,946,060	San Ysidro, CA	14,435,252	San Ysidro, CA	13,701,967	
El Paso, TX	9,461,721	El Paso, TX	10,877,163	El Paso, TX	11,595,319	El Paso, TX	12,258,192	El Paso, TX	12,525,548	
Olay Mesa, CA	5,346,210	Olay Mesa, CA	6,235,300	Olay Mesa, CA	6,910,219	Olay Mesa, CA	6,933,472	Olay Mesa, CA	7,722,264	
Hidalgo, TX	4,894,486	Laredo, TX	5,023,185	Laredo, TX	5,250,601	Laredo, TX	5,224,056	Laredo, TX	5,092,204	
Laredo, TX	4,440,407	Hidalgo, TX	4,768,256	Hidalgo, TX	4,565,037	Hidalgo, TX	4,594,298	Hidalgo, TX	4,721,387	
Pedestrians – top 5 gateways										
San Ysidro, CA	8,134,479	San Ysidro, CA	7,741,210	San Ysidro, CA	7,925,371	San Ysidro, CA	7,056,022	San Ysidro, CA	7,382,363	
El Paso, TX	6,090,841	El Paso, TX	6,015,421	El Paso, TX	6,572,313	El Paso, TX	6,847,689	El Paso, TX	7,032,715	
Calexico, CA	4,885,868	Calexico, CA	4,794,339	Calexico, CA	4,567,333	Calexico, CA	4,498,322	Calexico, CA	4,270,911	
Nogales, AZ	3,238,929	Laredo, TX	3,558,660	Laredo, TX	3,447,437	Laredo, TX	3,542,190	Laredo, TX	3,573,992	
Laredo, TX	3,206,372	Olay Mesa, CA	3,289,778	Olay Mesa, CA	3,415,957	Olay Mesa, CA	3,411,485	Olay Mesa, CA	3,504,800	
Bus passengers – top 5 gateways										
Laredo, TX	989,205	Laredo, TX	1,023,411	Laredo, TX	1,020,567	Laredo, TX	977,305	Laredo, TX	1,039,605	
San Ysidro, CA	583,589	San Ysidro, CA	507,750	San Ysidro, CA	491,058	San Ysidro, CA	440,033	Hidalgo, TX	288,020	
El Paso, TX	435,560	El Paso, TX	370,797	Hidalgo, TX	349,417	Hidalgo, TX	301,160	San Ysidro, CA	241,875	
Hidalgo, TX	302,789	Hidalgo, TX	334,477	El Paso, TX	313,684	El Paso, TX	266,168	El Paso, TX	199,819	
Olay Mesa, CA	163,672	Olay Mesa, CA	182,509	Olay Mesa, CA	186,898	Nogales, AZ	173,425	Nogales, AZ	186,719	
Buses – top 5 gateways										
San Ysidro, CA	68,194	San Ysidro, CA	60,173	San Ysidro, CA	57,171	San Ysidro, CA	51,693	Laredo, TX	41,856	
Laredo, TX	38,368	Olay Mesa, CA	42,145	Laredo, TX	41,230	Laredo, TX	40,065	San Ysidro, CA	36,215	
Olay Mesa, CA	37,799	Laredo, TX	38,017	Olay Mesa, CA	41,222	Olay Mesa, CA	38,303	Olay Mesa, CA	32,877	
El Paso, TX	22,798	Hidalgo, TX	22,521	Hidalgo, TX	26,087	Hidalgo, TX	25,776	Hidalgo, TX	25,045	
Hidalgo, TX	20,476	El Paso, TX	21,595	El Paso, TX	21,554	El Paso, TX	19,739	El Paso, TX	15,050	
Train passengers – top 5 gateways										
Nogales, AZ	2,628	Nogales, AZ	3,466	El Paso, TX	6,741	El Paso, TX	5,785	El Paso, TX	10,759	
Olay Mesa, CA	430	Olay Mesa, CA	474	Nogales, AZ	3,180	Nogales, AZ	3,204	Nogales, AZ	2,970	
Calexico East, CA	261	Calexico East, CA	259	Olay Mesa, CA	410	Olay Mesa, CA	440	Olay Mesa, CA	472	
				Calexico East, CA	247	Calexico East, CA	240	Calexico East, CA	250	
								Sasabe, AZ	11	

Table 1-48 cont'd: U.S.-Mexican Border Land-Passenger Gateways: Entering the United States

	2018			2019			2020		
All U.S.-Mexican land gateways									
All personal vehicle passengers	143,624,530	All personal vehicle passengers	144,891,237	All personal vehicle passengers	136,890,096	All personal vehicle passengers	136,890,096	All personal vehicle passengers	80,590,837
All personal vehicles	77,037,777	All personal vehicles	76,916,275	All personal vehicles	73,085,262	All personal vehicles	73,085,262	All personal vehicles	50,604,796
All pedestrians	42,598,071	All pedestrians	46,173,881	All pedestrians	49,175,926	All pedestrians	49,175,926	All pedestrians	24,988,502
All bus passengers	1,732,107	All bus passengers	1,838,132	All bus passengers	2,153,331	All bus passengers	2,153,331	All bus passengers	992,386
All buses	171,896	All buses	164,052	All buses	151,541	All buses	151,541	All buses	89,518
All train passengers	11,070	All train passengers	10,436	All train passengers	9,568	All train passengers	9,568	All train passengers	6,843
Personal vehicle passengers — top 5 gateways									
San Ysidro, CA	23,831,138	San Ysidro, CA	25,182,134	San Ysidro, CA	25,845,348	San Ysidro, CA	25,845,348	San Ysidro, CA	17,980,834
El Paso, TX	22,046,772	El Paso, TX	22,225,563	El Paso, TX	18,703,243	El Paso, TX	18,703,243	El Paso, TX	8,714,536
Olay Mesa, CA	13,600,059	Olay Mesa, CA	13,318,027	Olay Mesa, CA	11,372,048	Olay Mesa, CA	11,372,048	Olay Mesa, CA	7,092,082
Laredo, TX	10,488,748	Laredo, TX	10,597,928	Laredo, TX	10,373,765	Callexico, CA	10,373,765	Callexico, CA	5,854,619
Brownsville, TX	10,047,891	Brownsville, TX	10,043,076	Brownsville, TX	9,416,489	Laredo, TX	9,416,489	Laredo, TX	5,440,985
Personal vehicles — top 5 gateways									
San Ysidro, CA	13,777,990	San Ysidro, CA	14,505,306	San Ysidro, CA	14,979,363	San Ysidro, CA	14,979,363	San Ysidro, CA	11,775,960
El Paso, TX	12,615,101	El Paso, TX	12,383,403	El Paso, TX	10,528,448	El Paso, TX	10,528,448	El Paso, TX	5,605,237
Olay Mesa, CA	8,309,476	Olay Mesa, CA	7,708,214	Olay Mesa, CA	6,584,442	Olay Mesa, CA	6,584,442	Olay Mesa, CA	4,804,274
Laredo, TX	4,990,649	Laredo, TX	5,157,945	Laredo, TX	5,109,938	Callexico, CA	5,109,938	Callexico, CA	3,932,647
Brownsville, TX	4,859,573	Brownsville, TX	4,742,355	Callexico, CA	4,984,781	Laredo, TX	4,984,781	Laredo, TX	3,173,619
Pedestrians — top 5 gateways									
San Ysidro, CA	8,279,253	San Ysidro, CA	9,435,611	San Ysidro, CA	10,799,398	San Ysidro, CA	10,799,398	San Ysidro, CA	5,043,034
El Paso, TX	6,883,755	El Paso, TX	7,218,420	El Paso, TX	7,626,455	El Paso, TX	7,626,455	El Paso, TX	3,035,299
Callexico, CA	4,212,342	Callexico, CA	4,014,519	Laredo, TX	3,790,022	Olay Mesa, CA	3,790,022	Olay Mesa, CA	2,188,463
Olay Mesa, CA	3,361,489	Laredo, TX	3,701,135	Callexico, CA	3,707,777	Callexico, CA	3,707,777	Callexico, CA	1,983,805
Nogales, AZ	3,349,123	Nogales, AZ	3,422,816	Olay Mesa, CA	3,567,271	San Luis, AZ	3,567,271	San Luis, AZ	1,821,114
Bus passengers — top 5 gateways									
Laredo, TX	728,177	Laredo, TX	816,696	Laredo, TX	1,016,437	Laredo, TX	1,016,437	Laredo, TX	523,903
Hidalgo, TX	249,524	Hidalgo, TX	263,682	El Paso, TX	308,329	El Paso, TX	308,329	El Paso, TX	127,003
El Paso, TX	193,419	El Paso, TX	195,808	Hidalgo, TX	276,103	Hidalgo, TX	276,103	Hidalgo, TX	100,988
Nogales, AZ	191,750	Nogales, AZ	194,827	Nogales, AZ	207,487	Nogales, AZ	207,487	Nogales, AZ	74,382
Callexico East, CA	115,600	Callexico East, CA	104,080	San Ysidro, CA	79,960	San Ysidro, CA	79,960	San Ysidro, CA	67,466
Buses — top 5 gateways									
Laredo, TX	40,220	Laredo, TX	38,996	Laredo, TX	38,575	San Ysidro, CA	38,575	San Ysidro, CA	29,878
San Ysidro, CA	33,367	San Ysidro, CA	32,058	San Ysidro, CA	38,100	Laredo, TX	38,100	Laredo, TX	23,956
Olay Mesa, CA	31,467	Olay Mesa, CA	29,533	Hidalgo, TX	20,992	El Paso, TX	20,992	El Paso, TX	8,916
Hidalgo, TX	20,840	Hidalgo, TX	20,026	El Paso, TX	19,032	Hidalgo, TX	19,032	Hidalgo, TX	7,728
El Paso, TX	15,898	El Paso, TX	15,977	Nogales, AZ	9,720	Olay Mesa, CA	9,720	Olay Mesa, CA	6,475
Train passengers — top 5 gateways									
El Paso, TX	7,765	El Paso, TX	6,895	El Paso, TX	6,339	El Paso, TX	6,339	El Paso, TX	4,031
Nogales, AZ	2,600	Nogales, AZ	2,887	Nogales, AZ	2,581	Nogales, AZ	2,581	Nogales, AZ	2,320
Olay Mesa, CA	458	Olay Mesa, CA	408	Olay Mesa, CA	416	Olay Mesa, CA	416	Olay Mesa, CA	258
Callexico East, CA	247	Callexico East, CA	246	Callexico East, CA	232	Callexico East, CA	232	Callexico East, CA	234

NOTES
 Data reflect all *Personal vehicles*, *Buses*, *Passengers* and *Pedestrians* entering the United States across the U.S.-Mexican border, regardless of nationality.
 2009 to 2013 data for train passengers in Texas are not available since train crews were exchanged at the Texas-Mexico border and thus did not enter the United States.

Table 1-50: U.S. Ton-Miles of Freight (BTS special tabulation) (millions)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL U.S. ton-miles of freight	4,171,590	4,543,955	5,065,648	5,379,424	4,968,096	4,889,030	4,878,828	5,041,501	5,180,010	5,110,527	5,007,566	5,096,906	5,250,670	U	U
Air ^a	4,173	9,067	14,983	15,746	12,540	12,134	12,367	12,428	12,845	13,190	13,758	15,140	15,969	16,413	18,746
Truck	1,265,586	1,626,331	1,971,087	2,210,106	1,806,337	1,630,136	1,822,154	2,004,459	1,958,805	1,985,827	2,060,780	2,024,314	2,033,921	U	U
Railroad ^b	932,000	1,033,969	1,465,960	1,696,425	1,691,004	1,729,256	1,712,567	1,740,687	1,851,229	1,738,283	1,585,440	1,674,784	1,729,638	1,614,498	U
Domestic water transportation	921,836	833,544	645,799	591,447	502,228	499,422	474,867	465,091	504,498	490,627	477,861	489,000	491,800	456,300	U
Coastwise	631,149	479,134	283,872	263,580	192,348	180,212	157,098	163,810	172,470	175,604	171,709	176,000	173,600	164,000	U
Lakewise	61,747	60,930	57,879	51,976	45,346	49,120	47,974	48,673	49,543	46,436	43,409	47,400	46,900	47,000	U
Internal	227,343	292,393	302,558	274,366	263,258	268,821	268,522	251,506	281,274	267,447	261,583	264,200	270,200	244,100	U
Intrastate	1,596	1,087	1,490	1,525	1,277	1,269	1,273	1,103	1,212	1,139	1,160	1,400	1,100	1,200	U
Pipeline	1,047,995	1,041,044	967,819	865,700	955,986	1,018,082	856,873	818,836	854,632	882,600	869,727	893,668	979,343	U	U

KEY: U = data are not available.

^a Includes Freight, Express, and Mail.

^b Estimates from 1980 to 1989 come from the Association of American Railroads using ton mile values from the Surface Transportation Board's Waybill Sample. The Waybill Sample represents all major U.S. railroads, including all Class I railroads and several short-line railroads.

NOTE

Based on the Freight Analysis Framework (FAF) BTS developed a more comprehensive and reliable estimates of ton-miles for the *Air, Truck, Rail, Water, and Pipeline* modes than are presented in table 1-49. These improved estimates are not comparable to data in table 1-49.

Table 1-51: Top U.S. Foreign Trade Freight Gateways by Value of Shipments (billions of current dollars)

Gateway	Type	2019				2018			
		Rank	Exports	Imports	Total	Rank	Exports	Imports	Total
Laredo, TX	Land	1	94.5	132.3	226.8	1	99.7	128.3	228.0
New York, NY	Water	2	42.4	162.3	204.8	3	45.3	166.4	211.6
Los Angeles, CA	Water	3	31.0	173.6	204.6	2	35.5	187.0	222.5
John F. Kennedy International Airport, NY	Air	4	84.1	100.2	184.3	4	92.4	100.1	192.5
Chicago, IL	Air	5	49.3	134.5	183.8	6	51.2	125.3	176.5
Long Beach, CA	Water	6	31.9	129.7	161.5	5	34.1	150.1	184.2
Houston, TX	Water	7	92.3	63.1	155.4	7	88.7	68.6	157.3
Detroit, MI	Land	8	75.5	57.2	132.7	8	75.2	58.8	134.0
Los Angeles International Airport, CA	Air	9	54.0	63.1	117.1	9	57.4	62.3	119.7
Savannah, GA	Water	10	28.6	77.5	106.1	10	27.1	74.7	101.8
Port Huron, MI	Land	11	39.7	46.7	86.4	11	42.4	46.9	89.3
New Orleans, LA	Air	12	38.6	46.0	84.6	12	34.6	48.0	82.6
Norfolk, VA	Water	13	28.9	49.9	78.8	13	29.7	49.2	78.9
El Paso, TX	Land	14	31.6	43.4	75.0	15	32.1	40.4	72.5
Charleston, SC	Water	15	27.3	47.5	74.8	14	26.0	46.7	72.6
Buffalo-Niagara Falls, NY	Land	16	35.1	33.9	69.0	16	36.2	34.2	70.4
Cleveland, OH	Air	17	39.8	24.4	64.2	18	35.5	26.7	62.3
San Francisco International Airport, CA	Air	18	29.6	31.9	61.5	17	29.8	36.3	66.2
Atlanta, GA	Air	19	21.2	37.4	58.6	22	20.2	35.1	55.4
Baltimore, MD	Water	20	15.0	43.4	58.4	20	16.8	42.9	59.7
Dallas-Fort Worth, TX	Air	21	23.3	34.1	57.5	23	23.2	30.2	53.5
Miami International Airport, FL	Air	22	34.7	22.5	57.2	19	35.4	25.2	60.6
Oakland, CA	Water	23	20.1	31.5	51.6	24	19.3	30.9	50.2
Anchorage, AK	Air	24	15.4	35.5	50.9	21	15.7	42.5	58.2
Tacoma, WA	Water	25	8.0	40.2	48.2	25	8.9	39.6	48.5
Otay Mesa, CA	Land	26	16.8	30.7	47.5	26	17.2	29.5	46.7
Hidalgo, TX	Land	27	13.0	22.2	35.1	28	12.3	21.6	33.8
Newark, NJ	Air	28	6.6	28.4	35.0	29	5.6	25.6	31.2
Corpus Christi, TX	Water	29	29.2	5.8	35.0	31	22.6	7.1	29.6
New Orleans, LA	Water	30	18.8	14.9	33.7	27	21.2	17.8	39.0
Santa Teresa, NM	Land	31	14.1	15.7	29.8	34	11.7	13.8	25.5
Eagle Pass, TX	Land	32	7.5	21.9	29.4	30	8.3	21.7	30.0
Jacksonville, FL	Water	33	6.2	20.1	26.4	33	6.4	19.4	25.9
Chicago, IL	Land	34	0.0	25.9	25.9	37	0.0	25.2	25.2
Miami, FL	Water	35	9.7	16.1	25.9	36	9.6	15.7	25.3
Beaumont, TX	Water	36	19.7	5.9	25.6	35	15.2	10.2	25.4
Seattle, WA	Water	37	7.5	17.9	25.3	32	7.5	20.7	28.2
Nogales, AZ	Land	38	10.3	15.0	25.3	40	9.7	14.3	24.0
Pembina, ND	Land	39	12.7	12.3	25.0	39	13.1	11.3	24.4
Port Everglades, FL	Water	40	12.4	10.5	23.0	38	12.8	11.8	24.7
Champlain-Rouses Point, NY	Land	41	9.3	12.2	21.5	42	9.0	13.3	22.3
Blaine, WA	Land	42	11.6	9.5	21.0	43	12.1	9.9	22.0
Seattle-Tacoma International Airport, WA	Air	43	11.8	9.2	21.0	44	11.0	10.2	21.2
Washington, DC	Air	44	7.3	12.4	19.7	49	7.0	10.6	17.7
Philadelphia, PA	Water	45	3.5	15.9	19.5	45	3.6	16.3	19.9
Mobile, AL	Water	46	5.9	13.5	19.4	46	6.6	12.5	19.1
Brunswick, GA	Water	47	5.6	13.3	18.9	47	5.2	13.1	18.3
Cincinnati-Lawrenceburg, OH	Air	48	7.3	11.5	18.8	48	6.6	11.5	18.0
Gramercy, LA	Water	49	14.0	3.5	17.5	41	18.1	4.5	22.6
Calexico-East, CA	Land	50	6.6	10.8	17.4	51	6.7	10.2	16.9
Total top 50 gateways^a			1,259.1	2,037.2	3,296.3		1,274.6	2,071.6	3,346.2

^a Total for 2018 are based on the top 50 freight gateways in 2018 and are not a summation of the gateways on the table.

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).

Numbers may not add to totals due to rounding.

Air: Data for all air gateways are reported at the port level and 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, Chicago, Los Angeles, Miami, New Orleans, Anchorage, and Cleveland.

Table 1-52: U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings

Truck Containers		2000		2005		2010		2011			
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways		
1,655,683	1,219,260	6,232,035	4,393,842	6,775,444	4,472,799	5,311,147	3,528,927	5,212,338	3,496,194		
Port Huron, MI	618,159	1,654,316	Detroit, MI	1,678,177	Detroit, MI	1,388,797	Detroit, MI	1,290,385	Detroit, MI		
Blaine, WA	291,493	1,167,499	Buffalo-Niagara Falls, NY	1,142,274	Buffalo-Niagara Falls, NY	898,485	Buffalo-Niagara Falls, NY	913,001	Buffalo-Niagara Falls, NY		
Calais, ME	115,806	107,653	Port Huron, MI	924,776	Port Huron, MI	658,350	Port Huron, MI	665,194	Port Huron, MI		
Sweetgrass, MT	108,124	470,402	Champlain-Rouses Point, NY	374,524	Champlain-Rouses Point, NY	292,834	Blaine, WA	335,956	Blaine, WA		
Derby Line, VT	85,678	313,972	Blaine, WA	353,048	Blaine, WA	290,461	Champlain-Rouses Point, NY	283,658	Champlain-Rouses Point, NY		
Rail Containers		2000		2005		2010		2011			
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways		
453,990	382,198	1,594,837	1,169,034	1,940,357	1,325,479	1,802,359	1,255,980	1,926,376	1,356,670		
Port Huron, MI	249,713	425,211	Port Huron, MI	457,275	Port Huron, MI	390,777	International Falls-Ranier, MN	394,628	International Falls-Ranier, MN		
Blaine, WA	57,695	237,968	International Falls-Ranier, MN	251,118	International Falls-Ranier, MN	348,086	Port Huron, MI	391,482	Port Huron, MI		
Eastport, ID	27,007	181,462	Port, ND	231,832	Port, ND	217,196	Detroit, MI	217,204	Detroit, MI		
Noyes, MN	24,493	171,551	Detroit, MI	231,482	Detroit, MI	184,290	Port, ND	190,512	Port, ND		
Sweetgrass, MT	23,290	152,842	Buffalo-Niagara Falls, NY	153,772	Blaine, WA	125,632	Blaine, WA	164,844	Blaine, WA		
Truck Containers		2012		2013		2014		2015		2016	
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways
5,375,673	3,614,963	5,456,616	3,762,608	5,650,441	3,852,285	5,864,339	4,062,964	5,935,534	4,145,465	5,935,534	4,145,465
Detroit, MI	1,397,518	1,513,095	Detroit, MI	1,475,518	Detroit, MI	1,831,969	Detroit, MI	1,895,894	Detroit, MI	1,895,894	Detroit, MI
Buffalo-Niagara Falls, NY	929,620	919,904	Buffalo-Niagara Falls, NY	954,145	Buffalo-Niagara Falls, NY	874,373	Buffalo-Niagara Falls, NY	860,326	Buffalo-Niagara Falls, NY	860,326	Buffalo-Niagara Falls, NY
Port Huron, MI	679,095	723,725	Port Huron, MI	768,121	Port Huron, MI	790,103	Port Huron, MI	767,373	Buffalo-Niagara Falls, NY	767,373	Buffalo-Niagara Falls, NY
Blaine, WA	327,315	325,266	Blaine, WA	367,979	Blaine, WA	289,825	Blaine, WA	315,590	Champlain-Rouses Point, NY	315,590	Champlain-Rouses Point, NY
Champlain-Rouses Point, NY	281,415	280,618	Champlain-Rouses Point, NY	286,522	Champlain-Rouses Point, NY	277,094	Champlain-Rouses Point, NY	306,282	Blaine, WA	306,282	Blaine, WA
Rail Containers		2012		2013		2014		2015		2016	
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways
2,147,187	1,520,677	2,285,902	1,639,445	2,354,853	1,688,116	2,337,488	1,723,512	2,200,433	1,620,277	2,200,433	1,620,277
International Falls-Ranier, MN	500,164	561,238	International Falls-Ranier, MN	614,144	International Falls-Ranier, MN	703,399	International Falls-Ranier, MN	700,384	International Falls-Ranier, MN	700,384	International Falls-Ranier, MN
Port Huron, MI	397,670	425,774	Port Huron, MI	478,538	Port Huron, MI	437,175	Port Huron, MI	368,379	Port Huron, MI	368,379	Port Huron, MI
Port, ND	238,942	256,587	Port, ND	274,528	Port, ND	256,478	Port, ND	248,126	Port, ND	248,126	Port, ND
Detroit, MI	218,786	227,916	Detroit, MI	162,813	Blaine, WA	168,196	Blaine, WA	166,629	Blaine, WA	166,629	Blaine, WA
Blaine, WA	165,115	167,930	Blaine, WA	138,093	Detroit, MI	158,264	Detroit, MI	136,759	Detroit, MI	136,759	Detroit, MI
Truck Containers		2017		2018		2019		2020			
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways		
6,330,854	4,180,082	5,948,902	4,093,579	5,826,512	4,006,929	5,278,020	3,553,006	5,278,020	3,553,006		
Detroit, MI	1,630,696	1,591,329	Detroit, MI	1,560,091	Detroit, MI	1,338,993	Detroit, MI	1,338,993	Detroit, MI		
Buffalo-Niagara Falls, NY	984,739	957,551	Buffalo-Niagara Falls, NY	928,083	Buffalo-Niagara Falls, NY	844,359	Buffalo-Niagara Falls, NY	844,359	Buffalo-Niagara Falls, NY		
Port Huron, MI	866,777	846,099	Port Huron, MI	827,351	Port Huron, MI	734,861	Port Huron, MI	734,861	Port Huron, MI		
Blaine, WA	377,647	381,623	Blaine, WA	380,839	Blaine, WA	345,428	Blaine, WA	345,428	Blaine, WA		
Champlain-Rouses Point, NY	320,223	316,977	Champlain-Rouses Point, NY	310,565	Champlain-Rouses Point, NY	289,275	Champlain-Rouses Point, NY	289,275	Champlain-Rouses Point, NY		
Rail Containers		2017		2018		2019		2020			
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways		
2,488,272	1,851,269	2,595,895	1,944,685	2,624,644	1,957,436	2,434,102	1,809,538	2,434,102	1,809,538		
International Falls-Ranier, MN	783,670	840,927	International Falls-Ranier, MN	852,182	International Falls-Ranier, MN	804,978	International Falls-Ranier, MN	804,978	International Falls-Ranier, MN		
Port Huron, MI	408,075	401,880	Port Huron, MI	401,307	Port Huron, MI	363,921	Port Huron, MI	363,921	Port Huron, MI		
Port, ND	281,683	317,184	Port, ND	326,617	Port, ND	312,850	Port, ND	312,850	Port, ND		
Blaine, WA	213,470	231,663	Blaine, WA	212,102	Blaine, WA	192,309	Blaine, WA	192,309	Blaine, WA		
Detroit, MI	164,371	153,031	Pembina, ND	165,228	Detroit, MI	135,780	Detroit, MI	135,780	Detroit, MI		

NOTES
Truck Container data represent the number of Truck container crossings, not the number of unique vehicles. Data are for both loaded and empty truck containers.
Rail Container data include both loaded and empty Rail containers.

Table 1-53: U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Train Crossings

Trucks		2000		2005		2010		2011			
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways		
5,431,096	3,644,990	7,048,128	4,714,339	6,783,944	4,552,463	5,444,405	3,532,463	5,490,375	3,698,745		
Detroit, MI	1,332,014	1,769,389	Detroit, MI	1,745,318	Detroit, MI	1,452,659	Detroit, MI	1,474,775	1,474,775		
Buffalo-Niagara Falls, NY	996,455	1,198,085	Buffalo-Niagara Falls, NY	1,142,411	Buffalo-Niagara Falls, NY	898,752	Buffalo-Niagara Falls, NY	926,447	926,447		
Port Huron, MI	635,795	839,200	Port Huron, MI	832,401	Port Huron, MI	670,769	Port Huron, MI	673,707	673,707		
Blaine, WA	402,090	516,829	Blaine, WA	388,869	Blaine, WA	318,059	Blaine, WA	338,570	338,570		
Champlain-Rouses Point, NY	278,636	390,636	Champlain-Rouses Point, NY	354,264	Champlain-Rouses Point, NY	292,224	Champlain-Rouses Point, NY	285,246	285,246		
Trains		2000		2005		2010		2011			
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways		
31,457	17,152	33,447	18,697	32,807	19,129	26,123	13,993	26,667	14,435		
Detroit, MI	4,078	5,406	Port Huron, MI	6,344	International Falls-Ranier, MN	3,546	International Falls-Ranier, MN	3,672	3,672		
Port Huron, MI	3,715	3,919	International Falls-Ranier, MN	3,980	Port Huron, MI	3,525	Port Huron, MI	3,282	3,282		
Buffalo-Niagara Falls, NY	3,402	3,704	Detroit, MI	3,602	Buffalo-Niagara Falls, NY	2,395	Detroit, MI	2,850	2,850		
International Falls-Ranier, MN	3,309	3,456	Buffalo-Niagara Falls, NY	2,918	Detroit, MI	2,378	Warroad, MN	2,359	2,359		
Warroad, MN	2,648	2,212	Warroad, MN	2,285	Warroad, MN	2,149	Buffalo-Niagara Falls, NY	2,272	2,272		
Trucks		2012		2013		2014		2015		2016	
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways
5,623,507	3,802,599	5,648,658	3,830,616	5,802,209	3,947,685	5,791,021	3,974,888	5,877,938	4,068,338	5,877,938	4,068,338
Detroit, MI	1,541,150	1,533,049	Detroit, MI	1,554,162	Detroit, MI	1,544,702	Detroit, MI	1,598,017	1,598,017	1,598,017	1,598,017
Buffalo-Niagara Falls, NY	940,221	937,192	Buffalo-Niagara Falls, NY	962,076	Buffalo-Niagara Falls, NY	947,230	Buffalo-Niagara Falls, NY	956,491	956,491	956,491	956,491
Port Huron, MI	691,348	731,165	Port Huron, MI	776,268	Port Huron, MI	801,272	Port Huron, MI	834,731	834,731	834,731	834,731
Blaine, WA	348,955	349,983	Blaine, WA	367,947	Blaine, WA	378,947	Blaine, WA	365,489	365,489	365,489	365,489
Champlain-Rouses Point, NY	280,925	279,227	Champlain-Rouses Point, NY	285,195	Champlain-Rouses Point, NY	302,937	Champlain-Rouses Point, NY	313,610	313,610	313,610	313,610
Trains		2012		2013		2014		2015		2016	
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways
28,524	15,591	29,347	16,277	28,643	15,254	30,969	16,964	29,486	16,330	29,486	16,330
International Falls-Ranier, MN	3,924	3,902	Port Huron, MI	4,074	Baudette, MN	3,830	Baudette, MN	3,751	3,751	3,751	3,751
Port Huron, MI	3,269	3,607	International Falls-Ranier, MN	3,333	International Falls-Ranier, MN	3,732	International Falls-Ranier, MN	3,704	3,704	3,704	3,704
Detroit, MI	3,073	3,211	Warroad, MN	3,222	Warroad, MN	3,684	Warroad, MN	3,528	3,528	3,528	3,528
Warroad, MN	2,777	3,101	Buffalo-Niagara Falls, NY	2,395	Port Huron, MI	3,370	Port Huron, MI	3,003	3,003	3,003	3,003
Blaine, WA	2,548	2,456	Detroit, MI	2,181	Blaine, WA	2,368	Blaine, WA	2,344	2,344	2,344	2,344
Trucks		2017		2018		2019		2020		2021	
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways
5,846,593	4,041,593	5,830,926	4,036,197	5,861,155	3,927,665	5,744,333	3,534,497	5,744,333	3,534,497	5,744,333	3,534,497
Detroit, MI	1,574,771	1,581,443	Detroit, MI	1,541,294	Detroit, MI	1,353,296	Detroit, MI	1,353,296	1,353,296	1,353,296	1,353,296
Buffalo-Niagara Falls, NY	959,489	941,574	Buffalo-Niagara Falls, NY	904,788	Buffalo-Niagara Falls, NY	835,161	Buffalo-Niagara Falls, NY	835,161	835,161	835,161	835,161
Port Huron, MI	826,288	831,589	Port Huron, MI	809,541	Port Huron, MI	729,281	Port Huron, MI	729,281	729,281	729,281	729,281
Blaine, WA	369,916	373,191	Blaine, WA	363,777	Blaine, WA	337,412	Blaine, WA	337,412	337,412	337,412	337,412
Champlain-Rouses Point, NY	311,129	308,400	Champlain-Rouses Point, NY	295,365	Champlain-Rouses Point, NY	279,347	Champlain-Rouses Point, NY	279,347	279,347	279,347	279,347
Trains		2017		2018		2019		2020		2021	
Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways	Total U.S.-Canadian border	Total top 5 gateways
22,475	13,199	23,730	14,295	23,029	13,465	20,313	11,992	20,313	11,992	20,313	11,992
International Falls-Ranier, MN	3,994	4,287	International Falls-Ranier, MN	4,267	International Falls-Ranier, MN	3,842	International Falls-Ranier, MN	3,842	3,842	3,842	3,842
Port Huron, MI	3,423	3,133	Port Huron, MI	3,093	Port Huron, MI	2,954	Port Huron, MI	2,954	2,954	2,954	2,954
Blaine, WA	2,017	2,918	Blaine, WA	2,401	Blaine, WA	1,849	Blaine, WA	1,849	1,849	1,849	1,849
Detroit, MI	1,981	2,081	Buffalo-Niagara Falls, NY	1,862	Buffalo-Niagara Falls, NY	1,728	Buffalo-Niagara Falls, NY	1,728	1,728	1,728	1,728
Buffalo-Niagara Falls, NY	1,784	1,876	Port, ND	1,842	Port, ND	1,619	Port, ND	1,619	1,619	1,619	1,619

NOTE
Data do not include privately owned pickup trucks.

Table 1-54: U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings

Truck Containers	2000		2005		2010		2011	
	Total U.S.-Mexican border	Total top 5 gateways	Total U.S.-Mexican border	Total top 5 gateways	Total U.S.-Mexican border	Total top 5 gateways	Total U.S.-Mexican border	Total top 5 gateways
Total U.S.-Mexican border	3,067,777	4,200,681	4,677,562	4,709,137	4,709,137	4,709,137	4,797,940	4,797,940
Total top 5 gateways	2,502,299	3,353,446	3,740,341	3,765,646	3,765,646	3,765,646	3,845,841	3,845,841
Laredo, TX	967,916	1,351,771	1,455,504	1,573,315	1,573,315	1,573,315	1,695,576	1,695,576
El Paso, TX	566,346	688,224	744,278	731,980	731,980	731,980	747,531	747,531
Olay Mesa, CA	529,822	681,413	734,851	689,305	689,305	689,305	630,469	630,469
Brownsville, TX	225,656	332,367	494,572	459,698	459,698	459,698	469,028	469,028
Nogales, AZ	210,559	299,671	311,136	311,368	311,368	311,368	313,237	313,237
Rail Containers	1996	2000	2005	2010	2010	2011	2011	2011
Total U.S.-Mexican border	286,363	571,825	728,599	706,067	706,067	706,067	770,965	770,965
Total top 5 gateways	275,569	562,710	710,238	695,729	695,729	695,729	759,148	759,148
Laredo, TX	115,904	243,369	316,402	327,453	327,453	327,453	371,553	371,553
Eagle Pass, TX	61,560	139,803	143,741	182,695	182,695	182,695	194,731	194,731
Brownsville, TX	50,888	94,113	105,175	89,808	89,808	89,808	92,182	92,182
Nogales, AZ	25,352	50,602	98,089	54,003	54,003	54,003	61,232	61,232
El Paso, TX	21,865	34,823	46,831	41,860	41,860	41,860	39,450	39,450
Truck Containers	2012	2013	2014	2015	2015	2016	2016	2016
Total U.S.-Mexican border	5,083,126	5,031,783	4,285,646	5,313,783	5,313,783	5,313,783	5,765,003	5,765,003
Total top 5 gateways	4,088,740	4,041,210	4,285,646	4,486,128	4,486,128	4,486,128	4,623,982	4,623,982
Laredo, TX	1,760,041	1,820,187	1,923,085	1,923,085	1,923,085	1,923,085	2,046,183	2,046,183
Olay Mesa, CA	781,335	770,120	813,099	831,645	831,645	831,645	901,963	901,963
El Paso, TX	735,018	652,660	696,611	763,939	763,939	763,939	747,367	747,367
Hidalgo, TX	475,318	485,980	520,087	551,134	551,134	551,134	564,056	564,056
Calexico East, CA	337,028	312,280	332,764	346,534	346,534	346,534	361,413	361,413
Rail Containers	2012	2013	2014	2015	2015	2016	2016	2016
Total U.S.-Mexican border	827,763	837,326	909,993	938,540	938,540	938,540	995,381	995,381
Total top 5 gateways	817,241	827,632	899,756	928,642	928,642	928,642	984,348	984,348
Laredo, TX	399,839	413,401	405,076	392,416	392,416	392,416	401,567	401,567
Eagle Pass, TX	207,895	201,939	254,327	274,232	274,232	274,232	318,730	318,730
El Paso, TX	94,089	84,519	99,295	109,120	109,120	109,120	107,279	107,279
Nogales, AZ	61,395	83,366	75,765	79,315	79,315	79,315	85,518	85,518
Brownsville, TX	54,023	44,407	65,293	73,559	73,559	73,559	71,254	71,254
Truck Containers	2017	2018	2019	2020	2020	2020	2020	2020
Total U.S.-Mexican border	6,431,402	6,338,772	6,520,689	6,350,338	6,350,338	6,350,338	6,350,338	6,350,338
Total top 5 gateways	5,036,966	5,114,415	5,202,199	4,759,630	4,759,630	4,759,630	4,759,630	4,759,630
Laredo, TX	2,168,169	2,318,008	2,370,309	2,302,913	2,302,913	2,302,913	2,302,913	2,302,913
Olay Mesa, CA	897,558	956,045	990,312	942,835	942,835	942,835	942,835	942,835
El Paso, TX	854,106	812,097	795,295	666,859	666,859	666,859	666,859	666,859
Hidalgo, TX	687,965	648,739	653,251	454,256	454,256	454,256	454,256	454,256
Calexico East, CA	429,168	379,526	393,032	392,767	392,767	392,767	392,767	392,767
Rail Containers	2017	2018	2019	2020	2020	2020	2020	2020
Total U.S.-Mexican border	1,045,092	1,088,303	1,099,834	1,014,873	1,014,873	1,014,873	1,014,873	1,014,873
Total top 5 gateways	1,033,239	1,077,491	1,090,572	1,005,509	1,005,509	1,005,509	1,005,509	1,005,509
Laredo, TX	421,263	447,475	464,371	474,766	474,766	474,766	474,766	474,766
Eagle Pass, TX	351,057	359,088	336,540	334,512	334,512	334,512	334,512	334,512
El Paso, TX	109,115	108,265	120,699	69,784	69,784	69,784	69,784	69,784
Brownsville, TX	88,971	93,355	99,311	68,388	68,388	68,388	68,388	68,388
Nogales, AZ	62,833	69,308	69,651	58,059	58,059	58,059	58,059	58,059

NOTES
 Truck Container data represent the number of Truck container crossings, not the number of unique vehicles. Data includes loaded and empty Truck containers.
 Rail Container data includes both loaded and empty Rail containers.

Table 1-55: U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck and Train Crossings

	1996		2000		2005		2010		2011	
Trucks										
Total U.S.-Mexican border	3,254,084	4,525,579	4,677,601	4,877,601	4,742,925	4,868,376				
Total top 5 gateways	2,558,447	3,575,207	3,737,803	3,792,491	3,792,491	3,921,752				
Laredo, TX	1,015,905	1,493,073	1,455,607	1,455,607	1,585,662	1,695,916				
El Paso, TX	556,134	720,406	740,654	740,654	729,605	744,929				
Olay Mesa, CA	530,704	688,340	730,253	730,253	710,363	714,699				
Nogales, AZ	229,337	374,150	491,077	491,077	459,331	453,235				
Brownsville, TX	226,367	299,238	320,212	320,212	307,510	312,973				
Trains										
Total U.S.-Mexican border	7,509	7,108	9,458	9,458	7,667	8,366				
Total top 5 gateways	6,579	6,586	8,719	8,719	7,198	7,855				
Laredo, TX	3,206	2,700	3,459	3,459	3,036	3,413				
Eagle Pass, TX	1,334	1,448	1,812	1,812	2,012	2,151				
El Paso, TX	780	970	1,618	1,618	1,046	1,152				
Brownsville, TX	726	774	1,045	1,045	602	709				
Nogales, AZ	533	694	785	785	502	460				
Trucks										
Total U.S.-Mexican border	5,103,923	5,194,867	5,414,568	5,414,568	5,535,371	5,802,781				
Total top 5 gateways	4,097,483	4,191,478	4,372,500	4,372,500	4,476,769	4,665,130				
Laredo, TX	1,789,546	1,846,282	1,947,846	1,947,846	2,015,773	2,083,964				
Olay Mesa, CA	778,929	769,886	810,193	810,193	829,581	899,336				
El Paso, TX	724,964	738,914	759,125	759,125	747,702	763,868				
Hidalgo, TX	481,620	510,706	530,093	530,093	546,259	568,235				
Calixico East, CA	322,424	325,690	325,243	325,243	337,474	349,727				
Trains										
Total U.S.-Mexican border	8,957	9,341	9,957	9,957	9,991	10,439				
Total top 5 gateways	8,490	8,837	9,400	9,400	9,526	9,953				
Laredo, TX	3,492	3,629	3,768	3,768	3,634	3,739				
Eagle Pass, TX	2,349	2,459	2,728	2,728	2,814	3,062				
El Paso, TX	1,392	1,357	1,434	1,434	1,528	1,652				
Nogales, AZ	657	866	795	795	801	758				
Brownsville, TX	600	526	685	685	749	742				
Trucks										
Total U.S.-Mexican border	6,039,774	6,310,903	6,440,255	6,440,255	6,440,255	6,366,384				
Total top 5 gateways	4,873,077	5,110,715	5,146,377	5,146,377	5,146,377	4,796,702				
Laredo, TX	2,182,984	2,313,967	2,364,681	2,364,681	2,319,901	2,319,901				
Olay Mesa, CA	929,614	962,577	948,630	948,630	927,714	927,714				
El Paso, TX	779,410	810,935	792,441	792,441	671,506	671,506				
Hidalgo, TX	620,236	647,157	651,579	651,579	483,732	483,732				
Calixico East, CA	360,833	376,079	385,046	385,046	393,849	393,849				
Trains										
Total U.S.-Mexican border	11,283	11,206	11,673	11,673	11,673	10,203				
Total top 5 gateways	10,561	10,556	11,168	11,168	11,168	9,794				
Laredo, TX	4,252	4,251	4,587	4,587	4,078	4,078				
Eagle Pass, TX	3,333	3,452	3,430	3,430	3,338	3,338				
El Paso, TX	1,498	1,379	1,457	1,457	1,027	1,027				
Brownsville, TX	829	937	999	999	739	739				
Nogales, AZ	649	737	695	695	612	612				

NOTE
Data does not include privately owned pickup trucks.

Table 1-56: U.S. Waterborne Freight (million short tons)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL freight	1,099.9	1,531.7	1,998.9	2,163.9	2,424.6	2,528.1	2,334.5	2,371.8	2,311.8	2,274.8	2,345.8	2,279.0	2,292.0	2,387.0	2,437.7	2,363.4
Foreign	339.3	581.0	921.4	1,041.6	1,354.8	1,498.7	1,440.9	1,479.6	1,421.9	1,383.6	1,408.7	1,374.2	1,415.5	1,514.0	1,589.0	1,545.3
Imports	211.3	339.3	517.5	600.0	939.7	1,096.9	883.1	869.1	804.5	758.7	760.9	751.6	755.6	767.9	766.5	697.2
Exports	128.0	241.6	403.9	441.6	415.0	401.8	557.8	610.4	617.4	624.9	647.8	622.5	659.8	746.1	822.5	848.1
Domestic	760.6	950.7	1,077.5	1,122.3	1,069.8	1,029.4	893.6	892.2	889.9	891.2	937.1	904.8	876.6	873.1	848.7	818.1
Inland	291.1	472.1	535.0	622.6	628.4	624.0	565.0	556.6	569.1	566.3	596.3	563.3	545.3	535.6	524.6	502.3
Coastal	209.2	238.4	329.6	298.6	226.9	213.9	164.5	161.0	152.2	164.9	172.0	175.1	168.7	164.0	160.2	154.1
Great Lakes	155.1	157.1	115.1	110.2	114.4	96.2	80.5	88.1	84.4	85.4	87.9	83.9	78.2	81.8	80.2	82.1
Intraport	104.2	81.5	94.2	86.4	94.6	90.4	79.0	82.4	81.9	73.4	79.5	80.9	82.8	90.9	83.3	78.5
Intraterritory	1.0	1.6	3.6	4.5	5.5	4.9	4.6	4.2	2.3	1.3	1.3	1.6	1.5	0.8	0.4	1.1

NOTES

Beginning in 1996, shipments of fish are excluded from domestic *Inland* and *Intraport* tonnage. Numbers may not add to totals due to rounding.

Table 1-57: Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons^a

Ports	2019		2018		2009		Percent change 2018-2019	Percent change 2009-2019
	Rank	Total tons (millions)	Rank	Total tons (millions)	Rank	Total tons (millions)		
Houston, TX	1	284.9	2	268.9	2	211.3	6.0	34.8
South Louisiana, LA, Port of	2	238.0	1	275.5	1	212.6	-13.6	11.9
New York, NY and NJ	3	136.6	3	140.3	3	144.7	-2.6	-5.6
Corpus Christi, TX	4	111.2	5	93.5	5	68.2	19.0	63.0
Beaumont, TX	5	101.1	4	100.2	7	67.7	0.8	49.3
New Orleans, LA	6	92.2	6	93.3	6	68.1	-1.2	35.3
Long Beach, CA	7	80.7	7	86.5	4	72.5	-6.8	11.3
Baton Rouge, LA	8	73.4	8	82.2	13	51.9	-10.7	41.4
Los Angeles, CA	9	63.0	10	67.8	9	58.4	-7.1	7.9
Virginia, VA, Port of	10	61.7	9	71.8	15	40.3	-14.0	53.0
Lake Charles, LA	11	58.0	12	56.9	11	52.3	2.0	11.1
Mobile, AL	12	56.9	11	58.6	12	52.2	-3.0	9.0
Plaquemines, LA, Port of	13	52.8	13	56.9	14	50.9	-7.2	3.7
Baltimore, MD	14	44.2	14	44.8	26	30.1	-1.2	46.8
Savannah, GA	15	41.9	16	41.3	21	32.3	1.6	29.7
Texas City, TX	16	41.3	15	42.7	10	52.6	-3.1	-21.5
Huntington - Tristate	17	36.8	21	34.2	8	59.2	7.4	-37.8
Cincinnati-Northern KY, Ports of	18	36.6	18	38.5	42	11.8	-5.1	210.7
Port Arthur, TX	19	33.9	17	39.9	19	33.8	-14.8	0.4
Duluth-Superior, MN and WI	20	33.7	20	35.1	25	30.2	-3.9	11.6
St. Louis, MO and IL	21	31.3	19	37.4	23	31.3	-16.5	-0.3
Tampa, FL	22	30.0	22	31.0	17	34.9	-3.2	-13.9
Freeport, TX	23	29.8	28	25.4	27	27.4	17.3	9.1
Richmond, CA	24	28.5	24	27.3	28	25.4	4.5	12.3
Pascagoula, MS	25	25.8	23	27.4	16	36.6	-5.5	-29.4
Valdez, AK	26	25.2	27	25.8	18	34.5	-2.4	-27.0
Charleston, SC	27	24.6	30	24.8	40	15.8	-0.9	55.3
Port Everglades, FL	28	24.0	29	25.0	35	20.1	-4.1	19.6
Seattle, WA	29	23.0	26	26.0	29	24.6	-11.7	-6.5
Pittsburgh, PA	30	21.8	33	21.6	20	32.9	1.0	-33.8
Tacoma, WA	31	21.5	32	22.8	32	23.2	-5.9	-7.2
Portland, OR	32	19.4	31	23.2	31	23.3	-16.7	-17.0
Oakland, CA	33	19.3	34	19.4	39	17.4	-0.1	11.2
Paulsboro, NJ	34	18.4	39	16.1	24	30.3	14.2	-39.1
Jacksonville, FL	35	17.7	35	18.0	38	17.7	-1.5	0.2
Kalama, WA	36	17.0	40	15.8	46	9.9	7.8	71.7
Two Harbors, MN	37	16.9	36	17.2	56	7.1	-1.7	138.4
Marcus Hook, PA	38	16.7	44	12.2	30	24.6	36.8	-32.0
Philadelphia, PA	39	16.3	25	26.7	22	31.8	-38.8	-48.6
Boston, MA	40	16.0	38	16.2	34	20.5	-1.1	-21.9
Honolulu, HI	41	14.3	41	15.2	50	9.2	-5.5	56.6
Detroit, MI	42	13.3	42	14.8	51	9.0	-10.3	47.6
Indiana Harbor, IN	43	12.2	45	11.9	52	8.2	2.5	49.0
Mid-America Port Commission	44	12.0	N	N	N	N	N	N
Cleveland, OH	45	11.9	46	11.8	64	6.1	0.9	95.5
Vancouver, WA	46	11.0	50	10.5	60	6.8	4.1	60.7

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Table 1-57 cont'd: Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons^a

Ports	2019		2018		2009		Percent change 2018-2019	Percent change 2009-2019
	Rank	Total tons (millions)	Rank	Total tons (millions)	Rank	Total tons (millions)		
Galveston, TX	47	11.0	53	9.1	47	9.8	20.3	11.9
San Juan, PR	48	10.4	47	11.7	43	11.3	-11.3	-7.8
Chicago, IL	49	10.0	37	16.9	36	19.2	-40.5	-47.8
Longview, WA	50	9.7	43	13.7	68	5.1	-29.6	89.6
Total top 50^b		2,238.1		2,306.5		2,025.6	-3.0	10.5
All ports		2,363.2		2,416.9		2,210.8	-2.2	6.9

KEY: N = data do not exist.

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

^b Total for 2018 and 2009 are based on the top 50 water ports in 2018 and 2009, and are not a summation of the numbers in the table.

NOTES

When summarizing domestic commerce the following movements were excluded: Cargo carried on general ferries, coal and petroleum products loaded from shore facilities directly into bunkers of vessels for fuel, and insignificant amounts of government materials (less than 100 tons) moved on government owned equipment in support of Corps projects.

Numbers may not add to totals due to rounding.

Table 1-58: Freight Activity in the United States: 1993, 1997, 2002, 2007, 2012 and 2017

Mode of transportation	1993	1997	2002	2007	2012	2017	Percent change
							(2007-2017) ^d
Value (billion \$)							
TOTAL all modes	5,846	6,944	8,397	11,685	13,852	14,518	24.2
Single modes, total	4,941	5,720	7,049	9,539	11,900	11,738	23.1
Truck ^a	4,403	4,982	6,235	8,336	10,132	10,399	24.8
For-hire truck	2,625	2,901	3,757	4,956	6,505	6,968	40.6
Private truck	1,756	2,037	2,445	3,380	3,628	3,431	1.5
Rail	247	320	311	436	473	254	-41.8
Water	62	76	89	115	302	244	112.2
Shallow draft	41	54	57	91	219	117	28.9
Great Lakes	S	2	1	S	0	1	U
Deep draft	20	20	31	23	60	121	423.3
Air (includes truck and air)	139	229	265	252	451	497	96.9
Pipeline ^b	90	113	149	400	543	344	-13.8
Multiple modes, total	663	946	1,079	1,867	1,951	2,778	48.8
Parcel, U.S. Postal Service or courier	563	856	988	1,562	1,688	2,117	35.6
Truck and rail	83	76	70	187	225	348	85.9
Truck and water	9	8	14	58	29	251	330.6
Rail and water	4	2	3	14	8	44	214.1
Other multiple modes	3	4	4	45	1	17	-61.4
Other / unknown modes, total	242	279	269	279	1	2	-99.2
Tons (millions)							
TOTAL all modes	9,688	11,090	11,668	12,543	11,299	12,469	-0.6
Single modes, total	8,922	10,437	11,087	11,698	10,906	11,605	-0.8
Truck ^a	6,386	7,701	7,843	8,779	8,060	8,843	0.7
For-hire truck	2,808	3,403	3,657	4,075	4,299	5,232	28.4
Private truck	3,544	4,137	4,150	4,704	3,761	3,611	-23.2
Rail	1,544	1,550	1,874	1,861	1,629	1,251	-32.8
Water	505	563	681	404	576	804	99.3
Shallow draft	362	415	459	343	425	472	37.4
Great Lakes	33	38	38	18	31	42	135.8
Deep draft	110	110	185	43	73	269	531.5
Air (includes truck and air)	3	4	4	4	5	8	122.1
Pipeline ^b	484	618	685	651	636	698	7.2
Multiple modes, total	226	217	217	574	357	771	34.3
Parcel, U.S. Postal Service or courier	19	24	26	34	28	38	12.1
Truck and rail	41	54	43	226	214	471	109.0
Truck and water	68	33	23	146	57	110	-24.5
Rail and water	79	79	105	55	56	143	160.6
Other multiple modes	19	26	20	114	2	8	-92.8
Other / unknown modes, total	541	437	365	272	37	94	-65.5

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Table 1-58 cont'd: Freight Activity in the United States: 1993, 1997, 2002, 2007, 2012 and 2017

Mode of transportation	1993	1997	2002	2007	2012	2017	Percent change
							(2007-2017) ^d
Ton-miles ^c (billions)							
TOTAL all modes	2,421	2,661	3,138	3,345	2,970	3,117	-6.8
Single modes, total	2,137	2,383	2,868	2,894	2,697	2,480	-14.3
Truck ^a	870	1,024	1,256	1,342	1,248	1,327	-1.1
For-hire truck	629	741	960	1,056	1,051	1,162	10.1
Private truck	236	269	291	286	197	165	-42.4
Rail	943	1,023	1,262	1,344	1,211	825	-38.6
Water	272	262	283	157	193	260	65.0
Shallow draft	164	189	212	117	119	177	51.1
Great Lakes	12	13	14	7	11	16	127.1
Deep draft	95	59	57	33	22	51	54.4
Air (includes truck and air)	4	6	6	5	6	10	117.8
Pipeline ^b	S	S	S	S	S	S	U
Multiple modes, total	191	205	226	417	272	637	52.9
Parcel, U.S. Postal Service or courier	13	18	19	28	23	30	6.7
Truck and rail	38	56	46	197	170	443	125.2
Truck and water	41	35	32	98	49	52	-47.3
Rail and water	70	78	115	47	29	103	118.0
Other multiple modes	S	19	14	46	2	10	-79.4
Other / unknown modes, total	93	73	44	34	0	0	-99.6

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

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

^b 1993 and 1997 data exclude most shipments of crude oil. 2002 and 2007 data exclude shipments of crude petroleum.

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

^d Percent change has been revised in conjunction with 2017 data.

NOTE

Numbers may not add to totals due to rounding. Value-of-shipment estimates are reported in current prices. Coverage for the 2002 and 2007 Commodity Flow Survey (CFS) differs from the previous surveys due to a change from the 1997 Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS) and other survey improvements. The 2007 estimates are derived using an improved methodology of estimation.

Table 1-59: Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments, 2017²

SCTG	Value (billions of dollars)	Percent	Tons (millions)	Percent	Ton-miles ^c (billions)	Percent	Value per ton (dollars)	Average miles per shipment
01	10.8	0.07	4.6	0.04	1.6	0.05	2,356.7	866
02	108.6	0.75	707.1	5.67	230.5	7.40	153.5	158
03	237.0	1.63	315.2	2.53	145.9	4.68	751.9	524
04	134.4	0.93	325.3	2.61	78.9	2.53	413.2	514
05	356.4	2.46	93.9	0.75	46.0	1.48	3,796.9	183
06	198.1	1.36	132.8	1.07	56.4	1.81	1,491.1	187
07	606.3	4.18	530.2	4.25	203.3	6.52	1,143.6	373
08	226.9	1.56	111.9	0.90	27.8	0.89	2,028.4	195
09	79.8	0.55	4.7	0.04	0.9	0.03	17,129.4	1,014
10	7.2	0.05	14.1	0.11	2.5	0.08	511.2	345
11	12.2	0.08	535.9	4.30	112.8	3.62	22.8	170
12	19.7	0.14	1,615.2	12.95	96.0	3.08	12.2	41
13	24.6	0.17	216.6	1.74	57.1	1.83	113.5	274
14	30.7	0.21	70.5	0.57	44.3	1.42	435.9	607
15	31.7	0.22	878.2	7.04	483.1	15.50	36.1	74
17	746.0	5.14	1,388.4	11.13	138.3	4.44	537.3	44
18	474.6	3.27	909.1	7.29	79.3	2.54	522.1	36
19	258.4	1.78	547.1	4.39	88.4	2.84	472.4	65
20	290.9	2.00	418.7	3.36	151.6	4.86	694.8	421
21	1,099.0	7.57	19.6	0.16	10.1	0.32	56,161.6	623
22	57.9	0.40	172.5	1.38	40.1	1.29	335.6	102
23	431.2	2.97	127.5	1.02	60.7	1.95	3,382.7	881
24	642.5	4.43	224.8	1.80	123.6	3.97	2,858.1	689
25	6.5	0.04	25.6	0.21	5.4	0.17	253.9	138
26	220.9	1.52	322.8	2.59	88.8	2.85	684.4	350
27	127.5	0.88	139.6	1.12	83.4	2.67	913.3	267
28	148.4	1.02	80.9	0.65	26.3	0.84	1,835.7	577
29	133.9	0.92	27.9	0.22	11.1	0.36	4,791.1	480
30	510.5	3.52	39.8	0.32	24.3	0.78	12,822.1	1,083
31	203.6	1.40	920.8	7.38	103.6	3.32	221.1	544
32	464.5	3.20	332.2	2.66	113.6	3.65	1,398.2	413
33	394.3	2.72	128.4	1.03	49.0	1.57	3,072.0	559
34	870.5	6.00	94.8	0.76	42.8	1.37	9,186.3	439
35	1,135.6	7.82	56.9	0.46	31.1	1.00	19,973.1	783
36	1,244.9	8.57	170.5	1.37	66.9	2.15	7,303.6	475
37	281.9	1.94	6.5	0.05	3.8	0.12	43,273.8	918

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Table 1-59 cont'd: Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments, 2017^a

SCTG		Value (billions of dollars)		Tons (millions)		Ton-miles ^c (billions)		Value per ton (dollars)		Average miles per shipment
		Value	Percent	Tons	Percent	Ton-miles ^c	Percent	Value per ton	Percent	
38	Precision instruments and apparatus	384.1	2.65	7.8	0.06	5.5	0.18	49,537.7	0.18	910
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	179.0	1.23	27.0	0.22	15.0	0.48	6,633.1	0.48	822
40	Miscellaneous manufactured products	608.0	4.19	81.8	0.66	35.1	1.13	7,431.9	1.13	1,063
41	Waste and scrap	71.1	0.49	235.8	1.89	52.2	1.67	301.6	1.67	157
43	Mixed freight	1,447.8	9.97	406.2	3.26	79.8	2.56	3,564.1	2.56	383
00	All commodities^b	14,517.8	100.00	12,468.9	100.00	3,116.9	100.00	1,164.3	100.00	679

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

^a All data have been revised using data from the preliminary release of the 2017 Commodity Flow Survey.

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

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

NOTE

Details may not add to totals due to rounding or missing numbers that do not meet publication standards because of high sampling variability or poor response quality.

Table 1-60a: Value of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode (millions of dollars)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Exports to Canada, total	142,709.6	176,429.7	211,496.5	249,256.5	281,291.5	292,650.5	301,609.6	312,125.2	280,016.7	265,960.6	282,471.7	298,719.0	292,381.9	255,149.3
Truck	97,423.4	129,825.3	151,221.7	176,574.2	198,233.9	205,778.7	207,814.5	204,856.8	188,487.1	178,410.4	185,692.5	192,894.5	187,131.1	166,373.5
Rail	15,271.9	12,946.5	19,321.9	26,081.4	29,681.0	33,143.9	33,989.0	34,798.9	28,194.9	29,856.2	32,549.8	32,868.5	33,121.3	26,454.1
Pipeline	121.3	161.6	2,393.9	3,893.5	6,817.4	6,415.0	7,617.3	10,288.0	6,564.4	7,976.1	9,986.4	10,537.4	9,131.4	6,609.7
Air	10,943.7	19,097.8	14,317.3	17,637.7	18,391.1	17,932.6	17,897.2	16,959.4	15,974.6	14,990.0	15,847.6	17,472.5	18,568.5	18,317.2
Vessel	1,881.8	2,484.5	4,271.8	6,020.8	8,350.7	8,322.5	12,817.1	17,669.0	12,859.6	6,517.2	7,828.6	13,739.0	13,827.1	8,742.3
Other ^a	17,010.5	11,913.4	19,933.1	18,996.1	19,762.2	21,000.9	21,414.7	27,505.2	27,898.1	28,374.6	30,523.1	31,163.6	30,565.2	28,629.1
Mail ^b	57.0	0.6	36.9	52.8	55.3	56.9	59.8	47.9	38.0	36.2	43.6	43.5	37.4	23.4
Exports to Mexico, total	46,637.7	111,720.9	120,151.0	163,664.5	198,288.7	215,906.0	226,079.1	240,326.2	236,377.4	230,959.1	242,988.7	265,010.4	256,374.1	212,671.8
Truck	35,914.2	82,389.2	83,341.2	111,336.1	128,047.7	140,754.0	150,379.0	161,048.6	163,435.9	159,542.3	165,271.5	177,175.7	173,701.2	149,550.1
Rail	4,694.4	10,495.8	15,747.7	19,659.8	24,963.7	27,487.0	27,778.2	29,578.3	28,691.6	28,581.3	28,056.2	29,951.8	28,997.7	23,519.0
Pipeline	1.0	301.8	543.3	2,099.6	3,491.8	3,394.7	3,702.1	4,781.4	3,460.0	3,737.1	3,469.3	5,045.0	4,920.7	4,891.9
Air	1,775.3	7,808.6	6,440.2	7,484.8	7,565.8	7,413.7	7,646.5	8,664.9	9,795.6	8,669.2	9,179.0	9,780.1	9,117.0	7,828.3
Vessel	2,200.2	6,753.4	9,434.3	16,937.6	27,271.9	28,487.5	27,192.5	27,097.3	22,306.0	22,254.6	28,307.8	34,095.3	30,987.5	19,822.8
Other ^a	2,025.8	3,972.0	4,622.8	6,145.9	6,946.3	8,368.8	9,380.2	9,155.1	8,687.1	8,171.5	8,702.8	8,961.3	8,648.1	7,059.2
Mail ^c	26.8	0.0	21.6	0.6	1.5	0.4	0.6	0.6	1.2	3.1	2.1	1.1	1.8	0.5
Imports from Canada, total	154,484.7	229,209.1	287,848.5	277,636.7	315,324.8	324,262.6	332,552.8	346,062.6	295,190.3	278,066.8	299,975.2	318,481.1	319,735.7	270,381.8
Truck	88,964.9	127,816.3	143,695.6	123,311.7	135,778.0	139,140.3	140,517.5	149,098.7	146,716.7	148,817.2	150,401.2	155,388.0	155,943.9	142,639.1
Rail	39,996.9	49,699.2	60,606.3	56,917.5	65,116.4	69,906.2	71,420.5	69,356.1	62,334.8	58,715.7	61,649.4	67,597.2	63,178.2	52,241.8
Pipeline	10,606.6	23,117.1	48,766.5	58,762.4	69,449.9	67,477.2	72,101.1	78,848.3	46,785.0	37,775.4	51,629.9	57,757.1	58,230.5	41,549.2
Air	6,139.3	12,380.2	8,471.3	9,427.3	9,886.6	10,409.3	11,198.2	11,418.7	10,801.0	11,092.7	11,322.7	12,280.0	14,746.3	13,827.1
Vessel	4,675.9	6,558.4	13,975.2	20,779.8	24,073.2	23,769.2	23,365.6	20,848.8	15,186.5	11,448.4	15,049.9	15,982.3	17,071.9	11,424.4
Other ^a	3,888.2	9,571.0	12,184.4	7,270.6	6,913.4	6,698.1	8,296.2	10,068.5	10,014.7	8,842.1	7,876.2	7,388.5	8,285.5	7,705.2
Mail	5.2	4.1	0.1	0.2	0.7	0.3	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1
FTZ ^d	207.6	62.8	149.3	1,167.2	4,106.6	6,862.1	5,653.5	6,423.4	3,351.4	1,375.0	2,045.7	2,087.9	2,279.4	994.8
Imports from Mexico, total	63,144.8	135,910.5	170,119.2	229,985.6	262,873.6	277,593.6	280,528.8	294,157.5	294,741.1	294,151.0	314,045.2	346,527.7	358,126.0	325,394.3
Truck	43,014.3	88,668.7	112,267.6	148,994.6	167,473.9	182,416.0	184,972.1	199,619.2	213,115.5	213,210.8	219,462.1	246,779.3	255,498.2	236,130.6
Rail	9,137.9	21,056.1	20,782.2	28,484.6	32,306.8	36,911.6	42,072.9	44,111.3	46,020.8	48,598.6	51,887.8	48,421.1	53,271.5	46,203.7
Pipeline	27.4	11.5	0.0	181.6	281.3	214.5	242.3	205.9	221.9	195.4	158.0	147.7	127.3	61.9
Air	1,382.4	5,663.8	3,899.3	10,932.2	10,001.8	8,664.4	7,334.2	6,956.0	6,619.5	6,925.2	7,478.3	7,294.4	7,087.2	6,519.4
Vessel	7,713.5	16,810.2	30,819.5	37,650.4	48,810.6	45,294.5	40,187.8	38,132.2	22,625.6	18,146.3	24,448.6	32,718.5	33,636.9	28,610.9
Other ^a	768.9	1,573.9	1,990.2	1,878.4	1,879.6	1,807.6	1,908.4	1,909.9	1,963.1	2,682.0	3,121.8	3,477.0	3,322.8	3,312.2
Mail	1.3	0.6	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FTZ ^d	1,099.2	2,125.7	360.4	1,863.8	2,119.6	2,284.9	3,811.2	3,223.0	4,174.5	4,392.8	7,488.6	7,689.8	5,182.2	4,555.6

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Table 1-60a cont'd: Value of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode (Millions of dollars)

^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 Mail shipments data for several years prior to May 2004 were not compiled correctly resulting in undercounts.

^c Beginning in January 1996, new edit checks were added in the processing of the 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.

^d 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 in 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.

Component numbers may not add to totals due to rounding.

Table 1-60b: Weight of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode (millions of short tons)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Exports to Canada, total	141.6	147.8	110.7	136.1	141.2	147.0	155.4	185.4	194.0	197.3	188.0	183.4	182.2	150.1
Truck	63.4	63.6	54.1	62.8	64.6	64.8	65.3	66.5	64.6	63.6	66.5	65.4	62.7	56.6
Rail	33.9	33.0	26.4	33.0	32.5	36.4	35.5	36.2	32.9	33.8	34.7	31.3	30.2	27.1
Pipeline	2.7	1.5	1.3	1.7	12.0	12.8	16.0	24.3	28.3	45.0	42.6	28.4	28.3	21.4
Air	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Vessel	35.2	43.8	23.7	30.0	26.1	24.9	30.4	43.8	47.1	29.6	30.2	41.7	42.9	34.7
Other ^a	6.1	5.6	5.0	8.4	5.7	7.8	8.1	14.5	21.0	25.1	13.8	16.3	17.9	10.2
Exports to Mexico, total	87.4	88.7	76.8	108.3	137.6	130.5	124.5	142.1	129.9	147.2	160.9	179.2	189.0	156.7
Truck	31.2	30.1	25.7	39.2	55.0	40.9	38.7	38.6	40.8	43.7	47.8	55.6	49.8	42.1
Rail	27.5	29.5	21.0	26.9	29.5	35.3	30.1	26.9	27.1	39.2	37.7	40.7	50.2	45.9
Pipeline	2.0	2.1	2.1	8.1	11.1	11.3	13.1	33.0	13.1	7.7	8.3	9.2	21.6	15.9
Air	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Vessel	26.1	26.5	27.6	33.9	41.6	42.6	42.2	43.1	48.5	56.1	66.6	73.4	67.0	52.6
Other ^a	0.4	0.5	0.3	0.1	0.3	0.3	0.4	0.6	0.3	0.4	0.5	0.2	0.3	0.2
Imports from Canada, total	315.2	299.4	256.8	277.0	294.7	305.3	322.9	344.4	358.8	351.8	380.5	387.1	398.5	388.7
Truck	65.6	58.0	47.9	52.6	53.3	53.9	55.2	59.7	59.7	61.6	62.8	61.7	59.9	61.1
Rail	81.9	75.1	53.1	63.9	68.8	71.2	80.0	82.2	79.4	76.0	82.8	93.4	92.3	87.3
Pipeline	90.2	94.6	94.7	96.3	106.5	111.6	120.0	132.7	148.6	155.5	171.7	171.5	179.8	179.4
Air	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Vessel	76.5	71.1	60.7	62.0	58.6	55.7	55.2	55.0	58.0	51.4	57.5	55.4	61.4	58.0
Other ^a	0.8	0.6	0.4	2.2	7.4	12.9	12.4	14.7	13.0	7.4	5.6	5.1	5.1	2.8
Imports from Mexico, total	146.6	132.2	113.5	128.4	129.7	121.6	121.1	124.9	120.7	117.3	118.6	129.9	130.0	138.5
Truck	31.5	30.4	27.5	33.0	35.5	37.1	37.9	40.5	40.9	44.5	46.3	52.0	53.7	60.9
Rail	11.1	10.0	8.0	10.3	11.3	10.8	12.4	13.5	13.6	14.3	14.9	15.2	15.4	15.3
Pipeline	0.3	0.4	0.5	0.4	0.6	0.5	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.4
Air	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Vessel	103.5	91.2	77.4	84.3	82.0	73.0	70.0	69.9	65.0	57.2	56.2	61.5	59.6	61.3
Other ^a	0.1	0.2	0.1	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.6	0.6	0.6

^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, mode unknown, mail, imports into Foreign Trade Zones (FTZs), and miscellaneous. Although FTZs are treated as a mode of transportation in the Transborder Freight Data, the actual mode for a specific shipment into or out of an FTZ is unknown because U.S. Customs does not collect this information.

NOTES

The U.S. Department of Transportation, Bureau of Transportation Statistics estimates the weight of exports for truck, rail, pipeline, and other modes using value to weight ratios derived from imported commodities.

1 Kilogram = 0.00110231 Short tons.

Table 1-61: Crude Oil and Petroleum Products Transported in the United States by Mode (thousands)

	1990		2000		2005		2010		2011		2012		2013		2014	
	Barrels	Percent	Barrels	Percent	Barrels	Percent	Barrels	Percent	Barrels	Percent	Barrels	Percent	Barrels	Percent	Barrels	Percent
Crude oil, total	847,716	100.0	826,933	100.0	760,431	100.0	614,914	100.0	572,054	100.0	693,351	100.0	884,313	100.0	1,079,435	100.0
Pipelines	779,719	92.0	823,759	99.6	757,067	99.6	593,535	96.5	518,308	90.6	561,100	80.9	599,580	67.8	707,823	65.6
Water carriers	67,997	8.0	3,174	0.4	3,364	0.4	15,726	2.6	34,032	5.9	28,627	4.1	70,214	7.9	82,495	7.6
Railroads	N	N	N	N	N	N	5,653	0.9	19,714	3.4	103,624	14.9	214,519	24.3	289,117	26.8
Refined petroleum products, total	1,556,453	100.0	1,879,583	100.0	1,937,494	100.0	2,197,458	100.0	2,270,119	100.0	2,227,719	100.0	2,222,132	100.0	2,300,475	100.0
Pipelines	1,279,934	82.2	1,512,957	80.5	1,592,860	82.2	1,643,189	74.8	1,698,179	74.8	1,673,370	75.1	1,683,877	75.8	1,736,967	75.5
Water carriers	276,519	17.8	366,626	19.5	344,634	17.8	297,661	13.5	295,835	13.0	283,445	12.7	271,909	12.2	280,853	12.2
Railroads	N	N	N	N	N	N	256,608	11.7	276,105	12.2	270,904	12.2	266,346	12.0	282,655	12.3
Combined crude and petroleum products, total	2,404,169	100.0	2,706,516	100.0	2,697,925	100.0	2,812,372	100.0	2,842,173	100.0	2,921,070	100.0	3,106,445	100.0	3,379,910	100.0
Pipelines	2,059,653	85.7	2,336,716	86.3	2,349,927	87.1	2,236,724	79.5	2,216,487	78.0	2,234,470	76.5	2,283,457	73.5	2,444,790	72.3
Water carriers	344,516	14.3	369,800	13.7	347,998	12.9	313,387	11.1	329,867	11.6	312,072	10.7	342,123	11.0	363,348	10.8
Railroads	N	N	N	N	N	N	262,261	9.3	295,819	10.4	374,528	12.8	480,865	15.5	571,772	16.9
Crude oil, total	1,230,747	100.0	1,163,939	100.0	1,293,244	100.0	1,428,207	100.0	1,665,243	100.0	1,282,704	100.0	1,282,704	100.0	1,145,558	89.3
Pipelines	918,703	74.6	1,000,827	86.0	1,183,714	91.5	1,266,235	88.7	1,484,246	89.1	1,145,558	89.3	1,145,558	89.3	1,145,558	89.3
Water carriers	53,988	4.4	25,384	2.2	24,492	1.9	62,120	4.3	55,981	3.4	44,466	3.5	44,466	3.5	44,466	3.5
Railroads	258,056	21.0	137,728	11.8	85,038	6.6	99,852	7.0	125,016	7.5	92,680	7.2	92,680	7.2	92,680	7.2
Refined petroleum products, total	2,448,063	100.0	2,577,505	100.0	2,649,311	100.0	2,829,387	100.0	2,879,278	100.0	2,711,670	100.0	2,711,670	100.0	2,086,388	76.9
Pipelines	1,863,389	76.1	1,944,790	75.5	1,984,410	74.9	2,127,075	75.2	2,181,401	75.8	2,086,388	76.9	2,086,388	76.9	2,086,388	76.9
Water carriers	280,217	11.4	304,650	11.8	318,285	12.0	340,160	12.0	352,621	12.2	307,473	11.3	307,473	11.3	307,473	11.3
Railroads	304,457	12.4	328,065	12.7	346,616	13.1	362,152	12.8	345,256	12.0	317,809	11.7	317,809	11.7	317,809	11.7
Combined crude and petroleum products, total	3,678,810	100.0	3,741,444	100.0	3,942,555	100.0	4,257,594	100.0	4,544,521	100.0	3,994,374	100.0	3,994,374	100.0	3,231,946	80.9
Pipelines	2,782,092	75.6	2,945,617	78.7	3,168,124	80.4	3,393,310	79.7	3,665,647	80.7	3,231,946	80.9	3,231,946	80.9	3,231,946	80.9
Water carriers	334,205	9.1	330,034	8.8	342,777	8.7	402,280	9.4	408,602	9.0	351,939	8.8	351,939	8.8	351,939	8.8
Railroads	562,513	15.3	465,793	12.4	431,654	10.9	462,004	10.9	470,272	10.3	410,489	10.3	410,489	10.3	410,489	10.3

KEY: N = data do not exist.

NOTES

Details may not add to totals due to rounding in the source publication.

Crude oil, ethanol and biodiesel movements include pipeline, tanker, barge, and rail beginning with data for January 2010. Prior to data for January 2010, crude oil, ethanol and biodiesel movements included were by pipeline, tanker, and barge. Movements of products other than crude oil, ethanol and biodiesel are by pipeline, tanker, and barge.

A barrel unit of volume is equal to 42 U.S. gallons and 159 liters.

Current version of this table is not comparable with versions prior to 2018 due to previous editions including data from Association of Oil Pipe Lines, Shifts in Petroleum Transportation 1975-2009 ton-miles movements.

Table 1-62: U.S. Hazardous Materials Shipments by Transportation Mode, 2017

Transportation mode	Value		Tons		Ton-miles		Average miles per shipment
	(billions of dollars)	Percent	(millions)	Percent	(billions)	Percent	
TOTAL all modes	1,680.2	100.0	2,968.0	100.0	382.5	100.0	189
Single modes, total	1,612.1	95.9	2,889.5	97.4	307.2	80.3	72
Truck ^a	1091.3	64.9	1814.8	61.1	126.8	33.2	63
For-hire	567.6	33.8	932.7	31.4	92.1	24.1	153
Private ^b	523.7	31.2	882.2	29.7	34.7	9.1	28
Rail	39.0	2.3	90.4	3.0	61.7	16.1	640
Water	137.1	8.2	304.2	10.2	60.9	15.9	72
Air	4.8	0.3	0.3	0.0	0.2	0.1	1,333
Pipeline ^c	339.9	20.2	679.8	22.9	S	S	S
Multiple modes, total	68.1	4.1	78.4	2.6	75.3	19.7	947
Parcel, U.S. Postal Service or Courier	13.5	0.8	0.3	0.0	0.2	0.1	949
Other	54.6	3.3	78.1	2.6	75.0	24.4	4.0

KEY: S = withheld because estimate did not meet publication standards.

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

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

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

NOTE

Numbers may not add to totals due to rounding.

Table 1-63: U.S. Hazardous Materials Shipments by Hazard Class, 2017

Hazard class and description	Value		Tons		Ton-miles		Average miles per shipment
	(billions of dollars)	Percent	(millions)	Percent	(billions)	Percent	
Class 1. Explosives	14.9	0.9	3.3	0.1	1.0	0.3	1,046
Class 2. Gases	114.8	6.8	227.6	7.7	28.9	7.6	210
Class 3. Flammable liquids	1,373.8	81.8	2,466.6	83.1	269.8	70.5	100
Class 4. Flammable solids	5.3	0.3	28.2	1.0	7.6	2.0	478
Class 5. Oxidizers and organic peroxides	9.8	0.6	15.0	0.5	5.8	1.5	204
Class 6. Toxics (poison)	13.3	0.8	6.4	0.2	3.8	1.0	828
Class 7. Radioactive materials	6.9	0.4	0.4	U	U	U	63
Class 8. Corrosive materials	79.3	4.7	151.0	5.1	45.7	11.9	273
Class 9. Miscellaneous dangerous goods	62.0	3.7	69.4	2.3	19.8	5.2	944
Total	1,680.2	100.0	2,968.0	100.0	382.5	100.0	189

KEY: U = data are not available or less than 1 unit of measure or rounds to zero.

NOTE

Numbers may not add to totals due to rounding.

Section E:
System Performance

Table 1-64: Passengers Boarded and Denied Boarding by the Largest U.S. Air Carriers^a (thousands of passengers)

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Boarded	420,696	543,344	516,553	595,253	539,230	600,774	599,405	535,551	602,019	660,618	672,416	791,933	825,836	332,278
Denied boarding,^b total	628	1,120	597	746	551	598	494	467	531	471	363	352	490	74
Voluntary	561	1,062	552	681	509	539	440	418	486	430	337	341	470	71
Involuntary	67	57	45	65	41	59	54	49	44	41	26	11	20	3
Percent denied boarding	0.15	0.21	0.12	0.13	0.10	0.10	0.08	0.09	0.09	0.07	0.05	0.04	0.06	0.02

^a Before 1994, carriers included both majors and national airlines, i.e., airlines with over \$100 million in revenue. Prior to 2018, data include nonstop scheduled service between points within the United States (including territories) by U.S. air carriers with at least 1% of the total domestic scheduled service passenger revenues and operate aircraft with a passenger capacity of more than 60 seats. In 2018 and later, data include all reporting operating U.S. airlines.

^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.

NOTES

Since merging with Delta, data for Northwest Airlines are included under Delta as of January 2010.

United Airlines revised its Denied Boarding quarterly reports for January 2011 to March 2011, April 2011 to June 2011, July 2011 to September 2011 and October 2011 to December 2011, after the submissions were published in the ATRC. This table reflects these revisions.

AirTran Airways revised its Denied Boarding quarterly report for October 2011 to December 2011, after the submissions were published in the ATRC. This table reflects this revision.

Effective January 2011, Comair and Pinnacle Airlines are no longer ranked in this table. Totals for January – December 2010 reflect the deletion of Comair and Pinnacle's data for that quarter.

Effective January 2012, data of the merged operations of United Air Lines and Continental Airlines are combined. Effective January 2012, data of the merged operations of ExpressJet Airlines and Atlantic Southeast Airlines are combined.

Endeavor Air, formerly Pinnacle Airlines, was ranked for the first time in 1st Quarter of 2013.

Effective January 2014, the American Airlines and US Airways data are combined as American Airlines; the Southwest Airlines and AirTran Airways data are combined as Southwest Airlines.

Effective April 2018, data of the merged operations of Alaska Airlines and Virgin America are combined, and appear only as Alaska Airlines. Totals for the ranking period reflect the deletion of Virgin America's data.

Table 1-65: Baggage Mishandled by Marketing U.S. Air Carriers^a

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 ^c	2020 ^c
Total mishandled-bags (thousands)	N	N	N	N	N	N	N	N	N	N	N	N	N	899
Total bags enplaned (thousands)	N	N	N	N	N	N	N	N	N	N	N	N	N	506,800
Bags mishandled per 1,000 enplaned	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.85
Enplaned passengers (domestic) (millions) ^b	395.7	517.5	442.0	554.5	514.2	574.6	569.5	520.3	582.1	631.0	652.2	641.8	860.1	347.9
Bags mishandled per 1,000 passengers	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.45
Total mishandled-baggage reports (millions)	2.66	2.74	2.94	1.95	1.72	1.78	1.83	1.88	1.82	1.70	1.60	1.82	1.82	N
Reports per 1,000 passengers	6.73	5.29	6.64	3.51	3.35	3.09	3.22	3.61	3.13	2.70	2.46	2.84	NA	NA

Key: N = data do not exist; NA= not applicable.

^a 1990-2018 Data include nonstop scheduled service between points within the United States (including territories) by U.S. air carriers with at least 1% of the total domestic scheduled service passenger revenues and those carriers that report voluntarily. Starting in 2019, data include all marketing U.S. air carriers.

^b Enplaned passenger data is limited only to include air carriers that reported mishandled baggage data and are not representative of total enplaned passengers on all air carriers.

^c Starting in 2019, U.S. air carriers no longer submit number of mishandled-baggage reports. Total number of enplaned and mishandled bags are reported instead.

NOTES

Domestic flights only.

Mishandled bags are defined as the number of check bags that are lost, damaged, delayed, and pilfered, as reported by or on behalf of the passenger, that were in the airline's custody for its reportable domestic nonstop scheduled passenger flights.

Data for years 1990 to 2018 are based on passenger reports of mishandled-baggage, including those that did not subsequently result in claims for compensation.

Enplaned bags represent the total number of checked bags enplaned, including wheelchairs and scooters that were placed into the aircraft cargo compartment for any reportable domestic nonstop scheduled passenger flight.

Since merging with Delta, data for Northwest Airlines are included under Delta as of January 2010.

United Airlines revised its mishandled baggage reports for January 2011 thru October 2011 after the submissions were published in the ATRC. This table reflects these revisions.

Southwest Airlines revised its mishandled baggage reports for January 2011 thru February 2011 after the submissions were published in the ATRC. This table reflects these revisions.

Effective January 2011, Comair and Pinnacle Airlines are no longer ranked in this table. Totals for January – December 2010 reflect the deletion of Comair and Pinnacle's data.

Effective January 2012, data of the merged operations of United Air Lines and Continental Airlines are combined. Effective January 2012, data of the merged operations of ExpressJet Airlines and Atlantic Southeast Airlines are combined.

Endeavor Air, formerly Pinnacle Airlines, was ranked for the first time in 1st Quarter of 2013.

Effective January 2014, the American Airlines and US Airways data are combined as American Airlines; the Southwest Airlines and AirTran Airways data are combined as Southwest Airlines.

Effective April 2018, data of the merged operations of Alaska Airlines and Virgin America are combined.

Table 1-66: Flight Operations Arriving On Time by the Largest U.S. Air Carriers^a

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
On-time flight operations (percent)	79.4	72.6	77.4	79.8	79.6	81.9	78.3	76.2	79.9	81.4	80.2	79.2	79.0	84.5

^a Prior to 2018, data include nonstop scheduled service between points within the United States (including territories) by U.S. air carriers with at least 1% of the total domestic scheduled service passenger revenues and those carriers that report voluntarily. 2018 and after includes all operating reporting U.S. carriers.

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.

Since merging with Delta, data for Northwest Airlines are included under Delta as of January 2010.

Effective January 2011, Comair and Pinnacle Airlines are no longer ranked in the source.

Effective January 2012, data of the merged operations of United Air Lines and Continental Airlines are combined, and appear only as United Airlines data.

Effective January 2012, data of the merged operations of ExpressJet Airlines and Atlantic Southeast Airlines are combined, and appear only as ExpressJet Airlines data.

Endeavor Air, formerly Pinnacle Airlines, was ranked for the first time in 1st Quarter of 2013.

Effective January 2014, the American Airlines and US Airways data are combined as American Airlines; the Southwest Airlines and AirTran Airways data are combined as Southwest Airlines.

Effective April 2018, data of the merged operations of Alaska Airlines and Virgin America are combined as Alaska Airlines.

Table 1-67: FAA-Cited Causes of Departure and En Route Delays (after pushing back from the gate)

	1987	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Operations delayed (thousands)	356	393	450	438	335	330	277	333	341	325	345	445	444	456	92
Cause (percent)															
Weather	67	56	69	69	70	76	70	70	62	64	66	60	67	68	56
Airport terminal volume	11	33	14	15	19	16	17	19	21	24	23	24	21	21	30
Air Route Traffic Control volume	13	2	U	U	U	U	U	U	U	U	U	U	U	U	U
Closed runways / taxiways	4	3	6	10	4	3	7	5	8	7	6	10	7	6	6
National Airspace System equipment	4	1	2	1	0	1	1	0	4	0	0	0	0	1	1
Other	1	4	9	5	7	5	6	6	6	6	4	7	4	4	7

KEY: FAA = Federal Aviation Administration; U = data are not available.

NOTES

As of 2008, the FAA reports *delays* for aircraft that accumulate a *delay* of 15 minutes or more throughout the duration of the flight. Each holding segment is recorded as one *delay*. The Operations Network (OPSNET) Database *delay* data dating back to the year 2000 have been converted to be consistent with the new definitions.

Beginning in 2008 the FAA started to combine *Air Route Traffic Control volume* and *Airport Terminal volume* and retroactively applied this change through the year 2000.

Table 1-68: Major U.S. Air Carrier Delays, Cancellations, and Diversions

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total operations	5,270,893	5,683,047	7,140,596	6,450,117	6,085,281	6,096,762	6,369,482	5,819,811	5,819,079	5,617,658	5,674,621	7,213,446	7,422,037	4,688,354
Late departures	753,182	1,131,663	1,279,404	1,111,948	1,042,427	991,834	1,229,333	1,193,249	1,055,500	952,225	1,012,546	1,304,214	1,359,573	400,792
Percent of total	14.3	19.9	17.9	17.2	17.1	16.3	19.3	20.5	18.1	17.0	17.8	18.1	18.3	8.5
Late arrivals	1,087,774	1,356,040	1,466,065	1,174,884	1,109,872	1,015,158	1,269,277	1,240,528	1,063,439	964,239	1,029,474	1,352,710	1,389,253	431,921
Percent of total	20.6	23.9	20.5	18.2	18.2	16.7	19.9	21.3	18.3	17.2	18.1	18.8	18.7	9.2
Cancellations	52,458	187,490	133,730	113,255	115,978	78,862	96,012	126,984	89,884	65,861	82,693	116,584	134,925	281,034
Percent of total	1.0	3.3	1.9	1.8	1.9	1.3	1.5	2.2	1.5	1.2	1.5	1.6	1.8	6.0
Diversions	15,954	14,254	14,028	15,474	14,399	12,519	14,160	14,449	15,187	13,652	12,530	17,859	18,880	7,744
Percent of total	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2

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. 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.

The number of carriers reporting in previous years is as follows: 2020 (17); 2019 (17); 2018 (17); 18 through March after which Alaska Airlines and Virgin America began joint reporting); 2017 (12); 2016 (12); 2015 (13); 14 through June after which American and US Airways began joint reporting); 2014 (14); 2013 (16); 2012 (15); 2011 (16); 2010 (18); 2005 (20); 19 through April after which Frontier Airlines started reporting); 2000: (10; 11 starting in November when Aloha Airlines started reporting for the first time).

Chapter 1. The Transportation System

Table 1-69 cont'd: Annual Person-Hours of Highway Traffic Delay Per Auto Commuter

Urban area	Population group	Annual Person-Hours of Highway Traffic Delay Per Auto Commuter																	Percent change ^a			
		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Short-term 2015-2020		Long-term 1990-2020				
		Percent	Rank	Percent	Rank																	
Poughkeepsie-Newburgh, NY	Small	20	26	28	29	30	31	32	34	35	36	37	35	36	26	-26	12	30	39			
Providence, RI-MA	Large	17	36	39	41	42	43	44	44	46	47	48	48	47	33	-28	18	94	12			
Provo, UT	Medium	12	18	22	21	22	22	22	22	23	24	25	26	27	15	-35	34	25	42			
Raleigh-Durham, NC	Large	20	28	32	34	35	35	37	37	39	41	42	40	40	17	-56	83	-15	81			
Richmond, VA	Large	16	23	26	28	28	28	28	29	31	33	35	35	35	24	-23	6	50	27			
Riverside-San Bernardino, CA	Large	30	46	57	58	58	59	60	62	66	68	70	67	64	25	-62	100	-17	86			
Rochester, NY	Medium	24	32	35	35	36	36	37	38	39	40	40	41	41	26	-33	29	8	60			
Sacramento, CA	Large	26	37	44	46	48	50	51	53	55	57	59	58	56	38	-31	23	46	28			
Salem, OR	Small	21	31	40	37	38	37	38	38	39	40	41	40	40	15	-62	97	-29	95			
Salt Lake City, UT	Large	15	28	34	36	38	41	40	42	43	45	45	45	46	26	-40	44	73	15			
San Antonio, TX	Large	22	40	42	42	43	44	45	47	48	50	51	51	52	32	-33	29	45	29			
San Diego, CA	Very large	29	41	47	54	55	57	58	62	63	64	64	64	64	24	-62	99	-17	87			
San Francisco-Oakland, CA	Very large	68	79	83	90	93	95	97	99	101	102	103	103	103	46	-54	78	-32	96			
San Jose, CA	Large	37	49	56	63	69	72	73	76	78	80	81	80	80	31	-60	96	-16	85			
San Juan, PR	Large	17	31	41	43	46	48	52	54	55	56	58	57	57	29	-47	60	71	17			
Sarasota-Bradenton, FL	Medium	18	26	26	27	27	28	29	30	30	32	33	34	35	12	-60	94	-33	97			
Seattle, WA	Very large	43	55	62	64	66	69	71	72	74	76	78	77	77	31	-58	88	-28	94			
Spokane, WA	Small	22	35	37	39	39	40	41	42	43	44	45	46	47	20	-53	75	-9	77			
Springfield, MA-CT	Medium	23	33	35	36	38	39	39	40	41	41	41	41	40	25	-39	43	9	59			
St. Louis, MO-IL	Large	24	39	42	43	42	43	44	44	45	46	46	46	46	33	-27	15	38	33			
Stockton, CA	Small	10	16	20	22	24	26	27	29	30	30	32	33	34	25	-17	1	150	7			
Tampa-St. Petersburg, FL	Large	28	36	42	42	42	44	46	47	47	48	50	50	53	18	-62	98	-36	99			
Toledo, OH-MI	Medium	21	31	33	33	33	36	36	36	37	38	40	40	39	19	-49	63	-10	78			
Tucson, AZ	Medium	28	40	41	43	44	44	46	47	49	50	52	51	50	21	-57	85	-25	91			
Tulsa, OK	Medium	21	34	32	35	35	37	39	40	42	44	46	45	41	27	-36	37	29	40			
Virginia Beach, VA	Large	24	39	38	38	39	39	41	43	44	46	46	44	43	22	-50	67	-8	76			
Washington, DC-VA-MD	Very large	53	70	81	90	90	90	90	92	96	99	102	103	105	42	-56	81	-21	89			
Wichita, KS	Medium	22	28	28	29	30	31	32	34	34	35	36	36	36	25	-26	14	14	50			
Winston-Salem, NC	Small	9	17	21	20	20	21	21	22	24	26	27	27	26	15	-38	40	67	19			
Worcester, MA	Medium	21	34	37	39	40	39	40	40	41	42	43	42	42	28	-32	25	33	35			
494 Urban area average	494 Areas	28	38	42	44	45	46	48	49	51	52	53	54	54	27	-46	NA	-3	NA			
101 Urban area average	101 Areas	34	47	52	54	56	57	59	60	62	64	66	66	67	33	-46	NA	-3	NA			
Very large area average	Very large	46	58	64	68	70	72	74	76	79	81	83	84	84	41	-48	NA	-10	NA			
Large area average	Large	25	38	43	44	45	47	48	50	51	53	54	54	55	28	-46	NA	11	NA			
Medium area average	Medium	20	32	34	37	37	39	39	41	42	43	44	44	45	25	-41	NA	24	NA			
Small area average	Small	13	23	27	29	30	31	32	33	34	35	36	37	21	-38	NA	59	NA				

KEY: NA = not applicable.

Very large urban areas – 3 million and over population.
 Large urban areas – 1 million to less than 3 million population.
 Medium urban areas – 500,000 to less than 1 million population.
 Small urban areas – less than 500,000 population.

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

NOTES

The urban areas included are those containing over 500,000 people and several smaller places mostly chosen by previous sponsors of the Texas Transportation Institute study on mobility. Methodology and data sources have been changed in 2019 and were applied retroactively to past years; these figures are not comparable to those in past editions of NTS. *Population group* is based on 2020 population.

Chapter 1. The Transportation System

Table 1-70 cont'd: Travel Time Index

Urban area	Population group															Points change			
		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Short-term 2015-2020		Long-term 1990-2020	
		Points	Rank ^a	Points	Rank ^a														
Richmond, VA	Large	1.06	1.09	1.11	1.12	1.12	1.12	1.13	1.13	1.12	1.12	1.12	1.12	1.07	-5	15	1	18	
Riverside-San Bernardino, CA	Large	1.17	1.26	1.32	1.31	1.31	1.31	1.32	1.33	1.33	1.34	1.34	1.34	1.08	-25	95	-9	89	
Rochester, NY	Medium	1.10	1.13	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.09	-7	27	-1	33	
Sacramento, CA	Large	1.14	1.20	1.23	1.24	1.25	1.25	1.26	1.26	1.27	1.27	1.28	1.27	1.11	-16	73	-3	50	
Salem, OR	Small	1.10	1.15	1.19	1.17	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.05	-10	40	-5	65	
Salt Lake City, UT	Large	1.07	1.14	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.06	-12	61	-1	33	
San Antonio, TX	Large	1.12	1.22	1.24	1.23	1.23	1.24	1.24	1.24	1.23	1.23	1.23	1.23	1.12	-11	52	0	22	
San Diego, CA	Very large	1.14	1.22	1.27	1.30	1.31	1.32	1.33	1.34	1.34	1.35	1.35	1.34	1.10	-24	94	-4	60	
San Francisco-Oakland, CA	Very large	1.32	1.38	1.40	1.41	1.43	1.44	1.46	1.48	1.49	1.50	1.50	1.51	1.16	-33	100	-16	100	
San Jose, CA	Large	1.21	1.28	1.32	1.34	1.37	1.38	1.39	1.41	1.43	1.44	1.45	1.44	1.12	-31	99	-9	89	
San Juan, PR	Large	1.12	1.21	1.28	1.29	1.30	1.32	1.33	1.34	1.33	1.33	1.33	1.32	1.13	-20	88	1	18	
Sarasota-Bradenton, FL	Medium	1.11	1.16	1.16	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.05	-11	52	-6	75
Seattle, WA	Very large	1.26	1.33	1.37	1.36	1.37	1.37	1.38	1.38	1.37	1.37	1.37	1.37	1.11	-26	96	-15	99	
Spokane, WA	Small	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.07	-9	39	-9	89	
Springfield, MA-CT	Medium	1.08	1.12	1.13	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.07	-5	15	-1	33	
St. Louis, MO-IL	Large	1.09	1.15	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.14	1.08	-7	27	-1	33	
Stockton, CA	Small	1.07	1.10	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.16	1.10	-5	15	3	14	
Tampa-St. Petersburg, FL	Large	1.15	1.19	1.22	1.21	1.21	1.21	1.22	1.22	1.22	1.22	1.23	1.24	1.08	-14	69	-7	78	
Toledo, OH-MI	Medium	1.10	1.14	1.15	1.14	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.13	1.07	-7	27	-3	50	
Tucson, AZ	Medium	1.14	1.20	1.21	1.20	1.20	1.20	1.20	1.21	1.21	1.21	1.20	1.20	1.07	-14	69	-7	78	
Tulsa, OK	Medium	1.08	1.13	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.14	1.08	-7	27	0	22	
Virginia Beach, VA	Large	1.10	1.17	1.18	1.17	1.17	1.18	1.18	1.17	1.17	1.17	1.17	1.16	1.06	-11	52	-4	60	
Washington, DC-VA-MD	Very large	1.22	1.29	1.34	1.35	1.35	1.34	1.34	1.34	1.35	1.35	1.35	1.35	1.12	-23	92	-10	95	
Wichita, KS	Medium	1.11	1.14	1.16	1.14	1.14	1.15	1.14	1.14	1.14	1.14	1.14	1.13	1.09	-5	15	-2	45	
Winston-Salem, NC	Small	1.05	1.10	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.04	-7	27	-1	33	
Worcester, MA	Medium	1.07	1.11	1.12	1.13	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.13	1.10	-4	9	3	14	
494 Urban area average^b	494 Areas	1.14	1.19	1.21	1.21	1.21	1.22	1.22	1.22	1.22	1.23	1.23	1.23	1.09	-14	NA	-5	NA	
101 Urban area average^b	101 Areas	1.17	1.23	1.26	1.25	1.26	1.26	1.27	1.27	1.27	1.27	1.28	1.28	1.11	-16	NA	-6	NA	
Very large area average^b	Very large	1.22	1.29	1.32	1.31	1.32	1.32	1.33	1.33	1.34	1.34	1.34	1.35	1.13	-21	NA	-9	NA	
Large area average^b	Large	1.13	1.20	1.22	1.22	1.22	1.23	1.23	1.23	1.23	1.23	1.23	1.24	1.09	-15	NA	-4	NA	
Medium area average^b	Medium	1.10	1.15	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.08	-10	NA	-2	NA	
Small area average^b	Small	1.06	1.11	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.07	-7	NA	1	NA	

KEY: NA = not applicable.

Very large urban areas – 3 million and over population.
 Large urban areas – 1 million to less than 3 million population.
 Medium urban areas – 500,000 to less than 1 million population.
 Small urban areas – less than 500,000 population.

^a Rank is based on the calculated percent change with the highest number corresponding to a rank of 1.
^b Averages weighted by Vehicle Miles Traveled.

NOTES

The *Travel Time Index* is the ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. A value of 1.3, for example, indicates a 20-minute free-flow trip requires 26 minutes during the peak period.
 Methodology and data sources have been changed in 2019; these figures are not comparable to those in past editions of NTS. *Population group* is based on 2020 population.

Chapter 1. The Transportation System

Table 1-71 cont'd: Annual Roadway Congestion Index

Urban area	Population group	Annual Roadway Congestion Index												Points change			
		1982	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	Short-term 2006-2011		Long-term 1982-2011	
		Points	Rank ^a	Points	Rank ^a												
Pensacola, FL-AL	Small	0.71	0.74	0.86	0.97	1.01	1.10	1.10	1.09	0.96	0.95	0.93	0.93	-17	99	22	58
Philadelphia, PA-NJ-DE-MD	Very large	0.83	0.85	0.95	0.95	1.04	1.11	1.10	1.10	1.07	1.02	0.99	0.97	-13	87	14	79
Phoenix, AZ	Very large	1.03	1.02	1.01	1.07	1.25	1.32	1.29	1.24	1.20	1.17	1.15	1.15	-14	92	12	85
Pittsburgh, PA	Large	0.67	0.69	0.76	0.75	0.77	0.79	0.78	0.78	0.75	0.72	0.72	0.69	-9	78	2	94
Portland, OR-WA	Large	0.87	0.89	1.00	1.11	1.21	1.19	1.15	1.13	1.08	1.08	1.10	1.10	-5	42	23	55
Poughkeepsie-Newburgh, NY	Medium	0.83	0.85	0.85	0.86	0.88	0.90	0.91	0.88	0.85	0.81	0.80	0.79	-12	84	-4	97
Providence, RI-MA	Large	0.55	0.54	0.70	0.75	0.88	0.94	0.91	0.91	0.86	0.86	0.85	0.83	-8	73	28	43
Provo, UT	Small	1.16	1.17	1.16	1.10	1.06	1.03	1.00	0.98	0.92	0.95	0.95	0.97	-3	29	-19	101
Raleigh-Durham, NC	Large	0.63	0.75	0.85	0.92	0.96	1.00	1.02	1.04	1.01	0.97	0.98	0.96	-6	51	33	28
Richmond, VA	Medium	0.61	0.58	0.75	0.86	0.77	0.82	0.83	0.83	0.81	0.79	0.79	0.79	-4	35	18	73
Riverside-San Bernardino, CA	Large	0.76	0.89	1.14	1.16	1.26	1.53	1.56	1.53	1.49	1.46	1.39	1.41	-15	95	65	1
Rochester, NY	Medium	0.48	0.52	0.63	0.71	0.73	0.76	0.77	0.75	0.74	0.75	0.78	0.77	0	13	29	40
Sacramento, CA	Large	0.75	0.88	1.10	1.12	1.23	1.36	1.33	1.33	1.29	1.29	1.29	1.30	-3	29	55	3
Salem, OR	Small	0.58	0.66	0.82	0.84	0.89	0.89	0.88	0.87	0.82	0.81	0.83	0.82	-6	51	24	50
Salt Lake City, UT	Large	0.72	0.77	0.88	1.07	1.05	1.03	1.01	1.02	0.99	0.99	1.00	1.01	0	13	29	40
San Antonio, TX	Large	0.68	0.78	0.75	0.88	1.05	1.11	1.12	1.12	1.09	1.08	1.04	1.05	-7	63	37	16
San Diego, CA	Very large	0.83	0.93	1.23	1.22	1.33	1.41	1.39	1.37	1.34	1.32	1.30	1.32	-7	59	49	4
San Francisco-Oakland, CA	Very large	1.01	1.13	1.31	1.31	1.38	1.40	1.40	1.39	1.34	1.35	1.40	1.41	1	7	40	13
San Jose, CA	Large	1.03	1.10	1.23	1.19	1.35	1.34	1.35	1.35	1.32	1.33	1.35	1.37	2	3	34	24
San Juan, PR	Large	0.69	0.73	0.83	0.92	1.02	1.15	1.15	1.14	1.14	1.14	1.16	1.17	2	3	48	7
Sarasota-Bradenton, FL	Medium	0.77	0.86	0.87	0.94	1.13	1.24	1.27	1.23	1.17	1.18	1.13	1.13	-14	92	36	20
Seattle, WA	Very large	0.84	0.94	1.14	1.17	1.18	1.13	1.10	1.07	1.03	0.99	1.03	1.03	-7	63	19	65
Spokane, WA	Small	0.53	0.59	0.64	0.75	0.76	0.71	0.71	0.67	0.68	0.69	0.68	0.68	-3	28	15	76
Springfield, MA-CT	Medium	0.60	0.63	0.69	0.74	0.79	0.83	0.83	0.81	0.79	0.81	0.81	0.79	-4	35	19	65
St. Louis, MO-IL	Large	0.84	0.89	0.86	1.04	1.02	0.91	0.89	0.90	0.87	0.85	0.85	0.83	-6	51	-1	95
Stockton, CA	Small	0.64	0.72	0.83	0.96	1.02	1.11	1.15	1.20	1.12	1.11	1.11	1.12	-3	25	48	6
Tampa-St. Petersburg, FL	Large	1.04	1.09	1.13	1.16	1.13	1.27	1.29	1.28	1.22	1.21	1.21	1.19	-10	82	15	77
Toledo, OH-MI	Medium	0.54	0.61	0.65	0.81	0.91	0.87	0.87	0.83	0.76	0.75	0.74	0.73	-14	91	19	71
Tucson, AZ	Medium	0.89	0.91	0.93	0.91	1.01	1.18	1.17	1.15	1.16	1.15	1.14	1.13	-4	37	24	54
Tulsa, OK	Medium	0.62	0.74	0.75	0.79	0.81	0.81	0.81	0.79	0.74	0.72	0.69	0.69	-12	86	7	89
Virginia Beach, VA	Large	0.78	0.82	0.85	0.89	0.99	1.02	1.01	1.01	1.02	1.03	1.03	1.02	1	7	24	50
Washington, DC-VA-MD	Very large	0.83	1.01	1.05	1.22	1.25	1.35	1.35	1.37	1.35	1.35	1.34	1.32	-3	29	49	4
Wichita, KS	Medium	0.49	0.49	0.53	0.56	0.56	0.55	0.56	0.56	0.54	0.54	0.54	0.52	-4	37	3	91
Winston-Salem, NC	Small	0.70	0.75	0.78	0.80	0.84	0.85	0.84	0.84	0.79	0.79	0.79	0.76	-8	67	6	90
Worcester, MA	Small	0.68	0.70	0.74	0.81	0.83	0.85	0.83	0.84	0.81	0.79	0.78	0.77	-6	49	9	88
439 Urban area average^b	439 Areas	0.69	0.73	0.84	0.93	1.01	1.03	1.03	1.03	0.98	0.98	0.99	0.99	-4	NA	30	NA
101 Urban area average^b	101 Areas	0.77	0.84	0.95	1.02	1.09	1.12	1.12	1.11	1.07	1.06	1.06	1.06	-6	NA	29	NA
Very large area average^b	Very large	0.87	0.95	1.10	1.14	1.23	1.27	1.26	1.25	1.21	1.20	1.20	1.20	-6	NA	33	NA
Large area average^b	Large	0.72	0.78	0.87	0.96	1.03	1.07	1.06	1.06	1.02	1.01	1.00	0.99	-7	NA	27	NA
Medium area average^b	Medium	0.63	0.68	0.76	0.83	0.88	0.91	0.92	0.91	0.88	0.87	0.87	0.86	-6	NA	23	NA
Small area average^b	Small	0.63	0.67	0.73	0.78	0.83	0.86	0.87	0.87	0.82	0.82	0.81	0.81	-6	NA	18	NA

KEY: NA = not applicable.

Very large urban areas – 3 million and over population.

Large urban areas – 1 million to less than 3 million population.

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

Small urban areas – less than 500,000 population.

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

^b Average weighted by vehicle miles traveled in city.

NOTE

The Roadway Congestion Index (RCI) is a measure of vehicle travel density on major roadways in an urban area. An RCI exceeding 1.0 indicates an undesirable congestion level, on an average, on the freeways and principal arterial street systems during the peak period. The urban areas included are those containing over 500,000 people and several smaller places mostly chosen by previous sponsors of the Texas Transportation Institute study on mobility. *Population group* is based on 2010 population.

Table 1-72 cont'd: Annual Highway Congestion Cost

Urban area	Population group	Annual congestion cost per auto commuter (2020 dollars)																								
		Value																	Rank							
		2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Sarasota-Bradenton, FL	Medium	536	545	544	545	569	569	586	607	627	638	679	695	247	78	92	92	92	92	92	92	91	91	92	91	89
Seattle, WA	Very large	1,231	1,442	1,445	1,473	1,522	1,539	1,580	1,611	1,625	1,639	1,612	685	11	7	8	6	7	7	7	7	9	9	10	10	
Spokane, WA	Small	694	763	755	764	775	793	825	861	887	928	937	423	54	54	55	54	55	54	55	54	51	48	49	52	
Springfield, MA-CT	Medium	703	680	670	685	688	699	726	752	765	775	757	492	53	71	73	70	74	75	73	76	75	77	77	84	
St. Louis, MO-IL	Large	861	899	880	883	886	898	925	943	947	969	986	719	29	38	38	39	40	40	40	41	43	44	44	14	
Stockton, CA	Small	607	596	594	595	596	612	656	700	743	788	840	624	68	87	86	88	90	90	85	83	80	72	63	32	
Tampa-St. Petersburg, FL	Large	754	926	923	946	961	976	997	1,027	1,041	1,068	1,125	401	43	32	33	33	33	33	33	34	34	34	35	79	
Toledo, OH-MI	Medium	639	678	690	701	715	735	764	785	799	809	779	393	60	72	67	65	67	66	65	66	67	68	76	81	
Tucson, AZ	Medium	673	816	801	802	805	814	836	864	877	882	869	381	57	47	48	48	48	50	50	50	50	52	56	83	
Tulsa, OK	Medium	588	668	673	667	696	710	733	759	772	762	692	479	74	73	72	74	71	70	70	73	73	81	91		
Virginia Beach, VA	Large	788	771	756	743	756	768	781	800	800	783	763	399	38	51	54	58	58	58	60	63	66	75	82		
Washington, DC-VA-MD	Very large	1,610	1,965	1,946	1,912	1,931	1,956	2,015	2,093	2,125	2,176	2,191	905	4	3	3	3	3	3	3	3	3	3	3		
Wichita, KS	Medium	393	464	468	468	477	488	505	520	531	535	526	377	90	94	94	94	94	94	95	96	96	97	98		
Winston-Salem, NC	Small	357	449	441	432	437	449	474	498	514	515	503	303	94	95	96	97	97	97	98	98	98	99	99		
Worcester, MA	Medium	670	742	732	712	744	759	799	842	868	862	849	603	58	60	61	63	60	59	56	56	54	58	61		
494 Areas		155	273	294	309	324	336	341	353	368	380	384	204	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
101 Areas		657	1,154	1,245	1,309	1,370	1,423	1,441	1,495	1,559	1,609	1,627	841	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Very large area average		2,897	4,905	5,289	5,550	5,794	6,007	6,084	6,282	6,542	6,743	6,784	3,431	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Large area average		495	923	1,000	1,058	1,113	1,159	1,175	1,226	1,279	1,322	1,345	701	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Medium area average		175	323	347	363	380	397	402	420	440	456	467	258	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Small area average		60	131	142	149	155	162	164	174	183	191	195	117	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		

Continued next page

Table 1-72 cont'd: Annual Highway Congestion Cost

Urban area	Population group	Annual congestion cost (2020 millions of dollars)																			Rank						
		2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
Sarasota-Bradenton, FL	Medium	146	242	260	273	292	308	312	326	347	372	384	136	67	74	73	73	70	73	69	69	69	68	68	83		
Seattle, WA	Very large	1,387	2,660	2,873	3,043	3,234	3,354	3,360	3,472	3,589	3,672	3,664	1,556	13	13	13	13	12	12	12	12	12	12	12	13		
Spokane, WA	Small	96	173	185	194	203	213	216	227	240	257	263	119	77	81	83	83	83	83	83	83	81	81	81	86		
Springfield, MA-CT	Medium	156	247	264	280	289	302	305	318	333	337	330	214	64	71	70	70	72	72	72	72	73	72	73	69		
St. Louis, MO-IL	Large	720	1,226	1,298	1,350	1,394	1,454	1,462	1,506	1,550	1,582	1,610	1,175	21	22	22	23	24	24	24	24	24	24	25	17		
Stockton, CA	Small	67	145	156	162	167	176	187	200	218	234	250	185	86	85	85	86	86	86	86	84	84	84	84	75		
Tampa-St. Petersburg, FL	Large	679	1,361	1,458	1,559	1,628	1,694	1,713	1,804	1,914	2,020	2,154	767	22	21	21	21	21	21	21	21	21	21	21	28		
Toledo, OH-MI	Medium	101	174	191	202	212	223	226	236	243	247	238	120	75	80	80	80	80	80	79	80	80	80	82	85		
Tucson, AZ	Medium	275	545	576	600	621	643	650	675	699	708	697	306	46	46	46	46	46	46	46	46	46	46	47	56		
Tulsa, OK	Medium	210	388	423	436	467	489	492	514	536	526	469	325	54	53	53	53	53	53	54	54	54	54	62	52		
Virginia Beach, VA	Large	430	684	723	740	774	804	801	825	845	831	809	423	34	39	39	40	40	40	40	40	41	41	43	43		
Washington, DC-VA-MD	Very large	2,048	4,084	4,360	4,470	4,642	4,780	4,848	5,072	5,273	5,420	5,480	2,263	8	5	5	6	6	6	7	7	6	6	7	11		
Wichita, KS	Medium	89	173	189	197	205	216	217	226	236	236	230	164	80	81	81	81	82	82	82	82	83	83	84	78		
Winston-Salem, NC	Small	60	123	129	132	137	145	149	159	168	168	164	99	91	91	92	92	92	91	91	91	91	90	92	90		
Worcester, MA	Medium	113	206	219	222	238	249	255	271	286	287	283	201	73	77	77	77	77	77	77	77	77	77	77	73		
494 Urban area average		958	1,001	1,002	1,009	1,027	1,041	1,079	1,112	1,137	1,167	1,174	605	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
101 Urban area average		1,176	1,228	1,230	1,239	1,261	1,278	1,325	1,364	1,395	1,432	1,441	742	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Very large area average		1,594	1,623	1,627	1,637	1,665	1,685	1,749	1,794	1,830	1,877	1,880	948	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Large area average		827	936	941	955	978	994	1,028	1,066	1,087	1,113	1,127	586	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Medium area average		676	749	748	750	765	781	809	839	855	886	905	502	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Small area average		429	560	562	565	578	592	615	647	663	691	703	420	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		

KEY: NA = not applicable.

Very large urban areas - population of 3 million or more.

Large urban areas - population of 1 million to less than 3 million.

Medium urban areas - population of 500,000 to less than 1 million.

Small urban areas - population of less than 500,000.

NOTES

The urban areas included are those containing over 500,000 people and several smaller places mostly chosen by previous sponsors of the Texas Methodology and data sources have been changed in 2019 and were applied retroactively to past years; these figures are not comparable to those in 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

Table 1-73: Amtrak On-Time Performance Trends and Hours of Delay by Cause

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
On-time performance, total percent (weighted)	69.0	76.0	78.2	69.8	79.7	78.1	83.0	82.3	72.4	71.2	79.1	74.6	73.0	75.1	79.7
Northeast corridor, percent	N	N	N	N	N	N	N	86.2	77.3	76.5	80.3	76.7	79.7	84.1	86.9
State supported, percent ^a	N	N	N	N	N	N	N	82.0	73.8	71.4	81.4	77.7	76.4	75.6	80.9
Long distance, percent ^b	N	N	N	N	N	N	N	71.9	50.4	53.7	63.1	52.1	43.1	50.2	58.7
Short distance (<400 miles), percent	71.0	82.0	82.0	73.6	80.3	79.8	84.5	83.6	75.1	73.3	81.1	N	N	N	N
Long distance (>=400 miles), percent	64.0	53.0	55.0	42.1	74.7	63.6	70.7	71.9	50.6	53.7	63.0	N	N	N	N
Hours of delay by cause, total^c	N	12,126	70,396	95,259	79,976	86,021	79,235	78,604	100,018	102,058	89,983	95,033	96,378	96,961	73,265
Amtrak ^d	N	3,565	23,337	25,549	23,404	26,121	21,384	22,379	31,787	31,582	26,339	27,451	26,967	30,589	15,690
Host railroad ^e	N	4,244	43,881	64,097	44,090	48,707	46,564	44,632	57,413	57,701	48,555	53,332	55,217	53,702	41,868
Other ^f	N	4,316	3,176	5,613	12,482	11,192	11,286	11,592	10,816	12,774	15,087	14,250	14,194	12,670	15,707

KEY: N = data do not exist.

^a Routes outside the Northeast Corridor and under 750 miles in length.

^b Routes over 750 miles in length.

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

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

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

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

NOTES

As of 2017 Amtrak no longer records On-Time Performance for "Short distance (<400 miles)" or "Long Distance (>=400 miles)" and instead records three new categories of "Northeast corridor," "State supported," and "Long distance."

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

Numbers may not add to totals due to rounding.

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

Amtrak trains are considered on time if arrival at the endpoint is within the minutes of scheduled arrival time as shown on the following chart. Trip length is based on the total distance traveled by that train from origin to destination:

Trip length (miles)	Minutes late at endpoint
0–250	10 or less
251–350	15 or less
351–450	20 or less
451–550	25 or less
> 551	30 or less



CHAPTER 2

Transportation Safety

Section A: Multimodal Safety

Table 2-1: Transportation Fatalities by Mode

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL fatalities	U	U	U	47,298	44,279	45,640	35,040	34,568	35,693	34,691	34,637	37,367	39,748	39,364	38,766	38,174	40,732
Air, total	1,286	1,456	1,382	866	752	601	477	499	450	429	442	406	408	347	395	452	349
U.S. air carrier ^a	499	146	1	39	92	22	2	0	0	0	9	0	0	0	0	1	4
Commuter carrier ^b	N	N	37	6	5	0	0	0	0	0	5	0	1	8	0	0	2
On-demand air taxi ^c	N	N	105	51	71	18	17	41	12	25	20	27	19	16	16	32	21
General aviation ^d	787	1,310	1,239	770	596	563	458	458	438	390	422	378	386	331	379	414	332
Highway, total	36,399	52,627	51,091	44,599	41,945	43,510	32,999	32,479	33,782	32,893	32,744	35,484	37,806	37,473	36,835	36,096	38,680
Passenger car occupants	N	N	27,449	24,092	20,699	18,512	12,491	12,014	12,361	12,037	11,947	12,763	13,508	13,477	12,888	12,239	U
Motorcyclists	790	2,280	5,144	3,244	2,897	4,576	4,518	4,630	4,986	4,692	4,594	5,029	5,337	5,226	5,038	5,015	5,458
Truck occupants ^e , light	N	N	7,486	8,601	11,526	13,037	9,782	9,302	9,418	9,186	9,103	9,878	10,279	10,186	9,957	9,976	U
Truck occupants ^e , large	N	N	1,262	705	754	804	530	640	697	695	656	665	815	878	890	892	U
Bus occupants	N	N	46	32	22	58	44	55	39	54	44	49	64	43	44	35	U
Pedestrians	7,210	8,950	8,070	6,482	4,763	4,892	4,302	4,457	4,818	4,779	4,910	5,494	6,080	6,075	6,374	6,205	6,236
Pedalcyclists	490	760	965	859	693	786	623	682	734	749	729	829	853	806	871	846	891
Other incident ^f	27,909	40,637	669	584	591	845	709	699	729	701	761	777	870	782	773	889	U
Railroad, total^g	N	N	1,417	1,297	937	884	735	681	669	702	767	749	761	817	805	863	752
Train accidents	N	N	29	10	10	33	8	6	9	11	5	11	7	7	7	3	6
Highway-rail grade crossing	1,364	1,440	833	698	425	359	261	246	231	232	262	237	255	271	258	294	197
Trespassers	N	N	457	543	463	458	441	399	405	427	469	450	468	505	510	540	525
Other incident ^h	N	N	98	46	39	34	25	30	24	32	31	51	31	34	30	26	24
Transit, totalⁱ	N	N	N	N	N	149	222	226	265	273	236	250	258	249	260	268	289
Passenger/Occupant	N	N	N	N	N	48	42	42	67	56	56	29	52	47	40	53	57
Employee/Worker	N	N	N	N	N	7	6	3	5	11	5	3	8	6	11	5	10
Other incident	N	N	N	N	N	94	174	181	193	206	175	218	198	196	209	210	222
Water, total^j	N	1,418	1,360	865	701	829	821	904	765	650	674	700	737	709	682	707	851
Passenger vessel ^k	U	U	U	U	U	52	87	96	84	26	14	15	7	8	24	44	44
Freight vessel ^l	U	U	U	U	U	33	22	18	14	19	18	41	12	11	10	10	7
Industrial/Other ^m	U	U	U	U	U	47	40	32	16	45	32	18	17	32	15	40	33
Recreational boating ⁿ	739	1,418	1,360	865	701	697	672	758	651	560	610	626	701	658	633	613	767
Pipeline, total	N	30	19	9	38	17	22	13	12	9	19	11	16	7	7	11	15
Hazardous liquid pipeline	N	4	4	3	1	2	1	0	3	1	0	1	3	1	0	0	5
Gas pipeline	N	26	15	6	37	15	21	13	9	8	19	10	13	6	7	11	10
Other counts, redundant with above																	
Railroad, killed at public crossing with motor vehicle	1,261	1,362	678	567	306	258	136	138	135	141	144	128	130	140	132	128	94
Rail, passenger	N	N	52	202	220	202	215	189	194	197	219	249	254	307	266	271	201
Train accidents	U	U	1	0	2	14	4	0	0	5	3	10	4	5	3	3	1
Highway-rail grade crossing ^o	U	U	12	74	72	70	74	58	62	75	61	82	88	99	80	118	62

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Table 2-1 cont'd: Transportation Fatalities by Mode

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Trespassers	U	U	31	117	135	109	131	123	121	110	146	150	157	189	169	144	134
Rail, other	U	U	8	11	11	9	6	8	11	7	9	7	5	14	14	6	4
Rail, freight	N	N	1,365	1,095	717	682	520	492	475	505	551	500	507	510	539	593	551
Train accidents	U	U	28	10	8	19	4	6	9	6	2	1	3	2	4	0	5
Highway-rail grade crossing ^p	U	U	821	624	353	289	187	188	169	157	202	155	167	172	178	177	135
Trespassers	U	U	426	426	328	349	310	276	284	317	325	300	311	316	341	396	391
Rail, other	U	U	90	35	28	25	19	22	13	25	22	44	26	20	16	20	20
Transit, non-rail	N	N	N	110	98	92	100	96	115	124	101	105	108	98	86	95	110
Transit, rail	N	N	N	N	229	197	57	122	130	150	149	135	145	150	151	174	179
Water, Vessel-related ^d	N	178	206	85	53	46	37	27	25	16	14	46	18	24	32	57	25
Water, Not related to vessel casualties ^f	N	420	281	101	134	67	58	43	60	74	50	28	18	27	17	37	29

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

^a All services operating under 14 CFR 121 (Scheduled air carriers). 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. In 2001, other than the persons aboard the aircraft, who were killed, fatalities resulting from the September 11 terrorist acts are excluded. U.S. air carrier figure does not include 12 persons killed aboard a commuter aircraft when it and a US Air airliner collided.

^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. Commuter air carrier figure does not include 22 persons killed aboard a US Air airliner when it and a commuter aircraft collided.

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

^f Includes occupants of other vehicle types, other nonmotorists, and unknown. 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 Railroad fatality data for 1975 and before is not comparable with later years due to a change in the reporting system.

^h Other incidents are events other than Train Accidents or Crossing Incidents that cause physical harm to persons.

ⁱ Includes transit employee, contract worker, passenger, revenue facility occupant, and other fatalities for transit only modes reported in the National Transit Database (excludes commuter rail, reporting under FRA).

^j Passenger, freight, and industrial/other include only closed cases where vessels were involved in a marine casualty. See the notes below for a table of open investigations.

^k Passenger includes passenger ships, research ships, and schools ships and include only closed cases where vessels were involved in a marine casualty. See the notes below for a table of open investigations.

^l Freight includes barges, bulk carriers, general dry cargo ships, refrigerated cargo ships, roll-on/roll-off ships, tank ships, and towing ships and include only closed cases where vessels were involved in a marine casualty. See the notes below for a table of open investigations.

^m Industrial/other includes fishing vessels, miscellaneous vessels, and offshore include only closed cases where vessels were involved in a marine casualty. See the notes below for a table of open investigations.

ⁿ Recreational includes airboats, canoes, kayaks, motorboats, pontoon, rowboats, and sailboats. Data are based on information provided by the States, the District of Columbia and the five U.S. Territories to the Coast Guard Boating Accident Report Database (BARD) system, which is subject to some under- or delayed reporting.

^o Includes passenger train collisions with vehicles and people at all public and private highway-rail grade crossings.

^p Highway-rail grade crossing fatalities include freight train collisions with vehicles and people at all public and private highway-rail grade crossings.

^q Vessel-related casualties include those involving damage to vessels such as collisions or groundings. Fatalities not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.

^r 1992-97 data come from the Marine Safety Management Information System. Between 1998 and 2001, the U.S. Coast Guard phased in a new computer system to track safety data, the Marine Information for Safety and Law Enforcement System. During that period, data come from combining entries in the Marine Safety Management Information System with entries in the Marine Information for Safety and Law Enforcement System. Data for prior years come from other sources and may not be directly comparable.

Table 2-1 cont'd: Transportation Fatalities by Mode**NOTES**

To reduce double counting, the following adjustments are made to *Total Fatalities*: For Railroad, fatalities involving motor vehicles at public highway-rail grade crossings are excluded because such fatalities are assumed to be included in *Highway* fatalities. For Transit, non-rail modes, including aerial tramway, motor bus, bus rapid transit, commuter bus, demand response, demand taxi, ferryboat, jitney, publico, trolleybus, and vanpool fatalities are excluded because they are counted as *Water* and *Highway* fatalities. *Other counts, redundant with above* help eliminate double counting in the *Total Fatalities*.

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

The Federal Railroad Administration defines a grade crossing as a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade. The Federal Transit Administration defines two types of grade crossings: (1) At grade, mixed, and cross traffic crossings, meaning railway right-of-way over which other traffic moving in the same direction or other cross directions may pass. This includes city street right-of-way; (2) At grade with cross traffic crossings, meaning railway right-of-way over which no other traffic may pass, except to cross at grade-level crossings. This can include median strip rights-of-way with grade level crossings at intersecting streets.

Highway 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 traffic way that results in the death of a vehicle occupant or a nonmotorist within 30 days of the crash.

Water injury data for 2001 and before is not comparable with later years due to a change in the reporting system.

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Water Open Investigations not included above												
Marine Casualty, Reportable	1	23	37	36	58	70	61	87	138	202	197	627
PCAS Investigations	0	12	15	25	27	23	23	27	48	34	31	40

Table 2-2: Injured Persons by Transportation Mode

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
U.S. air carrier ^b	N	822	757	485	359	305	278	364	274	247	265	282	240	229	271	260	202
Commuter carrier ^c	N	107	19	29	31	14	17	21	18	9	9	4	24	18	19	26	8
On-demand air taxi ^d	N	N	N	11	7	0	2	0	0	9	0	0	4	11	0	0	0
General aviation ^e	N	N	N	43	36	12	3	15	9	16	15	9	9	4	17	14	9
Highway, total^f	N	N	N	681	409	309	256	328	247	214	236	248	199	206	228	229	187
Passenger car occupants	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Motorcyclists	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Truck occupants ^g , light	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Truck occupants ^g , large	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Bus occupants	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Pedestrians	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Pedalcyclists	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Other incident ^h	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Railroad, totalⁱ	N	N	N	62,246	25,143	11,643	8,379	8,455	8,462	8,752	8,805	9,130	8,702	8,890	8,326	7,997	5,503
Train accidents	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Highway-rail grade crossing	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Trespassers	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Other incident ^j	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Transit, total^k	N	N	N	54,556	56,697	19,039	25,376	23,027	23,380	24,772	23,900	24,338	24,385	22,830	22,837	23,363	15,418
Passenger/Occupant	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Employee/Worker	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Other incident	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Water, total	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Passenger vessel ^k	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Freight vessel ^l	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Industrial/Other ^m	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Recreational boating ⁿ	929	780	2,650	3,822	4,355	3,451	3,153	3,081	3,000	2,620	2,678	2,613	2,903	2,629	2,511	2,559	3,191
Pipeline, total	N	N	N	254	192	76	81	47	108	55	44	94	48	87	78	36	42
Hazardous liquid pipeline	N	21	15	7	4	2	3	1	4	6	0	0	0	9	1	2	0
Gas pipeline	N	233	177	69	77	45	105	54	53	38	94	48	78	31	76	36	30
Other counts, redundant with above																	
Railroad, injured at public crossing with motor vehicle	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Rail, passenger	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Train accidents	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Highway-rail grade crossing ^o	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Trespassers	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Other incidents	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 2-2 cont'd: Injured Persons by Transportation Mode

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Rail, freight	N	N	57,460	20,271	7,834	6,030	4,072	3,953	4,016	3,985	4,093	4,113	3,604	3,718	3,561	3,381	2,828
Train accidents	N	N	471	210	128	443	53	60	429	71	52	264	34	51	54	36	38
Highway-rail grade crossing ^o	N	N	3,844	2,276	1,099	909	667	694	696	755	678	716	618	662	630	592	543
Trespassers	N	N	441	490	362	359	308	324	331	355	363	344	388	403	404	421	463
Other incidents	N	N	52,704	17,295	6,245	4,319	3,044	2,873	2,576	2,804	3,000	2,789	2,564	2,602	2,473	2,332	1,784
Transit, non-rail	N	N	40,834	42,713	14,594	16,705	14,757	15,102	15,931	16,365	16,945	17,121	16,523	16,469	16,715	11,324	
Transit, rail	N	N	13,722	13,984	4,445	8,671	8,270	8,278	8,278	8,841	7,535	7,393	7,264	6,307	6,368	6,648	4,094
Water, Vessel-related ^d	N	105	180	175	150	116	128	99	137	164	98	128	158	119	115	108	73
Water, Not related to vessel casualties ^e	N	U	U	U	607	603	622	720	682	589	608	424	296	336	378	335	272

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

^a Serious injuries only. See *Glossary* for definitions
^b All service operating under 14 CFR 121 (Scheduled air carriers). 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 (Commuter air carriers). Before Mar. 20, 1997, 14 CFR 135 applied to aircraft with 30 or fewer seats. Since March 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent years' data.
^d Nonscheduled service operating under 14 CFR 135 (On-demand air taxis).
^e All operations other than those operating under 14 CFR 121 and 14 CFR 135.
^f Large trucks are defined as trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors. Light trucks are defined as trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and utility vehicles.
^g Includes occupants of other unknown vehicle types and other nonmotorists.
^h Railroad injury data for 1975 and before is not comparable with later years due to a change in the reporting system.
ⁱ Other incidents are events other than Train Accidents or Crossing Incidents that cause physical harm to persons.
^j Includes transit employee, contract worker, passenger, revenue facility occupant, and other fatalities for transit only modes reported in the National Transit Database (excludes commuter rail, reporting under FRA).
^k Passenger vessel includes passenger ship, research vessel, and school ships where vessels were involved in a marine casualty as of May 24, 2019.
^l Freight vessel includes barge, bulk carrier, general dry cargo ship, refrigerated, Ro-Ro, tanker, and towing vessels where vessels were involved in a marine casualty as of May 24, 2019.
^m Industrial/other includes fishing vessels, miscellaneous vessels, Mobile Offshore Drill Units, Lifboats, Offshore Supply Vessels and Floating Production and Storage Systems where vessels were involved in a marine casualty as of May 24, 2019.
ⁿ Recreational includes airboats, canoes, kayaks, motorboats, pontoon, rowboats, and sailboats. Data are based on information provided by the States, the District of Columbia and the five U.S. Territories to the Coast Guard Boating Accident Report Database (BAR) system, which is subject to some under- or delayed reporting.
^o Includes passenger train collisions with vehicles and people at all public and private highway-rail grade crossings.
^p Highway-rail grade crossing injuries include freight train collisions with vehicles and people at all public and private highway-rail grade crossings.
^q 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.
^r 1992-97 data come from the Marine Safety Management Information System. Between 1998 and 2001 the U.S. Coast Guard phased in a new computer system to track safety data, the Marine Information for Safety and Law Enforcement System. During that period data come from combining entries in the Marine Safety Management Information System with entries in the Marine Information for Safety and Law Enforcement System.
^s NHTSA's National Center for Statistics and Analysis (NCSA) redesigned the nationally representative sample of police-reported traffic crashes, which estimates the number of police-reported injury and property-damage-only crashes in the US. The new system, Crash Report Sampling System (CRSS), replaced the National Automotive Sampling System (NASS) General Estimates System (GES) in 2016 and has a different sample design. Thus, 2016 and later year estimates are not comparable to 2015 and earlier year estimates. People injured estimates have been solely estimated from CRSS/GES for injuries suffered in fatal as well as non-fatal crashes. Starting with 2018 reporting, NHTSA is implementing a change in the way people injured estimates are reported. Injured estimates will be based on people injured in fatal crashes from the Fatality Analysis Reporting System (FARS) and estimated people injured in non-fatal crashes from CRSS/GES.

NOTES

To reduce double counting, the following adjustments are made to Total Injuries: For Railroad, injuries involving motor vehicles at public highway-rail grade crossings are excluded because such fatalities are assumed to be included in Highway fatalities. For Transit, non-rail modes, including aerial tramway, motor bus, bus rapid transit, commuter bus, demand response, demand taxi, ferryboat, jitney, publico, trolleybus, and vanpool injuries are excluded because they are counted as Water and Highway fatalities.
 Highway numbers including totals are estimates rather than actual counts. The estimates are calculated from data obtained from a nationally representative sample of crashes. NHTSA redesigned the nationally representative sample of police-reported traffic crashes, which estimates the number of police-reported injury and property-damage-only crashes in the US. The new system, CRSS, replaced the NASS GES in 2016 and has a different sample design. Thus, the 2016 persons injured estimates are not comparable to 2015 and earlier year estimates.
 Water injury data for 2001 and before is not comparable with later years due to a change in the reporting system.

Table 2-3: Transportation Accidents by Mode

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air	4,883	4,767	3,818	2,388	1,985	1,782	1,507	1,558	1,540	1,296	1,291	1,282	1,337	1,317	1,348	1,302	1,144
U.S. air carrier ^a	90	55	19	24	56	40	30	33	27	22	31	28	30	33	31	40	14
Commuter carrier ^b	N	N	38	15	12	6	6	4	3	6	3	4	4	9	2	6	9
On-demand air taxi ^c	N	N	171	107	80	65	30	50	39	45	35	39	29	44	40	33	40
General aviation ^d	4,793	4,712	3,590	2,242	1,837	1,671	1,441	1,471	1,471	1,223	1,222	1,211	1,269	1,234	1,275	1,220	1,085
Highway, total crashes ^e	N	N	N	6,471,000	6,394,000	6,159,350	5,419,445	5,337,829	5,815,044	5,686,891	6,064,284	6,296,135	6,821,129	6,452,598	6,734,681	6,755,841	U
Passenger car	N	N	N	5,560,592	4,926,243	6,087,389	5,350,198	5,328,473	5,576,794	5,669,145	5,981,770	6,242,821	6,742,719	6,331,689	6,658,225	6,560,680	U
Motorcycle	N	N	N	103,114	68,783	103,185	96,467	99,520	111,896	106,508	110,486	102,346	134,290	116,300	109,067	110,531	U
Truck ^f , light	N	N	N	2,152,486	3,207,738	4,151,295	3,775,315	3,624,586	3,810,208	3,869,115	4,183,675	4,413,949	4,670,058	4,542,192	4,670,249	4,846,874	U
Truck ^f , large	N	N	N	371,801	437,861	441,552	275,702	287,392	333,283	341,914	438,095	432,930	457,760	474,910	530,967	537,504	U
Bus	N	N	N	60,412	55,594	51,382	54,242	57,438	55,118	66,563	69,425	68,225	68,126	66,804	65,292	73,930	U
Other/Unknown	N	N	N	26,000	15,172	23,556	15,172	14,284	15,368	11,251	15,423	15,049	21,047	15,962	15,904	15,945	U
Railroad, total ^g	N	N	N	67,228	26,153	14,024	11,816	10,032	9,915	9,549	10,068	10,497	9,965	10,363	10,210	10,078	7,322
Highway-rail grade crossing ^h	N	N	N	1,192	691	607	571	453	444	458	517	533	502	533	499	586	554
Railroad ⁱ	N	N	N	66,036	25,462	13,417	11,245	9,579	9,471	9,091	9,551	9,964	9,771	9,432	9,864	9,624	9,524
Transit, total ^j	N	N	N	58,002	24,261	8,151	3,492	3,184	3,539	4,726	4,998	6,636	7,002	7,080	7,040	7,232	U
Highway-rail grade crossing ^k	N	N	N	N	148	148	201	176	160	186	223	716	716	836	685	663	U
Transit ^l	N	N	N	N	24,113	8,003	3,291	3,008	3,379	4,540	4,775	5,920	6,166	6,324	6,355	6,569	U
Waterborne, total	N	6,385	10,137	10,024	13,143	9,946	9,889	10,425	9,813	9,789	10,112	7,488	6,863	6,545	6,568	7,299	7,818
Vessel-related ^m	N	2,582	4,624	3,613	5,403	4,977	5,285	5,837	5,298	5,727	6,048	3,330	2,400	2,254	2,423	3,131	2,553
Recreational boating	2,738	3,803	5,513	6,411	7,740	4,969	4,604	4,588	4,515	4,062	4,064	4,158	4,463	4,291	4,145	4,168	5,285
Pipeline, total	N	1,428	1,770	379	380	719	586	588	571	617	706	712	632	646	634	657	578
Hazardous liquid pipeline	N	351	246	180	146	369	350	344	366	400	455	460	420	415	405	384	333
Gas pipeline	N	1,077	1,524	199	234	350	236	244	205	217	251	252	212	231	229	273	245

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

^a Carriers operating under 14 CFR 121, all scheduled and nonscheduled services. Since Mar. 20, 1987, 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-1987 data for 14 CFR 121 and 14 CFR 135 with more recent data.

^b All scheduled service operating under 14 CFR 135. Since Mar. 20, 1987, 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-1987 data for 14 CFR 121 and 14 CFR 135 with more recent data.

^c Nonscheduled service operating under 14 CFR 135.

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

^e 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, and hence "total highway crashes" is smaller than the sum of the components. Estimates of transportation, National Highway Traffic Safety Administration are rounded to the nearest thousand in the source document.

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

^g Includes Amtrak. Accidents and incidents resulting from freight and passenger rail operations including commuter rail. Railroad accident data for 1970 and before are not comparable with post-1970 data due to a change in the reporting system.

^h Accidents and incidents occurring at highway-rail crossings resulting from freight and passenger rail operations including commuter rail. Data are not comparable after 1970 due to a change in reporting system. Train and commuter rail occupant and nonoccupant incidents, excluding highway-rail grade crossing incidents involving motor vehicles.

ⁱ All reportable incidents for heavy rail, light rail, and automated guideway.

^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. The drop in the number of accidents in 2002 is due largely to a change in definitions by the Federal Transit Administration particularly the definition of injuries. Beginning in 2002, only injuries requiring immediate medical treatment away from the scene qualified as reportable. In 2008, the property damage threshold was changed to \$25,000. Previously, any accident with property damage equal to or greater than \$7,500 was reported.

^k Accidents occurring at highway-rail grade crossings resulting from operations of public transit rail modes excluding commuter rail. Data for light rail crossings are: 2000 (106), 2005 (81), 2010 (133), 2011 (116), 2012 (116), 2013 (116), 2014 (143), 2015 (471), 2016 (509), 2017 (707), 2018 (625), 2019 (643). Since 2008, the data has included both directly operated (DO) and purchased transportation (PT) modes.

^l Transit total subtract highway-rail grade crossing.

^m 1992-97 data are obtained from the Marine Safety Management Information System. Between 1998 and 2000, the U.S. Coast Guard phased in a new computer system to track safety data, the Marine Information for Safety and Law Enforcement System. During this period, data are obtained from combining entries in the Marine Safety Management Information System with entries in the Marine Information for Safety and Law Enforcement System. Data after 2002 comes from the Marine Information for Safety and Law Enforcement System. Statistics for prior years may not be directly comparable due to the revised method of capture.

NOTES

The motor vehicle crash data are from the U.S. Department of Transportation, National Highway Traffic Safety Administration's 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. Highway crashes for detailed modes after 2007 are not comparable to the previous years due to different data sources.

The Federal Railroad Administration defines a grade crossing as a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade. The Federal Transit Administration defines two types of grade crossings: (1) At-grade, mixed, and cross traffic crossings, meaning railway right-of-way over which other traffic moving in the same direction or other cross directions may pass. This includes city street right-of-way; (2) at-grade with cross traffic crossings, meaning railway right-of-way over which no other traffic may pass, except to cross at grade-level crossings. This can include median strip rights-of-way with grade level crossings at intersecting streets.

Table 2-5: Highway-Rail Grade-Crossing Safety

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities ^a	1,440	833	698	425	359	261	246	231	232	262	237	255	271	260	299	203
Injured persons	3,272	3,890	2,407	1,219	1,053	888	1,048	971	977	870	1,048	853	848	846	827	669
Accidents ^a	3,559	10,796	5,715	3,502	3,066	2,052	2,064	1,988	2,104	2,296	2,080	2,050	2,124	2,231	2,228	1,883

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

NOTE

The Federal Railroad Administration recommended not to report property damage statistics, which had been done in previous editions of NTS, due to inconsistencies in the reporting of data.

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

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total fatalities	19	8	16	34	8	13	13	11	11	12	8	10	6	7	3
Accident-related	14	7	11	29	5	11	11	10	10	12	8	7	5	5	3
Air fatalities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highway fatalities	17	8	16	24	8	12	13	11	11	12	8	10	6	7	3
Accident-related	12	7	11	19	5	11	11	10	10	12	8	7	5	5	3
Rail fatalities	2	0	0	10	0	1	0	0	0	0	0	0	0	0	0
Accident-related	2	0	0	10	0	0	0	0	0	0	0	0	0	0	0
Water^a fatalities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other^b fatalities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total injured persons	626	423	251	915	169	165	185	171	163	390	182	155	148	182	57
Accident-related	47	18	16	700	4	20	18	14	6	208	14	9	14	17	19
Air injured persons	8	39	5	44	2	7	20	12	15	20	9	3	8	6	2
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highway injured persons	493	311	164	178	152	130	147	142	134	157	148	130	131	165	49
Accident-related	43	9	15	45	4	17	12	14	6	12	14	9	14	15	17
Rail injured persons^c	121	73	82	693	13	20	18	15	14	213	17	12	9	11	6
Accident-related	4	9	1	655	0	3	6	0	0	196	0	0	0	2	2
Water^a injured persons	1	0	0	0	2	8	0	2	0	0	8	10	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other^b injured persons	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total incidents	15,719	8,879	17,557	15,926	14,805	15,029	15,446	16,059	17,408	16,865	18,287	17,494	19,877	22,756	15,789
Accident-related	486	297	394	382	358	377	398	367	351	317	273	291	324	263	149
Air incidents	223	297	1,419	1,654	1,295	1,401	1,460	1,442	1,327	1,130	1,204	1,166	1,433	1,668	1,421
Accident-related	0	0	3	9	2	2	2	3	3	3	4	15	5	10	4
Highway incidents	14,161	7,296	15,063	13,460	12,658	12,812	13,255	13,887	15,316	15,130	16,527	15,746	17,928	20,661	13,992
Accident-related	347	249	329	323	320	335	363	333	330	280	245	252	292	227	115
Rail incidents	1,271	1,279	1,058	743	747	745	661	667	718	581	545	573	507	421	374
Accident-related	134	48	62	50	35	40	33	31	18	33	23	24	27	26	30

Continued next page

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

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Water^a incidents	34	7	17	69	105	71	70	63	47	24	11	9	9	6	2
Accident-related	2	0	0	0	1	0	0	0	0	1	1	0	0	0	0
Other^b incidents	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total property damage (current thousands of dollars)^d	10,828	32,354	78,132	55,946	71,615	125,789	78,876	87,460	82,509	108,364	79,550	69,766	114,442	92,063	54,298
Accident-related	6,236	24,792	62,636	44,114	60,691	95,696	62,392	74,036	66,773	92,893	52,405	46,546	78,495	60,398	41,078
Air property damage	12	142	272	198	20	171	41	143	129	47	1,930	27	75	65	6
Accident-related	0	0	42	0	0	0	1	0	113	0	49	0	0	0	0
Highway property damage	7,324	20,190	51,030	40,179	63,678	113,103	60,190	49,518	59,605	62,228	50,179	43,629	92,134	74,550	26,345
Accident-related	3,782	14,132	37,837	31,052	55,981	86,150	47,301	39,053	46,376	48,824	35,127	31,189	58,646	44,891	14,771
Rail property damage	2,952	11,952	26,547	15,454	7,342	12,310	17,839	37,780	22,657	46,086	27,388	20,612	22,200	17,433	27,945
Accident-related	2,357	10,660	24,756	13,063	4,688	9,546	15,091	34,984	20,284	44,070	17,228	15,358	19,849	15,507	26,307
Water^a property damage	505	70	283	114	574	205	806	19	117	3	53	5,498	33	15	2
Accident-related	81	0	0	0	23	0	0	0	0	0	1	0	0	0	0
Other^b property damage	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0

^a Water category includes only 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 The 2005 spike in *Rail Injured Persons* is due to a chlorine accident by a train operated by the Norfolk Southern Railway Co. in Graniteville, South Carolina, on January 6, 2005. 9 people died and 631 people were injured.

^d 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 components may not add to the totals. Different cost thresholds for reporting property damage exist by property type. See NTS table 2-8 for the various thresholds.

NOTE

Hazardous materials transportation incidents required to be reported are defined in the Code of Federal Regulations (CFR), 49 CFR 171.15, 171.16 (Form F 5800.1). Hazardous materials deaths and injuries are caused by the hazardous material in commerce.

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

	1992	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All occupational fatalities	6,217	5,920	5,734	4,690	4,693	4,628	4,585	4,821	4,836	5,190	5,147	5,250	5,333
Transportation-related fatalities, total^b	2,484	2,573	2,493	1,857	1,937	1,923	1,865	1,984	2,054	2,083	2,077	2,080	2,122
Highway ^c	1,158	1,365	1,437	1,044	1,103	1,153	1,099	1,157	1,264	1,252	1,299	1,276	1,270
Nonhighway ^d	436	399	340	276	222	233	227	248	253	245	209	225	236
Aircraft	353	280	149	152	145	127	136	135	139	130	126	133	152
Pedestrian struck by vehicle ^e	346	370	391	280	316	293	294	318	289	342	313	325	341
Water vehicle ^f	109	84	88	60	72	63	60	55	44	48	68	58	63
Railway ^g	66	71	83	45	50	38	41	57	50	50	48	48	47
As a percent of all occupational fatalities													
Transportation-related fatalities, total^b	40.0	43.5	43.5	39.6	41.3	41.6	40.7	41.2	42.5	40.1	40.4	39.6	39.8
Highway	18.6	23.1	25.1	22.3	23.5	24.9	24.0	24.0	26.1	24.1	25.2	24.3	23.8
Nonhighway	7.0	6.7	5.9	5.9	4.7	5.0	5.0	5.1	5.2	4.7	4.1	4.3	4.4
Aircraft	5.7	4.7	2.6	3.2	3.1	2.7	3.0	2.8	2.9	2.5	2.4	2.5	2.9
Pedestrian struck by vehicle	5.6	6.3	6.8	6.0	6.7	6.3	6.4	6.6	6.0	6.6	6.1	6.2	6.4
Water vehicle	1.8	1.4	1.5	1.3	1.5	1.4	1.3	1.1	0.9	0.9	1.3	1.1	1.2
Railway	1.1	1.2	1.4	1.0	1.1	0.8	0.9	1.2	1.0	1.0	0.9	0.9	0.9

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

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

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

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

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

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

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

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.

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

Modal administration	Reporting threshold
Federal Aviation Administration	More than \$25,000 damage to property other than the aircraft.
Federal Highway Administration	None; each state defines its own threshold and FHWA collects state reports.
Federal Railroad Administration	More than \$10,700 in damages to railroad on-track equipment, signals, track, track structures, and roadbed for accidents other than at grade-crossings. No threshold for grade-crossing accidents.
National Highway Traffic Safety Administration	None; property-damage-only crashes are recorded through the General Estimates System, a nationally representative sample of police-reported crashes of all severities.
Federal Transit Administration	More than \$25,000.
Pipeline and Hazardous Materials Safety Administration	More than \$50,000 for gas pipelines. More than \$50,000 for hazardous liquid pipelines.
U. S. Coast Guard	More than \$75,000 for commercial vessels. More than \$2,000 or complete loss of vessel for recreational boats.

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

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total fatalities	499	146	1	39	92	22	2	0	0	9	0	0	0	0	1	4	0
Total seriously injured persons	N	107	19	29	31	14	17	21	18	8	14	23	18	19	26	17	8
Total accidents	90	55	19	24	56	40	30	33	27	22	31	28	30	33	31	40	14
Fatal accidents	17	8	1	6	3	3	1	0	0	2	0	0	0	0	1	2	0
Aircraft-miles (millions)	1,130	2,685	2,924	4,948	7,524	8,166	7,598	7,714	7,660	7,673	7,691	7,822	8,017	8,155	8,474	8,688	3,895
Rates per 100 million aircraft-miles																	
Fatalities	44.159	5.438	0.034	0.788	1.223	0.269	0.026	0.000	0.000	0.117	0.000	0.000	0.000	0.000	0.012	0.046	0.000
Seriously injured persons	N	3.985	0.650	0.586	0.412	0.171	0.224	0.272	0.235	0.104	0.182	0.294	0.225	0.233	0.307	0.196	0.205
Total accidents	7.965	2.048	0.650	0.485	0.744	0.490	0.395	0.428	0.352	0.287	0.403	0.358	0.374	0.405	0.366	0.460	0.359
Total accidents, fatal	1.504	0.298	0.034	0.121	0.040	0.037	0.013	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.012	0.023	0.000
Aircraft departures (thousands)	N	N	5,479	8,092	11,468	11,130	9,634	9,584	9,391	9,402	9,179	9,107	9,243	9,274	9,526	9,751	4,519
Rates per 100,000 aircraft departures																	
Fatalities	N	N	0.018	0.482	0.802	0.198	0.021	0.000	0.000	0.096	0.000	0.000	0.000	0.000	0.010	0.041	0.000
Seriously injured persons	N	N	0.347	0.358	0.270	0.126	0.176	0.219	0.192	0.085	0.153	0.253	0.195	0.205	0.273	0.174	0.177
Total accidents	N	N	0.347	0.297	0.488	0.359	0.311	0.344	0.288	0.234	0.338	0.307	0.325	0.356	0.325	0.410	0.310
Total accidents, fatal	N	N	0.018	0.074	0.026	0.027	0.010	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.010	0.021	0.000
Flight hours (thousands)	N	6,470	7,067	12,150	18,299	19,390	17,751	17,963	17,722	17,780	17,743	17,926	18,294	18,581	19,288	19,788	8,899
Rates per 100,000 flight hours																	
Fatalities	N	2.257	0.014	0.321	0.503	0.113	0.011	0.000	0.000	0.051	0.000	0.000	0.000	0.000	0.005	0.020	0.000
Seriously injured persons	N	1.654	0.269	0.239	0.169	0.072	0.096	0.117	0.102	0.045	0.079	0.128	0.098	0.102	0.135	0.086	0.090
Total accidents	N	0.850	0.269	0.198	0.306	0.206	0.169	0.184	0.152	0.124	0.175	0.156	0.164	0.178	0.161	0.202	0.157
Total accidents, fatal	N	0.124	0.014	0.049	0.016	0.015	0.006	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.005	0.010	0.000

KEY: N = data do not exist.

^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.

NOTE

Aircraft-miles, *Aircraft 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*, *Seriously injured persons*, *Total accidents*, and *Fatal accidents* by the number of *Aircraft-miles*, *Aircraft 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. Illegal acts, such as suicide, sabotage and terrorism, are included in the totals for accidents, fatalities, and rate computation.

Chapter 2

Section B:

Air Safety

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

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total fatalities	37	6	5	0	0	0	0	0	0	1	8	0	0	2	5
Total seriously injured persons	14	11	7	0	2	0	0	9	0	4	17	0	0	0	0
Total accidents	38	15	12	6	6	4	3	6	3	4	9	6	2	9	5
Total accidents, fatal	8	3	1	0	0	0	0	2	0	1	2	0	0	1	1
Aircraft-miles (millions)	192	450	45	46	48	49	50	52	49	54	60	68	71	68	38
Rates per 100 million aircraft-miles															
Fatalities	19.27	1.33	11.13	0.00	0.00	0.00	0.00	9.53	0.00	1.86	13.28	0.00	0.00	2.94	13.06
Seriously injured persons	7.29	2.44	15.58	0.00	4.17	0.00	0.00	17.15	0.00	7.43	28.22	0.00	0.00	0.00	0.00
Total accidents ^b	19.79	3.33	26.70	13.12	12.50	8.21	5.96	11.43	6.17	7.43	14.94	8.81	2.82	13.22	13.06
Total accidents ^b , fatal	4.17	0.67	2.23	0.00	0.00	0.00	0.00	3.81	0.00	1.86	3.32	0.00	0.00	1.47	2.61
Aircraft departures (thousands)	1,777	3,160	604	527	605	608	602	577	624	632	636	625	645	634	321
Rates per 100 thousand aircraft departures															
Fatalities	2.08	0.19	0.83	0.00	0.00	0.00	0.00	0.87	0.00	0.16	1.26	0.00	0.00	0.32	1.56
Seriously injured persons	0.79	0.35	1.16	0.00	0.33	0.00	0.00	1.56	0.00	0.63	2.67	0.00	0.00	0.00	0.00
Total accidents ^b	2.14	0.47	1.99	1.14	0.99	0.66	0.50	1.04	0.48	0.63	1.42	0.96	0.31	1.42	1.56
Total accidents ^b , fatal	0.45	0.09	0.17	0.00	0.00	0.00	0.00	0.35	0.00	0.16	0.31	0.00	0.00	0.16	0.31
Flight hours (thousands)	1,176	2,342	370	300	315	326	322	325	335	360	377	392	421	417	225
Rates per 100 thousand flight hours															
Fatalities	3.15	0.26	1.35	0.00	0.00	0.00	0.00	1.54	0.00	0.28	2.12	0.00	0.00	0.48	2.22
Seriously injured persons	1.19	0.47	1.89	0.00	0.64	0.00	0.00	2.77	0.00	1.11	4.51	0.00	0.00	0.00	0.00
Total accidents ^b	3.23	0.64	3.25	2.00	1.91	1.23	0.93	1.85	0.90	1.11	2.39	1.53	0.47	2.16	2.22
Total accidents ^b , fatal	0.68	0.13	0.27	0.00	0.00	0.00	0.00	0.62	0.00	0.28	0.53	0.00	0.00	0.24	0.44

^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 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.

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*, *Seriously injured persons*, *Total accidents*, and *Total accidents, fatal* by the number of *Aircraft-miles*, *Aircraft 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.

Illegal acts, such as suicide, sabotage and terrorism, are included in the totals for accidents, fatalities, and rate computation.

Table 2-11: U.S. Air Carrier^a Fatal Accidents by Defining Event of Operation^b

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL fatal accidents	6	3	3	1	0	0	2	0	0	0	0	1	2	0
Phase of operation														
Approach / landing	1	0	1	0	0	0	1	0	0	0	0	0	1	0
Taxi / climb	3	1	0	0	0	0	1	0	0	0	0	0	0	0
Cruise (in-flight)	1	2	1	0	0	0	0	0	0	0	0	1	1	0
Standing (static)	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Maneuvering	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other / not reported	0	0	0	1	0	0	0	0	0	0	0	0	0	0

^a Carriers operating under 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 NTSB changed its reporting of phase of accidents. Data after 2008 is reported by Defining Event associated phase of flight leading to the accident. Before 2008 data is reported by first phase of operation, the phase of flight where the problem leading to the accident first occurs.

Table 2-12: U.S. Commuter Air Carrier^a Fatal Accidents by Defining Event of Operation

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL fatal accidents	3	1	0	0	0	0	2	0	1	2	0	0	1	1
Phase of operation														
Approach / landing	0	1	0	0	0	0	1	0	0	0	0	0	1	0
Taxi / climb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cruise (in-flight)	2	0	0	0	0	0	1	0	1	2	0	0	0	1
Standing (static)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maneuvering ^b	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Other / not reported	0	0	0	0	0	0	0	0	0	0	0	0	0	0

^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).

NOTE

NTSB changed its reporting of phase of accidents. Data after 2008 is reported by Defining Event associated phase of flight leading to the accident. Before 2008 data is reported by first phase of operation, the phase of flight where the problem leading to the accident first occurs.

Table 2-13: U.S. On-Demand Air Taxi^a Safety Data

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total fatalities	105	51	71	18	17	41	12	25	20	27	19	16	16	32	21
Total seriously injured persons	43	36	12	20	3	15	9	16	15	9	6	4	4	17	9
Total accidents	171	107	80	65	30	50	39	45	35	39	29	44	40	33	40
Total accidents, fatal	46	29	22	11	6	16	8	10	8	7	7	8	7	12	6
Flight hours (thousands)	3,618	2,249	3,930	3,815	3,113	U	3,522	3,385	3,654	3,566	3,500	3,509	3,843	3,765	3,037
Rates per 100,000 flight hours^b															
Fatalities	2.90	2.27	1.81	0.47	0.55	U	0.34	0.74	0.55	0.76	0.54	0.46	0.42	0.85	0.69
Seriously injured persons	1.19	1.60	0.31	0.52	0.10	U	0.26	0.47	0.41	0.25	0.17	0.11	0.44	0.37	0.30
Total accidents	4.73	4.76	2.04	1.70	0.96	U	1.11	1.33	0.96	1.09	0.83	1.25	1.04	0.88	1.32
Total accidents, fatal	1.27	1.29	0.56	0.29	0.19	U	0.23	0.30	0.22	0.20	0.20	0.23	0.18	0.32	0.20

KEY: U = data are not available.

^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 *Total fatalities*, *Total seriously injured persons*, *Total accidents*, *fatal* by the number of *Flight hours*.

NOTE

2011 *Flight hours* are not currently available, Federal Aviation Administration is engaged in re-calibration efforts.

Table 2-14: U.S. General Aviation^a Safety Data

	1960 ^d	1970 ^d	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total fatalities	787	1,310	1,239	770	596	563	458	458	438	390	422	378	386	331	379	414	332
Total seriously injured persons	U	715	681	409	309	271	256	328	247	214	236	247	199	206	228	229	187
Total accidents^{ab}	4,793	4,712	3,590	2,242	1,837	1,671	1,441	1,471	1,471	1,223	1,222	1,211	1,269	1,234	1,275	1,220	1,085
Total accidents ^{ab} , fatal	429	641	618	444	345	321	271	270	273	221	255	230	213	203	224	233	205
Flight hours (thousands)	13,121	26,030	36,402	28,510	27,838	23,168	21,688	U	20,881	19,492	19,617	20,576	21,334	21,703	21,663	21,801	19,454
Rates per 100,000 flight hours^c																	
Fatalities	6.00	5.03	3.40	2.70	2.14	2.43	2.11	U	2.10	2.00	2.15	1.84	1.81	1.53	1.75	1.90	1.71
Seriously injured persons	U	2.75	1.87	1.43	1.11	1.17	1.18	U	1.18	1.10	1.20	1.20	0.93	0.95	1.05	1.05	0.96
Total accidents ^{ab}	36.53	18.10	9.86	7.86	6.57	7.20	6.63	U	7.04	6.26	6.23	5.85	5.93	5.68	5.87	5.58	5.57
Total accidents, fatal ^{ab}	3.27	2.46	1.70	1.56	1.21	1.38	1.24	U	1.30	1.12	1.30	1.10	0.98	0.94	1.02	1.06	1.05

KEY: U = data are not available.

^a U.S. registered civil aircraft not operated under 14 CFR 121 or 14 CFR 135. Accidents on foreign soil and in foreign waters are excluded. Suicide, sabotage, and stolen/unauthorized cases included in accidents, fatalities and rate computation in this table are: 1985 (11 accidents, 6 fatal accidents); 1990 (4, 1); 2000 (7, 7); 2005 (2, 1); 2010 (3, 2); 2011 (1, 0); 2012 (1, 1); 2013(3, 3); 2014(0, 0); 2015(7, 4); 2016 (2, 2); 2017(U); 2018(U); 2019(U); 2020(U).

^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 *Total fatalities*, *Total seriously injured persons*, *Total accidents*, and *Total accidents, fatal* by the number of *Flight hours*, except for the exclusions mentioned in footnote a.

^d Data for 1960 and 1970 include air taxi.

Table 2-15: Number of Pilot-Reported Near Midair Collisions (NMAC) by Degree of Hazard

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total, all degrees of hazard	568	454	239	137	90	101	85	112	163	177	348	406	268	201	227
Critical ^a	118	74	30	14	13	14	12	15	27	29	56	67	20	19	23
Potential ^b	319	266	130	78	45	37	45	52	91	95	179	208	131	55	66
No hazard ^c	122	114	49	20	11	27	17	19	27	33	43	38	19	13	18
Unclassified ^d	9	0	30	25	21	23	11	26	18	20	70	93	98	114	120
NMAC involving aircraft operating under 14 CFR 121^e	U	136	75	42	29	31	17	23	42	31	74	90	38	32	24

KEY: 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

NMACs are reported voluntarily to the FAA so these numbers may not be representative. Reporters consist of pilots of air carriers, general aviation and other aircraft involved in public-use operations. Incidents involving military aircraft may be included if they also involved a civilian aircraft.

Table 2-16: Prohibited Items Intercepted at Airport Screening Checkpoints

	2002 ^a	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Domestic enplanements	551,899,643	657,261,487	629,537,593	638,247,667	642,289,482	645,677,554	662,826,955	696,016,894	719,996,828	741,735,098	777,972,787	811,545,260	335,053,414
Total prohibited items	3,775,345	15,886,039	N	N	N	N	N	N	N	N	N	N	N
Firearms ^b	927	660	1,123	1,320	1,556	1,813	2,212	2,653	3,391	3,957	4,244	4,432	3,257
Knives	1,036,697	1,822,752	N	N	N	N	N	N	N	N	N	N	N
Box cutters	32,788	21,315	N	N	N	N	N	N	N	N	N	N	N
Other cutting instruments	1,846,207	3,276,691	N	N	N	N	N	N	N	N	N	N	N
Clubs	11,131	20,531	N	N	N	N	N	N	N	N	N	N	N
Incendiaries	79,341	398,830	N	N	N	N	N	N	N	N	N	N	N
Other	768,254	10,345,260	N	N	N	N	N	N	N	N	N	N	N

KEY: N = data do not exist.

^a All data for 2002, except enplanements, are for April through December.

^b TSA has stopped the collection of data on all prohibited items except for *Firearms* as of 2010.

NOTES

The large increase in 2005 was primarily due to the prohibition of lighters on board from April 2005 to August 2007. Fluctuations in counts can be attributed to changes in definitions and regulations governing prohibited items, in addition to the proportion of passengers carrying prohibited items and the intensity of search.

Other cutting instruments include scissors, hatchets, swords, sabers, meat cleavers, ice axes, and picks. Effective Dec. 22, 2005, scissors less than 4 inches and tools less than 7 inches were no longer prohibited.

Knives include any length and type except round-bladed, butter, and plastic cutlery.

Clubs includes martial arts items, baseball bats, night sticks, hammers, pool cues, and billy clubs.

Firearms includes any weapon (including a starter gun) that is designed to or may readily be converted to expel a projectile by the action of an explosive, as well as spear guns, BB guns, flare pistols, compressed air guns, and stunning devices.

Other refers to tools, self-defense items, compressed gas cylinders, bleach, lighters, and certain sporting goods. Lighters (except for torch lighters and micro torches) were removed from the prohibited items list effective Aug. 4, 2007.

Section C:
Highway Safety

Table 2-17: Motor Vehicle Safety Data

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities	36,399	52,627	51,091	44,599	41,945	32,999	32,479	33,782	32,893	32,744	35,484	37,806	37,473	36,835	36,096
Injured persons	N	N	N	3,246,000	3,194,000	2,248,000	2,227,000	2,369,000	2,319,000	2,343,000	2,455,000	3,062,000	2,745,000	2,710,000	2,740,000
Crashes	N	N	N	6,471,000	6,394,000	5,419,000	5,338,000	5,615,000	5,687,000	6,064,000	6,296,000	6,821,000	6,453,000	6,735,000	6,756,000
Vehicle-miles (millions)	718,763	1,109,724	1,527,295	2,144,362	2,746,925	2,966,506	2,946,131	2,968,815	2,988,280	3,025,656	3,095,373	3,174,408	3,212,347	3,240,327	3,261,772
Rates per 100 million vehicle-miles															
Fatalities	5.06	4.74	3.35	2.08	1.53	1.11	1.10	1.14	1.10	1.08	1.15	1.19	1.17	1.14	1.11
Injured persons	N	N	N	151	116	76	76	80	78	77	79	96	85	84	84
Crashes	N	N	N	302	233	183	181	189	190	200	203	215	201	208	207

KEY: N = data do not exist.

NOTES

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.

Crashes are the rounded sum of fatal crashes, an actual count from the Fatality Analysis Reporting System, and injury crashes and property damage only crashes, which are estimates from the National Automotive Sampling System-General Estimates System.

Total Injured persons does not match NTS 02-02 as it is rounded by NHTSA.

Table 2-18: Motor Vehicle Fatalities, Vehicle-Miles, and Associated Rates by Highway Functional System

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities														
Rural, total	29,545	25,761	24,838	24,587	18,089	17,769	18,367	17,739	16,791	17,715	18,321	17,405	16,323	16,340
Interstate	2,263	2,732	3,254	3,248	2,113	1,969	1,835	1,994	1,762	1,934	2,282	1,991	1,881	1,975
Other arterials ^a	12,268	9,859	9,007	9,304	7,001	7,039	7,701	7,410	7,360	8,512	8,886	8,009	7,746	7,613
Collector ^b	10,004	8,878	7,309	7,392	5,314	5,171	5,178	4,747	4,502	4,432	4,789	4,446	4,318	4,449
Local	5,010	4,275	4,414	4,443	3,540	3,454	3,452	3,484	3,024	2,808	2,337	2,737	2,368	2,263
Urban, total	21,546	18,807	16,113	18,627	14,659	14,571	15,371	15,119	15,917	17,573	19,357	19,976	20,408	19,595
Interstate	2,184	2,261	2,419	2,734	2,124	2,159	2,150	2,101	2,332	2,526	2,799	2,762	2,893	2,669
Other arterials ^a	12,752	11,896	9,523	10,935	8,471	8,277	8,753	8,638	9,145	10,682	11,977	12,598	12,882	12,682
Collector	2,226	1,398	1,001	1,426	1,069	1,137	1,236	1,114	1,219	1,477	2,267	2,129	2,363	2,120
Local	4,384	3,245	2,912	3,458	2,978	2,969	3,195	3,249	3,127	2,815	2,288	2,469	2,261	2,096
Vehicle-miles of travel (VMT) (millions)														
Rural, total	672,030	868,878	1,083,152	1,032,426	984,148	974,038	976,624	941,912	920,928	928,905	949,545	963,206	978,802	983,853
Interstate	135,084	200,173	268,180	256,642	245,647	243,587	245,872	234,303	231,372	235,766	246,716	252,550	257,240	261,644
Other arterials ^a	262,774	330,866	420,599	396,455	376,413	373,099	371,954	358,762	355,119	357,431	367,605	372,393	379,531	383,808
Collector ^b	189,468	240,460	267,231	250,701	229,357	227,754	228,771	221,223	208,689	208,685	207,590	205,100	208,153	206,767
Local	84,704	97,379	127,142	128,628	132,731	129,597	130,027	127,623	125,747	127,024	127,634	133,162	133,878	131,633
Urban, total	855,265	1,275,484	1,663,773	1,957,004	1,982,358	1,972,094	1,992,191	2,046,369	2,104,728	2,166,468	2,224,863	2,249,142	2,261,525	2,277,919
Interstate	161,242	278,901	393,465	470,925	477,693	476,704	484,547	505,309	519,843	541,186	558,388	567,210	571,415	575,753
Other arterials ^a	484,189	699,233	900,392	1,051,088	1,052,572	1,044,104	1,052,184	1,068,927	1,085,036	1,108,786	1,137,848	1,144,086	1,154,156	1,156,585
Collector	83,043	106,297	135,372	170,265	180,565	178,778	179,513	188,547	205,063	213,425	222,207	223,350	229,608	240,037
Local	126,791	191,053	234,544	264,726	271,528	272,507	275,946	283,585	294,796	303,071	306,421	314,495	306,346	305,544
Fatality rates per 100 million vehicle miles														
Rural, total	4.40	2.96	2.29	2.38	1.84	1.82	1.88	1.88	1.82	1.91	1.93	1.81	1.67	1.66
Interstate	1.68	1.36	1.21	1.27	0.86	0.81	0.75	0.85	0.76	0.82	0.92	0.79	0.73	0.75
Other arterials ^a	4.67	2.98	2.14	2.35	1.86	1.89	2.07	2.07	2.07	2.38	2.42	2.15	2.04	1.98
Collector ^b	5.28	3.69	2.74	2.95	2.32	2.27	2.26	2.15	2.16	2.12	2.31	2.27	2.07	2.15
Local	5.91	4.39	3.47	3.45	2.67	2.67	2.65	2.73	2.40	2.21	1.83	2.06	1.77	1.72
Urban, total	2.52	1.47	0.97	0.95	0.74	0.74	0.77	0.74	0.76	0.81	0.87	0.89	0.90	0.86
Interstate	1.35	0.81	0.61	0.58	0.44	0.45	0.44	0.42	0.45	0.47	0.50	0.49	0.51	0.46
Other arterials ^a	2.63	1.70	1.06	1.04	0.80	0.79	0.83	0.81	0.84	0.96	1.05	1.10	1.12	1.10
Collector	2.68	1.32	0.74	0.84	0.59	0.64	0.69	0.59	0.69	0.69	1.02	0.95	1.03	0.88
Local	3.46	1.70	1.24	1.31	1.10	1.09	1.16	1.15	1.06	0.93	0.75	0.79	0.74	0.69

^a Urban Other arterials for all years and Rural Other arterials for 2015 are the sum of other freeways and expressways, other principal arterials, and minor arterials. Rural Other arterials for all other years are the sum of other principal arterials and minor arterials.

^b Collector is the sum of major and minor collectors.

NOTES

Includes the 50 states and the District of Columbia.

Rural Total includes unknown which functional system within rural areas. Urban Total includes unknown which functional system within urban areas.

Table 2-19: Occupant Fatalities by Vehicle Type and Nonoccupant Fatalities

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total traffic fatalities	51,091	44,599	41,945	43,510	32,999	32,479	33,782	32,893	32,744	35,484	37,806	37,473	36,835	36,096
Occupant fatalities (by vehicle type)	41,927	37,134	36,348	37,646	27,889	27,140	28,003	27,175	26,901	28,928	30,613	30,356	29,370	28,758
Passenger car, total	27,449	24,092	20,699	18,512	12,491	12,014	12,361	12,037	11,947	12,763	13,508	13,477	12,888	12,239
Subcompact ^a	7,124	8,309	4,773	2,988	1,430	1,352	1,360	1,213	1,073	1,153	1,083	1,094	1,045	858
Compact ^b	927	5,310	7,022	6,288	3,977	3,801	3,866	3,628	3,441	3,532	3,669	3,475	3,291	3,017
Intermediate ^c	3,878	4,849	5,204	5,571	4,244	4,066	4,088	4,102	4,333	4,621	4,966	5,145	4,850	4,681
Full ^d	11,577	4,635	3,184	3,287	2,678	2,647	2,860	2,838	2,833	3,149	3,424	3,393	3,308	3,233
Other/Unknown	3,943	989	516	378	162	148	187	256	267	308	366	370	394	450
Truck^e, total	8,748	9,306	12,280	13,841	10,312	9,942	10,115	9,881	9,759	10,543	11,094	11,064	10,847	10,868
Light	7,486	8,601	11,526	13,037	9,782	9,302	9,418	9,186	9,103	9,878	10,279	10,186	9,957	9,976
Large	1,262	705	754	804	530	640	697	695	656	665	815	878	890	892
Other vehicles, total	5,730	3,736	3,369	5,293	5,086	5,184	5,527	5,257	5,195	5,622	6,011	5,815	5,635	5,651
Motorcycle	5,144	3,244	2,897	4,576	4,518	4,630	4,986	4,692	4,594	5,029	5,337	5,226	5,038	5,014
Bus	46	32	22	58	44	55	39	54	44	49	64	43	44	35
Other / unknown vehicle type	540	460	450	659	524	499	502	511	557	544	610	546	553	602
Nonoccupant fatalities, total	9,164	7,465	5,597	5,864	5,110	5,339	5,779	5,718	5,843	6,556	7,193	7,117	7,465	7,338
Pedestrian	8,070	6,482	4,763	4,892	4,302	4,457	4,818	4,779	4,910	5,494	6,080	6,075	6,374	6,205
Pedalcyclist	965	859	693	786	623	682	734	749	729	829	853	806	871	846
Other	129	124	141	186	185	200	227	190	204	233	260	236	220	287

^a Includes minicompact cars (wheelbase under 95 inches) and subcompact cars (wheelbase between 95 and 99 inches).

^b Includes cars with a wheelbase of between 100 and 104 inches.

^c Includes cars with a wheelbase of between 105 and 109 inches.

^d Includes cars with a wheelbase of 110 inches or greater.

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

NOTE

Details may not add to totals due to rounding.

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

	1990		2000		2005		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019	
	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI
TOTAL fatalities	44,599	22,587	41,945	17,390	32,999	13,323	32,479	13,184	33,782	13,879	32,893	13,569	32,744	13,368	37,806	14,966	37,473	14,709	36,835	14,564	36,096	14,035	36,096	14,035	36,096	14,035
AI as a percent of total fatalities		51		41		40		41		41		41		41		40		39		40		40		40		39
Motorist fatalities, TOTAL	37,134	18,953	36,348	14,834	27,889	11,033	27,140	10,715	28,003	11,191	27,175	10,915	26,901	10,713	30,613	11,549	30,356	11,488	29,370	11,051	28,758	10,756	28,758	10,756	28,758	10,756
Single-vehicle crashes	18,159	11,162	17,471	8,964	14,609	7,060	14,311	7,055	14,633	7,130	14,009	6,903	13,567	6,561	14,692	6,547	14,178	6,424	13,421	5,832	13,067	5,953	13,067	5,953	13,067	5,953
Two-vehicle crashes	16,262	6,676	15,758	4,854	15,681	4,657	11,222	3,332	10,862	3,066	11,170	3,363	11,131	3,419	13,173	4,110	13,282	4,094	13,079	4,152	12,967	3,916	13,079	4,152	12,967	3,916
More than two-vehicle crashes	2,713	1,115	3,119	1,016	3,145	999	2,058	641	1,967	595	2,200	698	2,203	734	2,748	892	2,896	971	2,870	1,066	2,724	887	2,870	1,066	2,724	887
Nonmotorist fatalities, TOTAL	7,465	3,634	5,597	2,547	5,864	2,729	5,339	2,469	5,779	2,688	5,718	2,654	5,843	2,675	7,193	3,437	7,117	3,221	7,465	3,533	7,338	3,279	7,465	3,533	7,338	3,279
Pedestrians fatalities, total	6,482	3,264	4,763	2,254	4,892	2,360	4,457	2,033	4,818	2,337	4,779	2,341	4,910	2,357	6,080	3,036	6,075	2,862	6,374	3,137	6,205	2,877	6,374	3,137	6,205	2,877
Pedestrians, single-vehicle crashes	5,990	2,966	4,340	2,015	4,445	2,100	3,853	1,811	4,011	1,911	4,342	2,082	4,307	2,077	5,531	2,728	5,455	2,536	5,683	2,750	5,580	2,549	5,683	2,750	5,580	2,549
Pedestrians, multiple-vehicle crashes	492	298	423	239	447	260	446	247	476	254	472	265	479	262	535	286	535	286	549	308	620	327	691	387	625	329
Pedalcyclists fatalities, total	859	314	693	247	786	308	623	211	682	255	734	277	729	255	853	307	806	284	871	319	846	290	871	319	846	290
Pedalcyclists, single-vehicle crashes	832	301	668	236	757	292	603	201	655	240	697	261	723	245	811	284	776	268	818	292	812	273	818	292	812	273
Pedalcyclists, multiple-vehicle crashes	27	14	25	10	29	15	20	10	27	15	37	16	28	13	42	24	30	16	53	26	34	17	53	26	34	17
Others/unknown	124	57	141	46	186	62	200	57	227	75	190	56	204	63	260	94	236	75	220	77	287	111	220	77	287	111

KEY: AI = alcohol involvement; Fatal = fatalities.

NOTES

Alcohol involvement pertains to any driver, pedestrian, or pedalcyclist involved in the accident. Alcohol results are determined from positive blood alcohol concentration tests and police-reported alcohol involvement and are adjusted by the U.S. Department of Transportation, National Highway Traffic Safety Administration.
 In 2001, the National Highway Traffic Safety Administration (NHTSA) adopted a new method, i.e., multiple imputation, to estimate missing blood alcohol concentration (BAC) test result data. This new method is being used by NHTSA's National Center for Statistics and Analysis (NCSA) to improve the scope of alcohol involvement statistics by the Fatality Analysis Reporting System (FARS). As a result, alcohol involvement fatalities have undergone a complete revision.
 The sum of individual categories may not add to totals because NCSA generates a separate estimate for each category of fatalities, including total fatalities. The estimates are rounded to the nearest whole number.
 The total motorist and nonmotorist fatalities data in this table are not comparable to total motorist and nonmotorist fatality data in other NTS tables that cite the U.S. Department of Transportation, National Highway Traffic Safety Administration's *Traffic Safety Facts* publication as a source.

Table 2-21a: Passenger Car Occupant Safety Data

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities	27,449	24,092	20,699	18,512	12,491	12,014	12,361	12,037	11,947	12,763	13,508	13,477	12,888	12,239
Injured persons	N	2,384,000	2,057,000	1,580,000	1,256,000	1,244,000	1,330,000	1,299,000	1,294,000	1,382,000	1,690,000	1,529,000	1,511,000	1,498,000
Vehicles involved in crashes	N	8,358,000	6,891,000	6,087,000	5,350,000	5,328,000	5,577,000	5,669,000	5,982,000	6,243,000	6,743,000	6,332,000	6,658,000	6,561,000
Vehicle-miles (millions)	1,107,056	1,427,178	1,583,127	1,616,908	1,507,716	1,369,810	1,377,486	1,384,194	1,396,098	1,420,869	1,439,678	1,424,056	1,403,760	1,374,234
Rates per 100 million vehicle-miles														
Fatalities	2.48	1.69	1.31	1.14	0.83	0.88	0.90	0.87	0.86	0.90	0.94	0.95	0.92	0.89
Injured persons	N	167	130	98	83	91	97	94	93	97	117	107	108	109
Vehicles involved in crashes	N	586	435	376	355	389	405	410	428	439	468	445	474	477

KEY: N = data do not exist.

NOTES

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 in this table, and light and large trucks in table 2-23 should not be compared with Vehicle-miles in chapter 1, which are taken directly from FHWA. Rates per 100 million vehicle-miles figures may differ from those in the source data due to rounding by the source. Vehicles involved in crashes figures in this table are not comparable to figures in previous editions due to a change in the source.

In 2011, the Federal Highway Administration implemented an enhanced methodology for estimating registered vehicles and vehicle miles traveled by vehicle type. These revisions were applied to data from 2007 and later. In some cases the changes were significant and should be taken into account when comparing registered vehicle counts and/or vehicle miles traveled for 2006 and earlier years with the numbers for 2007 and later years. Due to an enhancement in the passenger vehicle registration data provided by R.L. Polk & Co. for 2011 and later, registration counts for those years changed considerably from the counts provided for 2010 and earlier years. This should be taken into account when comparing registration numbers and rates per registered vehicle for passenger cars for 2010 and earlier years with those for 2011 and later years.

The Injured persons and Vehicles involved counts are estimates and have been rounded to the nearest 1,000.

Table 2-21b: Work Zone Safety Data

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total work zone fatalities by person type	1,058	586	590	617	593	669	717	781	809	756	842
Drivers and passengers	901	499	481	505	482	548	601	652	667	620	690
Pedestrians and bicyclists	148	82	107	104	109	116	112	124	138	131	140
Others ^a	9	5	2	8	2	5	4	5	4	5	12
Worker fatalities in highway work zones^b	165	106	122	133	105	119	130	143	132	124	135
Total work zone fatal crashes by type of roadway	937	521	533	555	536	607	657	687	720	672	762
Interstate	269	185	192	206	194	232	263	260	288	286	293
Arterial	461	246	253	274	239	286	325	355	357	324	389
Collector	111	45	29	37	48	49	43	51	58	38	48
Local	89	40	52	36	54	40	24	20	17	23	31
Other	7	5	7	2	1	0	2	1	0	1	1
Types of fatal work zone crashes											
Involving a rear-end collision	148	82	96	116	107	130	165	141	176	141	182
Involving a commercial motor vehicle (large truck)	233	117	145	132	151	183	176	194	221	207	248
Where speeding was a factor	272	178	191	195	162	172	187	193	211	171	239
Percent of fatal work zone crashes involved rear-end collisions	15.8	15.7	18.0	20.9	20.0	21.4	25.1	20.5	24.4	21.0	23.9

^a Occupants of a non-motor vehicle transport device and persons on personal conveyances.

^b The road construction location category was implemented in 1995. Includes road construction workers and vehicle occupants fatally injured in work zones.

NOTE

Data include the 50 states and District of Columbia.

Table 2-22: Motorcycle Occupant Safety Data^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities	5,144	3,244	2,897	4,576	4,518	4,630	4,986	4,692	4,594	5,029	5,337	5,226	5,038	5,014
Injured persons	N	85,000	58,000	88,000	82,000	82,000	93,000	89,000	92,000	89,000	104,000	89,000	82,000	84,000
Motorcycles involved in crashes	N	105,000	70,000	103,000	96,000	100,000	112,000	107,000	110,000	102,000	134,000	116,000	109,000	111,000
Vehicle-miles (millions)	10,214	9,557	10,469	10,454	18,513	18,542	21,385	20,366	19,970	19,606	20,445	20,149	20,076	19,688
Rates per 100 million vehicle-miles														
Fatalities	50.36	33.94	27.67	43.77	24.40	24.97	23.32	23.04	23.00	25.65	26.10	25.94	25.09	25.47
Injured persons	N	886	552	838	445	441	436	436	461	453	511	440	408	426
Motorcycles involved in crashes	N	1,096	670	987	521	537	523	523	553	522	657	577	543	561

KEY: N = data do not exist.

^a Include riders (operators) and passengers.

NOTES

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 *Injured persons* and *Motorcycles involved in crashes* counts are estimates and have been rounded to the nearest 1,000.

Since *Vehicle-miles* data for 2000 and later years are estimated using enhanced methodology, data for these years are not comparable with prior years or with numbers published in the previous NTS reports.

Table 2-23: Truck Occupant Safety Data

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities, total	8,748	9,306	12,280	13,841	10,312	9,942	10,115	9,881	9,759	10,543	11,094	11,064	10,847	10,868
Light	7,486	8,601	11,526	13,037	9,782	9,302	9,418	9,186	9,103	9,878	10,279	10,186	9,957	9,976
Large	1,262	705	754	804	530	640	697	695	656	665	815	878	890	892
Injured persons, total	N	553,000	917,000	902,000	757,000	756,000	792,000	777,000	811,000	839,000	1,071,000	977,000	960,000	996,000
Light	N	511,000	886,000	874,000	737,000	733,000	766,000	753,000	784,000	809,000	1,035,000	937,000	921,000	950,000
Large	N	42,000	31,000	28,000	20,000	23,000	25,000	25,000	27,000	30,000	36,000	40,000	39,000	46,000
Trucks involved in crashes, total	N	2,784,000	4,308,000	4,593,000	4,051,000	3,912,000	4,143,000	4,211,000	4,622,000	4,847,000	5,128,000	5,017,000	5,201,000	5,384,000
Light	N	2,399,000	3,851,000	4,151,000	3,775,000	3,625,000	3,810,000	3,869,000	4,184,000	4,414,000	4,670,000	4,542,000	4,670,000	4,847,000
Large	N	385,000	457,000	442,000	276,000	287,000	333,000	342,000	438,000	433,000	458,000	475,000	531,000	538,000
Vehicle-miles (millions), total	403,966	701,901	1,145,739	1,355,087	1,427,267	1,548,242	1,555,781	1,568,553	1,593,590	1,638,668	1,697,935	1,750,915	1,798,187	1,849,869
Light	295,475	555,659	940,219	1,132,564	1,140,740	1,280,648	1,286,574	1,293,536	1,314,458	1,358,824	1,410,040	1,453,322	1,493,323	1,549,819
Large	108,491	146,242	205,520	222,523	286,527	267,594	269,207	275,017	279,132	279,844	287,895	297,593	304,864	300,050
Rates per 100 million vehicle-miles														
Fatalities, total	2.2	1.3	1.1	1.0	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6
Light	2.5	1.6	1.2	1.2	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6
Large	1.2	0.5	0.4	0.4	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3
Injured persons, total	N	79.0	80.0	67.0	53.0	49.0	51.0	50.0	51.0	51.0	63.0	56.0	53.0	54.0
Light	N	92.0	94.0	77.0	65.0	57.0	60.0	58.0	60.0	60.0	73.0	64.0	62.0	61.0
Large	N	29.0	15.0	13.0	7.0	9.0	9.0	9.0	10.0	11.0	13.0	13.0	13.0	15.0
Trucks involved in crashes, total	N	397	376	339	284	253	266	268	290	296	302	287	289	291
Light	N	432	410	367	331	283	296	299	318	325	331	313	313	313
Large	N	263	222	198	96	107	124	124	157	155	159	160	174	179

KEY: N = data do not exist.

NOTES

Large trucks - trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors. Light trucks - trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and utility vehicles. The injury and crash data in this table are from the U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration's (NHTSA) General Estimates System (GES). The data from GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or that did not result in property damage.

Injured persons and Trucks involved in crashes counts are estimates and have been rounded to the nearest 1,000.

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.

Rates per 100 million vehicle-miles figures may not match those in the source data due to rounding by the source. The category Trucks involved in crashes, total, is not comparable to the category Crashes, that appeared in this table in 2008 and previous editions.

Continued next page

Table 2-24: Bus Occupant Safety Data^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities	46	32	22	58	44	55	39	54	44	49	64	43	44	35
Injured persons	N	34,000	17,000	12,000	18,000	14,000	12,000	24,000	14,000	12,000	25,000	12,000	15,000	15,000
Vehicles involved in crashes	N	61,000	56,000	51,000	54,000	57,000	55,000	67,000	69,000	68,000	68,000	67,000	65,000	74,000
Vehicle-miles (millions)	6,059	5,726	7,590	6,980	13,770	13,807	14,781	15,167	15,999	16,230	16,350	17,227	18,303	17,980
Rates per 100 million vehicle-miles														
Fatalities	0.76	0.56	0.29	0.83	0.32	0.40	0.26	0.36	0.28	0.30	0.39	0.25	0.24	0.19
Injured persons	N	585	230	168	128	100	84	158	86	74	150	72	82	85
Vehicles involved in crashes	N	1,070	739	736	394	416	373	439	434	420	417	388	357	411

KEY: N = data do not exist.

^a Bus includes school, transit, and intercity buses.

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.

Injured persons and *Vehicles involved in crashes* counts are estimates and have been rounded to the nearest 1,000.

Rates per 100 million vehicle-miles figures may differ from those in the source data due to rounding by the source.

Table 2-25: State Laws on Distracted Driving - Ban on Hand-Held Devices and Texting While Driving: As of October 2021

State	AL	AK	AZ	AR	CA	CO	CT	DE	DC	FL	GA	HI	ID	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO	Total
Ban on hand-held devices for all drivers		Y			Y		Y	Y	Y		Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y			
Ban on texting for all drivers	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State	MT	NE	NV	NH	NJ	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	PR	
Ban on hand-held devices for all drivers	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	26
Ban on texting for all drivers	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	50

KEY: Y = Yes.

NOTES

A primary law means that an officer can ticket the driver for the offense without any other traffic violation taking place. A secondary law means an officer can only issue a ticket if a driver has been pulled over for another violation (like speeding).

Hand-held Cell Phone Use: 24 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands prohibit all drivers from using hand-held cell phones while driving. All are primary enforcement laws—an officer may cite a driver for using a hand-held cell phone without any other traffic offense taking place.

Text Messaging: Washington was the first state to pass a texting ban in 2007. Currently, 48 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands ban text messaging for all drivers. All but 2 (Missouri and Montana) have primary enforcement. Of the 2 state without an all driver texting ban, 1 prohibits text messaging by novice drivers.

Table 2-26: Fatalities by Highest Driver Blood Alcohol Concentration (BAC) in Highway Crashes

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total fatalities	44,599	41,945	43,510	32,999	32,479	33,782	32,893	32,744	35,484	37,806	37,473	36,835	36,096
Fatalities in alcohol-related crashes (BAC = .01+)	20,607	15,746	15,985	11,906	11,527	12,118	11,918	11,743	12,210	12,951	12,775	12,560	11,917
Percent	46.2	37.5	36.7	36.1	35.5	35.9	36.2	35.9	34.4	34.3	34.1	34.1	33.0
BAC = 0.00													
Number	23,823	26,082	27,423	21,005	20,848	21,563	20,865	20,913	23,165	24,762	24,589	24,186	24,106
Percent	53.4	62.2	63.0	63.7	64.2	63.8	63.4	63.9	65.3	65.5	65.6	65.7	66.8
BAC = 0.01 - 0.07													
Number	2,901	2,422	2,404	1,771	1,662	1,782	1,834	1,800	1,930	1,984	1,895	1,850	1,775
Percent	6.5	5.8	5.5	5.4	5.1	5.3	5.6	5.5	5.4	5.2	5.1	5.0	4.9
BAC = 0.08+													
Number	17,705	13,324	13,582	10,136	9,865	10,336	10,084	9,943	10,280	10,967	10,880	10,710	10,142
Percent	39.7	31.8	31.2	30.7	30.4	30.6	30.7	30.4	29.0	29.0	29.0	29.1	28.1

KEY: BAC = blood alcohol concentration.

NOTES

BAC values have been assigned by U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA) when alcohol test results are unknown. Alcohol-related crashes pertain to the highest BAC among the drivers involved in the crashes. For some years, numbers for Fatalities in alcohol-related crashes (BAC = .01+) may not add to totals due to rounding.

In 2001, the NHTSA adopted a new method to estimate missing blood alcohol concentration (BAC) test result data. This new method, multiple imputation, is being used by NHTSA's National Center for Statistics and Analysis (NCSA) to improve the scope of alcohol involvement statistics by the Fatality Analysis Reporting System. As a result of the methodology change, BAC 0.08 breakouts, which coincide with many state laws, can now be determined. Thus, NHTSA's general reporting categories have been modified to reflect this and are now BAC 0.00, BAC 0.01-0.07, and BAC 0.08+.

Table 2-27: Number of States with Different Types of Anti-DUI / DWI Legislation in Effect as of January 1 of the Listed Year

	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BAC = 0.08 per se laws ^{a,b,c}	4	18	20	29	33	47	52	52	52	52	52	52	52	52	52	52
BAC level 0.02 or less for persons younger than 21 years ^d	0	51	51	51	51	51	51	51	51	51	51	52	52	52	52	52
Administrative license revocation (ALR) for DUI / DWI offenders ^{e,f}	27	41	41	41	41	42	42	42	42	42	42	42	42	42	42	43

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 Includes the District of Columbia in 2000 and 2001.

^c Includes the District of Columbia and Puerto Rico beginning in 2003.

^d Includes the District of Columbia beginning in 1996. Includes the District of Columbia and Puerto Rico beginning in 2010.

^e States that impose additional thresholds for ALR beyond those imposed for DUI/DWI are not included in these figures.

^f Includes the District of Columbia for all years.

NOTES

National Uniform Minimum Drinking Age Act, which standardized the minimum drinking age at 21, was enacted in 1984.

Although Puerto Rico lacks an Age 21 Minimum Drinking Age law, it has a Zero Tolerance law for people under 18 and a .02% BAC law for people between the ages of 18 and 21 as of Jan. 1, 2010.

Table 2-28: Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions (percent)

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL fatal crashes	39,836	37,526	39,252	30,296	29,867	31,006	30,202	30,056	32,538	34,748	34,560	33,919	33,244
Day of week													
Sunday	16.1	16.1	15.9	15.9	15.6	16.3	15.9	15.6	16.3	15.4	15.7	15.0	15.3
Monday	11.7	12.3	12.6	12.5	12.6	12.6	12.4	12.5	12.4	13.1	12.8	13.6	13.1
Tuesday	11.5	12.0	11.8	11.7	12.2	12.1	12.6	12.1	12.2	12.0	12.7	12.7	12.9
Wednesday	11.5	12.2	12.4	12.3	12.2	12.6	12.4	12.8	12.9	12.8	12.6	12.7	12.7
Thursday	12.6	13.0	12.9	13.2	13.1	12.9	13.2	12.9	13.7	13.5	13.5	13.4	13.4
Friday	16.7	16.0	15.7	16.2	15.4	15.1	15.4	15.8	15.1	15.5	15.6	15.3	15.8
Saturday	20.0	18.5	18.6	18.2	18.8	18.3	18.1	18.3	17.4	17.7	17.2	17.2	16.8
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time of day													
Midnight to 3 a.m.	15.7	12.5	12.8	12.5	12.6	12.4	11.7	11.5	11.4	11.5	10.9	11.1	10.7
3 a.m. to 6 a.m.	7.7	8.0	8.1	8.3	8.1	8.3	8.3	8.5	8.3	8.8	8.3	8.4	8.3
6 a.m. to 9 a.m.	8.6	9.9	9.9	9.8	9.9	9.6	10.1	10.1	10.0	9.8	9.8	10.1	10.1
9 a.m. to noon	8.5	9.9	9.5	9.8	9.6	9.7	9.8	9.6	9.5	9.4	9.3	9.5	9.4
Noon to 3 p.m.	11.6	13.1	12.9	13.1	13.3	12.9	12.9	12.7	12.7	12.7	13.1	12.8	13.0
3 p.m. to 6 p.m.	15.7	16.7	16.5	16.2	16.0	16.1	15.8	15.8	15.9	15.8	15.9	15.4	15.7
6 p.m. to 9 p.m.	15.6	15.3	15.7	15.9	15.9	16.3	16.1	16.4	17.0	16.9	17.0	17.1	16.9
9 p.m. to midnight	15.9	13.7	13.8	13.8	13.9	14.0	14.6	14.6	14.4	14.3	14.8	15.1	15.2
Unknown	0.8	0.9	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.8	0.7	0.7
Atmospheric condition													
Normal	86.7	88.0	88.2	89.2	89.0	89.7	88.4	88.8	88.5	86.3	83.0	81.2	81.9
Rain	9.3	7.1	7.4	6.6	6.9	6.6	7.1	6.8	7.6	6.3	7.2	8.2	7.7
Snow/sleet	1.6	2.3	2.0	2.3	2.0	1.4	2.2	2.1	1.4	1.3	1.2	1.5	1.3
Other/unknown	2.3	2.6	2.4	2.0	2.2	2.3	2.4	2.3	2.5	6.2	8.7	9.1	9.0
Light condition													
Daylight	45.0	50.5	49.5	49.2	49.0	48.2	48.2	47.9	47.5	47.4	47.6	46.8	47.3
Dark, but lighted	17.7	15.9	15.9	17.9	18.3	17.7	18.0	18.2	18.7	19.9	19.5	20.1	19.9
Dark	32.7	29.2	30.0	28.2	28.3	29.5	29.3	29.1	28.8	28.2	28.2	28.2	27.8
Dawn or dusk	4.2	4.1	4.1	4.2	4.0	4.1	4.0	4.3	4.5	4.1	4.2	4.3	4.3
Unknown	0.3	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7

NOTE

The *Atmospheric condition, Other/unknown* category for 2010 includes unreported conditions. For 2009-10, the *Light condition, Dark* category includes fatal crashes where it was unknown whether the area was lit. The *Light condition, Unknown* category in 2009 also includes other light conditions, and for 2010-11 includes other light conditions and unreported light conditions.

Table 2-29: Motor Vehicles and Occupants Involved in Fatal Crashes by Posted Speed Limit

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles involved	44,862	44,119	45,960	45,101	44,950	49,478	52,714	53,128	52,286	51,247
Occupants involved	69,184	67,394	69,982	67,903	67,102	74,270	78,454	77,874	76,036	74,110
TOTAL Occupants killed	27,889	27,140	28,003	27,175	26,901	28,928	30,613	30,356	29,370	28,758
Under 55 mph, total	12,040	11,859	12,419	12,077	11,742	12,571	13,417	13,673	12,976	12,759
5, 10, 15, 20, 25 mph ^a	1,360	1,358	1,404	1,352	1,405	1,426	1,535	1,610	1,540	1,589
30, 35 mph	4,006	3,950	4,035	3,926	3,792	3,931	4,224	4,220	4,082	3,912
40, 45 mph	5,429	5,280	5,678	5,516	5,396	5,885	6,275	6,437	6,075	5,943
50 mph	1,245	1,271	1,302	1,283	1,149	1,329	1,383	1,406	1,279	1,315
55 mph and above, total	14,945	14,347	14,632	14,085	14,157	15,264	16,218	15,753	15,465	14,974
55 mph	8,703	8,334	8,587	8,063	7,909	8,491	8,946	8,691	8,359	8,121
60 mph	988	967	948	970	1,052	1,135	1,177	1,138	1,125	1,071
65 mph	3,003	2,790	2,558	2,586	2,530	2,688	2,935	2,888	2,840	2,725
70 mph	1,831	1,811	1,904	1,629	1,690	1,930	2,209	2,153	2,178	2,155
Over 70 mph	420	445	635	837	976	1,020	951	883	963	902
Unknown^b	904	934	952	1,013	1,002	1,093	978	930	929	1,025

KEY: mph = miles per hour.

^a The "No Statutory Limit/Non-Trafficway or Driveway Access" designation is included in this category.

^b The "Not Reported" designation is included in this category.

Table 2-30: Safety Belt and Motorcycle Helmet Use (percent)^a

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
OVERALL Safety Belt Use	71.0	82.0	85.0	84.0	86.0	87.0	87.7	88.5	90.1	89.7	89.6	90.7	90.3
Drivers	72.0	83.0	86.0	84.0	87.0	88.0	87.1	88.9	90.5	90.2	89.9	90.9	90.5
Passengers	68.0	78.0	83.0	82.0	84.0	85.0	85.5	86.8	88.6	87.9	88.7	89.8	89.6
Passenger cars^b	74.0	83.0	86.0	85.0	87.0	88.0	88.1	90.3	91.1	90.6	90.3	91.2	91.0
Drivers	75.0	N	N	N	N	N	N	N	N	N	N	N	N
Passengers	70.0	N	N	N	N	N	N	N	N	N	N	N	N
Light trucks^{b,c}	68.0	N	N	N	N	N	N	N	N	N	N	N	N
Drivers	69.0	N	N	N	N	N	N	N	N	N	N	N	N
Passengers	65.0	N	N	N	N	N	N	N	N	N	N	N	N
Vans and sport utility vehicles	74.0	85.0	88.0	87.0	89.0	90.0	89.1	90.3	92.3	91.7	91.5	92.5	92.0
Pickup trucks	59.0	73.0	75.0	74.0	77.0	78.0	77.2	80.8	83.2	83.2	84.1	85.6	85.5
Motorcycle Helmet Use	71.0	48.0	54.0	66.0	60.0	60.0	64.3	60.7	65.3	65.2	71.0	70.8	69.0
Riders (Operators)	72.0	56.0	55.0	67.0	63.0	62.0	66.8	63.9	67.8	68.0	71.4	75.0	68.6
Passengers	62.0	29.0	51.0	64.0	46.0	50.0	51.3	46.3	52.5	51.1	68.8	48.0	71.5

KEY: N = data do not exist.

^a Seat belt use is as of the Fall each year except in 2005 (June). Motorcycle helmet use is as of the Fall each year except in 2005 (June).

^b Beginning in 2003, the National Highway Traffic Safety Administration (NHTSA) no longer computes an overall light truck belt use estimate. Instead, belt use is computed separately for motorists in: (1) vans and sport utility vehicles, and (2) pickup trucks. Additionally, NHTSA no longer reports separate statistics for passengers and drivers, except at the overall level.

^c Includes pickup trucks, vans, minivans, and sport utility vehicles.

NOTE

Occupants of commercial and emergency vehicles are excluded. Passengers in cars and light trucks include right front only.

Table 2-31: Estimated Number of Lives Saved by Occupant Protection, Motorcycle Helmets, and Drinking Age Law

	1975-1994	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	Total 1975-2017
Safety belts ^{a,b}	68,940	12,882	15,688	12,670	12,071	12,386	12,644	12,801	14,062	14,753	14,955	374,276
Air bags ^c	730	1,716	2,752	2,403	2,341	2,422	2,398	2,400	2,597	2,774	2,790	50,457
Motorcycle helmets	15,076	872	1,554	1,551	1,622	1,715	1,640	1,673	1,800	1,885	1,872	45,746
Age 21 minimum legal drinking age	14,816	922	882	560	543	537	507	486	542	556	538	31,959
Child restraints	3,107	479	424	303	262	285	263	253	273	334	325	11,606

^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 In 2002, the National Highway Traffic Safety Administration (NHTSA) revised its method for estimating lives saved by safety belts. The previous method included survey data from states with and without belt use laws. The current method relies on police-reported restraint use information for each individual occupant fatality. Also, the estimate now includes lives saved in passenger vehicles at all seating positions, where previously it had been front outboard positions only.

^c In 2002, the National Highway Traffic Safety Administration revised the method for calculating lives saved by air bags.

Section D:
Transit Safety

Table 2-32: Transit Safety and Property Damage Data

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities^a	339	295	149	217	226	264	271	237	247	256	247	258	268	291
Injuries^{ab}	54,566	56,697	19,015	25,285	22,908	23,244	24,616	23,768	24,226	24,248	22,681	22,707	23,214	15,365
Accidents^{a,b,c}	58,002	24,261	10,049	4,121	4,210	4,183	4,551	4,838	6,655	6,889	6,722	6,857	6,925	5,175
Incidents^{a,b,c} (includes accidents)	90,163	59,898	22,098	22,683	20,433	20,350	21,678	20,674	23,234	23,877	22,331	22,639	23,103	16,859
Vehicle-miles^a (millions)	2,490	3,002	3,266	3,556	3,543	3,588	3,652	3,704	3,660	3,712	3,744	3,759	3,721	3,313
Rates per 100 million vehicle-miles^d														
Fatalities (all reportable incidents)	13.6	9.8	4.6	6.1	6.4	7.4	7.4	6.4	6.7	6.9	6.6	6.9	7.2	8.8
Injuries (all reportable incidents)	2,191	1,889	582	711	647	648	674	642	662	653	606	604	624	464
Accidents	2,329	808	308	116	119	117	125	131	182	186	180	182	186	156
Incidents	3,621	1,995	677	638	577	567	594	558	635	643	597	602	621	509
Property damage^{b,e} (current millions dollars)	38.0	58.9	71.7	50.3	48.0	453.0	45.0	57.2	51.5	54.4	50.1	53.1	59.0	U

KEY: U = data are not available.

^a Totals do not include data for cable car, inclined plane, jitney, aerial tramway, and ferry boat. This data appears in the footnotes for table 2-34.

^b The drop in the number of *Incidents*, *Accidents*, *Injuries*, and *Property damage* beginning from 2002 is due largely to a change in definitions by the Federal Transit Administration, particularly the definition of *Injuries*. The *Injury* threshold for filing an incident report changed to be two or more injuries requiring immediate medical transportation away from the scene, or one or more injuries requiring immediate medical transportation away from the scene in the case of incidents at grade crossings or along rail right-of-ways in 2002. Previously, any *Injury* was reportable. There were National Transportation Database definition changes made in 2008 to simplify the injury thresholds for filing an incident report. FTA simplified this threshold to being simply one or more injuries requiring immediate medical transportation away from the scene. This simplification resulted in larger reported number in *Injuries* since 2008. Commuter rail data is now derived from the Federal Railroad Administration's Rail Accident Incident Reporting System (RAIRS). The threshold for reporting *Property damage* was changed from \$1,000 in transit *Property damage* to \$7,500 in total *property damage* from 2002 to 2007. In 2008, the *property damage* threshold was changed to \$25,000. This change in coverage caused a large drop in the number of accidents beginning in 2008.

^c *Accidents* include all derailments, collision involving a roadway transit revenue vehicle where any (including private) vehicle is towed away, rail transit vehicle collision at a rail grade crossing, rail transit vehicle collision with an individual, collision between a rail transit vehicle and a second rail transit vehicle or rail transit non-revenue vehicle. *Incidents* include Accidents plus single-injury slips/falls, fire, fatality, injury (requiring transport), property damage of \$25,000 or more, evacuation due to or to a potentially hazardous situation, event occurring on transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle that meets at least one of the NTD reporting thresholds (note: Some thresholds have changed through the years.).

^d *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*.

^e Total does not include *Property damage* for cable car, inclined plane, jitney, and ferry boat, which were: 1990-\$335,000; 2000-\$77,000; 2005-\$44,000; 2010-\$250,000; 2011-\$75,500; 2012-\$44,955; 2013-\$123,500; 2014-\$15,600; 2015-\$22,500; 2016-\$125,067; 2017-\$1,052,233; 2018-\$760,000; 2019-\$150,000.

^f Includes hurricane Sandy

NOTES

Data are provided only for transit systems that furnished safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis*, annual reports.

Transit vehicle-miles in this table differ from those reported in Chapter 1. The American Public Transit Association, which is the source for the *vehicle-miles* table in Chapter 1, includes all transit systems, while *Transit Safety and Security Statistics and Analysis Annual Report* covers only directly operated urban transit systems.

Prior to the 2000 edition, *Transit Safety and Security Statistics and Analysis Report* was entitled *Safety Management Information Statistics* (SAMIS) annual report.

Data from 2002 on includes only transit modes reported in the National Transit Database and excludes commuter rail.

1990 - 2000 Includes only directly operated transit, purchased transportation (contracted) included from 2005 onward.

Table 2-33: Transit Safety Data by Mode^a for All Reported Accidents^b

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities, total	212	183	106	139	126	157	174	156	168	155	151	167	190
Motor bus ^c	92	82	49	64	69	68	73	72	82	80	74	67	65
Light rail	5	22	15	17	20	28	19	28	30	14	25	30	31
Heavy rail	51	19	7	40	25	37	33	31	31	25	23	41	53
Commuter rail	63	56	28	14	11	18	37	16	22	30	23	27	34
Demand responsive	0	4	7	3	1	5	9	8	3	5	6	2	6
Van pool	0	0	0	1	0	1	2	0	0	0	0	0	1
Automated guideway	1	0	0	0	0	0	1	1	0	1	0	0	0
Injured persons, total	20,023	22,140	8,102	6,862	6,962	6,711	8,643	8,785	9,000	8,898	8,518	8,041	8,119
Motor bus ^c	18,876	20,329	7,187	6,272	6,330	6,037	7,173	7,339	7,523	7,235	6,855	6,703	6,673
Light rail	465	415	268	288	314	320	171	270	249	252	383	254	307
Heavy rail	296	425	86	80	83	110	112	128	107	109	211	132	173
Commuter rail	84	53	263	36	50	34	298	82	115	119	94	105	55
Demand responsive	286	869	280	135	177	192	834	947	973	1,142	953	828	895
Van pool	16	49	18	33	8	17	55	19	32	40	22	19	16
Automated guideway	0	0	0	18	0	1	0	0	1	1	0	0	0
Accidents, total	58,002	24,261	8,152	3,477	3,532	3,379	4,435	4,694	6,347	6,464	6,903	6,855	7,031
Motor bus ^c	55,289	22,127	6,983	2,963	2,992	2,795	3,472	3,663	4,567	4,629	4,723	4,856	5,025
Light rail	699	357	625	155	192	223	158	211	594	556	888	827	747
Heavy rail	144	364	117	117	110	148	120	105	177	162	225	209	224
Commuter rail	175	258	68	131	113	77	80	58	82	70	87	82	82
Demand responsive	1,613	997	249	99	119	125	582	646	875	985	930	849	918
Van pool	81	157	110	11	6	10	22	10	50	59	50	32	35
Automated guideway	1	1	0	1	0	1	1	1	2	3	0	0	0
Vehicle-miles (millions), total	2,490	3,002	3,098	3,208	3,595	3,780	3,784	3,828	4,290	4,329	4,368	4,368	3,933
Motor bus ^c	1,668	1,868	1,853	1,929	1,770	1,793	1,793	1,808	2,048	2,080	2,097	2,097	1,826
Light rail	24	52	67	50	82	103	98	102	107	113	126	126	125
Heavy rail	529	595	645	87	652	644	644	643	695	696	703	703	673
Commuter rail	187	253	271	272	274	278	287	294	369	371	373	373	375
Demand responsive	74	179	196	688	711	744	744	754	842	838	842	842	707
Van pool	8	52	65	181	104	213	213	222	224	226	222	222	222
Automated guideway	1	2	2	1	2	5	5	5	5	5	5	5	5
Rates per 100 million vehicle-miles^d													
Fatalities, all modes	8.5	6.1	3.4	4.3	3.5	4.2	4.6	4.1	3.9	3.6	3.5	3.8	4.8
Motor bus ^c	5.5	4.4	2.6	3.3	3.9	3.8	4.1	4.0	4.0	3.8	3.5	3.2	3.6
Light rail	20.8	42.3	22.3	34.3	24.4	27.2	19.4	27.5	28.0	12.4	19.8	23.8	24.8
Heavy rail	9.6	3.2	1.1	45.8	3.8	5.7	5.1	4.8	4.5	3.6	3.3	5.8	7.9
Commuter rail	33.6	22.1	10.3	5.1	4.0	6.5	12.9	5.4	6.0	8.1	6.2	7.2	9.1
Demand responsive	0.0	2.2	3.6	0.4	0.1	0.7	1.2	1.1	0.4	0.6	0.7	0.2	0.8
Van pool	0.0	0.0	0.0	0.6	0.0	0.5	0.9	0.0	0.0	0.0	0.0	0.0	0.5
Automated guideway	162.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	19.6	0.0	0.0	0.0
Injured persons, all modes	804	738	262	214	194	178	228	229	210	206	195	184	206
Motor bus ^c	1,132	1,088	388	325	358	337	400	406	367	348	327	320	365
Light rail	1,933	798	398	581	383	311	174	265	233	223	304	202	246
Heavy rail	56	71	13	92	13	17	17	20	15	16	30	19	26
Commuter rail	45	21	97	13	18	12	104	28	31	32	25	28	15
Demand responsive	386	485	143	20	25	26	112	126	116	136	113	98	127
Van pool	208	94	28	18	8	8	26	9	14	18	10	9	7
Automated guideway	0	0	0	1,320	0	20	0	0	20	20	0	0	0

Continued next page

Table 2-33 cont'd: Transit Safety Data by Mode^a for All Reported Accidents^b

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Accidents, all modes	2,329	808	263	108	98	89	117	123	148	149	158	157	179
Motor bus ^c	3,315	1,184	377	154	169	156	194	203	223	223	225	232	275
Light rail	2,906	687	928	313	234	217	161	207	555	492	705	656	598
Heavy rail	27	61	18	134	17	23	19	16	25	23	32	30	33
Commuter rail	93	102	25	48	41	28	28	20	22	19	23	22	22
Demand response	2,177	557	127	14	17	17	78	86	104	118	110	101	130
Van pool	1,052	301	170	6	6	5	10	5	22	26	23	14	16
Automated guideway	162	62	0	73	0	20	20	20	40	59	0	0	0

^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 2-34.

^b *Accidents* includes 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 Accidents in this table by the number of Vehicle-miles.

NOTES

Data are provided only for transit systems that furnished safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration Transit Safety and Security Statistics and Analysis annual reports. Data covers only directly operated urban transit systems. Vehicle-miles for all transit systems including nonurban and purchased can be found in the Vehicle-miles table in chapter 1.

Prior to the 2000 edition, *Transit Safety and Security Statistics and Analysis Report* was entitled *Safety Management Information Statistics (SAMIS)* annual Analysts for the FTA believe the change in reporting requirements in 2002 may have resulted in unreliable data in that year, particularly for Injuries and Accidents. The reliability of reporting is believed to be much better in 2003 and is expected to improve in the future. Details may not add to totals due to rounding.

There were definition changes made in 2008 to simplify the injury thresholds for filing an incident report. Previously, the injury threshold for filing an incident report was two or more injuries requiring immediate medical transportation away from the scene, or one or more injuries requiring immediate medical transportation away from the scene in the case of incidents at grade crossings or along rail right-of-ways. FTA simplified this threshold to being simply one or more injuries requiring immediate medical transportation away from the scene.

Chapter 2. Transportation Safety

Table 2-34 cont'd: Transit Safety Data by Mode^a for All Reported Incidents^b

^a The figures for cable car, inclined plane, jitney, aerial tramway, and ferry boat are lumped together and appear in this footnote.

Other Modes	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities:	2	0	0	5	0	1	2	0	3	2	2	2	0	0
Injuries:	378	762	24	91	119	136	156	132	112	137	149	130	149	53
Incidents:	186	745	28	81	113	122	143	132	123	145	144	138	157	56

^b Incidents include non-major (Single-injury slips/falls, fire that do not meet major thresholds) or major (Fatality, injury (requiring transport), property damage of \$25,000 or more, evacuation due to or to a potentially hazardous situation, all derailments, collision involving a roadway transit revenue vehicle where any (including private) vehicle is towed away, rail transit vehicle collision at a rail grade crossing, rail transit vehicle collision with an individual, collision between a rail transit vehicle and a second rail transit vehicle or rail transit non-revenue vehicle) event occurring on transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle that meets at least one of the NTD reporting thresholds (note: Some thresholds have changed through the years.).

^c Motor bus includes trolley bus, commuter bus, and bus rapid transit.

^d Light rail includes streetcar rail and hybrid rail.

^e Automated guideway includes monorail/guideway and monorail.

^f 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.

^g 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 furnished safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration *Transit Safety and Security Statistics and Analysis* annual reports. Data covers only directly 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.

Excludes event data reported for all Commuter Rail (CR) and Alaska Railroad (AR) modes, the Heavy Rail (HR) service reported for Port Authority Trans Hudson (NTD ID: 20098), Hybrid Rail (YR) service for the Tri-County Metropolitan Transportation District of Oregon (NTD ID: 00008), and Hybrid Rail (YR) service for Capital Metropolitan Transportation Authority (NTD ID: 60048) are excluded from this analysis because these modes and operators are only required to report security data to the NTD, while their safety data reporting is strictly voluntary.

Prior to the 2000 edition, *Transit Safety and Security Statistics and Analysis Report* was entitled *Safety Management Information Statistics* (SAMIS) annual report.

Table 2-35: Transit and Grade-Crossing Fatalities by Rail Transit Mode

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All transit rail, total	186	197	162	167	176	182	228	219	242	241	242	271	277
Transit only	169	177	101	144	158	149	212	198	216	229	221	249	256
Grade crossing	17	20	58	23	18	33	16	21	26	12	21	22	21
Light rail, total	15	30	19	21	31	40	33	39	46	39	51	39	51
Transit only	N	18	9	12	24	25	25	24	29	30	34	26	36
Grade crossing	N	12	10	9	7	15	8	15	17	9	17	13	15
Heavy rail, total	79	80	35	87	88	97	108	93	97	104	90	121	124
Transit only	N	80	35	87	88	97	108	92	96	103	90	119	124
Grade crossing	N	0	0	0	0	0	0	1	1	1	0	2	0
Automated guideway, total	N	0	3	0	0	1	1	1	0	1	0	0	0
Transit only	N	N	N	0	0	1	1	1	0	1	0	0	0
Grade crossing	N	N	N	0	0	0	0	0	0	0	0	0	0
Commuter rail, total	92	87	105	59	57	44	86	86	99	97	101	111	102
Transit only	N	79	57	45	46	26	78	81	91	95	97	104	96
Grade crossing	N	8	48	14	11	18	8	5	8	2	4	7	6

KEY: N = data do not exist.

NOTES

Light rail and *Heavy rail* *Grade crossings* are regulated by the Federal Transit Administration. The Federal Transit Administration defines two types of *Grade crossings*: (1) At grade, mixed, and cross traffic crossings, meaning railway right-of-way over which other traffic moving in the same direction or other cross directions may pass. This includes city street right-of-way; (2) At grade with cross traffic crossings, meaning railway right-of-way over which no other traffic may pass, except to cross at grade-level crossings. This can include median strip rights-of-way with grade level crossings at intersecting streets.

Commuter rail *Grade crossings* are regulated by the Federal Railroad Administration. The Federal Railroad Administration defines a *Grade crossing* as a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.

All transit rail, total includes data for other transit rail modes which are not presented in this table (such as monorail), thus details may not add to totals. *Automated guideway* category is added in 2014 Q4 edition.

Table 2-36: Transit and Grade-Crossing Injuries by Rail Transit Mode

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All transit rail, total	14,931	13,969	6,104	9,604	9,379	9,089	10,185	8,773	9,093	8,712	8,058	7,635	8,406
Transit only	14,736	13,846	5,910	9,320	9,078	8,849	10,021	8,547	8,835	8,480	7,832	7,467	8,170
Grade crossing	195	123	194	284	301	240	164	226	258	232	226	168	236
Light rail, total	1,319	1,338	618	723	766	729	771	963	1,014	1,022	1,097	896	1,023
Transit only	N	1,227	458	472	510	516	651	755	814	832	879	745	833
Grade crossing	N	111	160	251	256	213	120	208	200	190	218	151	190
Heavy rail, total	11,238	10,848	3,814	6,976	6,688	6,717	7,708	6,291	6,114	5,977	4,887	4,969	5,307
Transit only	N	10,847	3,813	6,974	6,686	6,713	7,707	6,289	6,113	5,970	4,885	4,963	5,291
Grade crossing	N	1	1	2	2	4	1	2	1	7	2	6	16
Automated guideway, total	N	N	N	N	114	77	89	70	122	80	79	94	95
Transit only	N	N	N	N	114	77	89	70	122	80	79	94	95
Grade crossing	N	N	N	N	0	0	0	0	0	0	0	0	0
Commuter rail, total	2,374	1,783	1,672	1,905	1,811	1,566	1,617	1,449	1,843	1,633	1,995	1,676	1,981
Transit only	N	1,772	1,639	1,874	1,768	1,543	1,574	1,433	1,786	1,598	1,989	1,665	1,951
Grade crossing	N	11	33	31	43	23	43	16	57	35	6	11	30

KEY: N = data do not exist.

NOTES

Light rail and *Heavy rail* *Grade crossings* are regulated by the Federal Transit Administration. The Federal Transit Administration (FTA) defines two types of *Grade crossings*: (1) At grade, mixed, and cross traffic crossings, meaning railway right-of-way over which other traffic moving in the same direction or other cross directions may pass. This includes city street right-of-way; (2) At grade with cross traffic crossings, meaning railway right-of-way over which no other traffic may pass, except to cross at grade-level crossings. This can include median strip rights-of-way with grade level crossings at intersecting streets.

Commuter rail *Grade crossings* are regulated by the Federal Railroad Administration. The Federal Railroad Administration defines a *Grade crossing* as a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.

The drop in the number of *Injuries* beginning from 2002 is due largely to a change in definitions by the Federal Transit Administration. The *Injury* threshold for filing an incident report changed to be two or more *Injuries* requiring immediate medical transportation away from the scene, or one or more *Injuries* requiring immediate medical transportation away from the scene in the case of incidents at grade crossings or along rail right-of-ways in 2002. Previously, any *Injury* was reportable. Further, there were National Transportation Database definition changes made in 2008 to simplify the *Injury* thresholds for filing an incident report. FTA simplified this threshold to being simply one or more *Injuries* requiring immediate medical transportation away from the scene. This simplification resulted in larger reported number in *Injuries* since 2008.

All transit rail, total includes data for other transit rail modes which are not presented in this table (such as monorail), thus details may not add to totals.

Automated guideway category is added in 2014 Q4 edition.

Table 2-37: Transit and Grade-Crossing Incidents by Rail Transit Mode

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All transit rail, total	18,450	16,173	8,534	9,467	10,728	10,392	12,141	10,710	11,444	11,227	10,589	10,106	10,235
Transit only	18,323	16,025	7,999	9,285	10,550	10,232	12,039	10,546	10,950	10,756	9,865	9,456	9,606
Grade crossing	127	148	535	182	178	160	102	164	494	471	724	650	629
Light rail, total	1,276	1,319	1,130	585	696	737	838	971	1,472	1,475	1,992	1,781	1,538
Transit only	1,178	1,213	689	470	580	621	758	828	1,001	1,027	1,285	1,156	935
Grade crossing	98	106	441	115	116	116	80	143	471	448	707	625	603
Heavy rail, total	14,327	12,782	5,741	6,808	7,928	7,852	8,828	7,407	7,481	7,459	6,335	6,353	6,500
Transit only	14,325	12,781	5,740	6,807	7,926	7,849	8,826	7,404	7,480	7,453	6,332	6,347	6,494
Grade crossing	2	1	1	1	2	3	2	3	1	6	3	6	6
Automated guideway, total	N	N	N	N	117	80	92	73	124	86	85	99	114
Transit only	N	N	N	N	117	80	92	73	124	86	85	99	114
Grade crossing	N	N	N	N	0	0	0	0	0	0	0	0	0
Commuter rail, total	2,847	2,072	1,663	2,074	1,987	1,723	2,383	2,259	2,367	2,207	2,177	1,873	2,083
Transit only	2,820	2,031	1,570	2,008	1,927	1,682	2,363	2,241	2,345	2,190	2,163	1,854	2,063
Grade crossing	27	41	93	66	60	41	20	18	22	17	14	19	20

KEY: N = data do not exist.

NOTES

Light rail and *Heavy rail* *Grade crossings* are regulated by the Federal Transit Administration. The Federal Transit Administration (FTA) defines two types of *Grade crossings*: (1) At grade, mixed, and cross traffic crossings, meaning railway right-of-way over which other traffic moving in the same direction or other cross directions may pass. This includes city street right-of-way; (2) At grade with cross traffic crossings, meaning railway right-of-way over which no other traffic may pass, except to cross at grade-level crossings. This can include median strip rights-of-way with grade level crossings at intersecting streets.

Commuter rail *Grade crossings* are regulated by the Federal Railroad Administration. The Federal Railroad Administration defines a *Grade crossing* as a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.

Data thresholds changed for certain elements beginning with 2002. The extreme drop in the *Incidents*, injuries, collisions, and not otherwise classifieds (personal casualties) for 2002 is due to the change of the incident thresholds, specifically the definition of injuries, in the National Transportation Database. The injury threshold for filing an incident report changed to be two or more injuries requiring immediate medical transportation away from the scene, or one or more injuries requiring immediate medical transportation away from the scene in the case of incidents at grade crossings or along rail right-of-ways in 2002. Previously, any injury was reportable. Further, there were National Transportation Database definition changes made in 2008 to simplify the injury thresholds for filing an incident report. FTA simplified this threshold to being simply one or more injuries requiring immediate medical transportation away from the scene.

All transit rail, total includes data for other transit rail modes which are not presented in this table (such as monorail), thus details may not add to totals. *Automated guideway* category is added in 2014 Q4 edition.

Table 2-38: Security Events^a of Crime by Transit Mode (substantial damage threshold)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Homicide^b	14	10	14	16	16	7	22	18	10	17
Motor bus ^c	6	4	8	10	9	0	7	7	4	3
Demand responsive	0	0	0	0	2	0	1	0	0	0
Heavy rail	7	5	4	3	3	5	8	4	6	10
Light rail ^d	1	1	2	3	2	2	5	7	0	4
Other ^e	0	0	0	0	0	0	1	0	0	0
Rape^f	6	4	12	4	10	7	9	10	12	16
Motor bus ^c	2	2	3	2	3	1	4	1	3	1
Demand responsive	0	1	0	0	0	0	0	0	0	1
Heavy rail	2	1	9	1	5	5	3	7	4	8
Light rail ^d	2	0	0	1	2	1	1	2	5	5
Other ^e	0	0	0	0	0	0	1	0	0	1
Robbery^g	61	93	113	117	105	109	120	129	153	209
Motor bus ^c	11	20	23	44	44	23	27	15	17	12
Demand responsive	0	1	0	1	0	1	0	0	0	0
Heavy rail	42	58	69	48	41	56	45	74	109	161
Light rail ^d	8	14	18	23	17	27	48	39	26	33
Other ^e	0	0	3	1	3	2	0	1	1	3
Assault^h	459	761	930	789	835	911	907	1,014	1,219	1,539
Motor bus ^c	246	352	429	412	408	448	387	426	490	568
Demand responsive	4	0	1	4	3	4	5	2	6	3
Heavy rail	149	301	383	267	308	314	341	383	516	697
Light rail ^d	59	92	96	84	99	121	153	197	195	250
Other ^e	1	16	21	22	17	24	21	6	12	21
Theftⁱ	0	3	2	1	0	6	4	6	2	7
Motor bus ^c	0	0	1	1	0	1	3	3	0	6
Demand responsive	0	1	0	0	0	0	0	0	0	0
Heavy rail	0	0	0	0	0	3	0	2	1	1
Light rail ^d	0	0	0	0	0	2	1	1	0	0
Other ^e	0	2	1	0	0	0	0	0	1	0
Vandalism^j	4	4	4	2	6	3	7	8	2	3
Motor bus ^c	4	2	3	2	4	2	6	7	0	3
Demand responsive	0	1	0	0	0	1	0	0	0	0
Heavy rail	0	0	1	0	0	0	1	1	0	0
Light rail ^d	0	1	0	0	2	0	0	0	2	0
Other ^e	0	0	0	0	0	0	0	0	0	0
Suspicious package/Bomb threat^k	50	52	37	57	48	49	49	29	34	U
Motor bus ^c	10	12	13	22	21	22	33	11	15	U
Demand responsive	0	0	0	0	0	0	0	0	0	U
Heavy rail	0	0	0	0	0	0	0	0	0	U
Light rail ^d	36	35	16	23	24	22	12	10	11	U
Other ^e	4	5	8	12	3	5	4	8	8	U

Table 2-38 cont'd: Security Events^a of Crime by Transit Mode (substantial damage threshold)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Other^l	6	2	23	22	26	21	26	25	17	U
Motor bus ^c	4	1	21	20	21	18	20	13	10	U
Demand responsive	0	0	0	0	0	0	0	0	1	U
Heavy rail	2	0	1	2	3	1	3	8	4	U
Light rail ^d	0	1	1	0	2	1	2	2	2	U
Other ^e	0	0	0	0	0	1	1	2	0	U

KEY: U = data are not available.

^a *Security Events* must meet the National Transit Database (NTD) reporting threshold i.e., injury requiring immediate transport away from the scene, fatality, an evacuation for life-safety reasons, or estimated property damage equal to or exceeding \$25,000. In 2017, Monetary damage of \$25,000 or more was changed to Substantial Damage (Damage to any involved vehicles, facilities, equipment, rolling stock, or infrastructure that disrupts the operations of the rail transit agency AND adversely affects the structural strength, performance, or operating characteristics of the vehicle, facility, equipment, rolling stock, or infrastructure, requiring towing, rescue, on-site maintenance, or immediate removal prior to safe operation.). Serious Injuries (requires hospitalization for more than 48 hours, commencing within 7 days from the date of the event; results in a fracture of any bone (except simple fractures of fingers, toes, or nose); causes severe hemorrhages or nerve, muscle, or tendon damage; involves an internal organ; or involves second- or third-degree burns, or any burns affecting more than five percent of the body surface.) which do not require transport from the scene were added.

^b The killing of one or more human beings by another. This includes murder, non-negligent manslaughter, and manslaughter by negligence.

^c *Motor bus* transit mode includes trolley bus.

^d *Light rail* transit mode includes street car rail.

^e *Other* transit mode includes automated guideway, cable car, ferryboat, hybrid rail, monorail, publico, vanpool, inclined plane, and the Alaska Railroad.

^f The carnal knowledge of a person forcibly and/or against that person's will, or not forcibly or against that person's will if the victim is incapable of giving consent because of age or because of his or her temporary or permanent mental or physical incapacity.

^g The taking, or attempting to take, anything of value under confrontational circumstances from the control, custody, or care of another person by force or violence and/or by putting the victim in fear of immediate harm.

^h An unlawful attack or attempt by one person upon another. This includes incidents where injury resulted requiring immediate transport away from the scene. Prior to 2010, figure is for aggravated assaults only. NTD no longer makes the distinction between aggravated assaults (major violent crimes) and simple assaults (minor).

ⁱ 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, theft of motor vehicles, 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.

^j The willful or malicious destruction or defacement of transit property or vehicles.

^k *Suspicious package* includes bomb threats.

^l Other *Security Events* includes arson, bombing, burglary, chemical / biological / nuclear / radiological, hijacking and other.

NOTES

Data is from transit agencies in urbanized areas with a population over 50,000 and include patrons, employees, and others. Includes only agencies with greater than 30 vehicles operated in maximum service.

An *Assault*, *Robbery* or *Theft* has the potential to be a reportable incident, only the incidents meeting the thresholds are reported on the Reportable Incident form (S&S-40) e.g., injury requiring immediate transport away from the scene, fatality, an evacuation for life-safety reasons, or estimated property damage equal to or exceeding \$25,000 (changed to Substantial Damage in 2017).

Reporting methods and methodology change in 2020, not comparable with previous editions.

Beginning in 2016, attempted suicides and Suicides are reported under Other if there was no contact with a transit vehicle, and a collision (Safety Event) if the event involved contact with a transit vehicle. Suicides and Attempted Suicides are not included in this dataset.

Section E:
Railroad Safety

Table 2-39: Railroad and Grade-Crossing Fatalities by Victim Class

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Passengers on trains	4	3	4	16	3	6	5	6	4	15	2	9	6	1	2
Railroad only	4	3	4	16	3	2	5	6	4	10	2	9	6	1	2
Grade crossing	0	0	0	0	0	4	0	0	0	5	0	0	0	0	0
Employees on duty	97	40	24	25	20	21	16	14	10	11	14	11	17	9	11
Railroad only	97	35	22	23	20	15	15	13	10	11	14	11	16	8	9
Grade crossing	0	5	2	2	0	6	1	1	0	0	0	0	1	1	2
Employees not on duty	4	0	1	0	0	0	0	1	0	2	0	0	0	2	2
Railroad only	3	0	1	0	0	0	0	1	0	2	0	0	0	2	2
Grade crossing	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contractor employees	7	3	3	5	3	4	3	6	5	8	5	4	7	0	5
Railroad only	7	3	3	5	3	3	3	5	5	7	5	4	7	0	5
Grade crossing	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0
Nontrespassers^a	739	551	335	250	139	130	128	128	148	135	120	129	105	146	85
Railroad only	16	15	19	23	7	15	10	18	16	32	17	17	7	18	12
Grade crossing	723	536	316	227	132	115	118	110	132	103	103	112	98	128	73
Trespassers	566	700	570	588	570	519	517	547	599	578	619	664	669	705	647
Railroad only	457	543	463	458	441	399	405	427	469	450	467	505	510	540	525
Grade crossing	109	157	107	130	129	120	112	120	130	128	152	159	159	165	122
Volunteer employees	N	N	0	0	0	1	0	0	1	0	0	0	1	0	0
Railroad only	N	N	0	0	0	1	0	0	1	0	0	0	1	0	0
Grade crossing	N	N	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad only and grade crossing, total	1417	1297	937	884	735	681	669	702	767	749	760	817	805	863	752
Railroad only	584	599	512	525	474	435	438	470	505	512	505	546	547	569	555
Grade crossing ^b	833	698	425	359	261	246	231	232	262	237	255	271	258	294	197
Motor vehicles ^b	716	613	361	284	169	168	164	162	167	154	152	169	155	165	110
Non-motor vehicles ^c	81	84	64	75	92	78	67	70	95	83	103	102	103	129	87

KEY: N = data do not exist.

^a Beginning in 1997, *Nontrespassers* off railroad property are also included.

^b The components of *Grade crossing* data were revised at a different point in time from the total *Grade crossing* data and may not sum to the total of *Grade crossing* data.

NOTE

Railroad only includes fatalities from train accidents, train incidents, and nontrain incidents (excludes highway-rail grade crossings). This table includes information for both freight and passenger railroad operations. Details may not add to totals due to different data sources are used.

Table 2-40: Railroad and Grade-Crossing Injured Persons by Victim Class

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Passengers on trains	593	473	658	957	1,370	1,583	1,590	1,698	1,460	1,638	1,812	1,633	1,414	1,226	360
Railroad only	569	462	648	924	1,256	1,338	1,411	1,588	1,374	1,432	1,669	1,546	1,339	1,120	337
Grade crossing	24	11	10	33	114	245	179	110	86	206	143	87	75	106	23
Employees on duty	56,331	20,970	8,423	5,822	4,413	4,244	3,994	4,306	4,504	4,409	4,081	4,279	3,952	3,926	3,004
Railroad only	56,186	20,801	8,323	5,711	4,333	4,172	3,918	4,222	4,452	4,328	4,016	4,223	3,878	3,850	2,933
Grade crossing	145	169	100	111	80	72	76	84	52	81	65	56	74	76	71
Employees not on duty	671	326	286	172	134	123	87	123	133	137	101	106	141	72	79
Railroad only	669	324	283	169	134	123	87	122	132	137	101	105	141	71	78
Grade crossing	2	2	3	3	0	0	0	1	1	0	0	1	0	1	1
Contractor employees	74	242	368	415	445	439	360	433	455	432	460	472	415	358	243
Railroad only	74	240	367	413	443	437	357	432	454	432	456	466	410	354	241
Grade crossing	0	2	1	2	2	2	3	1	1	0	4	6	5	4	2
Nontrespassers^a	3,849	2,339	1,294	1,496	1,390	1,479	1,792	1,517	1,597	1,821	1,550	1,629	1,633	1,622	939
Railroad only	384	349	381	859	929	967	1,303	969	1,092	1,331	1,125	1,183	1,195	1,197	582
Grade crossing	3,465	1,990	913	637	461	512	489	548	505	490	425	446	438	425	357
Trespassers	728	793	606	687	621	583	634	665	648	683	695	763	743	747	772
Railroad only	474	560	414	420	390	366	410	432	423	412	479	511	489	532	557
Grade crossing	254	233	192	267	231	217	224	233	225	271	216	252	254	215	215
Volunteer employees	N	N	8	1	6	4	5	10	8	10	3	7	5	7	5
Railroad only	N	N	8	1	6	4	4	10	8	10	3	7	5	7	5
Grade crossing	N	N	0	0	0	0	1	0	0	0	0	0	0	0	0
Railroad only and grade crossing, total	62,246	25,143	11,643	9,550	8,379	8,455	8,462	8,752	8,805	9,130	8,702	8,889	8,303	7,958	5,402
Railroad only	58,356	22,736	10,424	8,497	7,491	7,407	7,490	7,775	7,935	8,082	7,849	8,041	7,457	7,131	4,733
Grade crossing ^b	3,890	2,407	1,219	1,053	888	1,048	972	977	870	1,048	853	848	846	827	669
Motor vehicles ^b	3,675	2,329	1,169	1,008	821	987	916	904	794	973	795	772	740	750	582
Non-motor vehicles ^b	149	75	50	47	67	61	58	73	77	75	59	76	106	77	90

KEY: N = data do not exist.

^a Beginning in 1997, *Nontrespassers* off railroad property are also included.^b The components of *Grade crossing* injuries were revised at a different point in time from the total *Grade crossing* injuries and may not sum to the total of *Grade crossing* injuries.**NOTE**Railroad only includes fatalities from train accidents, train incidents, and nontrain incidents (excludes *Highway-rail grade crossings*). This table includes information for both freight and passenger railroad operations. Details may not add to totals due to different data sources used.

Table 2-41: Train Fatalities, Injuries, and Accidents by Type of Accident^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities, total	29	10	10	33	8	6	9	11	5	11	7	7	7	3	1
Derailments	8	2	2	2	2	1	5	8	0	8	0	3	0	0	0
Collisions	20	8	1	6	1	4	4	1	2	1	3	0	5	0	0
Other	1	0	7	25	5	1	0	2	3	2	4	4	2	3	1
Injuries, total	665	451	275	790	110	217	466	328	143	564	433	319	204	57	67
Derailments	286	272	121	236	49	29	419	268	52	471	113	159	24	21	26
Collisions	341	139	89	101	31	74	19	37	69	32	14	13	155	12	8
Other	38	40	65	453	30	114	28	23	22	61	306	147	25	24	33
Accidents, total	8,205	2,879	2,983	3,266	1,902	2,032	1,766	1,853	1,886	1,930	1,723	1,787	1,988	1,972	1,519
Derailments	6,442	2,146	2,112	2,305	1,333	1,470	1,294	1,311	1,322	1,351	1,212	1,272	1,375	1,329	1,047
Collisions	1,198	315	237	274	127	157	155	153	145	136	78	81	99	114	91
Other	565	418	634	687	442	405	317	389	419	443	433	434	514	529	381

^a Excludes highway-rail grade crossing accidents.

NOTE

This table includes information for both freight and passenger railroad operations. It is train accidents only.

Table 2-42: Railroad Passenger Safety Data

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Passenger fatalities ^a	4	3	4	16	3	6	5	6	4	15	2	9	6	1	2
Injured persons	593	473	658	957	1,370	1,583	1,590	1,698	1,460	1,638	1,812	1,633	1,414	1,226	360
Train-miles, passenger trains (millions)	U	72	84	90	105	106	107	111	112	108	111	113	114	115	86
Fatalities per 100 million passenger train-miles	U	4.2	4.7	17.8	2.9	5.7	4.7	5.4	3.6	13.9	1.8	8.0	5.3	0.9	2.3
Injuries per 100 million passenger train-miles	U	656.9	780.7	1,062.0	1,303.5	1,497.9	1,479.4	1,528.3	1,302.2	1,513.7	1,639.6	1,450.9	1,242.1	1,065.7	420.2

^a A major train accident accounted for the increase in the number of deaths in 2005. In 2005, a Southern California Regional Rail Authority train struck a jeep at a non-grade crossing location, derailed and struck a UPRR locomotive, which caused the train to strike another Southern California Regional Rail Authority train. The total passenger fatalities from both trains were 10.

NOTES

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.

Passenger fatalities and *Injured persons* include passengers on trains only.

Table 2-43: Railroad System Safety and Property Damage Data (excludes highway-rail grade-crossing accidents)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities	785	584	599	512	525	474	435	438	470	505	512	505	546	553	579	580
Injured persons^a	17,934	58,356	22,736	10,424	8,497	7,491	7,407	7,491	7,775	7,935	8,082	7,849	8,041	7,457	7,131	4,733
Accidents^b	8,095	8,205	2,879	2,983	3,266	1,902	2,032	1,766	1,853	1,886	1,930	1,723	1,787	1,988	1,972	1,518
Train-miles (millions)^{c,d}	839	718	609	723	789	705	718	732	748	766	738	690	706	711	678	570
Rate per 100 million train-miles																
Fatalities	94	81	98	71	67	67	61	60	63	66	69	73	77	78	85	102
Injuries	N	8,131	3,734	1,442	1,077	1,063	1,032	1,024	1,039	1,036	1,095	1,138	1,139	1,048	1,052	830
Accidents	965	1,143	473	413	414	270	283	241	248	246	261	250	253	279	291	266
Property damage (current millions of dollars)	121.6	267.4	198.7	263.2	339.9	253.2	248.2	232.9	340.0	278.1	346.4	254.2	263.6	290.6	303.8	248.6

KEY: N = data do not exist.

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

^b Train accidents only; excludes highway-rail grade-crossing accidents.

^c *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 2005, Group II rail accounted for 78 million *Train-miles*, and other rail for 29 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.

^d 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.

Table 2-44: Fatalities and Injuries of On-Duty Railroad Employees^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Employee fatalities, total	97	40	24	25	20	21	16	14	10	11	14	11	17	9	11
Grade-crossing accidents and incidents	0	5	2	2	0	6	1	1	0	0	0	0	0	1	1
Train accidents and incidents only (grade-crossing excluded)	97	35	22	23	20	15	15	13	10	11	14	11	16	8	10
Employee injuries, total	56,331	20,970	8,423	5,822	4,413	4,228	3,985	4,306	4,504	4,409	4,081	4,279	3,952	3,926	3,004
Grade-crossing accidents and incidents	145	169	100	111	80	72	76	84	52	81	65	56	74	76	71
Train accidents and incidents only (grade-crossing excluded)	56,186	20,801	8,323	5,711	4,333	4,172	3,918	4,222	4,452	4,328	4,016	4,223	3,878	3,850	2,933
Employee hours (millions)	1,010.8	553.6	490.9	478.5	437.5	460.1	458.9	463.0	483.2	478.1	437.1	433.4	438.4	420.0	364.5
Fatality rates per million employee hours															
All accidents / incidents	0.10	0.07	0.05	0.05	0.05	0.05	0.03	0.03	0.02	0.02	0.03	0.03	0.04	0.02	0.03
Grade-crossing accidents and incidents	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Train accidents and incidents only (grade-crossing excluded)	0.10	0.06	0.04	0.05	0.05	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.04	0.02	0.03
Injury rates per million employee hours															
All accidents / incidents	55.7	37.9	17.2	12.2	10.1	9.2	8.7	9.3	9.3	9.2	9.3	9.9	9.0	9.3	8.2
Grade-crossing accidents and incidents	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2
Train accidents and incidents only (grade-crossing excluded)	55.6	37.6	17.0	11.9	9.9	9.1	8.5	9.1	9.2	9.1	9.2	9.7	8.8	9.2	8.0
Train-miles (millions)^{b,c}	718	609	723	789	705	718	732	748	766	738	690	706	711	678	570
Fatality rates per million train-miles															
All accidents / incidents	0.14	0.07	0.03	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.02
Grade-crossing accidents and incidents	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Train accidents and incidents only (grade-crossing excluded)	0.14	0.06	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.02
Injury rates per million train-miles															
All accidents/incidents	78.5	34.4	11.7	7.4	6.3	5.9	5.4	5.8	5.9	6.0	5.9	6.1	5.6	5.8	5.3
Grade-crossing accidents and incidents	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Train accidents and incidents only (grade-crossing excluded)	78.3	34.2	11.5	7.2	6.1	5.8	5.4	5.6	5.8	5.9	5.8	6.0	5.5	5.7	5.1

^a Excludes contractors.

^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. In 2005, Group II rail accounted for 78 million train-miles, and other rail for 29 million train-miles. Moreover, the vehicle-miles table in Chapter 1 includes only *rain-miles* between terminals and/or stations, thus excluding yard and switching miles. In 2005, Class I yard/switching train miles totaled 67 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.

^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.

NOTE

This table includes information for both freight and passenger railroad operations.

Section F:
Water Safety

Table 2-45: Waterborne Transportation Safety and Property Damage Data Related to Vessel Casualties

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities ^a	178	206	85	53	92	41	31	33	16	14	46	18	27	32	57	25
Injuries	105	180	175	150	169	172	131	141	223	98	108	141	119	115	108	73
Accidents ^b	2,582	4,624	3,613	5,403	5,190	5,285	5,837	5,298	5,727	6,048	3,330	2,400	2,254	2,423	3,131	2,533
Vessels ^c	4,063	7,694	5,494	7,103	6,599	8,369	9,177	7,972	8,839	8,852	4,106	3,216	2,830	3,060	3,726	3,034
Property damage																
(current \$ millions)	U	U	U	180.5	719.5	436.6	71.9	100.4	122.2	104.8	101.7	65.9	70.6	97.2	246.6	68.8

KEY: 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 CFR Part 4.05-1.

^c More than one *Vessel* may be involved in a marine *Accident*. Statistics from 1992 to 2011 include *Vessels* involved in pollution incidents, which the United States Coast Guard considers to be a *Vessel* casualty.

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). Commercial fishing *Vessels* are included.

Between 1998 and 2001, the U.S. Coast Guard phased in a new computer system to track safety data, the Marine Information for Safety and Law Enforcement System. During this period, data are derived by combining entries in the Marine Safety Management Information System with entries in the Marine Information for Safety and Law Enforcement System. Data for 2002 and after are from the Marine Information for Safety and Law Enforcement System. Data prior to 1992 come from other sources and may not be directly comparable to the data from later years.

Table 2-46: Waterborne Transportation Safety Data not Related to Vessel Casualties

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities ^a	420	281	101	69	60	52	27	30	74	50	28	18	27	17	37	29
Injuries	U	U	U	509	580	542	619	547	589	608	333	287	336	378	335	272
Vessels ^b	U	274	98	514	614	472	469	418	466	480	304	251	350	384	316	261

KEY: U = data are not available.

^a *Fatalities* include people who were declared missing.

^b Figures represent the number of *Vessels* involved in nonvessel casualties. These *Vessels* were not part of the accident, but the accident may have occurred on the *Vessel* (e.g., crewmembers swept overboard by a wave).

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, homicides, suicides, fights, and diving accidents have been excluded. The data reflect deaths and *Injuries* to people on both U.S. and foreign flag *Vessels* within the jurisdiction of the United States (within 12 miles of U.S. coast) and on U.S. flag vessels anywhere in the world.

Between 1998 and 2001 the U.S. Coast Guard phased in a new computer system to track safety data, the Marine Information for Safety and Law Enforcement System. During that period data came from combining entries in the Marine Safety Management Information System with entries in the Marine Information for Safety and Law Enforcement System. Data after 2002 comes from the Marine Information for Safety and Law Enforcement System. Data prior to 1992 came from other sources and may not be directly comparable to the data from later years.

Table 2-47: Recreational Boating Safety, Alcohol Involvement, and Property Damage Data

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Fatalities^a	739	1,418	1,360	865	701	697	672	758	651	560	610	626	701	658	633	613	767	
Injuries	929	780	2,650	3,822	4,355	3,451	3,153	3,081	3,000	2,620	2,678	2,613	2,903	2,629	2,511	2,559	3,191	
Accidents	2,738	3,803	5,513	6,411	7,740	4,969	4,604	4,588	4,515	4,062	4,064	4,158	4,463	4,291	4,145	4,168	5,265	
Vessels involved	3,562	4,762	6,954	8,591	10,984	6,628	6,062	5,939	5,900	5,458	5,333	5,560	5,967	5,876	5,594	5,651	7,248	
Numbered boats (thousands)^b	2,500	5,128	8,578	10,996	12,782	12,942	12,439	12,174	12,102	12,013	11,804	11,867	11,862	11,962	11,853	11,879	11,838	
Rates per 100,000 numbered boats																		
Fatalities	29.6	27.7	15.9	7.9	5.5	5.4	5.4	6.2	5.4	4.7	5.2	5.3	5.9	5.5	5.3	5.2	6.5	
Injuries	37.2	15.2	30.9	34.8	34.1	26.7	25.3	25.3	24.8	21.8	22.7	22.0	24.5	22.0	21.2	21.5	27.0	
Accidents	109.5	74.2	64.3	58.3	60.6	38.4	37.0	37.7	37.3	33.8	34.4	35.0	37.6	35.9	35.0	35.1	44.5	
Accident reports citing alcohol involvement^c			N	N	N	568	696	402	395	361	368	305	345	306	350	323	309	353
Property damage (current millions of dollars)	3.2	8.2	16.4	23.8	34.7	38.7	35.6	52.2	38.0	39.2	38.9	41.8	49.1	46.0	45.9	55.3	62.5	

KEY: N = data does not exist.

^a The numbers for recreational boating safety fatalities in 2000 are raw numbers. Coast Guard reports a 6% addition as instructed by the DOT Inspector General because it found a discrepancy in a review of the Search and Rescue Management Information System (SAR MIS) and BARD data. (See the discussion found in the DOT FY2003 Performance Plan/2001 Performance Report on pg. 135 under data details of recreational boating fatalities, available at <http://www.dot.gov/performance/> as of Feb 10, 2010).

^b Numbered boats in 1960 is an estimate.

^c Starting in 2001 only cases where alcohol is determined to be a direct or indirect cause of an accident are reported. Previous years include cases where alcohol was present but played no role in the

NOTE

Only a small fraction of property damages and nonfatal accidents are reported to the U.S. Coast Guard.

Table 2-48: Personal Watercraft Safety Data

	1987	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities	5	28	68	65	38	44	58	36	34	33	46	46	42	46	66
Injured persons	156	532	1,580	1,007	776	764	721	601	592	623	675	624	634	614	896
Accidents ^a	376	1,162	3,268	1,692	1,221	1,158	1,111	954	891	1,023	1,072	1,028	1,055	1,062	1,564
Sales	29,000	72,000	92,000	80,200	41,600	42,900	38,500	39,400	47,900	54,900	59,000	U	69,000	73,000	82,500
Number in use	92,756	241,376	1,230,000	1,230,000	1,270,000	1,270,000	1,250,000	1,270,000	1,200,000	U	U	U	U	U	U

KEY: U = data are not available.

^a Total vessels involved.

NOTE

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. Watercraft *Number in use* and *Sales* are estimates.

Table 2-49: U.S. Coast Guard Search and Rescue Statistics, Fiscal Year

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Cases	53,097	40,214	30,522	22,303	20,578	19,856	17,826	17,555	17,302	16,298	15,951
Responses ^a	64,971	48,226	52,741	46,407	43,954	43,940	38,272	38,282	37,215	U	U
Sorties ^a	84,033	57,697	31,088	23,248	21,575	21,598	19,475	19,084	18,776	17,198	16,907
Search and rescue resource hours ^b	108,282	80,533	77,888	61,616	56,233	59,583	53,911	U	U	U	U
Lives saved	4,407	3,400	5,671	4,362	3,820	4,102	3,773	3,900	3,930	5,450	4,188
Lives lost, total	1,085	1,018	745	737	660	655	608	597	605	626	618
Lives lost before notification ^{c,d}	622	779	526	554	485	429	431	427	436	469	420
Lives lost after notification ^e	463	239	219	183	175	226	177	170	169	157	198
Lives unaccounted for ^f	U	304	605	409	392	455	246	310	329	379	456
Persons otherwise assisted	117,327	54,866	41,551	33,411	32,429	27,042	26,249	U	U	U	U
Value of property lost (Million of dollars) ^{g,h}	368.5	415.2	97.0	194.3	92.7	53.8	385.9	U	U	U	U
Value of property assisted (Million of dollars)	2,044.9	778.8	1,661.8	779.8	1,461.9	604.8	506.8	U	U	U	U
Property loss prevented (Million of dollars)	1,673.4	84.3	146.4	87.0	83.1	123.4	65.2	U	U	U	U
Value of property unaccounted for (Million of dollars) ⁱ	U	2.1	2.1	5.1	9.8	5.9	4.4	U	U	U	U

KEY: 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 The Egypt Air (217 fatalities) and Alaska Air (88 fatalities) crashes account for the increase in 2000.

^e 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.

^f Added category; completes the accounting for all lives associated with USCG Search and Rescue (SAR) responses.

^g Includes several out of the normal high cost incidents.

^h The B-52 crash in Guam accounts for the increase (\$1,040 million) in 2008. The Asiana Airlines Boeing 777 crash in San Francisco (\$300M) and the F-16 Crash east of Chincoteague VA (\$47M) account for the large increase in Value of property lost in 2013.

ⁱ Added category; completes the accounting for all property associated with USCG SAR responses.

NOTES

2005 data does not include the 33,544 Lives Saved during Hurricane Katrina or the 138 during Hurricane Rita.

2017 data is as of September 28th, 2017.

Section G:
Pipeline Safety

Table 2-50: Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities																
Total hazardous liquid	4	4	3	1	2	1	0	3	1	0	1	3	1	0	0	5
Total gas	26	15	6	37	15	21	13	9	8	19	10	13	19	7	11	12
Gas transmission	2	1	0	15	0	10	0	0	0	1	6	3	3	1	1	2
Gas distribution	24	14	6	22	15	11	13	9	8	18	4	10	16	6	10	10
Injured persons																
Total hazardous liquid	21	15	7	4	2	3	1	4	6	0	0	9	1	2	0	12
Total gas	241	177	69	75	43	105	54	53	38	94	48	78	35	77	35	30
Gas transmission	25	13	17	16	5	61	1	7	2	1	16	3	3	5	8	1
Gas distribution	216	164	52	59	38	44	53	46	36	93	32	75	32	72	27	29
Incidents																
Total hazardous liquid	351	244	180	146	369	350	344	366	400	455	460	420	415	405	383	332
Total gas	1,365	1,524	198	230	328	227	234	192	210	239	245	209	211	220	259	228
Gas transmission	645	389	89	76	160	107	118	104	106	133	144	94	107	111	120	118
Gas distribution	720	1,135	109	154	168	120	116	88	104	106	101	115	104	109	139	110
Property damage (Millions of current dollars)																
Total hazardous liquid	1.2	5.7	15.7	150.6	306.5	1,075.2	273.5	145.5	278.6	141.0	256.3	212.1	163.3	159.5	158.9	97.5
Total gas	3.4	9.9	18.9	40.4	796.1	615.2	151.0	81.4	88.4	128.5	92.0	163.8	171.6	2,004.3	168.6	82.3
Gas transmission	3.2	8.8	11.3	17.0	298.1	594.0	123.7	55.9	51.0	55.6	59.8	106.9	79.6	59.9	100.5	52.2
Gas distribution	0.2	1.2	7.6	23.4	498.0	21.2	27.3	25.6	37.4	72.9	32.2	56.9	92.0	1,944.4	68.1	30.0

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 the sum of transmission and gathering and distribution operators.

Property damage includes, but is not limited to, damage to the operator's facilities and to the property of others; gas lost; restoration of service and relighting; facility repair and replacement; leak locating; right-of-way cleanup; and environmental cleanup and damage. Numbers may not add to totals due to rounding.

Beginning in 2002, only hazardous liquid accidents with gross loss greater than or equal to 5 gallons (confined and cleaned accidents excepted); those involving any fatality or injury requiring hospitalization; fire/explosion not intentionally set; those involving total costs greater than or equal to \$50,000; or those involving gross loss greater than or equal to 5 barrels are reported. Due to this change in reporting criteria, accident data for 2002 and later are not comparable with the previous years.

In 2002, one of the more significant of several incident reporting criterion changes occurred. One of PHMSA's reporting criterion for hazardous liquid pipeline incidents (the one based on volume released) was lowered from 50 barrels to 5 gallons, resulting in a significant increase in the number of hazardous liquid incidents reported. Data are for all reported incidents.



CHAPTER 3

Transportation and the Economy

Section A: Transportation and the Economy

Table 3-1: U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (billions of current dollars)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL U.S. GDP	2,788.1	5,800.5	10,252.3	13,036.6	14,992.1	15,542.6	16,197.0	16,784.9	17,527.3	18,238.3	18,745.1	19,543.0	20,611.9	21,433.2	20,336.6
For-hire transportation services GDP, total	102.6	172.8	307.8	375.8	433.0	451.4	472.0	491.1	521.8	565.8	582.0	607.0	650.7	696.7	595.9
Air transportation	13.1	31.3	58.1	61.7	84.2	84.6	87.8	94.1	102.9	117.7	129.0	133.5	138.5	147.1	59.1
Rail transportation	20.2	18.6	23.3	28.0	33.7	36.5	39.6	40.8	43.8	44.3	40.0	41.2	44.5	44.9	40.1
Water transportation	3.5	5.1	8.0	8.8	14.6	14.1	13.1	16.4	16.2	15.8	13.5	13.0	14.4	15.0	10.8
Truck transportation	28.4	49.7	98.0	116.9	113.4	121.7	128.0	130.8	140.7	149.0	148.7	156.1	166.9	175.0	168.3
Transit and ground passenger transportation	5.8	9.0	18.5	23.6	31.4	34.1	36.3	37.9	40.5	42.2	42.8	45.2	46.1	55.3	40.7
Pipeline transportation	5.1	6.0	9.4	9.9	20.2	21.5	25.2	26.9	30.2	36.8	39.1	40.8	46.1	50.5	49.2
Other transportation and support activities	20.2	39.9	65.9	88.8	90.4	93.9	94.7	96.9	99.9	108.1	110.8	114.9	123.8	133.8	145.1
Warehousing and storage	6.4	13.0	26.7	38.1	45.1	45.1	47.1	47.2	47.8	51.9	58.0	62.3	70.5	75.0	82.6
Percent of U.S. GDP															
For-hire transportation services	3.68	2.98	3.00	2.88	2.89	2.90	2.91	2.93	2.98	3.10	3.10	3.11	3.16	3.25	2.85
Air transportation	0.47	0.54	0.57	0.47	0.56	0.54	0.54	0.56	0.59	0.65	0.69	0.68	0.67	0.69	0.28
Rail transportation	0.72	0.32	0.23	0.21	0.22	0.23	0.24	0.24	0.25	0.24	0.21	0.21	0.22	0.21	0.19
Water transportation	0.13	0.09	0.08	0.07	0.10	0.09	0.08	0.10	0.09	0.09	0.07	0.07	0.07	0.07	0.05
Truck transportation	1.02	0.86	0.96	0.90	0.76	0.78	0.79	0.78	0.80	0.82	0.79	0.80	0.81	0.82	0.80
Transit and ground passenger transportation	0.21	0.16	0.18	0.18	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.23	0.22	0.26	0.19
Pipeline transportation	0.18	0.10	0.09	0.08	0.13	0.14	0.16	0.16	0.17	0.20	0.21	0.21	0.22	0.24	0.23
Other transportation and support activities	0.72	0.69	0.64	0.68	0.60	0.60	0.58	0.58	0.57	0.59	0.59	0.59	0.60	0.62	0.69
Warehousing and storage	0.23	0.22	0.26	0.29	0.30	0.29	0.29	0.28	0.27	0.28	0.31	0.32	0.34	0.35	0.39
Percent of for-hire transportation services GDP															
Air transportation	12.77	18.11	18.88	16.42	19.44	18.75	18.61	19.16	19.71	20.80	22.17	21.99	21.28	21.11	9.91
Rail transportation	19.69	10.76	7.57	7.45	7.78	8.07	8.39	8.31	8.39	7.83	6.88	6.78	6.84	6.45	6.73
Water transportation	3.41	2.95	2.61	2.35	3.38	3.12	2.78	3.34	3.10	2.79	2.31	2.15	2.21	2.16	1.81
Truck transportation	27.68	28.76	31.85	31.11	26.18	26.96	27.13	26.64	26.95	26.34	25.56	25.71	25.65	25.12	28.25
Transit and ground passenger transportation	5.65	5.21	6.00	6.27	7.24	7.55	7.69	7.71	7.76	7.46	7.36	7.45	7.09	7.93	6.84
Pipeline transportation	4.97	3.47	3.04	2.62	4.67	4.77	5.34	5.48	5.78	6.51	6.72	6.73	7.08	7.25	8.25
Other transportation and support activities	19.69	23.09	21.39	23.64	20.88	20.79	20.07	19.74	19.14	19.10	19.04	18.92	19.02	19.21	24.35
Warehousing and storage	6.24	7.52	8.66	10.14	10.42	9.99	9.99	9.62	9.16	9.18	9.97	10.27	10.83	10.77	13.86

NOTE

Numbers may not add to totals due to rounding.

Table 3-2: U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (billions of chained 2012 dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL U.S. GDP	13,138.0	14,901.3	15,649.0	15,891.5	16,254.0	16,553.3	16,932.1	17,390.3	17,680.3	18,079.1	18,606.8	19,032.7	18,384.7
For-hire transportation services GDP, total	423.5	449.0	461.0	470.0	473.3	479.9	494.4	507.1	514.7	537.1	556.4	566.1	490.3
Air transportation	75.9	71.2	92.3	92.5	88.1	92.4	96.1	101.7	110.5	118.0	120.6	122.5	59.6
Rail transportation	41.5	42.0	38.3	38.6	39.7	39.1	40.6	41.0	37.7	38.2	39.3	35.8	30.3
Water transportation	4.9	4.7	12.1	12.9	13.2	16.6	15.1	12.5	10.8	9.3	9.4	9.2	9.7
Truck transportation	129.0	129.5	121.6	127.3	128.4	127.9	132.4	131.2	129.2	136.7	136.2	135.6	130.9
Transit and ground passenger transportation	31.4	32.1	33.3	34.7	36.5	36.5	39.0	38.8	38.1	40.6	43.6	49.7	35.9
Pipeline transportation	16.0	15.7	21.8	22.1	25.3	25.0	27.6	33.7	34.1	34.9	37.1	33.1	30.1
Other transportation and support activities	106.5	125.8	101.3	99.0	94.9	92.7	91.7	93.7	94.8	97.3	103.6	107.7	111.6
Warehousing and storage	27.4	37.6	41.0	43.2	47.2	49.8	52.2	55.1	60.9	63.8	68.8	76.5	81.3
Percent of U.S. GDP													
For-hire transportation services	3.22	3.01	2.95	2.96	2.91	2.90	2.92	2.92	2.92	2.97	2.99	2.97	2.67
Air transportation	0.58	0.48	0.59	0.58	0.54	0.56	0.57	0.58	0.62	0.65	0.65	0.64	0.32
Rail transportation	0.32	0.28	0.25	0.24	0.24	0.24	0.24	0.24	0.21	0.21	0.21	0.19	0.16
Water transportation	0.04	0.03	0.08	0.08	0.08	0.10	0.09	0.07	0.06	0.05	0.05	0.05	0.05
Truck transportation	0.98	0.87	0.78	0.80	0.79	0.77	0.78	0.75	0.73	0.76	0.73	0.71	0.71
Transit and ground passenger transportation	0.24	0.22	0.21	0.22	0.22	0.22	0.23	0.22	0.22	0.22	0.23	0.26	0.20
Pipeline transportation	0.12	0.11	0.14	0.14	0.16	0.15	0.16	0.19	0.19	0.19	0.20	0.17	0.16
Other transportation and support activities	0.81	0.84	0.65	0.62	0.58	0.56	0.54	0.54	0.54	0.54	0.56	0.57	0.61
Warehousing and storage	0.21	0.25	0.26	0.27	0.29	0.30	0.31	0.32	0.34	0.35	0.37	0.40	0.44
Percent of for-hire transportation services GDP													
Air transportation	17.91	15.85	20.02	19.69	18.60	19.26	19.44	20.05	21.46	21.96	21.67	21.64	12.15
Rail transportation	9.80	9.35	8.32	8.22	8.40	8.14	8.22	8.09	7.32	7.11	7.06	6.32	6.18
Water transportation	1.15	1.05	2.63	2.74	2.78	3.46	3.05	2.46	2.09	1.74	1.68	1.62	1.97
Truck transportation	30.46	28.85	26.38	27.10	27.13	26.66	26.78	25.87	25.11	25.45	24.49	23.95	26.71
Transit and ground passenger transportation	7.42	7.16	7.21	7.37	7.70	7.61	7.89	7.66	7.40	7.56	7.84	8.78	7.32
Pipeline transportation	3.78	3.51	4.73	4.70	5.35	5.21	5.57	6.64	6.62	6.50	6.67	5.85	6.14
Other transportation and support activities	25.14	28.02	21.98	21.05	20.06	19.32	18.55	18.49	18.42	18.11	18.61	19.02	22.75
Warehousing and storage	6.46	8.38	8.90	9.20	9.98	10.38	10.55	10.87	11.82	11.89	12.37	13.52	16.58

NOTES

Details may not add to totals due to the nature of the chained dollar calculations.

At the time of this publication the Bureau of Economic Analysis (BEA) had only published chained 2012 dollar estimates from 1997 onward. Current dollar estimates for earlier years can be found in table 3-1. Chained 2009 dollars estimates for earlier years can be found in the 2018 edition of NTS, table 3-2.

Table 3-3: U.S. Gross Domestic Product (GDP) Attributed to Transportation Functions (billions of current dollars)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross Domestic Product (GDP)	542.4	1,073.3	2,857.3	5,963.1	10,251.0	13,039.2	15,049.0	15,599.7	16,254.0	16,843.2	17,550.7	18,206.0	18,695.1	19,479.6	20,527.2	21,372.6	20,893.7
Total transportation-related GDP	63.3	116.6	332.5	598.2	1,057.8	1,245.2	1,335.4	1,487.0	1,580.9	1,645.5	1,692.1	1,667.1	1,673.4	1,751.1	1,859.4	1,859.9	1,525.6
Total transportation in GDP (percent)	11.7	10.9	11.6	10.0	10.3	9.5	8.9	9.5	9.7	9.8	9.6	9.2	9.0	9.0	9.1	8.7	7.3
Gross Domestic Purchases^a	538.2	1,069.4	2,870.4	6,041.0	10,632.0	13,779.1	15,581.3	16,179.3	16,805.6	17,322.6	18,060.7	18,732.2	19,201.4	20,019.6	21,123.3	21,968.8	21,544.9
Total transportation-related Gross Domestic Purchases ^a	U	117.5	333.5	626.7	1,159.8	1,375.8	1,420.5	1,576.5	1,690.2	1,748.8	1,811.1	1,816.2	1,813.5	1,892.9	2,014.5	2,031.8	1,697.8
Personal consumption of transportation, total	40.8	76.5	226.5	442.9	793.1	953.3	961.8	1,080.3	1,135.5	1,170.5	1,202.0	1,163.7	1,163.2	1,233.2	1,317.3	1,326.5	1,133.4
Motor vehicles and parts	19.6	34.5	84.4	205.1	363.2	410.0	344.5	365.2	396.6	417.5	442.0	475.3	484.3	501.3	519.5	514.5	541.3
Motor vehicle fuels, lubricants, and fluids	12.0	21.9	86.7	111.4	168.6	261.4	312.1	368.8	397.8	393.0	377.0	289.7	259.2	291.0	328.4	316.7	228.7
Transportation services	9.2	20.0	55.4	126.4	261.3	283.9	305.2	328.4	341.1	359.9	383.0	398.7	419.7	440.9	469.4	495.3	363.4
Gross private domestic investment, total	9.3	17.2	51.6	73.3	177.6	186.7	145.7	187.4	226.2	253.5	285.0	319.8	305.4	308.8	327.4	337.5	221.9
Transportation structures	0.7	1.0	3.2	3.4	6.8	7.1	9.9	9.5	10.9	11.0	12.2	13.6	13.1	14.8	17.9	17.2	15.9
Transportation equipment	8.5	16.2	48.4	70.0	170.8	179.6	135.8	177.8	215.3	242.5	272.8	306.3	292.3	294.0	309.5	320.3	206.0
Exports (+), total	U	9.1	45.8	105.7	177.9	212.7	260.3	296.3	328.7	347.6	363.6	355.8	353.1	365.2	382.7	379.7	256.6
Civilian aircraft, engines, and parts	U	1.5	14.1	32.2	48.1	55.9	71.9	80.4	94.3	105.0	113.1	119.5	120.9	121.0	130.8	126.0	71.9
Automotive vehicles, engines, and parts	U	3.9	17.4	36.2	80.4	98.4	112.0	133.0	146.2	152.7	159.8	151.9	150.4	157.9	158.8	162.8	127.9
Transport	U	3.7	14.2	37.3	49.5	58.4	76.4	82.9	88.2	90.0	90.7	84.4	81.8	86.3	93.1	91.0	56.7
Imports (-), total	U	9.9	46.8	134.2	279.9	343.3	345.3	385.8	438.0	451.0	482.6	504.9	493.2	507.0	537.8	551.6	428.7
Civilian aircraft, engines, and parts	U	0.2	3.1	10.5	26.4	25.8	31.3	35.5	40.1	47.0	53.3	55.2	50.0	51.4	55.4	62.8	45.0
Automotive vehicles, engines, and parts	U	5.7	28.3	88.2	195.0	238.7	225.6	255.2	296.5	309.6	329.5	350.0	360.8	359.1	372.0	376.0	311.3
Transport	U	4.1	15.4	35.5	58.5	78.8	88.4	95.0	99.3	94.4	99.8	99.6	92.4	96.5	110.4	112.8	72.4
Net exports of transportation-related goods and services^b	U	-0.8	-1.0	-28.4	-102.0	-130.7	-85.0	-89.5	-109.3	-103.3	-119.0	-149.0	-140.1	-141.8	-155.1	-171.9	-172.2
Government transportation-related purchases, total	12.3	25.0	60.0	111.8	177.2	236.8	301.2	306.4	305.4	305.2	314.5	322.7	327.4	338.9	350.9	361.3	364.6
Federal purchases ^c	1.3	2.9	7.4	12.9	17.9	29.9	38.5	40.6	40.9	38.8	39.4	40.4	40.4	42.0	43.7	45.1	45.7
State and local purchases ^c	11.0	22.0	48.5	90.2	150.3	191.0	238.1	241.2	245.6	251.4	260.7	288.6	272.7	282.4	291.9	300.1	306.3
Defense-related purchases ^d	U	U	4.2	8.8	9.0	15.9	24.6	24.6	18.8	15.1	14.5	13.6	14.3	14.5	15.3	16.1	12.6
Change in private inventories by industry	1.0	-1.2	-4.6	-1.4	11.9	-2.9	11.8	2.4	23.2	19.7	9.5	9.9	17.5	11.9	19.0	6.5	-22.1

KEY: U = data are not available.

^a The market value of goods and services purchased by U.S. residents, regardless of where those goods and services were produced. It is gross domestic product (GDP) minus net exports of goods and services.^b Exports minus imports.^c Federal purchases and State and local purchases are the sum of consumption expenditures and gross investment.^d Defense-related purchases are the sum of transportation of material and travel.**NOTE**

On July 27, 2018, the Bureau of Economic Analysis (BEA) released the results of the comprehensive, or benchmark, revision of the national income and product accounts (NIPAs) which resulted in many changes relative to previously published results.

Table 3-4: U.S. Gross Domestic Product (GDP) Attributed to Transportation Functions (billions of chained 2012 dollars)

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross Domestic Product (GDP)	14,901.3	15,649.0	15,891.5	16,254.0	16,553.3	16,932.1	17,390.3	17,680.3	18,079.1	18,606.8	19,032.7	18,384.7
Total transportation-related GDP	1,585.1	1,486.2	1,523.7	1,580.9	1,638.7	1,682.6	1,751.8	1,785.9	1,810.5	1,854.5	1,840.3	1,552.0
Total transportation in GDP (percent)	10.6	9.5	9.6	9.7	9.9	9.9	10.1	10.1	10.0	10.0	9.7	8.4
Gross Domestic Purchases^a	15,816.6	16,238.4	16,462.6	16,805.6	17,072.7	17,507.3	18,112.0	18,437.4	18,878.5	19,471.0	19,937.9	19,327.4
Total transportation-related Gross Domestic Purchases^a	1,732.1	1,578.0	1,616.8	1,690.2	1,743.5	1,806.5	1,912.1	1,942.7	1,974.0	2,031.2	2,037.2	1,740.6
Personal consumption of transportation, total	1,206.3	1,086.9	1,105.3	1,135.5	1,175.9	1,216.8	1,282.6	1,317.7	1,354.3	1,391.5	1,399.7	1,235.4
Motor vehicles and parts	435.1	360.0	370.1	396.6	415.3	439.4	472.8	487.2	510.4	531.2	524.9	542.0
Motor vehicle fuels, lubricants, and fluids	419.5	406.0	400.3	397.8	404.2	403.1	421.7	424.5	422.4	421.0	420.4	356.3
Transportation services	351.7	320.8	334.8	341.1	356.4	374.3	388.1	406.1	421.4	439.2	454.4	337.1
Gross private domestic investment, total	200.3	151.8	191.5	226.2	249.3	276.7	305.6	288.3	286.8	302.7	309.6	204.4
Transportation structures	8.2	10.2	9.7	10.9	10.8	11.7	12.8	12.1	13.3	15.6	14.6	13.1
Transportation equipment	192.1	141.5	181.8	215.3	238.5	265.0	292.8	276.3	273.5	287.0	295.0	191.3
Exports (+), total	255.7	277.4	303.3	328.7	344.9	355.1	349.2	348.4	354.7	366.4	360.4	245.5
Civilian aircraft, engines, and parts	73.2	76.6	82.6	94.3	103.0	107.6	110.7	110.3	106.2	112.1	105.0	59.1
Automotive vehicles, engines, and parts	106.7	115.9	135.4	146.2	151.8	158.0	150.4	150.1	157.1	156.9	160.2	126.2
Transport	75.8	84.9	85.2	88.2	90.0	89.5	88.2	88.0	91.4	97.4	95.2	60.2
Imports (-), total	402.7	369.2	396.3	438.0	449.7	479.0	509.5	505.2	518.3	543.0	557.3	434.0
Civilian aircraft, engines, and parts	36.9	36.1	38.6	40.1	46.1	51.6	52.8	47.5	48.2	51.3	56.2	40.2
Automotive vehicles, engines, and parts	264.5	237.0	260.1	298.5	310.8	332.8	360.7	364.4	374.5	387.9	394.8	324.4
Transport	101.2	96.1	97.5	99.3	92.8	94.6	95.9	93.3	95.5	103.8	106.2	69.5
Net exports of transportation-related goods and services^b	-147.0	-91.8	-93.0	-109.3	-104.8	-123.9	-160.3	-156.8	-163.5	-176.7	-196.9	-188.6
Government transportation-related purchases, total	328.7	327.1	317.5	305.4	298.4	303.4	314.0	318.9	320.8	317.8	321.5	323.3
Federal purchases ^c	35.1	39.9	41.0	40.9	38.2	38.1	38.7	38.3	38.9	39.2	39.6	39.9
State and local purchases ^c	273.8	260.3	251.6	245.6	245.4	251.3	261.7	266.0	267.2	263.8	266.8	270.9
Defense-related purchases ^d	19.8	26.9	25.0	18.8	14.9	14.0	13.5	14.6	14.7	14.9	15.1	12.5
Change in private inventories by industry	-3.2	12.3	2.5	23.2	19.9	9.7	10.0	17.8	12.1	19.2	6.5	-22.5

^a The market value of goods and services purchased by U.S. residents, regardless of where those goods and services were produced. It is gross domestic product (GDP) minus net exports of goods and services.

^b Exports minus Imports.

^c Federal purchases and State and local purchases are the sum of consumption expenditures and gross investment.

^d Defense-related purchases are the sum of transportation of material and travel.

NOTES

On July 27, 2018, the Bureau of Economic Analysis (BEA) released the results of the comprehensive, or benchmark, revision of the national income and product accounts (NIPAs) which resulted in many changes relative to previously published results.

The Bureau Economic Analysis has changed the reference year for chained dollar estimates from 2002 onward as part of the comprehensive revision of the national income and product accounts in 2018.

Chained (2012) dollar series are calculated as the product of the chain-type quantity index and the 2012 current-dollar value of the corresponding series, divided by 100. Because the formula for the chain-type quantity indexes uses weights of more than one period, the corresponding chained-dollar estimates are usually not additive.

This table is not comparable with the previous version since the categories for "Export" and "Import" were changed based on US Bureau of Economic Analysis' reports.

Chained 2009 dollars estimates for earlier years can be found in the 2017 edition of NITS, table 3-4.

Numbers may not add to totals due to rounding.

Table 3-7: Contributions to U.S. Gross Domestic Product (GDP): Selected Industries (billions of current dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP by industry, total	10,251	13,039	15,049	15,600	16,254	16,843	17,551	18,206	18,895	19,480	20,527	21,373	20,894
Agriculture, forestry, fishing, and hunting	98	129	145	179	179	214	199	180	166	176	176	163	175
Mining	111	225	306	358	361	388	417	262	218	277	320	296	182
Utilities	180	198	279	288	281	287	298	299	302	312	319	333	342
Construction	461	652	526	526	555	589	638	695	748	801	847	904	896
Manufacturing, durable goods	925	956	966	1,018	1,065	1,104	1,136	1,184	1,188	1,235	1,299	1,328	1,269
Manufacturing, nondurable goods	625	736	834	856	869	893	918	947	915	964	1,035	1,043	1,003
Wholesale trade	623	755	890	937	1,000	1,042	1,090	1,144	1,136	1,166	1,217	1,275	1,243
Retail trade	685	841	852	873	910	951	975	1,020	1,053	1,082	1,120	1,167	1,202
Transportation and warehousing	308	376	434	453	473	492	523	566	582	609	648	686	572
Information	471	642	755	763	763	831	844	908	970	1,005	1,065	1,134	1,168
Finance, insurance, real estate, rental, and leasing	1,975	2,611	2,990	3,081	3,289	3,362	3,561	3,714	3,883	4,020	4,258	4,452	4,592
Professional and business services	1,105	1,446	1,768	1,860	1,969	2,020	2,120	2,238	2,306	2,434	2,587	2,731	2,690
Educational services, health care, and social assistance	695	970	1,311	1,356	1,409	1,448	1,493	1,571	1,653	1,711	1,784	1,871	1,799
Arts, entertainment, recreation, accommodation, and food services	386	481	556	582	623	652	692	747	790	828	870	914	672
Other services, except government	280	311	328	334	349	357	377	392	400	413	437	454	419
Government, total	1,323	1,710	2,108	2,137	2,159	2,213	2,271	2,339	2,384	2,447	2,546	2,622	2,671
Government, federal	424	551	697	712	714	704	716	731	743	762	789	811	848
Government, state and local	899	1,159	1,411	1,425	1,446	1,509	1,556	1,608	1,641	1,685	1,757	1,810	1,822
Percent of GDP													
Agriculture, forestry, fishing, and hunting	0.96	0.99	0.96	1.15	1.10	1.27	1.13	0.99	0.89	0.90	0.86	0.76	0.84
Mining	1.08	1.73	2.04	2.29	2.22	2.30	2.38	1.44	1.17	1.42	1.56	1.38	0.87
Utilities	1.76	1.52	1.85	1.85	1.73	1.70	1.70	1.64	1.62	1.60	1.55	1.56	1.64
Construction	4.50	5.00	3.49	3.37	3.41	3.50	3.63	3.82	4.00	4.11	4.13	4.23	4.29
Manufacturing, durable goods	9.02	7.33	6.42	6.53	6.55	6.56	6.47	6.51	6.35	6.34	6.33	6.21	6.07
Manufacturing, nondurable goods	6.10	5.65	5.54	5.49	5.35	5.30	5.23	5.20	4.89	4.95	5.04	4.88	4.80
Wholesale trade	6.07	5.79	5.91	6.01	6.15	6.19	6.21	6.28	6.08	5.98	5.93	5.97	5.95
Retail trade	6.69	6.45	5.66	5.60	5.60	5.64	5.56	5.60	5.63	5.55	5.45	5.46	5.75
Transportation and warehousing	3.00	2.88	2.88	2.90	2.91	2.92	2.98	3.11	3.12	3.13	3.16	3.21	2.74
Information	4.60	4.92	5.02	4.89	4.69	4.94	4.81	4.99	5.19	5.16	5.19	5.31	5.59
Finance, insurance, real estate, rental, and leasing	19.26	20.03	19.87	19.75	20.24	19.96	20.29	20.40	20.77	20.64	20.74	20.83	21.98
Professional and business services	10.78	11.09	11.75	11.92	12.11	11.99	12.08	12.29	12.34	12.50	12.60	12.78	12.87
Educational services, health care, and social assistance	6.78	7.44	8.71	8.69	8.67	8.60	8.50	8.63	8.84	8.78	8.69	8.76	8.61
Arts, entertainment, recreation, accommodation, and food services	3.77	3.69	3.70	3.73	3.83	3.87	3.94	4.10	4.23	4.25	4.24	4.28	3.22
Other services, except government	2.73	2.38	2.18	2.14	2.14	2.12	2.15	2.14	2.14	2.12	2.13	2.13	2.01
Government, total	12.91	13.12	14.01	13.70	13.29	13.14	12.94	12.85	12.75	12.56	12.40	12.27	12.78
Government, federal	4.13	4.23	4.63	4.57	4.39	4.18	4.08	4.02	3.97	3.91	3.85	3.80	4.06
Government, state and local	8.77	8.89	9.37	9.13	8.89	8.96	8.86	8.83	8.78	8.65	8.56	8.47	8.72

NOTE

Numbers may not add to totals due to rounding.

Table 3-8: Contributions to U.S. Gross Domestic Product (GDP): Selected Industries (billions of chained 2012 dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP by industry, total	13,271	15,017	15,663	15,888	16,218	16,466	16,844	17,298	17,586	17,991	18,513	18,945	18,300
Agriculture, forestry, fishing, and hunting	159	199	186	186	180	209	211	223	235	233	239	227	253
Mining	233	249	310	322	360	374	414	436	394	415	431	471	413
Utilities	243	219	266	277	281	277	266	266	283	287	285	289	303
Construction	776	784	548	540	555	568	578	602	623	648	665	674	643
Manufacturing, durable goods	668	862	968	1,034	1,064	1,089	1,105	1,123	1,127	1,176	1,233	1,243	1,183
Manufacturing, nondurable goods	946	1,026	970	910	869	901	917	922	906	936	973	1,009	1,007
Wholesale trade	800	960	943	966	1,000	1,021	1,061	1,106	1,092	1,098	1,110	1,105	1,084
Retail trade	818	980	903	903	910	938	955	991	1,028	1,062	1,096	1,123	1,093
Transportation and warehousing	421	445	457	466	469	475	489	502	510	532	551	560	485
Information	394	599	752	764	763	830	851	938	1,019	1,083	1,165	1,242	1,283
Finance, insurance, real estate, rental, and leasing	2,440	2,816	3,075	3,126	3,258	3,240	3,310	3,346	3,381	3,393	3,452	3,518	3,529
Professional and business services	1,453	1,668	1,809	1,863	1,969	1,993	2,084	2,154	2,198	2,301	2,433	2,543	2,483
Educational services, health care, and social assistance	985	1,168	1,361	1,385	1,409	1,426	1,452	1,506	1,549	1,576	1,620	1,666	1,560
Arts, entertainment, recreation, accommodation, and food services	560	599	586	607	623	636	658	679	690	707	719	733	513
Other services, except government	423	394	346	343	349	346	356	358	354	356	367	367	321
Government, total	1,978	2,096	2,183	2,176	2,160	2,145	2,140	2,140	2,159	2,182	2,200	2,211	2,186
Government, federal	621	656	716	717	713	697	693	694	700	705	709	713	733
Government, state and local	1,354	1,441	1,467	1,459	1,447	1,448	1,447	1,445	1,456	1,474	1,488	1,496	1,454
Percent of GDP													
Agriculture, forestry, fishing, and hunting	1.20	1.33	1.23	1.17	1.11	1.27	1.25	1.29	1.34	1.30	1.29	1.20	1.38
Mining	1.76	1.66	1.98	2.02	2.22	2.27	2.46	2.52	2.24	2.31	2.33	2.49	2.25
Utilities	1.83	1.46	1.70	1.74	1.73	1.68	1.58	1.54	1.61	1.59	1.54	1.52	1.66
Construction	5.85	5.22	3.50	3.40	3.42	3.45	3.43	3.48	3.54	3.60	3.59	3.56	3.51
Manufacturing, durable goods	5.03	5.74	6.18	6.51	6.56	6.61	6.56	6.49	6.41	6.54	6.66	6.56	6.46
Manufacturing, nondurable goods	7.13	6.83	6.20	5.73	5.36	5.47	5.44	5.33	5.15	5.20	5.25	5.32	5.51
Wholesale trade	6.02	6.33	6.02	6.08	6.17	6.20	6.30	6.39	6.21	6.10	5.99	5.83	5.92
Retail trade	6.16	6.52	5.75	5.68	5.61	5.69	5.67	5.73	5.84	5.90	5.92	5.93	5.97
Transportation and warehousing	3.17	2.96	2.92	2.93	2.89	2.89	2.90	2.90	2.90	2.96	2.97	2.96	2.65
Information	2.97	3.99	4.80	4.81	4.70	5.04	5.05	5.42	5.80	6.02	6.29	6.55	7.01
Finance, insurance, real estate, rental, and leasing	18.39	18.75	19.63	19.68	20.09	19.68	19.65	19.34	19.22	18.86	18.65	18.57	19.29
Professional and business services	10.95	11.11	11.55	11.85	12.14	12.10	12.37	12.45	12.50	12.79	13.14	13.43	13.57
Educational services, health care, and social assistance	7.42	7.78	8.69	8.72	8.69	8.66	8.62	8.71	8.81	8.76	8.75	8.79	8.52
Arts, entertainment, recreation, accommodation, and food services	4.22	3.99	3.74	3.82	3.84	3.86	3.91	3.92	3.92	3.93	3.88	3.87	2.80
Other services, except government	3.19	2.63	2.21	2.16	2.15	2.10	2.11	2.07	2.01	1.98	1.98	1.94	1.76
Government, total	14.90	13.96	13.94	13.70	13.32	13.03	12.71	12.37	12.27	12.13	11.88	11.67	11.95
Government, federal	4.68	4.37	4.57	4.51	4.40	4.23	4.11	4.01	3.98	3.92	3.83	3.76	4.00
Government, state and local	10.21	9.59	9.37	9.18	8.92	8.79	8.59	8.35	8.28	8.19	8.04	7.90	7.94

NOTES

Numbers may not add to totals due to rounding.
 The Bureau of Economic Analysis has changed the reference year for chained dollar estimates from 1999 onward as part of the comprehensive revision of the national income and product accounts in 2014. Chained (2012) dollar series are calculated as the product of the chain-type quantity index and the 2012 current-dollar value of the corresponding series, divided by 100. Because the formula for the chain-type quantity indexes uses weights of more than one period, the corresponding chained-dollar estimates are usually not additive.
 This table (Chained 2012 dollars) is not comparable with the previous version (Chained 2009 dollars). Chained 2009 dollars estimates for earlier years can be found in the 2016 edition of NTS, table 3-8.

Table 3-9: U.S. Gross Domestic Product (GDP) by Major Social Function (billions of current dollars)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total GDP	2,857	5,963	10,251	13,039	15,049	15,600	16,254	16,843	17,551	18,206	18,695	19,480	20,527	21,373	20,894
Housing	565	1,157	2,054	2,905	2,785	2,833	2,929	3,089	3,229	3,383	3,543	3,709	3,894	4,036	4,264
Percent of total	19.8	19.4	20.0	22.3	18.5	18.2	18.0	18.3	18.4	18.6	19.0	19.0	19.0	18.9	20.4
Healthcare	244	689	1,276	1,865	2,401	2,485	2,573	2,637	2,761	2,930	3,070	3,183	3,330	3,502	3,407
Percent of total	8.5	11.5	12.4	14.3	16.0	15.9	15.8	15.7	15.7	16.1	16.4	16.3	16.2	16.4	16.3
Food	408	704	998	1,237	1,489	1,550	1,618	1,663	1,730	1,775	1,822	1,890	1,954	2,030	2,032
Percent of total	14.3	11.8	9.7	9.5	9.9	9.9	10.0	9.9	9.9	9.7	9.7	9.7	9.5	9.5	9.7
Transportation	333	598	1,046	1,248	1,324	1,485	1,558	1,626	1,683	1,657	1,656	1,739	1,840	1,853	1,548
Percent of total	11.6	10.0	10.2	9.6	8.8	9.5	9.6	9.7	9.6	9.1	8.9	8.9	9.0	8.7	7.4
Education	160	362	679	871	1,082	1,090	1,097	1,135	1,166	1,204	1,245	1,286	1,341	1,387	1,387
Percent of total	5.6	6.1	6.6	6.7	7.2	7.0	6.8	6.7	6.6	6.6	6.7	6.6	6.5	6.5	6.6
Other	1,148	2,452	4,198	4,913	5,969	6,157	6,479	6,694	6,981	7,257	7,359	7,673	8,166	8,564	8,256
Percent of total	40.2	41.1	41.0	37.7	39.7	39.5	39.9	39.7	39.8	39.9	39.4	39.4	39.8	40.1	39.5

NOTES

On July 27, 2018, the Bureau of Economic Analysis (BEA) released the results of the comprehensive, or benchmark, revision of the national income and product accounts (NIPAs) which resulted in many changes relative to previously published results.

Details may not add to totals due to independent rounding.

Other includes all other categories (e.g. entertainment, personal care products and services, and payments to pension plans).

Table 3-10: National Transportation and Economic Trends

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Passenger-miles (billions)	3,903	4,902	5,473	5,602	5,602	5,657	5,704	5,797	5,956	6,115	6,209	6,309	6,375	U
Index (2012 = 100)	69	87	97	99	99	100	101	102	105	108	110	112	113	U
Ton-miles (billions)	4,544	5,066	5,379	4,968	4,889	4,879	5,042	5,180	5,111	5,008	5,097	5,251	U	U
Index (2012 = 100)	93	104	110	102	100	100	103	106	105	103	104	108	U	U
Population^a (millions)	250	282	296	310	312	314	316	319	321	323	325	327	328	330
Index (2012 = 100)	80	90	94	99	99	100	101	101	102	103	104	104	105	105
Industrial Production Index^b (2012 = 100)	64	95	100	94	97	100	102	105	104	102	104	109	109	102
Gross Domestic Product														
Current dollars (billions)	5,963	10,252	13,037	14,992	15,543	16,197	16,785	17,527	18,238	18,745	19,543	20,612	21,433	20,937
Index (2012 = 100)	37	63	80	93	96	100	104	108	113	116	121	127	132	129
Chained 2012 dollars (billions)	9,365	13,131	14,913	15,599	15,841	16,197	16,495	16,912	17,432	17,731	18,144	18,688	19,092	18,426
Index (2012 = 100)	58	81	92	96	98	100	102	104	108	109	112	115	118	114

KEY: U = data are not available.

^a Annual estimates as of July 1 of each year. Data include Armed Forces abroad.

^b *Industrial Production Index* covers manufacturing, mining, and utilities.

NOTES

On July 27, 2018, the Bureau of Economic Analysis (BEA) released the results of the comprehensive, or benchmark, revision of the national income and product accounts (NIPAs) which resulted in many changes relative to previously published results.

Passenger miles is the summation of all modes from table 1-40 less transit motor bus and demand response.

Ton-miles from 1990-2011 is the summation of all modes from table 1-50.

Chained (2012) dollar series are calculated as the product of the chain-type quantity index and the 2012 current-dollar value of the corresponding series, divided by 100. Because the formula for the chain-type quantity indexes uses weights of more than one period, the corresponding chained-dollar estimates are usually not additive. The residual line is the difference between the first line and the sum of the most detailed lines.

To make all the data comparable, all index data are using year 2012 as the base year.

Section B:

Transportation and Consumer Expenditures

Table 3-11: Sales Price of Transportation Fuel to End-Users (current cents / gallon)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aviation fuel (excluding taxes)															
Aviation gasoline ^a	108.4	112	130.6	223.1	302.8	380.3	397.1	393.2	398.6	W	W	W	W	W	263.9
Jet fuel kerosene ^a	86.8	76.6	89.9	173.5	220.1	305.4	310.4	297.9	277.2	162.9	131.9	162.9	211.9	197.0	121.8
Highway fuel (including taxes)															
Gasoline, premium ^b	N	134.9	169.3	249.1	304.7	379.2	392.2	384.3	371.3	286.6	261.0	291.1	327.0	321.2	279.1
Gasoline, regular ^b	124.5	116.4	151.0	229.5	278.8	352.7	364.4	352.6	336.7	244.8	214.2	240.8	273.5	263.6	217.4
Gasoline, all types	122.1	121.7	156.3	233.8	283.6	357.7	369.5	358.4	342.5	251.0	220.4	246.9	279.4	269.8	224.2
Diesel no. 2 (excluding taxes) ^a	81.8	72.5	93.5	178.6	231.4	311.7	320.2	312.2	292.3	181.9	151.1	181.1	225.6	211.4	147.7
Railroad fuel															
Diesel	82.6	69.2	87.5	151.4	225.7	307.1	316.7	312.4	294.7	179.1	144.0	177.1	223.0	205.1	U

KEY: N = data do not exist; U = data are not available; W = source withheld disclosure.

^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.

NOTE

For a comparison with other consumer goods prices see table 3-12.

Table 3-12: Price Trends of Gasoline v. Other Consumer Goods and Services

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Retail price of motor gasoline, all types (constant 2007 dollars per gallon)																
Total service station price	1.92	2.93	1.87	1.88	2.48	2.70	3.30	3.33	3.19	3.00	2.19	1.90	2.08	2.30	2.18	1.79
Service station price excluding taxes	1.33	2.58	1.51	1.43	2.08	2.31	2.93	2.97	2.83	2.64	1.81	1.53	1.70	1.93	1.81	U
Average motor gasoline taxes ^a	0.59	0.35	0.36	0.45	0.40	0.38	0.37	0.36	0.36	0.36	0.38	0.37	0.39	0.37	0.37	U
Retail price of motor gasoline, all types (current dollars per gallon)																
Total service station price	0.36	1.22	1.22	1.56	2.34	2.84	3.58	3.70	3.58	3.43	2.51	2.20	2.47	2.79	2.70	2.24
Service station price excluding taxes	0.25	1.08	0.98	1.19	1.96	2.43	3.18	3.29	3.18	3.02	2.08	1.77	2.01	2.34	2.24	2.06
Average motor gasoline taxes ^a	0.11	0.14	0.23	0.38	0.38	0.40	0.40	0.40	0.40	0.41	0.43	0.43	0.46	0.45	0.46	0.18
Consumer price indices (1982-84 = 100)																
All items	39	82	131	172	195	218	225	230	233	237	237	240	245	251	256	259
Food	39	87	132	168	191	220	228	234	237	243	247	248	250	254	258	267
Shelter	36	81	140	193	224	248	252	257	263	271	279	288	298	308	318	326
Apparel	59	91	124	130	120	120	122	126	127	128	126	126	126	126	124	118
Motor fuel	28	97	101	129	196	239	303	313	304	292	213	188	213	242	233	195
Medical care	34	75	163	261	323	388	400	415	425	435	447	464	475	485	498	519

KEY: U = data are not available.

^a Shows the tax rates for motor fuel as of December 31 for each year. Tax rates include inspection fees and environmental cleanup fees when these fees are targeted at highway fuel use, and include local taxes when these taxes are uniform across all the counties in the State.

Table 3-13: Producer Price Indices for Selected Transportation and Warehousing Services (North American Industry Classification System [NAICS] basis) (base date = 100)

Base date	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air transportation (NAICS 481)														
Scheduled air transportation (NAICS 4811)	12/92	N	147.7	171.0	202.9	218.3	227.6	226.0	230.0	221.7	216.7	219.1	225.0	207.8
Scheduled air transportation (NAICS 48111)	12/89	110.2	180.1	209.3	247.7	267.9	280.1	278.3	283.8	272.5	266.1	268.9	276.7	252.4
Scheduled passenger air transportation (NAICS 481111)	12/89	110.2	180.1	209.3	247.7	267.9	280.1	278.3	283.8	272.5	266.1	268.9	276.7	252.4
Scheduled freight air transportation (NAICS 481112)	12/89	110.6	186.5	217.1	254.7	273.5	285.1	283.1	289.1	277.4	270.4	273.6	281.4	255.4
Nonscheduled air transportation (NAICS 4812)	12/03	N	N	104.9	130.2	145.9	155.8	156.7	157.0	151.4	151.5	150.4	154.1	153.8
Nonscheduled air transportation (NAICS 48121)	12/96	N	107.3	126.7	165.4	168.1	169.5	167.6	166.8	168.1	165.8	168.5	170.7	175.6
Nonscheduled air transportation (NAICS 481211)	12/96	N	107.3	126.7	165.4	168.1	169.5	167.6	166.8	168.1	165.8	168.5	170.7	175.6
Rail transportation (NAICS 482)														
Rail transportation (NAICS 4821)	12/96	N	102.6	125.2	156.2	169.8	177.4	183.1	186.5	179.5	175.5	181.8	192.1	197.9
Rail transportation (NAICS 48211)	12/96	N	102.6	125.2	156.2	169.8	177.4	183.1	186.5	179.5	175.5	181.8	192.1	197.9
Line-haul railroads (NAICS 482111)	12/84	107.5	114.5	139.6	174.3	189.4	197.9	204.2	208.0	200.2	195.7	202.8	214.2	220.7
Water transportation (NAICS 483)														
Deep sea, coastal, and great lakes water transportation (NAICS 4831)	12/03	N	N	106.4	125.5	133.4	136.4	135.1	138.4	138.9	131.7	129.8	137.1	143.6
Deep sea, coastal, and great lakes water transportation (NAICS 48311)	NA	N	N	N	N	N	N	N	N	N	N	N	N	N
Deep sea, coastal, and great lakes water transportation (NAICS 483111)	NA	N	N	N	N	N	N	N	N	N	N	N	N	N
Deep sea freight transportation (NAICS 4831111)	06/88	113.1	155.8	231.9	244.8	253.8	249.9	249.2	262.5	259.2	241.6	262.8	291.8	309.5
Coastal and great lakes freight transportation (NAICS 4831113)	12/03	N	N	109.9	146.7	158.5	166.7	165.6	167.7	173.4	166.8	150.1	151.0	154.8
Inland water transportation (NAICS 4832)	12/03	N	N	119.3	171.4	186.0	193.6	187.2	185.0	178.4	169.9	164.2	166.7	177.3
Inland water transportation (NAICS 48321)	12/03	N	N	119.3	171.4	186.0	193.6	187.2	185.0	178.4	169.9	164.2	166.7	177.3
Inland water freight transportation (NAICS 483211)	12/90	100.0	117.9	151.4	217.4	235.9	245.7	237.5	234.7	226.3	215.5	208.3	211.5	224.9
Truck transportation (NAICS 484)														
General freight trucking (NAICS 4841)	12/03	N	N	109.0	119.4	126.4	130.8	132.7	134.9	132.3	131.4	134.4	143.2	146.6
General freight trucking, local (NAICS 48411)	12/03	N	N	110.0	119.3	126.8	132.4	134.7	137.5	134.9	133.9	137.3	147.9	151.8
General freight trucking, local (NAICS 484110)	12/03	N	N	111.5	127.2	130.5	132.8	135.0	135.2	135.1	130.3	130.0	139.9	146.2
General freight trucking, long distance (NAICS 48412)	12/03	N	N	109.7	117.5	126.1	132.4	134.7	138.1	134.9	134.8	139.0	149.8	153.1
General freight trucking, long distance, truckload (NAICS 484121)	12/03	N	N	108.6	113.3	120.9	126.3	127.4	129.6	126.1	123.5	125.6	135.8	137.0
General freight trucking, long distance, less than truckload (NAICS 484122)	12/03	N	N	111.8	126.8	137.6	146.1	151.0	157.5	155.0	160.8	170.0	181.8	188.9
Specialized freight trucking (NAICS 4842)	12/03	N	N	107.0	119.9	125.7	127.5	128.5	129.2	126.9	126.2	128.1	132.9	135.5
Used household and office goods moving (NAICS 48421)	12/03	N	N	106.0	114.7	122.9	124.4	124.9	126.7	126.1	124.6	127.3	132.0	136.5
Used household and office goods moving (NAICS 484210)	12/03	N	N	106.0	114.7	122.9	124.4	124.9	126.7	126.0	124.5	127.3	132.0	136.5
Specialized freight (except used goods) trucking, local (NAICS 48422)	12/03	N	N	107.1	126.5	131.3	133.4	135.1	135.6	132.3	132.3	133.3	136.9	141.7
Specialized freight (except used goods) trucking, local (NAICS 484220)	12/03	N	N	107.1	126.5	131.3	133.4	135.1	135.6	132.3	132.3	133.3	136.9	141.7
Specialized freight (except used goods) trucking, long distance (NAICS 48423)	12/03	N	N	107.5	115.8	121.4	122.9	123.4	123.9	121.6	120.7	122.9	129.2	128.8
Specialized freight (except used goods) trucking, long distance (NAICS 484230)	12/03	N	N	107.5	115.8	121.4	122.9	123.4	123.9	121.6	120.7	122.9	129.2	128.8
Pipeline transportation (NAICS 486)														
Pipeline transportation of crude oil (NAICS 4861)	12/03	N	N	113.3	183.4	184.7	195.5	211.1	222.6	233.0	237.0	232.8	231.7	238.5
Pipeline transportation of crude oil (NAICS 48611)	12/03	N	N	113.3	183.4	184.7	195.5	211.1	222.6	233.0	237.0	232.8	231.7	238.5
Pipeline transportation of crude oil (NAICS 486110)	06/86	94.2	101.0	125.5	203.3	204.7	216.7	234.0	246.7	258.2	262.7	258.0	256.7	264.3
Other pipeline transportation (NAICS 4869)	12/03	N	N	105.2	133.8	137.3	144.7	150.7	160.4	168.0	171.8	173.2	176.2	182.0

Table 3-13 cont'd: Producer Price Indices for Selected Transportation and Warehousing Services (North American Industry Classification System [NAICS] basis) (base date = 100)

Base date	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
12/03	N	N	105.2	133.8	137.3	144.7	150.7	160.4	168.0	171.8	173.2	176.2	182.0	187.8
06/86	100.8	105.3	120.3	153.1	157.1	165.6	172.5	183.6	192.2	196.6	198.2	201.6	208.3	215.0
12/03	N	N	104.1	110.7	114.0	115.7	117.5	118.7	118.7	119.2	121.3	123.9	126.3	123.9
12/96	N	114.2	134.2	154.5	157.5	159.0	160.7	162.2	165.9	168.9	173.1	177.1	181.5	178.1
12/03	N	N	104.8	122.1	123.4	125.3	126.2	127.5	129.8	131.5	133.7	136.3	139.9	135.8
NA	N	N	N	N	N	N	N	N	N	N	N	N	N	N
12/03	N	N	104.8	122.1	123.4	125.3	126.2	127.5	129.8	131.5	133.7	136.4	139.9	135.9
12/03	N	N	107.5	121.8	125.1	125.9	128.0	128.9	133.0	136.4	141.6	145.6	149.0	148.3
12/03	N	N	107.4	121.8	125.1	125.9	128.0	128.9	133.0	136.4	141.6	145.6	149.0	148.3
12/03	N	N	103.5	120.2	123.9	128.0	130.4	131.7	132.0	135.3	139.0	142.2	145.3	147.8
12/03	N	N	105.9	127.7	134.7	139.9	144.4	148.4	152.0	155.2	161.4	164.2	168.1	169.9
12/03	N	N	105.9	127.7	134.7	139.9	144.4	148.4	152.0	155.2	161.5	164.2	168.1	169.9
12/03	N	N	102.2	116.8	118.2	122.0	125.4	127.1	130.9	134.9	139.0	142.1	144.9	147.9
12/91	N	109.1	115.1	131.6	133.2	137.4	141.3	143.2	147.4	152.0	156.5	160.1	163.2	166.6
12/03	N	N	105.7	122.9	129.3	133.4	132.2	130.8	121.5	123.2	124.7	128.2	131.6	133.1
12/92	N	124.2	138.6	161.2	169.6	175.0	173.4	171.6	159.4	161.6	163.5	168.2	172.7	174.6
12/96	N	98.3	99.1	95.2	98.7	99.9	101.6	102.8	101.0	99.8	100.7	102.6	104.0	100.7
12/96	N	98.3	99.1	95.2	98.7	99.9	101.6	102.8	101.0	99.8	100.7	102.6	104.0	100.7
12/94	N	100.3	101.1	97.1	100.8	102.0	103.7	104.9	103.1	101.9	102.7	104.7	106.2	102.7
06/89	100.0	135.2	155.0	187.7	190.6	195.7	202.4	213.2	216.5	215.1	217.1	221.6	230.2	237.1
06/89	100.0	135.2	155.0	187.7	190.6	195.7	202.4	213.2	216.5	215.1	217.1	221.6	230.2	237.1
12/03	N	N	113.8	153.4	168.8	179.7	189.4	198.3	203.2	203.4	210.4	222.8	233.0	241.2
12/03	N	N	115.0	156.6	173.0	184.4	194.3	203.7	208.8	208.9	216.0	229.2	240.0	248.6
12/03	N	N	102.7	112.7	112.9	116.6	121.9	123.5	125.8	126.6	133.9	137.4	140.5	143.3
12/06	N	90.8	N	105.5	103.5	101.2	99.9	100.1	101.5	102.2	105.0	108.9	108.8	108.7
12/06	N	N	N	105.5	103.5	101.2	99.9	100.0	101.5	102.2	105.0	108.9	108.7	108.6
12/03	N	N	101.5	109.7	106.6	103.3	100.9	100.5	102.2	103.1	105.9	109.4	109.4	109.5
12/03	N	N	101.6	109.7	106.6	103.3	101.0	100.5	102.3	103.1	106.0	109.5	109.5	109.5
12/03	N	N	101.0	110.5	111.0	111.9	114.2	116.8	117.6	117.7	121.2	127.3	126.5	125.5
12/91	N	108.1	111.0	121.4	122.0	123.0	125.5	128.3	129.2	129.4	133.2	139.9	139.0	138.0
12/03	N	N	101.5	107.4	108.9	110.1	110.4	111.3	111.5	111.7	113.2	122.7	122.0	123.3
12/92	N	110.6	118.1	124.9	126.7	128.0	128.4	129.4	129.7	129.9	131.6	142.6	141.9	143.4

KEY: N = data do not exist; NA = not applicable; NAICS = North American Industry Classification System.

Table 3-14: Producer Price Indices for Transportation Equipment (North American Industry Classification System (NAICS) basis) (base date = 100)

	Base date	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Transportation equipment manufacturing (NAICS 336)	12/03	N	N	102.5	110.4	112.3	114.8	116.0	117.6	119.3	120.2	121.6	123.3	124.6	125.3
Motor vehicle manufacturing (NAICS 3361)	12/03	N	N	98.7	101.2	102.0	104.7	105.8	107.7	110.3	111.3	112.9	113.8	114.2	114.0
Automobile and light duty motor vehicle manufacturing (NAICS 33611)	12/03	N	N	98.2	99.4	100.1	102.6	103.7	105.6	108.2	109.1	110.5	111.3	111.6	111.2
Automobile and light duty motor vehicle manufacturing (NAICS 336110)	06/82	119.9	138.7	135.1	136.8	137.7	141.2	142.7	145.3	148.9	150.1	152.1	153.2	153.6	153.1
Heavy duty truck manufacturing (NAICS 33612)	12/03	N	N	N	128.1	131.1	134.5	136.7	139.3	142.0	144.8	147.6	149.3	150.8	152.2
Heavy duty truck manufacturing (NAICS 336120)	12/03	N	N	106.4	128.1	131.2	134.6	136.8	139.3	142.0	144.8	147.6	149.4	150.9	152.3
Motor vehicle body and trailer manufacturing (NAICS 3362)	12/03	N	N	109.7	122.7	125.4	128.5	130.0	131.8	134.1	135.4	137.4	142.7	148.4	150.3
Motor vehicle body and trailer manufacturing (NAICS 33621)	12/03	N	N	109.7	122.9	125.4	128.7	130.2	132.0	134.3	135.6	137.6	143.0	148.6	150.6
Motor vehicle body manufacturing (NAICS 336211)	12/82	125.4	160.3	190.3	217.7	220.9	227.7	231.1	235.4	237.4	239.7	246.1	257.1	260.6	
Truck trailer manufacturing (NAICS 336212)	12/79	125.6	156.6	176.2	205.6	215.5	221.0	223.2	227.4	227.9	229.0	240.5	253.7	254.0	
Truck trailer manufacturing (NAICS 336213)	06/84	125.8	149.4	169.3	168.5	170.4	174.9	178.4	179.0	180.1	183.7	188.0	192.3	194.5	198.4
Travel trailer and camper manufacturing (NAICS 336214)	12/03	N	N	104.7	121.3	123.3	127.0	129.8	132.5	135.3	136.8	140.0	146.1	150.5	153.5
Motor vehicle parts manufacturing (NAICS 3363)	12/03	N	N	102.7	109.8	111.6	112.8	113.0	113.2	113.1	112.1	112.0	113.4	113.8	114.1
Motor vehicle gasoline engine and engine parts manufacturing (NAICS 33631)	12/03	N	N	102.1	108.0	112.6	114.3	114.4	113.9	113.8	114.5	115.9	116.3	116.3	117.5
Gasoline engine and engine parts manufacturing (excluding carburetors) (NAICS 3363102)	12/03	N	N	102.7	108.4	113.9	115.7	115.8	115.1	114.5	115.3	116.6	116.7	116.6	118.3
Carburetor, piston, piston ring, and valve manufacturing (NAICS 3363103)	12/82	117.9	129.3	140.6	162.4	163.9	164.0	163.8	160.7	164.7	163.6	169.1	172.7	175.3	173.8
Motor vehicle electrical and electronic equipment manufacturing (NAICS 33632)	12/03	N	N	101.5	103.8	105.4	106.4	106.4	107.2	108.1	107.2	107.5	107.7	108.0	108.3
Vehicular lighting equipment manufacturing (NAICS 3363201)	12/83	107.9	108.4	109.7	117.7	119.3	121.3	124.6	127.4	132.6	131.7	130.7	129.8	130.0	129.0
Other motor vehicle electrical and electronic equipment manufacturing (NAICS 3363202)	12/03	N	N	99.4	99.5	100.4	100.6	99.9	100.4	100.3	99.3	99.4	99.7	100.3	101.1
Motor vehicle steering and suspension components (except spring) manufacturing (NAICS 33633)	12/03	N	N	105.1	105.9	106.7	107.4	107.0	106.8	105.4	103.8	103.3	103.2	103.8	103.0
Motor vehicle steering and suspension components (except spring) manufacturing (NAICS 336330)	12/03	N	N	104.9	105.7	106.5	107.2	106.8	106.6	105.2	103.6	103.1	103.0	103.6	102.8
Motor vehicle brake system manufacturing (NAICS 33634)	12/03	N	N	100.3	104.2	107.1	108.8	108.4	107.6	107.2	106.3	106.1	108.7	110.4	110.2
Motor vehicle brake system manufacturing (NAICS 336340)	12/03	N	N	100.3	104.2	107.1	108.8	108.4	107.6	107.2	106.2	106.1	108.7	110.4	110.2
Motor vehicle transmission and power train parts manufacturing (NAICS 33635)	12/03	N	N	102.5	115.2	116.0	118.4	119.8	121.5	122.3	122.4	120.8	121.9	121.7	123.8
Motor vehicle transmission and power train parts manufacturing (NAICS 336350)	12/03	N	N	101.2	113.8	114.6	117.0	118.4	120.1	120.9	121.0	119.3	120.4	120.3	123.3
Motor vehicle seating and interior trim manufacturing (NAICS 33636)	12/03	N	N	99.5	99.1	99.5	100.1	100.9	101.8	103.2	103.6	103.9	104.1	103.0	102.9
Motor vehicle seating and interior trim manufacturing (NAICS 336360)	12/03	N	N	99.5	99.1	99.5	100.1	100.8	101.8	103.1	103.6	103.9	104.0	103.0	102.8
Motor vehicle metal stamping (NAICS 33637)	12/03	N	N	109.9	118.0	117.6	117.5	117.3	116.9	115.4	110.8	109.6	111.0	112.7	111.0
Motor vehicle metal stamping (NAICS 336370)	12/82	112.6	110.6	120.4	129.2	128.8	128.7	128.4	128.1	126.4	121.4	120.0	121.6	123.5	121.5
Other motor vehicle parts manufacturing (NAICS 33639)	12/03	N	N	101.6	110.7	112.9	113.8	113.7	113.0	112.8	110.9	111.3	114.4	115.1	115.2
Motor vehicle air-conditioning manufacturing (NAICS 336390B)	12/03	N	N	99.7	101.0	101.1	101.2	101.2	100.9	N	N	N	N	101.4	100.6
All other motor vehicle parts manufacturing (NAICS 3363908)	12/03	N	N	100.5	108.3	111.0	112.3	111.9	110.2	109.7	109.3	108.7	108.3	107.9	108.2
Aerospace product and parts manufacturing (NAICS 3364)	06/85	117.7	149.9	176.0	203.4	210.8	215.7	219.1	222.5	224.4	227.9	230.4	234.6	239.2	242.8
Aerospace product and parts manufacturing (NAICS 33641)	06/85	117.7	149.9	176.0	203.4	210.8	215.7	219.1	222.5	224.4	227.9	230.4	234.6	239.2	242.8
Aircraft manufacturing (NAICS 336411)	12/85	116.0	150.5	180.9	207.8	216.8	222.6	225.7	229.0	231.5	235.3	238.7	243.5	248.6	252.4
Aircraft engine and engine parts manufacturing (NAICS 336412)	12/85	112.6	139.7	163.5	199.0	204.6	210.2	214.0	218.1	218.4	222.3	224.1	227.7	231.1	233.3
Other aircraft parts and auxiliary equipment manufacturing (NAICS 336413)	06/85	116.3	143.3	151.8	169.3	171.0	171.7	175.1	178.2	179.8	182.0	181.7	183.5	186.3	190.3
Railroad rolling stock manufacturing (NAICS 3365)	06/84	114.2	128.6	150.5	174.0	176.4	180.6	183.6	185.4	188.9	189.9	189.8	189.2	191.0	189.6
Railroad rolling stock manufacturing (NAICS 336510)	06/84	114.2	128.6	150.3	173.9	176.3	180.5	183.5	185.3	188.8	189.8	189.7	189.1	190.9	189.5

Table 3-14 cont'd: Producer Price Indices for Transportation Equipment (North American Industry Classification System [NAICS] basis) (base date = 100)

	Base date	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ship and boat building (NAICS 3366)	12/84	120.1	149.0	175.0	203.0	206.7	209.5	211.9	216.1	220.4	222.4	225.0	228.9	233.6	237.6
Ship and boat building (NAICS 33661)	12/84	120.1	149.0	175.0	203.0	206.7	209.5	211.9	216.1	220.4	222.4	225.0	228.9	233.7	237.6
Ship building and repairing (NAICS 336611)	12/85	114.0	137.6	163.9	191.1	195.0	196.4	196.7	200.2	203.9	204.4	205.4	207.6	210.9	213.6
Boat building (NAICS 336612)	12/81	136.0	179.4	206.7	237.4	241.2	246.7	253.1	259.2	264.9	269.8	275.9	283.9	294.4	303.1
Other transportation equipment manufacturing (NAICS 3369)	12/03	N	N	103.6	107.7	108.7	110.1	110.9	110.3	111.2	112.8	114.9	115.3	117.4	118.0
Other transportation equipment manufacturing (NAICS 33699)	12/03	N	N	103.6	107.7	108.7	110.1	110.9	110.3	111.2	112.8	114.9	115.3	117.4	118.0
Motorcycle, bicycle, and parts manufacturing (NAICS 336991)	12/84	109.9	127.7	132.2	138.5	139.6	142.2	143.1	143.3	145.2	147.6	148.1	148.6	151.7	153.0
All other transportation equipment manufacturing (NAICS 336999)	12/03	N	N	104.2	107.8	109.0	110.0	110.8	109.6	109.9	111.3	114.9	115.4	117.3	117.5

KEY: N = data do not exist; NAICS = North American Industry Classification System.

Table 3-15: Personal Expenditures by Category (Millions of current dollars)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total expenditures	331,180	646,724	1,750,667	3,808,994	6,767,179	8,769,066	10,260,256	10,698,857	11,047,363	11,363,528	11,847,725	12,263,476	12,693,266	13,239,111	13,913,531	14,428,676	14,047,565
Transportation	40,765	76,503	226,486	442,931	793,116	955,268	961,758	1,080,327	1,135,467	1,170,466	1,202,035	1,163,708	1,163,149	1,233,247	1,317,273	1,326,530	1,133,446
Transportation as a percent of total expenditures	12.3	11.8	12.9	11.6	11.7	10.9	9.4	10.1	10.3	10.3	10.1	9.5	9.2	9.3	9.5	9.2	8.1
Food and beverage ^a	83,040	145,130	360,888	653,911	949,359	1,201,848	1,422,537	1,489,007	1,551,126	1,596,245	1,673,789	1,753,823	1,813,845	1,886,616	1,961,150	2,039,181	1,948,223
Clothing and footwear	29,263	49,945	108,834	206,534	297,541	326,423	331,651	347,114	359,525	365,283	375,999	384,057	391,251	396,985	408,386	414,862	376,976
Communication	5,206	11,606	31,796	70,093	153,775	177,266	220,725	228,082	232,460	237,483	253,959	259,849	268,085	266,371	273,306	276,696	274,481
Final consumption expenditures of nonprofi institutions serving households	5,059	10,473	30,033	75,860	158,041	210,268	294,438	311,856	341,546	352,590	365,596	371,584	401,433	417,947	444,665	439,890	520,876
Health	20,363	56,849	195,473	583,724	1,109,593	1,612,264	2,078,090	2,153,221	2,230,720	2,288,266	2,409,121	2,564,801	2,690,123	2,795,969	2,919,476	3,073,873	2,954,135
Household operation ^b	26,179	46,617	110,737	200,559	344,003	430,127	410,668	423,666	438,571	454,290	476,580	500,127	519,125	540,194	575,718	601,244	645,216
Housing, utilities, and fuels	60,525	113,786	327,662	709,299	1,214,463	1,602,445	1,972,527	2,010,292	2,038,866	2,108,721	2,177,735	2,226,392	2,297,365	2,382,083	2,494,067	2,592,457	2,686,161
Financial services and insurance	13,155	30,107	91,659	230,757	541,925	676,845	767,987	811,064	830,923	869,309	922,941	974,430	996,139	1,068,958	1,151,901	1,171,585	1,196,283
Recreation	19,711	47,017	127,440	314,746	633,684	805,178	884,420	901,621	934,409	967,443	1,004,537	1,045,575	1,094,142	1,143,640	1,200,142	1,261,520	1,176,858
Education	3,360	9,914	25,443	65,958	134,291	180,507	240,315	248,206	250,589	256,653	263,324	271,904	281,701	288,774	297,915	308,351	293,150
Foreign travel, net	2,121	4,514	3,540	-7,673	-21,104	1,086	-12,066	-17,696	-22,210	-43,272	-44,127	-50,716	-45,192	-37,203	-21,683	-4,526	-9,505
Other	22,433	44,263	110,675	262,297	458,494	589,540	687,207	712,096	725,370	740,050	766,235	797,941	822,101	855,529	891,216	927,013	851,265
Disposable Personal Income (DPI)	376,070	761,975	2,024,133	4,319,123	7,419,590	9,392,473	11,356,896	11,885,600	12,504,825	12,517,264	13,191,991	13,745,280	14,138,669	14,801,198	15,629,709	16,219,261	17,432,026
Transportation as a percent of DPI	10.8	10.0	11.2	10.3	10.7	10.2	8.5	9.1	9.1	9.4	9.1	8.5	8.2	8.3	8.4	8.2	6.5

^a Includes alcoholic beverages purchased for off-premises consumption and accommodations.
^b Includes furnishings, household equipment, and routine household maintenance.

NOTES

Numbers may not add to totals due to rounding.
 The categories have been revised due to the Comprehensive Benchmark revision by the source in 2010, thus this table is not comparable to the 2009 and earlier editions.

Table 3-16: Personal Consumption Expenditures on Transportation by Subcategory (millions of current dollars)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL transportation	40,765	76,503	228,486	442,931	793,116	955,268	961,758	1,080,327	1,135,467	1,170,466	1,202,035	1,163,708	1,163,149	1,233,247	1,317,273	1,326,530	1,133,446
User-operated transportation, total	39,510	74,483	218,784	433,278	761,392	939,412	929,137	1,035,364	1,087,085	1,117,565	1,146,119	1,108,395	1,109,942	1,175,934	1,250,258	1,251,856	1,166,254
New cars and net purchases of used cars	16,571	26,754	57,243	118,988	159,402	154,235	116,912	125,483	139,063	142,334	143,986	144,678	137,417	129,250	119,477	101,261	84,689
New and used trucks and RVs	606	2,667	11,849	63,882	174,152	221,882	182,224	190,904	207,711	225,517	248,602	279,991	296,716	323,258	351,435	362,168	407,737
Motor vehicle parts and accessories	2,487	6,087	17,926	28,254	41,788	50,609	56,589	60,733	63,306	65,483	66,821	69,846	71,667	73,499	75,488	77,854	80,449
Repair and rental ^a	5,262	11,776	32,597	82,033	162,053	178,235	182,878	191,898	198,857	208,242	222,249	232,741	249,976	260,974	272,115	284,233	265,126
Gasoline and oil	12,004	21,921	86,689	111,440	168,609	261,430	312,138	386,787	397,808	392,996	377,002	289,690	259,154	291,022	328,430	316,670	228,740
Parking fees and tolls	567	1,205	2,529	5,171	12,318	15,405	18,117	17,797	18,616	19,971	21,481	23,204	23,926	24,953	25,694	26,659	17,146
Insurance premiums, less claims paid ^b	2,013	4,073	9,951	23,510	43,070	57,616	60,279	61,762	61,724	63,022	65,978	68,245	71,086	72,978	77,619	83,011	82,367
Purchased intercity transportation, total	1,447	4,156	15,376	29,468	72,321	72,234	83,085	95,751	100,109	106,391	112,037	113,811	115,954	123,494	136,167	150,094	65,075
Railroad	448	395	588	696	635	730	1,019	1,085	1,152	1,210	1,250	1,227	1,241	1,286	1,285	1,348	407
Intercity bus	154	311	873	615	1,360	1,420	1,183	1,146	1,128	1,149	1,167	1,130	1,227	1,329	1,324	1,322	802
Airline	678	3,075	12,768	25,891	61,817	58,131	66,875	78,636	82,102	87,210	91,545	91,757	92,418	97,861	107,670	120,355	49,649
Other ^c	167	375	1,147	2,266	8,509	11,953	14,008	14,884	15,727	16,822	18,075	19,697	21,068	23,028	25,888	27,069	14,217
Purchased local transportation, total	1,904	2,906	4,864	9,701	14,587	18,009	21,073	22,918	23,469	25,333	27,275	28,914	29,820	31,457	35,399	34,327	16,094
Mass transit system	1,295	1,726	2,998	7,124	11,516	13,875	16,478	17,534	18,095	19,076	19,732	20,233	20,507	20,675	20,926	21,302	8,568
Taxi	609	1,180	1,866	2,577	3,071	4,134	4,595	5,384	5,374	6,257	7,543	8,681	9,313	10,782	14,473	13,025	7,526

KEY: RVs = recreational vehicles.

^a Also includes greasing, washing, storage, and leasing.

^b Consists of premiums plus premium supplements less normal losses and dividends paid to policyholders for motor vehicles insurance.

^c Consists of baggage charges, coastal and inland waterway fares, travel agents' fees, airports bus fares, and limousine services.

NOTE

Numbers may not add to totals due to rounding and different sources used.

Table 3-17: Average Cost of Owning and Operating an Automobile^a (assuming 15,000 vehicle-miles per year)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Average total cost per mile (current cents)	21.2	33.0	49.1	56.1	56.6	58.5	59.6	60.8	59.2	58.0	57.1	56.5	59.0	61.9	63.7
Gas ^b	5.9	5.4	6.9	8.2	11.4	12.3	14.2	14.5	13.0	11.2	8.5	10.3	11.1	11.6	10.7
Gas as a percent of total cost ^b	27.9	16.4	14.1	14.6	20.1	21.1	23.8	23.8	22.0	19.3	14.8	18.2	18.7	18.7	16.7
Maintenance ^c	1.1	2.1	3.6	5.3	4.5	4.4	4.5	5.0	5.1	5.1	5.3	7.9	8.2	8.9	9.1
Tires	0.6	0.9	1.7	0.6	0.8	1.0	1.0	1.0	1.0	1.0	1.0	U	U	U	U
Average total cost per 15,000 miles (current dollars)	3,176	4,954	7,363	8,410	8,487	8,776	8,946	9,122	8,876	8,698	8,558	8,468	8,849	9,282	9,561
Variable cost	1,143	1,260	1,829	2,115	2,511	2,662	2,946	3,064	2,855	2,596	2,208	2,726	2,889	3,081	2,968
Fixed cost ^d	2,033	3,694	5,534	6,295	5,976	6,114	6,000	6,058	6,021	6,102	6,350	5,742	5,960	6,201	6,593

KEY: U = data are not available.

^a All figures reflect the average cost of operating a vehicle 15,000 miles per year in stop and go conditions.

^b Prior to 2004, data include oil cost.

^c Beginning in 2004, data include oil cost. Beginning in 2017, data include maintenance, repair and tires.

^d Fixed costs (ownership costs) include insurance, license, registration, taxes, depreciation, and finance charges.

NOTES

Changes in methodology have been made in 1985, 2004 and 2017, and thus costs may not be comparable before and after those years.

In 2004, the American Automobile Association adopted a new method for calculating vehicle operating costs that represent the real-world personal use of a vehicle over a five-year and 75,000-mile ownership period. The total cost of owning and operating an automobile include fuel, *Maintenance*, *Tires*, insurance, license, registration and taxes, depreciation, and finance.

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. Insurance figures are based on a full-coverage policy for a married 47-year-old male with a good driving record living in a small city and commuting three to ten miles daily to work. The policy includes \$100,000/\$300,000 level coverage with a \$500 deductible for collision coverage and a \$100 deductible for comprehensive coverage. Depreciation costs are based on the difference between new-vehicle purchase price and its estimated trade-in-value at the end of five years. 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.

The sum of *Variable* and *Fixed costs* may not add to totals due to rounding.

Table 3-18: Average Passenger Fares (current dollars)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air carrier, domestic, scheduled service ^a	33.01	40.65	84.60	107.96	339.00	307.31	336.09	363.85	374.77	382.00	391.70	376.95	349.15	347.63	349.62	354.83	292.37
Class I bus, intercity ^b	2.46	3.81	10.57	20.22	29.46	N	N	N	N	N	N	N	N	N	N	N	N
Transit, all modes ^c (unlinked)	0.14	0.22	0.30	0.67	0.93	1.05	1.22	1.31	1.33	1.40	1.43	1.49	1.52	1.57	1.61	1.63	1.52
Commuter rail	0.64	0.84	1.41	2.90	3.33	4.09	4.85	5.28	5.44	5.65	5.84	6.08	6.21	6.43	6.46	6.53	6.41
Intercity rail / Amtrak ^d	4.22	3.19	17.72	39.59	52.15	51.57	60.70	62.67	64.66	68.22	70.78	70.77	68.30	68.71	69.59	71.47	70.77

KEY: N = data do not exist.

^a Data for years after 1994 are not comparable with prior years or with numbers published in the previous NTS reports.

^b Regular route *Inter-city* service.

^c Prior to 1984, excludes *Commuter rail*, automated guideway, urban ferryboat, demand responsive, and most rural and smaller systems.

^d Amtrak began operations in 1971.

Table 3-19: Average Passenger Fares (chained 2012 dollars)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air carrier, domestic, scheduled service ^a	6.50	9.88	48.18	81.88	281.15	229.01	297.34	347.45	374.77	382.46	402.75	378.90	339.55	340.44	348.64	365.97	271.50
Class I bus, intercity ^b	0.22	0.45	3.16	11.21	18.85	N	N	N	N	N	N	N	N	N	N	N	N
Transit, all modes ^c (unlinked)	0.01	0.03	0.07	0.32	0.58	0.81	1.13	1.27	1.33	1.46	1.51	1.61	1.67	1.76	1.83	1.87	1.72
Commuter rail	0.07	0.11	0.41	1.81	2.74	3.34	4.69	5.33	5.44	5.72	5.87	6.11	6.46	6.75	6.81	6.83	6.49
Intercity rail / Amtrak ^d	0.48	0.44	5.17	24.76	42.83	42.19	58.63	63.25	64.66	69.09	71.16	71.11	71.09	72.13	73.26	74.77	71.63

KEY: N = data do not exist.

^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 This category is now deflated using the railway transportation instead of mass transit deflator and the *Inter-city rail* deflator used in previous editions.

^d *Amtrak* began operations in 1971.

NOTES

Chained (2012) dollar series are calculated as the product of the chain-type price index and the 2012 current-dollar value of the corresponding series, divided by 100. Because the formula for the chain-type price indexes uses weights of more than one period, the corresponding chained-dollar estimates are usually not additive.

This table is deflated using data from the Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts tables*, table 2.4.4U, Lines 203, 199, 201 and 197 are used respectively to deflate their corresponding rows.

***Section C:
Transportation Revenues, Employment,
and Productivity***

Table 3-20: Average Passenger Revenue per Passenger-Mile (current cents)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air carrier, domestic, scheduled service	N	N	N	N	17.8	14.9	17.2	18.4	18.9	19.3	19.9	19.2	18.3	18.3	18.5	18.6	15.3
Index (1993 = 100)	NA	NA	NA	NA	100	85	97	104	107	109	113	109	104	104	105	105	86
Commuter rail	N	N	N	13.4	14.6	18.3	20.7	21.5	22.9	22.9	24.3	25.5	26.3	26.1	25.7	26.0	27.6
Index (1993 = 100)	NA	NA	NA	94	102	127	144	150	160	160	170	178	184	182	179	181	193
Intercity / Amtrak^a	3.0	4.0	8.0	14.1	23.2	27.2	31.0	33.0	33.9	35.4	38.0	37.5	38.4	39.2	40.7	41.7	U
Index (1993 = 100)	22	29	57	101	165	194	221	235	241	253	271	267	274	279	290	297	U
Consumer Price Index (1990 = 100)	20	27	57	90	119	135	151	156	159	161	164	164	166	170	174	177	179

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

^a Amtrak began operations in 1971.

NOTES

The Bureau of Transportation Statistics rebased the consumer price index from 1982-84 = 100 to 1993 = 100.

Table 3-21: Average Freight Revenue Per Ton-mile (current cents)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air carrier, domestic^a	22.80	21.91	46.31	59.71	77.14	66.34	81.48	129.67	133.51	135.47	135.85	124.04	119.90	125.15	137.49	137.67	122.98
Index (1990 = 100)	38	37	78	100	129	111	136	217	224	227	228	208	201	210	230	231	206
Truck^b	U	U	U	8	11	12	14	18	17	16	18	18	17	19	20	U	U
Index (1990 = 100)	U	U	U	100	145	158	185	227	215	204	226	227	221	240	258	U	U
Class I rail	1.40	1.43	2.87	2.66	2.26	2.62	3.32	3.75	3.95	4.05	4.05	3.97	3.99	4.02	4.23	4.42	U
Index (1990 = 100)	53	54	108	100	85	99	125	141	149	152	153	149	150	151	159	166	U
Water Transportation, domestic	N	U	U	1.42	1.67	U	2.61	2.84	3.18	3.36	3.37	3.25	3.00	2.74	2.88	3.22	U
Index (1990 = 100)	N	U	U	100	97	U	184	200	224	236	238	229	212	193	203	227	U
Oil pipeline	U	U	U	1.22	1.30	1.30	U	U	1.63	1.92	2.26	2.49	2.66	2.85	2.96	U	U
Index (1990 = 100)	U	U	U	100	106	106	U	U	134	157	184	204	217	232	242	U	U
Producer Price Index (1990 = 100)^c	28	33	74	100	116	131	151	160	163	165	168	163	161	166	171	173	170

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

^a For 1990 and later, air carriers that did not report both financial data and all months of traffic data for a given period were excluded from the calculations. Cargo revenue includes both scheduled and charter property revenue and mail revenue.

^b General freight common carriers, most of which are LTL (less-than-truckload) carriers.

^c Total finished goods. Converted to 1990 base year index by the Bureau of Transportation Statistics and therefore not comparable to previous editions of this table.

NOTE

There is a break in the data from 1985 to 1990 for *Truck, Barge*, and *Oil/pipeline*; therefore, data prior to 1990 cannot be indexed using 1990 as the base year because the data are incomparable.

Table 3-22: Total Operating Revenues (current millions of dollars)

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Air carrier, domestic, all services	2,178	7,180	26,440	58,092	99,110	119,166	132,888	135,879	139,184	145,938	147,025	151,195	160,640	171,488	179,136
Trucking ^a	N	N	N	127,314	223,197	261,818	289,043	307,365	320,439	345,965	352,576	357,314	380,940	410,913	425,925
Interurban and rural bus	U	U	U	U	U	1,037	1,106	1,151	1,271	1,391	1,463	1,595	1,730	1,718	1,714
Transit ^b	1,407	1,707	6,510	16,053	21,971	39,086	41,017	42,850	44,271	46,393	46,416	48,699	50,094	51,764	54,360
Class I rail	9,514	11,992	28,258	28,370	34,102	58,165	67,154	69,887	72,873	77,659	71,709	65,762	69,998	76,177	74,300
Intercity/Amtrak ^c	N	N	454	1,308	2,111	2,513	2,707	2,877	2,992	3,234	3,206	3,146	3,175	3,208	3,323
Water transportation (domestic) ^d	U	U	U	11,532	8,819	13,718	14,824	15,744	16,314	17,807	16,800	15,297	14,520	15,380	16,012
Oil pipeline ^e	U	U	U	13,443	7,483	11,219	12,562	14,007	15,734	19,281	22,019	23,100	25,427	29,035	32,895
Gas pipeline (investor-owned) ^f	8,700	16,400	85,918	66,027	72,075	84,362	79,797	68,424	75,587	77,827	69,170	69,645	74,084	79,606	79,217
Transmission companies	3,190	5,928	41,604	21,756	10,404	12,188	12,948	9,208	12,184	12,087	10,777	11,095	12,091	12,872	12,592
Distribution companies	N	N	14,013	18,750	34,696	44,624	40,514	34,518	38,284	37,652	33,108	33,133	36,803	39,500	39,280
Integrated companies	N	N	17,300	10,117	3,755	2,295	2,448	2,131	2,605	2,508	2,140	2,449	2,290	2,420	2,398
Combination companies	N	N	13,001	15,404	23,220	25,255	23,887	22,567	22,514	25,580	23,145	22,968	22,900	24,814	24,947

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

^a Data from 1990 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 2000 onward are not directly comparable with data prior to 2000.

^b Sources of revenue applied to operating expenses. Prior to 1984 excludes commuter rail, automated guideway, urban boat, demand responsive, and most rural and smaller systems. Includes operating assistance.

^c Amtrak began operations in 1971.

^d Includes foreign traffic moving on domestic Coastal and Great Lakes and inland waterways.

^e Oil pipeline revenues are much smaller than gas pipeline revenues because oil pipeline companies are common carriers that include transportation costs only.

^f Data are not directly comparable from year to year due to acquisition and mergers. Prior to 1975, pipeline companies are not categorized by distribution, integrated, or combination. Total numbers for these companies are 1960 = 5,505; 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.

NOTES

Eno Transportation Foundation has revised their methodologies for calculating water transportation and oil pipeline data series starting in 1990. Class I rail data for 2017 include the impact of tax reform.

Table 3-23: Employment in For-Hire Transportation and Selected Transportation-Related Industries^a (North American Industry Classification System (NAICS) basis) (thousands)

NAICS Code	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
TOTAL U.S. labor force^b	54,296	71,006	90,533	109,326	132,011	134,034	130,345	131,914	134,157	136,364	138,940	141,825	144,336	146,608	148,908	150,905	142,185	
Transportation related labor force	2,115	2,312	3,054	12,328	13,901	13,395	12,054	12,270	12,536	12,756	13,107	13,542	13,851	14,128	14,501	14,846	14,236	
Transportation and warehousing^c	N	N	2,963	3,478	4,401	4,348	4,179	4,289	4,404	4,486	4,649	4,859	5,004	5,178	5,426	5,665	5,555	
Air transportation	N	N	N	529	614	501	458	457	459	444	444	459	478	492	497	505	430	
Scheduled air transportation	N	N	N	503	570	456	417	416	418	406	406	419	436	448	452	458	384	
Nonscheduled air transportation	N	N	N	27	45	44	42	41	41	38	38	40	42	44	45	47	46	
Rail transportation	862	617	518	270	206	193	183	193	195	196	200	204	184	182	182	174	149	
Water transportation	N	N	N	57	56	61	62	61	64	65	67	66	66	66	65	65	67	61
Sea, coastal, and Great Lakes water transportation	N	N	N	35	36	37	N	N	N	N	N	N	N	N	N	N	N	
Truck transportation	N	N	N	1,123	1,406	1,398	1,251	1,301	1,350	1,383	1,418	1,453	1,448	1,457	1,496	1,529	1,466	
General freight trucking	N	N	N	807	1,013	981	868	901	927	944	967	995	999	1,002	1,034	1,057	1,018	
Specialized freight trucking	N	N	N	315	393	418	383	400	423	438	451	458	449	455	463	472	448	
Transit and ground passenger transportation	N	N	N	272	376	396	436	447	448	456	474	485	490	495	495	494	375	
Urban transit, interurban, rural, and charter bus transportation	N	N	N	70	101	98	100	101	102	104	106	107	107	107	109	109	106	81
Taxi and limousine service	N	N	N	57	72	66	68	72	74	77	79	80	80	79	75	73	52	
School and employee bus transportation	N	N	81	114	152	169	186	187	182	184	193	196	199	200	201	204	150	
Other transit and ground passenger transportation	N	N	N	31	51	63	82	88	90	91	96	102	105	107	109	111	93	
Pipeline transportation	N	N	N	60	46	38	42	43	44	45	47	50	50	49	50	52	51	
Scenic and sightseeing transportation	N	N	N	16	28	29	27	28	28	29	31	33	35	35	35	36	23	
Support activities for transportation	N	N	N	367	546	563	553	573	591	609	637	663	678	701	729	754	700	
Support activities for air transportation	N	N	N	96	141	148	154	159	163	169	177	187	199	212	222	233	207	
Support activities for water transportation	N	N	N	91	97	94	91	91	92	95	98	98	98	92	95	94	85	
Support activities for road transportation	N	N	N	35	66	79	80	81	86	88	93	95	100	102	104	106	102	
Freight transportation arrangement	N	N	N	111	178	177	169	180	184	190	197	206	212	217	229	241	234	
Support activities for other transportation, including rail	N	N	N	35	65	65	59	63	66	68	73	78	75	78	79	80	74	
Couriers and messengers	N	N	N	375	605	571	528	529	534	544	577	613	645	676	740	827	957	
Couriers and express delivery services	N	N	N	340	546	522	480	477	480	488	517	551	576	598	647	711	807	
Local messengers, local delivery, and private postal service	N	N	N	35	59	50	48	52	54	56	59	62	69	78	93	116	150	
Warehousing and storage	N	N	N	409	518	599	638	658	692	716	755	834	932	1,027	1,139	1,229	1,343	
Transportation related manufacturing	N	N	N	153	123	112	114	112	112	110	112	113	113	115	115	114	106	
Petroleum and coal products manufacturing	N	N	N	280	149	157	146	139	134	128	122	123	121	121	126	133	136	
Tire manufacturing ^d	N	N	N	2,135	2,057	1,772	1,333	1,382	1,461	1,509	1,559	1,605	1,630	1,643	1,702	1,729	1,581	
Rubber and plastic hoses and belting manufacturing	N	N	N	271	291	248	153	158	168	182	194	201	212	219	234	237	187	
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing	N	N	N	130	183	171	107	114	127	135	141	148	151	155	165	162	150	
Transportation equipment manufacturing	N	N	N	653	840	678	419	446	483	499	537	565	581	589	600	594	535	
Motor vehicle manufacturing	N	N	N	841	517	465	478	487	499	495	491	490	490	488	508	535	511	
Motor vehicle body and trailer manufacturing	N	N	N	174	154	154	125	123	129	132	137	138	136	135	139	143	139	
Motor vehicle parts manufacturing	N	N	N	203	158	154	125	123	129	132	137	138	136	135	139	143	139	
Aerospace product and parts manufacturing	N	N	N	158	158	154	125	123	129	132	137	138	136	135	139	143	139	
Ship and boat building	N	N	N	158	158	154	125	123	129	132	137	138	136	135	139	143	139	

Continued next page

Table 3-23 cont'd: Employment in For-Hire Transportation and Selected Transportation-Related Industries^a (North American Industry Classification System (NAICS) basis) (thousands)

NAICS Code	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	N	N	N	66	73	66	52	55	56	57	59	63	60	57	57	59	59
3365, 3369																	
	N	N	N	289	340	351	287	286	294	293	294	310	319	328	341	349	345
2373																	
	N	N	N	314	361	351	317	321	328	333	337	338	341	346	352	361	343
4231																	
	N	N	N	36	41	34	35	35	35	35	36	36	34	34	34	35	33
42386																	
4247				158	122	105	99	98	99	101	105	103	102	101	102	104	102
441				1,494	1,847	1,919	1,629	1,691	1,737	1,793	1,862	1,929	1,980	2,005	2,015	2,026	1,908
4411				783	983	1,217	1,261	1,057	1,096	1,138	1,188	1,239	1,279	1,293	1,297	1,300	1,211
4412				93	132	166	129	128	130	134	140	146	151	156	160	162	149
4413				418	499	491	489	507	512	521	534	545	550	555	559	564	548
447				910	936	871	819	831	844	866	881	905	923	930	932	947	931
5321				163	208	199	161	165	173	179	189	201	207	213	218	227	191
5615				250	299	224	186	190	192	195	196	205	217	218	220	219	171
6219				99	173	206	251	258	267	272	278	287	292	305	308	312	306
8111				659	888	886	801	820	832	848	868	896	914	926	934	947	901
81293				68	93	103	111	115	120	125	129	137	140	141	146	145	96
912001				591	741	880	774	659	631	611	595	593	597	609	615	607	602
	532	795	846	903	867	888	876	854	839	837	843	845	852	853	865	868	872
Government employment, total ^f																	
U.S. DOT ^g	N	104	112	104	58	56	58	58	57	55	55	55	55	55	54	54	55
State and Local ^{h,i}	532	691	734	798	809	833	818	796	782	781	788	790	796	798	811	814	818

KEY: N = data do not exist.

^a Annual averages.

^b Excludes farm employment.

^c Does not include Postal service.

^d Includes tire manufacturing and tire retreading.

^e Does not include motor vehicle wholesalers.

^f Not all government agencies are included (e.g., the National Transportation Safety Board).

^g The U.S. Department of Transportation was created in 1966. Data are on a fiscal year basis and include permanent civilians as well as temporary employees and military. The United States Coast Guard (USCG) and the Transportation Security Administration (TSA) were transferred to the Department of Homeland Security in 2003.

^h 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. State and local data for 1960 include highway employment only. For years 1965 and later, state and local government employment covers highway, air, water and transit modes.

ⁱ Due to a change in the reference period, from October to March, the October 1986 Annual Survey of Government Employment and Payroll was not conducted.

NOTES

Details may not add to totals due to independent rounding.

State and local employment statistics for years 1965 and later are significantly different from the data reported in the previous edition of the report because current data include employment for air, water and transit modes in addition to highway. Due to lack of data, employment for inland water transportation; pipeline transportation of crude oil; pipeline transportation of natural gas; other pipeline; scenic and sightseeing transportation for land, water and other; commercial air, rail, water transportation equipment rental and leasing, and regulation and administration of transportation programs are not reported.

Table 3-24: Employment in Transportation and Transportation-Related Occupations

SOC code	Occupation	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Vehicle operators, pipeline operators, and primary support														
53-2011	Airline pilots, copilots, and flight engineers	94,820	76,240	68,560	68,350	66,270	73,030	75,760	81,350	81,520	84,070	82,890	84,520	83,550
53-2012	Commercial pilots	18,040	24,860	29,900	31,630	34,990	37,340	38,170	39,760	38,980	38,490	37,870	37,830	37,120
53-2021	Air traffic controllers	23,350	21,590	23,970	23,580	23,260	23,060	22,860	23,130	23,240	22,790	22,390	22,090	22,190
53-2022	Airfield operations specialists	4,580	4,510	6,790	6,060	6,990	7,250	7,050	7,920	8,760	9,590	9,960	10,680	10,590
53-3011	Ambulance drivers and attendants, except emergency medical technicians	15,700	18,320	19,440	18,080	18,540	18,380	19,350	19,950	17,300	15,310	15,380	14,740	14,120
53-3031	Driver/sales workers	373,660	400,530	371,670	387,950	394,110	396,470	405,810	417,660	426,310	426,870	414,860	444,660	420,890
53-3032	Truck drivers, heavy and tractor-trailer	1,577,070	1,624,740	1,466,740	1,508,620	1,556,510	1,585,300	1,625,290	1,678,280	1,704,520	1,748,140	1,800,330	1,856,130	1,797,710
53-3033	Truck drivers, light or delivery services	1,033,220	938,280	780,260	771,210	769,010	776,930	797,010	826,510	858,710	877,670	915,310	923,050	929,470
53-3062	Bus drivers, transit and intercity	175,470	183,450	179,700	176,190	162,840	157,830	158,050	168,620	169,680	176,140	174,110	179,510	162,850
53-3068	Passenger vehicle drivers, except bus drivers, transit and intercity	587,250	610,160	629,550	644,290	657,110	666,140	677,700	686,520	703,880	705,810	712,070	700,030	599,980
53-4011	Locomotive engineers	29,390	37,390	40,750	38,790	37,060	36,860	38,470	37,490	39,900	35,680	34,850	35,520	37,110
53-4013	Rail yard engineers, dinky operators, and hostlers	4,020	6,970	5,600	5,060	5,170	5,140	3,900	4,460	4,530	6,140	5,690	5,400	4,580
53-4022	Railroad brake, signal, switch operators, and locomotive firesh	17,870	21,240	23,890	25,500	25,960	25,830	22,670	20,580	21,070	14,860	14,830	11,080	14,630
53-4031	Railroad conductors and yardmasters	40,380	38,330	42,700	44,280	42,740	43,100	42,900	42,330	42,880	44,490	42,360	45,710	44,920
53-4041	Subway and street car operators	3,190	7,430	6,360	5,920	8,750	8,930	11,300	12,600	12,350	12,070	8,850	10,730	11,250
53-5011	Sailors and marine oilers	30,090	31,090	31,690	31,280	31,500	28,810	27,640	30,570	32,530	30,940	32,220	31,290	25,570
53-5021	Captains, mates, and pilots of water vessels	21,080	28,570	29,280	30,220	30,860	30,290	30,690	33,110	36,720	35,780	36,390	33,370	27,590
53-5022	Motorboat operators	3,540	2,700	2,480	2,550	3,040	3,400	4,060	3,650	3,290	2,510	2,510	2,120	2,380
53-5031	Ship engineers	7,370	13,240	9,470	10,010	10,760	9,930	10,060	9,940	9,750	7,890	8,740	8,410	7,480
53-6011	Bridge and lock tenders	4,790	3,620	3,250	3,420	3,460	3,170	3,280	3,170	3,510	3,240	3,170	3,150	3,080
53-7071	Gas compressor and gas pumping station operators	6,510	3,950	4,040	3,870	4,350	4,520	4,700	4,100	3,890	3,560	3,460	3,440	3,800
53-7072	Pump operators, except wellhead pumps	13,730	9,970	9,440	12,150	11,870	13,170	12,170	13,390	12,030	11,500	10,820	10,000	10,580
Transportation equipment manufacturing and maintenance occupations														
17-2011	Aerospace engineers	71,550	81,100	78,450	79,400	80,420	71,500	69,080	66,980	68,510	65,760	63,960	63,200	60,630
17-2121	Marine engineers and naval architects	4,680	6,550	5,720	5,470	6,880	6,640	7,570	7,600	8,120	10,960	11,350	11,360	8,700
17-3021	Aerospace engineering and operations technicians	19,850	9,950	8,480	9,290	9,750	10,540	11,230	12,890	11,970	11,710	10,110	11,540	11,900
49-2091	Avionics technicians	15,360	22,490	18,320	17,070	16,810	17,310	17,150	17,340	17,330	18,620	18,860	21,750	21,390
49-2093	Electrical and electronics installers and repairers, transportation equipment	15,930	20,560	12,830	14,410	15,530	15,340	14,160	14,210	13,960	12,310	11,680	9,790	10,390
49-2096	Electronic equipment installers and repairers, motor vehicles	12,480	17,650	15,630	13,610	12,590	11,900	11,460	12,470	11,750	11,520	10,880	10,310	10,230
49-3011	Aircraft mechanics and service technicians	135,730	115,120	117,510	117,320	119,160	115,410	116,830	124,040	128,570	131,500	131,690	133,310	128,300
49-3021	Automotive body and related repairers	168,170	158,160	129,730	131,040	135,610	134,650	137,140	143,040	143,940	144,320	142,060	144,180	137,120
49-3022	Automotive glass installers and repairers	21,240	17,760	14,020	13,690	14,780	15,910	15,670	17,160	18,610	20,190	19,640	19,410	18,490
49-3023	Automotive service technicians and mechanics	692,570	654,800	587,510	589,750	596,830	604,990	633,390	638,080	647,380	639,700	648,050	655,330	620,110
49-3031	Bus and truck mechanics and diesel engine specialists	258,800	248,280	222,770	222,940	230,030	238,150	243,080	251,750	254,280	260,380	264,860	286,330	253,010
49-3043	Rail car repairers	10,620	24,270	19,280	19,480	19,140	19,290	20,080	21,410	22,090	24,090	24,720	25,930	22,310
49-3051	Motorboat mechanics	19,040	18,190	16,850	16,770	18,380	19,650	20,210	20,440	20,260	21,160	22,280	22,940	20,440
49-3052	Motorcycle mechanics	11,720	16,140	14,750	15,010	14,950	14,960	15,420	15,850	16,000	15,850	15,090	15,590	13,490
49-3091	Bicycle repairers	7,940	7,980	9,530	9,950	10,490	10,450	10,520	12,560	12,560	12,720	12,200	13,190	11,290
49-3092	Recreational vehicle service technicians	12,200	13,540	9,540	10,110	10,970	11,200	10,990	11,970	13,520	14,780	15,560	15,580	15,150

Continued next page

Table 3-24 cont'd: Employment in Transportation and Transportation-Related Occupations

SOC code	Occupation	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
49-3093	Tire repairers and changers	88,530	100,860	94,120	94,740	96,880	99,370	100,510	107,500	109,350	114,690	111,620	110,880	98,560
51-2011	Aircraft structure, surfaces, rigging, and systems assemblers	32,680	22,820	36,320	36,570	41,180	42,810	40,630	42,810	42,010	41,130	43,150	42,940	38,460
51-9122	Painters, transportation equipment	43,270	52,650	43,300	44,730	46,290	46,770	49,950	51,760	54,860	52,880	55,710	U	U
51-9197	Tire builders	15,790	19,860	15,020	16,690	17,360	17,570	17,680	17,710	22,280	21,910	23,920	20,790	18,820
53-6031	Automotive and Watercraft Service Attendants	106,010	96,340	86,440	102,090	108,510	112,970	104,750	109,710	109,790	118,850	113,760	117,670	112,750
53-7061	Cleaners of vehicles and equipment	301,330	333,350	288,110	290,780	302,960	311,940	321,740	336,960	348,770	373,290	378,850	382,670	341,660
Transportation Infrastructure construction and maintenance occupations														
47-2071	Paving, surfacing, and tamping equipment operators	56,330	63,220	51,830	54,120	54,460	55,720	54,940	53,110	51,880	49,760	46,760	45,770	44,560
47-4051	Highway maintenance workers	145,790	140,600	142,530	143,760	141,180	139,070	140,650	142,300	143,320	146,580	149,260	150,860	149,890
47-4061	Rail-track laying and maintenance equipment operators	9,940	13,510	15,520	15,590	16,870	15,590	14,820	14,470	14,250	15,070	14,410	16,180	17,590
49-9097	Signal and track switch repairers	5,540	6,100	7,400	8,300	8,600	7,960	7,880	8,190	8,680	8,300	7,730	6,860	7,250
53-7031	Dredge operators	3,100	1,720	1,720	1,590	1,740	1,750	1,900	1,850	1,760	1,410	1,190	1,550	1,750
Secondary Support Service Occupations														
13-1032	Insurance appraisers, auto damage	12,320	12,900	10,280	10,950	11,770	13,180	13,690	15,270	15,130	16,150	15,200	13,750	13,220
33-3041	Parking enforcement workers	8,040	10,140	9,430	9,310	9,210	8,790	8,680	8,710	8,920	8,660	8,070	7,650	7,560
33-3052	Transit and railroad police	5,760	5,090	3,540	3,890	4,140	4,060	3,380	3,720	4,810	5,520	4,470	4,690	3,800
33-9091	Crossing guards	72,830	69,390	68,740	68,520	70,390	68,050	66,310	68,640	72,900	76,440	79,880	84,920	85,050
39-7012	Travel guides	5,200	3,120	3,620	4,110	4,210	4,250	3,090	2,810	3,030	U	U	U	U
53-2031	Flight attendants	126,380	99,590	88,020	87,190	84,960	93,550	98,510	108,510	113,390	119,000	118,770	120,840	116,260
53-6061	Transportation attendants, except flight attendants and baggage porters	23,550	24,810	25,150	27,040	23,790	21,280	16,380	15,680	18,410	24,360	25,460	28,200	22,990
41-3041	Travel agents	124,030	88,590	70,930	67,490	64,680	64,250	64,750	66,560	68,680	67,330	69,480	66,670	55,180
43-4181	Reservation and transportation ticket agents and travel clerks	199,700	160,120	121,250	126,790	135,930	141,900	138,260	136,810	146,350	148,220	132,050	123,660	110,020
43-5021	Couriers and messengers	130,210	106,520	85,620	83,250	76,830	74,060	71,760	73,180	74,120	76,710	75,720	74,720	70,700
43-5032	Dispatchers, except police, fire, and ambulance	167,180	172,550	180,540	182,310	184,890	185,270	190,330	196,940	197,910	198,520	199,880	199,360	188,450
43-5052	Postal service mail carriers	354,980	347,180	324,990	315,330	305,490	307,490	307,490	315,950	328,950	336,900	342,410	339,650	333,570
43-5071	Shipping, receiving, and traffic clerks	864,530	759,910	687,850	687,940	690,780	677,450	661,530	674,820	676,990	671,780	655,590	704,910	727,640
53-6021	Parking lot attendants	116,930	124,250	124,590	126,160	126,520	130,190	136,440	144,150	146,350	145,400	145,900	147,390	123,790
53-6041	Traffic technicians	4,590	6,990	6,730	6,280	6,340	6,220	6,490	6,750	6,410	6,980	7,290	7,470	7,430
53-6051	Transportation inspectors	26,520	25,570	24,280	24,810	24,310	23,970	24,350	25,860	27,430	30,030	29,990	30,020	27,360
53-7081	Refuse and recyclable material collectors	118,910	133,930	126,360	123,160	117,670	116,460	115,170	114,220	114,680	115,130	118,520	121,330	120,850
53-7121	Tank car, truck, and ship loaders	17,480	15,950	10,390	10,960	12,390	12,560	12,490	11,960	10,920	10,300	9,000	11,620	12,610
Other														
11-3071	Transportation, storage, and distribution managers	116,680	84,870	90,280	92,150	98,600	102,610	106,000	109,210	113,270	118,680	124,810	132,040	132,210
53-1041	Aircraft cargo handling supervisors	9,960	6,210	6,160	6,710	6,720	6,270	5,750	6,760	7,460	8,270	8,920	9,500	10,020
First-Line supervisors of transportation and material moving workers,														
53-1047	except aircraft cargo handling supervisors	333,500	397,550	362,780	365,250	366,210	364,990	368,720	379,580	386,380	395,350	411,060	455,390	477,430

KEY: SOC = Standard Occupational Classification; U = data are not available.

NOTES

Occupational Employment Statistics (OES) uses a mail survey to measure employment levels and wage rates for all full- and part-time wage and salary workers in nonfarm establishments. The survey does not include self-employed owners and partners in unincorporated firms, household workers, or unpaid family workers. In 1999, OES began using the Standard Occupational Classification (SOC) system to organize occupational data. Consequently, estimates from 1999 and subsequent years are not directly comparable to previous occupational estimates. The SOC is being adopted by all federal agencies and consists of 821 detailed occupations, grouped into 449 board occupations, 96 minor groups, and 23 major groups.

Table 3-24 cont'd: Employment in Transportation and Transportation-Related Occupations

A broad definition of transportation and transportation-related occupations is used in this table based on Sen, B. and M. Rossetti, "A Complete Count of the U.S. Transportation Workforce," *Transportation Research Record* 1719: 2000, pp 259-266. Some occupational categories may include workers not engaged in transportation or transportation-related activities. For example, the category "first-line supervisors/managers" (53-1021 and 53-1031) may include workers in material moving occupations along with transportation occupations. Moreover, some workers engaged in transportation and transportation-related activities may be excluded. For example, "baggage porters and bellhops" is not included in this table because it is believed that a large share of workers in this category work in hotels or similar establishments.

In 2010, the standard occupational classification code for *Travel guides*, *Flight attendants* and *Transportation attendants*, *Except flight attendants and baggage* are changed to 39-7012, 53-2031 and 53-6061 respectively.

In 2019, the SOC codes for *Aircraft cargo handling supervisors*; *First-Line supervisors of transportation and material workers*, *except aircraft cargo handling supervisors*, and *Bus drivers, transit and intercity* are changed to 53-1041, 53-1047, and 53-3052 respectively.

53-1048 is a new category introduced in 2017. Data for prior years are the sum of two now discontinued subcategories, 53-1021 and 53-1031.

53-3058 is a new category introduced in 2019. Data for prior years are the sum of two now discontinued subcategories, 53-3022 and 53-3041.

53-4022 is a new category introduced in 2019. Data for prior years are the sum of two now discontinued subcategories, 53-4012 and 53-4021.

Table 3-25: Average Wage^a and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (North American Industry Classification System [NAICS] basis) (current dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
All industries	39,231	45,643	53,239	54,699	56,089	56,667	58,350	59,993	60,826	62,721	64,685	66,781	71,456
Transportation and warehousing, total	39,055	43,939	49,744	51,305	52,427	53,364	54,817	55,941	56,593	57,905	59,652	60,647	61,666
Air	53,231	56,772	65,793	69,400	70,419	77,843	80,317	84,815	92,313	94,909	96,781	98,449	99,954
Rail	63,353	72,903	81,436	86,303	92,289	88,364	94,268	95,455	93,446	96,818	103,016	103,306	114,672
Water	51,516	62,903	78,598	82,480	82,976	84,329	87,942	90,253	89,909	92,209	95,416	96,468	101,096
Truck	36,030	41,481	45,537	46,869	47,810	48,831	50,679	52,057	52,676	54,525	57,211	58,338	60,585
Transit and ground passenger transportation	23,827	27,123	30,979	32,015	32,553	33,125	34,236	35,413	37,442	40,547	44,520	51,674	49,588
Pipeline	96,662	88,952	112,669	119,021	137,264	124,309	124,963	129,658	130,880	136,721	137,285	146,037	145,784
Other transportation and support activities ^b	35,823	42,518	49,169	49,988	50,800	51,636	52,364	52,882	53,007	53,984	55,216	55,694	57,562
Warehousing and storage	33,623	38,861	44,183	44,956	45,408	45,603	46,375	46,642	45,893	45,659	46,457	46,818	48,340

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

^b Comprises business establishments involved in scenic and sightseeing transportation, support activities for transportation, and couriers and messengers.

NOTES

Data in this table is based on the 2012 NAICS codes. The Bureau of Economic Analysis (BEA) provides this data on a Standard Industrial Classification (SIC) basis ending in 2000 and on a NAICS basis beginning in 1998. This table is not comparable to previous editions due to the Comprehensive Benchmark revision by the BEA in 2007. Use care in comparing the data in this table with those in table 3-26. This table includes weighted part-time employees' salaries. Table 3-26 covers only full-time employees.

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 salary paid is usually very small.

Table 3-26: Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation (2010 Standard Occupational Classification [SOC] basis) (current dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL, all occupations^a	576	651	747	756	768	776	791	809	832	860	886	917	984
Transportation and material moving occupations	481	543	599	614	621	619	637	646	662	681	689	711	719
Supervisors of transportation and material moving workers	671	734	743	761	812	882	829	894	807	881	850	923	919
Aircraft pilots and flight engineers	1,193	1,366	1,365	1,461	1,440	1,845	1,427	1,735	1,582	1,736	1,743	1,857	1,923
Air traffic controllers and airfield operations specialists	1,090	1,444	1,626	1,335	1,508	1,628	1,438	1,270	1,433	N	N	N	N
Flight attendants	N	N	N	791	775	767	857	846	873	860	878	823	895
Ambulance drivers and attendants, except emergency medical technicians	580	939	518	503	592	571	440	517	588	N	N	N	N
Bus drivers	462	517	574	608	601	579	602	615	641	605	655	674	647
Driver/sales workers and truck drivers	551	624	686	705	730	730	732	747	780	797	817	843	896
Taxi drivers and chauffeurs	451	483	537	553	554	521	608	585	580	604	611	614	606
Motor vehicle operators, all other	509	394	522	520	626	448	628	567	572	N	N	N	616
Locomotive engineers and operators	870	998	1,268	1,130	1,274	1,396	1,187	1,442	1,262	N	N	N	1,489
Railroad brake, signal, and switch operators	689	698	1,114	917	1,141	781	1,086	732	1,148	N	N	N	N
Railroad conductors and yardmasters	817	1,017	1,198	1,181	1,073	1,226	990	1,117	1,160	N	1,132	1,160	N
Subway, streetcar, and other rail transportation workers	754	497	488	876	951	1,066	1,153	1,052	938	N	N	N	N
Sailors and marine oilers	508	628	902	992	636	966	780	1,096	816	N	N	N	N
Ship and boat captains and operators	779	798	1,637	1,326	1,169	1,383	1,653	1,534	907	N	N	N	N
Ship engineers	712	1,288	1,512	1,435	2,430	1,454	1,659	1,610	1,933	N	N	N	N
Bridge and lock tenders	935	637	1,127	1,060	988	615	713	567	952	N	N	N	N
Parking lot attendants	316	360	464	467	404	423	440	492	519	560	575	561	N
Automotive and watercraft service attendants	314	323	393	404	428	398	512	452	462	514	570	518	N
Transportation inspectors	731	893	1,013	1,007	836	936	909	878	834	N	N	N	N
Transportation attendants, except flight attendants	N	N	N	452	579	594	900	521	479	N	N	N	611
Other transportation workers	483	735	831	752	688	784	623	744	741	N	N	N	N
Conveyor operators and tenders	465	501	850	688	809	575	742	720	666	N	N	N	N
Crane and tower operators	675	727	659	739	753	846	959	988	909	902	1,122	1,070	N
Dredge, excavating, and loading machine operators	572	616	708	708	792	697	867	696	768	N	N	N	N
Hoist and winch operators	733	516	631	667	817	978	1,495	1,104	940	N	N	N	N
Industrial truck and tractor operators	448	499	559	562	562	559	594	609	602	624	641	677	711
Cleaners of vehicles and equipment	361	385	448	465	425	429	482	485	491	530	538	587	580

Continued next page

Table 3-26 cont'd: Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation (2010 Standard Occupational Classification [SOC] basis) (Current dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Laborers and freight, stock, and material movers, hand	401	456	497	509	510	511	533	526	566	578	603	634	650
Machine feeders and off bearers	412	449	423	520	550	530	477	488	485	N	N	N	N
Packers and packagers, hand	313	372	400	397	404	422	413	438	456	480	495	530	582
Pumping station operators	730	910	952	815	1,161	1,015	1,058	952	1,074	N	N	N	593
Refuse and recyclable material collectors	435	491	481	541	501	550	550	501	562	522	524	686	N
Mine shuttle car operators	992	772	1,046	1,159	1,053	1,482	1,305	650	N	N	N	N	680
Tank car, truck, and ship loaders	420	462	456	608	804	851	745	539	900	N	N	N	N
Material moving workers, all other	491	598	742	614	701	673	622	631	566	N	N	N	N

KEY: N = data do not exist.

^a Earnings for all full-time workers, not just transportation related.

NOTES

The 2010 Standard Occupational Classification (SOC) System was developed by the Federal Government in response to a growing need for a universal occupational classification system. The SOC is being adopted by all Federal agencies and consists of 840 detailed occupations, grouped into 461 broad occupations, 97 minor groups, and 23 major groups. This table does not include part-time employees, while table 3-25 includes salaries of part-time employees. Updated population controls are introduced annually with the release of January data. N indicates no data or data that do not meet publication criteria (values not shown where base is less than 50,000).

Table 3-27: Total Wage^a and Salary Accruals by Transportation Industry (North American Industry Classification System [NAICS] basis) (millions of current dollars)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
All industries	4,824,946	5,691,379	6,372,510	6,626,182	6,928,124	7,113,994	7,476,332	7,859,482	8,091,239	8,474,687	8,900,515	9,323,541	9,444,106
Transportation and warehousing, total	164,605	183,725	195,474	207,370	219,538	226,748	242,296	259,278	267,396	283,833	306,237	328,332	334,603
Air	30,584	27,140	27,884	29,945	30,864	33,140	34,328	37,253	41,528	44,462	46,173	47,274	43,726
Rail	12,524	13,724	14,246	15,792	17,316	16,583	18,182	18,724	16,708	16,709	17,681	17,146	16,815
Water	2,510	3,622	4,687	4,941	5,158	5,307	5,714	5,830	5,549	5,637	5,847	6,068	5,628
Truck	49,339	56,465	54,525	58,463	62,207	64,481	69,263	72,998	73,084	76,157	82,093	85,741	85,362
Transit and ground passenger transportation	8,878	10,426	12,592	13,341	13,934	14,321	15,438	16,351	17,156	18,730	20,701	24,599	17,366
Pipeline	4,245	3,189	4,486	4,819	5,707	5,130	5,543	5,981	6,031	6,390	6,432	6,986	6,996
Other transportation and support activities ^b	40,151	46,809	50,753	52,729	55,176	57,127	60,996	65,269	67,053	71,348	77,141	85,267	91,748
Warehousing and storage	16,375	22,348	26,301	27,339	29,175	30,659	32,834	36,873	40,287	44,400	50,169	55,250	66,962

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

^b Comprises business establishments involved in scenic and sightseeing transportation, support activities for transportation, and couriers and messengers.

NOTES

Data in this table is based on the 2012 NAICS codes. The Bureau of Economic Analysis (BEA) provides this data on a Standard Industrial Classification (SIC) basis ending in 2000 and on a NAICS basis beginning in 1998.

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 salary paid is usually very small.

Table 3-28: Labor Productivity Indices for Selected Transportation Industries (North American Industry Classification System [NAICS] basis) (Index, 2007 = 100)

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Labor productivity^a														
Air transportation	44	59	84	102	102	109	114	114	113	114	118	124	126	54
Line-haul railroads	50	82	100	109	106	107	109	113	111	117	121	122	124	148
General freight trucking, long-distance	81	92	99	105	107	104	106	109	110	110	115	116	114	114
Postal Service	84	94	99	94	94	90	90	88	88	87	84	83	81	81
Couriers and messengers	102	94	97	79	78	74	69	65	63	63	63	60	52	47
Output per employee^b														
Air transportation	52	66	94	103	103	104	108	110	112	112	111	113	115	49
Line-haul railroads	52	85	101	106	105	104	107	109	105	110	119	124	125	144
General freight trucking, long-distance	76	91	100	107	109	106	108	111	111	112	118	119	115	115
Postal Service	82	94	101	91	93	90	91	89	89	89	86	86	84	86
Couriers and messengers	102	101	99	77	74	71	69	65	63	63	63	59	52	48

^a Defined as output per hour, based on the number of paid hours.

^b Full-time and part-time employees are counted equally. Hence, these data do not reflect output per full-time equivalent employee.

NOTES

Bureau of Labor Statistics developed labor productivity indexes for all manufacturing and retail trade of the North American Industry Classification System (NAICS) industries as well as selected mining, transportation, communications and services industries.

Section D:
Government Finance

Table 3-29: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (millions of current dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total government revenues	163,884	163,222	157,684	160,472	171,324	179,173	174,527	183,537	194,195	194,420	203,528	212,179
Federal	53,967	52,102	47,287	47,244	50,310	54,473	50,686	54,161	56,714	57,279	57,628	58,841
State and local	109,917	111,120	110,397	113,227	121,014	124,699	123,841	129,376	137,481	137,141	145,900	153,338
Total government expenditures	268,843	284,343	300,267	303,516	303,784	314,024	309,276	324,000	329,551	339,439	352,285	370,571
State and local expenditures including federal transfers	243,373	256,501	270,478	271,470	270,602	281,248	277,065	291,241	297,255	304,305	318,231	337,161
Federal transfers	47,579	50,837	53,937	57,013	54,408	58,262	57,282	58,756	57,107	59,631	57,629	64,282
Federal expenditures, less transfers	25,470	27,841	29,789	32,046	33,182	32,776	32,211	32,759	32,296	35,134	34,054	33,410

NOTES

Numbers may not add to totals due to rounding.

Total government expenditure is the sum of state and local expenditure including federal transfers and federal expenditures, less transfers.

Government transportation revenues consist of money collected by governments from transportation user charges and taxes to finance transportation programs. The following types of receipts are excluded:
 1) revenues collected from users of the transportation system that are directed to the general fund and used for nontransportation purposes, 2) nontransportation general fund revenues that are used to finance transportation programs and 3) proceeds from borrowing.

Total government revenues are for own source revenue only.

Table 3-30: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (millions of chained 2012 dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total government revenues	191,702	179,725	173,170	172,523	176,918	179,173	170,783	177,038	188,206	188,007	191,309	191,113
Federal	59,521	55,985	50,182	48,922	50,721	54,473	49,922	52,321	54,143	54,296	53,304	52,667
State and local	131,856	123,657	123,076	123,777	126,238	124,699	120,871	124,723	133,946	133,773	138,096	138,596
Total government expenditures	319,738	315,193	332,984	329,876	315,745	314,024	302,145	312,420	320,507	330,163	332,682	334,594
State and local expenditures including federal transfers	291,951	285,439	301,543	296,763	282,283	281,248	270,421	280,768	289,612	296,831	301,209	304,745
Federal transfers	57,076	56,573	60,131	62,325	56,757	58,262	55,908	56,643	55,638	58,167	54,546	58,101
Federal expenditures, less transfers	28,091	29,916	31,612	33,184	33,453	32,776	31,725	31,646	30,902	33,304	31,499	29,904

NOTES

Numbers may not add to totals due to rounding.

Total government expenditure is the sum of state and local expenditure including federal transfers and federal expenditures, less transfers.

Government transportation revenues consist of money collected by governments from transportation user charges and taxes to finance transportation programs. The following types of receipts are excluded:
 1) revenues collected from users of the transportation system that are directed to the general fund and used for nontransportation purposes, 2) nontransportation general fund revenues that are used to finance transportation programs and 3) proceeds from borrowing.

Data deflated using separate price indexes for federal transportation (NIPA Table 3.15.4 Line 19) and state & local transportation (NIPA Table 3.15.4 Line 31).

All chained-dollar measures are calculated based on the Fisher Ideal quantity index formula.

Total government revenues are for own source revenue only.

Table 3-31: Summary of Transportation Revenues and Expenditures from Own Funds and User Coverage, Fiscal Year (millions of current and chained 2012 dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Federal revenues												
Current	53,967	52,102	47,287	47,244	50,310	54,473	50,686	54,161	56,714	57,279	57,628	58,841
Chained	59,521	55,985	50,182	48,922	50,721	54,473	49,922	52,321	54,266	54,296	53,304	52,667
Federal expenditures												
Current	73,049	78,679	83,725	89,059	87,590	91,038	89,493	91,515	89,403	94,765	91,683	97,692
Chained	85,005	86,407	91,652	95,427	90,226	91,038	87,632	88,290	86,540	91,486	86,064	87,986
Federal user coverage (percent)	74	66	56	53	57	60	57	59	63	60	63	60
State and local revenues												
Current	109,917	111,120	110,397	113,227	121,014	124,699	123,841	129,376	137,481	137,141	145,900	153,338
Chained	131,856	123,657	123,076	123,777	126,238	124,699	120,871	124,723	133,946	133,773	138,096	138,596
State and local expenditures												
Current	195,794	205,664	216,542	214,457	216,194	222,986	219,783	232,485	240,148	244,674	260,602	272,879
Chained	234,874	228,867	241,412	234,439	225,526	222,986	214,513	224,125	233,974	238,665	246,663	246,644
State and local user coverage (percent)	56	54	51	53	56	56	56	56	57	56	56	56

NOTES

State and local expenditure includes outlays from all sources of funds excluding federal transfers.

Federal expenditure includes direct federal spending and transfers to state and local governments.

Government transportation revenues consist of money collected by governments from transportation user charges and taxes to finance transportation programs. The following types of receipts are excluded: 1) revenues collected from users of the transportation system that are directed to the general fund and used for nontransportation purposes, 2) nontransportation general fund revenues that are used to finance transportation programs and 3) proceeds from borrowing.

User coverage ratio is a measure of the extent to which federal outlays on transportation programs are covered by receipt from transportation-related taxes and charges that are earmarked for transportation programs. The coverage ratios are based on the current dollar amounts.

Data deflated using separate price indexes for federal transportation (NIPA Table 3.15.4 Line 19) and state & local transportation (NIPA Table 3.15.4 Line 31).

All chained-dollar measures are calculated based on the Fisher Ideal quantity index formula.

Government revenues are for own source revenue only.

BTS is in the process of reviewing and revising 2017 railroad and transit expenditures to account for new budget line items. All affected tables will be updated shortly.

Table 3-32: Transportation Revenues by Level of Government and Mode, Fiscal Year (millions of current dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Federal, state and local, total	163,884	163,222	157,684	160,472	171,324	179,173	174,527	183,537	194,195	194,420	203,528	212,179
Highway	115,443	112,637	109,398	111,614	118,598	125,026	119,179	125,709	133,766	132,365	138,760	146,096
Air	29,580	30,895	27,931	28,427	29,968	31,103	31,276	32,929	34,325	35,542	37,088	38,474
Transit	13,868	14,586	15,288	15,328	17,234	17,607	18,350	18,835	19,623	20,009	20,636	21,228
Water	4,963	5,073	5,029	5,055	5,485	5,385	5,679	6,025	6,435	6,487	7,028	6,361
Pipeline	13	18	17	18	15	20	19	17	23	18	16	21
General support	16	14	20	29	25	31	24	22	23	0	0	0
Railroads	0	0	0	0	0	0	0	0	0	0	0	0
Federal, total	53,967	52,102	47,287	47,244	50,310	54,473	50,686	54,161	56,714	57,279	57,628	58,841
Highway	40,652	38,458	35,144	35,026	36,955	40,265	36,448	39,031	40,789	41,224	40,984	42,587
Air	12,187	12,672	11,109	10,995	12,003	12,796	13,122	13,805	14,554	14,694	15,363	15,129
Water	1,099	940	997	1,176	1,312	1,361	1,074	1,286	1,325	1,343	1,265	1,104
Pipeline	13	18	17	18	15	20	19	17	23	18	16	21
General support	16	14	20	29	25	31	24	22	23	0	0	0
Railroads	0	0	0	0	0	0	0	0	0	0	0	0
State and local, total	109,917	111,120	110,397	113,227	121,014	124,699	123,841	129,376	137,481	137,141	145,900	153,338
Highway	74,791	74,179	74,254	76,588	81,642	84,761	82,731	86,678	92,977	91,141	97,776	103,509
Air	17,393	18,223	16,822	17,432	17,965	18,307	18,155	19,124	19,771	20,848	21,725	23,344
Transit	13,868	14,586	15,288	15,328	17,234	17,607	18,350	18,835	19,623	20,009	20,636	21,228
Water	3,864	4,133	4,032	3,879	4,173	4,024	4,605	4,739	5,110	5,144	5,763	5,257

NOTES

Numbers may not add to total due to independent rounding.

Government transportation revenues consist of money collected by governments from transportation user charges and taxes to finance transportation programs. The following types of receipts are excluded: 1) revenues collected from users of the transportation system that are directed to the general fund and used for non-transportation purposes, 2) non-transportation general fund revenues that are used to finance transportation programs and 3) proceeds from borrowing.

Government revenues are for own source revenue only.

Table 3-33: Transportation Revenues by Level of Government and Mode, Fiscal Year (millions of chained 2012 dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Federal, state and local, total	191,702	179,725	173,170	172,523	176,918	179,173	170,783	177,038	188,206	188,007	191,309	191,113
Highway	135,038	124,025	120,143	119,996	122,470	125,026	116,622	121,258	129,640	127,999	130,429	131,590
Air	34,601	34,018	30,675	30,562	30,946	31,103	30,605	31,763	33,266	34,369	34,861	34,654
Transit	16,636	16,231	17,044	16,757	17,978	17,607	17,910	18,158	19,118	19,517	19,533	19,187
Water	5,806	5,586	5,523	5,434	5,664	5,385	5,557	5,812	6,237	6,273	6,606	5,730
Pipeline	14	19	18	19	15	20	19	16	22	17	15	19
General support	18	15	21	30	25	31	24	21	22	0	0	0
Railroads	0	0	0	0	0	0	0	0	0	0	0	0
Federal, total	59,521	55,985	50,182	48,922	50,721	54,473	49,922	52,321	54,266	54,296	53,304	52,667
Highway	44,836	41,324	37,296	36,270	37,257	40,265	35,898	37,705	39,028	39,077	37,909	38,118
Air	13,441	13,616	11,789	11,386	12,101	12,796	12,924	13,336	13,926	13,929	14,210	13,542
Water	1,212	1,010	1,058	1,218	1,323	1,361	1,058	1,242	1,268	1,273	1,170	988
Pipeline	14	19	18	19	15	20	19	16	22	17	15	19
General support	18	15	21	30	25	31	24	21	22	0	0	0
Railroads	0	0	0	0	0	0	0	0	0	0	0	0
State and local, total	131,856	123,657	123,076	123,777	126,238	124,699	120,871	124,723	133,946	133,773	138,096	138,596
Highway	89,720	82,547	82,782	83,724	85,167	84,761	80,747	83,561	90,586	88,903	92,546	93,557
Air	20,865	20,278	18,755	19,056	18,740	18,307	17,719	18,436	19,263	20,336	20,563	21,100
Transit	16,636	16,231	17,044	16,757	17,978	17,607	17,910	18,158	19,118	19,517	19,533	19,187
Water	4,635	4,600	4,495	4,240	4,353	4,024	4,494	4,569	4,979	5,017	5,454	4,752

NOTES

Numbers may not add to totals due to rounding.

Government transportation revenues consist of money collected by governments from transportation user charges and taxes to finance transportation programs. The following types of receipts are excluded: 1) revenues collected from users of the transportation system that are directed to the general fund and used for non-transportation purposes, 2) non-transportation general fund revenues that are used to finance transportation programs and 3) proceeds from borrowing.

Data deflated using separate price indexes for federal transportation (NIPA, Table 3.15.4 Line 19) and state & local transportation (NIPA Table 3.15.4 Line 31).

All chained-dollar measures are calculated based on the Fisher Ideal quantity index formula.

Rows may not total due to Fisher Ideal Chaining.

Government revenues are for own source revenue only.

Table 3-34: Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year (millions of dollars)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL, all funds															
Current dollars	16,441	31,795	48,176	27,609	46,264	40,729	36,138	30,570	41,144	39,047	97,948	86,241	77,399	66,949	43,302
Chained 2012 dollars	34,126	61,011	70,226	33,625	48,501	41,440	36,138	29,873	39,397	37,330	93,254	80,301	69,534	59,018	37,759
Airport / Airway Trust Fund															
Current dollars	5,442	14,355	13,934	11,290	9,428	10,326	11,623	13,203	14,187	14,071	14,773	15,088	16,982	17,916	8,971
Chained 2012 dollars	11,296	27,546	20,312	13,750	9,884	10,506	11,623	12,902	13,585	13,452	14,079	14,049	15,256	15,794	7,823
Highway Trust Fund, total															
Current dollars	N	16,784	31,101	12,542	29,233	21,638	14,925	6,263	14,846	11,910	69,218	56,293	44,507	32,906	17,829
Chained 2012 dollars	N	32,207	45,336	15,275	30,647	22,015	14,925	6,120	14,216	11,386	65,968	52,416	39,984	29,008	15,547
Highway Trust Fund, highway account															
Current dollars	10,999	9,629	22,554	10,592	20,743	14,323	9,731	3,771	11,376	9,040	51,435	41,443	32,605	24,652	U
Chained 2012 dollars	22,830	18,477	32,876	12,900	21,747	14,572	9,731	3,685	10,892	8,643	49,021	38,588	29,292	21,731	U
Highway Trust Fund, transit account															
Current dollars	N	7,155	8,547	1,950	8,489	7,315	5,194	2,492	3,471	2,869	17,782	14,850	11,902	8,254	U
Chained 2012 dollars	N	13,730	12,460	2,375	8,900	7,443	5,194	2,435	3,323	2,743	16,948	13,827	10,693	7,276	U
Harbor Maintenance Trust Fund															
Current dollars	N	30	1,621	2,695	5,474	6,280	6,958	7,806	8,316	8,684	8,781	9,108	9,332	9,307	9,146
Chained 2012 dollars	N	58	2,363	3,282	5,739	6,390	6,958	7,628	7,963	8,302	8,369	8,481	8,384	8,204	7,975
Inland Waterways Trust Fund															
Current dollars	N	281	364	323	38	32	46	38	24	53	57	64	132	70	131
Chained 2012 dollars	N	539	531	393	40	33	46	37	23	51	54	60	119	62	114
Oil Spill Liability Trust Fund															
Current dollars	N	345	1,156	759	2,091	2,453	2,586	3,260	3,771	4,329	5,019	5,752	6,578	6,820	7,356
Chained 2012 dollars	N	662	1,685	924	2,192	2,496	2,586	3,186	3,611	4,139	4,783	5,356	5,910	6,012	6,414

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

NOTE

Reported figures are cash balances at the end of the fiscal year for all trust funds.

Table 3-35: Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (millions of current dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Federal, state and local, total	268,843	284,343	300,267	303,516	303,784	314,024	309,276	324,000	329,551	339,439	352,285	370,571
Highways	174,808	181,528	189,791	191,351	193,649	203,314	196,539	207,118	206,907	213,092	223,429	235,483
Air	34,107	36,828	39,022	40,478	39,200	38,105	37,647	38,576	39,330	40,369	43,004	46,458
Transit	46,183	51,811	54,897	54,245	53,042	55,205	57,353	59,699	64,261	66,530	66,861	70,009
Water	11,301	11,933	13,655	13,365	13,919	13,585	13,707	14,296	14,855	14,090	14,921	15,244
Rail	1,477	1,478	1,820	2,661	2,426	2,291	2,465	2,812	2,723	3,765	3,108	2,684
Pipeline	76	73	82	95	101	91	102	110	100	112	89	95
General support	891	691	1,000	1,321	1,447	1,434	1,463	1,389	1,375	1,480	873	598
Federal, total	25,470	27,841	29,789	32,046	33,182	32,776	32,211	32,759	32,296	35,134	34,054	33,410
Highways	2,284	2,906	2,861	3,580	3,850	3,220	3,326	3,172	2,706	4,980	4,366	3,328
Air	14,021	15,551	16,269	16,269	16,515	17,223	16,508	16,922	16,840	16,610	17,036	18,040
Transit	215	159	168	148	149	153	142	138	125	150	138	32
Water	6,543	7,019	7,640	8,024	8,750	8,416	8,267	8,286	8,500	8,124	8,516	8,712
Rail	1,472	1,477	1,820	2,661	2,426	2,291	2,465	2,812	2,723	3,765	3,108	2,684
Pipeline	57	50	47	65	66	61	64	62	50	52	40	43
General support	878	679	984	1,299	1,426	1,412	1,439	1,367	1,352	1,453	850	571
State and local, total	243,373	256,501	270,478	271,470	270,602	281,248	277,065	291,241	297,255	304,305	318,231	337,161
Highways	172,524	178,622	186,930	187,771	189,799	200,094	193,212	203,945	204,201	208,113	219,062	232,155
Air	20,086	21,277	22,753	24,209	22,685	20,882	21,139	21,654	22,490	23,759	25,968	28,418
Transit	45,968	51,652	54,729	54,097	52,893	55,052	57,211	59,561	64,136	66,380	66,723	69,977
Water	4,758	4,914	6,015	5,341	5,169	5,169	5,440	6,010	6,355	5,966	6,405	6,532
Rail	5	1	0	0	0	0	0	0	0	0	0	0
Pipeline	19	23	35	30	35	30	38	48	50	60	49	52
General support	13	12	16	22	21	22	24	22	23	27	23	27

NOTES

Numbers may not add to totals due to rounding.

Federal expenditures from own funds include direct expenditures only and exclude transfers to state and local governments. State and local expenditures from own funds include outlays of the state and local governments from all sources.

Federal expenditure on *General support* declined in 2017 and 2018 due to a drop in Transportation Security Administration funding of Transportation Security Support which decreased from \$973.0 million in 2016 to \$503.0 million in 2017 and \$139.0 million in 2018.

Table 3-36: Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (millions of chained 2012 dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Federal, state and local, total	319,738	315,193	332,984	329,876	315,745	314,024	302,145	312,420	320,507	330,163	332,682	334,594
Highways	207,901	201,223	210,470	207,970	201,273	203,314	192,007	199,715	201,229	207,269	210,996	212,620
Air	40,564	40,824	43,274	43,994	40,743	38,105	36,779	37,197	38,251	39,266	40,612	41,947
Transit	54,926	57,432	60,879	58,956	55,130	55,205	56,030	57,566	62,498	64,712	63,141	63,212
Water	13,440	13,228	15,143	14,526	14,467	13,585	13,391	13,785	14,447	13,705	14,090	13,764
Rail	1,757	1,638	2,018	2,892	2,522	2,291	2,408	2,711	2,648	3,662	2,935	2,423
Pipeline	90	81	91	103	105	91	100	106	97	109	84	86
General support	1,060	766	1,109	1,436	1,504	1,434	1,429	1,339	1,337	1,440	824	540
Federal, total	28,091	29,916	31,612	33,184	33,453	32,776	31,725	31,646	30,902	33,304	31,499	29,904
Highways	2,519	3,123	3,036	3,707	3,882	3,220	3,276	3,065	2,589	4,720	4,039	2,979
Air	15,464	16,710	17,265	16,847	16,650	17,223	16,259	16,347	16,113	15,745	15,758	16,147
Transit	237	171	178	153	150	153	140	133	120	142	128	29
Water	7,216	7,542	8,108	8,309	8,821	8,416	8,142	8,004	8,133	7,701	7,877	7,798
Rail	1,624	1,587	1,931	2,756	2,446	2,291	2,428	2,716	2,605	3,569	2,875	2,402
Pipeline	63	54	50	67	67	61	63	60	48	49	37	38
General support	968	730	1,044	1,345	1,438	1,412	1,417	1,321	1,294	1,377	786	511
State and local, total	291,951	285,439	301,543	296,763	282,283	281,248	270,421	280,768	289,612	296,831	301,209	304,745
Highways	206,960	198,774	208,399	205,266	197,992	200,094	188,579	196,612	198,951	203,001	207,345	209,834
Air	24,095	23,678	25,367	26,465	23,664	20,882	20,632	20,875	21,912	23,176	24,580	25,686
Transit	55,143	57,479	61,015	59,137	55,176	55,052	55,839	57,420	62,487	64,750	63,154	63,249
Water	5,708	5,468	6,706	5,839	5,392	5,169	5,310	5,794	6,192	5,820	6,062	5,904
Rail	6	1	0	0	0	0	0	0	0	0	0	0
Pipeline	23	26	39	33	37	30	37	46	49	59	46	47
General support	16	13	18	24	22	22	23	21	22	26	22	24

NOTES

Numbers may not add to totals due to rounding.

Federal expenditures from own funds include direct expenditures only and exclude transfers to state and local governments. State and local expenditures from own funds include outlays of the state and local governments from all sources.

Federal expenditure on *General support* declined in 2017 and 2018 due to a drop in Transportation Security Administration funding of Transportation Security Support which decreased from \$973.0 million in 2016 to \$503.0 million in 2017 and \$139.0 million in 2018.

Data deflated using separate price indexes for federal transportation (NIPA Table 3.15.4 Line 19) and state & local transportation (NIPA Table 3.15.4 Line 31).

All chained-dollar measures are calculated based on the Fisher Ideal quantity index formula.

Rows may not total due to Fisher Ideal Chaining.

Table 3-37: Federal Transportation Transfers to State and Local Governments by Mode, Fiscal Year (millions of current dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total, all modes	47,579	50,837	53,937	57,013	54,408	58,262	57,282	58,756	57,107	59,631	57,629	64,282
Highway	34,697	37,158	39,497	43,522	41,686	44,187	43,099	44,118	42,719	44,822	42,804	46,678
Air	3,874	3,808	3,759	3,156	3,095	3,012	3,519	3,100	2,988	2,963	3,129	3,054
Transit	8,984	9,847	10,536	10,177	9,471	10,920	10,500	11,382	11,250	11,738	11,590	14,442
Water	0	0	110	128	121	113	126	108	100	108	106	108
Rail	5	1	0	0	0	0	0	0	0	0	0	0
Pipeline	19	23	35	30	35	30	38	48	50	0	0	0
General Support	0	0	0	0	0	0	0	0	0	0	0	0

NOTE

Numbers may not add to totals due to rounding.

Table 3-38: Federal Transportation Transfers to State and Local Governments by Mode, Fiscal Year (millions of chained 2012 dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total, all modes	57,076	56,573	60,131	62,325	56,757	58,262	55,908	56,643	55,638	58,167	54,546	58,101
Highway	41,623	41,351	44,033	47,577	43,485	44,187	42,065	42,532	41,620	43,721	40,514	42,190
Air	4,647	4,238	4,191	3,450	3,229	3,012	3,435	2,989	2,911	2,890	2,962	2,760
Transit	10,777	10,958	11,746	11,125	9,880	10,920	10,248	10,973	10,961	11,450	10,970	13,053
Water	0	0	123	140	126	113	123	104	97	105	100	98
Rail	6	1	0	0	0	0	0	0	0	0	0	0
Pipeline	23	26	39	33	37	30	37	46	49	0	0	0
General Support	0	0	0	0	0	0	0	0	0	0	0	0

NOTES

Numbers may not add to totals due to rounding.

Data deflated using separate price indexes for federal transportation (NIPA Table 3.15.4 Line 19) and state & local transportation (NIPA Table 3.15.4 Line 31).

All chained-dollar measures are calculated based on the Fisher Ideal quantity index formula.



CHAPTER 4

Transportation, Energy, and the Environment

Section A: U.S. Transportation

Section Energy Consumption

Table 4-1: Overview of U.S. Petroleum Production, Imports, Exports, and Consumption (million barrels per day)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Domestic production, total^a	7.96	11.30	10.17	8.91	7.73	6.90	7.56	7.88	8.93	10.10	11.80	12.79	12.36	13.15	15.33	17.07	16.47
Crude oil ^b	7.04	9.64	8.60	7.36	5.82	5.18	5.48	5.67	6.52	7.49	8.79	9.45	8.85	9.37	10.96	12.25	11.31
Natural gas plant liquids	0.93	1.66	1.57	1.56	1.91	1.72	2.07	2.22	2.41	2.61	3.01	3.34	3.51	3.78	4.37	4.82	5.16
Gross imports, total	1.81	3.42	6.91	8.02	11.46	13.71	11.79	11.44	10.60	9.86	9.24	9.45	10.06	10.14	9.94	9.14	7.86
Crude oil ^{b,c}	1.02	1.32	5.26	5.89	9.07	10.13	9.21	8.94	8.53	7.73	7.34	7.36	7.85	7.97	7.77	6.80	5.88
Petroleum products ^d	0.80	2.10	1.65	2.12	2.39	3.59	2.58	2.50	2.07	2.13	1.90	2.09	2.20	2.18	2.17	2.34	1.98
Exports	0.20	0.26	0.54	0.86	1.04	1.16	2.35	2.99	3.20	3.62	4.18	4.74	5.26	6.38	7.60	8.47	8.51
U.S. net imports^e	1.61	3.16	6.36	7.16	10.42	12.55	9.44	8.45	7.39	6.24	5.07	4.71	4.79	3.77	2.34	0.67	-0.65
U.S. petroleum consumption	9.80	14.70	17.06	16.99	19.70	20.80	19.18	18.90	18.48	18.97	19.10	19.53	19.69	19.95	20.51	20.54	18.12
By the transportation sector	5.14	7.78	9.55	10.89	13.01	13.96	13.50	13.29	13.01	13.25	13.45	13.65	13.89	14.02	14.15	14.14	11.96
Transportation petroleum use as a percent of domestic petroleum production	64.5	68.9	93.9	122.1	168.3	202.3	178.6	168.6	145.7	131.2	114.0	106.7	112.4	106.6	92.3	82.8	72.6
Transportation petroleum use as a percent of domestic petroleum consumption	52.4	52.9	56.0	64.1	66.0	67.1	70.4	70.3	70.4	69.9	70.4	69.9	70.5	70.2	69.0	68.8	66.0
World petroleum consumption	21.34	46.81	63.11	66.67	77.07	84.65	88.70	89.38	90.71	92.24	93.53	95.26	96.79	98.94	100.05	U	U
U.S. petroleum consumption as percent of world petroleum consumption	45.9	31.4	27.0	25.5	25.6	24.6	21.6	21.1	20.4	20.6	20.4	20.5	20.3	20.2	20.5	U	U

KEY: U = data are not available.^a Includes crude oil and natural gas plant liquids. This data series has been revised from 1975 forward to exclude the field production of other liquids including: finished motor gasoline, motor gasoline blending components, and other hydrocarbons and oxygenates.^b Includes lease condensate.^c Includes imports for the Strategic Petroleum Reserve, which began in 1977.^d Beginning in 1985, motor gasoline blending components and aviation gasoline blending components are included.^e Net imports is equal to Imports minus Exports.**NOTE**

Component numbers may not add to totals due to independent rounding.

Table 4-2: U.S. Consumption of Energy from Primary Sources by Sector (quadrillion Btu)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy consumption, total	45.04	67.82	78.02	84.43	98.70	100.10	97.51	96.86	94.37	97.12	98.28	97.38	97.34	97.60	101.16	100.29	92.97
Transportation	10.56	16.06	19.66	22.37	26.46	28.18	26.90	26.52	26.05	26.53	26.79	27.16	27.71	27.94	28.39	28.43	24.23
Transportation as percent of total energy consumption	23.4	23.7	25.2	26.5	26.8	28.2	27.6	27.4	27.6	27.3	27.3	27.9	28.5	28.6	28.1	28.4	26.1
Industrial	16.95	22.94	22.55	21.12	22.75	21.34	20.33	20.51	20.78	21.38	21.46	21.42	21.55	21.95	22.86	23.05	22.18
Industrial as percent of total energy consumption	37.6	33.8	28.9	25.0	23.0	21.3	20.8	21.2	22.0	22.0	21.8	22.0	22.1	22.5	22.6	23.0	23.9
Residential	2.72	4.24	4.11	3.89	4.28	4.05	4.02	4.07	3.73	4.16	4.39	4.44	4.32	4.37	4.78	4.79	4.31
Residential as percent of total energy consumption	6.0	6.2	5.3	4.6	4.3	4.0	4.1	4.2	3.9	4.3	4.5	4.6	4.4	4.5	4.7	4.8	4.6
Commercial	6.65	8.32	7.44	6.55	7.16	6.90	6.64	6.47	5.68	6.69	7.01	6.46	6.03	6.10	6.98	7.02	6.48
Commercial as percent of total energy consumption	14.8	12.3	9.5	7.8	7.3	6.9	6.8	6.7	6.0	6.9	7.1	6.6	6.2	6.2	6.9	7.0	7.0
Energy input at electric utilities	8.16	16.25	24.27	30.50	38.06	39.63	39.62	39.29	38.13	38.36	38.63	37.89	37.73	37.24	38.16	37.00	35.76
Energy input at electric utilities as percent of total energy consumption	18.1	24.0	31.1	36.1	38.6	39.6	40.6	40.6	40.4	39.5	39.3	38.9	38.8	38.2	37.7	36.9	38.5
Percentage of primary demand met by petroleum																	
Transportation	95.9	95.3	96.7	96.7	97.5	97.8	97.4	97.2	97.0	96.7	97.2	97.3	97.3	97.1	96.6	96.4	95.8
Industrial	33.7	33.8	42.0	38.8	39.6	44.9	39.8	39.3	38.9	38.7	37.5	38.1	38.3	38.5	38.4	38.6	38.4
Residential	81.8	64.3	42.3	35.8	36.3	35.8	27.8	25.4	23.8	23.1	23.6	22.7	20.3	20.0	21.4	20.4	20.2
Commercial	18.8	19.1	17.7	15.1	11.3	11.0	9.8	9.8	9.9	8.4	8.3	13.8	14.2	13.9	12.5	12.4	11.8
Electric utilities	6.8	13.0	10.9	4.2	3.0	3.1	0.9	0.8	0.6	0.7	0.8	0.7	0.6	0.6	0.7	0.5	0.5

KEY: Btu = British thermal unit.

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 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.

Table 4-3: Domestic Demand for Refined Petroleum Products by Sector (quadrillion Btu)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total petroleum demand	19.87	29.50	34.16	33.50	38.15	40.22	35.32	34.64	33.83	34.40	34.66	35.37	35.71	36.04	36.89	36.87	32.23
Transportation	10.13	15.31	19.01	21.63	25.65	27.22	25.10	24.63	24.11	24.36	24.73	25.08	25.51	25.70	26.01	25.99	21.95
Industrial	5.72	7.75	9.46	8.20	9.00	9.57	8.08	8.05	8.06	8.26	8.02	8.14	8.25	8.43	8.75	8.87	8.49
Residential	2.23	2.73	1.73	1.39	1.55	1.45	1.12	1.03	0.89	0.96	1.04	1.01	0.88	0.87	1.02	0.98	0.87
Commercial	1.25	1.59	1.32	0.99	0.81	0.76	0.65	0.63	0.56	0.56	0.58	0.86	0.83	0.82	0.84	0.85	0.74
Electric utilities	0.55	2.12	2.63	1.29	1.14	1.22	0.37	0.30	0.21	0.26	0.30	0.28	0.24	0.22	0.26	0.19	0.18
Transportation as percent of total petroleum demand	50.9	51.9	55.6	64.6	67.2	67.7	71.1	71.1	71.3	70.8	71.3	70.9	71.4	71.3	70.5	70.5	68.1

KEY: Btu = British thermal unit.

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 a different Btu content per unit volume.
The sum of components may not add to totals due to rounding.

Section B:

Transportation Energy Consumption by Mode

Table 4-4: U.S. Energy Consumption by the Transportation Sector (quadrillion Btu)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy consumption (all sectors)	45.04	67.82	78.02	84.43	98.70	100.10	97.51	96.86	94.37	97.12	98.28	97.38	97.34	97.60	101.16	100.29	92.97
Total transportation consumption ^a	10.60	16.10	19.70	22.42	26.52	28.26	26.98	26.60	26.13	26.61	26.87	27.24	27.79	28.01	28.47	28.51	24.30
Transportation as percent of total energy consumption	23.53	23.74	25.25	26.55	26.86	28.23	27.67	27.46	27.68	27.40	27.34	27.97	28.55	28.70	28.14	28.42	26.13
Total primary consumption ^b	10.56	16.06	19.66	22.37	26.46	28.18	26.90	26.52	26.05	26.53	26.79	27.16	27.71	27.94	28.39	28.43	24.23
Coal ^c	0.075	0.007	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
in million short tons ^c	3.046	0.298	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
Natural gas ^d	0.36	0.74	0.65	0.68	0.67	0.62	0.72	0.73	0.78	0.89	0.76	0.74	0.76	0.80	0.96	1.04	1.02
in trillion cubic feet	0.35	0.72	0.63	0.66	0.65	0.61	0.70	0.72	0.76	0.86	0.74	0.72	0.73	0.77	0.93	1.00	0.98
Petroleum products ^e	10.13	15.31	19.01	21.63	25.65	27.22	25.10	24.63	24.11	24.36	24.73	25.08	25.51	25.70	26.01	25.99	21.95
in million barrels	1,880	2,839	3,494	3,974	4,762	5,094	4,927	4,851	4,763	4,837	4,911	4,982	5,083	5,116	5,166	5,162	4,379
Electricity	0.010	0.011	0.011	0.016	0.018	0.026	0.026	0.026	0.025	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.022
Electrical system energy losses ^f	0.026	0.026	0.027	0.037	0.042	0.056	0.055	0.054	0.051	0.053	0.053	0.051	0.050	0.050	0.050	0.048	0.041

KEY: Btu = British thermal unit; Z = a value of zero, or value too small to report.

^a Sum of primary consumption, electricity, and electrical system energy losses categories.

^b Sum of biomass, natural gas, and petroleum categories.

^c Beginning from 1980, small amounts of coal consumed for transportation are included in industrial sector consumption.

^d Consumed in the operation of pipelines, primarily in compressors, and small amounts consumed as vehicle fuel.

^e 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.

^f Incurred in the generation, transmission, and distribution of electricity plus plant use and unaccounted for electrical system energy losses.

NOTE

Energy consumption (all sectors) differs from totals in table 4-2 for 1990 and subsequent years.

Table 4-5: Fuel Consumption by Mode of Transportation in Physical Units

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Air																
Certificated carriers ^a																
Jet fuel (million gallons)	1,954	7,857	8,519	12,212	13,904	13,284	11,057	10,828	10,238	10,156	10,293	10,741	11,167	11,340	11,848	12,184
General aviation ^b																
Aviation gasoline (million gallons)	242	551	520	353	333	295	221	216	206	197	210	196	206	206	232	231
Jet fuel (million gallons)	N	208	766	663	972	1,527	1,435	1,456	1,435	1,260	1,466	1,383	1,437	1,541	1,820	1,879
Highway																
Gasoline, diesel and other fuels (million gallons)																
Light duty vehicle, short wheel base and motorcycle ^c	41,171	67,879	70,186	69,759	73,275	77,608	87,215	88,785	89,091	89,079	89,759	90,479	91,954	92,171	92,042	93,868
Light duty vehicle, long wheel base ^c	N	12,313	23,796	35,611	52,939	58,869	36,251	35,335	35,114	35,159	37,343	36,437	37,819	37,467	37,189	38,029
Single-unit 2-axle 6-tire or more truck	N	3,968	6,923	8,172	9,563	9,501	15,097	14,215	14,376	14,502	14,894	14,851	15,338	15,600	16,080	16,657
Combination truck	N	7,348	13,037	16,133	25,666	27,689	29,927	28,181	27,975	28,795	29,118	28,886	29,555	30,364	30,325	28,987
Bus	827	820	1,018	895	1,112	1,120	1,921	1,936	2,063	2,117	2,233	2,228	2,226	2,350	2,494	2,451
Transit^d																
Electricity (million kWh)	2,908	2,561	2,446	4,837	5,382	5,765	6,414	6,534	6,506	6,651	6,673	6,668	6,604	6,611	6,749	6,877
Motor fuel (million gallons)																
Diesel ^e	208	271	431	651	591	532	633	625	613	609	541	576	590	579	568	561
Gasoline and other nondiesel fuels ^f	192	68	11	34	24	29	98	101	102	107	108	114	116	113	112	116
Compressed natural gas	N	N	N	N	44	94	126	128	124	132	137	156	167	172	178	188
Rail, Class I (in freight service)																
Distillate / diesel fuel (million gallons)	3,463	3,545	3,904	3,115	3,700	4,098	3,494	3,685	3,600	3,682	3,867	3,692	3,385	3,495	3,656	3,419
Amtrak																
Electricity (million kWh)	N	N	254	330	470	531	559	555	549	525	515	504	516	490	485	484
Distillate / diesel fuel (million gallons)	N	N	64	82	95	65	63	63	63	66	66	62	60	64	65	63
Water																
Residual fuel oil (million gallons)	3,952	3,774	8,952	6,326	6,410	5,179	5,143	4,560	4,820	4,212	3,847	3,358	2,930	2,579	2,687	2,189
Distillate / diesel fuel oil (million gallons)	787	819	1,478	2,065	2,261	2,006	2,003	2,133	1,768	1,676	1,593	2,417	2,245	2,186	2,213	2,042
Gasoline (million gallons)	N	598	1,052	1,300	1,124	1,261	1,167	1,104	1,093	1,123	1,126	2,066	2,323	2,323	2,090	2,128
Pipeline																
Natural gas (million cubic feet)	347,075	722,166	634,622	659,816	642,210	584,026	674,124	687,784	730,790	833,061	700,150	678,183	686,732	722,049	876,535	944,265

KEY: kWh = kilowatt-hour. N = data do not exist.

^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 no respondents and are therefore not comparable to earlier years. See the accuracy statement in the appendix for more detailed information.^c Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category *Passenger car* and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces *Other 2-axle, 4-tire vehicle* and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.^d Data from 1997 are not comparable to data before 1997 due to different sources. Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and small systems.^e *Diesel* includes Diesel and Bio-Diesel.^f *Gasoline and all other nondiesel fuels* include Gasoline, Liquefied Petroleum Gas, Methane, Ethanol, Bunker Fuel, Kerosene, Grain Additive, and Other Fuel.

Chapter 4. Transportation, Energy, and the Environment

Table 4-6: Energy Consumption by Mode of Transportation (trillion Btu)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Air																
Certificated carriers ^a																
Jet fuel	264	1,061	1,150	1,649	1,877	1,793	1,493	1,462	1,382	1,371	1,390	1,450	1,508	1,531	1,600	1,645
General aviation ^b																
Aviation gasoline	29	66	63	42	40	35	27	26	25	24	25	24	25	25	28	28
Jet fuel	N	28	103	90	131	206	194	197	194	170	198	187	194	208	246	254
Highway																
Gasoline, diesel and other fuels																
Light duty vehicle, short wheel base and motorcycle ^c	4,952	8,165	8,442	8,391	8,814	9,335	10,491	10,680	10,716	10,715	10,797	10,883	11,061	11,087	11,071	11,291
Light duty vehicle, long wheel base ^c	N	1,481	2,862	4,284	6,368	7,081	4,360	4,250	4,224	4,229	4,492	4,383	4,549	4,507	4,473	4,574
Single-unit 2-axle 6-tire or more truck	N	477	833	983	1,150	1,143	1,816	1,710	1,729	1,744	1,792	1,786	1,845	1,876	1,934	2,004
Combination truck	N	884	1,568	1,941	3,087	3,331	3,600	3,390	3,365	3,464	3,502	3,475	3,555	3,652	3,648	3,487
Bus	99	99	122	108	134	135	231	233	248	255	269	268	268	283	300	295
Transit^e																
Electricity	10	9	8	17	18	20	22	22	22	23	23	23	23	23	23	23
Motor fuel																
Diesel ^f	29	37	59	89	81	73	87	86	84	84	74	79	81	80	78	77
Gasoline and other nondiesel fuels ^g	23	8	1	4	3	3	12	12	12	13	13	14	14	14	13	14
Compressed natural gas	N	N	N	N	6	13	18	18	17	18	19	22	23	24	25	26
Rail, Class I (in freight service)																
Distillate / diesel fuel	476	487	536	428	508	563	480	506	495	506	531	507	465	480	502	470
Amtrak																
Electricity	N	N	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Distillate / diesel fuel	N	N	9	11	13	9	9	9	9	9	9	9	8	9	9	9
Water																
Residual fuel oil	592	565	1,340	947	959	775	770	683	721	630	576	503	439	386	402	328
Distillate / diesel fuel oil	108	113	203	284	311	276	275	293	243	230	219	332	308	300	304	281
Gasoline	N	72	127	156	135	152	140	133	131	135	135	248	279	279	251	256
Pipeline																
Natural gas	360	749	658	684	666	606	699	713	758	864	726	703	712	749	909	979

KEY: Btu = British thermal unit; N = data does not exist.

^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 no respondents and are therefore not comparable to earlier years. See the accuracy statement in the appendix for more detailed information.

^c Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^e Data from 1997 are not comparable to data before 1997 due to different sources. Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and small systems.

^f Diesel includes Diesel and Bio-Diesel.

^g Gasoline and all other nondiesel fuels include Gasoline, Liquefied Petroleum Gas, Liquefied Natural Gas, Methane, Ethanol, Bunker Fuel, Kerosene, Grain Additive, and Other Fuel.

NOTES

The following conversion rates were used:

Jet fuel = 135,000 Btu/gallon.

Aviation gasoline = 120,200 Btu/gallon.

Automotive gasoline = 120,286 Btu/gallon.

Diesel motor fuel = 137,381 Btu/gallon.

Compressed natural gas = 138,700 Btu/gallon.

Distillate fuel = 137,381 Btu/gallon.

Residual fuel = 149,690 Btu/gallon.

Natural gas = 1,037 Btu/ft³.

Electricity 1kWh = 3,412 Btu, negating electrical system losses. To include approximate electrical system losses, multiply this conversion factor by 3.

Table 4-7: Domestic Demand for Gasoline by Mode (millions of gallons)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL demand	60,761	89,601	104,838	113,606	131,855	139,989	137,706	135,145	134,582	135,141	140,010	141,334	144,846	144,575	145,235	146,287
Highway	55,429	85,598	101,183	109,529	128,884	135,176	133,725	131,274	130,935	131,299	136,468	132,351	135,472	135,301	135,246	136,078
Nonhighway, total	5,332	4,003	3,655	4,076	2,972	4,813	3,981	3,871	3,647	3,842	3,542	8,983	9,374	9,274	9,989	10,209
Agriculture	2,292	1,932	1,059	681	652	1,078	784	799	875	655	644	159	168	168	160	129
Aviation ^a	1,324	393	413	358	296	334	240	221	193	213	177	194	167	163	161	165
Marine ^b	61	598	1,052	1,300	1,124	1,261	1,167	1,104	1,093	1,123	1,126	2,066	2,323	2,323	2,090	2,128
Other ^c	1,656	1,080	1,131	1,737	899	2,140	1,790	1,747	1,486	1,853	1,595	6,565	6,716	6,621	7,578	7,786

^a Does not include aviation jet fuel.

^b In 2015 Marine became Boating with unstated formula changes from the source.

^c Includes state, county, and municipal use, industrial and commercial use, construction use, and miscellaneous.

NOTES

All non-highway uses of gasoline were estimated by the U.S. Department of Transportation, Federal Highway Administration. For 2015 these estimates may not be comparable to data for prior years due to revised estimation procedures. Data are not comparable to prior years due to changes in data analysis and/or improvements in reporting procedures. As a result, Other count increased.

Gasohol, a mixture of gasoline and ethyl alcohol, is included in the data starting in 1995.

Table 4-8: Certificated Air Carrier Fuel Consumption and Travel^a

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of aircraft	2,135	2,679	3,808	6,083	7,826	7,686	7,185	7,168	6,914	6,740	6,761	6,876	7,077	7,196	7,475	7,628	5,882
Average miles flown per aircraft (thousands)^b	487	949	768	777	888	1,074	1,067	1,086	1,118	1,146	1,145	1,146	1,141	1,143	1,143	1,148	899
Aircraft-miles (millions)																	
Domestic operations	858	2,068	2,276	3,963	5,662	6,716	5,976	6,005	5,956	5,965	5,947	6,046	6,227	6,338	6,609	6,815	4,214
International operations	182	475	334	760	1,282	1,536	1,690	1,778	1,770	1,758	1,790	1,830	1,849	1,884	1,936	1,948	1,074
Fuel consumption (million gallons)																	
Domestic operations	1,954	7,857	8,519	12,212	13,904	13,284	11,057	10,828	10,238	10,156	10,293	10,741	11,167	11,340	11,849	12,184	7,233
International operations	566	2,243	1,747	3,938	5,123	5,040	5,247	5,521	5,621	5,749	5,900	5,988	5,877	5,955	6,020	6,085	3,047
Aircraft-miles flown per gallon																	
Domestic operations	0.44	0.26	0.27	0.32	0.41	0.51	0.54	0.55	0.58	0.59	0.58	0.56	0.56	0.56	0.56	0.56	0.58
International operations	0.32	0.21	0.19	0.19	0.25	0.30	0.32	0.32	0.31	0.31	0.30	0.31	0.31	0.32	0.32	0.32	0.35

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

^b Average miles per aircraft calculation may include Aircraft-miles flown that are categorized as Unknown, and therefor not included in either Domestic or International operations.

Table 4-9: Motor Vehicle Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles registered (thousands)	73,858	111,242	161,490	193,057	225,821	247,421	250,070	253,216	253,639	255,877	260,351	263,610	268,799	272,481	273,602	276,491
Vehicle-miles traveled (millions)	718,762	1,109,724	1,527,295	2,144,362	2,746,925	2,989,430	2,967,266	2,950,402	2,969,433	2,988,280	3,025,656	3,095,373	3,174,408	3,212,347	3,240,327	3,261,772
Fuel consumed (million gallons)	57,880	92,329	114,960	130,755	162,554	174,787	170,411	168,452	168,621	169,651	173,347	172,881	176,891	177,951	178,130	179,991
Average miles traveled per vehicle (thousands)	9.7	10.0	9.5	11.1	12.2	12.1	11.9	11.7	11.7	11.7	11.6	11.6	11.7	11.8	11.8	11.8
Average miles traveled per gallon	12.4	12.0	13.3	16.4	16.9	17.1	17.4	17.5	17.6	17.6	17.5	17.9	17.9	18.1	18.2	18.1
Average fuel consumed per vehicle (gallons)	784	830	712	677	720	706	681	665	665	663	666	656	658	653	651	651

NOTES

Motor vehicles, fuel consumption and travel data include light duty vehicles, buses, trucks and motorcycles.

Data from 2007 was calculated using a new methodology and data categories of the Highway Statistics series were updated, so the data from 1960-2006 are not comparable.

See tables 4-11, 4-12, 4-13, 4-14, and 4-15 for individual highway vehicles.

Table 4-10: Estimated Consumption of Alternative Fuels for Federal and State Governments, Transit Agencies, and Fuel Providers^a Vehicles (thousand gasoline-equivalent gallons)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Alternative fuels, total	152,610	169,139	167,798	167,786	155,853	154,194	153,698	165,522	162,689	163,081	169,174	172,212	187,493	178,679	190,545
Liquefied petroleum gases	64,382	51,402	45,882	33,467	25,931	22,421	19,484	17,003	16,104	12,540	12,669	14,079	12,637	11,769	10,938
Compressed natural gas	79,065	103,138	106,620	117,948	120,453	122,504	126,087	127,235	123,724	122,535	126,709	127,079	142,686	134,074	146,830
Liquefied natural gas	7,656	13,449	14,090	14,966	8,867	8,671	7,689	7,684	7,644	7,940	5,751	7,453	7,356	3,693	2,615
Ethanol, 85% ^b	U	U	U	U	U	U	U	13,121	14,659	19,590	23,527	22,973	24,003	27,961	27,938
Electricity ^c	1,506	1,147	1,202	1,391	584	581	415	453	520	438	481	586	724	1,059	1,990
Hydrogen	1	3	4	14	18	17	23	26	38	38	37	42	87	123	234

KEY: U = data are not available.

^a EIA's data collection does not produce enough survey coverage for local and municipal governments, private fleets, and household vehicles. EIA only publishes the fuel use and the number of vehicles for four fleets: federal government, state governments, transit agencies, and fuel providers. The total fuel used by these four types of fleets do not represent the U.S. total for AFV inventory and fuel use. These values should not be aggregated.

^b A high-level ethanol blend containing 51%-83% ethanol depending on season and geography for use in flexible fuel vehicles.

^c Includes gasoline-electric hybrids.

NOTE

Numbers may not add to totals due to rounding.

Table 4-11: Light Duty Vehicle, Short Wheel Base and Motorcycle Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles registered (thousands)																
Light duty vehicles, short wheel base ^a	61,671	89,244	121,601	133,700	133,621	136,568	190,203	183,523	183,172	184,497	187,555	189,618	192,775	193,672	192,856	194,349
Motorcycles	574	2,824	5,694	4,259	4,346	6,227	8,010	8,438	8,455	8,405	8,418	8,601	8,679	8,715	8,666	8,596
Vehicle-miles traveled (millions)																
Light duty vehicles, short wheel base ^a	587,012	919,679	1,121,810	1,417,823	1,600,287	1,708,421	2,025,745	2,046,282	2,062,828	2,074,423	2,072,071	2,147,840	2,191,764	2,220,801	2,232,588	2,254,309
Motorcycles	U	U	U	U	10,469	10,454	18,513	18,542	21,385	20,366	19,970	19,606	20,445	20,149	20,076	19,688
Fuel consumed (million gallons)																
Light duty vehicles, short wheel base ^a	41,171	67,879	70,186	69,759	73,065	77,418	86,789	88,359	88,600	88,611	89,301	90,031	91,488	91,712	91,585	93,420
Motorcycles	U	U	U	U	209	189	427	426	491	468	459	448	466	458	457	448
Average miles traveled per vehicle (thousands)																
Light duty vehicles, short wheel base ^a	9.5	10.3	9.2	10.6	12.0	12.5	10.7	11.2	11.3	11.2	11.0	11.3	11.4	11.5	11.6	11.6
Motorcycles	U	U	U	U	2.4	1.7	2.3	2.2	2.5	2.4	2.4	2.3	2.4	2.3	2.3	2.3
Average miles traveled per gallon																
Light duty vehicles, short wheel base ^a	14.3	13.5	16.0	20.3	21.9	22.1	23.3	23.2	23.3	23.4	23.2	23.9	24.0	24.2	24.4	24.1
Motorcycles	U	U	U	U	50.0	55.2	43.4	43.5	43.5	43.5	43.5	43.8	43.9	44.0	44.0	44.0
Average fuel consumed per vehicle (gallons)																
Light duty vehicles, short wheel base ^a	667.6	760.6	577.2	521.8	546.8	566.9	456.3	481.5	483.7	480.3	476.1	474.8	474.6	473.5	474.9	480.7
Motorcycles	U	U	U	U	48.2	30.4	53.3	50.5	58.1	55.6	54.5	52.1	53.7	52.6	52.7	52.1

KEY: U = data are not available.

^a 1960-1990 data include Motorcycles.

NOTES

Average miles traveled per vehicle, Average miles traveled per gallon, and Average fuel consumed per vehicle are derived by calculation.

Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base found in table 4-12 replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches. Numbers may not add to totals due to rounding.

Table 4-12: Light Duty Vehicle, Long Wheel Base Fuel Consumption and Travel

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	14,211	27,876	48,275	79,085	95,337	40,242	50,319	50,589	51,513	52,600	53,299	54,870	56,881	57,854	59,465
Vehicle-miles traveled (millions)	123,286	290,935	574,571	923,059	1,041,051	622,712	604,175	601,232	603,307	638,484	631,852	657,954	656,578	664,495	669,744
Fuel consumed (million gallons)	12,313	23,796	35,611	52,939	58,869	36,251	35,335	35,114	35,159	37,343	36,437	37,819	37,467	37,189	38,029
Average miles traveled per vehicle (thousands)	8.7	10.4	11.9	11.7	10.9	15.5	12.0	11.9	11.7	12.1	11.9	12.0	11.5	11.5	11.3
Average miles traveled per gallon	10.0	12.2	16.1	17.4	17.7	17.2	17.1	17.1	17.2	17.1	17.3	17.4	17.5	17.9	17.6
Average fuel consumed per vehicle (gallons)	866.5	853.6	737.7	669.4	617.5	900.8	702.2	694.1	682.5	709.9	683.6	689.2	658.7	642.8	639.5

NOTES

Data from 2007 was calculated using a new methodology for light duty vehicles and motorcycles developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, long wheel base replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches. The new category Light duty vehicle, short wheel base is found in table 4-11 and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches.

For 1993-2006, 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. The new categories were 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.

Table 4-13: Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel^a

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	3,681	4,374	4,487	5,926	6,395	8,217	7,819	8,190	8,126	8,329	8,456	8,747	9,337	10,328	10,160
Vehicle-miles (millions)	27,081	39,813	51,901	70,500	78,496	110,738	103,803	105,605	106,582	109,301	109,597	113,338	116,102	120,699	124,746
Fuel consumed (million gallons)	3,968	6,923	8,357	9,563	9,501	15,097	14,215	14,376	14,502	14,894	14,851	15,338	15,600	16,080	16,657
Average miles traveled per vehicle (thousands)	7.4	9.1	11.6	11.9	12.3	13.5	13.3	12.9	13.1	13.1	13.0	13.0	12.4	11.7	12.3
Average miles traveled per gallon	6.8	5.8	6.2	7.4	8.3	7.3	7.3	7.3	7.3	7.3	7.4	7.4	7.4	7.4	7.5
Average fuel consumed per vehicle (gallons)	1,078.0	1,582.8	1,862.4	1,613.7	1,485.7	1,837.2	1,818.0	1,755.3	1,784.6	1,788.2	1,756.1	1,753.7	1,670.8	1,557.0	1,639.4

^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

Data from 2007 was calculated using new sources and a new methodology developed by FHWA. Data for these years are not comparable to previous years. The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data (MF-21 and MF-27), vehicle registration data (MV-1, MV-9, and MV-10), other data such as the R. L. Polk vehicle data, and a host of modeling techniques. Starting with the 2007 VM-1, an enhanced methodology is used to provide timely indicators on both travel and travel behavior changes.

From 1998-2006, the Federal Highway Administration (FHWA) used the Census Bureau's *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.

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 those that have single frames, two axles, and at least 6 tires or a gross vehicle weight rating exceeding 10,000 lbs. Pre-1993 data have been reassigned to the most appropriate category.

Table 4-14: Combination Truck Fuel Consumption and Travel

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	905	1,417	1,709	2,097	2,087	2,553	2,452	2,469	2,471	2,577	2,747	2,752	2,892	2,906	2,925
Vehicle-miles traveled (millions)	35,134	68,678	94,341	135,020	144,028	175,789	163,791	163,602	168,436	169,830	170,246	174,557	181,490	184,165	175,305
Fuel consumed (million gallons)	7,348	13,037	16,133	25,666	27,689	29,927	28,181	27,975	28,795	29,118	28,886	29,555	30,364	30,325	28,987
Average miles traveled per vehicle (thousands)	38.8	48.5	55.2	64.4	69.0	68.9	66.8	66.3	68.2	65.9	62.0	63.4	62.8	63.4	59.9
Average miles traveled per gallon	4.8	5.3	5.8	5.3	5.2	5.9	5.8	5.8	5.8	5.8	5.9	5.9	6.0	6.1	6.0
Average fuel consumed per vehicle (gallons)	8,119	9,201	9,441	12,241	13,269	11,723	11,495	11,330	11,652	11,298	10,516	10,739	10,498	10,435	9,909

NOTES

Data from 2007 were calculated using new sources and a new methodology developed by FHWA. Data for these years are not comparable to previous years. The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data (MF-21 and MF-27), vehicle registration data (MV-1, MV-9, and MV-10), other data such as the R. L. Polk vehicle data, and a host of modeling techniques. Starting with the 2007 VM-1, an enhanced methodology is used to provide timely indicators on both travel and travel behavior changes. From 1998-2006, the Federal Highway Administration (FHWA) used the Census Bureau's 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. 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. Pre-1993 data have been reassigned to the most appropriate category. Numbers may not add to totals due to rounding.

Table 4-15: Bus Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	272	378	529	627	746	807	846	666	765	865	872	889	976	983	992	995
Vehicle-miles traveled (millions)	4,346	4,544	6,059	5,726	7,590	6,980	13,770	13,807	14,781	15,167	15,999	16,230	16,350	17,227	18,303	17,980
Fuel consumed (million gallons)	827	820	1,018	895	1,112	1,120	1,921	1,936	2,063	2,117	2,233	2,228	2,226	2,350	2,494	2,451
Average miles traveled per vehicle (thousands)	16.0	12.0	11.5	9.1	10.2	8.6	16.3	20.7	19.3	17.5	18.3	18.3	16.7	17.5	18.4	18.1
Average miles traveled per gallon	5.3	5.5	6.0	6.4	6.8	6.2	7.2	7.1	7.2	7.2	7.2	7.3	7.3	7.3	7.3	7.3
Average fuel consumed per vehicle (gallons)	3,039.0	2,172.4	1,925.8	1,427.6	1,490.4	1,387.8	2,270.7	2,906.9	2,698.5	2,448.2	2,561.0	2,506.5	2,280.2	2,390.4	2,513.5	2,462.8

NOTES

This table includes data for both publicly and privately owned school, transit, and other commercial buses.

Data from 2007 were calculated using new sources and a new methodology developed by FHWA. Data for these years are not comparable to previous years. The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data (MF-21 and MF-27), vehicle registration data (MV-1, MV-9, and MV-10), other data such as the R. L. Polk vehicle data, and a host of modeling techniques. Starting with the 2007 VM-1, an enhanced methodology is used to provide timely indicators on both travel and travel behavior changes.

Table 4-16: Transit Industry Electric Power and Primary Energy Consumption^a and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of vehicles (thousands)	65	61	75	93	106	122	136	137	130	137	133	136	135	136	135	138	138
Vehicle-miles traveled (millions)	2,143	1,883	2,287	3,242	3,202	3,603	4,400	4,331	4,347	4,413	4,429	4,495	4,545	4,574	4,592	4,629	4,029
Electric power consumed (million kWh)	2,908	2,561	2,446	4,837	5,382	5,765	6,414	6,534	6,506	6,651	6,673	6,668	6,604	6,611	6,749	6,877	6,198
Primary energy consumed (thousand gallons)																	
Diesel	208,100	270,600	431,400	651,030	590,610	480,456	583,446	573,409	557,579	542,305	504,988	532,667	546,981	542,321	518,462	518,477	454,605
Gasoline and other nondiesel fuels ^b	191,900	68,200	11,400	33,906	23,641	80,720	146,804	152,614	157,077	172,969	144,620	157,962	159,087	150,150	160,874	157,749	129,944
Compressed natural gas	N	N	N	N	43,676	93,866	126,235	128,499	124,059	131,899	137,227	156,152	166,868	171,613	178,362	187,808	171,975

KEY: kWh = kilowatt hour; N = data do not exist.

^a Prior to 1984, the data in this table include the energy consumption of bus, heavy rail, light rail and trolley bus, Commuter rail, automated guideway, urban ferryboat, demand responsive vehicles, and most rural and smaller systems are excluded from the data during this period.

^b 1960 to 1990 data include only propane, liquefied natural gas, methanol and ethanol. 2005 to 2012 data include the above, and also biodiesel and grain fuel. 2013 data include propane, liquefied natural gas, methanol, ethanol and biodiesel. 2014 data and beyond include propane, liquefied natural gas, ethanol, hydrogen and biodiesel.

NOTES

Data prior to 1996 are not comparable to data from 1996 onward due to a change in sources with differing methodologies. 2009 data for *Gasoline and other no diesel fuels* is not comparable to previous years' data due to a change in the reporting requirements that require transit agencies to submit energy consumption data for both purchased transportation (PT) services and directly operated (DO) transportation services. The major effect of this reporting change occurred within the following modes: Demand Response, Motor Bus, Publico, and Vanpool. This table includes approximate electrical system losses, and thus the conversion factor is multiplied by 3.

Table 4-17: Class I Rail Freight Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number in use																
Locomotives ^a	29,031	27,077	28,094	18,835	20,028	22,779	23,893	24,250	24,707	25,033	25,916	26,574	26,716	26,547	26,086	24,597
Freight cars ^b	1,965,486	1,784,181	1,710,827	1,212,261	1,380,796	1,316,522	1,514,113	1,514,845	1,531,913	1,546,289	1,581,733	1,632,188	1,655,043	1,659,965	1,668,963	1,675,511
Miles traveled (millions)																
Freight train-miles ^c	404	427	428	380	504	548	476	493	500	504	518	495	453	465	477	445
Locomotive unit-miles	N	N	1,531	1,280	1,503	1,588	1,415	1,468	1,486	1,497	1,523	1,510	1,431	1,451	U	U
Freight car-miles	28,170	29,890	29,277	26,159	34,590	37,712	35,541	36,649	36,525	35,253	37,193	35,853	32,572	34,065	35,018	33,242
Average miles traveled per gallon																
Freight trains	0.12	0.12	0.11	0.12	0.14	0.13	0.14	0.13	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13
Freight cars	8.13	8.43	7.50	8.40	9.35	9.20	10.17	9.95	10.15	9.57	9.62	9.71	9.62	9.75	9.58	9.72
Fuel consumed (million gallons)^d	3,463	3,545	3,904	3,115	3,700	4,098	3,494	3,685	3,600	3,682	3,867	3,692	3,385	3,495	3,656	3,419
Revenue ton-miles per gallon of fuel consumed	165	216	235	332	396	414	484	469	476	473	479	471	468	479	473	472
Average miles traveled per locomotive (thousands)	N	N	54.5	68.0	75.0	69.7	59.2	60.5	60.1	59.8	58.8	56.8	53.6	54.7	U	U
Average fuel consumed per locomotive^a (thousand gallons)	119.3	130.9	139.0	165.4	184.7	179.9	146.2	152.0	145.7	147.1	149.2	138.9	126.7	131.7	140.2	139.0

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

^a For 1960-80, the total includes a small number of steam and electric units, which are not included in the per locomotive fuel consumption figure.
^b For 1960-2007 United States owners only. Includes cars owned by Class I railroads, other railroads, car companies, and shippers. The AAR's Policy & Economics Department no longer collects freight car data by US, Canada, or Mexico. From 2008 total North America is used instead. Freight car data for all years from 2010 have been restated to include active cars in revenue freight service that have AAR or FRA interchange restrictions. These cars are typically older than 40 years and used in single line (a.k.a. local) freight service. At the end of 2017, 32 thousand active freight cars had interchange restrictions.
^c Based on the distance run between terminals and/or stations; does not include yard or passenger train-miles.
^d Excludes passenger and work trains.

NOTE
 Average miles traveled per locomotive, and average fuel consumed, can be distorted when portions of the fleet are in storage and therefore not in use.

Table 4-18: Amtrak Fuel Consumption and Travel

	1975	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number in use															
Locomotives	355	419	318	378	258	282	287	485	418	428	423	434	419	431	403
Cars	1,913	2,128	1,863	1,894	1,186	1,274	1,301	2,090	1,447	1,419	1,428	1,402	1,405	1,403	1,415
Miles traveled (millions)															
Train-miles	30	30	33	35	36	37	37	38	38	38	38	38	38	38	38
Car-miles	253	235	301	368	265	295	296	319	325	325	319	316	316	273	279
Train Energy Consumption															
Electric (million of kWhs)	180	254	330	470	531	559	555	549	525	515	504	516	490	485	484
Diesel (million gallons)	63	64	82	95	65	63	63	63	66	66	62	60	64	65	63
Average miles traveled per car (thousands)	132	110	162	194	223	231	228	153	225	229	224	226	225	194	197

KEY: kWh = kilowatt hour.

Table 4-19: U.S. Government Energy Consumption by Agency and Source (trillion Btu)

	Petroleum					Electricity	Natural gas	Steam &		Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b	Total petroleum			renewables	Coal & other	
FY 1980, total	210.3	144.2	643.6	13.5	1011.6	141.9	147.3	5.9	64.6	1371.2
Agriculture	5.0	0.8	0.3	0.2	6.3	1.1	1.2	0.0	0.0	8.6
Defense	172.0	125.7	635.8	11.8	945.3	87.8	105.3	2.7	41.9	1183.1
DHS	N	N	N	N	N	N	N	N	N	N
Energy	1.9	3.0	0.3	0.1	5.4	15.2	9.7	0.2	16.9	47.4
GSA	0.1	1.7	0.0	0.0	1.8	8.7	3.2	0.0	4.4	18.1
Health and Human Services	0.6	2.2	0.0	0.1	2.9	1.5	1.6	0.0	0.0	6.0
Interior	3.3	1.5	0.1	0.5	5.5	1.3	1.6	0.1	0.0	8.5
Justice	1.9	0.4	0.1	0.0	2.4	0.7	2.0	0.1	0.4	5.7
NASA	0.3	1.0	1.5	0.0	2.8	4.5	2.6	0.5	0.0	10.4
Postal Service	10.9	1.9	0.0	0.1	12.8	10.3	3.0	1.0	0.0	27.2
Transportation	6.0	2.5	5.3	0.6	14.3	3.5	1.0	0.2	0.2	19.2
Veterans Affairs	0.6	3.3	0.0	0.0	3.9	5.4	14.0	0.8	0.7	24.8
Other ^a	7.6	0.3	0.2	0.0	8.1	1.9	1.9	0.2	0.0	12.3
FY 1990, total	191.0	91.1	732.9	4.1	1019.1	193.6	159.4	17.7	48.2	1438.0
Agriculture	4.9	0.5	0.1	0.2	5.7	2.0	1.7	0.1	0.0	9.6
Defense	154.9	75.3	723.9	2.7	956.8	120.6	114.5	12.9	36.8	1241.7
DHS	N	N	N	N	N	N	N	N	N	N
Energy	2.1	2.1	0.4	0.2	4.8	19.1	9.6	0.3	9.7	43.5
GSA	0.1	2.0	0.0	0.0	2.2	9.2	4.3	1.5	0.4	17.5
Health and Human Services	0.0	2.1	0.0	0.1	2.3	2.4	2.2	0.1	0.1	7.1
Interior	2.5	0.8	0.3	0.5	4.1	1.4	1.2	0.1	0.6	7.4
Justice	1.9	0.4	0.2	0.0	2.5	1.9	2.2	0.1	0.3	7.0
NASA	0.2	1.0	1.5	0.0	2.7	6.6	2.8	0.3	0.0	12.4
Postal Service	12.1	1.3	0.0	0.2	13.6	11.8	4.6	0.5	0.0	30.6
Transportation	6.6	1.6	5.5	0.1	13.8	3.9	1.1	0.0	0.0	19.0
Veterans Affairs	0.5	2.2	0.0	0.0	2.7	7.9	13.0	1.0	0.2	24.9
Other ^a	5.0	1.8	1.0	0.0	7.9	6.7	2.2	0.6	0.0	17.5
FY 2000, total	167.6	41.2	403.2	8.9	621.0	193.6	133.8	17.4	27.3	993.1
Agriculture	2.7	0.1	0.0	0.1	3.0	2.0	1.9	0.2	0.4	7.4
Defense	124.0	33.6	395.1	8.0	560.8	104.8	79.9	11.3	22.3	779.1
DHS	N	N	N	N	N	N	N	N	N	N
Energy	1.5	1.0	0.2	0.1	2.8	16.6	6.7	1.5	2.9	30.5
GSA	0.1	0.1	0.0	0.0	0.3	9.8	6.1	1.5	0.0	17.6
Health and Human Services	0.6	0.6	0.0	0.1	1.3	2.9	3.3	0.4	0.1	8.0
Interior	3.0	0.6	0.2	0.4	4.1	1.7	1.3	0.0	0.7	7.8
Justice	7.7	0.2	1.7	0.0	9.7	4.3	5.3	0.4	0.1	19.7
NASA	0.4	0.3	1.1	0.0	1.8	6.0	3.1	0.3	0.0	11.1
Postal Service	15.8	0.9	0.0	0.0	16.7	18.6	7.4	0.0	0.6	43.3
Transportation	7.1	1.0	4.0	0.1	12.2	8.0	0.9	0.0	0.0	21.2
Veterans Affairs	0.9	1.0	0.0	0.0	2.0	9.3	14.2	1.2	0.3	27.0
Other ^a	3.7	1.7	0.9	0.0	6.3	9.7	3.7	0.5	0.1	20.3
FY 2010, total	181.3	23.7	536.1	6.6	747.7	193.7	130.1	15.7	25.6	1112.7
Agriculture	2.7	0.1	0.0	0.4	3.2	1.9	1.4	0.2	0.0	6.8
Defense	138.4	18.5	529.2	1.6	687.7	102.3	72.9	9.8	17.2	889.9
DHS	6.8	1.1	4.9	4.2	17.0	3.1	0.9	0.1	0.1	21.2
Energy	1.6	0.7	0.2	0.1	2.5	16.7	7.1	0.5	4.8	31.7
GSA	0.1	0.1	0.0	0.0	0.2	9.9	7.0	1.5	0.3	18.8
Health and Human Services	0.2	0.5	0.0	0.1	0.8	3.5	5.9	0.1	0.0	10.4
Interior	2.9	0.4	0.0	0.0	3.4	2.1	0.8	0.2	0.8	7.3
Justice	3.0	0.1	0.3	0.0	3.4	5.4	6.8	0.1	0.0	15.7
NASA	0.2	0.2	0.8	0.0	1.2	5.3	2.6	0.9	0.0	10.1
Postal Service	18.2	0.6	0.0	0.0	18.7	18.5	5.5	0.2	0.4	43.3
Transportation	0.7	0.2	0.6	0.0	1.5	3.8	0.3	0.1	0.0	5.7
Veterans Affairs	1.2	0.8	0.0	0.0	2.0	11.0	14.9	1.0	1.2	30.2
Other ^a	5.3	0.6	0.1	0.1	6.1	10.2	3.9	1.0	0.6	21.8

Continued next page

Chapter 4. Transportation, Energy, and the Environment

Table 4-19 cont'd: U.S. Government Energy Consumption by Agency and Source (trillion Btu)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam & renewables		Coal & other	Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b							
FY 2011, total	190.6	24.1	534.5	6.6	755.8	193.2	124.7	16.5	23.9	1114.1	
Agriculture	3.1	0.0	1.0	0.4	4.6	1.8	1.7	0.2	0.1	8.3	
Defense	146.8	19.0	526.9	1.2	693.9	103.0	68.6	8.6	16.2	890.3	
DHS	6.1	1.0	4.3	4.6	16.0	3.2	1.0	0.1	0.1	20.3	
Energy	2.4	0.7	0.2	0.1	3.3	17.3	7.4	0.7	4.5	33.1	
GSA	0.1	0.1	0.0	0.0	0.2	9.5	7.1	1.5	0.3	18.5	
Health and Human Services	0.2	0.6	0.0	0.1	0.9	3.4	5.9	0.3	0.1	10.5	
Interior	2.9	0.4	0.0	0.1	3.4	2.2	1.0	0.2	0.5	7.3	
Justice	3.2	0.1	0.6	0.0	3.9	5.2	4.2	0.4	0.1	13.9	
NASA	0.2	0.1	0.7	0.0	1.1	5.3	2.5	1.2	0.1	10.1	
Postal Service	19.1	0.6	0.0	0.0	19.6	17.1	5.6	0.2	0.5	43.0	
Transportation	0.5	0.0	0.5	0.0	1.1	4.0	0.8	0.8	0.0	6.7	
Veterans Affairs	1.4	0.8	0.0	0.0	2.2	11.3	15.1	1.4	0.6	30.6	
Other ^a	4.8	0.7	0.2	0.0	5.6	9.9	4.0	1.0	0.8	21.4	
FY 2012, total	174.5	19.9	493.9	6.1	694.4	187.2	116.2	20.1	21.4	1039.3	
Agriculture	2.7	0.1	0.1	0.2	3.0	1.8	1.6	0.2	0.1	6.7	
Defense	133.6	16.1	486.6	1.0	637.4	101.1	63.3	10.9	15.9	828.5	
DHS	5.7	0.9	4.9	4.5	16.0	3.0	0.9	0.1	0.1	20.1	
Energy	1.4	0.4	0.2	0.1	2.1	15.5	6.9	3.5	2.4	30.3	
GSA	0.0	0.1	0.0	0.0	0.1	8.9	5.8	1.2	0.3	16.3	
Health and Human Services	0.3	0.2	0.0	0.1	0.6	3.3	5.9	0.2	0.1	10.0	
Interior	2.7	0.3	0.0	0.0	3.1	2.0	0.8	0.2	0.6	6.7	
Justice	3.0	0.1	0.8	0.0	3.9	5.2	5.7	0.2	0.1	15.1	
NASA	0.2	0.1	0.6	0.0	0.9	5.0	2.1	0.8	0.1	8.9	
Postal Service	18.6	0.4	0.0	0.1	19.2	16.5	4.7	0.1	0.3	40.8	
Transportation	0.5	0.0	0.5	0.0	1.0	3.9	0.5	0.1	0.0	5.6	
Veterans Affairs	1.3	0.7	0.0	0.0	2.0	11.4	14.2	1.4	0.7	29.7	
Other ^a	4.6	0.3	0.2	0.0	5.2	9.6	3.7	1.3	0.8	20.5	
FY 2013, total	160.9	21.3	424.7	6.3	613.2	184.7	122.5	19.4	19.5	959.3	
Agriculture	3.0	0.1	0.3	0.2	3.5	1.7	1.5	0.2	0.4	7.3	
Defense	121.1	17.2	417.6	1.0	556.9	101.1	65.8	10.2	15.6	749.5	
DHS	5.1	1.1	4.3	4.6	15.1	2.6	1.0	0.0	0.1	18.9	
Energy	1.2	0.4	0.1	0.1	1.8	15.6	7.6	3.3	0.6	28.9	
GSA	0.0	0.1	0.0	0.0	0.1	8.6	6.0	1.3	0.3	16.4	
Health and Human Services	0.2	0.3	0.0	0.1	0.6	3.2	6.3	0.2	0.1	10.5	
Interior	2.4	0.3	0.0	0.1	2.8	1.9	0.8	0.2	0.5	6.2	
Justice	2.4	0.1	0.8	0.0	3.4	5.1	6.2	0.4	0.3	15.3	
NASA	0.1	0.1	0.7	0.1	1.0	4.7	2.1	0.9	0.1	8.7	
Postal Service	19.4	0.5	0.0	0.2	20.1	15.8	5.5	0.2	0.3	41.9	
Transportation	0.4	0.0	0.4	0.0	0.9	3.7	0.7	0.0	0.0	5.3	
Veterans Affairs	1.3	0.6	0.0	0.0	1.9	11.2	15.1	1.2	0.6	29.9	
Other ^a	4.3	0.4	0.4	0.0	5.1	9.4	4.0	1.2	0.7	20.4	
FY 2014, total	153.2	21.0	414.6	5.9	594.8	182.1	125.6	19.7	19.3	941.5	
Agriculture	2.9	0.1	0.0	0.1	3.0	1.6	1.3	0.3	0.0	6.3	
Defense	113.2	16.8	408.2	1.1	539.3	99.4	66.5	10.0	15.4	730.6	
DHS	5.1	0.6	4.3	4.0	14.1	3.0	1.1	0.1	0.2	18.5	
Energy	1.1	0.5	0.1	0.1	1.9	16.0	7.8	3.3	0.5	29.4	
GSA	0.0	0.2	0.0	0.0	0.2	8.2	6.9	1.4	0.3	17.0	
Health and Human Services	0.2	0.7	0.0	0.0	0.9	2.9	5.5	0.2	0.1	9.5	
Interior	2.4	0.3	0.0	0.1	2.7	1.9	0.8	0.2	0.5	6.2	
Justice	2.5	0.2	0.6	0.0	3.3	5.1	6.5	0.5	0.3	15.6	
NASA	0.1	0.1	0.6	0.1	0.9	4.4	2.2	0.8	0.1	8.3	
Postal Service	20.0	0.6	0.0	0.1	20.7	15.7	6.2	0.2	0.2	43.0	
Transportation	0.4	0.1	0.4	0.0	1.0	3.5	0.6	0.0	0.0	5.2	
Veterans Affairs	1.4	0.6	0.0	0.0	2.0	11.3	16.1	1.5	0.5	31.4	
Other ^a	3.9	0.4	0.2	0.3	4.8	9.3	4.1	1.2	1.2	20.6	

Table 4-19 cont'd: U.S. Government Energy Consumption by Agency and Source (trillion Btu)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam & renewables		Coal & other	Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b							
FY 2015, total	157.9	19.2	419.2	5.9	602.2	184.3	122.2	17.8	19.4	945.8	
Agriculture	2.7	0.1	0.0	0.2	3.0	1.6	1.2	0.3	0.1	6.2	
Defense	115.6	15.8	413.7	1.0	546.1	100.2	65.3	8.4	14.5	734.5	
DHS	5.8	0.5	3.5	3.8	13.6	2.9	1.1	0.1	0.2	17.9	
Energy	1.2	0.3	0.2	0.1	1.8	16.6	8.0	3.2	0.5	30.1	
GSA	0.0	0.1	0.0	0.0	0.1	8.0	6.2	1.1	1.0	16.3	
Health and Human Services	0.2	0.4	0.0	0.0	0.6	3.0	5.1	0.2	0.1	9.0	
Interior	2.5	0.2	0.0	0.0	2.8	2.1	1.1	0.2	0.5	6.8	
Justice	3.0	0.1	0.7	0.0	3.9	5.1	6.4	0.5	0.3	16.2	
NASA	0.1	0.0	0.4	0.1	0.6	4.8	2.4	0.6	0.0	8.4	
Postal Service	21.3	0.6	0.0	0.1	22.0	15.7	5.8	0.3	0.2	44.0	
Transportation	0.4	0.1	0.5	0.0	1.0	3.6	0.7	0.0	0.7	6.0	
Veterans Affairs	1.3	0.5	0.0	0.0	1.9	11.4	15.1	1.7	0.6	30.7	
Other ^a	3.6	0.5	0.2	0.6	4.9	9.3	3.8	1.2	0.7	19.8	
FY 2016, total	154.7	17.0	404.2	6.3	582.2	184.5	115.4	19.0	16.2	917.2	
Agriculture	2.9	0.1	0.0	0.2	3.2	1.6	1.1	0.1	0.2	6.2	
Defense	111.3	13.9	398.4	1.0	524.5	101.3	61.5	9.6	12.3	709.2	
DHS	5.7	0.5	3.6	4.2	14.0	2.9	1.0	0.1	0.1	18.1	
Energy	1.0	0.4	0.2	0.1	1.7	16.1	6.8	3.9	0.4	28.9	
GSA	0.0	0.0	0.0	0.0	0.1	7.8	6.8	0.9	0.3	15.8	
Health and Human Services	0.2	0.2	0.0	0.0	0.5	2.9	5.2	0.2	0.0	8.7	
Interior	2.4	0.2	0.0	0.1	2.7	2.2	0.8	0.2	0.4	6.4	
Justice	2.9	0.1	0.7	0.0	3.8	5.3	6.0	0.5	0.1	15.6	
NASA	0.1	0.0	0.6	0.1	0.8	4.7	2.3	0.7	0.0	8.5	
Postal Service	22.3	0.5	0.0	0.1	22.9	15.5	5.1	0.1	0.2	43.9	
Transportation	0.4	0.1	0.5	0.0	1.0	3.6	0.5	0.1	0.8	6.0	
Veterans Affairs	1.4	0.4	0.0	0.0	1.8	11.7	14.8	1.5	0.6	30.3	
Other ^a	4.0	0.5	0.2	0.5	5.3	9.1	3.5	1.0	0.6	19.5	
FY 2017, total	158.6	16.8	400.4	7.7	583.5	181.7	115.1	19.7	15.1	915.1	
Agriculture	2.9	0.0	0.0	0.1	3.1	1.6	1.2	0.2	0.2	6.3	
Defense	114.2	13.6	393.7	0.9	522.4	101.2	63.5	9.6	11.2	707.9	
DHS	6.1	0.5	4.1	4.6	15.3	2.7	0.9	0.1	0.1	19.2	
Energy	1.1	0.3	0.2	0.1	1.6	15.4	6.7	4.5	0.5	28.8	
GSA	0.0	0.0	0.0	0.0	0.1	7.5	5.5	0.9	0.9	15.0	
Health and Human Services	0.2	0.3	0.0	0.0	0.5	2.7	5.3	0.2	0.0	8.8	
Interior	2.2	0.2	0.0	0.1	2.4	2.0	0.9	0.2	0.4	5.9	
Justice	2.9	0.1	0.9	0.0	4.0	5.2	5.9	0.5	0.1	15.5	
NASA	0.1	0.0	0.8	0.1	1.0	4.7	2.0	0.8	0.0	8.6	
Postal Service	22.5	0.6	0.0	0.1	23.2	15.1	5.0	0.1	0.2	43.7	
Transportation	0.6	0.3	0.5	1.1	2.4	3.5	0.6	0.1	0.0	6.6	
Veterans Affairs	1.2	0.4	0.0	0.0	1.6	11.4	14.2	1.3	0.6	29.1	
Other ^a	4.7	0.3	0.2	0.6	5.9	8.5	3.5	1.0	0.8	19.7	
FY 2018, total	151.8	17.2	383.5	6.0	558.5	180.0	125.8	20.3	12.5	897.0	
Agriculture	2.9	0.1	0.0	0.2	3.1	1.6	0.8	0.2	0.3	6.1	
Defense	109.5	13.5	377.1	0.9	501.0	100.6	70.4	10.7	7.9	690.6	
DHS	4.4	0.5	4.1	3.9	12.8	2.7	1.1	0.2	0.1	16.8	
Energy	1.0	0.3	0.1	0.1	1.5	15.2	6.7	3.4	0.4	27.3	
GSA	0.0	0.1	0.0	0.0	0.2	7.6	5.8	0.9	1.0	15.6	
Health and Human Services	0.2	0.3	0.0	0.0	0.6	2.8	6.4	0.2	0.1	10.0	
Interior	2.2	0.2	0.1	0.1	2.5	2.0	1.0	0.2	0.5	6.1	
Justice	3.0	0.1	0.9	0.0	4.0	4.9	6.6	0.6	0.1	16.2	
NASA	0.1	0.1	0.6	0.1	0.8	4.3	2.5	0.8	0.0	8.4	
Postal Service	23.2	0.8	0.0	0.1	24.1	15.2	5.9	0.2	0.1	45.5	
Transportation	0.4	0.3	0.4	0.0	1.1	3.2	0.7	0.1	0.8	5.8	
Veterans Affairs	1.2	0.5	0.0	0.0	1.7	11.3	14.4	1.8	0.5	29.7	
Other ^a	3.8	0.4	0.2	0.6	4.9	8.4	3.7	1.1	0.6	18.8	

Continued next page

Table 4-19 cont'd: U.S. Government Energy Consumption by Agency and Source (trillion Btu)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam &		Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b				renewables	Coal & other	
FY 2019, total	152.6	16.0	377.0	5.4	551.0	178.2	131.7	18.5	10.6	890.0
Agriculture	2.8	0.1	0.0	0.1	3.0	1.5	1.0	0.2	0.2	5.9
Defense	108.5	12.3	371.3	1.0	493.1	99.7	73.9	9.0	6.4	682.1
DHS	5.0	0.5	3.5	3.2	12.2	2.7	1.1	0.1	0.1	16.2
Energy	1.1	0.4	0.0	0.1	1.6	15.0	6.6	3.6	0.5	27.2
GSA	0.0	0.1	0.0	0.0	0.1	7.5	5.8	1.0	1.0	15.4
Health and Human Services	0.2	0.2	0.0	0.1	0.5	2.8	6.2	0.2	0.0	9.8
Interior	2.1	0.2	0.1	0.1	2.5	2.0	1.0	0.2	0.5	6.2
Justice	3.0	0.1	0.9	0.0	4.0	4.8	6.2	0.7	0.1	15.8
NASA	0.1	0.0	0.6	0.1	0.8	4.1	2.8	0.7	0.0	8.5
Postal Service	24.4	0.8	0.0	0.1	25.2	14.6	5.9	0.1	0.1	46.0
Transportation	0.3	0.3	0.4	0.0	1.1	3.5	0.7	0.1	0.6	5.9
Veterans Affairs	1.3	0.5	0.0	0.0	1.7	11.7	16.4	1.5	0.5	31.9
Other ^a	3.7	0.6	0.2	0.6	5.1	8.4	4.0	1.1	0.5	19.1
FY 2020, total	153.0	15.7	345.2	6.1	520.0	173.8	128.3	17.6	9.4	849.0
Agriculture	2.6	0.0	0.0	0.1	2.8	1.5	0.9	0.1	0.1	5.4
Defense	110.6	12.5	339.6	0.9	463.6	97.8	72.8	8.6	6.1	648.8
DHS	4.4	0.5	3.6	4.3	12.8	2.7	1.2	0.3	0.1	17.1
Energy	1.0	0.3	0.0	0.2	1.5	14.6	6.5	3.4	0.4	26.4
GSA	0.0	0.1	0.0	0.0	0.1	7.0	5.6	0.9	0.9	14.4
Health and Human Services	0.0	0.2	0.0	0.1	0.3	2.7	6.2	0.2	0.0	9.5
Interior	1.8	0.1	0.1	0.0	2.1	1.9	0.9	0.2	0.4	5.5
Justice	2.6	0.1	0.8	0.0	3.5	4.6	6.0	0.4	0.1	14.6
NASA	0.1	0.1	0.5	0.1	0.8	3.8	2.7	0.8	0.0	8.1
Postal Service	25.5	0.6	0.0	0.1	26.3	14.4	5.2	0.2	0.1	46.1
Transportation	0.3	0.3	0.3	0.0	0.9	3.4	0.7	0.1	0.4	5.5
Veterans Affairs	0.9	0.4	0.0	0.0	1.3	11.7	15.7	1.5	0.4	30.6
Other ^a	3.1	0.4	0.3	0.2	4.0	7.7	3.9	1.1	0.4	17.0

KEY: Btu = British thermal unit; DHS = Department of Homeland Security; FY = fiscal year; GSA = General Services Administration; N = data do not exist; NASA = National Aeronautics and Space Administration.

^a Includes all U.S. government agencies not separately displayed. See <http://ctsdedweb.ee.doe.gov/Annual/Report/AgencyReference.aspx> for agency list.

^b Includes liquefied petroleum gas and Navy special fuel oil.

NOTES

Totals may not equal sum of components due to independent 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.

Data in this table are prepared using the following conversion factors:

Electricity = 3,412 Btu/kilowatt-hour.

Purchased steam = 1,000 Btu/pound.

Coal = 24,580 million Btu/short ton.

Natural gas = 1,031 Btu/cubic foot.

Aviation gasoline: 5,250 million Btu/barrel.

Fuel oil = 5,8254 million Btu/barrel.

Jet fuel = 5,460 million Btu/barrel.

Liquefied petroleum gas = 4,011 million Btu/barrel.

Diesel and Gasoline = 5,250 million Btu/barrel.

Section C:

***Transportation Energy Intensity and
Fuel Efficiency***

Table 4-20: Energy Intensity of Passenger Modes (Btu per passenger-mile)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air, certificated carrier																	
Domestic operations	8,633	10,382	6,029	4,767	3,892	3,232	2,691	2,588	2,428	2,366	2,323	2,298	2,290	2,255	2,246	2,219	4,423
International operations	9,199	10,462	4,374	4,207	3,857	3,817	3,338	3,519	3,484	3,393	3,260	3,248	3,162	3,150	3,109	3,019	8,353
Highway																	
Light duty vehicle, short wheel base ^{a,b,c}	4,325	4,659	4,184	3,667	3,454	3,450	3,044	3,068	3,053	3,039	3,067	2,985	2,974	2,974	2,954	2,984	U
Motorcycle ^{b,c}	U	2,406	2,045	1,915	2,187	1,717	2,389	2,384	2,381	2,381	2,381	2,368	2,362	2,358	2,358	2,358	U
Light duty vehicle, long wheel base ^{a,c}	U	6,553	5,494	4,284	4,339	3,923	4,354	4,371	4,351	4,327	4,331	4,260	4,231	4,074	3,995	4,054	U
Truck, single-unit 2-axle 6-tire or more ^c	U	20,131	23,888	22,120	18,635	16,629	18,729	18,814	18,702	18,693	18,720	18,615	18,592	18,459	18,303	18,344	U
Truck, combination	U	28,732	26,079	23,493	26,114	26,411	23,388	23,637	23,492	23,486	23,554	23,310	23,260	22,984	22,621	22,716	U
Bus	U	U	U	1,232	1,081	1,205	976	981	973	972	969	948	940	936	930	930	U
Transit motor bus	N	N	2,742	3,723	3,677	3,185	3,365	3,350	3,186	3,126	2,735	3,147	3,179	3,293	3,295	3,304	U
Amtrak	N	N	2,130	2,048	2,665	2,008	1,655	1,616	1,549	1,595	1,616	1,576	1,539	1,595	1,674	1,585	2,862

KEY: Btu = British thermal unit; N = data does not exist; U = data are not available.

^a Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^b U.S. Department of Transportation, Federal Highway Administration (FHWA), provides data separately for *Light duty vehicle, short wheel base* and *Motorcycle* in its annual *Highway Statistics* series. However, the 1995 summary report provides updated data for *Light duty vehicle, short wheel base* and *Motorcycle* combined. *Light duty vehicle, short wheel base* figures in this table were computed by U.S. Department of Transportation, Bureau of Transportation Statistics, by subtracting the most current motorcycle figures from the aggregate *Light duty vehicle, short wheel base* and *Motorcycle* figures.

^c 1960, *Motorcycle* data are included in *Light duty vehicle, short wheel base* (previously Passenger car), and *Long duty vehicle, long wheel base* (previously Other 2-axle, 4-tire vehicle) data are included in *Single-unit 2-axle 6-tire or more Truck*.

NOTES

To calculate total Btu, multiply fuel consumed (see tables 4-21, 4-22, 4-24, 4-26) by 135,000 Btu/gallon for *air carrier*; 120,286 Btu/gallon for *Light duty vehicle, short wheel base, Light duty vehicle, long wheel base*, and *Motorcycle*; 137,381 Btu/gallon for *Truck, single-unit 2-axle 6-tire or more*, *Truck, combination*, *Bus*, *Transit motor bus* and *Amtrak* diesel consumption; and 3,412 Btu/kWh for *Amtrak* electric consumption.

Amtrak passenger-miles data for 2000 and earlier years are for fiscal years; and are not comparable with 2001 and later years which is reported in calendar year. *Transit motor bus* data for 1996 and later years are obtained from the National Transit Database and cannot be compared with data for earlier years.

Table 4-21: Energy Intensity of Certificated Air Carriers, All Services^a

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aircraft-miles (millions)																	
Domestic operations	858	2,068	2,276	3,963	5,662	6,716	5,976	6,005	5,956	5,965	5,947	6,046	6,227	6,338	6,609	6,810	3,151
International operations	182	475	334	760	1,282	1,536	1,690	1,778	1,770	1,758	1,790	1,830	1,849	1,884	1,936	1,945	782
Available seat-miles (millions)																	
Domestic operations	52,220	213,160	326,734	570,558	726,291	758,665	689,911	697,779	699,590	708,403	721,277	756,922	794,475	822,525	866,592	898,106	391,251
International operations	13,347	51,960	84,514	182,652	254,048	270,588	302,013	314,744	312,475	316,908	326,472	333,155	337,460	345,457	353,943	361,062	100,183
Passenger-miles (millions)																	
Domestic operations	30,557	104,147	190,766	345,873	515,598	583,771	564,695	575,613	580,501	589,692	607,772	641,906	670,437	693,818	730,426	762,890	233,285
International operations	8,306	27,563	53,932	126,363	192,798	211,325	244,371	250,259	252,123	258,150	261,745	266,841	268,774	276,041	286,570	297,970	62,026
Fuel consumed (million gallons)																	
Domestic operations	1,954	8,009	8,519	12,212	14,865	13,976	11,257	11,035	10,440	10,337	10,459	10,929	11,374	11,588	12,151	12,541	7,643
International operations	566	2,136	1,747	3,938	5,508	5,975	6,042	6,523	6,506	6,487	6,321	6,421	6,295	6,441	6,599	6,663	3,838
Seats per aircraft																	
Domestic operations	60.9	103.1	143.6	144.0	128.3	113.0	115.5	116.2	117.5	118.8	121.3	125.2	127.6	129.8	131.1	131.9	124.2
International operations	73.3	109.4	252.7	240.2	198.2	176.2	178.7	177.0	176.6	180.2	182.4	182.0	182.5	183.4	182.9	185.6	128.1
Seat-miles per gallon																	
Domestic operations	26.7	26.6	38.4	46.7	48.9	54.3	61.3	63.2	67.0	68.5	69.0	69.3	69.9	71.0	71.3	71.6	51.2
International operations	23.6	24.3	48.4	46.4	46.1	45.3	50.0	48.3	48.0	48.9	51.6	51.9	53.6	53.6	53.6	54.2	26.1
Energy intensity (Btu/passenger-mile)																	
Domestic operations	8,633	10,382	6,029	4,767	3,892	3,232	2,691	2,588	2,428	2,366	2,323	2,298	2,290	2,255	2,246	2,219	4,423
International operations	9,199	10,462	4,374	4,207	3,857	3,817	3,338	3,519	3,484	3,393	3,260	3,248	3,162	3,150	3,109	3,019	8,353
Load factor (percent)																	
Domestic operations	58.5	48.9	58.4	60.6	71.0	76.9	81.9	82.5	83.0	83.2	84.3	84.8	84.4	84.4	84.3	84.9	59.6
International operations	62.2	53.0	63.8	69.2	75.9	78.1	80.9	79.5	80.7	81.5	80.2	80.1	79.6	79.9	81.0	82.5	61.9

KEY: Btu = British thermal unit.

^a U.S. owned carriers only. Operations of foreign-owned carriers in or out of the United States not included.**NOTES**

Aircraft-miles include all four large certificated 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 include all four large certificated 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.

Load factor: Ratio of Passenger-miles to Available seat-miles.

Heat equivalent factor used for Btu conversion is 135,000 Btu/gallon.

Table 4-22: Energy Intensity of Light Duty Vehicles and Motorcycles

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicle-miles (millions)																
Light duty vehicle, short wheel base ^a	587,000	917,000	1,112,000	1,408,000	1,600,287	1,708,421	2,025,745	2,046,282	2,062,828	2,074,423	2,072,071	2,147,840	2,191,764	2,220,801	2,232,588	2,254,309
Light duty vehicle, long wheel base	N	123,000	291,000	575,000	923,059	1,041,051	622,712	604,175	601,232	603,307	638,484	631,852	657,954	656,578	664,495	669,744
Motorcycle	U	3,000	10,200	9,600	10,469	10,454	18,513	18,542	21,385	20,366	19,970	19,606	20,445	20,149	20,076	19,688
Passenger-miles (millions)																
Light duty vehicle, short wheel base ^a	1,145,000	1,751,000	2,012,000	2,282,000	2,544,457	2,699,305	3,429,996	3,464,405	3,490,438	3,507,723	3,502,001	3,628,379	3,699,794	3,709,919	3,729,610	3,765,896
Light duty vehicle, long wheel base	N	226,000	521,000	1,000,000	1,467,664	1,804,848	1,001,456	972,382	970,669	977,477	1,037,129	1,028,774	1,075,234	1,106,303	1,119,644	1,128,489
Motorcycle	U	3,000	12,000	12,000	11,516	13,277	21,483	21,517	24,816	23,633	23,173	22,752	23,725	23,382	23,297	22,846
Average occupancy rate																
Light duty vehicle, short wheel base ^a	1.95	1.91	1.81	1.62	1.59	1.58	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.67	1.67
Light duty vehicle, long wheel base	N	1.84	1.79	1.74	1.59	1.73	1.61	1.61	1.61	1.62	1.62	1.62	1.63	1.63	1.68	1.68
Motorcycle	U	1.00	1.18	1.25	1.10	1.27	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Fuel consumed (million gallons)																
Light duty vehicle, short wheel base ^a	41,171	67,819	69,982	69,568	73,065	77,418	86,789	88,359	88,600	88,611	89,301	90,031	91,488	91,712	91,585	93,420
Light duty vehicle, long wheel base	N	12,313	23,796	35,611	52,939	58,869	36,251	35,335	35,114	35,159	37,343	36,437	37,819	37,467	37,189	38,029
Motorcycle	U	60	204	191	209	189	427	426	491	468	459	448	466	458	457	448
Energy intensity (Btu/passenger-mile)^b																
Light duty vehicle, short wheel base ^a	4,325	4,659	4,184	3,667	3,454	3,450	3,044	3,068	3,053	3,039	3,067	2,985	2,974	2,974	2,954	2,984
Light duty vehicle, long wheel base	N	6,553	5,494	4,284	4,339	3,923	4,354	4,371	4,351	4,327	4,331	4,260	4,231	4,074	3,995	4,054
Motorcycle	U	2,406	2,045	1,915	2,187	1,717	2,389	2,384	2,381	2,381	2,381	2,368	2,362	2,358	2,358	2,358

KEY: Btu = British thermal unit; N = data do not exist; U = data are not available.

^a Motorcycle is included in Light duty vehicle, short wheel base (previously Passenger car) in 1960.

^b 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 120,286

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 from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

For 1970-94, the unrevised motorcycle fuel consumed is subtracted from the combined passenger car and motorcycle fuel consumed from VM-201A.

Vehicle-miles and Passenger-miles data for 1960 through 1994 have been rounded to the nearest billion miles.

Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average U.S. light duty vehicle fuel efficiency (mpg) (calendar year)														
Light duty vehicle, short wheel base ^{a,b}	14.9	18.8	20.0	20.2	21.5	21.4	21.6	21.6	21.6	22.0	22.0	22.3	22.5	22.2
Light duty vehicle, long wheel base ^a	16.0	20.3	21.9	22.1	23.3	23.1	23.3	23.4	23.2	23.9	24.0	24.2	24.4	24.1
Light duty vehicle, long wheel base ^a	12.2	16.1	17.4	17.7	17.2	17.1	17.1	17.2	17.1	17.3	17.4	17.5	17.9	17.6
New vehicle fuel efficiency (mpg)^c (model year)														
Light-duty vehicle														
Passenger car	24.3	28.0	28.5	30.3	33.9	33.1	35.3	36.4	36.5	37.2	37.7	39.4	U	U
Domestic	22.6	26.9	28.7	30.5	33.1	32.7	34.8	36.1	36.3	37.2	37.3	39.2	U	U
Imported	29.6	29.9	28.3	29.9	35.2	33.7	36.0	36.8	36.9	37.3	38.1	39.7	U	U
Light truck (<8,500 lbs GVWR) ^d	18.5	20.8	21.3	22.1	25.2	24.7	25.0	25.7	26.5	27.3	27.4	28.6	U	U
CAFE standards (mpg)^e (model year)														
Passenger car	20.0	27.5	27.5	27.5	27.5	30.2	33.0	33.5	34.2	35.5	36.9	39.0	U	U
Light truck ^e	U	20.0	20.7	21.0	23.4	24.3	25.3	25.9	26.3	27.6	28.8	29.4	U	U

KEY: CAFE = Corporate Average Fuel Economy; GVWR = gross vehicle weight rating; mpg = miles per gallon; U = data are not available.

^a Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^b From 1980 to 1990, *Light duty vehicle, short wheel base* (previously *Passenger car*) fuel efficiency includes motorcycles.

^c 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.

^d Beginning with FY 1999, the total *Light truck* fleet ceased to be categorized by either domestic or import fleets.

^e No combined figure is available for 1980. In 1980, CAFE standard for 2 wheel drive, and 4 wheel drive light trucks were 16.0, and 14.0 mpg respectively.

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.

Table 4-24: Energy Intensity of Transit Motor Buses

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Vehicle-miles (millions)	1,576	1,409	1,677	2,130	2,041	2,192	2,229	2,160	2,147	2,155	2,182	2,205	2,243	2,259	2,289	2,308	2,080
Passenger-miles (millions)	N	N	21,790	20,981	18,807	19,425	20,570	20,559	21,142	21,257	21,429	20,093	20,411	19,224	18,625	18,367	12,616
Energy consumed																	
Diesel fuel (million gallons)	208	271	431	563	490	375	423	417	402	383	356	378	390	385	362	363	305
Compressed Natural Gas (million gallons)	N	N	N	N	42	93	124	126	122	128	132	151	161	165	171	180	166
Bio-diesel (million gallons)	N	N	N	N	N	51	41	45	50	61	31	40	40	35	47	39	31
Liquefied natural gas (million gallons)	N	N	N	N	9	14	23	21	19	17	14	11	11	11	5	3	2
Gasoline (million gallons)	N	N	N	N	1	1	7	7	8	9	8	9	8	9	10	10	9
Other major fuels ^a (million gallons)	N	N	N	N	1	3	3	4	4	6	6	8	6	6	2	2	2
Power ^b (million KWH)	N	N	N	N	1	1	1	1	1	1	3	13	15	16	19	31	40
Energy consumed, total (billion Btu)	N	N	N	N	69,150	61,864	69,208	68,877	67,368	66,441	58,603	63,224	64,888	63,297	61,365	60,685	51,329
Diesel fuel	28,575	37,230	59,211	77,366	67,261	51,553	58,093	57,286	55,209	52,664	48,910	51,902	53,521	52,889	49,748	49,865	41,959
Compressed Natural Gas	N	N	N	N	947	2,084	2,783	2,840	2,739	2,886	2,961	3,404	3,630	3,716	3,857	4,056	3,731
Bio-diesel	N	N	N	N	N	6,564	5,215	5,719	6,438	7,795	3,979	5,095	5,084	4,423	5,945	4,961	3,908
Liquefied natural gas	N	N	N	N	741	1,227	1,949	1,793	1,618	1,448	1,209	954	905	413	234	152	108
Gasoline	N	N	N	N	122	93	826	880	1,015	1,057	997	1,029	998	1,105	1,163	1,150	1,059
Other major fuels ^a	N	N	N	N	69	331	334	349	338	580	510	710	595	588	228	188	154
Power ^b	N	N	N	N	10	12	8	11	11	11	35	131	156	163	190	313	410
Energy intensity (Btu/passenger-mile)	N	N	N	N	3,677	3,185	3,365	3,350	3,186	3,126	2,735	3,147	3,179	3,293	3,295	3,304	4,069

KEY: Btu = British thermal unit; KWH = Kilowatt hour; N = data do not exist.

^a Before 2002, *Other major fuels* includes liquefied petroleum gas, methanol, ethanol, and bunker fuel. From 2002 - 13, *Other major fuels* includes liquefied petroleum gas, methanol, ethanol, bunker fuel, kerosene, and grain additive. After 2013, other major fuels includes liquefied petroleum gas, ethanol and hydrogen.

^b Power includes electric propulsion and electric battery.

NOTES

Data from 1996 and after are not comparable to the data for earlier years or to the data published in previous editions of the report due to different data sources used.

Data from 1997 and after are for those vehicles used for both directly operated (DO) and purchased transportation (PT) services.

Data from 2011 includes all buses including rapid transit as well as commuter buses.

Energy consumed, total does not include the other types of energy identified in table 17 in the *National Transit Database* due to the lack of information on the unit of measurement for such data.

The following conversion rates were used:

Diesel = 137,381 Btu/gallon.

Compressed natural gas = 22,500 Btu/gallon.

Bio-Diesel = 127,595 Btu/gallon.

Liquefied natural gas = 84,800 Btu/gallon.

Gasoline = 120,286 Btu/gallon.

Liquefied petroleum gas = 91,300 Btu/gallon.

Methanol = 64,600 Btu/gallon.

Ethanol = 84,600 Btu/gallon.

Bunker fuel = 149,700 Btu/gallon.

Kerosene = 135,000 Btu/gallon.

Grain additive = 120,900 Btu/gallon.

Electricity 1KWH = 3,412 Btu, negating electrical system losses. This table includes approximate electrical system losses, and thus the conversion factor is multiplied by 3.

Table 4-25: Energy Intensity of Class I Railroad Freight Service

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Revenue freight ton-miles (millions)	572,309	764,809	918,958	1,033,969	1,465,960	1,696,425	1,691,004	1,729,256	1,712,567	1,740,687	1,851,229	1,738,283	1,585,440	1,674,784	1,729,638	1,614,498
Car-miles (millions)	28,170	29,890	29,277	26,159	34,590	37,712	35,541	36,649	36,525	35,253	37,193	35,853	32,572	34,065	35,018	33,242
Tons per car load	44.4	54.9	67.1	66.6	62.6	61.0	63.4	62.9	62.0	61.0	60.9	58.4	56.2	56.6	55.8	55.4
Fuel consumed (million gallons)	3,463	3,545	3,904	3,115	3,700	4,098	3,494	3,685	3,600	3,682	3,867	3,692	3,385	3,495	3,656	3,419
Energy intensity (Btu/revenue freight ton-mile)	839	643	589	418	350	335	287	296	292	293	290	295	296	289	293	294
Energy intensity (Btu/car-mile)	17,051	16,450	18,495	16,516	14,836	15,072	13,635	13,946	13,671	14,487	14,421	14,283	14,414	14,230	14,481	14,266

KEY: Btu = British thermal unit.

NOTES

The threshold for classification as a *Class I Railroad* is based on operating revenues; the 2019 threshold is \$504.80 million, 2018: \$489.94 million, 2017: \$463.86 million, 2016: \$447.62 million, 2015: \$457.91 million, 2014: \$475.75 million, 2013: \$467.1 million, 2012: \$452.7 million, 2011: \$433.2 million, 2010: \$398.7 million, 2005: \$319.3 million.

The heat equivalent factor used for *Btu* conversion is 138,700 Btu/gallon.

Table 4-26: Energy Intensity of Amtrak Services

	1975	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue passenger-miles (millions) ^a	3,753	4,503	6,057	5,498	5,381	6,420	6,568	6,804	6,810	6,675	6,536	6,520	6,563	6,361	6,487	3,450
Total energy consumed (billion Btu) ^b	9,284	9,590	12,404	14,651	10,808	10,626	10,612	10,537	10,864	10,786	10,302	10,032	10,465	10,648	10,281	9,876
Electric (millions of kWh) ^{b,c}	180	254	330	470	531	559	555	549	525	515	504	516	490	485	484	351
Diesel (million gallons) ^c	63	64	82	95	65	63	63	63	66	66	62	60	64	65	63	63
Energy intensity (Btu/revenue passenger-mile) ^a	2,474	2,130	2,048	2,665	2,008	1,655	1,616	1,549	1,595	1,616	1,576	1,539	1,595	1,674	1,585	2,862

KEY: Btu = British thermal unit; kWh = kilowatt hour.

^a Revenue passenger-miles data prior to 2001 are fiscal year data; 2001 data and more recent data are calendar year data.

^b Does not include electric power generation and distribution losses, which, if included, would triple the electric conversion factor given below and increase the numbers in this row by about 20 percent.

^c Electric usage and diesel usage data are calendar year data.

NOTE

The heat equivalent factors used in Btu conversion are:

Diesel = 137,381 Btu/gallon.

Electric = 3,412 Btu/kWh.

Table 4-27: Energy Intensity of Amtrak Services (loss-adjusted conversion factors)

	1975	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue passenger-miles (millions)^a	3,753	4,503	6,057	5,574	5,381	6,420	6,568	6,804	6,810	6,675	6,536	6,520	6,563	6,361	6,487	3,450
Total energy consumed (billion Btu)^b	10,533	11,348	14,687	17,908	14,489	14,496	14,459	14,341	14,501	14,356	13,793	13,604	13,859	14,008	13,636	12,307
Electric (millions of kWh) ^{b,c}	180	254	330	470	531	559	555	549	525	515	504	516	490	485	484	351
Diesel (million gallons) ^c	63	64	82	95	65	63	63	63	66	66	62	60	64	65	63	63
Energy intensity (Btu/revenue passenger-mile)^a	2,807	2,520	2,425	3,213	2,692	2,258	2,202	2,108	2,130	2,151	2,110	2,087	2,112	2,202	2,102	3,567

KEY: Btu = British thermal unit; kWh = kilowatt hour.

^a Revenue passenger-miles data prior to 2001 are fiscal year data; 2001 data and more recent data are calendar year data.

^b Includes electric power generation and distribution losses.

^c Electric usage and diesel usage data are calendar year data.

NOTES

Energy intensity (Btu/revenue passenger-mile) is calculated by the source and may differ from direct calculations.

The heat equivalent factors used in Btu conversion are:

Diesel = 137,381 Btu/gallon.

Electric = 10,399 Btu/kWh. The electric conversion factor takes into account losses associated with the generation, transmission and distribution of electricity, and thus it is more than three times the value of the factor that is used in table 4-26.

National Transportation Statistics 50th Anniversary Edition: 2021

Table 4-28 cont'd: Annual Wasted Fuel Due to Congestion

Urban area	Population group	Gallons wasted (millions)															Percent change ^a			
		1982	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Short-term 2015-2020		Long-term 1982-2020	
Salem, OR	Small	0.3	1.0	2.0	3.0	2.9	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.1	3.2	1.2	-60.3	97	263.8	50
Salt Lake City, UT	Large	1.9	3.9	9.1	12.1	12.7	13.2	13.9	14.3	14.4	14.6	14.9	15.0	14.9	14.9	8.6	-40.8	44	346.6	40
San Antonio, TX	Large	4.2	6.8	17.3	21.0	22.9	23.7	24.7	25.5	25.6	25.8	26.0	27.2	28.3	17.7	-31.5	25	320.6	44	
San Diego, CA	Very large	4.9	11.1	22.6	28.0	28.5	29.4	30.0	30.4	30.7	31.5	32.2	34.7	34.2	13.0	-58.7	93	163.7	71	
San Francisco-Oakland, CA	Very large	37.2	53.6	74.8	81.7	79.6	80.3	84.5	86.0	87.8	88.9	89.7	91.0	92.0	40.9	-54.0	82	9.9	99	
San Jose, CA	Large	6.1	13.6	24.1	28.7	33.3	36.5	37.7	39.2	39.7	40.3	41.1	42.0	41.8	16.3	-59.6	96	166.4	70	
San Juan, PR	Large	3.0	8.5	19.5	27.0	27.8	28.3	28.7	29.0	29.3	29.5	29.9	30.2	29.6	14.7	-50.3	68	383.4	33	
Sarasota-Bradenton, FL	Medium	1.4	2.4	4.6	5.4	5.5	5.6	5.6	5.9	6.0	6.1	6.3	6.5	7.1	7.4	2.6	-57.5	90	86.7	94
Seattle, WA	Very large	14.0	23.9	41.3	53.4	56.9	58.2	59.6	61.8	62.1	62.3	62.6	62.7	64.2	27.6	-55.7	83	96.8	92	
Spokane, WA	Small	1.1	1.9	3.8	4.8	4.9	5.0	5.1	5.2	5.2	5.3	5.5	5.6	5.7	5.8	2.5	-53.3	80	120.2	85
Springfield, MA-CT	Medium	1.7	3.1	5.3	5.8	6.0	6.1	6.2	6.3	6.3	6.4	6.6	6.7	6.8	7.0	4.3	-33.0	27	149.6	76
St. Louis, MO-IL	Large	7.4	12.0	22.7	27.0	27.8	27.8	28.0	28.2	28.4	28.6	28.8	28.9	29.1	29.6	21.1	-26.1	12	187.1	64
Stockton, CA	Small	0.4	1.0	1.8	2.9	2.8	2.9	2.9	2.9	3.0	3.1	3.3	3.5	3.8	4.0	2.9	-6.0	2	570.2	17
Tampa-St. Petersburg, FL	Large	7.1	12.6	20.1	28.9	29.1	29.6	30.5	31.1	31.3	32.6	34.9	37.0	38.6	40.5	14.1	-56.6	87	99.4	90
Toledo, OH-MI	Medium	1.0	1.8	3.0	3.4	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.1	4.1	4.1	2.0	-53.0	78	98.1	91
Tucson, AZ	Medium	2.4	4.7	8.8	11.1	12.8	12.9	13.1	13.3	13.4	13.6	13.8	14.0	13.8	13.7	5.7	-58.0	92	142.9	78
Tulsa, OK	Medium	1.7	3.6	6.6	8.1	8.8	9.1	9.2	9.6	9.7	9.8	9.9	9.9	8.9	8.3	5.5	-43.7	51	220.2	58
Virginia Beach, VA	Large	3.1	6.1	12.2	13.4	14.1	14.2	14.2	14.4	14.5	14.4	14.3	14.1	14.3	14.3	7.2	-50.2	67	133.6	82
Washington, DC-VA-MD	Very large	20.1	36.3	59.4	76.0	86.0	87.0	87.5	87.8	88.1	88.7	89.3	89.9	94.1	98.1	38.9	-56.1	85	93.7	93
Wichita, KS	Medium	0.8	1.7	2.7	3.5	3.8	4.0	4.1	4.1	4.2	4.2	4.2	4.3	4.2	4.0	2.8	-34.2	35	245.8	54
Winston-Salem, NC	Small	0.3	0.5	1.7	2.3	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.7	2.8	2.8	1.6	-38.6	41	473.6	23
Worcester, MA	Medium	0.6	1.9	3.7	4.5	4.9	4.9	4.9	5.1	5.1	5.2	5.4	5.5	5.5	5.6	3.8	-27.5	17	491.3	21
494 Urban area average	494 Areas	1.6	2.7	4.8	5.9	6.1	6.2	6.3	6.5	6.5	6.6	6.7	6.8	6.9	7.0	3.5	-46.5	NA	117.2	NA
101 Urban area average	101 Areas	6.8	11.4	20.3	24.9	25.7	26.1	26.7	27.1	27.4	27.7	28.1	28.5	29.0	29.6	14.8	-46.5	NA	117.2	NA
Very large urban area average	Very large	34.9	53.5	88.3	106.9	107.9	109.7	111.8	113.4	114.5	115.5	116.5	117.8	119.6	121.8	59.8	-48.3	NA	71.2	NA
Large urban area average	Large	3.3	7.4	15.4	19.5	20.6	21.1	21.6	22.1	22.4	22.7	23.1	23.5	24.0	24.6	12.5	-45.1	NA	272.7	NA
Medium urban area average	Medium	1.6	2.9	5.7	6.9	7.6	7.7	7.9	8.0	8.1	8.3	8.4	8.5	8.7	8.9	4.8	-42.2	NA	196.7	NA
Small urban area average	Small	0.4	0.9	2.0	2.8	3.1	3.2	3.2	3.3	3.3	3.4	3.5	3.5	3.7	3.9	2.2	-33.7	NA	448.5	NA

KEY: NA = not applicable.

Very large urban areas - over 3 million population.

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

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

Small urban areas - less than 500,000 population.

^a Percent changes were calculated using the numbers in this table and were not obtained from the source. Ranks are based on the calculated percent changes with the highest number corresponding to a rank of 1.

NOTES

Wasted fuel is extra fuel consumed due to inefficient operation in slower stop-and-go traffic.

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

Population group is based on 2020 population.

National Transportation Statistics 50th Anniversary Edition: 2021

Table 4-29 cont'd: Annual Wasted Fuel Per Person

Urban area	Population group	Gallons wasted															Percent change ^a			
		1982	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Short-term 2015-2020		Long-term 1982-2020	
		Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent
San Jose, CA	Large	4	9	17	21	25	27	27	28	29	30	31	32	32	32	13	-56.7	85	225.0	62
San Juan, PR	Large	2	8	19	25	26	25	26	26	27	27	28	28	28	28	14	-48.1	61	600.0	15
Sarasota-Bradenton, FL	Medium	3	6	9	11	12	12	12	13	12	12	13	14	15	16	5	-58.3	89	66.7	94
Seattle, WA	Very large	6	12	20	25	27	27	28	29	28	29	30	31	31	32	13	-55.2	80	116.7	88
Spokane, WA	Small	4	9	18	22	22	22	22	23	23	24	25	26	26	26	11	-54.2	77	175.0	73
Springfield, MA-CT	Medium	4	9	17	18	18	18	19	19	19	19	19	19	20	20	12	-36.8	37	200.0	64
St. Louis, MO-IL	Large	4	10	17	21	20	20	19	19	19	19	19	19	19	19	14	-26.3	13	250.0	58
Stockton, CA	Small	1	4	6	11	12	12	13	14	15	16	16	17	18	19	14	-12.5	1	1,300.0	2
Tampa-St. Petersburg, FL	Large	4	8	13	18	17	17	19	18	18	19	19	20	20	21	7	-63.2	99	75.0	93
Toledo, OH-MI	Medium	4	10	15	17	20	20	19	19	19	20	20	21	21	21	10	-50.0	62	150.0	78
Tucson, AZ	Medium	3	9	15	19	20	19	19	19	20	20	20	20	20	19	8	-60.0	96	166.7	74
Tulsa, OK	Medium	2	8	13	16	15	15	16	17	16	17	17	17	15	15	10	-41.2	47	400.0	36
Virginia Beach, VA	Large	3	9	16	17	16	16	16	16	16	15	15	15	15	8	-46.7	57	166.7	74	
Washington, DC-VA-MD	Very large	8	15	24	31	35	35	35	35	35	36	37	38	40	41	16	-55.6	81	100.0	91
Wichita, KS	Medium	2	8	11	16	17	17	16	16	16	16	16	16	16	15	11	-31.3	24	450.0	32
Winston-Salem, NC	Small	1	2	6	8	7	7	7	7	7	8	9	9	10	10	6	-33.3	30	500.0	24
Worcester, MA	Medium	2	8	14	17	19	18	17	18	17	17	17	17	17	17	12	-29.4	19	500.0	24
494 Urban area average	494 Areas	5	9	15	18	18	19	19	19	20	20	21	21	22	22	11	-45.2	NA	108.5	NA
101 Urban area average	101 Areas	6	11	18	22	22	23	23	24	24	25	25	26	26	27	13	-45.2	NA	108.4	NA
Very large urban area average	Very large	10	14	22	26	27	28	28	29	29	30	31	32	32	33	16	-46.0	NA	64.2	NA
Large urban area average	Large	3	8	15	19	20	20	20	21	21	22	22	22	23	11	-45.7	NA	280.9	NA	
Medium urban area average	Medium	3	7	13	16	17	17	17	18	18	18	18	19	19	11	-42.5	NA	219.9	NA	
Small urban area average	Small	2	4	9	13	13	13	14	14	14	15	15	16	16	9	-37.0	NA	418.2	NA	

KEY: NA = not applicable.

Very large urban areas - over 3 million population.
 Large urban areas - over 1 million and less than 3 million population.
 Medium urban areas - over 500,000 and less than 1 million population.
 Small urban areas - less than 500,000 population.

^a Percent changes were calculated using the numbers in this table and were not obtained from the source. Ranks are based on the calculated percent changes with the highest number corresponding to a rank of 1.

NOTES

Wasted fuel is extra fuel consumed due to inefficient operation in slower stop-and-go traffic.
 The urban areas included are those containing over 500,000 people and several smaller places mostly chosen by previous sponsors of the Texas A&M Transportation Institute study on mobility.
 Population group is based on 2020 population.

SOURCE

Texas Transportation A&M Institute, *2021 Urban Mobility Report*, (College Station, TX: 2021), available at <http://mobility.tamu.edu> as of Sept. 8, 2021.

Section D:
Air Pollution

Table 4-30: 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 ¹ 1994-2003 ^b	Interim Tier 2 ¹ 2004-2006	Tier 2 ¹ 2007+
		g	g	g	g	g	g	g	g	g	g	g	g	g
Gasoline														
HC (total)	11	2.2	3.4	0.41	1.5	0.41					0.41 (h)			
NMHC	e										0.25 (0.31)			
NMOG	e												0.125 (0.156)	0.100 (0.125)
CO	80	23	39	7.0	15	3.4					3.4 (4.2)			
Cold-temp. CO ^c	e										10 (h)			
NO _x	4		3.0	2.0	3.1	1.0					0.4 (0.6)			0.14 (0.20)
Particulates	e										0.08 (0.10)		0.08 (0.08)	0.02 (0.02)
Formaldehyde	e												0.015 (0.018)	
Diesel														
HC (total)	11		1.5	0.41							0.41 (h)			
NMHC	e										0.25 (0.31)			
NMOG	e												0.100 (0.125)	0.100 (0.125)
CO	80		15	7.0	3.4	1.0					3.4 (4.2)		3.4 (4.2)	3.4 (4.2)
NO _x	4		3.1	2.0	1.0	1.0					1.0 (1.25)		0.6 (0.6)	0.14 (0.20)
Particulates	e										0.08 (0.10)		0.10 (0.10)	0.02 (0.02)
Formaldehyde	e								0.60	0.20			0.018 (0.018)	0.015 (0.018)
Test procedure														
		7-mode			CVS-72	CVS-75								
Useful life, intermediate^{b,f}														
		5 years/50,000 miles			5 years/50,000 miles									
		10 years/100,000 miles			10 years/100,000 miles									
Useful life, full														
		5 years/50,000 miles			5 years/50,000 miles									
		10 years/100,000 miles			10 years/100,000 miles									

KEY: CO = carbon monoxide; CVS = constant volume sampler; HC = hydrocarbons; NMHC = non-methane hydrocarbons; NMOG = nonmethane organic gases; NO_x = 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 NO_x tested under the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2000; these standards are not shown in this table.

^b All emissions standards must be met for a useful life of 5 years/50,000 miles. Beginning with model year 1994, a second set of emissions standards must also be met for a full useful life of 10 years/100,000 miles; these standards are shown in parentheses. Tier 1 exhaust standards were phased-in during 1994-96 at a rate of 40%, 80%, and 100%, respectively.

^c The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^d The "Prior to control" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^e No estimate available.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and have either 1) intermediate useful life standards waived or 2) receive additional NO_x 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 NO_x, CO, NMHC, 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 NO_x standard is met for the full useful life of the vehicle. The Tier 2 corporate average NO_x standard is 0.07 grams/mile. Interim corporate-based average NO_x standards are based on vehicle type. The interim 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.

Table 4-31: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks^{a,b} (category LDT1)

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+
	g	h													
Gasoline															
HC (total)	11		2.2	3.4	3.4	1.5	0.41					0.41	(h)		
NMHC	e											0.25	(0.31)		
NMOG	e													0.125	(0.156) (0.100) (0.125)
CO	80		23	39	39	15	7.0	3.4				3.4	(4.2)		
Cold-temp. CO ^c	e											10	(h)		
NO _x	4			3.0		3.1	2.0		1.0			0.4	(0.6)		0.14 (0.20)
Particulates	e											0.08	(0.10)		0.08 (0.08) 0.02 (0.02)
Formaldehyde	e														0.015 (0.018)
Diesel															
HC (total)	11					1.5	0.41					0.41	(h)		
NMHC	e											0.25	(0.31)		
NMOG	e														
CO	80					15	7.0	3.4				3.4	(4.2)		0.100 (0.125) 3.4 (4.2)
NO _x	4					3.1	2.0		1.0			1.0	(1.25)		0.14 (0.20)
Particulates	e										0.60	0.20	(0.10)		0.02 (0.02)
Formaldehyde	e														0.015 (0.018)
Test procedure															
			7-mode		CVS-72	CVS-75									
Useful life, intermediate^{b,f}	h														
Useful life, full	5 years/50,000 miles														
KEY:	CO = carbon monoxide; CVS = constant volume sampler; HC = hydrocarbons; NMHC = non-methane hydrocarbons; NMOG = nonmethane organic gases; NOx = nitrogen oxides.														

^a The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulations. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that the total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure. Additional standards for CO and composite standards for NMHC and NOx tested under the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2000; these standards are not shown in this table.

^b All emissions standards must be met for a useful life of 5 years/50,000 miles. Beginning with model year 1994, a second set of emissions standards must also be met for a full useful life of 10 years/100,000 miles; these standards are shown in parentheses. Tier 1 exhaust standards were phased-in during 1994-96 at a rate of 40%, 80%, and 100%, respectively.

^c The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^d The "Prior to control" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^e No estimate available.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and have either 1) intermediate useful life standards waived or 2) receive additional NOx credits.

^g In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^h No standard has been set.

ⁱ The term "tier" refers to a level of standards and is associated with specific years. Interim Tier 2 refers to an intermediate level of standards that move manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NOx, CO, NMOG, formaldehyde, and particulate matter; HC and NMHC standards are dropped for Tier 2 and Interim Tier 2. Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted 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.

Table 4-32: 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	1973-1974	1975-1978	1976-1978	1979-1981	1982-1983	1984-1986	1985-1987	1988-1990	1991-1993	Tier 1k 1994	Tier 1k 1995-2003	Interim Tier 2 ^k 2004-2006	Tier 2 ^k 2007+
Gasoline																
HC (total)	11	^e	2.2	3.4	2.0	1.7	0.80						j	(0.80)		
NMHC													j	(0.40)		
NMOG															0.125 (0.156)	0.100 (0.125)
CO	80		23	39	20	18	10		4.4 (5.5)				4.4 (5.5)		3.4 (4.2)	
Cold-temp. CO ^d									12.5 ^o							
NO _x	4			3.0	3.1	2.3				0.7 (0.97)	1.7		0.7 (0.97)		0.4 (0.6)	0.14 (0.20)
Particulates														0.08 (0.10)	0.08 (0.08)	0.02 (0.02)
Formaldehyde															0.015 (0.018)	
Diesel																
HC (total)	11				2.0	1.7	0.80						j	(0.80)		
NMHC													0.32 (0.40)			
NMOG															(0.156) (0.100)	(0.125) (0.100)
CO	80				20	18	10		4.4 (5.5)				4.4 (5.5)		(4.2) (3.4)	(4.2) (3.4)
NO _x	4				3.1	2.3				1.7 (0.97)			j	(0.97)	(0.6) (0.6)	0.14 (0.20)
Particulates										0.50	0.45	0.13		0.08 (0.10)	(0.10) (0.10)	0.02 (0.02)
Formaldehyde															(0.018) (0.015)	0.015 (0.018)
LDT2 weight criteria^e																
GVWR up through 6,000 pounds																
GVWR up through 6,000 pounds: LVW over 3,750 pounds																
Test procedure^e																
7-mode CVS-72																
GVWR up through 6,000 pounds																
GVWR up through 8,500 pounds																
Useful life, intermediate^{c,f}																
5 years/50,000 miles																
Useful life, full																
5 years/50,000 miles																
5 years/50,000 miles																
10 years/100,000 miles																
10 years/120,000 miles																
11 years/120,000 miles																
5 years/50,000 miles																
10 years/100,000 miles																
5 years/50,000 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; NMOG=nonmethane organic gases; NO_x=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 NO_x 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 at a rate of 40%, 80%, and 100%, respectively. Particulates standards were phased-in at a rate of 40%, 80%, and 100% during 1995-97.

^d The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. LVW is the curb weight (nominal vehicle weight) plus 300 pounds.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NO_x 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 1988-89, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^j No standard has been set.

^k The term "Tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that move manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NO_x, CO, MMOG, formaldehyde, and particulates (HC and NMHC standards are dropped for Tier 2 and Interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NO_x standard is met for the full useful life. The Tier 2 corporate average NO_x standard is 0.07 grams/mile. Interim corporate-based average NO_x standards are based on vehicle type. The interim corporate sales-weighted average for LDT2 vehicles is 0.3 grams/mile. Tier 2 standards will be phased in at a rate of 25% in 2004, 50% in 2005, 75% in 2006, and 100% in 2007. During this period all LDT2 vehicles not meeting the Tier 2 standards must meet Interim Tier 2 standards.

Table 4-33: 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	1968-1969 control ^b	1970-1971	1972-1974	1975-1978	1979-1981	1982-1983	1984-1986	1987-1989	1990-1995	1991-1996	Tier 1 ^k 2007	Interim Tier 2 ^k 2008	Tier 2 ^k 2009+		
Gasoline															
HC (total)	11	2.2	3.4	2.0	1.7	0.80					(0.80)				
NMHC	h									0.32	(0.46)				
NMOG	h											0.160	(0.230)		
CO	80	23	39	20	18	10				4.4	(6.4)		3.4		
Cold-temp. CO ^d	h									12.5	⁰		4.2		
NO _x	4			3.0	2.3		2.3	1.7		0.7	(0.98)	0.4	(0.6)		
Particulates	h										(0.10)	0.08	(0.08)		
Formaldehyde	h											0.018	(0.027)		
Formaldehyde	h											0.018	(0.027)		
Diesel															
HC (total)	11			2.0	1.7	0.80					(0.80)				
NMHC	h									0.32	(0.46)				
NMOG	h											(0.230)	0.125		
CO	80			20	18	10				4.4	(6.4)		3.4		
NO _x	4			3.1	2.3		2.3	1.7			(0.98)	0.4	(0.6)		
Particulates	h						0.50	0.45	0.13		(0.10)	0.08	(0.08)		
Formaldehyde	h											0.018	(0.027)		
Formaldehyde	h											0.018	(0.027)		
LDT3 weight criteria^e															
		GVWR up through 6,000 pounds			GVWR up through 8,500 pounds			Any ALVW			ALVW up through 5,750 pounds				
Test procedure^b		7-mode	CVS-72	CVS-75	GVWR 6,001-8,500 pounds										
Useful life, intermediate^{c,f}		5 years/50,000 miles													
Useful life, full		5 years/50,000 miles										11 years/120,000 miles		5 years/50,000 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 1988 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 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. ALVW is the numerical average of the GVWR and the curb weight.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NOx credits.

^g The "Prior to controls" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^h No estimate available.

ⁱ In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^j No standard has been set.

^k The term "tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that moves manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for 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.

Table 4-34: 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 ^d	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 2k 2009+
Gasoline																		
HC (total)	11	2.20	3.40	2.00	2.00	1.70	0.80									0.39	0.16	0.13
NMHC	h															(0.80)	(0.23)	(0.16)
NMHC	h															(0.56)	(6.40)	(4.20)
NMHC	h																	
CO	80	23.00	39.00	20.00	20.00	18.00	10.00									5.00	4.4	3.40
Cold-temp. CO ^d	h															12.50		
NO _x	4		3.00	3.10	2.30	2.30	2.30	2.30	2.30	2.30	1.70	2.30	2.30	1.70	1.10	0.4	0.4	0.14
Particulates	h															0.08	0.08	0.02
Formaldehyde	h															0.02	0.03	0.02
Diesel																		
HC (total)	11			2.00	1.70	0.80										0.39	0.16	0.13
NMHC	h															(0.80)	(0.23)	(0.16)
NMHC	h															(0.56)	(6.40)	(4.20)
NMHC	h																	
CO	80			20.00	18.00	10.00										5.00	4.4	3.40
NO _x	4			3.10	2.30	2.30	2.30	2.30	2.30	2.30	1.70	2.30	2.30	1.70	1.10	0.4	0.4	0.14
Particulates	h															0.08	0.08	0.02
Formaldehyde	h															0.02	0.03	0.02

LDT4 weight criteria^a GVWR up through 6,000 pounds GVWR up through 8,500 pounds GVWR over 8,500 pounds

Test procedure^b 7-mode CVS-72 CVS-75

Useful life, full 5 years/50,000 miles 11 years/120,000 miles 5 years/50,000 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 4-31, 4-32, and 4-33.

^b The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulation. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that the total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure.

Additional standards for CO and composite standards for NMHC and NOx tested over the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2002. These standards are not shown in this table.

^c Emissions standards had to be met for a full useful life of 5 years/50,000 miles through model year 1983, and a full useful life of 11 years/120,000 miles was defined for 1985-93 (several useful life options were available for 1984). Beginning in model year 1996, emissions standards were established for an intermediate useful life of 5 years/50,000 miles as well as a full useful life of 11 years/120,000 miles (intermediate and full useful life standards are shown in parentheses). This applied to all pollutants except HC and particulates for all LDT4 vehicles and NOx for diesel-powered LDT4 vehicles, which were only required to meet full useful life standards. Tier 1 exhaust standards were phased-in during 1996-97 at a rate of 50% and 100%, respectively.

^d The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. ALVW is the numerical average of the GVWR and the curb weight.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NOx credits.

^g The "Prior to control" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^h No estimate available.

ⁱ In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^j No standard has been set.

^k The term "Tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that moves manufacturers toward compliance with Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NOx, CO, NMHC, 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.

Table 4-35: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Medium-Duty Passenger Vehicles (MDPV)^{a,b}
(grams per mile)

Engine type and pollutant	Interim Tier 2 ^f		Tier 2 ^f	
	2004	2008	2009+	
Gasoline				
NMOG	0.195	-0.280	0.125	-0.156
CO	5.000	-7.300	3.400	-4.200
Cold-temp. CO ^c	12.500			
NO _x	0.600	-0.900	0.140	-0.200
Particulates	0.120	-0.120	0.020	-0.020
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	(7.300)	3.400 (4.200)
NO _x	4.0 g/bhp-hr	^g	(0.900)	0.140 (0.200)
Particulates	0.10 g/bhp-hr	^g	(0.120)	0.020 (0.020)
Formaldehyde		^g	(0.032)	0.015 (0.018)
Smoke opacity (acceleration / lugging / peak) ^d	20/15/50			
Weight Criteria	Greater than 8,500 pounds GVWR; less than 10,000 pounds GVWR			
Test procedure, gasoline	CVS-75			
Test procedure, diesel	EPA Transient	CVS-75		
Useful life-gasoline, intermediate^{b,e}	5 years/50,000 miles			
Useful life-gasoline, full	11 years/120,000 miles			
Useful life-diesel, intermediate^{b,e}	^g	5 years/50,000 miles		
Useful life-diesel, full	8 years/110,000 miles	11 years/120,000 miles		

KEY: CO = carbon monoxide; g/bhp-hr = grams per brake horsepower-hour; GVWR = gross vehicle weight rating; HC = hydrocarbons; NMHC=nonmethane hydrocarbon; NMOG = nonmethane organic gases; NO_x = nitrogen oxides.

^a The MDPV category was created for the Interim Tier 2 and Tier 2 vehicle emissions standards. This category was specifically designed to help bring passenger vehicles (such as large sport utility vehicles and passenger vans) over 8,500 pounds GVWR into the Tier 2 program. MDPVs are defined as any complete heavy-duty vehicle less than 10,000 pounds GVWR designed primarily for transportation of persons, including conversion vans (i.e., vans which are intended to be converted to vans used primarily for transporting people). This does not include vehicles that have 1) a capacity of more than 12 persons total, or 2) are designed to accommodate more than 9 persons seated rearward of the driver's seat, or 3) have a cargo box (i.e., a pickup-bed or box) of six feet or more in interior length. Prior to Tier 2 standards, these vehicles would have been regulated as light heavy-duty trucks.

^b Diesel MDPVs can continue to use light heavy-duty truck standards for new vehicle certification until 2008. Note that these standards are measured in grams per brake horsepower-hour (g/bhp-hr). Beginning in 2008, MDPVs must use the same on-chassis testing procedure as heavy light-duty trucks (categories LDT3 and LDT4) and must meet standards for MDPVs. Beginning in 2009, MDPVs must meet the same standards as light heavy-duty trucks, except MDPVs are not required to meet Supplemental Federal Test Procedure standards.

^c The cold CO emissions standard is measured at 20 °F (rather than 75 °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 standards that moves manufacturers toward compliance with Tier 2 standards. Tier 2 and interim Tier 2 standards are established as "bins." Each bin is a set of standards for NO_x, CO, NMOG, formaldehyde, and particulates (HC and NMHC standards are dropped for Tier 2 and Interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NO_x standard is met for full useful life. The Tier 2 corporate average NO_x standard is 0.07 grams/mile. Interim corporate-based average NO_x standards are based on vehicle type. The interim corporate sales-weighted average for MDPVs is 0.6 grams/mile. Tier 2 MDPV standards will be phased in during 2008 and 2009. In 2008, 50% of MDPVs must meet Tier 2 standards; the other 50% of MDPVs must meet interim Tier 2 standards. Beginning in 2009, all MDPVs must meet Tier 2 standards.

^g Diesel MDPVs are not required to meet intermediate life standards during this time period.

Chapter 4. Transportation, Energy, and the Environment

Table 4-36: Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Heavy-Duty Trucks (grams per brake horsepower-hour)

Engine type and pollutant	1970-73	1974-78	1979-83	1984	1985-86	1987	1988-89	1990	1991-93	1994-97	1998-2003	2004	2005-06	2007	2008+	
<i>Gasoline</i>																
HC + NO _x	j	16	10		j											
NO _x + NMHC	j											1.0		j		
NMHC	j														0.14	
HC	k	j	1.5		1.9	1.1							j			
NO _x	j				10.6			6.0	5.0		4.0		j		0.20	
CO	k	40	25		37.1	14.4										
Particulates	j														0.01	
<i>Diesel</i>																
HC + NO _x	j	16	10		j											
HC	k	j	1.5		1.3								j			
NO _x	j				10.7			6.0	5.0		4.0				0.20	
NO _x + NMHC	j											2.4 ⁱ		j		
NMHC	j														0.14	
CO	k	40	25		15.5											
Particulates	j						0.60		0.25	0.10					0.01	
Smoke opacity (acceleration / lugging / peak) ^a	40/20 ^j	20/15/50														
Weight criteria for light heavy-duty trucks^b	GVWR over 6,000 lbs			GVWR over 8,500 lbs			GVWR 8,501 through 14,000 lbs									
Test procedure, gasoline^c	9-mode steady-state						MVMA transient									
Test procedure, diesel^c	13-mode steady-state						EPA transient									
Useful life (gasoline)^d	5 years/50,000 miles						8 years/110,000 miles						10 years/110,000 miles			

Complete Vehicles - (Grams per mile)^{e,f}

Weight range and pollutant	2005-06	2007	2008+
GVWR 8,500 through 10,000 lbs			
NMOG ^g	0.28		e
NMHC ^h	e		0.195
CO	7.3		
NO _x	0.9		0.2
Particulates	e		0.02
HCHO	e		0.032
GVWR 10,001 lbs through 14,000 lbs			
NMOG ⁱ	0.33		e
NMHC ^j	e		0.230
CO	8.1		
NO _x	1.0		0.4
Particulates	e		0.02
HCHO	e		0.040
Test procedure^k	EPA HD-UDDS		

KEY: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxides; NMHC = nonmethane hydrocarbons; NMOG = nonmethane organic gas; HCHO = formaldehyde.

^a Smoke opacity is expressed in percentage for acceleration, lugging, and peak modes (acceleration/lugging/peak). Lugging is when a vehicle is carrying a load.

^b Gross vehicle weight rating (GVWR) is the maximum design loaded weight.

^c Several testing procedures have been used during the course of exhaust emissions control. A steady-state 9-mode test procedure (13-mode for diesel) was used for 1970-83 standards. For 1984, either the steady-state tests or the U.S. Environmental Protection Agency (EPA) transient test procedure could be used. For diesels, the EPA transient test was required from 1985 to the present. For gasoline-powered vehicles, either the EPA or the Motor Vehicle Manufacturers Association (MVMA) transient test procedure could be used during 1985-86, and the MVMA procedure was required thereafter.

^d Emissions standards apply to the useful life of the vehicle. Useful life was 5 years/50,000 miles through 1983 and became 8 years/110,000 miles beginning in model year 1985. 1984 was a transitional year in which vehicles could meet the older standard (and test procedure) or the newer one. Useful life requirement for gasoline-powered trucks meeting NO_x standards for 1998 and after is 10 years/110,000 miles. Starting in 2004, the useful life will be 10 years/110,000 miles. The useful life requirements for heavy-duty diesel truck standards are more complex and vary by vehicle weight, pollutant, test procedure, and year. Consult the U.S. Code of Federal Regulations for further information.

^e No standard set.

^f Although emissions standards for HC and CO were in effect for these years, they were not measured in grams per brake horsepower-hour and are, therefore, incompatible with the engine certification section of this table.

^g Vehicles can meet a NMHC + NO_x standard of 2.5 g/bhp-h, given they meet a NMHC standard of no more than 0.5 g/bhp-h.

^h Starting in 2005, complete gasoline heavy-duty vehicles of 14,000 lbs GVWR or below will have to be chassis certified.

ⁱ The manufacturer has the option of satisfying this standard by measurement of nonmethane hydrocarbons or total hydrocarbons.

^j The manufacturer has the option of satisfying this standard by measurement of nonmethane organic gas or total hydrocarbons.

^k This test procedure currently exists to test complete vehicles that have been optionally chassis certified. However, chassis certification is not required until 2005.

^l Required for complete gasoline heavy-duty vehicles only.

NOTE

Tables 4-32a and 4-32b are identical for heavy-duty diesel engines.

Table 4-37: 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	2005-06	2007	2008+
<i>Gasoline</i>															
HC + NO _x	e	16	10	e								1.0			e
NO _x + NMHC	e														0.14
NMHC	e														
HC	f	e	1.5	1.9							e				
NO _x	e			10.6			6.0	5.0	4.0		e				0.20
CO	f	40	25	37.1											14.4
Particulates	e														0.01
<i>Diesel</i>															
HC + NO _x	e	16	10	e											
HC	f	e	1.5	1.3					e						
NO _x	e			10.7			6.0	5.0	4.0		e				0.20
NO _x + NMHC	e											2.4 ^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 heavy heavy-duty trucks^b		GVWR over 6,000 lbs		GVWR over 8,500 lbs											GVWR over 14,000 lbs
Test procedure, gasoline^c		13-mode steady-state		MVMA transient											
Test procedure, diesel^c		13-mode steady-state		EPA transient											
Useful life (gasoline)^d		5 years/50,000 miles		8 years/110,000 miles											10 years/110,000 miles

KEY: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxides; NMHC = nonmethane hydrocarbons.

^a Smoke opacity is expressed in percentage for acceleration, lugging, and peak modes (acceleration/lugging/peak). Lugging is when a vehicle is carrying a load.

^b Gross vehicle weight rating (GVWR) is the maximum design loaded weight.

^c Several testing procedures have been used during the course of exhaust emissions control. A steady-state 9-mode test procedure (13-mode for diesel) was used for 1970-83 standards. For 1984, either the steady-state tests or the U.S. Environmental Protection Agency (EPA) transient test procedure could be used. For diesels, the EPA transient test was required from 1985 to the present. For gasoline-powered vehicles, either the EPA or the Motor Vehicle Manufacturers Association (MVMA) transient test procedure could be used during 1985-86, and the MVMA procedure was required thereafter.

^d Emissions standards apply to the useful life of the vehicle. Useful life was 5 years/50,000 miles through 1983 and became 8 years/110,000 miles beginning in model year 1985. 1984 was a transitional year in which vehicles could meet the older standard (and test procedure) or the newer one. Useful life requirements for gasoline-powered trucks meeting NO_x standards for 1998 and after is 10 years/110,000 miles. Starting in 2004, the useful life will be 10 years/110,000 miles. The useful life requirements for heavy-duty diesel truck standards are more complex and vary by vehicle weight, pollutant, test procedure, and year. Consult the U.S. Code of Federal Regulations for further information.

^e No standard set.

^f Although emissions standards for HC and CO were in effect for these years, they were not measured in grams per brake horsepower-hour and are, therefore, incompatible with this table.

^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.

NOTE

Tables 4-32a and 4-32b are identical for heavy-duty diesel engines.

Table 4-38: Federal Exhaust Emissions Standards for Newly Manufactured Motorcycles^a (g/km)^b

Pollutant	Engine displacement	Emissions prior to controls ^c			
		1978-2005	2006-09	2010+	
HC	Less than 50 cc				
	50-169 cc				
	170-279 cc	5.0	1.0		
	280 cc and greater				
HC+NOx	Less than 50 cc		1.4 ^{e,f}		
	50-169 cc				
	170-279 cc		1.4 ^f		
	280 cc and greater		1.4 ^g	0.8 ^h	
CO		12.0			
Useful life ^a	(Class I-A) ^e				
	(Class I-B) ^e	5 years or 12,000 km			
	(Class II)		5 years or 18,000 km		
	(Class III) ^{g,h}			5 years or 30,000 km	

KEY: cc = cubic centimeters; g = gram; HC = hydrocarbon; CO = Carbon Monoxide; kg = kilogram; km = kilometer; lb = pound; mi = miles; mph = miles per hour; NOx = Nitrogen Oxides.

^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. 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.

^c Useful life is expressed in years and kilometers, whichever comes first.

^e Starting with the 2006 model year EPA (Environmental Protection Agency) re-defined Class I to include motorcycles with engines smaller than 50 cubic centimeters. These new previously unregulated vehicles are Class I-A, and the pre-existing Class I became Class I-B.

^f This is an optional standard that allows manufacturers to average their emissions or transfer emission credits across classes.

^g With model year 2006-2009, Class III motorcycles must comply with the EPA Tier 1 Exhaust Emission Standards and shall not exceed the HC + NOx of 1.4 g/km.

^h 2010 and later model year, new Class III motorcycles must comply with the EPA Tier 2 Exhaust Emission Standards and shall not exceed the HC + NOx of 0.8 g/km.

NOTE

General applicability: These standards apply to 1978 and later model year, new gasoline-fueled motorcycles built after December 31, 1977, and to 1990 and later model year, new, methanol-fueled motorcycles built after December 31, 1989, and to 1997 and later model year, new, natural gas-fueled and liquefied petroleum gas-fueled motorcycles built after December 31, 1996, and to 2006 and later model year new motorcycles regardless of fuel.

Table 4-39: 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) ^{iPR}	
	Smoke						^h 83.6(rO) ^{-0.274}	

KEY: CO = carbon monoxide; g = gram; g/kN = grams of pollutant per kilonewtons of thrust; HC = hydrocarbon, kN = kilonewtons; kW = kilowatt; NO_x = nitrogen oxides; rO = rated output, which is the maximum power or thrust available for takeoff; rPR = rated pressure ratio.

^a Federal standards apply to all planes operating in the United States, regardless of where they were manufactured. This table primarily displays exhaust emissions standards for newly manufactured aircraft engines. Only two standards (smoke standards) have been set for in-use aircraft engines (see footnotes i and k). Therefore, unless otherwise noted, emissions in this table apply to new aircraft engines only.

^b HC, CO, and NO_x are measured using the International Civil Aviation Organization (ICAO) Gaseous Emissions Test Procedure. Smoke is measured using the ICAO Smoke Emission Test Procedure. There is no useful life or warranty period for purposes of compliance with emissions standards.

^c Examples of commercial aircraft that use each engine type include the following:

Class T3 turbojet—Boeing 707-320s (Class T3 engines are currently out of production, though some are still in use).

Class T8 turbojet—Boeing 727s and 737-200s, and McDonnell-Douglas MD-80s and DC-9s.

Turbofans and turbojets other than T3, T8, and TSS—Boeing 747-400s, 757s, 767-200s and 777s, and McDonnell-Douglas MD-11s; Canadair Regional Jets.

Turboprops—Used mostly in regional airliners such as ATR 72, Domier 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.

Table 4-40: Federal Exhaust Emissions Standards for Locomotives^a

(g/bhp-hr except where noted)

Duty-cycle ^b	Pollutant	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4
		1973-1992 ^{d,e}	1993-2004 ^{d,e}	2005-2011 ^d	2012-2014 ^f	2015+ ^g
Line-haul	HC ⁱ	1.00	0.55	0.30	0.30	0.14
	CO	5.00	2.20	1.50	1.50	1.50
	NO _x	9.50	7.40	5.50	5.50	1.30
	PM	0.22	0.22	0.1 ^j	0.10	0.03
		Tier 0	Tier 1	Tier 2	Tier 3	Tier 4
		1973-2001	2002-2004 ^h	2005-2010 ^h	2011-2014	2015+
Switch	HC	2.10	1.20	0.60	0.60	0.14
	CO	8.00	2.50	2.40	2.40	2.40
	NO _x	11.80	11.00	8.10	5.00	1.30
	PM	0.26	0.26	0.13 ^j	0.10	0.03
Smoke opacity (% opacity-normalized) ^m	Steady-state	30%	25%	20%	20%	-
	30-second peak	40%	40%	40%	40%	-
	3-second peak	50%	50%	50%	50%	-
Minimum Useful lifeⁿ (hours / years / miles)		(7.5 x hp) / 10 / 75,000 ^o		(7.5 x hp) / 10 / -		

KEY: bhp-hr = brake horsepower-hour; CO = carbon monoxide; g = gram; HC = hydrocarbon; NO_x = nitrogen oxides; PM = particulate matter; hp = horsepower.

^a Standards apply to locomotives that are propelled by engines with total rated horsepower (hp) of 750 kilowatts (kW) (1006 hp) or more, unless the owner chooses to have the equipment certified to meet the requirements of locomotives. This does not include vehicles propelled by engines with total rated horsepower of less than 750 kW (1006 hp); see the requirements in 40 Code of Federal Regulations (CFR) Parts 86, 89 and 1039. The test procedures specify chassis-based testing of locomotives. These test procedures include certification testing, production line testing, and in-use testing using the Federal Test Procedure (FTP) when the locomotive has reached between 50-70 percent of its useful life.

^b Line-haul locomotives are powered by an engine with a maximum rated power (or a combination of engines having a total rated power) greater than 2300 hp. Switch locomotives are powered by an engine with a maximum rated power (or a combination of engines having a total rated power) of 2300 hp or less.

^c The line-haul duty-cycle is weighted toward operation in the higher power notches and is typical of line-haul applications (with a maximum rated power greater than 2,300 hp). The switch duty-cycle is typical of switch operations, with more emphasis on idle and low power notch emissions (with a maximum rated power of 2,300 hp or less). Locomotives generally are required to meet the standards for both duty-cycles.

^d Line-haul locomotives subject to the Tier 0 through Tier 2 emission standards must also meet switch standards of the same tier.

^e The Tier 0 standards apply for 1993-2001 locomotives not originally manufactured with a separate loop intake air cooling system.

^f Tier 3 line-haul locomotives must also meet Tier 2 switch standards.

^g Manufacturers using credits may elect to meet a combined nitrogen oxides (NO_x) plus hydrocarbon (HC) standard of 1.4 grams per brakehorsepower-hour (g/bhp-hr) instead of the otherwise applicable Tier 4 NO_x and HC standards.

^h Tier 1 and Tier 2 switch locomotives must also meet line-haul standards of the same tier.

ⁱ The numerical emission standards for HC must be met based on the following types of hydrocarbon emissions for locomotives powered by the following fuels: (1) alcohol: total hydrocarbon equivalent (THCE) emissions for Tier 3 and earlier locomotives, and non-methane hydrocarbon equivalent (NMHCE) for Tier 4; (2) natural gas and liquefied petroleum gas: non-methane hydrocarbon (NMHC) emissions; and (3) diesel: total hydrocarbon (THC) emissions for Tier 3 and earlier locomotives, and NMHC for Tier 4.

^j Manufacturers may elect to meet a combined NO_x+HC standard of 1.4 g/bhp-hr instead of the otherwise applicable Tier 4 NO_x and HC standards.

^k The line-haul particulate matter (PM) standard for newly remanufactured Tier 2 locomotives is 0.20 g/bhp-hr until January 1, 2013, except as specified in 40 CFR Part 1033.150(a).

^l The switch PM standard for new Tier 2 locomotives is 0.24 g/bhp-hr until January 1, 2013, except as specified in 40 CFR Part 1033.150(a).

^m The smoke opacity standards apply only for locomotives certified to one or more PM standards or Family Emission Limits (FEL) greater than 0.05 g/bhp-hr. Percentages apply to smoke opacity at steady state/30-second peak/3-second peak, as measured continuously during testing.

ⁿ Useful life are expressed in megawatt-hours (mw-hr), years, or miles, whichever comes first. Manufacturers are required to certify to longer useful lives if their locomotives are designed to last longer between overhauls than the minimum useful life value.

^o For locomotives originally manufactured before January 1, 2000, and not equipped with mw-hr meters.

Table 4-41: Federal Exhaust Emissions Standards for Marine Spark-Ignition Engines and Vehicles^a (g/kW-hr)

Year	Engine type	HC + NOx (g/kW-hr)		CO (g/kW-hr)		Warranty period ^e	Useful life ^e
		P ≤ 4.3 kW ^c	P > 4.3 kW ^{c,d}	P ≤ 4.3 kW ^c	P > 4.3 kW ^c		
1998 ^b	Personal watercraft & Outboard Marine Engines	278.00	$(0.917 \times (151 + 557(P^{0.9}))) + 2.44$			1 yr for all emissions-related components 1 yr for all emission-related components; 200 hr/3 yr for specified major emissions control components 200 hr/2 yr for all emissions-related components; 200 hr/3 yr for specified major emissions control components Personal Watercraft: 175 hours or 30 months; Outboard Engines: 175 hr/5 yr Electrical & Mechanical Components: 480/3 Electrical Components: 480 / 3 Mechanical Components: P ≤ 485 kW: 150 / 3 P > 485 kW: 50 / 1	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	$(0.667 \times (151 + 557(P^{0.9}))) + 3.78$				
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	$(0.417 \times (151 + 557(P^{0.9}))) + 5.11$				
2005		105.00	$(0.333 \times (151 + 557(P^{0.9}))) + 5.56$				
2006-2009		81.00	$(0.250 \times (151 + 557(P^{0.9}))) + 6.00$				
2010+			30.00	$2.1 + 0.09 \times (151 + 557(P^{0.9}))$	500 - 5.0 x P		
2010+	Conventional Engines ^g	5.0		75.0			
	Stern-drive / Inboard Engines	P ≤ kW ^c		P > 485 kW ^c			
2010	High Performance Engines	20.0	25.0	350			
2011+		16.0	22.0				

KEY: CO = carbon monoxide; g = gram; hr = hour; HC = hydrocarbon; kW = kilowatt; kWh = kilowatt hour; NOx = nitrogen oxide; P = rated power; yr = year.

^a The standards apply to marine spark-ignition outboard, personal watercraft, and jet-boat engines only. 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 The standards for personal watercraft did not go into effect until 1999, although the standard went into effect for outboard engines in 1998.

^c P = the maximum engine power in kilowatts.

^d As an example, the standards for an outboard engine of 125 hp (just over 93 kW) would be 149.55 g/kWh in 1998, 123.65 g/kWh in 2000, 97.75 g/kWh in 2002, 72.01 g/kWh in 2004, 46.11 g/kWh in 2006, and 16.54 in 2010.

^e Warranty period and useful life are expressed hours or years of operation (unless otherwise indicated), whichever comes first.

^f A longer useful life in terms of hours must be specified for the engine family if the average service life is longer than the minimum value as described in 40 CFR 1045.103(e)(3).

^g Not-to-exceed emission standards specified in 40 CFR 1045.107 also apply.

^h The useful life may not be shorter than: (1) 150 hours of operation; (2) the recommended overhaul interval; or (3) the engine's mechanical warranty. A longer useful life must be specified in terms of hours if the average service life is longer than the minimum value as described in 40 CFR 1045.105(e)(3).

Table 4-42: Tier 2 Federal Exhaust Emissions Standards for Newly Manufactured Commercial Marine Compression-Ignition Engines ^{a,b}

Engine category ^{c,d}	Displacement (liters/cylinder)	Rated power (kW)	Speed (rpm)	Model year ^e	Nox (g/kW-hr)	HC (g/kW-hr)	THC + Nox (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)	Useful life ^g	Warranty period ^h
1	<0.9	37 kW and above		2005 ⁱ			7.5	0.40		10 years or 10,000 hours operation	5 years or 5,000 hours operation
	0.9 to <1.2			2004 ⁱ			7.2	0.30	5.0		
	1.2 to <2.5	All		2004 ⁱ			7.2	0.20			
	2.5 to <5.0			2007 ⁱ			7.2	0.20			
	<0.9	37 kW and above		2007			7.5	0.40		10 years or 1,000 hours operation	5 years or 500 hours operation
2	0.9 to <1.2			2006			7.2	0.30	5.0		
	1.2 to <2.5	All		2006			7.2	0.20			
	2.5 to <5.0			2009			7.2	0.20			
	5.0 to <15.0	All					7.8	0.27			
	15.0 to <20.0	< 3,300 kW					8.7	0.50			
3	15.0 to <20.0	3,300 kW and above		2007			9.8	0.50	5.0	10 years or 20,000 hours operation	5 years or 10,000 hours operation
	20.0 to <25.0	All					9.8	0.50			
	25.0 to <30.0						11.0	0.50			
	30.0 and above	All	<130 130 to <2,000 2,000 and above	2011	14.4 44.0 x N ^{0.231f} 7.7	2.0			5.0	3 years or 10,000 hours operation	3 years or 10,000 hours operation

KEY: CO = carbon monoxide; g/kW-hr = gram per kilowatt-hour; HC = hydrocarbons; THC = total hydrocarbon; kW = kilowatt; NOx = nitrogen oxides; PM = particulate matter; rpm = revolutions per minute.

^a Tier 2 emissions standards established by Congress apply to commercial compression-ignition (diesel) engines. 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 Tier 2 for marine engines less than 37 kW are subject to the same emission standards as for land-based engines.

^e Indicates the model years for which the specified standards start.

^f N is the maximum test speed of the engine in revolutions per minute (rpm).

^g 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. Useful life is expressed in hours or years, whichever comes first.

^h Warranty period is expressed in years and hours, whichever comes first.

ⁱ Indicates the model years for which the specified standards start.

Table 4-43 cont'd: Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel (grams per mile)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	(P) 2021	(P) 2022	(P) 2023	(P) 2024	(P) 2025	(P) 2026	(P) 2027	(P) 2028	(P) 2029	(P) 2030
Heavy-duty vehicles																							
Total HC	0.935	0.969	0.796	0.729	0.666	0.602	0.530	0.464	0.408	0.369	0.330	0.296	0.269	0.246	0.226	0.209	0.195	0.183	0.174	0.165	0.157	0.150	0.145
Exhaust CO	4.589	4.661	3.606	3.351	3.183	3.043	2.803	2.599	2.438	2.317	2.193	2.082	2.000	1.923	1.846	1.783	1.724	1.671	1.626	1.586	1.549	1.517	1.492
Exhaust NOx	24.929	18.397	12.409	11.311	10.057	8.949	7.857	6.923	6.133	5.615	5.059	4.580	4.169	3.822	3.518	3.269	3.060	2.883	2.742	2.616	2.501	2.396	2.315
Exhaust PM2.5	1.047	0.835	0.561	0.487	0.422	0.364	0.306	0.255	0.211	0.182	0.151	0.126	0.106	0.090	0.076	0.065	0.057	0.049	0.043	0.038	0.033	0.029	0.026
Brakewear PM2.5	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
Tirewear PM2.5	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003
Average Emissions Per Vehicle, Gasoline and Diesel Fleet																							
Total HC	2.074	1.296	0.857	0.785	0.702	0.638	0.588	0.533	0.474	0.434	0.398	0.362	0.330	0.310	0.293	0.278	0.261	0.248	0.224	0.214	0.201	0.192	0.184
Exhaust CO	23.187	14.520	9.786	9.241	8.622	8.024	7.650	7.106	6.288	5.846	5.473	5.094	4.702	4.418	4.205	4.000	3.805	3.607	3.369	3.198	3.010	2.832	2.681
Exhaust NOx	4.613	3.269	2.238	1.996	1.801	1.618	1.426	1.237	1.086	0.979	0.876	0.771	0.686	0.623	0.569	0.524	0.475	0.440	0.402	0.377	0.352	0.328	0.310
Exhaust PM2.5	0.117	0.083	0.066	0.055	0.049	0.043	0.037	0.032	0.027	0.024	0.021	0.019	0.016	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008	0.007	0.007
Brakewear PM2.5	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004
Tirewear PM2.5	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002

KEY: CO = carbon monoxide; HC = hydrocarbons; NOx = nitrogen oxides; P = projection; PM2.5 = particulate matter with diameter <= 2.5 micrometers.

NOTES

Estimates are by calendar year. Vehicles types are defined as follows: light-duty vehicles (passenger cars); light-duty trucks (two axle, four tire); heavy-duty vehicles (trucks with more than two axles or four tires); motorcycle (highway only). Emissions factors are averages based on the national average age distributions, vehicle activity (speeds, operating modes, vehicle-miles traveled fractions, starts and idling), temperatures, inspection/maintenance and anti-tampering programs, and average gasoline fuel properties in that calendar year. Total HC includes exhaust and evaporative emissions. Average emissions per vehicle rates assume a fleet comprised exclusively of gasoline and diesel vehicles. Gasoline-electric hybrids are accounted for in the values for gasoline vehicles. This table was generated using MOVES3, the U.S. Environmental Protection Agency's (EPA) mobile source emissions model. More information on MOVES is available at www.epa.gov/moves. Data for this update are based on new estimation models and are not comparable to previous releases. MOVES3 includes updates to historical data and methods as well as updates to future year projections and thus provides the current best estimates of emissions for all calendar years. Data for 2021 and later are projections.

Table 4-45: Estimated National Emissions of Carbon Monoxide (million short tons)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL all sources	204.04	185.41	154.19	114.47	88.55	73.77	73.76	71.76	69.75	65.54	63.52	58.90	66.60	65.49	64.38	63.27
Highway vehicles	163.23	143.83	110.26	68.06	42.83	28.24	27.36	26.38	25.41	24.44	23.35	20.14	19.51	18.41	17.30	16.19
Off-highway	11.37	16.69	21.45	24.18	21.90	15.35	14.95	14.39	13.82	13.26	12.69	11.66	11.35	11.34	11.34	11.33
Fuel combustion	4.63	7.30	5.51	4.78	5.13	4.52	4.60	4.42	4.24	4.06	4.07	4.07	4.07	4.07	4.07	4.07
Industrial processes ^a	9.84	6.95	4.77	2.63	2.03	1.89	1.97	1.99	2.01	2.03	1.92	1.81	1.70	1.70	1.70	1.70
Waste disposal and recycling	7.06	2.30	1.08	1.85	1.55	1.20	1.11	1.40	1.68	1.97	1.74	1.52	1.30	1.30	1.30	1.30
Miscellaneous	7.91	8.34	11.12	12.96	15.11	22.56	23.78	23.18	22.58	19.77	19.74	19.71	28.68	28.68	28.68	28.68

^a *Industrial processes* consists of chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

NOTE

Details may not add up to totals due to rounding in the source.

Table 4-46: Estimated National Emissions of Nitrogen Oxides (million short tons)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL all sources	26.88	27.08	25.53	22.60	20.35	14.85	14.52	13.88	13.24	12.59	11.68	10.30	9.84	9.35	8.79	8.23
Highway vehicles	12.62	11.49	9.59	8.39	8.34	5.70	5.87	5.54	5.21	4.88	4.44	3.66	3.49	3.13	2.77	2.41
Off-highway	2.65	3.35	3.78	4.17	4.27	3.32	3.08	2.95	2.81	2.68	2.51	2.22	2.11	2.05	1.99	1.93
Fuel combustion	10.06	11.32	10.89	8.82	6.34	4.33	3.90	3.74	3.57	3.45	3.20	2.94	2.68	2.62	2.47	2.34
Industrial processes ^a	0.78	0.56	0.80	0.81	0.98	1.12	1.18	1.18	1.17	1.17	1.13	1.10	1.06	1.06	1.06	1.06
Waste disposal and recycling	0.44	0.11	0.09	0.13	0.15	0.09	0.08	0.09	0.10	0.11	0.10	0.09	0.08	0.08	0.08	0.08
Miscellaneous	0.33	0.25	0.37	0.28	0.27	0.29	0.40	0.39	0.37	0.29	0.30	0.30	0.41	0.41	0.41	0.41

^a *Industrial processes* consists of chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

NOTE

Details may not add up to totals due to rounding in the source.

Table 4-47: Estimated National Emissions of Volatile Organic Compounds (million short tons)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL all sources	34.66	31.11	24.11	17.51	17.75	17.84	18.15	17.87	17.59	16.88	16.33	15.46	17.18	16.99	16.80	16.61
Highway vehicles	16.91	13.87	9.39	5.33	3.44	2.77	2.87	2.71	2.54	2.38	2.23	1.88	1.81	1.67	1.52	1.38
Off-highway	1.62	2.19	2.66	2.64	2.87	2.30	2.16	2.02	1.89	1.76	1.58	1.29	1.19	1.15	1.10	1.06
Fuel combustion	0.72	1.05	1.01	1.18	0.77	0.60	0.63	0.59	0.56	0.52	0.51	0.51	0.51	0.51	0.51	0.51
Industrial processes ^a	12.33	12.10	9.01	7.21	6.99	6.96	7.08	7.16	7.24	7.32	7.08	6.85	6.61	6.61	6.61	6.61
Waste disposal and recycling	1.98	0.76	0.99	0.42	0.39	0.15	0.13	0.17	0.20	0.23	0.21	0.20	0.18	0.18	0.18	0.18
Miscellaneous	1.10	1.13	1.06	0.73	3.29	5.06	5.29	5.22	5.16	4.67	4.70	4.74	6.89	6.89	6.89	6.89

^a *Industrial processes* consists of chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

NOTE

Details may not add up to totals due to rounding in the source.

Table 4-48: Estimated National Emissions of Particulate Matter (PM-10)^a (million short tons)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL all sources	13.02	7.01	27.75	23.75	21.30	20.82	20.72	19.97	19.22	18.18	17.53	16.83	17.03	17.02	17.01	16.99
Highway vehicles	0.48	0.43	0.39	0.23	0.38	0.28	0.37	0.35	0.33	0.30	0.29	0.24	0.24	0.23	0.22	0.22
Off-highway	0.16	0.26	0.33	0.32	0.30	0.23	0.22	0.21	0.20	0.19	0.17	0.15	0.14	0.13	0.13	0.12
Fuel combustion	2.87	2.45	1.20	1.47	1.44	0.98	0.98	0.94	0.90	0.87	0.83	0.79	0.75	0.75	0.75	0.75
Industrial processes ^b	7.67	2.75	1.04	0.71	1.22	1.05	0.94	0.91	0.87	0.83	0.86	0.88	0.90	0.90	0.90	0.90
Waste disposal and recycling	1.00	0.27	0.27	0.36	0.29	0.21	0.19	0.22	0.25	0.28	0.26	0.24	0.23	0.23	0.23	0.23
Miscellaneous	0.84	0.85	24.54	20.65	17.66	18.08	18.01	17.34	16.67	15.71	15.12	14.53	14.78	14.78	14.78	14.78

^a Fine particulate matter less than 10 microns. Data include PM without condensable.

^b *Industrial processes* consists of chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

NOTE

Details may not add up to totals due to rounding in the source.

Table 4-49: Estimated National Emissions of Particulate Matter (PM-2.5)^a (million short tons)

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL all sources	7.56	7.29	5.59	5.96	6.10	5.94	5.78	5.38	5.23	5.06	5.68	5.67	5.65	5.64
Highway vehicles	0.32	0.17	0.31	0.20	0.20	0.19	0.17	0.16	0.15	0.12	0.11	0.11	0.10	0.09
Off-highway	0.30	0.30	0.29	0.21	0.21	0.20	0.19	0.18	0.16	0.14	0.13	0.13	0.12	0.11
Fuel combustion	0.91	1.29	1.13	0.84	0.84	0.81	0.78	0.75	0.72	0.69	0.66	0.66	0.66	0.66
Industrial processes ^b	0.56	0.50	0.53	0.42	0.40	0.39	0.38	0.37	0.38	0.38	0.39	0.39	0.39	0.39
Waste disposal and recycling	0.23	0.33	0.27	0.18	0.16	0.19	0.21	0.23	0.22	0.21	0.20	0.20	0.20	0.20
Miscellaneous	5.23	4.69	3.07	4.11	4.29	4.17	4.05	3.69	3.60	3.52	4.19	4.19	4.19	4.19

^a Particulate matter less than 2.5 microns in size. Data include PM without condensable.

^b *Industrial processes* consists of chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes;

NOTE

Details may not add up to totals due to rounding in the source.

Table 4-50: Estimated National Emissions of Sulfur Dioxide (million short tons)

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL all sources	31.22	25.93	23.08	16.35	14.55	7.73	6.48	5.08	4.87	4.67	3.95	3.20	2.54	2.44	2.14	1.96
Highway vehicles	0.27	0.39	0.50	0.26	0.17	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02
Off-highway	0.28	0.32	0.37	0.44	0.51	0.12	0.13	0.11	0.09	0.07	0.06	0.04	0.03	0.03	0.03	0.03
Fuel combustion	23.46	21.39	20.29	14.16	12.72	6.75	5.52	4.17	4.02	3.89	3.20	2.50	1.81	1.71	1.42	1.24
Industrial processes ^a	7.09	3.77	1.85	1.38	0.99	0.64	0.58	0.55	0.53	0.50	0.48	0.46	0.44	0.44	0.44	0.44
Waste disposal and recycling	0.01	0.03	0.04	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Miscellaneous	0.11	0.01	0.01	0.07	0.13	0.16	0.20	0.19	0.18	0.15	0.15	0.15	0.22	0.22	0.22	0.22

^a *Industrial processes* consists of chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

NOTE

Details may not add up to totals due to rounding in the source.

**Table 4-51: Air Pollution Trends in Selected Metropolitan Statistical Areas
(Number of days with AQI values greater than 100 at monitoring sites)**

	Sites in 2010	Sites in 2020	Number of days with AQI > 100																	
			1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020			
Akron, OH	7	6	230	113	68	74	18	7	7	3	1	1	1	0	1	3	4			
Albany-Schenectady-Troy, NY	6	8	87	28	8	20	9	3	8	0	0	2	3	0	3	0	3			
Albuquerque, NM	22	18	51	26	35	26	5	28	25	9	1	4	3	4	24	4	10			
Allentown-Bethlehem-Easton, PA	7	7	104	34	35	39	31	39	18	14	8	6	11	6	5	4	1			
Atlanta-Sandy Springs-Roswell, GA	27	28	118	146	117	71	47	67	28	13	18	16	32	11	10	19	3			
Atlantic City-Hammonton, NJ	3	3	74	34	14	20	9	5	9	3	1	2	1	0	1	1	0			
Austin-Round Rock, TX	11	11	19	20	35	18	10	14	8	4	0	10	1	4	9	2	2			
Bakersfield, CA	20	24	162	177	204	169	125	140	142	136	160	122	116	139	130	95	129			
Baltimore-Columbia-Towson, MD	14	17	142	86	61	63	53	37	35	10	5	15	24	15	16	13	3			
Baton Rouge, LA	14	16	76	81	105	117	45	40	28	9	13	17	9	8	19	9	6			
Birmingham-Hoover, AL	31	33	63	66	124	69	30	39	20	3	6	6	11	10	8	18	3			
Boston-Cambridge-Newton, MA-NH	23	17	126	98	22	36	10	7	13	9	5	4	7	5	5	1	0			
Bradenton-Sarasota-Venice, FL	10	11	3	17	35	20	6	7	3	4	1	1	0	3	2	2	0			
Bridgeport-Stamford-Norwalk, CT	11	11	227	70	31	36	29	20	29	25	14	30	23	16	21	21	13			
Buffalo-Cheektowaga-Niagara Falls, NY	8	12	281	143	102	52	9	7	14	4	1	4	6	1	3	0	2			
Charleston-North Charleston, SC	8	8	41	17	21	16	2	4	1	0	0	1	5	1	0	1	1			
Charlotte-Concord-Gastonia, NC-SC	24	28	167	82	82	71	38	45	26	3	5	11	9	5	10	18	2			
Chicago-Naperville-Joliet, IL-IN-WI	66	71	301	200	126	94	43	32	59	20	21	14	28	25	26	17	28			
Cincinnati-Middletown, OH-KY-IN	21	22	245	223	107	110	50	57	59	17	20	13	18	10	13	20	8			
Cleveland-Elyria, OH	25	22	176	213	93	120	96	84	67	15	18	20	24	7	15	7	15			
Columbia, SC	10	9	84	79	59	35	12	22	3	0	3	0	5	2	1	2	1			
Columbus, OH	11	9	92	45	42	50	23	21	29	6	7	5	10	3	3	1	3			
Dallas-Fort Worth-Arlington, TX	48	48	107	67	126	99	28	66	62	46	28	44	18	24	36	29	24			
Dayton, OH	9	5	54	25	31	40	25	21	25	9	4	9	7	3	5	0	4			
Denver-Aurora-Lakewood, CO	48	48	166	46	53	41	38	57	70	44	34	26	29	40	57	22	34			
Detroit-Warren-Dearborn, MI	32	45	195	123	107	100	33	26	45	12	19	20	22	16	23	13	23			
El Paso, TX	21	18	133	196	42	42	16	20	24	14	9	7	6	23	17	13	18			
Fresno, CA	10	13	166	138	195	115	87	123	134	139	124	102	105	120	98	66	98			
Grand Rapids-Wyoming, MI	13	14	85	32	14	38	5	8	24	4	5	3	10	0	4	0	8			
Greensboro-High Point, NC	5	4	39	43	45	25	19	11	10	1	1	1	4	1	1	0	0			
Greenville-Anderson-Mauldin, SC	8	5	70	50	71	35	12	18	5	0	0	2	7	0	0	2	1			
Harrisburg-Carlisle, PA	4	3	46	30	32	42	14	16	13	12	4	8	6	1	1	6	3			
Hartford-West Hartford-East Hartford, CT	9	8	96	30	24	26	15	15	9	22	14	15	16	16	9	10	8			
Hilo, HI	13	19	N	46	55	110	344	271	339	304	269	304	311	301	170	0	11			

Continued next page

**Table 4-51 cont'd: Air Pollution Trends in Selected Metropolitan Statistical Areas
(Number of days with AQI values greater than 100 at monitoring sites)**

	Sites in 2010	Sites in 2020	Number of days with AQI > 100																
			1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
Houston-Sugarland-Baytown, TX	50	40	189	157	103	116	44	57	48	25	14	45	23	25	35	31	24		
Indianapolis-Carmel, IN	26	32	218	128	120	93	32	42	38	15	31	5	12	9	16	5	7		
Jacksonville, FL	20	22	89	85	84	31	21	21	5	2	5	1	0	1	7	1	6		
Kansas City, MO-KS	37	38	186	39	60	76	41	67	87	50	57	41	7	7	13	1	5		
Knoxville, TN	56	55	170	135	134	130	40	40	25	2	2	2	14	1	2	3	0		
Las Vegas-Paradise, NV	29	38	121	73	56	64	33	49	53	38	16	23	26	29	49	5	25		
Little Rock-North Little Rock-Conway, AR	8	5	46	37	41	44	8	18	17	3	3	0	0	1	2	0	2		
Los Angeles-Long Beach-Anaheim, CA	58	60	288	235	178	139	115	121	132	103	108	134	108	122	110	91	141		
Louisville/Jefferson County, KY-IN	28	29	311	120	128	105	63	49	56	4	32	14	19	6	11	4	7		
Madison, WI	10	10	88	7	8	18	4	2	13	1	3	1	3	0	2	0	5		
McAllen-Edinburg-Mission, TX	3	4	N	N	7	7	0	1	0	1	0	1	1	0	4	2	5		
Memphis, TN-MS-AR	30	32	230	114	76	92	24	35	37	5	4	5	8	4	11	5	4		
Miami-Fort Lauderdale-West Palm Beach, FL	30	34	90	9	26	12	6	9	4	5	5	1	6	8	4	2	2		
Milwaukee-Waukesha-West Allis, WI	27	28	161	67	27	41	14	11	32	4	9	5	9	8	9	3	7		
Minneapolis-St. Paul-Bloomington, MN-WI	84	122	190	117	27	27	12	3	8	4	2	6	5	1	5	3	3		
Nashville-Davidson-Murfreesboro-Franklin, TN	50	51	221	205	96	55	28	20	31	1	7	1	6	1	7	1	2		
New Haven-Milford, CT	9	10	75	76	27	36	18	15	26	15	8	16	14	12	14	14	13		
New Orleans-Metairie, LA	18	28	40	38	77	43	72	99	50	27	17	8	11	2	6	2	0		
New York-Newark-Jersey City, NY-NJ-PA	70	57	295	131	71	76	61	33	39	21	17	38	30	19	27	16	11		
Oklahoma City, OK	10	11	32	21	36	33	11	44	39	8	5	2	3	7	12	2	5		
Omaha-Council Bluffs, NE-IA	32	30	94	8	17	30	13	6	23	5	3	5	4	2	5	0	2		
Orlando-Kissimmee-Sanford, FL	10	11	12	23	33	21	8	12	7	3	2	1	1	3	3	6	0		
Oxnard-Thousand Oaks-Ventura, CA	8	7	161	139	84	62	18	16	32	11	15	13	9	33	17	9	26		
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	46	45	242	167	87	86	48	31	43	19	21	30	20	22	19	16	8		
Phoenix-Mesa-Scottsdale, AZ	57	56	211	108	167	91	59	133	111	105	119	70	75	95	85	54	230		
Pittsburgh, PA	34	29	303	288	166	151	83	60	67	24	22	32	30	32	25	16	14		
Portland-Vancouver-Hillsboro, OR-WA	43	72	78	19	12	15	3	17	3	17	8	7	2	16	10	3	14		
Providence-Warwick, RI-MA	27	30	134	99	31	29	20	16	20	13	3	11	6	7	13	2	4		
Raleigh, NC	13	11	98	57	68	46	11	24	9	0	0	3	3	0	0	0	1		
Richmond, VA	10	8	104	122	40	54	25	22	19	1	2	3	4	1	2	0	0		
Riverside-San Bernardino-Ontario, CA	52	57	245	251	205	178	162	174	182	158	175	169	161	175	173	145	176		
Rochester, NY	2	3	212	96	7	13	7	1	12	0	1	0	2	3	4	0	0		
Sacramento-Arden-Arcade-Roseville, CA	28	31	110	124	105	92	42	78	79	50	57	40	59	56	57	20	50		
St. Louis, MO-IL	88	95	308	285	162	169	103	88	110	45	21	16	19	12	19	10	11		

Table 4-51 cont'd: Air Pollution Trends in Selected Metropolitan Statistical Areas (Number of days with AQI values greater than 100 at monitoring sites)

	Sites in 2010	Sites in 2020	Number of days with AQI > 100																	
			1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020			
Salt Lake City, UT	14	20	228	197	52	62	24	24	30	17	50	23	27	28	48	43	17	21		
San Antonio, TX	12	14	34	17	23	27	11	11	22	16	17	6	14	6	6	11	6	10		
San Diego-Carlsbad, CA	18	24	210	191	97	55	25	25	34	36	37	39	41	42	62	35	25	49		
San Francisco-Oakland-Hayward, CA	47	53	57	21	29	21	14	14	12	7	9	10	14	15	16	19	9	23		
San Jose-Sunnyvale-Santa Clara, CA	15	20	56	48	50	24	13	13	7	12	12	9	7	6	12	18	4	22		
San Juan-Carolina-Caguas, PR	35	34	45	58	34	2	2	2	0	0	10	1	3	27	7	14	19	19		
Scranton-Wilkes-Barre-Hazleton, PA	5	6	72	30	15	26	9	9	5	4	2	0	3	4	0	1	0	0		
Seattle-Tacoma-Bellevue, WA	41	50	150	33	28	25	3	3	13	12	8	7	18	3	24	16	2	14		
Springfield, MA	5	3	63	81	16	31	12	12	13	15	6	0	6	6	5	3	0	0		
Stockton-Lodi, CA	4	3	44	34	34	15	13	13	43	42	33	34	36	26	33	33	12	34		
Syracuse, NY	5	4	81	18	9	22	6	6	2	8	0	0	1	2	0	2	0	0		
Tampa-St. Petersburg-Clearwater, FL	32	36	181	156	140	68	20	22	22	18	6	7	5	6	4	5	6	3		
Toledo, OH	11	10	128	38	19	40	8	8	11	26	1	5	1	5	4	10	1	8		
Tucson, AZ	22	19	190	30	23	18	5	5	20	9	8	3	1	4	7	11	2	13		
Tulsa, OK	13	16	121	111	46	49	9	9	46	48	11	2	2	3	2	11	2	2		
Virginia Beach-Norfolk-Newport News, VA-NC	5	5	105	51	48	20	17	16	16	7	3	0	0	3	0	0	0	0		
Washington-Arlington-Alexandria, DC-VA-MD-WV	25	22	124	96	70	63	50	39	39	36	12	10	14	16	8	10	11	3		
Wichita, KS	9	9	14	12	27	16	13	23	23	34	8	4	0	1	0	0	0	6		
Worcester, MA	5	4	41	13	17	22	7	7	6	10	4	2	3	5	5	7	1	0		
Youngstown-Warren-Boardman, OH	13	10	120	54	30	47	17	17	11	25	4	6	5	6	4	5	0	4		

KEY: AQI = Air Quality Index; N = data do not exist.

NOTES

The Air Quality Index (AQI) integrates information on 6 major pollutants (particulate matter less than 10 microns in diameter, particulate matter less than 2.5 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 unhealthy range on that day. Air quality monitoring sites are selected as 'trend sites' if they have complete data for at least 8 of the 10 last years.

The major reason for revisions to the historical data for the AQI is that changes in the National Ambient Air Quality Standards (NAAQS) are retroactively applied to the data for previous years to provide consistent comparisons over time. In addition, data from monitoring stations that have fallen below/surpassed the criterion to qualify as a 'trend site' is excluded/included in the latest calculation of the index. Data for 1999 to 2009 include particulate matter 2.5 micron in diameter (PM 2.5).

Particulate matter is the term for solid or liquid particles found in the air.

Table 4-52: Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants (Condensed nonattainment area list as of September 30, 2021)

Ref. no.	States ^a	Consolidated nonattainment area name ^b	Number of areas in nonattainment ^c						2010 Area population, in 1,000s ^e								
			O ₃ ^f 8-Hour (2008)	SO ₂ (1971)	SO ₂ (2010)	PM 10 (1987)	PM 2.5 (1997)	PM 2.5 (2006)	8-Hour O ₃ ^e (2008)	8-Hour O ₃ ^e (2015)	SO ₂ (1971)	SO ₂ (2010)	PM 10 (1987)	PM 2.5 (1997)	PM 2.5 (2006)	PM 2.5 (2012)	Pb (1978)
1	AK	Fairbanks			1										87		
2	AZ	Douglas/Paul Spur (Cochise County)		1	2	1	1								17		
3	AZ	Hayden/Miami		1		1	1								26		5
4	AZ	Nogales				1	1								30		31
5	AZ	Phoenix-Mesa	1	1		1	1							3,853			3,853
6	AZ	Rillito (Pima County)				1	1								1		1
7	AZ	West Pinal				1	1								283		52
8	AZ	Yuma		1		1	1								101		
9	CA	Amador and Calaveras Cos (Central Mountain Cos)	1	2											46	84	
10	CA	Chico	1	1											220	220	
11	CA	Imperial County	1	1		1	1								175	175	
12	CA	Los Angeles-South Coast Air Basin	3	3		1	1								15,723	15,704	154
13	CA	Cos	1	2											18	74	154
14	CA	Mono County				1									0		15,716
15	CA	Nevada Co. (Western Part)	1	1		1									82	82	15,716
16	CA	Owens Valley													7		15,716
17	CA	Plumas County															15,716
18	CA	Sacramento Metro	1	1			1								2,241	2,240	2,206
19	CA	San Diego	1	1											3,095	3,077	
20	CA	San Francisco-Bay Area	1	1		1	1								6,973	6,969	6,971
21	CA	San Joaquin Valley	2	2		1	1								3,938	3,937	126
22	CA	San Luis Obispo	1	1		1	1								2	1	3,842
23	CA	Searles Valley				1											4
24	CA	Southeast Desert Modified AQMA	2	2		2									1,294	1,292	495
25	CA	Tuscan Buttes	1	1											0	0	
26	CA	Ventura County	1	1		1	1								823	821	
27	CA	Yuba City		1												0	
28	CO	Denver-Boulder-Greeley-Ft. Collins-Loveland	1	1											3,330	3,330	
29	CT	Greater Connecticut	1	1											1,629	1,629	
30	DC-MD-VA	Washington		1											5,136		
31	GA	Atlanta		1											3,669		
32	GU ^d	Pfiri-Cabras		1	1											1	6
33	GU ^e	Tanguisson Power Plant		1												1	
34	IA	Muscatine County			1											30	
35	ID	Pocatello				1										1	
36	ID	Shoshone County														1	7
37	IL-IN-WI	Chicago-Joliet-Napier	1	1											9,180	9,075	
38	IN	Fort Wayne-Huntington-Auburn			1											21	
39	KS	Salina														1	
40	KY	Henderson-Webster Counties			1											7	
41	KY-IN	Louisville														1,061	
42	LA	Evangeliste Parish			1											0	

Table 4-52 cont'd: Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants (Condensed nonattainment area list as of September 30, 2021)

Ref. no.	States ^a	Consolidated nonattainment area name ^b	Number of areas in nonattainment ^c						2010 Area population, in 1,000s ^d						
			O ₃ ^e 8-Hour (2008)	SO ₂ (1971)	10 (1987)	2.5 (1997)	2.5 (2006)	2.5 (2012)	Pb (1978)	O ₃ ^e 8-Hour (2008)	SO ₂ (1971)	10 (1987)	2.5 (1997)	2.5 (2006)	2.5 (2012)
43	LA	New Orleans	1								36				
44	MA-NH	Boston-Worcester-Manchester	1	1					17						
45	MD	Baltimore	1	1					2,663	2,663	990				
46	MI	Allegan County	1						47						0
47	MI	Benion Harbor	1						157						
48	MI	Detroit-Ann Arbor	1	2					4,705	306					
49	MI	Muskegon	1						147						
50	MN	Minneapolis-St. Paul	1												9
51	MO	Iron, Dent, and Reynolds Counties	1												0
52	MO	New Madrid County	1												0
53	MO-IL	St. Louis	1	2					2,488	62					3
54	MO-KS	Kansas City	1	1						57					5
55	MT	Billings/Laurel		1						7					
56	MT	Lame Deer			1									1	
57	MT	Libby				1								4	
58	MT	Poison (Lake County)				1								3	
59	MT	Ronan (Lake County)				1								1	
60	MT	Thompson Falls				1								6	
61	MT	Whitefish (Flathead County)				1								3	
62	NM	Anthony				1									
63	NM	Sunland Park	1						13						
64	NV	Las Vegas	1						1,892						
65	NY	Jamestown	1						135						
66	NY	St. Lawrence County				1								12	
67	NY-NJ-CT	New York-N. New Jersey-Long Island	1	1					20,217	20,217					
68	OH	Cleveland-Akron-Elyria	1						2,780						
69	OH-KY-IN	Cincinnati-Middletown-Wilmington	1						1,929						
70	OR	Klamath Falls					1							47	
71	OR	Oakridge				1								4	
72	PA	Clearfield and Indiana Counties		1							93				
73	PA	Lancaster	1						519						
74	PA	Pittsburgh-New Castle	1	1					2,356	5	142			21	21
75	PA	Reading	1						411					21	1,223
76	PA	Warren County				1									49
77	PA-NJ	Allentown-Bethlehem-Easton	1	1					712	109					
78	PA-NJ-DE-MD	Philadelphia-Wilmington-Atlantic City	2	1					7,634	7,437					
79	PR	Arecibo													32
80	PR	Guayama-Salinas				1								23	
81	PR	San Juan				1								275	
82	TN	Johnson City-Kingsport-Bristol				1								15	
83	TX	Dallas-Fort Worth	1	1					6,280	6,202					649
84	TX	El Paso				1									

Continued next page

Table 4-52 cont'd: Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants (Condensed nonattainment area list as of September 30, 2021)

Ref. no.	States ^a	Consolidated nonattainment area name ^b	Number of areas in nonattainment ^c										2010 Area population, in 1,000s ^d									
			O ₃ ^e		SO ₂		PM		Pb		O ₃ ^e		SO ₂		PM		Pb					
			8-Hour (2008)	8-Hour (2015)	10 (1987)	2.5 (1997)	2.5 (2006)	2.5 (2012)	10 (1978)	2.5 (2008)	8-Hour (2008)	8-Hour (2015)	10 (1971)	2.5 (1971)	10 (1987)	2.5 (1997)	2.5 (2006)	2.5 (2012)	10 (1978)	2.5 (2008)		
85	TX	Fairfield																				
86	TX	Houston-Sugar Land-Baytown	1	1																		
87	TX	Howard County																				
88	TX	Hutchinson County																				
89	TX	Mount Pleasant																				
90	TX	Navarro County																				
91	TX	San Antonio																				
92	TX	Tatum																				
93	UT	Provo						1												518		
94	UT	Salt Lake City						1												1,665		
95	UT	Tooele County																				
96	UT	Utah Basin																		58		
97	VA	Giles County																		47		
98	WA	Whatcom County																				
99	WI	Door County																		17		
100	WI	Manitowoc County																		57		
101	WI	Milwaukee-Racine																		1,648		
102	WI	Rhineland																		18		
103	WI	Sheboygan																		68		
104	WV-OH	Parkersburg-Marietta																				
105	WY	Upper Green River Basin	1																	11		
National totals (105 areas)^f			35	51	8	33	23	4	13	6	1	10	99,466	124,742	1,216	2,158	5,615	19,588	31,314	20,948	3	9,555

KEY: O₃ = ozone; Pb = lead; PM-10 = particulate matter smaller than 10 micrometers; PM2.5 = particulate matter smaller than 2.5 micrometers; SO₂ = sulfur dioxide.

^a States are listed alphabetically. Some states on a row may be nonattainment for some pollutants and not for others in the general area. A multi-state area with states that have not all been redesignated to maintenance is counted as a nonattainment area until all of the states in the area are redesignated, with the whole area population displayed.
^b This is a simplified listing of classified nonattainment areas. Unclassified and Section 185a (transitional) nonattainment areas are not included. 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.
^c Guam (U.S. territory)

^d National total includes Guam (U.S. territory).

^e The number of nonattainment areas for each of the criteria pollutants is listed.

^f The 8-hour Ozone (1997) standard was revoked on April 6, 2015 and the 1-hour Ozone (1979) standard was revoked on June 15, 2005.

^g Population figures were obtained from the 2010 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.

NOTES

Reference numbers 1-105 do not indicate ranking.
 The "Total exposed" values represent estimated population living in areas that are in nonattainment for at least one pollutant.

Table 4-53: U.S. Carbon Dioxide Emissions from Energy Use by Sector (million metric tons of carbon dioxide)

Sector	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total U.S. CO₂ Emissions from energy use	4,751.5	5,041.5	5,867.8	5,997.6	5,583.9	5,445.3	5,228.3	5,355.4	5,412.1	5,261.8	5,169.4	5,129.6	5,274.9	5,139.7	4,570.5
Transportation	1,400.2	1,587.6	1,869.7	1,984.2	1,842.9	1,809.0	1,773.4	1,796.4	1,814.9	1,838.9	1,871.0	1,887.5	1,918.5	1,920.0	1,630.1
Coal	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
Natural gas	34.5	36.0	35.7	33.1	38.1	38.9	41.4	47.1	40.3	39.5	40.2	42.4	51.1	54.9	54.3
Electricity	2.4	3.2	3.6	5.0	4.7	4.4	4.0	4.2	4.2	3.9	3.6	3.5	3.5	3.2	2.6
Petroleum	1,363.3	1,548.4	1,830.4	1,946.1	1,800.0	1,765.6	1,728.0	1,745.1	1,770.4	1,795.5	1,827.2	1,841.6	1,864.0	1,861.8	1,573.3
Motor gasoline	881.3	966.8	1,119.4	1,180.1	1,088.8	1,057.0	1,051.1	1,066.0	1,077.2	1,083.1	1,101.6	1,098.9	1,099.0	1,095.3	947.7
Hydrocarbon gas liquids ^a	1.1	1.4	0.8	1.8	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4
Jet fuel	155.4	222.6	253.8	246.3	210.0	209.1	205.7	210.4	215.6	227.1	237.4	246.8	250.4	255.7	158.5
Distillate fuel oil	204.4	267.8	377.4	443.9	422.8	430.5	411.2	415.6	434.9	440.8	431.4	436.4	459.9	462.2	428.4
Residual fuel oil	110.2	80.1	69.9	66.0	70.3	61.2	52.8	45.8	35.2	36.5	49.1	52.4	47.6	41.7	32.5
Lubricants	6.4	6.5	6.7	5.6	5.7	5.5	5.0	5.3	5.5	6.0	5.7	5.3	5.1	4.9	4.4
Aviation gas	4.5	3.1	2.5	2.4	1.9	1.9	1.7	1.5	1.5	1.5	1.4	1.4	1.5	1.6	1.4
Industrial	1,778.1	1,698.1	1,791.1	1,683.9	1,506.6	1,497.6	1,480.6	1,500.8	1,511.8	1,453.6	1,422.6	1,428.6	1,455.0	1,428.5	1,312.3
Residential	911.4	963.2	1,185.1	1,261.0	1,209.5	1,148.8	1,042.7	1,099.9	1,115.2	1,037.0	982.0	946.8	1,015.6	958.3	896.7
Commercial	661.9	792.5	1,022.0	1,068.5	1,024.9	989.9	931.6	958.4	970.2	932.3	893.8	866.6	885.7	832.9	731.4

KEY: CO₂ = carbon dioxide; Z = a value of zero, or value too small to report.

^a Hydrocarbon Gas Liquids (HGL) includes ethane, propane, normal butane, isobutane, and natural gasoline, and their associated olefins. Excludes Liquefied Natural Gas (LNG).

NOTES

Electric utility emissions are distributed across end-use sectors. Numbers may not add to totals due to independent rounding.

Section E:

Water Pollution, Noise, and Solid Waste

Table 4-54: Petroleum Oil Spills Impacting Navigable U.S. Waterways

Source	1990		2000		2005		2010		2011		2012		2013	
	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled
TOTAL all spills	8,177	7,915,007	8,354	1,431,370	3,881	9,926,580	3,008	207,712,793	3,065	210,271	3,266	196,183	3,223	497,710
Vessel sources, total	2,485	6,387,158	5,560	1,033,643	1,835	2,124,808	1,508	894,934	1,531	107,663	1,824	131,986	1,721	207,106
Tankship	249	4,977,251	111	608,176	37	2,976	23	421,583	26	1,702	27	3,864	20	711
Tank barge	457	992,025	229	133,540	126	2,006,774	73	965	67	15,852	93	33,268	100	19,568
Other vessels ^a	1,779	417,882	5,220	291,927	1,672	115,058	1,412	472,386	1,438	90,109	1,704	94,854	1,601	186,827
Nonvessel sources, total	2,584	1,408,472	1,645	373,761	1,146	7,771,646	1,008	206,809,141	1,159	94,759	1,048	51,040	1,048	284,513
Offshore pipelines	73	46,228	4	17	23	26,465	34	4,627	38	1,687	16	251	35	6,028
Onshore pipelines	76	270,700	21	17,004	1	110,000	N	N	N	N	N	N	N	N
Other ^b	2,435	1,091,544	1,620	356,740	1,122	7,635,181	974	206,804,514	1,121	93,072	1,032	50,789	1,013	278,485
Mystery^c	3,108	119,377	1,149	23,966	900	30,126	492	8,718	375	7,849	394	13,157	454	6,091
	2014		2015		2016		2017		2018		2019		2020	
TOTAL all spills	3,077	668,363	2,873	361,482	2,663	301,723	2,472	241,204	2,834	549,914	2,855	714,416	2,194	181,275
Vessel sources, total	1,716	273,432	1,545	296,520	1,500	238,651	1,390	214,153	1,977	342,454	1,572	471,039	1,284	73,010
Tankship	18	146	75	147,087	73	32,165	10	100	18	1,520	24	47,710	16	636
Tank barge	89	199,667	24	1,147	17	87,416	50	84,319	58	41,360	62	131,400	49	17,592
Other vessels ^a	1,609	73,619	1,446	148,286	1,410	119,070	1,330	129,734	1,901	299,574	1,414	291,929	1,219	54,782
Nonvessel sources, total	963	386,350	931	63,027	943	59,318	887	22,183	687	206,173	1,283	230,093	910	108,265
Offshore pipelines	41	5,267	26	474	22	9,139	16	83	26	17,306	17	4,109	18	548
Onshore pipelines	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Other ^b	922	381,083	905	62,553	921	50,179	871	22,101	491	187,579	843	225,984	767	107,211
Mystery^c	398	8,581	397	1,935	220	3,754	195	4,868	170	1,288	153	13,284	125	506

KEY: N = data do not exist.

^a Other vessels include commercial vessels, fishing boats, freight boats, freight barges, 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 deepwater ports, designated waterfront facilities, nonmarine land facilities, fixed offshore and inshore platforms, mobile facility, municipal facility, aircraft, land vehicles, railroad equipment, bridges, factories, fleeing areas, industrial facilities, intakes, locks, marinas, MARPOL reception facilities, nonvessel common carrier facilities, outfalls, sewers, drains, permanently moored facilities, shipyards, and 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.

NOTES

Any offshore pipeline spills off shore now are addressed jointly by the Coast Guard (CG), National Oceanic and Atmospheric Administration (NOAA), Bureau of Safety and Environmental Enforcement (BSEE), and Bureau of Ocean Energy Management (BOEM). The latter two were the Minerals Management Service (MMS) prior to the DEEPWATER HORIZON casualty in 2010. The CG does generate offshore spill statistics which NOAA uses in their work. Any spills inshore (pipeline or not) are typically handled by the EPA and the associated state government agency. Spills involving interstate pipelines would have oversight by the DOT Pipelines Administration. The former was established in a memorandum of understanding (MOU) back in the 70s.

In shore pipeline spills may also be addressed by the Chemical Safety Board, which is a relatively new federal agency involving production and manufacturing facilities. CG has a MOU agreement with the EPA on who is the leading federal agency for response (Federal On-Scene Coordinator) and subsequent investigations. These statistics reflect the pollution incidents the CG has investigated as the lead agency. CG does not have any data on spills where the EPA or any of the state authorities are the lead agency.

The spike in *Gallons spilled* for 2005 can be attributed to the passage of Hurricane Katrina in Louisiana and Mississippi on Aug. 29, 2005, which caused numerous spills approximating 8 million gallons of oil in U.S. waters. The largest spill in U.S. waters began on April 20, 2010 with an explosion and fire on the mobile offshore drilling unit (MODU) DEEPWATER HORIZON. Subsequently, the MODU sank, leaving an open exploratory well to discharge crude oil into the Gulf of Mexico for several weeks. The most commonly accepted spill amount from the well is approximately 206.6 million gallons, plus approximately 400,000 gallons of oil products from the MODU. The totals in this table may be different from those that appear in the source, due to rounding by the source.

After 2006, the CG do not distinguish between onshore pipelines and offshore pipelines on its analysis systems. This change was in response to issues on offshore spills and pipelines and the overlapping jurisdiction with MMS, as well as the lack of significant inshore spills and response to incidents on the mainland. Details may not add up to totals due to rounding by the source.

Table 4-55: Leaking Underground Storage Tank Releases and Cleanups

	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total confirmed releases	87,528	412,392	452,041	494,997	501,723	507,540	514,123	521,271	528,521	532,420	538,193	543,812	555,384	559,900
Cleanups initiated	51,770	367,603	421,924	470,460	473,314	481,614	489,575	498,173	505,468	510,426	516,882	522,801	539,728	545,707
Cleanups not initiated	35,758	44,789	30,117	24,537	28,409	25,926	24,548	23,098	23,053	21,994	21,311	21,011	15,656	14,193
Cleanups completed	16,905	249,759	332,799	401,874	413,740	424,637	436,406	447,323	456,660	461,441	469,898	478,366	490,624	497,407
Releases not cleaned up	70,623	162,633	119,242	93,123	87,983	82,903	77,717	73,948	71,861	70,979	68,295	65,446	64,760	62,493

NOTES

All data are cumulative from the start of the U.S. Environmental Protection Agency's Underground Storage Tank program, which began in 1984. Data represent the fiscal year, October 1 through September 30.

TABLE 4-56 Highway Noise Barrier Construction (miles)

	1963-																	Total 1963-2019
	Unknown ^d	1989	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019		
TOTAL length	4	693	62	84	80	114	71	59	79	75	79	131	45	75	78	3,332		
Type I barriers ^a	2	510	43	70	55	88	59	49	76	63	70	114	42	70	60	2,513		
Type II barriers ^b	2	139	19	10	10	18	9	6	2	9	1	1	1	4	4	517		
All other types ^c	0	44	0	4	15	8	3	4	1	2	8	16	2	2	14	302		
Cost (millions of 2016 dollars)	0	1,441	148	200	226	319	193	177	169	192	210	341	110	245	208	8,117		

^a A Type I barrier is built on a new highway project or a physically altered existing highway.

^b A Type II barrier is built to abate noise along an existing highway (often referred to as retrofit abatement) and is not mandatory.

^c All other types of barriers are nonfederally funded.

^d Have not been assigned a year of construction or a cost.

NOTES

Miles of noise barriers can neither be assigned a year of construction or a cost.

Miles of barriers, while assigned a year of construction, cannot be assigned a cost.

**Table 4-57: Number of People Residing in Areas of Significant Noise Exposure Around U.S. Airports^{a,b,c}
(within 65 dB DNL noise-level contours)**

Exposure	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
People exposed (thousands)	5,200	2,700	874	491	292	318	315	319	321	340	343	408	454	430
Percent of U.S. resident population	2.29	1.08	0.31	0.17	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.13	0.14	0.13
U.S. resident population (millions)	227.2	249.5	282.2	295.5	309.3	311.6	313.8	316.0	318.3	320.6	322.9	325.0	326.7	328.2

KEY: dB = decibels; DNL = day-night sound level.

^a Noise-level contours are graphical representations of noise levels on a map, similar to elevation contours on a topographic map. Noise-level contours are lines that join points of equal sound levels. Areas between given noise-level contour lines would have a noise level between the two contour values. The U.S. Department of Transportation, Federal Aviation Administration (FAA) has identified DNL 65 dB as the highest threshold of airport noise *Exposure* that is normally compatible with indoor and outdoor activity associated with a variety of land uses, including residential, recreational, schools, and hospitals.

^b Estimates are for areas surrounding airport property of 250 of the largest civil airports with jet operations in the United States. They exclude *Exposure* to aircraft noise within an airport boundary.

^c 1980–2019 estimates were made by Federal Aviation Administration.

NOTE

Noise *Exposure* people data for 2000 and forward was re-estimated using an enhanced version of U.S. MAGENTA (Model for Assessing the Global Exposure of Noise because of Transport Airplanes). The enhanced version of the model uses radar-based traffic data to account for unscheduled operations including freight, General Aviation and military operations. The enhanced U.S. MAGENTA also includes improvements to the acoustical model to account for differences in the sound attenuation characteristics between wing-mounted and tail-mounted aircraft engines. These enhancements result in computed population noise *Exposure* estimates that are more accurate and larger than previous versions of the model. Therefore, it is important to note that the "growth" in the number of people exposed from 1999 to 2000 resulted from improvements in measurement, not deterioration in aviation noise trends. In 2013, Federal Aviation Administration has revised the reporting of noise exposure from calendar year to fiscal year going back to 2000 to align with other agency performance metrics.

Table 4-58: Motor Vehicles Scrapped (thousands)

	1970	1980	1990	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
TOTAL motor vehicles	8,298	10,137	11,073	14,299	13,464	13,597	13,441	12,954	13,077	11,438	13,412	14,187	11,632	11,047
Passenger cars	7,461	8,405	8,897	8,085	U	U	U	U	U	U	U	U	U	U
Trucks	837	1,732	2,177	6,214	U	U	U	U	U	U	U	U	U	U

KEY: U = data are not available.

NOTES

Figures represent vehicles that are not re-registered.
 Numbers may not add to totals due to rounding.



APPENDIX A
Metric Conversion Tables

Table 1-1M: System Kilometers Within the United States

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Highway ^a	5,706,240	6,002,985	6,211,806	6,223,214	6,334,735	6,545,326	6,562,512	6,586,610	6,623,194	6,722,348	6,686,385	6,662,858	6,703,479	6,722,094	6,712,775		U
Class I rail ^{b,c}	333,672	316,202	265,255	192,732	159,727	154,014	153,715	153,517	153,266	151,877	150,680	150,215	149,910	149,407	148,513		U
Amtrak ^c	N	N	38,624	38,624	37,015	34,083	34,158	34,334	34,369	34,369	34,372	34,372	34,451	34,451	34,451		U
Transit ^d																	
Commuter rail ^c	N	N	N	6,649	8,383	12,280	12,193	12,427	12,442	12,545	12,388	12,464	12,577	12,717	12,715		12,762
Heavy rail	N	N	N	2,174	2,507	2,603	2,603	2,610	2,610	2,610	2,644	2,649	2,660	2,671	2,673		2,676
Light rail ^e	N	N	N	777	1,343	2,409	2,801	2,775	2,955	3,021	3,047	3,151	3,267	3,290	3,360		3,373
Navigable channels ^f	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234	40,234		40,234
Oil pipeline ^g	N	N	N	N	N	N	292,879	295,435	299,694	309,657	321,538	335,745	341,445	347,702	352,667		369,381
Gas pipeline ^h	N	N	N	3,011,543	3,403,148	3,905,740	3,935,959	3,955,650	3,975,205	4,005,216	4,038,169	4,071,218	4,095,569	4,117,072	4,156,959		4,190,286

KEY: N = data do not exist; 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 kilometers of nonpublic roadways are included. No consistent data on private road mileage are available. Beginning in 1998, approximately 69,202 kilometers of Bureau of Land Management Roads are excluded. 2010 Missouri and Wyoming's data are 2009.

^b Data represent miles of road owned (aggregate length of road, excluding yard tracks, sidings, and parallel lines) and includes a 528 kilometer state-owned rail line and a small amount, approximately 161 kilometers, of road owned in Canada.

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

^d *Transit* system length is measured in directional route-miles. Directional route-miles are the distance 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. Beginning in 2002, directional route-mileage data for *Commuter* and *Light rail* modes include purchased transportation. 2005 and later years directional route-mileage data for the *heavy rail* mode include purchased transportation.

^e Beginning in 2011, *Light rail* includes Light Rail, Street Car Rail, and Hybrid Rail.

^f These are estimated sums of all domestic waterways which include rivers, bays, channels, and the inner route of the Southeast Alaskan Islands, but does not include the Great Lakes or deep ocean traffic. The Waterborne Commerce Statistics Center monitored 20,287 kilometers as commercially significant inland shallow-draft waterways in 2001. Beginning in 2007, waterways connecting lakes and the Great Lakes St. Lawrence seaway inside the U.S. are included.

^g Includes trunk and gathering lines for crude-oil pipeline. Includes Highly Volatile Liquid (HVL), Carbon Dioxide, and other hazardous liquid systems.

^h Data not adjusted to common diameter equivalent. Mileage as of the end of each year. Data includes gathering, transmission, service, and distribution mains. Prior to 1985 data also include field lines. See table 1-10 for a more detailed breakout of *Oil and Gas pipeline* mileage. Length data reported in *Gas Facts* prior to 1985 was taken from the American Gas Association's member survey, the Uniform Statistical Report, supplemented with estimates for companies that did not participate. *Gas Facts* length data is now based on information reported to the U.S. Department of Transportation on Form 7100. Since data for 1985 and later years are obtained from the Pipeline and Hazardous Material Safety Administration, data for these years are not comparable with prior years or with numbers published in the previous NTS reports.

NOTES

Eno Transportation Foundation has discontinued its oil pipeline data for years prior to 2001.

1 kilometer = 0.621371 miles.

Table 1-4M: Kilometers of Public Roads and Streets in the United States by Type of Surface^a (thousands of kilometers)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL paved and unpaved	5,706	6,003	6,212	6,223	6,357	6,454	N	6,407	6,541	6,552	6,703	6,641	6,618	6,673	6,696	6,638
Paved^b, total	1,980	2,669	3,336	3,629	4,031	4,187	N	4,193	4,259	4,309	4,416	4,402	4,426	4,474	4,577	4,676
Low and intermediate type ^c	1,082	1,443	1,676	1,649	N	N	N	N	N	N	N	N	N	N	N	N
High-type ^c	899	1,226	1,660	1,980	N	N	N	N	N	N	N	N	N	N	N	N
Unpaved^d, total	3,726	3,334	2,876	2,594	2,326	2,267	N	2,214	2,282	2,243	2,287	2,240	2,192	2,199	2,119	1,962

KEY: N = data do not exist.

^a 1960-90 data includes the 50 states and the District of Columbia; 2000-08 data includes the 50 states, District of Columbia, and Puerto Rico; 2011-16 data includes the 50 states and the District of Columbia; 2017 and later data includes the 50 states, Puerto Rico (data may be incomplete), and the District of Columbia.

^b Paved kilometrage includes the following categories: low type (an earth, gravel, or stone roadway that has a bituminous surface course less than 2.5 cm thick); intermediate type (a mixed bituminous or bituminous penetration roadway on a flexible base having a combined surface and base thickness of less than 17.8 cm); high-type flexible (a mixed bituminous or bituminous penetration roadway on a flexible base having a combined surface and base thickness of 17.8 cm or more; high-type composite (a mixed bituminous or bituminous penetration roadway of more than 2.5 cm compacted material on a rigid base with a combined surface and base thickness of 17.8 cm or more; high-type rigid (Portland cement concrete roadway with or without a bituminous wearing surface of less than 2.5 cm).

^c Beginning in 1997, data is no longer available for paved minor collectors and local public roads.

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

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 is available (although prior to 1980 some nonpublic roadway mileage is included). Most data is provided by the states to the US DOT Federal Highway Administration (FHWA). Some years contain FHWA estimates for some states.

Numbers may not add to totals due to rounding.

1 kilometer = 0.621371 miles.

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

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL lane-kilometers	12,749,503	12,956,959	13,235,639	13,472,974	13,811,810	13,788,245	13,850,020	13,930,595	14,107,589	14,060,174	14,019,118	14,106,830	14,153,487	14,138,727
Urban, total	2,245,429	2,688,403	3,082,703	3,642,525	3,965,844	3,959,806	4,027,161	4,250,054	4,312,552	4,362,181	4,375,220	4,405,092	4,431,214	4,474,434
Interstate	77,986	100,124	118,950	138,381	148,468	149,208	151,432	159,219	165,024	168,559	169,350	170,181	171,783	172,202
Other arterial ^b	536,995	642,733	734,152	843,036	917,399	903,600	914,828	936,475	923,032	948,803	944,692	949,605	956,722	956,680
Collector ^c	233,561	270,000	303,474	362,984	413,919	405,620	412,239	436,343	479,744	495,723	505,706	507,406	507,867	522,290
Local	1,396,888	1,675,546	1,926,127	2,298,124	2,486,057	2,501,377	2,548,662	2,718,016	2,744,752	2,749,096	2,755,472	2,777,901	2,794,843	2,823,262
Rural, total	10,504,074	10,268,556	10,152,936	9,830,449	9,845,966	9,828,439	9,822,859	9,680,541	9,795,036	9,697,994	9,643,898	9,701,739	9,722,273	9,664,293
Interstate	210,792	218,663	216,597	202,076	199,028	199,293	200,791	194,511	191,010	190,308	191,494	191,823	192,936	193,326
Other arterial ^b	816,095	832,581	869,781	852,236	873,560	866,282	866,324	853,884	851,236	851,367	856,472	859,700	860,166	865,637
Collector ^c	2,303,401	2,361,876	2,276,686	2,210,189	2,224,515	2,203,875	2,199,352	2,187,047	2,157,542	2,153,694	2,149,292	2,159,145	2,154,090	2,141,441
Local	7,173,786	6,855,435	6,789,872	6,565,948	6,548,862	6,558,989	6,556,391	6,445,099	6,595,249	6,502,625	6,446,640	6,491,071	6,515,081	6,463,889

^a Includes the 50 States and the District of Columbia.
^b *Urban other arterial* include other freeways and expressways, other principal arterial, and minor arterial. *Rural other arterial* includes other principal arterial and minor arterial prior to 2009 and other freeways and expressways, other principal arterial and minor arterial after 2009.
^c *Collector* is the sum of major and minor collectors.

NOTES

When estimating rural and urban lane mileage, the U.S. Department of Transportation, Federal Highway Administration assumes that rural minor collector and urban/rural local roads are two lanes wide.
 1 kilometer = 0.621371 miles.

Table 1-36M: Roadway Vehicle-Kilometers Traveled (VKT) and VKT per Lane-Kilometer by Functional System^a

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Urban VKT, total (millions)	1,376,416	2,052,693	2,677,583	3,149,493	3,190,296	3,173,777	3,206,120	3,293,311	3,387,232	3,486,593	3,580,570	3,619,643	3,639,571	3,665,955
Interstate	259,494	448,848	633,221	757,880	768,772	767,181	779,803	813,216	836,607	870,955	898,638	912,836	919,603	926,585
Other arterial ^b	779,227	1,125,306	1,449,040	1,691,562	1,693,950	1,680,322	1,693,327	1,720,272	1,746,196	1,784,418	1,831,189	1,841,228	1,867,434	1,861,343
Collector ^c	133,645	171,068	217,860	274,015	290,592	287,716	288,898	303,437	330,000	343,474	357,608	359,447	369,518	386,302
Local	204,050	307,470	377,462	426,035	436,982	438,558	444,092	456,387	474,428	487,746	493,136	506,131	493,016	491,725
Rural VKT, total (millions)	1,081,527	1,398,324	1,743,164	1,661,529	1,583,833	1,567,562	1,571,725	1,515,860	1,482,089	1,494,927	1,528,144	1,550,129	1,575,229	1,583,357
Interstate	217,397	322,147	431,594	413,025	395,331	392,016	395,692	377,075	372,357	379,428	397,051	406,440	413,988	421,075
Other arterial ^b	422,894	532,477	676,888	638,032	605,778	600,445	598,602	577,372	571,509	575,229	591,602	599,309	610,796	617,679
Collector ^c	304,919	386,983	430,067	403,464	369,115	366,535	368,172	356,025	335,853	335,845	334,084	330,076	334,990	332,760
Local	136,318	156,716	204,615	207,007	213,609	208,565	209,259	205,389	202,370	204,425	205,407	214,304	215,455	211,843
Urban VKT per lane-kilometer, total (thousands)	987	1,229	1,398	1,392	1,295	1,290	1,281	1,247	1,264	1,286	1,317	1,322	1,322	1,319
Interstate	5,355	7,215	8,567	8,814	8,333	8,275	8,287	8,220	8,159	8,316	8,540	8,632	8,615	8,660
Other arterial ^b	2,335	2,818	3,176	3,229	2,972	2,993	2,979	2,956	3,045	3,027	3,120	3,120	3,124	3,131
Collector ^c	921	1,020	1,155	1,215	1,163	1,176	1,128	1,119	1,107	1,115	1,138	1,140	1,171	1,190
Local	235	295	315	298	283	282	280	270	278	286	288	293	284	280
Rural VKT per lane-kilometer, total (thousands)	166	219	276	272	259	257	258	252	244	248	255	257	261	264
Interstate	1,660	2,371	3,207	3,289	3,197	3,166	3,171	3,120	3,137	3,209	3,337	3,410	3,453	3,505
Other arterial ^b	834	1,029	1,252	1,205	1,149	1,149	1,112	1,088	1,080	1,087	1,112	1,122	1,143	1,148
Collector ^c	213	264	304	294	267	268	269	262	251	251	250	246	250	250
Local	31	37	48	51	52	51	51	51	49	51	51	53	53	53

^a Includes the 50 States and the District of Columbia.

^b *Urban other arterial* includes other freeways and expressways, other principal arterial, and minor arterial. *Rural other arterial* includes other principal arterial and minor arterial prior to 2009, and includes other freeways and expressways, other principal arterial and minor arterial for 2009.

^c *Collector* is the sum of major and minor collectors.

NOTES

See table 1-6M for estimated highway *Lane-kilometers* by functional system.

Component values may not add to totals due to rounding.

1 kilometer = 0.621371 miles.

Table 1-38M: Average Length of Haul, Domestic Freight and Passenger Modes (kilometers)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Freight																	
Air carrier	U	U	U	U	1,733	1,961	1,862	1,852	1,890	1,855	1,869	1,875	1,876	1,935	1,959	1,950	2,044
Class I rail	742	829	991	1,168	1,357	1,438	1,470	1,476	1,566	1,594	1,619	1,641	1,642	1,662	1,684	1,660	U
Coastwise (water)	2,408	2,429	3,082	2,582	2,013	1,984	1,882	1,801	1,661	1,599	1,614	1,614	1,638	1,728	1,744	1,713	U
Lakewise (water)	840	814	863	890	814	869	907	897	915	917	907	891	893	934	942	922	U
Internal (water)	454	531	652	756	775	708	750	777	759	715	759	763	771	794	829	782	U
Intraport (water)	U	U	27	20	25	27	26	25	26	25	27	25	24	24	22	22	U
Crude (oil pipeline)	523	483	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Petroleum products (oil pipeline)	433	575	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Passenger																	
Air carrier, domestic, scheduled	938	1,091	1,184	1,292	1,342	1,394	1,413	1,421	1,425	1,440	1,445	1,458	1,475	1,484	1,491	1,493	1,457
Commuter rail	U	U	37	35	37	36	38	39	38	40	38	38	38	40	41	40	U
Amtrak ^a	NA	NA	348	439	393	345	355	343	350	351	351	342	334	330	322	319	U

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

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

NOTES

Average length of haul for *freight* is calculated by dividing ton-kilometers 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* and *Amtrak* it is calculated by dividing passenger-kilometers by number of passengers.

Eno Transportation Foundation has discontinued some data series years prior to 1990.

Detail may not add to totals due to rounding.

1 kilometer = 0.621371 miles.

Table 1-50M: U.S. Tonne-Kilometers of Freight (BTS Special Tabulation) (millions)

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TOTAL U.S. tonne-kilometers of freight	6,090,405	6,634,048	7,395,706	7,853,811	7,253,282	7,137,849	7,122,954	7,360,452	7,562,671	7,461,228	7,310,908	7,441,341	7,665,833	U	U
Air ^a	6,092	13,238	21,874	22,988	18,309	17,715	18,056	18,144	18,754	19,258	20,086	22,104	23,314	23,963	27,369
Truck	1,847,721	2,374,398	2,877,733	3,226,694	2,637,202	2,379,954	2,660,295	2,926,454	2,856,882	2,899,252	3,008,681	2,955,442	2,969,468	U	U
Railroad ^b	1,360,694	1,509,566	2,140,261	2,476,734	2,468,819	2,524,666	2,500,300	2,541,355	2,702,743	2,537,845	2,314,699	2,445,138	2,525,224	2,357,122	U
Domestic water transportation	1,345,855	1,216,951	942,849	863,496	733,239	729,143	693,292	679,021	736,553	716,301	697,664	713,926	718,014	666,185	U
Coastwise	921,460	699,522	414,445	384,819	280,822	263,105	229,358	239,158	251,801	256,376	250,690	256,955	253,451	239,435	U
Lake-wise	90,149	88,956	84,502	75,863	66,203	71,714	70,040	71,061	72,331	67,796	63,377	69,203	68,473	68,619	U
Internal	331,914	426,886	441,727	400,567	384,350	392,471	392,035	367,192	410,653	390,466	381,903	385,725	394,485	356,379	U
Intraport	2,331	1,587	2,176	2,227	1,864	1,853	1,859	1,610	1,769	1,663	1,694	2,044	1,606	1,752	U
Pipeline	1,530,043	1,519,895	1,412,989	1,263,898	1,395,713	1,486,372	1,251,011	1,195,479	1,247,739	1,288,572	1,269,778	1,304,730	1,429,813	U	U

KEY: U = data are not available.

^a Includes Freight, Express, and Mail.

^b Estimates from 1980 to 1989 come from the Association of American Railroads using ton mile values from the Surface Transportation Board's Waybill Sample. The Waybill Sample represents all major U.S. railroads, including all Class I railroads and several short-line railroads.

NOTES

Based on the Freight Analysis Framework (FAF) BTS developed a more comprehensive and reliable estimates of ton-kilometers for the Air, Truck, Rail, Water, and Pipeline modes than are presented in table 1-49M. These improved estimates are not comparable to data in table 1-49M.

1 tonne-kilometer = 0.684945 ton-miles.

Table 1-56M: U.S. Waterborne Freight (million short tonnes)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL freight	997.8	1,389.5	1,813.4	1,963.0	2,199.6	2,293.4	2,117.9	2,151.7	2,097.3	2,063.6	2,128.0	2,067.5	2,079.3	2,165.5	2,211.4	2,144.0
Foreign	307.8	527.0	835.9	944.9	1,229.0	1,359.6	1,307.2	1,342.2	1,290.0	1,255.2	1,278.0	1,246.6	1,284.1	1,373.5	1,441.5	1,401.9
Imports	191.7	307.8	469.5	544.3	852.5	995.1	801.1	788.5	729.8	688.3	690.3	681.9	685.5	696.6	695.4	632.5
Exports	116.1	219.2	366.4	400.6	376.5	364.5	506.1	553.8	560.1	566.9	587.7	564.7	598.6	676.9	746.2	769.4
Domestic	690.0	862.5	977.5	1,018.1	970.5	933.8	810.7	809.4	807.3	808.4	850.1	820.8	795.2	792.0	769.9	742.1
Inland	264.0	428.3	485.3	564.8	570.1	566.1	512.6	505.0	516.3	513.7	541.0	511.0	494.7	485.9	475.9	455.6
Coastal	189.8	216.3	299.0	270.9	205.9	194.0	149.2	146.0	138.0	149.6	156.0	158.8	153.1	148.8	145.3	139.8
Great Lakes	140.7	142.5	104.4	99.9	103.7	87.3	73.1	79.9	76.6	77.4	79.8	76.1	71.0	74.2	72.8	74.5
Intraport	94.5	73.9	85.4	78.4	85.8	82.0	71.6	74.7	74.3	66.6	72.1	73.4	75.2	82.5	75.6	71.2
Intrateritory	0.9	1.5	3.3	4.1	5.0	4.4	4.2	3.8	2.1	1.1	1.2	1.4	1.3	0.7	0.3	1.0

NOTES

Beginning in 1996, shipments of fish are excluded from domestic *Inland* and *Intraport* tonnage.

Numbers may not add to totals due to rounding.

1 short tonne = 1.10231 short tons.

Table 4-2M: U.S. Consumption of Energy from Primary Sources by Sector (petajoules)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy consumption, total	47,520	71,551	82,317	89,081	104,136	105,613	102,882	102,195	99,570	102,464	103,687	102,736	102,696	102,972	106,732	105,814	98,086
Transportation	11,141	16,946	20,741	23,597	27,912	29,731	28,378	27,978	27,484	27,994	28,264	28,657	29,236	29,477	29,952	29,999	25,567
Transportation as percent of total energy consumption	23.4	23.7	25.2	26.5	26.8	28.2	27.6	27.4	27.6	27.3	27.3	27.9	28.5	28.6	28.1	28.4	26.1
Industrial	17,882	24,205	23,790	22,282	24,000	22,518	21,446	21,634	21,925	22,555	22,637	22,597	22,740	23,161	24,119	24,315	23,402
Industrial as percent of total energy consumption	37.6	33.8	28.9	25.0	23.0	21.3	20.8	21.2	22.0	22.0	21.8	22.0	22.1	22.5	22.6	23.0	23.9
Residential	2,873	4,470	4,331	4,108	4,514	4,276	4,245	4,289	3,930	4,390	4,632	4,685	4,559	4,609	5,039	5,052	4,544
Residential as percent of total energy consumption	6.0	6.2	5.3	4.6	4.3	4.0	4.1	4.2	3.9	4.3	4.5	4.6	4.4	4.5	4.7	4.8	4.6
Commercial	7,017	8,781	7,849	6,913	7,550	7,281	7,006	6,829	5,997	7,057	7,392	6,821	6,362	6,433	7,366	7,403	6,833
Commercial as percent of total energy consumption	14.8	12.3	9.5	7.8	7.3	6.9	6.8	6.7	6.0	6.9	7.1	6.6	6.2	6.2	6.9	7.0	7.0
Energy input at electric utilities	8,607	17,148	25,606	32,174	40,157	41,807	41,800	41,456	40,230	40,468	40,756	39,976	39,804	39,291	40,264	39,039	37,733
Energy input at electric utilities as percent of total energy consumption	18.1	24.0	31.1	36.1	38.6	39.6	40.6	40.6	40.4	39.5	39.3	38.9	38.8	38.2	37.7	36.9	38.5
Percentage of primary demand met by petroleum																	
Transportation	95.9	95.3	96.7	96.7	97.5	97.8	97.4	97.2	97.0	96.7	97.2	97.3	97.3	97.1	96.6	96.4	113.1
Industrial	33.7	33.8	42.0	38.8	39.6	44.9	39.8	39.3	38.9	38.7	37.5	38.1	38.3	38.5	38.4	38.6	40.1
Residential	81.8	64.3	42.3	35.8	36.3	35.8	27.8	25.4	23.8	23.1	23.6	22.7	20.3	20.0	21.4	20.4	22.7
Commercial	18.8	19.1	17.7	15.1	11.3	11.0	9.8	9.8	9.9	8.4	8.3	13.8	14.2	13.9	12.5	12.4	13.5
Electric utilities	6.8	13.0	10.9	4.2	3.0	3.1	0.9	0.8	0.6	0.7	0.8	0.7	0.6	0.6	0.7	0.5	0.5

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 historical data, some numbers may not add to totals due to rounding.

1 petajoule = 947,800,000,000 British thermal units (Btu).

Table 4-3M: Domestic Demand for Refined Petroleum Products by Sector (petajoules)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total petroleum demand	20,968	31,123	36,040	35,344	40,252	42,431	37,265	36,546	35,696	36,292	36,566	37,315	37,678	38,028	38,923	38,896	34,006
Transportation	10,683	16,153	20,056	22,817	27,061	28,715	26,485	25,982	25,438	25,703	26,089	26,463	26,915	27,117	27,445	27,418	23,155
Industrial	6,035	8,181	9,984	8,650	9,494	10,093	8,525	8,495	8,507	8,714	8,463	8,587	8,701	8,897	9,234	9,355	8,959
Residential	2,350	2,876	1,830	1,471	1,640	1,530	1,182	1,091	934	1,016	1,093	1,063	927	919	1,079	1,030	919
Commercial	1,317	1,680	1,391	1,046	851	803	682	667	591	589	610	912	878	865	891	893	782
Electric utilities	583	2,234	2,779	1,360	1,207	1,289	391	311	226	269	312	291	257	230	275	199	189
Transportation as percent of total petroleum demand	50.9	51.9	55.6	64.6	67.2	67.7	71.1	71.1	71.3	70.8	71.3	70.9	71.4	71.3	70.5	70.5	68.1

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 a different Btu content per unit volume.

The sum of components may not add to totals due to rounding.

1 petajoule = 947,800,000 British thermal units (Btu).

Table 4-4M: U.S. Energy Consumption by the Transportation Sector (petajoules)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy consumption (all sectors)	47,520	71,551	82,317	89,081	104,136	105,613	102,882	102,195	99,570	102,464	103,687	102,736	102,696	102,972	106,732	105,814	98,086
Total transportation consumption^a	11,179	16,985	20,781	23,653	27,975	29,817	28,464	28,063	27,564	28,077	28,348	28,738	29,315	29,557	30,032	30,077	25,634
Transportation as percent of total energy consumption	23.5	23.7	25.2	26.6	26.8	28.2	27.6	27.4	27.7	27.4	27.3	27.9	28.5	28.7	28.1	28.4	26.1
Total primary consumption ^b	11,141	16,946	20,741	23,597	27,912	29,731	28,378	27,978	27,484	27,994	28,264	28,657	29,236	29,477	29,952	29,999	25,567
Coal ^c	79.1	7.2	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
in million short tons ^c	3,046	0,298	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
Natural gas ^d	379	786	686	717	709	658	759	774	823	936	802	786	799	843	1015	1092	1079
in trillion cubic feet	0.35	0.72	0.63	0.66	0.65	0.61	0.70	0.72	0.76	0.86	0.74	0.72	0.73	0.77	0.93	1.00	1.00
Petroleum products ^e	10,683	16,153	20,056	22,817	27,061	28,715	26,485	25,982	25,438	25,703	26,089	26,463	26,915	27,117	27,445	27,418	23,155
in million barrels	1,880	2,839	3,494	3,974	4,762	5,094	4,927	4,851	4,763	4,837	4,911	4,982	5,083	5,116	5,166	5,162	5,162
Electricity	11.0	11.2	11.7	17.1	19.4	27.0	27.8	27.6	26.4	27.4	27.9	27.5	27.0	27.1	27.6	27.5	23.5
Electrical system energy losses ^f	27.3	27.1	28.0	39.3	43.8	58.7	58.1	57.2	53.4	55.4	56.1	53.7	52.3	52.3	52.4	50.7	43.8

KEY: Z = a value of zero, or value too small to report.

^a Sum of primary consumption, electricity, and electrical system energy losses categories.

^b Sum of biomass, natural gas, and petroleum categories.

^c Beginning from 1980, small amounts of coal consumed for transportation are included in industrial sector consumption.

^d Consumed in the operation of pipelines, primarily in compressors, and small amounts consumed as vehicle fuel.

^e 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.

^f Incurred in the generation, transmission, and distribution of electricity plus plant use and unaccounted for electrical system energy losses.

NOTES

Energy consumption (all sectors) differs from totals in table 4-2 for 1990 and subsequent years.

¹ 1 petajoule = 947,800,000,000 British thermal units (Btu).

Appendix A. Metric Conversion Tables

Table 4-5M: Fuel Consumption by Mode of Transportation

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Air																
Certificated carriers ^a																
Jet fuel (million liters)	7,397	29,742	32,249	46,228	52,631	50,286	41,854	40,990	38,755	38,445	38,962	40,660	42,273	42,928	44,850	46,121
General aviation ^b																
Aviation gasoline (million liters)	916	2,086	1,968	1,336	1,260	1,117	836	818	781	747	793	741	782	781	878	876
Jet fuel (million liters)	N	787	2,900	2,510	3,679	5,779	5,431	5,513	5,432	4,768	5,551	5,234	5,439	5,833	6,889	7,114
Highway																
Gasoline, diesel and other fuels (million liters)																
Light duty vehicle, short wheel base and motorcycle ^c	155,849	256,950	265,681	264,068	277,375	293,778	330,146	336,088	337,247	337,200	339,776	342,501	348,082	348,904	348,417	355,330
Light duty vehicle, long wheel base ^c	N	46,611	90,078	134,802	200,395	222,844	137,225	133,756	132,922	133,090	141,359	137,930	143,160	141,827	140,777	143,955
Single-unit 2-axle 6-tire or more truck	N	15,022	26,206	30,936	36,200	35,966	57,147	53,811	54,421	54,896	56,379	56,215	58,062	59,052	60,870	63,053
Combination truck	N	27,815	49,350	61,070	97,155	104,813	113,285	106,677	105,898	109,001	110,222	109,345	111,876	114,939	114,793	109,726
Bus	3,131	3,105	3,855	3,388	4,210	4,240	7,272	7,329	7,809	8,012	8,454	8,434	8,426	8,897	9,440	9,277
Transit^d																
Electricity (million kWh)	2,908	2,561	2,446	4,837	5,382	5,765	6,414	6,534	6,506	6,651	6,673	6,668	6,604	6,611	6,749	6,877
Motor fuel (million liters)																
Diesel ^e	787	1,026	1,632	2,464	2,236	2,015	2,395	2,365	2,321	2,304	2,049	2,182	2,233	2,194	2,148	2,122
Gasoline and other nondiesel fuels ^g	727	257	42	129	89	110	369	383	385	404	410	433	440	428	423	437
Compressed natural gas	N	N	N	N	N	165	355	478	486	470	499	519	591	632	650	711
Rail, Class I (in freight service)																
Distillate / diesel fuel (million liters)	13,109	13,419	14,778	11,792	14,006	15,513	13,226	13,949	13,627	13,938	14,638	13,976	12,814	13,230	13,839	12,942
Amtrak																
Electricity (million kWh)	N	N	254	330	470	531	559	555	549	525	515	504	516	490	485	484
Distillate / diesel fuel (million liters)	N	N	242	310	359	248	240	240	239	250	249	236	228	242	248	238
Water																
Residual fuel oil (million liters)	14,960	14,286	33,887	23,948	24,264	19,603	19,467	17,262	18,244	15,942	14,563	12,711	11,090	9,764	10,173	8,287
Distillate / diesel fuel oil (million liters)	2,979	3,100	5,595	7,816	8,560	7,592	7,582	8,076	6,694	6,343	6,032	9,150	8,499	8,274	8,376	7,729
Gasoline (million liters)	N	2,264	3,982	4,921	4,256	4,773	4,418	4,179	4,138	4,249	4,261	7,819	8,792	8,792	7,912	8,054
Pipeline																
Natural gas (million cubic meters)	9,828	20,450	17,971	18,684	18,185	16,538	19,089	19,476	20,694	23,590	19,826	19,204	19,446	20,446	24,821	26,739

KEY: kWh = kilowatt-hour; N = data do not exist.

^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 no respondents and are therefore not comparable to earlier years. See the accuracy statement in the appendix for more detailed information.

^c Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^d Data from 1997 are not comparable to data before 1997 due to different sources. Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and small systems.

^e Diesel includes Diesel and Bio-Diesel.

^g Gasoline and all other nondiesel fuels include Gasoline, Liquefied Petroleum Gas, Methane, Ethanol, Bunker Fuel, Kerosene, Grain Additive, and Other Fuel.

NOTES:

The following conversion rates were used:

1 liter = 0.264172 gallons.

1 cubic meter = 35.3147 cubic feet.

Table 4-6M: Energy Consumption by Mode of Transportation (petajoules)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Air																
Certificated carriers ^a																
Jet fuel	278	1,119	1,213	1,739	1,980	1,892	1,575	1,542	1,458	1,447	1,466	1,530	1,591	1,615	1,688	1,735
General aviation ^b																
Aviation gasoline	31	70	66	45	42	37	28	27	26	25	27	25	26	26	29	29
Jet fuel	N	30	109	94	138	217	204	207	204	179	209	197	205	219	259	268
Highway																
Gasoline, diesel and other fuels																
Light duty vehicle, short wheel base and motorcycle ^c	5,225	8,614	8,907	8,853	9,299	9,849	11,068	11,268	11,306	11,305	11,391	11,483	11,670	11,697	11,681	11,913
Light duty vehicle, long wheel base ^c	N	1,563	3,020	4,519	6,718	7,471	4,601	4,484	4,456	4,462	4,739	4,624	4,800	4,755	4,720	4,826
Single-unit 2-axle 6-tire or more truck	N	504	879	1,037	1,214	1,206	1,916	1,804	1,824	1,840	1,890	1,885	1,947	1,980	2,041	2,114
Combination truck	N	933	1,655	2,047	3,257	3,514	3,798	3,576	3,550	3,654	3,695	3,666	3,751	3,853	3,849	3,679
Bus	105	104	129	114	141	142	244	246	262	269	283	283	282	298	316	311
Transit^d																
Electricity	10	9	9	17	19	21	23	24	23	24	24	24	24	24	24	25
Motor fuel																
Diesel ^f	30	39	62	94	86	77	92	91	89	88	78	84	86	84	82	81
Gasoline and other nondiesel fuels ^g	24	9	1	4	3	4	12	13	13	14	14	15	15	14	14	15
Compressed natural gas	N	N	N	N	6	14	18	19	18	19	20	23	24	25	26	27
Rail, Class I (in freight service)																
Distillate / diesel fuel	502	514	566	452	536	594	506	534	522	534	561	535	491	507	530	496
Amtrak																
Electricity	N	N	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Distillate / diesel fuel	N	N	9	12	14	9	9	9	9	10	10	9	9	9	9	9
Water																
Residual fuel oil	624	596	1,414	999	1,012	818	812	720	761	665	608	530	463	407	424	346
Distillate / diesel fuel oil	114	119	214	299	328	291	290	309	256	243	231	350	325	317	321	296
Gasoline	N	76	134	165	143	160	148	140	139	142	143	262	295	295	265	270
Pipeline																
Natural gas	380	790	694	722	703	639	738	752	800	911	766	742	751	790	959	1,033

KEY: N = data does not exist.

^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 no respondents and are therefore not comparable to earlier years. See the accuracy statement in the appendix for more detailed information.^c Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches. This edition of table 4-6M is not comparable to previous editions before 2013.^d Data from 1997 are not comparable to data before 1997 due to different sources. Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and small systems.^f Diesel includes Diesel and Bio-Diesel.^g Gasoline and all other nondiesel fuels include Gasoline, Liquefied Petroleum Gas, Liquefied Natural Gas, Methane, Ethanol, Bunker Fuel, Kerosene, Grain Additive, and Other Fuel.**NOTES**

The following conversion rates were used:

Jet fuel = 37,627 kJ/liter.

Aviation gasoline = 33,502 kJ/liter.

Automotive gasoline = 33,526 kJ/liter.

Diesel motor fuel = 38,290 kJ/liter.

Compressed natural gas = 38,658 kJ/liter.

Distillate fuel = 38,290 kJ/liter.

Residual fuel = 41,721 kJ/liter.

Natural gas = 38,638 kJ/m³.

Electricity 1kWh = 3,412 Btu, negating electrical system losses. To include approximate electrical system losses, multiply this conversion factor by 3.

1 kilojoule = 0.947817 British thermal unit (Btu).

Table 4-7M: Domestic Demand for Gasoline by Mode (millions of liters)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL demand	230,005	339,178	396,854	430,044	499,126	529,914	521,274	511,581	509,447	511,565	529,997	535,006	548,303	547,276	549,775	553,756
Highway	209,820	324,025	383,019	414,614	487,878	511,697	506,205	496,928	495,642	497,019	516,588	501,002	512,818	512,169	511,962	515,112
Nonhighway, total	20,185	15,152	13,834	15,430	11,249	18,217	15,069	14,653	13,805	14,545	13,409	34,004	35,486	35,107	37,813	38,644
Agriculture	8,675	7,313	4,009	2,579	2,469	4,080	2,967	3,025	3,312	2,478	2,439	601	637	636	606	490
Aviation ^a	5,011	1,488	1,563	1,354	1,120	1,264	910	837	730	805	670	734	633	618	608	626
Marine ^b	230	2,264	3,983	4,923	4,256	4,773	4,418	4,179	4,138	4,249	4,261	7,819	8,792	8,792	7,912	8,054
Other ^c	6,270	4,087	4,280	6,574	3,404	8,100	6,775	6,612	5,625	7,013	6,039	24,850	25,424	25,061	28,687	29,475

^a Does not include aviation jet fuel.

^b In 2015 Marine became Boating with unstated formula changes from the source.

^c Includes state, county, and municipal use, industrial and commercial use, construction use, and miscellaneous.

NOTES

All non-highway uses of gasoline were estimated by the U.S. Department of Transportation, Federal Highway Administration. For 2015 these estimates may not be comparable to data for prior years due to revised estimation procedures. Data are not comparable to prior years due to changes in data analysis and/or improvements in reporting procedures. As a result, Other count increased.

Gasohol, a mixture of gasoline and ethyl alcohol, is included in the data starting in 1995.
1 liter = 0.264172 gallons.

Table 4-8M: Certificated Air Carrier Fuel Consumption and Travel^a

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of aircraft	2,135	2,679	3,808	6,083	7,826	7,686	7,185	7,168	6,914	6,740	6,761	6,876	7,077	7,196	7,475	7,628	5,882
Average kilometers flown per aircraft (thousands)^b	784	1,528	1,236	1,250	1,428	1,728	1,717	1,747	1,799	1,845	1,842	1,844	1,837	1,839	1,840	1,847	1,447
Aircraft-kilometers (millions)																	
Domestic operations	1,381	3,328	3,663	6,378	9,112	10,809	9,617	9,663	9,586	9,600	9,571	9,730	10,022	10,200	10,636	10,968	6,782
International operations	293	764	538	1,224	2,063	2,471	2,720	2,861	2,848	2,830	2,881	2,945	2,976	3,032	3,115	3,136	1,728
Fuel consumption (million liters)																	
Domestic operations	7,397	29,742	32,249	46,228	52,631	50,286	41,884	40,990	38,755	38,445	38,962	40,660	42,273	42,928	44,851	46,121	27,380
International operations	2,143	8,491	6,614	14,906	19,391	19,080	19,860	20,899	21,279	21,761	22,332	22,668	22,248	22,541	22,789	23,035	11,533
Aircraft-kilometers flown per liters																	
Domestic operations	0.19	0.11	0.11	0.14	0.17	0.21	0.23	0.24	0.25	0.25	0.25	0.24	0.24	0.24	0.24	0.24	0.25
International operations	0.14	0.09	0.08	0.08	0.11	0.13	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.15

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

^b Average miles per aircraft calculation may include Aircraft-miles flown that are categorized as Unknown, and therefor not included in either Domestic or International operations.

NOTES

1 kilometer = 0.621371 miles.

1 liter = 0.264172 gallons.

Table 4-9M: Motor Vehicle Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles registered (thousands)	73,858	111,242	161,490	193,057	225,821	247,421	250,070	253,216	253,639	255,877	260,351	263,610	268,799	272,481	273,602	276,491
Vehicle-kilometers traveled (millions)	1,156,735	1,785,928	2,457,943	3,451,016	4,420,747	4,811,021	4,775,352	4,748,211	4,778,839	4,809,171	4,869,321	4,981,519	5,108,714	5,169,772	5,214,800	5,249,313
Fuel consumed (million liters)	219,099	349,504	435,170	494,962	615,334	661,640	645,074	637,661	638,298	642,199	656,190	654,426	669,606	673,618	674,297	681,340
Average kilometers traveled per vehicle (thousands)	15.7	16.1	15.2	17.9	19.6	19.4	19.1	18.8	18.8	18.8	18.7	18.9	19.0	19.0	19.1	19.0
Average kilometers traveled per liter	5.3	5.1	5.6	7.0	7.2	7.3	7.4	7.4	7.5	7.5	7.4	7.6	7.6	7.7	7.7	7.7
Average fuel consumed per vehicle (liters)	2,967	3,142	2,695	2,564	2,725	2,674	2,580	2,518	2,517	2,510	2,520	2,483	2,491	2,472	2,465	2,464

NOTES

Motor vehicles, fuel consumption and travel data include light duty vehicles, buses, trucks and motorcycles.
 Data from 2007 was calculated using a new methodology and data categories of the Highway Statistics series were updated, so the data from 1960-2006 are not comparable.
 See tables 4-11M, 4-12M, 4-13M, 4-14M, and 4-15M for individual highway vehicles.
 1 liter = 0.264172 gallons and 1 kilometer = 0.621371 miles.

Table 4-11M: Light Duty Vehicle, Short Wheel Base and Motorcycle Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles registered (thousands)																
Light duty vehicles, short wheel base ^a	61,671	89,244	121,601	133,700	133,621	136,568	190,203	183,523	183,172	184,497	187,555	189,618	192,775	193,672	192,856	194,349
Motorcycles	574	2,824	5,694	4,259	4,346	6,227	8,010	8,438	8,455	8,405	8,418	8,601	8,679	8,715	8,666	8,596
Vehicle-kilometers traveled (millions)																
Light duty vehicles, short wheel base ^a	944,703	1,480,080	1,805,378	2,281,765	2,575,412	2,749,437	3,260,120	3,293,172	3,319,799	3,338,460	3,334,676	3,456,614	3,527,302	3,574,032	3,593,002	3,627,959
Motorcycles	U	U	U	U	16,848	16,825	29,794	29,841	34,416	32,776	32,138	31,553	32,904	32,427	32,309	31,685
Fuel consumed (million liters)																
Light duty vehicles, short wheel base ^a	155,849	256,950	265,681	264,068	276,582	293,061	328,530	334,474	335,388	335,429	338,040	340,805	346,319	347,168	346,688	353,635
Motorcycles	U	U	U	U	793	717	1,615	1,614	1,859	1,770	1,736	1,695	1,763	1,735	1,729	1,695
Average kilometers traveled per vehicle (thousands)																
Light duty vehicles, short wheel base ^a	15.3	16.6	14.8	17.1	19.3	20.1	17.1	17.9	18.1	18.1	17.8	18.2	18.3	18.5	18.6	18.7
Motorcycles	U	U	U	U	3.9	2.7	3.7	3.5	4.1	3.9	3.8	3.7	3.8	3.7	3.7	3.7
Average kilometers traveled per liter																
Light duty vehicles, short wheel base ^a	6.1	5.8	6.8	8.6	9.3	9.4	9.9	9.8	9.9	10.0	9.9	10.1	10.2	10.3	10.4	10.3
Motorcycles	U	U	U	U	21.3	23.5	18.4	18.5	18.5	18.5	18.5	18.6	18.7	18.7	18.7	18.7
Average fuel consumed per vehicle (liters)																
Light duty vehicles, short wheel base ^a	2,527.1	2,879.2	2,184.9	1,975.1	2,069.9	2,145.9	1,727.3	1,822.5	1,831.0	1,818.1	1,802.4	1,797.3	1,796.5	1,792.6	1,797.7	1,819.6
Motorcycles	U	U	U	U	182.4	115.2	201.7	191.3	219.9	210.7	206.2	197.1	203.2	199.1	199.5	197.2

KEY: U = data are not available.

^a 1960-1990 data include Motorcycles.

NOTES

Average kilometers traveled per vehicle, Average kilometers traveled per liter, and Average fuel consumed per vehicle are derived by calculation. Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base found in table 4-12M replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport utility vehicles with wheelbases (WB) larger than 121 inches.

Numbers may not add to totals due to rounding.

1 liter = 0.264172 gallons and 1 kilometer = 0.621371 miles.

Table 4-12M: Light Duty Vehicle, Long Wheel Base Fuel Consumption and Travel

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	14,211	27,876	48,275	79,085	95,337	40,242	50,319	50,589	51,513	52,600	53,299	54,870	56,881	57,854	59,465
Vehicle-kilometers traveled (millions)	198,410	488,214	924,682	1,485,519	1,675,410	1,002,157	972,326	967,589	970,928	1,027,541	1,016,868	1,058,874	1,056,659	1,069,401	1,077,849
Fuel consumed (million liters)	46,611	90,078	134,802	200,395	222,844	137,225	133,756	132,922	133,090	141,359	137,930	143,160	141,827	140,777	143,955
Average kilometers traveled per vehicle (thousands)	14.0	16.8	19.2	18.8	17.6	24.9	19.3	19.1	18.8	19.5	19.1	19.3	18.6	18.5	18.1
Average kilometers traveled per liter	4.3	5.2	6.9	7.4	7.5	7.3	7.3	7.3	7.3	7.3	7.4	7.4	7.5	7.6	7.5
Average fuel consumed per vehicle (liters)	3,280.0	3,231.4	2,792.4	2,533.9	2,337.4	3,410.0	2,658.2	2,627.5	2,583.6	2,687.4	2,587.9	2,609.0	2,493.4	2,433.3	2,420.8

NOTES

Data from 2007 was calculated using a new methodology for light duty vehicles and motorcycles developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches. The new category *Light duty vehicle, short wheel base* is found in table 4-11M and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches.

For 1993-2006, 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. The new categories were 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.

1 liter = 0.264172 gallons and 11 kilometer = 0.621371 miles.

Table 4-13M: Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel^a

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	3,681	4,374	4,487	5,926	6,395	8,217	7,819	8,190	8,126	8,329	8,456	8,747	9,337	10,328	10,160
Vehicle-kilometers (millions)	43,583	64,073	83,527	113,459	126,327	178,216	167,055	169,955	171,526	175,904	176,380	182,400	186,849	194,246	200,759
Fuel consumed (million liters)	15,022	26,206	31,633	36,200	35,966	57,147	53,811	54,421	54,896	56,379	56,215	58,062	59,052	60,870	63,053
Average kilometers traveled per vehicle (thousands)	11.8	14.6	18.6	19.1	19.8	21.7	21.4	20.8	21.1	21.1	20.9	20.9	20.0	18.8	19.8
Average kilometers traveled per liter	2.9	2.4	2.6	3.1	3.5	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2
Average fuel consumed per vehicle (liters)	4,080.5	5,991.5	7,050.1	6,108.7	5,623.8	6,954.5	6,882.1	6,644.6	6,755.6	6,769.2	6,647.7	6,638.4	6,324.5	5,893.7	6,205.7

^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

Data from 2007 were calculated using new sources and a new methodology developed by FHWA. Data for these years are not comparable to previous years. The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data (MF-21 and MF-27), vehicle registration data (MV-1, MV-9, and MV-10), other data such as the R. L. Polk vehicle data, and a host of modeling techniques. Starting with the 2007 VM-1, an enhanced methodology is used to provide timely indicators on both travel and travel behavior changes.

From 1998-2006, the Federal Highway Administration (FHWA) used the Census Bureau's *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.

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 those that have single frames, two axles, and at least 6 tires or a gross vehicle weight rating exceeding 10,000 lbs.. Pre-1993 data have been reassigned to the most appropriate category.

1 liter = 0.264172 gallons and 1 kilometer = 0.621371 miles.

Table 4-14M: Combination Truck Fuel Consumption and Travel

	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	905	1,417	1,709	2,097	2,087	2,553	2,452	2,469	2,471	2,577	2,747	2,752	2,892	2,906	2,925
Vehicle-kilometers traveled (millions)	56,543	110,527	151,827	217,294	231,791	282,905	263,597	263,291	271,071	273,315	273,985	280,922	292,080	296,385	282,126
Fuel consumed (million liters)	27,815	49,350	61,070	97,155	104,813	113,285	106,677	105,898	109,001	110,222	109,345	111,876	114,939	114,793	109,726
Average kilometers traveled per vehicle (thousands)	62.5	78.0	88.8	103.6	111.1	110.8	107.5	106.6	109.7	106.1	99.7	102.1	101.0	102.0	96.4
Average kilometers traveled per liter	2.0	2.2	2.5	2.2	2.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6
Average fuel consumed per vehicle (liters)	30,732	34,831	35,736	46,339	50,228	44,376	43,512	42,889	44,106	42,768	39,807	40,652	39,741	39,502	37,510

NOTES

Data from 2007 were calculated using new sources and a new methodology developed by FHWA. Data for these years are not comparable to previous years. The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data (MF-21 and MF-27), vehicle registration data (MV-1, MV-9, and MV-10), other data such as the R. L. Polk vehicle data, and a host of modeling techniques. Starting with the 2007 VM-1, an enhanced methodology is used to provide timely indicators on both travel and travel behavior changes. From 1998-2006, the Federal Highway Administration (FHWA) used the Census Bureau's 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. 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. Pre-1993 data have been reassigned to the most appropriate category. Numbers may not add to totals due to rounding.

1 liter = 0.264172 gallons and 1 kilometer = 0.621371 miles.

Table 4-15M: Bus Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number registered (thousands)	272	378	529	627	746	807	846	666	765	865	872	889	976	983	992	995
Vehicle-kilometers traveled (millions)	6,994	7,313	9,751	9,216	12,215	11,234	22,161	22,220	23,788	24,409	25,748	26,120	26,313	27,725	29,456	28,936
Fuel consumed (million liters)	3,131	3,105	3,855	3,388	4,210	4,240	7,272	7,329	7,809	8,012	8,454	8,434	8,426	8,897	9,440	9,277
Average kilometers traveled per vehicle (thousands)	25.7	19.4	18.4	14.7	16.4	13.9	26.2	33.4	31.1	28.2	29.5	29.4	27.0	28.2	29.7	29.1
Average kilometers traveled per liter	2.2	2.4	2.5	2.7	2.9	2.6	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1
Average fuel consumed per vehicle (liters)	11,503.9	8,223.4	7,289.8	5,404.1	5,641.8	5,253.5	8,595.6	11,003.6	10,215.0	9,267.6	9,694.3	9,488.2	8,631.3	9,048.7	9,514.8	9,322.9

NOTES

This table includes data for both publicly and privately owned school, transit, and other commercial buses.

Data from 2007 were calculated using new sources and a new methodology developed by FHWA. Data for these years are not comparable to previous years. The FHWA estimates national trends by using State reported Highway Performance and Monitoring System (HPMS) data, fuel consumption data (MF-21 and MF-27), vehicle registration data (MV-1, MV-9, and MV-10), other data such as the R. L. Polk vehicle data, and a host of modeling techniques. Starting with the 2007 VM-1, an enhanced methodology is used to provide timely indicators on both travel and travel behavior changes.

1 liter = 0.264172 gallons and 1 kilometer = 0.621371 miles.

Table 4-16M: Transit Industry Electric Power and Primary Energy Consumption^a and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of vehicles (thousands)	65	61	75	93	106	122	136	137	130	137	133	136	135	136	135	138	138
Vehicle-kilometers traveled (millions)	3,449	3,031	3,680	5,217	5,154	5,799	7,081	6,971	6,995	7,103	7,128	7,235	7,314	7,362	7,390	7,450	6,484
Electric power consumed (million kJ)	10,468,800	9,219,600	8,805,600	17,413,200	19,373,883	20,754,283	23,088,878	23,522,355	23,422,536	23,942,278	24,022,757	24,004,579	23,773,223	23,801,108	24,295,337	24,757,198	22,313,313
Primary energy consumed (thousand liters)																	
Diesel	787,744	1,024,332	1,633,027	2,464,417	2,235,701	1,818,723	2,208,583	2,170,588	2,110,668	2,052,848	1,911,586	2,016,363	2,070,547	2,052,907	1,962,593	1,962,648	1,720,868
Gasoline and other nondiesel fuels ^b	726,421	258,165	43,154	128,348	89,492	305,558	555,715	577,706	594,599	654,760	547,447	597,951	602,209	568,381	608,976	597,144	491,893
Compressed natural gas	N	N	N	N	165,333	355,322	477,853	486,420	469,616	499,294	519,461	591,100	631,663	649,625	675,175	710,931	650,997

KEY: KJ = Kilojoule; N = data do not exist.

^a Prior to 1984, the data in this table include the energy consumption of bus, heavy rail, light rail and trolley bus, Commuter rail, automated guideway, urban ferryboat, demand responsive vehicles, and most rural and smaller systems are excluded from the data during this period.

^b 1960 to 1990 data include propane, 2000 data include only propane, liquefied natural gas, methanol and ethanol. 2005 to 2012 data include the above, and also biodiesel and grain fuel. 2013 data include propane, liquefied natural gas, methanol, ethanol and biodiesel. 2014 data and beyond include propane, liquefied natural gas, ethanol, hydrogen and biodiesel.

NOTES

Data prior to 1996 are not comparable to data from 1996 onward due to a change in sources with differing methodologies. 2009 data for Gasoline and other no diesel fuels is not comparable to previous years' data due to a change in the reporting requirements that require transit agencies to submit energy consumption data for both purchased transportation (PT) services and directly operated (DO) transportation services. The major effect of this reporting change occurred within the following modes: Demand Response, Motor Bus, Publico, and Vanpool.

The heat equivalent factor used in joule conversion for electric = 3,600 kJ/kWh, negating electrical system losses (to include electrical system losses, multiply this conversion factor by approximately three).

1 kilometer = 0.621371 miles.

1 liter = 0.264172 gallons.

Table 4-17M: Class I Rail Freight Fuel Consumption and Travel

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number in use																
Locomotives ^a	29,031	27,077	28,094	18,835	20,028	22,779	23,893	24,250	24,707	25,033	25,916	26,574	26,716	26,547	26,086	24,597
Freight cars ^b	1,965,486	1,784,181	1,710,827	1,212,261	1,380,796	1,316,522	1,514,113	1,514,845	1,531,913	1,546,289	1,581,733	1,632,188	1,655,043	1,659,965	1,668,963	1,675,511
Kilometers traveled (millions)																
Freight train-kilometers ^c	651	687	690	611	811	881	766	794	805	811	834	796	729	749	767	716
Locomotive unit-kilometers	N	N	2,464	2,060	2,419	2,555	2,277	2,363	2,391	2,409	2,452	2,429	2,303	2,335	U	U
Freight car-kilometers	45,335	48,103	47,117	42,099	55,667	60,692	57,197	58,981	58,781	56,734	59,857	57,700	52,419	54,823	56,356	53,498
Average kilometers traveled per liter																
Freight trains	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Freight cars	3.46	3.58	3.19	3.57	3.97	3.91	4.32	4.23	4.31	4.07	4.09	4.13	4.09	4.14	4.07	4.13
Fuel consumed (million liters)^d	13,109	13,419	14,778	11,792	14,006	15,513	13,226	13,949	13,628	13,939	14,640	13,977	12,815	13,231	13,839	12,942
Revenue tonne-kilometers per liter of fuel consumed	241	315	344	485	578	604	707	685	694	690	699	687	684	700	691	689
Average kilometers traveled per locomotive (thousands)	N	N	87.7	109.4	120.8	112.2	95.3	97.4	96.8	96.2	94.6	91.4	86.2	88.0	U	U
Average fuel consumed per locomotive^a (thousand liters)	451.5	495.6	526.0	626.0	699.3	681.0	553.5	575.2	551.6	556.8	564.9	526.0	479.7	498.4	530.5	526.2

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

^a For 1960-80, the total includes a small number of steam and electric units, which are not included in the per locomotive fuel consumption figure.
^b For 1960-2007 United States owners only. Includes cars owned by Class I railroads, other railroads, car companies, and shippers. The AAR's Policy & Economics Department no longer collects freight car data by U.S., Canada, or Mexico. From 2008 total North America is used instead. Freight car data for all years from 2010 have been restated to include active cars in revenue freight service that have AAR or FRA interchange restrictions. These cars are typically older than 40 years and used in single line (a.k.a. local) freight service. At the end of 2017, 32 thousand active freight cars had interchange restrictions.
^c Based on the distance run between terminals and/or stations; does not include yard or passenger train-miles.
^d Excludes passenger and work trains.

NOTES

Average miles traveled per locomotive, and average fuel consumed, can be distorted when portions of the fleet are in storage and therefore not in use.

1 Kilometer = 0.621371 miles.

1 liter = 0.264172 gallons.

1 tonne-kilometer = 0.684945 ton-miles.

Table 4-18M: Amtrak Fuel Consumption and Travel

	1975	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number in use															
Locomotives	355	419	318	378	258	282	287	485	418	428	423	434	419	431	403
Cars	1,913	2,128	1,863	1,894	1,186	1,274	1,301	2,090	1,447	1,419	1,428	1,402	1,405	1,403	1,415
Kilometers traveled (millions)															
Train-kilometers	48	48	53	56	58	60	60	61	62	61	61	61	61	61	61
Car-kilometers	407	378	484	592	426	474	477	514	523	523	514	509	509	439	449
Train Energy Consumption															
Electric (million of kWhs)	180	254	330	470	531	559	555	549	525	515	504	516	490	485	484
Diesel (million liters)	239	240	311	359	248	240	240	239	250	249	236	228	242	248	238
Average kilometers traveled per car (thousands)	213	178	260	313	359	372	367	246	361	368	360	854	852	735	746

KEY: kWh = kilowatt hour.

NOTE

1 liter = 0.264172 gallons and 1 kilometer = 0.621371 miles.

Table 4-19M: U.S. Government Energy Consumption by Agency and Source (petajoules)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam & renewables		Coal & other	Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b							
FY 1980, total	221.9	152.2	679.0	14.2	1067.3	149.7	155.4	6.2	68.1	1446.7	
Agriculture	5.3	0.8	0.3	0.2	6.7	1.1	1.3	0.0	0.0	9.1	
Defense	181.5	132.6	670.8	12.4	997.4	92.6	111.1	2.9	44.2	1248.2	
DHS	N	N	N	N	N	N	N	N	N	N	
Energy	2.0	3.1	0.4	0.1	5.7	16.1	10.2	0.2	17.9	50.0	
GSA	0.1	1.7	0.0	0.0	1.9	9.1	3.4	0.0	4.7	19.1	
Health and Human Services	0.6	2.3	0.0	0.1	3.1	1.5	1.7	0.0	0.0	6.4	
Interior	3.5	1.5	0.1	0.6	5.8	1.4	1.7	0.1	0.0	9.0	
Justice	2.0	0.4	0.1	0.0	2.5	0.8	2.1	0.1	0.4	6.0	
NASA	0.3	1.0	1.5	0.0	2.9	4.7	2.8	0.6	0.0	11.0	
Postal Service	11.5	2.0	0.0	0.1	13.5	10.9	3.2	1.1	0.0	28.7	
Transportation	6.3	2.7	5.5	0.6	15.1	3.7	1.1	0.2	0.2	20.2	
Veterans Affairs	0.6	3.5	0.0	0.0	4.1	5.7	14.7	0.9	0.7	26.2	
Other ^a	8.0	0.4	0.2	0.0	8.6	2.0	2.0	0.3	0.0	12.9	
FY 1990, total	201.6	96.1	773.2	4.3	1075.2	204.2	168.2	18.7	50.9	1517.2	
Agriculture	5.1	0.6	0.1	0.2	6.0	2.1	1.8	0.1	0.0	10.1	
Defense	163.5	79.4	763.8	2.9	1009.5	127.3	120.8	13.7	38.8	1310.0	
DHS	N	N	N	N	N	N	N	N	N	N	
Energy	2.2	2.2	0.5	0.2	5.0	20.2	10.1	0.3	10.2	45.8	
GSA	0.1	2.2	0.0	0.0	2.3	9.7	4.5	1.6	0.5	18.5	
Health and Human Services	0.0	2.3	0.0	0.1	2.4	2.6	2.3	0.1	0.1	7.5	
Interior	2.7	0.8	0.3	0.5	4.3	1.5	1.2	0.1	0.7	7.8	
Justice	2.0	0.4	0.2	0.0	2.6	2.0	2.3	0.1	0.3	7.3	
NASA	0.2	1.0	1.6	0.0	2.9	6.9	3.0	0.3	0.0	13.1	
Postal Service	12.8	1.4	0.0	0.2	14.4	12.4	4.9	0.6	0.0	32.3	
Transportation	7.0	1.7	5.8	0.1	14.6	4.1	1.2	0.0	0.0	20.0	
Veterans Affairs	0.5	2.3	0.0	0.0	2.9	8.4	13.7	1.1	0.2	26.3	
Other ^a	5.3	1.9	1.1	0.0	8.3	7.1	2.3	0.6	0.0	18.4	
FY 2000, total	176.8	43.5	425.4	9.4	655.2	204.3	141.1	18.4	28.8	1047.8	
Agriculture	2.9	0.1	0.0	0.1	3.2	2.1	2.0	0.2	0.4	7.9	
Defense	130.9	35.5	416.9	8.5	591.7	110.5	84.3	11.9	23.5	821.9	
DHS	N	N	N	N	N	N	N	N	N	N	
Energy	1.6	1.1	0.2	0.1	3.0	17.5	7.1	1.6	3.0	32.2	
GSA	0.1	0.1	0.0	0.0	0.3	10.3	6.4	1.6	0.0	18.6	
Health and Human Services	0.6	0.6	0.0	0.1	1.4	3.0	3.5	0.4	0.1	8.4	
Interior	3.1	0.6	0.2	0.4	4.3	1.8	1.3	0.1	0.8	8.3	
Justice	8.1	0.2	1.8	0.0	10.2	4.5	5.5	0.4	0.1	20.8	
NASA	0.4	0.3	1.2	0.0	1.9	6.3	3.2	0.3	0.0	11.7	
Postal Service	16.7	0.9	0.0	0.0	17.6	19.7	7.8	0.0	0.6	45.7	
Transportation	7.5	1.1	4.2	0.1	12.9	8.4	1.0	0.0	0.0	22.4	
Veterans Affairs	1.0	1.1	0.0	0.0	2.1	9.8	15.0	1.3	0.3	28.5	
Other ^a	3.9	1.8	0.9	0.0	6.6	10.3	3.9	0.6	0.1	21.4	
FY 2010, total	191.3	25.0	565.6	6.9	788.9	204.4	137.2	16.5	27.0	1174.0	
Agriculture	2.8	0.1	0.0	0.4	3.4	2.0	1.5	0.3	0.0	7.2	
Defense	146.0	19.5	558.3	1.7	725.5	107.9	76.9	10.3	18.2	938.9	
DHS	7.2	1.1	5.2	4.4	17.9	3.2	0.9	0.1	0.1	22.3	
Energy	1.7	0.7	0.2	0.1	2.7	17.6	7.5	0.5	5.0	33.4	
GSA	0.1	0.1	0.0	0.0	0.2	10.4	7.4	1.5	0.3	19.8	
Health and Human Services	0.2	0.6	0.0	0.1	0.9	3.7	6.3	0.1	0.0	11.0	
Interior	3.1	0.4	0.0	0.0	3.6	2.3	0.8	0.2	0.8	7.7	
Justice	3.1	0.1	0.3	0.0	3.6	5.7	7.2	0.1	0.0	16.6	
NASA	0.2	0.2	0.8	0.0	1.2	5.6	2.8	0.9	0.0	10.6	
Postal Service	19.2	0.6	0.0	0.0	19.8	19.5	5.8	0.2	0.4	45.6	
Transportation	0.7	0.2	0.6	0.0	1.5	4.1	0.3	0.1	0.0	6.1	
Veterans Affairs	1.3	0.8	0.0	0.0	2.1	11.6	15.8	1.1	1.3	31.8	
Other ^a	5.6	0.6	0.1	0.1	6.5	10.7	4.1	1.0	0.7	23.0	

Continued next page

Appendix A. Metric Conversion Tables

Table 4-19M cont'd: U.S. Government Energy Consumption by Agency and Source (petajoules)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam &		Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b				renewables	Coal & other	
FY 2011, total	201.1	25.4	563.9	6.9	797.4	203.9	131.6	17.4	25.2	1175.5
Agriculture	3.3	0.0	1.1	0.4	4.8	1.9	1.8	0.2	0.1	8.8
Defense	154.9	20.0	556.0	1.3	732.1	108.6	72.4	9.1	17.1	939.3
DHS	6.4	1.1	4.5	4.9	16.8	3.3	1.1	0.1	0.1	21.4
Energy	2.5	0.7	0.2	0.1	3.5	18.2	7.8	0.7	4.8	35.0
GSA	0.1	0.1	0.0	0.0	0.2	10.0	7.4	1.6	0.3	19.5
Health and Human Services	0.3	0.6	0.0	0.1	0.9	3.6	6.2	0.3	0.1	11.1
Interior	3.1	0.4	0.0	0.1	3.6	2.3	1.0	0.2	0.6	7.7
Justice	3.4	0.1	0.6	0.0	4.2	5.5	4.4	0.4	0.1	14.6
NASA	0.2	0.1	0.8	0.0	1.1	5.6	2.6	1.2	0.1	10.7
Postal Service	20.1	0.6	0.0	0.0	20.7	18.0	5.9	0.2	0.5	45.4
Transportation	0.5	0.1	0.6	0.0	1.1	4.3	0.9	0.8	0.0	7.1
Veterans Affairs	1.4	0.9	0.0	0.0	2.3	11.9	15.9	1.5	0.7	32.3
Other ^a	5.0	0.7	0.2	0.0	5.9	10.5	4.3	1.0	0.8	22.6
FY 2012, total	184.1	21.0	521.1	6.4	732.6	197.5	122.5	21.2	22.6	1096.5
Agriculture	2.8	0.1	0.1	0.2	3.1	1.9	1.7	0.2	0.1	7.1
Defense	141.0	17.0	513.4	1.1	672.5	106.6	66.7	11.5	16.7	874.1
DHS	6.1	0.9	5.2	4.7	16.9	3.2	1.0	0.1	0.1	21.2
Energy	1.5	0.5	0.2	0.1	2.2	16.3	7.3	3.6	2.6	32.0
GSA	0.1	0.1	0.0	0.0	0.1	9.4	6.1	1.2	0.3	17.2
Health and Human Services	0.3	0.2	0.0	0.1	0.6	3.5	6.2	0.2	0.1	10.6
Interior	2.8	0.3	0.0	0.0	3.2	2.2	0.9	0.2	0.6	7.1
Justice	3.1	0.1	0.8	0.0	4.1	5.5	6.0	0.2	0.1	15.9
NASA	0.2	0.1	0.6	0.1	0.9	5.3	2.2	0.9	0.1	9.4
Postal Service	19.6	0.5	0.0	0.1	20.2	17.4	5.0	0.1	0.3	43.1
Transportation	0.5	0.0	0.5	0.0	1.1	4.2	0.6	0.1	0.0	5.9
Veterans Affairs	1.4	0.7	0.0	0.0	2.1	12.0	15.0	1.5	0.7	31.3
Other ^a	4.9	0.4	0.2	0.0	5.5	10.1	3.9	1.4	0.8	21.7
FY 2013, total	169.7	22.4	448.1	6.7	647.0	194.9	129.2	20.5	20.6	1012.1
Agriculture	3.1	0.1	0.3	0.2	3.7	1.8	1.6	0.2	0.4	7.7
Defense	127.7	18.2	440.6	1.1	587.6	106.6	69.4	10.7	16.5	790.8
DHS	5.4	1.2	4.6	4.9	16.0	2.8	1.0	0.1	0.1	19.9
Energy	1.3	0.4	0.2	0.1	1.9	16.5	8.0	3.5	0.7	30.5
GSA	0.0	0.1	0.0	0.0	0.1	9.1	6.3	1.4	0.3	17.3
Health and Human Services	0.2	0.4	0.0	0.1	0.7	3.4	6.7	0.3	0.1	11.1
Interior	2.5	0.3	0.0	0.1	2.9	2.0	0.8	0.2	0.5	6.5
Justice	2.6	0.1	0.8	0.0	3.5	5.3	6.5	0.5	0.3	16.1
NASA	0.2	0.1	0.8	0.1	1.1	5.0	2.2	0.9	0.1	9.2
Postal Service	20.5	0.5	0.0	0.2	21.2	16.7	5.8	0.2	0.3	44.2
Transportation	0.4	0.0	0.5	0.0	0.9	3.9	0.7	0.0	0.0	5.6
Veterans Affairs	1.3	0.7	0.0	0.0	2.0	11.8	15.9	1.2	0.6	31.6
Other ^a	4.5	0.4	0.5	0.0	5.4	9.9	4.2	1.2	0.8	21.5
FY 2014, total	161.7	22.2	437.5	6.3	627.6	192.1	132.5	20.8	20.3	993.3
Agriculture	3.0	0.1	0.0	0.1	3.2	1.7	1.4	0.3	0.0	6.6
Defense	119.4	17.7	430.7	1.2	569.0	104.9	70.2	10.6	16.2	770.8
DHS	5.4	0.6	4.6	4.3	14.9	3.1	1.2	0.1	0.2	19.5
Energy	1.2	0.6	0.2	0.1	2.0	16.8	8.2	3.4	0.6	31.1
GSA	0.0	0.2	0.0	0.0	0.2	8.6	7.3	1.5	0.3	17.9
Health and Human Services	0.2	0.7	0.0	0.0	0.9	3.0	5.8	0.2	0.1	10.0
Interior	2.5	0.3	0.0	0.1	2.9	2.0	0.9	0.2	0.6	6.5
Justice	2.6	0.2	0.7	0.0	3.5	5.4	6.8	0.5	0.3	16.5
NASA	0.1	0.1	0.6	0.1	0.9	4.7	2.3	0.8	0.1	8.8
Postal Service	21.1	0.6	0.0	0.1	21.8	16.5	6.5	0.2	0.3	45.3
Transportation	0.4	0.1	0.5	0.0	1.0	3.7	0.7	0.0	0.0	5.5
Veterans Affairs	1.5	0.6	0.0	0.0	2.1	11.9	17.0	1.6	0.6	33.1
Other ^a	4.2	0.4	0.2	0.3	5.1	9.8	4.3	1.3	1.3	21.7

National Transportation Statistics 50th Anniversary Edition: 2021

Table 4-19M cont'd: U.S. Government Energy Consumption by Agency and Source (petajoules)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam & renewables		Coal & other	Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b							
FY 2015, total	166.6	20.2	442.2	6.3	635.3	194.4	128.9	18.8	20.5	997.9	
Agriculture	2.9	0.1	0.0	0.2	3.1	1.7	1.3	0.3	0.1	6.6	
Defense	122.0	16.7	436.4	1.1	576.2	105.7	68.9	8.9	15.3	774.9	
DHS	6.1	0.5	3.7	4.0	14.3	3.0	1.1	0.1	0.3	18.9	
Energy	1.2	0.4	0.2	0.1	1.9	17.5	8.4	3.4	0.5	31.8	
GSA	0.0	0.1	0.0	0.0	0.1	8.4	6.6	1.1	1.0	17.2	
Health and Human Services	0.2	0.4	0.0	0.0	0.7	3.2	5.4	0.2	0.1	9.5	
Interior	2.6	0.2	0.0	0.0	2.9	2.3	1.1	0.2	0.6	7.1	
Justice	3.2	0.1	0.8	0.0	4.1	5.4	6.8	0.6	0.3	17.1	
NASA	0.1	0.0	0.4	0.1	0.7	5.1	2.5	0.6	0.0	8.9	
Postal Service	22.5	0.6	0.0	0.1	23.2	16.5	6.1	0.3	0.3	46.4	
Transportation	0.4	0.1	0.5	0.0	1.1	3.8	0.7	0.0	0.7	6.3	
Veterans Affairs	1.4	0.5	0.0	0.0	2.0	12.1	16.0	1.8	0.6	32.4	
Other ^a	3.8	0.5	0.2	0.6	5.1	9.8	4.0	1.2	0.7	20.9	
FY 2016, total	163.2	18.0	426.5	6.6	614.3	194.7	121.7	20.1	17.0	967.7	
Agriculture	3.0	0.1	0.0	0.2	3.3	1.7	1.1	0.2	0.2	6.5	
Defense	117.4	14.7	420.3	1.0	553.4	106.9	64.9	10.2	13.0	748.3	
DHS	6.0	0.5	3.8	4.4	14.8	3.0	1.0	0.1	0.1	19.1	
Energy	1.1	0.4	0.2	0.1	1.8	17.0	7.2	4.1	0.4	30.5	
GSA	0.0	0.0	0.0	0.0	0.1	8.2	7.2	1.0	0.3	16.7	
Health and Human Services	0.2	0.2	0.0	0.0	0.5	3.0	5.5	0.2	0.0	9.2	
Interior	2.6	0.2	0.0	0.1	2.8	2.3	0.9	0.3	0.5	6.8	
Justice	3.1	0.1	0.8	0.0	4.0	5.6	6.3	0.5	0.1	16.5	
NASA	0.1	0.0	0.6	0.1	0.8	4.9	2.4	0.8	0.0	9.0	
Postal Service	23.5	0.5	0.0	0.1	24.2	16.4	5.4	0.1	0.2	46.3	
Transportation	0.4	0.1	0.5	0.0	1.1	3.8	0.6	0.1	0.9	6.4	
Veterans Affairs	1.5	0.4	0.0	0.0	1.9	12.3	15.6	1.6	0.6	32.0	
Other ^a	4.3	0.5	0.2	0.6	5.6	9.6	3.7	1.1	0.6	20.6	
FY 2017, total	167.4	17.7	422.4	8.1	615.6	191.8	121.4	20.8	15.9	965.5	
Agriculture	3.1	0.1	0.0	0.1	3.3	1.7	1.2	0.2	0.2	6.6	
Defense	120.5	14.4	415.4	0.9	551.2	106.8	67.0	10.1	11.8	746.9	
DHS	6.5	0.5	4.3	4.9	16.2	2.9	0.9	0.2	0.1	20.3	
Energy	1.1	0.3	0.2	0.1	1.7	16.3	7.1	4.8	0.5	30.4	
GSA	0.0	0.1	0.0	0.0	0.1	7.9	5.8	1.0	1.0	15.8	
Health and Human Services	0.3	0.3	0.0	0.0	0.6	2.9	5.6	0.2	0.0	9.3	
Interior	2.3	0.2	0.0	0.1	2.5	2.1	0.9	0.2	0.5	6.3	
Justice	3.1	0.1	1.0	0.0	4.2	5.5	6.2	0.5	0.1	16.4	
NASA	0.1	0.0	0.8	0.1	1.1	5.0	2.1	0.9	0.0	9.1	
Postal Service	23.7	0.6	0.0	0.1	24.4	16.0	5.3	0.2	0.2	46.1	
Transportation	0.6	0.4	0.5	1.1	2.6	3.7	0.6	0.1	0.0	7.0	
Veterans Affairs	1.2	0.5	0.0	0.0	1.7	12.1	15.0	1.4	0.6	30.7	
Other ^a	5.0	0.3	0.2	0.7	6.2	9.0	3.7	1.1	0.8	20.8	
FY 2018, total	160.2	18.1	404.6	6.3	589.2	189.9	132.7	21.4	13.2	946.4	
Agriculture	3.1	0.1	0.0	0.2	3.3	1.7	0.8	0.2	0.4	6.5	
Defense	115.5	14.3	397.8	1.0	528.6	106.1	74.2	11.3	8.4	728.6	
DHS	4.6	0.5	4.3	4.1	13.5	2.8	1.1	0.2	0.1	17.8	
Energy	1.1	0.3	0.1	0.1	1.6	16.1	7.1	3.6	0.5	28.8	
GSA	0.0	0.1	0.0	0.0	0.2	8.1	6.2	1.0	1.0	16.4	
Health and Human Services	0.2	0.3	0.0	0.1	0.6	3.0	6.7	0.2	0.1	10.5	
Interior	2.3	0.2	0.1	0.1	2.6	2.1	1.0	0.3	0.5	6.5	
Justice	3.1	0.1	0.9	0.0	4.2	5.2	6.9	0.6	0.1	17.0	
NASA	0.1	0.1	0.6	0.1	0.9	4.6	2.6	0.8	0.0	8.9	
Postal Service	24.5	0.9	0.0	0.1	25.4	16.1	6.2	0.2	0.1	48.0	
Transportation	0.4	0.4	0.4	0.0	1.2	3.3	0.7	0.1	0.9	6.2	
Veterans Affairs	1.3	0.5	0.0	0.0	1.8	12.0	15.2	1.9	0.5	31.4	
Other ^a	4.0	0.4	0.2	0.6	5.2	8.9	3.9	1.2	0.6	19.8	

Continued next page

Appendix A. Metric Conversion Tables

Table 4-19M cont'd: U.S. Government Energy Consumption by Agency and Source (petajoules)

	Petroleum				Total petroleum	Electricity	Natural gas	Steam & renewables		Coal & other	Total
	Diesel & gasoline	Fuel oil	Jet fuel & aviation gas	Other ^b							
FY 2019, total	161.0	16.8	397.8	5.7	581.3	188.0	139.0	19.5	11.2	939.0	
Agriculture	3.0	0.1	0.0	0.1	3.2	1.6	1.0	0.2	0.2	6.2	
Defense	114.4	13.0	391.7	1.1	520.2	105.2	78.0	9.5	6.8	719.7	
DHS	5.3	0.5	3.7	3.4	12.8	2.8	1.2	0.1	0.1	17.1	
Energy	1.1	0.4	0.0	0.1	1.7	15.8	7.0	3.8	0.5	28.7	
GSA	0.0	0.1	0.0	0.0	0.1	7.9	6.1	1.0	1.1	16.2	
Health and Human Services	0.2	0.2	0.0	0.1	0.5	2.9	6.6	0.2	0.0	10.3	
Interior	2.2	0.2	0.1	0.1	2.6	2.1	1.1	0.2	0.5	6.5	
Justice	3.2	0.1	0.9	0.0	4.2	5.0	6.6	0.7	0.1	16.7	
NASA	0.1	0.0	0.6	0.1	0.9	4.3	3.0	0.8	0.0	9.0	
Postal Service	25.7	0.8	0.0	0.1	26.6	15.4	6.2	0.1	0.1	48.5	
Transportation	0.4	0.4	0.4	0.0	1.1	3.7	0.7	0.1	0.6	6.2	
Veterans Affairs	1.3	0.5	0.0	0.0	1.8	12.4	17.3	1.6	0.5	33.7	
Other ^a	3.9	0.7	0.2	0.6	5.4	8.9	4.3	1.1	0.6	20.2	
FY 2020, total	161.4	16.5	364.2	6.4	548.6	183.3	135.3	18.6	10.0	895.8	
Agriculture	2.8	0.1	0.0	0.1	3.0	1.5	1.0	0.2	0.1	5.7	
Defense	116.6	13.2	358.3	1.0	489.1	103.2	76.8	9.0	6.4	684.5	
DHS	4.6	0.5	3.8	4.5	13.5	2.8	1.3	0.3	0.1	18.1	
Energy	1.1	0.3	0.0	0.2	1.6	15.4	6.9	3.6	0.4	27.9	
GSA	0.0	0.1	0.0	0.0	0.1	7.4	5.9	0.9	1.0	15.2	
Health and Human Services	0.0	0.2	0.0	0.1	0.3	2.9	6.6	0.2	0.0	10.0	
Interior	1.9	0.1	0.1	0.1	2.2	2.0	1.0	0.2	0.4	5.8	
Justice	2.8	0.1	0.8	0.0	3.7	4.9	6.3	0.5	0.1	15.4	
NASA	0.1	0.1	0.6	0.1	0.8	4.0	2.9	0.8	0.0	8.5	
Postal Service	26.9	0.7	0.0	0.1	27.7	15.2	5.4	0.2	0.1	48.7	
Transportation	0.3	0.3	0.4	0.0	1.0	3.6	0.7	0.1	0.5	5.8	
Veterans Affairs	1.0	0.4	0.0	0.0	1.4	12.3	16.5	1.6	0.4	32.3	
Other ^a	3.3	0.4	0.3	0.3	4.2	8.1	4.1	1.1	0.4	17.9	

KEY: DHS = Department of Homeland Security; FY = fiscal year; GSA = General Services Administration; N = data do not exist; NASA = National Aeronautics and Space Administration.

^a Includes all U.S. government agencies not separately displayed. See <http://ctsedwweb.ee.doe.gov/Annual/Report/AgencyReference.aspx> for agency list.

^b Includes liquefied petroleum gas and Navy special fuel oil.

NOTES

Totals may not equal sum of components due to independent 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.

1 kilojoule = 0.947817 British thermal unit (Btu).

Table 4-20M: Energy Intensity of Passenger Modes (kilojoule per passenger-kilometer)

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Air, certificated carrier																	
Domestic operations	5,659	6,806	3,952	3,125	2,552	2,119	1,764	1,697	1,592	1,551	1,523	1,507	1,501	1,478	1,472	1,455	2,900
International operations	6,031	6,859	2,867	2,758	2,528	2,502	2,188	2,307	2,284	2,224	2,137	2,130	2,073	2,065	2,038	1,979	5,476
Highway																	
Light duty vehicle, short wheel base ^{a,b,c}	2,835	3,054	2,743	2,404	2,264	2,262	1,995	2,011	2,002	1,992	2,011	1,957	1,950	1,949	1,936	1,956	U
Motorcycle ^{b,c}	U	1,577	1,341	1,255	1,434	1,125	1,566	1,563	1,561	1,561	1,561	1,552	1,548	1,546	1,546	1,546	U
Light duty vehicle, long wheel base ^{a,c}	N	4,296	3,602	2,808	2,844	2,572	2,854	2,866	2,853	2,836	2,839	2,793	2,774	2,671	2,619	2,657	U
Truck, single-unit 2-axle 6-tire or more ^c	U	13,198	15,661	14,501	12,217	10,901	12,278	12,334	12,261	12,255	12,273	12,204	12,189	12,101	11,999	12,026	U
Truck, combination	U	18,836	17,097	15,402	17,120	17,314	15,333	15,496	15,401	15,397	15,442	15,281	15,249	15,068	14,830	14,892	U
Bus	U	U	U	808	709	790	640	643	638	637	635	621	616	614	610	610	U
Transit motor bus	N	N	1,798	2,441	2,410	2,088	2,206	2,196	2,089	2,049	1,793	2,063	2,084	2,159	2,160	2,166	U
Amtrak	N	N	1,396	1,343	1,747	1,317	1,085	1,059	1,015	1,046	1,059	1,033	1,009	1,045	1,097	1,039	1,877

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

^a Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^b U.S. Department of Transportation, Federal Highway Administration (FHWA), provides data separately for *Light duty vehicle, short wheel base* and *Motorcycle* in its annual *Highway Statistics* series. However, the 1995 summary report provides updated data for *Light duty vehicle, short wheel base* and *Motorcycle* combined. *Light duty vehicle, short wheel base* figures in this table were computed by U.S. Department of Transportation, Bureau of Transportation Statistics, by subtracting the most current motorcycle figures from the aggregate *Light duty vehicle, short wheel base* and *Motorcycle* figures.

^c 1960, *Motorcycle* data are included in *Light duty vehicle, short wheel base* (previously Passenger car), and *Long duty vehicle, long wheel base* (previously Other 2-axle, 4-tire vehicle) data are included in *Single-unit 2-axle 6-tire or more Truck*.

NOTES

To calculate total kilojoule, multiply fuel consumed (see tables 4-21, 4-22, 4-24, 4-26) by 135,000 Btu/gallon for *air carrier*; 120,286 Btu/gallon for *Light duty vehicle, short wheel base*; *Light duty vehicle, long wheel base*, and *Motorcycle*; 137,381 Btu/gallon for *Truck, single-unit 2-axle 6-tire or more*; *Truck, combination*; *Bus*, *Transit motor bus* and *Amtrak* diesel consumption; and 3,412 Btu/kWh for *Amtrak* electric consumption. These values are then multiplied by 1.055056 to reach the kilojoule value.

Amtrak passenger-miles data for 2000 and earlier years are for fiscal years; and are not comparable with 2001 and later years which is reported in calendar year.

Transit motor bus data for 1996 and later years are obtained from the National Transit Database and cannot be compared with data for earlier years.

1 kilometer = 0.621371 miles, 1 liter = 0.264172 gallons, 1 kilojoule = 0.947817 British thermal unit (Btu).

Table 4-21M: Energy Intensity of Certificated Air Carriers, All Services^a

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Aircraft-kilometers (millions)																	
Domestic operations	1,381	3,328	3,663	6,378	9,112	10,809	9,617	9,663	9,586	9,600	9,571	9,730	10,022	10,200	10,636	10,960	5,071
International operations	293	764	538	1,224	2,063	2,471	2,720	2,861	2,848	2,830	2,881	2,945	2,976	3,032	3,115	3,131	1,258
Available seat-kilometers (millions)																	
Domestic operations	84,040	343,048	525,827	918,225	1,163,853	1,220,953	1,110,304	1,122,966	1,125,881	1,140,065	1,160,784	1,218,148	1,278,583	1,323,725	1,394,645	1,445,361	629,657
International operations	21,480	83,622	136,011	293,950	408,850	435,469	486,042	506,531	502,879	510,015	525,406	536,161	543,090	555,960	569,616	581,073	161,229
Passenger-kilometers (millions)																	
Domestic operations	49,177	167,608	307,008	556,629	829,775	939,489	908,788	926,359	934,226	949,018	978,114	1,033,047	1,078,964	1,116,591	1,175,507	1,227,753	375,436
International operations	13,367	44,358	86,795	203,361	310,278	340,094	393,277	402,752	405,752	415,453	421,237	429,438	432,550	444,245	461,189	479,535	99,822
Fuel consumed (million liters)																	
Domestic operations	7,397	30,318	32,249	46,228	56,272	52,904	42,612	41,774	39,519	39,130	39,590	41,369	43,054	43,864	45,997	47,474	28,933
International operations	2,143	8,086	6,614	14,906	20,850	22,616	22,870	24,691	24,629	24,557	23,929	24,305	23,828	24,383	24,979	25,224	14,527
Seats per aircraft																	
Domestic operations	60.9	103.1	143.6	144.0	128.3	113.0	115.5	116.2	117.5	118.8	121.3	125.2	127.6	129.8	131.1	131.9	124.2
International operations	73.3	109.4	252.7	240.2	198.2	176.2	178.7	177.0	176.6	180.2	182.4	182.0	182.5	183.4	182.9	185.6	128.1
Seat-kilometers per liter																	
Domestic operations	11.4	11.3	16.3	19.9	20.8	23.1	26.1	26.9	28.5	29.1	29.3	29.4	29.7	30.2	30.3	30.4	21.8
International operations	10.0	10.3	20.6	19.7	19.6	19.3	21.3	20.5	20.4	20.8	22.0	22.1	22.8	22.8	22.8	23.0	11.1
Energy intensity (kilojoule/passenger-kilometer)																	
Domestic operations	5,659	6,806	3,952	3,125	2,552	2,119	1,764	1,697	1,592	1,551	1,523	1,507	1,501	1,478	1,472	1,455	2,900
International operations	6,031	6,859	2,867	2,758	2,528	2,502	2,188	2,307	2,284	2,224	2,137	2,130	2,073	2,065	2,038	1,979	5,476
Load factor (percent)																	
Domestic operations	58.5	48.9	58.4	60.6	71.0	76.9	81.9	82.5	83.0	83.2	84.3	84.8	84.4	84.4	84.3	84.9	59.6
International operations	62.2	53.0	63.8	69.2	75.9	78.1	80.9	79.5	80.7	81.5	80.2	80.1	79.6	79.9	81.0	82.5	61.9

^a U.S. owned carriers only. Operations of foreign-owned carriers in or out of the United States not included.

NOTES

Aircraft-kilometers include all four large certificated 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 include all four large certificated 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.

Load factor: Ratio of *Passenger-kilometers* to *Available seat-kilometers*.

Heat equivalent factor used for conversion is 37,626.7 kilojoules/liter.

1 kilometer = 0.621371 miles.

1 liter = 0.264172 gallons.

Table 4-22M: Energy Intensity of Light Duty Vehicles and Motorcycles

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicle-kilometers (millions)																
Light duty vehicle, short wheel base ^a	944,685	1,475,768	1,789,591	2,265,956	2,575,412	2,749,437	3,260,120	3,293,172	3,319,799	3,338,460	3,334,676	3,456,614	3,527,302	3,574,032	3,593,002	3,627,959
Light duty vehicle, long wheel base	N	197,949	468,319	925,373	1,485,519	1,675,410	1,002,157	972,326	967,589	970,928	1,027,541	1,016,868	1,058,874	1,056,659	1,069,401	1,077,849
Motorcycle	U	4,828	16,415	15,450	16,848	16,825	29,794	29,841	34,416	32,776	32,138	31,553	32,904	32,427	32,309	31,685
Passenger-kilometers (millions)																
Light duty vehicle, short wheel base ^a	1,842,699	2,817,961	3,238,000	3,672,523	4,094,907	4,344,110	5,520,043	5,575,420	5,617,316	5,645,133	5,635,924	5,839,310	5,954,242	5,970,536	6,002,226	6,060,622
Light duty vehicle, long wheel base	N	363,712	838,468	1,609,344	2,361,976	2,904,621	1,611,687	1,564,898	1,562,141	1,573,096	1,669,097	1,655,651	1,730,421	1,780,423	1,801,892	1,816,127
Motorcycle	U	4,828	19,312	19,312	18,533	21,367	34,573	34,628	39,937	38,034	37,294	36,615	38,182	37,629	37,493	36,768
Average occupancy rate																
Light duty vehicle, short wheel base ^a	1.95	1.91	1.81	1.62	1.59	1.58	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.67	1.67
Light duty vehicle, long wheel base	N	1.84	1.79	1.74	1.59	1.73	1.61	1.61	1.61	1.62	1.62	1.63	1.63	1.63	1.68	1.68
Motorcycle	U	1.00	1.18	1.25	1.10	1.27	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Fuel consumed (million liters)																
Light duty vehicle, short wheel base ^a	155,849	256,723	264,911	263,344	276,582	293,061	328,530	334,474	335,388	335,429	338,040	340,805	346,319	347,168	346,688	353,635
Light duty vehicle, long wheel base	N	46,610	90,078	134,802	200,395	222,844	137,225	133,756	132,922	133,090	141,359	137,930	143,160	141,827	140,777	143,955
Motorcycle	U	227	772	723	793	717	1,615	1,614	1,859	1,770	1,736	1,695	1,763	1,735	1,729	1,695
Energy intensity (kilojoules/passenger-kilometer)^b																
Light duty vehicle, short wheel base ^a	2,947	3,174	2,850	2,498	2,353	2,350	2,074	2,090	2,080	2,070	2,090	2,033	2,026	2,026	2,012	2,033
Light duty vehicle, long wheel base	N	4,465	3,743	2,918	2,956	2,673	2,966	2,978	2,964	2,948	2,951	2,902	2,882	2,775	2,722	2,762
Motorcycle	U	1,639	1,393	1,304	1,490	1,170	1,628	1,624	1,622	1,622	1,622	1,613	1,609	1,607	1,606	1,606

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

^a Motorcycle is included in Light duty vehicle, short wheel base (previously Passenger car) in 1960.

^b Energy Intensity (kJ/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 33,526 kJ/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.

Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base replaces the old and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

For 1970-94, the unrevised motorcycle fuel consumed is subtracted from the combined passenger car and motorcycle fuel consumed from VM-201A.

Vehicle-kilometers and Passenger-kilometers data for 1960 through 1999 have been rounded to the nearest billion kilometers.

1 kilometer = 0.621371 miles.

1 liter = 0.264172 gallons.

1 kilojoule = 0.947817 British thermal unit (Btu).

Table 4-23M: Average Fuel Efficiency of U.S. Light Duty Vehicles

	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average U.S. light duty vehicle fuel efficiency (kmp/l) (calendar year)														
Light duty vehicle, short wheel base ^{a,b}	6.3	8.0	8.5	8.6	9.2	9.1	9.2	9.2	9.1	9.3	9.4	9.5	9.6	9.5
Light duty vehicle, long wheel base ^a	6.8	8.6	9.3	9.4	9.9	9.8	9.9	10.0	9.9	10.1	10.2	10.3	10.4	10.3
New vehicle fuel efficiency (kmp/l)^c (model year)														
Light-duty vehicle														
Passenger car	10.3	11.9	12.1	12.9	14.4	14.1	15.0	15.5	15.5	15.8	16.0	16.8	U	U
Domestic	9.6	11.4	12.2	13.0	14.1	13.9	14.8	15.3	15.4	15.8	15.9	16.7	U	U
Imported	12.6	12.7	12.0	12.7	15.0	14.3	15.3	15.6	15.7	15.9	16.2	16.9	U	U
Light truck (<8,500 lbs GVWR) ^d	7.9	8.8	9.1	9.4	10.7	10.5	10.6	10.9	11.3	11.6	11.6	12.2	U	U
CAFE standards (kmp/l)^b (model year)														
Passenger car	8.5	11.7	11.7	11.7	11.7	12.8	14.0	14.2	14.6	15.1	15.7	16.6	U	U
Light truck ^e	U	8.5	8.8	8.9	9.9	10.3	10.8	11.0	11.2	11.7	12.2	12.5	U	U

KEY: CAFE = Corporate Average Fuel Economy; GVWR = gross vehicle weight rating; kmp/l = kilometers per liter; U = data are not available.

^a Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category *Light duty vehicle, short wheel base* replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category *Light duty vehicle, long wheel base* replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches.

^b From 1980 to 1990, *Light duty vehicle, short wheel base* (previously *Passenger car*) fuel efficiency includes motorcycles.

^c 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.

^d Beginning with FY 1999, the total *Light truck* fleet ceased to be categorized by either domestic or import fleets.

^e No combined figure is available for 1980. In 1980, CAFE standard for 2 wheel drive, and 4 wheel drive light trucks were 16.0, and 14.0 mpg respectively.

NOTES

The fuel efficiency figures for *Light duty vehicles* represent the sales-weighted harmonic average of the combined *Passenger car* and *Light truck* fuel economies.

1 kilometer = 0.621371 miles.

1 liter = 0.264172 gallons.

Table 4-24M: Energy Intensity of Transit Motor Buses

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Vehicle-kilometers (millions)	2,537	2,268	2,699	3,428	3,284	3,527	3,586	3,476	3,456	3,468	3,511	3,549	3,611	3,636	3,684	3,715	3,347
Passenger-kilometers (millions)	N	N	35,068	33,766	30,267	31,261	33,104	33,086	34,025	34,210	34,487	32,337	32,848	30,937	29,973	29,559	20,304
Energy consumed																	
Diesel fuel (million liters)	787	1,026	1,632	2,132	1,853	1,421	1,601	1,578	1,521	1,451	1,348	1,430	1,475	1,457	1,371	1,374	1,156
Compressed Natural Gas (million liters)	N	N	N	N	159	351	468	478	461	486	498	573	611	625	649	662	628
Bio-diesel (million liters)	N	N	N	N	N	195	155	170	191	231	118	151	151	131	176	147	116
Liquefied natural gas (million liters)	N	N	N	N	33	55	87	80	72	65	54	43	40	18	10	7	5
Gasoline (million liters)	N	N	N	N	4	3	26	28	32	33	31	32	31	35	37	36	33
Other major fuels ^a (million liters)	N	N	N	N	3	11	13	14	14	24	21	29	25	24	9	8	6
Power ^b (million KWH)	N	N	N	N	1	1	1	1	1	1	3	13	15	16	19	31	40
Energy consumed, total (billion kilojoules)	N	N	N	N	72,957	65,270	73,018	72,669	71,078	70,098	61,829	66,705	68,460	66,781	64,744	64,026	54,155
Diesel fuel	30,148	39,280	62,471	81,626	70,965	54,392	61,291	60,440	58,249	55,563	51,603	54,760	56,467	55,801	52,487	52,610	44,269
Compressed Natural Gas	N	N	N	N	999	2,199	2,936	2,996	2,890	3,045	3,124	3,592	3,830	3,920	4,070	4,279	3,937
Bio-diesel	N	N	N	N	N	6,925	5,502	6,034	6,793	8,224	4,198	5,375	5,363	4,667	6,272	5,234	4,123
Liquefied natural gas	N	N	N	N	781	1,295	2,056	1,891	1,707	1,527	1,276	1,007	954	435	246	160	114
Gasoline	N	N	N	N	129	98	872	928	1,071	1,115	1,052	1,085	1,053	1,166	1,227	1,214	1,117
Other major fuels ^a	N	N	N	N	73	349	352	368	356	612	539	749	628	620	241	199	162
Power ^b	N	N	N	N	10	13	9	11	11	11	37	138	164	172	201	330	432
Energy intensity (kilojoules/passenger-kilometer)	N	N	N	N	2,410	2,088	2,206	2,196	2,089	2,049	1,793	2,063	2,084	1,197	1,234	1,217	1,223

KEY: Btu = British thermal unit; KWH = Kilowatt hour; N = data do not exist.

^a Before 2002, *Other major fuels* includes liquefied petroleum gas, methanol, ethanol, and bunker fuel. From 2002 - 13, *Other major fuels* includes liquefied petroleum gas, methanol, ethanol, bunker fuel, kerosene, and grain additive. After 2013, other major fuels includes liquefied petroleum gas, ethanol, and hydrogen.

^b Power includes electric propulsion and electric battery.

NOTES

Data from 1996 and after are not comparable to the data for earlier years or to the data published in previous editions of the report due to different data sources used.

Data from 1997 and after are for those vehicles used for both directly operated (DO) and purchased transportation (PT) services.

Data from 2011 includes all buses including rapid transit as well as commuter buses.

Energy consumed, total does not include the other types of energy identified in table 17 in the *National Transit Database* due to the lack of information on the unit of measurement for such data.

The following conversion rates were used:

Diesel = 38,290 kJ/liter.

Compressed natural gas = 36658 kJ/liter.

Bio-Diesel = 35,563 kJ/liter.

Liquefied natural gas = 23,635 kJ/liter.

Gasoline = 33,526 kJ/liter.

Liquefied petroleum gas = 25,447 kJ/liter.

Methanol = 18,005 kJ/liter.

Ethanol = 23,579 kJ/liter.

Bunker fuel = 41,724 kJ/liter.

Kerosene = 37,627 kJ/liter.

Grain additive = 33,697 kJ/liter.

Electricity 1KWH = 3,600 kJ, negating electrical system losses. This table includes approximate electrical system losses, and thus the conversion factor is multiplied by 3.

1 kilometer = 0.621371 miles.

1 kilojoule = 0.947817 British thermal unit (Btu)

1 liter = 0.264172 gallons.

Table 4-25M: Energy Intensity of Class I Railroad Freight Service

	1960	1970	1980	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Revenue freight tonne-kilometers (millions)	835,555	1,116,600	1,341,653	1,509,566	2,140,261	2,476,733	2,468,818	2,524,665	2,500,300	2,541,354	2,702,743	2,537,845	2,314,698	2,445,138	2,525,223	2,357,122
Car-kilometers (millions)	45,335	48,103	47,117	42,099	55,667	60,692	57,198	58,981	58,781	56,734	59,856	57,700	52,420	54,822	56,356	53,498
Tonnes per car load	40.3	49.8	60.9	60.4	56.8	55.3	57.5	57.1	56.2	55.3	55.2	53.0	51.0	51.3	50.6	50.3
Fuel consumed (million liters)	13,109	13,419	14,778	11,792	14,006	15,513	13,226	13,949	13,627	13,938	14,638	13,976	12,814	13,230	13,839	12,942
Energy intensity (kilojoule / revenue freight tonne-kilometer)	606	465	426	302	253	242	207	214	211	212	209	213	214	209	212	212
Energy intensity (kilojoule / car-kilometer)	11,178	10,784	12,124	10,827	9,726	9,880	8,939	9,142	8,962	9,497	9,454	9,363	9,449	9,329	9,493	9,352

NOTES

The threshold for classification as a Class I Railroad is based on operating revenues; the 2019 threshold is \$504.80 million, 2018: \$469.94 million, 2017: \$463.86 million, 2016: \$447.62 million, 2015: \$457.91 million, 2014: \$475.75 million, 2013: \$467.1 million, 2012: \$452.7 million, 2011: \$433.2 million, 2010: \$398.7 million, 2005: \$319.3 million.

The heat equivalent factor used for joule conversion is 38,655,900 joules/liter.

1 tonne-kilometer = 0.684945 ton-miles.

1 kilometer = 0.621371 miles.

1 tonne = 1.102311 tons.

1 liter = 0.264172 gallons.

1 kilojoule = 0.947817 British thermal unit (Btu).



APPENDIX B

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 in-patient 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: An aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation.

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 designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less carrying passengers or cargo for hire or compensation.

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 serving scheduled air carrier operations in aircraft designed for more than 9 passenger seats but less than 31 passenger seats. 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 semitrailer 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 scheduled 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 105 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 (CAF): 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 traffic way or while the vehicle is still in motion after running off the traffic way.

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 7 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 115 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.

GASOLINE: A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives that have been blended to produce a fuel suitable for use in spark ignition engines. Motor gasoline includes both

leaded or unleaded grades of finished motor gasoline, blending components, and gasohol. Leaded gasoline is no longer used in highway motor vehicles in the United States.

GENERAL AVIATION: 1) All facets of civil aviation, except facets of those air carriers holding a Certificate of Public Convenience and Necessity. 2) All civil aviation activity except that of air carriers certificated in accordance with Federal Aviation Regulations (FAR) Parts 121, 123, 127, and 135. The types of aircraft used in general aviation range from corporate multiengine jet aircraft piloted by professional crews to amateur-built single-engine piston-driven acrobatic planes to balloons and dirigibles. 3) All civil aviation operations other than scheduled air services and nonscheduled air transport operations for taxis, commuter air carriers, and air travel clubs that do not hold Certificates of Public Convenience and Necessity.

GENERAL ESTIMATES SYSTEM: A data collection system that uses a nationally representative probability sample selected from all police-reported highway crashes. It began operation in 1988.

GROSS DOMESTIC PRODUCT: The total output of goods and services produced by labor and property located in the United States, valued at market prices. As long as the labor and property are located in the United States, the suppliers (workers and owners) may be either U.S. residents or residents of foreign countries.

GROSS VEHICLE WEIGHT RATING (gvwr) (Truck): The maximum rated capacity of a vehicle, including the weight of the base vehicle, all added equipment, driver and passengers, and all cargo.

HARBOR MAINTENANCE TRUST FUND: See Trust Funds.

HAZARDOUS MATERIAL: Any toxic substance or explosive, corrosive, combustible, poisonous, or radioactive material that poses a risk to the public's health, safety, or property-particularly when transported in commerce.

HEAVY RAIL (Transit): An electric railway with the capacity to transport a heavy volume of passenger traffic and characterized by exclusive rights-of-way, multicar trains, high speed, rapid acceleration, sophisticated signaling, and high-platform loading. Also known as subway, elevated (railway), or metropolitan railway (metro).

HIGHWAY-RAIL GRADE CROSSING (Rail): A location where one or more railroad tracks are crossed by a public highway, road, or street or a private roadway at grade, including sidewalks and pathways at or associated with the crossing.

HIGHWAY TRUST FUND: A grant-in-aid type fund administered by the U.S. Department of Transportation, Federal Highway Administration. Most funds for highway improvements are apportioned to States according to formulas that give weight to population, area, and mileage.

HOUSEHOLD TRIP (American Travel Survey): A trip in which one or more members of a household travel together.

HIGHWAY-USER TAX: A charge levied on persons or organizations based on their use of public roads. Funds collected are usually applied toward highway construction, reconstruction, and maintenance.

INCIDENT (Hazmat): Any unintentional release of hazardous material while in transit or storage.

INCIDENT (Train): Any event involving the movement of a train or railcars on track equipment that results in a death, a reportable injury, or illness, but in which railroad property damage does not exceed the reporting threshold.

INCIDENT (Transit): Collisions, derailments, personal casualties, fires, and property damage in excess of \$1,000 associated with transit agency revenue vehicles; all other facilities on the transit property; and service vehicles, maintenance areas, and rights-of-way.

INJURY (Air): See SERIOUS INJURY (air and general aviation).

INJURY (Gas): Described in DOT Forms 7100.1 or 7100.2 as an injury requiring in-patient hospitalization (admission and confinement in a hospital beyond treatment administered in an emergency room or out-patient clinic in which confinement does not occur).

INJURY (Hazardous Liquid Pipeline): An injury resulting from a hazardous liquid pipeline accident that results in one or more of the following: 1) Loss of consciousness, 2) A need to be carried from the scene, 3) A need for medical treatment, and/or 4) A disability that prevents the discharge of normal duties or the pursuit of normal duties beyond the day of the accident.

INJURY (Highway): Police-reported highway injuries are classified as follows:

- **Incapacitating Injury:** Any injury, other than a fatal injury, that prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred. Includes severe lacerations, broken or distorted limbs, skull or chest injuries, abdominal injuries, unconsciousness at or when taken from the accident scene, and inability to leave the accident scene without assistance. Exclusions include momentary unconsciousness.
- **Nonincapacitating Evident Injury:** Any injury, other than a fatal injury or an incapacitating injury, evident to observers at the scene of the accident. Includes lumps on head, abrasions, bruises, minor lacerations, and others. Excludes limping.
- **Possible Injury:** Any injury reported or claimed that is not evident. Includes momentary unconsciousness, claim of injuries not obvious, limping, complaint of pain, nausea, hysteria, and others.

INJURY (Highway-Rail Grade Crossing): 1) An injury to one or more persons other than railroad employees that requires medical treatment; 2) An injury to one or more employees that requires medical treatment or that results in restriction of work or motion for one or more days, or one or more lost work days, transfer to another job, termination of employment, or loss of consciousness; 3) Any occupational illness affecting one or more railroad employees that is diagnosed by a physician.

INJURY (Rail): 1) Injury to any person other than a railroad employee that requires medical treatment, or 2) Injury to a railroad employee that requires medical treatment or results in restriction of work or motion for one or more workdays, one or more lost workdays, termination of employment, transfer to another job, loss of consciousness, or any occupational illness of a railroad employee diagnosed by a physician.

INJURY (Recreational Boating): Injury requiring medical treatment beyond first aid as a result of an occurrence that involves a vessel or its equipment.

INJURY (Transit): Any physical damage or harm to a person requiring medical treatment or any physical damage or harm to a person reported at the time and place of occurrence. For employees, an injury includes incidents resulting in time lost from duty or any definition consistent with a transit agency's current employee injury reporting practice.

INJURY (Water): All personal injuries resulting from a vessel casualty that require medical treatment beyond first aid.

INLAND AND COASTAL CHANNELS: Includes the Atlantic Coast Waterways, the Atlantic Intracoastal Waterway, the New York State Barge Canal System, the Gulf Coast Waterways, the Gulf Intracoastal Waterway, the Mississippi River System (including the Illinois Waterway), Pacific Coast Waterways, the Great Lakes, and all other channels (waterways) of the United States, exclusive of Alaska, that are usable for commercial navigation.

INSTRUCTIONAL FLYING: Flying accompanied in supervised training under the direction of an accredited 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 110 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, a divided arterial highway for through traffic with full or partial control of access and grade separations at major intersections.

INTRAPORT (Water): Movement of freight within the confines of a port whether the port has one or several channels included in the port definition. Does not include car-ferries and general ferries moving within a port.

INTRATERRITORY TRAFFIC (Water): Traffic between ports in Puerto Rico and the U.S. Virgin Islands, which are considered a single unit.

JET FUEL: The term includes kerosene-type jet fuel and naphtha-type jet fuel. Kerosene-type jet fuel is used primarily for commercial turbojet and turboprop aircraft engines. Naphtha-type jet fuel is used primarily for military turbojet and turboprop aircraft engines.

LAKELIKE OR GREAT LAKES TRAFFIC: Waterborne traffic between U.S. ports on the Great Lakes system. The Great Lakes system is treated as a separate waterways system rather than as a part of the inland system.

LARGE CAR: As designated by the automobile industry, a car with a wheelbase greater than 115 inches.

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 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, semi-exclusive 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: A self-propelled unit of equipment designed for moving other railroad rolling equipment in revenue service including a self-propelled unit designed to carry freight or passenger traffic, or both, and may consist of one or more units operated from a single control.

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 colorless poisonous liquid with essentially no odor and very little taste. It is the simplest alcohol and boils at 64.7 degrees Celsius. In transportation, methanol is used as a vehicle fuel by itself, or blended with gasoline.

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 data entry 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.

NONRESPASSERS (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 2-AXLE 4-TIRE VEHICLES (Truck): Includes vans, pickup trucks, and sport utility vehicles.

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 WORK (General Aviation): Construction work (not Federal Aviation Regulations, Part 135), helicopter hoist, parachuting, aerial advertising, and towing gliders.

OXYGENATES: Any substance that when added to motor gasoline increases the amount of oxygen in that gasoline blend. Includes oxygen-bearing compounds such as ethanol, methanol, and methyl tertiary butyl ether. Oxygenated fuel tends to give a more complete combustion of carbon into carbon dioxide (rather than monoxide), thereby reducing air pollution from exhaust emissions.

PASSENGER CAR: A motor vehicle designed primarily for carrying passengers on ordinary roads, includes convertibles, sedans, and station wagons.

PASSENGER-MILE: 1) Air: One passenger transported 1 mile; passenger-miles for one interairport flight are calculated by multiplying aircraft miles flown by the number of passengers carried on the flight. The total passenger-miles for all flights is the sum of passenger-miles for all interairport flights. 2) Auto: One passenger traveling 1 mile; e.g., one car transporting two passengers 4 miles results in eight passenger-miles. 3) Transit: The total number of miles traveled by transit passengers; e.g., one bus transporting five passengers 3 miles results in 15 passenger-miles.

PASSENGER REVENUE: 1) Rail: Revenue from the sale of tickets. 2) Air: Revenues from the transport of passengers by air. 3) Transit: Fares, transfer, zone, and park-and-ride parking charges paid by transit passengers. Prior to 1984, fare revenues collected by contractors operating transit services are not included.

PASSENGER VESSELS: A vessel designed for the commercial transport of passengers.

PEDALCYCLIST: A person on a vehicle that is powered solely by pedals.

PEDESTRIAN: Any person not in or on a motor vehicle or other vehicle. Excludes people in buildings or sitting at a sidewalk cafe. The National Highway Traffic Safety Administration also uses an "other pedestrian" category to refer to pedestrians using conveyances and people in buildings. Examples of pedestrian conveyances include skateboards, nonmotorized wheelchairs, roller-skates, sleds, and transport devices used as equipment.

PERSON 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.

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.

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 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.

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.

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.

PLEASURE TRIP (American Travel Survey): Any trip where the purpose of the trip is given as to visit friends or relatives, rest or relaxation, school activities, sightseeing, entertainment, outdoor recreation, or shopping.

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): The percent that revenue passenger-miles are of available seat-miles in revenue passenger services, representing 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 over an air carrier's routes, based on published flight schedules, including extra sections.

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: Rail cars with motive capability, usually driven by electric power taken from overhead lines, configured for passenger traffic and usually operating on non-exclusive right-of-way.

SUBCOMPACT CAR: As designated by the automobile industry, a car with a wheelbase between 95 and 100 inches.

SUPPLEMENTAL AIR CARRIER: An air carrier certificated in accordance with FAR Part 121, and providing nonscheduled or supplemental carriage of passengers or cargo, or both, in air transportation. Also referred to as nonscheduled or charter air carriers.

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: The movement of a train a distance of one mile measured by the distance between terminals and/or stations and includes yard switching miles, train switching miles, and work train miles. Yard switching miles may be computed on any reasonable, supportable, and verifiable basis. 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.

TRANSHIPMENTS: 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.

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 highway, 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 5,000 or more population. The boundaries of urban areas are fixed by the states, subject to the approval of the Federal Highway Administration, for purposes of the Federal-Aid highway program.

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.

VANPOOL (Transit): Public-sponsored commuter service operating under prearranged schedules for previously formed groups of riders in 8- to 18-seat vehicles. Drivers are also commuters who receive little or no compensation besides the free transportation and use of the vehicle during off hours.

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 the subcategories of the vehicle operations function: transportation administration and support; revenue vehicle operation; ticketing and fare collection; and system security.

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: The document covering a shipment and showing the forwarding and receiving stations, the name of consignor and consignee, the car initials and number, the routing, the description and weight of the commodity, instructions for special services, the rate, total charges, advances and waybill reference for previous services, and the amount prepaid.

WEEKEND TRIP (American Travel Survey): Travel by persons who stay one or two nights away, including a Friday night. Travel over three to five nights including a Friday and/or Saturday night stay is defined as a long-weekend trip.



APPENDIX C

List of Acronyms and Initialisms

Appendix C. List of Acronyms and Initialisms

AAA	American Automobile Association
AADT	Annual Average Daily Traffic
AAMA	American Automobile Manufacturers
AAR	Association 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
EIA	Energy Information Administration
EPA	U.S. Environmental Protection Agency
FAA	Agency 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
LWW	Loaded Vehicle Weight
MARAD	Maritime Administration
MCMIS	Motor Carrier Management Information System
MDPV	Medium-Duty Passenger Vehicles
MIC	Motorcycle Industry Council, Inc.
mmbd	Million Barrels Per Day
MOBILE	Mobile Source Emissions Factor model
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
OAG	Board Official Airline Guide
OAI	Office of Airline Information
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

Appendix C. List of Acronyms and Initialisms

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	Sulfur Dioxide
STB	Surface Transportation Board
TAF	Terminal Area Forecast
TIUS	Truck Inventory and Use Survey
TMG	Traffic Monitoring Guide
TRFD	Transportation-Related Final Demand
TSFD	Transborder Surface Freight Data
TTI	Texas Transportation Institute
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	U.S. Department of Transportation
USSR	Union of Soviet Social Republic



APPENDIX D
Modal Profiles

Air Carrier Profile cont'd

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Fatal air carrier accidents, total	17	8	55	38	26	7	16	8	14	8	8	8	9	8	8	15	7
Operating under 14 CFR 121 (airlines)																	
Scheduled services	N	N	0	6	2	0	0	0	0	0	0	0	0	0	1	1	0
Nonscheduled services	N	N	1	0	1	1	0	0	2	0	0	0	0	0	0	1	0
Operating under 14 CFR 135																	
Scheduled services (commuters)	N	N	8	3	1	0	0	0	2	0	1	1	2	0	0	1	1
Nonscheduled services (on-demand air taxis)	N	N	46	29	22	6	16	8	10	8	7	7	7	8	7	12	6

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

^a Some totals include data not in the table; thus totals may not equal sum of table data.

^b Includes scheduled and nonscheduled (charter) operators. By Sec. 2 of the Airline Deregulation Act of 1978 "charter air carrier" and "charter air transportation" replaced supplemental air carriers and supplemental air transportation, which were formerly Sec. 101(36) and (37) of the Act. The 24 pre-deregulation supplemental carriers now have scheduled service authority. Carriers with annual revenue over \$20 million.

^c Total includes only those carriers who have reported employment statistics to BTS' Office of Airline Information. Full-time equivalent employees count two part-time employees as one full-time equivalent employee. Prior to 1980, there was no breakout for part-time employees so earlier numbers will overstate full-time equivalent employees.

^d Data does not include small-certificated and commuter carriers prior to 2002. Small-certificated and commuter carriers began reporting T1 data in January of 2002 for Alaskan carriers and in October of 2002 for the remainder of the U.S.

^e Passenger travel totals do not include Canada because the source does not record departures and arrivals to and from Canada.

^f Total revenue ton-miles includes passenger, freight, express, and mail.

^g Total revenue ton-miles of freight includes freight, express, and mail.

NOTE

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.

General Aviation Profile		1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
FINANCIAL																	
Expenditures, total (millions of dollars)																	
Aircraft	895	2,035	8,053	9,907	21,909	N	N	N	N	N	N	N	N	N	N	N	N
Operating costs	202	339	2,853	3,398	14,291	N	N	N	N	N	N	N	N	N	N	N	N
	693	1,696	5,200	6,509	7,618	N	N	N	N	N	N	N	N	N	N	N	N
INVENTORY																	
Number of active aircraft by primary use, total																	
Corporate	76,549	131,743	211,045	196,800	217,533	223,370	U	209,034	199,927	204,400	210,000	211,793	211,757	211,749	210,981	U	
Business	N	6,835	14,860	10,100	11,003	10,405	U	9,392	10,670	11,888	11,276	9,770	11,112	10,997	11,058	U	
Instructional	N	26,900	49,391	33,100	25,169	21,666	U	17,542	15,915	15,794	15,887	16,177	17,267	15,499	15,030	U	
Personal	N	10,727	14,862	18,600	14,883	15,404	U	12,838	13,401	13,163	15,667	15,826	16,123	16,976	18,025	U	
Aerial application	N	65,398	96,222	112,600	148,192	150,854	U	141,317	133,859	135,716	139,700	142,105	139,748	143,178	141,767	U	
Aerial observation	N	5,455	7,294	6,200	4,294	3,313	U	3,606	3,636	3,126	3,303	3,206	4,134	3,335	3,126	U	
External load	N	N	N	4,900	5,093	5,929	U	5,294	4,806	5,958	5,477	6,101	4,437	4,767	4,146	U	
Other work ^a	N	N	N	N	N	234	223	U	405	304	268	321	304	256	208	327	U
Air taxi / air tours ^b	N	2,054	2,813	1,400	1,787	806	U	910	963	1,154	1,272	1,331	1,666	985	1,034	U	
Sightseeing ^c	N	N	N	5,800	4,019	7,013	U	7,587	7,843	7,355	7,015	6,413	7,016	6,924	7,326	U	
Other ^d	N	N	N	N	881	1,457	U	1,097	1,079	1,663	1,164	1,126	1,303	974	968	U	
Public use ^{e1}	N	8,249	17,045	4,100	2,500	4,311	U	6,180	4,519	4,912	5,674	6,086	4,456	4,775	5,020	U	
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U
PERFORMANCE																	
Number of flight hours by actual use, total (thousands)																	
Corporate	13,121	26,030	36,430	30,763	29,960	24,802	U	24,403	22,876	23,271	24,142	24,833	25,212	25,506	25,566	U	
Business	5,699	7,204	8,434	4,417	3,588	2,387	U	2,126	1,717	1,745	1,839	1,779	1,906	1,695	1,635	U	
Instructional	1,828	6,791	5,748	7,244	5,050	3,885	U	2,126	1,717	1,745	1,839	1,779	1,906	1,695	1,635	U	
Personal	3,172	6,896	8,894	9,276	11,477	8,006	U	8,185	7,189	6,860	7,438	7,868	7,789	7,721	7,849	U	
Aerial application	N	N	2,044	1,872	1,318	1,070	U	956	1,014	940	941	869	1,080	915	884	U	
Aerial observation	N	N	N	1,745	1,545	1,667	U	1,325	1,141	1,496	1,412	1,434	1,257	1,279	946	U	
External load	N	N	N	N	161	144	U	209	167	161	176	151	115	91	158	U	
Other work ^a	N	N	1,053	572	496	259	U	261	264	250	241	429	377	297	246	U	
Air taxi / air tours ^b	N	N	N	2,249	2,122	2,498	U	2,794	2,738	2,925	2,852	2,746	2,742	3,108	3,081	U	
Sightseeing ^c	N	N	N	N	197	173	U	166	157	176	162	167	208	195	141	U	
Other ^d	2,422	5,139	4,925	475	665	886	U	1,261	974	1,052	1,080	945	772	850	921	U	
Public use ^{e1}	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U	
Vehicle-miles (millions)^g	1,769	3,207	5,204	4,548	N	N	N	N	N	N	N	N	N	N	N	N	N
Passenger-miles (millions)^g	2,300	9,100	14,700	13,000	15,200	N	N	N	N	N	N	N	N	N	N	N	N
Fuel consumed, total (million gallons)^g	242	759	1,286	1,016	1,305	1,656	1,672	1,641	1,457	1,676	1,578	1,643	1,747	2,052	1,711	1,453	
Aviation gasoline	242	551	520	353	333	221	216	206	197	210	196	206	206	232	200	184	
Jet fuel	N	208	766	663	972	1,435	1,456	1,435	1,260	1,466	1,383	1,437	1,541	1,820	1,510	1,269	

General Aviation Profile

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
SAFETY																
Fatalities, total^h	787	1,310	1,239	730	596	458	458	438	390	422	378	386	331	379	414	332
Corporate	N	28	66	21	13	3	0	12	11	17	0	0	0	0	0	0
Business	N	148	126	80	44	19	10	22	20	9	12	24	12	19	27	22
Instructional	N	93	73	62	65	28	26	30	25	39	20	29	35	28	24	15
Personal	N	726	808	492	390	327	342	316	266	287	298	250	254	255	271	248
Aerial application	N	41	32	17	19	7	9	4	5	12	10	13	7	8	7	10
Other	N	174	134	95	84	79	74	58	65	61	43	73	23	71	80	45
Accidents, total	4,793	4,712	3,590	2,242	1,837	1,441	1,471	1,471	1,223	1,222	1,211	1,269	1,234	1,275	1,220	1,085
Fatal	429	641	618	444	345	271	270	273	221	255	230	213	203	224	233	205
Accident rate (per 100,000 flight hours)^{ij}	36.5	18.1	9.9	7.3	6.1	5.8	NA	6.0	5.3	5.3	5.0	5.1	4.9	5.0	4.8	U
Fatal	3.3	2.5	1.7	1.4	1.2	1.1	NA	1.1	1.0	1.1	1.0	0.9	0.8	0.9	0.9	U

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

^a In 1960, 1970, 1980, classified as *Industrial*.

^b Includes *Air tours* done under 14 CFR 135; *Air taxi* operators and commercial operators.

^c Includes *Sightseeing* done under 14 CFR 91; general operating and flight rules.

^d The significant decrease in *Other* for 1990 and later can be attributed to a redefinition of the category to only include aerial other, general aviation other, and medical use.

^e Federal, state or local government-owned or leased aircraft used for the purpose of fulfilling a government function.

^f Beginning in 2000, *Public Use* was included in *Other Work*.

^g Includes *air taxi* operations. Nautical miles in source multiplied by 1.151 to convert from nautical miles.

^h The sum of *Fatalities* does not necessarily equal the total due to aircraft involved in midair and on-ground collisions.

ⁱ Suicide/sabotage cases are included in *Accidents* and *Fatalities* data but are excluded from *Accident rates*.

^j *Accident rates* are calculated by the Bureau of Transportation Statistics (BTS) using the formula: Accident Rates (per 100,000 flight hours) = Accidents or Fatalities/Flight Hours (thousands)*100.

NOTES

Numbers may not add to totals due to changes in sub-categories reported by the source, due to estimation and 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.

Highway Profile

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
^a Figures obtained by addition/subtraction and may not appear directly in data source.															
^b Gross amounts collected by state governments from highway users. Does not include tolls. Not all revenues are allocated to highway expenditures.															
^c Includes distributor and dealer licenses, inspection fees, fines and penalties, and miscellaneous receipts.															
^d Includes driver licenses, title fees, special title taxes, fines and penalties, estimated service charges and local collections. From 2012, includes only driver license fees, fines and penalties, and certificate of title fees.															
^e Includes carrier gross receipt taxes; mileage, ton-mile and passenger-mile taxes; special license fees and franchise taxes; and certificate or permit fees. From 2012, includes only dealer licenses and permits, oversized and overweight permits, and motor carrier taxes.															
^f From 2012 data is no longer reported.															
^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 is included with the "other local roads" jurisdiction. Mileage for municipal roads is included in "Town, Township and Municipal Road" jurisdiction after 1999.															
ⁱ From 2010 data includes minor and major collectors.															
^j Data for years 1994 and later are based on the North American Industry Classification System (NAICS). Prior to 1994, data are based on the Standard Industrial Classification System (SIC).															
^k Highway category classifications changed several times before 1980. Actual 1960 data categories were: Main Rural Roads, Local Rural Roads, Rural Other Arterial, Other Rural, Urban Interstate and Other Urban.															

NOTES

Total system mileage may differ when categorized by ownership and functional system due to rounding at different levels of aggregation. Additionally, total system mileage categorized by surface type is based on sampling and is not comparable to the totals based on the other categorizations.

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.

Automobile Profile cont'd

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mobicycle ^d	N	22.9	50.9	34.3	28.4	25.1	25.7	23.9	23.6	23.6	26.2	26.7	26.7	25.8	26.0	U
Per 100,000 registered vehicles ^g																
Passenger car	N	56.0	37.3	27.7	21.7	13.2	13.8	14.4	13.9	13.7	14.9	15.6	16.0	15.5	15.1	U
Light truck	N	N	42.2	31.3	27.0	17.1	14.2	14.6	14.1	13.9	14.8	15.1	14.8	14.1	13.5	U
Mobicycle	N	82.0	91.2	76.9	68.5	58.1	56.5	60.5	57.1	55.9	59.7	63.0	62.1	59.7	59.5	U

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

^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 1960-90 includes Motorcycle data.

^d Involvement only with motor vehicle.

^e 1980 included in Single-unit 2-axle 6-tire or more truck in Truck Profile.

^f 1960-90 included in Light duty vehicle, short wheel base category.

^g Rates come directly from the source and may differ slightly from rates that could be calculated from the information displayed in this table.

^h 2007 and later data are based on the 2007 NAICS codes. All previous years are based on data that uses 2002 NAICS codes, which do not correspond to 2007 NAICS codes. Thus, data may not be directly comparable, or available for years after 2002 in these categories.

ⁱ Data from 2007 were calculated using a new methodology developed by FHWA. Data for these years are based on new categories and are not comparable to previous years. The new category Light duty vehicle, short wheel base replaces the old category Passenger car and includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase (WB) equal to or less than 121 inches. The new category Light duty vehicle, long wheel base replaces Other 2-axle, 4-tire vehicle and includes large passenger cars, vans, pickup trucks, and sport/utility vehicles with wheelbases (WB) larger than 121 inches. Data for 1960-2006 are not comparable to data after 2007.

Truck Profile cont'd

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average miles traveled per vehicle, all trucks	10,693	13,565	18,736	23,603	25,617	26,604	26,054	25,255	25,951	25,594	24,979	25,037	24,335	23,037	22,930
Single-unit truck	NA	7,356	9,103	11,567	11,897	13,476	13,276	12,894	13,116	13,123	12,960	12,958	12,435	11,687	12,278
Combination truck	NA	38,819	48,472	55,206	64,399	68,859	66,809	66,260	68,155	66,897	61,978	63,428	62,751	63,374	59,929
SAFETY															
Occupant fatalities, large truck	N	N	1,262	705	754	530	640	697	695	656	665	815	878	890	892
Occupant fatality rate															
Per 100 million vehicle-miles, large truck	NA	NA	1.16	0.48	0.37	0.18	0.24	0.26	0.25	0.24	0.24	0.28	0.30	0.29	0.30
Per 10,000 registered vehicles, large truck	NA	NA	2.18	1.14	0.94	0.49	0.62	0.65	0.66	0.60	0.59	0.71	0.72	0.67	0.68
Vehicle involvement rate (fatal crashes)															
Per 100 million vehicle-miles, large truck	NA	NA	4.96	3.27	2.43	1.22	1.36	1.42	1.43	1.34	1.46	1.58	1.61	1.61	1.67
Per 10,000 registered vehicles, large truck	NA	NA	9.29	7.71	6.23	3.24	3.54	3.59	3.70	3.44	3.64	3.97	3.93	3.71	3.82

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

^a **Truck transportation (NAICS 484)** - Industries primarily engaged in over-the-road transportation of cargo using motor vehicles, truck-tractors, and trailers.

Couriers and messengers (NAICS 492) - Establishments primarily engaged in providing air, surface, or combined courier delivery services of parcels or primarily engaged in furnishing local messenger and delivery services of small items within a single metropolitan area or urban center.

^b In 1999, the Occupational Employment Statistics survey began using the Standard Occupational Classification (SOC) system to organize occupational data. Therefore, estimates from 2000 and subsequent years are not directly comparable to previous occupational data.

^c Urban consists of travel on all roads and streets in urban places of 5,000 or greater population.

^d As cited on the Federal Highway Administration (FHWA), highway passenger-miles are calculated by multiplying vehicle-miles of travel and the average number of occupants for each vehicle type.

^e Includes other 2-axle 4-tire vehicle in 1960.

NOTES

In 1995, FHWA revised its vehicle type 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. Occupant fatality rates (OFR) for Light Trucks have been removed, but can be found in the Automobile Profile. The remaining fatality rates are calculated by NHTSA and may be different from what would be calculated from the data presented.

From 1998-2006, the Federal Highway Administration (FHWA) used the Census Bureau's 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.

In 2011, FHWA developed a new methodology. This methodology takes advantage of additional and improved information available beginning in 2007 when states were first required to report motorcycle data - before that time, the reporting was not mandatory and the data were missing for a few states. Also, the new methodology does not rely on data from the Vehicle Inventory and Use Survey which provided critical data for the original methodology (The last VIUS was carried out in 2002). The data are revised with the new methodology back to the year 2007, so the data from 1980-2006 are not comparable. Component values may not add to totals due to independent rounding.

Bus Profile	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
FINANCIAL															
Expenditures (thousands of dollars)	486,338	1,218,557	3,833,145	8,030,990	13,007,625	21,819,304	22,370,807	22,926,700	23,237,941	23,845,036	23,961,692	24,325,727	25,350,286	U	U
School bus															
INVENTORY															
Number of vehicles, all buses	272,129	377,562	528,769	626,987	746,125	846,051	666,064	764,509	864,534	872,027	888,907	976,161	983,232	992,152	884,398
Number of employees (NAICS based)															
Interurban and rural bus transportation	38,200	40,900	35,800	24,600	23,400	17,720	17,470	18,130	18,270	17,150	16,540	16,570	17,690	17,880	17,440
School and employee bus transportation	N	N	81,400	114,200	152,000	200,190	199,370	199,820	200,780	205,150	212,110	214,260	214,880	216,230	218,880
Charter bus industry	N	N	14,800	26,100	38,200	31,090	31,100	30,390	30,110	30,530	30,570	29,070	29,940	29,420	28,850
PERFORMANCE															
Vehicle-miles, all buses (millions)	4,346	4,544	6,059	5,727	7,590	13,770	13,783	14,755	15,167	15,999	16,230	16,350	17,227	18,303	17,980
Rural highway, total	2,332	2,549	3,035	3,444	4,489	5,635	5,703	5,741	5,667	5,540	5,611	5,802	5,870	6,016	6,036
Interstate rural	N	339	533	567	978	1,553	1,670	1,674	1,513	1,533	1,643	1,740	1,775	1,664	1,717
Other arterial rural	N	944	991	995	1,270	2,034	1,981	2,036	2,079	2,022	1,966	2,116	2,109	2,271	2,339
Other rural	N	1,266	1,511	1,882	2,241	2,048	2,052	2,031	2,075	1,986	2,002	1,946	1,986	2,081	1,980
Urban highway ^a , total	2,014	1,995	3,024	2,283	3,101	8,135	8,079	9,013	9,500	10,458	10,619	10,548	11,358	12,287	11,944
Interstate urban	N	277	560	455	791	2,011	2,112	2,359	2,144	2,373	2,521	2,542	2,628	2,793	2,683
Other urban	N	1,718	2,464	1,828	2,310	6,123	5,967	6,654	7,356	8,085	8,098	8,006	8,730	9,494	9,261
Passenger-miles (millions), all buses	N	N	N	N	121,398	160,919	291,914	292,192	312,797	321,544	339,177	344,073	346,610	365,220	381,176
Average miles traveled per vehicle, all buses	15,970	12,035	11,458	9,133	10,173	16,275	20,693	19,299	17,543	18,347	18,258	16,749	17,521	18,448	18,070
Fuel consumed (million gallons), all buses	827	820	1,018	895	1,112	1,921	1,933	2,059	2,117	2,233	2,228	2,226	2,350	2,494	2,451
Average fuel consumption per vehicle (gallons), all buses	3,039	2,172	1,925	1,427	1,490	2,271	2,902	2,694	2,448	2,561	2,507	2,280	2,390	2,514	2,463
Average miles traveled per gallon of fuel consumed, all buses	5.3	5.5	6.0	6.4	6.8	7.2	7.1	7.2	7.2	7.2	7.3	7.3	7.3	7.3	7.3
SAFETY															
Number of school bus fatalities^b															
School bus-related	N	N	150	115	147	130	123	132	131	120	115	125	96	117	U
School bus occupants	N	N	9	11	21	16	11	14	11	11	13	14	12	14	U
Other vehicle															
Occupants	N	N	88	64	99	84	86	88	93	77	87	85	71	79	U
Nonoccupants	N	N	53	40	27	30	26	30	27	32	15	26	13	24	U
Occupant fatalities, all buses	N	N	47	32	22	44	55	39	54	44	49	64	43	43	U
School buses	N	N	14	13	16	15	15	13	10	11	10	10	9	12	U
Cross country buses	N	N	23	2	3	15	32	15	24	19	12	10	6	13	U
Transit buses	N	N	7	3	1	3	4	1	2	2	14	14	4	2	U
Other and unknown	N	N	3	14	2	11	10	10	18	12	13	30	24	16	U
Fatalities in vehicular accidents ^c , all buses	N	N	329	286	323	247	243	252	282	235	259	231	231	230	U
Occupant fatality rate															
Per 100 million vehicle-miles, all buses	N	N	0.8	0.6	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.2	0.2	U
Per 10,000 registered vehicles, all buses	N	N	0.9	0.5	0.3	0.5	0.8	0.5	0.6	0.5	0.6	0.7	0.4	0.4	U
Vehicle involvement rate (fatal crashes)															
Per 100 million vehicle-miles, all buses	N	N	6.4	5.9	3.8	1.8	1.8	1.7	1.9	1.5	1.6	1.4	1.3	1.3	U
Per 10,000 registered vehicles, all buses	N	N	7.4	5.4	3.9	2.9	3.6	3.3	3.3	2.7	2.9	2.4	2.3	2.3	U

Bus Profile cont'd

KEY: N = data do not exist; 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 the School bus vehicle body type and other vehicles that were currently being used as a school bus.
- ^c Includes all fatalities that occurred in an accident in which a bus was involved.

NOTE

See transit profile for transit bus data.

Transit Profile	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	FINANCIAL														
Passenger operating revenues, total (millions of dollars)	1,407	1,707	6,522	16,053	21,971	39,086	41,017	42,850	44,271	46,393	46,416	48,699	50,094	51,764	54,360
Operating revenues, total	1,407	1,707	2,817	6,786	10,029	14,538	15,506	16,141	16,586	17,222	17,789	18,105	18,216	18,453	19,154
Passenger fares, total	1,335	1,639	2,568	5,891	8,746	12,181	13,201	13,735	14,606	14,970	15,434	15,570	15,626	15,649	15,814
Motor bus	910	1,194	1,791	2,967	4,376	4,924	5,252	5,451	5,674	5,696	5,660	5,628	5,482	5,409	5,342
Heavy rail	270	369	717	1,741	2,483	3,966	4,402	4,511	4,944	5,126	5,400	5,413	5,511	5,542	5,676
Light rail ^a	74	47	31	83	181	422	463	488	552	556	568	604	607	608	606
Trolley bus	81	30	26	46	60	80	84	89	92	88	84	83	73	72	71
Demand responsive	U	U	U	U	172	252	242	269	284	269	286	294	303	309	314
Ferryboat ^b	U	U	U	U	56	118	124	132	133	143	190	195	201	253	269
Commuter rail	U	U	U	952	1,375	2,233	2,434	2,551	2,685	2,837	2,984	3,099	3,201	3,237	3,305
Other ^c	U	U	3	6	41	187	199	244	242	255	262	254	250	219	232
Other operating revenue	72	68	248	895	1,283	2,356	2,305	2,406	1,980	2,253	2,355	2,535	2,590	2,803	3,339
Operating assistance ^d , total	N	N	3,705	9,267	11,943	24,549	25,511	26,709	27,685	29,170	28,627	30,594	31,878	33,312	35,207
State and local	N	N	2,611	8,297	10,958	20,626	21,534	22,953	23,668	25,135	24,709	26,625	27,657	28,893	30,958
Federal	N	N	1,094	970	984	3,923	3,977	3,756	4,017	4,036	3,918	3,969	4,221	4,419	4,249
Operating expenses, total (millions of dollars)	1,377	1,996	6,247	15,742	22,646	35,216	30,319	37,319	33,964	41,735	42,697	44,691	44,718	48,431	51,007
Motor bus	U	U	U	8,903	12,966	18,497	14,576	19,159	15,583	20,582	20,928	21,831	22,234	23,702	25,186
Heavy rail	U	U	U	3,825	3,931	6,370	6,152	6,982	7,625	8,648	8,950	9,475	8,711	9,076	9,328
Light rail ^a	U	U	U	237	606	1,522	1,445	1,710	1,680	2,009	2,107	2,345	2,497	2,644	2,879
Trolley bus	U	U	U	109	178	242	174	234	179	249	262	274	273	304	288
Demand responsive	U	U	U	518	1,805	3,174	2,983	3,357	3,252	3,607	3,674	3,732	3,899	5,151	5,527
Ferryboat ^b	U	U	U	171	268	487	406	547	431	569	632	665	632	787	828
Commuter rail	U	U	U	1,939	2,685	4,608	4,271	4,942	4,860	5,675	5,749	5,972	6,061	6,378	6,566
Other ^c	U	U	U	41	206	316	313	389	354	396	395	398	410	390	405
Average passenger revenue per passenger-mile, all modes (dollars)	NA	NA	0.06	0.14	0.18	0.23	0.24	0.25	0.26	0.26	0.28	0.28	0.29	0.29	0.29
Motor bus	NA	NA	0.08	0.14	0.21	0.24	0.26	0.26	0.27	0.27	0.28	0.28	0.29	0.29	0.29
Heavy rail	NA	NA	0.07	0.15	0.18	0.24	0.25	0.26	0.27	0.28	0.30	0.29	0.31	0.33	0.33
Light rail ^a	NA	NA	0.08	0.14	0.13	0.19	0.20	0.20	0.22	0.21	0.22	0.22	0.22	0.22	0.22
Trolley bus	NA	NA	0.12	0.24	0.31	0.50	0.53	0.55	0.59	0.56	0.57	0.54	0.52	0.57	0.56
Demand responsive	NA	NA	NA	0.09	0.20	0.29	0.28	0.30	0.32	0.29	0.31	0.31	0.32	0.33	0.33
Ferryboat ^b	NA	NA	NA	NA	0.18	0.30	0.32	0.33	0.33	0.34	0.42	0.40	0.41	0.49	0.49
Commuter rail	NA	NA	NA	0.13	0.15	0.21	0.22	0.23	0.23	0.24	0.26	0.26	0.26	0.26	0.26
Other ^c	NA	NA	0.01	0.01	0.09	0.15	0.15	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18

Transit Profile cont'd

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average passenger fare, per unlinked trip, all modes (dollars)															
Motor bus	0.14	0.22	0.30	0.67	0.93	1.22	1.31	1.33	1.40	1.42	1.47	1.50	1.55	1.59	1.60
Heavy rail	NA	NA	0.31	0.52	0.77	0.96	1.02	1.03	1.08	1.10	1.09	1.12	1.15	1.15	1.15
Light rail ^a	NA	NA	0.34	0.74	0.94	1.12	1.21	1.21	1.30	1.31	1.40	1.41	1.44	1.49	1.50
Trolley bus	NA	NA	0.23	0.47	0.57	0.92	0.96	0.97	1.07	1.03	1.06	1.08	1.08	1.11	1.12
Demand responsive Ferryboat ^b	NA	NA	0.18	0.36	0.49	0.81	0.86	0.90	0.95	0.92	0.94	0.88	0.88	0.94	0.93
Commuter rail	NA	NA	NA	0.60	1.63	2.56	2.37	2.53	2.62	2.46	1.74	1.82	1.89	1.95	2.01
Other ^c	NA	NA	NA	2.90	3.33	4.85	5.28	5.44	5.65	5.84	6.08	6.21	6.43	6.46	6.53
NA	NA	NA	0.04	0.07	1.01	2.25	2.10	2.48	2.55	2.62	2.51	2.58	2.65	2.71	2.82
INVENTORY															
Number of systems^{d,e}, total	1,286	1,096	1,055	5,078	6,000	7,088	7,100	7,118	6,804	6,817	6,752	6,719	6,770	6,704	6,782
Motor bus	1,236	1,075	1,022	2,688	2,262	1,206	1,175	1,365	1,268	1,223	1,163	1,232	1,226	1,241	1,240
Heavy rail	31	15	11	12	14	15	15	15	15	15	15	15	15	15	15
Light rail ^a	~	~	9	17	25	35	38	39	40	39	40	43	47	49	53
Trolley bus	19	6	5	5	5	5	5	5	5	5	5	5	5	5	5
Demand responsive Ferryboat ^b	U	U	U	3,893	5,252	6,741	6,600	6,511	6,270	6,370	6,340	6,532	6,426	6,343	6,340
Commuter rail	U	U	U	16	27	32	38	43	41	41	41	42	47	44	46
Other ^c	U	U	U	18	14	19	27	27	26	27	28	28	28	29	30
U	U	U	5	35	83	100	101	110	119	116	119	122	121	127	128
Number of vehicles, total	65,292	61,350	75,388	93,430	131,089	174,425	175,258	176,728	178,612	181,847	183,601	179,021	181,652	181,541	185,732
Motor bus	49,600	49,700	59,411	58,714	75,013	66,239	69,175	70,187	71,139	71,066	72,075	71,956	72,338	71,743	72,665
Heavy rail	9,010	9,338	9,641	10,567	10,311	11,510	11,342	10,469	10,380	10,551	10,737	10,775	10,705	10,763	11,198
Light rail ^a	2,856	1,262	1,013	910	1,327	2,104	2,301	2,354	2,446	2,444	2,478	2,553	2,557	2,729	2,811
Trolley bus	3,826	1,050	823	610	652	571	479	570	560	537	611	601	539	571	572
Demand responsive Ferryboat ^b	U	U	U	16,471	33,080	68,621	65,336	68,632	68,559	71,359	71,299	68,059	69,316	70,093	73,155
Commuter rail ^f	U	U	U	U	119	196	184	186	189	202	201	187	214	228	246
Other ^g	U	U	U	4,500	4,982	6,927	7,193	7,059	7,310	7,337	7,216	7,350	7,290	7,184	7,209
U	U	U	1,176	5,089	18,257	19,248	17,272	18,029	18,351	18,983	17,539	18,643	18,230	17,875	
Number of employees^h, total	156,400	138,040	187,000	262,176	347,841	382,827	387,152	388,880	386,878	402,978	421,336	423,364	415,948	418,000	432,231
Motor bus	121,300	101,598	U	162,189	211,095	186,545	193,453	195,151	196,854	195,619	201,144	205,581	205,769	203,870	209,654
Heavy rail	35,100	36,442	U	46,102	47,087	47,650	49,362	49,796	50,669	52,721	53,165	53,675	49,228	48,980	49,655
Light rail ^a	+	+	U	4,066	6,572	10,372	10,513	11,120	11,541	13,073	12,577	13,508	13,664	14,601	14,961
Trolley bus	+	+	U	1,925	2,223	1,786	1,730	1,774	1,763	1,638	1,790	1,849	1,860	1,699	1,729
Demand responsive Ferryboat ^b	U	U	U	22,740	52,021	102,666	98,087	96,596	90,734	103,387	115,923	111,729	107,228	108,397	115,073
Commuter rail	U	U	U	2,813	4,108	4,273	4,186	4,191	4,209	4,757	4,786	4,825	5,585	6,548	6,751
U	U	U	21,443	23,518	27,168	27,689	28,182	29,197	29,602	29,554	29,795	30,088	31,105	31,522	

		1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Transit Profile cont'd		U	U	U	898	1,217	2,367	2,132	2,070	1,911	2,181	2,397	2,403	2,526	2,800	2,886
Other ^c																
PERFORMANCE																
Vehicle-miles, total (millions)		2,143	1,883	2,287	3,242	4,081	4,553	4,389	4,347	4,527	4,601	5,213	5,279	5,327	5,354	5,398
Motor bus		1,576	1,409	1,677	2,130	2,315	2,229	2,196	2,147	2,220	2,249	2,399	2,453	2,472	2,506	2,529
Heavy rail		391	407	385	537	595	739	655	656	674	676	695	696	704	705	719
Light rail ^a		75	34	18	24	53	143	96	101	109	114	117	124	130	131	136
Trolley bus		101	33	13	14	15	12	12	12	12	11	11	12	11	11	10
Demand responsive		U	U	U	306	759	837	856	841	908	928	1,307	1,314	1,333	1,331	1,326
Ferryboat ^b		U	U	U	U	3	3	3	3	3	3	4	4	4	5	5
Commuter rail		U	U	U	213	271	371	339	344	355	367	369	372	374	375	377
Other ^c		U	U	U	15	18	217	233	241	246	253	309	305	298	290	296
Unlinked passenger trips, total (millions)		9,395	7,332	8,567	8,799	9,363	9,960	10,085	10,352	10,409	10,505	10,500	10,373	10,067	9,867	9,884
Motor bus		6,425	5,034	5,837	5,677	5,678	5,139	5,136	5,268	5,237	5,186	5,183	5,039	4,779	4,695	4,647
Heavy rail		1,850	1,881	2,108	2,346	2,632	3,550	3,647	3,743	3,817	3,928	3,860	3,848	3,816	3,724	3,790
Light rail ^a		463	235	133	175	320	456	484	503	517	539	536	557	562	550	541
Trolley bus		657	182	142	126	122	99	98	99	96	96	90	94	83	77	76
Demand responsive		U	U	U	68	105	98	102	106	108	109	165	162	160	158	156
Ferryboat ^b		U	U	U	U	53	62	62	65	64	64	71	75	76	81	86
Commuter rail		U	U	U	280	413	460	461	469	476	486	491	499	498	501	506
Other ^c		U	U	U	67	79	83	95	98	95	97	104	98	94	81	82
Passenger-miles, total (millions)		U	U	39,854	41,143	47,666	52,627	54,328	55,169	56,467	57,012	55,698	56,322	54,826	53,830	54,097
Motor bus		U	U	21,790	20,981	21,241	20,570	20,559	21,142	21,257	21,429	20,093	20,411	19,224	18,625	18,367
Heavy rail		U	U	10,558	11,475	13,844	16,407	17,317	17,516	18,005	18,339	18,283	18,357	17,591	16,914	17,366
Light rail ^a		U	U	381	571	1,356	2,173	2,363	2,489	2,565	2,675	2,627	2,756	2,776	2,728	2,693
Trolley bus		U	U	219	193	192	159	160	162	156	158	146	154	140	126	126
Demand responsive		U	U	U	431	839	874	879	887	898	917	924	943	952	945	942
Ferryboat ^b		U	U	U	U	330	389	389	402	402	414	451	489	486	520	547
Commuter rail		U	U	6,516	7,082	9,402	10,774	11,314	11,121	11,736	11,600	11,687	11,768	12,251	12,610	12,707
Other ^c		U	U	390	410	462	1,268	1,347	1,450	1,449	1,481	1,486	1,444	1,406	1,362	1,349
Average trip length, all modes (miles)		NA	NA	4.7	4.7	5.1	5.3	5.4	5.3	5.4	5.4	5.3	5.4	5.4	5.5	5.5
Motor bus		NA	NA	3.7	3.7	3.7	4.0	4.0	4.0	4.1	4.1	3.9	4.1	4.0	4.0	4.0
Heavy rail		NA	NA	5.0	4.9	5.3	4.6	4.7	4.7	4.7	4.7	4.7	4.8	4.6	4.5	4.6
Light rail ^a		NA	NA	2.9	3.3	4.2	4.8	4.9	4.9	5.0	5.0	4.9	4.9	4.9	5.0	5.0
Trolley bus		NA	NA	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.7	1.6	1.7
Demand responsive		NA	NA	U	6.3	8.0	8.9	8.6	8.4	8.3	8.4	5.6	5.8	6.0	6.0	6.0
Ferryboat ^b		NA	NA	U	U	6.2	6.3	6.3	6.2	6.3	6.4	6.3	6.5	6.4	6.4	6.4
Commuter rail		NA	NA	23.3	21.6	22.8	23.4	24.5	23.7	24.7	23.9	23.8	23.6	24.6	25.2	25.1

Transit Profile cont'd

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Other ^c	NA	NA	5.8	5.2	11.6	15.3	14.2	14.7	15.3	15.2	14.3	14.7	14.9	16.8	16.4
Average vehicle speed, all modes (miles per hour)															
Motor bus	U	U	U	U	14.7	15.2	15.2	15.5	15.3	15.3	15.1	15.1	15.1	15.1	15.1
Heavy rail	U	U	U	U	12.8	12.9	12.9	13.0	12.9	12.8	12.5	12.5	12.4	12.4	12.4
Light rail ^a	U	U	U	U	20.4	20.2	20.0	20.0	20.1	20.0	20.2	20.1	20.1	19.8	19.9
Trolley bus	U	U	U	U	15.3	14.8	15.8	15.4	17.0	17.8	15.6	15.5	15.6	15.6	16.1
Demand responsive Ferryboat ^b	U	U	U	U	7.3	7.3	7.1	7.1	7.1	6.9	6.8	6.9	6.9	6.8	6.9
Demand responsive Ferryboat ^b	U	U	U	U	14.7	15.0	15.0	15.3	14.8	14.8	14.8	14.9	15.2	15.0	15.3
Demand responsive Ferryboat ^b	U	U	U	U	7.5	9.0	9.6	8.8	7.6	8.0	8.5	8.7	8.1	8.6	9.3
Commuter rail	U	U	U	U	28.5	32.7	32.7	32.8	32.5	32.0	32.0	31.6	31.5	30.8	30.7
Other ^c	U	U	U	U	19.9	20.3	19.8	20.1	20.0	20.7	19.7	19.9	19.5	19.4	19.1
Energy consumption, diesel, total (million gallons)															
Motor bus	208	271	431	651	590	633	625	613	609	541	576	590	579	568	561
Heavy rail	U	U	U	563	490	464	462	452	444	387	418	429	420	409	402
Light rail ^a	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trolley bus	NA	NA	NA	NA	Z	1	1	1	2	2	2	2	2	2	2
Demand responsive Ferryboat ^b	U	U	U	15	13	42	38	34	30	30	23	20	17	14	10
Demand responsive Ferryboat ^b	U	U	U	20	25	33	32	33	34	32	37	38	39	42	44
Commuter rail	U	U	U	53	63	93	91	93	97	90	96	101	102	100	102
Other ^c	U	U	U	Z	Z	Z	Z	Z	1	1	1	1	1	1	1
Energy consumption, other, total (million gallons)															
Gasoline and other nondiesel fuels ⁿ	192	68	11	33	67	224	230	226	239	245	270	283	285	290	303
Compressed natural gas	192	68	11	33	24	98	101	102	107	108	114	116	113	112	116
Other ^c	N	N	N	N	44	126	128	124	132	137	156	167	172	178	188
Energy consumption, electric power, total (million kWh)															
Motor bus	2,908	2,561	2,446	4,837	5,381	6,415	6,534	6,506	6,651	6,673	6,668	6,604	6,611	6,749	6,877
Heavy rail	NA	NA	NA	NA	Z	1	1	1	1	3	13	15	16	19	31
Light rail ^a	2,098	2,261	U	3,284	3,549	3,780	3,854	3,795	3,856	3,812	3,816	3,760	3,728	3,874	3,966
Trolley bus	393	157	U	239	450	749	783	804	881	950	946	958	988	997	1,012
Demand responsive Ferryboat ^b	417	143	U	69	77	66	61	61	62	64	62	64	62	63	57
Demand responsive Ferryboat ^b	NA	NA	NA	NA	NA	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
Commuter rail	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other ^c	U	U	U	1,226	1,288	1,797	1,813	1,808	1,816	1,809	1,792	1,764	1,776	1,764	1,780
Other ^c	U	U	U	19	16	22	22	36	35	35	39	42	41	32	32
SAFETY															
Fatalities, all modes	N	N	N	339	295	313	323	373	361	314	351	353	341	352	370

Transit Profile cont'd	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Transit highway-rail grade crossing fatalities ¹	N	N	N	N	U	20	23	18	33	16	20	26	12	23
Other transit fatalities	N	N	N	N	U	275	290	305	340	345	294	325	341	318	349
Injured persons, all modes^k	N	N	N	N	54,556	27,037	22,250	23,099	25,495	22,973	24,197	24,255	24,592	23,727	25,164
Transit highway-rail grade crossing injuries ¹	N	N	N	N	U	123	284	301	240	142	182	258	232	258	236
Other transit injuries	N	N	N	N	U	56,574	26,753	21,949	22,859	25,353	22,791	23,939	24,023	24,334	24,928
Incidents, all modes	N	N	N	N	90,163	59,898	24,664	20,061	23,473	20,780	25,717	26,146	25,008	24,418	23,541
Transit highway-rail grade crossing incidents ¹	N	N	N	N	U	148	182	178	160	102	151	494	471	770	629
Other transit incidents	N	N	N	N	U	59,750	24,482	19,314	19,901	23,371	20,629	25,223	25,675	24,238	22,912
Major incidents ¹	N	N	N	N	U	U	5,087	5,500	5,704	5,962	6,248	8,679	8,949	9,053	9,790

KEY: ~ = included in heavy rail figure; + = included in motor bus figure; kWh = kilowatt hours; N = data do not exist; NA = not applicable; U = data are not available; Z = a value too small to report.

^a After 2010, includes hybrid rail, light rail, and street car rail.
^b Excludes international, rural, rural interstate, island and urban park ferries.
^c Includes aerial tramway, automated guideway transit, cable car, inclined plane, monorail, publico, vanpool, jitney and Alaska railroad.
^d Beginning in 1992, local operating assistance and other revenue declined by about \$500 million due to a 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 Total is not the sum of all modes since many providers operate more than one mode.
^f Includes locomotives which make up roughly 10 percent of commuter rail vehicles.
^g Based on employee equivalents of 2,080 hours equals one employee; beginning in 1993, based on number of actual employees. Number of employees are operating employees.
^h Liquefied natural gas, liquefied petroleum gas, methanol, propane, and other nondiesel fuels, except compressed natural gas and bio-diesel fuels.
ⁱ These data are for motor bus, commuter rail, heavy rail, light rail, automated guideway, demand response, and vanpool.
^j Transit highway-rail grade crossing fatalities, injuries, and incidents are the result of public transit rail mode operations excluding commuter rail. Almost all transit highway-rail crossings are light rail crossings. The heavy rail system in Chicago has 5 crossings. For the most part heavy rail operates on rights-of-way that do not include crossings.
^k Beginning in 2002, the Federal Transit Administration changed the reporting threshold for injuries. Before 2002, essentially all injuries had to be reported to the National Transit Database. Beginning in 2002, only those injuries requiring immediate medical attention away from the scene of the incident are required to be reported.
^l From 2002 through 2007, the Federal Transit Administration defined major incidents as safety and/or security incidents resulting in: a fatality, two or more injuries transported for immediate medical treatment away from the scene, grade crossing collisions with injury or \$7500 in total damage, rail transit vehicle collisions resulting in one or more injuries, main-line derailments and evacuations due to life safety reasons. Since 2008, reported property damages were equal to or greater than \$25,000 and major incidents were reclassified as reportable incidents requiring one or more injuries transported for immediate medical treatment away from the scene.
NOTES
 Data may not add to total due to independent rounding.
 Beginning in 1996, Operating expenses, Number of vehicles, Vehicle miles, Unlinked passenger trips, Passenger miles, Average trip length and Energy consumption data are obtained from Federal Transit Administration and are not comparable with earlier years.
 Beginning in 2002 passenger fare by mode, Other operating revenue and Operating assistance data are obtained from Federal Transit Administration and are not comparable with earlier years.
 Incident figures include collisions with vehicles, objects, and people, derailments / vehicles going off the road. Accident figures do not include fires and personal casualties. The drop in the number of injuries and incidents in 2002 is largely due to a change in definitions by the Federal Transit Administration, particularly the definition of injuries. Beginning in 2002, only injuries requiring immediate medical treatment away from the scene qualified as reportable.
 Energy consumption for purchased transport is not included.
 Other operating revenue includes other revenue, non-transported funds and dedicated and other directly generated funds.
 As of 2007, Federal Transit Authority (FTA) collected and made available data for rural agencies. Based on this survey, American Public Transportation Association reassess the distribution of motor bus and paratransit service. Due to this redistribution, number of motor buses, paratransit (demand responsive), other categories and number of employees for these modes are not continuous from 2006 to 2007.
 Energy consumption, diesel includes bio-diesel.

Rail Profile		1960	1970 ^c	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
FINANCIAL																	
Class ^f																	
Operating revenues, total (millions of dollars)	9,514	11,992	28,258	28,370	34,102	58,165	67,154	69,887	72,873	77,659	71,709	65,762	69,998	76,117	74,300	U	
Passenger	640	421	446	94	62	82	83	104	109	111	119	121	128	134	138	U	
Freight	8,025	10,922	26,350	27,471	33,083	56,310	64,763	67,589	70,514	75,055	68,955	63,238	67,346	73,154	71,300	U	
Other	849	649	1,462	805	957	2,014	2,256	2,195	2,251	2,492	2,635	2,403	2,523	2,890	2,862	U	
Operating expenses (millions of dollars) ^b	8,775	11,478	26,355	24,652	29,040	42,708	49,263	50,641	51,583	54,129	48,731	44,909	47,241	50,807	48,785	U	
Amtrak																	
Total revenue (millions of dollars)	N	162	429	1,308	2,111	2,501	2,754	2,852	3,045	3,193	3,112	3,182	3,244	3,308	3,420	U	
Total expenses (millions of dollars)	N	301	1,103	2,012	2,976	3,757	3,977	4,092	4,189	4,309	4,274	4,166	4,287	4,189	4,395	U	
INVENTORY																	
Class ^f																	
Number of vehicles, total	1,687,323	1,450,998	1,196,208	677,737	580,182	421,623	404,949	405,348	398,871	397,558	357,570	341,943	332,815	319,828	294,975	U	
Class I freight cars	1,658,292	1,423,921	1,168,114	658,902	560,154	397,730	380,699	380,641	373,838	371,642	330,996	315,227	306,268	293,742	270,378	U	
Number of Locomotives	29,031	27,077	28,094	18,835	20,028	23,893	24,250	24,707	25,033	25,916	26,574	26,716	26,547	26,086	24,597	U	
Number of companies	106	71	38	14	8	7	7	7	7	7	7	7	7	7	7	U	
Number of employees	780,494	566,282	458,994	216,424	168,360	151,854	158,623	163,464	162,819	166,209	169,394	152,702	147,537	146,783	139,956	U	
Miles of road owned	207,334	196,479	164,822	119,758	99,250	95,700	95,514	95,391	95,235	94,372	93,628	93,339	93,150	92,837	92,282	U	
Miles of track owned	340,779	319,092	270,623	200,074	168,535	161,926	162,393	162,306	161,980	161,240	160,692	160,141	160,023	159,572	159,003	U	
Amtrak																	
Number of passenger vehicles																	
Train-cars	N	1,569	2,128	1,863	1,894	1,274	1,301	2,090	1,447	1,419	1,428	1,402	1,405	1,403	1,415	U	
Locomotives	N	185	419	318	378	282	287	485	418	428	423	434	419	431	403	U	
Number of employees	N	1,500	21,416	24,000	25,624	20,047	20,781	20,860	20,500	20,743	20,388	20,377	20,249	19,436	18,885	U	
System route mileage	N	N	24,000	24,000	23,000	21,178	21,225	21,334	21,356	21,356	21,358	21,358	21,407	21,407	21,407	U	
PERFORMANCE																	
Class ^f																	
Car mileage, freight (thousands)	28,170,000	29,890,000	29,277,000	26,159,000	34,590,000	35,541,000	36,649,000	36,525,000	35,253,000	37,193,000	35,853,000	32,572,000	34,065,000	35,018,000	33,242,000	U	
Train mileage, freight (thousands)	404,464	427,065	428,498	379,582	504,001	475,906	493,311	500,148	503,984	518,167	494,590	452,846	465,252	476,522	444,610	U	
Locomotive mileage, total (thousands)	N	N	1,531,050	1,280,365	1,502,819	U	U	U	U	U	U	U	U	U	U	U	
Freight	421,900	1,278,200	1,319,010	1,144,559	1,354,590	U	U	U	U	U	U	U	U	U	U	U	
Train and yard switching	N	N	212,040	135,806	148,229	U	U	U	U	U	U	U	U	U	U	U	
Revenue ton-miles of freight (millions)	572,309	764,809	932,000	1,033,969	1,465,960	1,691,004	1,729,256	1,712,567	1,740,687	1,851,229	1,738,283	1,585,440	1,674,784	1,729,638	1,614,498	U	
Average length of haul, freight (miles)	461	515	616	726	843	914	917	973	990	1,006	1,020	1,021	1,033	1,046	1,032	U	
Fuel consumed in freight service (million gallons)	3,463	3,545	3,904	3,115	3,700	3,494	3,685	3,600	3,682	3,867	3,692	3,385	3,495	3,656	3,419	U	
Average miles traveled per vehicle																	
Car	16,695	20,600	24,475	38,598	59,619	84,296	90,503	90,108	88,382	93,554	100,268	95,256	102,354	109,490	112,694	U	
Locomotive	N	N	54,497	67,978	75,036	U	U	U	U	U	U	U	U	U	U	U	
Average miles traveled per gallon																	
Car	8.13	8	7	8	9	10	10	10	10	10	10	10	10	10	10	10	
Train	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Rail Profile	1960	1970 ¹	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Amtrak																
Passenger train car-miles (millions)	N	213	235	301	368	295	296	319	325	325	319	316	316	273	279	U
Passenger train-miles (millions)	N	26	30	33	35	37	37	38	38	38	38	38	38	38	38	U
Passenger locomotive-miles (millions)	N	N	41	49	U	U	U	U	U	U	U	U	U	U	U	U
Revenue passengers carried (millions)	N	17	21	22	23	29	31	31	31	31	31	31	32	32	32	32
Revenue passenger-miles (millions)	N	6,179	4,503	6,057	5,574	6,420	6,568	6,804	6,810	6,675	6,536	6,520	6,563	6,361	6,487	3,450
Average passenger fare (dollars)	N	3.2	17.7	39.6	52.1	60.7	62.7	64.7	68.2	70.8	70.8	68.3	68.7	69.6	71.5	70.8
Average passenger revenue / passenger-mile (cents)	N	3.0	8.2	14.5	23.2	31.0	33.0	33.9	35.4	38.0	37.5	38.4	39.2	40.7	41.7	U
Average passenger trip length (miles)	N	182.6	216.0	273.0	244.0	220.3	212.8	217.8	218.1	218.1	212.7	207.6	205.1	200.1	198.4	U
Locomotive fuel consumed																
Diesel (million gallons)	N	N	64	82	95	63	63	63	66	66	62	60	64	65	63	U
Electric kWh (millions)	N	N	254	330	470	559	555	549	525	515	504	516	490	485	484	U
SAFETY^a																
Number of fatalities, railroads and grade crossings, total																
Passengers on Trains	2,345	2,331	1,417	1,297	937	735	680	669	702	766	749	760	817	804	863	752
Employees on duty	34	10	4	3	4	3	6	5	6	4	15	2	9	6	1	2
Employees not on duty	215	179	97	40	24	20	21	16	14	10	11	14	11	17	9	11
Trespassers	637	607	566	700	570	570	519	517	547	599	578	619	664	669	705	647
Nontravellers	1,459	1,535	739	551	335	139	130	128	128	148	135	120	129	105	146	85
Contractor employees	N	N	7	3	3	3	4	3	6	5	8	5	4	7	0	5
Grade crossing only	1,421	1,440	833	698	425	261	246	231	232	262	237	255	271	258	294	197
Railroad only^b	924	785	584	599	512	474	435	438	470	505	512	505	546	547	569	555

KEY: kWh = kilowatt-hour; N = data do not exist; U = data are not available.

^a Excluding Amtrak and all non-Class I railroads, except for Section IV.
^b Operating expenses include equipment, joint facility rents, leased roads and equipment, and all taxes except Federal Income.
^c Safety figures from U.S. Department of Transportation, Federal Railroad Administration are for all railroads.
^d Figures may not appear directly in data source.
^e Amtrak data in this column are for 1972, Amtrak's first full year of operation.

NOTE
 Amtrak figures are based on Amtrak fiscal year (October 1-September 30).

Water Transport Profile cont'd

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tug / towboat	N	10	27	19	10	U	U	U	U	U	U	U	U	U	U	U
Offshore supply	N	N	N	N	5	U	U	U	U	U	U	U	U	U	U	U
Fishing vessel	N	13	28	31	24	U	U	U	U	U	U	U	U	U	U	U
Recreational vessel	N	N	N	N	2	U	U	U	U	U	U	U	U	U	U	U
Mobile offshore drilling units	N	N	N	13	0	U	U	U	U	U	U	U	U	U	U	U
Platform	N	N	N	9	1	U	U	U	U	U	U	U	U	U	U	U
Freight barge	N	N	N	3	2	U	U	U	U	U	U	U	U	U	U	U
Tank barge	N	N	N	3	0	U	U	U	U	U	U	U	U	U	U	U
Miscellaneous	N	N	98	12	6	U	U	U	U	U	U	U	U	U	U	U
Fatalities in recreational boating (vessel-related), total	739	1,418	1,360	865	701	672	758	651	560	610	626	701	658	633	613	767
Air thrust	N	N	N	N	4	2	2	4	3	3	1	3	5	5	1	1
Propeller	N	N	N	N	439	405	465	399	343	362	378	423	369	361	373	472
Inboard	N	119	100	50	48	33	36	48	24	33	52	42	36	45	46	4
Outboard	N	774	609	454	328	320	356	286	261	271	279	318	285	288	287	370
Inboard / outboard	N	28	47	53	49	38	56	56	40	47	30	62	44	44	36	47
Jet	N	N	10	25	70	46	47	63	38	40	47	41	55	50	50	75
Sail	N	44	43	20	14	11	12	15	14	9	4	3	11	4	4	5
Manual (oars, paddle)	N	205	272	182	137	185	210	156	153	178	181	199	196	180	176	204
Other	N	29	14	5	0	0	0	5	15	1	9	0	0	0	0	47
Propulsion unknown	N	219	265	76	37	23	22	14	9	18	15	21	22	48	9	10

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

^aThe 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.
^bRevenues paid by American travelers to U.S. and foreign flag carriers.
^cData is based on NAICS classifications. Data for water transportation in 2002 includes NAICS categories 483100, 483200, 488300. Data for ships, boat building, and repairing is based on the NAICS category 336600.
^dFreighters include Containerships, General Cargo vessels, and Roll On-Roll Off vessels. Freighters data include bulk carriers prior to calendar year 1983.
^eThe 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.
^fDoes not include intra-territorial traffic (traffic between ports in Puerto Rico and the Virgin Islands, which are considered a single unit).
^gBeginning in 1996, fish are excluded from *Internal* and *Intraport* Tons of freight hauled.
^h2000 data come from the Marine Safety Management Information System. Data for prior years may not be directly comparable. Beginning in 2000, numbers may not add to totals because data is now recorded in a new information system known as MISLE, which does not associate every fatality and injury with a specific vessel.
ⁱVessel-related casualties include those involving damage to vessels such as collisions or groundings. Fatalities not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.

Oil Pipeline Profile		1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
		FINANCIAL																
FERC-regulated operating revenues (millions of dollars)		770	1,188	6,340	7,164	7,551	11,219	12,562	14,007	15,734	19,281	22,019	23,100	25,427	29,035	32,895	U	
INVENTORY																		
Pipeline operators, hazardous liquid		N	N	N	N	171	220	380	394	414	442	460	486	519	536	547	546	U
Number of employees, pipeline companies ^a		23,100	17,600	21,300	18,500	13,230	15,540	15,570	15,340	15,160	17,800	18,200	18,900	20,190	19,850	20,140	U	
Miles of pipeline (statute miles) ^b , all lines		190,944	218,671	218,393	208,752	176,996	181,986	183,580	186,221	192,412	199,793	208,621	212,109	215,995	219,038	224,903	U	
Crude lines		141,085	146,275	129,831	118,805	85,480	54,631	56,100	57,463	61,087	66,943	73,055	75,710	79,211	80,790	83,990	U	
Product lines		49,859	72,396	88,562	89,947	91,516	64,800	64,130	64,042	63,351	61,766	62,634	62,461	62,369	62,720	63,117	U	
PERFORMANCE																		
Barrels transported (millions) ^c		N	N	N	N	2,060	2,337	2,237	2,216	2,234	2,283	2,445	2,782	2,946	3,168	3,393	3,666	3,232
SAFETY																		
Fatalities		N	4	4	4	3	1	1	0	3	1	0	1	3	1	0	0	5
Injured persons		N	21	15	7	4	3	3	1	4	6	0	0	9	1	2	0	12
Incidents		N	351	244	180	146	350	344	366	400	455	460	420	415	405	383	332	332

KEY: FERC = Federal Energy Regulatory Commission; N = data do not exist, U = data are not available.

^a Includes companies whose pipelines carry crude petroleum, petroleum products, and nonpetroleum pipeline liquids.

^b Mileages of oil pipeline for years 1960-2000 include regulated and unregulated trunk and gathering crude lines, as well as refined oil trunk lines. Beginning in 2001, data include information for FERC-regulated oil pipeline companies only. For years 2001 and after, total miles of pipeline include both trunk and gathering lines, whereas the individual components, namely, crude and product lines, include the mileages of trunk lines only. Thus, details do not add to the total for this period.

^c Includes Crude Oil and Petroleum Products movement by pipeline.

NOTE

The Interstate Commerce Committee regulated oil pipelines in the 1960s and 1970s.

Natural Gas Pipeline Profile

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
SAFETY																
Fatalities	N	26	15	6	37	21	13	9	8	19	10	13	19	7	11	12
Injured persons	N	241	177	69	75	105	54	53	38	94	48	78	35	77	35	30
Incidents	N	1,365	1,524	198	230	227	234	192	210	239	245	209	211	220	259	228

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

^aTotal does not sum from components due to the omission of a line from source table for depreciation and other noncash expenses.

^bFigures obtained by addition / subtraction and may not appear directly in data source.

^cIndustry total includes integrated and combination company totals in addition to distribution and transmission company totals.

^dExcludes service pipeline. Data are not adjusted to common diameter equivalent. Mileage as of the end of each year.

^eBefore 1985, data include field line mileage.

^fNumber of employees in investor-owned companies is the sum of employees in distribution, transmission, integrated and combination companies.

^gBeginning in 1991 the number of interstate natural gas pipeline companies is calculated using the Federal Energy Regulatory Commission's FASTR database, which contains a listing by year of pipeline companies that are regulated and, therefore, required to pay tariff duties to the federal government. Data for the years prior to 1991 were collected from the Energy Information Administration's discontinued publication *Statistics of Interstate Natural Gas Pipeline Companies*. Data from the two sources may not be comparable.

NOTES

Numbers may not add to total due to independent rounding.

Gas utility industry totals include employees of privately owned companies.

Pipeline mileage data for 1985 and later years are obtained from the Pipeline and Hazardous Material Safety Administration and data for these years are not comparable with prior years or with numbers published in the previous NTS reports.



APPENDIX E

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). Beginning in 1998, approximately 43,000 miles of Bureau of Land Management Roads are excluded. Data include the 50 States and the District of Columbia.

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 2019, the adjusted threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 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 independent rounding of this series by AAR. Data represent miles of road owned (aggregate length of road, excluding yard tracks, sidings, and parallel lines) and includes a 329-mile state-owned rail line and a small amount, approximately 92 miles, of road owned in Canada.

Amtrak

Up until 2001 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. From 2002 onwards these data are from Railroad Facts, published annually by the Association of American Railroads (AAR). The source for these data are National Railroad Passenger Corporation (Amtrak).

Transit

These data are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including vehicle inventories and directly operated mileage. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding—typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary, however, because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

Navigable Channels

These statistics originate from the 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 and Gas Pipeline

The Office of Pipeline Safety (OPS) in the U.S. Department of Transportation's Research and Special Programs Administration provides a variety of data about federally regulated and state-regulated natural gas pipelines, hazardous liquid pipelines, and liquefied natural gas (LNG) plants. The operators of these pipeline facilities report this data in accordance with Part 191 and Part 195 of PHMSA's pipeline safety regulations. PHMSA provides downloads of the raw data, yearly summaries, multi-year trends of safety performance metrics, and inventories tracking the removal of aging and other higher-risk infrastructure. Since 1970, PHMSA has collected data about pipeline infrastructure from operators. The annual report formats have changed several times over the years. Since 2010, PHMSA has collected mileage data for five pipeline system types.

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

Air Carriers

1960 to 2002 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. Data from 2003 are from the *Accounting and Reporting Directives, All Carrier Groupings*, published by the Office of Airline Information. *Accounting and Reporting Directive* updates the reporting groups for filing the Form 41 report during the current calendar year. Changes in the reporting groups are effective January 1.

Railroads

The Association of American Railroads (AAR)'s *Railroad Ten-Year Trends* series is the source for the number of railroads for years before 1999. After 1999 data are from AAR, *Railroad Facts*. 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 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 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 non-respondents, 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 (USDOT), 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 2 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. After 2013 the Safety Measurement System maintained by the USDOT, Federal Motor Carrier Safety Administration data is used.

Marine Vessel Operators

The U.S. Army Corps of Engineers (USACE) provides the data for marine vessel operators through 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 principal source of data. More than 3,000 surveys are sent to these companies, and response rates are typically above 90 percent.

Pipeline Operators

The Office of Pipeline Safety (OPS) in the U.S. Department of Transportation's Research and Special Programs Administration collects annual report data from natural gas transmission and distribution operators as required by 49 CFR 191.17 and 191.11, respectively. Annual data must be submitted by March 15 of the following calendar year. No annual report is required for hazardous liquid pipeline operators. However, information is available through the pipeline safety program. Since 1986, the program has been funded by fees assessed to each OPS-regulated pipeline operator based on per-mile of hazardous pipeline operated. Data for each operator and each mile of pipeline are stored in the OPS user-fee database, which is revised annually as updated fees are assessed.

Totals for pipeline operators in this table will differ from those in other tables due to differences in the regulatory authority of USDOT and the Federal Energy Regulatory Commission (FERC). FERC regulates only interstate pipelines, whereas DOT regulates both interstate and intrastate pipelines, except for rural gathering lines and some offshore pipelines, which fall under jurisdiction of the U.S. Coast Guard or the U.S. Department of the Interior's Minerals Management Service. An OPS official stated that FERC regulates about two-thirds the amount of pipeline mileage that USDOT regulates.

TABLE 1-3 Number of U.S. Airports

The Federal Aviation Administration (FAA), Office of Airport Safety and Standards *Administrator's Fact Book* (annual issues) furnished the data shown in this table and includes airports certified for air carrier operations with aircraft that seat 30 or more passengers. These airports include civil and joint civil-military use airports, heliports, STOL ports (short takeoff and landing), and seaplane facilities. The FAA obtained these data via physical inspections and mail solicitations of all federally regulated landing facilities. Because 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. From 2012, data are obtained from personal communications with FAA.

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

TABLE 1-5 Public Road and Street Mileage in the United States 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 areawide mileage information provided by states. These adjustments are now 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-260, "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 from 1984 to 2009 and by personal communication from Amtrak for data from 2010 to 2015 and then by Amtrak's Management Discussion Analysis Audited Financial Statements 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 daily or not), and location. These data should be considered reliable.

Rail Transit data are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD).

TABLE 1-8 ADA Lift- or Ramp-Equipped Transit Buses

These data are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Summaries and Trends from 1993 to 2011. Data after 2011 are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD).

TABLE 1-9 ADA-Accessible Rail Transit Stations by Agency

These data are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including certain aspects of station and vehicle accessibility. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

TABLE 1-10 U.S. Oil and Gas Pipeline Mileage

From 1985 these data are collected from the U.S. Department of Transportation, Pipeline and Hazardous materials Safety Administration, Office of Pipeline Safety, *Natural Gas Transition, Gas Distribution, and Hazardous Liquid Pipeline Annual Mileage*. Before 1985 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, while the remaining 2 percent was estimated for the nonreporting companies based on recent historical experience. Varying percentages of nonreporters from year to year introduce minor reliability problems for time-series comparisons.

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

Air Carrier

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 *FAA Aerospace Forecasts*. 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 1960–1985 figures originated from the FAA *Statistical Handbook of Aviation and General Aviation Activity Survey*. 1990–2009 data were from FAA annual issues of the *General Aviation and Air Taxi Activity (GAATA) Survey* report, table 1.1. Later data are from the *FAA Aerospace Forecasts*. The FAA collects both aircraft registration data and voluntary information about aircraft operation, equipment, and location. Before 1978, the FAA mandated owners to annually register their aircraft for the Aircraft Registration Master File. This was a complete enumeration of operating aircraft. Registrants were also asked to voluntarily report information on hours flown, avionics equipment, base location, and use. The FAA changed their data collection methodology in 1978. The annual registration requirement became triennial, and the General Aviation Activity and Avionics Survey was initiated to sample aircraft operation and equipment data.

The General Aviation Activity and Avionics Survey was renamed the General Aviation and Air Taxi Activity Survey in 1993 to reflect survey inclusion of 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.

Highway, Total (registered vehicles)

The 1960 to 1993 figures are from the U.S. Department of Transportation, Federal Highway Administration (FHWA) document, *Highway Statistics, Summary to 1995*, table VM-201A. 1994 and later, data are collected from *Highway Statistics*, table VM-1. 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 like 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.

Light-Duty Vehicle, Long Wheelbase (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 5 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). Stratification in 1982 was 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 1960 to 1995 figures are from the American Public Transit Association (APTA), 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, small, and rural operators). From 1996, data is retrieved directly from the U.S. Department of Transportation, Federal Transit Administrations and *National Transit Database*.

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 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 2019, the adjusted threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 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 daily or not), and location. This data should be considered reliable. After 2001 the data was retrieved from AARs, *Railroad Facts*.

Water Transportation

The source for Inland Non Self-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 principal source of data. More than 3,000 surveys are sent to these companies, and response rates are typically above 90 percent.

Oceangoing Steam Motor Ships

Merchant Fleets of the World until 2000 and then *United States Flag Privately Owned Merchant Fleet Summary* after 2001, 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 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 1-12 Sales or Deliveries of New Aircraft, Vehicles, Vessels, and Other Conveyances

Civilian Aircraft

The Aerospace Industries Association (AIA) provided Transport and Helicopters data in *Aerospace Facts and Figures* "Civil Aircraft Shipments." (1960–94), *Aerospace Statistics* (1995–2000), *Year-end Review and Forecast* (2001–11), *Facts and Figures* (2012–17). AIA collects their data from aircraft company reports, the General Aviation Manufacturers Association (GAMA), and the U.S. Department of Commerce's (DOC's) 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 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. For 2018 data, the National Business Aviation Association is the source.

General Aviation

The 1960-1965 figures are also generated in *Aerospace Facts and Figures* "Civil Aircraft Shipments." From 1970, data are retrieved directly from General Aviation Manufacturers Association, *Annual Data Reports*, table 1.4.

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 until 2007. 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 2007 to exclude all-terrain vehicles from its totals. From 2008 to 2010, Bart Madson, *Motorcycle USA* was the source for these data. From 2011 to 2014, Asphalt & Rubber was the source. From 2015 to 2017, Statista, *U.S. motorcycle and ATV sales* was the source. For 2018 Motorcycles Data, *United States Motorcycles & ATV market* was the source. 2019 data was from Asphalt & Rubber. For 2020, data is retrieved from Motorcycles Data, *United States 2021*.

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 1997–2009 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, 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 2019, the threshold for Class I railroads was \$504.80 million. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 686 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 daily or not), and location. These data should be considered 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*. This data is no longer available. Recreational boat sales data is retrieved from the National Marine Manufacturers Association, *Recreational Boating Statistical Abstract*.

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

Air Carrier, Certificated, All Services

Prior to 1995, data originated from the U.S. Department of Transportation, Federal Aviation Administration (FAA), *FAA Statistical Handbook of Aviation*. Later data are from the Aerospace Industries Association (AIA), *Aerospace Facts and Figures* (1995-2008) and the *FAA Aerospace Forecasts*. 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 1965—1975 and 1985 figures originated from the *FAA Statistical Handbook of Aviation*. 1980 data was from FAA annual issues of the *General Aviation and Air Taxi Activity* (GAATA) Survey report, table 3.1. The FAA collects both aircraft registration data and voluntary information about aircraft operation, equipment, and location. Before 1978, the FAA mandated owners to annually register their aircraft for the Aircraft Registration Master File. This was a complete enumeration of operating aircraft. Registrants were also asked to voluntarily report information on hours flown, avionics equipment, base location, and use. The FAA changed their data collection methodology in 1978. The annual registration requirement became triennial, and the General Aviation Activity and Avionics Survey was initiated to sample aircraft operation and equipment data.

The General Aviation Activity and Avionics Survey was renamed the General Aviation and Air Taxi Activity Survey in 1990 which is the source for 1990-2019 data except for 2011 data to reflect survey inclusion of 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. For 2011 and 2020, data are from the *FAA Aerospace Forecasts*, table 28.

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 3-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 5 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 0.7 percent in 1997 for the general aviation fleet. A large standard error relative to an estimate indicates lack of precision and, inversely, a small standard error indicates precision.

Nonsampling errors could include problems such as nonresponse, respondent's inability or unwillingness to provide correct information, differences in interpretation of questions, and data-entry mistakes. Readers should note that nonresponse bias might be a component of reliability errors in the data from 1980 to 1990. The FAA conducted telephone surveys of nonrespondents in 1977, 1978, and 1979 and found no significant differences or inconsistencies in respondents' and nonrespondents' replies. The FAA discontinued the telephone survey of nonrespondents in 1980 to save costs. Nonresponse surveys were resumed in 1990, and the FAA found notable differences and thus adjusted its fleet estimates. The 1991–1996 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.

TABLE 1-14 U.S. Automobile and Truck Fleets by Use

The 1990-2016 data were originated from Bobit Publishing Co. and obtained fleet vehicle sales data from automobile manufacturers. This source covered nearly 100 percent of fleet vehicles in the United States. Thus, the data should be accurate. From 2017, data are derived from the U.S. Department of Energy, Energy Vehicle Technologies Office, Oak Ridge National Laboratory, *Transportation Energy Data Book*, table 8.1, in which these data are originated directly from Bobit Publishing Co.

TABLE 1-15 Annual U.S. Motor Vehicle Production and Domestic 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.

TABLE 1-16 Retail New Passenger Car 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.

TABLE 1-17 New and Used Passenger Car and Light Truck Sales and Leases**TABLE 1-18 Retail Sales of New Cars by Sector**

The U.S. Department of Commerce, Bureau of Economic Analysis, uses data from Ward's Automotive Reports. The sectorial 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.

TABLE 1-19 Hybrid-Electric, Plug-in Hybrid-Electric and Electric Vehicle Sales

These data are collected from U.S. Department of Energy, Energy Information Administration, Energy Vehicle Technologies Office, Oak Ridge National Laboratory, *Transportation Energy Data Book*, table 6.2. Data are compiled by the Transportation Research Center at Argonne National Laboratory.

TABLES 1-20 Productions, Production Shares, and Production-Weighted Fuel Economies of New Domestic and Imported Automobiles

These data originate from Oak Ridge National Laboratory's (ORNL) Light-Duty MPG and Market Shares System database, which relies on information from monthly Ward's Automotive Reports. Comparisons and observations are made on sales and fuel economy trends from one model year to the next. ORNL has adopted several conventions to facilitate these comparisons, such as the use of sales-weighted average to estimate fuel economy and vehicle characteristics. For example, "sales-weighted" miles per gallon refers to a composite or average fuel economy based on the distribution of vehicle sales. ORNL's methodology for sales-weighting can be found in the Appendix of the *Highway Vehicle MPG and Market Shares Report: Model Year 1990* (the latest published report). The method was changed dramatically in 1983, and data reliability prior to that year is questionable. This information is now published annually in ORNL's *Transportation Energy Data Book*.

TABLE 1-21 Table discontinued**TABLE 1-22a Number of Trucks by Weight**

These data are derived from the Vehicle Inventory and Use Survey (VIUS) conducted in 1997 by the U.S. Bureau of the Census. This survey, formerly known as the Truck Inventory and Use Survey (TIUS), has been conducted every 5 years since 1963. The VIUS collects data on 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).

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.

TABLE 1-22b Number of U.S. Truck Registrations by Type

After 1980, the U.S. Department of Transportation, Federal Highway Administration (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*. These figures in this table are from FAA, *Highway Statistics*, table MV-9.

TABLE 1-23 World Motor Vehicle Production, Selected Countries

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.

TABLE 1-24 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 IHS Maritime – Lloyds Maritime Database (TLMD) in Merchant Fleets of the World before 2000. The parent company, Lloyd's Register (LR), collects data from several sources: its 200 offices worldwide, data transfers and agreements with other classification societies, questionnaires to ship owners and shipbuilders, feedback from government agencies, and input from port agents. According to an LR official, consistent

data gathering methods have been maintained for more than 30 years but cautioned that inconsistencies may occur in groupings of ship types over time. For example, tank barges are now included in the tanker ship-type grouping rather than the barge grouping. Figures after 2000 collected from U.S.-Flag Privately-Owned Fleet Summary with data from IHS Maritime, Sea-Web and Maritime Administration Vessel Inventory Lists. World fleet data starting in 2018 was received directly from IHS Markit, World Fleet Statistics.

TABLE 1-25 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 2 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 1-26 Average 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 reliable. R.L. Polk Co was acquired by IHS Markit in July 2013. Data source name has been changed accordingly but remains the same as it is now only available from the new source. This data was used from 1995 to 2001 and from 2018 to present. 2002-2016 data gathered from U.S. Department of Energy, Vehicle Technologies Office, Average Age of Cars and Light Trucks. 2017 data from Wolf Street Co., Average Age of Cars & Trucks by Household Income and Vehicle Type over Time. Average age of household vehicles figures from U.S. Department of Transportation, Federal Highway Administration, Nationwide Personal Transportation Survey: Summary of Travel Trends which became the National Household Travel Survey (NHTS).

TABLE 1-27 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 is 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 for 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 1-28 Condition of U.S. Highway Bridges

These figures are from the U. S. Department of Transportation, Federal Highway Administration (FHWA), National Bridge Inventory (NBI). State highway agencies are required to maintain a bridge inspection program and inspect most bridges on public roadways at a minimum of every 2 years. With FHWA approval, certain bridges may be inspected less frequently. A complete file of all bridges is collected and maintained, representing a 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 1-29 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 (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including vehicle inventories. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

TABLE 1-30 Condition of Urban Bus and Rail Transit Maintenance Facilities**TABLE 1-31 Condition of Rail Transit Infrastructure****TABLE 1-32 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 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 percent of the industry's mileage operated.

TABLE 1-33 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 reliable.

TABLE 1-34 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.

TABLE 1-35 U.S. Vehicle-Miles**TABLE 1-36 Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional System****TABLE 1-37 U.S. Air Carrier Aircraft Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons****TABLE 1-38 Average Length of Haul, Domestic Freight and Passenger Modes****Freight*****Air Carrier and Truck***

The U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, Office of Airline Information, reports average trip length in its online publication *TranStats*. 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.

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. 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 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 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 Pipelines 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), Bureau of Transportation Statistics, Office of Airline Information reports average trip length in its online publication *TranStats*. 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.

Commuter Rail

These figures are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database. The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report

financial and operating data, including vehicle inventories. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

Intercity/Amtrak

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. 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 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 percent of the industry's mileage operated.

TABLE 1-39 Worldwide Commercial Space Launches

TABLE 1-40 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 online publication *TranStats*. 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.

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:

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 follow the guidelines. Estimates for higher level roadway systems are more accurate than those for lower level ones, because 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 3-year cycle. Under this scheme, about one-third of the traffic counts for these roadway sections are actually measured each year, 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 because there are no standard guidelines for calculating travel on these roadways.

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.

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.

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.

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

These figures are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including vehicle inventories. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

Class I Rail/Intercity/Amtrak (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 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 6 percent of the industry's mileage operated.

TABLE 1-41 Principal Means of Transportation to Work

The data presented in this table are derived from the American Community Survey conducted for the U.S. Department of Commerce, Census Bureau.

TABLE 1-42 Average Annual PMT, VMT Person Trips and Trip Length by Trip Purpose

TABLE 1-43 Summary Statistics on Demographic Characteristics and Total Travel

The data presented in these tables are estimates derived from the National Household Travel Survey (NHTS) 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.

Because NHTS estimates come from a sample, they are subject to two 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 under coverage.

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 slight differences between estimates.

Standard errors for NHTS 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 NHTS reports. Because of methodological differences, users should use caution when comparing these data with data from other sources.

TABLE 1-44 Passengers Boarded at the Top 50 U.S. Airports

The *Air Carrier Statistics T-100* is the source of these data. Published by USDOT, Bureau of Transportation Statistics, Office of Airline Information (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.

Monthly data reported by certificated U.S. and foreign air carriers on passengers, freight and mail transported. Also includes aircraft type, service class, available capacity and seats, and aircraft hours ramp-to-ramp and airborne

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 1-45 Air Passenger Travel Arrivals in the United States from Selected Foreign Countries

TABLE 1-46 Air Passenger Travel Departures from the United States to Selected Foreign Countries

The *Air Carrier Statistics T-100* is the source of these data. Published by USDOT, Bureau of Transportation Statistics, Office of Airline Information (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.

Monthly data reported by certificated U.S. and foreign air carriers on passengers, freight and mail transported. Also, includes aircraft type, service class, available capacity and seats, and aircraft hours' ramp-to-ramp and airborne

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 1-47 U.S.-Canadian Border Land-Passenger Gateways: Entering the United States**TABLE 1-48 U.S.-Mexican Border Land-Passenger Gateways: Entering the United States**

The Bureau of Transportation Statistics (BTS) Border Crossing Data provide summary statistics for inbound crossings at the U.S.-Canada and the U.S.-Mexico border at the port level. Data are available for trucks, trains, containers, buses, personal vehicles, passengers, and pedestrians. Border crossing data are collected at ports of entry by U.S. Customs and Border Protection (CBP). The data reflect the number of vehicles, containers, passengers, or pedestrians entering the United States. CBP does not collect comparable data on outbound crossings. Users seeking data on outbound counts may therefore want to review data from individual bridge operators, border state governments, or the Mexican and Canadian governments.

TABLE 1-49 Table discontinued**TABLE 1-50 U.S. Ton-Miles of Freight*****Total U.S. Ton-Miles of Freight***

These figures are generated from the U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration (FHWA), *Freight Analysis Framework* (FAF) which provides a comprehensive and reliable estimate for all modes.

Air Carrier

T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class, 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.

Truck

The data are the difference between the total of U.S. ton-miles and the sum of other modes.

Railroad

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. 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 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 percent of the industry's mileage operated.

Domestic Water Transport

The 1980-2016 data were from *Waterborne Commerce of the United States* and later data are from *The U.S. Waterway System: Transportation Facts & Information*, 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 cargo tonnage by the distance between the points of loading and unloading.

Pipeline

The data for 1980-2016 were from Shifts in Petroleum Transportation, by the Association of Petroleum Pipelines. The U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) was the source for 1997-2011 data. The later data are from BTS, Federal Highway Administration (FHWA), Freight Analysis Framework (FAF).

TABLE 1-51 Top U.S. Foreign Trade Freight Gateways by Value of Shipments

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. Consequently, 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 1-52 U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings

TABLE 1-53 U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Train Crossings

TABLE 1-54 U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings**TABLE 1-55 U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck and Train Crossings**

The Bureau of Transportation Statistics (BTS) Border Crossing Data provide summary statistics for inbound crossings at the U.S.-Canada and the U.S.-Mexico border at the port level. Data are available for trucks, trains, containers, buses, personal vehicles, passengers, and pedestrians. Border crossing data are collected at ports of entry by U.S. Customs and Border Protection (CBP). The data reflect the number of vehicles, containers, passengers, or pedestrians entering the United States. CBP does not collect comparable data on outbound crossings. Users seeking data on outbound counts may therefore want to review data from individual bridge operators, border state governments, or the Mexican and Canadian governments.

TABLE 1-56 U.S. Waterborne Freight

Until 1999 the data were from *Waterborne Commerce of the United States* and later data are from *Waterborne Commerce Cargo Data*, 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 while traveling via the Panama Canal are considered domestic traffic.

TABLE 1-57 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. U.S. 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 1-58 Freight Activity in the United States

TABLE 1-59 Value, Tons, and Ton-Miles of Freight Shipments Within the United States by Domestic Establishments

TABLE 1-60a Value of U.S. Land Exports to and Imports from Canada and Mexico by Transportation Mode

TABLE 1-60b Weight of U.S. Land Exports to and Imports from Canada and Mexico by Transportation Mode

The Transborder Freight Data (TFD) is derived from official U.S. international merchandise import and export data. 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 TFD 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 as of January 1997, detailed information on transshipments has been removed. However, the TFD 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., in transits) 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 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 TFD, 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 TFD, the reader is referred to the U.S. Department of Transportation, Bureau of Transportation Statistics internet site at <https://www.bts.gov/transborder>.

TABLE 1-61 Crude Oil and Petroleum Products Transported in the United States by Mode

Data are from *Movements between PAD Districts*, published by the U.S. Department of Energy, Energy Information Administration.

TABLE 1-62 U.S. Hazardous Materials Shipments by Transportation Mode

TABLE 1-63 U.S. Hazardous Materials Shipments by Hazard Class

These data are collected via the 2017 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 2007 CFS, Census conducted a sample of 100,000 domestic establishments randomly selected from a universe of about 800,000 multi establishment 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 2012 Economic Census report and are available online <https://bhs.econ.census.gov/ec12/index.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 1-64 Passengers Boarded and Denied Boarding by the Largest U.S. Air Carriers

TABLE 1-65 Baggage Mishandled by Marketing U.S. Air Carriers

Data are from *Air Travel Consumer Report*, published by the U.S. Department of Transportation, Office of Aviation Enforcement and Proceedings, Aviation Consumer Protection Division.

TABLE 1-66 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 1 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 1-67 FAA-Cited Causes of Departure and Enroute Delays

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 28.7–40.5 percent of the average taxi-out time at the three major

New York area airports (OIG Audit Report CR-2000-112) but is not included in FAA delay calculations.

Reliability

Several data collection changes complicate comparisons over time. For example, FAA modified its method for calculating volume-related delays, which resulted in a 17 percent drop in such delays. Decreases in volume-related delays from 1998 to 1999 totaled less than 1 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 brake. 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 by as much as 30 percent.

TABLE 1-68 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 1 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 hours on the ramp or runway, in which case the delay would be accounted for as a late arrival.

TABLE 1-69 Annual Person-Hours of Highway Traffic Delay per Person

TABLE 1-70 Travel Time Index

TABLE 1-71 Annual Roadway Congestion Index

TABLE 1-72 Annual Highway Congestion Cost

The Texas Transportation Institute's (TTI) Urban Mobility Report provided figures for tables 1-69 through 72. TTI relies on data from the U.S. Department of Transportation, Federal Highway Administration, Highway Performance Monitoring System database (HPMS). TTI utilizes these data as inputs to its congestion estimation model. Detailed

documentation for the TTI model and estimations can be found at this website <http://mobility.tamu.edu>.

Structure, Assumptions, and Parameters

Urban roadway congestion levels are estimated using a formula measuring traffic density. Average travel volume per lane on freeways and principal arterial streets are estimated using area wide estimates of vehicle-miles of travel (VMT) and lane miles of roadway. The resulting ratios are combined using the amount of travel on each portion of the system so that the combined index measures conditions on the freeway and principal arterial street systems. Values greater than one are indicative of undesirable congestion levels. Readers seeking the algorithm for the congestion index should examine this website <http://mobility.tamu.edu>.

Annual person-hours of delay results from the multiplication of daily vehicle-hours of incident and recurring delay times 250 working days per year times 1.30 persons per vehicle. Two types of costs are incurred due to congestion: time delay and fuel consumption. Annual time delay costs are the product of total passenger vehicle hours of delay multiplied by \$16.79 per hour person time value multiplied by 1.30 occupants per vehicle (total annual hours of delay X \$16.79 X 1.30). 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 49 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 2011 estimates now vary by urban area anywhere from 18–60 percent of congestion travel. 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 five categories: uncongested, moderately congested, heavily congested, severely congested, and extremely congested (a new category in 1999). The threshold between uncongested and congested was changed in 2002. Previous editions classified congested travel when areawide traffic levels reached 14,000 vehicles per lane per day on highways and 5,500 vehicles per lane per day on principal arterial streets. For the current edition, these values are 15,500 and 5,500 vehicles per lane per day, respectively. Previous years values have been re-estimated based on these new assumptions. Readers should refer to the TTI internet site for more detailed algorithms and estimation procedures at <http://mobility.tamu.edu>.

TTI reviews and adjusts the data used in their models. State and local officials also review the TTI data and estimations. Some 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 1-73 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 Defining Event of Operation

TABLE 2-12 U.S. Commuter Air Carrier Fatal Accidents by Defining Event 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 considered 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 GAATAA Survey, 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 9–10 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 members' 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 the possibility of collision existed.

TABLE 2-16 Prohibited Items Intercepted at Airport Screening Checkpoints

Highway 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 2-5 Highway-Rail Grade-Crossing Safety

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 2-20 Occupant and Nonmotorist Fatalities in Crashes by Number of Vehicles and Alcohol Involvement

TABLE 2-21a. Passenger Car Occupant Safety Data

TABLE 2-21b. Work Zone Safety Data

TABLE 2-22 Motorcycle Rider Safety Data

TABLE 2-23 Truck Occupant Safety Data**TABLE 2-24 Bus Occupant Safety Data****TABLE 2-26 Fatalities by Highest Driver Blood Alcohol Concentration in Highway Crashes****TABLE 2-28 Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions****TABLE 2-29 Motor Vehicles and Occupants Involved in Fatal Crashes by Posted Speed Limit*****Fatalities***

Highway fatality data come from the Fatality Analysis Reporting System (FARS), which is compiled by trained FARS analysts at U.S. Department of Transportation, 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: *State Blood Alcohol Concentration (BAC) Testing and Reporting for Drivers Involved in Fatal Crashes: Current Practices, Results, and Strategies*, DOT HS 811 661 (Washington, DC: September 2012).

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 traffic way. 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. The numbers for persons injured are not actual counts but estimates of the actual

counts. The estimates are calculated from data obtained from a nationally representative sample of crashes. NHTSA redesigned the nationally representative sample of police-reported traffic crashes, which estimates the number of police-reported injury and property-damage-only crashes in the United States. The new system, the Crass Report Sampling System (CRSS), replaced the National Automotive Sampling System, General Estimates System (NASS GES) in 2016 and has a different sample design. Thus, the 2016 persons injured estimates are not comparable to 2015 and earlier year estimates.

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 2017* (Washington, DC: 2009), appendices B and C for further information on GES, including a table of standard errors applicable to GES data.)

TABLE 2-30 Safety Belt and Motorcycle Helmet Use

The National Occupant Protection Use Survey (NOPUS), conducted biennially between 1994 and 2020 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.

The NOPUS is the only survey that provides nationwide probability-based observed data on motorcycle helmet use in the United States and is conducted annually by the National Center for Statistics and Analysis of the National Highway Traffic Safety Administration. DOT-compliant helmets are marked with an identifying sticker on the back of the helmets.

However, because of the prevalence of counterfeit stickers, NOPUS data collectors categorize DOT-compliant helmets as helmets that cover the motorcyclists' ears or are at least 1 inch thick. NHTSA estimates helmet use as the use of DOT compliant helmets. At the time the 2020 survey was conducted, 19 states and the District of Columbia required all motorcyclists to be helmeted.

NHTSA established standards for motorcycle helmets to ensure a certain degree of protection in a crash in Federal Motor Vehicle Safety Standard 218 (Code of Federal Register, Title 49, Volume 5, Part 571, Section 218, October 2003). DOT-compliant helmets are helmets that meet this safety standard, while noncompliant helmets do not.

The survey data is collected by sending observers to probabilistically sampled roadways to observe motorcyclists between the hours of 7 a.m. and 6 p.m. Observations are made either while standing at the roadside or, in the case of expressways, while riding in a vehicle in traffic. In order to capture the true behavior of motorcyclists, NOPUS observers do not stop motorcycles or interview motorcyclists. The 2020 NOPUS data was collected between July 27 and August 16, 2020, while the 2019 data was collected between June 2 and June 17, 2019.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. The 2020 NOPUS Moving Traffic Survey shows that a total of 719 motorcyclists were observed on the 620 motorcycles at the 1,877 data collection sites.

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 2-31 Estimated Number of Lives Saved by Occupant Protection, Motorcycle Helmets, and Drinking Age Law

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 because 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 each type of restraint in preventing fatalities. 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.

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

TABLE 2-7 Transportation-Related Occupational Fatalities

TABLE 2-39 Railroad and Grade-Crossing Fatalities by Victim Class

TABLE 2-40 Railroad and Grade-Crossing Injured Persons by Victim Class

TABLE 2-41 Train Fatalities, Injuries, and Accidents by Type of Accident

TABLE 2-42 Railroad Passenger Safety Data

TABLE 2-43 Railroad System Safety and Property Damage Data

TABLE 2-44 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 \$10,700 (2018 threshold), 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 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.

Transit 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 2-32 Transit Safety and Property Damage Data

TABLE 2-33 Transit Safety Data by Mode for All Reported Accidents

TABLE 2-34 Transit Safety Data by Mode for All Reported Incidents

TABLE 2-38 Security Events of Crime by Transit Mode

The data for this report is 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 2019, 2,977 agencies reported to the NTD. Of that total, 520 agencies submitted full reports, 525 agencies submitted Reduced Reporter reports, 1,245 agencies submitted Rural General Public transit reports, and agencies received other waivers for detailed reporting (Reporting, Planning and Capital Waivers). 2,977 agencies are included in the 2018 NTD database.

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: 2004) 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.

Waterborne Transportation 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 2-45 Waterborne Transportation Safety Data and Property Damage Related to Vessel Casualties

TABLE 2-46 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 5 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 Injured Persons by Transportation Mode

TABLE 2-3 Transportation Accidents by Mode

TABLE 2-4 Distribution of Transportation Fatalities by Mode

TABLE 2-47 Recreational Boating Safety, Alcohol Involvement, and Property Damage Data

TABLE 2-48 Personal Watercraft Safety Data**TABLE 2-49 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 \$25,000 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 Injured Persons by Transportation Mode****TABLE 2-3 Transportation Accidents by Mode****TABLE 2-4 Distribution of Transportation Fatalities by Mode****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, Pipeline and Hazardous Materials Safety Administration (PHMSA) 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. PHMSA 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 PHMSA 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 PHMSA's attention and 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 updated. Property damage figures, therefore, may underestimate actual damages.

TABLE 2-50 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), Pipeline and Hazardous Materials Safety Administration (PHMSA), 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.)

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 fatalities 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 work shed. 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).

Chapter 3 - Transportation and the Economy

TABLE 3-1 & 3-2 U.S. Gross Domestic Product Attributed to For-Hire Transportation Services (Current and chained 2012 dollars)

TABLE 3-3 & 3-4 U.S. Gross Domestic Product Attributed to Transportation Functions (Current and chained 2012 dollars)

TABLE 3-5 & 3-6 Tables discontinued

TABLE 3-7 & 3-8 Contributions to U.S. Gross Domestic Product: Selected Industries (Current and chained 2012 dollars)

TABLE 3-9 Gross Domestic Product by Major Social Function

Tables 3-1–3-9 present data on transportation's contributions to the economy through consumption (or the money spent on transportation activity). 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 principal 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.

Gross domestic demand (GDD) is 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

This section describes BEA's methodology for estimating transportation's share of GDP. BEA's methodology changed in May 2014 and is reflected in the data from 1997 onward.

Chained dollars is a method of adjusting real dollar amounts for inflation over time that allows comparison of figures from different years. The U.S. Department of Commerce introduced the chained-dollar measure in 1996. Chained dollars generally reflect dollar figures computed with 2009 as the base year. Chained dollars is weighted by a basket/list that changes yearly to reflect actual spending more accurately. The basket is an average of the basket for successive pairs of years; examples of paired years are 2010-2011, 2011-2012, etc. The technique is so named because the second number in a pair of successive years becomes the first in the next pair. The result is a continuous "chain" of weights and averages. The advantage of using the chained-dollar measure is that it is more closely related to any given period covered and is subject to less distortion over time.

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).

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 5 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 are from the second tier of GDP data and emanate from sources such

as IRS tax returns and smaller surveys of establishments. The Annual Retail Trade Survey, for instance, forms one of the major components of the annual estimates. The U.S. Census Bureau collects sales and end-of-year inventory data from about 22,000 retail firms totaling \$2 trillion of the \$8.8 trillion GDP amount. While considered reliable by many economists, sampling variability may introduce errors into these annual estimates. Moreover, the Census Bureau imputes (substitutes estimate 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 1958–1963 and dropped to 1.1 percent for 1968–1972. 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 5 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 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, which provided the data for tables 3-1–3-8. 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 types 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 tables 3-7 and 3-8, transportation-related final demand (TRFD) is from NIPA. 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. Because 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, and 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 vehicles, engines, and parts excludes boats, aircraft, and noncommercial 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 Survey of Current Business (SCB). Data users who desire more methodological detail can refer to the list of references at the end of this chapter.

TABLE 3-10 National Transportation and Economic Trends

The *Population Division Population Estimates* published by the U.S. Department of Commerce, Census Bureau, is the source of the population data from 2000 on, previously sourced *Statistical Abstract of the United States*. 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 noninstitutionalized 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 changed as 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.

TABLE 3-11 Sales Price of Transportation Fuel to End-Users

The U.S. Department of Energy, Energy Information Administration's (EIA's) *Monthly Energy Review*, tables 9.4 and 9.7, provided price data, except for railroad fuel. Pre-1981 data were reported by the EIA from Bureau of Labor Statistics reports. Beginning in 1983, the EIA administered a series of surveys to collect data on petroleum prices, market distribution, supply, and demand. The EIA-782 series encompasses three surveys: 1) Form EIA-782A, Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report; 2) Form EIA-782B, Resellers'/Retailers' Monthly Petroleum Product Sales Report; and 3) Form EIA-782C, Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption.

EIA developed a method for comparing data from the new surveys with older information gathered by various methods. As a result, a number of adjustment factors were developed and used to "backcast" price estimates. Readers who require a more detailed description of this methodology should refer to EIA's petroleum data publications web page (www.eia.doe.gov/oil_gas/petroleum/pet_frame.html) and the explanatory notes section.

Changes in sample elements or collection methods may affect data continuity. Two regulatory changes affected data collection in October 1993. The Clean Air Act Amendments of 1990 required that oxygenated gasoline be sold in the winter months in ozone nonattainment areas. Thus, the EIA-782 forms were modified to collect information on fuels divided among conventional, oxygenated, and reformulated categories. Second, requirements for the production and selling of low-sulfur diesel were required and necessitated the separation of diesel fuel into high- and low-sulfur categories. Moreover, surveys prior to October 1993 did not include propane. The EIA followed several different sampling designs during two periods in the 1980s and thus, there may be some price estimate discontinuity for periods between December 1983 and January 1984 as well as between August and September of 1988.

Data Collection

The 782 series occurs on a monthly schedule via mail. The 782A and 782C surveys reflect a census of about 115 and 190 firms, respectively. The 782B samples about 2,000 firms. The EIA first stratifies by sales volume for the form 782B survey to ensure that dealers with 5 percent or more of the market are captured with certainty. The remaining elements of the frame were assigned a probability of selection to form a 2,200 firm survey. These "noncertainty" companies were post stratified 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, 86, 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 3-12 Price Trends of Gasoline v. Other Consumer Goods and Services

Data in this table from 1970-1980 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 1981–2001 retail gasoline prices. The remainder of this section discusses the BLS Consumer Price Index (CPI) data collection and estimation methods used to derive the average retail price of gasoline. In 2019 a new data source was used for data back to 1985 onward for retail gasoline price, U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics*.

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 nonurban consumers.

For the retail outlet sampling frame, BLS relies on the Census Bureau's Point-of-Purchase Survey (CPOPS) conducted by the 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 that dispersed households evenly within a Census enumeration district (ED). More detailed sampling design information can be found in BLS's *Handbook of Methods*.

Prices for the goods and services used to calculate the CPI are collected in 91 PSUs located in 85 urban areas throughout the country. The sample size for the CPOPS totals about 21,000 retail and service establishments—supermarkets, department stores, gasoline stations, hospitals, etc. Food, fuels, and a few other items are priced monthly in all 85 locations. BLS field representatives collect all price information through visits or telephone calls in the household surveys. Price changes are computed based on a sample of outlets selected from locations identified by consumers. Specific sample items are then selected from each sample outlet to ensure that the market basket is representative of where households shop.

Estimation

BLS routinely updates its price estimates for specific items among the collection of goods and services, for example, a new car model year. BLS employs three techniques to produce new price estimates. First, an item that is directly comparable to the previous discontinued good will be used to provide a price estimate. However, a substitute item may be inappropriate when goods change slightly in their characteristics. BLS relies on Hedonic regression modeling as a second "quality adjustment" for price estimates. This statistical technique can model the importance of various quality characteristics that add value to a particular good (the fiber content and construction of apparel products for instance). A researcher can estimate a Hedonic regression model that identifies the factors most important in determining the price of a good, and BLS field representatives will note these in their data collection. Imputation is a third quality adjustment used for "noncomparable" substitutions where BLS estimates the price change from previous averages. Detailed algorithms can be found in chapter 17 of the BLS *Handbook of Methods*.

Effective January 1999, BLS began using a new formula for calculating the basic components of the Consumer Price Index for all Urban Consumers (CPI-U) and the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). The new formula, the geometric mean estimator, is used in index categories that comprise approximately 61 percent of total consumer spending represented by the CPI-U. Based on BLS research, it is expected that use of the new formula will reduce the annual rate of increase in the CPI by approximately 0.2 percentage points per year. Additional information on this change was published in the April 1998 CPI Detailed Report.

Accuracy

One of the CPI's limitations is that it represents price movements for urban residents and may not correctly represent nonurban consumption patterns. The CPI may also contain sampling error because it is estimated from a sample of consumer purchases. Nonsampling error may occur if respondents provide BLS field representatives with inaccurate or incomplete information. Another potential source of error identified by BLS may occur because of a time lag between the Point-of-Purchase Survey and the initiation of price collection for commodities and services at resampled outlets. Because of the time lag, the products offered by the outlet at the time pricing is initiated may not coincide with the set from which the CPOPS respondents were purchasing.

The CPI is also subject to response error when data are not collected because of nonresponse. BLS established a nonresponse auditing program in 1986. It reported that response rates in 1990 for transportation commodities and services were above 90 percent.

Bias

Four categories of bias were identified in the BLS report, *Measurement Issues in the Consumer Price Index*, published in 1997. First, because of the fixed-weight nature of the index, the CPI creates substitution bias by placing too much weight on items measured in previous surveys from which consumers may have shifted away. Second, the study found that the index did not account for consumers switching to discount stores. Third, a quality change bias was also identified when the differences between goods priced in two

different periods cannot be accurately measured nor deduced from the accompanying price difference between the goods. Finally, the report noted that the CPI also had a new product bias because the index inadequately reflected consumer value of products introduced into the market. The commission concluded that the CPI overstated the true cost-of-living change by 1.1 percentage points per year.

TABLE 3-13 Producer Price Indices for Selected Transportation and Warehousing Services (NAICS)

TABLE 3-14 Producer Price Indices for Transportation Equipment (NAICS)

Data shown in these tables are drawn from *Producer Price Index Industry Data*, 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 establishments' revenue-producing activities. This disaggregation procedure assigns a probability of selection to each shipping or receipt category proportionate to its value within a reporting unit. In most cases, the final price index produced by the BLS requires that 1) there are at least three different respondents to a survey, 2) at least two reporting units provide price information in a given month, and 3) no single respondent accounts for 50 percent or more of the weight for a given item.

BLS regional offices review field data for consistency and completeness. The national office then conducts a final review, and a survey is then tailored specifically to establishments or clusters of establishments. BLS refers to these as repricing schedules and sends them to reporting establishments on a regular basis. Most prices refer to a reporting schedule on a particular day of the month, usually the first Tuesday or the 13th of a month.

Estimation

BLS collects prices for over 100,000 items. It utilizes several different weighting schemes for the numerous indexes produced because some products will have a greater effect on the movement of groupings of individual products. BLS utilizes the net output of shipment values as weights for the 4-digit SIC industries. Net output values include only shipments from establishments in one industry to other industry establishments and, thus, differ from gross shipment values. The latter would include shipments among establishments in the same industry, even if those establishments are separate firms. BLS also makes seasonal adjustments if statistical tests and economic rationale justify them and computes data when a participating company does not deliver a price report. BLS bases the missing price estimation on the average of price changes for similar products reported by other establishments.

Accuracy

As in all surveys, the accuracy of producer price indexes depends on the quality of information voluntarily provided by participating establishments. One of the accuracy concerns of BLS revolves around the preferred use of realistic transaction prices (including discounts, premiums, rebates, allowances, etc.) rather than list or book prices. Before BLS fully changed its data collection method in 1986, a survey indicated that about 20 percent of traditional commodity indexes were based on list prices. The newer and more systematic methodology decreased the use of list prices. BLS documentation (available at <https://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 3-15 Personal Expenditures by Category**TABLE 3-16 Personal Consumption Expenditures on Transportation by Subcategory**

Data used in these tables are from the Bureau of Economic Analysis, *National Income and Product Accounts Tables*. Our Nation's principal 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 3-17 Average 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 cars equipped with a variety of standard and optional accessories. From 1985 to 1999, the cost figures represent a composite of three model American cars. After 2010, driving costs in each category are based on average costs for five top-selling models selected by AAA. The 2012 fuel costs are based on average late-2011 U.S. prices from AAA's *Fuel Gauge Report*: www.fuelgaugereport.com. Insurance figures are based on a full-coverage policy for a married 47-year-old male with a good driving record living in a small city and commuting 3 to 10 miles daily to work. The policy includes \$100,000/\$300,000 level coverage with a \$500 deductible for collision coverage and a \$100 deductible for comprehensive coverage. Depreciation costs are based on the difference between new-vehicle purchase price and its estimated trade-in-value at the end of 5 years. 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.

2012 models:

Small sedan—Chevrolet Cruze, Ford Focus, Honda Civic, Hyundai Elantra and Toyota Corolla.

Medium sedan—Chevrolet Impala, Ford Fusion, Honda Accord, Nissan Altima, and Toyota Camry.

Large sedan—Buick LaCrosse, Chrysler 300, Ford Taurus, Nissan Maxima and Toyota Avalon.

Thus, the estimates are not reliable estimates for all cars.

Fuel costs were based on an average price of \$3.278 per gallon of regular unleaded gasoline, weighted 60 percent city and 40 percent highway driving. 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 4 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 3-18 & 3-19 Average Passenger Fares (current and chained 2012 dollars)

TABLE 3-20 Average Passenger Revenue per Passenger-Mile

TABLE 3-21 Average Freight Revenue Per Ton-mile

TABLE 3-22 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 Reports*. These numbers are based on 100 percent reporting by large, certificated air carriers. Minor errors from nonreporting may occur but amount to less than 1 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.

Trucking

The Census Bureau's *Service Annual Survey* (formerly known as the Transportation Annual Survey and the Motor Freight Transportation and Warehousing Survey) is the source of this information. The sample survey represents all employer firms with one or more establishments engaged primarily in providing commercial motor freight transportation or public warehousing services. It excludes motor carriers that operate as auxiliary establishments to nontransportation companies, as well as independent owner-operators with no paid employees. Thus, the data do not represent the total trucking industry.

In 1999, Transportation Annual Survey was merged with the Census Bureau's Service Annual Survey (SAS) and is the source of data for years 1998 and later. SAS provides estimates of operating revenue of taxable firms and revenue and expenses of firms exempt from Federal income taxes for selected service industries. Unlike the Transportation Annual Survey, the SAS is based on the North American Industry Classification System (NAICS).

As with all sample surveys, two types of errors are possible: sampling and nonsampling. Nonsampling errors may include response errors and mistakes in coding or keying data.

For additional information about the survey and data reliability, the reader is referred to the Census Bureau website at www.census.gov.

Interurban and rural bus

The Census Bureau's Service Annual Survey (formerly known as the Transportation Annual Survey and the Motor Freight Transportation) is the source of this information.

Transit

The American Public Transit Association (APTA) reports these figures, which are based on the annual National Transit Database (NTD) report published by the USDOT, Federal Transit Administration (FTA). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including capital expenditures, revenues, and expenses. These data are generally considered accurate because the FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or misinterpret certain data definitions. APTA conservatively adjusts FTA data to include transit operators that do not report to the database (private and 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 (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2019, the threshold for Class I railroads was \$504.80 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for 3 consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 68 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.

Water (domestic)

Eno Transportation Foundation, Inc. was the source of these data until 2004. 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. After 2009 the Census Bureau's Service Annual Survey is the source of this information.

Oil Pipeline

Eno Transportation Foundation, Inc., published these data, which were 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. Starting in 2000 data are retrieved from the *Oil and Gas Journal* special report on pipeline economics.

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 3-23 Employment in For-Hire Transportation and Selected Transportation-Related Industries (NAICS)

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 60 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.

Beginning in 2009 Public Employment Survey (PES) uses a new multistage sample method that combines cut-off sampling based on unit size with stratified sampling to reduce the sample size, save resources, and improve the precision of the estimates.

The Annual Public Employment Survey provides current estimates for full-time and part-time state and local government employment and payroll by government function (i.e., elementary and secondary education, higher education, police protection, fire protection, financial administration, judicial and legal, etc.). This survey covers all State and local governments in the United States, which include counties, cities, townships, special districts, and school districts. The first three types of governments are referred to as general-purpose governments as they generally cover several governmental functions. School districts cover only the education function. Special districts cover generally one, but sometimes two functions. These are the only sources of public employment data by program function and selected job category.

Data on employment include number of full- and part-time employees, gross pay, and hours paid for part-time employees. Reported data are for each government's pay period that includes March 12. Data collection began in March and continued for about 7 months.

Currently, a stratified, modified probability proportional-to-size sample method is used to obtain annual national and state level estimates. The current sample design yields a large number of small townships and special districts.

These units only account for a small part of the final estimates and have a poor response rate. Within a geographic area, there is usually little variability in the responses from small units for the same type of government. The objective of this research was to design a sample that would reduce the number of small units in certain problematic areas of the country.

For more information on the methodology, see Barth et al. (2009).

TABLE 3-24 Employment in Transportation and Transportation-Related Occupations

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 3 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 is 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 <https://stats.bls.gov/oes/home.htm>.

TABLE 3-26 Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation (SOC)

The source of the data is the *Current Population Survey (CPS)*. This is a monthly survey administered by the Census Bureau of a scientifically selected sample representative of the noninstitutionalized civilian population in 754 areas covering all 50 States 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.

TABLE 3-25 Average Wage and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (NAICS)**TABLE 3-27 Total Wage and Salary Accruals by Transportation Industry (NAICS)**

The *Wages and Salaries by Industry* (tables 6.3d and 6.6d) 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. Estimates in this table are based on the 2002 North American Industry Classification System (NAICS). Readers should also refer to the earlier discussion of GDP methods and reliability for more detail.

TABLE 3-28 Labor Productivity Indices for Selected Transportation Industries (NAICS)

The Bureau of Labor Statistics (BLS) *Industry Productivity and Costs*, formally *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 trunk line barrel-miles. A barrel-mile is one barrel of petroleum moved through 1 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 1 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 assumes that transportation outputs should be measured using the production of passenger- 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 the Bureau of Economic Analysis (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 1 percentage point. For transportation, differences in growth rates across BLS and BEA estimates were 2 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 3-29 & 3-30 Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (current and chained 2012 dollars)

TABLE 3-31 Summary of Transportation Revenues and Expenditures from Own Funds and User Coverage, Fiscal Year (current and chained 2012 dollars)

TABLE 3-32 & 3-33 Federal Transportation-Related Expenditures by Mode, Fiscal Year (current and chained 2012 dollars)

TABLE 3-35 & 3-36 Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (current and chained 2012 dollars)

TABLE 3-37 & 3-38 Federal Transportation Transfers to State and Local Governments by Mode, Fiscal Year (current and chained 2012 dollars)

TABLE 3-34 Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year

The main sources for Federal-level data are the Budget of the U.S. Government and the Appendix to the Budget. These data are the actual figures as reported for the various transportation-related programs in the appendices of each year's budget document.¹ The figures are consistent from year to year and follow the definitional structure required by the Office of Management and Budget (OMB).

Primary sources for state and local transportation-related revenues and expenditures data are censuses and surveys collected by the U.S. Census Bureau. All units of government are included in the Census of Governments, which is taken at 5-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 non-census 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 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. 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 2.00 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):

- 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;
- converts the 10 percent ad valorem tax on domestic passenger tickets to a combination of ad valorem and flight segment tax over 3 years beginning October 1, 1997;

- 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;
- increases the current 6 dollar international departure tax to 12 dollars per passenger and adds a 12 dollar international arrival tax;
- lowers tax rates on flights to certain rural airports to 7.5 percent without a flight segment component; and
- transfers revenues from the 4.3 cents-per-gallon aviation fuel taxes currently dedicated to reducing 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

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 and 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 go 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, 2012). 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. The fund was discontinued after 2000.

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

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 conduct 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 support expenditures include all of the expenses of the following agencies: Office of Inspector General, National Transportation Safety Board, all expenses of the Research and Special Programs Administration (except pipeline expenditures), and the Office of the Secretary of Transportation (except for payments to Air Carriers and the Commission on Aircraft Safety).

Limitations of the Source Data Sets

The database covers civilian transportation-related activities of government agencies including those of the U.S. Army Corps of Engineers and U.S. Coast Guard.

As mentioned 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 3 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, such as 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 2009, while the earlier version was presented in chained 2005 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 motorboat 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 include 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, such as Search and Rescue and Ice Operations, have been included. In addition, Boat Safety Program expenditures have also been included.

Trust funds share of pipeline safety was added to the Research and Special Programs Administration expenditures since FY 1994. This item was not covered in the previously published data.

Federal Grants

Federal grants to State and local governments for the Boat Safety Program have been included. These were not included in the previously reported data.

Data for Federal transit grants are obtained from the Office of Management and Budget public budget database. In the previous data series, they were estimated by deducting direct Federal transit expenditures grants from the total Federal transit expenditures.

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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).

² Public Law 101-508, 104 Stat. 1388 (Nov. 5, 1990).

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 because Conrail has been returned to the private sector. In 1988, the unobligated balances available from this program were transferred to the U.S. Coast Guard, and in 1990 they were returned to the U.S. Treasury.

BOX 3-1 U.S. Census Bureau and Federal Highway Administration Calculations of State and Local Transportation Financial Statistics Differ in the Following Ways:

Item	Census	FHWA
Motor fuel tax revenues	Includes state and local tax revenues on any fuel used in motor vehicles and on gasoline used by aircraft.	Includes state and local fuel tax revenues attributed to highway use of fuels, including diesel fuel, gasohol, and liquefied petroleum gas used by private and commercial highway use motor vehicles and transit. Does not include revenues on gasoline used by aircraft.
Motor vehicle license tax revenues	Includes vehicle mileage and weight taxes on motor carriers; highway use taxes; or off-highway fees.	Does not include vehicle mileage and weight taxes on motor carriers; highway use taxes or off-highway fees.
Local parking charges revenues	Includes local parking revenues.	Not explicitly collected.
Highway expenditures	Excludes patrols or policing of streets and highways; traffic control activities of police or public safety agencies; law enforcement and safety activities of vehicle inspection enforcement, and vehicle size and weight enforcement; street cleaning activities; and roads within parks maintained by a park agency.	Includes patrols or policing of streets and highways; traffic control activities of police or public safety agencies; law enforcement and safety activities of vehicle inspection enforcement, and vehicle size and weight enforcement; street cleaning activities; and roads within parks maintained by a park agency.

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).

- 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 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 2011*, released in Sept. 2012, provided a preliminary 2011 number for total petroleum production of 5.09 million barrels per day (mmbd), and the 2014 *Review* reported 5.08 mmbd.

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 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 no respondent's value for that month is the same as for the previous month except for imports. Because 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 5.08 mmbd in 2011 suggests that there could be an error of 0.0025 mmbd (2,500 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 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.

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 adjust 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 by Mode

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.

Motor Gasoline

Almost all gasoline is consumed in the transportation sector. Relatively 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 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 2011, FHWA reported 131.3 billion gallons of gasoline sold nationally for highway use. EIA's table 3.7c of the *Annual Energy Review 2012* lists 8.59 mmbd of gasoline supplied for the transportation sector, the same as 131.7 billion gallons.

Such close agreement between supply and demand is not convincing. Definitions are unique to each state (e.g., whether gasohol is counted as pure gasoline or part gasoline and part renewables), measurement points vary from state to state, and each state handles losses differently. Hence, the total of all states' sales of gasoline is not entirely consistent.

Separation of highway from nonhighway uses of gasoline is, by necessity, based in part on careful estimates. Nevertheless, overall gasoline sales are well documented, and the separation is probably fairly accurate. Refinery output of motor gasoline was 7.93 mmbd in 2011, which is probably accurate to the first decimal place and maybe a little better. The transportation sector's 8.59 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. Because 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 5–96 percent of reported consumption. Even a 20 percent adjustment could introduce an error of 1 or 2 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 good estimates 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. Because most groups cooperate with DOE, it is likely that the data reported are accurate. EIA tracks the number of natural gas vehicles and the number of refueling stations to provide a cross check on estimates of natural gas consumption.

Electricity

Electricity powers intercity trains (Amtrak) and intracity rail systems. In addition, the number of electric vehicles is growing. There is considerable uncertainty over the energy consumed by these modes. Amtrak no longer provides national totals of its electricity consumption. Data on intracity transit is based on U.S. Department of Transportation, Federal Transit Administration's (FTA's) National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including energy use. Although the data is generally considered accurate because FTA reviews and validates information submitted, reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data.

If electric vehicles become important over the next decade or two, dedicated charging stations may become commonplace, which could provide accurate data. Fleet owners (e.g., electric utilities) can keep accurate records, but individuals who plug their vehicles in at home may not. Electricity use must be estimated from the number of such vehicles and the expected driving cycles. Hence, data on electric power for transportation must be viewed as an estimate.

It should also be noted that electricity is a form of work that usually is generated from heat with the loss of about two-thirds of the energy. Automobile engines are equivalent to electric generators in that they convert chemical energy to heat and then to work, losing most of the energy as waste heat. When electrical energy is compared to petroleum in transportation, the waste heat must be included for consistency. A kilowatt-hour of electricity is equivalent to 3,413 British thermal units (Btu), but about 10,000 Btu of heat are required to produce it. This factor is dropping as generators become more efficient. High efficiency gas turbines may require 8,000 Btu or less, but the average is much higher. It is usually impossible to tell where the power for a specific use is generated, so average figures for a region are used to estimate the waste energy, a factor that further reduces the accuracy of the data.

Alternative Fuels

In addition to oxygenates, natural gas, and electricity, alternative fuels include ethanol and methanol. EIA tracks the numbers of such vehicles through Form-886, state energy

offices, Federal demonstration programs, manufacturers, and private associations. These numbers probably are fairly accurate although it is difficult to monitor retirements. Fuel consumption is estimated from the types of vehicles in operation, vehicle miles traveled, and expected fuel efficiency. Adjustments are necessary for the relatively few flexible-fuel vehicles. Obviously, the reported data are estimates only.

Fuel and Energy Consumption by Mode

TABLE 4-5 Fuel Consumption by Mode of Transportation

TABLE 4-6 Energy Consumption by Mode of Transportation

TABLE 4-7 Domestic Demand for Gasoline by Mode

TABLE 4-8 Certificated Air Carrier Fuel Consumption and Travel

TABLE 4-9 Motor Vehicle Fuel Consumption and Travel

TABLE 4-10 Estimated Consumption of Alternative and Replacement Fuels for Highway Vehicles

TABLE 4-11 Light Duty Vehicle, Short Wheelbase and Motorcycle Fuel Consumption and Travel

TABLE 4-12 Light Duty Vehicle, Long Wheelbase 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 4-11–4-15) are collected mainly by FHWA. All 50 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 managed.

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, Truck Inventory and Use Survey (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. 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 90–95 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 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 (GAATA) 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 2012 a sample of 209,034 aircraft was identified and surveyed from an approximate population of 277,010 registered general aviation aircraft.

The reliability of the GAATA survey can be impacted by two factors: sampling and non-sampling 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 2.4 percent in 2000 for the general aviation fleet. A large standard error relative to an estimate indicates lack of precision, and inversely, a small standard error indicates precision.

Non-sampling 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 should 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 adjusted its data to reflect nonresponse bias.

The U.S. Government, in particular the Department of Defense (DOD), uses a large amount of jet fuel as shown in table 4-19 (see discussion on government consumption below). However, DOD reports all fuel purchased, including from foreign sources for operations abroad. While the data may be accurate, it is not comparable to EIA's overall U.S. supply and consumption figures on jet fuel.

International operations are included in table 4-8 but not table 4-5. The fuel use for international operations includes that purchased by U.S. airlines for return trips. OAI does not collect data on foreign airline purchases of fuel in the United States. Thus, a significant use of U.S. jet fuel is missed. However, these two factors approximately balance each other out. As shown in table 1-34, foreign carrier traffic is just slightly less than U.S. carrier international traffic, so presumably the fuel purchased here by foreign carriers is 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 (2010) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2019, the adjusted threshold for Class I railroads was \$504.80 million. Although Class I railroads represent only 1 percent of the number of railroads in the country, they account for over 68 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 American Public Transit Association (APTA) figures are based on information in FTA's National Transit Database. APTA conservatively adjusts FTA data to include transit operators that do not report to the FTA Database (private and small operators and rural operators), which accounts for about 90–95 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 91.4 percent response rate for the 2012 survey. The EIA also provides estimates of the sampling error for geographic areas and U.S. averages are 1.8 percent for residential distillate fuel oil, 0.8 percent for nonresidential retail distillate fuel oil, and 0.1 percent 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 <https://www.eia.gov/petroleum/fueloilkerosene/>.

TABLE 4-16 Transit Industry Electric Power and Primary Energy Consumption and Travel

TABLE 4-17 Class I Rail Freight Fuel Consumption and Travel

TABLE 4-18 Amtrak Fuel Consumption and Travel

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. Because 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 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 Light Duty Vehicles and Motorcycles

TABLE 4-23 Average Fuel Efficiency of U.S. Light Duty Vehicles

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

TABLE 4-27 Energy Intensity of Amtrak Service (Loss-adjusted conversion factors)

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. The reliability of vehicle-miles traveled (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 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 unique 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 (2010) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2019, the adjusted threshold for Class I railroads was \$504.80 million. Although Class I railroads comprise only 1 percent of the number of railroads in the country, they account for over 68 percent of the industry's mileage and 91 percent of all freight revenue; energy data should be of the same order.

TABLE 4-28 Annual Wasted Fuel Due to Congestion

TABLE 4-29 Annual Wasted Fuel per Person

The Texas Transportation Institute's (TTI) *Urban Roadway Congestion Annual Report* provided figures for tables 4-27 and 4-28. TTI relies on data from the U.S. Department of Transportation, Federal Highway Administration, Highway Performance Monitoring System database (HPMS). (See box 1-1 for detailed information about the HPMS.) TTI utilizes these data as inputs for its congestion estimation model. Detailed documentation for the TTI model and estimations can be found at <http://mobility.tamu.edu/>.

The sum of fuel wasted in typical congestion (recurring delay) and incident-related delays equal the annual wasted fuel for an urban area. Recurring delay is the product of recurring delay (annual hours in moderate, heavy, and severe delays) and average peak period system speed divided by average fuel economy. Incident delay hours are multiplied by the average peak period system speed and divided by the average fuel economy to produce the amount of incident fuel wasted.

Structure, Assumptions, and Parameters

Urban roadway congestion levels are estimated using a formula measuring traffic density. Average daily travel volume per lane on freeways and principal arterial streets are estimated using area wide estimates of vehicle-miles of travel and lane-miles of roadway. The resulting ratios are combined using the amount of travel on each portion of the system (freeway and principal arterials) so that the combined index measures conditions overall. This variable weighting factor allows comparisons between areas. Values greater than one are indicative of undesirable congestion levels. Readers seeking the algorithm for the congestion index should examine <http://mobility.tamu.edu/>.

In previous reports, TTI assumed that 49 percent of all traffic, regardless of the urban location, occurred in congested conditions. TTI indicated that this presumption overestimated travel in congested periods. Its 2011 estimates now vary by urban area anywhere from 18–60 percent of travel that occurs in congestion. TTI's model structure applies to two types of roads: the mix of high-speed freeways and slower 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 five categories: uncongested, moderately congested, heavily congested, severely congested, and extremely congested (a new category in 1999). The threshold between uncongested and congested was changed in 1999. Previous editions classified congested travel when area wide traffic levels reached 14,000 vehicles per lane per day on highways and 5,500 vehicles per lane per day on principal arterial streets. For the current edition, these values are 15,500 and 5,500 vehicles per lane per day, respectively. Previous years values have been re-estimated based on these new assumptions. Readers should refer to the TTI website for more detailed information on its estimation procedures <http://mobility.tamu.edu/>.

TTI reviews and adjusts the data used in its model, including statewide average fuel cost estimates (published by the American Automobile Association) and the number of eligible drivers for each urban area (taken from the Statistical Abstract of the United States, published by the U.S. Department of Commerce, Bureau of the Census). The model has some limitations because it does not include local variations (e.g., 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 4-43 Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel

TABLE 4-44 Table discontinued

TABLES 4-45, 4-46, 4-47, 4-48, 4-49, 4-50 Estimates of National Emissions of Carbon Monoxide, Nitrogen Oxides, Volatile Organic Compounds, Particular Matter, Sulfur Dioxide

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 3 years.) The U.S. Department of

Transportation, Federal Highway Administration's Highway Performance Monitoring System is the source of vehicle travel estimates used in the model. Although the methodology for this survey data is sound and well documented, analyses have shown that individual states vary in how rigorously they follow the established sampling guidelines.

The nonhighway vehicle emissions are calculated annually by running EPA's NONROAD model for all categories except aircraft, commercial marine vessels, and railroads, which are calculated via emission factors and relevant activity data. Inputs to the NONROAD model include average temperatures, Reid vapor pressure, fuel usage programs and controls.

Particulate Matter Under 10 Microns (PM-10) and 2.5 Microns (PM-2.5) in Size

Highway vehicle emissions are estimated using the U.S. Environmental Protection Agency's PART model, which estimates emissions factors for exhaust emissions and brake and tire wear by vehicle type. Exhaust emissions factors are based on certification tests, while brake wear (per vehicle) and tire wear (per tire) are assumed values, which are constant over all years. Per-mile emissions factors are multiplied by vehicle travel (vehicle-miles) and adjusted to account for other factors that affect 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 nonhighway vehicle emissions are calculated annually by running EPA's NONROAD model for all categories except aircraft, commercial marine vessels, and railroads, which are calculated via emission factors and relevant activity data. Inputs to the NONROAD model include average temperatures, Reid vapor pressure, fuel usage programs, and controls.

Sulfur Dioxide (SO₂)

Highway vehicle SO₂ emissions are estimated by multiplying vehicle travel (for each vehicle type and highway type) by an emissions factor reflecting each vehicle type and highway type. Highway SO₂ emissions factors are based on vehicle type and model year, sulfur content of fuel by type and year, fuel density by fuel type, and vehicle fuel efficiency by type and model year.

In general, estimates for nonhighway vehicles are calculated based on fuel consumption and sulfur content of fuel, though other factors may be considered.

Lead

In general, lead emissions are estimated by multiplying an activity level by an emissions factor that represents the rate at which lead is emitted for the given source category. This

estimate is then adjusted by a factor that represents the assumed effectiveness of control technologies. For lead released during combustion, a top-down approach is used to share national estimates of fuel consumption by fuel type to each consumption category (e.g., motor fuel, electric utility, etc.) and, subsequently, each source (e.g., passenger cars, light-duty trucks, etc.).

TABLE 4-51 Air Pollution Trends in Selected Metropolitan Statistical Areas

TABLE 4-52 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 4-53 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. Because fossil fuels are typically 75–90 percent carbon by weight, emissions from the combustion of these fuels can be easily measured in carbon units, as is shown in the table.

CO₂ emissions data are derived from estimates. The U.S. Department of Energy, Energy Information Administration (EIA), estimates CO₂ emissions by multiplying energy consumption for each fuel type by its carbon emissions coefficient, then subtracting carbon that is sequestered by nonfuel use of fossil fuels. Carbon emissions coefficients are values used for scaling emissions to specific activities (e.g., pounds of CO₂ emitted per barrel of oil consumed).

Emissions estimates are based on energy consumption data collected and published by EIA. Several small adjustments are made to its energy consumption data to eliminate double counting or miscounting of emissions. For example, EIA subtracts the carbon in ethanol from transportation gasoline consumption because of its biological origin.

Emissions coefficients are based on the density, carbon content, and heat content of petroleum products. For many fuels, except liquefied petroleum gas (LPG), jet fuel, and crude oil, EIA assumed coefficients to be constant over time. For LPG, jet fuel, and crude oil, EIA annualized carbon emissions coefficients to reflect changes in chemical composition or product mix.

Because the combustion of fossil fuels is a major producer of CO₂ emissions, sources of uncertainty are related to 1) volumes of fuel consumed; 2) characteristics of fuel consumed; 3) emissions coefficients; and 4) coverage. EIA notes that volumetric fuel data are fairly reliable in the 3–5 percent range of uncertainty. The density and energy content of fuels are usually estimated. According to EIA, the reliability of these estimates

varies. 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 4-54 Petroleum Oil Spills Impacting Navigable 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, and the cause of the accident, as well as whether there is evidence that failure of material (either physical or design) was involved or contributed to the incident. This is done so financial responsibility may be properly assigned for the incidents and proper recommendations made to prevent the recurrence of similar incidents.

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 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 1969–2011 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

<https://homeport.uscg.mil/Lists/Content/DispForm.aspx?ID=226&Source=/Lists/Content/DispForm.aspx?ID=226>

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 suspected low reporting rates for small spills. Most of the error in spill counts involves spills of less than 100 gallons.

TABLE 4-55 Leaking Underground Storage Tank Releases and Cleanups

A national inventory of reported spills and corrective actions taken for leaking underground storage tanks is compiled biannually based on state counts of leaking tanks reported by owners as required by the Resource Conservation and Recovery Act of 1976.¹ These data may be affected by general accounting errors, some of which have changed semiannual counts by as many as 2,000 actions.

TABLE 4-56 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 4-57 Number of People Residing in Areas of Significant Noise Exposure Around U.S. Airports

The number of the people exposed to aircraft noise around airports is estimated by computer modeling rather than by actual measurements. The U.S. Department of Transportation (USDOT), Federal Aviation Administration's (FAA's) Integrated Noise Model (INM) has been the primary tool for assessing aircraft noise around airports for nearly 30 years. This model uses information on aircraft mix, average daily operations, flight tracks, and runway distribution to generate and plot contours of Day Night Sound Level (DNL). With the addition of a digitized population census database, the model can estimate the number of residents exposed to noise levels of 65 decibels (db) DNL.

The U.S. Environmental Protection Agency (EPA) produced the first estimate of airport noise exposure in 1975. It reported that 7 million residents were exposed to significant levels of aircraft noise in 1978. This number became the "anchor point" for all future estimates of the nationwide noise impacts. In 1980, FAA developed another methodology

for estimating the change in the number of people impacted by noise (from the 1975 anchor value) as a function of changes in both the national fleet and in the FAA's Terminal Area Forecast (TAF). In 1990, the FAA created an improved method of estimating the change in number of people impacted (relative to the 1980 estimates).

In 1993 the FAA began using its newly developed Nationwide Airport Noise Impact Model (NANIM) to estimate the impact of airplane noise on residential communities surrounding U.S. airports that support jet operations. FAA uses this model to determine the relative changes in number of people and land area exposed to 65 db DNL as a result of changes in nationwide aircraft fleet mix and operations. NANIM uses data on air traffic patterns found in the Official Airline Guide (OAG), air traffic growth projections found in FAA's TAF, population figures from the U.S. Census Bureau, and information on noise contour areas for the top 250 U.S. civil airports with jet operations.

The methodology used in NANIM has been peer reviewed and approved. However, a formal evaluation of the model's accuracy has not been conducted. Some data used in NANIM are updated manually, thus the possibility of data entry errors 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, because 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 comparable size and similar operation. Without actual airport data, it is impossible to quantify the error introduced by the approximation.

Noise Exposure people data for 2000 and forward was re-estimated using an enhanced version of U.S. MAGENTA Model for Assessing the Global Exposure of Noise because of Transport Airplanes). The enhanced version of the model uses radar-based traffic data to account for unscheduled operations including freight, general aviation, and military operations. The enhanced U.S. MAGENTA also includes improvements to the acoustical model to account for differences in the sound attenuation characteristics between wing-mounted and tail-mounted aircraft engines. These enhancements result in computed population noise exposure estimates that are more accurate and larger than previous versions of the model. Therefore, it is important to note that the "growth" in the number of people exposed from 1999 to 2000 resulted from improvements in measurement, not deterioration in aviation noise trends. In 2013, the Federal Aviation Administration revised the reporting of noise exposure from calendar year to fiscal year going back to 2000 to align with other agency performance metrics.

TABLE 4-58 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 (e.g., a flood or accident), or 2) No renewal (reregistration) notice is received by Polk within a state's allotted time (normally one year). In the latter case, if a vehicle is subsequently reregistered, it is returned to the database. The Polk data on motor vehicles is broken down into passenger cars and trucks, and this identification comes with the registration data from the DMV.

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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.

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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).

¹ Public Law 94-580, 90 Stat. 2795 (Oct. 21, 1976).

Petroleum Supply Data and Energy Consumption tables

TABLE A Average Response Rates for Monthly Surveys, 2007

Survey Site	Average universe site	Average number of respondents	Percent
Refinery	153	153	99.8
Bulk terminal	220	220	99.9
Pipeline	75	75	100.0
Crude oil stocks	133	133	99.8

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: 2009).

TABLE B Reported Ratio of Fuel Supply to Reported Consumption

Sector	Electricity	Gas	Oil
Residential	1.05	0.92	0.92
Commercial	0.91	1.38	1.96
Industrial	1.18	1.28	1.34

SOURCE: U.S. Department of Energy, Energy Information Administration, Energy Consumption by End Use Sector, A Comparison of Measures by Consumption and Supply Surveys, DOE/EIA-0533 (Washington, DC: 331990).



APPENDIX F

Sources

TABLE A: Social and Economic Characteristics of the United States**U.S. resident population, age, sex, region:**

1980-2005: U.S. Census Bureau, Population Division, *Population Estimates* as of Nov. 2, 2015.

2010-20: U.S. Census Bureau, Population Division, *National Population by Characteristics*, available at <https://www.census.gov/programs-surveys/popest/data/tables.html> as of Aug. 23, 2021.

U.S. metropolitan areas, micropolitan areas:

1980-2005: U.S. Census Bureau, Population Division, *Population Estimates* as of Nov. 2, 2015.

2010-19: U.S. Census Bureau, Population Division, *Metropolitan and Micropolitan Statistical Area Datasets* available at <https://www.census.gov/programs-surveys/metro-micro/data/datasets.html> as of June 3, 2020.

Rural / urban:

1980-90: U.S. Census Bureau, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 37.

2000: U.S. Census Bureau, *Urban and Rural: Total Population*, P2 as of Sept. 25, 2019.

2010-2019: U.S. Census Bureau, *American Community Survey*, table DP05, 1-Year Estimates Profiles, available at <https://data.census.gov/> as of Aug. 27, 2021.

Regions:

1980-2005: U.S. Census Bureau, Population Division, *Population Estimates* as of Nov. 2, 2015.

2010-20: U.S. Census Bureau, Population Division, *Annual Estimates of the Resident Population*, available at <https://www.census.gov/programs-surveys/popest/data/data-sets.html> as of Aug. 27, 2021.

Immigrants:

U.S. Department of Homeland Security, U.S. Citizenship and Immigration Services, *Yearbook of Immigration Statistics* (Washington, DC: Annual Issues), table 1, available at <https://www.dhs.gov/immigration-statistics/yearbook> as of Aug. 23, 2021.

Total area:

1980-2010: U.S. Census Bureau, *Statistical Abstract of the United States*, Section 1, table 1, available at https://www.census.gov/library/publications/time-series/statistical_abstracts.html as of Dec. 20, 2017.

2018-19: U.S. Census Bureau, *United States Profiles*, available at <https://data.census.gov/cedsci/> as of Aug. 27, 2021.

Gross domestic product, government, and private industry:

1980-90: U.S. Department of Commerce, Bureau of Economic Analysis, *National Economic Accounts, National Income and Product Accounts Table*, table 1.1.6, available at <http://www.bea.gov/national/index.htm> as of Oct. 8, 2019.

2000-2020: U.S. Department of Commerce, Bureau of Economic Analysis, *Industry Economic Accounts, Gross-Domestic-Product-by-Industry Accounts*, Real Value Added by Industry, available at <http://www.bea.gov/industry/index.htm> as of Aug. 27, 2021.

Civilian labor force:

U.S. Department of Labor, Bureau of Labor Statistics, *Current Population Survey*, Employment status of the civilian noninstitutional population 16 years and over by sex, Household Data, table 2, available at <http://www.bls.gov/cps/tables.htm#empstat> as of Aug. 23, 2021.

Number of households and average size of households:

U.S. Department of Commerce, Bureau of the Census, *Current Population Survey*, Table HH-6, Average Population Per Household and Family: 1940 to Present, available at <https://www.census.gov/data/tables/time-series/demo/families/households.html> as of Aug. 23, 2021.

Mean and median household income:

U.S. Department of Commerce, Bureau of the Census, *Current Population Survey*, Historical Income Tables, table H-6. Regions--All Races by Median and Mean Income, available at <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html> as of Sept. 17, 2021.

Average household expenditures:

U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, *Average Annual Expenditures, All Consumer Units*, available at <http://www.bls.gov/cex/> as of Aug. 27, 2021.

TABLE 1-01, 1-01M: System Mileage Within the United States**Highway:**

1960-70: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: Annual Issues), table HM-212.

1980-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics*, table HM-220, (Washington, DC: Annual Issues), available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 29, 2020.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), page 47, and similar pages in earlier editions.

Amtrak:

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

1990-2000: Amtrak, Corporate Planning and Development, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), page 73, and similar tables in earlier editions.

Transit:

1990: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Nov. 16, 2009.

2000-2014: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), table 23 and similar tables in earlier edition, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 28, 2016.

2015-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Federal Funding Allocation, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 8, 2021.

Navigable channels:

U.S. Army Corps of Engineers, available at <http://www.usace.army.mil/Missions/Civil-Works/Navigation/> as of July 26, 2021.

Oil pipeline:

2005-20: U.S. Department of Transportation, Pipeline and Hazardous Materials Administration, *Annual Report Mileage Summary Statistic*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/data-and-statistics-overview> as of Nov. 8, 2021.

Gas pipeline:

U.S. Department of Transportation, Pipeline and Hazardous Materials Administration, *Annual Report Mileage Summary Statistics*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/data-and-statistics-overview> as of Nov. 8, 2021.

TABLE 1-02: Number of Air Carriers, Railroads, Interstate Motor Carriers, Marine Vessel Operators, and Pipeline Operators

Air carriers:

1960-2000: 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".

2005-20: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Accounting and Reporting Directives, *Air Carrier Groupings* (Washington, DC), available at <https://www.bts.gov/topics/airlines-and-airports/accounting-and-reporting-directives> as of July 26, 2021.

Railroads:

1960-80: Association of American Railroads, *Railroad Ten-Year Trends*, Vol. 2 (Washington, DC), table I-2.

1990: Association of American Railroads, *Railroad Ten-Year Trends*, Vol. 16 (Washington, DC: 1999), p. 10.

2000-2019: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 3.

Interstate motor carriers:

1990-2000: U.S. Department of Transportation, *Federal Motor Carrier Safety Administration*, Motor Carrier Management Information System, and personal communication, Nov. 6, 2001.

2005-12: U.S. Department of Transportation, *Federal Motor Carrier Safety Administration*, Analysis and Information Online, as of June 4, 2004, and personal communication, Jan. 2007, Jan. 2010, Jan. 2011, Jan. 2012, and Nov. 2013.

2013-20: U.S. Department of Transportation, *Federal Motor Carrier Safety Administration*, available at <https://ai.fmcsa.dot.gov/SMS/Tools/Reports.aspx> as of July. 26, 2021.

Marine vessel operators:

U.S. Army Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 1, National*

Summaries (New Orleans, LA: Annual Issues), table 13, available at <http://www.navigationdatacenter.us/veslchar/veslchar.htm> as of Oct. 2, 2020.

Pipeline operators:

U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Office, *Gas Distribution Systems, Gas Transmission & Gathering Systems and Hazardous Liquid Pipeline Systems Annual Reporting*, personal communication, Sept. 2009, Jan. 2011, Jan. 2012, Nov. 2013, Sept. 2016, Sept. 19, 2017, Aug. 21, 2018, Sept. 25, 2019, Oct. 2, 2020, and July 28, 2021.

TABLE 1-03: Number of U.S. Airports

1980-2011: U.S. Department of Transportation, Federal Aviation Administration, *Administrator's Fact Book* (Washington, DC), available at http://www.faa.gov/about/office_org/headquarters_offices/aba/admin_factbook/.

2012-20: U.S. Department of Transportation, Federal Aviation Administration, personal communication, as of Aug. 21, 2014, Aug. 31, 2015, June 22, 2017, July 9, 2018, May 14, 2019, May 4, 2020, and Apr. 29, 2021.

TABLE 1-04, 1-04M: Public Road and Street Mileage in the United States by Type of Surface

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995* (Washington, DC), table HM-212, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 7, 2010.

2000-2005: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-12, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 7, 2010.

2010: Due to the transition for data model, there are no plans for U.S. Department of Transportation, Federal Highway Administration to produce the data for those years currently.

2011-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-12, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 1, 2020.

TABLE 1-05: U.S. Public Road and Street Mileage by Functional System

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HM-220, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 7, 2020.

TABLE 1-06, 1-06M: Estimated U.S. Roadway Lane-Miles by Functional System

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HM-260, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Sept. 17, 2021.

TABLE 1-07: Number of Stations Served by Amtrak and Rail Transit, Fiscal Year

Amtrak:

1990: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2000-2005: Amtrak, *Annual Report* (Washington, DC: Annual Issues), p. 67 and similar pages in previous editions.

2010-15: Amtrak, personal communication, Nov. 14, 2012, Nov. 17, 2015, and June 16, 2017.

2016-20: Amtrak, Management Discussion and Analysis of Financial Condition and Results of Operations and Consolidated Financial Statements with Report of Independent Auditors (Washington, DC: Annual Issues), p. 5 and similar pages in previous editions, available at <https://www.amtrak.com/reports-documents> as of Aug. 5, 2021.

Rail transit:

1990-2000: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), table 20: Transit Way Mileage - Rail Modes, and similar table in earlier editions, available at <https://www.transit.dot.gov/ntd> as of Mar. 30, 2020.

2005-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Transit Stations, available at <https://www.transit.dot.gov/ntd> as of Nov. 8, 2021.

TABLE 1-08: ADA Lift- or Ramp-Equipped Transit Buses

Small, medium, and large buses:

2000-2011: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends* (Washington, Annual Issues), pp. 85-87 and similar tables in earlier editions.

2012-13: U.S. Department of Transportation, Federal Transit Administration, *Annual National Transit Summaries and Trends: Appendix* (Washington, Annual Issues), available at <https://www.transit.dot.gov/ntd/annual-national-transit-summaries-and-trends> as of Dec. 18, 2019.

Articulated and total buses:

2000-2011: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends* (Washington, Annual Issues), pp. 85-87 and similar tables in earlier editions.

2012-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, (Washington, Annual Issues), Annual Database Revenue Vehicle Inventory, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 9, 2021.

TABLE 1-09: ADA-Accessible Rail Transit Stations by Agency

2000-2014: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), table 21.

2015-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Transit Stations, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 9, 2021.

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

1960-80: American Gas Association, *Gas Facts* (Arlington, VA: Annual Issue), tables 5-1 and 5-3 and similar in earlier editions.

1990-2020: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Natural Gas Transmission, Gas Distribution, and Hazardous Liquid Pipeline Annual Mileage*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/annual-report-mileage-hazardous-liquid-or-carbon-dioxide-systems> as of July 8, 2021.

TABLE 1-11: Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances**Air:***Air carrier:*

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

1970: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation*, 1979 edition (Washington, DC: 1979), table 5.1.

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1960: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation*, 1969 (Washington, DC: 1969), table 9.10.

1970: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation*, Calendar Year 1976 (Washington, DC: 1976), table 8-6.

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2010-20: U.S. Department of Transportation, Federal Aviation Administration, *FAA Aerospace Forecasts*, table 28, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of July 27, 2021.

Highway:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 18, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 6, 2021.

Transit:

1960-1990: American Public Transit Association, *Public Transportation Fact Book, Appendix A: Historical Tables* (Washington, DC), table 17.

2000: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, table 19 (Washington, DC: Annual Issues).

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Rail (all categories, except Amtrak):

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 9 and 65, and similar pages in earlier editions.

Amtrak:

1980: Amtrak, State and Local Affairs Department, personal communication.

1990-2000: Amtrak, *Amtrak Annual Report, Statistical Appendix* (Washington, DC: Annual Issues), p. 47.

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in earlier editions.

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1960-90: U.S. Army, Corps of Engineers, *Waterborne Transportation Lines of The United States, Volume 1, National Summaries* (New Orleans, LA: Annual Issues), table 1, available at <https://www.iwr.usace.army.mil/about/technical-centers/wcsc-waterborne-commerce-statistics-center/> as of Nov. 14, 2016.

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1960-90: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues), and unpublished revisions.

2017-19: U.S. Department of Transportation, Maritime Administration, Vessel Fleet lists, *2000-2019 U.S.-Flag Privately-Owned Fleet Summary*, available at <https://www.maritime.dot.gov/data-reports/data-statistics/data-statistics> as of Jan. 6, 2021.

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U.S. Department of Transportation, U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual Issues), table 36 and table 35 in earlier editions, available at http://uscgboating.org/statistics/accident_statistics.php as of Aug. 20, 2021.

TABLE 1-12: U.S. Sales or Deliveries of New Aircraft, Vehicles, Vessels, and Other Conveyances

Civilian aircraft:

Transport:

1960-90: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington, DC: Annual Issues), Civil Aircraft Shipments.

2000: Aerospace Industries Association, *Aerospace Statistics*, Group 1: General Statistics, Series 02 Year-End Review and Forecast, Year-End Data Table, table 5 as of Dec. 2, 2013.

2005-11: Aerospace Industries Association, *2014 Year-End Review and Forecast*, table 5, available at <http://www.aia-aerospace.org/report/2014-year-end-review-and-forecast/> as of Dec. 31, 2015.

2012-17: Aerospace Industries Association, *2018 Facts and Figures*, Civil Aircrafts, available at <https://www.aia-aerospace.org/report/2018-facts-figures/> as of Apr. 10, 2019.

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1960-90: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington, DC: Annual Issues), Civil Aircraft Shipments.

2000: Aerospace Industries Association, *Aerospace Statistics*, Group 1: General Statistics, Series 02 Year-End Review and Forecast, Year-End Data Table, table 5 as of Dec. 2, 2013.

2005-11: Aerospace Industries Association, *2014 Year-End Review and Forecast*, table 5, available at <http://www.aia-aerospace.org/report/2014-year-end-review-and-forecast/> as of Dec. 31, 2015.

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1960: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington, DC: Annual Issues), Civil Aircraft Shipments.

1970-2020: General Aviation Manufacturers Association, *Annual Data Reports* (Washington, DC: Annual Issues), Table 1.4, available at <https://gama.aero/> as of June 25, 2021.

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Passenger cars and trucks:

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

1970-2020: Wards Intelligence, *Wards Automotive Yearbook* (Southfield, MI: Annual Issues).

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

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2012-13: Asphalt & Rubber, US Motorcycles Sales Up 3% in 2013, available at <https://www.asphaltandrubber.com/news/united-states-motorcycle-sales-2013/> as of Apr. 17, 2020.

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2015-17: Statista, U.S. motorcycle and ATV sales from 2013 to 2017, available at <https://www.statista.com/statistics/252261/us-motorcycle-salesin-units/> as of Mar. 5, 2020.

2018: Motorcycles Data, United States Motorcycles & ATV market down for the fourth year in a row, available at <https://motorcyclesdata.com/2020/02/02/united-states-motorcycles-market/> as of Apr. 17, 2020.

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2020: Motorcycles Data, United States 2021. Motorcycles market posted a spectacular Q1, available at <https://www.motorcyclesdata.com/2021/05/11/united-states-motorcycles-market/> as of May 11, 2021.

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1970-90: American Automobile Manufacturers Association, *Motor Vehicle Facts & Figures*, 1998 (Detroit, MI: 1998), p. 6 and similar tables in earlier editions.

Recreational vehicles:

Wards Intelligence, *Motor Vehicle Facts & Figures* (Southfield, MI: Annual Issues), p. 13 and similar tables in earlier editions.

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1980: National Bicycle Dealers Association, personal communication, Sept. 24, 1996.

1990-2005: National Bicycle Dealers Association, *A Look at the Bicycle Industry's Vital Statistics*, available at <http://www.nbda.com> as of June 28, 2017.

2010-19: National Bicycle Dealers Association, personal communication, May 5, 2021.

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1960-2017: American Public Transit Association, *Public Transportation Fact Book, Appendix A: Historical Tables* (Washington, DC: Annual Issues), table 25: New Revenue Vehicles Delivered by Mode, available at <http://www.apta.com> as of Apr. 14, 2020.

2018-19: U.S. Department of Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues), Annual Database Revenue Vehicle Inventory, available at <https://www.transit.dot.gov/ntd>, as of Aug. 18, 2021.

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Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues), p. 52 and similar pages in earlier editions.

Amtrak:

1980: Association of American Railroads, *Railroad Facts 1997* (Washington, DC: 1997), p. 17 and similar pages in earlier editions.

1990: National Passenger Railroad Corporation (Amtrak), *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2000-20: National Passenger Railroad Corporation (Amtrak), personal communications, Mar. 24, 2011, Feb. 27, 2012, Nov. 20, 2013, June 16, 2017, Oct. 24, 2019, Aug. 31, 2020, and Aug. 5, 2021.

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1960-2000: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues) and personal communication, Sept. 2, 2003, Mar. 1, 2005, and Jan. 9, 2006.

2005: U.S. Department of Transportation, Maritime Administration, personal communication, June 21, 2007.

Recreational boat:

1980-90: National Marine Manufacturers Association, *Boating 2004* (Chicago, IL: 2005), annual retail unit estimates, available at <http://www.nmma.org> as of Feb. 7, 2006.

2000-14: National Marine Manufacturers Association, *Recreational Boating Statistical Abstract* (Chicago, IL: Annual issues), available at www.nmma.org/facts as of Jan. 05, 2016.

2015-20: National Marine Manufacturers Association, Annual Statistics Articles, *U.S. Boat Sales*, available at www.nmma.org/facts as of July 2, 2021.

TABLE 1-13: Active U.S. Air Carrier and General Aviation Fleet by Type of Aircraft**Air carriers:**

1970: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1971*. (Washington, DC: 1972), table 5.5.

1980: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1980*. (Washington, DC: Dec. 31, 1980), table 5.2.

1990: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1996*, table 5.2.

2000-2020: U.S. Department of Transportation, Federal aviation administration, *FAA Aerospace Forecasts*, tables 21, 22, and 27, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of Aug. 19, 2021.

Fixed wing, turbojet, turboprop, piston, helicopter:

1970: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1971*. (Washington, DC: 1972), table 5.5.

1980: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1980*. (Washington, DC: Dec. 31, 1980), table 5.2.

1990: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1996*, table 5.2.

2000-2008: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington DC: Annual Issues), "Active U.S. Air Carrier Fleet," and similar tables in earlier editions.

General aviation:

1970: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1971*. (Washington, DC: 1972), table 8.3.

1980: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation Activity and Avionics Survey*, Annual Report Calendar Year 1980, FAA-MS-81-5 (Washington, DC: December 1985), table 2-6.

1990: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey*, Calendar Year 1999 (Washington, DC: 2001), table 1.2.

2000: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey* (Washington, Annual Issue), table 1.2, available at http://www.faa.gov/data_research/aviation_data_statistics/general_aviation/ as of July 11, 2012

2005-10, 2012-19: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey* (Washington, Annual Issue), table 1.1, available at http://www.faa.gov/data_research/aviation_data_statistics/general_aviation/ as of Dec. 7, 2020.

2011 & 2020: U.S. Department of Transportation, Federal aviation administration, *FAA Aerospace recasts*, table 28, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of Aug. 19, 2021.

TABLE 1-14: U.S. Automobile and Truck Fleets by Use

1990-2016: Bobit Publishing Co., *Fleet Vehicles by Industry Segment*, annual issues, available at <https://www.automotive-fleet.com/statistics> as of Oct. 9, 2020.

2017-20: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, *Transportation Energy Data Book*, Edition 39, table 8.1 (Oak Ridge, TN), available at <https://tedb.ornl.gov/data/> as of May 20, 2021.

TABLE 1-15: Annual U.S. Motor Vehicle Production and Domestic Sales

Wards Intelligence, *Wards Automotive Yearbook* (Southfield, MI: Annual Issues), North America Car & Truck Production and U.S. Vehicle Sales by Year, and similar tables in earlier editions.

TABLE 1-16: Retail New Passenger Car Sales

Wards Intelligence, *Wards Automotive Yearbook* (Southfield, MI: Annual Issues), U.S. Sales by Year and U.S. Light Vehicle Sales by Country of Origin, and similar tables in earlier editions.

TABLE 1-17: New and Used Passenger Car and Light Truck Sales and Leases

New vehicle sales and leases:

1990-2005: CNW Research, personal communication, Mar. 22, 2011.

2010-20: Edmunds, personal communication, May 13, 2020, and May 24, 2021.

Used vehicle sales and average price:

1990-2005: Manheim Consulting, personal communication, Mar. 15, 2011.

2010-19: Edmunds, Used Vehicle Report, available at <https://www.edmunds.com/industry/insights/> as of Apr. 10, 2020.

TABLE 1-18: Retail Sales and Lease of New Cars by Sector

U.S. Department of Commerce, Bureau of Economic Analysis, *Underlying Detail for the National Income and Product Account Tables*, table 7.2.5S, available at <http://www.bea.gov/> as of Aug. 5, 2021.

TABLE 1-19: Gasoline Hybrid and Electric Vehicle Sales

U.S. Department of Energy, Energy Vehicle Technologies Office, Oak Ridge National Laboratory, *Transportation Energy Data Book*, Edition 39 table 6.2, available at <https://tedb.ornl.gov/data/> as of May 19, 2021.

TABLE 1-20: Productions, Production Shares, and Production-Weighted Fuel Economies of New Domestic and Imported Automobiles

U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, *Transportation Energy Data Book*, Edition 38.1, tables 4.9, 4.11 and 4.13, and similar tables in earlier editions (Oak Ridge, TN), available at <https://tedb.ornl.gov/data/> as of May 6, 2021.

TABLE 1-22a: Number of Trucks by Weight

1992, 1997: U.S. Census Bureau, *1997 Economic Census: Vehicle Inventory and Use Survey: United States*, EC97TV-US (Washington, DC: 1999).

2002: U.S. Census Bureau, *2002 Economic Census: Vehicle Inventory and Use Survey: United States*, EC02TV-US (Washington, DC: 2004).

TABLE 1-22b: Number of U.S. Truck Registrations by Type

U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics* (Washington, DC: Annual Issues), table MV-9, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Feb. 16, 2021.

TABLE 1-23: World Motor Vehicle Production, Selected Countries

1961-2016: Wards Intelligence, *Motor Vehicle Facts & Figures* (Southfield, MI: Annual Issues), p. 10 and similar pages in earlier editions.

2017-20: Wards Intelligence, *Wards Automotive Yearbook* (Southfield, MI: Annual Issues), World Vehicle Production in Major Countries.

TABLE 1-24: Number and Size of the U.S. Flag Merchant Fleet and Its Share of the World Fleet

World fleet:

2000-2005: U.S. Department of Transportation, Maritime Administration, personal communication as of June 2010 and September 2011.

2010-13: U.S. Department of Transportation, Maritime Administration, *Maritime Statistics*, Top 25 Flag of Registry, available at: <https://www.maritime.dot.gov/data-reports/data-statistics/top-25-flags-registry> as of Mar. 18, 2019.

2015-16: U.S. Department of Transportation, Maritime Administration, *Fleet Statistics*, available at: <https://www.maritime.dot.gov/data-reports/data-statistics/data-statistics> as of Mar. 18, 2019.

2018-19: IHS Markit, World Fleet Statistics, personal communication, Apr. 11, 2019.

All other categories:

1960-90: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues), and unpublished revisions.

2000-19: U.S. Department of Transportation, Maritime Administration, Fleet Statistics, *2000-2019 U.S.-Flag Privately-Owned Fleet Summary*, available at <https://www.marad.dot.gov/resources/data-statistics/> as of Oct. 8, 2019.

TABLE 1-25: U.S. Airport Runway Pavement Conditions

Condition:

1990: U.S. Department of Transportation, Federal Aviation Administration, National Plan of Integrated Airport Systems (Washington DC: 1991).

2000-20: U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Planning and Programming, National Planning Division, personal communication, Dec. 22, 2009, Dec. 7, 2010, Dec. 22, 2011, Aug. 22, 2013, Sept. 1, 2014, Oct. 25, 2016, July 9, 2018, May 17, 2019, June 4, 2020, and May 11, 2021.

Total number of airports:

U.S. Department of Transportation, Federal Aviation Administration, personal communications, Dec. 22, 2009, Dec. 7, 2010, Dec. 22, 2011, Aug. 22, 2013, Sept. 1, 2014, Oct. 25, 2016, Aug. 31, 2017, May 17, 2019, June 4, 2020, and May 11, 2021.

TABLE 1-26: Average Age of Automobiles and Trucks in Operation in the United States

Average age of automobiles:

1995-2000: IHS Markit Co., *Average Age of Light Cars and Trucks in U.S.* (Annual release), available at <https://news.ihsmarket.com/news-releases>.

2005-16: U.S. Department of Energy, Vehicle Technologies Office, *Average Age of Cars and Light Trucks, 2002-2016*, available at https://www.energy.gov/sites/prod/files/2017/09/f37/fotw%23997_web.xlsx as of Sept. 17, 2019.

2017: Wolf Street Co., *Average Age of Cars & Trucks by Household Income and Vehicle Type over Time*, available at <https://wolfstreet.com/2018/08/21/average-age-of-cars-trucks-vehicles-by-household-income-vehicle-type/> as of Sept. 17, 2019.

2018-19: IHS Markit Co., *Average Age of Cars and Light Trucks in U.S. Rises Again in 2019 to 11.8 Years*, IHS Markit Says, available at <https://news.ihsmarket.com/press-release/automotive/average-age-cars-and-light-trucks-us-rises-again-2019-118-years-ihs-market-> as of Sept. 17, 2019.

2020: IHS Markit CO., *Average age of US light trucks and cars approaches 12 years*, available at <https://ihsmarkit.com/research-analysis/average-age-of-us-light-trucks-and-cars-approaches-12-years.html> as of May 5, 2021.

Average age of household vehicles:

1969, 1977, 1983, 1990, 1995: U.S. Department of Transportation, Federal Highway Administration, Bureau of Transportation Statistics, *1995 Nationwide Personal Transportation Survey: Summary of Travel Trends* (Washington, DC: 1999).

2001: U.S. Department of Transportation, Federal Highway Administration, Bureau of Transportation Statistics, *2001 National Household Travel Survey (NHTS) Data*, available at <http://nhts.ornl.gov> as of Sept. 2009.

2009: U.S. Department of Transportation, Federal Highway Administration, Bureau of Transportation Statistics, *2009 National Household Travel Survey (NHTS) Data*, personal communication.

2017: U.S. Department of Transportation, Federal Highway Administration, Bureau of Transportation Statistics, *2017 National Household Travel Survey* available at <https://nhts.ornl.gov/> as of May 17, 2018.

TABLE 1-27: Condition of U.S. Roadways by Functional System

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), tables HM-63 and HM-64, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 3, 2020.

TABLE 1-28: Condition of U.S. Highway Bridges

U.S. Department of Transportation, Federal Highway Administration, Office of Bridges and Structure, *National Bridge Inventory (NBI)*, available at <https://www.fhwa.dot.gov/bridge/nbi.cfm> as of Mar. 5, 2021.

TABLE 1-29: Average Age of Urban Transit Vehicles

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

1990-14: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual reports), table 25 and similar tables in earlier editions.

2015-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual reports), Vehicles, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 9, 2021.

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

1990: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database 1991* (Washington, DC: 1993), table 29 and similar tables in earlier editions

2000-13: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends* (Washington, DC: Annual reports), table A56 and similar tables in earlier editions, available at <https://www.transit.dot.gov/ntd/annual-national-transit-summaries-and-trends> as of May 5, 2016.

TABLE 1-30: Condition of Urban Bus and Rail Transit Maintenance Facilities

1995-2004: U.S. Department of Transportation, Federal Transit Administration, Transit Economic Requirements Model, as of Feb. 12, 2008.

2006: U.S. Department of Transportation, Federal Transit Administration, *Status of the Nation's Highways, Bridges and Transit: Conditions and Performance* (Washington, DC: Biennial Issues), tables 3-31 and 3-34, available at <http://www.fhwa.dot.gov/pubstats.html> as of June 25, 2010.

2009-14: U.S. Department of Transportation, Federal Transit Administration, Personal Communication, Oct 2017.

2018-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database, Annual Database Facility Inventory*, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Feb. 16, 2021.

TABLE 1-31: Condition of Rail Transit Infrastructure

1995-2006: U.S. Department of Transportation, Federal Transit Administration, *Status of the Nation's Highways, Bridges and Transit: Conditions and Performance* (Washington, DC: Biennial Issues), tables 3-35 and 3-36, available at <http://www.fhwa.dot.gov/pubstats.html> as of June 25, 2010.

2009-14: U.S. Department of Transportation, Federal Transit Administration, Personal Communication, Oct 2017.

TABLE 1-32: Class I Railroad Locomotive Fleet by Year Built

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues) p. 51 and similar pages in earlier editions.

TABLE 1-33: Age and Availability of Amtrak Locomotive and Car Fleets

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

1990-2000: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-20: Amtrak, Amtrak Active Fleet, personal communications, Aug. 20, 2009, July 1, 2010, Sept. 13, 2011, July 24, 2012, May 10, 2013, and July 19, 2013, June 16, 2014, July 21, 2016, June 26, 2017, May 23, 2019, Aug. 31, 2020, and Aug. 5, 2021.

TABLE 1-34: U.S. Flag Vessels by Type and Age

U.S. Army Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 1, National Summaries* (New Orleans, LA: Annual Issues), table 4, available at <https://www.iwr.usace.army.mil/About/Technical-Centers/WCSC-Waterborne-Commerce-Statistics-Center/> as of Feb. 9, 2021.

TABLE 1-35, 1-35M: U.S. Vehicle-Miles

Air:

Air carrier:

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

1970: Civil Aeronautics Board, *Handbook of Airline Statistics 1973* (Washington, DC: 1974), part III, table 2.

1980-2019: U.S. Department of Transportation, Bureau of Transportation Statistics, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class, Revenue Aircraft Miles Flown by Carrier Group (1-6) and Carrier Region (D for domestic) for all services (Z for all services)*, available at <https://www.transtats.bts.gov/homepage.asp> as of Jan. 8, 2021.

General aviation:

1960: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation 1972* (Washington, DC: 1973), table 9.10.

1970: 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.

1990: U.S. National Transportation Safety Board, *General Aviation Activity and Avionics Survey* (Washington, DC: Annual Issues), table 3.3.

Highway:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan 6, 2020

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 8, 2021.

Transit:

1960-90: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: Annual Issues), tables 6, 51, and similar tables in earlier editions.

2000-14: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Transit Operating Stats.

2015-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 23, 2020.

Rail:

Class I rail freight train- and car-miles:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 36 and 37.

Intercity/Amtrak train-miles:

1960-70: Association of American Railroads, *Yearbook of Railroad Facts* (Washington, DC: 1975), p. 39.

1980-2000: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73.

Intercity/Amtrak car-miles:

1960-70: 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.

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73.

TABLE 1-36, 1-36M: Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional System

Vehicle-miles traveled (VMT):

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-202, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 29, 2020.

Lane-miles:

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HM-260, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 29, 2020.

TABLE 1-37: U.S. Air Carrier Aircraft Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons

Hub classifications:

U.S. Department of Transportation, Federal Aviation Administration, Airport Categories, available at https://www.faa.gov/airports/planning_capacity/categories/ as of Apr. 16, 2021.

Airport data:

1980-90: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Airport Activity Statistics of Certified Route Air Carriers (Washington, DC: Annual issues), tables 2, 3, 4, and 5.

2000-20: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Airport Activity Statistics Database (Form 41 Schedule T-3), special tabulation, available at <https://www.transtats.bts.gov/>, as of June 14, 2021.

TABLE 1-38, 1-38M: Average Length of Haul, Domestic Freight and Passenger Modes

Freight:

Air carrier:

2000: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Freight Summary Data* (U.S. Carriers), special tabulation, available at http://www.transtats.bts.gov/rtm91_02.htm as of Aug. 18, 2011.

2005-20: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Cargo Summary Data* (All U.S. Carriers), special tabulation, available at <http://www.transtats.bts.gov/freight.asp> as of July 26, 2021.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), pp. 30, 31, and similar pages in previous editions.

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, available at <http://www.navigationdatacenter.us/wcsc/wcsc.htm> as of July 27, 2021.

Oil pipeline:

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

Passenger:

Air carrier:

1960-90: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Air Carrier Traffic Statistics, *T-100 Segment Data* (Washington, DC: Annual Issues), p. 3 and similar pages in previous issues.

2000-20: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, TranStats Database, *T-100 Market Data and T-100 Segment Data*, special tabulation, available at http://www.transtats.bts.gov/Data_Elements.aspx?Data=3 as of July 26, 2021.

Commuter rail:

1980-90: American Public Transportation Association, *Public Transportation Fact Book, Appendix A: Historical Tables* (Washington, DC: April 2011), table 3, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Aug. 18, 2011.

2000: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), table 19 and similar tables in earlier editions as of Nov. 2016.

2005-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 10, 2020.

Amtrak:

1970-80: Amtrak, personal communication, Jan. 26, 1999.

1990-2000: Amtrak, *Amtrak Annual Report* (Washington, DC: 2003), Statistical Appendix.

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in previous editions.

TABLE 1-39: Worldwide Commercial Space Launches

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

2000-14: U.S. Department of Transportation, Federal Aviation Administration, *Commercial Space Transportation: Year in Review* (Washington, DC: Annual Issues), table 2, available at http://www.faa.gov/about/office_org/headquarters_offices/ast/ as of May 19, 2015.

2015-17: U.S. Department of Transportation, Federal Aviation Administration, Office of Commercial Space Transportation, *The Annual Compendium of Commercial Space Transportation*, Appendix 2, available at http://www.faa.gov/about/office_org/headquarters_offices/ast/ as of Aug. 8, 2018.

TABLE 1-40, 1-40M: U.S. Passenger-Miles

Air:

All data except general aviation:

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

1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: 1974), part III, table 2.

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Summary, T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class*, available at <https://transtats.bts.gov/> as of Mar. 25, 2020.

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Statistics T-100*, available at <https://transtats.bts.gov/> as of Aug. 19, 2021.

General aviation:

Eno Transportation Foundation, Inc., *Transportation in America, Annual Issues* (Washington, DC), pp. 40 and 45, and similar tables in earlier editions.

Highway:

Bus:

1990: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, table VM-201A, minus transit bus categories (Motor bus, Trolley bus, and Demand response).

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 8, 2021, minus transit bus categories (Motor bus, Trolley bus, and Demand response).

All other data:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, table VM-201A.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 8, 2021.

Transit:

Ferryboat:

2000-05: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Table 19, available at <http://www.ntdprogram.gov/ntdprogram/data.htm> as of Apr. 26, 2016.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Jan. 8, 2021.

All other data:

1960-1990: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: Annual Issues), table 2 and similar tables in earlier editions.

2000-05: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Table 19, available at <http://www.ntdprogram.gov/ntdprogram/data.htm> as of Apr. 26, 2016.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Jan. 8, 2021.

Intercity / Amtrak:

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

1990-2000: Amtrak, *Amtrak Annual Report* (Washington, DC: Annual Issues), Statistical Appendix.

2005-20: Amtrak, Energy Management Department and Government Affairs Department, personal communications, Aug. 5, 2021.

Walking, cycling:

U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, *National Household Travel Survey data*, available at <https://nhts.ornl.gov/> as of July 15, 2020.

TABLE 1-41: Principal Means of Transportation to Work

1990-2000: U.S. Department of Housing and Urban Development, *American Housing Survey for the United States: 2005* (Washington, DC: 2006), table 2-24 and similar tables in earlier editions, available at <http://www.census.gov/hhes/www/ahs.html> as of Oct. 12, 2006.

2005-19: U.S. Department of Commerce, Bureau of Census, *American Community Survey*, table B08301, 1-Year estimates, available at <https://data.census.gov/> as of Sept. 17, 2020.

TABLE 1-42: Average Annual PMT, VMT Person Trips and Trip Length by Trip Purpose

U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, *National Household Travel Survey data*, May 18, 2018.

TABLE 1-43: Summary Statistics on Demographic Characteristics and Total Travel

U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, *National Household Travel Survey data*, May 17, 2018.

TABLE 1-44: Passengers Boarded at the Top 50 U.S. Airports

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information (Air Carriers Statistics - Form 41 Traffic), *T-100 Market (All Carriers)*, available at <http://transtats.bts.gov/> as of Oct. 13, 2021.

TABLE 1-45: Air Passenger Travel Arrivals in the United States from Selected Foreign Countries**Total and all selected countries:**

1980: 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

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, TranStats, Air Carriers data, *T-100 International Segment*, available at www.transtats.bts.gov as of June 14, 2021.

U.S. carriers:

U.S. Department of Transportation, Bureau of Transportation Statistics, TranStats, Air Carriers data, *T-100 International Segment*, available at www.transtats.bts.gov as of June 14, 2021.

TABLE 1-46: Air Passenger Travel Departures from the United States to Selected Foreign Countries

Totals and all selected countries:

1980: 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.

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, TranStats, Air Carriers data, *T-100 International Segment*, available at www.transtats.bts.gov as of June 14, 2021.

U.S. carriers:

U.S. Department of Transportation, Bureau of Transportation Statistics, TranStats, Air Carriers data, *T-100 International Segment*, available at www.transtats.bts.gov as of June 14, 2021.

TABLE 1-47: U.S.-Canadian Border Land-Passenger Gateways: Entering the United States

U.S. Department of Transportation, Bureau of Transportation Statistics, *Border Crossing/Entry Data*, Annual Data, available at <https://www.bts.gov/content/border-crossingentry-data> as of Feb. 9, 2021.

TABLE 1-48: U.S.-Mexican Border Land-Passenger Gateways: Entering the United States

U.S. Department of Transportation, Bureau of Transportation Statistics, *Border Crossing/Entry Data*, available at <https://www.bts.gov/content/border-crossingentry-data> as of Feb. 9, 2021.

TABLE 1-50, 1-50M: U.S. Ton-Miles of Freight (BTS Special Tabulation)

Total:

1980-2011: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation.

2012-18: U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, *Freight Analysis Framework*, available at <http://faf.oml.gov/fafweb/Extraction1.aspx>, as of July 21, 2020.

Air:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, TranStats Database, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class*, available at <https://www.transtats.bts.gov/Fields.asp> as of July 26, 2021.

Truck:

Difference between total of all modes, and sum of other modes.

Railroad:

1980: Association of American Railroads

1990-2019: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 30 and similar pages in previous editions.

Water:

1980-2016: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: Annual Issues), part 5, tables 1-4, available at <http://www.navigationdatacenter.us/wcsc/wcsc.htm> as of Mar. 10, 2020.

2017-19: U.S. Army Corps of Engineers, The U.S. Waterway System, *Transportation Facts & Information*, p. 3, available at <http://www.navigationdatacenter.us/wcsc/wcsc.htm> as of July 26, 2021.

Pipeline:

1980-90: Association of Petroleum Pipelines, *Shifts in Petroleum Transportation* (Washington, DC: Annual Issues), table 1, available at <http://www.aopl.org/publications/?fa=reports> as of Oct. 22, 2013.

2000-11: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation.

2012-18: U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, *Freight Analysis Framework*, available at <http://faf.oml.gov/fafweb/Extraction1.aspx>, as of July 21, 2020.

TABLE 1-51: Top U.S. Foreign Trade Freight Gateways by Value of Shipments

Air: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, *USA Trade Online*, available at <https://usatrade.census.gov> as of Nov. 13, 2020.

Land: U.S. Department of Transportation, Bureau of Transportation Statistics, *North American Transborder Freight Data*, available at <https://www.bts.gov/transborder> as of Nov. 13, 2020.

Water: U.S. Army Corps of Engineers, Navigation Data Center, personal communication, special tabulation, Dec. 9, 2019 and Nov. 12, 2020.

TABLE 1-52: U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings

U.S. Department of Transportation, Bureau of Transportation Statistics, *Border Crossing/Entry Data*, available at <https://www.bts.gov/content/border-crossingentry-data> of Feb. 9, 2021.

TABLE 1-53: U.S.-Canadian Border Land-Freight Gateways: Number of Incoming Truck or Train Crossings

U.S. Department of Transportation, Bureau of Transportation Statistics, *Border Crossing/Entry Data*, available at <https://www.bts.gov/content/border-crossingentry-data> of Feb. 9, 2021.

TABLE 1-54: U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck or Rail Container Crossings

U.S. Department of Transportation, Bureau of Transportation Statistics, *Border Crossing/Entry Data*, available at <https://www.bts.gov/content/border-crossing-entry-data> of Feb. 10, 2021.

TABLE 1-55: U.S.-Mexican Border Land-Freight Gateways: Number of Incoming Truck and Train Crossings

U.S. Department of Transportation, Bureau of Transportation Statistics, *Border Crossing/Entry Data*, available at <https://www.bts.gov/content/border-crossingentry-data> as of Feb. 10, 2021.

TABLE 1-56, 1-56M: U.S. Waterborne Freight

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

1970-2015: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: Annual Issues), part 5, tables 1-2 and 1-3, available at <http://www.navigationdatacenter.us/wcsc/wcsc.htm> as of Apr. 16, 2018.

2000-19: U.S. Army Corps of Engineers, *Waterborne Commerce Cargo Data*, available at <https://www.iwr.usace.army.mil/about/technical-centers/wcsc-waterborne-commerce-statistics-center/> as of Feb. 12, 2021.

TABLE 1-57: Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons

U.S. Army Corps of Engineers, *Principal Ports of the United States*, Waterborne tonnage for principal U.S. ports and all 50 states and U.S. territories, available at <https://www.iwr.usace.army.mil/about/technical-centers/wcsc-waterborne-commerce-statistics-center/> as of Jan. 29, 2021.

TABLE 1-58: Freight Activity in the United States

U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2017 Commodity Flow Survey* (Washington, DC: July 2020), CF1700A09, available at <https://www.census.gov/programs-surveys/cfs.html> as of July 16, 2020.

TABLE 1-59: Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments

U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2017 Commodity Flow Survey* (Washington, DC: July 2020), CF1700A09, available at <https://www.census.gov/programs-surveys/cfs.html> as of July 16, 2020.

TABLE 1-60a: Value of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode (Millions of dollars)

2000: U.S. Department of Commerce, Census Bureau, *FT 920: U.S. Merchandise Trade Selected Highlights*, various December issues.

2005: U.S. Department of Commerce, Census Bureau, *USA Trade Online*, available at <https://usatrade.census.gov/> as of Mar. 22, 2019.

2010-20: U.S. Department of Transportation, Bureau of Transportation Statistics, *Transborder Freight Data*, available at <https://www.bts.gov/transborder> as of Mar. 11, 2021.

TABLE 1-60b: Weight of U.S. Exports to and Imports from Canada and Mexico by Transportation Mode (Millions of short tons)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Transborder Freight Data*, available at <https://www.bts.gov/transborder> as of Mar. 17, 2021.

TABLE 1-61: Crude Oil and Petroleum Products Transported in the United States by Mode (Thousands)

U.S. Department of Energy, Energy Information Administration, *Movements between PAD Districts*, available at <https://www.eia.gov/petroleum/data.php> as of Mar. 22, 2021.

TABLE 1-62: U.S. Hazardous Materials Shipments by Transportation Mode

U.S. Department of Transportation, Bureau of Transportation Statistics, U.S. Department of Commerce, Census Bureau, *2017 Commodity Flow Survey, Hazardous Materials Series* (Washington, DC: July 2020), table CF1700H01, available at <https://www.census.gov/programs-surveys/cfs.html> of July 17, 2020.

TABLE 1-63: U.S. Hazardous Materials Shipments by Hazard Class

U.S. Department of Transportation, Bureau of Transportation Statistics, U.S. Department of Commerce, Census Bureau, *2017 Commodity Flow Survey: Hazardous Materials Series* (Washington, DC: July 2020), table CF1700H02, available at <https://www.census.gov/programs-surveys/cfs.html> of July 17, 2020.

TABLE 1-64: Passengers Boarded and Denied Boarding by the Largest U.S. Air Carriers

U.S. Department of Transportation, Office of Aviation Enforcement and Proceedings, Aviation Consumer Protection Division, *Air Travel Consumer Report* (Washington, DC: Annual February Issues), Passengers Denied Boarding by Reporting Operating U. S. Airlines, available at <http://www.dot.gov/airconsumer/air-travel-consumer-reports> as of Feb. 25, 2021.

TABLE 1-65: Mishandled-Baggage Reports Filed by Passengers with the Largest U.S. Air Carriers

U.S. Department of Transportation, Office of Aviation Enforcement and Proceedings, Aviation Consumer Protection Division, *Air Travel Consumer Report* (Washington, DC: Annual February Issues), available at <http://www.dot.gov/airconsumer/air-travel-consumer-reports> as of Apr. 21, 2021.

TABLE 1-66: Flight Operations Arriving on Time by the Largest U.S. Air Carriers

U.S. Department of Transportation, Office of Aviation Enforcement and Proceedings, Aviation Consumer Protection Division, *Air Travel Consumer Report* (Washington, DC: Annual February Issues), Table 1B, available at <http://www.dot.gov/airconsumer/air-travel-consumer-reports> as of Feb. 26, 2021.

TABLE 1-67: FAA-Cited Causes of Departure and En Route Delays

1987-90: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Capacity Enhancement Plan* (Washington, DC: Annual Issues).

2000-20: U.S. Department of Transportation, Federal Aviation Administration, *The Operations Network (OPSNET) Database Delays: Delay by Cause Report*, available at <https://aspm.faa.gov/opsnet/sys/Delays.asp> as of Feb. 5, 2021.

TABLE 1-68: Major U.S. Air Carrier Delays, Cancellations, and Diversions

1990: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airline Service Quality Performance Data*.

2000-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airline On-Time Tables*, Table 1A - Reporting Operating Carrier Summary of Airline On-Time Performance from 1995 Year-to-date December 2020, available at <https://www.bts.gov/topics/airline-time-tables> as of Feb. 25, 2021.

TABLE 1-69: Annual Person-Hours of Highway Traffic Delay per Person

Texas A&M Transportation Institute, *2021 Urban Mobility Report*, (College Station, TX: 2021), available at <http://mobility.tamu.edu> as of Sept. 7, 2021.

TABLE 1-70: Travel Time Index

Texas A&M Transportation Institute, *2021 Urban Mobility Report*, (College Station, TX: 2021), available at <http://mobility.tamu.edu> as of Sept. 8, 2021.

TABLE 1-71: Annual Roadway Congestion Index

Texas Transportation Institute, *Congestion Data for Your City*, Excel spreadsheet of the base statistics for the 101 urban areas and population group summary statistics (College Station, TX: 2012), available at <http://mobility.tamu.edu> as of Feb. 6, 2013.

TABLE 1-72: Annual Highway Congestion Cost

Texas A&M Transportation Institute, *2021 Urban Mobility Report*, (College Station, TX: 2021), available at <http://mobility.tamu.edu> as of Sept. 9, 2021.

TABLE 1-73: Amtrak On-Time Performance Trends and Hours of Delay by Cause

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

1990: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2000-20: Amtrak, Government Business, National Network, personal communications, Oct. 2010, Oct. 2011, Dec. 2012, Feb. 25, 2016, July 25, 2017, May 30, 2019, Aug. 31, 2020, and Aug. 5, 2021.

TABLE 2-01: Transportation Fatalities by Mode

Air:

Air, total:

1960-99: Sum of categories.

2000-20: National Transportation Safety Board, Personal Communication, as of Oct. 21, 2021.

U.S. 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).

1970: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1975*, NTSB/ARC-77/1 (Washington, DC: January 1977).

1980: 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), tables 2 and 16.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 5, available at http://www.ntsb.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Commuter:

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.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 8, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

On-demand air taxi:

1980: 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.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 9, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

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.

1980: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1985*, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 10, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Highway:

1960: 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).

1970: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts* (Annual Editions), Table 4, available at <https://crashstats.nhtsa.dot.gov/#/> as of Oct. 2017.

1980-2019: U.S. Department of Transportation, *National Highway Traffic Safety Administration*, Personal Communication, Jan. 12, 2021.

2020: U.S. Department of Transportation, National Highway Traffic Safety, *Early Estimates of Motor Vehicle Traffic Fatalities and Fatality Rate by Sub-Categories in 2020*, Table 2, available at <https://crashstats.nhtsa.dot.gov/#/> as of Sept. 24, 2021.

Rail:

1960-70: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Rail-Highway Grade-Crossing Handbook 2007*, available at https://safety.fhwa.dot.gov/hsip/xings/com_roaduser/07010/sec01.cfm as of Nov. 14, 2019.

1980-2020: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, table 1.12, 1.13, and 5.14, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Oct. 22, 2021.

Transit:

1990-2000: U.S. Department of Transportation, Volpe Center, *Transit Safety and Security Statistics*, Mar. 2015.

2005-20: U.S. Department of Transportation, Federal Transit Administration, *National Transportation Database*, Safety & Security Time Series Data (Washington, DC: Monthly Issues) available at <https://www.transit.dot.gov/ntd/ntd-data> as of Oct. 22, 2021.

Water:

Passenger, Freight, Industrial/Other:

U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, Nov. 20, 2012 and Nov. 12, 2013, Aug. 31, 2015, May 2016, July 2017, Aug. 16, 2018, Aug. 28, 2019, Sept. 9, 2020, and Aug. 6, 2021.

Recreational:

1960-00: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual Issues), table 31, available at <http://www.uscgboating.org> as of June 2014.

2005-20: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Recreational Boating Statistics* (annual issues), table 29, available at www.uscgboating.org as of Aug. 6, 2021.

Pipeline:

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

1990-2020: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Accident and Incident Summary Statistics by Year*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends> as of Aug. 16, 2021.

TABLE 2-02: Injured Persons by Transportation Mode

Air:

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

1995-2020: National Transportation Safety Board, Analysis and Data Division, personal communications, Nov. 9, 2009, Sept. 29, 2011, Jan. 23, 2013, Aug. 2013, Apr. 2015, Oct. 2015, Sept. 2016, Apr. 4, 2018, May 21, 2019, Nov. 25, 2019, Sept. 15, 2020 and Oct. 22, 2021.

Highway:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Personal Communication, Jan. 12, 2021.

Rail:

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

1975-2020: U.S. Department of Transportation, Federal Railroad Administration, *Office of Safety Analysis*, tables 1.12, 1.13, and 5.14, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Oct. 22, 2021.

Transit:

1990-2001: U.S. Department of Transportation, Volpe Center, Transit Safety and Security Statistics, *Safety & Security Time Series Data*, as of Mar. 2015.

2002-20: U.S. Department of Transportation, Federal Transit Administration, *National Transportation Database*, Safety & Security Time Series Data available at <https://www.transit.dot.gov/ntd/ntd-data> as of Oct. 22, 2021.

Water:*Passenger, freight, industrial/other:*

2002-15: U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, Marine Casualty and Pollution Data for Researchers (Apr. 6, 2015), available at <https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Marine-Casualty-and-Pollution-Data-for-Researchers-/> as of July 11, 2017.

2016-20: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, May 24, 2019, Sept. 9, 2020, and Aug 6, 2021.

Recreational boating:

1960-2002: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual Issues), table 31, available at <http://www.uscgboating.org> as of June 2014.

2003-20: U.S. Department of Homeland Security, U.S. Coast Guard, *Recreational Boating Statistics* (annual issues), available at www.uscgboating.org as of Aug. 19, 2020.

Pipeline:

U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Accident and Incident Summary Statistics by Year*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends> as of Oct. 25, 2021.

TABLE 2-03: Transportation Accidents by Mode**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: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1975*, NTSB/ARC-77/1 (Washington, DC: January 1977).

1975: National Transportation Safety Board, *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: 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), tables 2 and 16.

1985-95: National Transportation Safety Board, personal communication, Sept. 4, 2007.

1996-2020: National Transportation Safety Board, *Preliminary Aviation Statistics*, table 5, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

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.

1985-95: National Transportation Safety Board, personal communication, Sept. 4, 2007.

1996-2020: National Transportation Safety Board, *Preliminary Aviation Statistics*, table 8, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

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.

1985-95: National Transportation Safety Board, personal communication, Sept. 4, 2007.

1996-2020: National Transportation Safety Board, *Preliminary Aviation Statistics*, table 9, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

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

1985-95: National Transportation Safety Board, personal communication, Sept. 4, 2007.

1996-2020: National Transportation Safety Board, *Preliminary Aviation Statistics*, table 10, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Highway:

Total:

1990-2004: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts Annual Report Tables*, table 1, available at <https://cdan.nhtsa.gov/tsftables/tsfar.htm#> as of Aug. 28, 2020.

2005-2019: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Fatality and Injury Reporting System Tool*, available at <https://cdan.dot.gov/query> as of Feb. 3, 2021.

Passenger car, motorcycle, light truck, large truck, and bus:

1990-2004: 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*.

2005-2019: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Fatality and Injury Reporting System Tool*, available at <https://cdan.dot.gov/query> as of Feb. 3, 2021.

Rail:

U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, table 1.12 and 5.14, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Oct. 22, 2021.

Transit:*Transit total:*

1990-2011: U.S. Department of Transportation, Federal Transit Administration, Transit Safety, Safety and Security Statistics, August 9, 2016.

2012-19: U.S. Department of Transportation, Federal Transit Administration, personal communication, Jan. 11, 2018, June 26, 2019 and Oct. 29, 2020.

Highway-rail grade crossings:

1960-2007: U.S. Department of Transportation, Federal Transit Administration, Office of Program Management, personal communication, Sept. 4, 2007.

2008-19: U.S. Department of Transportation, Federal Transit Administration, personal communication, Oct. 14, 2010, Nov. 4, 2011, Jan. 18, 2013, Jan. 8, 2015, June 20, 2016, and Jan. 11, 2018, June 26, 2019 and Oct. 29, 2020.

Water:*Vessel-related:*

1970-91: Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, Apr. 13, 1999.

1992-2005: Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, Data Administration Division (G-MRI-1), personal communication, June 8, 2005.

2006-20: Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, Nov. 20, 2012 and Nov. 12, 2013, Aug. 31, 2015, May 2016, July 11, 2017, Oct. 11 2017, Aug. 16, 2018, Aug. 28, 2019, Sept. 9, 2020, and Aug. 6, 2021.

Recreational boating:

U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual Issues), table 29, available at http://www.uscgboating.org/statistics/accident_statistics.php as of Aug. 6, 2021.

Pipeline:

1970-85: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, *Accident and Incident Summary Statistics by Year*, available at <http://ops.dot.gov> as of Nov. 18, 2003.

1990-2020: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Pipeline Incident 20 Year Trends*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends> as of Oct. 22, 2021.

TABLE 2-04: Distribution of Transportation Fatalities by Mode**Air:***Air, total:*

1960-90: Sum of categories.

2000-19: National Transportation Safety Board, Personal Communication, as of Oct. 28, 2020.

U.S. 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).

1970: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations*, Calendar Year 1975, NTSB/ARC-77/1 (Washington, DC: January 1977).

1980: 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), tables 2 and 16.

1990-2019: Ibid., *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 5, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 28, 2020.

Commuter:

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.

1990-2019: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 8, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 28 2020.

On-demand air taxi:

1980: 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.

1990-2019: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 9, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 28, 2020.

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.

1980: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation*, Calendar Year 1985, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.

1990-2019: National Transportation Safety Board, *Aviation Accident Statistics* (Washington, DC: Annual Issues), table 10, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 28, 2020.

Highway:

1960: 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).

1970: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts* (Annual Editions), Table 4, available at <https://crashstats.nhtsa.dot.gov/#/> as of Oct. 2017.

1980-2018: U.S. Department of Transportation, National Highway Traffic Safety Administration, Personal Communication, Nov. 5, 2019.

2019: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts* (Annual Editions), Preview of Motor Vehicle Traffic Fatalities in 2019, available at <https://crashstats.nhtsa.dot.gov/#/> as of Oct. 5 2020.

Rail:

1960-70: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Rail-Highway Grade-Crossing Handbook 2007*, available at https://safety.fhwa.dot.gov/hsip/xings/com_roaduser/07010/sec01.cfm as of Nov. 14, 2019.

1980-2019: U.S. Department of Transportation, Federal Railroad Administration, *Office of Safety Analysis*, table 1.12, 1.13, and 5.14, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Oct. 19, 2020.

Transit:

1990-2000: U.S. Department of Transportation, Volpe Center, *Transit Safety and Security Statistics*, as of Mar. 2015.

2005-19: U.S. Department of Transportation, Federal Transit Administration, National Transportation Database, *Safety & Security Time Series Data* (Washington, DC: Monthly Issues) available at <https://www.transit.dot.gov/ntd/ntd-data> as of Oct. 19, 2020.

Water:

Passenger, freight, industrial/other:

U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, Nov. 20, 2012 and Nov. 12, 2013, Aug. 31, 2015, May 2016, July 2017, Aug. 16, 2018, Aug. 28, 2019, and Sept. 9, 2020.

Recreational:

1960-2000: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, *Boating Statistics* (Washington, DC: Annual Issues), table 31, available at <http://www.uscgboating.org> as of June 2014.

2005-19: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis, *Recreational Boating Statistics* (annual issues), table 29, available at www.uscgboating.org as of Aug. 7, 2020.

Pipeline:

1970-80: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, *Accident and Incident Summary Statistics by Year*, Nov. 18, 2003.

1990-2019: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Accident and Incident Summary Statistics by Year*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends> as of Oct. 19, 2020.

TABLE 2-05: Highway-Rail Grade-Crossing Safety

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

1980-2020: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *FRA Accident/Incident Database*, table 1.12, Ten Year Accident/Incident Overview, available at <https://safetydata.fra.dot.gov/OfficeofSafety/default.aspx> as of Mar. 19, 2021.

TABLE 2-06: Hazardous Materials Fatalities, Injuries, Accidents, and Property Damage Data

1980: U.S. Department of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Safety, *Hazardous Materials Information System Database*, 1999.

1990-2020: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Material Safety, 10 Year Incident Summary Reports, available at <https://www.phmsa.dot.gov/hazmat-program-management-data-and-statistics/data-operations/incident-statistics> as of Mar. 9, 2021.

TABLE 2-07: Transportation-Related Occupational Fatalities

U.S. Department of Labor, Bureau of Labor Statistics, *Census of Fatal Occupational Injuries (CFOI)*, available at <http://www.bls.gov/iif/oshcfoi1.htm> as of Mar. 19, 2021.

TABLE 2-08: Reporting Thresholds for Property Damage by U.S. Department of Transportation Modal Administrations

Federal Aviation Administration: 49 CFR 830.5 (as of Apr. 12, 2019).

Federal Highway Administration: U.S. Department of Transportation, Federal Highway Administration, personal communication, Dec 2007.

Federal Railroad Administration: 49 CFR 225.19 (as of Apr. 12, 2019).

National Highway Traffic Safety Administration: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2006*, DOT HS 810 818 (Washington, DC: 2006), available at: <http://www-nrd.nhtsa.dot.gov/Pubs/810818.pdf>, as of Apr. 12, 2019.

Federal Transit Administration: U.S. Department of Transportation, Federal Transit Administration, National Transit Database, *2019 Safety and Security Reporting Manual* (Washington, DC: 2019), available at: <https://www.transit.dot.gov/ntd/2019-ntd-safety-and-security-policy-manual> as of Apr. 12, 2019.

Pipeline and Hazardous Materials Safety Administration:

Gas pipeline: 49 CFR 191.3 (as of Apr. 12, 2019).

Hazardous liquid pipelines: 49 CFR 195.50 (as of Apr. 12, 2019).

U.S. Coast Guard:

Commercial shipping: 46 CFR 4.05-1 (as of Apr. 12, 2019).

Recreational boating: 33 CFR 173.55 (as of Apr. 12, 2019).

TABLE 2-09: U.S. Air Carrier Safety Data

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).

1970: National Transportation Safety Board, Calendar Year 1975, NTSB/ARC-77/1 (Washington, DC: January 1977).

1980: National Transportation Safety Board, Calendar Year 1981, NTSB/ARC-85/01 (Washington, DC: February 1985), tables 2 and 16.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics*, table 5, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Serious injuries:

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

1990-2020: National Transportation Safety Board, Analysis and Data Division, personal communication, Apr. 2011, July 2012, Aug. 2013, Sept. 25, 2014, Apr. 2, 2015, Mar. 22, 2016, Sept. 26, 2016, Apr. 20, 2018, Aug. 8, 2019, Nov. 25, 2019, Oct. 28, 2020 and Oct. 21, 2021.

TABLE 2-10: U.S. Commuter Air Carrier Safety Data

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.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics*, table 8, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Serious injuries:

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

1990-2020: National Transportation Safety Board, Analysis and Data Division, personal communications, Apr. 16, 2011, July 18, 2012, Aug. 7, 2013, Sept. 24, 2014, Mar. 22, 2016, Sept. 26, 2016, Apr. 30, 2018, Aug. 8, 2019, Nov. 25, 2019, Oct. 28, 2020, and Oct. 21, 2021.

TABLE 2-11: U.S. Air Carrier Fatal Accidents by First Phase of Operation

National Transportation Safety Board, personal communications, Dec. 20, 2010, Aug. 10, 2011, July 18, 2012, Aug. 7, 2013, Sept. 24, 2014, Mar. 23, 2016, Sept. 26, 2016, Apr. 30, 2018, Aug. 12, 2019, Nov. 25, 2019, Oct. 14, 2020 and Oct. 21, 2021.

TABLE 2-12: U.S. Commuter Air Carrier Fatal Accidents by First Phase of Operation

National Transportation Safety Board, personal communications, Dec. 20, 2010, and Aug. 11, 2011, July 18, 2012, Aug. 7, 2013, Sept. 24, 2014, Mar. 23, 2016, Sept. 26, 2016, Apr. 30, 2018, Aug. 12, 2019, Nov. 25, 2019, Oct. 14, 2020 and Oct. 21, 2021.

TABLE 2-13: U.S. On-Demand Air Taxi Safety Data

Fatalities, accidents, and flight hours:

1980: 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.

1990-2020: National Transportation Safety Board, *Aviation Accident Statistics*, table 9, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Serious injuries:

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

1990-2020: National Transportation Safety Board, Analysis and Data Division, personal communications, July 1, 2010, July 20, 2011, July 20, 2012, Sept. 24, 2014, Mar. 22, 2016, Sept. 26, 2016, Aug. 8, 2017, Aug. 9, 2019, Nov. 25, 2019, Oct. 14, 2020, and Oct. 21, 2021.

TABLE 2-14: U.S. General Aviation Safety Data

Fatalities, accidents, flight hours and rates per 100,000 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.

1980-2020: National Transportation Safety Board, *Aviation Accident Statistics*, table 10, available at http://www.nts.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

Serious injuries:

1970-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation* (Washington, DC: Annual Issues).

1990-2020: National Transportation Safety Board, Analysis and Data Division, personal communications, July 1, 2010, July 20, 2011, July 18, 2012, Aug. 8, 2013, Sept. 24, 2014, Mar. 22, 2016, Sept. 26, 2016, Apr. 30, 2018, Nov. 25, 2019, Oct. 28, 2020 and Oct. 21, 2021.

TABLE 2-15: Number of Pilot-Reported Near Midair Collisions (NMAC) by Degree of Hazard

1980: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Safety Statistical Handbook Annual Report* (Washington, DC: Annual issues) and personal communication, Aug. 6, 2002.

1990-2020: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Safety Information Analysis and Sharing (ASIAS) System, Data & Information, NMACS Database Query Tool*, available at <http://www.asias.faa.gov/> as of July 27, 2021.

TABLE 2-16: Prohibited Items Intercepted at Airport Screening Checkpoints

All data, except enplanements:

2005: U.S. Department of Homeland Security, Transportation Security Administration, *Performance Measurement Information System (PMIS)* and personal communication, November 2010.

2010-20: U.S. Department of Homeland Security, Transportation Security Administration, *TSA Year in Review*, available at <https://www.tsa.gov/blog/2020/01/15/tsa-year-review-2019> as of Oct. 26, 2021.

Enplanements:

U.S. Department of Transportation, Office of Airline Information, *T-100 Domestic Market Data*, at https://www.transtats.bts.gov/Data_Elements.aspx?Data=1 as of Oct. 26, 2021.

TABLE 2-17: Motor Vehicle Safety Data**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).

1980-2019: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, personal communication, Oct. 16, 2018, Nov. 6, 2019, and Jan. 6, 2021.

Injured persons and crashes:

1990-2019: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, personal communication, Oct. 16, 2018, Nov. 6, 2019, and Jan. 6, 2021.

Vehicle-miles:

1960: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Apr. 13, 2011.

1970-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-202, and similar tables in earlier editions, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 8, 2021.

Fatality, injury, and 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**Fatalities:**

1980: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table FI-220, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Feb. 19, 2019.

1990-2019: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System (FARS) Database, personal communications, Jan. 12, 2021.

Vehicle miles:

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-202, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 13, 2021.

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

U.S. Department of Transportation, National Highway Traffic Safety Administration, personal communications, June 7, 2012, May 22, 2013, June 14, 2014, Mar. 17, 2016, Nov. 23, 2016, Oct. 11, 2017, Oct. 16, 2018, Nov. 6, 2019, and Jan. 12, 2021.

TABLE 2-20: Occupant and Nonmotorist Fatalities in Crashes by Number of Vehicles and Alcohol Involvement (AI)

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System (FARS) Database, personal communications, Sept. 6, 2006, Dec. 9, 2008, Oct. 20, 2009, Nov. 22, 2010, June 7, 2012, May 22, 2013, June 16, 2014, Mar. 15, 2016, Nov. 23, 2016, Oct. 11, 2017, Oct. 16, 2018, Nov. 6, 2019, and Jan. 12, 2021.

TABLE 2-21a: Passenger Car Occupant Safety Data

U.S. Department of Transportation, National Highway Traffic Safety Administration, personal communications, Oct. 16, 2018, Nov. 6, 2019, May 12, 2020, and Jan. 12, 2021.

TABLE 2-21b: Work Zone Safety Data

U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics* (Washington, DC: Annual Issues), table MV-9, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Feb. 16, 2021.

TABLE 2-22: Motorcycle Occupant Safety Data

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System (FARS) Database and General Estimates System (NASS GES) Database, personal communications, June 7, 2012, May 22, 2013, June 16, 2014, Sept. 15, 2017, Oct. 16, 2018, Nov. 6, 2019, and Jan. 12, 2021.

TABLE 2-23: Truck Occupant Safety Data

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System (FARS) Database and General Estimates System (NASS GES) Database, personal communications, May 15, 2012, May 22, 2013, June 20, 2014, Mar. 31, 2015, Mar. 15, 2016, Sept. 15, 2017, Oct. 16, 2018, Nov. 6, 2019, May 13, 2020, and Jan. 12, 2021.

TABLE 2-24: Bus Occupant Safety Data

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, personal communications, June 7, 2012, June 20, 2014, Mar. 15, 2016, Sept. 15, 2017, Oct. 16, 2018, May 22, 2019, May 13, 2020, and Jan. 12, 2021.

TABLE 2-25: State Laws on Distracted Driving- Ban on Hand-Held Devices and Texting While Driving

Insurance Institute for Highway Safety (IIHS), Distracted Driving, *Cellphone use laws by state*, available at <https://www.iihs.org/topics/distracted-driving/cellphone-use-laws> as of Oct. 7, 2021.

TABLE 2-26: Fatalities by Highest Driver Blood Alcohol Concentration (BAC) in Highway Crashes

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, personal communications, Oct. 16, 2018, Nov. 6, 2019, and Jan. 12, 2021.

TABLE 2-27: Number of States with Different Types of Anti-DUI/DWI Legislation in Effect as of January 1 of the Listed Year**0.02 BAC and administrative license revocation:**

1990: 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.

2000, 2005-14: U.S. Department of Transportation, National Highway Traffic Safety Administration, Impaired Driving Division, personal communications, May 22, 2000, Feb. 5, 2004, Oct. 15, 2004, Apr. 20, 2010, Feb. 12, 2013 and Mar. 6, 2014.

0.08 BAC:

1990-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Presidential Initiative for Making 0.08 BAC the National Legal Limit, A Progress Report*, available at <http://www.nhtsa.dot.gov/people/injury/alcohol/limit.08/08progressreport/index.html> as of Aug. 13, 2001.

2005-14: U.S. Department of Transportation, National Highway Traffic Safety Administration, *08 BAC Laws* (Washington, DC: 2004), available at <http://www.nhtsa.dot.gov/people/injury/alcohol/blood.htm> as of Oct. 19, 2004 and personal communication, Aug. 21, 2004, Aug. 17, 2007, Apr. 20, 2011, Mar. 6, 2012, Feb. 12, 2013 and Mar. 6, 2014.

TABLE 2-28: Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Fatality Analysis Reporting System (FARS) Data Tables, Crashes, Web-Based Encyclopedia*, available at <http://www-fars.nhtsa.dot.gov/> as of Jan. 5, 2021.

TABLE 2-29: Motor Vehicles and Occupants Involved in Fatal Crashes by Posted Speed Limit

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System (FARS), *Fatality and Injury Reporting System Tool (FIRST)*, available at cdan.dot.gov/query as of Jan. 6, 2021.

TABLE 2-30: Safety Belt and Motorcycle Helmet Use**Safety belt use:**

2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Safety Belt and Helmet Use in 2002 -- Overall Results*, DOT HS 809 500 (Washington, DC: 2002), table 1 and 4, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809500> as of July 17, 2020.

2005-20: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts - Research Note, Seat Belt Use in 2020—Overall Results*, (Washington, DC, Annual issues), Table 1, and similar tables in previous years' publications, available at <https://crashstats.nhtsa.dot.gov/> as of July 8, 2021.

Motorcycle helmet use:

2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Safety Belt and Helmet Use in 2002 -- Overall Results*, DOT HS 809 500 (Washington, DC: 2002), table 6 as of Jan. 2003.

2005-20: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts - Research Note, Motorcycle Helmet Use in 2020--Overall Results*, (Washington, DC, Annual issues), Table 1, and similar tables in previous years' publications, available at <https://crashstats.nhtsa.dot.gov/> as of July 8, 2021.

TABLE 2-31: Estimated Number of Lives Saved by Occupant Protection, Motorcycle Helmets, and Drinking Age Law

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts, Crash*, available at <https://crashstats.nhtsa.dot.gov/#/> as of Apr. 23, 2019.

TABLE 2-32: Transit Safety and Property Damage Data

All except for property damage:

1990-2000: U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis Report* (Cambridge, MA: Annual Issues), available at <https://www.volpe.dot.gov/> as of Mar. 23, 2009.

2005-20: U.S. Department of Transportation, Federal Transit Administration, *Safety & Security Time Series Data* (Washington, DC: Monthly Issues), available at <https://www.transit.dot.gov/ntd/ntd-data> as of Oct. 13, 2021.

Property damage:

1990-2005: U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis Report* (Cambridge, MA: Annual Issues), available at <https://www.volpe.dot.gov/> as of Mar. 23, 2009.

2010-19: U.S. Department of Transportation, Federal Transit Administration, personal communications, May 11, 2011, July 8, 2013, Jan. 8, 2015, June 23, 2016, Jan. 11, 2018, Mar. 11, 2019 and Oct. 29, 2019.

TABLE 2-33: Transit Safety Data by Mode for All Reported Accidents

U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics*, available at <http://transit-safety.volpe.dot.gov/Data/Samis.asp> as of Sept. 15, 2009, and personal communications, Oct. 8, 2004, Apr. 22, 2005, Apr. 24, 2006, June 14, 2007, June 18, 2008, Sept. 1, 2010, Apr. 5, 2012, July 8, 2013, Jan. 8, 2015, June 23, 2016, Jan. 11, 2018, Mar. 11, 2019 and Oct. 29, 2020.

TABLE 2-34: Transit Safety Data by Mode for All Reported Incidents

1990-2000: U.S. Department of Transportation, Federal Transit Administration, *2004 Transit Safety and Security Statistics and Analysis Report* (Cambridge, MA: 2005).

2002-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database, Safety and Security Time Series Data* (Washington, DC: Monthly Issue), available at <https://www.transit.dot.gov/ntd/ntd-data> as of Oct. 13, 2021.

TABLE 2-35: Transit and Grade-Crossing Fatalities by Rail Transit Mode

U.S. Department of Transportation, Federal Transit Administration, Transit Safety and Security Statistics and Analysis Annual Report (Washington, DC: Annual Issues), available at <http://volpe.dot.gov/> as of Apr. 5, 2006, and personal communications on June 8, 2005, Apr. 5, 2006, June 14, 2007, June 18, 2008, Aug. 20, 2010, Apr. 20, 2011, May 22, 2012, June 22, 2012, July 8, 2013, Jan. 8, 2015, June 23, 2016, Jan. 11, 2018, Mar. 11, 2019, and Oct. 29, 2020.

TABLE 2-36: Transit and Grade-Crossing Injuries by Rail Transit Mode

U.S. Department of Transportation, Federal Transit Administration, Transit Safety and Security Statistics and Analysis Annual Report, (Washington, DC: Annual Issues), available at <http://volpe.dot.gov/> as of Apr. 5, 2006, and personal communications on June 8, 2005, Apr. 5, 2006, June 14, 2007, June 18, 2008, Aug. 20, 2010, Apr. 20, 2011, May 22, 2012, June 22, 2012, July 8, 2013, Jan. 9, 2015, June 23, 2016, Jan. 11, 2018, Mar. 11, 2019, and Oct. 29, 2020.

TABLE 2-37: Transit and Grade-Crossing Incidents by Rail Transit Mode

U.S. Department of Transportation, Federal Transit Administration, Transit Safety and Security Statistics and Analysis Annual Report, (Washington, DC: Annual Issues), available at <http://volpe.dot.gov/> as of Apr. 5, 2006, and personal communications on June 8, 2005, Apr. 5, 2006, June 14, 2007, June 18, 2008, Aug. 20, 2010, Apr. 20, 2011, May 22, 2012, June 22, 2012, July 8, 2013, Jan. 9, 2015, June 23, 2016, Jan. 11, 2018, Mar. 11, 2019, and Oct. 29, 2020.

TABLE 2-38: Reports of Violent Crime, Property Crime, and Arrests by Transit Mode

Federal Transit Administration, Office of Safety and Security, personal communication, Apr. 11, 2019 and Oct. 29, 2020.

TABLE 2-39: Railroad and Grade-Crossing Fatalities by Victim Class**Railroad only and grade crossing:**

1980-90: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Accident Trends - Summary Statistics*, table 4.08, Casualties by Type Person and Primary Event, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Mar. 5, 2020.

2000-20: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Accident Trends - Summary Statistics*, table 3.01, Hwy/Rail Incidents Summary Tables, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Oct. 14, 2021.

Motor vehicle and non-motor vehicle:

U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Highway-Rail Crossing Accidents*, table 5.14, Highway-rail Incidents by Type Highway User, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Oct. 14, 2021.

TABLE 2-40: Railroad and Grade-Crossing Injured Persons by Victim Class**Railroad only and grade crossing:**

1980-90: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual Issues), and *Accident/Incident Bulletin* (Washington, DC: Annual Issues).

2000-20: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Accident Trends - Summary Statistics*, table 3.01, Summary by Type Incident and Type Person, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Oct. 14, 2021.

Motor vehicle and non-motor vehicle:

U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Highway-Rail Crossing Accidents*, table 5.14, Hwy/Rail Accident Incidents Summary by Railroad, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Oct. 14, 2021.

TABLE 2-41: Train Fatalities, Injuries, and Accidents by Type of Accident

U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Train Accidents by Type and Major Cause from Form FRA F 6180.54*, table 3.16, Accident Summary Tables, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Mar. 22, 2021.

TABLE 2-42: Railroad Passenger Safety Data

Fatalities and injuries:

U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Overview*, table 1.13, Passenger Operations Ten Year Overview, available at <http://safetydata.fra.dot.gov/OfficeofSafety/default.aspx> as of Mar. 22, 2021.

Train-miles, passenger trains:

1990: 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).

2000-2020: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Overview*, table 1.13, Passenger Operations Ten Year Overview, available at <http://safetydata.fra.dot.gov/OfficeofSafety/default.aspx> as of Mar. 22, 2021.

TABLE 2-43: Railroad System Safety and Property Damage Data

Fatalities, injuries, accidents, and train-miles:

1970: 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.

1980-2020: U.S. Department of Transportation, Federal Railroad Administration, Ten Year Accident/Incident *Overview*, tables 1.12, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Mar. 23, 2021.

Property damage:

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

1980-2020: U.S. Department of Transportation, Federal Railroad Administration, *Summary of Train Accidents with Reportable Damage, Casualties, and Major Causes*, table 3.16, available at <http://safetydata.fra.dot.gov/OfficeofSafety/> as of Mar. 23, 2021.

TABLE 2-44: Fatalities and Injuries of On-Duty Railroad Employees

Employee fatalities, and injuries:

1980-90: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Reportable Casualties*, table 4.08, Casualty Summary Tables, available at <https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/query/QuerySas.aspx> as of Sept. 16, 2020.

2000-20: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Train Accidents*, table 3.01, Accident Trends - Summary Statistics, available at <https://safetydata.fra.dot.gov/OfficeofSafety/default.aspx> as of Mar. 23, 2021.

Employee hours, Train-miles:

U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Overview*, table 1.02, Operational Data Tables, available at <https://safetydata.fra.dot.gov/OfficeofSafety/default.aspx> as of Mar. 23, 2021.

TABLE 2-45: Waterborne Transportation Safety and Property Damage Data Related to Vessel Casualties

1970-2000: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, November 2008.

2005-16: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis (CG-545), personal communication, Nov. 20, 2012, Nov. 13, 2013, Aug. 27, 2015, Apr. 26, 2016, July 11, 2017 and Aug. 16, 2018.

2017-20: U.S. Department of Homeland Security, U.S. Coast Guard, MISLE CGBI Incident Investigations, *Vessel Events and Personnel Casualties Cubes*, personal communication, as of Aug 28, 2019, Sept. 10, 2020, and Aug. 9, 2021.

TABLE 2-46: Waterborne Transportation Safety Data not Related to Vessel Casualties

1970-2000: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communications, June 29, 2004, June 8, 2005, and June 22, 2007.

2005-16: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis (CG-545), personal communication, Nov. 20, 2012, Nov. 13, 2013, Aug. 27, 2015, Apr. 26, 2016, July 11, 2017 and Aug. 16, 2018.

2017-20: U.S. Department of Homeland Security, U.S. Coast Guard, MISLE CGBI Incident Investigations, *Vessel Events and Personnel Casualties Cubes*, personal communication, as of Aug. 28, 2019, Sept. 10, 2020, and Aug. 9, 2021.

TABLE 2-47: Recreational Boating Safety, Alcohol Involvement, and Property Damage Data

Vessels involved for 1960 and 1965, and property damage for 1994 and 1995:

U.S. Department of Transportation, U.S. Coast Guard (CG), Office of Boating Safety, personal communication, May 15, 2002.

All other data:

U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual Issues), tables 8, 16, 36 and similar tables in earlier editions, available at http://uscgboating.org/statistics/accident_statistics.php as of June 30, 2021.

TABLE 2-48: Personal Watercraft Safety Data**Fatalities, injuries, and accidents:**

U.S. Department of Homeland Security, United States Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual Issues), table 19 and similar tables in earlier editions, available at http://uscgboating.org/statistics/accident_statistics.php as of June 30, 2021.

Sales:

1990: Personal Watercraft Industry Association as of June 19, 2000.

2000-2014: National Marine Manufacturers Association, *Recreational Boating Statistical Abstract* (Annual Issues), table 3.1 and similar tables in earlier editions, available at <http://www.nmma.org/statistics/publications/statisticalabstract.aspx> as of June 18, 2018.

2015-20: National Marine Manufacturers Association, *News*, available at <http://www.nmma.org/press/latest-news> as of July 2, 2021.

Use:

1990: National Marine Manufacturers Association, data compiled by the United States Coast Guard, personal communications.

2000-2014: National Marine Manufacturers Association, *Recreational Boating Statistical Abstract* (Annual Issues), table 1.3 and similar tables in earlier editions, available at <http://www.nmma.org/statistics/publications/statisticalabstract.aspx> as of June 18, 2018.

TABLE 2-49: U.S. Coast Guard Search and Rescue Statistics, Fiscal Year**All data except Search and rescue resource hours and value of property unaccounted for:**

U.S. Department of Homeland Security, U.S. Coast Guard, *USCG Search and Rescue Summary Statistics*, available at <https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Response-Policy-CG-5R/Office-of-Incident-Management-Preparedness-CG-5RI/US-Coast-Guard-Office-of-Search-and-Rescue-CG-SAR/CG-SAR-1/SAR-Facts-Reports/> as of Oct. 22, 2019.

Search and rescue resource hours:

1990-2000: U.S. Department of Transportation, U.S. Coast Guard, Office of Command and Control Architecture, personal communications, Sept. 30, 2003 and July 28, 2004.

2005-13: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Search and Rescue, personal communications, Apr. 1, 2008, July 2, 2010, July 25, 2011, Feb. 25, 2013 and Mar. 7, 2014

Value of property unaccounted for:

U.S. Department of Homeland Security, U.S. Coast Guard, Office of Search and Rescue, personal communications, July 25, 2011, Feb. 25, 2013 and Mar. 7, 2014.

TABLE 2-50: Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data

1970-90: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Distribution, Transmission & Gathering, LNG, and Liquid Accident and Incident Data*, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/distribution-transmission-gathering-lng-and-liquid-accident-and-incident-data> as of Feb. 19, 2020.

2000-20: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Incident 20 Year Trends, All Reported Incident 20 Year Trend, available at <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends> as of Mar. 3, 2021.

TABLE 3-01: U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services

U.S. Department of Commerce, Bureau of Economic Analysis, GDP by Industry, *Interactive Data: Industry Data tables*, available at <https://www.bea.gov/data/gdp/gdp-industry> as of Apr. 8, 2021.

TABLE 3-02: U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (chained dollars)

U.S. Department of Commerce, Bureau of Economic Analysis, Industry Economic Accounts, *Interactive tables: GDP by industry, Real Value Added by Industry table*, available at <http://www.bea.gov/industry/index.htm> as of Nov. 5, 2021.

TABLE 3-03: U.S. Gross Domestic Product (GDP) Attributed to Transportation Functions

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, tables 1.1.5, 2.4.5, 3.11.5, 3.15.5, 4.1, 4.2.5, 5.4.5, 5.5.5, and 5.7.5B, available at https://apps.bea.gov/iTable/index_nipa.cfm as of Oct. 29, 2021.

TABLE 3-04: U.S. Gross Domestic Product (GDP) Attributed to Transportation Functions (chained dollars)

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables and Underlying Detail Tables*, tables 1.1.6, 2.4.6, 3.11.6, 3.15.6, 4.2.6, 5.4.6, 5.5.6, and 5.7.6B, available at https://apps.bea.gov/iTable/index_nipa.cfm as of Oct. 29, 2021.

TABLE 3-07: Contributions to Gross Domestic Product (GDP): Selected Industries

U.S. Department of Commerce, Bureau of Economic Analysis, *Industry Data, GDP-by-Industry, Annual Tables*, available at https://apps.bea.gov/iTable/index_industry_gdplndy.cfm as of Nov. 3, 2021.

TABLE 3-08: Contributions to Gross Domestic Product (GDP): Selected Industries (chained dollars)

U.S. Department of Commerce, Bureau of Economic Analysis, *Industry Data, GDP-by-Industry*, available at https://www.bea.gov/iTable/index_industry_gdplndy.cfm as of Nov. 4, 2021.

TABLE 3-09: U.S. Gross Domestic Product (GDP) by Major Social Function (Current dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, calculated based on data from U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Account Tables*, 1.1.5, 2.4.5, 3.11.5, 3.15.5, 4.2.5, 5.4.5, 5.5.5, 5.7.5A, and 5.7.5B, available at https://apps.bea.gov/iTable/index_nipa.cfm as of Nov. 3, 2021.

TABLE 3-10: National Transportation and Economic Trends

Passenger-miles:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-40, available at <https://www.bts.gov> as of Mar. 18, 2021.

Ton-miles:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-50, available at <https://www.bts.gov> as of Mar. 18, 2021.

Population:

1990-99: U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract of the United States* (Washington, DC: Annual Issues), table 2, available at <http://www.census.gov/> as of Aug. 4, 2011.

2000-20: U.S. Census Bureau, Population Division, Population Estimates, available at <https://www.census.gov/data/datasets/time-series/demo/popest/2010s-national-total.html> as of Mar. 18, 2021.

Industrial Production Index:

Board of Governors of the Federal Reserve System (US), Industrial Production: Total Index, retrieved from FRED, Federal Reserve Bank of St. Louis; available at <https://fred.stlouisfed.org/series/INDPRO> as of Mar. 18, 2021.

Gross Domestic Product:

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, tables 1.1.5 and 1.1.6, available at https://apps.bea.gov/iTable/index_nipa.cfm as of Mar. 18, 2021.

TABLE 3-11: Sales Price of Transportation Fuel to End-Users

All data except railroad fuel:

U.S. Department of Energy, Energy Information Administration, Monthly Energy Review, tables 9.4 and 9.7, available at <https://www.eia.gov/totalenergy/data/monthly/#prices> as of Mar. 25, 2021.

Railroad fuel:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 46 and similar tables in earlier editions.

TABLE 3-12: Price Trends of Gasoline v. Other Consumer Goods and Services

Retail price: Average motor gasoline taxes:

1970-80: American Petroleum Institute, Policy Analysis and Statistics, personal communications, April 2009, and August 2013.

1990-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), tables MF-205 and FE-101A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Feb. 23, 2021.

Retail price: Total service station price:

1970: U.S. Department of Energy, Energy Information Agency, *Annual Energy Review 2003* (Washington, DC: 2004), table 5.24, available at <http://www.eia.doe.gov> as of September 2004.

1980-2020: U.S. Department of Energy, Energy Information Agency, *Monthly Energy Review* (Washington, DC: March 2007), table 9.4, available at <https://www.eia.gov/totalenergy/data/monthly/> as of Mar. 22, 2021.

Consumer price indices:

1970-2020: U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Price Index-Urban* (Current Series), available at <http://www.bls.gov/cpi/> as of Mar. 22, 2021.

TABLE 3-13: Producer Price Indices for Selected Transportation and Warehousing Services (NAICS)

U.S. Department of Labor, Bureau of Labor Statistics, *Producer Price Index Industry Data*, available at www.bls.gov/data/sa.htm as of Sept. 7, 2021.

TABLE 3-14: Producer Price Indices for Transportation Equipment (NAICS)

U.S. Department of Labor, Bureau of Labor Statistics, *Producer Price Index Industry Data*, available at <https://www.bls.gov/ppil/> as of Sept. 14, 2021.

TABLE 3-15: Personal Expenditures by Category

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 2.1 and 2.3.5u, available at https://apps.bea.gov/iTable/index_nipa.cfm as of Aug. 4, 2021.

TABLE 3-16: Personal Consumption Expenditures on Transportation by Subcategory

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, tables 2.3.5U and 2.4.5U, available at https://apps.bea.gov/iTable/index_nipa.cfm as of Aug. 4, 2021.

TABLE 3-17: Average Cost of Owning and Operating an Automobile

American Automobile Association, Newsroom, *Your Driving Costs Fact Sheet*, available at <https://newsroom.aaa.com/asset/your-driving-costs-fact-sheet-december-2020/> as of Oct. 13, 2021.

TABLES 3-18 and 3-19: Average Passenger Fares (Current dollars and Chained dollars)**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).

1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1980: Civil Aeronautics Board, *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).

1990: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *TranStats Database*, T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class, available at <https://www.transtats.bts.gov/homepage.asp> as of Aug. 14, 2017, and *Air Carrier Financial Reports, Schedule P-12*, available at <https://www.transtats.bts.gov/homepage.asp> as of Aug. 14, 2017.

2000-20: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Annual U.S. Domestic Average Itinerary Fare in Current and Constant Dollars* (Washington, DC: Quarterly Release), available at <https://www.bts.gov/content/annual-us-domestic-average-itinerary-fare-current-and-constant-dollars> as of July 28, 2021.

Class I bus, intercity:

1960-90: Interstate Commerce Commission, *Transport Statistics in the United States*, Motor Carriers (Washington, DC: Annual Issues), part 2.

2000: U.S. Department of Transportation, Bureau of Transportation Statistics, Selected Earnings Data, Class I Motor Carriers of Passengers (Washington, DC: Annual Issues) (operating revenue / revenue passengers).

Transit and commuter rail:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Appendix A: Historical Tables* (Washington, DC: Annual Issues), table 43, and similar tables in earlier editions (passenger fares / passenger trips).

2005-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, D.C.: Annual Reports), Annual Database Fare Revenue and Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 9, 2021.

Intercity rail / Amtrak:

1960-70: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues).

1980: Amtrak, State and Local Affairs Department and Public Affairs Department, personal communication.

1990: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues) (transportation revenues / Amtrak system passenger trips).

2000-15: Amtrak, *News Release* (ticket revenue divided by ridership), available at <http://www.amtrak.com> as of Apr. 17, 2018.

2016-20: Amtrak, *September Monthly Performance Report* (ticket revenue divided by ridership), available at <https://www.amtrak.com/reports-documents> as of July 28, 2021.

TABLE 3-20: Average Passenger Revenue per Passenger-Mile

Air carrier, domestic, scheduled service:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *TranStats Database*, Origin and Destination Survey, available at <https://www.transtats.bts.gov/homepage.asp> as of Nov. 12, 2021.

Commuter rail:

1990-2000: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: 2011), tables 3 and 92 and similar tables in previous editions (passenger fares / passenger miles).

2005-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database, Annual Database Service and Annual Database Fare Revenue* (Washington, D.C.: Annual reports), available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 12, 2021.

Intercity / Amtrak:

1960-70: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues).

1980: Amtrak, personal communication, June 22, 2011.

1990-2000: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues) (transportation revenues / passenger-miles).

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in previous editions (passenger revenue/revenue passenger miles).

Consumer Price Index:

U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index-Urban, U.S. All Items Indexes, available at <http://www.bls.gov/cpi/> as of Nov. 12, 2021.

TABLE 3-21: Average Freight Revenue per Ton-Mile**Air carrier, domestic, scheduled service:**

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: 1970), part III, tables 2 and 13.

1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: 1974), part III, tables 2 and 13.

1980: Civil Aeronautics Board, *Air Carrier Traffic Statistics* (Washington, DC: 1976, 1981), pp. 4 and 14 (December 1976) and pp. 2 and 3 (December 1981).

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, *TranStats Database*, T-1, Schedule P-1.1, and Schedule P-1.2 data, available at <http://www.transtats.bts.gov/> as of Aug. 31, 2021, special tabulation.

Truck:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Truck Profile, available at <https://www.bts.gov/content/truck-profile> as of Aug. 31, 2021, special tabulation.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 34 and similar pages in previous editions.

Water transportation, domestic:

1990-2000: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2007), p. 46.

2005-19: As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Water Transport Profile, available at <https://www.bts.gov/content/water-transport-profile> as of Aug. 31, 2021, special tabulation.

Oil pipeline:

1960-2005: PennWell Corporation, *Oil and Gas Journal: Transportation Special Report* (Houston, TX: September 2012 Issue), p. 127; and Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC: February 2012), table 1.

2010-18: PennWell Corporation, *Oil and Gas Journal: Transportation Special Report* (Houston, TX: October 2019 Issue), p. 44; and U.S. Department of Transportation, Federal Highway Administration, *Freight Analysis Framework*, available at <http://faf.oml.gov/fafweb/Extraction1.aspx>, as of Jan. 21, 2020, special tabulation.

Producer price index:

U.S. Department of Labor, Bureau of Labor Statistics, *Producer Price Index-Commodities*, available at <http://www.bls.gov/ppi/> as of Aug. 31, 2021.

TABLE 3-22: Total Operating Revenues**Air carrier, domestic, all services:**

1960-70: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974).

1980: Civil Aeronautics Board, *Air Carrier Financial Statistics* (Washington, DC: Annual Issues), p. 1.

1990-2019: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, Office of Airline Information, *TranStats Database*, Air Carrier Financial Reports, Schedule P-1.1 and Schedule P-1.2, available at <http://www.transtats.bts.gov> as of Feb. 8, 2021.

Trucking:

1990: U.S. Department of Commerce, U.S. Census Bureau, *Transportation Annual Survey, 1998* (Washington, DC: January 2000), table 1.

2000-19: U.S. Department of Commerce, U.S. Census Bureau, *Service Annual Survey* (Washington, DC: Annual Issues), table 2 and similar tables in earlier editions, NAICS codes 484, 492, available at <https://www.census.gov/programs-surveys/sas.html> as of Feb. 8, 2021.

Interurban and rural bus:

U.S. Department of Commerce, U.S. Census Bureau, *Service Annual Survey* (Washington, DC: Annual Issues), table 2, NAICS code 4852, available at <https://www.census.gov/programs-surveys/sas.html> as of Feb. 8, 2021.

Transit:

1960-90: American Public Transportation Association, *Public Transportation Fact Book, 2007* (Washington, DC: 2007), table 50 and similar tables in earlier editions.

2000-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, (Washington, D.C.: Annual Reports), TS1.1 - Total Funding Time-Series, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Feb. 8, 2021.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 12 and similar tables in earlier editions.

Intercity/Amtrak:

1980: National Railroad Passenger Corporation (Amtrak), State and Local Affairs Department and Public Affairs Department, personal communication.

1990-2000: National Railroad Passenger Corporation (Amtrak), *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-11: National Railroad Passenger Corporation (Amtrak), *Amtrak Annual Report* (Washington, DC: Annual Issues).

2012-19: National Railroad Passenger Corporation (Amtrak), *Report & Documents: Year-End Reports* (Washington, D.C: Annual Issues), available at <https://www.amtrak.com/reports-documents> as of Feb. 8, 2021.

Water transportation:

1990-2000: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2007), p. 32.

2005-19: U.S. Department of Commerce, U.S. Census Bureau, *Service Annual Survey* (Washington, DC: Annual Issues), table 2 and similar tables in earlier editions, NAICS codes 483113, 483114, 483211, 483212, available at <https://www.census.gov/programs-surveys/sas.html> as of Feb. 8, 2021.

Oil pipeline:

1990: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2007), p. 32.

2000-19: PennWell Corporation, *Oil and Gas Journal: Special Report - Pipeline Economics* (Houston, TX), table 2, p 71 and similar tables in other editions.

Gas pipeline:

American Gas Association, *Gas Facts*, Annual Income Accounts, Balance Sheets and Analytical Ratios (Washington, DC: Annual Issues), tables 11-1, 11-2, 11-3, and 11-4, and similar tables in earlier editions, available at <https://www.aga.org/research/data/income-accounts-balance-sheets-and-ana...> as of Feb. 11, 2021.

TABLE 3-23: Employment in For-Hire Transportation and Selected Transportation-Related Industries (NAICS)**All data, except as noted:**

U.S. Department of Labor, Bureau of Labor Statistics Data, *National Employment Hours and Earnings*, available at <http://www.bls.gov/data/> as of June 15, 2021.

Government employment:*USDOT:*

1970: 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: U.S. Department of Transportation, Office of the Secretary of Transportation, *DOT Employment Facts, A Report to Management* (Washington, DC: Annual issues).

1990: U.S. Department of Transportation, Office of the Secretary of Transportation, *DOT Workforce Demographics* (Washington, DC: Annual issues).

2000-20: U.S. Department of Transportation, Office of the Secretary of Transportation, *Workforce Statistics Archive, Workforce Data by Fiscal Year*, Onboard Statistics, available at <https://www.transportation.gov/assistant-secretary-administration/human-resources/workforce-statistics-archive> as of Feb. 24, 2021.

State and local:

1960-90: 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.

2000-20: U.S. Department of Commerce, Bureau of the Census, Annual Survey of Public Employment & Payroll, *State & Local Government: Employment and Payroll Data*, available at <https://www.census.gov/programs-surveys/apes/data/datasetstables.All.html> as of June 15, 2021.

TABLE 3-24: Employment in Transportation and Transportation-Related Occupations

U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics, *Occupational Employment and Wages* (Washington, DC: Annual Issues), available at http://www.bls.gov/oes/current/oes_nat.htm as of Mar. 31, 2021.

TABLE 3-25: Average Wage and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (NAICS)

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 6.6d, available at <https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey> as of Aug. 5, 2021.

TABLE 3-26: Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation (SOC)

2000-16: U.S. Department of Commerce, Bureau of the Census, *Current Population Survey*, table A-26, personal communications, Oct. 4, 2004, Nov. 20, 2005, Oct. 27, 2006, Dec. 20, 2007, Mar. 4, 2009, June 8, 2010, May 23, 2011, July 17, 2012, July 18, 2013, Feb. 9, 2015, Jan. 3, 2018.

2017-20: U.S. Department of Commerce, Bureau of the Census, *Current Population Survey*, table 39, available at <https://www.bls.gov/cps/tables.htm#weekearn> as of Feb. 4, 2021.

TABLE 3-27: Total Wage and Salary Accruals by Transportation Industry (NAICS)

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 6.3d, available at <https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey> as of Aug. 5, 2021.

TABLE 3-28: Labor Productivity Indices for Selected Transportation Industries (NAICS)

U.S. Department of Labor, Bureau of Labor Statistics, *Industry Productivity and Costs*, available at <http://www.bls.gov/data/> as of Sept. 2, 2021.

TABLE 3-29: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (current dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics* available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-30: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Chained dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics* available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-31: Summary of Transportation Revenues and Expenditures from Own Funds and User Coverage, Fiscal Year

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics*, available at <https://www.bts.gov/browse-statistical-products-and-data/government-transportation-financial-statistics-gtfs/government> as of Dec. 21, 2020.

TABLE 3-32: Transportation Revenues by Level of Government and Mode, Fiscal Year (Current dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics* available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-33: Transportation Revenues by Level of Government and Mode, Fiscal Year (Chained dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics*, available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-34: Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year**Highway and transit accounts:**

1980: 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.

1990-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table FE-210, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Feb. 5, 2021.

All others:

1980-1990: 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.

2000-20: U.S. Executive Office of the President, Office of Management and Budget, *Budget of the United States Government, Appendix* (Washington, DC: Annual Issues), Department of Transportation: Trust Funds, Status of Funds, pg. 535, 948, 957, 1124 and 1125, and similar tables in earlier editions, available at <https://www.govinfo.gov/app/collection/BUDGET/> as of June 3, 2021.

Chained dollar deflator:

U.S. Department of Commerce, Bureau of Economic Analysis, *Interactive Access to National Income and Product Accounts Tables*, table 3.9.4, available at <https://www.bea.gov/data> as of June 3, 2021.

TABLE 3-35: Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (Current dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics*, available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-36: Transportation Expenditures by Level of Government and Mode from Own Funds, Fiscal Year (Chained dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics*, available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-37: Federal Transportation Grants to State and Local Governments by Mode, Fiscal Year (Current dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics*, available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 3-38: Federal Transportation Transfers to State and Local Governments by Mode, Fiscal Year (Chained dollars)

U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics*, available at <https://www.bts.gov/explore-topics-and-geography/topics/government-transportation-financial-statistics> as of Dec. 21, 2020.

TABLE 4-01: Overview of U.S. Petroleum Production, Imports, Exports, and Consumption

Domestic production, imports, exports, and U.S. petroleum consumption by transportation sector:

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, tables 3.1, 3.3b and 3.7c, available at <https://www.eia.gov/totalenergy/data/monthly/index.php> as of June 28, 2021.

U.S. and World petroleum consumption:

1960-70: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* (Washington, DC: Annual Issues), tables 5.1 and 11.10.

1980-2020: U.S. Department of Energy, Energy Information Administration, International, *Annual refined petroleum products consumption*, available at <https://www.eia.gov/international/data/world> as of June 28, 2021.

TABLE 4-02, 4-02M: U.S. Consumption of Energy from Primary Sources by Sector

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, tables 2.1, 3-8a - c, available at <https://www.eia.gov/totalenergy/data/monthly/index.php> as of Mar. 29, 2021.

TABLE 4-03, 4-03M: Domestic Demand for Refined Petroleum Products by Sector (Quadrillion Btu)

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, tables 2.2, 2.3, 2.4, 2.5, and 2.6, available at <https://www.eia.gov/totalenergy/data/monthly/> as of Mar. 26, 2021.

TABLE 4-04, 4-04M: U.S. Energy Consumption by the Transportation Sector

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* (Washington DC: Annual Issues), tables 2.1, 2.5, 3.7c, 4.3, and 6.2, available at <https://www.eia.gov/totalenergy/data/monthly/index.php> as of Mar. 29, 2021.

TABLE 4-05, 4-05M: Fuel Consumption by Mode of Transportation in Physical Units

Air:

Certificated air carriers:

1960-2019: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Fuel Cost and Consumption*, available at <http://www.transtats.bts.gov/fuel.asp> as of Jan. 26, 2021.

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: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey* (Washington, DC: Annual Issues), table 5.1, and similar tables in earlier editions.

1994-2019: U.S. Department of Transportation, Federal Aviation Administration, Federal Aviation Administration, *FAA Aerospace Forecasts Fiscal Years 2020-2040* (Washington, DC: 2019), tables 23, and similar tables in earlier editions, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of Nov. 30, 2020.

Highway:

1960-93: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.cfm> as of Apr. 6/2020.

1994-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 6, 2021.

Transit:

1960-96: American Public Transportation Association, *2009 Public Transportation Fact Book* (Washington, DC: June 2009), tables 26, 27, 28 and similar tables in earlier editions.

1997-2001: U.S. Department of Transportation, Federal Transit Administration, *National Transportation Database*, table 17 and similar tables in previous years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 24, 2016.

2002-19: U.S. Department of Transportation, Federal Transit Administration, *National Transportation Database*, Annual Database Energy Consumption, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 30, 2020.

Rail:

1960-2019: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 45 and similar tables in previous issues.

Amtrak:

1975-2019: National Railroad Passenger Corporation (Amtrak), Energy Management Department and Government Affairs Department, personal communications, Apr. 27, 2011, May 8, 2013, Aug. 20, 2014, Sept. 11, 2015, June 21, 2016, Aug. 8, 2017, May 23, 2019, and Oct. 21, 2020.

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.

1985-2019: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual Issues), table HL1, available at <https://www.eia.gov/petroleum/fueloilkerosene/> as of Jan. 28, 2021.

Gasoline:

1970-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MF-24 and similar tables in earlier editions, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 26, 2021.

Pipeline:

1960-2019: U.S. Department of Energy, *Natural Gas Annual*, DOE/EIA-0131(04) (Washington, DC), table 15 and similar tables in earlier editions, available at <https://www.eia.gov/naturalgas/annual/> as of Nov. 30, 2020.

TABLE 4-06, 4-06M: Energy Consumption by Mode of Transportation

Air:

Certificated air carriers:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Fuel Cost and Consumption*, available at <http://www.transtats.bts.gov/fuel.asp> as of Jan. 26, 2021.

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: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey* (Washington, DC: Annual Issues), table 5.1, and similar tables in earlier editions.

1994-2019: U.S. Department of Transportation, Federal Aviation Administration, Federal Aviation Administration, *FAA Aerospace Forecasts Fiscal Years 2020-2040* (Washington, DC: 2019), tables 23, and similar tables in earlier editions, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of Nov. 30, 2020.

Highway:

1960-93: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.cfm> as of Apr. 6, 2020.

1994-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 6, 2021.

Transit:

1960-96: American Public Transportation Association, *2009 Public Transportation Fact Book* (Washington, DC: June 2009), tables 26, 27, 28 and similar tables in earlier editions.

1997-2001: U.S. Department of Transportation, Federal Transit Administration, *National Transportation Database*, table 17 and similar tables in previous years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 24, 2016.

2002-19: U.S. Department of Transportation, Federal Transit Administration, *National Transportation Database*, Annual Database Energy Consumption, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 30, 2020.

Rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 45 and similar tables in previous issues.

Amtrak:

National Railroad Passenger Corporation (Amtrak), Energy Management Department and Government Affairs Department, personal communications, Apr. 27, 2011, May 8, 2013, Aug. 20, 2014, Sept. 11, 2015, June 21, 2016, Aug. 8, 2017, May 23, 2019, and Oct. 21, 2020.

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.

1985-2019: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual Issues), available at <https://www.eia.gov/petroleum/fueloilkerosene/> as of Jan. 28, 2021.

Gasoline:

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MF-24 and similar tables in earlier editions, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 26, 2021.

Pipeline:

U.S. Department of Energy, *Natural Gas Annual*, DOE/EIA-0131(04) (Washington, DC), table 15 and similar tables in earlier editions, available at <https://www.eia.gov/naturalgas/annual/> as of Nov. 30, 2020.

TABLE 4-07, 4-07M: Domestic Demand for Gasoline by Mode

Highway and nonhighway total:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995* (Washington, DC: 1996), table MF-221, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Feb. 29, 2012.

1995-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MF-21, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Dec. 7, 2020.

Nonhighway:

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MF-24, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 14, 2021.

TABLE 4-08, 4-08M: Certificated Air Carrier Fuel Consumption and Travel

Number of aircraft:

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

1970: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1979* (Washington, DC: 1979), table 5.1.

1980: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1986* (Washington, DC: 1986), table 5.1.

1990: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, Calendar Year 1997* (Washington, DC: unpublished), personal communication, Mar. 19, 1999.

2020: Department of Transportation, Federal aviation administration, *FAA Aerospace Forecasts*, tables 21, 22, and 27, and similar tables in earlier editions, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of July 2, 2021.

Aircraft-miles flown:

1960-70: Air Transport Association, as of July 31, 2002.

1980-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, *TranStats Database*, T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class, available at <https://www.transtats.bts.gov/homepage.asp> as of June 22, 2021, special tabulation.

Fuel consumption:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airline Fuel Cost and Consumption*, available at <http://www.transtats.bts.gov/fuel.asp> as of June 22, 2021.

TABLE 4-09, 4-09M: Motor Vehicle Fuel Consumption and Travel

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 17, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 7, 2021.

TABLE 4-10: Estimated Consumption of Alternative and Replacement Fuels for Highway Vehicles

U.S. Department of Energy, Energy Information Administration, *Alternative Fuel Vehicle Data*, available at <http://www.eia.gov/renewable/afv/index.cfm> as of Aug. 5, 2019.

TABLE 4-11, 4-11M: Light Duty Vehicle, Short Wheel Base and Motorcycle Fuel Consumption and Travel

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), tables MV-201 and VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 23, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 8, 2021.

TABLE 4-12, 4-12M: Light Duty Vehicle, Long Wheelbase Fuel Consumption and Travel

1970-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 20, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 12, 2021.

TABLE 4-13, 4-13M: Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel

1970-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 20, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 13, 2021.

TABLE 4-14, 4-14M: Combination Truck Fuel Consumption and Travel

1970-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 23, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 12, 2020.

TABLE 4-15, 4-15M: Bus Fuel Consumption and Travel

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Apr. 20, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 12, 2021.

TABLE 4-16, 4-16M: Transit Industry Electric Power and Primary Energy Consumption and Travel

1960-90: American Public Transportation Association, *2009 Public Transportation Fact Book Appendix A: Historical Tables* (Washington, DC: Annual Issues), tables 7, 17, 29, 30, 31 and similar tables in earlier editions.

2000-13: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, tables 17 and 19 and similar tables in previous editions.

2014-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database, Annual Database Service & Annual Database Energy Consumption*, available at <https://www.transit.dot.gov/ntd> as of Nov. 9, 2021.

TABLE 4-17, 4-17M: Class I Rail Freight Fuel Consumption and Travel

All data except for locomotive unit-miles:

1960-2007: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), pp. 33, 34, 40, 49, and 51, and similar pages in earlier editions.

2008-17: Association of American Railroads, personal communication, May 20, 2013, Feb. 6, 2018, and Feb. 21, 2018.

2018-19: Association of American Railroads, *Railroad Facts 2019* (Washington, DC: Annual Issues), pp. 9, 36, 37, and 45.

Locomotive unit-miles:

1975-92, 2002: Association of American Railroads, *Railroad Ten-Year Trends* (Washington, DC: Annual Issues).

1993-2001, 2003-04: Association of American Railroads, *Analysis of Class I Railroads* (Washington, DC: Annual Issues).

2005-17: Association of American Railroads, personal communications, June 13, 2007, Apr. 24, 2008, Apr. 28, 2010, Aug. 12, 2011, May 04, 2012, May 20, 2013, Feb. 6, 2018 and Feb. 21, 2018.

TABLE 4-18, 4-18M: Amtrak Fuel Consumption and Travel

Number of locomotives and cars:

1980: National Passenger Railroad Corporation (Amtrak), State and Local Affairs Department, personal communication.

1990-2000: National Passenger Railroad Corporation (Amtrak), *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in earlier editions.

Miles traveled:

Train-miles:

1980-2000: National Passenger Railroad Corporation (Amtrak), *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2000-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in earlier editions.

Car-miles:

1980: National Passenger Railroad Corporation (Amtrak), State and Local Affairs Department and Public Affairs Department, personal communication.

1990-2000: National Passenger Railroad Corporation (Amtrak), *Amtrak Corporate Reporting*, Route Profitability System, personal communication, Aug. 22, 2001.

2005-19: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in earlier editions.

Locomotive fuel consumed:

1980-2000: National Passenger Railroad Corporation (Amtrak), State and Local Affairs Department, personal communication.

2005-19: National Passenger Railroad Corporation (Amtrak), personal communications, Apr. 20, 2011, May 9, 2013, Sept. 14, 2015, Oct. 11, 2018, May 23, 2019, Aug. 31, 2020.

TABLE 4-19, 4-19M: U.S. Government Energy Consumption by Agency and Source

U.S. Department of Energy, Energy Efficiency & Renewable Energy, *Comprehensive Annual Energy Data and Sustainability Performance*, available at <http://ctsedweb.ee.doe.gov/Annual/Report/HistoricalFederalEnergyConsumptionDataByAgencyAndEnergyTypeFY1975ToPresent.aspx> as of Aug. 17, 2021.

TABLE 4-20, 4-20M: Energy Intensity of Passenger Modes**Air:***Passenger-miles:*

1960-70: Air Transport Association, available at <http://www.air-transport.org/> as of July 31, 2002.

1980-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class*, available at http://www.transtats.bts.gov/Fields.asp?Table_ID=264 as of June 14, 2021.

Fuel consumed:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airline Fuel Cost and Consumption*, available at <http://www.transtats.bts.gov/fuel.asp> as of June 14, 2021.

Highway:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Oct. 6, 2011.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 13, 2021.

Transit motor bus:

1960-90: American Public Transportation Association, *2010 Public Transportation Fact Book Appendix A: Historical Tables* (Washington, DC: Annual Issues), tables 2, 6, 30, 32 and similar tables in earlier editions, available at <http://www.apta.com/resources/statistics/Pages/transitstats.aspx> as of Aug 23, 2010.

2000-14: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, tables 17, 19, and similar tables in earlier editions, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Apr. 13, 2016.

2015-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Annual Database Energy Consumption and Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Jan. 13, 2021.

Amtrak:

1980-2000: Amtrak., State and Local Affairs Department, personal communication.

2005-20: Amtrak, personal communications, Jan. 7, 2010, July 26, 2011, Apr. 24, 2012, June 9, 2014, Sept. 11, 2015, June 21, 2016, Aug. 8, 2017, May 30, 2019, Aug. 31, 2020, and Aug. 19, 2021.

TABLE 4-21, 4-21M: Energy Intensity of Certificated Air Carriers, All Services

Aircraft-miles, available seat-miles, and passenger-miles:

1960-70: Air Transport Association, available at <http://www.air-transport.org/> as of July 31, 2002.

1980-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, TranStats Database, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class*, available at <http://www.transtats.bts.gov/> as of June 14, 2021, special tabulation.

Fuel consumed:

1960-70: Civil Aeronautics Board as of Sept 13, 2018.

1980-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airline Fuel Cost and Consumption*, available at <http://www.transtats.bts.gov/fuel.asp> as of June 14, 2021.

Seats per aircraft, seat-miles per gallon, energy intensiveness and load factor:

Derived by calculation.

TABLE 4-22, 4-22M: Energy Intensity of Light Duty Vehicles and Motorcycles**Passenger-miles:**

1960-90: Vehicle-miles multiplied by vehicle occupancy rates.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 11, 2021.

All other data:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995, FHWA-PL-97-009* (Washington, DC: July 1997), table VM-201A.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 11, 2021.

TABLE 4-23, 4-23M: Average Fuel Efficiency of U.S. Light Duty Vehicles**Average U.S. light duty vehicle fuel efficiency:**

1980-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, table VM-201A, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Oct. 6, 2011.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 14, 2021.

New vehicle fuel efficiency (based on model year production) and CAFE standards:

1960-2014: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Summary of Fuel Economy Performance* (Washington, DC: Annual Issues), available at <http://www.nhtsa.gov/fuel-economy> as of Mar. 3, 2016.

2015-17: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Fleet Fuel Economy Performance Report*, available at https://one.nhtsa.gov/cafe_pic/CAFE_PIC_fleet_LIVE.html as of Oct. 16, 2019.

TABLE 4-24, 4-24M: Energy Intensity of Transit Motor Buses

1960-90: American Public Transportation Association, *Public Transportation Fact Book Appendix A: Historical Tables* (Washington, DC: Annual Issues), tables 3 and 8 and similar tables in earlier editions, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Dec. 18, 2019.

2000: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, tables 17, 19, and similar tables in earlier editions.

2005-20: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Annual Database Energy Consumption and Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Nov. 9, 2021.

TABLE 4-25, 4-25M: Energy Intensity of Class I Railroad Freight Service

Association of American Railroads, *Railroad Facts* (Washington, DC: 2019), pp. 37, 40, and 45, and similar tables in earlier editions.

TABLE 4-26: Energy Intensity of Amtrak Services**Revenue passenger-miles:**

1975-2000: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-20: Amtrak, personal communications, Jan. 7, 2010, July 26, 2011, Apr. 24, 2012, June 9, 2014, June 23, 2016, Aug 8, 2017, May 23, 2019, Aug. 31, 2020, and Aug. 19, 2021.

Locomotive fuel consumed:

1975-2000: Amtrak., State and Local Affairs Department, personal communication.

2005-20: Amtrak, personal communications, Jan. 7, 2010, July 26, 2011, Apr. 24, 2012, June 9, 2014, June 23, 2016, Aug 8, 2017, May 23, 2019, Aug. 31, 2020, and Aug. 19, 2021.

TABLE 4-27: Energy Intensity of Amtrak Services**Revenue passenger-miles:**

1975-2000: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual Issues).

2005-20: Amtrak, personal communications, Jan. 7, 2010, July 26, 2011, Apr. 24, 2012, June 23, 2016, Aug. 8, 2017, Aug. 31, 2020, and Aug. 19, 2021.

Fuel consumed:

1975-2000: Amtrak., State and Local Affairs Department, personal communication.

2005-20: Amtrak, personal communications, Jan. 7, 2010, July 26, 2011, Apr. 24, 2012, June 23, 2016, Aug. 8, 2017, Aug. 6, 2019, Aug. 31, 2020, and Aug. 19, 2021.

TABLE 4-28: Annual Wasted Fuel Due to Congestion

Texas A&M Transportation Institute, *2021 Urban Mobility Report*, (College Station, TX: 2021), available at <http://mobility.tamu.edu> as of Sept. 8, 2021.

TABLE 4-29: Annual Wasted Fuel Per Person

Texas Transportation A&M Institute, *2021 Urban Mobility Report*, (College Station, TX: 2021), available at <http://mobility.tamu.edu> as of Sept. 8, 2021.

TABLE 4-30: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Vehicles

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 Light Duty Trucks (Category LDT1)

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

TABLE 4-32: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (Category LDT2)

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

TABLE 4-33: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (Category LDT3)

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

TABLE 4-34: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Duty Trucks (Category LDT4)

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

TABLE 4-35: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Medium-Duty Passenger Vehicles (MDPV)

40 CFR 86, Subpart A (July 1, 2000) Federal Register, Vol. 65, No. 28, pp. 6851-6858.

TABLE 4-36: Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Heavy-Duty Trucks

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 4-37: Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Heavy Heavy-Duty Trucks

40 CFR 86, Electronic Code of Federal Regulations, internet site at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_40/40cfr86_00.html as of Oct. 9, 2001.

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, personal communication, Oct. 2001.

TABLE 4-38: Federal Exhaust Emissions Standards for Newly Manufactured Motorcycles

Emissions prior to controls:

40 CFR 86 Subpart E (July 1, 2000). U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

1978 and later model year:

United States Environmental Protection Agency, Office of Transportation and Air Quality, EPA-420-B-16-016, *Highway Motorcycles: Exhaust Emission Standards*, available at <https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-light-duty-vehicles-and-trucks> as of Nov. 6, 2019.

TABLE 4-39: Federal Exhaust Emissions Standards for Newly Manufactured and In-Use Aircraft Engines

40 CFR 87, Subparts A-D (July 1, 2000), and U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

TABLE 4-40: Federal Exhaust Emissions Standards for Locomotives

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, *Locomotives: Exhaust Emission Standards* (EPA-420B-16-024, March 2016) available at <https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles> as of Nov. 20, 2019.

TABLE 4-41: Federal Exhaust Emissions Standards for Newly Manufactured Marine Spark-Ignition Outboard, Personal Watercraft, and Jet-Boat Engines

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, *Marine Spark-Ignition Engines and Vehicles: Exhaust Emission Standards*, (March 2016, EPA-420-B-16-026), available at <https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles> as of Dec. 12, 2019.

TABLE 4-42: Tier 2 Federal Exhaust Emissions Standards for Newly Manufactured Commercial Marine Compression-Ignition Engines

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, *Federal Marine Compression-Ignition (CI) Engines: Exhaust Emission Standards* (EPA-420-B-16-025, March 2016), available at <https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles> as of Nov. 22, 2019.

TABLE 4-43: Estimated U.S. Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, personal communication, Apr. 30, 2021.

TABLE 4-45: Estimated U.S. Emissions of Carbon Monoxide

U.S. Environmental Protection Agency, Air Emissions Inventories, *Air Pollutant Emissions Trends Data*, National Tier 1 CAPS Trends, available at <https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data> as of Mar. 31, 2021.

TABLE 4-46: Estimated U.S. Emissions of Nitrogen Oxides

U.S. Environmental Protection Agency, Air Emissions Inventories, *Air Pollutant Emissions Trends Data*, National Tier 1 CAPS Trends, available at <https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data> as of Mar. 31, 2021.

TABLE 4-47: Estimated U.S. Emissions of Volatile Organic Compounds

U.S. Environmental Protection Agency, Air Emissions Inventories, *Air Pollutant Emissions Trends Data*, National Tier 1 CAPS Trends, available at <https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data> as of Mar. 31, 2021.

TABLE 4-48: Estimated U.S. Emissions of Particulate Matter (PM-10)

U.S. Environmental Protection Agency, Air Emissions Inventories, *Air Pollutant Emissions Trends Data*, National Tier 1 CAPS Trends, available at <https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data> as of Mar. 31, 2021.

TABLE 4-49: Estimated U.S. Emissions of Particulate Matter (PM-2.5)

U.S. Environmental Protection Agency, Air Emissions Inventories, *Air Pollutant Emissions Trends Data*, National Tier 1 CAPS Trends, available at <https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data> as of Mar. 31, 2021.

TABLE 4-50: Estimated U.S. Emissions of Sulfur Dioxide

U.S. Environmental Protection Agency, Air Emissions Inventories, *Air Pollutant Emissions Trends Data*, National Tier 1 CAPS Trends, available at <https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data> as of Mar. 31, 2021.

TABLE 4-51: Air Pollution Trends in Selected Metropolitan Statistical Areas

U.S. Environmental Protection Agency, Office of Air and Radiation, *Air Trends, Air Quality Index: Daily AQI*, available at https://aqs.epa.gov/aqsweb/airdata/download_files.html as of June 10, 2021.

TABLE 4-52: Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants

U.S. Environmental Protection Agency, Office of Air Quality and Standards, Green Book, *Summary Nonattainment Area Population Exposure Report*, available at <https://www3.epa.gov/airquality/greenbook/popexp.html> as of Oct. 8, 2021.

TABLE 4-53: U.S. Carbon Dioxide Emissions from Energy Use by Sector

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, tables 11.1, 11.2, 11.3, 11.4, and 11.5, available at <https://www.eia.gov/totalenergy/data/monthly/index.php> as of June 2, 2021.

TABLE 4-54: Petroleum Oil Spills Impacting Navigable U.S. Waters

1990-2009: U.S. Coast Guard, *Polluting Incidents In and Around U.S. Waters, A Spill/Release Compendium: 1969-2011* (Washington, DC: January 2013), tables Number of Spills by Source, Volume of Spills by Source (Gallons) and Oil Spills In U.S. Waters Calendar Year, available at <http://homeport.uscg.mil/> as of Aug 6, 2013.

2010-20: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Investigations and Analysis (CG-INV), *ISLE CGBI Pollution Substances Spilled cube*, personal communication, Aug. 27, 2015, Apr. 21, 2016, July 11, 2017, Aug. 16, 2018, May 7, 2019, Aug. 25, 2020, and July 3, 2021.

TABLE 4-55: Leaking Underground Storage Tank Releases and Cleanups

1990: U.S. Environmental Protection Agency, Office of Underground Storage Tanks, personal communications, Nov. 17 and 18, 1998.

2000-20: U.S. Environmental Protection Agency, Office of Underground Storage Tanks, *UST Performance Measures*, available at <http://www.epa.gov/swerust1/cat/camarchv.htm> as of Dec. 7, 2020.

TABLE 4-56: Highway Noise Barrier Construction

U.S. Department of Transportation, Federal Highway Administration, Office of Planning, Environment, and Realty, Summary of Noise Barriers Constructed by December 31, 2019 (Washington, DC: June 2021), available at http://www.fhwa.dot.gov/environment/noise/noise_barriers/inventory/ as of Oct. 13, 2021.

TABLE 4-57: Number of People Residing in Areas of Significant Noise Exposure Around U.S. Airports*Exposure:*

1980-2019: U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, personal communications, June 3, 2010, Feb. 15, 2011, Oct. 18, 2011, Feb. 11, 2013, Mar. 6, 2014, Feb. 19, 2015, Jan. 11, 2018, May 7, 2019, and May 27, 2020.

Population:

U.S. Census Bureau, Population Division, *Population and Housing Units Estimates*, available at <http://www.census.gov/popest/> as of May 27, 2020.

TABLE 4-58: Motor Vehicles Scrapped

1970-2000: The Polk Co., personal communication, July 31, 2002.

2005-14: National Automobile Dealers Association, NADA Data 2014: Vehicles in Operation and Scrapage, available at <https://www.nada.org/nadadata/> as of Nov. 30, 2016.

Air Carrier Profile

Unless otherwise noted, refer to chapter tables for sources.

Financial:

1960-70: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), pp. 69 and 71.

1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC), pp. 3/28, 42, and 44.

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, *Form 41 Air Carrier Financial Reports, Schedules P1.1 and P1.2*, available at <https://www.transtats.bts.gov/homepage.asp> as of Sept. 24, 2021.

Inventory:

Number of carriers and full-time equivalent employees:

1960: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Oct. 14, 2003.

1970-80: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Nov. 2, 2007.

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Form 41 Air Carrier Financial Reports, Schedule P1 Employees*, available at <https://www.transtats.bts.gov/homepage.asp> as of Sept. 24, 2021.

Number of aircraft available for service:

1960-2005: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, personal communication, Oct. 17, 2003, Sept. 10, 2004, Feb. 1, 2007, and Nov. 2, 2007.

2006-20: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Form 41 Air Carrier Financial Reports, Schedule B43 Inventory and Schedule P1 Employees*, available at <https://www.transtats.bts.gov/homepage.asp> as of Sept. 24, 2021.

Performance:

Aircraft revenue-miles, Aircraft revenue-hours, Revenue passenger-miles, Revenue passenger enplanements, Load factor, Total revenue ton-miles, Revenue ton-miles of freight:

1960-70: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), Part III, tables 2, 4, 7, and 13.

1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC), pp. 2, 5, 46, and 86.

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class*, available at <https://www.transtats.bts.gov/homepage.asp> as of Sept. 24, 2021.

Average passenger revenue / passenger-mile:

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).

1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974), part III, table 2 (passenger-miles); part IV, table 2 (passenger revenues).

1980: Civil Aeronautics Board, *Air Carrier Financial Statistics* (Washington, DC: Annual December Issues), p. 2, line 3; and *Air Carrier Traffic Statistics* (Washington, DC: Annual December Issues), p. 4, line 9.

1990-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, TranStats Database, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class and Air Carrier Financial Reports, Schedule P-1.2*, available at <https://www.transtats.bts.gov/homepage.asp> as of Sept. 24, 2021.

Average passenger fare:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: February 1970), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1980: Civil Aeronautics Board, *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).

1990: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, TranStats Database, *T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class*, available at <https://www.transtats.bts.gov/homepage.asp> as of Aug. 14, 2017, and *Air Carrier Financial Reports, Schedule P-12*, available at <https://www.transtats.bts.gov/homepage.asp> as of Aug. 14, 2017.

1995-2020: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Annual U.S. Domestic Average Itinerary Fare in Current and Constant Dollars* (Washington, DC: Quarterly Release), available at <https://www.bts.gov/content/annual-us-domestic-average-itinerary-fare-current-and-constant-dollars> as of Sept. 24, 2021.

U.S. international passenger travel:

1960-70: U.S. Department of Justice, Immigration and Naturalization Service, *Report of Passenger Travel Between the U.S. and Foreign Countries, 1960, 1970* (Washington, DC).

1980: U.S. Department of Transportation, Research and Special Programs Administration, *U.S. International Air Travel Statistics* (Washington, DC: Annual issues), tables IIa and IIb.

1990-19: U.S. Department of Transportation, Research and Special Programs Administration, Bureau of Transportation Statistics, *T100: International Market*, available at <https://www.transtats.bts.gov/homepage.asp> as of Oct. 8, 2020.

Safety:

1960-87: National Transportation Safety Board, available at <http://www.ntsb.gov/aviation/stats.htm> as of November 2007 and personal communication.

1998-2020: National Transportation Safety Board, *Aviation Accident Statistics*, table 6, 7, 8, 9 available at https://www.ntsb.gov/investigations/data/pages/aviation_stats.aspx as of Oct. 22, 2021.

General Aviation Profile

Financial:

Eno Transportation Foundation, Inc., *Transportation in America*, Annual Issues (Washington, DC), pp. 40 and 45, and similar tables in earlier editions.

Inventory:

U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Part 135 Activity Surveys* (Washington, DC), tables 1.2 and similar tables in earlier editions, available at http://www.faa.gov/data_research/aviation_data_statistics/general_aviation/ as of Feb. 16, 2021.

Performance:

Number of flight hours by actual use:

U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Part 135 Activity Surveys* (Washington, DC), tables 1.4 and similar tables in earlier editions, available at http://www.faa.gov/data_research/aviation_data_statistics/general_aviation/ as of Feb. 16, 2021.

Vehicle-miles and passenger-miles:

Eno Transportation Foundation, Inc., *Transportation in America*, Annual Issues (Washington, DC), pp. 40 and 45, and similar tables in earlier editions.

Fuel consumed:

1960-1990: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity and Avionics Survey* (Washington, DC: 1990-2000 issues), table 5.1.

1995-2020: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Forecasts, FAA Aerospace Forecasts*, (Washington, DC: Annual issues), table 31 and similar tables in earlier editions, available at https://www.faa.gov/data_research/aviation/aerospace_forecasts/ as of Oct. 22, 2021.

Safety:

Fatalities:

1960-1970: National Transportation Safety Board, RE-50, personal communication.

1980-2020: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Accident Statistics*, table 10, available at <https://www.nts.gov/safety/Pages/research.aspx> as of Oct. 22, 2021.

Fatalities, flight purpose:

National Transportation Safety Board, personal communication on Sept. 10, 2002, Dec. 22, 2003, Apr. 30, 2004, Mar. 24, 2005, Nov. 7, 2006, Oct. 30, 2007, Mar. 04, 2010, Apr. 30, 2018, Nov. 25, 2019, Nov. 11, 2020 and Oct. 21, 2021.

Accidents:

1960-80: National Transportation Safety Board, RE-50, personal communication. *Annual Review of Aircraft Accident Data*, U.S. General Aviation, Calendar Year 1998 (Washington, DC: July 2000), table 10 as of July 22, 2004.

1990-2020: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Accident Statistics*, table 10, available at <https://www.nts.gov/safety/Pages/research.aspx> as of Oct. 22, 2021.

Highway Profile

Financial:

Government receipts, total and Government expenditures, total:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HF-210.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HF-10, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of May 13, 2021.

State highway user tax revenues:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MF-201 and MV-202.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MF-1 and MV-2, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 15, 2021.

Inventory:

Rural / urban mileage by ownership, total:

1960-70: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1985* (Washington, DC: July 1997), table M-203.

1980-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HM-210.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HM-10, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 11, 2021.

Rural / urban mileage by functional system, total:

1960-70: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), tables HM-212 and HM-220.

1980-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HM-220, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 11, 2021.

U.S. roads and streets by surface:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HM-212.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table HM-12, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 11, 2021.

State and local govt. highways employees:

1960-90: U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract of the United States*, (Washington, DC: Annual issues), State and Local Government Section.

2000-19: U.S. Department of Commerce, U.S. Census Bureau, *State and Local Government Employment and Payroll Data*, (Washington, DC: Annual Issues), available at <https://www.census.gov/programs-surveys/apes.html> as of June 17, 2021.

Highway, street and bridge construction employees:

1960-2019: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours, and Earnings from the Current Employment Statistics survey (National)* available at <http://www.bls.gov/data/sa.htm> as of June 17, 2021.

Performance:

Vehicle-miles of travel by functional system (millions), total:

1960-70: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1985*, FHWA-PL-97-009 (Washington, DC: April 1987), table VM-201.

1970-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), tables VM-202, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 1, 2021.

Motor fuel:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.cfm> as of Aug. 14, 2020.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 1, 2021.

Asphalt and road oil:

1960-80: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report* (Washington, DC: July 1982), p. 13.

1990-2019: U.S. Department of Energy, Energy Information Administration, *Petroleum Supply Annual: Volume 1* (Washington, DC: Annual Issues), table 1, available at <https://www.eia.gov/petroleum/supply/annual/volume1/> as of June 17, 2021.

Safety:

1960-80: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, NRD-30, personal communication.

1990-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts* (Washington, DC: Annual Issues), tables 1 and 4, available at <http://www-nrd.nhtsa.dot.gov/Cats/listpublications.aspx?Id=E&ShowBy=DocType> as of Jan. 11, 2021.

2010-19: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Fatality and Injury Reporting System Tool (FIRST)*, available at <https://cdan.dot.gov/query> as of Jan. 11, 2021.

Automobile Profile

Unless otherwise noted, refer to chapter tables for sources.

Financial:

All data except Auto registration fees and Driver's license fee:

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 2.5.5 available at <https://apps.bea.gov/itable/index.cfm> as of Sept. 17, 2021.

Auto registration fees and Driver's license fee:

1960-90: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, FHWA-97-009 (Washington, DC: July 1997), table MV-202.

2000-18: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics* (Washington, DC: Annual Issues), table MV-2 available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Aug. 21, 2020.

Inventory:

Vehicle registration:

1960-90: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.

2000-19: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics* (Washington, DC: Annual Issues), table MV-1 available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Sept. 17, 2021.

Motor vehicle licensed drivers:

1960-90: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, FHWA-PI-97-009 (Washington, DC: July 1997), table DL-201.

2000-19: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics* (Washington, DC: Annual Issues), table DL-22 available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Sept. 17, 2021.

Number of employees (based on NAICS):

1990-2000: U.S. Department of Labor, Bureau of Labor Statistics, *BLS Database*, available at <http://www.bls.gov/data/sa.htm> as of January 2007; codes "48531 Taxi service," "4231 Wholesale motor vehicles and parts," "441 Retail motor vehicle and parts dealers," "447 Gasoline stations," "81293 Parking lots and garages," "8111 Automotive repair and maintenance."

2010-20: U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Employment Statistics*; NAICS codes "485300," "423100," "441100," "447100," "811100," "81293." available at <https://www.bls.gov/oes/tables.htm> as of Sept. 17, 2021.

Performance:

1960-90: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, FHWA-97-009 (Washington, DC: July 1997), table VM-201A, table revised in June 1999.

2000-19: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics* (Washington, DC: Annual Issues), table VM-1 available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Sept. 17, 2021.

Safety:

Number of occupants and nonoccupant fatalities:

U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), personal communication, received on May 12, 2020.

Number of vehicles involved in fatal crashes:

1960-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), *Traffic Safety Facts* (Washington, DC: Annual Issues), table 3 and similar tables in previous issues, available at <https://cdan.nhtsa.gov/tsftables/tsfar.htm> as of Aug. 21, 2020.

2010-19: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), *FARS data query*, available at <https://www-fars.nhtsa.dot.gov/Main/index.aspx> as of Sept. 17, 2021.

All other categories:

1960-2019: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), *Traffic Safety Facts* (Washington, DC: Annual Issues), tables 1, 4, 7, 8, and 10 and similar tables in previous issues, available at <https://cdan.nhtsa.gov/tsftables/tsfar.htm> as of Sept. 17, 2021.

Truck Profile

Unless otherwise noted, refer to chapter tables for sources.

Financial:

Operating revenues, total and Operating expenses, total (based on NAICS):

U.S. Census Bureau, *Service Annual Survey* (Washington, DC: Annual Issues), table 2 and 3 and similar tables in earlier editions, available at <https://www.census.gov/programs-surveys/sas.html> as of Mar. 15, 2021.

Truck highway-user taxes:

1960-90: American Trucking Association, *American Trucking Trends*, (Washington, DC: Annual issues).

2000: American Trucking Association, *American Trucking Trends*, unpublished data, personal communication, June 30, 2008.

2015, 2017-18: American Trucking Association, *Reports, Trends & Statistics*, Industry Data, available at <https://www.trucking.org/economics-and-industry-data> as of May 3, 2021.

Inventory:

Number of truck registrations:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2019: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 15, 2021.

Number of employees: Truck transportation (based on NAICS) and Couriers and messengers (based on NAICS):

U.S. Department of Labor, Bureau of Labor Statistics, Database and Tables, NAICS codes "484 Truck transportation" and "492 Couriers and messengers," available at <https://www.bls.gov/ces/> as of May 3, 2021.

Number of employees: Truck drivers and sales workers (based on NAICS):

U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics, *Occupational Employment and Wage estimates*, (Washington, DC: Annual Issues), available at <https://www.bls.gov/oes/> as of May 3, 2021.

Number of trucking and courier establishments:

U.S. Bureau of the Census, *County Business Patterns* (Washington, DC: Annual Issues), NAICS 484 and 492, available at <https://www.census.gov/programs-surveys/cbp.html> as of May 11, 2021.

Performance:

Vehicle-miles, total rural and urban:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 15, 2021.

Ton-miles:

U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Table 1-50, available at <https://www.bts.gov/topics/national-transportation-statistics> as of Mar. 15, 2021.

Fuel consumed, Average fuel consumption per vehicle, Average miles traveled per gallon of fuel consumed, and Average miles traveled per vehicle:

1970-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Mar. 15, 2021.

Safety:

1980-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts*, (Washington, DC: Annual Issues), tables 3 and 9, available at <https://crashstats.nhtsa.dot.gov/#/> as of May 7, 2020.

2010-19: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Fatality and Injury Reporting System Tool (FIRST)*, available at <https://cdan.dot.gov/query> as of Mar. 15, 2021.

Bus Profile

Financial:

School bus:

National Center for Education Statistics, *Digest of Education Statistics* (Washington, DC: Annual Issues), Table 236.90, available at https://nces.ed.gov/programs/digest/current_tables.asp as of Sept. 25, 2020.

Inventory:

Number of vehicles, all buses:

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MV-10, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 6, 2021.

Number of employees (NAICS based):

U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours, and Earnings from the Current Employment Statistics Survey*, NAICS codes: "4852 Interurban and rural bus transportation," "4854 School and employee bus transportation," and "4855 Charter bus industry," available at <http://www.bls.gov/ces/data.htm> as of Sept. 25, 2020.

Performance:

1960-90: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A, available at <http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.cfm> as of July 16, 2010.

2000-19: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table VM-1, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Jan. 6, 2021.

Safety:

Number of fatalities, all buses:

1960-2000: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts* (Washington, DC: Annual Issues), tables 75 and 95 and similar tables in previous issues, available at <https://crashstats.nhtsa.dot.gov> as of Oct. 23, 2018.

2010-18: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts, School-Transportation-Related Crashes*, (Washington, DC: Annual Issues), table 1, available at <https://crashstats.nhtsa.dot.gov/#/> as of Sept. 25, 2020.

Occupant fatalities, all buses:

U.S. Department of Transportation, Federal Motor Carrier Safety Administration, *Large Truck and Bus Crash Facts*, table 28, available at <https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus...> as of Sept. 25, 2020.

Fatalities in vehicular accidents, all buses:

U.S. Department of Transportation, Federal Motor Carrier Safety Administration, *Large Truck and Bus Crash Facts*, table 25, available at <https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus...> as of Sept. 25, 2020.

Transit Profile

Financial:

Passenger operating revenues:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), tables 92 and similar tables in earlier years.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Annual Database Fare Revenue and Operating Funding Time-Series and similar tables in earlier years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Feb. 24, 2021.

Operating expense:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), table 68 and similar tables in earlier years.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Operating Expenses and similar tables in earlier years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Feb. 24, 2021.

Average passenger revenue per passenger-mile:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), tables 45 to 52 and similar tables in earlier years.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Annual Database Fare Revenue and Annual Database Service and similar tables in earlier years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 1, 2021.

Average passenger fare, per unlinked trip:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), tables 45 to 52 and similar tables in earlier years.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Annual Database Fare Revenue and Annual Database Service and similar tables in earlier years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 1, 2021.

Inventory:

Number of systems:

American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), table 47, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Sept. 21, 2021.

Number of vehicles:

American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), table 21, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Sept. 21, 2021.

Number of employees:

American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), table 18, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Sept. 21, 2021.

Performance:

Vehicle-miles, Unlinked passenger trips and Passenger-miles:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), tables 1, 3, and 8, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Oct. 4, 2019.

2010-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Annual Database Service, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 1, 2021.

Average trip length:

1960-2000: American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), tables 1, 3, and 8, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Oct. 4, 2019.

2010-18: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Annual Database Service and similar tables in earlier years, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 1, 2021.

Average vehicle speed:

American Public Transportation Association, *Public Transportation Fact Book Historical Tables* (Washington, DC: Annual Issues), table 17, available at <https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/> as of Sept. 21, 2021.

Energy consumption, diesel, other and electric power:

1960-90: American Public Transportation Association, *2011 Public Transportation Fact Book Historical Tables*, table 29, 30 and 31.

2000-14: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), table 17 as of Sept. 28, 2018.

2015-19: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, (Washington, DC.: Annual Reports), Annual Database Energy Consumption, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 1, 2021.

Safety:

Fatalities, injured persons, and incidents:

1990-2000: U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis Annual Report* (previously Safety Management Information Statistics - SAMIS), available at <http://transit-safety.volpe.dot.gov/Data/samis/default.asp> as of Feb. 22, 2010.

2010-18: U.S. Department of Transportation, Federal Transit Administration, Office of Program Management, personal communications, Jan. 08, 2010, Sept. 17, 2010, Feb. 25, 2011, Mar. 11, 2019 and Oct. 29, 2020.

Transit highway-rail grade crossing fatalities, injured persons, and incidents:

U.S. Department of Transportation, Federal Transit Administration, Office of Program Management, personal communications, Sept. 5, 2007, Jan. 8, 2010, Mar. 8, 2010, Sept. 17, 2010, Feb. 25, 2011, Mar. 11, 2019 and Oct. 29, 2020.

Major incidents:

U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC.: Annual Reports), Safety & Security Major-Only Time Series Data, available at <https://www.transit.dot.gov/ntd/ntd-data> as of Mar. 1, 2021.

Rail Profile

Unless otherwise noted, refer to chapter tables for sources

Financial:

Class I:

Association of American Railroads, *Railroad Facts* (Washington, DC), p. 10 and similar pages in earlier issues.

Amtrak:

1970-2016: Amtrak, *National Railroad Passenger Corporation Annual Report, Statistical Appendix to Amtrak Annual Report*, Annual issues.

2017-19: Association of American Railroads, *Railroad Facts* (Washington, DC), pp. 73 and similar pages in earlier issues.

Inventory:

Number of companies and employees:

1970-90: Amtrak, Public Affairs, personal communication. 1994-1997: Ibid., National Railroad Passenger Corporation Annual Report, 1972, 1980, 1990, and 1993-95.

1998-2019: Association of American Railroads, *Railroad Facts* (Washington, DC), pp. 65 & 73 and similar pages in earlier issues.

Class I, track mileage:

Association of American Railroads, *Railroad Facts* (Washington, DC), p.47 and similar pages in earlier issues.

Performance:

All data except locomotive mileage, total and revenue passenger-carried:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Tables 1-35, 1-38, 1-40, 1-50, 3-18, 3-20, 4-5, and 4-18, available at <https://www.bts.gov/>.

Locomotive mileage, total:

1980-2000: Association of American Railroads, *Analysis of Class 1 Railroads* (Washington, DC: Annual issues).

Revenue passenger-carried:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual Issues), p. 73 and similar pages in previous editions.

Safety:

1960-70: U.S. Department of Transportation, Federal Railroad Administration, Systems Support Division, RRS-22, personal communication.

1980-9: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Accident Trends - Summary Statistics*, table 4.08, Casualties by Type Person and Primary Event, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Mar. 5, 2020.

2000-20: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, *Accident Trends - Summary Statistics*, table 3.01, Summary by Incident and Type Person, available at <http://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx> as of Oct. 14, 2021.

Water Transport Profile

Financial:

Operating revenues:

1960-90: 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), page 2.

2000: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center Databases, personal communication, Aug. 3, 2001 and Apr. 21, 2006.

2010-19: U.S. Census Bureau, *Service Annual Survey* (Washington, DC: Annual Issues), table 2 and similar tables in earlier editions, available at <https://www.census.gov/programs-surveys/sas.html> as of Apr. 22, 2021.

Revenues of U.S. commercial fishing fleet-domestic landings:

U.S. Department of Commerce, National Marine Fisheries Services, *Fisheries of the United States* (Silver Spring, MD: Annual Issues), p. 11 and similar pages in earlier editions, available at <https://www.fisheries.noaa.gov/> as of Feb. 26, 2020.

Inventory:

Number of employees, ship and boat building and water transportation:

1960-90: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994) and 1988-1996 (Washington, DC: August 1996), SICs 373 and 44.

2000-20: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours, and Earnings from the Current Employment Statistics survey*, available at <http://www.bls.gov> as of Apr. 22, 2021.

Number of vessels and cargo capacity:

1960-90: U.S. Army Corps of Engineers, *Summary of U.S. Flag Passenger & Cargo Vessels* (New Orleans, LA: Annual issues).

1980-2019: U.S. Army Corps of Engineers, *Waterborne Transportation Lines of the United States* (New Orleans, LA: Annual issues) vol. 1, section 1, table 13 as of Apr. 22, 2021.

Total U. S. flag:

1960-90: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues), and unpublished revisions.

2000-19: U.S. Department of Transportation, Maritime Administration, *U.S.-Flag Privately-Owned Merchant Fleet* (Washington, DC: Annual issues) available at <https://www.marad.dot.gov/resources/data-statistics/> as of Apr. 22, 2021.

Recreational boats:

U.S. Department of Transportation, U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual Issues), table 36 and similar in earlier editions, available at http://uscgboating.org/statistics/accident_statistics.php as of Mar. 19, 2020.

Performance:

Ton-miles, tons of freight hauled, and average haul:

U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: Annual issues), part 5, section 1, tables 1-2, 1-3, and 1-4 available at <http://www.navigationdatacenter.us/wcsc/wcsc.htm> as of July 23, 2021.

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.

1990-2019: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual Issues), available at <https://www.eia.gov/petroleum/fueloilkerosene/> as of Apr. 22, 2021.

Gasoline:

U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual Issues), table MF-24 and similar tables in earlier editions, available at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of Apr. 22, 2021.

Safety:

Fatalities:

1970-1990: U.S. Coast Guard, Office of Investigations and Analysis, G-MAO-2, personal communication.

2000: U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, Feb. 13, 2002, July 2, 2003 and August 29, 2007.

2010-20: U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, Nov. 20, 2012 and Nov. 12, 2013, Aug. 31, 2015, May 2016, July 2017, Aug. 16, 2018, Aug. 28, 2019, Sept. 9, 2020, and Aug. 6, 2021.

Injuries:

1970-1990: U.S. Coast Guard, Office of Investigations and Analysis, G-MAO-2, personal communication.

2000: U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, Feb. 13, 2002, July 2, 2003 and August 29, 2007.

2010-15: U.S. Coast Guard, Marine Casualty and Pollution Data for Researchers (Apr. 6, 2015), available at <https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Marine-Casualty-and-Pollution-Data-for-Researchers-/> as of July 11, 2017.

2016-20: U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, May 24, 2019, Sept. 9, 2020, and Aug. 6, 2021.

Fatalities in recreational boats:

U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual Issues), table 20 and similar in earlier editions, available at http://uscgboating.org/statistics/accident_statistics.php as of Apr. 22, 2021.

Oil Pipeline Profile

Financial:

1960-2000: Eno Transportation Foundation, Inc., *Transportation In America 2002* (Washington, DC: 2002), pp. 38 and 39, and similar tables in earlier editions.

2010-19: PennWell Corporation, *Oil and Gas Journal: Transportation Special Report* (Houston, TX), pp. 44 and similar table in earlier editions.

Inventory

Pipeline operators:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Table 1-2, available at <https://www.bts.gov/>.

Number of employees, pipeline companies:

1960-80: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-94* (Washington, DC: September 1994), SIC 46.

1990: U.S. Department of Labor, Bureau of Labor Statistics, *Hours and Earnings, United States, 1988-1996* (Washington, DC: July 1996), SIC 46.

2000: U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Employment Statistics*, SIC 46, as of Feb. 22, 2010.

2010-19: U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Employment Statistics*, available at http://www.bls.gov/oes/oes_doc.htm, NAICS 486100 and NAICS 486900, as of Feb. 2, 2021.

Miles of pipeline (statute-miles), all lines:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Table 1-10, available at <https://www.bts.gov/>.

Performance:

U.S. Department of Energy, Energy Information Administration, *Movements between PAD Districts*, available at <https://www.eia.gov/petroleum/data.php> as of Mar. 11, 2021.

Safety:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, Table 2-50, available at <https://www.bts.gov/>.

Natural Gas Pipeline Profile

Financial:

Transmission pipeline companies:

1960-70: American Gas Association, *Gas Facts*, 1979 (Arlington, VA: 1980), table 134.

1980-2019: American Gas Association, *Gas Facts*, (Washington, DC: Annual Issues), table 11-2 and similar tables in earlier editions, available at <https://www.aga.org/research/data/>.

Distribution pipeline companies:

1980: American Gas Association, *Gas Facts*, 1979 (Arlington, VA: 1980), table 134.

1990-2019: American Gas Association, *Gas Facts*, (Washington, DC: Annual Issues), table 11-1 and similar tables in earlier editions, available at <https://www.aga.org/research/data/>.

Investor-owned:

American Gas Association, *Gas Facts*, (Washington, DC: Annual Issues), tables 11-1, 11-2, 11-3, and 11-4 and similar tables in earlier editions, available at <https://www.aga.org/research/data/>.

Inventory:

Pipeline mileage:

As cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-10, available at <https://www.bts.gov/>.

Number of employees:

1960-80: American Gas Association, *Gas Facts*, 1979 (Arlington, VA: 1980), table 153.

1990-2019: American Gas Association, *Gas Facts* (Washington, DC: Annual Issues), table 13-2, and similar tables in earlier editions, available at <https://www.aga.org/research/data/>.

Number of interstate natural gas pipeline companies:

1960-90: U.S. Department of Energy, Energy Information Administration, *Statistics of Interstate Natural Gas Pipeline Companies* (Washington, DC: Annual Issues), preface.

Performance:

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