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Bureau of Transportation Statistics

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Preface

Congress requires the Bureau of Transportation Statistics (BTS) to report on transportation statistics to the President and Congress. This *Transportation Statistics Annual Report (TSAR)* is the tenth such report prepared in response to this congressional mandate, laid out in 49 U.S.C. 111 (j). In addition to presenting the state of transportation statistics, the report focuses on transportation indicators related to 15 topics. Most of these topics were specified in the Intermodal Surface Transportation Efficiency Act; one was added by the Transportation Equity Act for the 21st Century.

The BTS publication, *National Transportation Statistics (NTS),* a companion to this annual report, has more comprehensive and longer time series data than could be accommodated here. *NTS* is available both in print and online at www.bts.gov.

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APPENDICES

Chapter 1

Summary

Summary

In this edition of the *Transportation Statistics Annual Report,* the Bureau of Transportation Statistics (BTS) focuses on transportation indicators related to 15 specific topics (chapter 2) and on the state of transportation statistics (chapter 3).

SUMMARY OF TRANSPORTATION INDICATORS (CHAPTER 2)

Chapter 2 contains transportation data and information on the following topics:[1]

1. productivity in the transportation sector,
2. traffic flows,
3. travel times,
4. vehicle weights,
5. variables influencing traveling behavior,
6. travel costs of intracity commuting and intercity trips,
7. availability of mass transit and number of passengers served,
8. frequency of vehicle and transportation facility repairs and other interruptions of transportation service,
9. accidents,
10. collateral damage to the human and natural environment,
11. condition of the transportation system,
12. transportation-related variables that influence global competitiveness,
13. transportation and economic growth,
14. government transportation finance, and
15. transportation energy.

Each of these topics is represented by a series of key indicators in chapter 2. The indicators are presented graphically along with analyses; supporting data tables are in appendix B (box 1).

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[1] See 49 U.S. Code 111(c)(1). Topics 1 through 11 come from the Intermodal Surface Transportation Efficiency Act of 1991; topic 12 was added by the Transportation Equity Act for the 21st Century of 1998.

BOX 1
About the Data in this Report

The data in this report come from a variety of sources—principally, from the Bureau of Transportation Statistics and other operating administrations of the Department of Transportation. However, other sources are federal government agencies, such as the U.S. Census Bureau, the Bureau of Economic Analysis, the U.S. Environmental Protection Agency, the U.S. Coast Guard, and the Energy Information Administration. To supplement government sources, the report occasionally uses data and information from trade associations, such as the Association of American Railroads and the American Public Transportation Association. Data from any of these sources may be subject to omissions and errors in reporting, recording, and processing. Sample data are subject to sampling variability. Documents cited as sources in this report often provide detailed information about definitions, methodologies, and statistical reliability.

To be consistent, when trend data are used in this report they are shown, if possible, for at least a 10-year period. Because of the differing availability of data among all the indicators included, it has not been possible to use the same span of 10 years for each indicator without sacrificing timeliness. Instead, the data span a decade up to the year of most recent data available when this report was prepared. (More information about data in the report can be found in the introduction to chapter 2.)

In this summary chapter, full data sources are not provided. However, the data here are from chapter 2, where full citations are given in the text and graphs. Corresponding tables in appendix B also contain source information. The data here are presented in the same order—by topic section—as they appear in chapter 2, enabling easy access to data sources. Also not present in this chapter are complete definitions, which can vary across data sources.

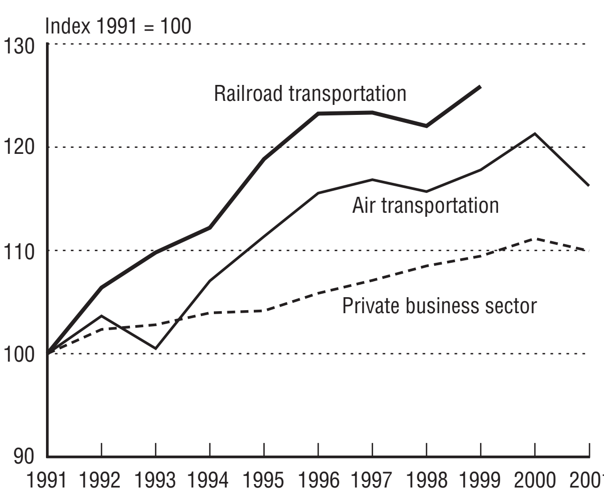
1. Productivity in the Transportation Sector

Two differing indicators of economic productivity exist: multifactor and labor productivity. Labor productivity relates output to labor input, while multifactor productivity relates changes in output to changes in a complete set of inputs, including capital, labor, energy, materials, and services. Multifactor productivity is, thus, a more comprehensive indicator. However, air and rail are the only components of the transportation sector for which multifactor productivity estimates are currently available (from the Bureau of Labor Statistics—BLS); BTS is developing them for all modes using BLS methodologies.

Labor productivity in the for-hire transportation services and petroleum pipeline industries increased 16 percent between 1991 and 2001, a slower rate than the entire business sector, which rose 23 percent. Among transportation modes, rail increased the most, by 64 percent from 1991 to 2001. Despite a decline of 6 percent between 2000 and 2001, air transportation labor productivity grew 18 percent over the entire period.

Multifactor productivity of all business sectors combined increased 10 percent between 1991 and 2001, while multifactor productivity in air transportation increased 16 percent (figure A).

Figure A Multifactor Productivity: 1991–2001



See chapter 2, figure 1-3, for notes and sources.

2. Traffic Flows

Tracking the volume and geographic flow of traffic on America's roads, rails, and waterways and at airports helps to ensure that transportation infrastructure is properly maintained and has adequate capacity to meet the demand. Data on traffic flows also help to evaluate congestion trends by mode or a combination of modes and the potential for shifts in traffic within the route structure of a particular mode and from one mode to another. Aggregate traffic flow data, used to evaluate trends over time, can be helpful in measuring transportation-related safety and environmental trends.

Passenger and freight flows are measured in a variety of ways. Vehicle-miles of travel (vmt) for both passenger and freight are calculated by multiplying the number of vehicles by miles of travel. Passenger travel can also be measured by estimating the number of miles traveled per person for each mode (box 2). This method takes into account not only the distance traveled by a vehicle but also the number of people in the vehicle. In addition to vmt, freight flows are measured in ton-miles—the movement of one ton of cargo the distance of one mile. Each of these measurements allows for comparisons across modes and between passenger and freight traffic, although these comparisons are affected by data-collection methods and definitions.

Passenger-miles of travel (pmt) in the United States totaled an estimated 4.8 trillion in 2001, or about 17,000 miles for every man, woman, and child. Over the decade 1991 to 2001, pmt increased 24 percent. Over 85 percent of pmt in 2001 was in personal vehicles (passenger cars and light trucks, which include sport utility vehicles, pickup trucks, and minivans). Air carriers accounted for another 10 percent of pmt (figure B).

BOX 2
Data on Passenger-Miles of Travel

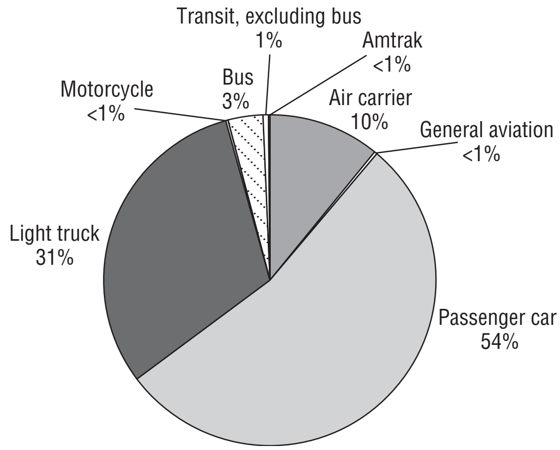
Two national estimates of passenger-miles of travel (pmt) are available; they differ in coverage, methodology, and other factors. The 2001 pmt data presented in this Traffic Flows section come from the Bureau of Transportation Statistics (BTS) publication, *National Transportation Statistics* (NTS). BTS compiles these data for NTS annually, primarily using mode-by-mode data derived in various ways by BTS and others. For instance, pmt for large air carriers and intercity trains are estimated from ticket sales and trip lengths; for transit, the data are reported by transit authorities. Each method used to estimate these pmt has differing strengths and weaknesses, as discussed in NTS in the Data Source and Accuracy Statements for table 1-34 (available at http://www.bts.gov/).

Later, the section on Variables Influencing Traveling Behavior presents pmt data from the 2001 National Household Travel Survey (NHTS), jointly conducted by BTS and the Federal Highway Administration between March 2001 and May 2002. As survey data, they are collected using a single methodology. This provides a coherence and comparability not available with the NTS data. However, these data are not collected annually, limiting their use for trend analyses. Another difference between the NTS and NHTS data is the extent of their coverage among modes. It is to be expected, then, that because of methodological and coverage issues the NTS and NHTS data will differ.

As with pmt, BTS employs differing methodologies to generate freight ton-miles. When individual, modal ton-mile data are combined, freight transportation generated 4.3 trillion domestic ton-miles in 2001, 20 percent more than in 1991 (figure C). Based on preliminary data from the 2002 Commodity Flow Survey (CFS) combined with supplemental estimates, freight activity totaled 4.5 trillion ton-miles, an increase of 24 percent between 1993 and 2002.[2] There were 15.8 billion tons of commodities

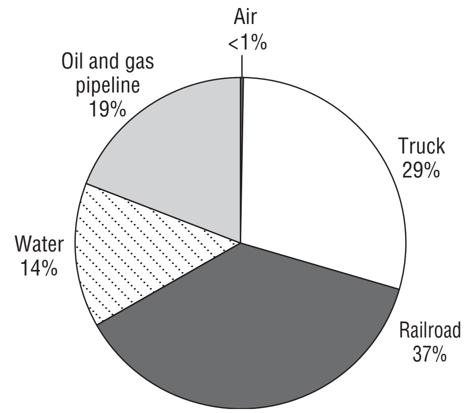
[2] The most recent CFS data collections occurred in 1993, 1997, and 2002.

Figure B Shares of Passenger-Miles of Travel by Mode: 2001



See chapter 2, figure 2-1, for notes and sources.

Figure C Shares of Domestic Freight Ton-Miles by Mode: 2001



See chapter 2, figure 2-8, for notes and sources.

shipped in 2002 (up 18 percent since 1993) at a value of $10.5 trillion (in chained 2000 dollars),[3] up 45 percent since 1993.

Highway passenger vmt dominates total highway vmt and amounted to 2,641.2 billion (2.6 trillion) in 2002, up 26 percent since 1992. Meanwhile, domestic service air carrier (aircraft) vmt rose 41 percent to total 5.6 billion in 2002. Freight highway vmt totaled 214.5 billion in 2002, a growth of 40 percent since 1992.

In addition to studying freight and passenger volumes, it is also important to track changes in the geographic and modal distribution of freight and passenger travel in order to anticipate and alleviate areas of high congestion and for other purposes. Truck, rail, and waterborne freight flow maps, using tools such as *GeoFreight,*[4] help planners pinpoint potential problem areas in the transportation system.

3. Travel Times

How long it takes people and goods to get from their starting point to their final destination is a key measure of transportation system performance. Many current measures of travel time trends tend to focus on delay, congestion, and whether or not scheduled trips arrive on time. While delay and congestion measures are important, they are by no means the only consideration in evaluating these trends.

New research at BTS on an Air Travel Time Variability Index aims to improve the measurement of air travel time and reliability. In preliminary results, the index rose by 4 percent per year between 1990 and 2000 and then fell by 12 percent per year between 2000 and 2002, indicating that the actual travel time for a typical flight became more uncertain and took longer, on average, between 1990 and 2000 and then improved starting in 2001 (figure D).

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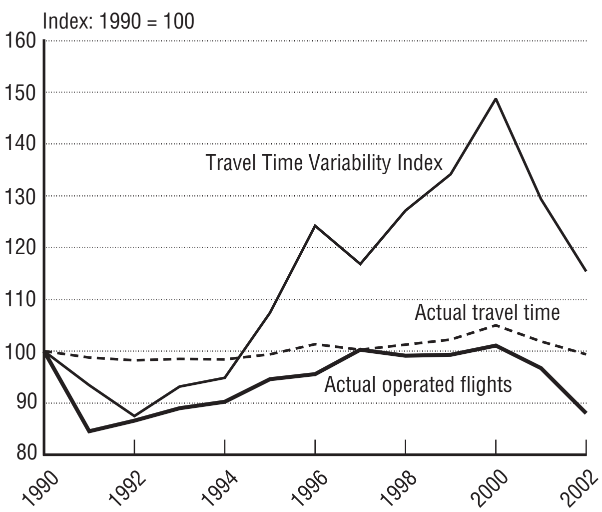
[3] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified, to eliminate the effects of inflation over time.

[4] *GeoFreight* was developed in 2003 by BTS, the Federal Highway Administration, and the Office of Intermodalism of the U.S. Department of Transportation.

The data supporting the new Air Travel Time Index are collected by BTS from air carriers with at least 1 percent of total domestic passenger revenues. These Air Service Quality Performance data[5] also show that nearly 82 percent of domestic air flights arrived on time in 2003, compared with 79 percent in 1995. On average, 37 percent of delays between July 2003 and January 2004 occurred because of circumstances within an airline's control, such as maintenance or crew problems, while 40 percent happened because a previous flight arrived late. Security delays caused less than 1 percent of delays, on average, and extreme weather, 7 percent.

Figure D Travel Time Variability Index and Actual Travel Time and Operated Flights: 1990–2002



See chapter 2, figure 3-7, for notes and sources.

For those using personal vehicles, highway travel times increased in 72 of 75 urban areas (95 percent) between 1991 and 2001. In 2001, it took 39 percent longer, on average, to make a peak period trip in urban areas compared with the time it would take if traffic were flowing freely. More than two of five adults in the United States reported in 2002 that traffic congestion was a problem in their community, according to the BTS *Omnibus Household Surveys*.

Seventy-four percent of Amtrak trains arrived at their final destination on time in 2003, compared with 72 percent in 1993. During this period, short-distance trains—those with runs of less than 400 miles—have consistently registered better on-time performance than long-distance trains—those of 400 miles or more.

4. Vehicle Weights

Vehicle traffic affects the condition and longevity of infrastructure. Traffic on a given highway segment can be measured by average weights and numbers of vehicles. A way to assess the resultant highway pavement stress is by estimating vehicle loadings[6] on the nation's highways. Aircraft landing weights can affect airport pavement, as can the weight of rail equipment on rail tracks. For maritime infrastructure, especially ports, vessel size—often expressed in deadweight tons (dwt), which is a measure of cargo capacity rather than weight—can be of concern. As larger waterborne vessels are added to the worldwide merchant marine fleet, U.S. ports may have to expand to accommodate larger ships or decide to specialize in handling cargoes that are not affected by changes in vessel size.

The number of trucks in the U.S. truck fleet grew 23 percent between 1992 and 1997.[7] In the *heavy* category (over 26,000 pounds), the number of trucks grew 37 percent during the period, while *medium* trucks (between 6,001

[5] BTS has been collecting on-time performance data since 1985 and in mid-2003 began collecting cause-of-delay data as well.

[6] Vehicle loadings are based on equivalent single-axle loads.

[7] These number and weight data, from the Vehicle Inventory and Use Survey (VIUS) conducted every five years, were the most recent available when this report was prepared. National summary VIUS 2002 data are expected in fall 2004.

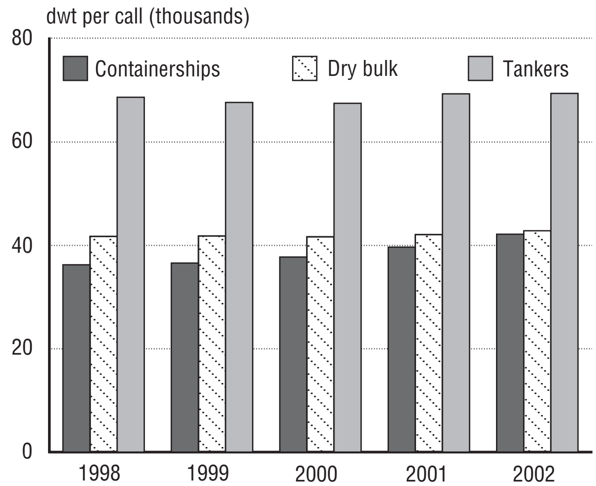
and 19,500 pounds) increased 14 percent. *Light* trucks, which include sport utility vehicles (SUVs), minivans, vans, and pickup trucks, represented 85 percent of the truck fleet in 1997. The number of light trucks increased by 24 percent between 1992 and 1997; however, the strongest growth occurred among the light truck subcategories of SUVs (93 percent) and minivans (61 percent).

Large combination trucks[8] made up only 6 percent of traffic volume on urban Interstate highways in 2002, but accounted for 77 percent of the loadings on these highways. In rural areas, they represented 18 percent of traffic and 89 percent of Interstate loadings in 2002. Between 1992 and 2002, large combination truck traffic volume grew from 16 percent to 18 percent on rural roads, while decreasing from 7 percent to 6 percent on urban Interstate highways.

The average capacity of containerships calling at U.S. ports increased 16 percent to 42,158 dwt per call between 1998 and 2002.[9] Meanwhile, the average capacity of all types of vessels calling at U.S. ports grew 5 percent, to 47,625 dwt per call in 2002 (figure E).

The average weight of each freight railcar remained fairly constant—ranging from 62 to 67 tons per carload—between 1992 and 2002. However, this relatively steady average weight of a loaded railcar masks countervailing trends among selected freight commodities. For instance, the average weight of a carload of coal was 111 tons in 2002, up from 99 tons in 1992. Meanwhile, miscellaneous mixed shipment carloads were 14 percent lighter in 2002 than they were in 1992.

Figure E Average Capacity of Vessels Calling at U.S. Ports by Selected Type: 1998–2002



See chapter 2, figure 4-4, for notes and sources.

5. Variables Influencing Traveling Behavior

Travel patterns across the nation are the result of literally millions of different decisions by individuals and businesses. Travel behavior both shapes and is shaped by available transportation options. Hence, understanding the variables that influence travel behavior are important in evaluating transportation needs and making appropriate decisions about changes in the system.

Results from the 2001 National Household Travel Survey (NHTS),[10] sponsored by BTS and the Federal Highway Administration, show that the daily non-occupational travel of all people in the United States totaled about 4 trillion miles, an average of 14,500 miles per person per year. On a daily basis, each person traveled an average of 40 miles, 88 percent of it in a personal vehicle.[11] Overall, people took 411 billion daily one-way trips in 2001, an average of 1,500

[8] Large combination trucks weigh more than 12 tons and have 5 or more axles.

[9] 1998 is the first year for which data are available.

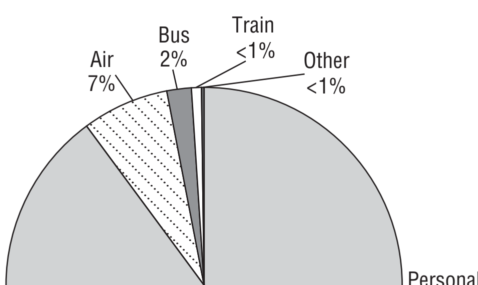
[10] See box 2 on page 5 for a discussion about pmt data. Full details of the 2001 NHTS are in chapter 2, section 5, along with a discussion of the difference between daily and long-distance travel data.

[11] *Personal vehicles* include cars, vans, SUVs, pickup trucks, other trucks, recreational vehicles, and motorcycles.

trips per person annually or about 4 trips per day. The largest number of daily trips (45 percent) were to shop, to visit doctors and dentists, and for other family and personal business. Commuting—trips made to and from work—accounted for 15 percent of all personal trips in 2001. The average length of these trips was 12 miles.

On average, each person made 9 roundtrip long-distance trips of at least 50 miles in 2001 for a total of 2.6 billion trips covering 1.4 trillion miles. Eighty-nine percent of long-distance trips were in personal vehicles; most of the other trips (7 percent) were by airplane (figure F). For 28 percent of the long-distance miles traveled and 63 percent of the trips, people stayed within their home state. International travel accounted for only 1 percent of long-distance trips but was 14 percent of total miles traveled.

Figure F Shares of Long-Distance Trips by Mode: 2001



See chapter 2, figure 5-3, for notes and sources.

Among other variables affecting the way people travel are income, gender, and age. For instance, both the number of daily and long-distance trips increases with household income. On average, people in households earning $100,000 or more made 13 long-distance trips, while those in households earning less than $25,000 made 6 long-distance trips. For daily travel, the differences are not as great. People in $100,000-income households took an average of 4.6 trips per day; those living in households earning less than $25,000 averaged 3.5 trips per day. Older adults do not travel as often or as far as do younger adults but rely as heavily on personal vehicles. However, people aged 65 and older make 55 percent of their daily trips between 10 a.m. and 4 p.m., while daily trips of people 19 to 64 years old peak 3 times a day: early morning, noon, and early evening.

Proximity to transportation options can also affect modal choices that people make. A geospatial analysis conducted by BTS in early 2003 showed that over 94 percent of rural residents in the United States live within a 25-mile radius of an intercity rail station, an intercity bus terminal, or a nonhub or small airport or within a 75-mile radius of a large or medium hub airport.

6. Travel Costs of Intracity Commuting and Intercity Trips

Comparing travel costs, by mode, of intracity and intercity trips is challenging because not all such costs are currently measured in the same way. BTS has developed a new method of computing price indexes for air travel that might one day serve as a model for producing price indexes for other modes.

BTS released initial data from its Air Travel Price Index (ATPI) in March 2004. The research phase of ATPI includes three indexes: one covering U.S. origin flights, one for foreign origin flights, and a third that is a combination of the first two. A comparison of the official BLS Airline Fare Index (of the U.S. Consumer Price Index) and the ATPI "U.S. origin only" index between the fourth quarters of 1998 and

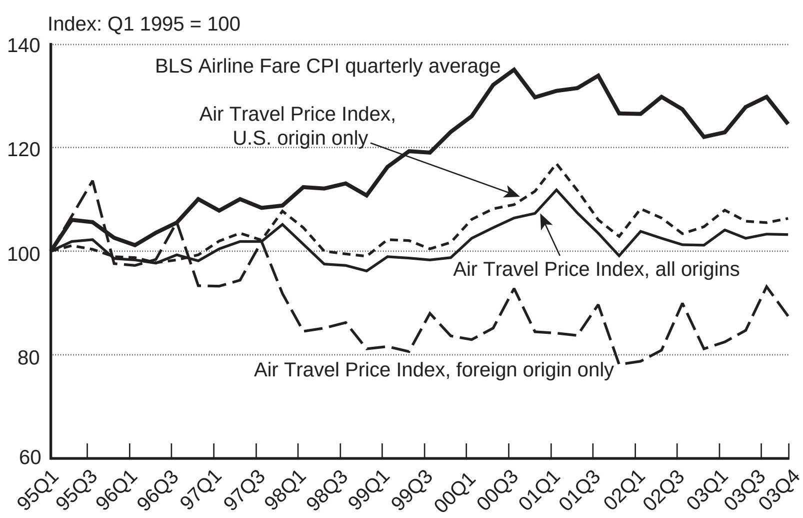
2003 shows that the ATPI increased 7 percent while the BLS index rose 12 percent. The difference may be because the ATPI accounts for special discount fares that involve differential pricing, while the BLS measure does not, and other factors (figure G).

On average, U.S. households spent $7,825 (in chained 2000 dollars)[12] on transportation (including vehicle purchases) in 2002 compared with $5,849 in 1992, an increase of 34 percent. Costs related to motor vehicles rose 36 percent between 1992 and 2002, while other transportation expenditures increased 6 percent. Transportation costs were 19 percent of all household expenditures in 2002; only housing cost more (33 percent).

Driving an automobile 15,000 miles per year cost 51¢ per mile in 2002, or 13 percent more than it did in 1992, when total costs were 45¢ (in chained 2000 dollars). For those using transit, the average fare ranged from 17¢ to 19¢ per passenger-mile (in chained 2000 dollars) between 1992 and 2002. Increases in fares per passenger-mile for some types of transit service were offset by lower fares per passenger-mile for other types.

On average, intercity trips via Amtrak cost 23¢ per revenue passenger-mile in 2002, up 44 percent from 16¢ per revenue passenger-mile in 1993 (in chained 2000 dollars). Meanwhile, average intercity Class I bus fares rose 23 percent, from $23 to $28, between 1992 and 2002 (in chained 2000 dollars).

Figure G Comparison of Airfare Indexes: 1995–2003



See chapter 2, figure 6-9, for notes and sources.

7. Availability of Mass Transit and Number of Passengers Served

While there are several thousand transit authorities in the United States, 30 of them served 43 percent of the resident population in 2002. Transit use continues to be concentrated in specific markets, such as communities where households do not tend to own cars, in certain large cities, and among lower income households. According to the 2001 NHTS, approximately 40 percent of all daily transit trips are work related.

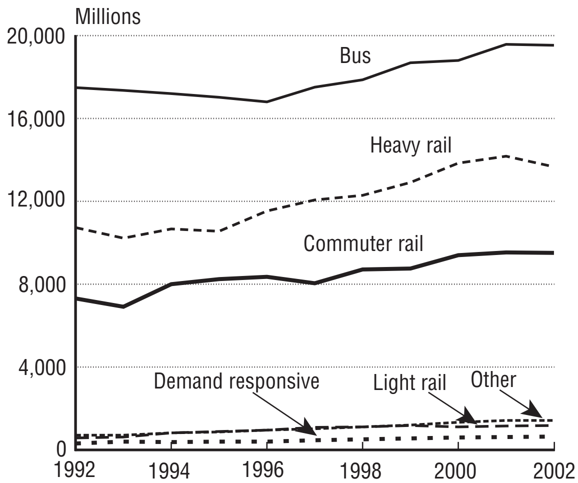
Transit service can be measured in a variety of ways, including passenger-miles of travel and linked and unlinked trips.[13] There were 45.9 billion transit pmt in 2002 compared with 37.2 billion pmt in 1992, an increase of 24 percent. As they have historically, buses had the largest pmt share in 2002, generating 19.5 billion pmt or 43 percent of all transit pmt (figure H).

Measured in unlinked trips, transit ridership has grown 17 percent since 1992 to 9.0 billion unlinked trips in 2002. Bus ridership comprised the majority of

[12] All dollar amounts are expressed in chained 2000 dollars unless otherwise specified to eliminate the effects of inflation over time.

[13] For a discussion of linked vs. unlinked trips, see section 7 in chapter 2.

Figure H Transit Passenger-Miles by Type of Service: 1992–2002



See chapter 2, figure 7-1, for notes and sources.

unlinked trips (5.3 billion) in 2002. However, rail transit ridership, with 3.4 billion trips in 2002, posted stronger growth (31 percent) between 1992 and 2002. Approximately 78 percent of all unlinked transit passenger trips (7.0 billion trips in 2002) were within the service area of only 30 transit authorities. New York City alone accounted for 30 percent of all transit trips in 2002.

The nationwide fleet of ADA-compliant lift- or ramp-equipped transit buses increased to 94 percent (to 64,407 buses) in 2002 from 52 percent of the bus fleet in 1993. In 2002, 53 percent or 1,506 rail transit stations were ADA[14] accessible.

8. Frequency of Vehicle and Transportation Facility Repairs and Other Interruptions of Transportation Service

Repairs to vehicles, vessels, aircraft, and other transportation equipment, as well as roads, bridges, and other infrastructure, can impact the schedules of people and movement of goods. Data on these repair frequencies could help planners reduce the disruption repairs can cause. Unfortunately, data are not readily available to properly characterize the frequency of repairs for vehicles and infrastructure of most modes. There are a number of reasons for this lack of data.

In some cases where repair data are available, establishing a link to service interruptions can be problematic. In other cases, maintenance cost data are available (e.g., airlines and highways), but, again, the connection between costs and frequency and, thus, interruptions of service are not clear. Annual data are available on U.S. domestic vessel fleet capacity, but capacity results from market and other factors as well as repair downtime.

Most of the vehicle repair data for the trucks and buses operated by the nation's more than 662,000 motor carriers are not public information. A surrogate measure is data on highway truck inspections. Over 2.1 million roadside truck inspections were completed in 2003, up 9 percent since 1993. The percentage of inspected trucks taken out of service declined from 26 percent in 1993 to 23 percent in 2003.

Work zones on freeways, an indicator of maintenance activity, cause an estimated 24 percent of the nonrecurring delays on freeways and principal arterials. The level of highway maintenance funding is an indirect measure of the amount of maintenance activity. Funding for highway maintenance increased by 15 percent (in constant 1987 dollars)[15] between 1990 and 2001. Pavement resurfacing represented just over half (51 percent) of the miles of federal-aid roads undergoing federally supported construction or maintenance in 2001, up from about 42 percent in 1997.[16]

[14] ADA refers to the Americans with Disabilities Act of 1990.

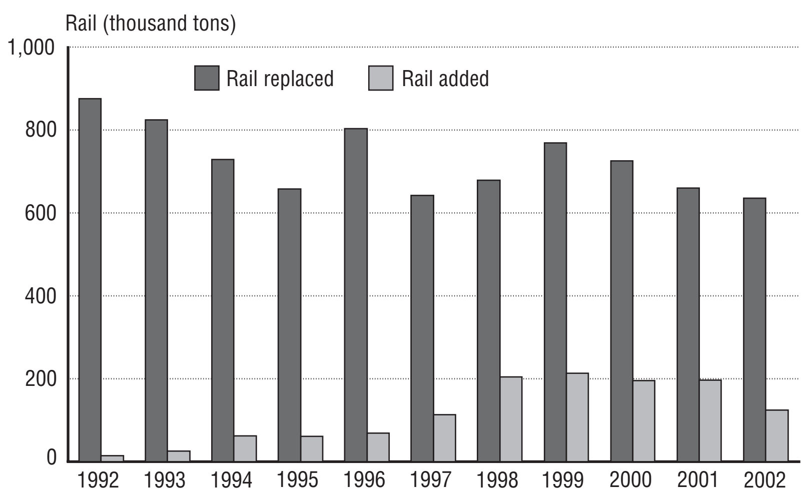
[15] Instead of chained 2000 dollars, these Federal Highway Administration data are published in constant 1987 dollars.

[16] 1997 is the earliest year for which these data are available.

Class I railroad companies maintained 170,048 miles of track in 2002, down from 190,591 miles of track in 1992. In 2002, rail companies replaced 636,000 tons of rail (27 percent fewer than in 1992) and 13.1 million crossties (3 percent fewer than in 1992) (figure I). Railroads also periodically replace or rebuild locomotives and freight cars. On average, new and rebuilt locomotives made up 4 percent of Class I railroad fleets between 1992 and 2002.

Transit service[17] interruptions due to mechanical failures remained relatively level from 1995 through 2000,[18] averaging between 18 and 19 mechanical problems per 100,000 revenue vehicle-miles.

Figure I Rail Replaced or Added by U.S. Class I Railroads: 1992–2002



See chapter 2, figure 8-4, for notes and sources.

Natural disasters, accidents, labor disputes, terrorism, security breaches, and other incidents can result in major disruptions to the transportation system. Although a comprehensive account of these interruptions has not been undertaken nor data compiled on them, numerous studies and other analyses have sought to evaluate the effects of individual events on the transportation system. Terrorist attacks and security alerts have affected transportation services for decades. After the terrorist attacks of September 11, 2001, for instance, all commercial flights scheduled for September 12 were canceled and full service only gradually returned in the following weeks. Labor disputes can also disrupt transportation. A labor lockout in fall 2002 shut down all west coast ports for 10 days. Shipments by retailers, manufacturers, automakers, and the agricultural sector were particularly impacted.

9. Accidents

Crashes involving motor vehicles and other transportation accidents in the United States result in tens of thousands of fatalities and millions of injuries each year. The number of fatalities and injuries per year represents a common means for evaluating the safety of each transportation mode. Presenting data in the form of the number of fatalities or injuries per 100,000 residents or by passenger-miles or vehicle-miles of travel can enable useful comparisons across time and modes. However, care must be taken in doing so, because definitions of fatalities and injuries vary by mode and estimates of vmt and, especially, pmt are inexact.

There were more than 45,000 fatalities related to transportation in 2002, almost 16 fatalities per 100,000 U.S. residents. This is the same rate as in 1992, when there were just over

[17] See detailed definitions of the type of transit equipment included in section 8 in chapter 2.

[18] Data prior to 1995 and later than 2000 were collected using different definitions of what constitutes an interruption of service and are not comparable.

42,000 deaths. About 94 percent of all transportation fatalities in 2002 were highway-related.

An estimated 3.0 million people suffered some kind of injury involving passenger and freight transportation in 2002. Most of these injuries, about 98 percent, resulted from highway crashes. However, injuries per pmt for most highway vehicle types declined between 1992 and 2002. One exception was the rate for light truck occupants, which rose 13 percent, from 45 per 100 million pmt in 1992 to 51 per 100 million pmt in 2002.

A BTS analysis of motor vehicle-related injury data for 2002[19] shows that there were sharp peaks in injuries associated with youth. For motor vehicle occupants and motorcyclists, the peak spanned ages 15 to 24 years. Young males exhibited a substantially greater peak in serious injuries than did young females (figure J). In addition, the percentage of injuries classified as serious was greater for motorcyclists (21 percent of all motorcyclist injuries were serious), pedestrians (19 percent), and pedalcyclists (13 percent) than it was for motor vehicle occupants (7 percent).

Motor vehicle crashes in the United States cost an estimated $231 billion in 2000 (in 2000 dollars), about $820 per person or 2 percent of the Gross Domestic Product (GDP). The largest components of the total cost (26 percent each) are market productivity—the cost of foregone paid labor due to death and disability—and property damage.

Figure J Serious Motor Vehicle-Related Injuries by Age and Gender: 2002

See chapter 2, figure 9-9 for notes and sources.

10. Collateral Damage to the Human and Natural Environment

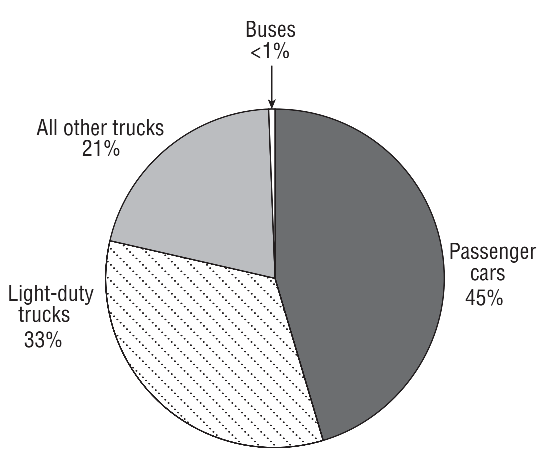
As people travel and freight is transported, damage can occur to the human and natural environment. Transportation also impacts the environment when transportation equipment and fuels are produced and infrastructure is built, during repair and maintenance of equipment and infrastructure, and when equipment and infrastructure are no longer usable and are discarded and dismantled. The extent of damage throughout these life cycles of transportation fuel, equipment, and infrastructure can vary by mode. In all cases, actual impacts on the human and natural environment are dependent on ambient levels or concentrations of pollutants and rates of exposure.

[19] This analysis was based on data from the U.S. Consumer Product Safety Commission's National Electronic Injury Surveillance System. Due to methodological differences, these data are not necessarily consistent with other injury data in this report that come from the U.S. Department of Transportation, National Highway Traffic Safety Administration's National Automotive Sampling System General Estimates System.

Transportation vehicles and vessels in 2001 emitted 66 percent of the nation's pollution from carbon monoxide (CO), 47 percent of nitrogen oxides (NO_x), 35 percent of volatile organic compounds (VOC), 5 percent of particulates, 6 percent of ammonia, and 4 percent of sulfur dioxide. Highway vehicles emitted almost all of transportation's share of CO emissions in 2001, 79 percent of the NO_x, and 78 percent of all VOC. With the exception of ammonia, emissions by transportation of these types of air pollutants have declined since 1991.

Transportation emissions of greenhouse gases (GHGs) grew 22 percent between 1992 and 2002, while total U.S. emissions rose 14 percent to 6,934.6 teragrams of carbon dioxide (CO_2) equivalent. Of this, 27 percent were emitted by transportation. Nearly all (97 percent) of CO_2 emissions—the predominant GHG—are generated by the combustion of fossil fuels. Transportation was responsible for 31 percent of all U.S. CO_2 emissions in 2002 (figure K). Transportation CO_2 emissions grew 21 percent between 1992 and 2002.

Figure K Shares of Carbon Dioxide Emissions by Type of Highway Vehicle: 2002



See chapter 2, figure 10-5, for notes and sources.

Transportation-related sources typically account for most oil spills into U.S. waters reported each year to the U.S. Coast Guard. For instance, transportation's share of the reported total volume of oil spilled between 1991 and 2001 varied from a high of 97 percent (in 1996) to a low of 77 percent (in 1992). The volume of each spill varies significantly from incident to incident. One catastrophic incident can, however, spill millions of gallons into the environment.

Transportation can also affect human health and the environment when hazardous materials accidents occur. Transportation firms reported more than 15,300 hazardous materials incidents in 2002.[20] These incidents resulted in 7 deaths and 129 injuries, compared with annual averages of 22 deaths and 419 injuries between 1992 and 2002. During that period, the number of reported hazardous materials incidents increased. However, much of the increase may be attributed to improved reporting and an expansion of reporting requirements.

11. Condition of the Transportation System

Two major components of the transportation system—vehicles and infrastructure—are prone to deterioration due to wear, aging, and damage. Measures of the net capital stock of the transportation system—the value in dollars of vehicles, infrastructure, and other components—provide comprehensive indicators that combine system condition (quality) with capacity (quantity) and allow for comparisons across modes.

Highway-related capital stock (highway infrastructure, consumer motor vehicles, and trucking and warehousing) represented the majority ($2,432 billion in chained 2000 dollars) of the nation's transportation capital

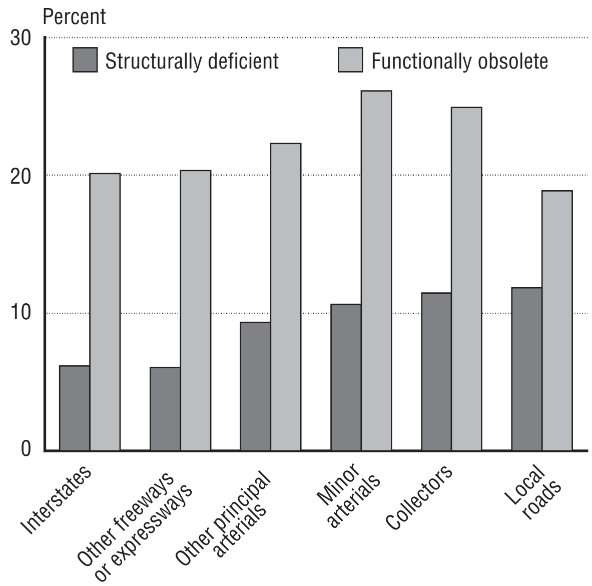
[20] See section 10 in chapter 2 for a definition of a reported incident.

stock in 2001, rising 27 percent since 1991. The combined value of privately owned capital stock ($650 billion in 2001) for other individual modes of the transportation system, including rail, water, air, pipeline, and transit, is less than the value of consumer motor vehicles alone ($855 billion). Between 1991 and 2001, the capital stock value of transportation services (a component of all modes) rose 94 percent, the most rapid growth of all capital stock components. The only modes with declining values during the period were water transportation (down 4 percent) and railroad transportation (down 6 percent).

Other infrastructure data reflect qualitative evaluations of the pavement and associated structures. The condition of highways, bridges, and airport runways has mostly improved in recent years. The percentage of rural Interstate mileage in poor or mediocre condition declined from 35 percent in 1993 to 12 percent in 2002. However, while poor or mediocre urban Interstate mileage decreased from 42 to 28 percent during this same period, urban minor arterial and collector conditions worsened. Of the nearly 600,000 roadway bridges existing in 2002, 14 percent were deemed structurally deficient and 14 percent functionally obsolete (figure L). Ten years earlier, about 35 percent of bridges were either structurally deficient or functionally obsolete. At the nation's commercial service airports, pavement in poor condition declined from 3 percent of runways in 1993 to 2 percent in 2003. For the larger group of several thousand National Plan of Integrated Airport Systems airports, poor conditions existed on 4 percent of runways in 2003, down from 7 percent in 1993.

The age of various transportation fleets is another measure of condition, although not a very precise one. The equipment in air, rail, highway, water, and transit transportation fleets

Figure L Urban Bridge Condition by Functional Class: 2002



See chapter 2, figure 11-7, for notes and sources.

varies widely in terms of scheduled maintenance, reliability, and expected life span. Additional information, such as fleet maintenance standards, actual hours of vehicle use, and durability, would provide a more thorough means for analyzing the condition of a vehicle fleet and comparing fleets across modes.

The median age of the automobile fleet in the United States has increased 20 percent since 1992. The median age of the truck fleet,[21] by contrast, began to increase in the early 1990s but has been declining since 1997 as new purchases of light trucks (including SUVs, pickups, and minivans) have increased substantially.

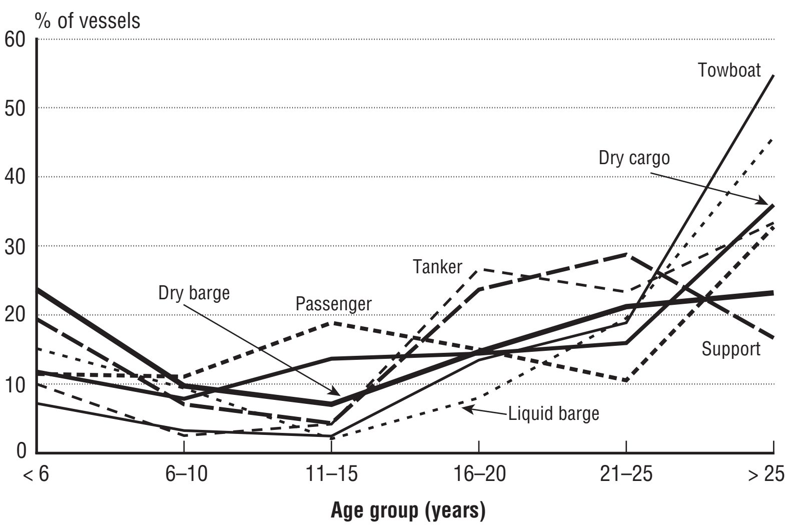
The age of transit vehicles varies by transit and vehicle type. For instance, ferryboat fleets have aged, while the average age of full-size transit buses and light-rail vehicles has decreased between 1991 and 2001. Similarly, the age of

[21] This includes all truck categories: light, heavy, and heavy-heavy.

vessels varies by type. While 30 percent of the overall U.S. flag vessel fleet was 25 years old or more in 2001, 55 percent of towboats and 46 percent of tank and liquid barges were 25 years old or older in 2001 (figure M).

The average age of Amtrak locomotives was 14 years in fiscal year 2001, up 8 percent since fiscal year 1991, while the average age of Amtrak railcars declined by 2.5 years during the same period. Of the 20,503 Class I freight locomotives in service in 2002, 47 percent were built in 1990 or later. While these data on rail equipment are publicly available, data on the condition of infrastructure are not released by the nation's private railroads.

Figure M Age of U.S. Flag Vessels by Type: 2001



See chapter 2, figure 11-13, for notes and sources.

Finally, the average age of all U.S. commercial aircraft was 12 years in 2001, up from 11 years in 1991. During the 1990s, the average age of aircraft belonging to the major airlines (a subset of all commercial aircraft) was one year younger but in 2001 these aircraft also averaged 12 years.

12. Transportation-Related Variables That Influence Global Competitiveness

Transportation contributes to economic activity and to a nation's global competitiveness as a service, an industry, and an infrastructure. It affects the price competitiveness of domestic goods and services because final market prices reflect transportation costs.

U.S. prices for transportation goods and services in 2000[22] were relatively lower than prices in 11 out of 24 Organization for Economic Cooperation and Development countries. However, the nation's top two overall merchandise trade partners, Canada and Mexico, had lower relative prices in 2000 than the United States.

The United States traded $300 billion worth (in current dollars)[23] of transportation-related goods (e.g., cars, trains, boats, and airplanes and their related parts) in 2002 with its partners. As is the case with its overall international trade, the United States had a merchandise trade deficit in transportation-related goods (with an excess of imports over exports) totaling $82.1 billion in 2002. The trade deficit has grown over the years, reflecting far greater imports than exports in the automotive sector. There is, however, a surplus in the aircraft sector.

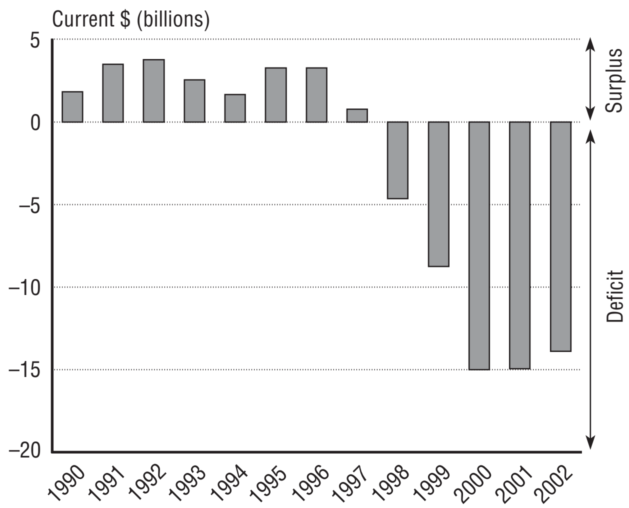
U.S. trade in transportation services in 2002 totaled $105.4 billion (in current dollars). The

[22] 2000 is the most recent year for which comparable international data were available at the time this report was prepared.

[23] All dollar amounts in this section are in current dollars. While it is important to compare trends in economic activity using constant or chained dollars to eliminate the effects of price inflation, it is not possible to do so in this instance (see notes on chapter 2 figures and corresponding tables in appendix B).

United States had a surplus in transportation services from 1990 through 1997. Then, between 1997 and 1998, imports increased 7 percent while exports decreased 5 percent, resulting in a $4.6 billion deficit. This transportation services deficit continued to grow, reaching $13.9 billion in 2002 (figure N).

Figure N U.S. Trade Balance in Transportation-Related Services: 1990–2002



See chapter 2, figure 12-5, for notes and sources.

13. Transportation and Economic Growth

Transportation comprises a sizable segment of the U.S. economy. Total transportation-related final demand rose by 42 percent between 1992 and 2002 (in chained 2000 dollars), from $759.3 billion to $1,076.9 billion. This measure—the value of transportation-related goods and services sold to the final users—is a component of GDP and a broad measure of the importance of transportation to the economy. In 2002, the share of transportation-related final demand in GDP was 11 percent compared with 10 percent in 1992.

The contribution of for-hire transportation industries to the U.S. economy, as measured by their value added (or net output), increased (in chained 2000 dollars) from $206.4 billion in 1991 to $300.2 billion in 2001. In the same time period, this segment's share in GDP fluctuated slightly, increasing from 2.9 percent in 1991 to 3.2 percent in 2000 before declining to 3.0 percent in 2001. This is also a component of GDP but cannot be added to transportation final demand because the two measures reflect different approaches (supply-side and demand-side) to assessing the relationship between transportation and the economy.

In addition to knowledge about transportation's relationship to GDP, a monthly index of changes in freight and passenger activity in the economy is now available. The new, experimental BTS Transportation Services Index (TSI) rose to 122.5 in March 2004, its highest level since January 1990.[24] The separate freight TSI rose to 123.3, while the passenger TSI was at 120.5 in March 2004 (figure O).

14. Government Transportation Finance

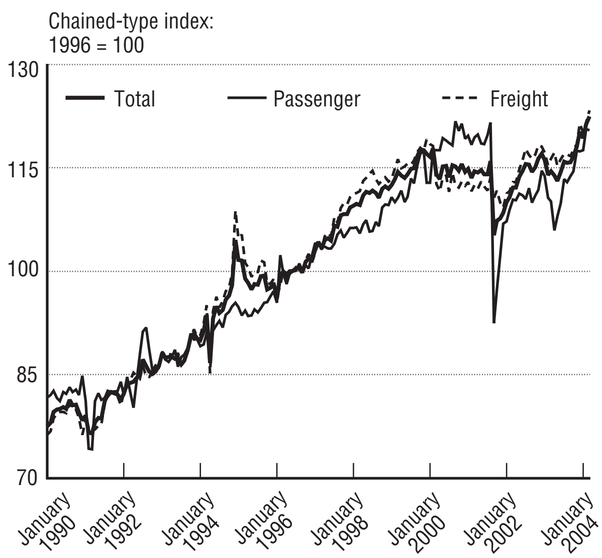
Governments collect revenues and spend money on transportation-related infrastructure and equipment. Federal, state, and local government transportation revenues targeted to finance transportation programs[25] increased 39 percent from $90.9 billion in 1990 (in chained 2000 dollars) to $125.9 billion in 2000 (figure P).

Spending on building, maintaining, operating, and administering the nation's transportation system by all levels of government totaled $167.5 billion in 2000 (in chained 2000 dollars). Among all modes of transportation, highways receive the largest amount of total government transportation expenditures. In 2000, this amounted to $104.0 billion and accounted for 62 percent of the total.

[24] The TSI is a chained-type index where 1996 = 100.0.

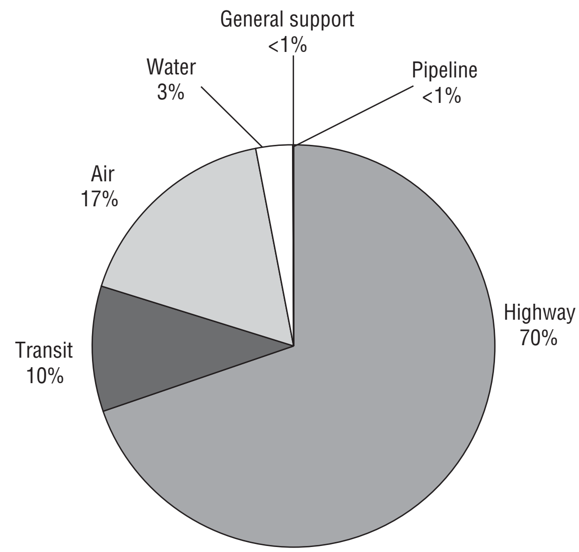
[25] See section 14 in chapter 2 for detailed descriptions of the government revenues included.

Figure O Transportation Services Index: January 1990–March 2004



See chapter 2, figure 13-1, for notes and sources.

Figure P Shares of Government Transportation Revenues by Mode: Fiscal Year 2000



See chapter 2, figure 14-2, for notes and sources.

Gross government transportation investment,[26] including infrastructure and vehicles, is a measure of the building of new public transportation capital. As a major component of the nation's total transportation capital stocks, gross investment has risen steadily over the last decade from $67.4 billion in 1990 to $86.1 billion in 2000, an increase of 28 percent (in chained 2000 dollars).

15. Transportation Energy

The transportation sector used 17 percent more energy in 2003 than in did it 1993. Still, transportation energy use has grown more slowly than GDP during the period, indicating that the U.S. economy is gradually becoming less energy intensive and, thus, less vulnerable to changes in energy prices. Over 97 percent of all transportation energy consumed in 2002 came from petroleum. Total U.S. petroleum usage increased 15 percent between 1992 and 2002, with transportation responsible for 84 percent of that rise.

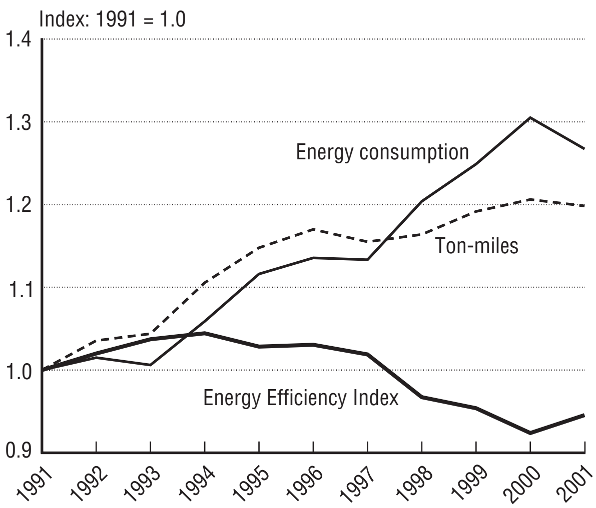
Transportation fuel prices experienced short-term fluctuations (in chained 2000 dollars) between 1993 and 2003. However, per capita vehicle-miles traveled for all modes of transportation increased almost every year. For instance, between 1993 and 2002,[27] per capita highway vmt rose 12 percent, while that of large air carriers grew 22 percent.

Passenger travel (pmt per British thermal unit—Btu) was 1.0 percent more energy efficient in 2001 than in 1991, mainly due to gains by domestic commercial aviation. (Improved aircraft fuel economy and increased passenger loads resulted in a 26 percent gain in commercial air passenger energy efficiency between 1991 and 2001.) Freight energy efficiency (ton-miles per Btu) declined 5.4 percent from 1991 to 2001. The decline in freight energy efficiency occurred as a result of a 1.8 percent annual

[26] See section 14 in chapter 2 for detailed descriptions of transportation investments.

[27] At the time this report was prepared, data for highway and aircraft vmt were only available through 2002.

Figure Q Freight Ton-Miles, Energy Consumption, and Energy Efficiency Index: 1991–2001



See chapter 2, figure 15-8, for notes and sources.

average growth in ton-miles paired with a relatively rapid annual rise of 2.4 percent in freight energy consumption over the period (figure Q).

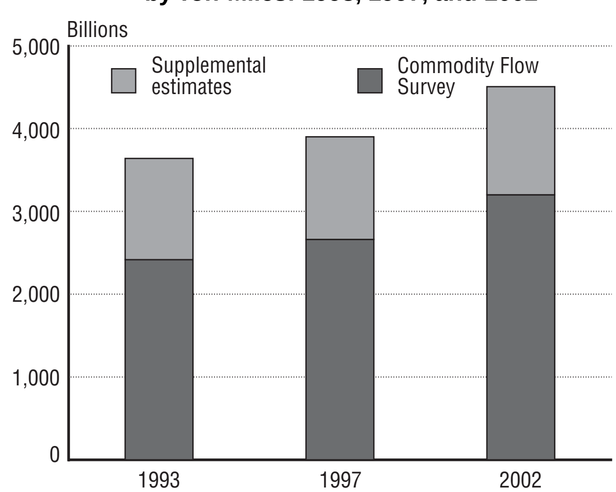
SUMMARY OF THE STATE OF TRANSPORTATION STATISTICS (CHAPTER 3)

Data collection, compilations, and analyses by BTS are focused on five core transportation data areas: freight, passenger travel, air transportation, economic, and geospatial. The previous October 2003 edition of this *Transportation Statistics Annual Report* (TSAR) series presented an overview of why these data are important to the transportation community, reviewed the existing data, and presented possible options for filling crucial data gaps. This edition of TSAR expands on that presentation by providing information on how BTS programs and projects are filling data gaps and improving the state of transportation statistics.

Improving the Knowledge Base for Freight Planning

Meeting the variety and changing needs of the U.S. freight community and policymakers can be challenging for data providers. For many years, the **Commodity Flow Survey** has been the principal national freight flows data source. It was conducted in 1993, 1997, and 2002 as a partnership between BTS and the U.S. Census Bureau (figure R). CFS 2002 preliminary data were released in December 2003, and final data are expected in December 2004. To better meet data needs, BTS is working with others in the Department of Transportation (DOT) and the broader transportation community to plan a **National Freight Data Program**, which will provide enhanced freight flow data and integrated information collected from a variety of sources.

Figure R Commercial Freight Activity by All Modes by Ton-Miles: 1993, 1997, and 2002



See chapter 2, figure 2-10, for notes and sources.

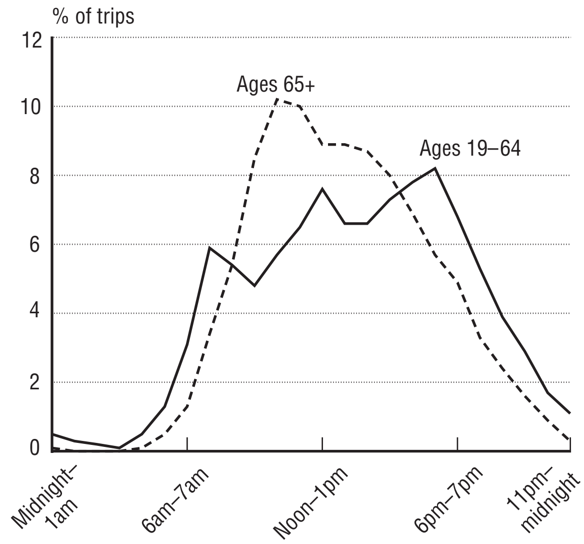
Tracking Freight and International Trade

International freight flows data are important not only for tracking the growth of imports and exports but also for assessing domestic transportation requirements and impacts of trade. In May 2004, BTS completed the *International Trade Traffic Study* on domestic highway movements associated with international trade. The work was requested of BTS by the U.S. Congress in the *Transportation Equity Act for the 21st Century*. Two BTS data programs disseminate continuing, detailed information on transportation aspects of U.S. trade with Canada and Mexico. **Border Crossing Data** counts incoming vehicles, containers, passengers, and pedestrians for land gateways on the U.S.-Canadian and U.S.-Mexican borders. The **Transborder Freight Data** program has been providing monthly mode-specific trade data on surface modes, such as rail, truck, and pipeline, since 1993; and starting in 2004, BTS added air and waterborne mode data. Several federal agencies are working to put in place an **International Trade Data System** (ITDS), aimed at accelerating the phase-in of electronically filed trade documents. BTS is working with other DOT operating administrations and the ITDS managers at U.S. Customs and Border Protection of the Department of Homeland Security to ensure that ITDS will provide transportation-related data.

Understanding People's Attitudes, Opinions, and Use of the Transportation System

Knowing how, why, when, and where people in the United States travel is one of the most basic data needs of transportation policymakers, planners, and others. Most recently, data to understand how people use the transportation system for local and long-distance travel was generated by BTS and the Federal Highway Administration in the **2001 National Household Travel Survey**[28] (2001 NHTS) (figure S). For three years, BTS conducted the **Omnibus Household Survey** on a regular basis to ascertain people's usage of the country's transportation system. Data were also gathered on what people think about the system and to gauge public satisfaction with government programs.

Figure S Daily Trips by Time of Day: 2001



See chapter 2, figure 5-16, for notes and sources.

Supporting State and Local Transportation Planning

Across the nation, metropolitan planning organizations are responsible for assuring that transportation planning meets the needs of their communities, including those of local residents and businesses. How people get from home to work and back and how these patterns change over time is essential data for transportation planners at the state and local level.

Various government entities and associations cooperate to disseminate state-, county-, and city-level journey-to-work (JTW) data collected with each decennial census. BTS provides statistical quality assurance expertise to the project team producing the **Census Transportation Planning Package 2000** and is responsible for

[28] This survey was conducted between March 2001 and May 2002.

distribution of the data. A more robust provision of JTW data may arise from a **Longitudinal Employer-Household Dynamics** pilot program, initiated by the U.S. Census Bureau. The aim is to demonstrate the potential for linking existing economic administrative records with survey demographic data. BTS is participating in the pilot by conducting research to develop the necessary detailed origin and destination component. Finally, while the **2001 NHTS** was primarily a national sample, an additional 40,000 households were surveyed from 9 jurisdictions (i.e., 4 urban areas, 4 states, and part of Kentucky), not only assisting these jurisdictions directly but also providing valuable insights at the national level.

Connecting Transportation to People's Needs

Some transportation modes can be underrepresented in major surveys. Groups such as the elderly and disabled have special needs. Other people may reside in areas not well served by public transportation. BTS has augmented data on these and other special transportation issues with more specific surveys and studies, such as the **National Survey of Pedestrian and Bicyclist Attitudes & Behaviors** (with the National Highway Traffic Safety Administration); the **2002 National Transportation Availability and Use Survey**, which surveyed people with and without disabilities; and a geospatial study of access to **Scheduled Intercity Transportation** by the nation's rural population.

Understanding the Transportation Industry

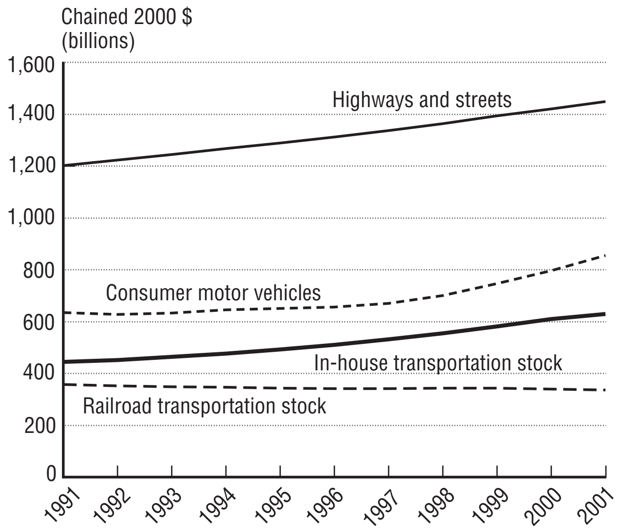
Transportation, a major U.S. industry, is multifaceted. It includes, for instance, carriers that are in the business of transporting people and goods ("for hire") and other firms that use their own fleets of trucks or other vehicles to transport their own goods and people ("in house"). BTS collects various sets of modal data from the for-hire segment of the transportation industry, such as **Airline Financial and Operating Statistics** of both passenger and freight components of the airline industry and **Motor Carrier Financial and Operating Statistics** from Class I and II trucking and bus firms.

Linking Transportation and the Economy

Transportation's contribution to the U.S. economy can be measured in several ways. On a value-added basis, about 3.2 percent of the economy is produced by firms in the for-hire transportation industry, such as trucking, railroads, and waterborne shipping. In-house trucking services contribute another 1.0 percent or more. Work underway at BTS on **Transportation Satellite Accounts** will determine the full contribution of transportation services to the economy by developing data on the contribution of other modal in-house transportation services and a methodology to annually update the data.

After a three-year development phase, BTS released its experimental **Transportation Services Index** in March 2004. The TSI is a monthly, seasonally adjusted measure of the volume of services performed by the for-hire transportation sector. A comprehensive modal set of **Capital Stock** data, which help policymakers assess transportation investment needs, are not currently available (figure T). BTS is developing values for publicly owned airport and airway capital stocks, waterways, and transit systems that will augment capital stock data produced annually by the Bureau of Economic Analysis for modes such as trucking, air, and railroad transportation and highways and streets. **Multifactor Productivity** (MFP) provides a more comprehensive view of productivity than does labor productivity, a commonly used measure.

Figure T Transportation Capital Stock for Selected Modes: 1991–2001



See chapter 2, figure 11-1, for notes and sources.

The Bureau of Labor Statistics currently produces transportation MFP data for the railroad and air transportation industries. BTS is developing the methodology for and anticipating the production of MFP data for other transportation industries, such as trucking.

Improving the Nation's Price Indexes

BTS developed the **Air Travel Price Index (ATPI)** to improve on traditional air travel cost indexes that are complicated by the variety of discount fares airlines now offered directly and through the internet and by frequent flyer programs. The ATPI applies the statistical methodology of a price index to measure changes in airfares. BTS released the still experimental ATPI data series in March 2004 and plans to issue quarterly updates.

Understanding the Relationship Between Transportation and the Environment

As people travel and freight is transported, damage can occur to the human and natural environment. A BTS-managed project for the DOT Center for Climate Change and Environmental Forecasting, will assess the feasibility of developing a **Transportation Greenhouse Gas Intensity of the Economy** index. This study is expected to provide data and information on the validity of various measurements including an aggregate transportation measure. BTS is also assisting the DOT Center for Climate Change and Environmental Forecasting with the geographic information system component of a research project to better understand the impact of climate change and variability on the U.S. transportation system in the Gulf Coast region.

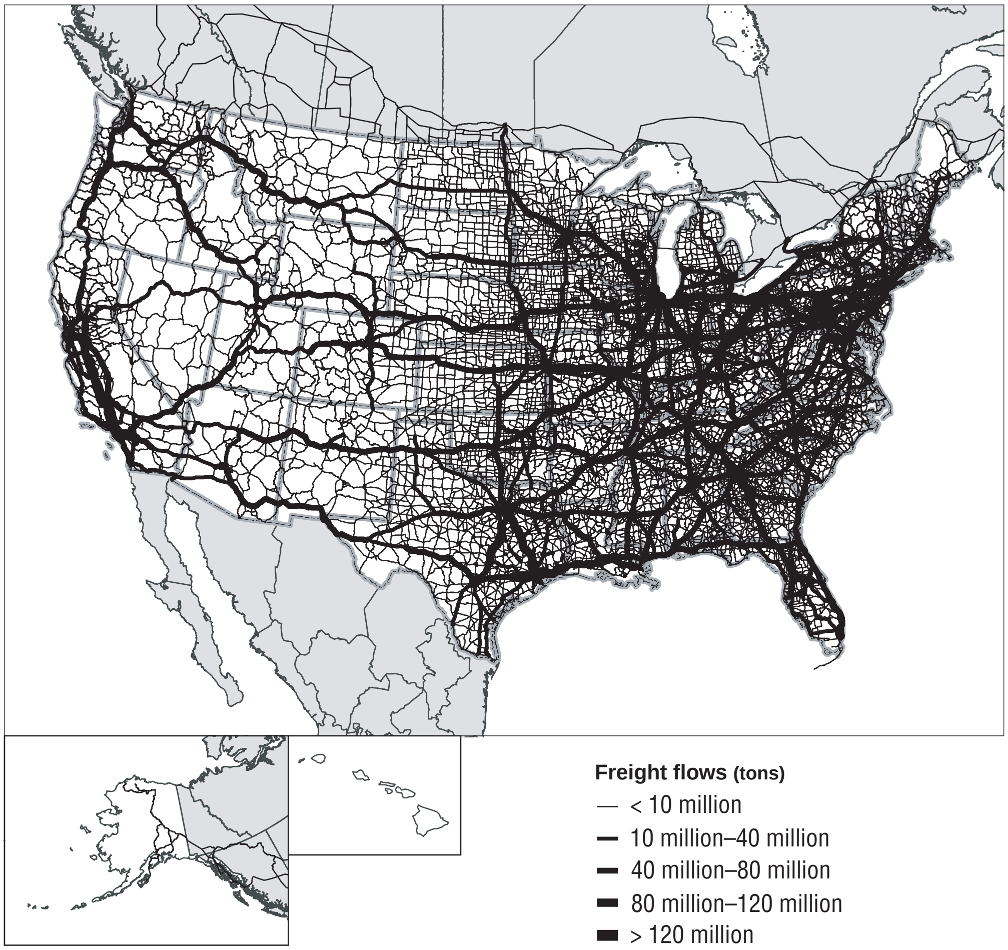
Demonstrating Accountability to the Public

Under the Government Performance and Results Act, each federal agency must develop a performance plan and report annually on its progress. BTS assists in the preparation of **DOT's Performance Plan** by providing performance measurement and statistical methodology support to the Office of the Secretary of Transportation and DOT's operating administrations.

Enhancing the Tools for Data Users

Managing raw data can be time consuming and resource intensive. Improvements in data analysis tools can reduce those costs as well as increase the quality of the analysis. The geographic relationships between freight movements and infrastructure can be displayed graphically by ***GeoFreight***, a new tool produced by BTS, the Federal Highway Administration, and DOT's Office of Intermodalism (figure U). Another GIS product produced by BTS, the ***National Transportation Atlas Database*** (***NTAD***), is a set of nationwide geographic databases of transportation facilities, transportation networks, and associated infrastructure.

FIGURE U Truck Freight Flows in the United States: 1998



See chapter 2, figure 2-13, for notes and sources.

Improving the Quality of Transportation Data

The quality and utility of transportation data and the datasets can be problematic. Using an intra-agency committee process, BTS developed the statistical portion of DOT's **"Information Dissemination Quality Guidelines."** The result was a comprehensive set of guidelines that cover all aspects of the data-collection process from planning through dissemination. Under the BTS **Data Quality Review** program, the agency has conducted several in-depth assessments of DOT data systems, providing data managers with recommendations and suggestions for data quality improvements.

Opening Up Access to Information: Citizen-Centered Government

People gain needed information in a variety of ways. Satisfying that need means providing information in multiple formats. The BTS **TranStats** website provides downloadable data from over 100 transportation databases as well as links to many transportation datasets stored on other agency websites. For those in the transportation community who want quick access to already compiled multimodal data, BTS has produced a ***National Transportation Statistics*** (NTS) document since 1993. Collected from a variety of sources, the NTS provides, in print and online versions, over 190 tables of the most frequently used transportation data.

Making Comparisons Easier

Relevance and other measures of progress are often determined by comparing results. Between 2001 and 2003, BTS produced a series of individual ***State Transportation Profiles*** covering all 50 states and the District of Columbia. The profiles provide—through tabular data—a picture of each state's infrastructure, freight movement and passenger travel, safety, vehicles, economy and finance, and energy and environment. A summary version will be updated regularly for inclusion in the NTS.

Along with other federal agencies, BTS participates in the **North American Transportation Statistics Interchange**, a collaboration between transportation and statistical agencies of the United States, Canada, and Mexico. Its mission is to raise the general awareness and improve the quality, relevance, and comparability of transportation data and information across North America. A tri-country transportation database, produced by the Interchange, is expected to go online by the end of 2004.

Creating a Forum for Transportation Statistical Research

Advancing statistical methods and standards and ensuring the accuracy, reliability, and relevance of transportation data is a continuing process. It requires the sharing of the latest research among the transportation statistics research community. BTS helps to enable this process with the production and dissemination of its ***Journal of Transportation and Statistics***, a peer-reviewed international journal that encourages the application of advanced statistical methods to transportation problems. The completely digital **National Transportation Library** provides a full range of information access services to researchers as well as others in the transportation community.

CONCLUSION

The preceding overview shows that the nation has a wealth of available transportation indicators data, but the data are not always comparable nor are they complete. Fortunately, many accomplishments and work underway are succeeding in filling critical transportation data needs. Through its own efforts and in collaboration with others throughout the transportation community, BTS is contributing value to the state of transportation statistics, especially within the focused core areas of freight, passenger travel, air transportation, economic, and geospatial data.

Chapter 2

Transportation Indicators

Introduction

The Intermodal Surface Transportation Efficiency Act of 1991[1] charged the Bureau of Transportation Statistics (BTS) with compiling, analyzing, and publishing a comprehensive set of transportation statistics, including information on:

- productivity in various parts of the transportation sector;
- traffic flows;
- travel times;
- vehicle weights;
- variables influencing traveling behavior, including choice of transportation mode;
- travel costs of intracity commuting and intercity trips;
- availability of mass transit and the number of passengers served by each mass transit authority;
- frequency of vehicle and transportation facility repairs and other interruptions of transportation service;
- accidents;
- collateral damage to the human and natural environment;
- the condition of the transportation system; and
- transportation-related variables that influence global competitiveness.[2]

For this report (as in the previous October 2003 *Transportation Statistics Annual Report*), BTS added three topics: transportation and economic growth, government transportation finance, and transportation energy. Each of these 15 topics is represented by a series of key indicators. Data tables supporting all the indicators are in appendix B at the end of the report. Appendix table numbers correspond to the figure numbers in this chapter.

About the Data in the Report

For consistency, most trend indicator data are shown over at least a 10-year period. Because of the differing availability of data among all the indicators included, it has not been possible to use the same 10-year span for each indicator without sacrificing timeliness. Instead, the data span a decade up to the year of most recent data available when this report was prepared. There are some instances where less than 10 years of data are presented—either because the data are not comparable over the period or are not available.

With a few exceptions, trend data involving costs have been converted to 2000 chained ("real") dollars to eliminate the effect of inflation over time. Appendix B provides both 2000 chained dollar and current dollar value tables. Throughout the text in the report, results of most percent calculations have been rounded up or down, as appropriate, to a whole number. If the percent value is less than 5, data are presented with one decimal point, because rounding

[1] See 49 U.S. Code 111(c)(1).

[2] This last item was added to 111(c)(1) by the Transportation Equity Act for the 21st Century in 1998.

these data can mask differences when making comparisons. Average annual percentage change calculations have been made using a logarithmic formula to account for compounding over time.[3] It is not always possible to obtain the same percentage or other calculation presented in this report using the tabulated data in appendix B. These differences occur because of the rounding of data on the printed tables.

Data in this report come from a variety of sources, principally from BTS and other operating administrations of the U.S. Department of Transportation. However, other sources are federal government agencies, such as the U.S. Census Bureau, the Bureau of Economic Analysis, the U.S. Environmental Protection Agency, the U.S. Coast Guard, and the Energy Information Administration. To supplement government sources, the report occasionally uses data and information from trade associations, such as the Association of American Railroads and the American Public Transportation Association. Data from any of these sources may be subject to omissions and errors in reporting, recording, and processing. Sampling data are subject to sampling variability. Documents cited as sources in this report often provide detailed information about definitions, methodologies, and statistical reliability.

Source information in the report details where BTS obtained data used (e.g., from a printed document, website, or by direct communication with an individual). Use of website data can be problematic. These data may be available one day and then revised or updated or removed shortly thereafter. Thus, the day and month of the BTS download from a website is included in the source information, along with the website address (url) at that time.

[3] The formula is: average annual rate = $\mathrm{Exp}\,[(lnY - lnX)/(n - m)] - 1$, where Y is the end year value, X is the initial year value, n is the end year, and m is the initial year.

Labor Productivity in Transportation

Labor productivity (output per hour) in the for-hire transportation services and petroleum pipeline industries increased by 16 percent from 1991 to 2001. This compares with an increase of 44 percent for all manufacturing and 23 percent for the overall business sector (figure 1-1). Labor productivity, a common and basic productivity measure, is calculated as the ratio of output to hours worked or to the number of full-time employees.

The growth of individual transportation subsector labor productivity between 1991 and 2001 varied[1] (figure 1-2). Compared with the overall business sector, rail labor productivity increased at a considerably higher rate (64 percent). Meanwhile, labor productivity in air transportation increased 18 percent and long-distance trucking productivity grew 12 percent.

Comparing annual growth rates is another way to interpret changes of labor productivity over time. For overall business, labor productivity grew at an average annual rate of 2.1 percent between 1991 and 2001. Labor productivity in rail transportation—where productivity has been affected by consolidation of companies, more efficient use of equipment and lines, increased ton-miles (output), and labor force reductions—increased by 5.0 percent annually. For long-distance trucking and air transportation, average annual rates of growth were 1.1 percent and 1.6 percent, respectively.

[1] At the time this report was prepared, data were only available for 1991 through 2000 for local trucking, petroleum pipeline, and bus carriers. See detailed notes on tables 1-1 and 1-2 for further information.

FIGURE 1-1 Labor Productivity of Major Sectors: 1991–2001
Output per hour

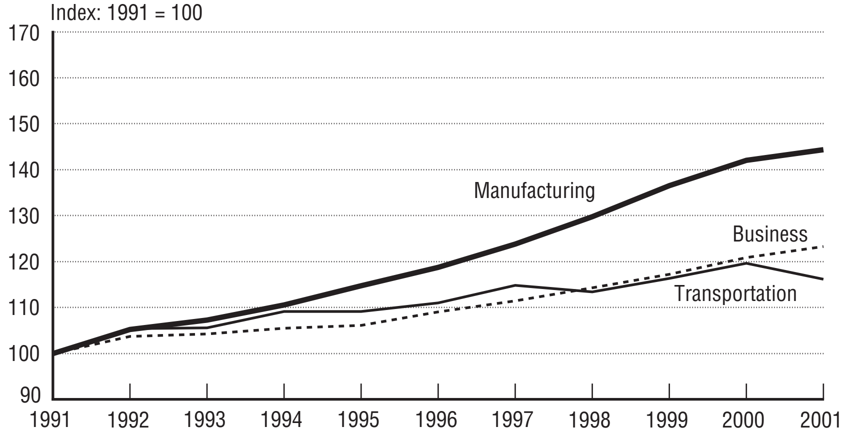
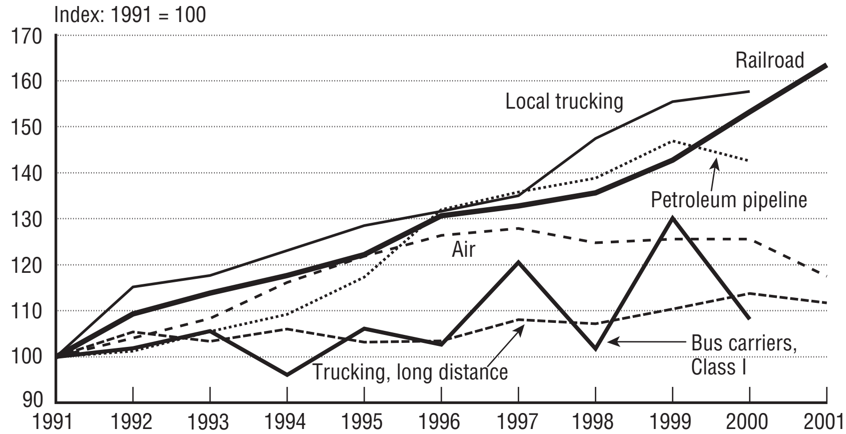


FIGURE 1-2 Labor Productivity of For-Hire Transportation Industries:1991–2001



NOTES: No data are available for water transportation or natural gas pipeline. Data for local trucking, bus carriers, and petroleum pipeline were not available for 2001 at the time this report was prepared.
See tables 1-1 and 1-2 in appendix B for detailed notes on these datasets.

SOURCES: Transportation—U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS), Office of Productivity and Technology, "Industry Productivity Database," available at http://www.bls.gov, as of October 2003; and U.S. Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product by Industry," available at http://www.bea.gov, as of October 2003. **Manufacturing and business—**USDOL, BLS, Office of Productivity and Technology, "Industry Productivity Database," available at http://www.bls.gov, as of October 2003.

Multifactor Productivity

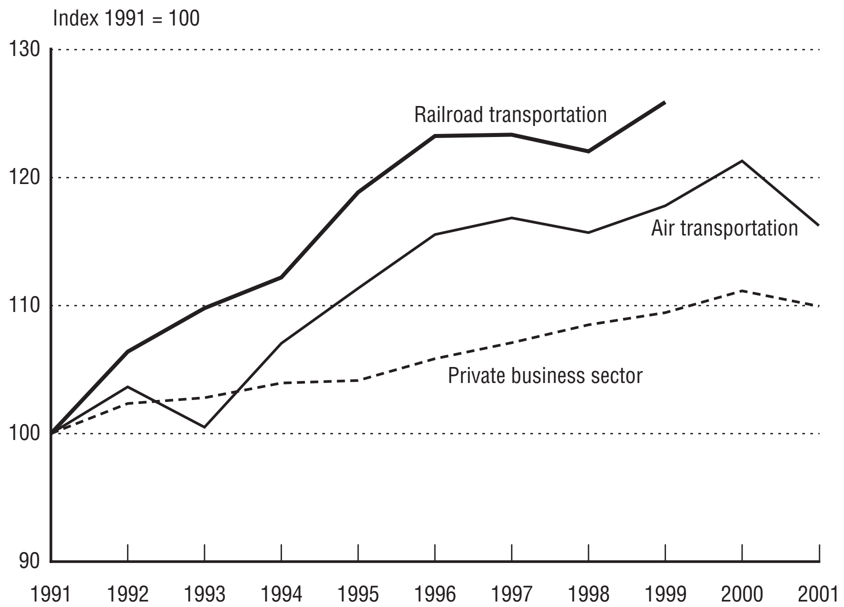
Multifactor productivity (MFP) in air transportation increased by 16 percent between 1991 and 2001 (an average annual rate of 1.5 percent), while in the overall private business sector, MFP increased by 10 percent (just under 1 percent annually) (figure 1-3). Thus, the air transportation industry has contributed positively to increases in MFP in the business sector and to the U.S. economy over this period. Data are not available for the same period for rail transportation, but between 1991 and 1999, MFP in this industry increased by 26 percent (an average annual rate of 3 percent).

While MFP measures are difficult to construct, they provide a much more comprehensive view of productivity than labor productivity measures. The conventional methodology for calculating multifactor productivity, which is used here, employs growth rates of inputs weighted by their share in total costs. This methodology has been developed and used by various academic researchers and government agencies, such as the Bureau of Labor Statistics.[1]

Transportation MFP data are currently available from the Bureau of Labor Statistics for the rail and air transportation sectors only. The Bureau of Transportation Statistics is developing MFP measures for other transportation industries, such as trucking, pipelines, and so on. The objective is to provide information on the relative importance of changes in the inputs and on the productivity of the inputs relative to changes in transportation output. This research should also provide information on the relative importance of transportation in increasing the productivity of the U.S. economy and, hence, transportation's contribution to the economic growth of the country.

[1] See, for instance, discussion on MFP by the Bureau of Labor Statistics in the *BLS Handbook of Methods*, available at http://www.bls.gov/opub/hom/homch11_a.htm, as of May 2004.

FIGURE 1-3 Multifactor Productivity: 1991–2001



NOTE: Rail productivity data are only available through 1999. Source data are indexes with base years of 1997 (air), 1996 (business), and 1987 (rail). BTS reindexed these data so that 1991 is the base year for all.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, available at http://www.bls.gov, as of October 2003. **Business sector**—"Most Requested Statistics." **Rail**—"Industry Multifactor Productivity Data Table by Industry, 1987–1999." **Air**—"Multifactor Productivity Data for Air Transportation."

Passenger-Miles of Travel

Estimated U.S. passenger-miles of travel (pmt) increased 24 percent between 1991 and 2001. Pmt totaled an estimated 4.8 trillion in 2001,[1] averaging about 17,000 miles for every man, woman, and child (box 2-A) [2, 3].

Just over 85 percent of pmt in 2001 was in personal vehicles (passenger cars and light trucks, including sport utility vehicles, pickups, and minivans) (figure 2-1). Most of the balance (11 percent) occurred by air. Passenger travel in light trucks accounted for a little under one-third of all pmt. Transit, excluding bus, made up less than 1 percent of pmt in 2001.

Travel increased between 1991 and 2001 at an annual average rate of 2.2 percent [3]. Pmt by light trucks grew at 2.9 percent per year on average, while passenger car pmt rose 1.6 percent (figure 2-2). Although air pmt grew the fastest at an average of 3.7 percent per year over the entire period, it declined 5.5 percent between 2000 and 2001 reflecting the impacts of the terrorist attacks in 2001 and the ongoing economic downturn. Pmt by intercity train (Amtrak) declined, although there has been modest growth since 1996. Likewise, transit pmt has grown since the mid-1990s.

Passenger travel increased between 1991 and 2001 for a variety of reasons. The U.S. resident population grew by 32.3 million over this period [2]. Moreover, the economy also grew significantly. Gross Domestic Product (GDP) increased 39 percent[2] and GDP per capita grew 23 percent between 1991 and 2001 (figure 2-3) [1].

[1] This calculation excludes travel in heavy trucks, by bicycle, by walking, and by boat (including recreational boat). Pmt in heavy trucks is excluded because such travel is assumed to be incidental to the hauling of freight, the main purpose of this travel. Bicycle, pedestrian, and boat travel are excluded because national estimates are not available on an annual basis.

[2] Calculation is based on chained 2000 dollars.

BOX 2-A
Data on Passenger-Miles of Travel (pmt)

Two national estimates of pmt are available; they differ in coverage, methodology, and other factors. The pmt data presented in section 2 of this report come from the Bureau of Transportation Statistics (BTS) publication, *National Transportation Statistics* (NTS). BTS compiles these data for NTS annually, using primarily mode-by-mode data derived in various ways by BTS and others. For instance, pmt for large air carriers and intercity trains are estimated from ticket sales and trip lengths; for transit, data are reported by transit authorities. Each method used to estimate these pmt has differing strengths and weaknesses, as discussed in the Data Source and Accuracy Statements for table 1-34 in NTS, available at http://www.bts.gov/.

Section 5, Variables Influencing Traveling Behavior, presents 2001 pmt data from the *2001 National Household Travel Survey*, jointly conducted by BTS and the Federal Highway Administration. As survey data, they are collected using a single methodology. This provides a coherence and comparability not available with NTS data. However, these data are not collected annually, making them unsuitable for year-to-year trend analyses. Another difference between NTS and NHTS data is the extent of their coverage among modes. It can be expected, then, that because of methodological and coverage issues NTS and NHTS data will differ.

Sources

1. U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, summary GDP table, available at http://www.bea.doc/bea/dn1.htm, as of January 2004.
2. U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract of the United States: 2002* (Washington, DC: 2003), for population data.
3. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-34 revised, available at http://www.bts.gov/ as of October 2003.

FIGURE 2-1 Share of Passenger-Miles of Travel by Mode: 2001

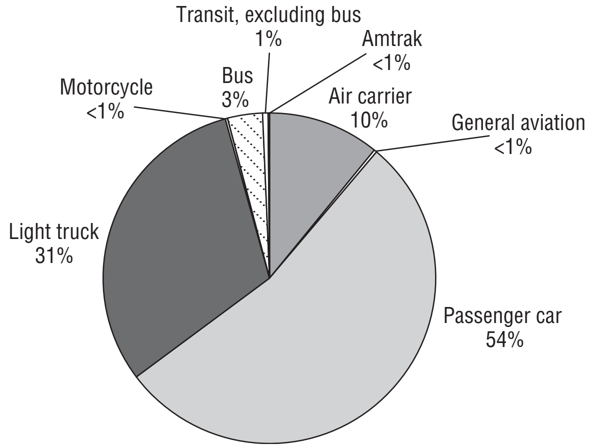


FIGURE 2-2 Passenger-Miles of Travel by Selected Mode: 1991–2001

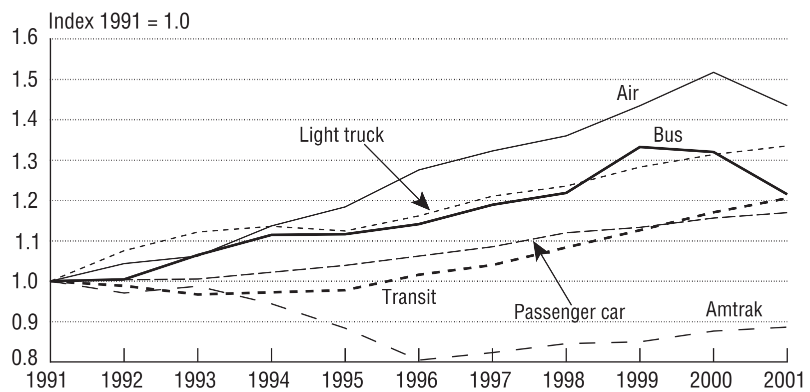
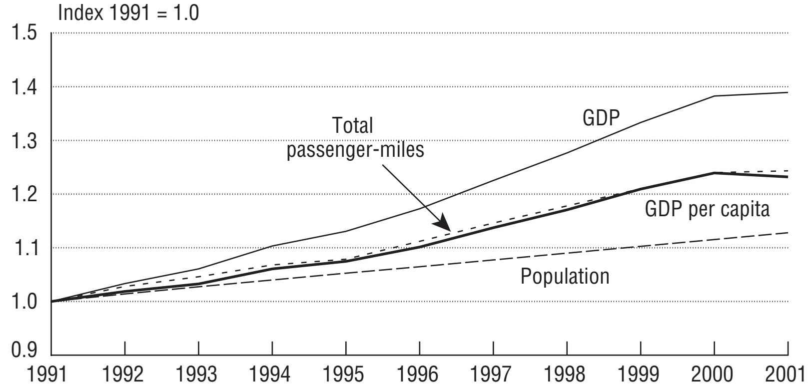


FIGURE 2-3 Passenger-Miles of Travel, U.S. Population, and Gross Domestic Product (GDP): 1991–2001



NOTES: Figures 2-1 and 2-2—see tables 2-1 and 2-2 in appendix B. **Figure 2-3—***Total passenger-miles of travel* (pmt) excludes motorcycle pmt and results in some double counting of bus pmt.

SOURCES: Passenger-miles—U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-34 revised, available at http://www.bts.gov/, as of October 2003. **GDP—**Based on chained 2000 dollar data from U.S. Department of Commerce (USDOC), Bureau of Economic Analysis, National Income and Product Accounts, summary GDP table, available at http://www.bea.doc.gov/bea/dn1.htm, as of January 2004. **Population—**USDOC, U.S. Census Bureau, National Intercensal Estimates 1990–2000 and National Population Estimates, available at http://eire.census.gov/popest/estimates.php, as of October 2003.

Daily Travel by Walking and Bicycling

Walking and bicycling are minor components of passenger travel in terms of total miles traveled or trips taken. According to the 2001 National Household Travel Survey (NHTS), walking accounted for 0.7 percent of person-miles of daily[1] (mostly local) travel (26.2 billion miles), and bicycling accounted for 0.2 percent (6.2 billion miles) in 2001. By trips, walking accounted for 9 percent (35.3 billion trips) and bicycling, 1 percent (3.5 billion trips) of daily trips [1] (figure 2-4).

However, the shares of walking and bicycling vary by distance traveled. Of all trips under a mile, for instance, one-quarter are taken on foot and another 2 percent are made by bicycle (figure 2-5). These shares drop off sharply as trip distance increases.

Trip purpose is another element of a person's decision whether or not to walk or use a bicycle. Trips to visit friends and relatives and for other social and recreational purposes (e.g., to go to the gym, attend a movie, go to a bar, visit a park, or visit a library) are often made on foot, especially shorter trips (figure 2-6). For instance, 39 percent to 43 percent of these trips of a mile or less are accomplished by walking. However, people are much less likely to walk a mile or less to see a doctor or dentist (7 percent) or to shop (13 percent). The share of walking trips dips below its overall share (9 percent) at about 3 miles. Bicycling as a share of all trips by distance and purpose shows the same overall tendency as does walking, although its share of trips for social and recreational purposes between 3.1 miles and 4.0 miles in length is twice (2 percent) its share of all trips.[1].

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, 2001 National Household Travel Survey, January 2004 dataset, available at http://www.nhts.ornl.gov/2001/index.shtml, as of June 2004.

1 See Section 5, "Variables Influencing Traveling Behavior" for a discussion about the definition of daily travel.

FIGURE 2-4 Daily Travel by Walking and Bicycling: 2001

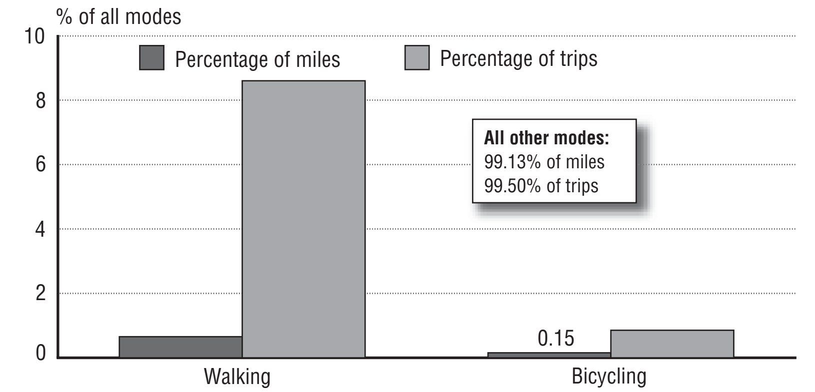


FIGURE 2-5 Walking and Bicycling as a Share of All Daily Trips by Distance: 2001

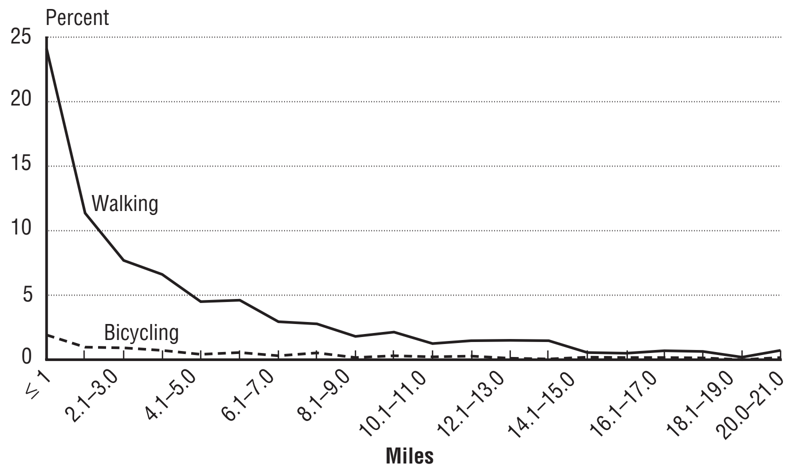
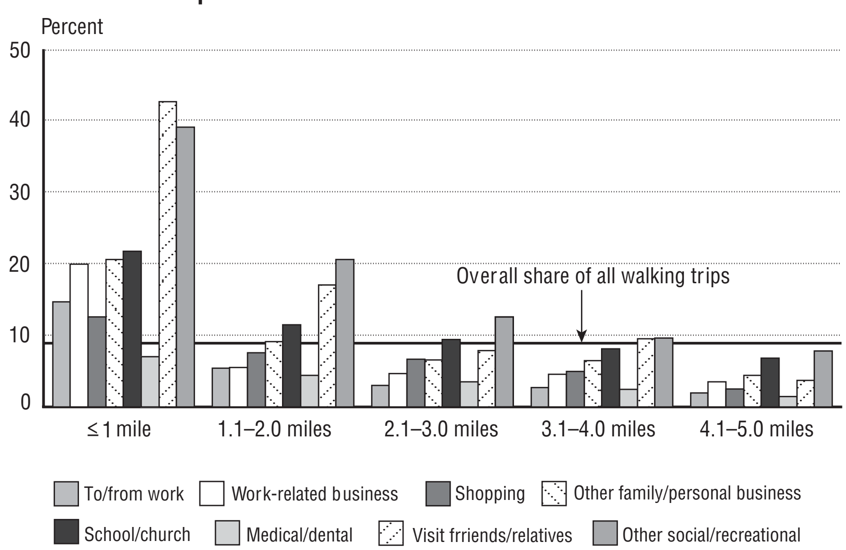


FIGURE 2-6 Walking as a Share of Daily Person Trips by Selected Purpose and Distance: 2001



NOTE: *Other modes* include only number of person-miles and person trips where a mode was reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey, preliminary data, 2003.

Domestic Freight Ton-Miles

All modes of freight transportation, combined, generated 4.3 trillion domestic ton-miles in 2001, 20 percent more than in 1991 (box 2-B). This represents an average growth rate of 1.8 percent per year during the period.

Domestic ton-miles for all modes, except water, grew during most of this period (figure 2-7). On an annual average basis, rail grew the fastest (4.4 percent), closely followed by air (3.8 percent) and truck (3.4 percent). Rail and truck accounted for the majority of domestic ton-miles at 37 percent and 29 percent, respectively, in 2001 (figure 2-8). Truck data, however, do not include retail and government shipments and some imports and, therefore, understate total truck traffic.

Water transportation and oil and gas pipelines[1] accounted for 14 and 19 percent of domestic ton-miles, respectively, in 2001. Although domestic waterborne ton-miles decreased 27 percent between 1991 and 2001, waterborne vessels continued to play a prominent role in international trade [1]. U.S. waterborne imports and exports, valued at $719 million, totaled 1.2 billion metric tons in 2001 [3]. Oil and gas pipeline combined ton-miles grew 10 percent between 1991 and 1996, were stagnant in 1997, and then declined 7 percent through 2001.

Air freight declined between 2000 and 2001, from 15 billion ton-miles to 13 billion ton-miles. In addition to the impact of the terrorist attacks of September 11, 2001, and the economic downturn, some of the decline in air freight may be attributed to restrictions placed on the air transport of U.S. mail packages as a security precaution in late 2001. In general, air freight tends to transport high-value, relatively low-weight goods. Thus, on a ton-miles basis, air freight accounted for less than 1 percent of domestic freight in 2002, whereas on a value basis, this mode accounted for 7 percent of domestic freight [2].

BOX 2-B
Domestic Freight Ton-Miles Data

The Bureau of Transportation Statistics (BTS) gathers two datasets on freight ton-miles. Here, the data were compiled from a variety of modal sources to produce annual trend data. The original sources derive their data using various methods, as noted in the Data Source and Accuracy Statements in BTS's *National Transportation Statistics 2002*. The other set of freight ton-miles data—discussed next—come from the Commodity Flow Survey conducted periodically by BTS and the U.S. Census Bureau of the Department of Commerce. Because the methodologies and coverage differ, the data may differ.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *U.S. International Trade and Freight Transportation Trends* (Washington, DC: 2003).
2. U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, U.S. Census Bureau, *2002 Economic Census, Transportation, 2002 Commodity Flow Survey* (Washington, DC: 2003), preliminary data.
3. U.S. Department of Transportation, Maritime Administration, Office of Statistical and Economic Analysis, U.S. Foreign Waterborne Transportation Statistics, available at http://www.marad.dot.gov/statistics/usfwts/index.html, as of October 2003.

[1] Pipeline ton-miles data in the previous October 2003 edition of *Transportation Statistics Annual Report* only included oil pipelines.

FIGURE 2-7 Domestic Freight Ton-Miles by Mode: 1991–2001

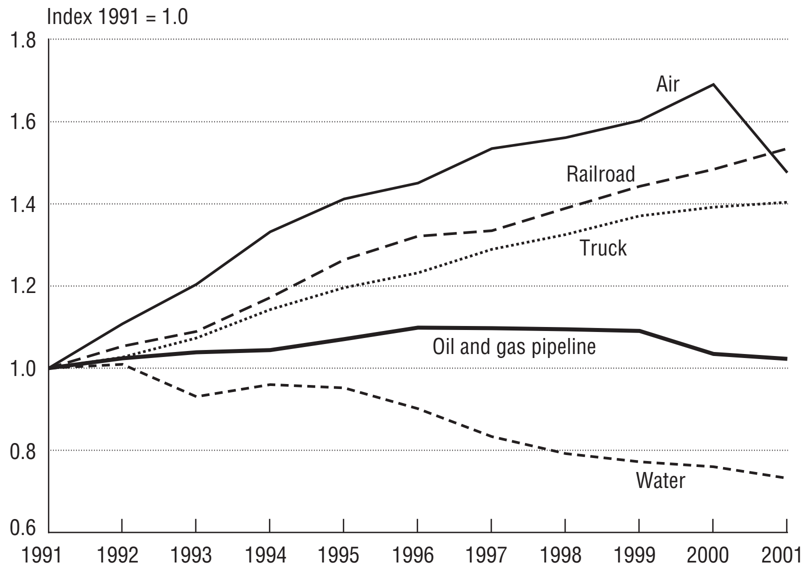
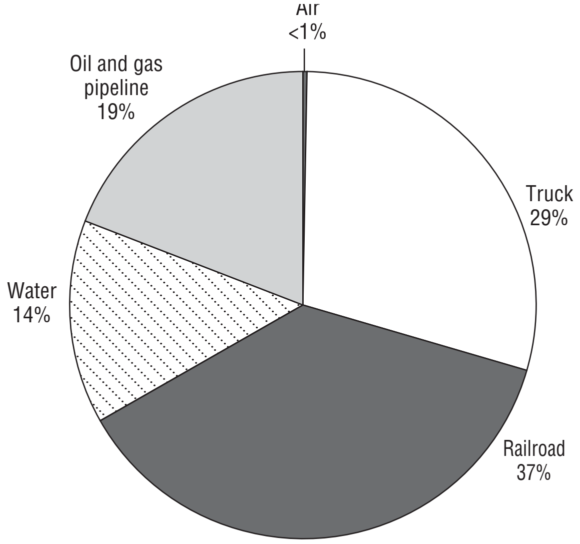


FIGURE 2-8 Shares of Domestic Freight Ton-Miles by Mode: 2001



SOURCES: Air, pipeline, and water—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2002*, table 1-44 revised, available at http://www.bts.gov/, as of October 2003. **Truck, rail, natural gas pipeline—**USDOT, BTS, calculations based on data from various sources. See table 2-7 for details.

Commercial Freight Activity

The nation's freight transportation system, all modes combined, carried 15.8 billion tons of raw materials and finished goods in 2002, up 18 percent from 13.4 billion tons in 1993 (figure 2-9). The 2002 freight activity also represented 4,506 billion ton-miles at a value of $10,460 billion (in chained 2000 dollars[1]). Ton-miles have grown 24 percent since 1993, while value rose 45 percent (figures 2-10 and 2-11).

Trucking moved the majority of freight by tonnage and by shipment value in 2002: 9.2 billon tons (58 percent of the total tonnage) and $6,660 billion (64 percent of the total value). Multimodal shipments—a combination of more than one mode—were second by value at 11 percent ($1,111 billion), while waterborne carried 15 percent by weight (2.3 billion tons). Trucking and rail were responsible for 32 and 28 percent, respectively, of the total ton-miles [1].

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts were adjusted to eliminate the effects of inflation over time.

These total commercial freight data were calculated by the Bureau of Transportation Statistics, based on the Commodity Flow Survey (CFS) conducted in 1993, 1997, and 2002 and estimates of activity not covered by CFS (box 2-C). While these total estimates provide the most complete commercial freight picture for all modes of transportation, they exclude most shipments by the retail sector and governments (e.g., goods for defense operations and the collection of municipal solid waste). The estimate also excludes shipments by nongoods producing sectors (e.g., services, construction, household goods movers, and transportation service providers).

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, U.S. Census Bureau, *2002 Economic Census, Transportation, 2002 Commodity Flow Survey* (Washington, DC: 2003).

BOX 2-C
Measuring the Nation's Freight Movements

Accurately measuring the magnitude of freight movement is a challenge. No single data source provides complete and timely information on all freight transportation modes for all goods and sectors of the economy. The most comprehensive national picture of freight movement comes from the Commodity Flow Survey (CFS) produced most recently in 1993, 1997, and 2002 by the Bureau of Transportation Statistics (BTS) and the Census Bureau. As a shipper-based survey, the CFS collects information on how U.S. establishments transport raw materials and finished goods; the types of commodities shipped by mode of transportation; the value, weight, origin, and destination of shipments; and the distance shipped. (By contrast, a carrier-based survey would provide information on shipment route, cost, and time of travel.)

Despite the comprehensive nature of the CFS, important data gaps exist in its coverage of certain industries and commodities and in the domestic movement of imports. BTS estimated that the 2002 CFS covered about 81 percent of the shipment value, 73 percent of the tonnage, and 71 percent of the ton-miles of total U.S. freight movements. To improve the data, BTS made supplemental estimates for farm shipments to processing plants, crude petroleum pipeline shipments, waterborne imports and exports, and imports by surface and air. [1] These supplemental estimates were made for the 1993, 1997, and 2002 CFS. For the 2002 CFS, BTS also filled gaps in shipments of logs and lumber.

Some major differences arise when CFS totals are compared with the supplemental data, especially in relative modal combinations, average shipment distance, and commodity mix. For example, CFS shipments were valued at $733 per ton compared with $470 per ton of shipments in the supplemental data, which has a lower value because it better covers crude oil and petroleum products. A ton of CFS shipments, on average, traveled about 270 miles, slightly less than the approximate 300 miles for the shipments in the supplemental data, in part because CFS includes large bulk shipments (e.g., sand and gravel), which are mostly local shipments.

[1] Both the CFS and supplemental data for 2002 are preliminary estimates.

FIGURE 2-9 Commercial Freight Activity for All Modes by Weight: 1993, 1997, and 2002

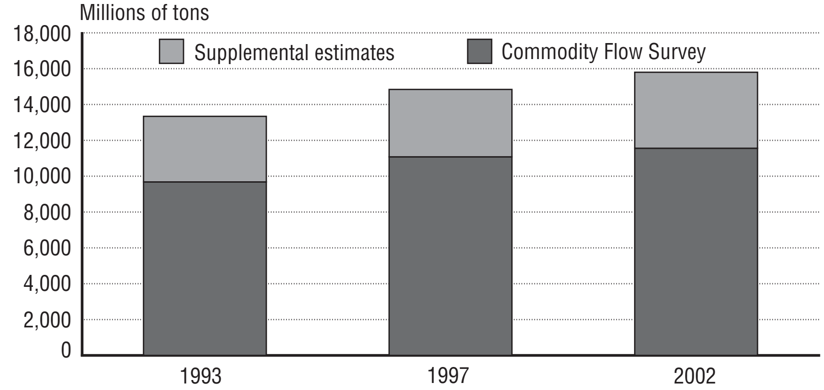


FIGURE 2-10 Commercial Freight Activity for All Modes by Ton-Miles: 1993, 1997, and 2002

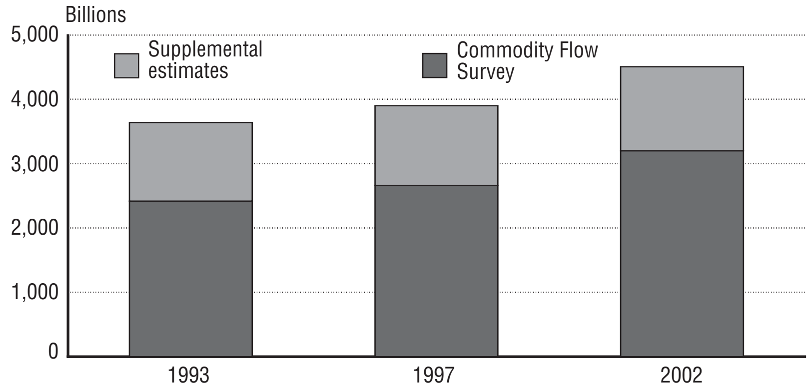
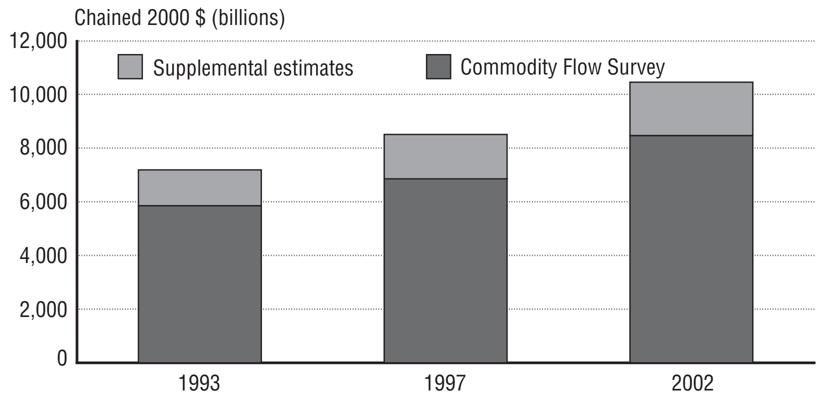


FIGURE 2-11 Commercial Freight Activity for All Modes by Shipment Value: 1993, 1997, and 2002



NOTES: 2002 Commodity Flow Survey and supplemental data are preliminary. For information on coverage of supplemental estimates, see tables 2-9, 2-10, and 2-11 in appendix B.

Current dollar amounts were converted to chained 2000 dollars by BTS to eliminate the effects of inflation over time.

SOURCES: Commodity Flow Survey data—U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Commerce, U.S. Census Bureau, *Commodity Flow Survey* (Washington, DC: 2003). **Supplemental estimates**—MacroSys Research and Technology calculations for BTS based on data compiled from a variety of sources.

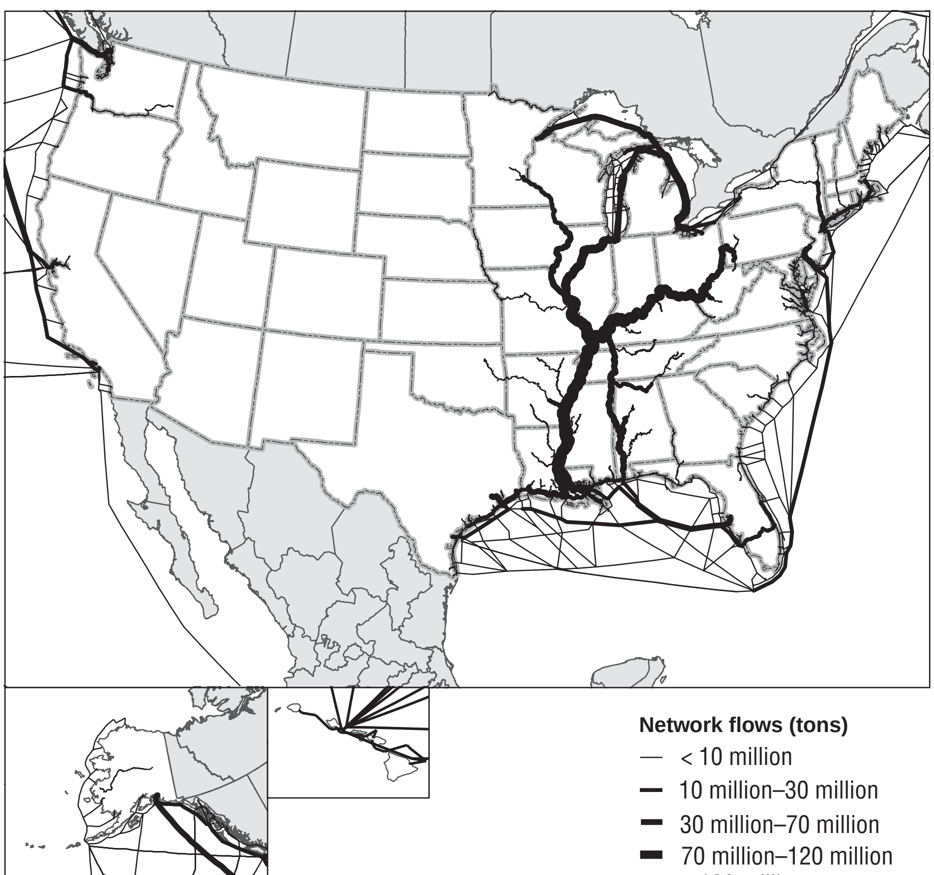
Geography of Domestic Freight Flows

The U.S. transportation system carried 18 percent more tons of freight in 2002 than in 1993 [2]. This growth was unevenly distributed in terms of geography and by mode, in part because of the differing characteristics of truck, waterborne, and rail modes and the infrastructure on which each relies.

At more than 120 million tons, waterborne freight flows in 1998[1] were heaviest along the Mississippi River, while between 70 million and 120 million tons flowed along the Ohio and Illinois Rivers and within the Great Lakes (figure 2-12). Lesser amounts were transported north and south along various rivers connected by the Tennessee Tombigbee Waterway.

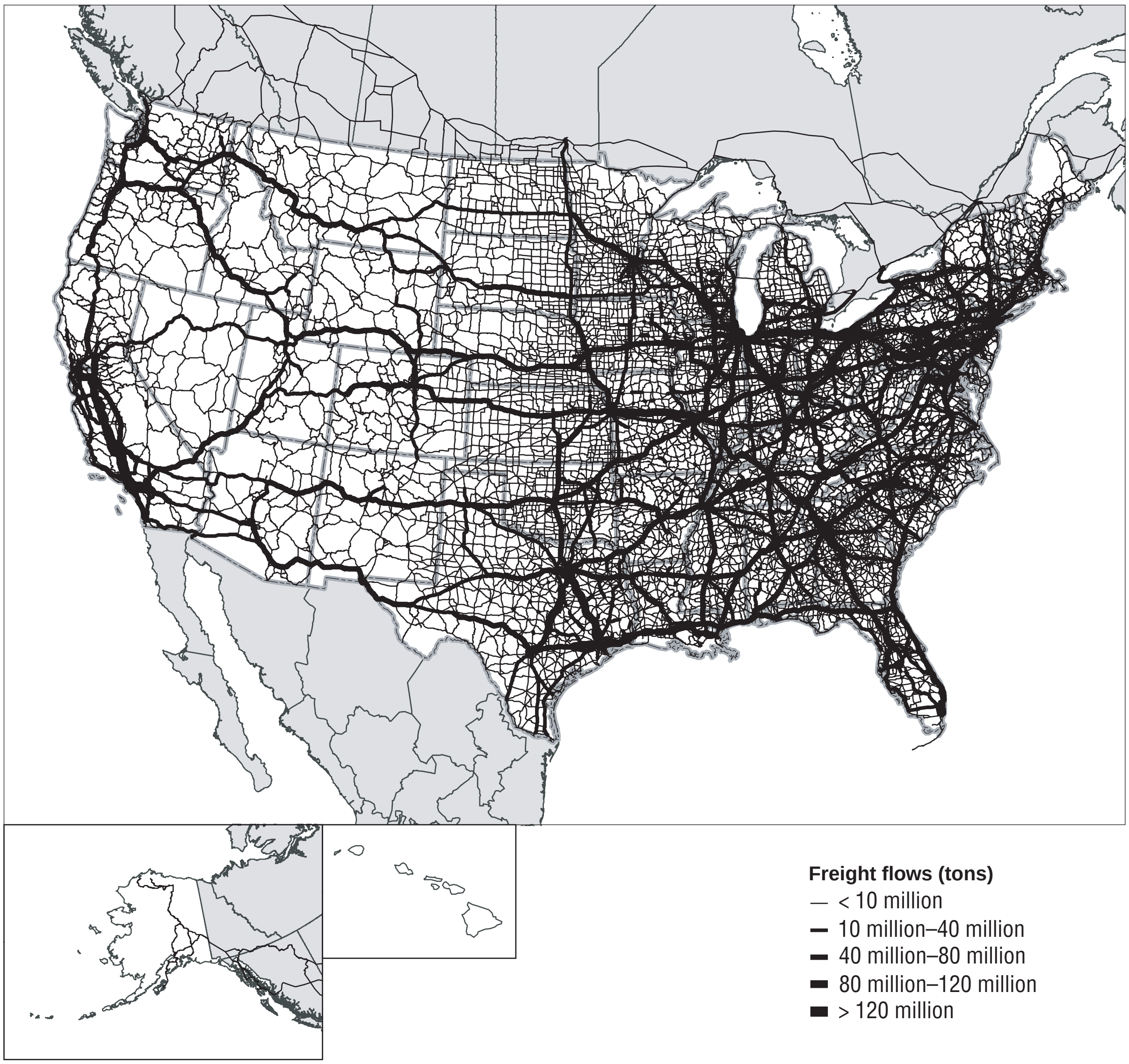
[1] The most recent data available when this report was prepared was 1998 for trucking and waterborne and 1999 for rail.

FIGURE 2-12 Waterborne Freight Flows in the United States: 1998



SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, and Office of Intermodalism (Office of the Secretary), *GeoFreight,* CD (Washington, DC: 2003).

FIGURE 2-13 Truck Freight Flows in the United States: 1998

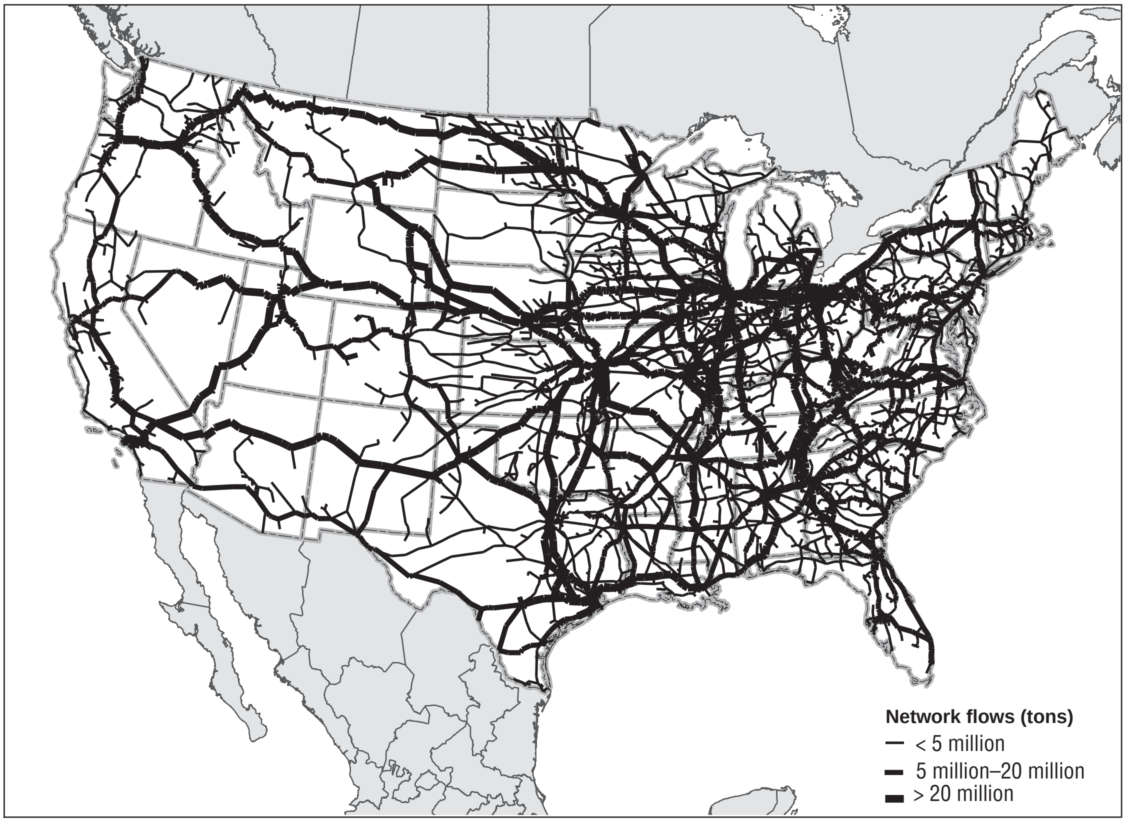


SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, and Office of Intermodalism (Office of the Secretary), *GeoFreight,* CD (Washington, DC: 2003).

Some of the heaviest truck flows in 1998 (those greater than 120 million tons) occurred along routes in California and Texas; around Atlanta, Georgia; and within the central and northeastern areas of the country (figure 2-13).

(*continues on next page*)

FIGURE 2-14 Rail Freight Flows in the United States: 1999



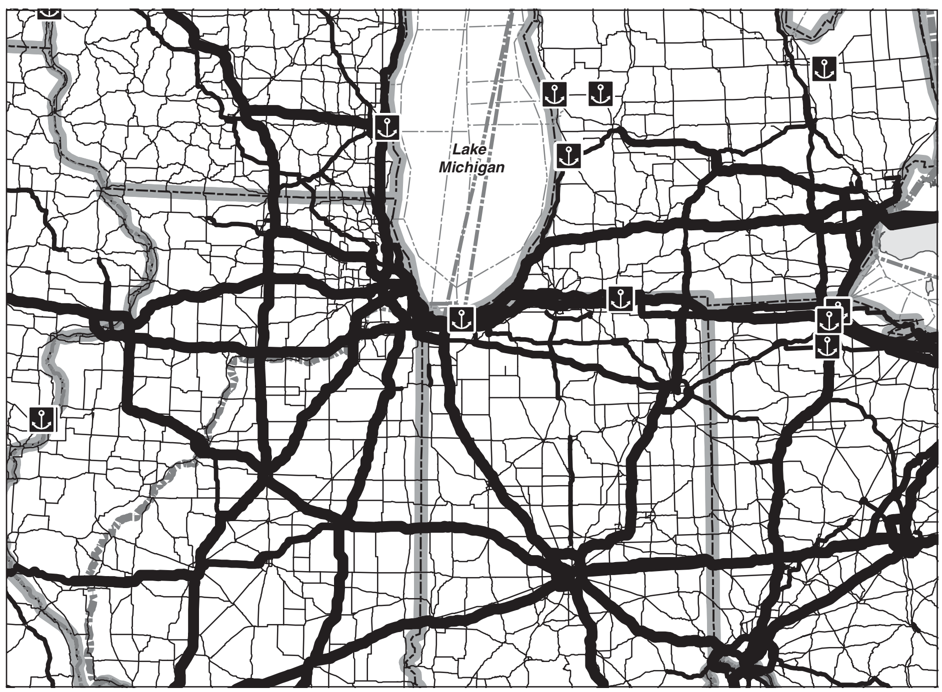
SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, and Office of Intermodalism (Office of the Secretary), *GeoFreight,* CD (Washington, DC: 2003).

Main rail routes carried more than 20 million tons of freight in 1999 throughout the United States (figure 2-14).

Intermodal flows, in which a combination of modes are used to transport freight, are becoming increasingly important. In the regional Lake Michigan area, for instance, maritime and trucking provide intermodal services not only at lake ports but inland as well (figure 2-15).

These mapped data were generated by *GeoFreight* [1]. This analysis tool was developed in 2003 by the Bureau of Transportation Statistics, the Federal Highway Administration, and the Office of Intermodalism of the U.S. Department of Transportation to help freight policymakers and planners identify flows of domestic and international freight across the country and assess major freight bottlenecks in

FIGURE 2-15 Truck and Waterborne Freight Flows in the Lake Michigan Area: 1998



KEY: ⚓ = water/truck intermodal terminals; ▬ ▬ = state boundaries.

Waterway network flows (tons)	Highway network flows (tons)
< 20 million	< 20 million
20 million–80 million	20 million–40 million
> 80 million	40 million–60 million
	> 60 million

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, and Office of Intermodalism (Office of the Secretary), *GeoFreight,* CD (Washington, DC: 2003).

the transportation system. Geographic displays produced using *GeoFreight* enable comparisons of infrastructure impacts by mode at national, regional, and local levels.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, and Office of Intermodalism (Office of the Secretary), *GeoFreight,* CD (Washington, DC: 2003).
2. U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, U.S. Census Bureau, *2002 Economic Census, Transportation, 2002 Commodity Flow Survey* (Washington, DC: 2003), preliminary data.

Passenger and Freight Vehicle-Miles of Travel

Annual highway vehicle-miles of travel (vmt) amounted to 2,856 billion in 2002, rising by 27 percent since 1992, an average annual increase of 2.4 percent. Vmt per capita rose by 13 percent during the same period, an average annual increase of 1.2 percent [1].

In recent years, the makeup and use of the highway vehicle fleet in the United States has changed, altering the share of vmt by vehicle type (figure 2-16). With the increasing popularity of sport utility vehicles and other light trucks, this class of vehicles registered the fastest passenger vmt growth (37 percent) between 1992 and 2002. However, during the same period, freight vehicle vmt (single-unit and combination trucks) grew 40 percent, outpacing total passenger vehicle vmt growth (26 percent). Nevertheless, in 2002, passenger vehicles accounted for more than 90 percent of highway vmt.

Vehicle travel[1] has also generally increased in other modes of transportation including rail, air, and rail transit. Vehicle-miles by rail (measured in train-miles and excluding transit rail) grew 27 percent between 1992 and 2002, an average annual increase of 2.4 percent. Freight train-miles made up over 90 percent of all rail vehicle travel in 2002. This share increased slightly between 1992 and 2002 as freight rail vehicle movements outpaced those of passenger rail over the period (figure 2-17).

Domestic service air carrier aircraft vmt increased by 41 percent between 1992 and 2002, an average annual increase of 3.5 percent. Air carrier aircraft vmt peaked in 2000 at 5,664 million, falling back to 5,550 million in 2001, mainly because of the terrorist attacks that year. Aircraft vmt increased again in 2002 reaching 5,612 million [2].

The biggest change in rail transit between 1992 and 2002 was a doubling of light rail vmt as existing systems were expanded and new systems were built (e.g., in Baltimore, Dallas, Denver, St. Louis, and Salt Lake City). The average annual increase over this period was 7.7 percent (figure 2-18). Commuter rail vehicle-miles were up 30 percent over this period and heavy rail miles, 18 percent. This is an average annual increase of 2.6 percent for commuter rail and 1.7 percent for heavy rail.

Sources

1. U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract of the United States: 2003* (Washington, DC: 2003), table 2 (resident population), also available at http://www.census.gov/statab/www, as of April 2004.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues).

[1] A vehicle-mile of travel (1 vehicle traveling 1 mile) is a concept that is more easily applied to highway vehicles than to other modes of transportation. For instance, rail can be measured in car-miles (1 car, 1 mile) or in train-miles, which includes any number of cars but may be more comparable to highway vmt. For air transportation, vmt is synonymous with an aircraft-mile of travel (1 aircraft, 1 mile).

FIGURE 2-16 Highway Vehicle-Miles of Travel by Vehicle Type: 1992–2002

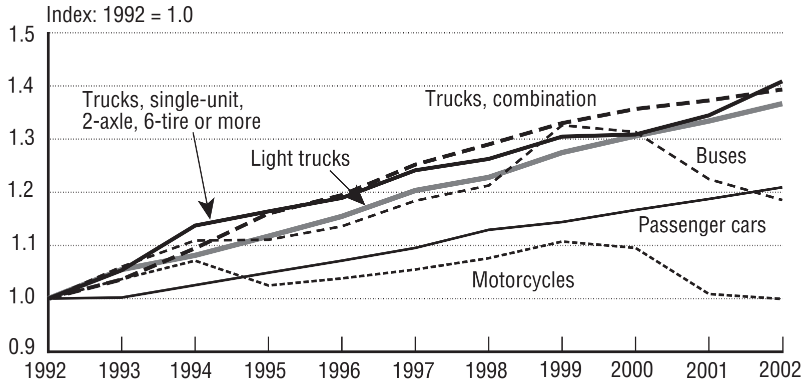


FIGURE 2-17 Freight and Passenger Train-Miles: 1992–2002

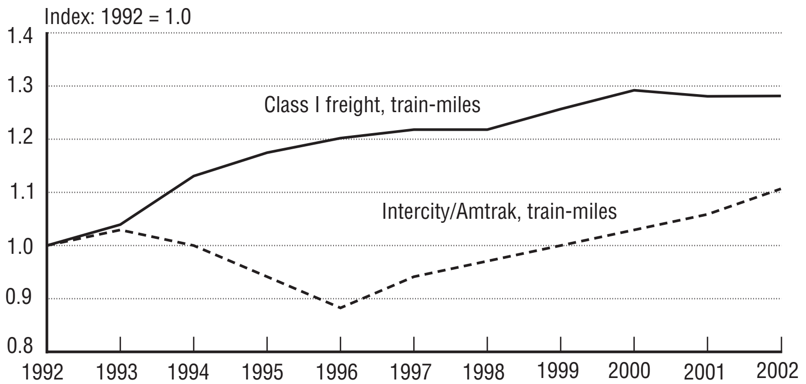
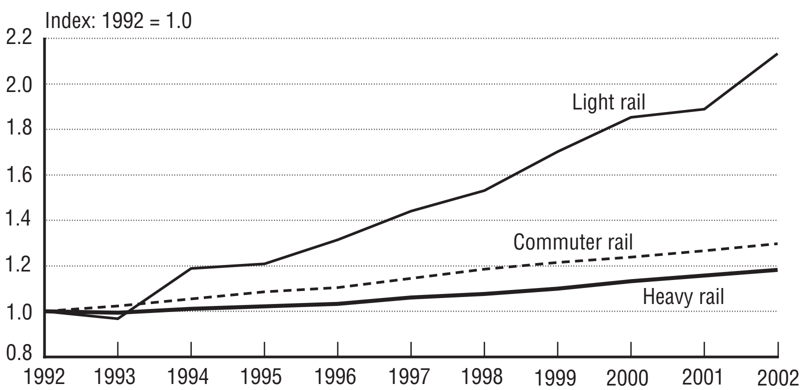


FIGURE 2-18 Rail Transit Vehicle-Miles: 1992–2002



SOURCES: Figure 2-16— 1992–1994: U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995* (Washington, DC: 1997), table VM-201A, also available at http://www.fhwa.dot.gov/ohim/summary95/index.html, as of June 2004.
1995–2002: USDOT, FHWA, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.
Figure 2-17—Class I rail freight train-miles: Association of American Railroads (AAR), *Railroad Facts 2003* (Washington, DC: 2003), p. 33.
Intercity/Amtrak train-miles: 1992–2001: Amtrak, *Amtrak Annual Report* (Washington, DC: Annual issues), statistical appendix.
2002: AAR, *Railroad Facts 2003* (Washington, DC: 2003), p. 77.
Figure 2-18—American Public Transit Association, *Public Transportation Fact Book, 2004* (Washington, DC: 2004), table 18.

Urban Highway Travel Times

Highway travel times increased between 1991 and 2001 in 72 of the 75 urban areas studied by the Texas Transportation Institute. The average Travel Time Index (TTI) for these areas in 2001 was 1.39, an increase from 1.29 in 1991 [2]. This means that in 2001 it took 39 percent longer, on average, to make a peak period trip in urban areas compared with the time it would take if traffic flowed freely (box 3-A).

Travel times tend to deteriorate as urban area size increases (figure 3-1). For instance, Los Angeles, California, had the highest TTI (1.83) in 2001, while Anchorage, Alaska, and Corpus Christi, Texas, had the lowest (each 1.05). Of the 30 urban areas with the highest index in 2001, only three had a population under 1 million: Austin, Texas (1.31); and Tacoma, Washington, and Charlotte, North Carolina (1.27 each). At the other end of the spectrum, urban areas of over 1 million people with low indexes include Buffalo-Niagara Falls, New York (1.08) and Oklahoma City, Oklahoma, and Pittsburgh, Pennsylvania (1.10 each).

Between 1991 and 2001, the greatest increases in TTI generally occurred in large urban areas, while the increases were more moderate in the very large, medium, and small areas[1] (figure 3-2). Overall, the average index for large urban areas increased by 11.9 percent, while that for medium urban areas was up by 8.2 percent. In small and very large areas, the increases were 4.7 percent and 7.0 percent, respectively.

[1] Very large urban areas have a population over 3 million; large urban areas, 1 million to 3 million population; medium urban areas, 500,000 to 1 million; and small urban areas, less than 500,000.

BOX 3-A
Travel Time Index

Developed by the Texas Transportation Institute, the Travel Time Index is the ratio of peak period travel time to free-flow travel time. A value of 1.0 indicates that traffic is moving freely. A value of 1.3 indicates that it takes 30 percent longer to make a trip than in free-flow conditions. If, say, a trip takes 20 minutes in free-flow conditions and the index is 1.3, then the trip would take, on average, 6 minutes longer to complete during a peak period.

In urban areas, where highway infrastructure is typically well developed, the principal factor affecting travel times is highway congestion resulting from recurring and nonrecurring events. Recurring delay is largely a phenomenon of the morning and evening commutes, although in some places congestion may occur all day and on weekends. National estimates, based on model simulations, of the effect of nonrecurring events on freeways and principal arterials suggest that about 38 percent are due to crashes, followed by weather (27 percent), freeway work zones (24 percent), and breakdowns (11 percent) [1].

Sources

1. Chin, S.M., O. Franzese, D.L. Greene, H.L. Hwang, and R. Gibson, "Temporary Losses of Highway Capacity and Impacts on Performance," Oak Ridge National Laboratory, 2002.
2. Texas A&M University, Texas Transportation Institute, *2003 Urban Mobility Report* (College Station, TX: 2003).

FIGURE 3-1 Travel Time Index by Metro Area Population for 75 Metro Areas: 2001

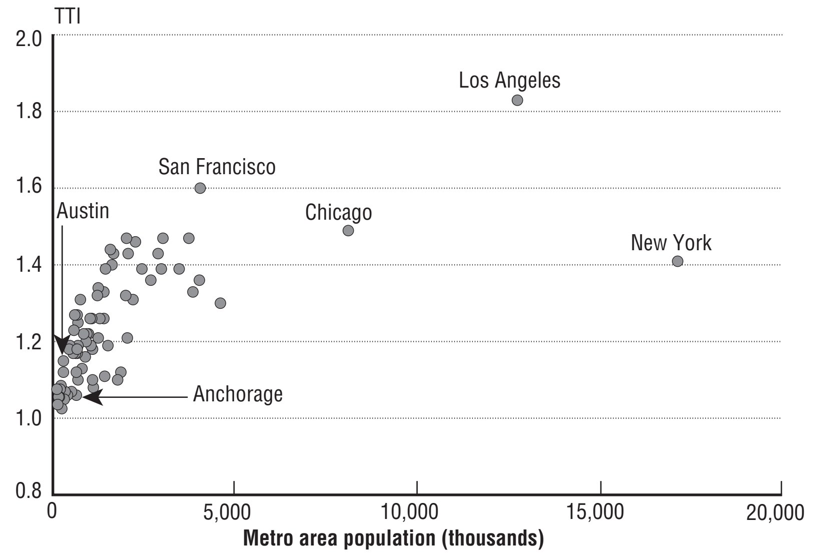
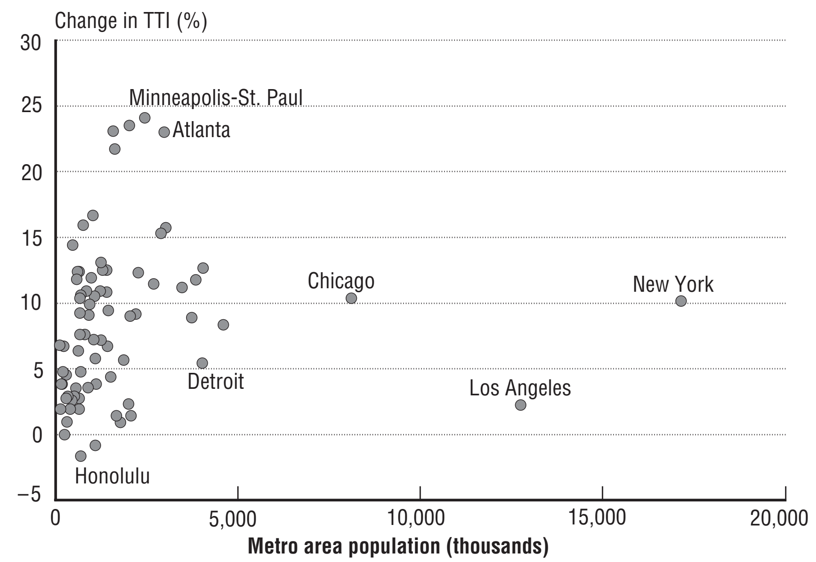


FIGURE 3-2 Change in Travel Time Index by Metro Area Population: 1991 and 2001



KEY: TTI = Travel Time Index.

NOTE: The TTI is the ratio of peak period travel time to free-flow travel time. It expresses the average amount of extra time it takes to travel during the peak period relative to free-flow travel.

SOURCE: Texas A&M University, Texas Transportation Institute, *2003 Urban Mobility Report* (College Station, TX: 2003), also available at http://tti.tamu.edu/, as of October 2003.

U.S. Air Carrier On-Time Performance

Almost 82 percent of domestic air carrier scheduled flights arrived on time in 2003, compared with 79 percent in 1995. Late flight arrivals totaled 16 percent in 2003, down from 20 percent in 1995 (figure 3-3). Overall, between 1995 and 2003, late, canceled, and diverted flights peaked at 1.6 million in 2000 and declined to their lowest number (941,448) in 2002 before rising to 1.2 million in 2003 [1].

The total number of scheduled nonstop domestic passenger flights at the nation's airports rose 12 percent between 1995 and 2001 from 5.3 million to 6.0 million flights. After the shutdown of flight operations on September 11, 2001, the number of scheduled flights decreased 12 percent between 2001 and 2002 to 5.3 million flights. They then rose 23 percent to 6.5 million flights in 2003.

Air carriers with at least 1 percent of total domestic scheduled service passenger revenues have been required to report ontime performance data to the Bureau of Transportation Statistics (BTS) since 1987. As of mid-2003, the airlines began reporting data on the cause of delays, as well.[1] A flight has an "on-time departure" if the aircraft leaves the airport gate less than 15 minutes after its scheduled departure time, regardless of the time the aircraft actually lifts off from the runway. An arriving flight is counted as ontime if it arrives less than 15 minutes after its scheduled gate arrival time.

On average, 37 percent of delays occur because of circumstances within an airline's control, such as maintenance or crew problems, while 40 percent are caused by a previous flight arriving late (figure 3-4). According to these monthly data, security delays have had the least impact on airline schedules, and extreme weather is the cause of an average of 7 percent of delays. However, the number of weather-related delays was highest in August 2003 (5,887) and January 2004 (7,907) and lowest in October 2003 (1,667). Monthly delays ranged from 8 percent to 15 percent of all scheduled flights between July 2003 and January 2004.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, Airline Service Quality Performance data, March 2004.

[1] See tables 3-3a and b and 3-4 in appendix B for details on reporting carriers and detailed information on cause-of-delay categories.

FIGURE 3-3 U.S. Air Carrier On-Time Performance: 1995–2003

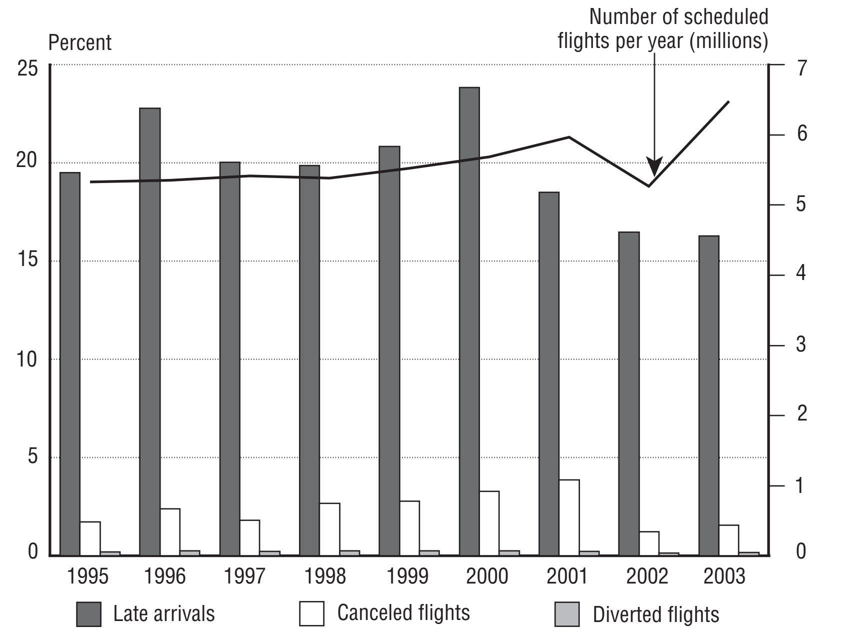
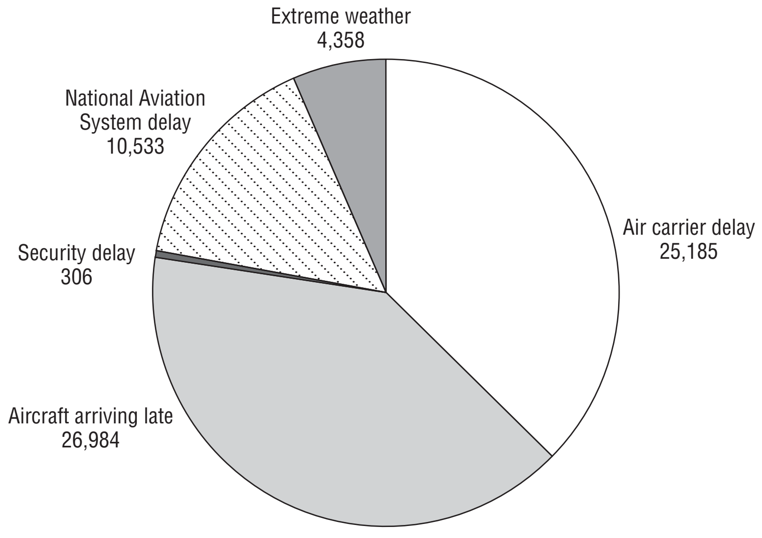


FIGURE 3-4 Average Monthly Number of Delays by Cause: July 2003–January 2004



NOTES: Flights are on time if they depart from or arrive at the gate less than 15 minutes after their scheduled departure or arrival times. See table 3-4 in appendix B for definitions of categories of delay.

SOURCES: Figure 3-3—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), Office of Airline Information, Airline Service Quality Performance data, March 2004. **Figure 3-4—**USDOT, BTS, "Causes of Flight Delays," available at http://www.bts.gov/oai, as of March 2004.

Air Travel Time Index Research

Air travel times and the reliability of expected travel times are important determinants of customers' satisfaction, air system operating efficiency, and policymakers' success in meeting performance objectives. A major reason consumers choose to travel by air is that it is often the fastest way to travel longer distances.

According to research the Bureau of Transportation Statistics (BTS) is conducting to improve the measurement of air travel time and reliability, the average *actual* travel time of nonstop flights in the United States rose by an average of 0.5 percent per year between 1990 and 2000 and then fell by 2.7 percent per year between 2000 and 2002 (figure 3-5). In comparison, the average *scheduled* travel time for nonstop flights in the United States rose by 0.2 percent per year between 1990 and 2000 and remained the same between 2000 and 2002. As a result, the gap between actual air travel time and scheduled travel time of nonstop flights widened from 8 minutes in 1990 to a maximum of 11 minutes in 2000 and then narrowed to 4 minutes in 2002 (figure 3-6).

The Travel Time Variability Index, which measures the deviation in actual travel time, rose by 4 percent per year between 1990 and 2000 and then fell by 12 percent per year between 2000 and 2002 (figure 3-7). Thus, actual travel time for a typical flight became more uncertain and took longer, on average, between 1990 and 2000. However, starting in 2001, both actual travel time and travel time variability improved as the number of flight operations declined.

This new BTS research, which is based on Airline Service Quality Performance data collected from airlines (box 3-B), enables analysis of changes in air travel time nationally, as well as by airport, carrier, and time of day, and for flight distance. For instance, from 1990 to 2002, most improvements[1] occurred in flights departing in the evening offpeak (after 9:00 p.m.). The least improved were flights departing in the evening peak (between 3:00 p.m. and 9:00 p.m.). Grouped by distance, flights of more than 750 miles experienced improvement in travel time, while flights of 750 miles or less were approximately unchanged [1].

BOX 3-B
Airline Service Quality Performance (ASQP) Data and Air Travel Time Indexes

These indexes are calculated using ASQP data reported to the Bureau of Transportation Statistics on both scheduled and actual flight times (based on gate-departure and gate-arrival) for all domestic nonstop flight segments flown by U.S. carriers with at least 1 percent of passenger revenues in the previous year. Actual (or scheduled) travel time is the difference in minutes between the scheduled departure and the actual (or scheduled) arrival. Air Travel Time Variability is measured using standardized deviations of actual air travel time from its average value. Deviations are weighted to increase the variability index more for extreme deviations than for small deviations. All of the Air Travel Time Indexes are designed to control for changes in carriers, routes, and time of departure in order to improve the reliability of comparisons over time. Airports included in the analysis are those that ranked in the top 50 (by passenger enplanements of all large certified carriers) for at least one year between 1990 and 2002. The time-of-departure periods are: morning offpeak (before 9 a.m.); mid-day peak (between 9 a.m. and 3 p.m.); evening peak (between 3 p.m. and 9 p.m.); and evening offpeak period (after 9 p.m.).

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on Airline Service Quality Performance data, as of February 2004.

[1] Improvement occurs when the actual travel time decreases.

FIGURE 3-5 Change in Actual and Scheduled Travel Time: 1990–2002
Seasonally adjusted, yearly averages

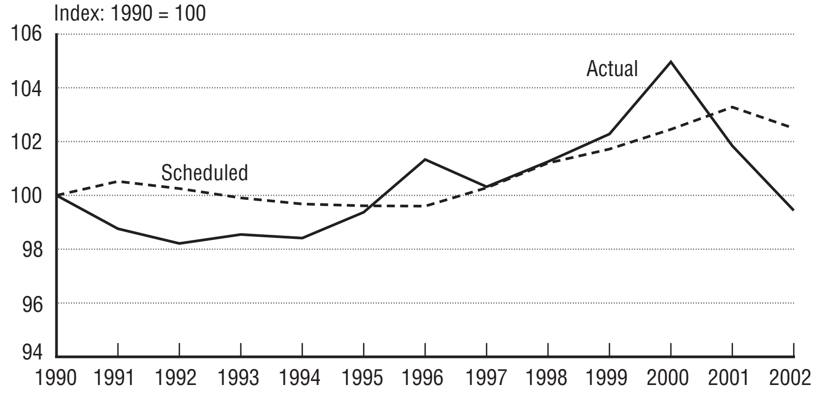


FIGURE 3-6 Average Actual and Scheduled Travel Time: 1990, 2000, and 2002

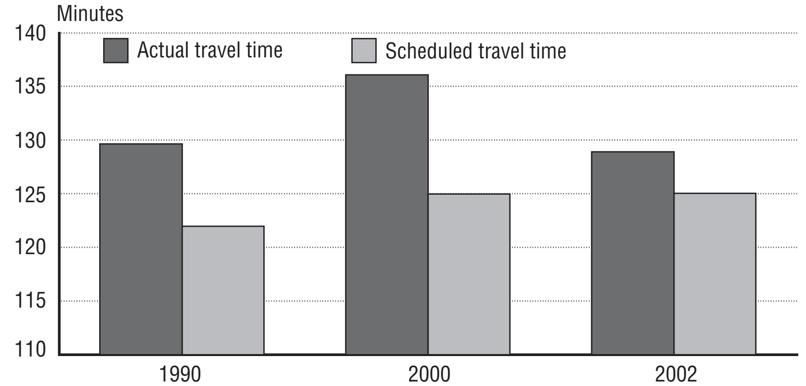
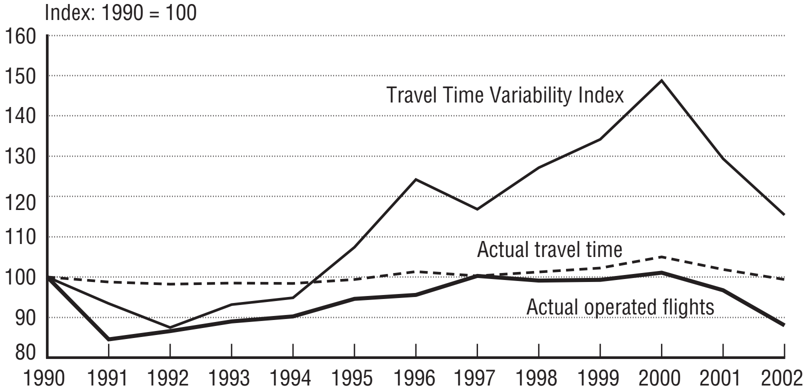


FIGURE 3-7 Travel Time Variability Index and Actual Travel Time and Operated Flights: 1990–2002
Seasonally adjusted, yearly averages



NOTE: These results, based on ongoing research, are preliminary. The Travel Time Variability Index is based on the standard deviation of actual travel time.

SOURCES: Data for scheduled and actual air travel times—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on Airline Service Quality Performance data, March 2004.
Flight operations—USDOT, BTS, Airline Market and Segment (T-100) data, March 2004.

Amtrak On-Time Performance

Seventy-four percent of Amtrak trains arrived at their final destination on time in 2003 [2]. This was below the system's performance peak of 79 percent in 1998 and 1999 (figure 3-8). Amtrak counts a train as delayed if it arrives at least 10 to 30 minutes beyond the scheduled arrival time, depending on the distance the train has traveled.[1] In addition, Amtrak on-time data are based on a train's arrival at its final destination and do not include delay statistics for intermediate points.[2]

Over the years, short-distance Amtrak trains—those with runs of less than 400 miles (and including all Northeast Corridor and Empire State Service trains)—have consistently registered better on-time performance than long-distance trains—those with runs of 400 miles or more. Annual on-time performance for short-distance trains reached a high of 82 percent in 2000 but fell to 77 percent in 2003. Fifty-three percent of long-distance trains arrived on time in 2003, up from 52 percent in 2002 but short of their high of 61 percent in 1999.

Amtrak also collects data on the cause and cumulative hours of delay for its trains, including delays at intermediate points, and attributes the cause of each delay to Amtrak, the host railroad, or "other" (figure 3-9). Delays assigned to Amtrak represented 29 percent of all delay hours in 2003. Delays ascribed to host railroads represented 65 percent, and other delays accounted for the remaining 6 percent.[3] (Amtrak trains operate over tracks owned primarily by private freight railroads except in most of the Northeast Corridor, along a portion of the Detroit-Chicago route, and in a few other short stretches across the country [1].) Throughout the years, host railroad delays have consistently represented the largest share of delay hours. Between 2000 and 2003, host railroad and other delays increased each year. Amtrak-caused delay hours declined in both 2002 and 2003 but remain greater than they were in 2000.

Sources

1. National Passenger Railroad Corp. (Amtrak), "Amtrak Facts," available at http://www.amtrak.com/about/amtrakfacts.html, as of November 2003.
2. ______. Personal communication, Oct. 22, 2003.

1 Amtrak trips of up to 250 miles are considered on time if they arrive less than 10 minutes beyond the scheduled arrival time; 251–350 miles, 15 minutes; 351–450 miles, 20 minutes; 451–550 miles, 25 minutes; and greater than 550 miles, 30 minutes.

2 Accordingly, a train traveling between Chicago and St. Louis (282 miles), for example, could arrive 15 minutes late at all intermediate points, yet arrive 12 minutes late at St. Louis and be reported as "on time."

3 Because of a change in reporting methodology in 2000, earlier cause-of-delay data are not comparable. The Bureau of Transportation Statistics presented Amtrak cause-of-delay data for 1990 through 1999 in its *Transportation Statistics Annual Report* (October 2003).

FIGURE 3-8 Share of Amtrak Trains Arriving On Time: 1993–2003

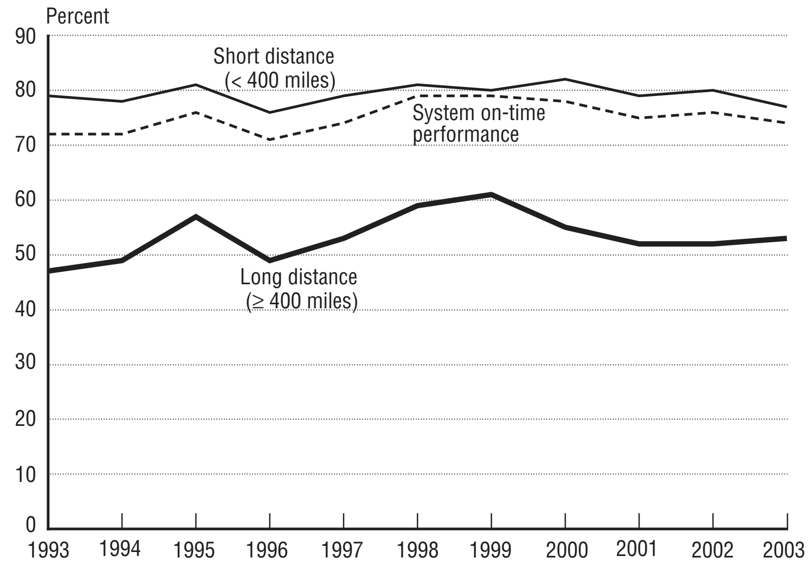
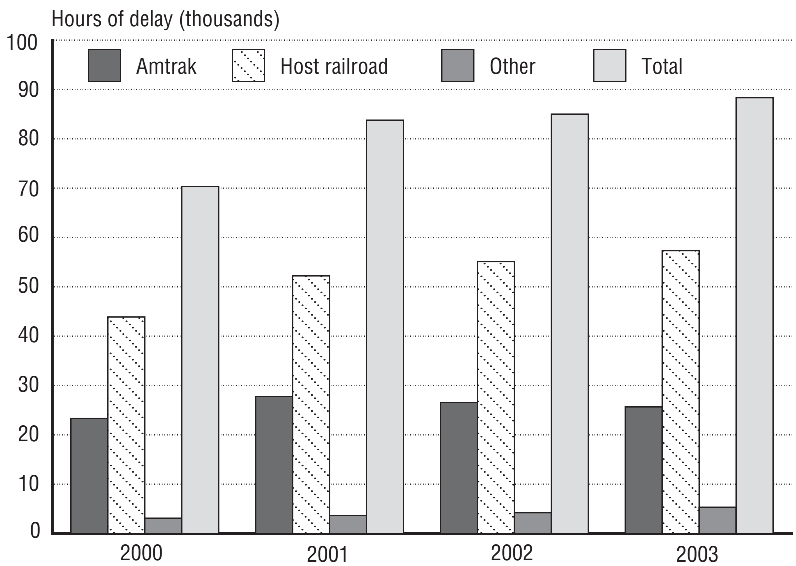


FIGURE 3-9 Amtrak Hours of Delay by Cause: 2000–2003



NOTE: Amtrak changed its method for reporting delays by cause in 2000. Therefore, data before 2000 are not comparable to previous years and are not presented in figure 3-9.
Amtrak includes all delays when operating on Amtrak-owned tracks and delays for equipment or engine failure, passenger handling, holding for connections, train servicing, and mail/baggage handling when on tracks of a host railroad.
Host railroad includes all operating delays not attributable to Amtrak when operating on tracks of a host railroad, e.g., track- and signal-related delays, power failures, freight and commuter train interference, and routing delays. Also includes delays for track repairs/track conditions, freight train interference, and signal delays.
Other includes delays not attributable to Amtrak or other host railroads, e.g., customs and immigrations, law enforcement action, weather, or waiting for scheduled departure time.

SOURCES: 1993–1999—National Railroad Passenger Corp. (Amtrak), *Amtrak Annual Report* (Washington, DC: Annual issues). **2000–2003—**Amtrak, personal communication, Oct. 22, 2003.

Survey Data on Congestion Delays

More than two of five adults in the United States reported in 2002 that traffic congestion was a problem in their community (figure 3-10). These data are results from the Bureau of Transportation Statistics *Omnibus Household Survey,* conducted in January, May, and September 2002. The survey responses indicated that concern about congestion was higher among adults in metropolitan statistical areas[1] (MSAs) than among the general adult population or among adult residents of non-MSAs.

Four times between December 2001 and February 2003, the *Omnibus Household Survey* queried participants to find out whether they experienced any significant delays while traveling (in the previous month). On average, significant delays were reported by 28 percent of air travelers, 19 percent of public transit users, and 18 percent of personal vehicle users (figure 3-11). In the survey, *significant delays* were designed to be the respondent's perception, given the differences in commutes across the country.

According to surveys conducted over four months in 2003, 81 percent of commuters used only their personal vehicle to complete their commute and most personal vehicle users (86 percent) drove alone [1]. Since 2001, many Omnibus surveys have asked people who commute to work how much time it takes to travel door-to-door, one way. On average, these commutes took 25 minutes in 2001, 26 minutes in 2002, and 27 minutes in 2003 (figure 3-12). In 2003, commuting was longer than 30 minutes for 23 percent of workers [1].

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *OmniStats* 3(4), October 2003.

[1] MSAs are generally urban. They are defined by the White House Office of Management and Budget at http://www.whitehouse.gov/omb/bulletins/95-04.html, as of May 2004.

FIGURE 3-10 Share of U.S. Residents Experiencing Highway Traffic Congestion: 2002

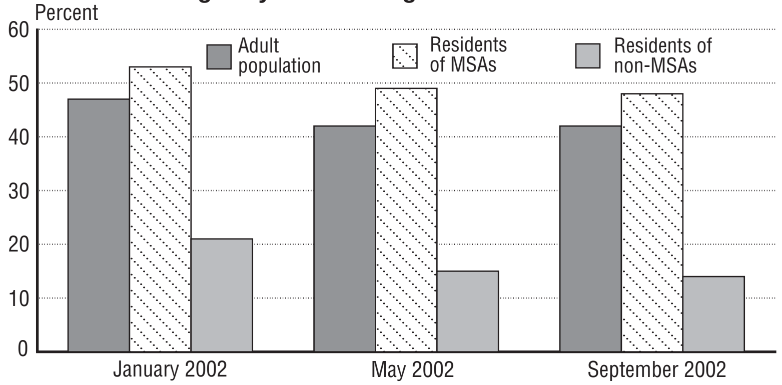


FIGURE 3-11 Share of U.S. Residents Experiencing Significant Delays by Mode: December 2001–August 2002

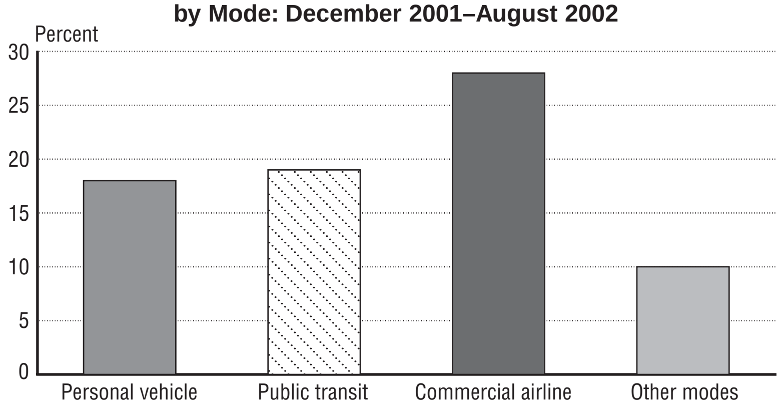
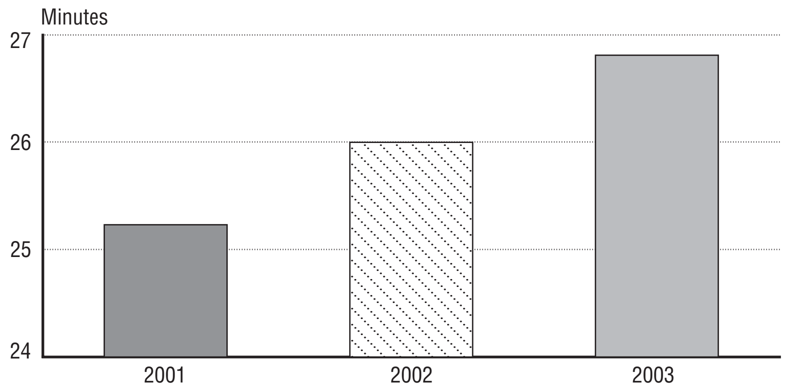


FIGURE 3-12 Average Commute Travel Time: 2001, 2002, and 2003



KEY: MSA = metropolitan statistical area.

NOTE: See corresponding tables for information on months/years of original data.

SOURCES: Figure 3-10—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *Omnibus Household Survey,* January, May, and September 2002, as reported in USDOT, BTS, "Traffic Congestion Rated a Problem by Two of Five U.S. Adults, BTS Survey Shows," Press release, Aug. 21, 2003, available at http://www.bts.gov/press_releases/2003/index.html, as of May 2004.
Figure 3-11—USDOT, BTS, *OmniStats* 2(5), October 2002.
Figure 3-12—USDOT, BTS, calculations based on *Omnibus Household Surveys* (Washington, DC: Various months).

Highway Trucks by Weight

The United States truck fleet grew 23 percent between 1992 and 1997, according to the Vehicle Inventory and Use Survey (VIUS) conducted once every five years[1] [1, 2]. The fleet includes a variety of vehicles, ranging from large 18-wheel combination trucks used to transport freight to small pickup trucks, often used for personal travel.

The fleet of medium and heavy trucks grew 18 percent between 1992 and 1997 (figure 4-1). However, the number of trucks in one of the heaviest subcategories (those weighing 100,001 to 130,000 pounds) grew 46 percent, from 12,300 trucks to 17,900. Overall, the number of trucks in the heavy category (over 26,000 pounds) grew 37 percent between 1992 and 1997.

Light trucks, which include sport utility vehicles (SUVs), minivans, vans, and pickup trucks, represented 85 percent of the truck fleet in 1997.[2] Within the light truck category, pickup trucks outnumbered minivans and SUVs. However, the number of SUVs and minivans increased by 93 percent and 61 percent, respectively, over the previous five years—much faster than the growth rate for pickup trucks (8 percent). Light trucks represent a growing proportion of auto industry sales; consumers purchased more light trucks than passenger cars for the first time in 2001 [3].

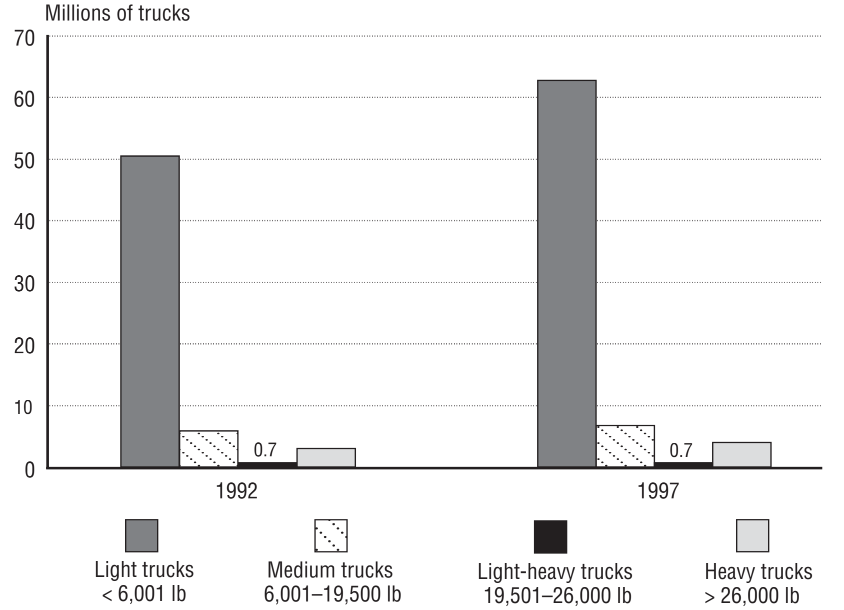
Sources

1. U.S. Department of Commerce, U.S. Census Bureau, *1997 Economic Census: Vehicle Inventory and Use Survey: United States*, EC97TV-US (Washington, DC: 1999).
2. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2002), table 1-21, also available at http://www.bts.gov/, as of April 2003.
3. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), table MV-9, also available at http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm, as of April 2003.

[1] National summary data for the 2002 VIUS is expected to be issued in fall 2004.

[2] Here, light trucks include trucks less than 6,001 lbs. In the original source of the data (the Vehicle Inventory and Use Survey), trucks between 6,001 lbs and 10,000 lbs are also categorized as light trucks. See figure 18 for further explanation.

FIGURE 4-1 Number of Trucks by Vehicle Weight: 1992 and 1997



NOTES: Weight is the empty weight of the vehicle plus the average vehicle load.

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

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2002), table 1-21, also available at http://www.bts.gov/, as of April 2003.

The original source of these data is the U.S. Census Bureau's *Vehicle Inventory and Use Survey* (VIUS). The truck categories in *National Transportation Statistics 2002* and this report differ from those in the VIUS, which has the following categories: light trucks—10,000 lbs or less; medium trucks—10,001 lbs–19,500 lbs; light-heavy trucks—19,501 lbs–26,000 lbs; and heavy-heavy trucks—26,001 lbs or more.

Vehicle Loadings on the Interstate Highway System

Large combination trucks[1] represent a small portion of traffic on the U.S. Interstate Highway System [1]. Because they are heavier, they may cause more pavement damage, a measurement that is estimated in terms of vehicle loadings (box 4-A). In urban areas, these trucks made up only 6 percent of traffic volume, but accounted for 77 percent of loadings in 2002 (figure 4-2). These trucks also make up a greater portion of the vehicles on rural segments of the Interstate Highway System, representing 18 percent of traffic volume and 89 percent of loadings in 2002 (figure 4-3).

Between 1992 and 2002, large combination truck traffic volume grew from 16 percent to 18 percent on rural roads, while declining from 7 percent to 6 percent on urban Interstate highways. Concurrently, their share of loadings decreased on both rural and urban Interstate highways. Passenger cars, buses, and light trucks, which the Federal Highway Administration aggregates into one category, followed a different trend—representing an unchanged percentage of traffic volume but a growing portion (from 1 percent to 3 percent) of loadings in urban areas [1].

BOX 4-A
Measuring Vehicle Loadings

Planning agencies design roadways to have a specific lifespan based on the expected volume and weight of vehicle traffic [1]. Since traffic streams are composed of a variety of vehicles of different weights and axle configurations, an equivalent unit of pavement damage is used to calculate the wear caused by different types of vehicles. An equivalent single-axle load (ESAL) is a standard unit of pavement damage and is based on the amount of force applied to pavement by an 18,000-pound axle, which is roughly equivalent to a standard truck axle. This unit may be used to calculate the cumulative damage caused to a roadway by an expected traffic stream.

Source

1. American Association of State Highway and Transportation Officials, *Guide for Design of Pavement Structures* (Washington, DC: 1993), p. I-10 and appendix D.

Source

1. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2002*, table TC-3, available at http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/tc3.pdf, as of February 2004.

[1] Large combination trucks weigh more than 12 tons and have 5 or more axles.

FIGURE 4-2 Share of Loadings on Urban Interstate Highways by Vehicle Type: 2002

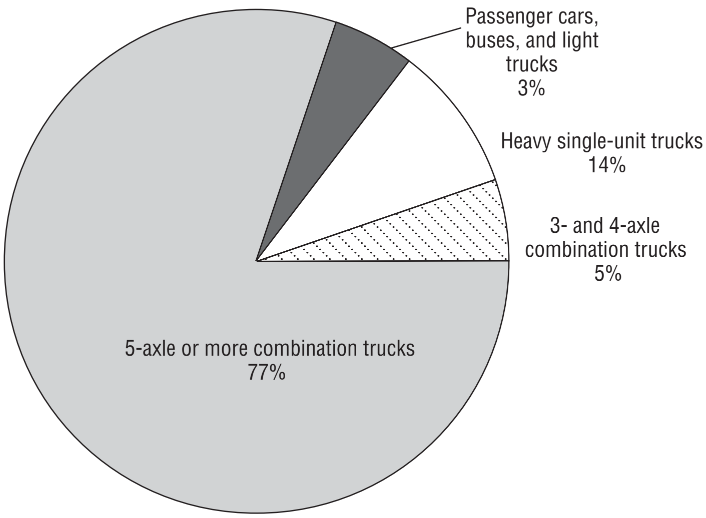
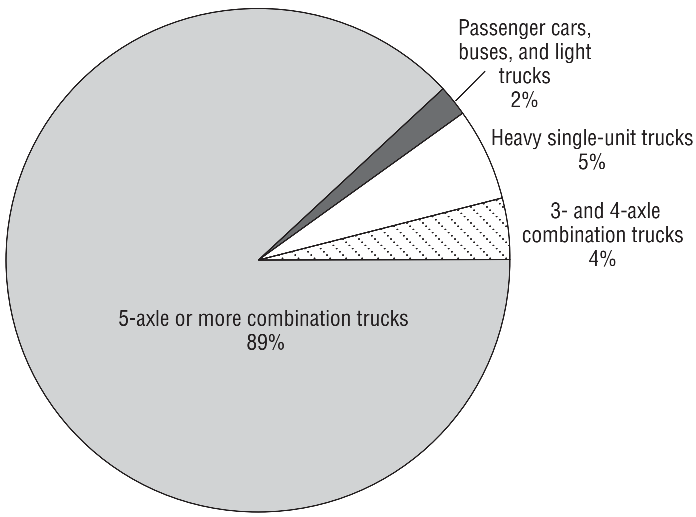


FIGURE 4-3 Share of Loadings on Rural Interstate Highways by Vehicle Type: 2002



NOTES: Based on data from the Truck Weight Study that are collected by the states for varying time periods each year and are not adjusted to typify annual averages. Loadings are based on equivalent single-axle loads (ESALs), a standard unit of pavement damage based on the amount of force applied to pavement by an 18,000-pound axle, which is roughly equivalent to a standard truck axle. Raw data are not readily available.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2002* (Washington, DC: 2003), table TC-3, "Percentage Distribution of Traffic Volumes and Loadings on the Interstate System," available at http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/tc3.pdf/, as of February 2004.

Merchant Marine Vessel Capacity

Merchandise trade valued at over $729 billion moved by maritime vessels between U.S. and foreign seaports in 2002 [2]. Container shipments increased 86 percent between 1992 and 2002[1] [3].

The average capacity of containerships calling at U.S. ports increased 16 percent to 42,158 deadweight tons (dwt)[2] per call between 1998[3] and 2002 (figure 4-4). The world's largest containerships, built primarily during the late 1990s and early 2000s, are over 3 football fields long (1,138 ft), 140 feet wide, and 50 feet deep [1].

Containership capacity increased faster than any other type of vessel calling at U.S. ports between 1998 and 2002. The average capacity of tankers, which dock at specialized ports, grew the least (1 percent) between 1998 and 2002 but represent the largest average capacity vessel (69,412 dwt per call). The average vessel capacity of all ships grew 5 percent between 1998 and 2002 to 47,625 dwt per call.

Sources

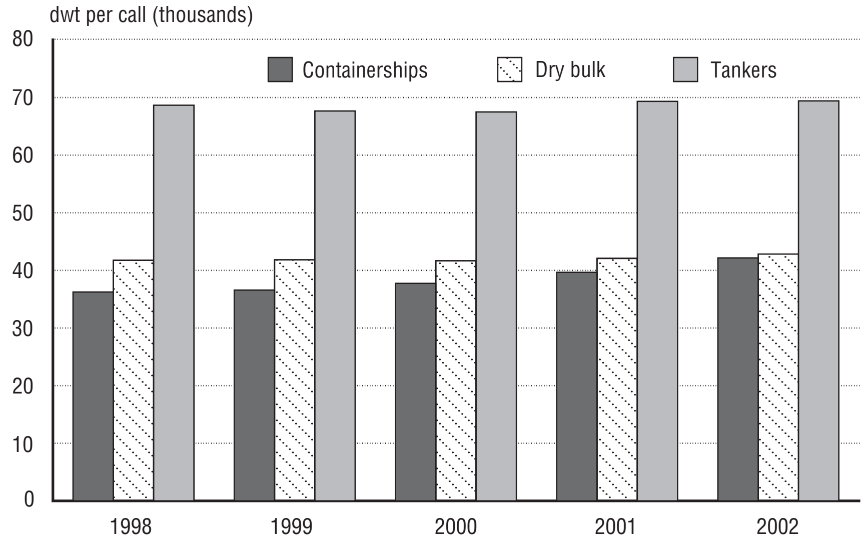
1. Maersk-Sealand, Vessels web page, available at http://www.maersksealand.com/, as of April 2003.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on U.S. Department of Commerce, Census Bureau, *U.S. Imports of Merchandise Trade CD* (Washington, DC: 2003).
3. U.S. Department of Transportation, Maritime Administration, personal communication, March 2004.

1 Percentage change was calculated in terms of 20-foot equivalent units (TEUs).

2 Deadweight tons refers to the lifting capacity of a vessel expressed in long tons (2,240 lbs), including cargo, commodities, and crew.

3 1998 is the first year for which data are available.

FIGURE 4-4 Average Capacity of Vessels Calling at U.S. Ports by Selected Type: 1998–2002



KEY: dwt = deadweight tons.

NOTE: Calls are by oceangoing vessels of 10,000 dwt or greater at U.S. ports, excluding Great Lakes ports. Beginning in 2002, chemical tanker data are no longer reported separately and are, instead, included in tanker. Historical data were adjusted for consistency. 1998 is the first year for which data are available.

SOURCE: U.S. Department of Transportation, Maritime Administration, *Vessel Calls at U.S. Ports* (Washington, DC: December 2003), table S-1.

Railcar Weights

The amount of freight carried by railroads between 1992 and 2002 increased 26 percent (in tons) and 32 percent (by carload) on railcars (figure 4-5). However, on average, the weight of each railcar remained fairly constant. The average weight of a loaded railcar ranged from 62 to 67 tons during the same period (figure 4-6).

The relatively steady average weight of a loaded railcar masks countervailing trends among selected freight commodities. The average weight of a carload of coal, which represented 44 percent of rail freight tonnage in 2002, was 111 tons, up from 99 tons in 1992 (figure 4-7). Farm products, food and kindred products, nonmetallic minerals, and chemicals and allied products, which together represented 30 percent of tonnage in 2002, were also shipped in heavier average carloads in 2002 than in 1992 [1, 2].

Miscellaneous mixed shipments is the only category of goods that was transported in lighter average carloads. Miscellaneous mixed shipments are primarily intermodal freight composed of shipping containers on flatbed railcars. The containers, which are primarily used to move manufactured goods that tend to be lighter and more valuable than raw materials, may be partly transported by waterborne vessel and truck, as well. Miscellaneous mixed shipments increased by 55 percent in terms of tonnage and by 79 percent in terms of carloads between 1992 and 2002, resulting in carloads that were 14 percent lighter in 2002 [1, 2].

Sources

1. Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003).
2. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on Association of American Railroads, *Railroad Ten-Year Trends, 1990–1999* (Washington, DC: 2000).

FIGURE 4-5 U.S. Railroad Freight Traffic: 1992–2002

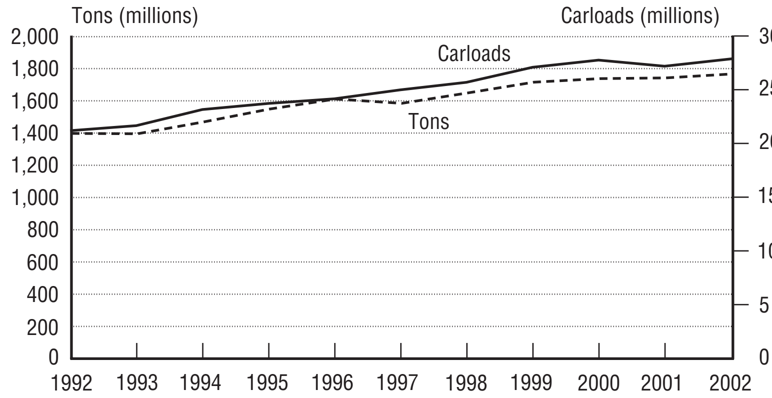


FIGURE 4-6 Average Loaded U.S. Railcar Weight: 1992–2002

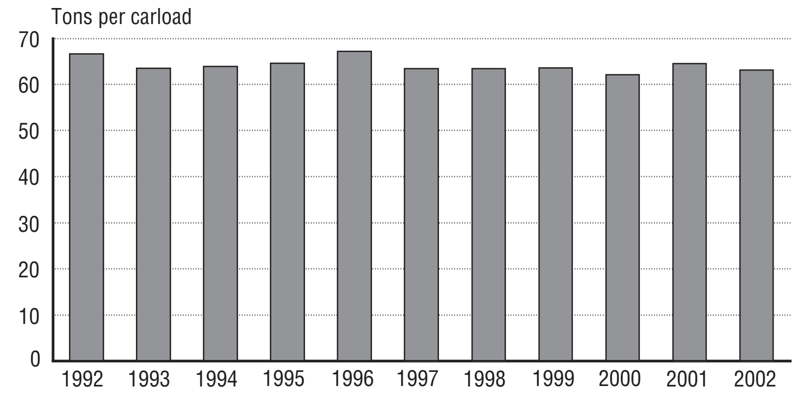
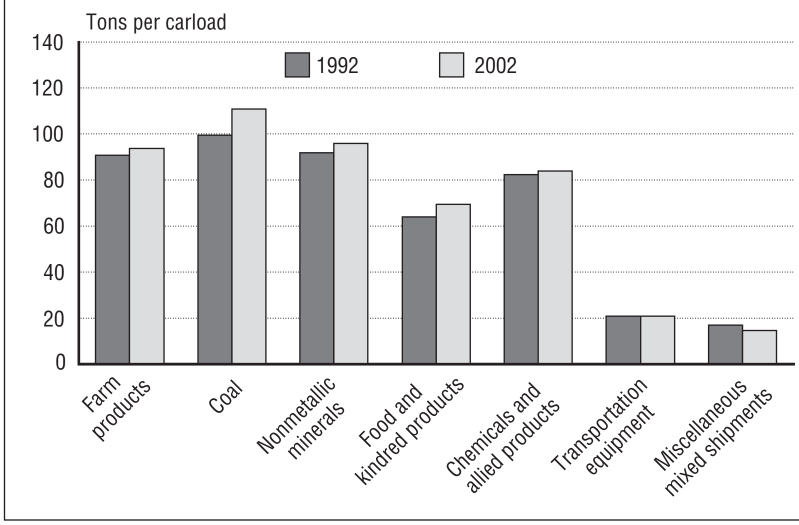


FIGURE 4-7 Average Loaded U.S. Railcar Weight for Selected Commodities: 1992 and 2002



NOTES: Figure 4-6—Average railcar weight is total tons transported divided by total carloads transported. **Figure 4-7**—Miscellaneous mixed shipments is mostly intermodal traffic. Some intermodal traffic is included in commodity-specific categories, as well.

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

Daily Passenger Travel

In their daily nonoccupational travel, people in the United States journeyed about 4 trillion miles in 2001, or 14,500 miles per person per year, according to results from the 2001 National Household Travel Survey (box 5-A). On average, people traveled 40 miles per day, 88 percent of it (35 miles) in a personal vehicle[1] such as an automobile (figure 5-1). The total number of vehicle-miles for this passenger travel in 2001 was nearly 2.3 trillion.[2]

Americans took 411 billion daily trips annually, or an average of 1,500 trips per person per year. On a daily basis, individuals averaged about four trips per day [1] (figure 5-2).

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey, Preliminary Data Release Version 1 (day trip data only), available at http://nhts.ornl.gov/, as of January 2003.

[1] Personal vehicles are cars, vans, sport utility vehicles, pickup trucks, other trucks, recreational vehicles (not including watercraft), and motorcycles.

[2] For more extensive daily (mostly local) travel data and analysis, see section 5 (pages 50–57) of the *Transportation Statistics Annual Report,* October 2003.

BOX 5-A
2001 National Household Travel Survey (NHTS)

The 2001 NHTS was sponsored by the Bureau of Transportation Statistics and the Federal Highway Administration of the U.S. Department of Transportation. Households were asked about all the trips[1] they took on a specific day (daily travel), known as the "travel day," and about trips of 50 miles or more taken from home in the 27 days preceding and including the travel day, a period known as the "travel period." Detailed characteristics were collected for each trip including, among other things, the mode of transportation, the purpose of the trip, and the distance traveled. Additionally, households were asked to provide information about their social and demographic characteristics, including income and vehicle ownership, as well as the age, sex, education level, and so forth of household members. The 2001 NHTS collected information from 26,000 households nationally between March 2001 and May 2002.

The NHTS combines two previous surveys—the Nationwide Personal Transportation Survey (NPTS), a survey of daily travel, and the American Travel Survey (ATS), a survey of long-distance travel. The NPTS and ATS both were last conducted in 1995. Because of methodological changes, comparisons between the 2001 NHTS and the 1995 NPTS and ATS are not attempted here. Analysts need more time to study the effects of the methodological changes before meaningful comparisons can be made.

NHTS passenger data differ from data presented in section 2, "Passenger-Miles of Travel." See box 2-A for a detailed discussion of these differences.

[1] A trip is defined as traveling from one address to another, whether it is down the street, across town, or cross country.

FIGURE 5-1 Miles Traveled per Day: 2001

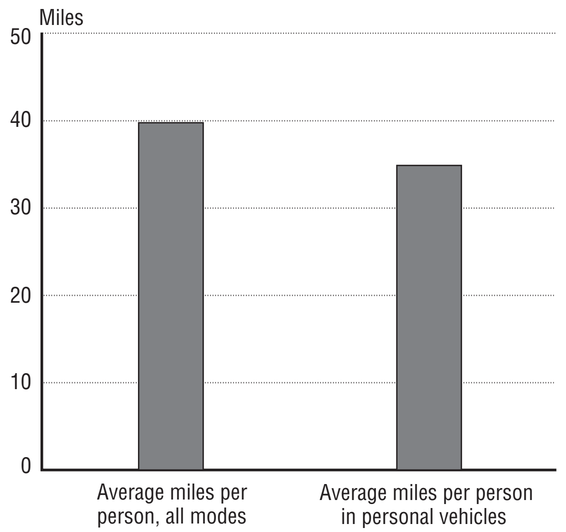
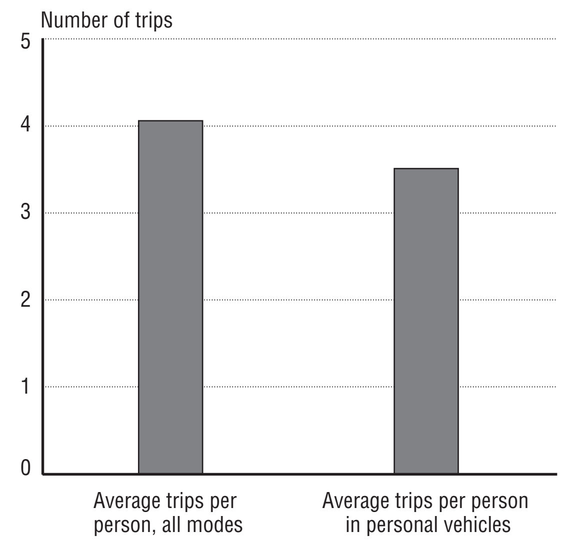


FIGURE 5-2 Trips Completed per Day: 2001



NOTE: Data are from the daily travel segment of the 2001 National Household Travel Survey. Long-distance travel data (i.e., trips of 50 miles or more collected during a 4-week travel period) are not included here.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey (NHTS), Preliminary Data Release Version 1, available at http://nhts.ornl.gov/, as of January 2003.

Long-Distance Passenger Travel

People in the United States made, on average, nine long-distance trips per person in 2001. This amounted to a total of 2.6 billion trips covering 1.4 trillion miles. The distance traveled on these trips in 2001 was about 4,900 miles per person [1].

Long-distance trips are trips of 50 miles or more from home to the farthest destination traveled. The data come from the *2001 National Household Travel Survey* (box 5-B) and were collected between March 2001 and May 2002. U.S. residents made 89 percent of their long-distance trips in 2001 by personal vehicle, such as cars, vans, and motorcycles[1] (figure 5-3). Travel by airplane (7 percent) accounted for most of the other trips. People used buses for 2 percent of long-distance trips and trains for 1 percent. The median length of long-distance airplane trips is much longer than trips on other modes (figure 5-4). Still, people traveled 56 percent of the miles by personal vehicle and 41 percent by air (figure 5-5).

People stayed in their home state for most of their long-distance trips (63 percent). These trips accounted for 28 percent of the miles traveled. International travel made up only 1 percent of long-distance trips but consumed 14 percent of the total miles traveled. Trips within the United States but away from the home state constituted 37 percent of trips and 59 percent of the miles traveled [1].

[1] Personal vehicles are cars, vans, sport utility vehicles, pickup trucks, other trucks (e.g., dump trucks and trailer trucks), recreational vehicles (not including watercraft), and motorcycles.

BOX 5-B
Long-Distance Travel Data in the 2001 National Household Travel Survey (NHTS)

The 2001 NHTS collected information from 26,000 households nationally about both their daily and long-distance travel behavior. While many aspects of the survey are consistent across its daily and long-distance trip components, differences exist. The most important differences are the definition of a trip and the period over which data were collected. For daily travel, households were asked to record information about all the trips they took, regardless of length, on a specific day known as the *travel day*. A trip is generally defined as traveling from one address to another, whether it is down the street, across town, or cross country, although walking and bicycling trips for recreation, including walking the dog, where a person starts and ends at the same address were also counted. As such, this definition means a trip does not have to originate from home, such as trips from work to the doctor. Long-distance trips, by contrast, are defined as trips originating *from home* of 50 miles or more to the furthest destination and include the return component as well as any overnight stops and stops to change transportation mode. Participants recorded their long-distance trips over a four-week period known as the *travel period*.

Other minor differences exist between the daily and long-distance components of the NHTS. For instance, data collected on long-distance trips do not include travel time and the time of day the trip took place, but do include the location of overnight stops and access/egress to an airport, train station, bus station, or boat pier.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

FIGURE 5-3 Share of Long-Distance Trips by Mode: 2001

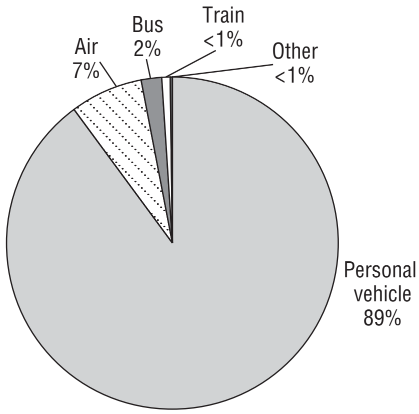


FIGURE 5-4 Median Length of Long-Distance Trips by Mode: 2001

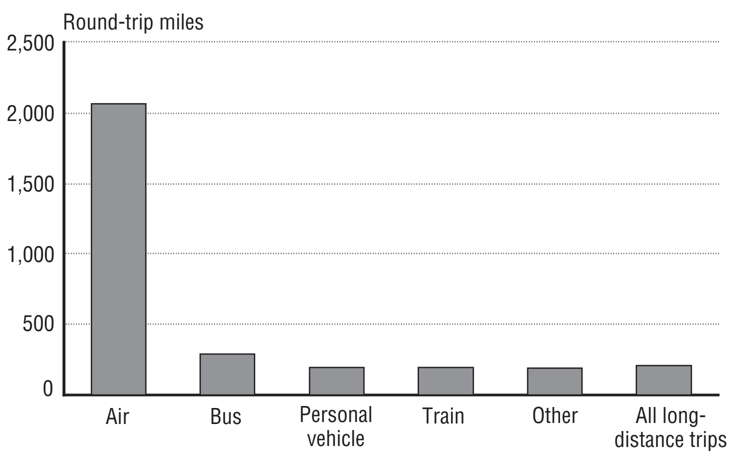
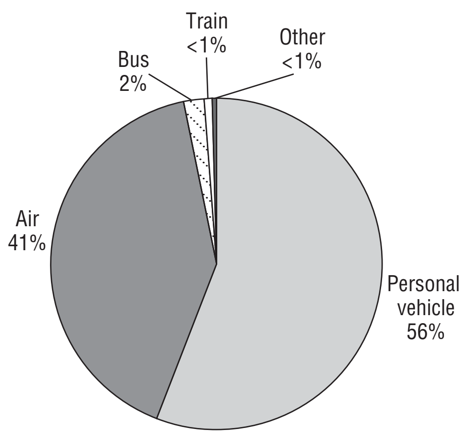


FIGURE 5-5 Share of Long-Distance Trip Miles by Mode: 2001



NOTES: *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

Long-Distance Travel by Purpose and Mode

Long-distance trips are those over 50 miles away from home. People in the United States took over half of their long-distance trips (56 percent) in 2001 for pleasure. These include trips to visit friends and relatives and for recreation. Another 16 percent were for business travel and 13 percent for commuting to a regular place of employment. Trips for personal business, such as shopping, medical visits, weddings, and funerals, accounted for another 13 percent of long-distance trips [1] (figure 5-6).

Nearly 90 percent or more of most long-distance trips are made by personal vehicle.[1] The only exception is for business, where 328.6 million (79 percent) of trips were made by personal vehicle and 73.6 million (18 percent) were made by air (figure 5-7). Bus was the second choice by people traveling on personal business (18.2 million trips) and the third choice for pleasure (31.8 million trips). For train trips, differences in the shares by purpose cannot be discerned because of the small sample size.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

[1] Personal vehicles are cars, vans, sport utility vehicles, pickup trucks, other trucks (e.g., dump trucks and trailer trucks), recreational vehicles (not including watercraft), and motorcycles.

FIGURE 5-6 Share of Long-Distance Trips by Purpose: 2001

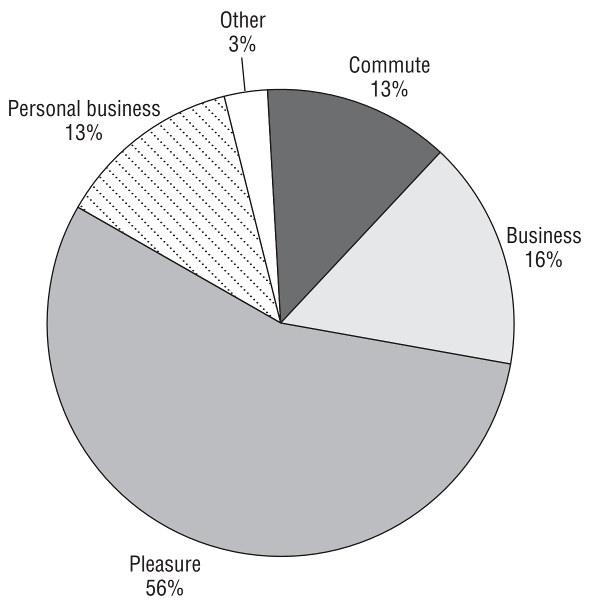
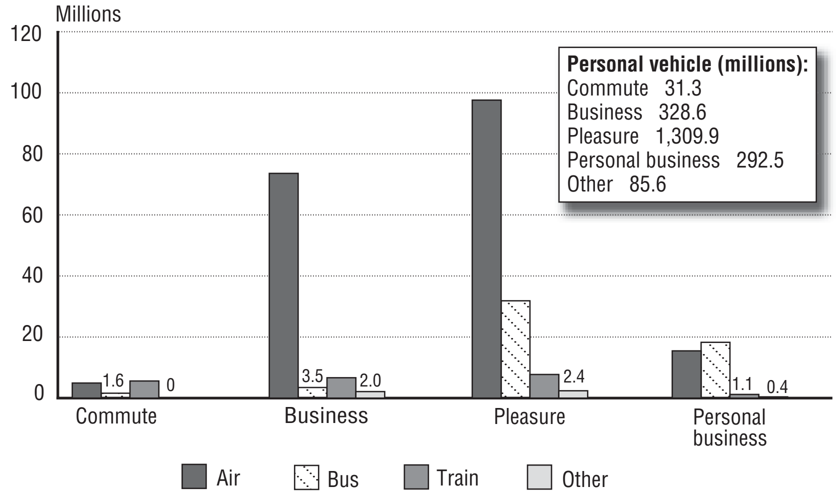


FIGURE 5-7 Long-Distance Trips by Purpose and Mode: 2001



NOTES: Figures 5-6 and 5-7—*Other purpose* includes spending the night, giving someone a ride, and responses not elsewhere classified. Excludes trips where purpose was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

Long-Distance Travel by Income, Gender, and Age

While, on average, each person in the United States made nine long-distance trips in 2001, sociodemographic variables influence the number of these trips that individuals take. Among these variables are household income, gender, and age.

The number of long-distance trips increases with household income. On average, in 2001, people in households earning $100,000 or more made over twice as many long-distance trips (13 per person) as people in households with incomes of less than $25,000 (6 per person) (figure 5-8).

The vast majority of long-distance trips are made by personal vehicle, one reason lower income households make fewer long-distance trips. Households earning $25,000 or more a year are almost 10 times more likely to have a vehicle compared with households with incomes less than $25,000 [2]. Higher income households are also more likely to travel by airplane. For instance, people in households earning $100,000 or more made 17 percent of their trips by air, while those in households earning less than $25,000 made 3 percent of their trips by this mode. Low-income h ouseholds (under $25,000) made a slightly higher share of their trips by bus than did households in higher income groups (4 percent versus about 1 to 2 percent). For train travel, because of small sample sizes, differences in the shares of train trips by household income group cannot be discerned.

Men took 57 percent of all the long-distance trips taken in the United States in 2001, making up the predominant share of trips by personal vehicle and air (figure 5-9). However, shares of bus and train trips for females and males are not statistically different.

Age affects the average amount of long-distance travel a person does. People travel the most in their middle years. Between the ages of 25 and 64 they took 11 to 13 long-distance trips per person on average (figure 5-10). This rate drops to 9 trips per person for those between 65 and 74. Children under 5 and adults over 75 travel the least.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.
2. ____. *NHTS: Highlights of the 2001 National Household Travel Survey* (Washington, DC: 2003).

FIGURE 5-8 Average Long-Distance Trips per Person by Household Income: 2001

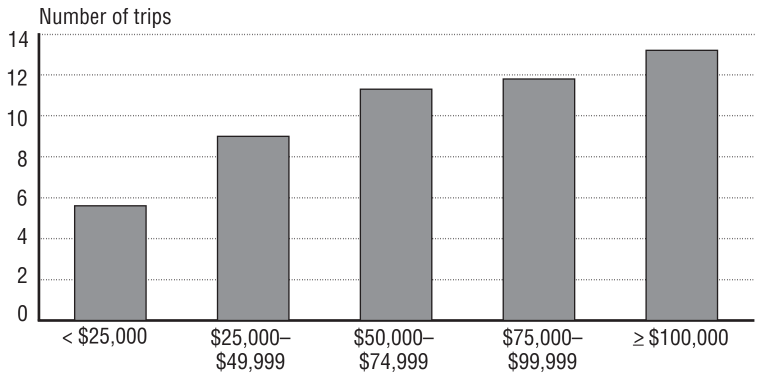


FIGURE 5-9 Long-Distance Trips by Mode and Gender: 2001

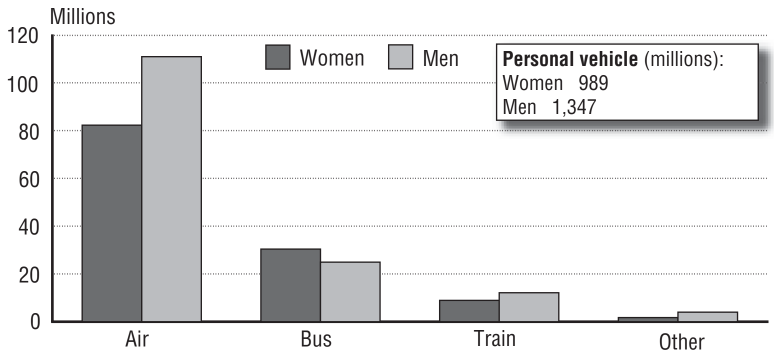
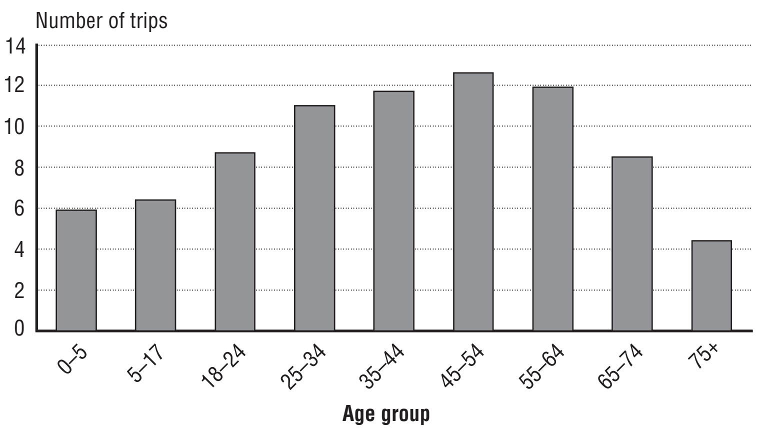


FIGURE 5-10 Average Long-Distance Trips per Person by Age: 2001



NOTES: Figure 5-8—Excludes trips where income was not reported. **Figure 5-9—***Other* includes: watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where gender or mode were not reported. **Figure 5-10—**Excludes trips where age was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

Daily Travel by Income, Gender, and Age

In their daily nonoccupational travel, people in the United States journeyed about 4 trillion miles in 2001, or 14,500 miles per person that year. On average, people traveled 40 miles per day on four one-way trips. Daily trips are influenced by a number of interrelated sociodemographic characteristics. Among them are household income, gender, and age [1].

Daily trip making increases slightly with household income. People in households earning $100,000 or more a year averaged 4.6 trips per day, while people in households earning less than $25,000 took 3.5 trips per day (figure 5-11). Because lower income households are less likely to own a personal vehicle, however, they tend to use transit, walk, or bicycle more than do higher income groups[1] (figure 5-12). There is a greater gap between lower and higher income households in the distance they travel, on average. People in households earning less than $25,000 traveled 26 miles a day each on average compared with 53 miles by people in households earning $100,000 or more. People in the income groups between these extremes traveled between 38 and 48 miles a day, on average [1].

Men and women, on average, made the same number of trips per day: four. Both men and women made most of their daily trips in personal vehicles; 86 percent and 87 percent, respectively. However, men tend to travel farther than women, 43 miles per day compared with 35 miles a day (figure 5-13). These differences in trip distance are related, to some extent, to trip purpose. Men, on average, make more longer distance work and work-related business trips, while women make more shopping and other family/personal business trips, which tend to be shorter.

Age is another factor affecting how much and by what means people travel on a daily basis. People travel the most in the middle years when income tends to be higher and traveling to work and on work-related business may be necessary. People between the ages of 35 and 44 made the most trips a day, about 4.8 per person on average, compared with 2.8 per person for those 75 and older and 3.2 per person for children under 5 (figure 5-14). Not only do those in the middle years make more trips, again those trips tend to be longer work and work-related trips. As a result, people between 35 and 44 traveled 51 miles, on average, compared with less than 30 miles for the youngest and oldest age groups.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

[1] Other factors, such as household location, may also contribute to this difference.

FIGURE 5-11 Average Daily Trips per Day by Income and All Modes: 2001

FIGURE 5-12 Average Daily Trips per Day by Income and Selected Modes: 2001

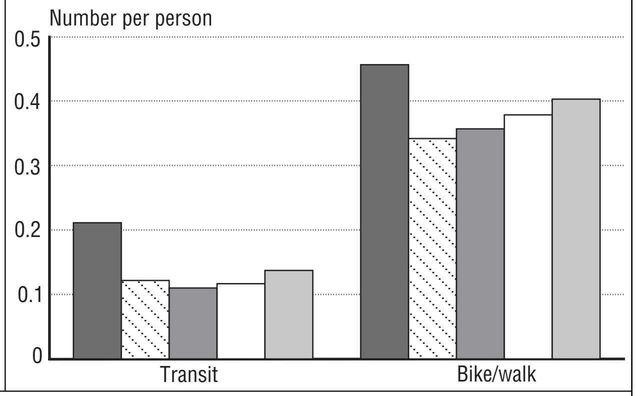


FIGURE 5-13 Average Daily Trips and Miles by Gender and Mode: 2001

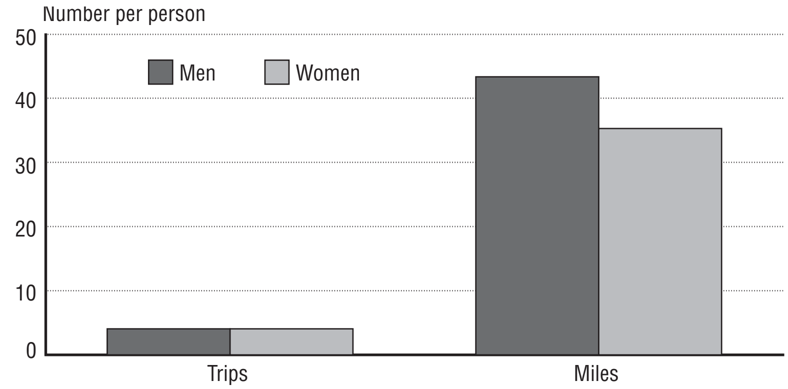
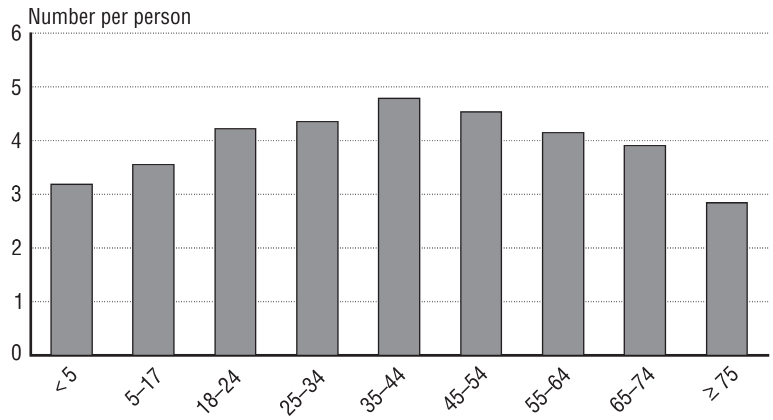


FIGURE 5-14 Average Daily Trips per Day by Age: 2001



NOTES: Figure 5-13—*Other mode* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where mode, gender, or income was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

Travel by Older Adults

Older U.S. residents do not travel as often or as far as do younger people but rely as heavily on personal vehicles,[1] according to data collected by the 2001 National Household Travel Survey [1]. Americans aged 65 and older, for instance, took 89 percent of their daily trips[2] in personal vehicles while people between the ages of 19 and 64 used personal vehicles 90 percent of the time (figure 5-15). Overall, older adults made 10 percent of the 411 billion daily trips people took in 2001 and 8 percent of the 2.6 billion long-distance trips[3] [2].

People aged 65 years and older tend to travel at different times than do those 19 to 64 years old (figure 5-16). Older adults take 55 percent of their daily trips between 10 am and 4 pm. The trips of younger people peak three times a day, between 7 am and 8 am (6 percent of trips), between noon and 1 pm (8 percent), and between 5 pm and 6 pm (8 percent).

Among older men and women, women tend to be less mobile. In their daily travel, they take fewer trips per day (3 trips vs. 4 trips for men), travel shorter distances (10 miles vs. 27 miles),[4] and are more likely to report medical conditions that limit their travel (26 percent vs. 20 percent). Fewer women also say they are drivers (72 percent) than do men (90 percent). These gender differences are not necessarily unique to the older population, however. For instance, all women travel 17 miles in their daily travel, while men travel 29 miles, based on mean distances [2].

Older men and women take long-distance trips at about the same rates and show a strong preference for using personal vehicles (figure 5-17). While older men and women take an equal percentage of their trips by air, older women show a stronger preference than men for bus travel.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *NHTS: Highlights of the 2001 National Household Travel Survey* (Washington, DC: 2003).
2. D.V. Collia, J. Sharp, and L. Giesbrecht, "The 2001 National Household Travel Survey: A Look Into the Travel Patterns of Older Americans," *Journal of Safety Research* 34 (2003).

[1] Personal vehicles are cars, vans, sport utility vehicles, pickup trucks, other trucks, recreational vehicles (not including watercraft), and motorcycles.

[2] Daily trips in the National Household Travel Survey are those taken on a specific day, traveling from one address to another.

[3] Long-distance trips are those of 50 miles or more from home to the farthest destination traveled and return.

[4] Trips and miles traveled are based on mean number of trips and distance, rather than averages.

FIGURE 5-15 Share of Daily Trips by Age Group by Mode: 2001

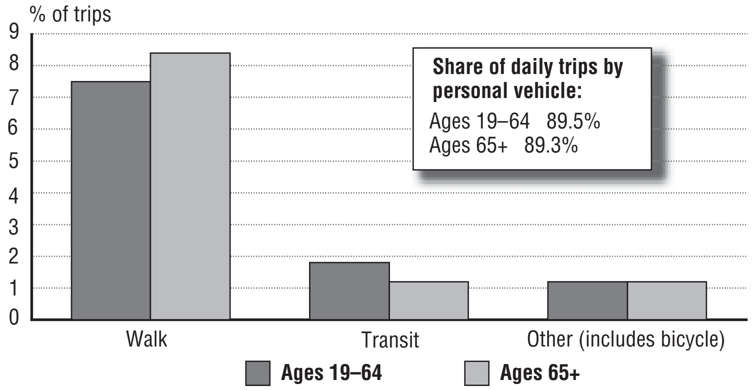


FIGURE 5-16 Daily Trips by Age Group and Time of Day: 2001

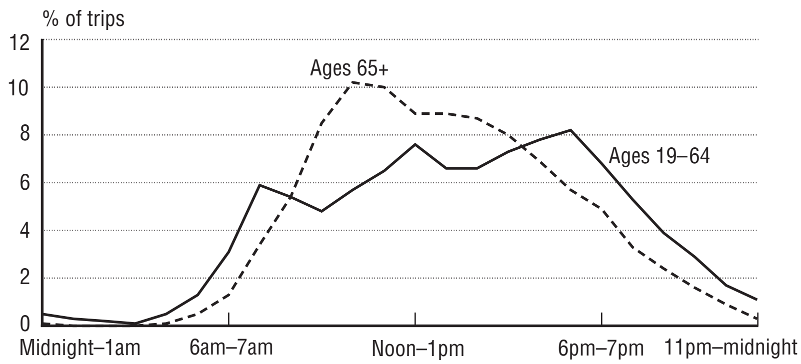
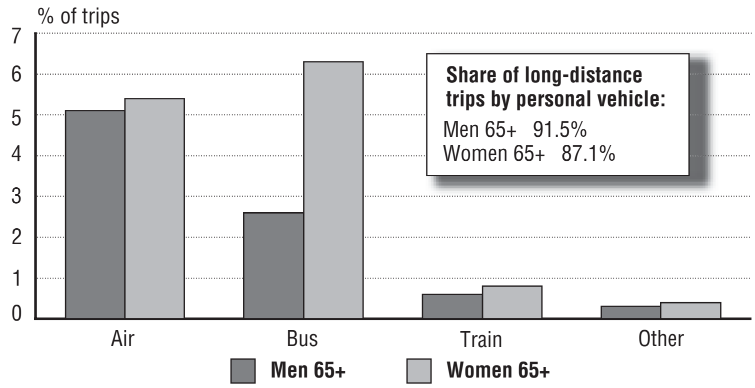


FIGURE 5-17 Share of Long-Distance Trips by Mode and Gender: 2001



SOURCE: D.V. Collia, J. Sharp, and L. Giesbrecht, “The 2001 National Household Travel Survey: A Look Into the Travel Patterns of Older Americans,” *Journal of Safety Research* 34 (2003).

Scheduled Intercity Transportation in Rural America

Over 94 percent of the 82 million rural residents[1] in the United States lived within a 25-mile radius of an intercity rail station, an intercity bus terminal, or a nonhub or small hub[2] airport or within a 75-mile radius of a large or medium hub airport in early 2003. About 30 million rural residents (36 percent) were served by all three modes, while 5 million lived outside this coverage area of any scheduled intercity transportation service.

These data are the result of a January 2003 geographic information system analysis conducted by the Bureau of Transportation Statistics (BTS) [1]. The results show that most rural residents can access scheduled transportation modes for long-distance intercity trips, based on the distance criteria BTS used.

At the time of the study, intercity bus reached 75 million rural residents (91 percent), and for 15 million residents it was the sole mode providing service within 25 miles (figure 5-18). Scheduled airline service reached 58 million (70 percent) and was the sole mode for 2 million rural residents. Intercity rail (Amtrak and the Alaska Railroad) reached 35 million (42 percent) and was the sole mode for about 300,000 rural residents.

In January 2003, the United States had nearly 4,590 intercity passenger stations, terminals, and airports. Over 75 percent of them were intercity bus terminals, and all but 149 of the stations, terminals, and airports were located within the 48 contiguous states.

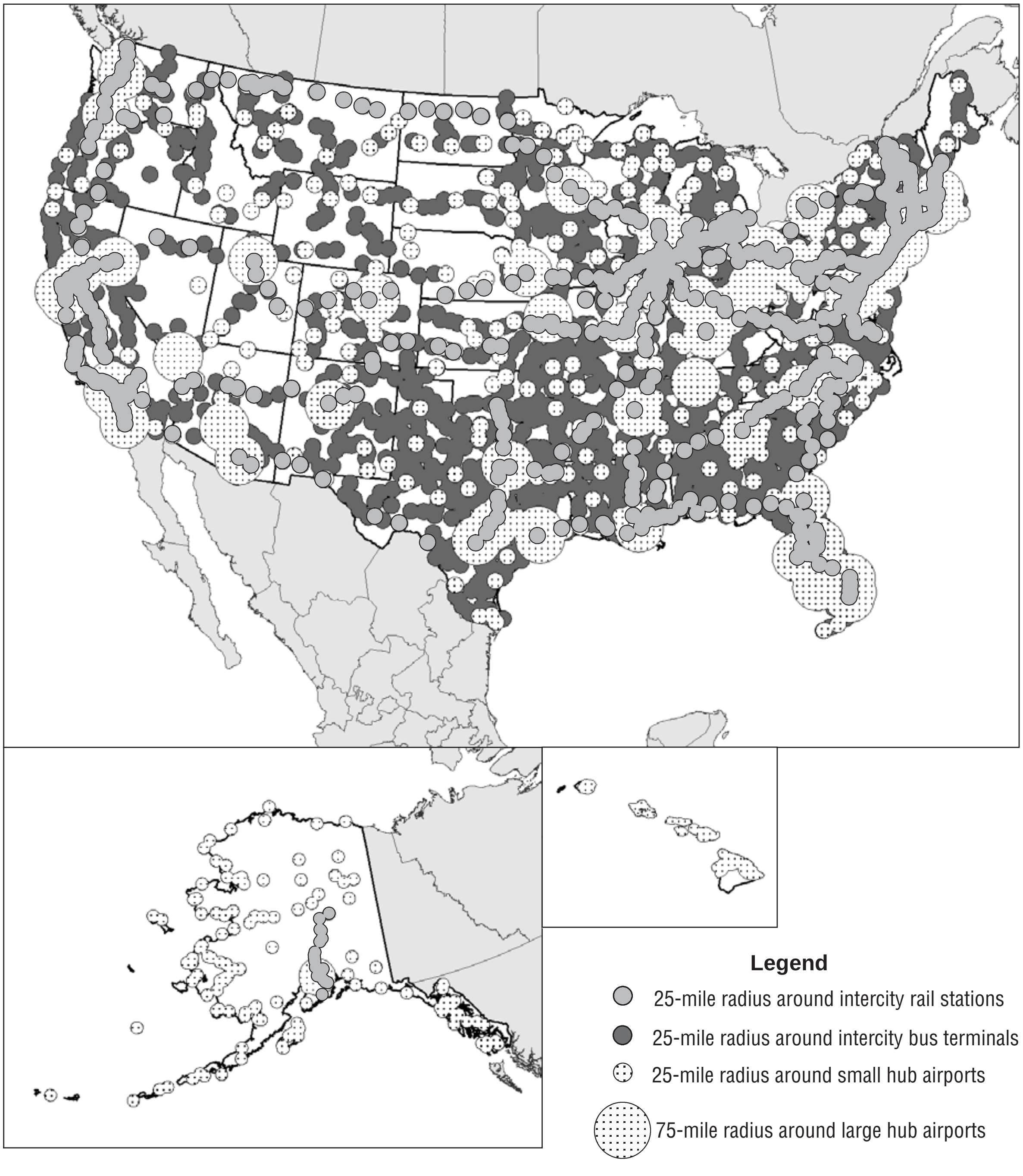
Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *Scheduled Intercity Transportation and the U.S. Rural Population,* available at http://www.bts.gov, as of October 2003.

[1] Rural residents are those who live outside of urbanized areas or urban clusters as defined by the U.S. Census Bureau.

[2] The term hub is used here within the context of individual airports rather than air traffic hubs, which can include more than one airport.

FIGURE 5-18   Areas Served by Intercity Passenger Transportation



SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Scheduled Intercity Transportation and the U.S. Rural Population,* available at http://www.bts.gov, as of October 2003.

Household Spending on Transportation

On average, households spent $7,825 (in chained 2000 dollars[1]) on transportation in 2002. This represented 19 percent of all household expenditures that year. Only housing cost households more (33 percent)[2] [1].

Over the last 10 years, consumer spending on private transportation (mainly motor vehicles and related expenses) increased (figure 6-1). On average, households spent $3,711 purchasing new and used motor vehicles in 2002, up 47 percent from $2,517 in 1992. Spending on other vehicle expenses, including insurance, financing charges, maintenance, and repairs, also increased from $1,712 to $2,370 (39 percent). Meanwhile, gasoline and oil expenditures rose 8 percent, to $1,366 in 2002. On average, households spent almost $400 on other transportation in 2002, an increase of 6 percent between 1992 and 2002.

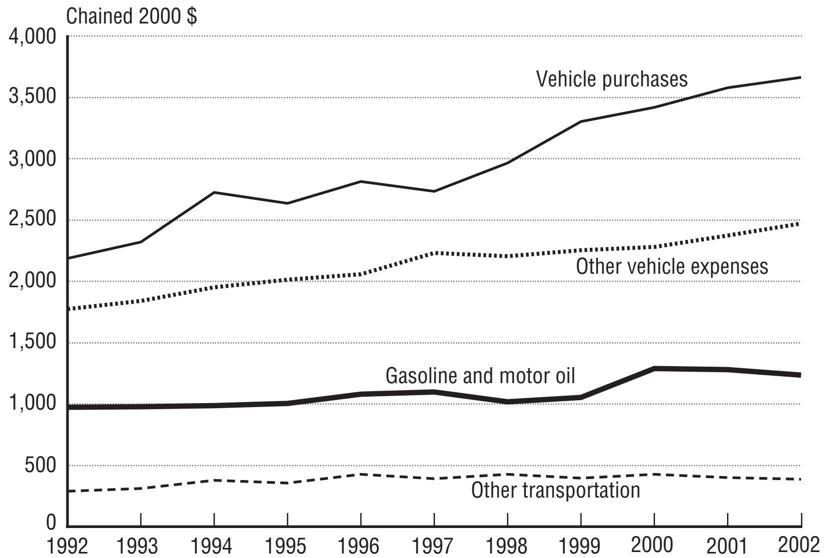
Source

1. U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Expenditure Survey*, available from http://www.bls.gov/cex/home.htm, as of March 2004.

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

[2] The Bureau of Labor Statistics (BLS) collects these data. In its survey, BLS uses the term *consumer units* instead of *households* and *public transportation* rather than *other transportation*. There are an average of 2.5 persons in each consumer unit, according to BLS (see the full definition on figure and table 6-1). Public transportation, according to BLS, includes both local transit, such as bus travel, and long-distance travel, such as airplane trips.

FIGURE 6-1 Average Household Transportation Expenditures: 1992–2002



NOTES: Data are based on survey results. The Bureau of Labor Statistics (BLS) uses the term consumer unit rather than household. BLS defines a consumer unit as 1) members of a household related by blood, marriage, adoption, or other legal arrangement; 2) a person living alone; sharing a household with others; rooming in a private home, lodging, or in permanent living quarters in a hotel or motel but who is financially independent; or 3) two or more persons living together and making joint expenditure decisions.

Other transportation includes both local transit (e.g., bus and taxi travel) and long-distance travel (e.g., airplane trips).

Current dollar amounts (see table 6-1b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Expenditure Survey* data query, January 2004.

Cost of Owning and Operating an Automobile

Driving an automobile 15,000 miles per year cost 51¢ per mile in 2002, or 13 percent more than it did in 1992, when total costs were 45¢ (figure 6-2). These data, which are expressed in 2000 chained dollars,[1] include fixed costs (e.g., depreciation, insurance, finance charges, and license fees) and variable costs (e.g., gasoline and oil, maintenance, and tires). Between 1992 and 2002, fixed costs represented an average of 75 percent of total per-mile costs. Gasoline and oil, a component of variable costs, represented 12 percent of driving costs per mile in 2002, down from 15 percent in 1992 [1].

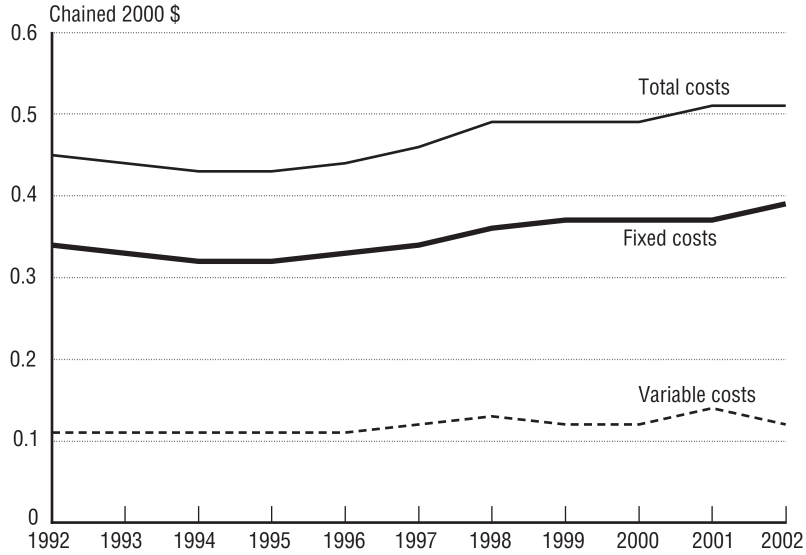
Americans take about 87 percent of their daily trips in highway vehicles, including their own automobiles [2]. For the other 13 percent of trips, people travel via public transportation or air, ride bicycles, walk, or travel by other means.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003,* table 3-14, available at http://www.bts.gov, as of March 2004.
2. U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, *Highlights of the 2001 National Household Travel Survey,* available at http://www.bts.gov, as of March 2004.

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

FIGURE 6-2 Average Cost per Mile of Owning and Operating an Automobile: 1992–2002



NOTES: Data are the cost per mile based on 15,000 miles per year. Current dollar amounts (see table 6-2b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on USDOT, BTS, *National Transportation Statistics 2003,* table 3-14, available at http://www.bts.gov, as of March 2004.

Cost of Intercity Trips by Train and Bus

Amtrak collected an average of 23¢ per revenue passenger-mile in 2002 (in chained 2000 dollars[1]), up 44 percent from 16¢ per revenue passenger-mile in 1993 (figure 6-3). During the 1990s, Amtrak shifted its focus to urban routes in the northeast and west. When Amtrak reduced its number of route-miles by 3 percent in 1995, revenue per passenger-mile increased by 7 percent the following year. When track operational length was further reduced by 7 percent in 1999, revenue per passenger-mile increased 10 percent the following year [1, 2].

Average intercity Class I bus fares rose 23 percent, from $23 to $28 (in chained 2000 dollars), between 1992 and 2002 (figure 6-4). The average bus fare is based on total intercity passenger revenues and the number of intercity bus passenger trips, as reported by carriers to the Bureau of Transportation Statistics. Since passenger-mile data are not reported, average bus fare per passenger-mile cannot be calculated and compared with similar Amtrak fare data.

Sources

1. Association of American Railroads, *Railroad Facts* (Washington, DC: 1994–2003 issues).
2. National Railroad Passenger Corp. (Amtrak), *Amtrak 2000 Annual Report, Statistical Appendix* (Washington, DC: 2001).

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

FIGURE 6-3 Average Amtrak Revenue per Revenue Passenger-Mile: 1993–2002

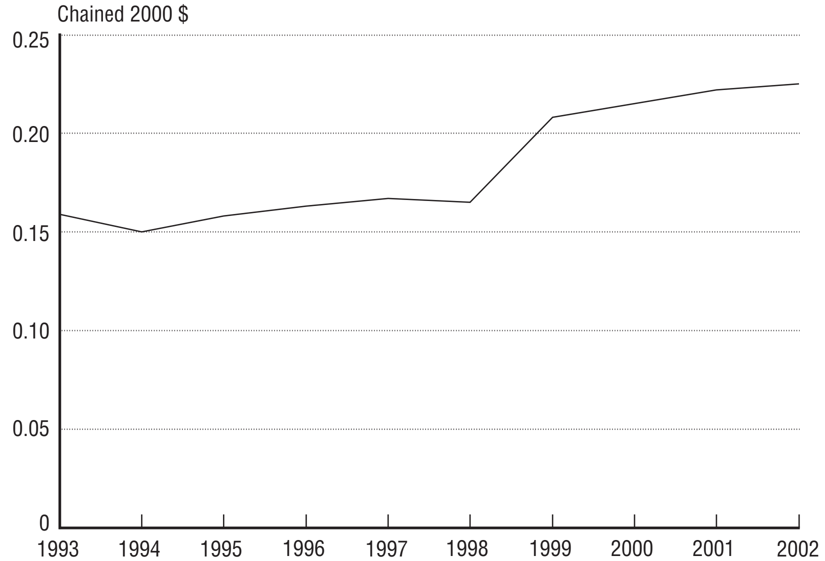
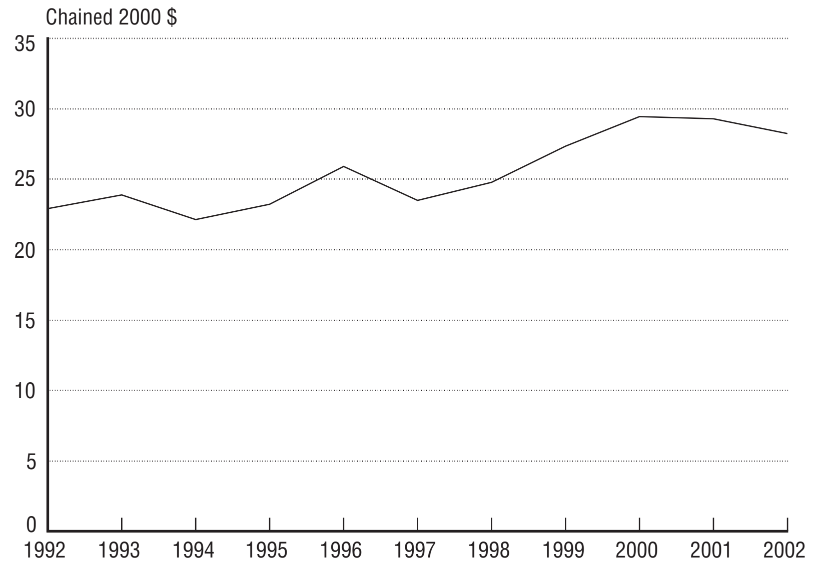


FIGURE 6-4 Average Class I Intercity Bus Fare: 1992–2002



NOTES: Amtrak data are not available prior to 1993. Current dollar amounts (see tables 6-3 and 6-4 in appendix B) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: Figure 6-3—Association of American Railroads, *Railroad Facts* (Washington, DC: 1994–2003 issues). **Figure 6-4—**U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2003,* table 3-15a and 3-15b, available at http://www.bts.gov, as of May 2004. **2002—**USDOT, BTS, personal communication, May 2004.

Average Transit Fares

Transit fares remained relatively stable between 1992 and 2002 (figure 6-5). Increases in fares per passenger-mile for some types of transit service were offset by lower fares per passenger-mile for other types.

Local transit bus service, which accounted for 58 percent of public transportation ridership (by number of unlinked passenger trips[1]) in 2002, cost the same (18¢ per passenger-mile) in 2002 as it did in 1992 (in chained 2000 dollars),[2] although it rose to 21¢ in 2000 (figure 6-6).

Demand-responsive transit[3] fares rose the most between 1992 and 2002: from 18¢ to 22¢ per passenger-mile or 20 percent. These fares were at their highest point (27¢), however, in 1995. All rail transit fares declined during this period: commuter rail, –7 percent; heavy rail, –13 percent; and light rail, –8 percent. Rail transit, the second-most heavily used component of transit, accounted for 39 percent of unlinked passenger trips in 2002, while demand responsive had less than 1 percent of the trips [1].

Source

1. U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends, Annual Reports,* available at http://www.ntdprogram.com, as of May 2004.

[1] See Transit Ridership in section 7, "Availability of Mass Transit," for a discussion of unlinked trips.

[2] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

[3] Demand-responsive transit operates on a nonfixed route and nonfixed schedule in response to calls from passengers or their agents to the transit operator or dispatcher.

FIGURE 6-5 Average Transit Fare per Passenger-Mile: 1992–2002

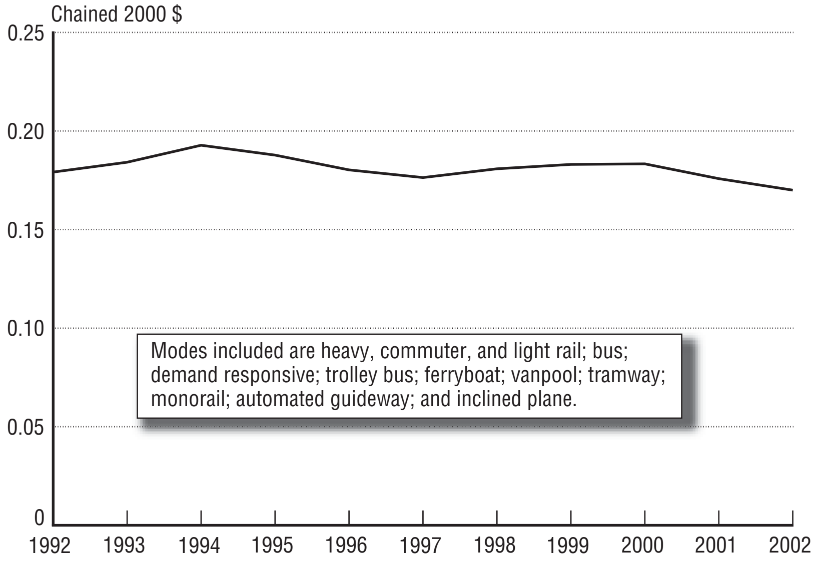
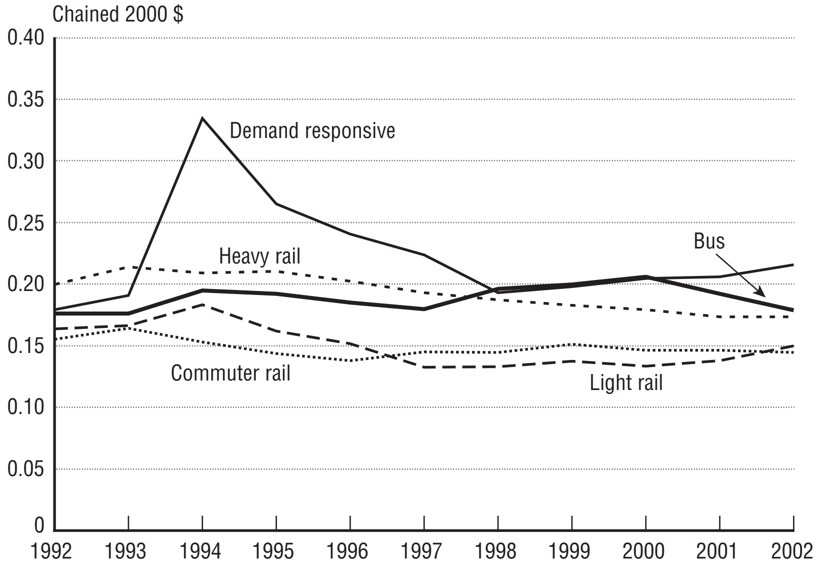


FIGURE 6-6 Average Transit Fare per Passenger-Mile by Selected Service Type: 1992–2002



NOTES: Data for 2002 are preliminary. Fares include subsidies. For definitions of service types, see Glossary.

Current dollar amounts (see table 6-5/6-6b in appendix B) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on American Public Transportation Association, *Public Transportation Fact Book 2004* (Washington, DC: 2004), tables 8 and 65, also available online at http://www.apta.com, as of May 2004.

Air Travel Price Index

Commercial airlines offer a variety of discount fares to fill their flights, but these special airfares, facilitated by Internet commerce and "frequent flyer" programs, complicate efforts to measure changes in the prices people pay for commercial air travel. To improve these measurements, the Bureau of Transportation Statistics (BTS) in consultation with the Bureau of Labor Statistics (BLS) developed an Air Travel Price Index (ATPI) (box 6-A).

ATPI research data can be used to compare changes in prices among many cities. In a comparison of three medium-size cities, for instance, a dip appears between 1995 and 1998 for flights originating in Colorado Springs, Colorado (figure 6-7). During this time, the discount carrier Western Pacific operated flights from Colorado Springs, and the figure shows the effect it had on bringing airfares down before it withdrew from the market. The ATPI can be used to compare prices for international travel as well. Third quarter spikes in a comparison of travel originating in Frankfurt, London, and Tokyo indicate that a high percentage of passengers traveling to the United States from these cities pay peak fares July through September (figure 6-8). These types of specific domestic and foreign points of origin comparisons are possible because of the sample size on which the index is based.

A comparison of the ATPI with the official BLS Airline Fare Index shows how they differ (figure 6-9). The BLS index covers only itineraries originating in the United States and is most comparable to the ATPI "U.S. Origin Only" series. However, these two indexes give different results. Between fourth quarter 1998 and the end of 2003, the "U.S. Origin Only" ATPI increased 7.3 percent, while the BLS index increased 12.4 percent. This difference is probably due mainly to the type of target formulas used,[1] and the survey's inclusion of special discount fares that involve differential pricing (e.g., frequent flier awards and Internet discounts) combined with consumers' increasing use of these discount tickets during this period. The "U.S. Orgin Only" ATPI also shows a sharper drop in the last two quarters of 2001—a more pronounced "9/11 effect"—than it does in the BLS index, which is the official U.S. Consumer Price Index. The ATPI covering all origins increased 7.3 percent between fourth quarter 1998 and the end of 2003. Decreasing fares for flights from foreign points of origin cause the "all origins" index to run below the BLS index for most of the years shown.

BOX 6-A
Air Travel Price Index (ATPI)

The BTS quarterly *Passenger Origin and Destination Survey* provides the data for the ATPI. Through this survey, BTS collects data on a 10 percent sample of airline itineraries. Each sample observation comprises a fare value (actual fare paid, including tax), a sequence of airports and carriers, and other details of an itinerary traveled by a passenger or group of passengers.

The ATPI data presented here were developed only for research purposes by BTS statisticians. This ongoing BTS research[1] aims to develop a new method of computing price indexes for air travel, based on transaction prices. The current official U.S. Consumer Price Index for commercial air travel is the Bureau of Labor Statistics (BLS) Airline Fare Index, but it does not reflect the full range of fares consumers pay.[2]

[1] For a description of the experimental index estimation methodology, see Lent and Dorfman, "A Transaction Price Index for Air Travel," 2003, available from BLS.

[2] A description of the BLS estimation method is available at http://www.bls.gov/cpi/cpifacaf.htm.

[1] Since the fourth quarter of 1998, BLS has based its index on the hybrid Jevons/Modified Laspeyres formula. In prior years, the BLS index was based on the Modified Laspeyes formula. The BTS ATPI is computed using the Fisher Index formula.

FIGURE 6-7 Air Travel Price Index by City of Origin for Three Medium-sized U.S. Cities: 1995–2003
(All classes of service combined)

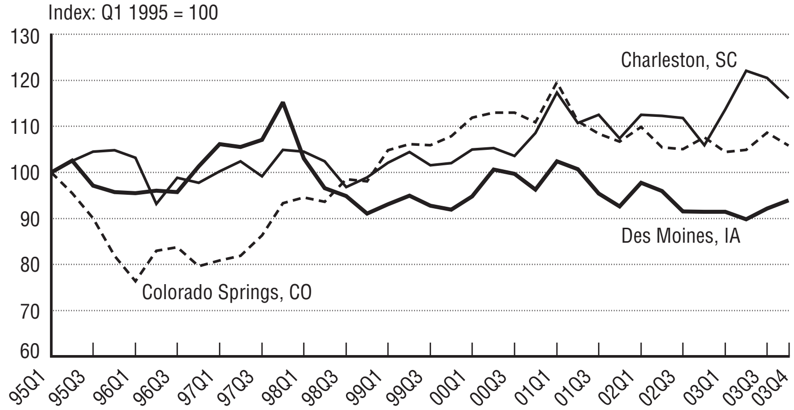


FIGURE 6-8 Air Travel Price Index by City of Origin for Three Large International Cities: 1995–2003
(All classes of service combined)

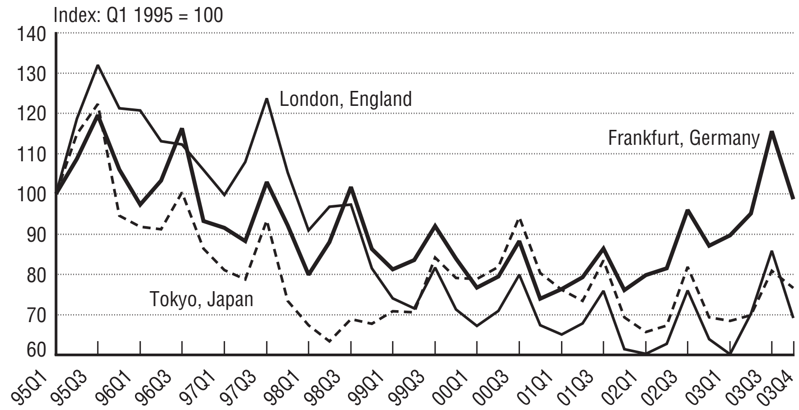
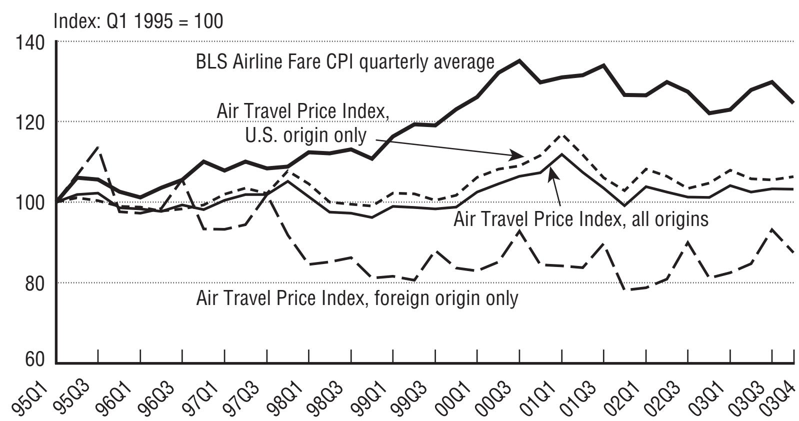


FIGURE 6-9 Comparison of Airfare Indexes: 1995–2003
(Not seasonally adjusted)



NOTES: These data were developed for research purposes only and are not official BTS data.

Air Travel Price Index values are computed using the Fisher Index formula, which differs from the formulas used to compute the Bureau of Labor Statistics (BLS) Airline Fare Consumer Price Index (CPI).

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS), calculations based on data from BTS's quarterly Passenger Origin and Destination Survey, October 2003 and June 2004. **Figure 6-9 (in addition to above)—**USDOL, BLS, Airline Fare Consumer Price Index, available at http://www.bls.gov/cpi/home.htm#data, as of March 2003 and June 2004.

Transit Passenger-Miles of Travel

Transit passenger-miles of travel (pmt) grew 24 percent between 1992 and 2002, from 37.2 billion pmt to 45.9 billion pmt. However, transit pmt declined 1.2 percent between 2001 and 2002, similar to the 2.5 percent decline that occurred between 1992 and 1993. As they have historically, buses maintained the largest pmt share in 2002 (43 percent) while generating 19.5 billion pmt (figure 7-1). Also in 2002, heavy rail pmt totaled 13.7 billion or 30 percent and commuter rail reached 9.5 billion pmt, for a 21 percent share.

Light rail and demand-responsive services[1] had only 3.1 percent and 1.4 percent, respectively, of transit pmt shares in 2002. However, pmt on these transit services more than doubled between 1992 and 2002 (figure 7-2). In comparison, bus pmt grew 12 percent between 1992 and 2002.

The top 30 transit authorities (ranked by unlinked passenger trips)[2] logged 35.2 billion passenger-miles in 2002 or 77 percent of all transit pmt that year. In 2002, people riding New York City Transit traveled 9.7 billion passenger-miles (or 28 percent of all passenger-miles out of the top 30 authorities) and the Chicago Transit Authority generated 1.8 billion pmt or 5 percent [1].

Source

1. U.S. Department of Transportation, Federal Transit Administration, National Transit Database, *2002 Transit Profiles,* available at http://www.ntdprogram.com, as of May 2004.

1 Demand-responsive transit operates on a nonfixed route and a nonfixed schedule in response to calls from passengers or their agents to the transit operator or dispatcher.

2 See the following pages for further discussion and data on unlinked passenger trips and trips by authorities.

FIGURE 7-1 Transit Passenger-Miles by Type of Service: 1992–2002

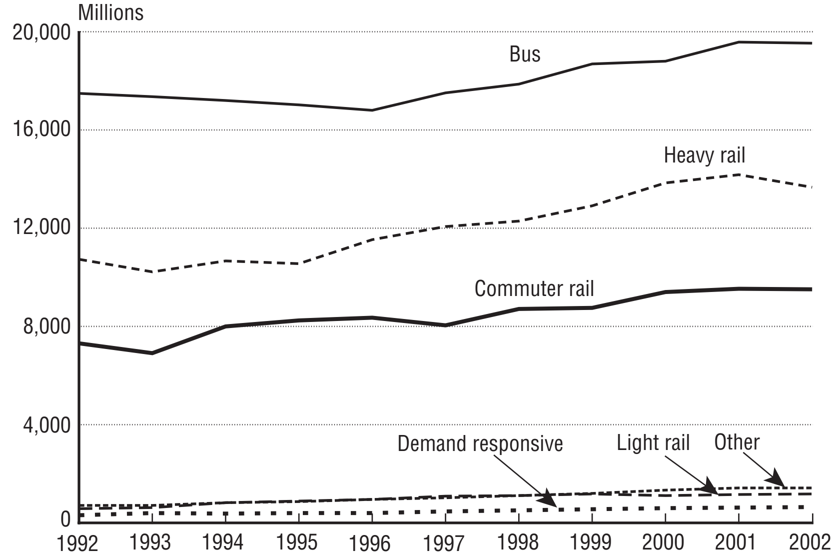
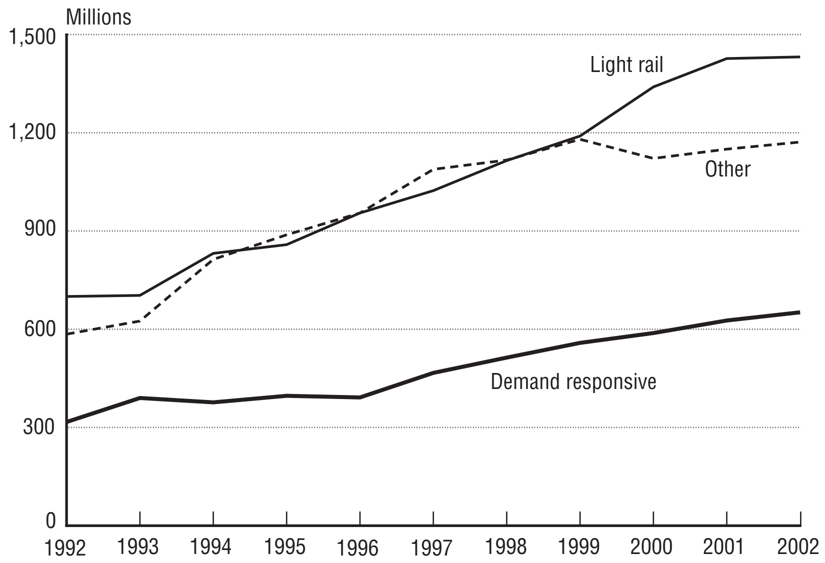


FIGURE 7-2 Detail of Transit Passenger-Miles by Type of Service: 1992–2002



NOTE: *Other* includes modes such as automated guideway, Alaska Railroad, cable car, ferryboat, inclined plane, monorail, trolleybus, and vanpool.

SOURCES: 1992–2001—U.S. Department of Transportation (USDOT), Federal Transit Administration (FTA), National Transit Database, *National Transit Summaries and Trends* (Washington, DC: Annual Issues). **2002—**USDOT, FTA, personal communication, June 2004.

Transit Ridership

Transit ridership has grown steadily since 1995, reaching 9.0 billion unlinked trips (box 7-A) in 2002, an increase of 20 percent (figure 7-3). Between 1992 and 1995, total transit ridership declined 3 percent, and transit ridership growth between 2001 and 2002 (less than 1 percent) was not as strong as it had been between 2000 and 2001 (3 percent) [1].

Among the various types of transit service, bus ridership comprised the majority of unlinked trips (5,268 million) in 2002, having grown 15 percent between 1995 and 2002. However, rail transit ridership, with 3,439 million trips in 2002, posted stronger growth over the period (31 percent). Among the rail components, heavy rail grew 32 percent; light rail, 35 percent; and commuter rail, 21 percent (figures 7-3 and 7-4). Heavy-rail ridership posted 2,688 million trips; commuter rail, 414 million trips; and light rail, 337 million trips in 2002. Other modes, such as ferryboats and demand responsive, posted a combined 311 million trips.

Source

1. U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends, Annual Reports,* available at http://www.ntdprogram.com, as of May 2004.

BOX 7-A
Linked and Unlinked Trips vs. Number of Passengers

Transit authorities reporting to the Federal Transit Administration (FTA) provide data on the number of passengers who board public transportation vehicles rather than the number of passengers they serve. Passenger boardings are called unlinked and linked passenger trips. Unlinked trips are total boardings on an individual vehicle. Linked trips refers to the total number of riders and measures the actual number of complete trips from origin to destination, including transfers. Unlinked trips are viewed as a measure of transit utilization (at the system, route, or subroute level), while linked trips are used to measure revenue passengers. The ratio of unlinked to linked trips indicates the relative usage of transfers in the transit system [2]. Determining the actual number of passengers using a transit system can be a difficult task because of the tracking requirements for the number of transfers from one vehicle or mode to the next, from one agency to another, and from the use of day passes and cash.

Because FTA does not have an official methodology for estimating the actual number of passengers that ride transit systems, individual transit agencies develop their own passenger counting and estimation methodology based on their resources and local attributes. Individual transit agencies may estimate the actual number of passengers based on a variety of methods and data-collection tools to help control for double counting, such as, automatic passenger counting units, on-board surveys, manual people counters, video camera tracking, and fare box analysis.

The American Public Transportation Association (APTA) made an estimate, based on an average weekday, of the actual number of passengers carried by member authorities in 2000. APTA concluded that the number of people using the national transit system is 45 percent of the number of total unlinked trips reported or 14 million people, based on an average of 32.9 million daily unlinked weekday trips. This estimate reflects the average travel patterns of approximately 50 percent of all transit riders who take 2 trips per day between home and employment and those dependent on transit who could take up to 10 trips per day [1].

Sources

1. American Public Transportation Association, *Public Transportation Fact Book 2003* (Washington, DC: February 2003).
2. Boyle, D.B., “Passenger Counting Technologies and Procedures,” *TCRP Synthesis of Transit Practice 29* (Washington, DC: Transportation Research Board, 1998).

FIGURE 7-3 Transit Ridership by Selected Type of Service: 1992–2002

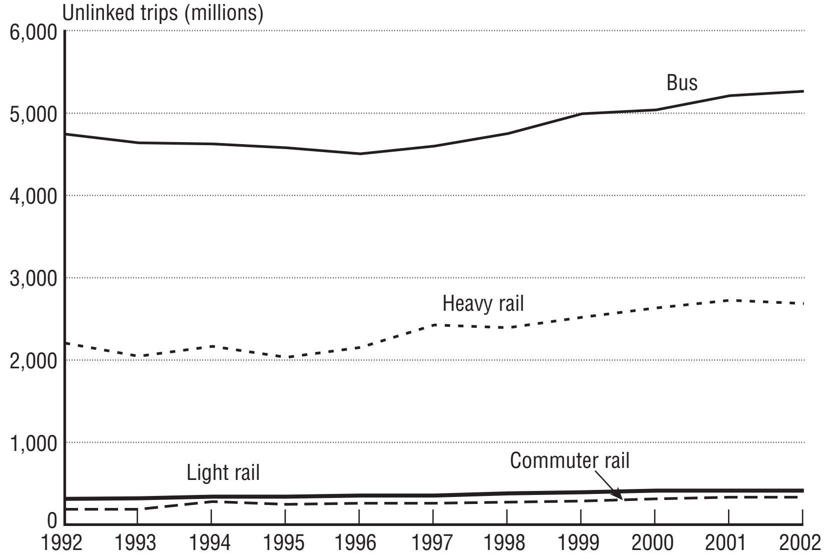
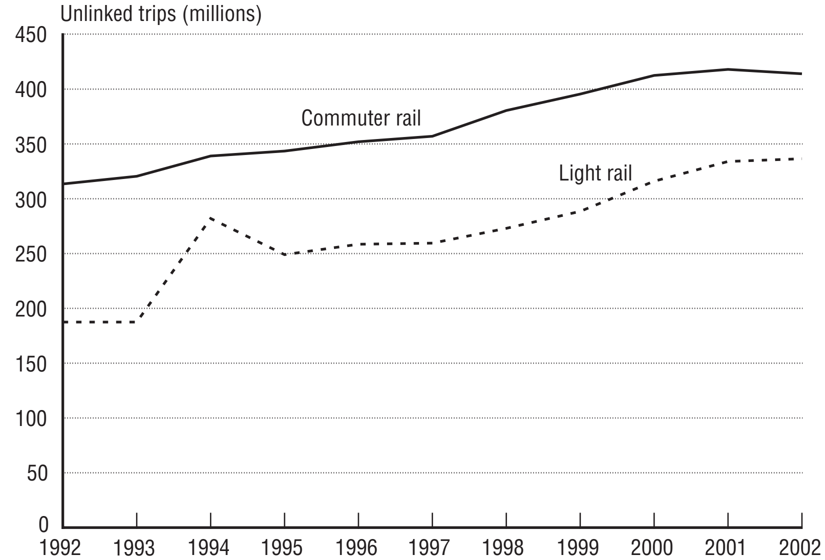


FIGURE 7-4 Detail of Commuter-Rail and Light-Rail Transit Ridership: 1992–2002



SOURCE: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends, Annual Reports,* available at http://www.ntdprogram.com, as of May 2004.

Transit Ridership by Transit Authority

Approximately 78 percent of all unlinked transit passenger trips in 2002 were made within the service area of just 30 transit authorities. These 30 top authorities logged 7.0 billion unlinked trips in 2002[1] (figure 7-5). New York City Transit alone reported 2.7 billion, or 30 percent, of all unlinked passenger trips. The Chicago Transit Authority followed with 485 million or 5 percent of all trips [2].

The top 30 transit authorities served a population of about 124 million in 2002 [2]. All transit authorities reporting to the National Transit Database determine their population-served data using definitions of bus and rail service in the Americans with Disabilities Act of 1990 and their own local criteria for other service such as ferryboat and vanpool. Some double counting of populations served occurs, especially among authorities operating in the largest metropolitan areas such as New York City, Los Angeles, Chicago, and San Francisco [2].

According to a Bureau of Transportation Statistics (BTS) survey,[2] an average of 71 percent of household respondents indicated they had public transportation available in their area [1].

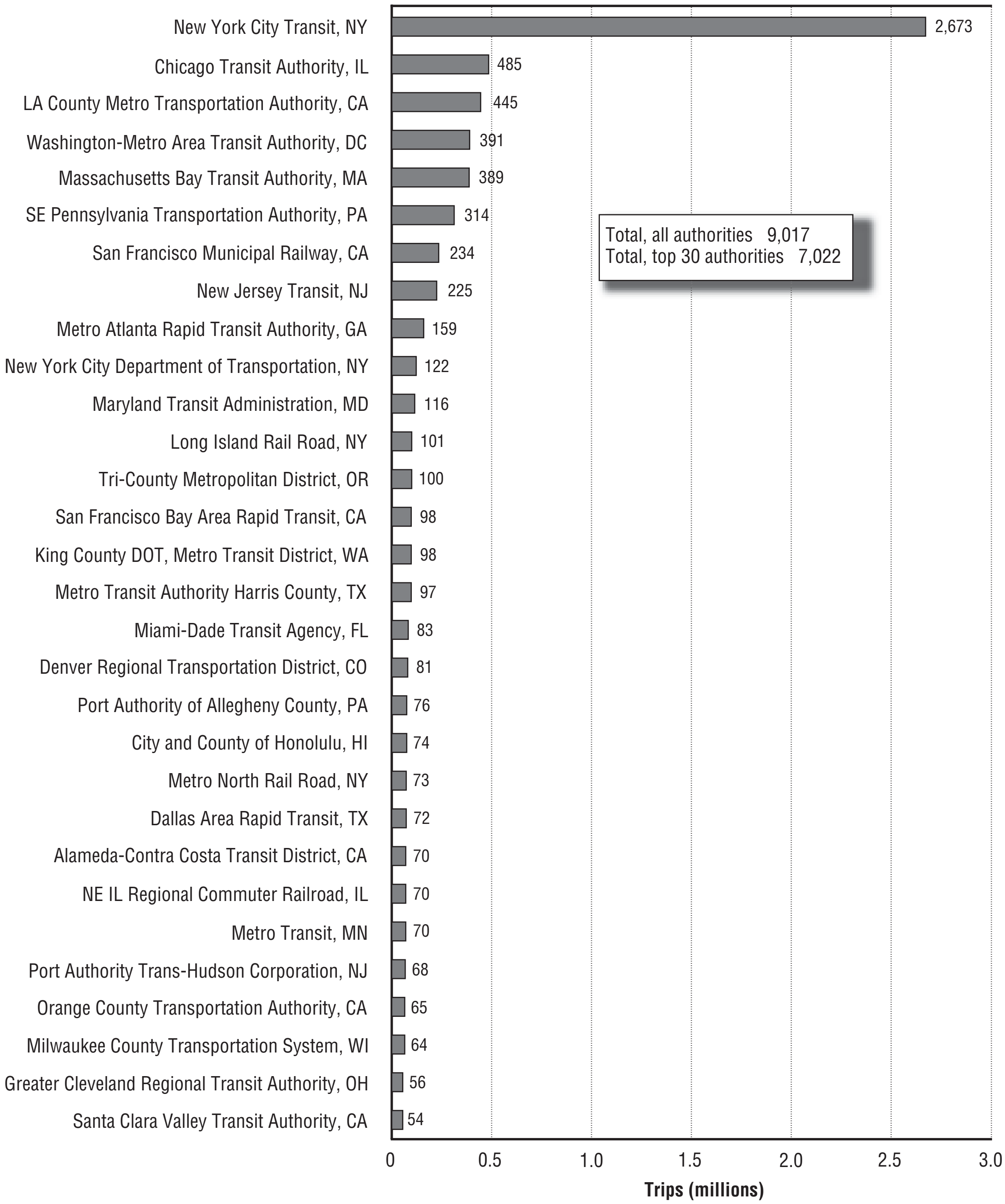
Sources

1. U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *Omnibus Survey, Summer 2002,* available at http://www.bts.gov, as of June 2003.
2. USDOT, BTS calculation based on data in USDOT, Federal Transit Administration, National Transit Database, available at http://www.ntdprogram.com/, as of May 2004.

[1] In 2002, 613 transit authorities submitted data to the Federal Transit Administration. However, due to reporting omissions, only 539 transit authorities are reflected in that year's database.

[2] In the summer of 2002, BTS's Omnibus Survey collected data on public transportation in June, July, and August.

FIGURE 7-5 Top 30 Transit Authorities by Unlinked Passenger Trips: 2002



NOTES: Tri-County is a municipal corporation of the State of Oregon.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database, available at http://www.ntdprogram.com, as of May 2004.

Lift- or Ramp-Equipped Buses and Rail Stations

The nationwide fleet of lift- or ramp-equipped transit buses increased to 94 percent (64,407 buses) in 2002 from 52 percent of the bus fleet (29,088 buses) in 1993 (figure 7-6). While compliance with the Americans with Disabilities Act (ADA) requirements (box 7-B) increased from 1993 to 2002, the rate differed among bus types and the gap between them narrowed (figure 7-7).

The small bus fleet had the highest level of compliance in 1993 (79 percent) and articulated buses the lowest (38 percent). By 2002, the small bus fleet continued to have the highest rate (99 percent, or 9,743 vehicles), followed by medium buses with 98 percent (8,550 vehicles). Meanwhile, large buses had the lowest level of compliance (92 percent, or 44,035 vehicles). Articulated bus compliance fell in the middle at 97 percent, or 2,079 vehicles.

Rail transit infrastructure consists of track and stations. In 2002, 53 percent (1,506) of stations were ADA accessible, serving automated guideway transit, cable cars, commuter rail, heavy rail, inclined plane, light rail, monorail, and the Alaska Railroad. In 2002, light-rail riders enjoyed 72 percent accessibility (458 stations), followed by commuter-rail riders with 55 percent accessibility (624 stations) and heavy-rail riders with 37 percent accessibility (366 stations) [1].

BOX 7-B
Transit Accessibility Under the ADA

While the Americans with Disabilities Act (ADA) of 1990 requires public transit services, under specific conditions, to be accessible to persons with special needs, it did not impose a statutory deadline for fleet accessibility. The ADA did require all key stations to be accessible by July 1993, but allowed the Federal Transit Administration to grant an extension up to July 2020 for stations requiring structural modifications to bring them into compliance [1].

The ADA was enacted in 1990; data have been collected since 1993.

Source

1. U.S. Department of Transportation, Federal Transit Administration, *FY 2002 Performance Plan* (Washington, DC: 2003), also available at http://www.fta.dot.gov/performfy2001/pg2.html, as of February 2003.

Source

1. U.S. Department of Transportation, Federal Transit Administration, National Transit Database 2002, available at http://www.ntdprogram.com, as of May 2004.

FIGURE 7-6 Share of Transit Buses that are Lift- or Ramp-Equipped: 1993–2002

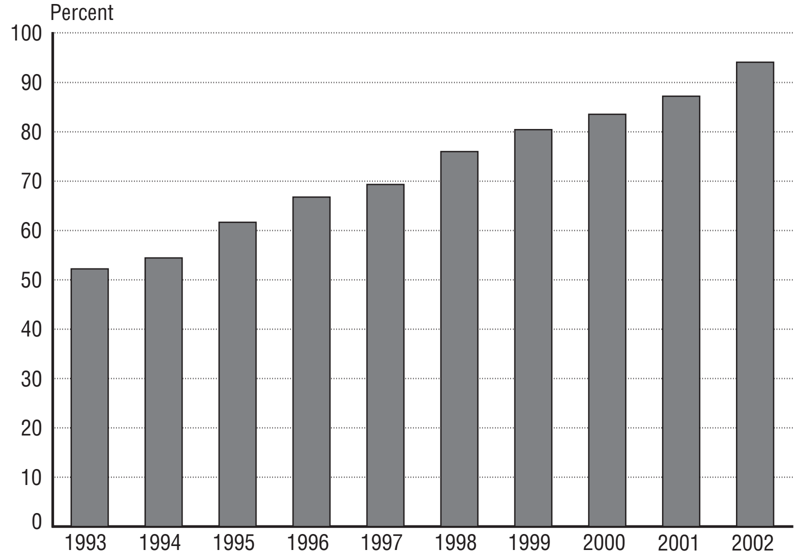
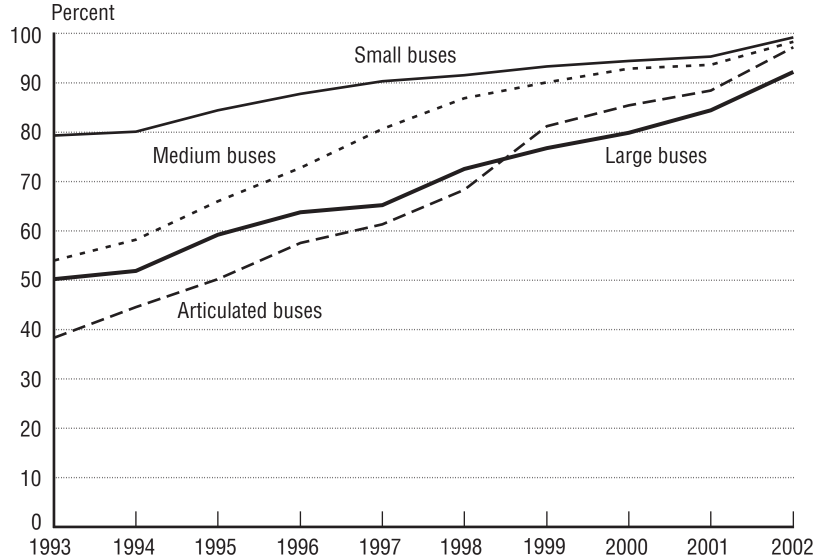


FIGURE 7-7 Share of Transit Buses that are Lift- or Ramp-Equipped by Bus Type: 1993–2002



SOURCE: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends, Annual Reports,* available at http://www.ntdprogram.com, as of May 2004.

Commercial Motor Vehicle Repairs

In the United States, there were over 662,000 active motor carriers—common, contract, or private—using buses or trucks to provide commercial transportation of passengers or freight in 2004 [2]. Trucking accounted for 28 percent of the nation's freight ton-miles in 2001 [1]. Repair data for most trucks are not public information.

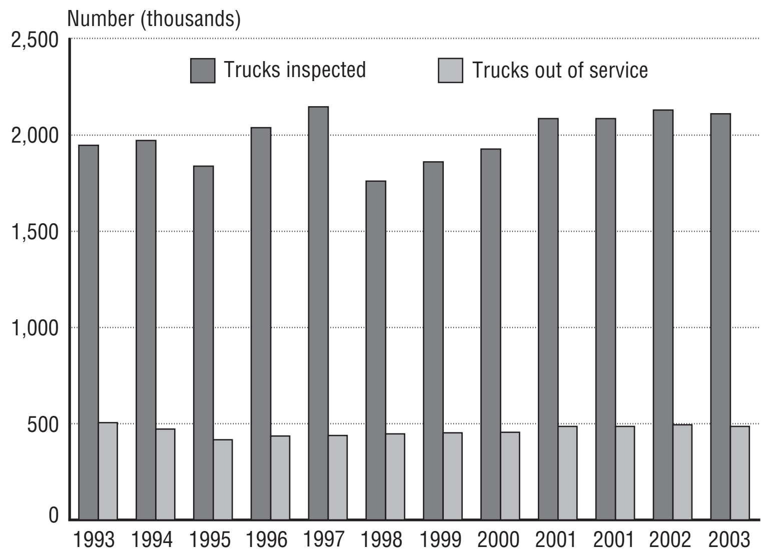
Over 2.1 million roadside truck inspections were completed in 2003, up from 1.9 million in 1993, to ensure that trucks are in compliance with federal safety regulations and standards (figure 8-1). Nearly one-quarter of those inspected in 2003 were taken out of service for repairs, 3 percent fewer than in 1993. Trucks are taken out of service when they receive a serious violation during the inspection process.

The downtime for a truck undergoing an inspection can vary from 30 to 60 minutes. Trucks that are placed out-of-service for repairs may be delayed from a few minutes to several days, depending on circumstances.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003*, table 1-44, available at http://www.bts.gov/, as of July 2004.
2. U.S. Department of Transportation, Federal Motor Carrier Safety Administration, *Commercial Motor Vehicle Facts,* available at http://www.fmcsa.dot.gov/factsfigs/cmvfacts.htm, as of July 2004.

FIGURE 8-1 Roadside Truck Inspections: 1993–2003



NOTES: Trucks are taken out of service (OOS) when inspectors find serious violations that warrant the issuance of a vehicle OOS order. There may be some inconsistencies across the 1993–2003 data. The Bureau of Transportation Statistics obtained the data at different times (see Sources) and was unable to verify the consistency of the entire data series prior to publication.

SOURCES: 1993–1998—U.S. Department of Transportation (USDOT), Federal Motor Carrier Safety Administration (FMCSA), Motor Carrier Management Information System, available at http://www.fmcsa.dot.gov, as of June 2003. **1999–2001—**USDOT, FMSCA, personal communication, Aug. 11, 2003. **2002–2003—**USDOT, FMCSA, personal communication, June 22, 2004.

Highway Maintenance and Repairs

Work zones on freeways cause an estimated 24 percent of the nonrecurring delays on freeways and principal arterials [1]. According to the Federal Highway Administration, the purpose of maintenance—which includes restoration, resurfacing, minor widening, and reconstruction—is to keep highways in usable condition not to extend service life. Pavement resurfacing represented just over half (51 percent) of the miles of federal-aid roads undergoing federally supported construction or maintenance in 2001 (figure 8-2), up from about 42 percent in 1997.[1]

The level of funding applied to highway maintenance is an indirect measure of the amount of maintenance activity and, thus, presence of work zones on highways. Although well-maintained roads are vital to a smoothly functioning transportation system, the maintenance activity may temporarily disrupt the flow of vehicles, causing traffic delays and congestion.

Funding for highway maintenance increased by 15 percent (in constant 1987 dollars)[2] between 1990 and 2001 (figure 8-3). The amount of funds disbursed by federal, state, and local governments for maintenance activities totaled $20.3 billion in 2001. This represented 24 percent of total disbursements for highways in 2001 [2].

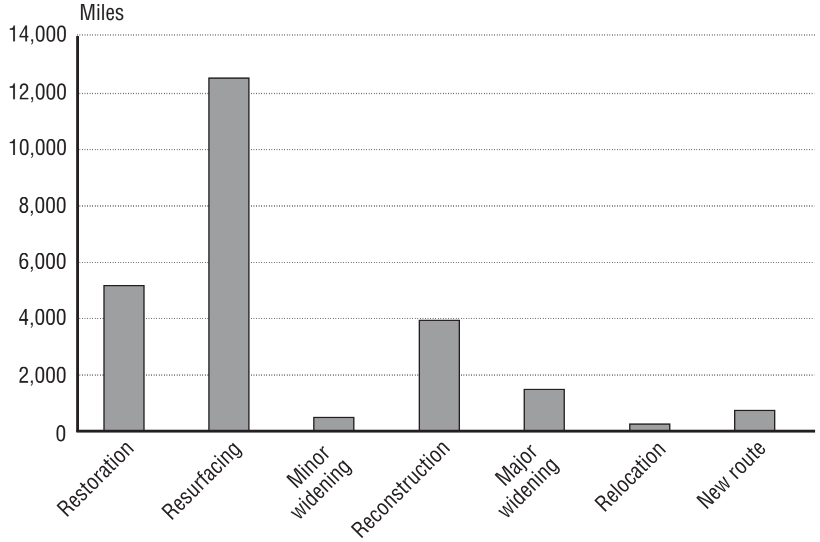
Sources

1. Chin, S.M., O. Franzese, D.L. Greene, H.L. Hwang, and R. Gibson. "Temporary Losses of Highway Capacity and Impacts on Performance," Oak Ridge National Laboratory, May 2002.
2. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), table HF-2, also available at http://www.fhwa.dot.gov/ohim, as of June 2003.

[1] 1997 is the earliest year for which these data are available.

[2] Instead of chained 2000 dollars, constant 1987 dollars are used here because the Federal Highway Administration publishes its data accordingly.

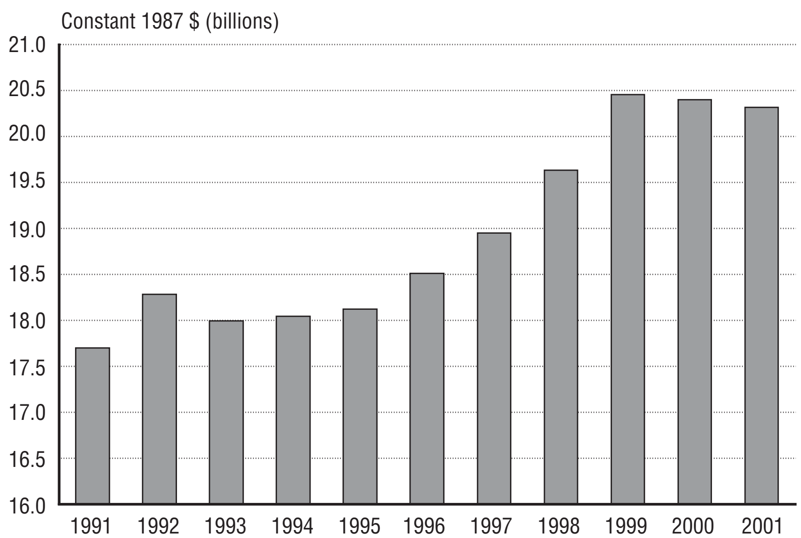
FIGURE 8-2 Federal-Aid Roadway Projects Underway by Improvement Type: 2001



NOTES: Maintenance includes any work required to keep highways in usable condition that does not extend the service life of the roadway beyond the original design. Restoration includes renovation. Although the following categories are not generally considered maintenance, they are included for comparison: major widening, relocation, and new route.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), "Miles of Federal-Aid Roadway Projects Underway by Improvement Type" chart, also available at http://www.fhwa.dot.gov/ohim, as of June 2003.

FIGURE 8-3 Federal, State, and Local Government Highway Maintenance Expenditures: 1991–2001



NOTE: Although dollar values in most other sections of this book have been converted to chained 2000 dollars, these data are presented in constant 1987 dollars. The Federal Highway Administration, which collects the data, adjusts current dollar data to constant 1987 dollars using an index it designed for that purpose.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2001* (Washington DC: 2002), "Highway Expenditures by Government Type, Current and Constant Dollars" chart, also available at http://www.fhwa.dot.gov/ohim, as of June 2003.

Rail Infrastructure and Equipment Repairs

Class I railroads[1] provide vital freight transportation services—carrying more than one-third of domestic freight ton-miles[2] each year [2]. These companies maintained 170,048 miles of track in 2002, down from 190,591 miles in 1992 [1]. Class I track mileage declined for many decades especially on lower density lines, in part because ownership and maintenance is expensive. As such, rail companies have focused more on replacing worn rails and crossties than on laying new track.

Between 1992 and 2002, rail companies replaced an average of 727,500 tons of rail each year (figure 8-4). The yearly replacements, which can vary substantially because of the long life of rails, ranged from a high of 875,000 tons in 1992 to a low of 636,000 tons in 2002. Using the most common rail weight (130 to 139 lbs per yard), it would take approximately 120 tons of rail to cover one mile [1].

There was some growth in the amount of new rails added to the Class I system in the late 1990s as firms increased capacity to handle growing amounts of coal traffic and reconfigured their systems as a result of mergers. Over 200,000 tons of new rail were added both in 1998 and 1999, up from 19,000 in 1990. By 2002, however, additions totaled only 125,200 tons.

Railroads also replace crossties periodically in order to ensure the integrity of their tracks. Between 1992 and 2002, railroads replaced an average of 12.0 million crossties each year (figure 8-5). The yearly replacements ranged from a high of 13.5 million crossties in 1992 to a low of 10.4 million in 1998. There was some growth in the number of new crossties added to the Class I system in the late 1990s as firms increased capacity or reconfigured their systems. In 1998, 1.8 million new crossties were added; but by 2002, the number of new crossties added declined to the level seen a decade earlier.

Railroads also periodically replace or rebuild locomotives and freight cars. On average, new and rebuilt locomotives made up 4 percent of Class I railroad fleets between 1992 and 2002 (figure 8-6). The number of locomotives that were new or rebuilt varied from a low of 3 percent in 1992 to a high of 7 percent in 1994. However, the number of both locomotives and freight cars built and rebuilt reached a peak in 1998. There were, for instance, 64,244 fewer new and rebuilt cars in 2002 compared with 1998.

Sources

1. Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003).
2. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2002), table 1-44, also available at http://www.bts.gov.

[1] Rail companies with annual operating revenues of $272.0 million or more in 2002.

[2] Ton-miles are calculated by multiplying the weight in tons of each shipment transported by the miles hauled.

FIGURE 8-4 Rail Replaced or Added by U.S. Class I Railroads: 1992–2002

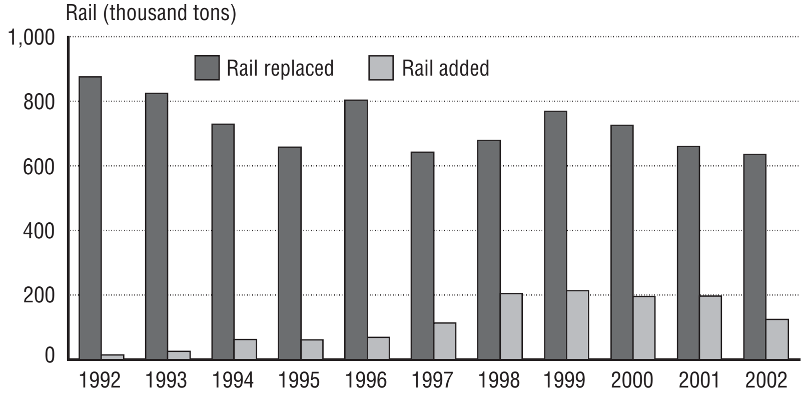


FIGURE 8-5 Crossties Replaced or Added by U.S. Class I Railroads: 1992–2002

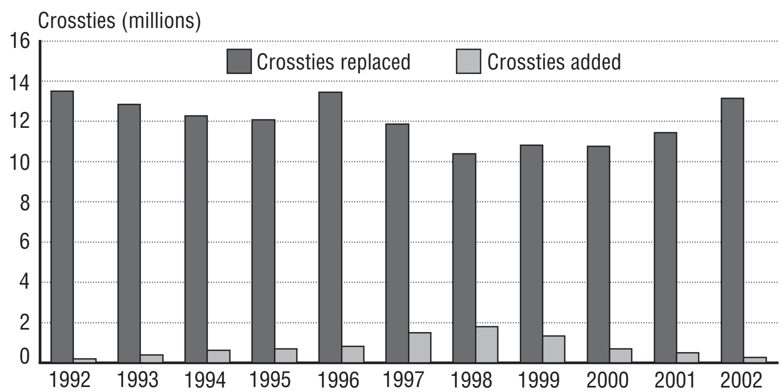
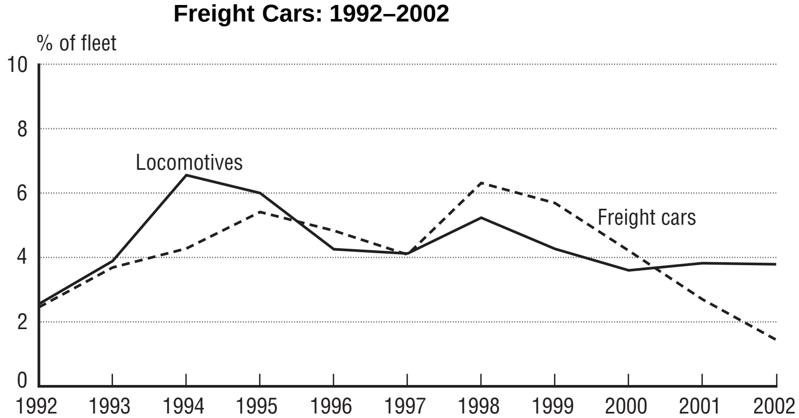


FIGURE 8-6 New and Rebuilt Locomotives and Freight Cars: 1992–2002



NOTE: Locomotive data are for Class I railroads only. Freight car data cover Class I railroads, other railroads, and private car owners.

SOURCES: Figures 8-4 and 8-5—Association of American Railroads, *Railroad Ten-Year Trends, 1990–2000* (Washington, DC: 2000); **2000–2002—**Association of American Railroads, *Analysis of Class I Railroads* (Washington, DC: 2001–2003). **Figure 8-6—**Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003).

Transit Vehicle Reliability

Transit service[1] interruptions due to mechanical failures remained relatively level from 1995 through 2000,[2] averaging between 18 and 19 mechanical problems per 100,000 revenue vehicle-miles [1, 2] (figure 8-7).

Among transit vehicles, buses and light rail had the highest rates of mechanical failure in 2000. Buses broke down an average of 28 times per 100,000 revenue vehicle-miles, while light-rail vehicles broke down 15 times per 100,000 revenue vehicle-miles. Light-rail vehicle breakdowns have changed the most since 1995. In that year, there were 32 mechanical failures per 100,000 revenue vehicle-miles. The rate of failure then dropped 56 percent to 14 per 100,000 revenue vehicle-miles by 1998.

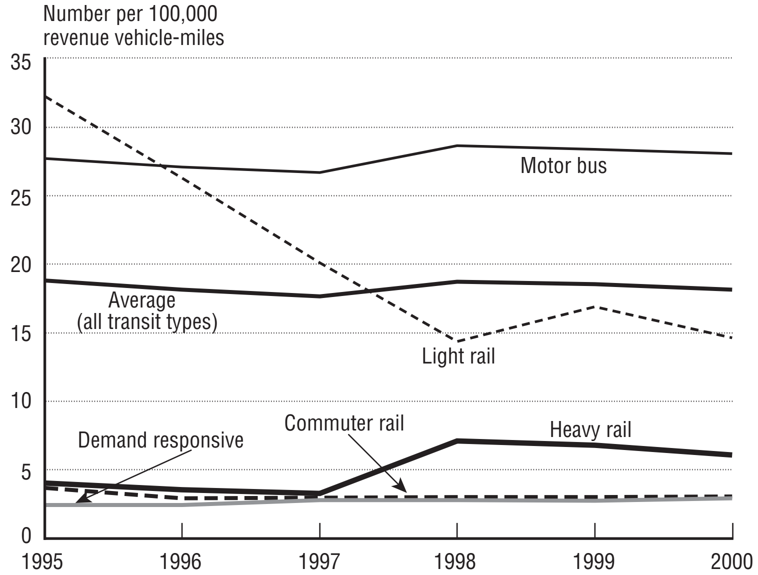
Sources

1. U.S. Department of Transportation, Federal Transit Administration, *National Summaries and Trends* (Washington, DC: Annual issues), also available at http://www.ntdprogram.com/, as of April 2003.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2002), table 1-32 and Transit Profile, also available at http://www.bts.gov/, as of April 2003.

[1] Here transit service includes light rail, commuter rail, heavy rail, and demand-responsive vehicles (see glossary for definitions).

[2] Data prior to 1995 and later than 2000 were collected using different definitions of what constitutes an interruption of service and are not comparable.

FIGURE 8-7 Interruptions of Service by Type of Transit: 1995–2000



NOTE: Interruptions of service include major and minor mechnical failures. If the vehicle operator was able to fix the problem and return the vehicle to service without assistance, the incident is not considered an interruption of service. For definitions of service types, see Glossary.

SOURCES: U.S. Department of Transportation, Federal Transit Administration, National Transit Library, *2001 Reporting Manual*, available at http://www.ntdprogram.com/, as of April 2003; and American Public Transportation Association, Maintenance data tables, available at http://www.apta.com/research/stats/maint/index.cfm, as of April 2003.

Lock Downtime on the Saint Lawrence Seaway

Locks along the Saint Lawrence Seaway (the Seaway) are usually closed between late December to late March because of ice. At other times of the year, shipping can be disrupted when locks are closed for other reasons.

Excluding the winter closure, the 2002 season for the two locks in the Seaway maintained and operated by the United States consisted of 276 days. The U.S. locks, located between Montreal and Lake Ontario, had 63 hours (just over 2½ days) of downtime during the 2002 season. Weather-related poor visibility, high winds, and ice caused 65 percent of all lock downtime; vessel incidents caused another 27 percent. Lock malfunctions caused only three hours of downtime during the 2002 season, 5 percent of the total.

Over the last decade, weather has been the primary cause of downtime (figure 8-8). Exceptions include 124½ hours of downtime in 1993 caused by water level/flow and 43 and 46 hours in 1998 and 1999, respectively, caused by vessel incidents. Although weather was responsible for the majority of downtime hours in 2001, vessel incidents that year accounted for 45 hours of downtime.

Lock downtime is not the only way Seaway shipping is impacted. For instance, in 2000 and 2001, water levels in the Great Lakes were at their lowest point in 35 years. During these reduced water level periods, some vessels could only carry approximately 90 percent of their normal shipment loads [1, 2].

During the 2002 navigation season, 30.0 million metric tons of cargo were transported through the Montreal-Lake Ontario section of the Seaway. Grain, iron ore, and other bulk commodities, as well as manufactured iron and steel, constitute the majority of shipments [3].

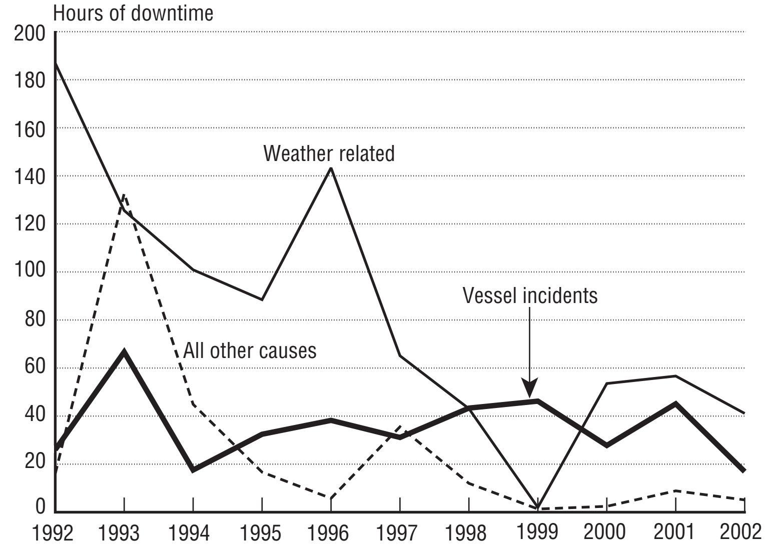
The Seaway is part of the Great Lakes Saint Lawrence Seaway System jointly operated by the United States and Canada.[1] The entire system encompasses the Saint Lawrence River, the five Great Lakes, and the waterways connecting the Great Lakes, and extends 2,340 miles—from the Gulf of the Saint Lawrence at the Atlantic Ocean in the east to Lake Superior in the west.

Sources

1. U.S. Department of Transportation, Saint Lawrence Seaway Development Corp., *Fiscal Year 2000 Annual Report: Great Lakes Seaway System Moves Forward Into the 21st Century,* available at http://www.greatlakes-seaway.com/en/pdf/fy2000ar.pdf, as of July 2004.
2. U.S. Department of Transportation, Saint Lawrence Seaway Development Corp., *Fiscal Year 2001 Annual Report: Linking North America's Heartland to the World,* available at http://www.greatlakes-seaway.com/en/pdf/fy2001ar.pdf, as of July 2004.
3. ______. *Fiscal Year 2002 Annual Report: Linking North America's Heartland to the World,* available at http://www.greatlakes-seaway.com/en/pdf/fy2002ar.pdf, as of July 2004.

[1] The U.S. Saint Lawrence Seaway Development Corp. operates and maintains the U.S. portion of the Saint Lawrence Seaway between the Port of Montreal and Lake Erie.

FIGURE 8-8 Saint Lawrence Seaway U.S. Locks Downtime by Cause: 1992–2002



NOTE: These data pertain only to the two U.S. locks (Snell and Eisenhower) on the Saint Lawrence Seaway between the Port of Montreal and Lake Ontario. Canada operates another five locks along this portion of the Seaway, as well as other Seaway locks.

SOURCE: U.S. Department of Transportation, Saint Lawrence Seaway Development Corporation (SLSDC), *Annual Reports* (Washington, DC: various years). Reports for years 1997–2001 available at http://www.greatlakes-seaway.com/en/aboutus/slsdc_annrept.html, as of March 2004. **2002—**SLSDC, personal communication, March 2004.

Intermittent Interruptions of Transportation Services

Natural disasters, accidents, labor disputes, terrorism, security breaches, and other incidents can result in major disruptions to the transportation system.[1] Although a comprehensive account of these unpredictable interruptions has not been undertaken nor data compiled on them, numerous studies and other analyses have sought to evaluate the effects of individual events on the transportation system.

In a 10-day shutdown of West Coast ports in fall 2002, members of the Pacific Maritime Association imposed a lockout in response to a perceived work slowdown by International Longshore and Warehouse Union workers. The port closure ended when the Bush Administration invoked the Taft-Hartley Act; management and the union subsequently ratified a six-year contract in January 2003. Over half of U.S. containerized merchandise trade, measured in 20-foot equivalent units (TEUs), passes through West Coast ports. With a sizeable share of this trade originating from or destined for states throughout the country, the shutdown of these ports negatively affected freight traffic nationwide. Shipments by retailers, manufacturers, automakers, and the agricultural sector were particularly impacted. Each year, imports through West Coast ports decline in late fall and resume early in the following year (figure 8-9). Because of this, the decline caused by the lockout is not readily apparent in overall containerized cargo data.

Vehicle accidents are a common cause of transportation delays. National estimates, based on model simulations, suggest that nearly 40 percent of nonrecurring delays on freeways and principal arterials are due to crashes. Weather, another unpredictable factor, accounts for 27 percent of highway delays. Relatively fewer delays resulted from road work zones (24 percent) and vehicle breakdowns (11 percent) [1]. Although motor vehicle accidents are, by far, the most frequent type of transportation accident, other modes also experience major disruptions due to accidents. A freight train carrying hazardous materials derailed in a Baltimore tunnel in 2001 [2]. The resulting fire lasted several days and forced the city to close some highways and rail passages. Freight and passengers were delayed as trains were diverted hundreds of miles throughout the mid-Atlantic region.

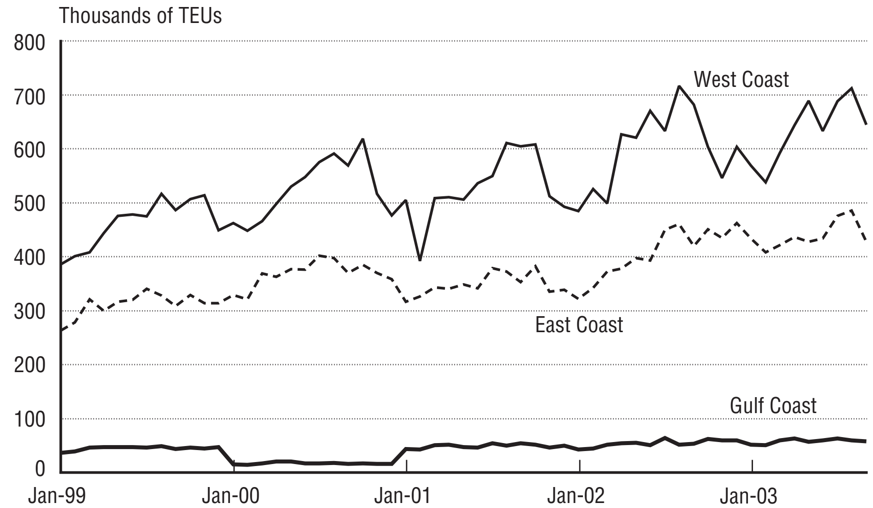
The United States, because of its size and varied geography, is vulnerable to many types of natural disasters that can affect transportation. The flooding of the Mississippi River in 1993 shut down large portions of the inland waterway system, washed out rail track, damaged rail bridges, and closed an estimated 250 highway segments and bridges [3]. The following year, the Northridge earthquake had a major impact on the Los Angeles metropolitan area transportation system. Measuring 6.8 on the Richter scale, the earthquake knocked out four freeways, caused the collapse of parking structures, and ruptured numerous natural gas distribution lines [4, 5]. The threat and aftermath of Hurricane Isabel in September 2003 caused the Washington (DC) Metropolitan Area Transit Authority to shut down its transit rail system for two days.

[1] For data on the impact of the Sept. 11, 2001, terrorist attacks on U.S. domestic flight operations that month, see U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Statistics Annual Report (October 2003)* (Washington, DC: 2003).

Sources

1. Chin, S.M., O. Franzese, D.L. Greene, H.L. Hwang, and R. Gibson, "Temporary Losses of Highway Capacity and Impacts on Performance," Oak Ridge National Laboratory, May 2002.
2. National Transportation Safety Board, "Update on July 18, 2001 CSXT Derailment in Baltimore Tunnel," press release, Dec. 4, 2002, available at http://www.ntsb.gov/Pressrel/prsrel02.htm, as of June 2004.
3. U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Statistics Annual Report 1994* (Washington, DC: 1994).
4. _____. *Transportation Statistics Annual Report 1995* (Washington, DC: 1995).
5. _____. *Journal of Transportation and Statistics: Special Issue on the Northridge Earthquake* 1(2), May 1998.

FIGURE 8-9 U.S. Containerized Imports by Major Port Regions: January 1999–September 2003



KEY: TEUs = 20-foot equivalent units.

NOTES: The reduction in Gulf Coast container traffic in 2000 was a result of the general economic downturn at the time. Because the data for this figure come from a private source, there is no corresponding table in appendix B.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, based on *Journal of Commerce,* Port Import/Export Reporting Services (PIERS), 1999–2003 data.

Transportation Fatality Rates

There were about 45,500 fatalities related to transportation in 2002—16 fatalities per 100,000 U.S. residents[1] [1, 2, 4]. This is the same rate as in 1992, when there were about 42,000 deaths. Approximately 94 percent of all transportation fatalities in 2002 were highway-related (figure 9-1). Most of these people who died were occupants of passenger cars or light trucks (including pickups, sport utility vehicles, and minivans). Air, rail, transit, water, and pipeline transportation result in comparatively few deaths per capita (see box 9-A). For instance, railroads contributed about 0.33 deaths per 100,000 residents in 2002.[2]

Overall, highway safety remained about the same between 1992 and 2002 when compared to the size of the population. There were around 15 fatalities per 100,000 residents each year over the entire period. Highway fatalities declined 15 percent for occupants of passenger cars, but increased 34 percent for occupants of light trucks between 1992 and 2002 (figure 9-2). (This is a period during which the number of registered light trucks increased from 57 million to 85 million [3].) Motorcyclist fatalities per 100,000 residents have been rising since 1997.

Similar trends in highway fatality rates are apparent when the rate is based on vehicle-miles traveled (vmt). Passenger car occupant fatalities per 100 million vmt declined 21 percent between 1992 and 2002, while light-truck occupant fatalities per 100 million vmt rose 10 percent (figure 9-3). Motorcyclist fatalities grew 36 percent during the period. However, after falling from 25 fatalities per 100 million vmt in 1992 to 21 fatalities per 100 million vmt in 1997, motorcyclist fatalities grew 62 percent by 2002.[3]

BOX 9-A
Fatality Data

Each transportation mode tends to define *fatality* differently and may generate its fatality data using different methods. Therefore, comparisons across modes should be viewed very carefully. For further information on modal fatality definitions, see the glossary section of this report.

Sources

1. U.S. Department of Commerce, U.S. Census Bureau, *Monthly Population Estimates for the United States,* available at http://eire.census.gov/popest/data/national/tables/NA-EST2003-01.php, as of January 2004.
2. U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics,* available at http://www.uscgboating.org, as of January 2004.
3. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995* and *Highway Statistics 2002* (Washington DC: 1997 and 2003), tables VM-201A and VM-1, also available at http://www.fhwa.dot.gov/policy/ohim/hs02/index.htm, as of January 2004.
4. U.S. Department of Transportation (USDOT), Federal Transit Administration, *National Transit Database, Safety and Security Newsletter,* Spring 2003, available at http://transit-safety.volpe.dot.gov/Data/NTDNewsletters/Default.asp, as of January 2004.

[1] This total fatality rate has not been adjusted to account for double counting across modes, because detailed data needed to do so were not available at the time this report was prepared. See table 9-1 for further information on double-counting impacts.

[2] This calculation includes fatalities occurring at highway-rail grade crossings.

[3] These motorcycle data are not shown in figure 9-3 but appear in table 9-3 in appendix B.

FIGURE 9-1 Transportation Fatality Rates by Mode: 2002

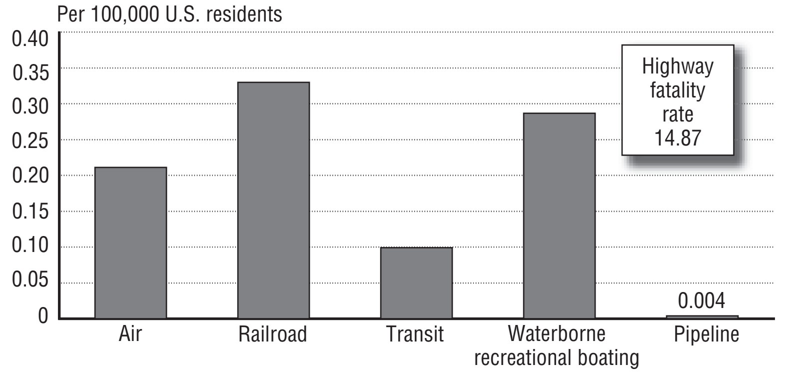


FIGURE 9-2 Highway Fatalities per 100,000 Residents for Selected Vehicle Types: 1992–2002

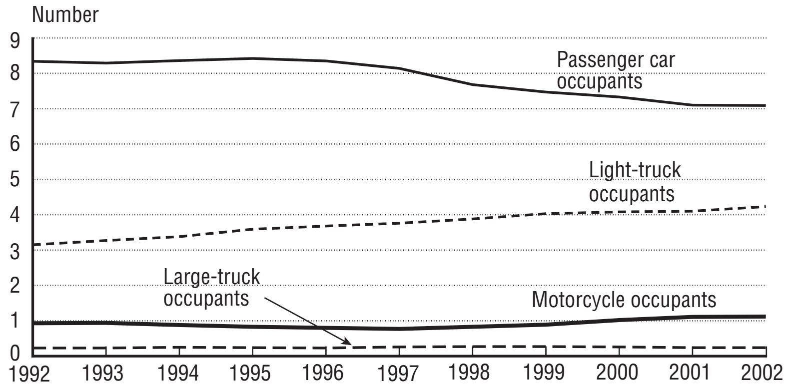
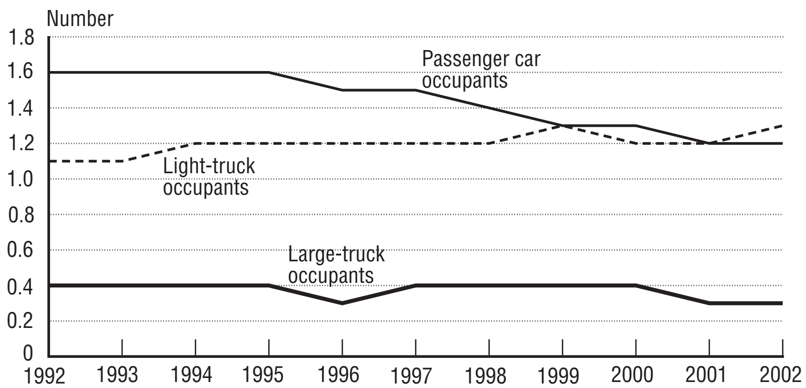


FIGURE 9-3 Highway Fatalities per 100 Million Vehicle-Miles for Selected Vehicle Types: 1992–2002



NOTES: Figure 9-1—See note on table 9-1 in appendix B regarding double counting. **Figures 9-2 and 9-3—**Large trucks are defined as trucks over 10,000 pounds gross vehicle weight rating (GVWR), including single-unit trucks and truck tractors. Light trucks are defined as trucks of 10,000 pounds GVWR or less, including pickup trucks, vans, truck-based station wagons, and sport utility vehicles.

SOURCES: Fatalities—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2002), table 2-1 revised, available at http://www.bts.gov/, as of January 2004. **Transit—**USDOT, Federal Transit Administration, National Transit Database, *Safety and Security Newsletter* (Washington, DC: Spring 2003) available at http://transit-safety.volpe.dot.gov/Data/NTDNewsletters/Default.asp, as of January 2004. **Vehicle-miles—**USDOT, Federal Highway Administration, *Highway Statisitics 2002* (Washington, DC: 2003), table VM-1. **Waterborne recreational boating—**U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: December 2003), available at http://www.uscgboating.org, as of January 2004. **Population—**U.S. Department of Commerce, U.S. Census Bureau, *Monthly Population Estimates for the United States,* available at http://eire.census.gov/popest/data/national/tables/NA-EST2003-01.php, as of January 2004.

Years of Potential Life Lost from Transportation Accidents

For people under 65 years of age, the Centers for Disease Control (CDC) has ranked transportation accidents as the third leading cause of death in the United States (after cancer and heart disease) each year from 1991 to 2000 [1]. During those years, an average of nearly 36,000 people under 65 died each year from transportation accidents.[1]

While transportation accidents amounted to 6 percent of the deaths of those under age 65 between 1991 and 2000, these fatalities represented 10 percent of the total years of potential life lost (YPLL) during this period (figure 9-4). YPLL, which is computed by adding up the remaining life expectancies of all victims (up to 65 years of age) at their deaths, is a measurement that accounts for the age distribution among different causes of injury mortality and other common causes of death (box 9-B). The difference between the percentage of deaths and YPLL indicates that people who die from transportation accidents tend to be younger on average than victims of other causes of death.

Motor vehicle crashes are the most frequent cause of transportation-related fatalities. YPLLs associated with deaths related to motor vehicle accidents can be compared with YPLLs for deaths from all other modes of transportation (figure 9-5). This shows that, over the 9 years, motor vehicle deaths also contributed to the bulk of YPLLs due to transportation accidents.

BOX 9-B
Data for Calculating Years of Potential Life Lost

Data used here come from a national mortality database compiled by the Centers for Disease Control's National Center for Health Statistics. Years of potential life lost (YPLL) are computed from this data by matching the ages of victims with the corresponding entries in the life expectancy tables. Remaining years of life expectancy from the age of death to 65 years are counted toward YPLL. Victims 65 years and older are not included. YPLL data for 1982 through 2000 are available online through the Web-Based Injury Statistics Query and Reporting System (WISQARS).

Source

Centers for Disease Control, National Center for Injury Prevention and Control, Web-Based Injury Statistics Query and Reporting System (WISQARS), available at http://www.cdc.gov/ncipc/wisqars/, as of May 2004.

Source

1. U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, *National Vital Statistics Reports: Deaths,* 1991–2000 issues, available at http://www.cdc.gov/nchs/products.htm, as of March 2003.

[1] Because of methodological differences, fatality data from the CDC differ from those collected by the individual modal administrations.

FIGURE 9-4 Deaths and Years of Potential Life Lost Due to Transportation Accidents: 1991–2000

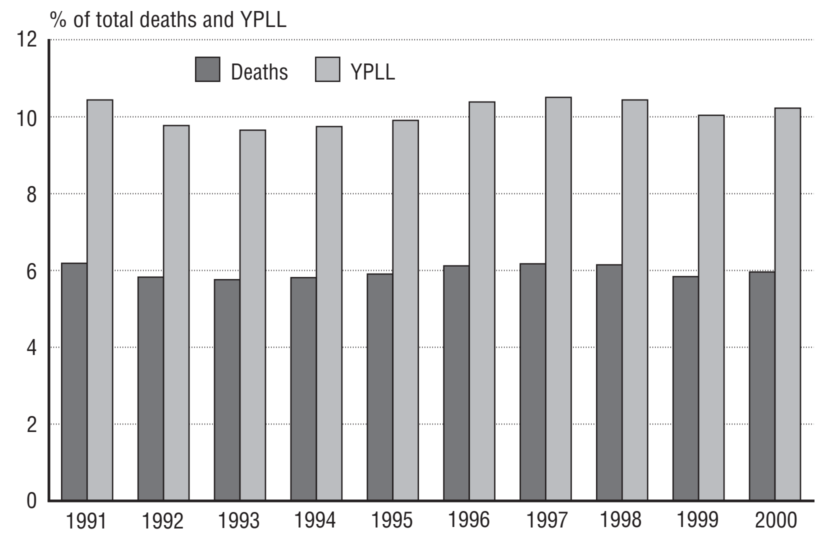
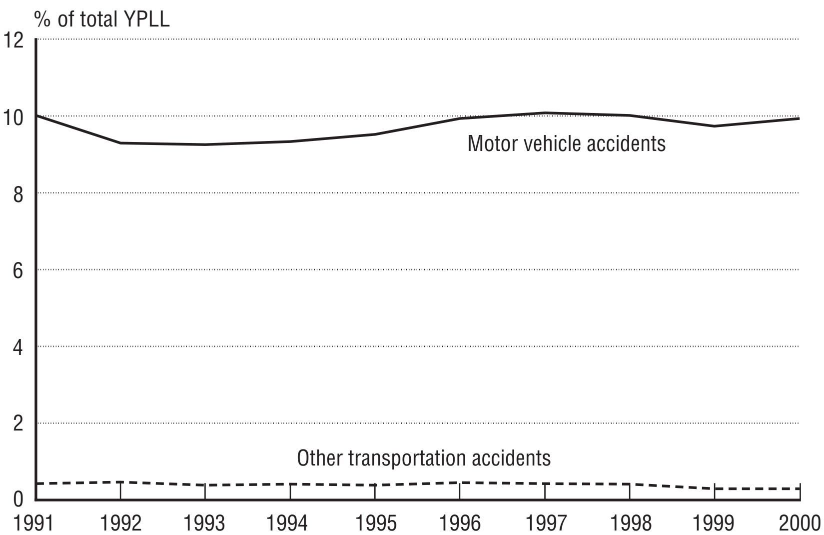


FIGURE 9-5 Years of Potential Life Lost Due to Motor Vehicle and Other Transportation Accidents: 1991–2000



NOTE: Years of potential life lost (YPLL) is the difference between the age of death and 65 years of age. Fatalities of people 65 years old and older are not included in this calculation.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Injury Prevention and Control, Web-Based Injury Statistics Query and Reporting System (WISQARS), available at http://www.cdc.gov/ncipc/wisqars/, as of February 2003.

Transportation Injury Rates

Each year a far larger number of people are injured than killed in transportation-related accidents. An estimated 3.0 million[1] people suffered some kind of injury involving passenger and freight transportation in 2002 (box 9-C). Most of these injuries, about 98 percent, resulted from highway crashes[2] [1, 2].

Highway injury rates vary by the type of vehicle used (figure 9-6). In 2002, 69 passenger car occupants were injured per 100 million passenger-miles of travel (pmt) compared with 51 light truck occupants. Occupants of large trucks and buses are less likely to sustain an injury per mile of travel. Motorcycle riders are, by far, the most likely to get hurt.

Injury rates for most modes declined between 1992 and 2002.[3] However, rates for light truck occupants rose 13 percent, from 45 per 100 million pmt in 1992 to 51 per 100 million pmt in 2002 (figure 9-7). Motorcycling became safer per mile ridden until 1999, but since then, the injury rate increased from 429 per 100 million pmt to 555 per 100 million pmt by 2002. Bus injuries per 100 million pmt have fluctuated.

BOX 9-C
Injury Data

Each transportation mode tends to define *injury* differently. In addition, each mode may generate its injury data using different methods. Therefore, comparisons across modes should be viewed very carefully. For further information on modal injury definitions, see the glossary section of this report.

In the following pages, another source of highway injury data—the National Electronic Injury Surveillance System operated by the U.S. Consumer Product Safety Commission—results in yet another set of highway injury data that differs from modal data presented here.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 2-2 revised, available at http://www.bts.gov/, as of January 2004.
2. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2002* (Washington DC: 2003), table VM-1, also available at http://www.fhwa.dot.gov/policy/ohim/hs02/index.htm, as of March 2004.

[1] Some of the data included in this number are preliminary.

[2] There is the potential for some double counting involving highway-rail grade crossing and transit bus data.

[3] These calculations exclude bicycling, walking, and boating (including recreational boating), because there are no national annual trend data estimates of pmt for these modes of transportation.

FIGURE 9-6 Injury Rates for Occupants of Highway Vehicles and Motorcycles: 2002

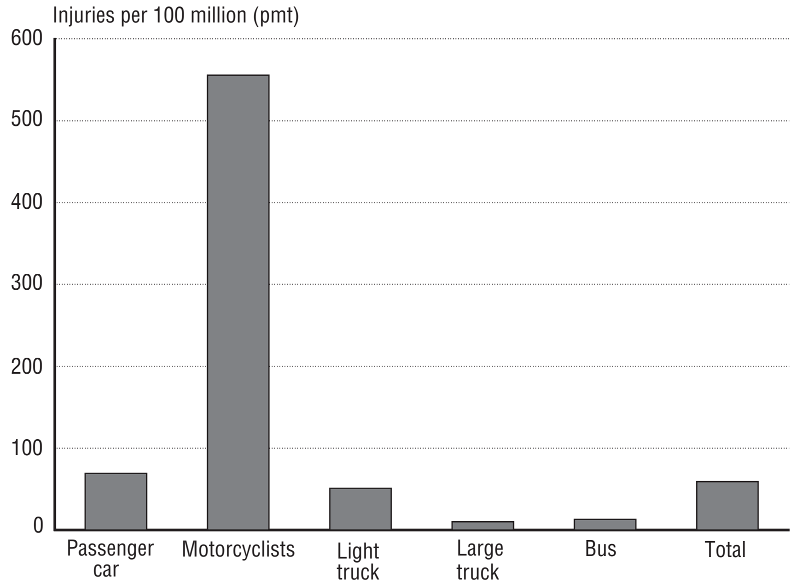
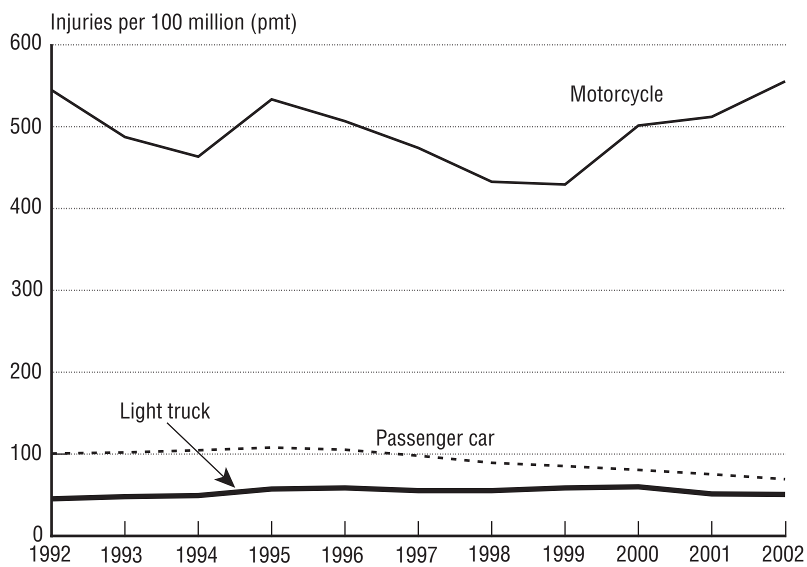


FIGURE 9-7 Injury Rates for Occupants of Selected Highway Vehicles and Motorcycles: 1992–2002



NOTE: Some of the data used to calculate 2002 injury rates are preliminary. **Figure 9-7—** Bus and large truck occupant injury rates, 1992–2002, are included on table 9-7.

SOURCES: Injuries—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 2-2 revised, available at http://www.bts.gov/, as of January 2004.
Passenger-miles of travel (pmt)—USDOT, Federal Highway Administration, *Highway Statistics 2002* (Washington, DC: 2003), table VM-1, also available at http://www.fhwa.dot.gov/policy/ohim/hs02/index.htm, as of March 2004.

Motor Vehicle-Related Injuries

There were an estimated 3.6 million motor vehicle-related injuries in the United States in 2002, according to data reported to the U.S. Consumer Product Safety Commission (CPSC)[1] (box 9-D) [1]. An estimated 3.3 million of these injuries involved motor vehicle occupants. The rest involved about 130,000 pedestrians, 114,000 motorcyclists, and 59,000 pedalcyclists.

More females than males were treated for minor injuries in 2002 across most age groups (figure 9-8). The 20 to 24 age group sustained almost 480,000 minor motor vehicle-related injuries. For serious injuries, more males than females were treated across all age groups up to about 65 years (figure 9-9). Again, serious injuries spiked at ages 20 to 24, but male injuries spiked substantially higher. This age group incurred over 35,000 serious injuries in 2002, 64 percent of which happened to males.

In summary, there were sharp peaks in injuries associated with youth: for motor vehicle occupants and motorcyclists, the peak spanned ages 15 to 24; for pedalcyclists and pedestrians, the peak spanned ages 10 to 14. Young males exhibited a substantially greater peak in serious injuries than young females. In addition, the percentage of injuries classified as serious was greater for motorcyclists (21 percent of all motorcyclist injuries were serious), pedestrians (19 percent), and pedalcyclists (13 percent) than it was for motor vehicle occupants (7 percent) (figure 9-10).

This analysis comes from a Bureau of Transportation Statistics (BTS) comprehensive study using 2002 data from the CPSC's National Electronic Injury Surveillance System. Only a small portion of the BTS study is presented here. The study included data on motor vehicle occupants, motorcyclists, pedalcyclists, and pedestrians injured on or near public roads,[2] but only for injuries involving collisions with moving motor vehicles.[3]

BOX 9-D
National Electronic Injury Surveillance System (NEISS) Injury Data

Use of NEISS data from the U.S. Consumer Product Safety Commission (CPSC) enables analyses of injuries by factors such as age and gender, type of vehicle, and severity of injuries sustained. NEISS data are a probability sample of reports from hospital emergency rooms in the United States and territories open 24 hours a day with at least 6 beds. Each hospital has a computer linked to CPSC headquarters. Staff consistently computer code information in emergency room medical reports, which allows injuries to be analyzed and compared within and across transportation modes and over time. Physicians diagnose injuries, specify injured body part(s), determine disposition, and give other detailed medical information. NEISS data cannot estimate injuries treated at sites other than hospital emergency rooms (e.g., HMOs, physician's offices, and onsite medical facilities) and do not include investigative information aside from emergency room medical reports.

Source

1. U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System (NEISS), information available at http://www.cpsc.gov/Neiss/oracle.html, as of June 2003.

[1] Because of methodological and other differences, motor vehicle-related injury data from CPSC differ from those estimated by the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation. For 2002, NHTSA reported an estimated 3.0 million highway injuries.

[2] This includes injuries involving traffic on public roads and in driveways and parking lots, and at other locations near, but not on, public roads.

[3] This excludes occupants injured when entering or exiting parked vehicles, pedalcyclists injured by parked cars or other fixed objects, and pedestrians struck by pedalcyclists or off-road vehicles.

FIGURE 9-8 Minor Motor Vehicle-Related Injuries by Age and Gender: 2002

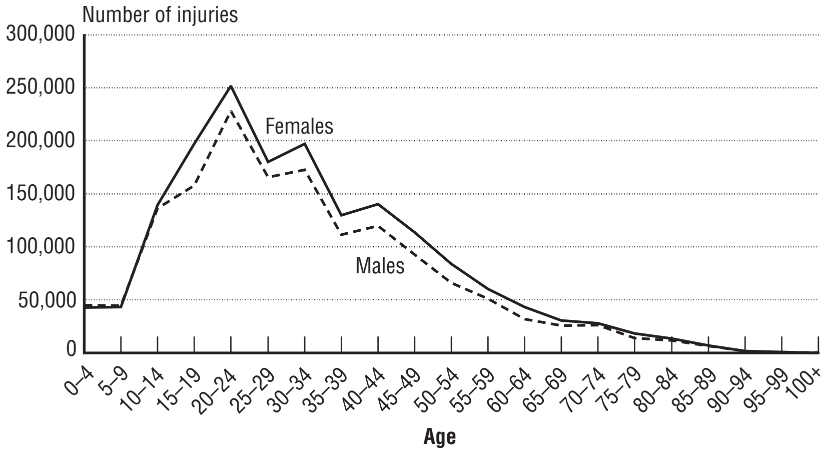


FIGURE 9-9 Serious Motor Vehicle-Related Injuries by Age and Gender: 2002

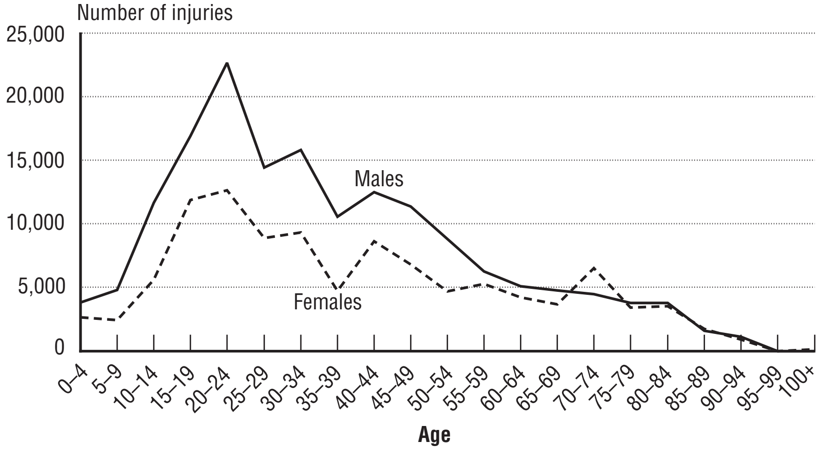
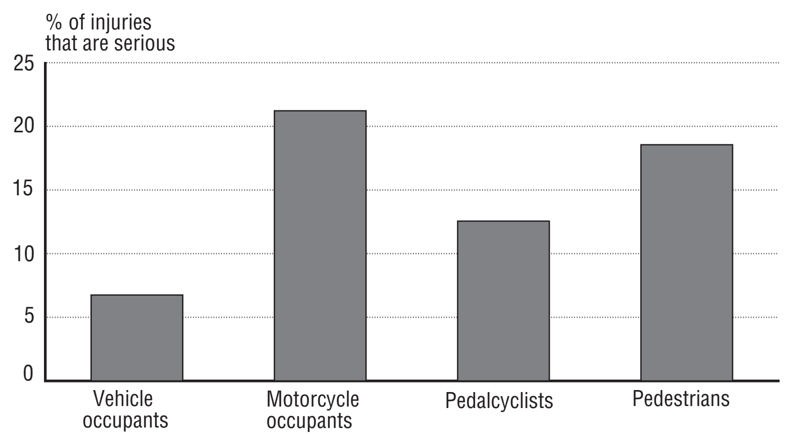


FIGURE 9-10 Serious Motor Vehicle-Related Injuries by Type: 2002



NOTES: A *minor injury* is one in which the victim was treated and released. A *serious injury* is one in which the victim was either hospitalized or treated and transferred to another facility, dead on arrival, or died in the emergency room. A *pedalcyclist* is a person on a vehicle that is powered solely by pedals.

Figures 9-8 and 9-9—Injuries for which age was unknown or not recorded in the original data are not included. See corresponding tables for further details.

Figure 9-10— Data are the share of injuries that were serious for one person type (e.g., the share of seriously injured pedestrians of all injured pedestrians).

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System (NEISS), October 2003.

Economic Costs of Motor Vehicle Crashes

Motor vehicle crashes in the United States cost an estimated $231 billion[1] in 2000, about $820 per person or 2 percent of the Gross Domestic Product[2] [1]. The largest components of the total cost (26 percent each) are market productivity—the cost of foregone paid labor due to death and disability—and property damage (figure 9-11). Household productivity—the cost of foregone household (unpaid) labor—accounted for 9 percent of the total cost. Workplace cost (2 percent) is the disruption due to the loss or absence of an employee such that it requires training a new employee, overtime to accomplish the work of the injured employee, and administrative costs to process personnel changes.

Alcohol-involved crashes cost $50.9 billion or 22 percent of the total costs. Costs related to speeding were estimated to be $40.4 billion, 18 percent of the total. The failure of drivers and passengers to wear safety belts cost an estimated $26 billion, but the use of safety belts saved $50 billion [1].

Ultimately, all people pay for the cost of motor vehicle crashes through insurance premiums, taxes, out-of-pocket expenses, and the like. About one-quarter of the cost of crashes is paid directly by those involved, while society in general pays the rest (figure 9-12). Insurance companies, funded by all insured drivers whether they are involved in a crash or not, paid about half the cost in 2000, while government paid 9 percent.

Source

1. U.S. Department of Transportation, National Highway Traffic Safety Administration, *The Economic Impact of Motor Vehicle Crashes 2000* (Washington, DC: 2002), also available at http://www.nhtsa.dot.gov/people/economic, as of December 2002.

[1] The costs detailed here are the economic costs not the intangible consequences of these events to individuals and families, such as pain and suffering and loss of life.

[2] All dollar amounts are in current 2000 dollars.

FIGURE 9-11 Share of Economic Costs of Motor Vehicle Crashes by Type: 2000

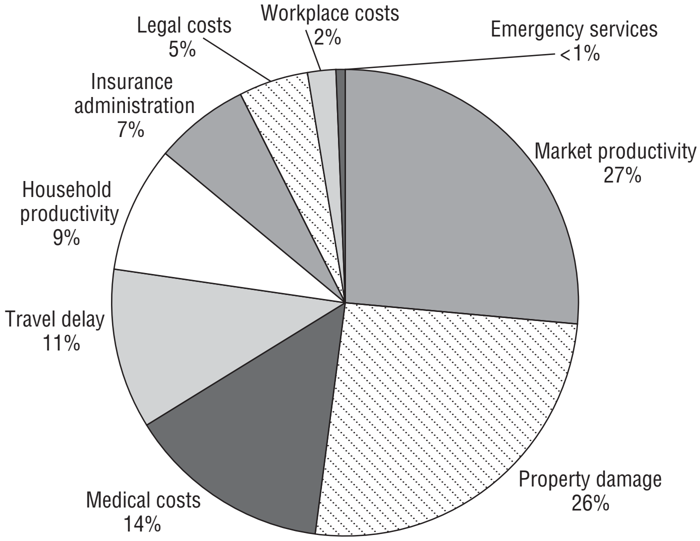
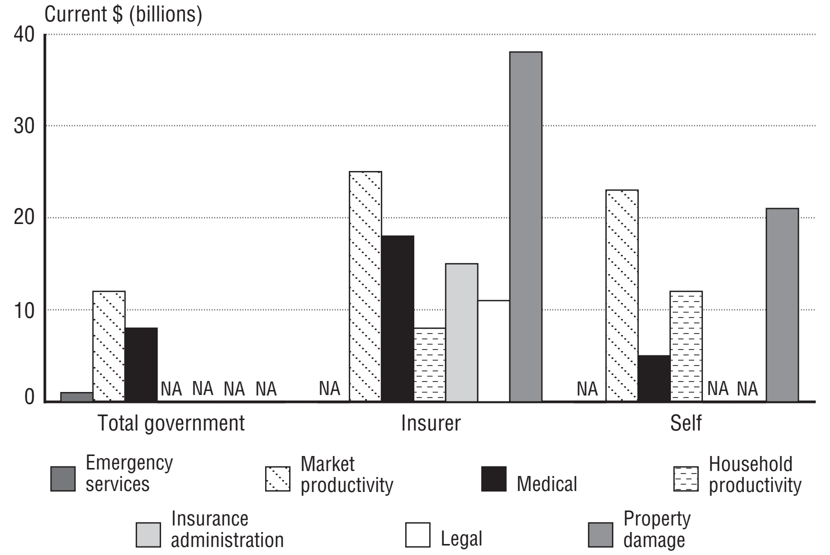


FIGURE 9-12 Estimated Sources of Payment for Motor Vehicle Crashes: 2000



KEY: NA = not applicable.

NOTE: Figure 9-12 does not include payments by sources other than the government, insurers, and individuals involved in the accident. These other payments amounted to $33 billion, mainly for travel delays.

SOURCE: U.S. Department of Transportation, National Highway Traffic Safety Administration, *The Economic Impact of Motor Vehicle Crashes 2000* (Washington, DC: 2002), available at http://www.nhtsa.dot.gov/people/economic/, as of December 2002.

Key Air Emissions

Transportation in 2001 emitted 66 percent of the nation's carbon monoxide (CO), 47 percent of nitrogen oxides (NO_x), 35 percent of volatile organic compounds (VOC), 5 percent of particulates, 6 percent of ammonia, and 4 percent of sulfur dioxide.[1] Highway vehicles emitted almost all of transportation's share of CO in 2001, 79 percent of the NO_x, and 78 percent of all VOC (figure 10-1). Marine vessels and railroad locomotives each contributed 10 percent of transportation's NO_x emissions, and other nonroad vehicles[2] had a 20 percent share of VOC emissions. With the exception of ammonia, transportation air emissions have declined since 1991 (figure 10-2). NO_x shows only a slight decrease between 1991 and 2001.

Gasoline powered highway vehicles experienced the greatest decline in NO_x emissions, while diesel-powered highway vehicles and aircraft show increases between 1991 and 2001 (figure 10-3). New, tightened NO_x emissions standards for diesel and gasoline trucks are due to go into effect in 2007 and 2008 [1]. In addition, new, tightened NO_x standards will apply to certain marine engines built in 2004 or later. NO_x emissions standards for locomotives went into effect in 2000, and tightened standards will apply to locomotives built in 2005 and later [2].

These key air emissions—generated during the use of various vehicles, locomotives, aircrafts, and vessels—affect the nation's air quality and are the most widely used indicator of transportation's impact on the environment and human health (box 10-A).

[1] With its 2001 updates, the U.S. Environmental Protection Agency is no longer estimating lead emissions. In 2000, transportation emitted 13 percent of the nation's lead emissions. Aircraft emitted almost 96 percent of all transportation lead emissions. While the substance is no longer used in most fuels, it is still present in aviation fuels.

[2] Other nonroad vehicles include recreational marine vessels, airport service vehicles, and road maintenance equipment.

BOX 10-A
Transportation Air Emissions

National data on air emissions are estimated by the U.S. Environmental Protection Agency (EPA). EPA's National Emissions Inventory (NEI) is updated annually and covers mobile, stationary, and area sources of pollution regulated under the Clean Air Act. These pollutants include the so-called "criteria" and hazardous air pollutants.[1] Most criteria emissions have been estimated since 1970, hazardous emissions only since 1996.

EPA's mobile source category contains "onroad" (highway) and "nonroad" (all other modes) emissions. However, its nonroad category includes nontransportation sources such as farming and construction equipment, lawn and garden equipment, and logging, industrial, and light commercial equipment. To more accurately assess transportation air emissions, the Bureau of Transportation Statistics removes the nontransportation components from EPA's criteria mobile source emissions. It is this subset that is presented here as "transportation" emissions.

[1] For details on transportation's contribution to hazardous air pollutants, see U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Statistics Annual Report 2000*, available at http://www.bts.gov/, as of June 2004.

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2003), tables 4-30–4-32, also available at http://www.bts.gov/, as of June 2004.
2. U.S. Department of Transportation, Federal Railroad Administration, personal communication, July 2003.

FIGURE 10-1 Share of Selected Air Pollutants by Mode: 2001

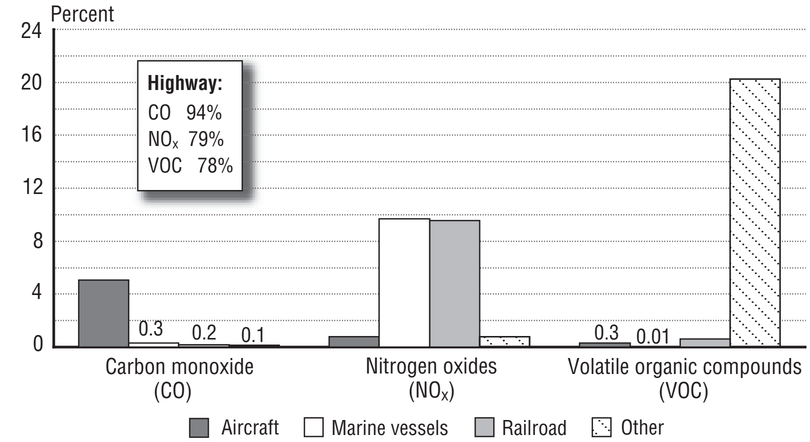


FIGURE 10-2 Selected Transportation Air Pollutant Emissions by Type: 1991–2001

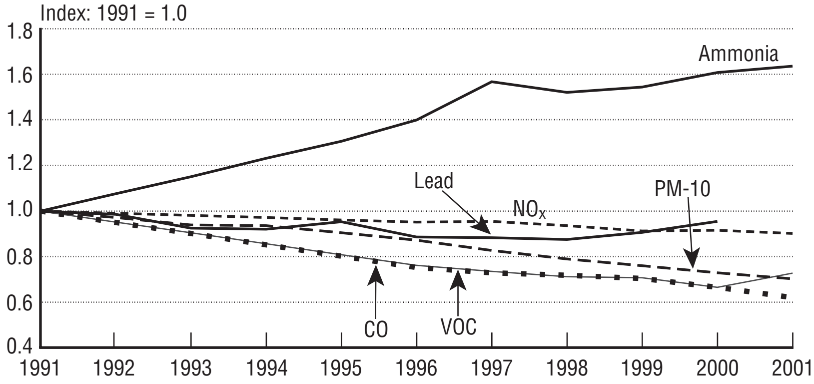
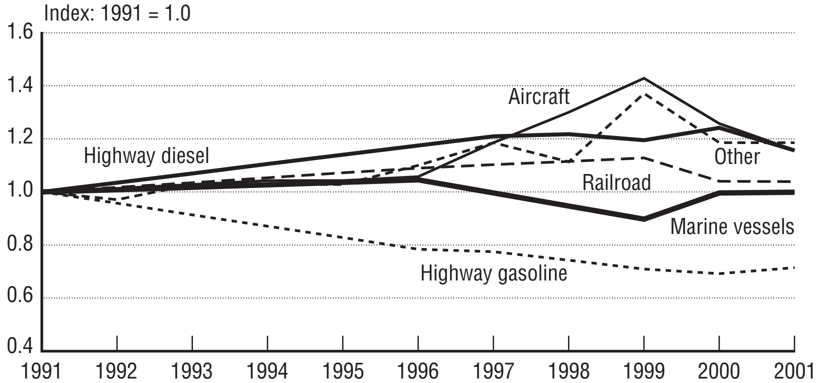


FIGURE 10-3 Emissions of Nitrogen Oxides by Mode: 1991–2001



KEY: PM-10 = particulate matter 10 microns in diameter or smaller.

NOTES: Figure 10-1—EPA no longer estimates lead emissions. Modal shares in 2000 were: highway gasoline vehicles, 4.1%; aircraft, 95.9%. See table 10-1 in appendix B for definitions of "highway" and "other" vehicles.

SOURCE: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Emissions Inventory, Air Pollutant Emission Trends*, available at http://www.epa.gov/ttn/ chief/trends/ index.html/, as of August 2003.

Greenhouse Gas Emissions

The transportation sector's greenhouse gas (GHG) emissions in 2002 totaled 1,861.4 teragrams of carbon dioxide equivalent ($TgCO_2Eq$), 27 percent of total U.S. GHG emissions.[1] Transportation emissions have grown 22 percent since 1992, while total U.S. emissions rose 14 percent [1].

Carbon dioxide (CO_2) accounted for 83 percent of U.S. GHG emissions in 2002 [1]. Nearly all (97 percent) of these emissions are generated by the combustion of fossil fuels; transportation was responsible for 1,767.5 $TgCO_2Eq$ (31 percent) of CO_2 emissions. Transportation CO_2 emissions grew 21 percent between 1992 and 2002, an average annual change of 1.9 percent (figure 10-4). Heavy-truck emissions grew the most over the period (46 percent). Aircraft emissions rose more slowly, increasing 16 percent from 1992 to 2000, then declining 8 percent in the following two years, most likely a "9/11 effect" that reduced 1992 to 2002 growth to 6 percent.[2] (See box 10-B for information on the two sources of U.S. GHG data.)

Highway vehicles emitted 79 percent of all transportation CO_2 emissions in 2002 and rose at an average annual rate of 2.2 percent between 1992 and 2002. Passenger cars and light-duty vehicles, which include pickup trucks, sport utility vehicles, and vans, were responsible for 79 percent of highway emissions (figure 10-5).

[1] A teragram is a trillion grams.

[2] The GHG data here cover domestic emissions only. Figure and table 10-4 include data on international bunker fuel emissions, which result from the combustion of fuel purchased domestically but used for international aviation and maritime transportation.

BOX 10-B
Greenhouse Gas Emissions Data

Both the U.S. Environmental Protection Agency (EPA) and the Energy Information Administration (EIA) estimate annual U.S. GHG emissions. EPA is responsible for producing the official inventory of U.S. emissions, as required under the United Nations Framework Convention on Climate Change. Both agencies use EIA fuel consumption data as a basis for estimating most GHG emissions, but differences in their methodologies can result in different datasets.[1] EIA usually releases its data about six months before EPA. EPA provides more detail of interest to transportation, such as emissions by mode. EIA presents emissions in million metric tons of carbon equivalent (mmtce), while EPA uses teragrams of carbon dioxide equivalent ($TgCO_2Eq$) as required under the Convention.[2]

[1] For more information, see U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Statistics Annual Report 2001* (Washington, DC: 2002), p. 239, also available at http://www.bts.gov.

[2] $TgCO_2Eq = 1 \text{ mmtce} \times (44/12)$.

Most air pollutants impact local or regional air quality. Greenhouse gases, however, have the potential to alter the earth's climate on a regional and global scale.

Source

1. U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002*, available at http://www.epa.gov, as of May 2004.

FIGURE 10-4 Carbon Dioxide Emissions by Selected Mode: 1992–2002

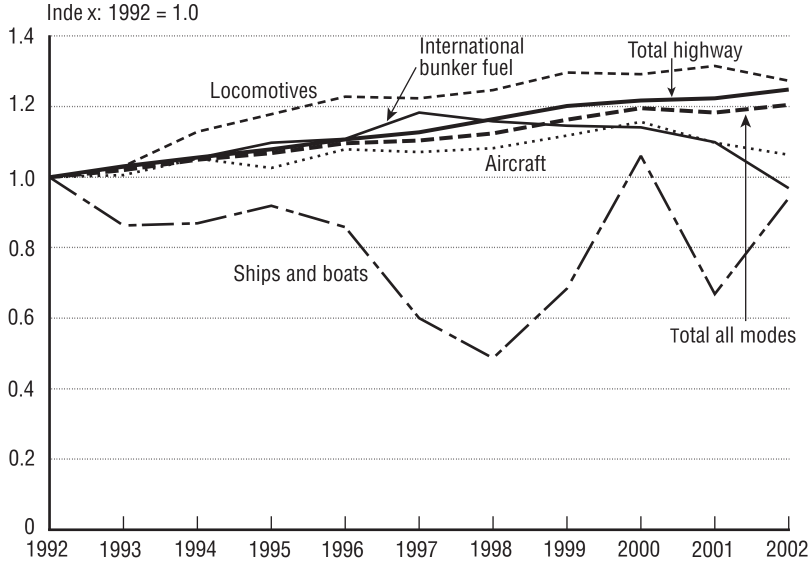
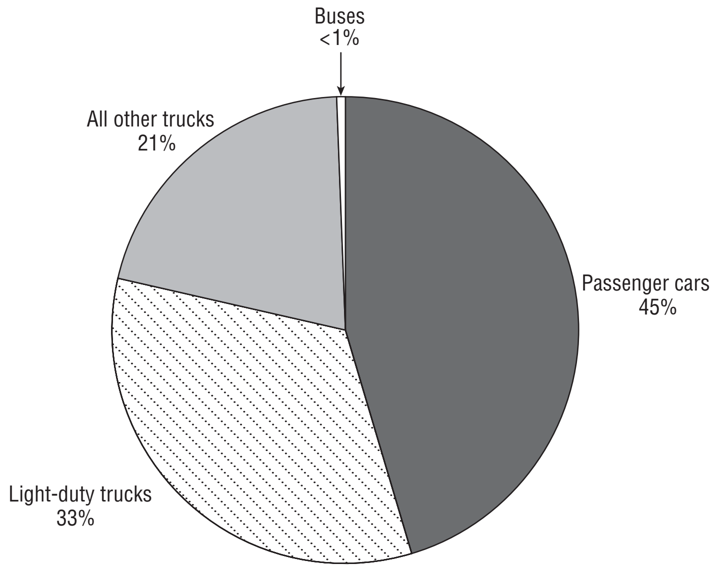


FIGURE 10-5 Share of Carbon Dioxide Emissions by Type of Highway Vehicle: 2002



NOTES: *Highway* includes passenger cars, buses, light-duty trucks, and other trucks. *Total* does not include international bunker fuels. *International bunker fuel* emissions result from the combustion of fuels purchased in the United States but used for international aviation and maritime transportation. Thus, aircraft and ships and boats data, which are included in U.S. total emissions, involve only domestic activities of these modes as do all other data shown.

The large annual variations in *ships and boats* data may result from methodological problems related to the domestic/international partition of maritime fuels. Economic factors may also contribute.

SOURCE: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002* (Washington, DC: April 2004), table 2-9, available at http://www.epa.gov, as of May 2004.

Oil Spills into U.S. Waters

Transportation-related sources typically account for most oil reported spilled into U.S. waters reported each year[1] (box 10-C). For instance, transportation's share of the total volume of oil spilled between 1991 and 2001 varied from a high of 97 percent in 1996 to a low of 77 percent in 1992. The volume of each spill varies significantly from incident to incident: one catastrophic incident can, however, spill millions of gallons into the environment. Consequently, the total volume of reported oil spills each year is volatile (figure 10-6).

BOX 10-C
Aggregating Oil Spill Data

The U.S. Coast Guard (USCG) summarizes reported oil spill data in its *Pollution Incidents In and Around U.S. Waters, A Spill Release Compendium: 1969–2001*. USCG aggregates the source data into five categories: marine vessels, pipelines, facilities, other, and unknown. The Bureau of Transportation Statistics has reviewed USCG's detailed source data and classified each transportation-related reported oil spill incident by transportation mode. The data presented here are preliminary, as research on the dataset is ongoing.

Maritime incidents are the source of most reported oil spills, particularly on a volume basis. On average, 1.8 million gallons of various types of oil were spilled each year by all transportation and nontransportation sources between 1991 and 2001. Of this, 78 percent of oil spilled came from incidents associated with maritime transportation, 10 percent from pipeline incidents, and over 1 percent from all other transportation modes (figure 10-7). Oil cargo accounted for 58 percent of the total volume spilled in 2000 [1].

Failures in transportation systems (vessels, pipelines, highway vehicles, and railroad equipment) or errors made by operators can result in spillage of crude oil, refined petroleum products, and other materials and cause serious damage to the environment. The ultimate impact of each spill depends on the location and volume of the spill, weather conditions, and the natural resources affected. While data exist on oil spilled into U.S. waters, there is less information available on the resulting consequences to the environment. In addition, little information exists on the quantity of oil entering the water from improper disposal of used motor oil or other nonreported sources.

Source

1. American Petroleum Institute, *Oil Spills in U.S. Navigable Waters: 1991–2000* (Washington, DC: Feb. 11, 2003).

[1] When an oil spill occurs in U.S. waters, the responsible party is required to report the spill to the U.S. Coast Guard. The Coast Guard collects data on the number, location, and source of spills, volume and type of oil spilled, and the type of operation that caused the spill.

FIGURE 10-6 Oil Spills Reported to the U.S. Coast Guard by Source: 1991–2001

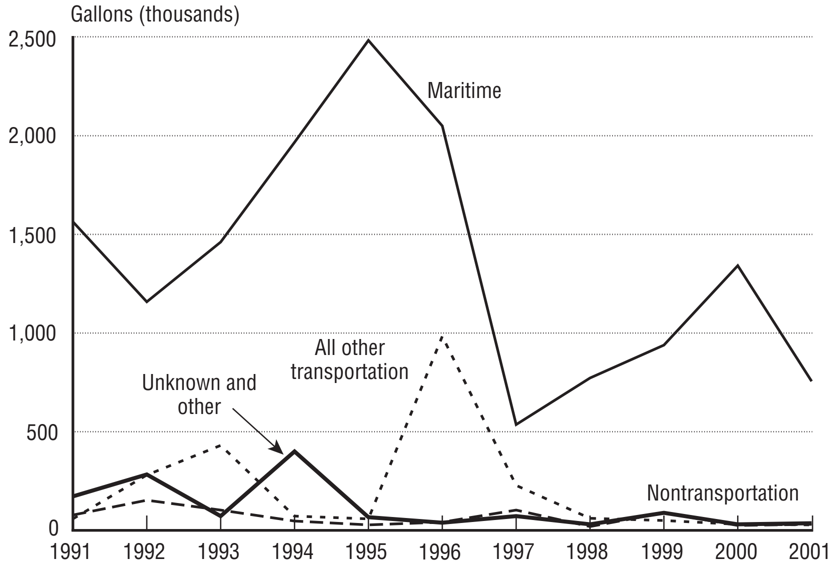
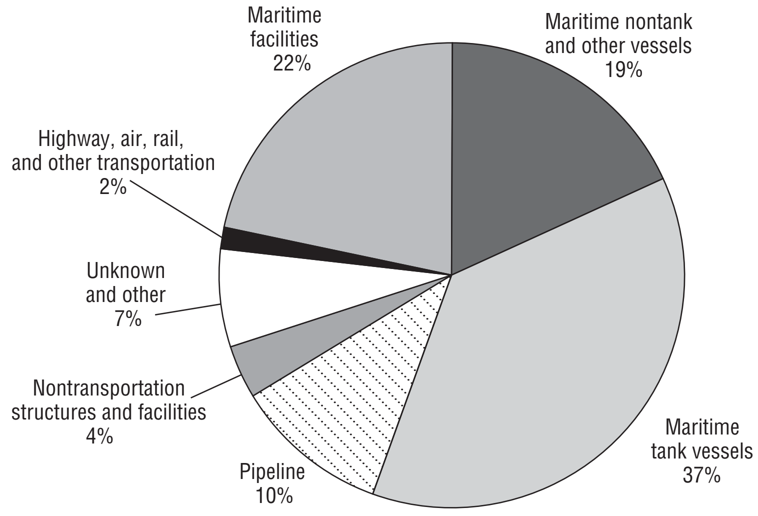


FIGURE 10-7 Share of Total Oil Spills by Volume and Source: 1991–2001



NOTE: Data are preliminary.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, based on U.S. Department of Homeland Security, U.S. Coast Guard, *Pollution Incidents In and Around U.S. Water*s, available at http://www.uscg.mil/hq/g-m/nmc/response/stats/aa.htm, as of October 2003.

Hazardous Materials Incidents and Injuries

Transportation firms reported more than 15,300 hazardous materials incidents in 2002.[1] These incidents resulted in 7 deaths and 129 injuries, compared with annual averages of 22 deaths and 419 injuries between 1992 and 2002. During that decade, the number of reported hazardous materials incidents increased (figure 10-8). However, much of the increase may be attributed to improved reporting and an expansion of reporting requirements[2] (box 10-D).

Highway vehicles transported 56 percent of the tons of hazardous materials shipped in 1997 [2]. Between 1992 and 2002, 61 percent of the injuries and 52 percent of the fatalities attributed to hazardous materials were the result of highway incidents. Fatal hazardous materials transportation incidents in other modes tend to be infrequent. After a DC-9 aircraft crashed in Florida in 1996, killing 110 people, the National Transportation Safety Board found that the crash was caused by ignited oxygen leaking from improperly stored oxygen generators [1]. With the exception of occasional spikes, injuries generally declined in the 1990s, especially from highway incidents (figure 10-9). Of the 926 injuries attributed to rail incidents in 1996, 787 resulted from chlorine released when a train derailed in February in Alberton, Montana [3].

Environmental contamination can occur as the result of hazardous materials incidents, but data are not routinely collected on the extent of the damage. Their environmental impacts will depend on the concentration and type of material spilled, the location and volume of the spill, and exposure rates.

[1] A reported incident is a report of any unintentional release of hazardous materials while in transportation (including loading, unloading, and temporary storage). It excludes pipeline and bulk shipments by water, which are reported separately.

[2] Incident reporting requirements were extended to intrastate motor carriers on Oct. 1, 1998, which may partly explain the subsequent increased volume of reports. Beginning in April 1993, there was a sharp improvement in reporting of incidents by small package carriers.

BOX 10-D
Hazardous Materials Reporting

The U.S. Department of Transportation's Hazardous Materials Information System (HMIS) is the primary source of national data on hazardous materials transportation safety. Hazardous materials, as defined in regulations, include nine classes of gases and liquids and other substances.[1] However, the vast majority of the hazardous materials shipped within the United States each year (81 percent in 1997) are flammable and combustible liquids, primarily petroleum products. There are an estimated 800,000 hazardous materials shipments per day (or 1.5 billion tons per year).

Source

U.S. Department of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Safety, *Hazardous Materials Shipments* (Washington, DC: October 1998).

[1] The nine classes are: explosives; flammable, nonflammable, and poisonous gases; flammable and combustible liquid; flammable, spontaneously combustible, and dangerous-when-wet materials; oxidizers and organic peroxides; poisonous materials and infectious substances; radioactive materials; corrosive materials; and miscellaneous hazardous materials.

Sources

1. National Transportation Safety Board, NTSB Report AAR-97/06, Docket No. DCA96MA054.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, and U.S. Department of Commerce, U.S. Census Bureau, *1997 Commodity Flow Survey, Hazardous Materials* (Washington, DC: December 1999).
3. U.S. Department of Transportation, Research and Special Programs Administration, personal communication, May 2003.

FIGURE 10-8 Hazardous Materials Incidents by Selected Mode: 1992–2002

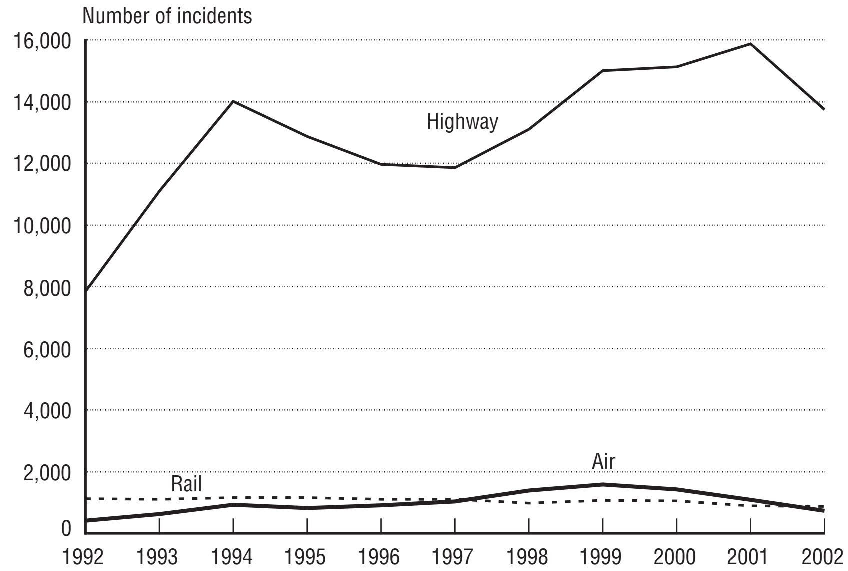
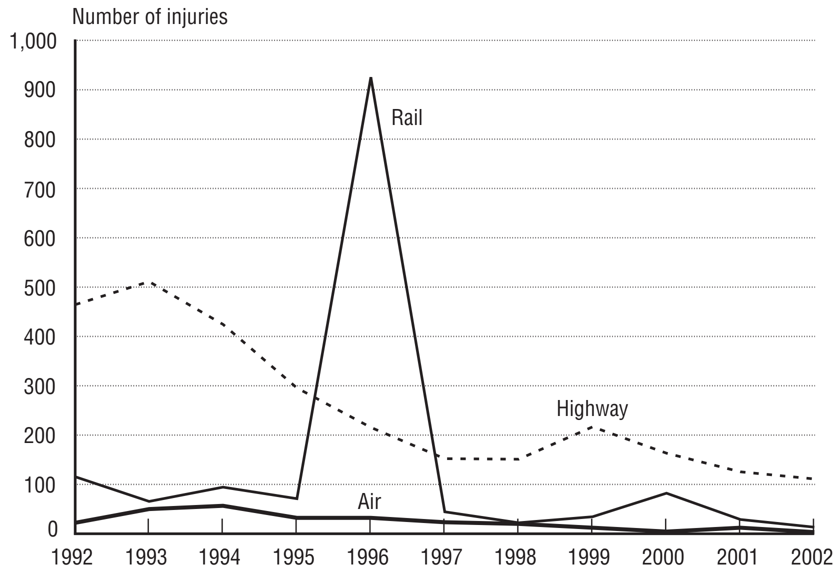


FIGURE 10-9 Hazardous Materials Injuries by Selected Mode: 1992–2002



NOTES: Water data are not included on these figures but are included in the corresponding tables. On an average annual basis, 9 incidents were reported by vessels. Two injuries were reported in 1998; none in other years. **Figure 10-9—**The 1996 spike in rail injuries resulted from 1 train derailment in which 787 people were injured by the release of chlorine gas.

SOURCE: U.S. Department of Transportation, Research and Special Programs Administration, Hazardous Materials Information System database, available at http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm, as of October 2003.

Transportation Capital Stock

Highway-related capital stock (highway infrastructure, consumer motor vehicles, and trucking and warehousing) represented the majority of the nation's transportation capital stock, $2,432 billion in 2001 (in chained 2000 dollars[1]). Highway infrastructure constituted the largest portion (60 percent) of highway-related capital stock in 2001, as well as the largest portion (39 percent) of all transportation capital stock (figure 11-1). The combined value of capital stocks for other individual modes of the transportation system, including rail, water, air, pipeline, and transit, is less than the value of consumer motor vehicles alone (figure 11-2).

All transportation capital stocks, except those of rail and water, increased between 1991 and 2001. Highway-related capital stocks were not the fastest growing, however. The most rapid growth occurred in transportation services, a component of all modes, at 94 percent, and air transportation at 68 percent. Trucking and warehousing grew 51 percent; consumer motor vehicles, 35 percent; and highway infrastructure, 21 percent. In-house transportation, another multimodal component, increased 42 percent. During the period, rail and water transportation capital stock decreased 6 percent and 4 percent, respectively.

Capital stock is a commonly used economic measure of the capacity of the transportation system. It combines the capabilities of modes, components, and owners into a single measure of capacity in dollar value. This measure takes into account both the quantity of each component (through initial investment) and its condition (through depreciation and retirements).

With the exception of highway and street data, the capital stock data presented here pertain only to that owned by the private sector. For instance, railroad companies own their own trackage. All of these data are available from the Bureau of Economic Analysis and the Bureau of Labor Statistics [1, 2]. The Bureau of Transportation Statistics is currently developing data on publicly owned capital stock, such as airports, waterways, and transit systems.

Sources

1. U.S. Department of Commerce, Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States,* tables 3.1ES, 7.1, and 8.1, available at http://www.bea.gov/bea/dn/faweb/AllFATables.asp, as of February 2004.
2. U.S. Department of Labor, Bureau of Labor Statistics, *Producer Price Indexes*, All Urban Consumers, various series, available at http://www.bls.gov/ppi/home.htm, as of February 2004.

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

FIGURE 11-1 Transportation Capital Stock for Selected Modes: 1991–2001

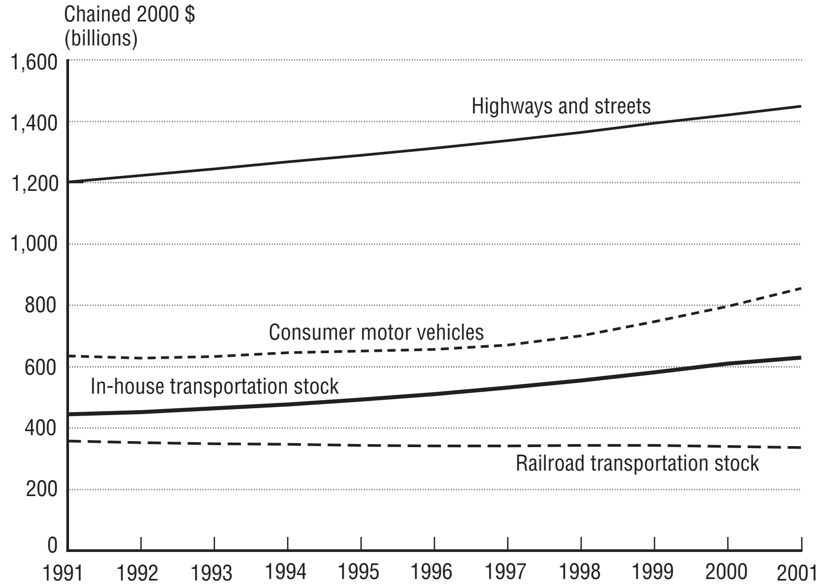
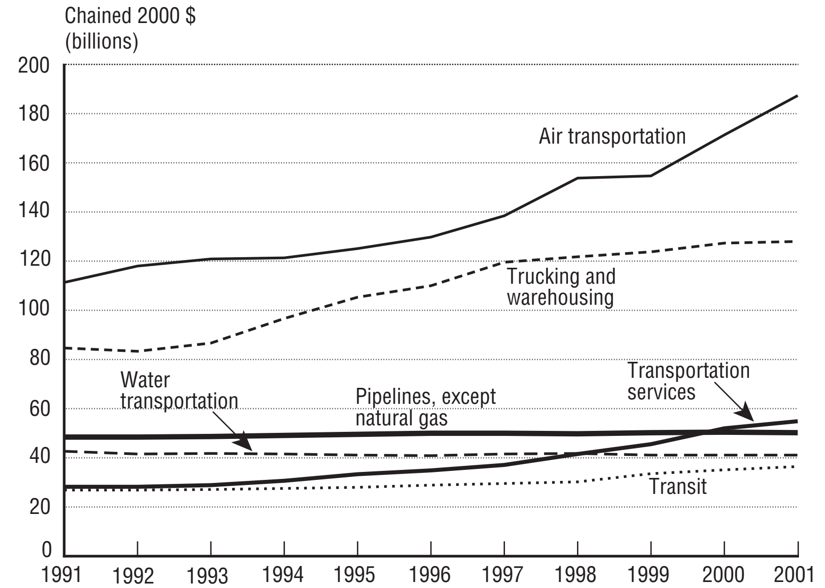


FIGURE 11-2 Transportation Capital Stock for Selected Modes: 1991–2001



NOTES: Data include only privately owned capital stock, except for highways and streets. Capital stock data are reported after deducting depreciation. Consumer motor vehicles are consumer durable goods. In-house transportation includes transportation services provided within a firm whose main business is not transportation. For example, grocery companies often use their own truck fleets to move goods from their warehouses to their retail outlets. These chained 2000 dollar values were calculated from current dollar data (see tables 11-1b/11-2b) to eliminate the effect of inflation over time.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States,* tables 3.1ES, 7.1, and 8.1, available at http://www.bea.gov/bea/dn/faweb/AllFATables.asp, as of February 2004.

Highway Condition

The condition of roads in the United States improved between 1993 and 2002. For instance, the percentage of rural Interstate mileage in poor or mediocre condition declined from 35 percent in 1993 to 12 percent in 2002 (figure 11-3). Moreover, poor or mediocre urban Interstate mileage decreased from 42 to 28 percent over this period (figure 11-4).

However, while all classes of rural roads (box 11-A) have improved in recent years, the condition of urban collectors and minor arterials has declined. For instance, 27 percent of urban minor arterial mileage and 33 percent of collector mileage were rated poor or mediocre in 2002, rising from 20 percent and 27 percent, respectively, in 1997.

Just over 41 percent of all U.S. urban and rural roads were in good or very good condition in 2002, while nearly 18 percent were in poor or mediocre condition. The rest were in fair condition.[1] In general, rural roads are in better condition than urban roads. In 2002, for instance, 29 percent of urban road-miles were classified as poor or mediocre compared with only 14 percent of rural-miles [1].

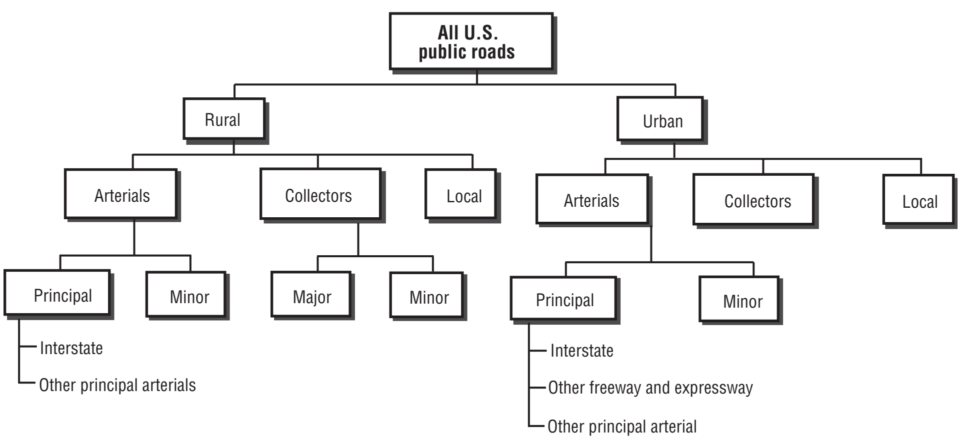
Source

1. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2002* (Washington, DC: 2002), table HM-64, available at http://www.fhwa.dot.gov/policy/ohim/hs02/index.htm, as of February 2004.

[1] These percentages include all classes of roads except local roads or minor collector roads.

BOX 11- A
Highway Functional Classification System

The Federal Highway Administration classifies roads according to the type of service provided and the type of area (urban or rural). There are three main types of roads: 1) arterials that provide the highest level of mobility for longer, uninterrupted trips; 2) collectors that collect and distribute traffic from the arterial network and connect with local roads; and 3) local roads that provide direct access to residences and businesses.



SOURCES:
U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA) and Federal Transit Administration, *1999 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance* (Washington, DC: 2000).
USDOT, FHWA, *Our Nation's Highways: Selected Facts and Figures 1998* (Washington, DC: 1998).

FIGURE 11-3 Rural Roads in Poor or Mediocre Condition by Functional Class: 1993–2002

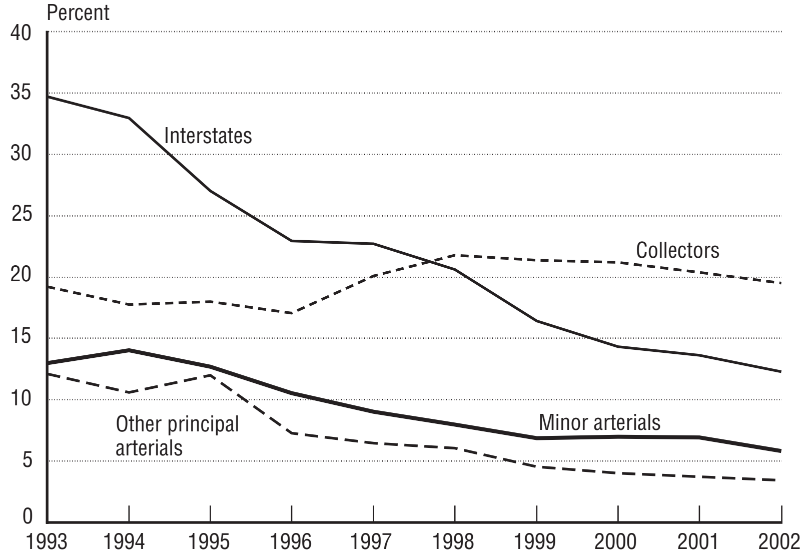
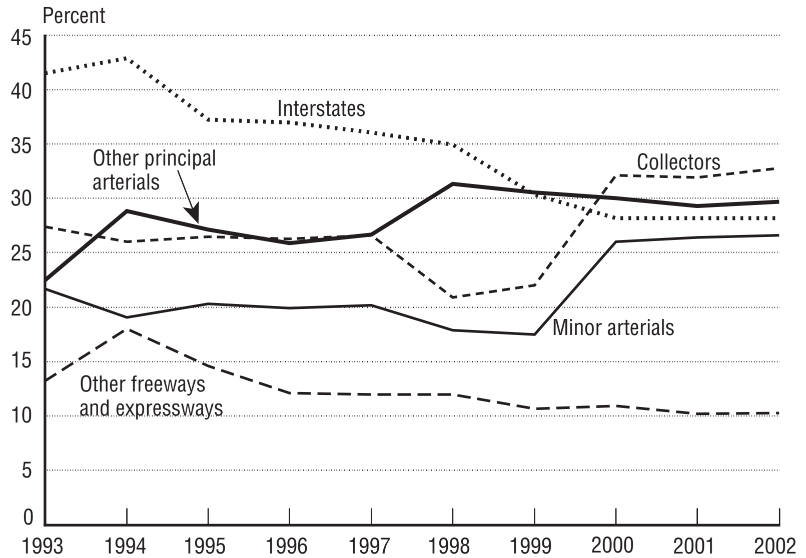


FIGURE 11-4 Urban Roads in Poor or Mediocre Condition by Functional Class: 1993–2002



NOTES: Data are for the 50 U.S. states and the District of Columbia. The terms poor and mediocre as used here are Federal Highway Administration (FHWA) pavement condition criteria term categories for quantitative International Roughness Index and Present Serviceability Ratings. (See http://www.fhwa.dot.gov/policy/2002cpr/ch3b.htm, Exhibit 3.3 for further detailed information.) Because of the transition to a new indicator for pavement condition beginning with U.S. Department of Transportation, FHWA data published in 1993, comparisons between pre-1993 data and 1993 and later data are inappropriate.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-26 revised, available at http://www.bts.gov/, as of February 2004.

Bridge Condition

The condition of bridges nationwide has improved markedly since the early 1990s. Of the 591,877 roadway bridges in 2002, the Federal Highway Administration found that 14 percent were structurally deficient and 14 percent were functionally obsolete. About 35 percent of all bridges in 1992 were either structurally deficient or functionally obsolete [1].

Structurally deficient bridges are those that are restricted to light vehicles, require immediate rehabilitation to remain open, or are closed. Functionally obsolete bridges are those with deck geometry (e.g., lane width), load carrying capacity, clearance, or approach roadway alignment that no longer meet the criteria for the system of which the bridge is a part.[1] In the 1990s, while the number of structurally deficient bridges steadily declined, the number of functionally obsolete bridges remained constant (figure 11-5).

In general, bridges in rural areas suffer more from structural deficiencies than functional obsolescence (particularly on local roads), whereas the reverse is true for bridges on roads in urban areas (figures 11-6 and 11-7). A large number of problem bridges nationwide are those supporting local rural roads: 44,156 of the 163,000 deficient and obsolete bridges in 2002 (27 percent) were rural local bridges. Problems are much less prevalent on other parts of the highway network. Nevertheless, in 2002, 26 percent of urban Interstate bridges and 16 percent of rural Interstate bridges were deficient or obsolete.

Source

1. U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, *National Bridge Inventory* database, available at http://www.fhwa.dot.gov/bridge/britab.htm/, as of January 2004.

[1] Structurally deficient bridges are counted separately from functionally obsolete bridges even though most structurally deficient bridges are, by definition, functionally obsolete.

FIGURE 11-5 Structurally Deficient and Functionally Obsolete Bridges: All Roadways,1992–2002

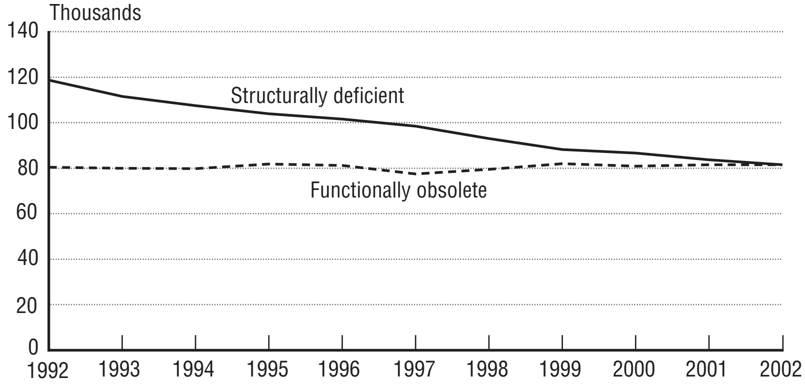


FIGURE 11-6 Rural Bridge Condition by Functional Class: 2002

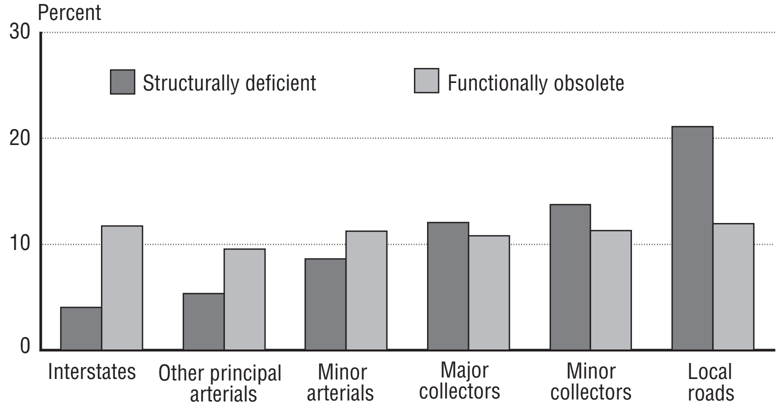
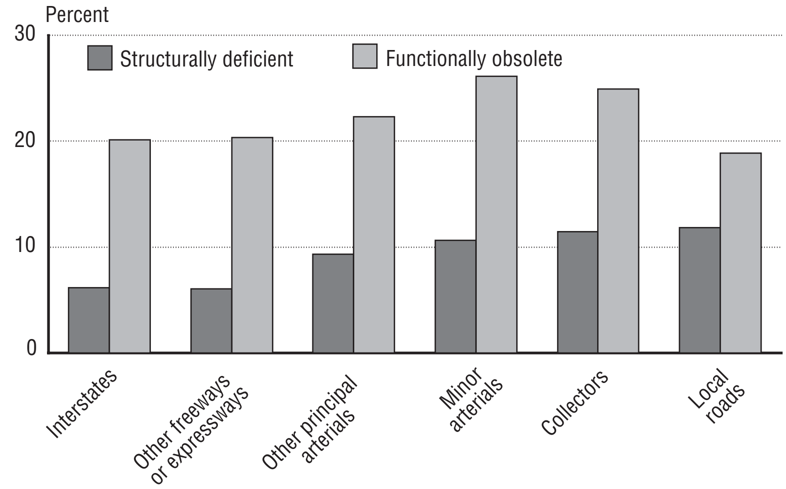


FIGURE 11-7 Urban Bridge Condition by Functional Class: 2002



NOTES: Functionally obsolete refers to bridges that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding. Structurally deficient refers to bridges needing significant maintenance attention, rehabilitation, or replacement.

SOURCES: Figure 11-5—U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), Office of Engineering, Bridge Division, *National Bridge Inventory* database, available at http://www.fhwa.dot.gov/bridge/britab.htm, as of January 2004.
Figure 11-6 and 11-7—USDOT, FHWA, Office of Engineering, Bridge Division, *National Bridge Inventory* database, CD-ROM, June 23, 2003.

Airport Runway Conditions

Airport runway conditions stayed about the same at the nation's major public-use airports between 1993 and 2003 [1] (box 11-B). At the nation's commercial service airports, pavement in poor condition declined from 3 percent of runways in 1993 to 2 percent in 2003 (figure 11-8). At the larger group of National Plan of Integrated Airport Systems (NPIAS) airports, the Federal Aviation Administration (FAA) found poor conditions on 4 percent of runways in 2003, down from 7 percent in 1993 (figure 11-9).

FAA inspects runways at public-use airports and classifies runway condition as good, fair, or poor. A runway is classified as good if all cracks and joints are sealed. Fair condition means there is mild surface cracking, unsealed joints, and slab edge spalling.[1] Runways are in poor condition if there are large open cracks, surface and edge spalling, and/or vegetation growing through cracks and joints [1].

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-24 revised, available at www.bts.gov, as of February 2004.

BOX 11-B
Classification of Airports in the United States

As of December 2002, there were 19,572 airports[1] in the United States, with 5,286 of these open to the public and known as public-use airports. The Federal Aviation Administration (FAA) includes 3,346 of the existing public-use airports in its National Plan of Integrated Airport Systems (NPIAS). The NPIAS includes both commercial and general aviation airports that are eligible to receive grants under the Air Improvement Program. Commercial service airports are defined as public airports receiving scheduled passenger service with at least 2,500 enplaned passengers per year. These airports handle the vast majority of enplanements in the United States. In 2003, there were 510 commercial service airports. FAA estimates that 67 percent of the U.S. population lives within 20 miles of at least 1 commercial service airport.

Sources

U.S. Department of Transportation, Federal Aviation Administration, *National Plan of Integrated Airport Systems (NPIAS) (2001–2005*) (Washington, DC: 2002).

U.S. Department of Transportation, Federal Aviation Administration, *Administrator's Fact Book* (Washington DC: December 2003).

[1] 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.

[1] Spalling refers to chips, scales, or slabs breaking off of surface pavement.

FIGURE 11-8 Runway Pavement Condition of 510 Commercial Service Airports: 1993–2003

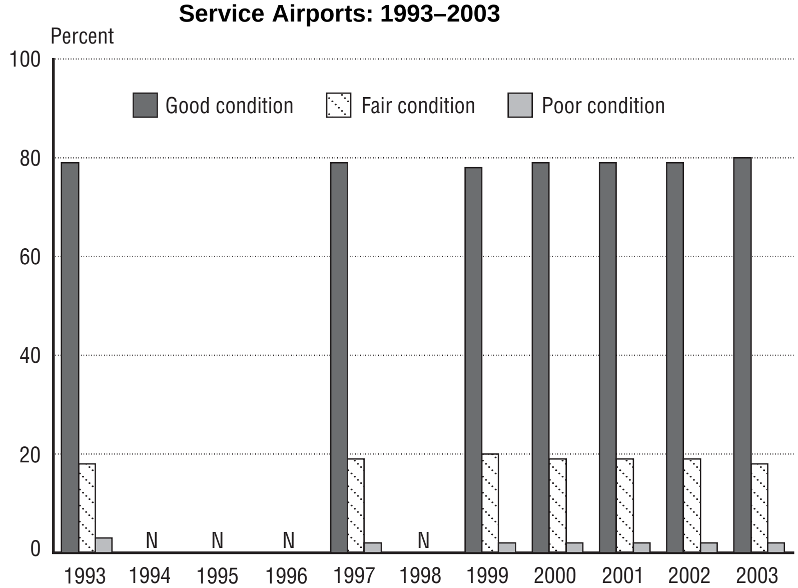
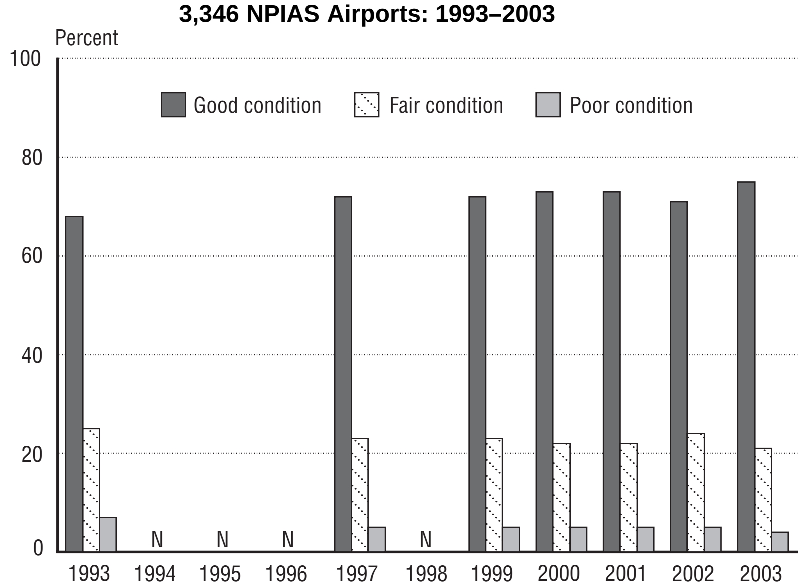


FIGURE 11-9 Runway Pavement Condition of 3,346 NPIAS Airports: 1993–2003



KEY: N = data are nonexistent; NPIAS = National Plan of Integrated Airport Systems.

NOTES: See box 11-B for definitions of NPIAS and commercial service airports. NPIAS airport data include commercial service airports.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-24 revised, available at http://www.bts.gov/, as of February 2004.

Age of Highway and Transit Fleet Vehicles

The median age of the automobile fleet in the United States increased appreciably, by 20 percent, from 7.0 years in 1992 to 8.4 years in 2002. The median age of the truck fleet,[1] by contrast, began to increase in the early 1990s but has been declining since 1997 as new purchases of light trucks have increased substantially (figure 11-10). As a result, the truck median age of 6.8 years in 2002 is less than its 7.2 years in 1992.

The age of transit vehicle fleets varies by transit and vehicle type (figure 11-11). The average age of heavy-rail passenger cars and ferryboats increased 28 percent and 26 percent, respectively, between 1991 and 2001. By contrast, the average age of full-size transit buses decreased 3 percent and light-rail vehicles decreased 1 percent over the same period [1].

The age of fleets as a measure of condition is not very precise. Because of the different characteristics of vehicle fleets across the modes—some serving freight and other passenger, some owned predominantly by businesses, and others by individuals—the measure varies widely.

[1] This includes all truck categories: light, heavy, and heavy-heavy.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, tables 1-25 and 1-28 revised, available at http://www.bts.gov/, as of January 2004.

FIGURE 11-10 Median Age of Cars and Trucks: 1992–2002

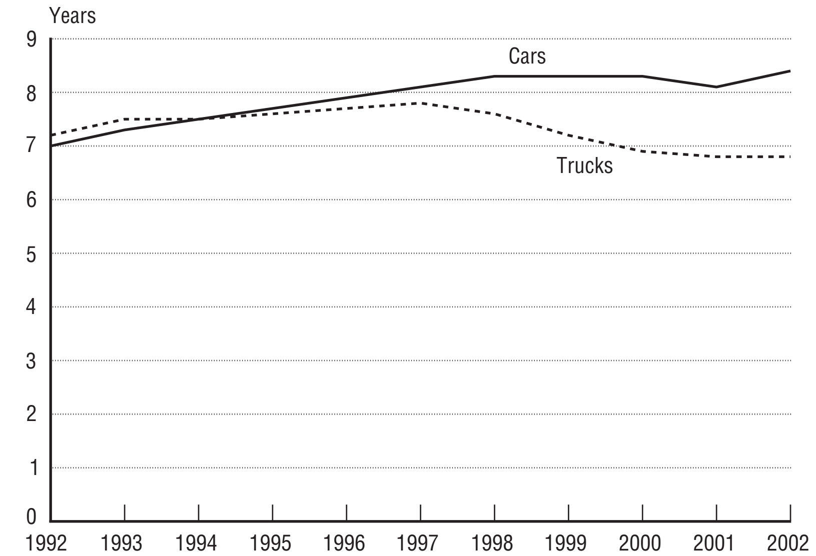
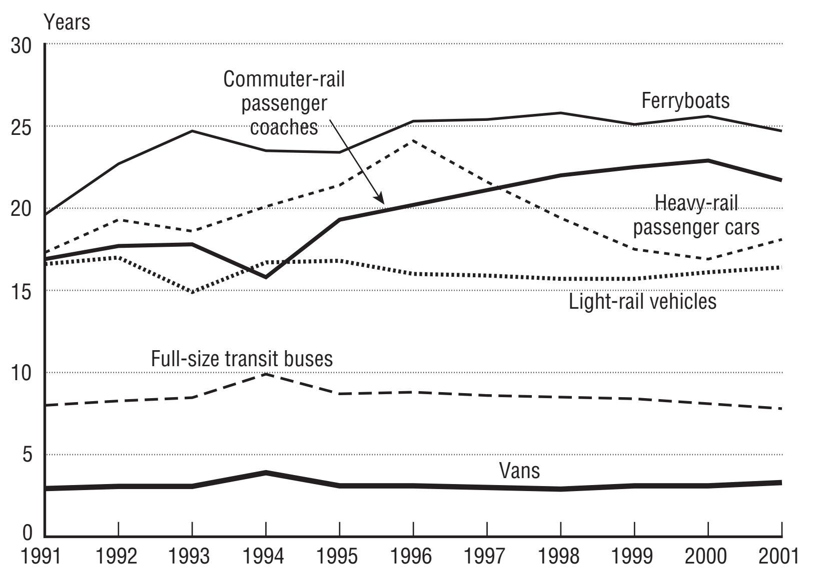


FIGURE 11-11 Average Age of Selected Transit Vehicles: 1991–2001



NOTES: Figure 11-10—*Trucks* represents all types of trucks, including light trucks (sport utility vehicles, vans, and pickup trucks). **Figure 11-11**—Full-size buses have more than 35 seats.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* tables 1-25 and 1-28 revised, available at http://www.bts.gov/, as of January 2004.

Age of Rail, Aircraft, and Maritime Vessel Fleets

The average age of Amtrak locomotives and passenger train cars fluctuated in a narrow range for most of the 1990s (figure 11-12). The average age of locomotives was 14 years in fiscal year 2001, up 8 percent from 13 years in fiscal year 1991. Meanwhile, Amtrak railcar age dropped from 21 to 19 years over this period. Of the 20,503 Class I freight locomotives in service in 2002, 35 percent were built before 1980, 18 percent between 1980 and 1989, and 47 percent from 1990 onwards [1].

Overall, 30 percent of the U.S.-flag vessel fleet was 25 years old or more in 2001, up from 17 percent in 1990–1991[1] [2]. However, during the same period, the percentage of the fleet less than six years old grew from 8 percent to 20 percent. Of the various components of the fleet, only support ships and dry barges have a greater number of newer vessels (19 percent and 24 percent, respectively) than older ones (17 percent and 23 percent) (figure 11-13). The towboat fleet had the highest proportion of older ships (55 percent) in 2001.

The average age of U.S. commercial aircraft was 12 years in 2001, up from 11 years in 1991 (figure 11-14). Commercial airlines are air carriers providing scheduled or nonscheduled passenger or freight service, including commuter and air taxi on-demand services. Major airlines—those with $1 billion or more in annual revenues—accounted for 83 percent of commercial aircraft in 2001 [3]. These aircraft were approximately one year younger on average than all commercial aircraft during the 1990s, but the gap narrowed in 2001. The average age of major airlines aircraft was 12 years in 2001, up from 11 years in 1991.

Sources

1. Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), pp. 49–50.
2. U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2002*, table 1-31 revised, available at http://www.bts.gov, as of January 2004.
3. _____. calculation based on USDOT, BTS, Form 41, Schedule B-43, 1991–2001.

[1] These waterborne vessel data are normally surveyed as of December 31 each year. However, due to a system migration of the data in 1990, the annual survey was collected in June 1991, or half way between the dates when 1990 and 1991 data would otherwise have been collected.

FIGURE 11-12 Average Age of Amtrak Locomotive and Car Fleets: Fiscal Years 1991–2001

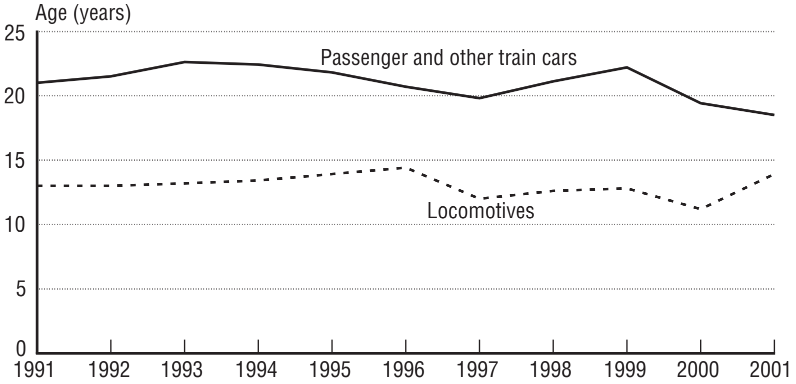


FIGURE 11-13 Age of U.S. Flag Vessels by Type: 2001

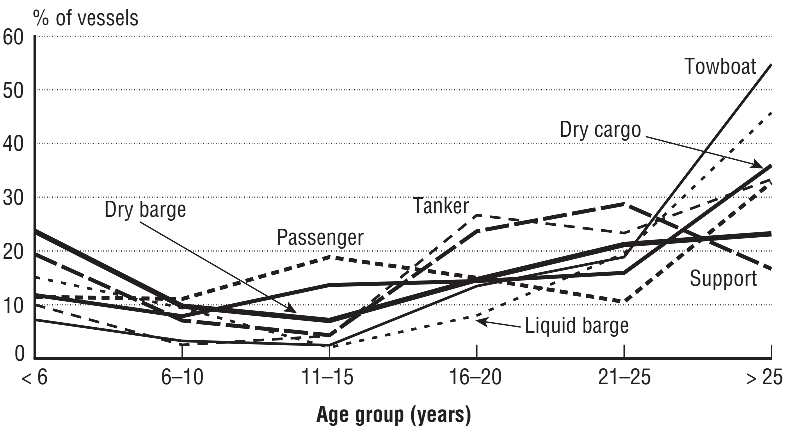
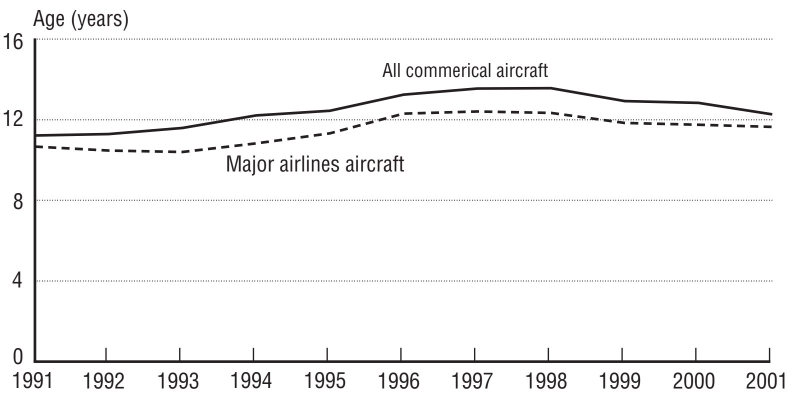


FIGURE 11-14 Average Age of U.S. Commercial Aircraft: 1991–2001



NOTES: Figure 11-13—*Support* includes offshore support and crewboats. *Liquid barge* includes tank barges. **Figure 11-14—***Commercial aircraft* are aircraft of air carriers providing scheduled or nonscheduled passenger or freight service, including commuter and air taxi on-demand services. *Major airlines* include only commercial airlines with operating revenues greater than $1 billion annually. See table 11-14 notes in appendix B for additional information.

SOURCES: Figure 11-12—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2003,* table 1-30, available at http://www.bts.gov/, as of March 2004. **2001 data**—USDOT, BTS, calculations based on data provided by Amtrak, personal communication, March 2004. **Figure 11-13—** USDOT, BTS, *National Transportation Statistics 2002,* table 1-31 revised, available at http://www.bts.gov/, as of January 2004. **Figure 11-14—**USDOT, BTS, calculations based on USDOT, BTS, Form 41, Schedule B-43, 1991–2001.

Relative Prices for Transportation Goods and Services

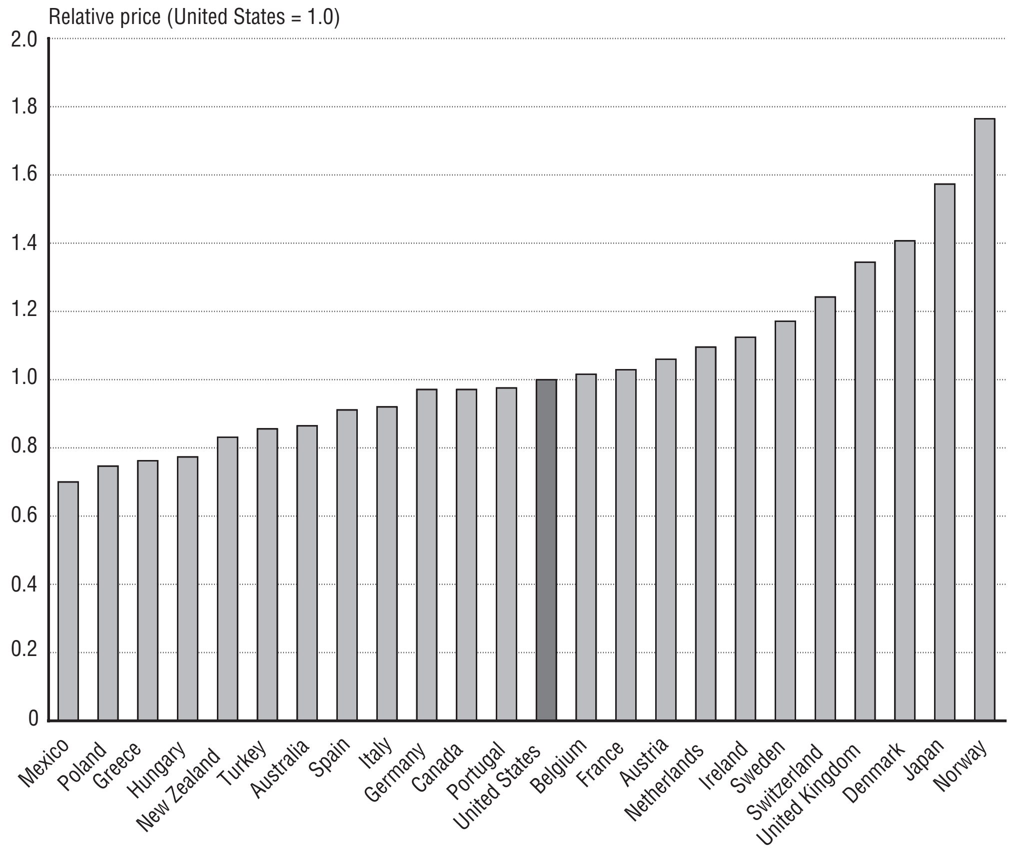
The United States had relatively lower prices for transportation goods and services in 2000[1] than did 11 out of 24 Organization for Economic Cooperation and Development (OECD) countries (figure 12-1). However, the nation's top two overall merchandise trade partners, Canada and Mexico, had lower relative prices in 2000 than did the United States. Prices in Japan and the United Kingdom—both major U.S. trade partners—were much higher than in the United States. Many of the OECD countries that had less expensive transportation goods and services than the United States have developing and transitional economies.

Further analytical research is needed to clarify transportation's contribution to America's global competitiveness. One theory is that Americans' incomes would go further if transportation consumer goods and services were relatively cheaper than in other countries. Because transportation goods and services are a major input of business production, relatively lower transportation prices might also result in relatively lower production costs. Furthermore, it could be expected that an inexpensive and efficient transportation system would stimulate market expansion and result in more specialization, faster distribution, and lower production costs.

The comparisons here may indicate how domestic U.S. transportation industries, goods, and services fare against their foreign counterparts. The relative price for a good or service traded between two countries is the price for that commodity in one country divided by the price for the same commodity in another country, with the prices for the goods and services in both countries expressed in a common currency. However, relative prices alone do not reveal why transportation is more expensive in one country than another. Nor do they justify making transportation relatively cheaper than it is. They also do not reveal the quality or reliability of the transportation or fully take into account differences in geospatial factors between countries.

[1] The most recent year for which comparable international data were available at the time this report was prepared.

FIGURE 12-1 Relative Prices for Transportation Goods and Services for the United States and Selected Major Trade Partners: 2000



NOTES: 2000 was the most recent year for which these data were available by country at the time this report was prepared. Data are not available for goods and services separately.

Relative prices are based on purchasing power parity for transportation-related goods and services.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from Organisation for Economic Co-operation and Development (OECD), *Purchasing Power Parities and Real Expenditures, 1999 Results* (Paris, France: August 2002), table 11; and OECD, Main Economic Indicators, January 2002, for 1999 and 2000 Gross Domestic Product implicit price index, consumer price index, and exchange rates.

U.S. International Trade in Transportation-Related Goods

The United States traded $299.6 billion worth (in current dollars[1]) of transportation-related goods (e.g., cars, trains, boats, and airplanes and their related parts) in 2002 with its partners (figure 12-2). Motor vehicles and automotive parts constituted by far the largest share of U.S. international trade in transportation-related goods ($233.0 billion) in 2002; however, they resulted in a subsector trade deficit. Trade in aircraft, spacecraft, and parts ($61.9 billion) generated the largest single surplus of any transportation-related commodity category ($25.9 billion) [1]. This surplus was due to trade with several partners, particularly the United Kingdom. The only deficits for aircraft products were with France and Canada, countries that have large aviation manufacturing sectors (box 12-A).

As is the case with overall international trade, the United States had a merchandise trade deficit in transportation-related exports and imports, totaling $82.1 billion in 2002 (figure 12-3). The deficit arose from a $108.0 billion U.S. trade deficit for motor vehicles and parts, which accounted for 23 percent of the total U.S. merchandise trade deficit of $470.3 billion. Over one-third of the motor vehicles and parts deficit involved U.S. trade with Japan, while about one-fifth was with Canada [2].

The United States had a relatively small deficit ($90 million) in trade of ships, boats, and floating structures in 2002, following a $693 million surplus in 2001 [1]. A $53 million trade surplus for railway locomotives and parts was down from $149 million in 2001. The 2002 surplus can largely be attributed to the United States supplying railcars and parts to Canada, the largest U.S. trade partner for rail products [2].

BOX 12-A
Merchandise Trade Balance Trends

Trade balances indirectly measure the U.S. competitiveness in supplying transportation-related goods globally and indicate the U.S. competitive position in the production, provision, and delivery of these goods compared with other major trading partners. Between 1990 and 2002, the United States had a growing overall trade balance deficit in all categories of transportation-related goods, due primarily to increased demand for imported motor vehicles. The U.S. trade deficit during this period in these commodity groups included trade with our top three trading partners: Canada, Mexico, and Japan.

Source

U.S. Department of Transportation, Bureau of Transportation Statistics, *U.S. International Trade and Freight Transportation Trends* (Washington, DC: 2003).

Sources

1. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, U.S. International Trade Commission, Interactive Tariff and Trade DataWeb, available at http://dataweb.usitc.gov/, as of February 2003.
2. _____. *U.S. International Trade and Freight Transportation Trends* (Washington, DC: 2003).

[1] All dollar amounts in this section are in current dollars. While it is important to compare trends in economic activity using constant or chained dollars to eliminate the effects of price inflation, it is not possible to do so in this instance (see note on the figures and on tables 12-2 and 12-3 in appendix B).

FIGURE 12-2 U.S. Trade in Transportation-Related Goods: 1990–2002

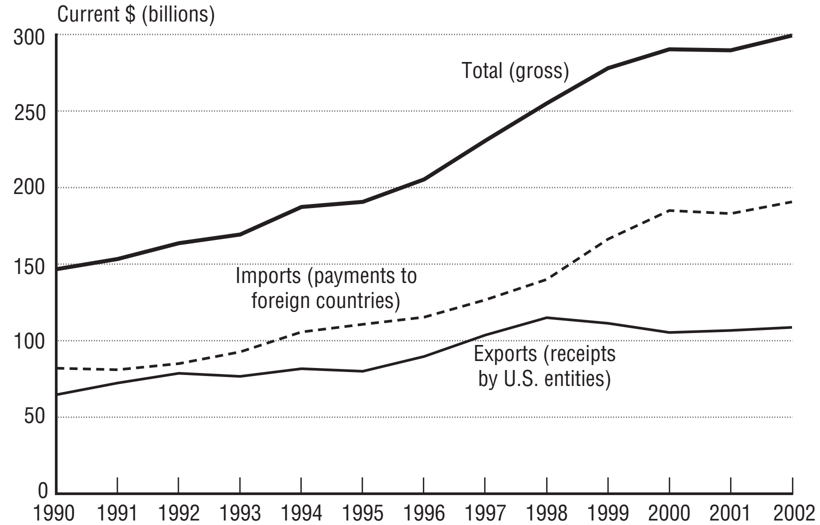
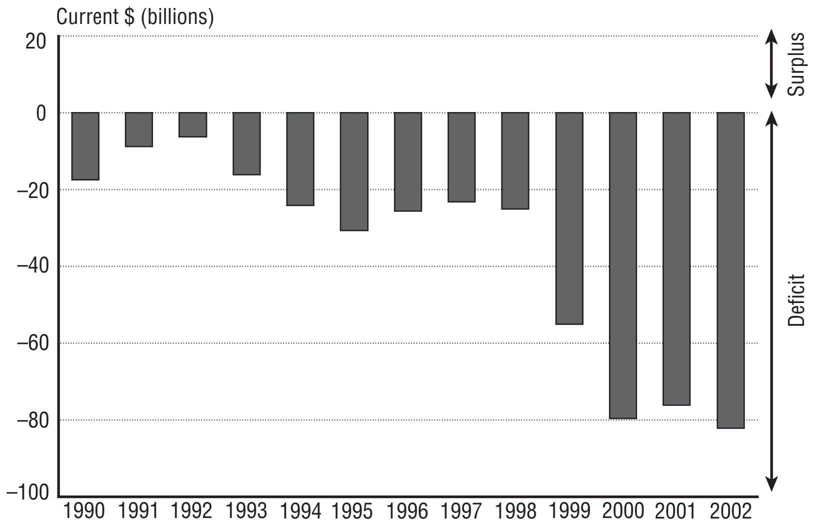


FIGURE 12-3 U.S. Trade Balance in Transportation-Related Goods: 1990–2002



NOTES: Transportation-related goods are motor vehicles and parts, aircraft and spacecraft and parts, railway vehicles and parts, and ships and boats.

All dollar amounts are in current dollars. These data have not been adjusted for inflation because there is no specific deflator available for transportation-related goods. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, U.S. International Trade Commission, Interactive Tariff and Trade DataWeb, available at http://dataweb.usitc.gov/, as of February 2003.

U.S. International Trade in Transportation-Related Services

U.S. trade in transportation services in 2002 totaled $105.4 billion (in current dollars[1]), down 2 percent from $107.6 billion in 2001 (figure 12-4). This decline was smaller than the 8 percent drop between 2000 and 2001. Of the trade in 2001, 57 percent was for imports (payments to foreign countries) and 43 percent was for exports (receipts by U.S. entities), resulting in a $14.9 billion trade deficit for transportation services (box 12-B).

The United States had a surplus in transportation services from 1990 through 1997 (figure 12-5). The trade surplus was highest in 1992, at $3.8 billion (in current dollars), but exports exceeded imports by over $3 billion in other years prior to 1997, as well. Then, between 1997 and 1998, imports increased 7 percent while exports decreased 5 percent, resulting in a $4.6 billion deficit. The deficit continued to grow at an average annual rate of 32 percent between 1998 and 2002, when the deficit reached $13.9 billion.

U.S. exports and imports in transportation services include freight services provided by carriers; port services provided by airports, seaports, and terminals; and passenger travel services provided by carriers. U.S. trade in transportation services generates substantial revenues for U.S. businesses in receipts to U.S. carriers and ports. These services also result in payments by U.S. companies to foreign freight and passenger carriers and ports. Because an efficient transportation system puts a premium on system reliability and speed, the performance of freight carriers and ports directly influences the competitiveness of U.S. businesses engaged in international trade.

BOX 12-B
Components of Service Trade

Exports of freight transportation services occur when a U.S. carrier *receives* payments from a foreign company or individual for transporting merchandise. Imports of freight transportation services occur when a U.S. company or individual *pays* a foreign carrier for transporting merchandise. Similarly, U.S. exports of port services occur when foreign carriers purchase services and goods (e.g., fuel) at U.S. airports and seaports. U.S. imports of port services occur when a U.S. carrier purchases services and goods at ports in foreign countries. For passenger travel services, exports consist of fares received by U.S. carriers from foreign residents for travel between the United States and foreign countries and between two foreign points. Imports of travel services consist of fares paid by U.S. residents to foreign carriers for travel between the United States and foreign countries.

Source

U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, November 2001.

[1] All dollar amounts in this section are in current dollars. While it is important to compare trends in economic activity using constant or chained dollars to eliminate the effects of price inflation, it is not possible to do so in this instance (see the note on the figures and tables 12-4 and 12-5 in appendix B).

FIGURE 12-4 U.S. Trade in Transportation-Related Services: 1990–2002

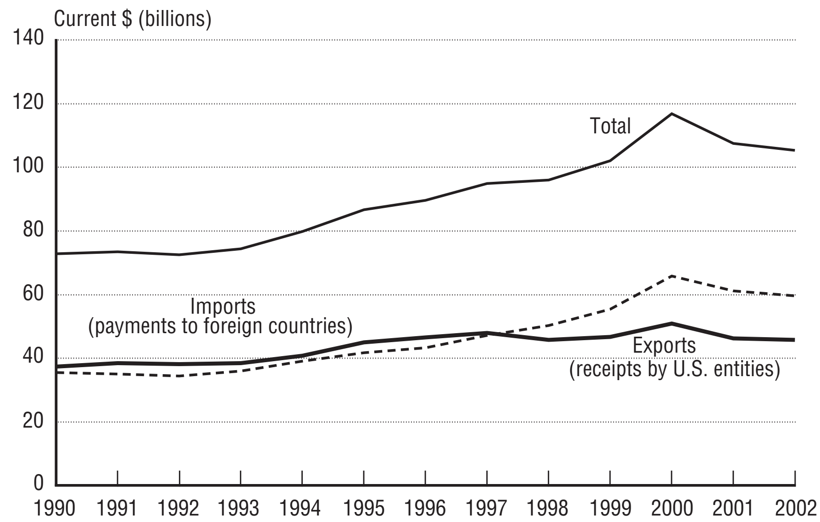
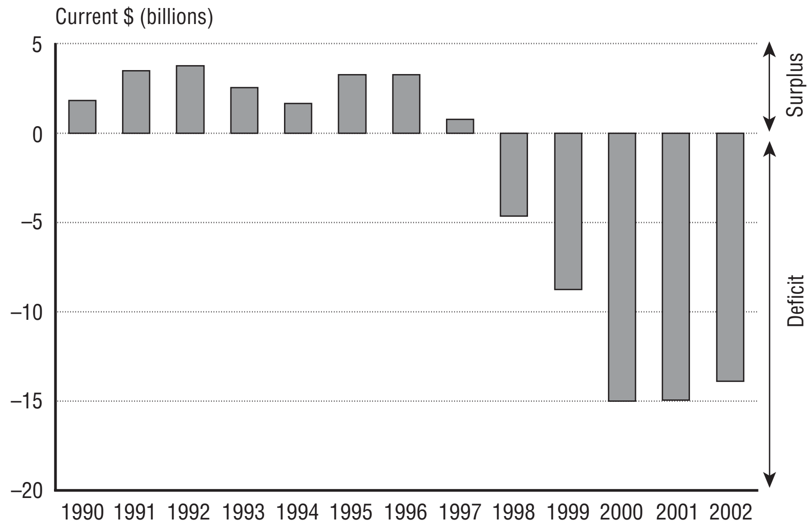


FIGURE 12-5 U.S. Trade Balance in Transportation-Related Services: 1990–2002



NOTES: Transportation services include passenger fares and freight and port services. It excludes receipts and payments for travel services, which includes purchases of goods and services (e.g., food, lodging, recreation, gifts, entertainment, and any incidental expense on a foreign visit).

These data have not been adjusted for inflation because there is no specific deflator available for transportation-related services. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculation based on data from U.S. Department of Commerce, Bureau of Economic Analysis, International Transactions Accounts data, available at http://www.bea.doc.gov/bea/di1.htm, as of April 2003.

Transportation Services Index

The Transportation Services Index (TSI), a new product of the Bureau of Transportation Statistics (BTS), rose to 122.5[1] in March 2004, its highest level since January 1990 and a growth of 1.0 percent since the previous month (figure 13-1). The TSI is an experimental, seasonally adjusted index of monthly changes in the output of services of the for-hire transportation industries, including railroad, air, truck, inland waterways, pipeline, and local transit. BTS calculates the TSI as a single transportation index and as separate freight and passenger indexes.

As of March 2004, the TSI had risen every month since August 2003 except for a drop in January 2004 to 119.3. The freight TSI rose to 123.3 in March 2004, 6.0 percent higher than in March 2003, and a record high for the 14-year period covered by the index. However, the passenger TSI decreased 0.1 percent in March 2004 (to 120.5) after two consecutive rises in January and February of 2004 [1].

BTS released the first TSI data (covering January 1990 through December 2003) in March 2004. The index is still under development as BTS works to refine the index data sources, methodologies, and interpretations. Both the TSI and the freight index show potential to be considered leading indicators of economic performance. A prototype version of the TSI was successful at forecasting downturns in the economy and slightly less accurate in projecting upturns. To verify these linkages, however, more research is needed.

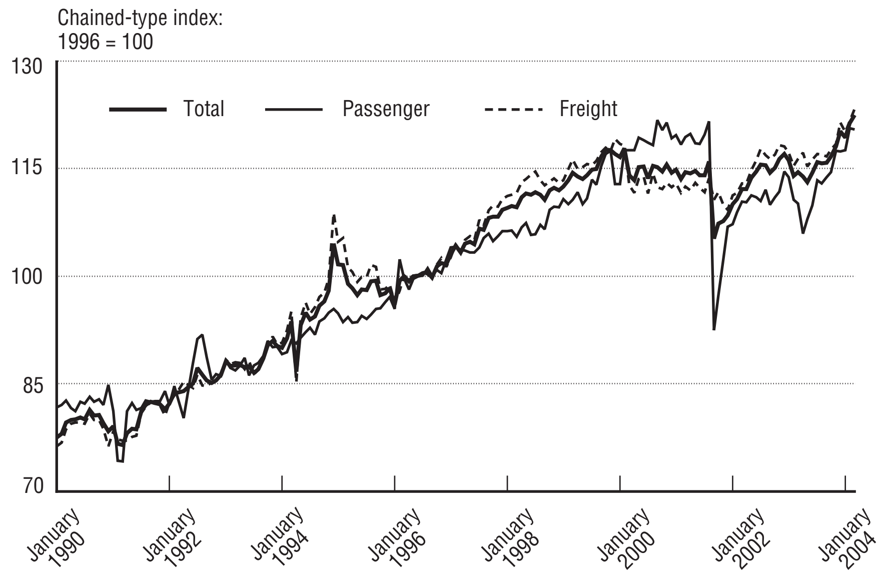
Economists, forecasters, and others use monthly economic measures to understand the performance of the economy, to understand the short-term relationships among different sectors of the economy, and to forecast the performance of the economy, particularly business cycles. To do this they use measures called “indicators,” such as employment, manufacturing production, sales, business inventories, purchasing managers’ plans, and consumer confidence. In addition to giving information that is valuable in its own right, these indicators often have a relationship with the growth of the economy, measured by the Gross Domestic Product.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Services Index,* available at http://www.bts.gov/xml/tsi/src/index.xml, as of June 2004.

[1] The TSI is a chained-type index where 1996 = 100.

FIGURE 13-1 Transportation Services Index: January 1990–March 2004
Monthly data, seasonally adjusted



SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Services Index,* available at http://www.bts.gov/xml/tsi/src/index.xml, as of June 2004.

Transportation-Related Final Demand

Total transportation-related final demand rose by 42 percent between 1992 and 2002 (in 2000 chained dollars[1]) from $759.3 billion to $1,076.9 billion (figure 13-2). However, transportation-related final demand as a share of Gross Domestic Product (GDP) showed little change throughout the period. This implies that transportation-related final demand grew at about the same rate as GDP. In 2002, the share of transportation-related final demand in GDP was 11 percent, compared with 10 percent in 1992.

Personal consumption of transportation—which includes household purchases of motor vehicles and parts, gasoline and oil, and transportation services—is the largest component of transportation-related final demand. It amounted to $867.0 billion in 2002 and accounted for 81 percent of the total transportation-related final demand (figure 13-3). Government purchases and private domestic investment commanded equal shares of transportation-related final demand in 1999 and 2000. However, during the balance of the 1992 to 2002 period, government purchases held a greater share. Government purchases reached $189.8 billion in 2002 (a 18 percent share), while private investment totaled $134.6 billion (a 13 percent share).

Net exports were a negative component of transportation-related final demand between 1992 and 2002. In other words, the United States imported more transportation-related goods and services than it exported. This gap has widened in recent years. In 1992, net exports had a –2.5 percent share in total transportation-related final demand. Net exports then remained at about –5 percent through 1998. Starting in 1999, net exports declined again, dropping to –11 percent by 2002. Deficits in the trade of automobiles and other vehicles and parts have been the primary component of the negative net exports of transportation-related goods and services.

Transportation-related final demand is the total value of transportation-related goods and services purchased by consumers and government and by business as part of their investments.[2] Transportation-related final demand is part of GDP, and its share in GDP provides a direct measure of the importance of transportation in the economy from the demand side. The goods and services included in transportation-related final demand are diverse and extensive, ranging from automobiles and parts, fuel, maintenance, auto insurance, and so on, for user-operated transportation to various transportation services provided by for-hire transportation establishments.

Source

1. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Account Tables, available at http://www.bea.gov, as of February 2004.

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

[2] Also included are the net exports of these goods and services, because they represent spending by foreigners on transportation goods and services produced in the United States. Imports, however, are deducted because consumer, business, and government purchases include imported goods and services. Therefore, deducting imports ensures that total transportation-related spending reflects spending on domestic transportation goods and services.

FIGURE 13-2 Transportation-Related Final Demand and Share of GDP: 1992–2002

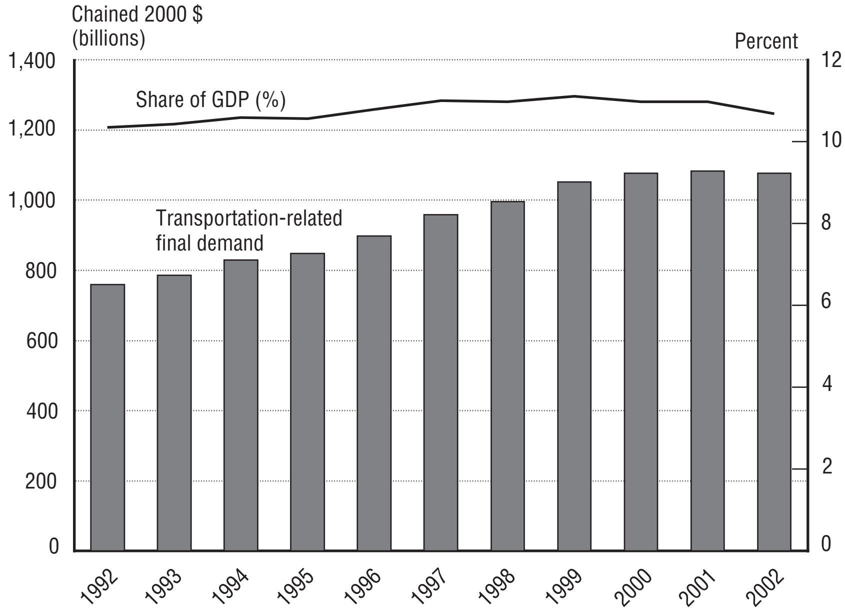
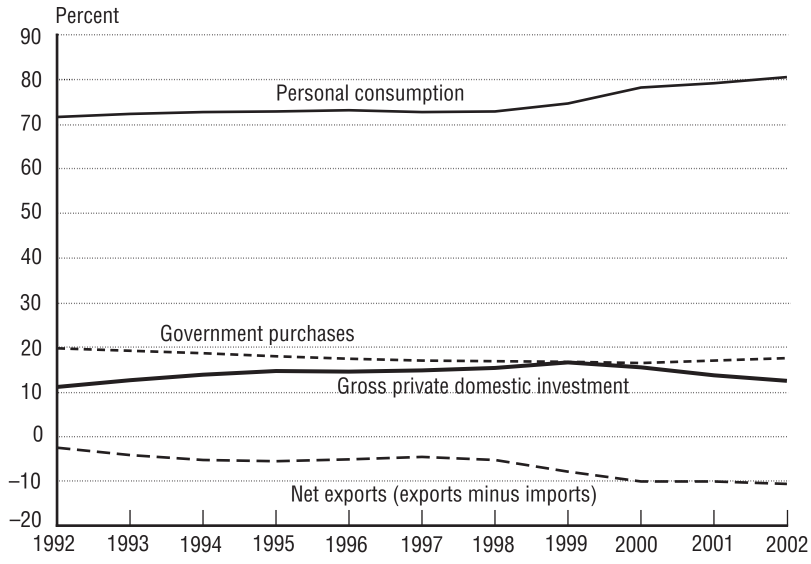


FIGURE 13-3 Share of Transportation-Related Final Demand by Type: 1992–2002



KEY: GDP = Gross Domestic Product.

NOTES: Total transportation-related final demand is the sum of all consumer, private business, and government purchases of transportation-related goods and services, and net exports (i.e., transportation imports subtracted from transportation exports). Gross private domestic investment covers railroad and petroleum pipelines only.

Current dollars (see table 13-2b in appendix B) were adjusted to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts data, available at http://www.bea.doc.gov/, as of February 2004.

Transportation Services

The contribution of for-hire transportation industries to the U.S economy, as measured by their value added (or net output), increased (in 2000 chained dollars[1]) from $206.4 billion in 1991 to $300.2 billion in 2001 (figure 13-4). In the same time period, this segment's share in Gross Domestic Product (GDP) fluctuated slightly, increasing from 2.9 percent in 1991 to 3.2 percent in 1996 before declining to 3.0 percent in 2001. The decreased share of for-hire transportation services in 2001 can largely be attributed to the decrease in output of air transportation, reflecting significant reductions in personal and business air travel after the September 11, 2001, terrorist attacks.

Among for-hire transportation industries, trucking and air contribute the largest amount to GDP (figure 13-5). In 2001, they contributed $118.5 billion and $84.8 billion, respectively [1]. Together, they accounted for more than two-thirds of the total for-hire transportation industries' net output. Air transportation's contribution also grew the most (74 percent) between 1991 and 2001, even while declining 8 percent in the last year. Next in growth were trucking and warehousing and local and interurban transit at 39 percent and 38 percent, respectively. Pipelines' (excluding natural gas) contribution declined in growth by 3 percent between 1991 and 2001.

There are two major components of transportation services—for-hire transportation, as detailed above, and in-house transportation services. For-hire transportation services are provided by firms for a fee. In-house transportation services are provided by nontransportation establishments for their own use. For instance, when a retail store uses its own trucks to move goods from one place to another, it is providing an in-house service.

Time-series data on in-house transportation services are not readily available. The Bureau of Transportation Statistics analyzed the contribution of in-house transportation services to GDP in 2000, using 1996 data, and is in the process of updating that work. The earlier analysis estimated that in-house transportation contributed $142 billion (in 1996 dollars) to the economy in 1996, while for-hire transportation contributed $243 billion.[2]

Source

1. U.S. Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product by Industry," available at http://www.bea.doc.gov/, as of February 2004.

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

[2] The full results of the 2000 study appear in *Transportation Statistics Annual Report 2000,* available at http://www.bts.gov/ publications/transportation_statistics_annual_report/2000/index.html, as of March 2004. Data from the new analysis were not available at the time this report was prepared.

FIGURE 13-4 Value Added by For-Hire Transportation Services to U.S. GDP and Share of GDP: 1991–2001

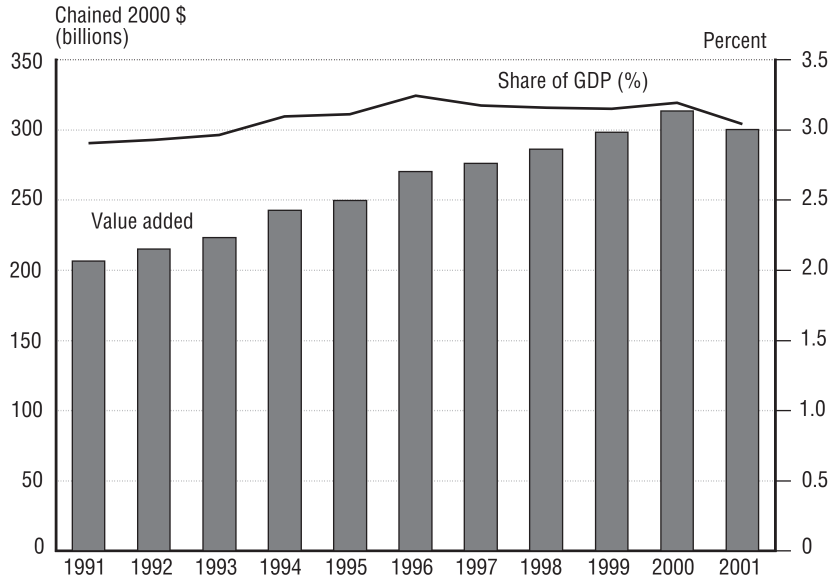
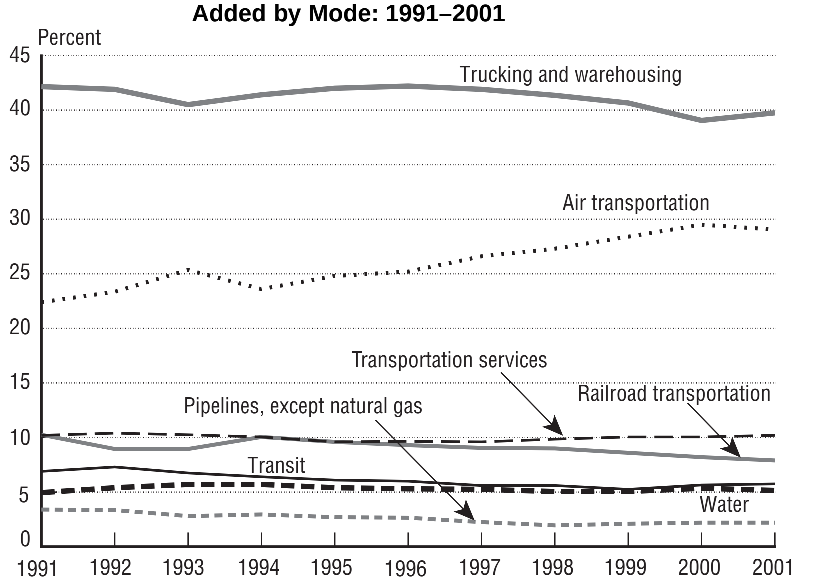


FIGURE 13-5 Share of For-Hire Transportation Value Added by Mode: 1991–2001



KEY: GDP = Gross Domestic Product.

NOTES: *Transportation services* cover establishments furnishing services incidental to transportation (e.g., forwarding and packing services and the arrangement of passenger and freight transportation).

Current dollars (see table 13-4b in appendix B) were adjusted to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product by Industry" available at http://www.bea.gov/bea/dn2/gpo.htm, as of February 2004.

Government Transportation Revenues

Federal, state, and local government transportation revenues earmarked to finance transportation programs[1] increased from $90.9 billion in 1990 to $125.9 billion in 2000 (in 2000 chained dollars[2]) for an annual average growth rate of 3.3 percent (figure 14-1). However, the share of transportation revenues in total government revenues decreased slightly from 3.6 percent to 3.4 percent during the same period [1, 2].

The federal government share of transportation revenues averaged 32 percent per year between 1990 and 1997 and then rose to an average share of 38 percent per year from 1998 to 2000. On the other hand, the state government share of revenues dropped from an average share of 48 percent in 1990 through 1997 to a share of 43 percent between 1998 and 2000. The rise in the federal government share after 1997 can be attributed to increased federal motor fuel taxes, the introduction of new transportation user charges, and the shift of transportation receipts from the general fund for deficit reduction to transportation trust funds [1, 2].

Among all transportation modes, highway usage generates the largest amount of government transportation revenues, accounting for $87.8 billion or 70 percent of the total in 2000 (figure 14-2). Air transportation produces the second largest share (17 percent). Transit revenues, a combination of highway fees paid into the Mass Transit Account of the Highway Trust Fund for transit purposes and proceeds from operations of the public mass transportation system, represent 10 percent of the total. With annual growth rates of 15 percent and 8 percent, respectively, pipeline and air revenues grew faster than did other modes from 1990 to 2000 [3]. Rail is not represented, because fuel and property tax receipts from rail are channeled into the general fund for deficit reduction and hence do not fall under the definition of transportation revenues used by the Bureau of Transportation Statistics. Amtrak generates revenues from passenger fares, but since Amtrak is not considered a government entity, its revenues are not included.

[1] Money collected by government from transportation user charges and taxes, which are earmarked to finance transportation programs, are counted by the Bureau of Transportation Statistics as transportation revenues. 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.

[2] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

Source

1. U.S. Department of Commerce, U.S. Census Bureau, *State and Local Government Finances,* available at http://www.census.gov/, as of March 2004.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from Executive Office of the President of the United States, Office of Management and Budget, *Budget of the U.S. Government,* Historical Tables, available at http://www.gpo.gov, as of March 2004.
3. _____. *Government Transportation Financial Statistics 2002*, forthcoming.

FIGURE 14-1 Federal, State, and Local Government Transportation Revenues: Fiscal Years 1990–2000

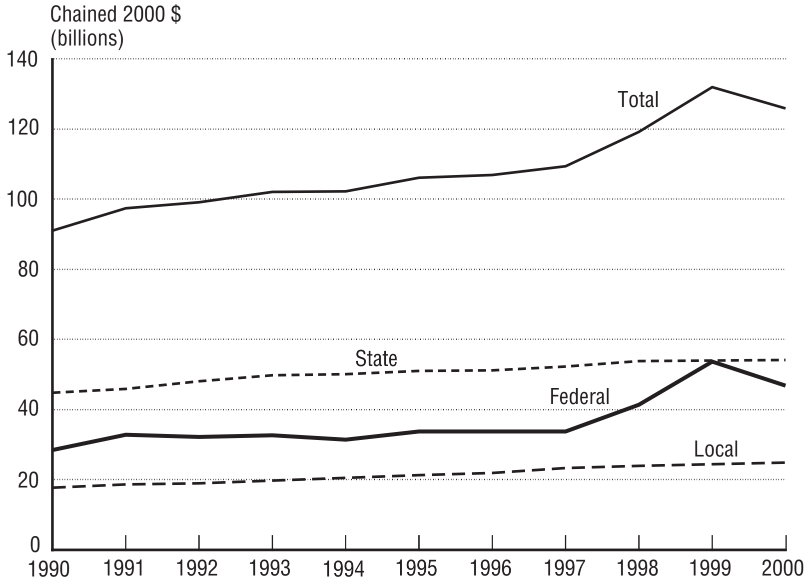
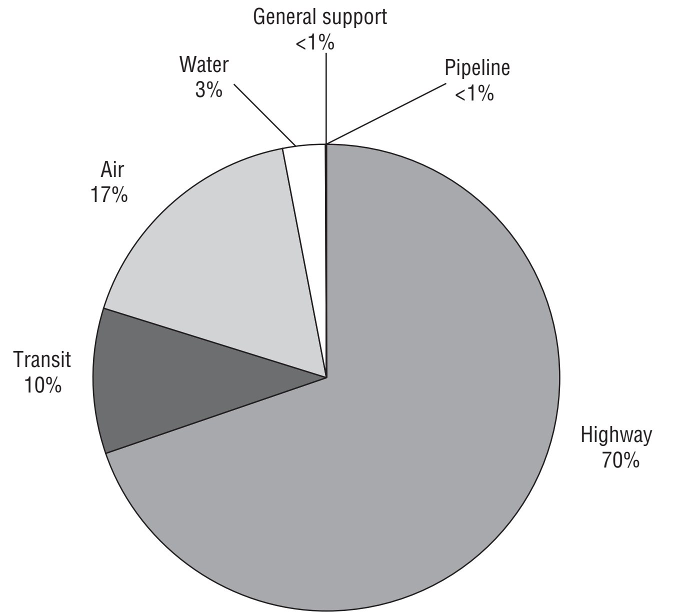


FIGURE 14-2 Shares of Government Transportation Revenues by Mode: Fiscal Year 2000



NOTE: Current dollars (see table 14-1b in appendix B) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

Government Transportation Expenditures

Spending on building, maintaining, operating, and administering the nation's transportation system by all levels of government totaled $167.5 billion in 2000 (in chained 2000 dollars[1]). The federal government spent 30 percent of the funds; state and local governments, 70 percent [1, 2] (figure 14-3).

Between 1990 and 2000, these transportation expenditures grew faster than total (federal, state, and local) government expenditures, increasing transportation's share in the total from 4.8 percent to 6.0 percent. State and local government spending on transportation grew faster (at an average annual rate of 2.7 percent) than the federal government's spending (at 1.9 percent). State and local governments also spent more on transportation, as a percentage of their total expenditures, than the federal government. In 2000, the respective shares were 8.1 percent and 2.8 percent [1, 2].

Among all modes of transportation, highways receive the largest amount of total government transportation funds. In 2000, this amounted to $104.0 billion and accounted for 62 percent of the total (figure 14-4). Transit and air modes accounted for 19 percent and 13 percent, respectively, while rail and pipeline modes accounted for less than 1 percent each. Between 1990 and 2000, government expenditures on highways, transit, and air transportation increased at about the same rate, leaving the overall modal distribution of government transportation expenditures almost unchanged [3].

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

Source

1. U.S. Department of Commerce, U.S. Census Bureau, *State and Local Government Finances,* available at http://www.census.gov/, as of March 2004.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from Executive Office of the President of the United States, Office of Management and Budget, *Budget of the U.S. Government,* Historical Tables, available at http://www.gpo.gov, as of March 2004.
3. _____. *Government Transportation Financial Statistics 2002*, forthcoming.

FIGURE 14-3 Federal, State, and Local Government Transportation Expenditures: Fiscal Years 1990–2000

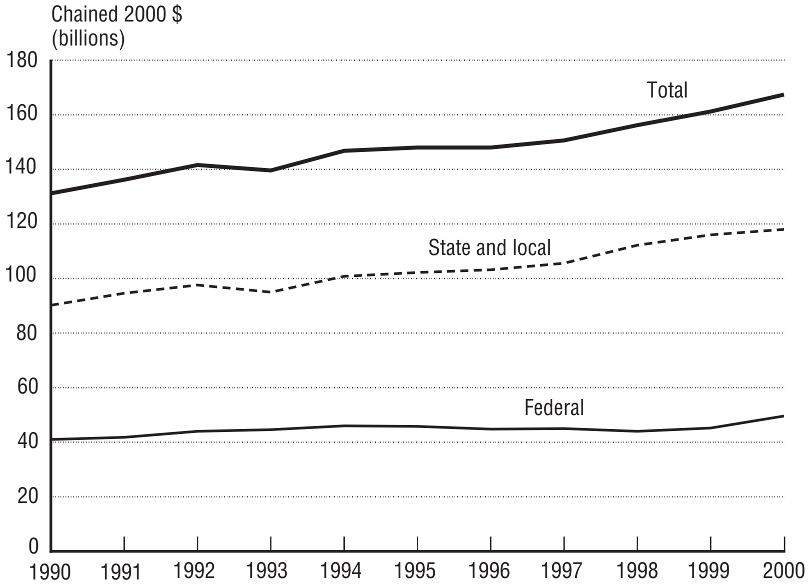
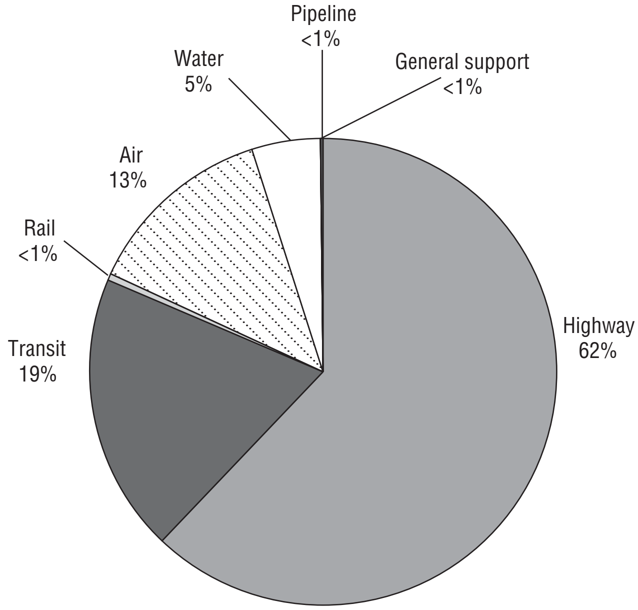


FIGURE 14-4 Shares of Government Transportation Expenditures by Mode: Fiscal Year 2000



NOTES: Federal transportation expenditures consist of outlays of the federal government including not only direct spending but also grants made to state and local governments. To avoid double counting, state and local transportation expenditures include their outlays from all sources of funds except federal grants received. Pipeline data only include federal-level expenditures, as state and local data are not available. State and local data are reported together, because disaggregated federal grants data are not available.

Current dollars (see table 14-3b in appendix B) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

Government Transportation Investment

Gross government transportation investment,[1] including infrastructure and vehicles, has increased steadily over the last decade. The Bureau of Transportation Statistics has estimated that total gross government transportation investment reached $86.1 billion in 2000, compared with $67.4 billion in 1990 (in chained 2000 dollars[2]), an average annual growth rate of 2.6 percent (figure 14-5). Government transportation investment grew faster than did other government investments. As a result, the share of transportation in total government investment increased from 24 percent in 1990 to 27 percent in 2000 [1, 2]. However, the share of government transportation investment in the Gross Domestic Product (GDP) changed little, remaining at almost 1 percent each year [2]. This indicates that funds allocated by government for improving and expanding transportation capital have been growing at the same pace as GDP.

State and local governments are the main investors in transportation infrastructure, but their relative role has decreased slightly over time. Direct federal infrastructure investment rose from $2.7 billion to $4.4 billion—an average annual growth rate of 5 percent between 1990 and 2000. State and local investment in transportation infrastructure grew from $56.9 billion to $72.1 billion, an average annual growth rate of 2.4 percent (figure 14-6).

Infrastructure accounted for 90 percent of the total government transportation investment during the 1990s, the bulk of which (almost three-quarters of the total) was allocated to highways (figure 14-7). Nevertheless, the share of highway investment in total infrastructure investment has gone down, whereas that for transit and air has gone up. Air investment grew at an average annual rate of 3.4 percent, faster than all other modes in the 1990s.

Sources

1. U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Account tables, available at http://www. bea.gov, as of February 2003.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Investment: Concepts, Data and Analysis," draft, May 29, 2003.

[1] Transportation investment is the purchase value of transportation equipment and the purchase or construction value of transportation facilities and structures, namely, roads, railways, airports, air traffic control facilities, water ports, pipelines, and so forth, that have a service life of longer than one year. The total purchase or construction value of new transportation capital in a year is gross investment. While investment increases the stock of transportation capital, the existing transportation capital stock depreciates or wears out over time. Therefore, gross investment minus depreciation provides net investment.

[2] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

FIGURE 14-5 Gross Government Investment in Transportation Infrastructure and Rolling Stock: Fiscal Years 1990–2000

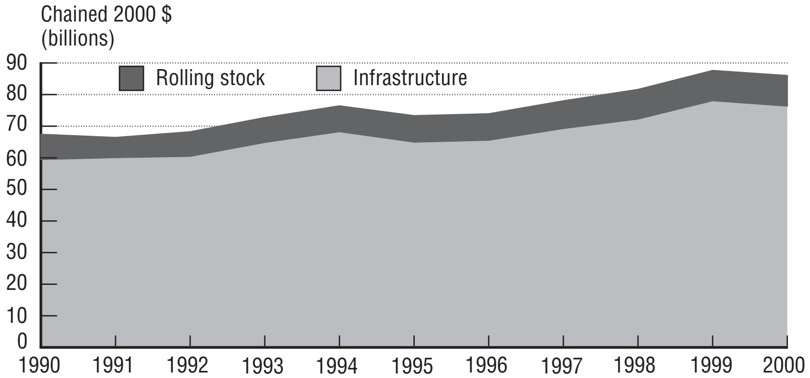


FIGURE 14-6 Gross Government Investment in Transportation Infrastructure by Level of Government: Fiscal Years 1990–2000

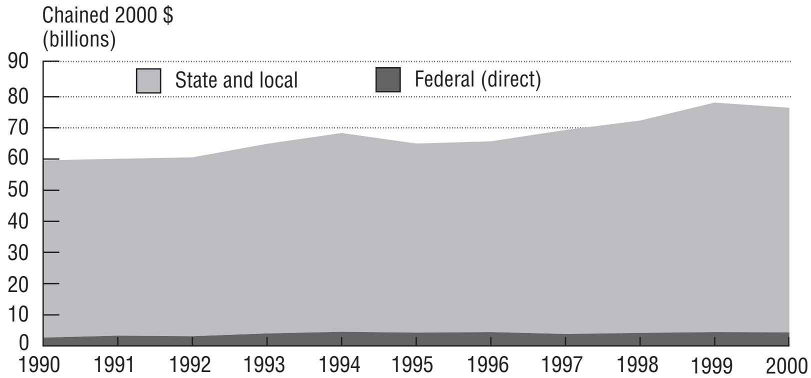
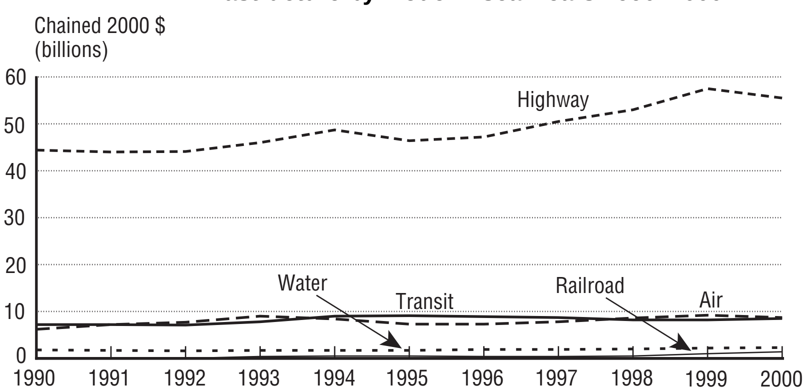


FIGURE 14-7 Gross Government Investment in Transportation Infrastructure by Mode: Fiscal Years 1990–2000



NOTES: Investment in transportation infrastructure constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. *Investment in rolling stock* data consist of government outlays for motor vehicles only, because data for other rolling stock (e.g., aircraft, vessels, and boats) are not available. State and local transportation investment data are not available separately.
Current dollar amounts (see tables 14-5b, 14-6b, and 14-7b in appendix B) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Investment: Concepts, Data, and Analysis," draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, "Value of Construction Put in Place Statistics," Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

Transportation Sector Energy Use

The transportation sector used 17 percent more energy in 2003 than it did in 1993, an average annual growth rate of 1.6 percent. Transportation's share of the nation's total energy consumption also grew between 1993 and 2003, from 26 percent to 27 percent (figure 15-1).

Still, transportation energy use has grown more slowly than Gross Domestic Product (GDP). As a result, the amount of transportation energy used per dollar of GDP[1] declined at the average annual rate of 1.9 percent between 1993 and 2003 (figure 15-2).

Over 97 percent of all transportation energy consumed in 2002 came from petroleum [1]. Total U.S. petroleum usage increased 15 percent between 1992 and 2002, with transportation responsible for 84 percent of that rise. In 2002, transportation consumed 67 percent of all petroleum, up from 64 percent in 1992 (figure 15-3). Because over half of U.S. petroleum is imported, the United States, and especially the transportation sector, may be vulnerable to supply disruptions with fuel price fluctuations having the potential to contribute to economic instability.

Source

1. U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review,* table 2.5, available at http://www.eia.doe.gov/mer/, as of February 2004.

[1] GDP is in chained 2000 dollars.

FIGURE 15-1 U.S. Energy Consumption by Sector: 1993–2003

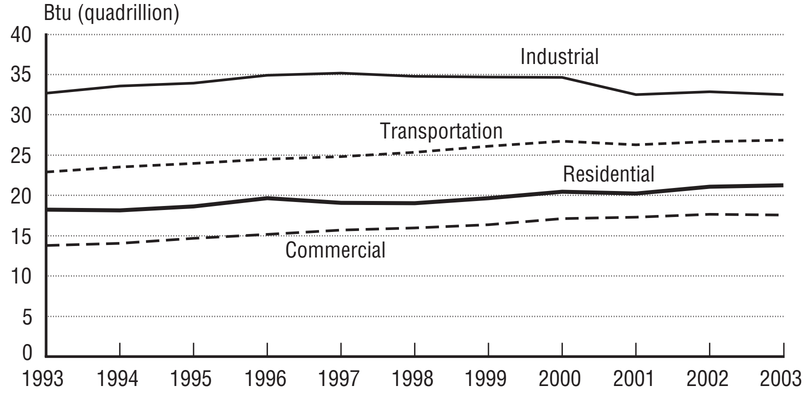


FIGURE 15-2 Transportation Sector Energy Use and Gross Domestic Product: 1993–2003

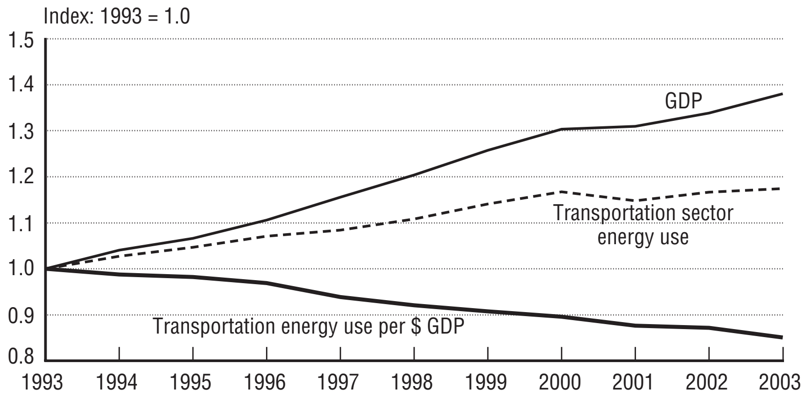
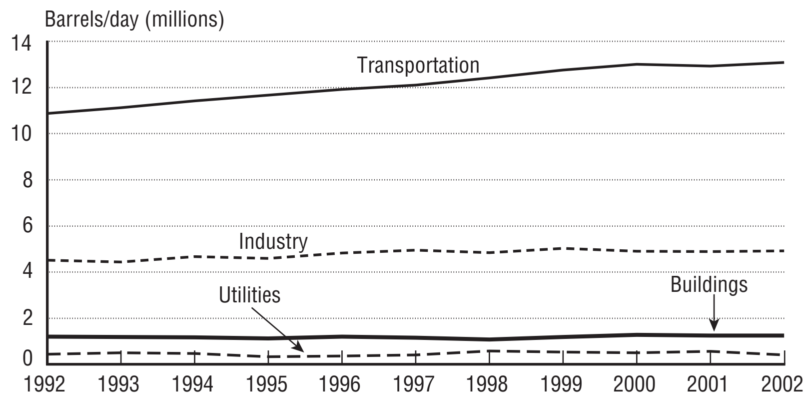


FIGURE 15-3 U.S. Petroleum Use by Sector: 1992–2002



KEY: Btu = British thermal units; GDP = Gross Domestic Product—GDP is shown in terms of 2000 chained dollars.

NOTE: Figure 15-3—2002 data are estimates, except for utilities, which are preliminary.

SOURCES: Figures 15-1 and 15-2—U.S. Department of Energy (USDOE), Energy Information Administration (EIA), *Monthly Energy Review,* table 2.1, available at http://www.eia.doe.gov/mer/consump.html, as of June 2004. **Figure 15-3—**USDOE, EIA, *Annual Energy Review 2002,* table 5.12, available at http://www.eia.doe.gov/aer, as of November 2003. **GDP—**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Account tables, available at http://www.bea.gov/bea/dn/nipaweb/TableView.asp#Mid, as of June 2004.

Transportation Energy Prices

Transportation fuel prices (in chained 2000 dollars[1]) experienced short-term flucuations between 1993 and 2003 (figure 15-4). For instance, the average price of motor fuel (all types of gasoline) decreased 14 percent in 1998, to $1.16 per gallon from $1.35 per gallon in 1997. Gasoline prices then jumped 34 percent, to $1.56 per gallon in 2000, dipped in 2001 and 2002, and rose again in 2003 to $1.55.

Other fuels, such as aviation fuels and diesel used by railroads, underwent similar price fluctuations. Fuel prices decreased slightly in 2001 and again in 2002 but then rose in 2003. The average diesel price increased 22 percent between 2002 and 2003, slightly more than the price of jet fuel at 19 percent. Among transportation fuels, the average motor gasoline price grew the least (12 percent) between 2002 and 2003.

Transportation fuel prices are correlated with the world price of crude oil, because crude oil represents a large percentage of the final price of transportation fuel. This correlation can be seen in the price trends from 1993 to 2003 for crude oil and various transportation fuels. However, average crude oil prices started to rise in 2002 (4 percent over 2001), while fuel prices were still dropping, and increased again in 2003 (16 percent).

While prices of transportation fuels fluctuate over time, domestic travel does not appear to be affected. For instance, between 1993 and 2002,[2] highway vehicle-miles of travel per capita rose at an annual average rate of 1.1 percent or 12 percent over the entire period (figure 15-5). During the same time, aircraft-miles of travel per capita for large carriers increased 2.0 percent on an annual average basis or 22 percent overall (figure 15-6).

Transportation fuel prices can affect overall consumer transportation prices. As measured by the Consumer Price Index, between 1993 and 2003, motor fuel prices and transportation prices increased at about the same average annual rate (2.1 percent and 1.9 percent, respectively). This inflation rate for transportation was lower than average annual inflation for all goods and services (2.5 percent) [1]. In fact, transportation-related consumer prices increased less than all other major spending categories except apparel, which decreased 1.0 percent from 1993 to 2003.

Sources

1. U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index, available at http://www.bls.gov, as of June 2004.

[1] All dollar amounts are expressed in chained 2000 dollars, unless otherwise specified. Current dollar amounts (which are available in appendix B of this report) were adjusted to eliminate the effects of inflation over time.

[2] At the time this report was prepared, data for vehicle-miles of travel and aircraft-miles of travel were only available through 2002.

FIGURE 15-4 Average Transportation Fuel Prices by Type: 1993–2003

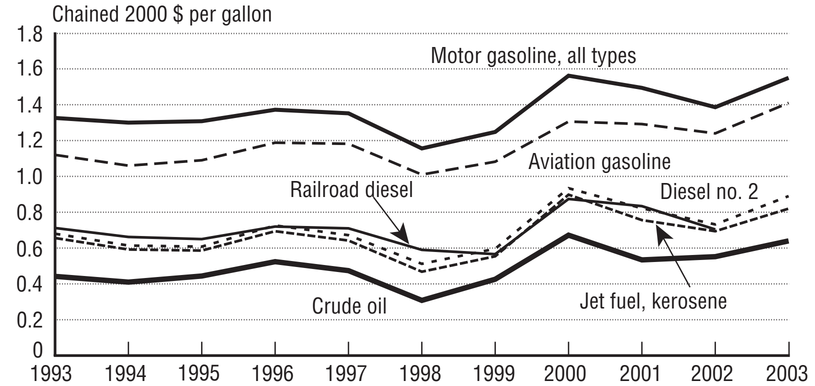


FIGURE 15-5 Average Motor Gasoline Prices and Highway Vehicle-Miles of Travel per Capita: 1993–2003

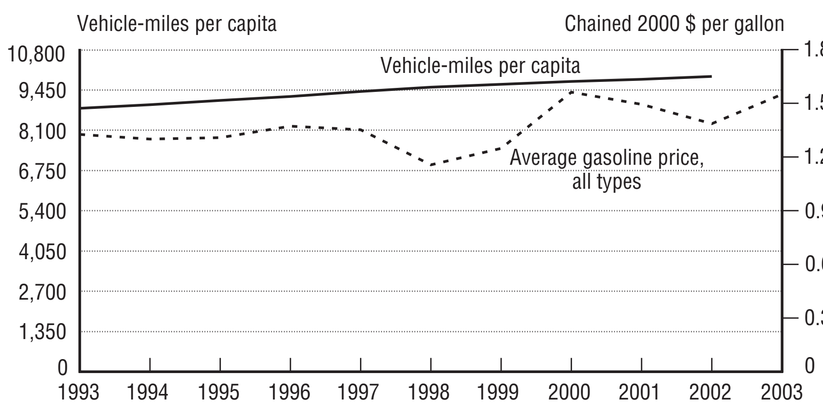
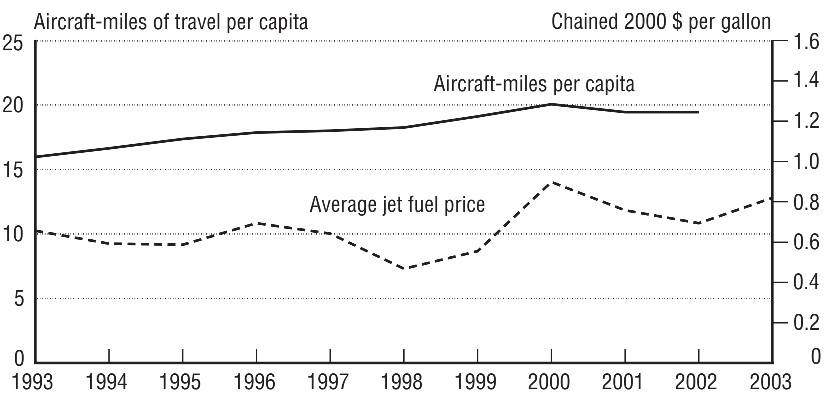


FIGURE 15-6 Average Jet Fuel Price and Aircraft-Miles of Travel per Capita: 1993–2003



NOTES: Railroad diesel fuel price and highway vehicle- and aircraft-miles of travel data were not available for 2003 when this report was prepared. Current dollars (available in table 15-4b in appendix B) were converted to 2000 chained dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: Except railroad diesel—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review,* tables 9.1 (crude oil), 9.4 (motor gasoline), and 9.7 (aviation, jet, and diesel no. 2), available at http://www.eia.doe.gov/mer/prices.html, as of May 2004. **Railroad diesel**—Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 61. **Vehicle- and aircraft-miles of travel per capita**—calculated using data from U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003,* table 1-32, available only at http://www.bts.gov, as of May 2004. U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract 2003,* Mini Historical Statistics, available at http://www.census.gov/statab/www/minihs.html, as of May 2004.

Transportation Energy Efficiency

Passenger travel was 1.0 percent more energy efficient in 2001 than in 1991. During the same period, however, freight energy efficiency declined by 5.4 percent[1] [1, 2].

Improvements in domestic commercial aviation are the primary reason for the gains in passenger travel efficiency (figure 15-7). For instance, improved aircraft fuel economy and increased passenger loads resulted in a 26 percent increase in commercial air passenger energy efficiency between 1991 and 2001. Domestic commercial air pmt rose 44 percent during this same period, while energy consumption grew only 14 percent [2].

Highway passenger travel—by passenger cars, motorcycles, and light trucks[2]—represented 86 percent of all pmt and 91 percent of passenger travel energy use in 2001. Overall, highway travel was 1.0 percent less efficient in 2001 compared with 1991. This loss was due to a 4.3 percent decrease in the efficiency of light trucks. For the period 1991 to 2001, light truck pmt increased 34 percent, while energy use rose 39 percent. On an annual average basis, the decline in light truck energy efficiency is due to a 2.9 percent rise in pmt coupled with a faster average annual increase of 3.4 percent in energy consumption during this period. Meanwhile, passenger car pmt rose 17 percent and motorcycle pmt declined 10 percent. Total highway passenger pmt grew 22 percent [2].

The decline in freight energy efficiency between 1991 and 2001 resulted from a 1.8 percent average annual growth rate of ton-miles paired with a 2.4 percent average annual growth rate in freight energy consumption (figure 15-8). Contributing to this trend was a decline in the energy efficiency of freight trucks (–1.8 percent), pipelines (–4.0 percent), and waterborne transportation (–13 percent). However, during the same period, rail and air freight energy efficiency increased by 13 percent and 9 percent, respectively [2].

Sources

1. American Public Transportation Association, *Public Transportation Fact Book 2003* (Washington, DC: 2003), tables 33 and 35.
2. U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003,* calculations based on tables 1-34, 1-44, 4-6, and 4-8, available at http://www.bts.gov, as of March 2004.

[1] Passenger energy efficiency is measured in passenger-miles of travel (pmt) per British thermal unit (Btu). Freight energy efficiency is ton-miles per Btu.

[2] Light trucks include minivans, pickup trucks, and sport utility vehicles.

FIGURE 15-7 Passenger-Miles of Travel, Energy Consumption, and Energy Efficiency Index: 1991–2001

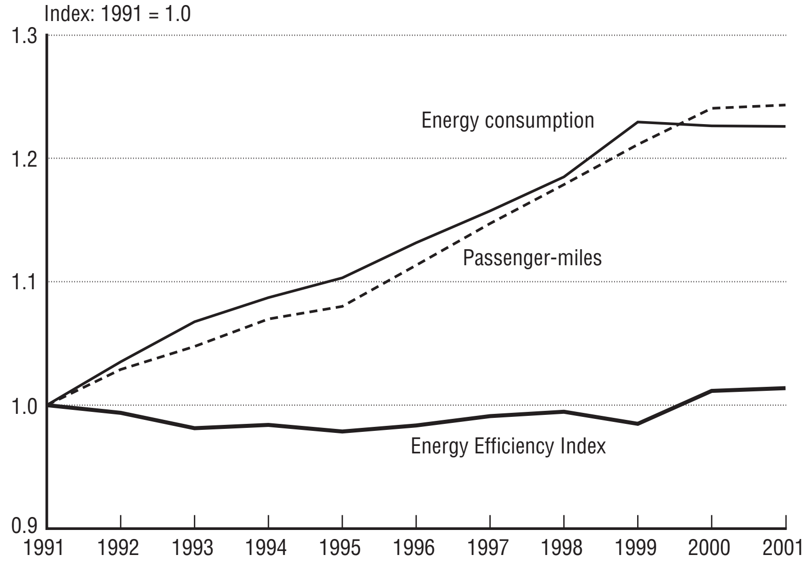
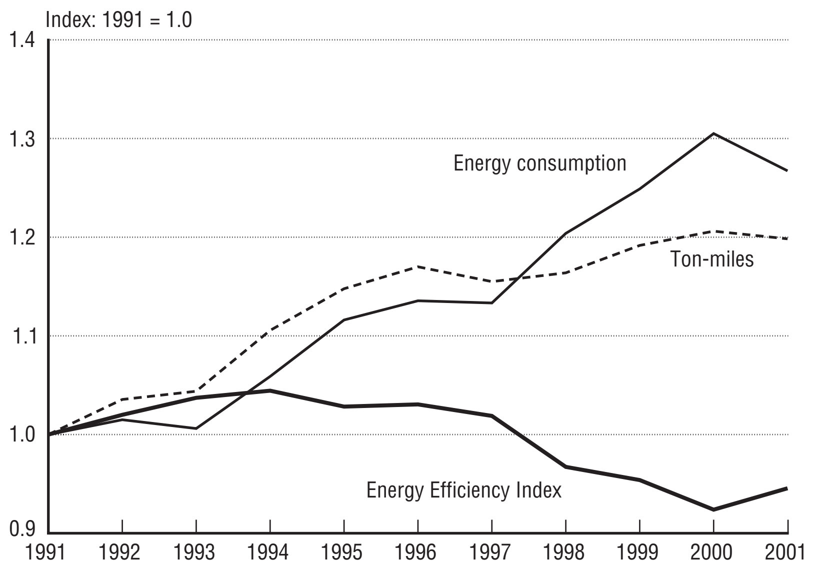


FIGURE 15-8 Freight Ton-Miles, Energy Consumption, and Energy Efficiency Index: 1991–2001



NOTE: For detailed information on data used here, see tables 15-7 and 15-8 in appendix B.

SOURCES: Passenger-miles of travel, ton-miles, and energy use (except transit)— U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003,* tables 1-34, 1-44, 4-6, and 4-8, available at http://www.bts.gov/, as of March 2004. **Transit energy use—**American Public Transportation Association, *Public Transportation Fact Book 2003* (Washington, DC: 2003), tables 33 and 35.

Chapter 3

State of Transportation Statistics

State of Transportation Statistics

Data collection, compilations, and analyses by the Bureau of Transportation Statistics (BTS) of the U.S. Department of Transportation (DOT) focus on five core transportation data areas: freight, passenger travel, air transportation, economic, and geospatial. The previous edition of *Transportation Statistics Annual Report* (TSAR)[1] presented an overview of why these data are important to the transportation community, reviewed the existing data, and presented possible options for filling crucial data gaps. This edition of TSAR expands on that presentation by providing information on how BTS programs and projects are filling data gaps and improving the state of transportation statistics in other ways.

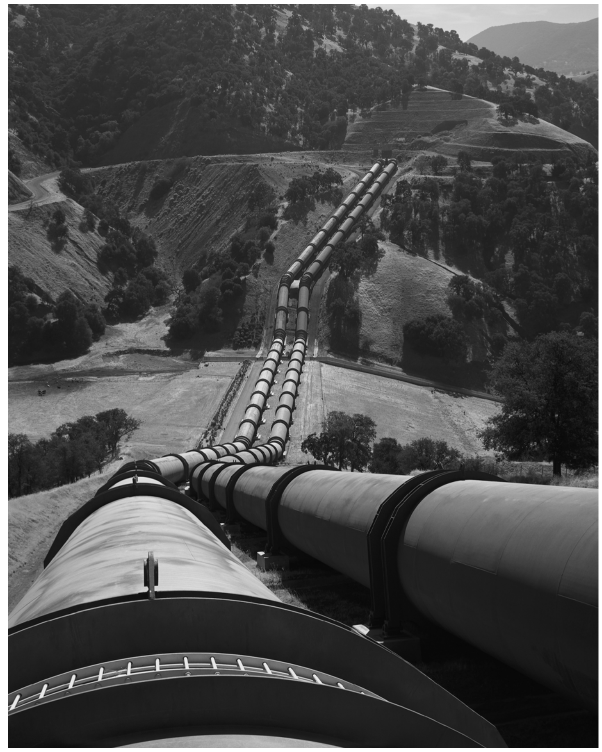
IMPROVING THE KNOWLEDGE BASE FOR FREIGHT PLANNING

Changes in freight transportation reflect the dynamic nature of national and global economies, growth in domestic and international trade, and continuing improvements and innovations in technology. Alterations in the mix of manufactured products, shifts in global production and trade patterns, and growing domestic demands from industry and consumers all affect freight transportation and related data needs. Meeting these needs can be challenging for data providers. The Transportation Research Board (TRB) in 2003 reaffirmed the importance of freight data for guiding decisions on infrastructure investments and policymaking affecting both the public and private sector [2]. TRB found several shortcomings in the current freight data system and recommended that DOT, with the assistance of BTS, develop a national freight data framework.

[1] Released in October 2003.

The **Commodity Flow Survey** (CFS), conducted by the U.S. Census Bureau for BTS, is the most extensive, long-running national survey of domestic freight activity. After a 15-year hiatus, CFS data collections began again in 1993, after BTS was created, and were repeated in 1997 and 2002. BTS and the Census Bureau released preliminary data from the 2002 CFS in December 2003; data were made available to users on the BTS website. Although the CFS is the most comprehensive multimodal source of national freight data, it does not cover all freight shipping industries and excludes most imports. For the near future, BTS is considering a number of ways to enhance freight data, such as conducting small surveys of sectors not covered by the CFS and seeking ways to obtain data directly from carriers. To provide more detail, BTS is also considering increasing the sample size of the CFS. In the meantime, BTS has augmented CFS national totals by adding supplemental freight data from other sources. BTS published *Freight Shipments in America: Preliminary Highlights from the 2002 Commodity Flow Survey* in April 2004 with combined CFS and supplemental data [7]. (See "Commercial Freight Activity" in chapter 2, section 2.)

The changing needs of policymakers, the freight industry, transportation planners, and others have converged on the necessity of finding new approaches for collecting, analyzing, and disseminating freight transportation data. Accordingly, BTS is planning a **National Freight Data Program** to expand coverage and increase collection frequency of freight flow data and integrate information collected from a variety of sources, such as the CFS, other targeted surveys, and intelligent transportation system data; provide new data access tools and models; and release periodic reports and special products.

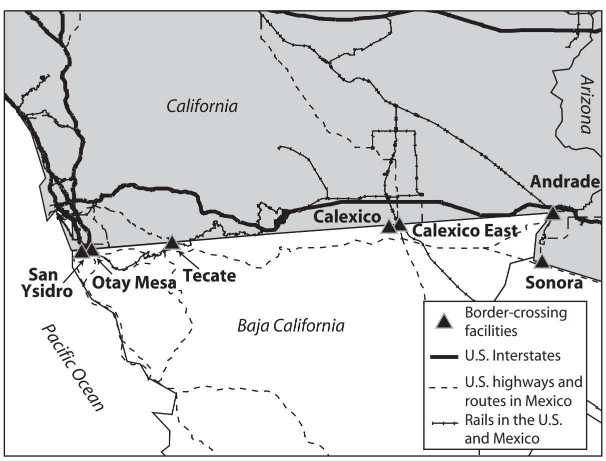


Tracking Freight and International Trade

International freight flows data are important not only for tracking the growth of imports and exports but also for assessing the domestic transportation requirements and impacts of trade. In January 2004, BTS released a preliminary report, "International Trade Traffic Study." This report, on domestic highway movements associated with international trade, was prepared in response to section 5115 of the *Transportation Equity Act for the 21st Century*. Using CFS and other freight data, BTS found that imported goods and goods headed for export carried on domestic highways in 1997 totaled nearly 227 billion ton-miles. After a committee of the National Academy of Sciences concurred with the report's major findings, BTS transmitted the final report to Congress in May 2004.

Canada and Mexico are not only the United States' trading partners under the North American Free Trade Agreement but also its two largest trading partners worldwide. Two BTS data programs provide detailed information on this trade and vehicle passage across U.S. borders. **Border Crossing Data** counts incoming vehicles, containers, passengers, and pedestrians at land gateways on the U.S.-Canadian and U.S.-Mexican borders. BTS obtains the original data from the Bureau of Customs and Border Protection (CBP) of the Department of Homeland Security (DHS). The data have been disseminated since 1994; annual data are available on the BTS website and monthly data can be requested from BTS by telephone or email.

U.S.-Mexico Border Crossing Facilities



Trade corridor studies, transportation infrastructure planning, marketing, and logistics analysis require mode-specific trade data. The **Transborder Freight Data** program has been making such data available on a monthly basis since April 1993 for surface modes, such as rail, truck, and pipeline. Included are merchandise trade data by commodity type and by mode with geographic detail for U.S. exports to and imports from Canada and Mexico. BTS is expanding the program's coverage in 2004 to include trade with Canada and Mexico involving air and water modes. BTS derives the transborder freight data from official U.S. international merchandise import and export trade data collected by CBP and provided to BTS by the U.S. Census Bureau.

In the longer term, with expected continued growth in international trade, timely and complete data on modes and commodities associated with this trade will be critical. Several federal agencies are working to put in place the **International Trade Data System** (ITDS) aimed at accelerating the phase-in of electronically filed trade documents, thus allowing much more rapid processing of trade data than is now possible. BTS is working with other DOT operating administrations and the ITDS managers at CBP to ensure that this new data system includes transportation-related data. The development of ITDS is expected to take many years, but initial data on truck manifests is scheduled to be provided to DOT's Federal Motor Carrier Safety Administration in late 2004.

UNDERSTANDING PEOPLE'S ATTITUDES, OPINIONS, AND USE OF THE TRANSPORTATION SYSTEM

Knowing how, why, when, and where people in the United States travel is one of the most basic data needs of transportation policymakers, planners, and others. While the federal government has long been collecting these types of data, two BTS surveys have been instrumental in providing comprehensive datasets on a periodic basis for a number of years.

Most recently, data were collected by BTS and the Federal Highway Administration (FHWA) in the **2001 National Household Travel Survey** (2001 NHTS). These new data will help us understand how people use the transportation system for local and long-distance travel. In this new survey, specific questions were added to capture biking and walking trips—trips thought to be underrepresented in prior surveys. The definition of long-distance travel was expanded to include one-way trips as short as 50 miles and trips made for the purpose of commuting to work from more distant locations. The survey also introduced the first look at the daily travel characteristics of children under five years of age.

In addition to making 2001 NHTS data available online and on CDs, BTS and FHWA have produced various analyses of the survey data. An overview, *NHTS: Highlights of the 2001 National Household Travel Survey,* provides background on the survey itself, details the household characteristics captured, and summarizes the results of daily and long-distance travel [9]. In the *America on the Go* series, BTS focused on specific issues, such as holiday and business travel [3, 4]. (See chapter 2, section 5 for 2001 NHTS data and analyses.)

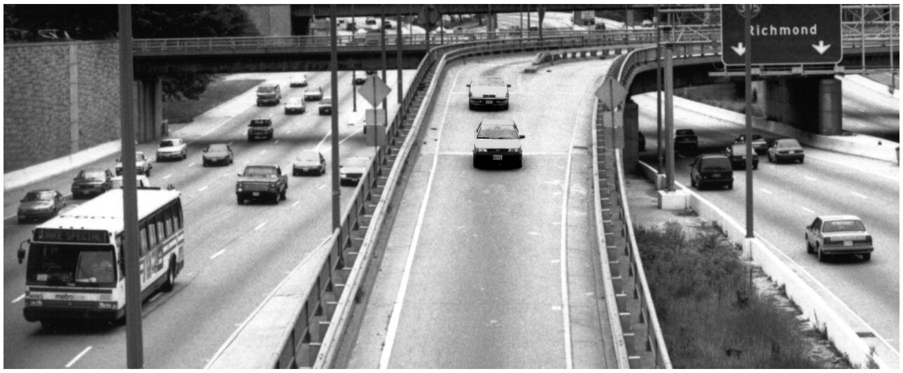
For three years, BTS conducted the **Omnibus Survey** on a regular basis to ascertain people's usage of the country's transportation system. Data were also gathered on what people think about the system and to gauge public satisfaction with government programs. Surveys were often conducted with the cooperation of DOT operating administrations. The wealth of data collected by Omnibus Surveys resides on the BTS website, available for use by policymakers and planners at national, state, and local levels. On the website under the title *OmniStats,* BTS has published analyses of Omnibus data. These short reports cover topics such as airline passengers' views of airport security screening; walking, bicycling, and recreational boating frequencies; commuting trends; and congestion experiences. (See "Survey Data on Congestion Delays" in chapter 2, section 3.)

SUPPORTING STATE AND LOCAL TRANSPORTATION PLANNING

Across the nation, metropolitan planning organizations (MPOs) are responsible for ensuring that transportation planning meets the needs of their communities and the people who live in them. National data are only partially useful within this context. A number of efforts to provide more detailed data are underway.

How people get from home to work and back and how these patterns change over time is essential data for transportation planners at the state and local level. With each decennial census, the U.S. Census Bureau collects this "journey-to-work" (JTW) data. Most importantly for local purposes, the data can be aggregated at a transportation analysis zone (TAZ) level.[2] Since 1960, various government

[2] A TAZ is similar in size to block groups but is specifically designed to fit local planning needs and is defined by individual MPOs for tabulating transportation statistics from the census.



entities and associations have cooperated to pay for and disseminate special tabulations of JTW decennial data. BTS provides statistical quality assurance staffing for a JTW project team. The team released county and state profiles of the **Census Transportation Planning Package 2000** (CTPP 2000) in October 2002, containing selected transportation-related data items from the 2000 and 1990 censuses.[3] A programming format version of final CTPP 2000 Part I data was released in February 2004 containing tabulations for residence geography. Similar place-of-work data (Part 2) and JTW flow tables (Part 3) were expected in summer 2004.[4] BTS is responsible for distribution of CTPP data to the general public and responds to technical queries. In addition, BTS plans to develop a geographic information system (GIS) web-based access tool to give users of CTPP 2000 data mapping capability through its TranStats website.

A more robust provision of JTW data may arise from a **Longitudinal Employer-Household Dynamics** (LEHD)[5] pilot program, initiated by the U.S. Census Bureau. The aim of this program is to demonstrate the potential for linking existing economic administrative records with survey demographic data. BTS is participating in the pilot by conducting research to develop detailed origin and destination tables. This research effort will combine information about U.S. workers (place of residence, employment, and income) and employers (location, type of business, number of employees, and payroll). Once available, these data will illustrate the travel flow of workers to places of employment. It is anticipated that LEHD data will provide greater geographic specificity than has been available in the past and will lead to the ability to derive enhanced travel demand patterns for use by transportation researchers, planners, and engineers.

While the **2001 National Household Travel Survey** (see above) was primarily a national sample, an additional 40,000 households were surveyed in 9 jurisdictions. Four of these were the urban areas of Baltimore, Maryland; Des Moines, Iowa; Lancaster, Pennsylvania; and Oahu, Hawaii. The other five jurisdictions were the states of Hawaii, New York, Texas, and Wisconsin and four counties in Kentucky. The costs of these additional surveys were borne by the individual jurisdictions. The local and state data generated, which include all of the components of the national sample, will not only assist planners in these jurisdictions directly but also provide valuable insights at the national level.

[3] See http://www.bts.gov/pdc/index.html, as of July 2004, to view or download this product.

[4] See U.S. Department of Transportation, Federal Highway Administration, http://www.fhwa.dot.gov/ctpp/dataprod.htm for further information on releases.

[5] This pilot program is also known as Longitudinal Employer Dynamics (LED).

CONNECTING TRANSPORTATION TO PEOPLE'S NEEDS

Some transportation modes can be underrepresented in major surveys. Some groups, such as the elderly and disabled, have special needs. Other people may reside in areas not well served by public transportation. BTS has augmented data on these and other special transportation issues with more specific surveys and studies.

With the National Highway Traffic Safety Administration, BTS conducted a separate survey in 2002 to better understand the scope and magnitude of bicycle and pedestrian activity and the public's behavior and attitudes regarding bicycling and walking. According to responses to the **National Survey of Pedestrian & Bicyclist Attitudes and Behaviors,** approximately 57 million persons aged 16 or older rode a bicycle during the summer of 2002 [11]. During this period, 8 out of 10 of the people in this age group (79 percent) walked, ran, or jogged for 5 minutes or more at least once. The survey data can be useful in a number of ways, such as analyzing the links between walking and bicycling and infrastructure and how perceptions of walkers and nonwalkers differ. (See "Daily Travel by Walking and Bicycling" in chapter 2, section 2.)

With its **2002 National Transportation Availability and Use Survey,** BTS sought data on people with and without disabilities to help transportation policymakers and planners create systems that serve everyone equally. Both those with and without disabilities reported similar difficulties in using the transportation system: bus and airline schedules not being kept, inadequate seating on subways and airplanes, and insensitive drivers encountered while walking or biking. However, 12 percent of people with disabilities have difficulty getting the transportation they need, compared with 3

percent of persons without disabilities. About 528,000 disabled people never leave home because of transportation difficulties [5].

The reduction in air services after September 11, 2001, amid an ongoing gradual decrease in rural services by other modes, has raised questions about the mobility of the country's 82 million rural residents. To quantify the availability of air, rail, and intercity bus services for this population group, BTS conducted a **Rural Access to Transportation** GIS analysis in January 2003. This study plotted each of the nation's intercity bus stations, rail stations, and commercial airports. It defined rural populations residing within a 25-mile radius of bus and rail stations and smaller airports as having reasonable access to these modes of intercity transportation. For medium and large hub airports the study used a wider 75-mile coverage radius. The study's use of GIS techniques enabled BTS to show that nearly 78 million rural residents (94 percent) are within the coverage radius of at least one intercity transportation facility. The study is covered comprehensively, in a report, *Scheduled Intercity Transportation: Rural Service Areas in the United States* [8]. Both maps depicting the research findings and the report are available

on the BTS website. (See "Scheduled Intercity Transportation in Rural America" in chapter 2, section 5.)

UNDERSTANDING THE TRANSPORTATION INDUSTRY

Transportation, a major U.S. industry, is multifaceted. Carriers in the for-hire transportation industry are in the business of transporting people and goods. Other firms, such as many large retailers and grocers, use their own fleets of trucks or other vehicles to transport goods and people. Mode-specific data can be key to understanding transportation industry trends, but most data collected generally apply only to the for-hire component. Detailed modal data arising from business operations were once commonly reported to government regulatory agencies by carriers. With deregulation in the 1970s and 1980s, many of these reporting requirements were eased or eliminated, although some aspects, such as safety reporting, continued to be extensive.

Reporting on financial and operating conditions does continue for some modes. Air carriers report monthly and quarterly data for a number of measures and activities to BTS. These data include **Airline Financial and Operating Statistics** for both passenger and freight components of the industry and are useful in benchmarking, investment planning, competitive analyses, and for other purposes. BTS prepares quarterly reports on domestic airline financial data such as operating profit/loss margins, unit revenue and costs, and revenue yield by both individual airline and airline groupings. In addition, BTS collects and makes available data on airline on-time performance. In 2003, BTS began reporting data on the causes of flight delays. All of these data and reports are available on the BTS website.

Trucking firms transported 66 percent of freight tonnage nationwide in 2002.[6] Financial and operating data reported to the government by these firms, however, is far less extensive than that of the air industry, since less than 5 percent of the country's motor carriers report **Motor Carrier Financial and Operating Statistics** data to BTS. Reporting frequency of Class I and Class II trucking and bus companies varies depending on a firm's category and size.[7] Policymakers, academics, and the industry itself use these data for benchmarking and competitive and other types of analyses. After verification and quality control, BTS makes the nonconfidential motor carrier data available to the public through its website and *TranStats*

[6] These are preliminary data from the 2002 CFS, as discussed earlier. Trucks contributed 41 percent of all ton-miles in 2002 as well as 73 percent of the value of commodities.

[7] See http://www.bts.gov/mcs/desc.html/, for more details.

database. BTS has produced annual reports covering data from 1994 through 2001; selected quarterly earnings data reports are available for 1995 through 2001.[8]

LINKING TRANSPORTATION AND THE ECONOMY

Transportation's contribution to the U.S. economy can be measured in a number of ways, including:

- For-hire transportation industry Gross Domestic Product (GDP)—the value added to GDP by this sector of the economy.
- For-hire GDP plus in-house transportation services GDP—the latter is the value added to GDP by firms that operate their own, internal transportation services.
- Transportation final demand—the value of transportation-related goods and services (not necessarily produced by the transportation industry) sold to consumers and government, such as cars and gasoline, and transportation equipment purchased by industries as investment.
- Transportation-related GDP—the value added by transportation services, as well as the value added by various intermediate inputs to transportation, such as diesel fuel, trucks, and business services.
- Transportation-driven GDP—adds to transportation-related GDP more distant inputs down the production chain, such as the steel and glass that are used to make vehicles.

On a value-added basis, about 3.2 percent of the economy is produced by firms in the for-hire transportation industry, such as trucking, railroads, and waterborne shipping. In-house trucking services contribute another 1 percent or more.[9] (See "Transportation and Economic Growth," section 13 of chapter 2.)

After a development period of three years, BTS released the **Transportation Services Index** (TSI) in March 2004. The TSI is a monthly, seasonally adjusted measure of the volume of services performed by the for-hire transportation sector. The index, with a base year of 1996, covers the activities of for-hire freight carriers, for-hire passenger carriers, and a combination of the two since 1990. Still an experimental index, BTS continues to make refinements in data and methodologies while releasing online updates monthly.

The TSI shows the increases or decreases in the output of transportation services from month to month, using ton-mile or passenger-mile data where available monthly, or proxies (e.g., tonnage or passengers) when not. Useful in itself as an indicator of overall freight and passenger industry activity, the movement of the index over time also can be compared with other economic measures to understand

[8] See http://www.bts.gov/mcs/prod.html for report availability, as of July 2004.

[9] BTS and the Bureau of Economic Analysis of the Commerce Department found that in-house trucking in 1996, the last year for which this number is available, contributed 1.6 percent of GDP to the economy.

the relationship of transportation to long-term changes in the economy. (See “Transportation Services Index” in chapter 2, section 13.)

Work underway at BTS on **Transportation Satellite Accounts** will determine the full contribution of transportation to the economy. Current Bureau of Economic Analysis (BEA) data on transportation services only cover for-hire transportation. BTS’s aim is to fill the gaps in knowledge of in-house transportation services. These services include, for instance, private fleets of trucks used by grocery firms to carry products from their warehouses to their stores. BTS previously published 1992 and 1996 data on in-house trucking and bus transportation.[10] Work underway will produce 1997 data on rail, air, water, and private car transportation and a methodology to enable annual updating capabilities.

A comprehensive set of modal **Capital Stock** data would enable policymakers and others to, for instance, better estimate the amount of investment needed to accommodate current or future levels of traffic and would improve modal productivity measures. While BEA compiles transportation capital stock data, they pertain mostly to that owned by the private sector. The exception is data on the dollar value of public highways and streets. BTS is developing values for publicly owned airport and airway capital stocks, waterways, and transit systems. Capital stock is a commonly used economic measure of the capacity of the transportation system. It combines the capabilities of modes, components, and owners into a single measure of capacity in dollar value. This measure takes into account both the quantity

of each component (through initial investment) and its condition (through depreciation and retirements). (See “Transportation Capital Stock” in chapter 2, section 11.)

Productivity measures are critical to assessing how effectively the nation is enhancing the performance of its transportation system. Labor productivity—a commonly used measure—is based on a single factor, such as output per labor hour. **Multifactor Productivity** (MFP) provides a more comprehensive view of productivity. One MFP methodology, for instance, employs growth rates of inputs weighted by their income shares. The Bureau of Labor Statistics (BLS) currently produces MFP data for the railroad and air transportation industries. BTS is developing the methodology for and anticipating the production of MFP data for other transportation industries. Trucking MFP data will be the first product of this new dataset. (See “Labor Productivity in Transportation” and “Multifactor Productivity” in chapter 2, section 1.)

[10] The 1996 data and analysis were presented in *Transportation Statistics Annual Report 2000,* pp. 142–143, available at http://www.bts.gov.

IMPROVING THE NATION'S PRICE INDEXES

While data on the costs of travel by various modes are available, it is not always possible to do relevant comparisons because of the variety of different measurements in use. BTS, in collaboration with BLS, has developed a new method of computing price indexes for air travel that one day might serve as a model for producing price indexes for other modes.

The **Air Travel Price Index** (ATPI) uses data from the Origin & Destination Survey through which BTS collects information on a 10 percent sample of all airline tickets purchased. BTS developed the ATPI to improve on traditional measurements that are complicated by the variety of discount fares airlines now offer directly and through the internet and by frequent flyer programs. BTS released the still-experimental ATPI data in March 2004. The agency makes available a range of datasets (by airport and category) in figure and table form on its website and allows users to create customized sets by airport. Research on the ATPI has shown that it generates different results than does the Airline Fare Index, a component of the Consumer Price Index (CPI) produced by BLS. While developing a production system, BTS plans to do quarterly updates of its research data. BTS is also working with BLS to improve the accuracy of airfare indexes overall. (See "Air Travel Price Index" in chapter 2, section 6.)

UNDERSTANDING THE RELATIONSHIP BETWEEN TRANSPORTATION AND THE ENVIRONMENT

As people travel and freight is transported, damage can occur to the human and natural environment. While much data are available on

air pollutants emitted from transportation vehicles of all kinds, less is known about other pollutants and about the direct relationship between transportation emissions and public health or the economy.

BTS is assisting the DOT Center for Climate Change and Environmental Forecasting with the GIS component of a research project to better understand the impact of climate change and variability on the U.S. transportation system in the Gulf Coast region. This multiyear research effort, which is being conducted under the auspices of the interagency Climate Change Science Program, aims to assist transportation planners in making decisions that result in a more robust and reliable transportation network.

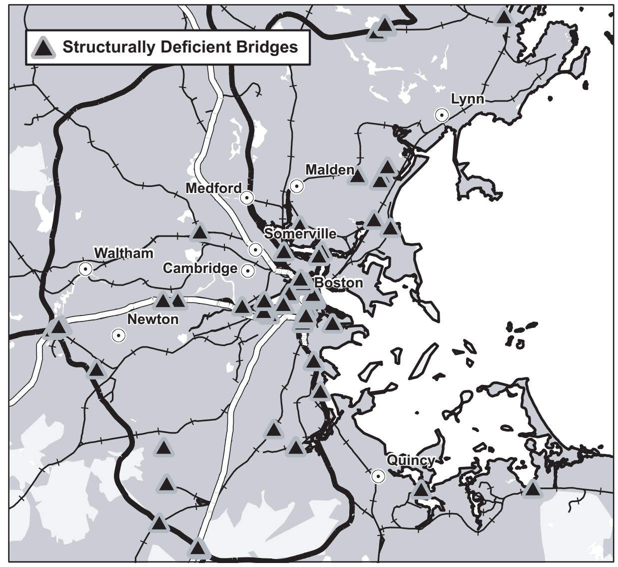
A BTS-managed project for the DOT Center for Climate Change and Environmental Forecasting will assess the feasibility of developing a measure of the **Transportation Greenhouse Gas Intensity of the Economy.** Such a measure for the U.S. economy as a whole was introduced by the Bush Administration in February 2002, setting a goal of reducing the greenhouse gas intensity of the economy by 18 percent by 2010. The study of a transportation-related measure is expected to provide data and information on the validity of various measurements, such as those based on different greenhouse gases, vehicles, and fuel types and by mode of transportation. In addition, the study will investigate the validity of an aggregate transportation measure. (See "Greenhouse Gas Emissions" in chapter 2, section 10.)

DEMONSTRATING ACCOUNTABILITY TO THE PUBLIC

Under the Government Performance and Results Act (GPRA), each federal agency must develop a performance plan and report annually on its progress. Another component of accountability is making sure that DOT programs are relevant to people who rely on them. As mentioned above, the BTS **Omnibus Survey** included questions about people's knowledge of and attitudes about DOT programs.

To assist in DOT's implementation of GPRA, BTS provides performance measurement and statistical methodology support to the Office of the Secretary of Transportation and DOT's operating administrations. Specifically, BTS helped DOT develop its verification and validation plan, write data details on the strengths and weaknesses of measures used in performance reports and plans, and build projections and estimates for indirect measures. BTS also develops improved measures and compiles aggregate DOT safety measures. The annual DOT performance plan has twice been rated in the top two of all government agencies. George Mason University's Mercatus Center emphasized DOT's transparency of information in data details in

National Bridge Inventory Data



ENHANCING THE TOOLS FOR DATA USERS

Managing raw data can be time consuming and resource intensive. Improvements in data analysis tools can reduce those costs, as well as increase the quality of the analysis. BTS has produced a number of such tools, especially using GIS technology.

The geographic relationships between freight movements and infrastructure can be displayed graphically by ***GeoFreight,*** a new tool produced by BTS, FHWA, and the Office of Intermodalism of DOT. This tool helps freight policymakers and planners identify the flows of domestic and international freight across the country and assess major freight bottlenecks in the transportation system. *GeoFreight* can display information on freight traffic flows by mode (highway, rail, and water); examine freight activity at key access points (highway-seaport, highway-airport, and highway-rail terminal); analyze origins and destinations of freight movements on highways and rail and maritime networks; and display freight volume data in relation to infrastructure, traffic delays, and trade. The tool employs data from FHWA's Freight Analysis Framework and other sources. *GeoFreight* is available on a CD; BTS provides technical assistance to users [10]. (See "Geography of Domestic Freight Flows" in chapter 2, section 2.)

Another GIS product produced by BTS, the ***National Transportation Atlas Database*** (***NTAD***),[11] is a set of nationwide geographic databases of transportation facilities, transportation networks, and associated infrastructure. Included are spatial information for transportation modal networks and intermodal terminals, as well as the related attribute information for these features. While the data are most useful at the national level, they also have major applications at the regional, state, and local levels. Each database is supported by metadata documentation, as prescribed by the Federal Geographic Data Committee. *NTAD 2004* is available from BTS in a two-disk CD set [6]; 2000 through 2003 versions are available on the BTS website.

IMPROVING THE QUALITY OF TRANSPORTATION DATA

The quality and utility of transportation data and datasets can be problematic. Data can be irrelevant to some key users, suffer from definitional issues that reduce their usefulness, be collected too infrequently, not be comparable with other relevant data, have omissions, or contain errors. Data quality reviews can uncover these problems and pose solutions. An end result of higher quality data is more accurate information for policymakers and others.

Under the BTS **Data Quality Review** program, the agency has conducted several in-depth assessments of DOT data systems, providing recommendations and suggestions for data quality improvements to data managers. Data quality assessments have included Airline Traffic and Financial data, Airline On-Time Performance data, the Hazardous Materials Information System, the safety and security module of the National Transit Database, and the Unified Shipper Enforcement Data System. The program has also provided data quality assistance to various DOT administrations, conducted statistical reviews of BTS products, and developed various data quality methods to support BTS work.

Quality can also be enhanced through the use of standards. Legislation enacted in 2000 (the so-called Information Quality Act),[12] required all federal agencies to develop Information Quality Guidelines by October 1, 2002. Using an intra-agency committee process, BTS developed the statistical portion of DOT's **Information Dissemination Quality Guidelines**. The result was a comprehensive set of guidelines that cover all aspects of the data-collection process from planning through dissemination. In May 2003, the Center for Regulatory Effectiveness, an organization working to ensure that information federal agencies disseminate to the public is of the highest quality, commended DOT on its statistical guidelines, citing their completeness and specificity. DOT's guideline document is available on the department's website.[13]

[11] *NTAD 2004* was produced by BTS in cooperation with FHWA, the Federal Aviation Administration, the Federal Transit Administration, the Federal Railroad Administration, the U.S. Census Bureau, BEA, the Army Corps of Engineers, the National Park Service, and the Military Traffic Management Command Transportation Engineering Agency.

[12] Public Law 106-554, Sec. 515, 114 Stat. 2763 (Treasury and General Government Appropriations Act of 2000).

[13] See http://dmses.dot.gov/submit/DataQualityGuidelines.pdf.

OPENING UP ACCESS TO INFORMATION: CITIZEN-CENTERED GOVERNMENT

Because people use a variety of ways to gain needed information, BTS's data collections, compilations, and analyses are available in print, on its website, and on CDs. In addition, BTS operates an interactive answer line (accessible by telephone or email) to help people determine what specific information would address their needs and where they can get it.

The BTS **TranStats** website provides downloadable data from over 100 transportation databases as well as links to many transportation datasets stored on other agency websites. Its unique features include a searchable index of the included databases; selective download into formats usable by most databases, spreadsheets, or statistical packages; online data documentation; and interactive analytical and mapping tools. This BTS-designed combination of tools and capabilities greatly simplifies the labor-intensive process of finding, gathering, compiling, and analyzing transportation data.

Many in the transportation community need quick access to compiled data. To serve this need, BTS has produced the ***National Transportation Statistics*** (NTS) report since 1993.[14] Compiled from a variety of sources, NTS now provides, in print and online versions, over 190 tables of the most frequently used transportation data. Data tables are grouped into four sections: the transportation system, safety, economy, and energy and the environment. Once an annually updated publication, NTS's online version is now updated as new data become available. Starting with the 2002 issue, BTS publishes a print version every two years. Annually, BTS produces the ***Pocket Guide to Transportation*** containing key datasets and figures.

MAKING COMPARISONS EASIER

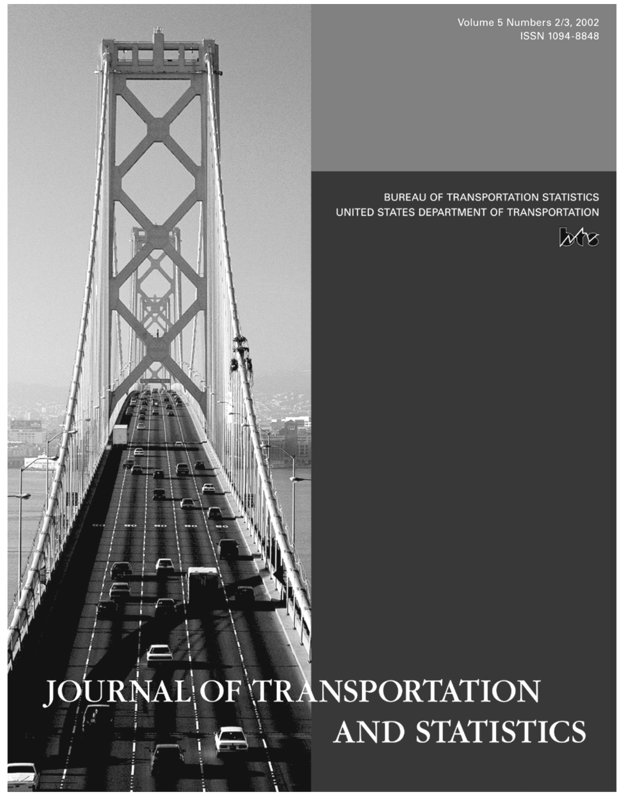
Relevance and other measures of progress are often determined by comparing results. The data collections presented in NTS provide one way comparisons can be made, especially among modes of transportation. Other comparisons, across states and internationally, have been facilitated through other BTS efforts.

Federal agencies collect much state transportation data, but its usefulness at the state level is reduced by the disaggregated nature of the various collections. Between 2001 and 2003, BTS produced a series of individual ***State Transportation Profiles*** covering all 50 states and the District of Columbia. Each profile provided—through tabular data—a picture of each state's infrastructure, freight movement and passenger travel, safety, vehicles, economy and finance, and energy and environment. The individual profiles are available in print; some are available on the BTS website or on CDs. BTS also produced *State Transportation Profile:*

[14] Previously, several issues of an NTS document were produced by the U.S. Department of Transportation itself.

Summary 2003, which updates the state data that appears in the initial series. This summary document also includes a description of the data sources used; information on data formats; federal, state, and national data sources; a glossary of terms; and contact information for each state Department of Transportation. BTS plans to update the summary data each year as a new component of NTS.

Raising the general awareness and improving the quality, relevance, and comparability of transportation data and information across North America is the mission of the **North American Transportation Statistics Interchange**. The Interchange is a collaboration between transportation and statistical agencies of the United States, Canada, and Mexico. BTS, the U.S. Census Bureau, and the U.S. Army Corp of Engineers serve as the lead U.S. agencies. Together these agencies work with Mexico's Ministry of Communications and Transport, Institute of Transportation, and National Institute of Statistics, Geography and Informatics, and with Statistics Canada and Transport Canada to provide information necessary for an efficient and fully integrated transportation system for North America. An initial, key result of the trilateral collaboration was the development of the *North American Transportation in Figures* report in 2000 [12]. An online North American Transportation Statistics Database will be made publicly available by the end of 2004.



CREATING A FORUM FOR TRANSPORTATION STATISTICAL RESEARCH

Advancing statistical methods and standards and ensuring the accuracy, reliability, and relevance of transportation data is a continuing process. It requires the sharing of the latest research among the transportation statistics research community. BTS helps to enable this process with the production and dissemination of a journal and the maintenance and operation of a digital library.

The BTS ***Journal of Transportation and Statistics*** (JTS) publishes original research focused on the statistical analysis of transportation. This peer-reviewed international journal encourages the application of advanced statistical methods to transportation problems. As such, JTS supports the work of the community of transportation statisticians—in universities, university transportation centers, research institutes, private research firms, and transportation agencies at the federal, state, and local levels—by providing them with a common venue for the publication of their research. BTS statisticians and analysts also use this flagship publication for dissemination of their advanced research on transportation and to communicate with the transportation statistics community about the statistical characteristics of new BTS datasets.

JTS presents articles that measure and analyze transportation activity and the performance of the transportation system; advance the science of acquiring, validating, managing, and disseminating transportation information; and measure and analyze how transportation interacts with the economy and how it affects the environment.

The completely digital **National Transportation Library** (NTL) provides a full range of information access services to the transportation community. The collection contains over 12,000 full-text, public research and policy documents covering a wide range of transportation topics, with a focus on USDOT and state DOT publications. NTL services also include reference and referral as well as networking. The broad outreach efforts of the NTL led to the implementation of a union catalog that provides transportation library users with information about the holdings of many regional transportation libraries. Furthermore, the NTL website links users to the Transportation Libraries Catalog (TLCat) website and an internet version of TRB's Transportation Research Information Service (TRIS Online), which gives users free access to almost half a million records of published research on all modes and disciplines in transportation.

CONCLUSION

The preceding overview shows that accomplishments and work underway are succeeding in filling critical transportation data gaps and providing useful information to the transportation community. While work will always remain to be done, through its own efforts and in collaboration with others, BTS is improving the state of transportation statistics, especially within the focused core areas of freight, passenger travel, air transportation, economic, and geospatial data.

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Appendices

Appendix A: List of Acronyms and Glossary

AAR	Association of American Railroads
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASQP	Airline Service Quality Performance
ATPI	Air Travel Price Index
ATS	American Travel Survey
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BTS	Bureau of Transportation Statistics
Btu	British thermal unit
CBP	U.S. Customs and Border Protection
CFS	Commodity Flow Survey
CO	carbon monoxide
CO_2	carbon dioxide
CPI	Consumer Price Index
CPSC	Consumer Product Safety Commission
CTPP	Census Transportation Planning Package
DHS	U.S. Department of Homeland Security
DOC	U.S. Department of Commerce
DOE	U.S. Department of Energy
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
dwt	deadweight tons
EIA	Energy Information Administration
EPA	U.S. Environmental Protection Agency
ESAL	equivalent single-axle load
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FY	fiscal year
GDP	Gross Domestic Product
GHG	greenhouse gas
GIS	geographic information systems
GPRA	Government Performance and Results Act
GVWR	gross vehicle weight rating

HMIS	Hazardous Materials Information System
ISTEA	Intermodal Surface Transportation Efficiency Act
ITDS	International Trade Data System
ITS	intelligent transportation system
JTS	*Journal of Transportation and Statistics*
JTW	journey-to-work
LED	longitudinal employer dynamics
LEHD	longitudinal employer-household dynamics
MARAD	Maritime Administration
MFP	multifactor productivity
mmtc	million metric tons of carbon
mpg	miles per gallon
mph	miles per hour
MPO	metropolitan planning organization
MSA	metropolitan statistical area
NAFTA	North American Free Trade Agreement
NAICS	North American Industry Classification System
NEI	National Emissions Inventory
NEISS	National Electronic Injury Surveillance System
NHTS	National Household Travel Survey
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen oxides
NPIAS	National Plan of Integrated Airport Systems
NTL	National Transportation Library
NTS	*National Transportation Statistics* report
NTSB	National Transportation Safety Board
OECD	Organization for Economic Cooperation and Development
OMB	Office of Management and Budget
OOS	out of service
OPEC	Organization of Petroleum Exporting Countries
PIERS	Port Import/Export Reporting Services
PM-2.5	particulate matter of 2.5 microns in diameter or smaller
PM-10	particulate matter of 10 microns in diameter or smaller
pmt	passenger-miles of travel
quads	quadrillion
ro-ro	roll-on, roll-off vessels
rpm	revenue passenger-mile
RSPA	Research and Special Programs Administration

SCTG	Standard Classification of Transported Goods
SE	standard error
SLSDC	Saint Lawrence Seaway Development Corp.
SUV	sport utility vehicle
TAZ	transportation analysis zone
TEA-21	Transportation Equity Act for the 21st Century
TEU	20-foot equivalent container unit
$TgCO_2Eq$	teragrams of carbon dioxide equivalent
TLCat	Transportation Libraries Catalog
TRB	Transportation Research Board
TRIS	Transportation Research Information Service
TSAR	*Transportation Statistics Annual Report*
TSI	Transportation Services Index
TTI	Texas Transportation Institute
USCG	U.S. Coast Guard
VIUS	Vehicle Inventory and Use Survey
vmt	vehicle-miles of travel
VOC	volatile organic compounds
WISQARS	Web-Based Injury Statistics Query and Reporting System
YPLL	years of potential life lost

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 a 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 more than $500 or resulting in the 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, including another vehicle, an object, or person (except suicides), or a derailment/left roadway.

AIR CARRIER: The commercial system of air transportation comprising large certificated air carriers, small certificated air carriers, commuter air carriers, on-demand air taxis, supplemental air carriers, and air travel clubs.

AIR 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 or reporting purposes) in an aircraft with 30 or fewer passenger seats and a payload capacity of 7,500 pounds or less. An air taxi operates on an on-demand basis and does not meet the flight schedule qualifications of a commuter air carrier (see below).

AIRPORT: A landing area regularly used by aircraft for receiving or discharging passengers or cargo.

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, this rail system was created by the Rail Passenger Service Act of 1970 (Public Law 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 bitumen 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 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.

BRITISH THERMAL UNIT (Btu): The quantity of heat needed to raise the temperature of 1 pound (approximately 1 pint) 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, including school buses, intercity buses, and transit buses.

CAR-MILE (rail): The movement of a railroad car a distance of one 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 or containers are moved with or without a waybill.

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (air carrier): A certificate issued by the U.S. 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 to conduct scheduled services interstate. These carriers may also conduct nonscheduled or charter operations. Certificated air carriers operate large aircraft (30 seats or more or a maximum load of 7,500 pounds or more) in accordance with FAR Part 121. See also Large Certificated Air Carrier.

CERTIFICATED AIRPORTS: Airports that service air carrier operations with aircraft seating more than 30 passengers.

CHAINED DOLLARS: A measure used to express real prices, defined as prices that are adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices usually reflect buying power relative to a reference year. The "chained-dollar" measure is based on the average weights of goods and services in successive pairs of years. It is "chained" because the second year in each pair, with its weights, becomes the first year of the next pair. Prior to 1996, real prices were expressed in constant dollars, a weighted measure of goods and services in a single year. See also Constant Dollars and Current Dollars.

CLASS I RAILROAD: A carrier that has an annual operating revenue of $250 million or more after applying the railroad revenue deflator formula, which is based on the Railroad Freight Price Index developed by the U.S. Department of Labor, Bureau of Labor Statistics. The formula is the current year's revenues multiplied by the 1991 average index or 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.

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.

COMBINATION TRUCK: A power unit (truck tractor) and one or more trailing units (a semi-trailer or trailer).

COMMERCIAL BUS: Any bus used to carry passengers at rates specified in tariffs; charges may be computed per passenger (as in regular route service) or per vehicle (as in charter service).

COMMERCIAL SERVICE AIRPORT: Airport receiving scheduled passenger service and having 2,500 or more enplaned passengers per year.

COMMUTER AIR CARRIER: Different definitions are used for safety purposes and for economic regulations and reporting. For safety analysis, commuter carriers are defined as air carriers operating under 14 CFR 135 that carry passengers for hire or compensation on at least five round trips per week on at least one route between two or more points according to published flight schedules, which specify the times, days of the week, and points of service. On March 20, 1997, the size of the aircraft subject to 14 CFR 135 was reduced from 30 to fewer than 10 passenger seats. (Larger aircraft are subject to the more stringent regulations of 14 CFR 121.) Helicopters carrying passengers or cargo for hire, however, are regulated under CFR 135 whatever their size. Although, in practice, most commuter air carriers operate aircraft that are regulated for safety purposes under 14 CFR 135 and most aircraft that are regulated under 14 CFR 135 are operated by commuter air carriers, this is not necessarily the case.

For economic regulations and reporting requirements, commuter air carriers are those carriers that operate aircraft of 60 or fewer seats or a maximum payload capacity of 18,000 pounds or less. These carriers hold a certificate issued under section 298C of the Federal Aviation Act of 1958, as amended.

COMMUTER RAIL (transit): Urban passenger train service for short-distance travel between a central city and adjacent suburb. Does not include rapid rail transit or light rail service.

CONSTANT DOLLARS: Dollar value adjusted for changes in the average price level by dividing a current dollar amount by a price index. See also Chained Dollars and Current Dollars.

CRASH (highway): An event that produces injury and/or property damage, involves a motor vehicle in transport, and occurs on a trafficway or while the vehicle is still in motion after running off the trafficway.

CRUDE OIL: A mixture of hydrocarbons that exists in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface-separating facilities.

CURRENT DOLLARS: Dollar value of a good or service in terms of prices current at the time the good or service is sold. See also Chained Dollars and Constant Dollars.

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, nonfixed-schedule vehicle that operates in response to calls from passengers or their agents to the transit operator or dispatcher.

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.

DOMESTIC FREIGHT (water): All waterborne commercial movement 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.

ENERGY EFFICIENCY: The ratio of energy inputs to outputs from a process, for example, miles traveled per gallon of fuel (mpg).

ENPLANED PASSENGERS (air carrier): See Revenue Passenger Enplanements.

FATAL CRASH (highway): A police-reported crash involving a motor vehicle in transport on a trafficway in which at least 1 person dies within 30 days of the crash as a result of that crash.

FATAL INJURY (air): Any injury that results in death within 30 days of the accident.

FATALITY: For purposes of statistical reporting on transportation safety, a fatality is 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 or incident (may include nontrain accidents or 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.

FERRYBOAT (transit): Vessels that carry passengers and/or vehicles over a body of water. Generally steam or diesel-powered, ferryboats 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.

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.

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 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. 2) All civil aviation activity except that of air carriers certificated in accordance with Federal Aviation Regulations, Parts 121, 123, 127, and 135. The types of aircraft used in general aviation range from corporate multi-engine jet aircraft piloted by professional crews to amateur-built single-engine piston-driven acrobatic planes to balloons and dirigibles.

GENERAL ESTIMATES SYSTEM (highway): 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 (U.S.): 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 (truck): The maximum rated capacity of a vehicle, including the weight of the base vehicle, all added equipment, driver and passengers, and all cargo.

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, 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.

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 (hazardous materials): 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 carrier/general aviation).

INJURY (gas): Described in U.S. Department of Transportation 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, among others, momentary unconsciousness, claim of injuries not obvious, limping, complaint of pain, nausea, and hysteria.

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), the Pacific Coast Waterways, the Great Lakes, and all other channels (waterways) of the United States, exclusive of Alaska, that are usable for commercial navigation.

INTERCITY CLASS I BUS: 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: A truck that carries freight beyond local areas and commercial zones.

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. Internal traffic also applies to carriage on both inland waterways and the water on the Great Lakes; carriage between offshore areas and inland waterways; and carriage occurring within the Delaware Bay, Chesapeake Bay, Puget Sound, and the San Francisco Bay, which are considered internal bodies of water rather than arms of the ocean.

INTERSTATE HIGHWAY: Limited access, divided highway of at least four lanes designated by the Federal Highway Administration as part of the Interstate System.

JET FUEL: Includes kerosene-type jet fuel (used primarily for commercial turbojet and turboprop aircraft engines) and naphtha-type jet fuel (used primarily for military turbojet and turboprop aircraft engines).

LAKEWISE OR GREAT LAKES TRAFFIC: Waterborne traffic between U.S. ports on the Great Lakes system. The Great Lakes system is treated as a separate waterways system rather than as a part of the inland system.

LARGE CERTIFICATED AIR CARRIER: 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), 3) large regionals (between $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.

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.

LOCOMOTIVE: Railroad vehicle equipped with flanged wheels for use on railroad tracks, powered directly by electricity, steam, or fossil fuel, and used to move other railroad rolling equipment.

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 Service 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 entering the United States, 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.

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.

MINOR ARTERIALS (highway): Roads linking cities and larger towns in rural areas. In urban areas, roads that link but do not penetrate neighborhoods within a community.

MOTORBUS (transit): A rubber-tired, self-propelled, manually steered bus with a fuel supply onboard the vehicle. Motorbus 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.

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).

NONSCHEDULED SERVICE (air): Revenue flights not operated as regular scheduled service, such as charter flights, and all nonrevenue flights incident to such flights.

NONSELF-PROPELLED VESSEL (water): A vessel without the means for self-propulsion. Includes dry cargo barges and tanker barges.

NONTRAIN INCIDENT: An event that results in a reportable casualty, but does not involve the movement of ontrack equipment and does not cause reportable damage above the threshold established for train accidents.

NONTRESPASSERS (rail): A person lawfully on any part of railroad property used in railroad operations or a person adjacent to railroad premises when injured as the result of railroad operations.

NONVESSEL-CASUALTY-RELATED DEATH (water): 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 (highway): Any person in or on a motor vehicle in transport. Includes the driver, passengers, and persons riding on the exterior of a motor vehicle (e.g., a skateboard rider holding onto a moving vehicle). Excludes occupants of parked cars unless they are double parked or motionless on the roadway.

OCCUPATIONAL FATALITY: Death resulting from a job-related injury.

OPERATING EXPENSES (air): Expenses incurred in the performance of air transportation, based on overall operating revenues and expenses. Does not include nonoperating income and expenses, nonrecurring items, or income taxes.

OPERATING EXPENSES (rail): Expenses of furnishing transportation services, including maintenance and depreciation of the plant used in the service.

OPERATING EXPENSES (transit): The total of all expenses associated with operation of an individual mode by a given operator. Includes distributions of "joint expenses" to individual modes and excludes "reconciling items," such as interest expenses and depreciation. Should not be confused with "vehicle operating expenses."

OPERATING EXPENSES (truck): Includes expenditures for equipment maintenance, supervision, wages, fuel, equipment rental, terminal operations, insurance, safety, and administrative and general functions.

OPERATING REVENUES (air): Revenues from the performance of air transportation and related incidental services. Includes 1) transportation revenues from the carriage of all classes of traffic in scheduled and nonscheduled services, and 2) nontransportation revenues consisting of federal subsidies (where applicable) and services related to air transportation.

OTHER FREEWAYS AND EXPRESSWAYS (highway): All urban principal arterials with limited access but not part of the Interstate system.

OTHER PRINCIPAL ARTERIALS (highway): Major streets or highways, many of multi-lane or freeway design, serving high-volume traffic corridor movements that connect major generators of travel.

OTHER RAIL REVENUE: Includes revenues from miscellaneous operations (i.e., dining- and bar-car services), income from the 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 and railway cars, not covered otherwise.

OTHER 2-AXLE 4-TIRE VEHICLES (truck): Includes vans, pickup trucks, and sport utility vehicles.

PASSENGER CAR: A motor vehicle designed primarily for carrying passengers on ordinary roads, includes convertibles, sedans, and stations wagons.

PASSENGER-MILE: 1) Air: One passenger transported 1 mile; passenger-miles for 1 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., 1 car transporting 2 passengers 4 miles results in 8 passenger-miles. 3) Transit: The total number of miles traveled by transit passengers; e.g., 1 bus transporting 5 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 were not included.

PASSENGER VESSELS (water): A vessel designed for the commercial transport of passengers.

PEDALCYCLIST: A person on a vehicle that is powered solely by pedals.

PEDESTRIAN: Any person not in or on a motor vehicle or other vehicle. Excludes people in buildings or sitting at a sidewalk cafe. The National Highway Traffic Safety Administration also uses an “other pedestrian” category to refer to pedestrians using conveyances and people in buildings. Examples of pedestrian conveyances include skateboards, nonmotorized wheelchairs, rollerskates, sleds, and transport devices used as equipment.

PERSON-MILES: An estimate of the aggregate distances traveled by all persons on a given trip based on the estimated transportation-network-miles traveled on that trip.

PERSON TRIP: A trip taken by an individual. For example, if three persons from the same household travel together, the trip is counted as one household trip and three person trips.

PERSONAL 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.

PETROLEUM (oil): A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, petroleum products, natural gas plant liquids, and nonhydrocarbon compounds blended into finished petroleum products.

PROPERTY DAMAGE (transit): The dollar amount required to repair or replace transit property (including stations, right-of-way, bus stops, and maintenance facilities) damaged during an incident.

PUBLIC ROAD: Any road under the jurisdiction of and maintained by a public authority (federal, state, county, town or township, local government, or instrumentality thereof) and open to public travel.

RAPID RAIL TRANSIT: Transit service using railcars 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.

REVENUE: Remuneration received by carriers for transportation activities.

REVENUE PASSENGER: 1) Air: Person receiving air transportation from an air carrier for which remuneration is received by the carrier. Air carrier employees or others, except ministers of religion, elderly individuals, and handicapped individuals, receiving reduced rate charges (less than the applicable tariff) are considered nonrevenue passengers. Infants, for whom a token fare is charged, are not counted as passengers. 2) Transit: Single-vehicle transit rides by initial-board (first-ride) transit passengers only. Excludes all transfer rides and all nonrevenue rides. 3) Rail: Number of one-way trips made by persons holding tickets.

REVENUE PASSENGER ENPLANEMENTS (air): The total number of passengers boarding aircraft. Includes both originating and connecting passengers.

REVENUE PASSENGER LOAD FACTOR (air): Revenue passenger-miles as a percentage of available seat-miles in revenue passenger services. The term is used to represent the proportion of aircraft seating capacity that is actually sold and utilized.

REVENUE PASSENGER-MILE: One revenue passenger transported one mile.

REVENUE PASSENGER TON-MILE (air): One ton of revenue passenger weight (including all baggage) transported one mile. The passenger weight standard for both domestic and international operations is 200 pounds.

REVENUE TON-MILE: One short ton of freight transported one mile.

REVENUE VEHICLE-MILES (transit): One vehicle (bus, trolley bus, or streetcar) traveling one 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.

ROLL ON/ROLL OFF VESSEL (water): Ships that are designed to carry wheeled containers or other wheeled cargo and use the roll on/roll off method for loading and unloading.

RURAL HIGHWAY: Any highway, road, or street that is not an urban highway.

RURAL MILEAGE (highway): Roads outside city, municipal district, or urban boundaries.

SCHEDULED SERVICE (air): Transport service operated on published flight schedules.

SCHOOL BUS: A passenger motor vehicle that is designed or used to carry more than 10 passengers, in addition to the driver, and, as determined by the Secretary of Transportation, is likely to be significantly used for the purpose of transporting pre-primary, primary, or secondary school students between home and school.

SCHOOL BUS-RELATED CRASH: Any crash in which a vehicle, regardless of body design and used as a school bus, is directly or indirectly involved, such as a crash involving school children alighting from a vehicle.

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, or 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 outlays, maintenance and traffic surfaces, administration and research, highway law enforcement and safety, and interest on debt.

SUPPLEMENTAL AIR CARRIER: An air carrier authorized to perform passenger and cargo charter services.

TANKER: An oceangoing ship designed to haul liquid bulk cargo in world trade.

TON-MILE (truck): The movement of one ton of cargo the distance of one 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 one ton of cargo the distance of one 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.

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, which can consist of many cars, the distance of one mile. A train-mile differs from a vehicle-mile, which is the movement of one car (vehicle) the distance of one 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; motorbus; trolley bus; van pools; automated guideway; and demand responsive vehicles.

TRANSSHIPMENTS: Shipments that enter or exit the United States by way of a U.S. Customs port on the northern or southern border, but whose origin or destination is a country other than Canada or Mexico.

TRESPASSER (rail): Any person whose presence on railroad property used in railroad operations is prohibited, forbidden, or unlawful.

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 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 towing or pushing ships, dumb barges, pushed-towed barges, and rafts, but not for the carriage of goods.

U.S.-FLAG CARRIER OR AMERICAN FLAG CARRIER (air): One of a class of air carriers holding a Certificate of Public Convenience and Necessity, issued by the U.S. Department of Transportation and approved by the President, authorizing scheduled operations over specified routes between the United States (and/or its territories) and one or more foreign countries.

UNLEADED GASOLINE: See Gasoline.

UNLINKED PASSENGER TRIPS (transit): The number of passengers boarding public transportation vehicles. A passenger is counted each time he/she boards a vehicle even if the boarding is part of the same journey from origin to destination.

URBAN HIGHWAY: Any road or street within the boundaries of an urban area. An urban area is an area including and adjacent to a municipality or urban place with a population of 5,000 or more. The boundaries of urban areas are fixed by state highway departments, subject to the approval of the Federal Highway Administration, for purposes of the Federal-Aid Highway Program.

VANPOOL (transit): Public-sponsored commuter service operating under prearranged schedules for previously formed groups of riders in 8- to 18-seat vehicles. Drivers are also commuters who receive little or no compensation besides the free ride.

VEHICLE MAINTENANCE (transit): All activities associated with revenue and nonrevenue (service) vehicle maintenance, including administration, inspection and maintenance, and servicing (e.g., cleaning and fueling) vehicles. In addition, it includes repairs due to vandalism or to revenue vehicle accidents.

VEHICLE-MILES (highway): Miles of travel by all types of motor vehicles as determined by the states on the basis of actual traffic counts and established estimating procedures.

VEHICLE-MILES (transit): The total number of miles traveled by transit vehicles. Commuter rail, heavy rail, and light rail report individual car-miles, rather than train-miles for vehicle-miles.

VEHICLE OPERATIONS (transit): All activities associated with transportation administration, including the control of revenue vehicle movements, scheduling, ticketing and fare collection, system security, and revenue vehicle operation.

VESSEL CASUALTY (water): An occurrence involving commercial vessels that results in 1) actual physical damage to property in excess of $25,000; 2) material damage affecting the seaworthiness or efficiency of a vessel; 3) stranding or grounding; 4) loss of life; or 5) injury causing any person to remain incapacitated for a period in excess of 72 hours, except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

VESSEL-CASUALTY-RELATED DEATH (water): 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.

Appendix B: Tables

TABLE 1-1 Change in Labor Productivity of Major Sectors: 1991–2001
Output per hour
Index: 1991 = 100.0

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Transportation	100.0	105.4	105.6	109.1	109.1	111.0	114.8	113.4	116.3	119.6	116.2
Manufacturing	100.0	105.3	107.3	110.5	114.7	118.7	123.8	129.8	136.5	142.0	144.3
Business	100.0	103.7	104.3	105.5	106.1	109.0	111.4	114.3	117.2	120.9	123.2

NOTES: Labor productivity for transportation measures quality-adjusted ton- and passenger-miles per hour. Quality adjustment corrects for differences in services and handling, e.g., the difference between flying first class and coach or differences in the handling requirements and revenue generation of high- and low-value commodities. Petroleum pipeline labor productivity is measured by output per employee.

Labor productivity for transportation is calculated by dividing an index of output by an index of employee hours. Transportation output index is a weighted average of output indexes of railroad, trucking, and air transportation. The shares of each mode in total transportation value added (Gross Domestic Product) are used as annual weighting factors. The index of transportation employee hours is computed by weighting the employee hour indexes of each mode by its share in total transportation employees. The modal output and employee hour indexes were initially estimated by the Bureau of Labor Statistics using 1987 as the base year.

SOURCES: Transportation—U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS), Office of Productivity and Technology, "Industry Productivity Database," available at http://www.bls.gov, as of October 2003; and U.S. Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product by Industry," available at http://www.bea.gov, as of October 2003. **Manufacturing and business**—USDOL, BLS, Office of Productivity and Technology, "Industry Productivity Database," available at http://www.bls.gov, as of October 2003.

TABLE 1-2 Change in Labor Productivity of the For-Hire Transportation Industries: 1991–2001
Index: 1991 = 100.0

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Railroad	100.0	109.3	113.8	117.7	122.2	130.7	132.8	135.6	142.8	153.3	163.5
Trucking, long distance	100.0	105.4	103.4	106.1	103.1	103.5	108.1	107.1	110.4	113.7	111.7
Local trucking	100.0	115.1	117.6	123.0	128.5	131.6	135.0	147.4	155.4	157.7	U
Bus carriers, Class I	100.0	101.8	105.6	96.0	106.1	102.6	120.5	101.7	130.1	108.1	U
Air	100.0	104.1	108.3	116.1	121.9	126.3	127.9	124.8	125.6	125.6	117.5
Petroleum pipeline	100.0	101.2	105.5	109.2	117.3	132.0	135.8	138.8	146.9	142.5	U

KEY: U = data are unavailable.

NOTES: No data are available for water transportation or natural gas pipelines. Data for local trucking, bus carriers, and petroleum pipeline were not available for 2001. Labor productivity for transportation measures quality-adjusted ton- and passenger-miles per hour. Quality adjustment corrects for differences in services and handling, e.g., the difference between flying first class and coach or differences in the handling requirements and revenue generation of high- and low-value commodities. Petroleum pipeline labor productivity is measured by output per employee.

Productivity measures for railroad, trucking, and air transportation are estimated based on the North American Industry Classification System (NAICS), whereas local trucking, bus, and pipeline are based on the Standard Industrial Classification. (Data beyond 2000 will not be available for the latter modes until NAICS-based data are produced.) Railroad includes line-haul railroads primarily engaged in transportation of passengers and cargo over a long distance within a rail network. Trucking comprises establishments engaged in providing long-distance general freight trucking, usually between metropolitan areas that may cross North American country borders. Air includes establishments that provide scheduled and nonscheduled air transportation of passengers and cargo using aircraft, e.g., airplanes and helicopters. Local trucking includes establishments that generally provide trucking services within a single municipality, contiguous municipalities, or a municipality and its suburban areas.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, “Industry Productivity Database,” available at http://www.bls.gov, as of October 2003; and U.S. Department of Commerce, Bureau of Economic Analysis, “Gross Domestic Product by Industry,” available at http://www.bea.gov, as of October 2003.

TABLE 1-3 Change in Multifactor Productivity: 1991–2001
Index: 1991 =100.0

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Railroad industry	100.0	106.4	109.8	112.2	118.8	123.2	123.3	122.0	125.9	U	U
Air transportation	100.0	103.6	100.5	107.0	111.3	115.5	116.8	115.7	117.8	121.3	116.2
Business sector (all industries)	100.0	102.3	102.8	103.9	104.1	105.8	107.1	108.5	109.4	111.1	109.9

KEY: U = data are unavailable.

NOTE: Rail productivity data are only available through 1999. Source data are indexes with base years of 1997 (air), 1996 (business), and 1987 (rail). BTS reindexed these data so that 1991 is the base year for all.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, available at http://www.bls.gov, as of October 2003. **Business sector—** "Most Requested Statistics." **Rail—**"Industry Multifactor Productivity Data Table by Industry, 1987–1999." **Air—**"Multifactor Productivity Data for Air Transportation."

TABLE 2-1 Passenger-Miles of Travel by Mode: 2001
Millions

	1991	2001	1991–2001 % change	2001 % of total
Air carrier	338,085	486,459	43.9	10.2
General aviation	12,100	15,900	31.4	0.3
Passenger car	2,200,260	2,574,882	17.0	54.1
Light truck	1,116,958	1,491,164	33.5	31.3
Motorcycle	11,656	10,482	–10.1	0.2
Bus	121,906	148,113	21.5	3.1
Transit, excluding bus	19,613	27,048	37.9	0.6
Amtrak	6,273	5,559	–11.4	0.1
Total	**3,828,842**	**4,759,607**	**24.3**	**100.0**

NOTES: *Transit* includes travel by heavy rail, commuter rail, light rail, ferryboat, demand responsive, and other nonbus transit vehicles. *Bus* comprises all travel by bus including intercity, transit, and school bus.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-34 revised, available at http://www.bts.gov/, as of October 2003.

TABLE 2-2a Change in Passenger-Miles of Travel by Selected Mode: 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air	1.00	1.04	1.06	1.14	1.18	1.28	1.32	1.36	1.43	1.52	1.43
Passenger car	1.00	1.00	1.01	1.02	1.04	1.06	1.09	1.12	1.13	1.16	1.17
Light truck	1.00	1.08	1.12	1.14	1.12	1.16	1.21	1.24	1.28	1.31	1.34
Bus	1.00	1.00	1.07	1.11	1.12	1.14	1.19	1.22	1.33	1.32	1.21
Transit	1.00	0.99	0.97	0.97	0.98	1.02	1.04	1.08	1.13	1.17	1.21
Amtrak	1.00	0.97	0.99	0.94	0.88	0.81	0.82	0.85	0.85	0.88	0.89

NOTES: *Transit* includes travel by motor bus, heavy rail, commuter rail, light rail, ferryboat, trolley bus, demand responsive, and other transit vehicles. *Bus* comprises all travel by bus including intercity, transit, and school bus. This results in some double counting of bus passenger-miles of travel.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-34 revised, available at http://www.bts.gov/, as of October 2003.

TABLE 2-2b Passenger-Miles of Travel by Selected Mode: 1991–2001
Millions

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air	350,185	365,564	372,130	398,199	414,688	446,652	463,112	476,362	502,457	531,329	502,359
Passenger car	2,200,260	2,208,226	2,213,281	2,249,742	2,286,887	2,337,068	2,389,065	2,463,828	2,494,870	2,544,457	2,574,882
Light truck	1,116,958	1,201,667	1,252,860	1,269,292	1,256,146	1,298,299	1,352,675	1,380,557	1,432,625	1,467,664	1,491,164
Bus	121,906	122,496	129,852	135,871	136,104	139,136	145,060	148,558	162,445	160,919	148,113
Transit	40,703	40,241	39,384	39,585	39,808	41,378	42,339	44,128	45,857	47,666	49,070
Amtrak	6,273	6,091	6,199	5,921	5,545	5,050	5,166	5,304	5,330	5,498	5,559

NOTE: *Transit* includes travel by motor bus, heavy rail, commuter rail, light rail, ferryboat, trolley bus, demand responsive, and other transit vehicles. *Bus* comprises all travel by bus including intercity, transit, and school bus. This results in some double counting of bus passenger-miles of travel.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-34 revised, available at http://www.bts.gov/, as of October 2003.

TABLE 2-3a Change in Passenger-Miles of Travel, U.S. Population, and Gross Domestic Product (GDP): 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP	1.00	1.03	1.06	1.10	1.13	1.17	1.23	1.28	1.33	1.38	1.39
U.S. resident population	1.00	1.01	1.03	1.04	1.05	1.06	1.08	1.09	1.10	1.12	1.13
GDP per capita	1.00	1.02	1.03	1.06	1.07	1.10	1.14	1.17	1.21	1.24	1.23
Total pmt	1.00	1.03	1.05	1.07	1.08	1.11	1.15	1.18	1.21	1.24	1.24

NOTE: *Total passenger-miles of travel* (pmt) excludes motorcycle pmt and results in some double counting of bus pmt.

SOURCES: GDP—Based on chained 2000 dollar data from U.S. Department of Commerce (USDOC), Bureau of Economic Analysis, National Income and Product Accounts, summary GDP table, available at http://www.bea.doc.gov/bea/dn1.htm, as of January 2004. **Population—**USDOC, U.S. Census Bureau, National Intercensal Estimates 1990–2000 and National Population Estimates, available at http://eire.census.gov/popest/estimates.php, as of October 2003. **Pmt—**U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-34 revised, available at http://www.bts.gov/, as of October 2003.

TABLE 2-3b Total Passenger-Miles of Travel, U.S. Population, and Gross Domestic Product (GDP): 1991–2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP (billions of chained 2000 $)	7,101	7,337	7,533	7,836	8,032	8,329	8,704	9,067	9,470	9,817	9866.6
U.S. resident population (thousands)	252,981	256,514	259,919	263,126	266,278	269,394	272,647	275,854	279,040	282,224	285,318
GDP per capita	28,067	28,601	28,981	29,779	30,163	30,917	31,922	32,868	33,939	34,784	34,581
Total pmt (millions)	3,836,284	3,944,285	4,013,706	4,098,611	4,139,178	4,267,583	4,397,417	4,518,737	4,643,584	4,757,533	4,771,147

NOTE: *Total passenger-miles of travel* (pmt) excludes motorcycle pmt and results in some double counting of bus pmt.

SOURCES: GDP—Based on chained 2000 dollar data from U.S. Department of Commerce (USDOC), Bureau of Economic Analysis, National Income and Product Accounts, summary GDP table, available at http://www.bea.doc.gov/bea/dn1.htm, as of January 2004. **Population—**USDOC, U.S. Census Bureau, National Intercensal Estimates 1990–2000 and National Population Estimates, available at http://eire.census.gov/popest/estimates.php, as of October 2003. **Pmt—**U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-34 revised, available at http://www.bts.gov/, as of October 2003.

TABLE 2-4 Daily Travel by Walking and Bicycling: 2001

	Person-miles		Person trips	
	Number (billions)	Percentage of miles	Number (millions)	Percentage of trips
Walking	26,202	0.65	35,326	8.60
Bicycling	6,195	0.15	3,522	0.86
Other modes	3,977,148	99.19	371,854	90.54
Total	**4,009,545**	**100.0**	**410,702**	**100.0**

NOTE: *Total* and *other modes* include only number of person-miles and person trips where a mode was reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey, preliminary data, 2003.

TABLE 2-5 Walking and Bicyling as a Share of All Daily Trips by Distance: 2001
Percent

Trip distance (miles)	Bicycling	SE	Walking	SE
1 or less	1.9	0.1	24.1	0.4
1.1 to 2.0	1.0	0.1	11.4	0.3
2.1 to 3.0	0.9	0.1	7.7	0.3
3.1 to 4.0	0.7	0.1	6.6	0.4
4.1 to 5.0	0.4	0.1	4.5	0.3
5.1 to 6.0	0.6	0.1	4.6	0.5
6.1 to 7.0	0.3	0.1	3.0	0.5
7.1 to 8.0	0.5	0.1	2.8	0.3
8.1 to 9.0	0.2	0.1	1.8	0.3
9.1 to 10.0	0.3	0.1	2.1	0.3
10.1 to 11.0	0.2	0.1	1.2	0.4
11.1 to 12.0	0.3	0.1	1.5	0.3
12.1 to 13.0	0.1	0.1	1.5	0.5
13.1 to 14.0	0.1	0.1	1.5	0.4
14.1 to 15.0	0.2	0.1	0.6	0.1
15.1 to 16.0	0.2	0.1	0.5	0.2
16.1 to 17.0	0.2	0.1	0.7	0.6
17.1 to 18.0	0.1	0.1	0.6	0.2
18.1 to 19.0	0	0	0.2	0.2
19.1 to 20.0	0.2	0.1	0.7	0.2
20.1 to 21.0	0.2	0.2	0.4	0.3
21.1 to 22.0	0.1	0.1	0.1	0.1
22.1 to 23.0	0.1	0.1	0.2	0.2
23.1 to 24.0	0.2	0.2	0.5	0.3
24.1 to 25.0	0.2	0.2	0.1	0.04
25.1 to 26.0	0.01	0.005	0.4	0.2
26.1 to 27.0	0.1	0.1	0.001	0.001
27.1 to 28.0	0	0	0.01	0.01
28.1 to 29.0	0	0	0.001	0.001
29.1 to 30.0	0.1	0.1	0.3	0.2

KEY: SE = standard error.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey, January 2004 dataset, available at http://nhts.ornl.gov/2001/index.shtml, as of June 2004.

TABLE 2-6 Walking as a Share of Daily Person Trips by Selected Purpose and Distance: 2001
Percent

Trip distance (miles)	To/from work	Work-related business	Shopping	Other family/ personal business	School/ church	Medical/ dental	Visit friends/ relatives	Other social/ recreational
1 or less	14.6	19.9	12.5	20.5	21.7	7.0	42.5	39.0
1.1–2.0	5.4	5.5	7.6	9.1	11.5	4.4	17.0	20.5
2.1–3.0	3.0	4.7	6.6	6.5	9.4	3.5	7.8	12.5
3.1–4.0	2.7	4.6	4.9	6.5	8.1	2.4	9.5	9.6
4.1–5.0	2.0	3.5	2.5	4.4	6.8	1.4	3.7	7.8
5.1–10.0	1.1	2.7	2.6	2.8	4.4	2.9	2.4	5.0
10.1–15.0	0.3	0.3	1.3	0.9	1.3	1.6	0.8	2.4
15.1–20.0	0.1	0.6	1.2	0.5	0.6	0.3	0.7	1.2
20.1–30.0	0.1	0.1	0.01	0.2	0.6	0.2	0.2	0.4
More than 30	0.05	0.1	0.1	0.03	0	0	0.1	0.1
Total	**2.8**	**4.2**	**6.2**	**8.2**	**9.3**	**2.8**	**12.5**	**15.5**

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey, January 2004 dataset, available at http://nhts.ornl.gov/2001/index.shtml, as of June 2004.

TABLE 2-7a Change in Domestic Freight Ton-Miles by Mode: 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air	1.00	1.11	1.20	1.33	1.41	1.45	1.54	1.56	1.60	1.69	1.48
Truck	1.00	1.03	1.07	1.14	1.20	1.23	1.29	1.33	1.37	1.39	1.40
Railroad	1.00	1.05	1.09	1.17	1.26	1.32	1.34	1.39	1.44	1.48	1.53
Water	1.00	1.01	0.93	0.96	0.95	0.90	0.83	0.79	0.77	0.76	0.73
Oil and natural gas pipeline	1.00	1.02	1.04	1.04	1.07	1.10	1.10	1.10	1.09	1.04	1.02
Total	**1.00**	**1.03**	**1.04**	**1.09**	**1.13**	**1.15**	**1.15**	**1.17**	**1.19**	**1.19**	**1.20**

SOURCES: Air, oil pipeline, and water—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2002,* table 1-44 revised, available at http://www.bts.gov/, as of October 2003.
Truck, rail, and natural gas pipeline—USDOT, BTS, calculations based on data from various sources as follows: **Truck**—USDOT, BTS, *Transportation Statistics Annual Report 2000* (Washington, DC: 2001), p. 124, table 2; *U.S. International Trade and Freight Transportation Trends* (Washington, DC: 2003), figure 14; USDOT, BTS, *Martime Trade and Transportation 2002* (Washington, DC: 2002), table 1-20; and USDOT, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), table VM-1. **Rail**—Surface Transportation Board, Carload Waybill Sample; Transport Canada, *Transportation in Canada, Addendum* (Ottawa, Ontario: Annual issues), table A6-10; and Association of American Railroads, *Railroad Facts* (Washington, DC: 1991-2001 issues), p. 36. **Natural gas pipeline**—U.S. Department of Energy (DOE), Energy Information Administration (EIA), *Annual Energy Review 2001* (Washington, DC: 2002), table 6.5, and DOE, EIA, *International Energy Annual 2001* (Washington, DC: 2003), table C-1.

TABLE 2-7b Domestic Freight Ton-Miles by Mode: 1991–2001
Billions

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air	9	10	11	12	13	13	14	14	14	15	13
Truck	898	922	963	1,027	1,074	1,106	1,157	1,190	1,231	1,249	1,260
Railroad	1,042	1,098	1,135	1,221	1,317	1,377	1,391	1,448	1,504	1,546	1,599
Water	848	857	790	815	808	765	707	673	656	646	622
Oil and natural gas pipeline	824	844	856	860	882	905	905	902	899	853	843
Total	**3,620**	**3,731**	**3,754**	**3,935**	**4,093**	**4,165**	**4,174**	**4,227**	**4,304**	**4,310**	**4,337**

SOURCES: Air, oil pipeline, and water—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2002,* table 1-44 revised, available at http://www.bts.gov/, as of October 2003.
Truck, rail, and natural gas pipeline—USDOT, BTS, calculations based on data from various sources as follows: **Truck**—USDOT, BTS, *Transportation Statistics Annual Report 2000* (Washington, DC: 2001), p. 124, table 2; *U.S. International Trade and Freight Transportation Trends* (Washington, DC: 2003), figure 14; USDOT, BTS, *Martime Trade and Transportation 2002* (Washington, DC: 2002), table 1-20; and USDOT, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), table VM-1. **Rail**—Surface Transportation Board, Carload Waybill Sample; Transport Canada, *Transportation in Canada, Addendum* (Ottawa, Ontario: Annual issues), table A6-10; and Association of American Railroads, *Railroad Facts* (Washington, DC: 1991-2001 issues), p. 36. **Natural gas pipeline**—U.S. Department of Energy (DOE), Energy Information Administration (EIA), *Annual Energy Review 2001* (Washington, DC: 2002), table 6.5, and DOE, EIA, *International Energy Annual 2001* (Washington, DC: 2003), table C-1.

TABLE 2-8 Domestic Freight Ton-Miles by Mode: 2001

	Ton-miles	Percent
Air	13	0.3
Truck	1,260	29.1
Railroad	1,599	36.9
Water	622	14.3
Oil and natural gas pipeline	843	19.4
Total	**4,337**	**100.0**

SOURCES: Air, oil pipeline, and water—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2002,* table 1-44 revised, available at http://www.bts.gov/, as of October 2003.
Truck, rail, and natural gas pipeline—USDOT, BTS, calculations based on data from various sources as follows: **Truck**—USDOT, BTS, *Transportation Statistics Annual Report 2000* (Washington, DC: 2001), p. 124, table 2; *U.S. International Trade and Freight Transportation Trends* (Washington, DC: 2003), figure 14; USDOT, BTS, *Martime Trade and Transportation 2002* (Washington, DC: 2002), table 1-20; and USDOT, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), table VM-1. **Rail**—Surface Transportation Board, Carload Waybill Sample; Transport Canada, *Transportation in Canada, Addendum* (Ottawa, Ontario: Annual issues), table A6-10; and Association of American Railroads, *Railroad Facts* (Washington, DC: 1991-2001 issues), p. 36.
Natural gas pipeline—U.S. Department of Energy (DOE), Energy Information Administration (EIA), *Annual Energy Review 2001* (Washington, DC: 2002), table 6.5, and DOE, EIA, *International Energy Annual 2001* (Washington, DC: 2003), table C-1.

TABLE 2-9 Commercial Freight Activity for All Modes by Weight: 1993, 1997, and 2002
Millions of tons

	1993	1997	2002
Truck	7,275	8,836	9,197
Rail	1,580	1,612	1,895
Water	2,128	2,281	2,345
Air (includes truck and air)	7	10	10
Oil pipeline	1,595	1,448	1,656
Multimodal combinations	231	227	213
Other and unknown modes	541	440	499
Total	**13,357**	**14,854**	**15,815**
Commodity Flow Survey	9,688	11,090	11,573
Percentage of total	72.5	74.7	73.2
Supplemental estimates	3,669	3,764	4,242
Percentage of total	27.5	25.3	26.8

NOTES: 2002 Commodity Flow Survey and supplemental data are preliminary. Multimodal includes the traditional intermodal combination of truck and rail plus truck and water; rail and water; parcel, postal, and courier service; and other multiple modes for the same shipment. Supplemental estimates cover logging, farm-based truck shipments, truck imports from Canada and Mexico, rail imports from Canada and Mexico, air cargo imports and exports, water imports and exports, and pipeline crude and petroleum products shipments. These estimates exclude other supplemental categories of goods movement for which no reasonable basis for an estimate currently exists, including government shipments; the service, retail, and construction sectors; transportation service providers; household goods movers; and municipal solid waste providers.

SOURCES: Commodity Flow Survey data—U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Commerce, U.S. Census Bureau, *Commodity Flow Survey* (Washington, DC: 2003). **Supplemental estimates—**MacroSys Research and Technology calculations for BTS based on data compiled from a variety of sources.

TABLE 2-10 Commercial Freight Activity for All Modes by Ton-Miles: 1993, 1997, and 2002
Billions

	1993	1997	2002
Truck	931	1,109	1,449
Rail	965	1,066	1,254
Water	883	813	733
Air (includes truck and air)	9	15	15
Oil pipeline	593	617	753
Multimodal combinations	166	212	226
Other and unknown modes	93	73	77
Total	**3,639**	**3,904**	**4,506**
Commodity Flow Survey	2,421	2,661	3,204
Percentage of total	66.5	68.2	71.1
Supplemental estimates	1,218	1,243	1,301
Percentage of total	33.5	31.8	28.9

NOTES: 2002 Commodity Flow Survey and supplemental data are preliminary. Multimodal includes the traditional intermodal combination of truck and rail plus truck and water; rail and water; parcel, postal, and courier service; and other multiple modes for the same shipment. Supplemental estimates cover logging, farm-based truck shipments, truck imports from Canada and Mexico, rail imports from Canada and Mexico, air cargo imports and exports, water imports and exports, and pipeline crude and petroleum products shipments. These estimates exclude other supplemental categories of goods movement for which no reasonable basis for an estimate currently exists, including government shipments; the service, retail, and construction sectors; transportation service providers; household goods movers; and municipal solid waste providers.

SOURCES: Commodity Flow Survey data—U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Commerce, U.S. Census Bureau, *Commodity Flow Survey* (Washington, DC: 2003). **Supplemental estimates—** MacroSys Research and Technology calculations for BTS based on data compiled from a variety of sources.

TABLE 2-11 Commercial Freight Activity for All Modes by Shipment Value: 1993, 1997, and 2002

	Billions of chained 2000 dollars			Billions of current dollars		
	1993	1997	2002	1993	1997	2002
Truck	4,684	5,271	6,660	4,672	5,336	6,672
Rail	278	366	388	278	371	388
Water	620	753	867	618	762	869
Air (includes truck and air)	395	654	777	394	662	778
Oil pipeline	312	229	285	311	231	285
Multimodal combinations	665	935	1,111	663	947	1,112
Other and unknown modes	243	310	373	242	313	373
Total	**7,197**	**8,518**	**10,460**	**7,178**	**8,622**	**10,478**
Commodity Flow Survey	5,862	6,860	8,468	5,846	6,944	8,483
Percentage of total	81.4	80.5	81.0	81.4	80.5	81.0
Supplemental estimates	1,335	1,658	1,992	1,332	1,678	1,995
Percentage of total	18.6	19.5	19.0	18.6	19.5	19.0

NOTES: 2002 Commodity Flow Survey and supplemental data are preliminary. Multimodal includes the traditional intermodal combination of truck and rail plus truck and water; rail and water; parcel, postal, and courier service; and other multiple modes for the same shipment. Supplemental estimates cover logging, farm-based truck shipments, truck imports from Canada and Mexico, rail imports from Canada and Mexico, air cargo imports and exports, water imports and exports, and pipeline crude and petroleum products shipments. These estimates exclude other supplemental categories of goods movement for which no reasonable basis for an estimate currently exists, including government shipments; the service, retail, and construction sectors; transportation service providers; household goods movers; and municipal solid waste providers.

Current dollar amounts were converted to chained 2000 dollars by BTS to eliminate the effects of inflation over time.

SOURCES: Commodity Flow Survey data—U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Commerce, U.S. Census Bureau, *Commodity Flow Survey* (Washington, DC: 2003). **Supplemental estimates—**MacroSys Research and Technology calculations for BTS based on data compiled from a variety of sources.

[NOTE: Figures 2-12 through 2-15 are water, truck, and rail freight flow maps, and corresponding tables are not included here.]

Table 2-16a Change in Highway Vehicle-Miles of Travel by Vehicle Type: 1992–2002
Index: 1992 = 1.00

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Highway, total	**1.00**	**1.02**	**1.05**	**1.08**	**1.11**	**1.14**	**1.17**	**1.20**	**1.22**	**1.24**	**1.27**
Passenger vehicles	1.00	1.02	1.04	1.07	1.10	1.13	1.16	1.19	1.21	1.24	1.26
Passenger cars	1.00	1.00	1.03	1.05	1.07	1.10	1.13	1.14	1.17	1.19	1.21
Light trucks	1.00	1.06	1.08	1.12	1.16	1.20	1.23	1.27	1.31	1.33	1.37
Buses	1.00	1.06	1.11	1.11	1.14	1.18	1.21	1.33	1.31	1.22	1.19
Motorcycles	1.00	1.04	1.07	1.03	1.04	1.05	1.08	1.11	1.10	1.01	1.00
Freight vehicles	1.00	1.04	1.11	1.16	1.19	1.25	1.28	1.32	1.34	1.36	1.40
Trucks, single-unit, 2-axle, 6-tire or more	1.00	1.05	1.14	1.16	1.19	1.24	1.26	1.30	1.31	1.34	1.41
Trucks, combination	1.00	1.04	1.09	1.16	1.19	1.25	1.29	1.33	1.36	1.37	1.39

NOTE: *Light trucks* include sport utility vehicles, minivans, and pickup trucks.

SOURCES: **1992–1994—**U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995* (Washington, DC: 1997), table VM-201A, also available at http://www.fhwa.dot.gov/ohim/summary95/index.html, as of June 2004. **1995–2002**—USDOT, FHWA, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, also available at http://www.fhwa.dot.gov/ohim/ohimstat.htm, as of June 2004.

TABLE 2-16b Highway Vehicle-Miles of Travel by Vehicle Type: 1992–2002
Millions of miles

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Highway, total	**2,247,15**	**2,296,37**	**2,357,58**	**2,422,69**	**2,485,84**	**2,561,69**	**2,631,52**	**2,691,05**	**2,746,92**	**2,797,28**	**2,855,75**
Passenger vehicles	2,093,767	2,136,490	2,187,372	2,244,540	2,302,877	2,370,218	2,435,142	2,488,368	2,541,405	2,588,255	2,641,226
Passenger cars	1,371,569	1,374,709	1,406,089	1,438,294	1,469,854	1,502,556	1,549,577	1,569,100	1,600,287	1,628,332	1,658,640
Light trucks	706,863	745,750	764,634	790,029	816,540	850,739	868,275	901,022	923,059	943,207	966,184
Buses	5,778	6,125	6,409	6,420	6,563	6,842	7,007	7,662	7,590	7,077	6,849
Motorcycles	9,557	9,906	10,240	9,797	9,920	10,081	10,283	10,584	10,469	9,639	9,553
Freight vehicles	153,384	159,888	170,216	178,156	182,971	191,477	196,380	202,688	205,520	209,032	214,530
Trucks, single-unit, 2-axle, 6-tire or more	53,874	56,772	61,284	62,705	64,072	66,893	68,021	70,304	70,500	72,448	75,887
Trucks, combination	99,510	103,116	108,932	115,451	118,899	124,584	128,359	132,384	135,020	136,584	138,643

NOTE: *Light trucks* include sport utility vehicles, minivans, and pickup trucks.

SOURCES: **1992–1994—**U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995* (Washington, DC: 1997), table VM-201A, also available at http://www.fhwa.dot.gov/ohim/summary95/index.html, as of June 2004. **1995–2002—**USDOT, FHWA, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, also available at http://www.fhwa.dot.gov/ohim/ohimstat.htm, as of June 2004.

TABLE 2-17a/2-18a Change in Nonhighway Vehicle-Miles of Travel: 1992–2002
Index: 1992 = 1.00

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rail, total train-miles	1.00	1.04	1.12	1.16	1.18	1.20	1.20	1.24	1.27	1.26	1.27
Class I freight, train-miles	1.00	1.04	1.13	1.17	1.20	1.22	1.22	1.26	1.29	1.28	1.28
Intercity/Amtrak, train-miles	1.00	1.03	1.00	0.94	0.88	0.94	0.97	1.00	1.03	1.06	1.11
Air carrier, large certificated, domestic, all services	1.00	1.04	1.10	1.16	1.20	1.23	1.26	1.33	1.42	1.39	1.40
Rail transit											
Light rail	1.00	0.97	1.19	1.21	1.31	1.44	1.53	1.70	1.85	1.89	2.13
Heavy rail	1.00	0.99	1.01	1.02	1.03	1.06	1.08	1.10	1.13	1.16	1.18
Commuter rail	1.00	1.02	1.05	1.09	1.11	1.15	1.19	1.22	1.24	1.27	1.30

NOTE: See Glossary for definitions of rail transit service types.

SOURCES: Class I rail freight train-miles—Association of American Railroads (AAR), *Railroad Facts 2003* (Washington, DC: 2003), p. 33. **Intercity/Amtrak train-miles**: **1992–2001—**Amtrak, *Amtrak Annual Report* (Washington, DC: Annual issues), statistical appendix. **2002—**AAR, *Railroad Facts 2003* (Washington, DC: 2003), p. 77. **Air carrier—**U.S. Department of Transportation, Bureau of Transportation Statistics, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues). **Rail transit—**American Public Transit Association, *Public Transportation Fact Book, 2004* (Washington, DC: 2004), table 18.

TABLE 2-17b/2-18b Nonhighway Vehicle-Miles of Travel: 1992–2002
Millions of miles

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rail, total train-miles	424	440	475	490	499	507	508	524	539	536	537
Class I freight, train-miles	390	405	441	458	469	475	475	490	504	500	500
Intercity/Amtrak, train-miles	34	35	34	32	30	32	33	34	35	36	38
Air carrier, large certificated, domestic, all services	3,995	4,157	4,380	4,629	4,811	4,911	5,035	5,332	5,664	5,550	5,612
Rail transit											
Light rail	29	28	34	35	38	41	44	49	53	54	61
Heavy rail	525	522	532	537	543	558	566	578	595	608	621
Commuter rail	219	224	231	238	242	251	260	266	271	277	284

NOTE: See Glossary for definitions of rail transit service types.

SOURCES: Class I rail freight train-miles—Association of American Railroads (AAR), *Railroad Facts 2003* (Washington, DC: 2003), p. 33. **Intercity/Amtrak train-miles—1992–2001:** Amtrak, *Amtrak Annual Report* (Washington, DC: Annual issues), statistical appendix. **2002—**AAR, *Railroad Facts 2003* (Washington, DC: 2003), p. 77. **Air carrier**—U.S. Department of Transportation, Bureau of Transportation Statistics, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues). **Rail transit**—American Public Transit Association, *Public Transportation Fact Book, 2004* (Washington, DC: 2004), table 18.

TABLE 3-1/3-2 Travel Time Index and Change by Metro Area Population for 75 Metro Areas: 1991 and 2001

Urban areas (≥1 million population)	Population (000) 2001	Travel Time Index 1991	Travel Time Index 2001	1991–2001 % change
New York NY-Northeastern NJ	17,160	1.28	1.41	10.16
Los Angeles CA	12,770	1.79	1.83	2.23
Chicago IL-Northwestern IN	8,110	1.35	1.49	10.37
Philadelphia PA-NJ	4,600	1.20	1.30	8.33
San Francisco-Oakland CA	4,045	1.42	1.60	12.68
Detroit MI	4,030	1.29	1.36	5.43
Dallas-Fort Worth TX	3,840	1.19	1.33	11.76
Washington DC-MD-VA	3,730	1.35	1.47	8.89
Houston TX	3,475	1.25	1.39	11.20
Boston MA	3,030	1.27	1.47	15.75
Atlanta GA	2,990	1.13	1.39	23.01
Phoenix AZ	2,900	1.24	1.43	15.32
San Diego CA	2,695	1.22	1.36	11.48
Minneapolis-Saint Paul MN	2,440	1.12	1.39	24.11
Miami-Hialeah FL	2,265	1.30	1.46	12.31
Baltimore MD	2,210	1.20	1.31	9.17
Seattle-Everett WA	2,065	1.41	1.43	1.42
Saint Louis MO-IL	2,055	1.11	1.21	9.01
Denver CO	2,025	1.19	1.47	23.53
Tampa-St Petersburg-Clearwater FL	2,000	1.29	1.32	2.33
Cleveland OH	1,870	1.06	1.12	5.66
Pittsburgh PA	1,790	1.09	1.10	0.92
San Jose CA	1,680	1.41	1.43	1.42
Fort Lauderdale-Hollywood-Pompano Beach FL	1,625	1.15	1.40	21.74
Portland-Vancouver OR-WA	1,590	1.17	1.44	23.08
Norfolk-Newport News-Virginia Beach VA	1,520	1.14	1.19	4.39
San Bernardino-Riverside CA	1,445	1.27	1.39	9.45
Kansas City MO-KS	1,425	1.04	1.11	6.73
Sacramento CA	1,405	1.20	1.33	10.83
Milwaukee WI	1,400	1.12	1.26	12.50
Cincinnati OH-KY	1,290	1.12	1.26	12.50
San Antonio TX	1,260	1.07	1.21	13.08
Las Vegas NV	1,255	1.25	1.34	7.20
Orlando FL	1,220	1.19	1.32	10.92
Buffalo-Niagara Falls NY	1,115	1.04	1.08	3.85
New Orleans LA	1,095	1.19	1.18	–0.84
Oklahoma City OK	1,085	1.04	1.10	5.77
West Palm Beach-Boca Raton-Delray Beach FL	1,075	1.14	1.26	10.53
Columbus OH	1,050	1.11	1.19	7.21
Indianapolis IN	1,030	1.08	1.26	16.67

TABLE 3-1/3-2 Travel Time Index and Change by Metro Area Population for 75 Metro Areas: 1991 and 2001 *(continued)*

Urban areas (≥1 million population)	Population (000) 2001	Travel Time Index 1991	Travel Time Index 2001	1991–2001 % change
Memphis TN-AR-MS	980	1.09	1.22	11.93
Providence-Pawtucket RI-MA	930	1.11	1.22	9.91
Salt Lake City UT	910	1.10	1.20	9.09
Jacksonville FL	890	1.12	1.16	3.57
Louisville KY-IN	840	1.10	1.22	10.91
Tulsa OK	805	1.05	1.13	7.62
Austin TX	760	1.13	1.31	15.93
Tucson AZ	705	1.13	1.25	10.62
Honolulu HI	700	1.21	1.19	–1.65
Richmond VA	700	1.05	1.10	4.76
Birmingham AL	670	1.06	1.17	10.38
Nashville TN	670	1.08	1.18	9.26
Charlotte NC	665	1.18	1.27	7.63
El Paso TX-NM	660	1.05	1.18	12.38
Rochester NY	655	1.04	1.06	1.92
Hartford-Middletown CT	645	1.09	1.12	2.75
Omaha NE-IA	630	1.10	1.17	6.36
Tacoma WA	615	1.13	1.27	12.39
Albuquerque NM	590	1.10	1.23	11.82
Fresno CA	560	1.13	1.17	3.54
Albany-Schenectady-Troy NY	520	1.04	1.07	2.88
Colorado Springs CO	470	1.04	1.19	14.42
Charleston SC	460	1.15	1.18	2.61
Bakersfield CA	410	1.04	1.06	1.92
Spokane WA	335	1.04	1.07	2.88
Corpus Christi TX	320	1.04	1.05	0.96
Pensacola FL	305	1.09	1.12	2.75
Fort Myers-Cape Coral FL	300	1.10	1.15	4.55
Anchorage AK	260	1.05	1.05	0.00
Eugene-Springfield OR	230	1.04	1.11	6.73
Salem OR	210	1.05	1.10	4.76
Laredo TX	190	1.04	1.08	3.85
Brownsville TX	160	1.04	1.08	3.85
Beaumont TX	145	1.04	1.06	1.92
Boulder CO	110	1.03	1.10	6.80

NOTE: The Travel Time Index is the ratio of peak period travel time to free-flow travel time. It expresses the average amount of extra time it takes to travel in the peak period relative to free-flow travel.

SOURCE: Texas A&M University, Texas Transportation Institute, *2003 Urban Mobility Report* (College Station, TX: 2003), available at http://tti.tamu.edu/, as of October 2003.

TABLE 3-3a U.S. Air Carrier On-Time Performance: 1995–2003
Percentage of scheduled flights

	1995	1996	1997	1998	1999	2000	2001	2002	2003
On-time flights	78.6	74.5	77.9	77.2	76.1	72.6	77.4	82.1	82.0
Late arrivals	19.5	22.8	20.0	19.9	20.9	23.8	18.5	16.5	16.3
Diverted flights	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2
Canceled flights	1.7	2.4	1.8	2.7	2.8	3.3	3.9	1.2	1.6

NOTES: Flights are on time if they depart from or arrive at the gate less than 15 minutes after their scheduled departure or arrival times. Data cover nonstop scheduled service flights between points within the United States (including territories) operated by U.S. air carriers that have at least 1 percent of total domestic scheduled service passenger revenues. The airlines required to report in 2003 were: Alaska Airlines, America West Airlines, American Airlines, American Eagle Airlines, ATA Airline (formerly doing business as American Trans Air), Atlantic Coast Airlines, Atlantic Southeast Airlines, Continental Airlines, Continental Express, Delta Airlines, ExpressJet Airlines, Northwest Airlines, Southwest Airlines, SkyWest Airlines, United Airlines, and US Airways. JetBlue Airways and Hawaiian Airlines reported voluntarily.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Airline Service Quality Performance data, March 2004.

TABLE 3-3b U.S. Air Carrier On-Time Performance: 1995–2003
Number of flights

	1995	1996	1997	1998	1999	2000	2001	2002	2003
On-time flights	4,185,788	3,989,281	4,218,165	4,156,980	4,207,293	4,130,185	4,619,234	4,329,804	5,315,608
Late arrivals	1,039,250	1,220,045	1,083,834	1,070,071	1,152,725	1,356,450	1,104,439	867,962	1,055,803
Diverted flights	10,492	14,121	12,081	13,161	13,555	14,254	12,909	8,347	11,750
Canceled flights	91,905	128,536	97,763	144,509	154,311	187,599	231,198	65,139	101,448
Total flights scheduled	**5,327,435**	**5,351,983**	**5,411,843**	**5,384,721**	**5,527,884**	**5,688,488**	**5,967,780**	**5,271,252**	**6,484,609**

NOTES: Flights are on time if they depart from or arrive at the gate less than 15 minutes after their scheduled departure or arrival times. Data cover nonstop scheduled service flights between points within the United States (including territories) operated by U.S. air carriers that have at least 1 percent of total domestic scheduled service passenger revenues. The airlines required to report in 2003 were: Alaska Airlines, America West Airlines, American Airlines, American Eagle Airlines, ATA Airline (formerly doing business as American Trans Air), Atlantic Coast Airlines, Atlantic Southeast Airlines, Continental Airlines, Continental Express, Delta Airlines, ExpressJet Airlines, Northwest Airlines, Southwest Airlines, SkyWest Airlines, United Airlines, and US Airways. JetBlue Airways and Hawaiian Airlines reported voluntarily.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Airline Service Quality Performance data, March 2004.

TABLE 3-4 Average Monthly Number of Delays by Cause: July 2003–January 2004
Number, except as noted

	July	August	September	October	November	December	January	7-month average
Air carrier delay	28,040	27,897	17,194	19,293	21,240	30,155	32,476	25,185
Aircraft arriving late	30,588	29,814	16,764	18,177	24,978	35,104	33,466	26,984
Security delay	324	376	109	259	185	467	424	306
National Airspace System delay	10,114	10,588	7,757	7,499	11,598	12,685	13,491	10,533
Extreme weather	5,170	5,887	2,292	1,667	3,381	4,201	7,907	4,358
Total	**74,236**	**74,562**	**44,116**	**46,895**	**61,382**	**82,612**	**87,764**	**67,367**
Delays as a percentage of scheduled flights	13.3	13.4	8.4	8.5	11.6	14.9	15.0	U

KEY: U = data are unavailable (i.e., not calculated).

NOTES: Air carrier delay is due to circumstances within the airline's control (e.g., maintenance or crew problems, aircraft cleaning, baggage loading, and fueling). Extreme weather is significant meteorological conditions (actual or forecast) that, in the judgment of the carrier, delays or prevents the operation of a flight (e.g., tornado, blizzard, or hurricane). National Airspace System are delays and cancellations attributable to the national aviation system that refer to a broad set of conditions (e.g., non-extreme weather conditions, airport operations, heavy traffic volume, and air traffic control). Aircraft arriving late refers to the late arrival of the previous flight, where the same aircraft is used for the present flight, causing the present flight to depart late. A security delay is a delay or cancellation caused by evacuation of a terminal or concourse, re-boarding of the aircraft because of a security breach, inoperative screening equipment, and/or long lines in excess of 29 minutes at screening areas.

The airlines required to report in 2003 were: Alaska Airlines, America West Airlines, American Airlines, American Eagle Airlines, ATA Airline (formerly doing business as American Trans Air), Atlantic Coast Airlines, Atlantic Southeast Airlines, Continental Airlines, Continental Express, Delta Airlines, ExpressJet Airlines, Northwest Airlines, Southwest Airlines, SkyWest Airlines, United Airlines, and US Airways. JetBlue Airways and Hawaiian Airlines reported voluntarily.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, “Causes of Flight Delays,” available at http://www.bts.gov/oai, as of March 2004.

TABLE 3-5 Change in Actual and Scheduled Travel Time: 1990–2002
Seasonally adjusted, yearly averages
Index: 1990 = 100.0

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Actual	100.0	98.8	98.2	98.5	98.4	99.4	101.3	100.3	101.3	102.3	105.0	101.8	99.4
Scheduled	100.0	100.5	100.3	99.9	99.7	99.6	99.6	100.3	101.2	101.7	102.5	103.3	102.5

NOTES: The average travel time is the Travel Time Index multiplied by the base year (1990) travel time in minutes and divided by 100. Because the Travel Time Index controls for distance and other factors, the average travel time may differ from the actual travel times of specific flights. The Travel Time Variability Index is based on the standard deviation of actual travel time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on Airline Service Quality Performance data, March 2004.

TABLE 3-6 Average Actual and Scheduled Travel Time: 1990, 2000, and 2002
Minutes

	1990	2000	2002
Actual travel time	129.6	136.1	128.9
Scheduled travel time	122.0	125.0	125.0

NOTES: The average travel time is the Travel Time Index multiplied by the base year (1990) travel time in minutes and divided by 100. Because the Travel Time Index controls for distance and other factors, the average travel time may differ from the actual travel times of specific flights.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Airline Service Quality Performance data, March 2004.

TABLE 3-7 Change in Travel Time Variability Index and Actual Travel Time and Operated Flights: 1990–2002
Seasonally adjusted, yearly averages
Index: 1990 = 100.0

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Actual travel time	100.0	98.8	98.2	98.5	98.4	99.4	101.3	100.3	101.3	102.3	105.0	101.8	99.4
Operated flights	100.0	84.6	86.6	89.0	90.3	94.6	95.5	100.3	99.2	99.3	101.1	96.7	88.0
Travel Time Variability	100.0	93.5	87.5	93.2	94.9	107.4	124.2	116.9	127.1	134.2	148.7	129.3	115.4

NOTE: The Travel Time Variability Index is based on the standard deviation of actual travel time.

SOURCES: Data for actual travel time—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on Airline Service Quality Performance data, March 2004. **Operated flights—**USDOT, BTS, Airline Market and Segment (T-100) data, March 2004.

TABLE 3-8 Amtrak Trains Arriving On Time: 1993–2003
Percent

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
System on-time performance	72	72	76	71	74	79	79	78	75	76	74
Short distance (<400 miles)	79	78	81	76	79	81	80	82	79	80	77
Long distance (≥400 miles)	47	49	57	49	53	59	61	55	52	52	53

NOTE: Short distance includes all Amtrak Northeast Corridor and Empire Service (New York State) trains. Amtrak provides on-time performance data in percent. Raw data are not readily available.

SOURCES: 1993–1999—National Railroad Passenger Corp. (Amtrak), *Amtrak Annual Reports* (Washington, DC: Annual issues). **2000–2003—**Amtrak, personal communication, Oct. 22, 2003.

TABLE 3-9 Amtrak Hours of Delay by Cause: 2000–2003

	2000	2001	2002	2003
Amtrak	23,337	27,822	26,575	25,711
Host railroad	43,881	52,273	55,090	57,346
Other	3,176	3,741	4,266	5,355
Total	**70,396**	**83,837**	**85,032**	**88,413**

NOTES: Amtrak changed its method for reporting delays by cause in 2000. Therefore, data before 2000 are not comparable to previous years and are not presented here.

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

Host railroad 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, and routing delays. Also includes delays for track repairs/track conditions, freight train interference, and signal delays.

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

SOURCES: 1993–1999—National Railroad Passenger Corp. (Amtrak), *Amtrak Annual Report* (Washington, DC: Annual issues). **2000–2003—**Amtrak, personal communication, Oct. 22, 2003.

TABLE 3-10 Share of U.S. Residents Experiencing Highway Traffic Congestion: 2002
Percentage of respondents who say traffic congestion is a problem

Month of survey	Adult population	Residents of MSAs	Residents of non-MSAs
January 2002	47	53	21
May 2002	42	49	15
September 2002	42	48	14

KEY: MSA = metropolitan statistical area.

NOTE: Maximum margin of error is +/–5%.

SOURCES: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *Omnibus Household Survey,* January, May, and September 2002, as reported in USDOT, BTS, “Traffic Congestion Rated a Problem by Two of Five U.S. Adults, BTS Survey Shows,” Press release, Aug. 21, 2003, available at http://www.bts.gov/press_release/2003/index.html, as of May 2004.

TABLE 3-11 Share of U.S. Residents Experiencing Significant Delays by Mode: December 2001–August 2002

Mode	Percent
Personal vehicle	18
Public transit	19
Commercial airline	28
Other modes	10

NOTE: Based on averages derived from the December 2001 and April and August 2002 *Omnibus Household Surveys.*

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *OmniStats* 2(5), October 2002.

TABLE 3-12 Average Commute Travel Time: 2001, 2002, and 2003
Minutes

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly average
2001	U	U	23.4	U	U	U	26.2	26.5	U	24.7	25.9	24.7	25.2
2002	24.6	24.7	24.7	24.5	25.1	26.2	25.3	29.0	26.1	28.8	U	26.9	26.0
2003	U	27.4	U	25.4	U	26.5	26.5	U	U	28.3	U	U	26.8

KEY: U = data are unavailable (not collected in these months).

NOTE: The survey asked: “On a typical day, how much time did a one-way, door-to-door trip from home to work take?”

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on *Omnibus Household Surveys* (Washington, DC: Various months).

TABLE 4-1 Number of Trucks by Vehicle Weight: 1992 and 1997

	Thousands of trucks	
	1992	**1997**
Light trucks (< 6,001 lb)	50,545.7	62,798.4
Medium trucks (6,001 to 19,500 lb)	5,906.5	6,737.1
Light-heavy trucks (19,501 to 26,000 lb)	732.0	729.3
Heavy trucks (> 26,000 lb)	3,074.5	3,986.9

KEY: lb = pound.

NOTES: Weight is the empty weight of the vehicle plus the average vehicle load. Excludes vehicles owned by federal, state, or local governments; ambulances; buses; motor homes; farm tractors; unpowered trailer units; and trucks reported to have been sold, junked, or wrecked prior to July 1 of the year preceding the survey.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002* (Washington, DC: 2002), table 1-21, also available at http://www.bts.gov/, as of April 2003.
The original source of these data is the U.S. Census Bureau's *Vehicle Inventory and Use Survey* (VIUS). The truck categories in *National Transportation Statistics 2002* and this report differ from those in the VIUS, which has the following categories: light trucks—10,000 lbs or less; medium trucks—10,001 lbs–19,500 lbs; light-heavy trucks—19,501 lbs–26,000 lbs; and heavy-heavy trucks—26,001 lbs or more.

TABLE 4-2/4-3 Share of Loadings on Interstate Highways: 2002
Percent

Location	Passenger cars, buses, and light trucks	Heavy single-unit trucks	3- and 4-axle combination trucks	5-axle or more combination trucks
Urban	3	14	5	77
Rural	2	5	4	89

NOTES: Based on data from the Truck Weight Study that are collected by the states for varying time periods each year and are not adjusted to typify annual averages. Loadings are based on equivalent single-axle loads, a standard unit of pavement damage based on the amount of force applied to pavement by an 18,000-pound axle, which is roughly equivalent to a standard truck axle. Raw data are not available.

SOURCE: U.S. Department of Transportation, Federal Highway Adminstration, *Highway Statistics 2002* (Washington, DC: 2003), table TC-3, "Percentage Distribution of Traffic Volumes and Loadings on the Interstate System," available at http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/tc3.pdf, as of February 2004.

TABLE 4-4 Average Capacity of Vessels Calling at U.S. Ports: 1998–2002
Deadweight tons (dwt) per call

	1998	1999	2000	2001	2002
Tanker	68,670	67,703	67,551	69,313	69,412
Dry bulk	41,740	41,833	41,694	42,142	42,876
Containerships	36,243	36,586	37,784	39,656	42,158
Roll-on, roll-off vessels	19,898	18,662	18,456	20,445	20,376
Gas carriers	29,954	31,402	31,397	33,438	32,099
Other	21,409	22,331	22,857	23,416	23,496
All vessels	45,289	45,117	45,646	47,034	47,625

NOTES: Calls are by oceangoing vessels of 10,000 dwt or greater at U.S. ports, excluding Great Lakes ports. 1998 is the first year for which data are available. Beginning in 2002, chemical tanker data are no longer reported separately and are, instead, included in tanker data. Historical data were adjusted for consistency. *Other* includes general cargo and combination vessels. *Roll-on, roll-off vessels* are especially designed to carry wheeled container trailers or other wheeled cargo and use the roll-on, roll-off method for loading and unloading.

SOURCE: U.S. Department of Transportation, Maritime Administration, *Vessel Calls at U.S. Ports* (Washington, DC: December 2003), table S-1.

TABLE 4-5 U.S. Railroad Freight Traffic: 1992–2002
Millions

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Tons	1,399	1,397	1,470	1,550	1,611	1,585	1,649	1,717	1,738	1,742	1,767
Carloads	21	22	23	24	24	25	26	27	28	27	28

SOURCE: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), pp. 24 and 28.

TABLE 4-6 Average Loaded U.S. Railcar Weight: 1992–2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Tons per carload	66.6	63.5	63.9	64.6	67.1	63.4	63.4	63.6	62.1	64.5	63.1

NOTE: Average railcar weight is total tons transported divided by total carloads transported.

SOURCE: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), pp. 24 and 28.

TABLE 4-7 Average Loaded U.S. Railcar Weight for Selected Commodities: 1992 and 2002

	Tons per carload	
	1992	2002
Farm products	90.8	93.6
Coal	99.4	110.8
Nonmetallic minerals	91.9	95.9
Food and kindred products	63.9	69.4
Chemicals and allied products	82.4	83.9
Transportation equipment	20.9	20.9
Miscellaneous mixed shipments	17.0	14.6

NOTES: Miscellaneous mixed shipments is mostly intermodal traffic. Some intermodal traffic is included in commodity-specific categories, as well.

SOURCES: 2002 data—Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), pp. 25 and 29. **1992 data**—U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on Association of American Railroads, *Railroad Ten-Year Trends 1990–1999* (Washington, DC: 2000).

TABLE 5-1 Miles Traveled Per Day: 2001

Person-miles for all modes	40
Person-miles in personal vehicles	35

NOTE: Data are from the daily travel segment of the 2001 National Household Travel Survey. Long-distance travel data (i.e., trips of 50 miles or more collected during a 4-week travel period) are not included here.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, National Household Travel Survey, Preliminary Data Release Version 1, available at http://nhts.ornl.gov, as of January 2003.

TABLE 5-2 Trips Completed Per Day: 2001

Person trips for all modes	4.1
Person trips in personal vehicles	3.5

NOTE: Data are from the daily travel segment of the 2001 National Household Travel Survey. Long-distance travel data (i.e., trips of 50 miles or more collected during a 4-week travel period) are not included here.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, National Household Travel Survey, Preliminary Data Release Version 1, available at http://nhts.ornl.gov, as of January 2003.

TABLE 5-3 Long-Distance Trips by Mode: 2001

	Percent	Number (millions)	SE (millions)
Personal vehicle	89.4	2,336	36.9
Air	7.4	193	6.3
Bus	2.1	55	3.5
Train	0.8	21	2.9
Other	0.2	6	1.5
Total	**100.0**	**2,612**	**37.7**

KEY: SE = standard error.

NOTES: Excludes trips where mode was not reported. *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-4 Median Length of Long-Distance Trips by Mode: 2001

	Round trip miles	SE
Air	2,068	60.8
Bus	287	20.6
Personal vehicle	194	2.6
Train	192	20.9
Other	188	9.3
All long-distance trips	209	2.5

KEY: SE = standard error.

NOTE: Excludes trips where mode was not reported. *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-5 Long-Distance Trip Person-Miles by Mode: 2001

	Percent	Person-miles (millions)	SE (million)
Personal vehicle	55.9	760,325	11,695
Air	41.0	557,609	25,376
Bus	2.0	27,081	3,048
Train	0.8	10,546	1,998
Other	0.4	5,118	1,124
Total	**100.0**	**1,360,679**	**28,295**

KEY: SE = standard error.

NOTES: Excludes trips where mode was not reported. *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-6 Long-Distance Trips by Purpose: 2001

Trip purpose	Percent	Number (millions)	SE (millions)
Commute	12.7	330	25
Business	15.9	414	14
Pleasure	55.5	1,450	23
Personal business	12.6	328	11
Other	3.4	89	5
Total	**100.0**	**2,611**	

KEY: SE = standard error.

NOTES: *Other* includes spending the night, givng someone a ride, and responses not elsewhere classified. Excludes trips where purpose was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-7 Long-Distance Trips by Purpose and Mode: 2001
Number (millions)

Mode	Commute	SE	Business	SE	Pleasure	SE	Personal business	SE	Other	SE
Personal vehicle	318.3	24.1	328.6	13.8	1,309.9	22.1	292.5	10.5	85.63	5.1
Air	4.9	1.1	73.6	3.6	97.5	4.3	15.4	1.4	1.65	0.6
Bus	1.6	0.8	3.5	1.0	31.8	2.7	18.2	1.6	0.43	0.2
Train	5.6	2.3	6.6	1.5	7.8	1.2	1.1	0.4	0.04	0.04
Other	0	0	2.0	1.1	2.4	0.6	0.4	0.1	0.89	0.5
Total	**330.4**	**24.5**	**414.3**	**14.1**	**1,449.4**	**23.4**	**327.7**	**10.6**	**88.6**	**5.1**

KEY: SE = standard error.

NOTES: *Other purpose* includes spending the night, giving someone a ride, and responses not elsewhere classified. *Other mode* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where purpose or mode was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-8a Annual Average Long-Distance Trips per Person by Household Income: 2001
Number (millions)

Income group	Trips per person	SE
Less than $25,000	5.6	0.24
$25,000 to $49,999	9.0	0.27
$50,000 to $74,999	11.3	0.35
$75,000 to $99,999	11.8	0.42
$100,000 or more	13.2	0.36
Total	**9.4**	**0.14**

KEY: SE = standard error.

NOTE: Excludes trips where income was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-8b Annual Long-Distance Trips by Household Income and Mode: 2001
Number (millions)

	< $25,000		$25,000–$49,999		$50,000–$74,999		$75,000–$99,999		≥ $100,000		Total	
	Number	SE	Number	SE	Number	SE	Number	SE	Number	SE	Number	SE
Personal vehicle	302.4	15.0	701.4	22.5	541.5	17.0	332.1	15.5	359.6	14.2	2,336.1	36.9
Air	9.9	1.0	28.8	2.1	31.0	2.4	38.7	2.8	74.3	4.2	193.3	6.3
Bus	12.1	1.8	15.9	1.5	11.7	1.8	7.2	1.4	5.1	1.1	55.4	3.5
Train	2.2	0.7	4.7	1.4	4.6	1.3	1.6	0.6	4.7	1.1	21.1	2.9
Other	1.1	0.9	1.0	0.3	1.8	0.8	0.7	0.3	0.6	0.2	5.8	1.5
Total	**327.9**	**14.7**	**751.9**	**22.8**	**590.9**	**17.8**	**380.4**	**16.3**	**444.8**	**15.1**	**2,617.1**	**37.9**

KEY: SE = standard error.

NOTES: *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where income or mode was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-9 Annual Long-Distance Trips by Mode and Gender: 2001
Number (millions)

	Women		Men		All	
	Number	SE	Number	SE	Number	SE
Personal vehicle	989	15	1,347	29	2,336	37
Air	82	4	111	4	193	6
Bus	30	2	25	2	55	3
Train	9	1	12	3	21	3
Other	2	0	4	1	6	1
Total	**1,117**	**16**	**1,500**	**29**	**2,617**	**38**

KEY: SE = standard error.

NOTES: *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where gender or mode was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-10 Annual Long-Distance Trips by Age: 2001
Number (millions)

Age group	Number	SE	Trips per person	SE
Under 5	113	4	5.9	0.22
5 to 17	338	10	6.4	0.19
18 to 24	209	11	8.7	0.43
25 to 34	448	15	11.0	0.37
35 to 44	510	17	11.7	0.38
45 to 54	448	11	12.6	0.28
55 to 64	289	11	11.9	0.41
65 to 74	155	5	8.5	0.26
75 or older	65	4	4.4	0.25

KEY: SE = standard error.

NOTE: Excludes trips where age was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-11/12 Average Daily Trips per Person per Day by Mode and Household Income: 2001

	Total		< $25,000		$25,000–$49,999		$50,000–$74,999		$75,000–$99,999		≥ $100,000	
	Number	SE	Number	SE	Number	SE	Number	SE	Number	SE	Number	SE
Personal vehicle	3.85	0.02	3.20	0.04	3.93	0.03	4.14	0.04	4.15	0.04	4.24	0.04
Transit	0.14	0.00	0.21	0.01	0.12	0.01	0.11	0.01	0.12	0.01	0.14	0.01
Bike/walk	0.38	0.01	0.46	0.01	0.34	0.01	0.36	0.01	0.38	0.02	0.40	0.01
Other	0.022	0.001	0.016	0.003	0.016	0.002	0.022	0.003	0.037	0.008	0.036	0.005
All modes	4.06	0.02	3.51	0.04	4.08	0.03	4.34	0.04	4.41	0.05	4.55	0.05

KEY: SE = standard error.

NOTES: *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where income or mode was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-13 Average Daily Trips and Miles by Gender and Mode: 2001

	Person trips per person per day	SE	Person-miles per person per day	SE
Men	4.05	0.023	43.37	0.773
Personal vehicle	3.49	0.022	38.58	0.513
Transit	0.14	0.004	4.30	0.588
Bike/walk	0.39	0.007	0.30	0.025
Other	0.03	0.002	0.17	0.039
Women	4.08	0.022	35.29	0.746
Personal vehicle	3.54	0.024	30.95	0.418
Transit	0.14	0.005	3.66	0.526
Bike/walk	0.38	0.008	0.24	0.010
Other	0.02	0.001	0.09	0.020

KEY: SE = standard error.

NOTES: *Other* includes watercraft (e.g., ship, ferry, and motorboat); taxi, limousine, and hotel/airport shuttle; bicycle and walking; and other not elsewhere classified. Excludes trips where mode or gender was not reported.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-14 Average Daily Trips and Miles per Person by Age: 2001

Age group	Person trips per person per day	SE	Person-miles per person per day	SE
Under 5	3.2	0.05	26.5	1.27
5–17	3.6	0.03	26.0	1.48
18–24	4.2	0.05	40.1	1.79
25–34	4.4	0.04	46.9	1.41
35–44	4.8	0.04	51.4	1.58
45–54	4.5	0.04	50.1	1.76
55–64	4.1	0.05	42.3	0.98
65–74	3.9	0.06	35.2	1.97
75 or older	2.8	0.06	20.3	1.34
All	**4.1**	**0.02**	**39.2**	**0.61**

KEY: SE = standard error.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, 2001 National Household Travel Survey data, CD-ROM, February 2004.

TABLE 5-15 Daily Trips by Age Group by Mode: 2001

	Ages 19–64			Ages 65+		
	Number (millions)	Percent	SE	Number (millions)	Percent	SE
Personal vehicle	241,918.5	89.5	0.20	37,503.3	89.3	0.34
Walk	20,272.5	7.5	0.15	3,527.7	8.4	0.29
Transit	4,865.4	1.8	0.07	503.9	1.2	0.14
Other (includes bicycle)	3,243.6	1.2	0.07	503.9	1.2	0.13
Total	**270,300.0**	**100.0**	**U**	**41,997.0**	**100.1**	**U**

KEY: SE = standard error; U = data are unavailable in source.

NOTE: Percentages do not necessarily add to 100 due to rounding.

SOURCES: Percent and SE—D.V. Collia, J. Sharp, and L. Giesbrecht, "The 2001 National Household Travel Survey: A Look Into the Travel Patterns of Older Americans," *Journal of Safety Research* 34 (2003), table 2. **Number—**U.S. Department of Transportation, Bureau of Transportation Statistics calculations.

TABLE 5-16 Daily Trips by Age Group and Time of Day: 2001

	Ages 19–64		Ages 65+	
	Number (millions)	Percent	Number (millions)	Percent
Midnight–1am	1,351.5	0.5	42.0	0.1
1am–2am	810.9	0.3	0.0	0.0
2am–3am	540.6	0.2	0.0	0.0
3am–4am	270.3	0.1	0.0	0.0
4am–5am	1,351.5	0.5	42.0	0.1
5am–6am	3,513.9	1.3	210.0	0.5
6am–7am	8,379.3	3.1	546.0	1.3
7am–8am	15,947.7	5.9	1,427.9	3.4
8am–9am	14,596.2	5.4	2,267.8	5.4
9am–10am	12,974.4	4.8	3,569.7	8.5
10am–11am	15,407.1	5.7	4,283.7	10.2
11am–noon	17,569.5	6.5	4,199.7	10.0
Noon–1pm	20,542.8	7.6	3,737.7	8.9
1pm–2pm	17,839.8	6.6	3,737.7	8.9
2pm–3pm	17,839.8	6.6	3,653.7	8.7
3pm–4pm	19,731.9	7.3	3,359.8	8.0
4pm–5pm	21,083.4	7.8	2,897.8	6.9
5pm–6pm	22,164.6	8.2	2,393.8	5.7
6pm–7pm	18,380.4	6.8	2,057.9	4.9
7pm–8pm	14,325.9	5.3	1,385.9	3.3
8pm–9pm	10,541.7	3.9	1,007.9	2.4
9pm–10pm	7,838.7	2.9	672.0	1.6
10pm–11pm	4,595.1	1.7	378.0	0.9
11 pm–midnight	2,973.3	1.1	126.0	0.3
Total	**270,300.0**	**100.1**	**41,997.0**	**100.0**

NOTES: Standard error data are not available. Percentages do not necessarily add to 100 due to rounding.

SOURCES: Percent—D.V. Collia, J. Sharp, and L. Giesbrecht, "The 2001 National Household Travel Survey: A Look Into the Travel Patterns of Older Americans," *Journal of Safety Research* 34 (2003). **Number—**U.S. Department of Transportation, Bureau of Transportation Statistics calculations.

TABLE 5-17 Long-Distance Trips by Mode and Gender: 2001

	Men 65+			Women 65+		
	Number (millions)	Percent	SE	Number (millions)	Percent	SE
Personal vehicle	107.5	91.5	0.84	89.3	87.1	0.78
Air	5.9	5.1	0.65	5.5	5.4	0.46
Bus	3.1	2.6	0.47	6.4	6.3	0.68
Train	0.7	0.6	0.21	0.8	0.8	0.20
Other	0.3	0.3	0.10	0.4	0.4	0.09
Total	**117.5**	**100.1**	**U**	**102.5**	**100.0**	**U**

KEY: SE = standard error; U = data are unavailable in source.

NOTE: Percentages do not necessarily add to 100 due to rounding.

SOURCES: Percent and SE—D.V. Collia, J. Sharp, and L. Giesbrecht, "The 2001 National Household Travel Survey: A Look Into the Travel Patterns of Older Americans," *Journal of Safety Research* 34 (2003), table 16. **Number—**U.S. Department of Transportation, Bureau of Transportation Statistics calculations.

[NOTE: Figure 5-18 is an intercity passenger transportation map, and the corresponding data table is not provided.]

TABLE 6-1a Average Household Transportation Expenditures: 1992–2002
Chained 2000 dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicle purchases	2,517	2,569	2,889	2,693	2,820	2,732	2,989	3,320	3,418	3,566	3,711
Gasoline and motor oil	1,263	1,281	1,287	1,293	1,310	1,330	1,415	1,349	1,291	1,328	1,366
Other vehicle expenses	1,712	1,806	1,925	1,979	2,025	2,206	2,202	2,262	2,281	2,317	2,370
Other transportation	357	368	437	396	467	421	450	407	427	394	378

NOTES: Data are based on survey results. The Bureau of Labor Statistics (BLS) uses the term consumer unit rather than household. BLS defines a consumer unit as 1) members of a household related by blood, marriage, adoption, or other legal arrangement; 2) a person living alone; sharing a household with others; rooming in a private home, lodging, or in permanent living quarters in a hotel or motel but who is financially independent; or 3) two or more persons living together and making joint expenditure decisions.

Other transportation includes both local transit (e.g., bus and taxi travel) and long-distance travel (e.g., airplane trips).

Current dollar amounts (see table 6-1b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Expenditure Survey* data query, January 2004.

TABLE 6-1b Average Household Transportation Expenditures: 1992–2002
Current dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicle purchases	2,189	2,319	2,725	2,638	2,815	2,736	2,964	3,305	3,418	3,579	3,665
Gasoline and motor oil	973	977	986	1,006	1,082	1,098	1,017	1,055	1,291	1,279	1,235
Other vehicle expenses	1,776	1,843	1,953	2,015	2,058	2,230	2,206	2,254	2,281	2,375	2,471
Other transportation	290	314	381	355	427	393	429	397	427	400	389

NOTES: Data are based on survey results. The Bureau of Labor Statistics (BLS) uses the term consumer unit rather than household. BLS defines a consumer unit as 1) members of a household related by blood, marriage, adoption, or other legal arrangement; 2) a person living alone; sharing a household with others; rooming in a private home, lodging, or in permanent living quarters in a hotel or motel but who is financially independent; or 3) two or more persons living together and making joint expenditure decisions.

Other transportation includes both local transit (e.g., bus and taxi travel) and long-distance travel (e.g., airplane trips).

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Expenditure Survey* data query, January 2004.

TABLE 6-2a Average Cost per Mile of Owning and Operating an Automobile: 1992–2002
Chained 2000 dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Variable costs	0.11	0.11	0.11	0.11	0.11	0.12	0.13	0.12	0.12	0.14	0.12
Fixed costs	0.34	0.33	0.32	0.32	0.33	0.34	0.36	0.37	0.37	0.37	0.39
Total costs	**0.45**	**0.44**	**0.43**	**0.43**	**0.44**	**0.46**	**0.49**	**0.49**	**0.49**	**0.51**	**0.51**

NOTES: Data are the cost per mile based on 15,000 miles per year. Current dollar amounts (see table 6-2b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on USDOT, BTS, National Transportation Statistics 2003, table 3-14, available at http://www.bts.gov, as of March 2004.

TABLE 6-2b Average Cost per Mile of Owning and Operating an Automobile: 1992–2002
Current dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Variable costs	0.09	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.12	0.14	0.12
Fixed costs	0.30	0.29	0.30	0.32	0.33	0.34	0.35	0.36	0.37	0.37	0.38
Total costs	**0.39**	**0.38**	**0.39**	**0.42**	**0.43**	**0.45**	**0.46**	**0.47**	**0.49**	**0.51**	**0.50**

NOTE: Data are the cost per mile based on 15,000 miles per year.

SOURCE: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on USDOT, BTS, National Transportation Statistics 2003, table 3-14, available at http://www.bts.gov, as of March 2004.

TABLE 6-3 Average Amtrak Revenue per Revenue Passenger-Mile: 1993–2002

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Revenue per RPM (chained 2000 dollars)	0.16	0.15	0.16	0.16	0.17	0.17	0.21	0.22	0.22	0.23
Revenue per RPM (current dollars)	0.13	0.12	0.14	0.15	0.15	0.15	0.20	0.22	0.23	0.25

KEY: RPM = revenue passenger-mile.

NOTES: Amtrak data are not available prior to 1993. Revenue includes revenue from concessions and other passenger services in addition to passenger fares. A revenue passenger-mile is the number of revenue passengers multiplied by the number of miles traveled by each passenger.

Current dollar amounts were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on Association of American Railroads, *Railroad Facts* (Washington, DC: 1994–2003 issues), annual Amtrak passenger revenue and revenue passenger-miles data.

TABLE 6-4 Average Class I Intercity Bus Fare: 1992–2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Class I intercity bus (chained 2000 dollars)	22.93	23.87	22.16	23.22	25.91	23.51	24.79	27.36	29.46	29.31	28.26
Class I intercity bus (current dollars)	21.15	21.32	19.77	20.10	22.85	20.83	23.14	26.16	29.46	30.27	30.11

NOTE: Current dollar amounts were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2003,* tables 3-15a and 3-15b, available only at http://www.bts.gov, as of May 2004. **2002—**USDOT, BTS, personal communication, May 2004.

TABLE 6-5/6-6a Average Transit Fare per Passenger-Mile by Service Type: 1992–2002
Chained 2000 dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bus	0.18	0.18	0.19	0.19	0.19	0.18	0.20	0.20	0.21	0.19	0.18
Commuter rail	0.16	0.16	0.15	0.14	0.14	0.15	0.14	0.15	0.15	0.15	0.14
Demand responsive	0.18	0.19	0.33	0.27	0.24	0.22	0.19	0.20	0.20	0.21	0.22
Heavy rail	0.20	0.21	0.21	0.21	0.20	0.19	0.19	0.18	0.18	0.17	0.17
Light rail	0.16	0.17	0.18	0.16	0.15	0.13	0.13	0.14	0.13	0.14	0.15
Trolley bus	0.29	0.32	0.33	0.32	0.30	0.30	0.30	0.32	0.31	0.31	0.30
Other	0.18	0.17	0.20	0.19	0.13	0.14	0.11	0.12	0.13	0.14	0.14
Total	**0.18**	**0.18**	**0.19**	**0.19**	**0.18**	**0.18**	**0.18**	**0.18**	**0.18**	**0.18**	**0.17**

NOTES: Data for 2002 are preliminary. Fares include subsidies. For definitions of service types, see Glossary. *Other* includes aerial tramway, automated guideway transit, cable car, inclined plane, and monorail. Current dollar amounts (see table 6-5/6-6b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on American Public Transportation Association, *Public Transportation Fact Book 2004* (Washington, DC: 2004), tables 8 and 65, also available online at http://www.apta.com, as of May 2004.

TABLE 6-5/6-6b Average Transit Fare per Passenger-Mile: 1992–2002
Current dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bus	0.15	0.15	0.17	0.17	0.18	0.18	0.20	0.20	0.21	0.20	0.19
Commuter rail	0.13	0.14	0.14	0.13	0.14	0.15	0.14	0.15	0.15	0.15	0.15
Demand responsive	0.15	0.17	0.30	0.24	0.24	0.23	0.19	0.20	0.20	0.21	0.23
Heavy rail	0.17	0.19	0.19	0.19	0.20	0.19	0.19	0.18	0.18	0.18	0.18
Light rail	0.14	0.15	0.16	0.15	0.15	0.13	0.13	0.14	0.13	0.14	0.16
Trolley bus	0.24	0.28	0.29	0.29	0.30	0.30	0.30	0.32	0.31	0.32	0.32
Other	0.16	0.15	0.18	0.17	0.13	0.14	0.11	0.12	0.13	0.14	0.15
Total	**0.15**	**0.16**	**0.17**	**0.17**	**0.18**	**0.18**	**0.18**	**0.18**	**0.18**	**0.18**	**0.18**

NOTES: Data for 2002 are preliminary. Fares include subsidies. For definitions of service types, see Glossary. *Other* includes aerial tramway, automated guideway transit, cable car, inclined plane, and monorail.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on American Public Transportation Association, *Public Transportation Fact Book 2004* (Washington, DC: 2004), tables 8 and 65, also available online at http://www.apta.com, as of May 2004.

TABLE 6-7 Air Travel Price Index by City of Origin for Three Medium-Sized U.S. Cities: 1995–2003
All classes of service combined, domestic carriers only
Q1: 1995 = 100.0

Quarter	Charleston, SC	Colorado Springs, CO	Des Moines, IA
95Q1	100.0	100.0	100.0
95Q2	102.5	95.5	102.5
95Q3	104.5	90.0	97.1
95Q4	104.9	81.8	95.7
96Q1	103.2	76.4	95.5
96Q2	93.2	83.0	96.1
96Q3	98.8	83.8	95.7
96Q4	97.8	79.6	101.3
97Q1	100.2	80.8	106.1
97Q2	102.4	81.9	105.5
97Q3	99.2	86.3	107.1
97Q4	104.9	93.3	115.3
98Q1	104.5	94.6	103.0
98Q2	102.4	93.6	96.5
98Q3	96.8	98.5	94.9
98Q4	98.9	98.0	91.0
99Q1	102.1	104.8	93.1
99Q2	104.4	106.2	94.9
99Q3	101.6	105.9	92.8
99Q4	102.0	107.8	91.9
00Q1	105.0	111.9	94.8
00Q2	105.3	113.0	100.7
00Q3	103.6	113.0	99.6
00Q4	108.6	110.9	96.3

(Table continues on the next page)

TABLE 6-7 Air Travel Price Index by City of Origin for Three Medium-Sized U.S. Cities: 1995–2003 *(continued)*
All classes of service combined, domestic carriers only
Q1: 1995 = 100.0

Quarter	Charleston, SC	Colorado Springs, CO	Des Moines, IA
01Q1	117.4	119.6	102.4
01Q2	110.7	111.1	100.7
01Q3	112.5	108.4	95.4
01Q4	107.4	106.7	92.6
02Q1	112.5	109.9	97.8
02Q2	112.3	105.4	95.9
02Q3	111.8	105.1	91.5
02Q4	105.9	107.6	91.4
03Q1	113.7	104.5	91.5
03Q2	122.1	104.9	89.8
03Q3	120.6	108.6	92.2
03Q4	116.1	105.9	93.9

NOTES: These data have been developed for research purposes only and are not official Bureau of Transportation Statistics data. *Air Travel Price Index* values are computed using the Fisher Index formula.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Labor, Bureau of Labor Statistics, calculations based on data from BTS's quarterly Passenger Origin and Destination Survey, October 2003 and 2004.

TABLE 6-8 Air Travel Price Index by City of Origin for Three Large International Cities: 1995–2003
All classes of service combined
Q1: 1995 = 100.0

Quarter	Frankfurt, Germany	London, England	Tokyo, Japan
95Q1	100.0	100.0	100.0
95Q2	108.7	118.7	114.9
95Q3	119.6	132.1	122.3
95Q4	106.1	121.3	94.6
96Q1	97.4	120.7	91.8
96Q2	103.3	113.1	91.2
96Q3	116.3	112.3	100.4
96Q4	93.3	106.0	86.4
97Q1	91.6	99.8	81.1
97Q2	88.3	108.0	78.8
97Q3	103.0	123.8	93.5
97Q4	92.2	105.4	73.5
98Q1	80.0	91.0	67.4
98Q2	88.0	96.8	63.4
98Q3	101.7	97.4	68.9
98Q4	86.3	81.5	67.7
99Q1	81.2	74.1	70.9
99Q2	83.6	71.6	70.6
99Q3	92.0	81.7	84.2
99Q4	84.0	71.3	79.2
00Q1	76.7	67.3	78.8
00Q2	79.5	70.9	81.9
00Q3	88.3	79.9	94.3
00Q4	74.0	67.4	80.4

(Table continues on the next page)

TABLE 6-8 Air Travel Price Index by City of Origin for Three Large International Cities: 1995–2003 *(continued)*
All classes of service combined
Q1: 1995 = 100.0

Quarter	Frankfurt, Germany	London, England	Tokyo, Japan
01Q1	76.4	65.1	76.2
01Q2	79.3	67.9	73.5
01Q3	86.4	76.0	83.4
01Q4	76.1	61.4	69.4
02Q1	79.8	60.3	65.7
02Q2	81.5	62.8	67.3
02Q3	96.0	76.0	81.9
02Q4	87.1	63.9	69.4
03Q1	89.7	60.2	68.5
03Q2	95.1	70.2	69.9
03Q3	115.6	85.9	80.9
03Q4	98.7	69.2	76.7

NOTES: These data have been developed for research purposes only and are not official Bureau of Transportation Statistics data. *Air Travel Price Index* values are computed using the Fisher Index formula.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Labor, Bureau of Labor Statistics, calculations based on data from BTS's quarterly Passenger Origin and Destination Survey, October 2003 and 2004.

TABLE 6-9 Comparison of Airfare Indexes: 1995–2003
Not seasonally adjusted, domestic carriers only
Q1: 1995 = 100.0

Quarter	BLS Airline Fare CPI (quarterly average)	Air Travel Price Index (all origins)	Air Travel Price Index (U.S origin only)	Air Travel Price Index (foreign origin only)
95Q1	100.0	100.0	100.0	100.0
95Q2	106.1	101.9	101.1	106.7
95Q3	105.7	102.3	100.4	113.6
95Q4	102.6	98.6	99.0	97.6
96Q1	101.1	98.4	98.7	97.3
96Q2	103.6	97.8	97.8	98.4
96Q3	105.5	99.3	98.4	105.6
96Q4	110.1	98.2	99.3	93.4
97Q1	107.9	100.5	102.0	93.3
97Q2	110.1	101.9	103.5	94.4
97Q3	108.4	101.9	102.2	101.9
97Q4	108.8	105.2	107.8	91.8
98Q1	112.4	101.4	104.6	84.5
98Q2	112.1	97.5	100.0	85.2
98Q3	113.1	97.3	99.5	86.3
98Q4	110.8	96.2	99.1	81.1
99Q1	116.3	98.9	102.2	81.6
99Q2	119.4	98.7	102.1	80.7
99Q3	119.1	98.4	100.4	88.0
99Q4	123.1	98.8	101.7	83.6
00Q1	126.1	102.5	106.1	83.0
00Q2	132.1	104.6	108.2	85.1
00Q3	135.1	106.4	109.0	92.8
00Q4	129.7	107.3	111.6	84.4

(Table continues on the next page)

TABLE 6-9 Comparison of Airfare Indexes: 1995–2003 *(continued)*
Not seasonally adjusted, domestic carriers only
Q1: 1995 = 100.0

Quarter	BLS Airline Fare CPI (quarterly average)	Air Travel Price Index (all origins)	Air Travel Price Index (U.S origin only)	Air Travel Price Index (foreign origin only)
01Q1	131.0	111.8	116.9	84.2
01Q2	131.5	107.4	111.8	83.8
01Q3	133.9	103.5	106.0	89.7
01Q4	126.6	99.1	102.9	78.2
02Q1	126.5	103.8	108.2	78.8
02Q2	129.8	102.6	106.4	80.9
02Q3	127.4	101.2	103.4	90.0
02Q4	122.0	101.1	104.7	81.2
03Q1	123.0	104.1	108.0	82.5
03Q2	127.8	102.5	105.8	84.7
03Q3	129.8	103.3	105.5	93.2
03Q4	124.5	103.2	106.3	87.5

NOTES: These data have been developed for research purposes only and are not official Bureau of Transportation Statistics data. *Air Travel Price Index* values are computed using the Fisher Index formula, which differs from the formulas used to compute the Bureau of Labor Statistics Airline Fare Consumer Price Index.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics (BTS) and U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS), calculations based on data from BTS's quarterly Passenger Origin and Destination Survey, October 2003 and 2004; and USDOL, BLS, Airline Fare Consumer Price Index, available at http://www.bls.gov/cpi/home.htm#data, as of March 2003 and June 2004.

TABLE 7-1/7-2 Transit Passenger-Miles by Type of Service: 1992–2002
Millions

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bus	17,494.0	17,363.7	17,195.4	17,024.0	16,802.2	17,509.2	17,873.7	18,683.8	18,807.3	19,582.9	19,527.8
Heavy rail	10,737.0	10,231.0	10,668.0	10,558.8	11,530.2	12,056.1	12,284.4	12,902.1	13,843.5	14,178.1	13,663.2
Commuter rail	7,320.0	6,912.0	7,996.0	8,244.0	8,350.4	8,037.5	8,702.3	8,764.0	9,399.9	9,544.0	9,499.8
Light rail	700.0	703.7	831.0	858.7	955.2	1,023.7	1,115.4	1,190.2	1,339.4	1,427.0	1,431.7
Demand responsive	317.0	389.5	377.0	397.0	391.0	466.0	513.4	559.0	589.0	626.0	651.0
Other	585.0	625.0	814.0	888.0	955.0	1,088.0	1,116.0	1,180.0	1,121.0	1,150.0	1,171.7
Total	**37,153.0**	**36,224.9**	**37,881.5**	**37,970.6**	**38,984.1**	**40,180.2**	**41,605.0**	**43,278.9**	**45,100.2**	**46,507.5**	**45,945.2**

NOTE: *Other* includes modes such as automated guideway, Alaska Railroad, cable car, ferryboat, inclined plane, monorail, trolleybus, and vanpool.

SOURCES: **1992–2001—**U.S. Department of Transportation (USDOT), Federal Transit Administration (FTA), National Transit Database, *National Transit Summaries and Trends* (Washington, DC: Annual Issues). **2002—**USDOT, FTA, personal communication, June 2004.

TABLE 7-3/7-4 Transit Ridership by Type of Service: 1992–2002
Millions of unlinked trips

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bus	4,748.5	4,638.5	4,629.4	4,579.1	4,505.6	4,602.0	4,753.7	4,991.9	5,040.2	5,215.1	5,267.5
Commuter rail	313.5	320.8	339.0	343.5	352.2	357.2	380.6	395.7	412.8	418.1	414.1
Heavy rail	2,207.2	2,045.5	2,169.4	2,033.5	2,156.9	2,429.5	2,392.8	2,521.4	2,632.2	2,728.3	2,688.0
Light rail	187.5	187.5	282.2	249.3	258.7	259.4	272.9	288.6	316.2	333.9	336.5
Other	240.0	240.0	282.0	298.0	291.0	306.0	315.0	326.0	318.6	312.0	311.0
Total	**7,696.2**	**7,432.7**	**7,701.6**	**7,503.7**	**7,564.6**	**7,954.2**	**8,115.1**	**8,523.2**	**8,719.9**	**9,007.8**	**9,016.7**

NOTE: *Other* includes vanpool, demand responsive, ferryboats, inclined planes, and trolley buses. Numbers may not add to total due to rounding.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends*, *Annual Reports*, available at http://www.ntdprogram.com, as of May 2004.

TABLE 7-5 Top 30 Transit Authorities by Unlinked Passenger Trips: 2002

Agency	Number of unlinked trips (thousands)
New York City Transit, NY	2,672,871
Chicago Transit Authority, IL	485,225
LA County Metro Transportation Authority, CA	445,196
Washington-Metro Area Transit Authority, DC	391,304
Massachusetts Bay Transit Authority, MA	388,975
SE Pennsylvania Transportation Authority, PA	313,687
San Francisco Municipal Railway, CA	234,303
New Jersey Transit, NJ	225,436
Metro Atlanta Rapid Transit Authority, GA	159,356
New York City Department of Transportation, NY	121,999
Maryland Transit Administration, MD	115,679
Long Island Rail Road, NY	100,504
Tri-County Metropolitan District, OR	100,219
San Francisco Bay Area Rapid Transit, CA	97,807
King County DOT, Metro Transit District, WA	97,517
Metro Transit Authority Harris County, TX	96,888
Miami-Dade Transit Agency, FL	82,952
Denver Regional Transportation District, CO	80,923
Port Authority of Allegheny County, PA	75,773
City and County of Honolulu, HI	74,260
Metro North Rail Road, NY	73,461
Dallas Area Rapid Transit, TX	71,602
Alameda-Contra Costa Transit District, CA	69,746
NE IL Regional Commuter Railroad, IL	69,610
Metro Transit, MN	69,589

(Table continues on the next page)

TABLE 7-5 Top 30 Transit Authorities by Unlinked Passenger Trips: 2002 *(continued)*

Agency	Number of unlinked trips (thousands)
Port Authority Trans-Hudson Corporation, NJ	68,322
Orange County Transportation Authority, CA	64,803
Milwaukee County Transportation System, WI	64,034
Greater Cleveland Regional Transit Authority, OH	55,745
Santa Clara Valley Transit Authority, CA	54,430
Total, top 30 authorities	**7,022,216**
Total, all authorities	**9,016,700**
Top 30 authorities as percent of all authorities	77.9

NOTES: Tri-County Metropolitan is a municipal corporation of the State of Oregon. Green Transit Jamaica Corp. data listed in earlier versions of this table are now included in the New York City Department of Transportation.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database, available at http://www.ntdprogram.com, as of May 2004.

TABLE 7-6 Lift- or Ramp-Equipped Transit Buses: 1993–2002

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total number of buses	55,726	57,023	57,322	57,369	58,975	60,830	63,618	65,324	67,379	68,418
Lift or ramp-equipped buses (number)	29,088	31,065	35,381	38,316	40,932	46,278	51,213	54,585	58,785	64,407
Lift or ramp-equipped buses (percent)	52.2	54.5	61.7	66.8	69.4	76.1	80.5	83.6	87.2	94.1

NOTE: Total includes buses of transit agencies receiving federal funding for bus purchases, as well as buses of agencies not receiving federal funds that voluntarily report data to the Federal Transit Administration.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends, Annual Reports,* available at http://www.ntdprogram.com, as of May 2004.

TABLE 7-7a Share of Transit Buses that are Lift- or Ramp-Equipped by Bus Type: 1993–2002
Percent

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Large buses	50.3	51.9	59.2	63.8	65.2	72.6	76.8	79.9	84.5	92.2
Medium buses	54.0	58.3	66.0	72.8	80.7	86.9	90.1	92.9	93.7	98.4
Small buses	79.4	80.1	84.5	87.8	90.4	91.6	93.4	94.5	95.4	99.2
Articulated buses	38.4	44.6	50.2	57.6	61.4	68.4	81.3	85.5	88.5	97.2

NOTES: Large buses (also referred to as type A) have more than 35 seats, medium buses (type B) have 25–35 seats, and small buses (type C) have less than 25 seats. Articulated buses are extra-long buses that measure between 54 and 60 feet.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends*, *Annual Reports*, available at http://www.ntdprogram.com, as of May 2004.

TABLE 7-7b Lift- or Ramp-Equipped Transit Buses by Type: 1993–2002
Number

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Large buses	23,338	24,398	27,420	29,073	29,684	33,512	36,029	37,581	40,501	44,035
Medium buses	1,911	2,153	2,561	3,081	4,143	5,150	5,959	6,926	7,337	8,550
Small buses	3,146	3,795	4,539	5,269	6,194	6,545	7,722	8,366	9,176	9,743
Articulated buses	693	719	861	893	911	1,071	1,503	1,712	1,771	2,079

NOTES: Large buses (also referred to as type A) have more than 35 seats, medium buses (type B) have 25–35 seats, and small buses (type C) have less than 25 seats. Articulated buses are extra-long buses that measure between 54 and 60 feet.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends*, *Annual Reports*, available at http://www.ntdprogram.com, as of May 2004.

TABLE 8-1 Roadside Truck Inspections: 1993–2003
Thousands

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Trucks inspected	1,947	1,974	1,840	2,039	2,148	1,763	1,862	1,928	2,087	2,132	2,113
Trucks taken out of service	506	472	417	437	439	448	453	457	486	494	486

NOTES: Trucks are taken out of service (OOS) when inspectors find serious violations that warrant the issuance of a vehicle OOS order. There may be some inconsistencies across the 1993–2003 data. The Bureau of Transportation Statistics obtained the data at different times (see Sources) and was unable to verify the consistency of the entire data series prior to publication.

SOURCES: 1993–1998—U.S. Department of Transportation (USDOT), Federal Motor Carrier Safety Administration (FMCSA), Motor Carrier Management Information System, available at http://www.fmcsa.dot.gov, as of June 2003. **1999–2001—**USDOT, FMSCA, personal communication, Aug. 11, 2003. **2002–2003—**USDOT, FMCSA, personal communication, June 22, 2004.

TABLE 8-2 Federal-Aid Roadway Projects Underway by Improvement Type: 2001

Improvement type	Miles
Restoration	5,167
Resurfacing	12,549
Minor widening	492
Reconstruction	3,937
Major widening	1,476
Relocation	246
New route	738

NOTES: Maintenance includes any work required to keep highways in usable condition that does not extend the service life of the roadway beyond the original design. Restoration includes renovation. Although the following categories are not generally considered maintenance, they are included for comparison: major widening, relocation, new route.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC), "Miles of Federal-Aid Roadway Projects Underway by Improvement Type" chart, available at http://www.fhwa.dot.gov/ohim, as of June 2003.

TABLE 8-3 Federal, State, and Local Government Highway Maintenance Expenditures: 1991–2001
Billions of dollars

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total in current $	21,222	22,578	22,894	23,553	24,319	25,564	26,777	28,173	29,997	30,636	31,677
Total in constant 1987 $	17,700	18,282	17,998	18,048	18,121	18,514	18,952	19,635	20,455	20,400	20,319

NOTES: Although dollar values in most other sections of this report have been converted to chained 2000 dollars, these data are presented in constant 1987 dollars. The Federal Highway Administration, which collects the data, adjusts current dollar data to constant 1987 dollars using an index it designed for that purpose.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2001* (Washington, DC: 2002), "Highway Expenditures by Government Type, Current and Constant Dollars" chart, also available at http://www.fhwa.dot.gov/ohim, as of June 2003.

TABLE 8-4 Rail Replaced or Added by U.S. Class I Railroads: 1992–2002
Thousands of tons

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rail replaced	875.3	824.3	728.8	657.6	803.3	642.7	679.0	769.3	726.1	660.1	635.5
Rail added	14.2	26.2	62.9	61.3	68.7	113.8	204.8	213.4	196.3	197.0	125.2

SOURCES: Association of American Railroads, *Railroad Ten-Year Trends, 1990–2000* (Washington, DC: 2000); **2000–2002—**Association of American Railroads, *Analysis of Class I Railroads* (Washington, DC: 2001–2003).

TABLE 8-5 Crossties Replaced or Added by U.S. Class I Railroads: 1992–2002
Millions of crossties

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Crossties replaced	13.5	12.8	12.3	12.1	13.4	11.9	10.4	10.8	10.8	11.4	13.1
Crossties added	0.2	0.4	0.6	0.7	0.8	1.5	1.8	1.3	0.7	0.5	0.3

SOURCES: Association of American Railroads, *Railroad Ten-Year Trends, 1990–2000* (Washington, DC: 2000); **2000–2002**—Association of American Railroads, *Analysis of Class I Railroads* (Washington, DC: 2001–2003).

TABLE 8-6 New and Rebuilt Locomotives and Freight Cars: 1992–2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Locomotives	460	707	1,214	1,129	821	811	1,061	865	721	755	778
Percentage of fleet	2.6	3.9	6.6	6.0	4.3	4.1	5.2	4.3	3.6	3.8	3.8
Freight cars	28,876	43,332	51,079	66,052	59,993	51,963	83,076	77,901	58,245	35,475	18,832
Percentage of fleet	2.5	3.7	4.3	5.4	4.8	4.1	6.3	5.7	4.2	2.7	1.4

NOTE: Locomotive data are for Class I railroads only. Freight car data cover Class I railroads, other railroads, and private car owners.

SOURCE: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), pp. 49, 51, and 55.

TABLE 8-7 Interruptions of Service by Type of Transit: 1995–2000
Number per 100,000 revenue vehicle-miles

	1995	1996	1997	1998	1999	2000
Motor bus	28	27	27	29	28	28
Light rail	32	26	20	14	17	15
Heavy rail	4	4	3	7	7	6
Commuter rail	4	3	3	3	3	3
Demand responsive	2	2	3	3	3	3
Average (all transit types)	18.8	18.1	17.6	18.7	18.6	18.1

NOTES: Interruptions of service include major and minor mechnical failures. If the vehicle operator was able to fix the problem and return the vehicle to service without assistance, the incident is not considered an interruption of service.

For definitions of service types, see Glossary.

SOURCES: U.S. Department of Transportation, Federal Transit Administration, National Transit Library, *2001 Reporting Manual*, available at http://www.ntdprogram.com/, as of April 2003; and American Public Transportation Association, Maintenance data tables, available at http://www.apta.com/research/stats/maint/index.cfm, as of April 2003.

TABLE 8-8 Saint Lawrence Seaway U.S. Locks Downtime by Cause: 1992–2002
Hours of downtime

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Weather related	187.0	125.7	101.0	88.5	143.4	65.2	43.2	2.0	53.7	56.8	41.1
Vessel incident	26.0	66.7	17.7	32.6	38.3	31.2	43.3	46.3	27.8	45.1	16.9
All other causes	16.0	132.7	45.0	16.7	5.9	35.6	12.1	1.3	2.6	8.9	5.1

NOTES: *Weather-related* causes include poor visibility and high wind/ice; *All other causes* includes lock equipment malfunction, civil interference, and water level/flow. These data pertain only to the two U.S. locks (Snell and Eisenhower) on the Saint Lawrence Seaway between the Port of Montreal and Lake Ontario. Canada operates another five locks along this portion of the Seaway, as well as other Seaway locks.

SOURCES: U.S. Department of Transportation, Saint Lawrence Seaway Development Corp. (SLSDC), *Annual Reports* (Washington, DC: Various years). Reports for years 1997–2001 available at http://www.greatlakes-seaway.com/en/aboutus/slsdc_annrept.html, as of March 2004. **2002—** SLSDC, personal communication, March 2004.

TABLE 8-9 U.S. Containerized Imports by Major Port Regions: January 1999–September 2003
Thousands of TEUs

NOTE: Data for this table come from a private source and cannot be made available to the public.

TABLE 9-1 Transportation Fatalities by Mode: 2002

	Per 100,000 U.S. residents	Number of fatalities
Air	0.21	609
Railroad	0.33	951
Transit	0.10	285
Waterborne recreational boating	0.29	826
Pipeline	0.004	11
Highway	14.87	42,815
Total	**15.80**	**45,497**

NOTES: *Air* fatalities include air carrier service, commuter service, air taxi sevice, and general aviation. *Highway* fatalities include all types of highway motor vehicles, bicycles, and pedestrians. *Railroad* fatalities include railroad and highway-rail grade-crossing incidents. *Transit* fatalities include motor bus, heavy rail, light rail, commuter rail, demand responsive, trolley bus, aerial tramway, automated guideway transit, cablecar, ferryboat, inclined plane, monorail, and vanpool. *Waterborne* fatalities include those due to vessel-related incidents or nonvessel- related incidents on commercial and recreational vessels. *Pipeline* fatalities include hazardous liquid pipelines and gas pipelines.

These fatality rates have not been adjusted to account for double counting across modes, because the detailed fatality data needed to do so were not available at the time this report was prepared. Double counting is of particular concern across rail and highway modes due to highway-rail grade-crossings fatalities and across highway and transit due to transit bus fatalities. The Bureau of Transportation Statistics estimates that double counting inflates the total fatality rate by about 0.1 fatality per 100,000 residents. Air and waterborne data are preliminary.

SOURCES: Except as noted—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 2-1 revised, available at http://www.bts.gov/, as of January 2004. **Transit—**USDOT, Federal Transit Administration, National Transit Database, *Safety and Security Newsletter* (Washington, DC: Spring 2003) available at http://transit-safety.volpe.dot.gov/Data/NTDNewsletters/Default.asp, as of January 2004. **Waterborne recreational boating—**U.S. Department of Homeland Security, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: December 2003), available at http://uscgboating.org, as of January 2004. **Population—**U.S. Department of Commerce, U.S. Census Bureau, *Monthly Population Estimates for the United States,* available at http://eire.census.gov/popest/data/national/tables/NA-EST2003-01.php, as of January 2004.

TABLE 9-2 Highway Fatalities per 100,000 Residents for Selected Vehicle Types: 1992–2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Passenger car occupants	8.3	8.3	8.4	8.4	8.4	8.1	7.7	7.5	7.3	7.1	7.1
Light-truck occupants	3.2	3.3	3.4	3.6	3.7	3.8	3.9	4.0	4.1	4.1	4.2
Large-truck occupants	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2
Motorcycle occupants	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.1	1.1

NOTES: *Large trucks* are defined as trucks over 10,000 pounds gross vehicle weight rating (GVWR), including single-unit trucks and truck tractors. *Light trucks* are defined as trucks of 10,000 pounds GVWR or less, including pickup trucks, vans, truck-based station wagons, and sport utility vehicles.

SOURCES: Fatalities—U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 2-1 revised, available at http://www.bts.gov/, as of January 2004. **1991–1999 population—**U.S. Department of Commerce (USDOC), U.S. Census Bureau, *Census 2000,* available at http://www.census.gov, as of June 2003; **2000–2002—**USDOC, U.S. Census Bureau, *Monthly Population Estimates for the United States,* available at http://eire.census.gov/popest/data/national/tables/NA-EST2003-01.php, as of January 2004.

TABLE 9-3 Highway Fatalities per 100 Million Vehicle-Miles for Selected Vehicle Types: 1992–2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Passenger car occupants	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.3	1.3	1.2	1.2
Light-truck occupants	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.3
Large-truck occupants	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3
Motorcycle occupants	25.1	24.7	22.7	22.7	21.8	21.0	22.3	23.5	27.7	33.2	34.0

NOTES: *Large trucks* are defined as trucks over 10,000 pounds gross vehicle weight rating (GVWR), including single-unit trucks and truck tractors. *Light trucks* are defined as trucks of 10,000 pounds GVWR or less, including pickup trucks, vans, truck-based station wagons, and sport utility vehicles.

SOURCES: Fatalities—U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 2-1 revised, available at http://www.bts.gov/, as of January 2004. **Vehicle-miles—**USDOT, Federal Highway Administration, *Highway Statistics 2002* (Washington, DC: 2003), table VM-1.

TABLE 9-4 Deaths and Years of Potential Life Lost Due to Transportation Accidents: 1991–2000
Percent

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Deaths	6.2	5.8	5.8	5.8	5.9	6.1	6.2	6.2	5.8	6.0
YPLL	10.4	9.8	9.7	9.8	9.9	10.4	10.5	10.4	10.0	10.2

NOTES: Years of potential life lost (YPLL) is the difference between the age of death and 65 years of age. Fatalities of people 65 years old and older are not included in this calculation.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Injury Prevention and Control, Web-based Injury Statistics Query and Reporting System (WISQARS), available at http://www.cdc.gov/ncipc/wisqars/, as of February 2003.

TABLE 9-5 Years of Potential Life Lost Due to Motor Vehicle and Other Transportation Accidents: 1991–2000
Percentage of YPLL

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Motor vehicle	10.0	9.3	9.3	9.3	9.5	9.9	10.1	10.0	9.7	9.9
Other transportation	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3

NOTES: Years of potential life lost (YPLL) is the difference between the age of death and 65 years of age. Fatalities of people 65 years old and older are not included in this calculation.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Injury Prevention and Control, Web-based Injury Statistics Query and Reporting System (WISQARS), available at http://www.cdc.gov/ncipc/wisqars/, as of February 2003.

TABLE 9-6 Injuries for Occupants of Highway Vehicles and Motorcycles: 2002

Vehicle type	Injuries per 100 million pmt	Number of injuries
Passenger car	69.3	1,926,625
Motorcycle	555.2	60,236
Light truck	51.1	860,527
Large truck	10.4	29,242
Bus	13.0	15,427
Total	**59.0**	**2,892,057**

KEY: pmt = passenger-miles of travel.

NOTE: Some of the data used to calculate these injury rates are preliminary.

SOURCES: **Injuries—**U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 2-2 revised, available at http://www.bts.gov/, as of January 2004.
Pmt—USDOT, Federal Highway Administration, *Highway Statistics 2002* (Washington, DC: 2003), table VM-1, also available at http://www.fhwa.dot.gov/policy/ohim/hs02/index.htm, as of March 2004.

TABLE 9-7 Injury Rates for Occupants of Highway Vehicles and Motorcycles: 1992–2002
Injuries per 100 million passenger-miles of travel (pmt)

Vehicle type	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Passenger car	101.1	102.3	105.1	108.0	105.2	98.0	89.3	85.7	80.6	75.4	69.3
Light truck	45.3	48.0	49.7	57.5	58.7	55.8	55.2	59.1	60.4	51.3	51.1
Motorcycle	544.9	487.8	463.3	533.4	506.6	474.1	433.0	429.4	501.2	512.2	555.2
Large truck	22.0	20.1	17.7	17.0	17.9	16.1	14.6	16.2	15.0	11.9	10.4
Bus	16.4	13.1	11.6	14.1	14.6	11.6	10.5	13.5	11.0	10.3	13.0

NOTE: Some of the data used to calculate 2002 injury rates are preliminary.

SOURCES: **Injuries—**U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 2-2 revised, available at http://www.bts.gov/, as of January 2004. **Pmt—**USDOT, Federal Highway Administration, *Highway Statistics 2002* (Washington, DC: 2003), table VM-1, also available at http://www.fhwa.dot.gov/policy/ohim/hs02/index.htm, as of March 2004.

TABLE 9-8 Minor Motor Vehicle-Related Injuries by Age and Gender: 2002

Age	Males (number)	Females (number)
0–4	44,877	42,532
5–9	44,624	43,263
10–14	136,387	139,247
15–19	157,678	196,890
20–24	227,866	251,521
25–29	165,428	180,138
30–34	172,648	196,972
35–39	111,208	129,833
40–44	119,692	140,111
45–49	92,579	113,564
50–54	65,711	83,718
55–59	50,942	60,162
60–64	31,784	43,002
65–69	25,668	30,410
70–74	25,946	27,847
75–79	13,978	18,048
80–84	11,819	13,494
85–89	6,209	6,651
90–94	1,491	1,670
95–99	162	649
100+	120	42

NOTES: A *minor injury* is one in which the victim was treated and released. Table does not include an additional 67,155 minor injuries for which age was unknown or not recorded in the original data.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System (NEISS), October 2003.

TABLE 9-9 Serious Motor Vehicle-Related Injuries by Age and Gender: 2002

Age	Males (number)	Females (number)
0–4	3,804	2,654
5–9	4,805	2,416
10–14	11,653	5,595
15–19	16,899	11,864
20–24	22,647	12,625
25–29	14,403	8,887
30–34	15,815	9,329
35–39	10,537	4,705
40–44	12,489	8,637
45–49	11,362	6,786
50–54	8,810	4,679
55–59	6,267	5,283
60–64	5,085	4,230
65–69	4,766	3,665
70–74	4,476	6,509
75–79	3,787	3,393
80–84	3,760	3,522
85–89	1,585	1,734
90–94	1,122	907
95–99	0	0
100+	0	115

NOTES: A *serious injury* is one in which the victim was either hospitalized or treated and transferred to another facility, was dead on arrival, or died in the emergency room. This table does not include an additional 4,908 serious injuries for which age was unknown or not recorded in the original data.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System (NEISS), October 2003.

TABLE 9-10 Serious Motor Vehicle-Related Injuries by Type: 2002

Type	Total number of injuries	Number of serious injuries	Percentage serious
Vehicle occupants	3,267,533	220,840	6.8
Motorcycle occupants	113,718	24,146	21.2
Pedalcyclists	59,087	7,417	12.6
Pedestrians	129,917	24,117	18.6

NOTES: A *serious injury* is one in which the victim was either hospitalized or treated and transferred to another facility, was dead on arrival, or died in the emergency room. A *pedalcyclist* is a person on a vehicle that is powered solely by pedals. Data are the share of injuries that were serious for one person type (e.g., the share of seriously injured pedestrians of all injured pedestrians).

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System (NEISS), October 2003.

TABLE 9-11 Economic Costs of Motor Vehicle Crashes by Type: 2000

Millions of current dollars

Type of cost	Percentage of total	Cost (millions of current dollars)
Market productivity	26.5	60,991
Property damage	25.6	59,036
Medical costs	14.1	32,622
Travel delay	11.1	25,560
Household productivity	8.7	20,151
Insurance administration	6.6	15,167
Legal costs	4.8	11,118
Workplace costs	1.9	4,472
Emergency services	0.6	1,453
Total	**100.0**	**230,568**

SOURCE: U.S. Department of Transportation, National Highway Traffic Safety Administration, *The Economic Impact of Motor Vehicle Crashes 2000*, available at http://www.nhtsa.dot.gov/people/economic/, as of December 2002.

TABLE 9-12 Estimated Sources of Payment for Motor Vehicle Crashes: 2000
Billions of current dollars

	Federal government	State government	Total government	Insurer	Other	Self
Emergency services	NA	1	1	NA	NA	NA
Market productivity	10	2	12	25	1	23
Medical	5	3	8	18	2	5
Household productivity	NA	NA	NA	8	NA	12
Insurance administration	NA	NA	NA	15	NA	NA
Workplace costs	NA	NA	NA	NA	4	NA
Legal/court	NA	NA	NA	11	NA	NA
Travel delay	NA	NA	NA	NA	26	NA
Property damage	NA	NA	NA	38	NA	21
Total	**15**	**6**	**21**	**116**	**33**	**60**

KEY: NA = not applicable.

SOURCE: U.S. Department of Transportation, National Highway Traffic Safety Administration, *The Economic Impact of Motor Vehicle Crashes 2000*, available at http://www.nhtsa.dot.gov/people/economic/, as of December 2002.

TABLE 10-1 Share of Selected Air Pollutants by Mode: 2001
Percent

	CO	NO_x	VOC	PM-10
Highway gasoline	92.9	41.7	74.7	27.1
Highway diesel	1.4	37.5	3.6	37.8
Aircraft	5.1	0.8	0.3	0.9
Marine vessels	0.3	9.7	0.01	13.1
Railroad	0.2	9.6	0.6	7.4
Other	0.1	0.8	20.2	13.7

KEY: CO = carbon monoxide; NO_x = nitrogen oxides; VOC = volatile organic compounds; PM-10 = particulate matter 10 microns in diameter or smaller.

NOTES: EPA no longer estimates lead emissions. Modal shares in 2000 were: highway gasoline vehicles, 4.1%; aircraft, 95.9%. *Highway gasoline* includes: light-duty gas vehicles and motorcycles, light-duty gas trucks, and heavy-duty gas vehicles. *Highway diesel* includes heavy-duty diesel vehicles and light-duty diesel trucks and vehicles. *Marine vessels* include: coal, diesel, residual oil, gasoline, and other. *Other* includes: diesel and gasoline recreational vehicles, airport service, railway maintenance, and recreational marine service. This table does not include farm, construction, industrial, logging, light commercial, and lawn and garden equipment.

SOURCE: U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards, *National Emissions Inventory, Air Pollutant Emission Trends,* available at http://www.epa.gov/ttn/chief/trends/index.html/, as of August 2003.

TABLE 10-2a Change in Transportation Air Pollutant Emissions by Type: 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Carbon monoxide	1.00	0.95	0.90	0.86	0.81	0.76	0.74	0.71	0.71	0.66	0.73
Nitrogen oxides	1.00	0.99	0.98	0.97	0.96	0.95	0.95	0.94	0.91	0.91	0.90
Volatile organic compounds	1.00	0.95	0.90	0.85	0.80	0.75	0.73	0.72	0.70	0.66	0.62
PM-10	1.00	0.97	0.94	0.94	0.90	0.87	0.83	0.79	0.76	0.73	0.70
PM-2.5	1.00	0.96	0.93	0.90	0.86	0.83	0.80	0.76	0.73	0.69	0.66
Lead	1.00	0.99	0.92	0.92	0.95	0.89	0.88	0.88	0.91	0.95	N
Ammonia	1.00	1.08	1.15	1.23	1.31	1.40	1.57	1.52	1.54	1.61	1.64

KEY: PM-10 = particulate matter 10 microns in diameter or smaller; PM-2.5 = particulate matter 2.5 microns in diameter or smaller; N = data are nonexistent.

NOTES: EPA is no longer estimating lead emissions. The lead data presented here appeared in prior year EPA reports.

Revisions to previous estimates are all related to the development of the 1999 National Emissions Inventory (NEI). The 1999 estimates In the table are taken from Version 2 of the 1999 NEI and reflect many new data submissions from state and local air management agencies. The 1999 emissions estimates from mobile sources are in most cases based on the new MOBILE6 and the draft NONROAD2002 emissions models. This is the first time that estimates using these models have appeared in this format. Some but relatively few mobile source estimates were provided by state air agencies. The largest set of state-submitted data in 1999 was from California. Estimates for mobile sources for years prior to 1999 were made consistent with the estimates for 1999 and later, allowing for a generally consistent time trend except that state-submitted data was incorporated for 1999 only.

SOURCE: U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards, *National Emissions Inventory, Air Pollutant Emission Trends,* available at http://www.epa.gov/ttn/chief/trends/index.html/, as of August 2003.

TABLE 10-2b Transportation Air Pollutant Emissions by Type: 1991–2001
Thousand short tons

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Carbon monoxide	109,113	103,833	98,667	93,440	88,217	82,988	80,222	77,644	77,178	72,493	79,336
Nitrogen oxides	11,558	11,445	11,332	11,217	11,101	10,990	11,021	10,819	10,537	10,572	10,423
Volatile organic compounds	10,049	9,549	9,050	8,553	8,056	7,554	7,326	7,212	7,067	6,681	6,226
PM-10	478	464	449	447	432	417	395	377	363	348	336
PM-2.5	407	392	378	366	351	338	325	308	296	279	268
Lead	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	N
Ammonia	173	186	199	213	226	242	271	263	267	278	283

KEY: PM-10 = particulate matter 10 microns in diameter or smaller; PM-2.5 = particulate matter 2.5 microns in diameter or smaller; N = data are nonexistent.

NOTES: EPA is no longer estimating lead emissions. The lead data presented here appeared in prior year EPA reports.

Revisions to previous estimates are all related to the development of the 1999 National Emissions Inventory (NEI). The 1999 estimates In the table are taken from Version 2 of the 1999 NEI and reflect many new data submissions from state and local air management agencies. The 1999 emissions estimates from mobile sources are in most cases based on the new MOBILE6 and the draft NONROAD2002 emissions models. This is the first time that estimates using these models have appeared in this format. Some but relatively few mobile source estimates were provided by state air agencies. The largest set of state-submitted data in 1999 was from California. Estimates for mobile sources for years prior to 1999 were made consistent with the estimates for 1999 and later, allowing for a generally consistent time trend except that state-submitted data was incorporated for 1999 only.

SOURCE: U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards, *National Emissions Inventory, Air Pollutant Emission Trends,* available at http://www.epa.gov/ttn/chief/trends/index.html/, as of August 2003.

TABLE 10-3a Change in Emissions of Nitrogen Oxides by Mode: 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highway gasoline	1.00	0.96	0.91	0.87	0.83	0.78	0.77	0.74	0.71	0.69	0.72
Highway diesel	1.00	1.03	1.07	1.11	1.14	1.18	1.21	1.22	1.19	1.24	1.16
Aircraft	1.00	1.01	1.03	1.04	1.04	1.06	1.19	1.30	1.43	1.26	1.16
Marine vessels	1.00	1.01	1.02	1.03	1.04	1.05	1.00	0.95	0.90	1.00	1.00
Railroad	1.00	1.02	1.04	1.05	1.07	1.09	1.10	1.12	1.13	1.04	1.04
Other nonroad	1.00	0.97	1.03	1.03	1.03	1.10	1.19	1.11	1.37	1.19	1.19

NOTES: *Highway gasoline* includes: light-duty gas vehicles and motorcycles, light-duty gas trucks, and heavy-duty gas vehicles. *Highway diesel* includes: heavy-duty diesel vehicles and light-duty diesel trucks and vehicles. *Marine vessels* include: coal, diesel, residual oil, gasoline, and other. *Other* includes: diesel and gasoline recreational vehicles, airport service, railway maintenance, and recreational marine service. This table does not include farm, construction, industrial, logging, light commercial, and lawn and garden equipment.

SOURCE: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Emissions Inventory, Air Pollutant Emission Trends,* available at http://www.epa.gov/ttn/chief/trends/index.html/, as of August 2003.

TABLE 10-3b Emissions of Nitrogen Oxides by Mode: 1991–2001
Thousands of short tons

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highway gasoline	6,072	5,811	5,548	5,287	5,026	4,765	4,705	4,509	4,312	4,201	4,345
Highway diesel	3,377	3,495	3,614	3,732	3,850	3,968	4,087	4,111	4,035	4,192	3,904
Aircraft	70	71	72	73	73	74	83	91	100	88	81
Marine vessels	1,012	1,021	1,030	1,039	1,049	1,058	1,008	958	908	1,008	1,011
Railroad	962	979	996	1,014	1,031	1,048	1,061	1,073	1,085	1,001	999
Other nonroad	70	68	72	72	72	77	83	78	96	83	83

NOTES: *Highway gasoline* includes: light-duty gas vehicles and motorcycles, light-duty gas trucks, and heavy-duty gas vehicles. *Highway diesel* includes: heavy-duty diesel vehicles and light-duty diesel trucks and vehicles. *Marine vessels* include: coal, diesel, residual oil, gasoline, and other. *Other* includes: diesel and gasoline recreational vehicles, airport service, railway maintenance, and recreational marine service. This table does not include farm, construction, industrial, logging, light commercial, and lawn and garden equipment.

SOURCE: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Emissions Inventory, Air Pollutant Emission Trends,* available at http://www.epa.gov/ttn/chief/trends/index.html/, as of August 2003.

TABLE 10-4a Change in Carbon Dioxide Emissions by Mode: 1992–2002
Index: 1992 = 1.00

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Passenger cars	1.00	1.02	1.03	1.03	1.05	1.04	1.08	1.10	1.10	1.10	1.13
Light-duty trucks	1.00	1.04	1.07	1.11	1.15	1.18	1.22	1.27	1.28	1.29	1.32
All other trucks	1.00	1.03	1.10	1.15	1.21	1.27	1.32	1.38	1.43	1.44	1.46
Buses	1.00	1.06	1.12	1.12	1.17	1.22	1.25	1.39	1.38	1.29	1.20
Total highway	1.00	1.03	1.06	1.08	1.11	1.13	1.16	1.20	1.22	1.22	1.25
Aircraft	1.00	1.01	1.05	1.03	1.08	1.07	1.08	1.12	1.16	1.10	1.06
Ships and boats	1.00	0.86	0.87	0.92	0.86	0.60	0.49	0.68	1.06	0.67	0.94
Locomotives	1.00	1.03	1.13	1.18	1.23	1.22	1.25	1.30	1.29	1.32	1.27
Other	1.00	1.01	1.06	1.07	1.11	1.14	1.06	1.03	1.06	1.12	1.09
Total all modes	**1.00**	**1.02**	**1.05**	**1.07**	**1.10**	**1.10**	**1.12**	**1.16**	**1.20**	**1.18**	**1.21**
International bunker fuels	1.00	1.03	1.05	1.10	1.11	1.18	1.16	1.15	1.14	1.10	0.97

NOTES: *Highway* total includes passenger cars, buses, light-duty trucks, and other trucks. *Other* carbon dioxide emissions are from motorcycles, construction equipment, agricultural machinery, pipelines, and lubricants. *International bunker fuel* emissions (not included in the total) result from the combustion of fuels purchased in the United States but used for international aviation and maritime transportation. Thus, *aircraft* and *ships and boats* data included in U.S. total emissions involve only domestic activities of these modes as do all other data shown. The large annual variations in ships and boats data may result from methodological problems related to the domestic/international partition of maritime emissions. Economic factors may also contribute. Alternative fuel vehicle emissions are allocated to the specific vehicle types in which they were classified (i.e., passenger cars, light-duty trucks, and other trucks and buses).

SOURCE: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002* (Washington, DC: April 2004), table 2-9, available at http://www.epa.gov, as of May 2004.

TABLE 10-4b Carbon Dioxide Emissions by Mode: 1992–2002
Teragrams of carbon dioxide equivalent

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Passenger cars	564.6	577.5	581.7	582.9	590.1	588.2	608.0	619.1	621.7	623.3	636.9
Light-duty trucks	351.8	367.6	375.5	390.2	404.0	416.2	427.8	446.4	450.1	453.4	465.5
All other trucks	200.6	206.8	220.9	231.2	242.5	254.3	264.3	276.2	286.6	289.2	292.4
Buses	6.9	7.3	7.7	7.7	8.1	8.4	8.6	9.6	9.5	8.9	8.3
Total highway	1,123.9	1,159.2	1,185.8	1,212.0	1,244.7	1,267.1	1,308.7	1,351.3	1,367.2	1,374.8	1,403.1
Aircraft	167.1	168.1	175.9	171.4	180.2	178.9	180.8	186.7	193.2	183.4	177.6
Ships and boats	55.7	48.1	48.4	51.2	47.8	33.4	27.1	38.1	59.1	37.2	52.4
Locomotives	26.3	27.1	29.7	31.0	32.3	32.2	32.8	34.1	34.0	34.6	33.5
Other	92.9	93.8	98.9	99.5	102.9	106.3	98.6	95.8	98.8	104.2	101.0
Total all modes	**1,465.9**	**1,496.3**	**1,538.7**	**1,565.1**	**1,607.8**	**1,617.8**	**1,648.0**	**1,706.1**	**1,753.0**	**1,734.1**	**1,767.5**
International bunker fuels	89.6	92.1	94.5	98.4	99.3	106.1	103.8	102.7	102.2	98.5	86.8

NOTES: A teragram = 1 trillion grams. *Other* carbon dioxide emissions are from motorcycles, construction equipment, agricultural machinery, pipelines, and lubricants. *International bunker fuel* emissions (not included in the total) result from the combustion of fuels purchased in the United States but used for international aviation and maritime transportation. Thus, aircraft and ships and boats data included in U.S. total emissions involve only domestic activities of these modes as do all other data shown. Alternative fuel vehicle emissions are allocated to the specific vehicle types in which they were classified (i.e., passenger cars, light-duty trucks, and other trucks and buses).

SOURCE: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002* (Washington, DC: April 2004), table 2-9, available at http://www.epa.gov, as of May 2004.

TABLE 10-5 Carbon Dioxide Emissions by Type of Highway Vehicle: 2002

	$TgCO_2Eq$	Percent
Passenger cars	636.9	45.4
Light-duty trucks	465.5	33.2
All other trucks	292.4	20.8
Buses	8.3	0.6
Total highway	**1,403.1**	**100.0**

KEY: $TgCO_2Eq$ = teragrams of carbon dioxide equivalent. A teragram = 1 trillion grams.

NOTES: Alternative fuel vehicle emissions are allocated to the specific vehicle types in which they were classified (i.e., passenger cars, light-duty trucks, and other trucks and buses).

SOURCE: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2002* (Washington, DC: April 2004), table 2-9, available at http://www.epa.gov, as of May 2004.

TABLE 10-6 Oil Spills Reported to the U.S. Coast Guard by Source: 1991–2001
Gallons

Mode or source	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Transportation-related	1,624,043	1,440,177	1,893,188	2,040,858	2,543,706	3,035,138	767,439	832,689	991,313	1,373,538	786,157
Maritime vessels and facilities	1,565,492	1,159,266	1,462,701	1,966,782	2,484,891	2,050,317	537,668	772,261	940,212	1,342,630	757,309
All other	58,551	280,911	430,487	74,076	58,815	984,821	229,771	60,428	51,101	30,908	28,848
Pipeline	49,382	200,396	362,399	62,340	11,894	978,392	224,122	47,863	36,140	17,021	13,577
Air	760	63,717	63,384	3,360	1,716	2,221	683	943	355	2,224	861
Highway	7,203	13,577	748	3,219	758	690	1,432	10,111	13,037	7,148	13,905
Rail	1,206	123	3,419	2,117	43,955	610	34	305	563	7	500
Other transportation	0	3,098	537	3,040	492	2,908	3,500	1,206	1,006	4,508	5
Nontransportation	77,872	152,249	102,348	48,161	27,602	43,540	102,671	20,987	90,779	25,890	31,073
Unknown and other	174,038	283,241	71,852	400,254	66,921	39,153	72,464	31,627	90,357	31,942	37,290
Total	**1,875,953**	**1,875,667**	**2,067,388**	**2,489,273**	**2,638,229**	**3,117,831**	**942,574**	**885,303**	**1,172,449**	**1,431,370**	**854,520**
Transportation as % of total	86.6	76.8	91.6	82.0	96.4	97.3	81.4	94.1	84.6	96.0	92.0

NOTES: Data are preliminary. *Transportation-related* includes oil spilled from transportation vessels, vehicles, and equipment, as well as from transportation-related facilities (e.g., at ports and fuel stations). *Other transportation* includes nonvessel common carriers.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on U.S. Department of Homeland Security, U.S. Coast Guard, *Pollution Incidents In and Around U.S. Waters,* available at http://www.uscg.mil/hq/g-m/nmc/response/stats/aa.htm, as of October 2003.

TABLE 10-7 Total Reported Oil Spills by Source: 1991–2001

Mode or source	Percentage of total	All oil spills (gallons)
Maritime tank vessels	37.4	7,245,027
Maritime nontank and other vessels	18.5	3,584,388
Maritime facilities	21.8	4,210,114
Pipeline	10.4	2,003,526
Highway, air, rail, and other transportation	1.5	285,191
Nontransportation structures and facilities	3.7	723,172
Unknown and other	6.7	1,299,139
Total	**100.0**	**19,350,557**

NOTE: Data are preliminary.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on U.S. Department of Homeland Security, U.S. Coast Guard, *Pollution Incidents In and Around U.S. Waters,* available at http://www.uscg.mil/hq/g-m/nmc/response/stats/aa.htm, as of October 2003.

TABLE 10-8 Hazardous Materials Incidents by Mode: 1992–2002
Number

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air	414	622	931	817	919	1,029	1,386	1,584	1,420	1,081	734
Highway	7,843	11,095	14,011	12,868	11,962	11,864	13,110	15,004	15,126	15,885	13,739
Rail	1,128	1,113	1,157	1,155	1,112	1,103	989	1,074	1,059	898	867
Water	8	8	6	12	6	5	14	8	17	5	7
Total	**9,393**	**12,838**	**16,105**	**14,852**	**13,999**	**14,001**	**15,499**	**17,670**	**17,622**	**17,869**	**15,347**

SOURCE: U.S. Department of Transportation, Research and Special Programs Administration, Hazardous Materials Information System database, available at http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm, as of October 2003.

TABLE 10-9a Hazardous Materials Injuries by Mode: 1992–2002
Number

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air	23	50	57	33	33	24	20	12	5	13	4
Highway	465	511	425	296	216	152	151	217	164	126	111
Rail	116	66	95	71	926	45	22	35	82	29	14
Water	0	0	0	0	0	0	2	0	0	0	0
Total	**604**	**627**	**577**	**400**	**1,175**	**221**	**195**	**264**	**251**	**168**	**129**

SOURCE: U.S. Department of Transportation, Research and Special Programs Administration, Hazardous Materials Information System database, available at http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm, as of October 2003.

TABLE 10-9b Hazardous Materials Fatalities by Mode: 1992–2002
Number

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air	0	0	0	0	110	0	0	0	0	0	0
Highway	16	15	11	7	8	12	13	10	15	11	6
Rail	0	0	0	0	2	0	0	0	0	0	1
Water	0	0	0	0	0	0	0	0	0	0	0
Total	**16**	**15**	**11**	**7**	**120**	**12**	**13**	**10**	**15**	**11**	**7**

SOURCE: U.S. Department of Transportation, Research and Special Programs Administration, Hazardous Materials Information System database, available at http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm, as of October 2003.

TABLE 11-1a/11-2a Transportation Capital Stock by Mode: 1991–2001
Billions of chained 2000 dollars

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highways and streets	1,202	1,223	1,245	1,268	1,290	1,312	1,337	1,365	1,394	1,420	1,449
Consumer motor vehicles	635	628	634	645	651	657	671	701	747	796	855
In-house transportation stock	444	452	464	477	493	511	531	555	582	618	629
Railroad transportation stock	357	352	349	346	344	343	342	343	343	340	336
Air transportation stock	111	118	121	121	125	130	139	154	155	171	187
Trucking and warehousing stock	85	83	87	97	105	110	119	122	124	127	128
Pipelines stock, except natural gas	48	48	49	49	50	50	50	50	50	50	50
Transportation services stock	28	28	29	31	33	35	37	41	46	52	55
Water transportation stock	43	41	42	42	41	41	42	42	41	41	41
Local and interurban transit stock	27	27	27	28	28	29	30	30	34	35	36

NOTES: Data include only privately owned capital stock, except for highways and streets. Capital stock data are reported after deducting depreciation. Consumer motor vehicles are consumer durable goods. In-house transportation includes transportation services provided within a firm whose main business is not transportation. For example, grocery companies often use their own truck fleets to move goods from their warehouses to their retail outlets. These chained 2000 dollar values were calculated from current dollar data (see tables 11-1b/11-2b) to eliminate the effect of inflation over time.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States,* tables 3.1ES, 7.1, and 8.1, available at http://www.bea.gov/bea/dn/faweb/AllFATables.asp, as of February 2004.

TABLE 11-1b/11-2b Transportation Capital Stock by Mode: 1991–2001
Billions of current dollars

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Highways and streets	889	910	941	1,004	1,075	1,129	1,193	1,238	1,322	1,420	1,479
Consumer motor vehicles	567	574	599	629	646	663	673	703	748	796	849
In-house transportation stock	309	331	360	396	429	463	481	517	573	618	624
Railroad transportation stock	303	307	324	329	337	349	352	347	340	340	329
Air transportation stock	91	99	104	108	115	122	131	145	149	171	191
Trucking and warehousing stock	71	72	77	89	99	104	113	117	122	127	129
Pipelines stock, except natural gas	39	40	42	44	44	45	47	47	49	50	50
Transportation services stock	27	27	28	30	34	36	37	41	45	52	54
Water transportation stock	35	35	36	37	37	38	39	40	41	41	42
Local and interurban transit stock	21	22	23	24	25	27	28	28	33	35	37

NOTES: Data include only privately owned capital stock, except for highways and streets. Capital stock data are reported after deducting depreciation. Consumer motor vehicles are consumer durable goods. In-house transportation includes transportation services provided within a firm whose main business is not transportation. For example, grocery companies often use their own truck fleets to move goods from their warehouses to their retail outlets.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States,* tables 3.1ES, 7.1, and 8.1, available at http://www.bea.gov/bea/dn/faweb/AllFATables.asp, as of February 2004.

TABLE 11-3 Rural Roads in Poor or Mediocre Condition by Functional Class: 1993–2002
Percentage of mileage in roadway class

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Interstates	34.7	33.0	27.0	23.0	22.7	20.6	16.4	14.3	13.6	12.3
Other principal arterials	12.1	10.6	12.0	7.3	6.5	6.1	4.5	4.0	3.7	3.4
Minor arterials	13.0	14.0	12.7	10.5	9.0	7.9	6.9	7.0	6.9	5.8
Collectors	19.2	17.8	18.0	17.0	20.1	21.8	21.4	21.2	20.4	19.5

NOTES: Data are for the 50 U.S. states and the District of Columbia. The terms poor and mediocre as used here are Federal Highway Administration (FHWA) pavement condition criteria term categories for quantitative International Roughness Index and Present Serviceability Ratings. (See http://www.fhwa.dot.gov/policy/2002cpr/ch3b.htm, Exhibit 3.3 for further detailed information.) Because of the transition to a new indicator for pavement condition beginning with FHWA data published in 1993, comparisons between pre-1993 data and 1993 and later data are inappropriate.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-26 revised, available at http://www.bts.gov/, as of February 2004.

TABLE 11-4 Urban Roads in Poor or Mediocre Condition by Functional Class: 1993–2002
Percentage of mileage in roadway class

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Interstates	41.5	42.9	37.2	36.9	36.0	34.9	30.4	28.2	28.2	28.2
Other freeways and expressways	13.2	18.0	14.6	12.1	12.0	12.0	10.6	10.9	10.2	10.3
Other principal arterials	22.5	28.8	27.1	25.9	26.7	31.3	30.6	30.0	29.3	29.7
Minor arterials	21.7	19.0	20.3	19.9	20.2	17.9	17.5	26.0	26.4	26.6
Collectors	27.4	26.0	26.5	26.3	26.6	20.9	22.0	32.1	31.9	32.8

NOTES: Data are for the 50 U.S. states and the District of Columbia. The terms poor and mediocre as used here are Federal Highway Administration (FHWA) pavement condition criteria term categories for quantitative International Roughness Index and Present Serviceability Ratings. (See http://www.fhwa.dot.gov/policy/2002cpr/ch3b.htm, Exhibit 3.3 for further detailed information.) Because of the transition to a new indicator for pavement condition beginning with FHWA data published in 1993, comparisons between pre-1993 data and 1993 and later data are inappropriate.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-26 revised, available at http://www.bts.gov/, as of February 2004.

TABLE 11-5 Structurally Deficient and Functionally Obsolete Bridges: All Roadways, 1992–2002
Number

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Structurally deficient	118,698	111,512	107,476	103,920	101,518	98,475	93,076	88,150	86,692	83,630	81,437
Functionally obsolete	80,392	80,012	79,781	81,806	81,208	77,410	79,506	81,900	80,889	81,469	81,573

NOTES: *Structurally deficient* refers to bridges needing significant maintenance attention, rehabilitation, or replacement. *Functionally obsolete* refers to bridges that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, *National Bridge Inventory* database, available at http://www.fhwa.dot.gov/bridge/britab.htm, as of January 2004.

TABLE 11-6a Rural Bridge Condition by Functional Class: 2002
Percent

	Structurally deficient	Functionally obsolete
Interstates	4.0	11.8
Other principal arterials	5.4	9.6
Minor arterials	8.6	11.2
Major collectors	12.1	10.8
Minor collectors	13.8	11.3
Local roads	21.1	12.0

NOTES: *Structurally deficient* refers to bridges needing significant maintenance attention, rehabilitation, or replacement. *Functionally obsolete* refers to bridges that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, *National Bridge Inventory* database, CD-ROM, June 23, 2003.

TABLE 11-6b Rural Bridge Condition by Functional Class: 2002
Number

	Structurally deficient	Functionally obsolete	All rural bridges
Interstates	1,104	3,210	27,310
Other principal arterials	1,886	3,364	35,216
Minor arterials	3,407	4,451	39,571
Major collectors	11,426	10,217	94,768
Minor collectors	6,783	5,579	49,309
Local roads	44,156	25,029	209,366
Total	**68,762**	**51,850**	**455,540**

NOTES: *Structurally deficient* refers to bridges needing significant maintenance attention, rehabilitation, or replacement. *Functionally obsolete* refers to bridges that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, *National Bridge Inventory* database, CD-ROM, June 23, 2003.

TABLE 11-7a Urban Bridge Condition by Functional Class: 2002
Percent

	Structurally deficient	Functionally obsolete
Interstates	6.1	20.1
Other freeways or expressways	6.1	20.4
Other principal arterials	9.4	22.3
Minor arterials	10.6	26.1
Collectors	11.5	24.9
Local roads	11.8	18.9

NOTES: *Structurally deficient* refers to bridges needing significant maintenance attention, rehabilitation, or replacement. *Functionally obsolete* refers to bridges that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, *National Bridge Inventory* database, CD-ROM, June 23, 2003.

TABLE 11-7b Urban Bridge Condition by Functional Class: 2002
Number

	Structurally deficient	Functionally obsolete	All urban bridges
Interstates	1,715	5,617	27,924
Other freeways or expressways	1,025	3,431	16,843
Other principal arterials	2,273	5,428	24,300
Minor arterials	2,605	6,402	24,510
Collectors	1,739	3,783	15,166
Local roads	3,147	5,014	26,594
Total	**12,504**	**29,675**	**135,337**

NOTES: *Structurally deficient* refers to bridges needing significant maintenance attention, rehabilitation, or replacement. *Functionally obsolete* refers to bridges that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, *National Bridge Inventory* database, CD-ROM, June 23, 2003.

TABLE 11-8 Runway Pavement Condition of 510 Commercial Service Airports: 1993–2003
Percent

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Good condition	79	N	N	N	79	N	78	79	79	79	80
Fair condition	18	N	N	N	19	N	20	19	19	19	18
Poor condition	3	N	N	N	2	N	2	2	2	2	2

KEY: N = data are nonexistent.

NOTES: Commercial service airports are defined in box 11-B in the text. Raw data are not readily available.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-24 revised, available at http://www.bts.gov/, as of February 2004.

TABLE 11-9 Runway Pavement Condition of 3,346 NPIAS Airports: 1993–2003
Percent

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Good condition	68	N	N	N	72	N	72	73	73	71	75
Fair condition	25	N	N	N	23	N	23	22	22	24	21
Poor condition	7	N	N	N	5	N	5	5	5	5	4

KEY: N = data are nonexistent; NPIAS = National Plan of Integrated Airport Systems.

NOTES: NPIAS airports are defined in box 11-B in the text; they include the 510 commercial service airports. Raw data are not readily available.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-24 revised, available at http://www.bts.gov/, as of February 2004.

TABLE 11-10 Median Age of Cars and Trucks in the United States: 1992–2002

Years

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Cars	7.0	7.3	7.5	7.7	7.9	8.1	8.3	8.3	8.3	8.1	8.4
Trucks	7.2	7.5	7.5	7.6	7.7	7.8	7.6	7.2	6.9	6.8	6.8

NOTE: *Trucks* represents all types of trucks, including light trucks (sport utility vehicles, vans, and pickup trucks) and heavy and heavy-heavy trucks.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-25 revised, available at http://www.bts.gov/, as of January 2004.

TABLE 11-11 Average Age of Selected Transit Vehicles: 1991–2001

Years

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heavy-rail passenger cars	16.9	17.7	17.8	15.8	19.3	20.2	21.1	22.0	22.5	22.9	21.7
Commuter rail passenger coaches	17.3	19.3	18.6	20.1	21.4	24.1	21.6	19.4	17.5	16.9	18.1
Light rail vehicles (streetcars)	16.6	17.0	14.9	16.7	16.8	16.0	15.9	15.7	15.7	16.1	16.4
Full-size transit buses	8.0	8.3	8.5	9.9	8.7	8.8	8.6	8.5	8.4	8.1	7.8
Vans	3.0	3.1	3.1	3.9	3.1	3.1	3.0	2.9	3.1	3.1	3.3
Ferryboats	19.6	22.7	24.7	23.5	23.4	25.3	25.4	25.8	25.1	25.6	24.7

NOTES: Full-size buses have more than 35 seats. Preliminary 2002 data were available at the time this report was prepared but, because the Federal Transit Administration changed the data series, they are not included here.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002*, table 1-28 revised, available at http://www.bts.gov/, as of January 2004.

TABLE 11-12 Average Age of Amtrak Locomotive and Car Fleets: Fiscal Years 1991–2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Locomotives	13.0	13.0	13.2	13.4	13.9	14.4	12.0	12.6	12.8	11.2	13.9
Passenger and other train cars	21.0	21.5	22.6	22.4	21.8	20.7	19.8	21.1	22.2	19.4	18.5

SOURCES: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), *National Transportation Statistics 2003,* table 1-30, available at http://www.bts.gov/, as of March 2004. **2001 data—**USDOT, BTS, calculations based on data provided by Amtrak, personal communication, March 2004.

TABLE 11-13a Age of U.S. Flag Vessels by Type: 2001
Percentage of vessels

	Age range (years)						
Vessel types	< 6	6–10	11–15	16–20	21–25	> 25	Total percent
Dry cargo	11.8	7.9	13.7	14.4	15.9	35.9	100
Tanker	10.0	2.5	4.2	26.7	23.3	33.3	100
Towboat	7.2	3.2	2.4	13.4	18.9	54.7	100
Passenger	11.5	11.1	18.8	15.0	10.5	32.7	100
Support	19.4	7.1	4.3	23.6	28.7	16.7	100
Dry barge	23.6	9.7	7.1	14.7	21.2	23.2	99
Liquid barge	15.1	9.4	2.1	8.0	19.5	45.7	100
Total	**20.0**	**8.8**	**6.2**	**14.2**	**20.7**	**29.6**	**100**

NOTE: *Support* includes offshore support and crewboats. *Liquid barge* includes tank barges. Total percent may not equal 100 due rounding.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-31 revised, available at http://www.bts.gov/, as of January 2004.

TABLE 11-13b Age of U.S. Flag Vessels by Type: 2001
Number

	Age group (years)					
Vessel types (number of vessels)	**< 6**	**6–10**	**11–15**	**16–20**	**21–25**	**> 25**
Dry cargo (966)	114	76	132	139	154	347
Tanker (120)	12	3	5	32	28	40
Towboat (5,150)	369	167	125	692	972	2,818
Passenger (733)	84	81	138	110	77	240
Support (1,573)	305	111	68	372	452	262
Dry barge (28,920)	6,830	2,815	2,043	4,241	6,126	6,712
Liquid barge (4,122)	623	388	85	329	805	1,884
Total (41,588)	**8,337**	**3,641**	**2,596**	**5,916**	**8,614**	**12,306**

NOTE: *Support* includes offshore support and crewboats. *Liquid barge* includes tank barges.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2002,* table 1-31 revised, available at http://www.bts.gov/, as of January 2004.

TABLE 11-14 Average Age of U.S. Commercial Aircraft: 1991–2001
Years, unless noted

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All commercial aircraft	11.2	11.3	11.6	12.2	12.4	13.2	13.5	13.6	12.9	12.8	12.3
Major airlines aircraft	10.7	10.5	10.4	10.8	11.3	12.3	12.4	12.3	11.8	11.8	11.6
Major airlines share of commercial aircraft (percent)	86.8	84.1	82.1	79.9	76.1	72.5	78.7	77.8	78.5	78.8	82.9

NOTES: *Commercial aircraft* are aircraft of air carriers providing scheduled or nonscheduled passenger or freight service, including commuter and air taxi on-demand services. *Major airlines* include only commercial airlines with operating revenues greater than $1 billion annually. In 2001, they were: America West Airlines, American Airlines, American Eagle Airlines, America Trans Air, Alaska Airlines, Continental Airlines, Delta Airlines, Federal Express, Northwest Airlines, Southwest Airlines, Trans World Airlines, United Airlines, United Parcel Service, and US Airways. Average aircraft age is based on the year that an aircraft was delivered to the original owner from the manufacturer. It does not reflect the age of the engines or other parts that may have been replaced more recently.

SOURCE: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on USDOT, BTS, Form 41, Schedule B-43, 1991–2001.

TABLE 12-1 Relative Prices for Transportation Goods and Services for the United States and Selected Major Trade Partners: 2000
United States = 1.00

Country	2000
Mexico	0.70
Poland	0.75
Greece	0.76
Hungary	0.77
New Zealand	0.83
Turkey	0.86
Australia	0.87
Spain	0.91
Italy	0.92
Germany	0.97
Canada	0.97
Portugal	0.97
United States	1.00
Belgium	1.02
France	1.03
Austria	1.06
Netherlands	1.10
Ireland	1.13
Sweden	1.17
Switzerland	1.24
United Kingdom	1.35
Denmark	1.41
Japan	1.57
Norway	1.76

NOTES: 2000 was the most recent year for which these data were available by country at the time this report was prepared. Data are not available for goods and services separately.

Relative prices are based on purchasing power parity for transportation-related goods and services.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from Organisation for Economic Co-operation and Development (OECD), *Purchasing Power Parities and Real Expenditures, 1999 Results* (Paris, France: August 2002), table 11; and OECD, Main Economic Indicators, January 2002, for 1999 and 2000 Gross Domestic Product implicit price index, consumer price index, and exchange rates.

TABLE 12-2a U.S. Trade in Transportation-Related Goods: 1990–2002
Millions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Imports	82,101	81,109	85,070	92,804	105,754	110,781	115,504	126,927	140,053	166,553	185,027	183,003	190,880
Exports	64,642	72,364	78,773	76,658	81,658	80,091	89,958	103,819	114,971	111,469	105,429	106,860	108,744
Total	**146,744**	**153,473**	**163,843**	**169,462**	**187,412**	**190,872**	**205,462**	**230,745**	**255,024**	**278,022**	**290,456**	**289,863**	**299,624**

NOTES: *Transportation-related goods* are motor vehicles and parts, aircraft and spacecraft and parts, railway vehicles and parts, and ships and boats. Totals may not equal the sum of parts due to rounding.

All dollar amounts are in current dollars. These data have not been adjusted for inflation because there is no specific deflator available for transportation-related goods. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, U.S. International Trade Commission, Interactive Tariff and Trade DataWeb, available at http://dataweb.usitc.gov/, as of February 2003.

TABLE 12-2b U.S. Trade in Transportation-Related Goods by Commodity: 2002
Millions of current dollars

	Overall (exports plus imports)	Balance (exports minus imports)
Vehicles other than railway	233,027	–108,005
Aircraft, spacecraft, and parts	61,897	25,905
Ships, boats, and floating structures	2,568	–90
Railway locomotives and parts	2,133	53
Total, transportation-related goods	**299,624**	**–82,136**
Total, all commodities	1,856,806	–470,292

NOTES: *Transportation-related goods* are motor vehicles and parts, aircraft and spacecraft and parts, railway vehicles and parts, and ships and boats. Totals may not equal the sum of parts due to rounding.

All dollar amounts are in current dollars. These data have not been adjusted for inflation because there is no specific deflator available for transportation-related goods. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, U.S. International Trade Commission, Interactive Tariff and Trade DataWeb, available at http://dataweb.usitc.gov/, as of February 2003.

TABLE 12-3 U.S. Trade Balance in Transportation-Related Goods: 1990–2002
Transportation-related goods exports minus imports
Millions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Trade balance	–17,459	–8,745	–6,296	–16,145	–24,096	–30,689	–25,546	–23,108	–25,082	–55,083	–79,598	–76,143	–82,136

NOTES: *Transportation-related goods* are motor vehicles and parts, aircraft and spacecraft and parts, railway vehicles and parts, and ships and boats. Totals may not equal the sum of parts due to rounding.

All dollar amounts are in current dollars. These data have not been adjusted for inflation because there is no specific deflator available for transportation-related goods. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, U.S. International Trade Commission, Interactive Tariff and Trade DataWeb, available at http://dataweb.usitc.gov/, as of February 2003.

TABLE 12-4 U.S. International Trade in Transportation-Related Services: 1990–2002
Millions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Imports	35,497	34,987	34,370	35,934	39,081	41,697	43,212	47,097	50,334	55,454	65,904	61,241	59,624
Exports	37,339	38,485	38,149	38,486	40,751	44,989	46,496	47,878	45,702	46,701	50,897	46,313	45,746
Total	**72,836**	**73,472**	**72,519**	**74,420**	**79,832**	**86,686**	**89,708**	**94,975**	**96,036**	**102,155**	**116,801**	**107,554**	**105,370**

NOTES: Detail service type data are not available in inflation-adjusted terms. *Transportation services* include passenger fares and freight and port services. It excludes receipts and payments for travel services, which includes purchases of goods and services (e.g., food, lodging, recreation, gifts, entertainment, and any incidental expense on a foreign visit).

These data have not been adjusted for inflation because there is no specific deflator available for transportation-related services. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculation based on data from U.S. Department of Commerce, Bureau of Economic Analysis, International Transactions Accounts data, available at http://www.bea.doc.gov/bea/di1.htm, as of April 2003.

TABLE 12-5 U.S. Trade Balance in Transportation-Related Services: 1990–2002
Transportation-related services exports minus imports
Millions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Trade balance	1,842	3,498	3,779	2,552	1,670	3,292	3,284	781	–4,632	–8,753	–15,007	–14,928	–13,878

NOTES: Detail service type data are not available in inflation-adjusted terms. *Transportation services* include passenger fares and freight and port services. It excludes receipts and payments for travel services, which includes purchases of goods and services (e.g., food, lodging, recreation, gifts, entertainment, and any incidental expense on a foreign visit).

These data have not been adjusted for inflation because there is no specific deflator available for transportation-related services. In addition, it is difficult to control for trading partners' inflation rates as well as currency exchange fluctuations when adjusting the value of internationally traded goods and services for inflation.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculation based on data from U.S. Department of Commerce, Bureau of Economic Analysis, International Transactions Accounts data, available at http://www.bea.doc.gov/bea/di1.htm, as of April 2003.

TABLE 13-1 Transportation Services Index (TSI): January 1990–January 2004
Index: Monthly average of 1996 = 100.0; seasonally adjusted

January	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
TSI total	77.5	79.1	82.2	88.1	90.0	101.6	96.0	103.0	109.5	112.5	116.6	114.8	110.0	116.1	119.3
TSI freight	76.3	78.4	82.3	88.4	90.7	104.8	96.3	102.6	111.1	113.3	118.5	112.9	111.2	117.2	120.1
TSI passenger	81.7	81.1	82.1	88.1	89.1	94.8	95.5	104.0	106.2	110.7	112.8	119.6	107.2	113.8	117.6

NOTE: Data are shown here only for the month of January due to space limitations. See source for balance of data in figure 13-1.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Services Index,* available at http://www.bts.gov/xml/tsi/src/index.xml, as of June 2004.

TABLE 13-2a Transportation-Related Final Demand and Share of GDP: 1992–2002
Billions of chained 2000 dollars, except as noted

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Transportation-related final demand	759.3	785.6	829.5	848.1	898.2	957.9	995.6	1,051.6	1,077.4	1,082.6	1,076.9
Share of GDP (percent)	10.4	10.4	10.6	10.6	10.8	11.0	11.0	11.1	11.0	11.0	10.7

KEY: GDP = Gross Domestic Product.

NOTE: *Total transportation-related final demand* is the sum of all consumer, private business, and government purchases of transportation-related goods and services, and net exports (i.e., transportation imports subtracted from transportation exports).

Current dollars (see table 13-2b) were adjusted to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on chained 2000 dollar data from U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, available at http://www.bea.doc.gov/bea/dn/nipaw, as of January 2004.

TABLE 13-2b Transportation-Related Final Demand and Share of GDP: 1992–2002
Billions of current dollars, except as noted

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Transportation-related final demand	666.8	712.2	771.5	805.1	867.3	935.6	976.7	1,044.1	1,088.7	1,103.9	1,099.4
Share of GDP (percent)	10.5	10.7	10.9	10.9	11.1	11.3	11.2	11.3	11.1	10.9	10.5

KEY: GDP = Gross Domestic Product.

NOTE: *Total transportation-related final demand* is the sum of all consumer, private business, and government purchases of transportation-related goods and services, and net exports (i.e., transportation imports subtracted from transportation exports).

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on current dollar data from U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, available at http://www.bea.doc.gov/bea/dn/nipaw, as of January 2004.

TABLE 13-3a Share of Transportation-Related Final Demand by Type: 1992–2002
Percent

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Personal consumption	71.6	72.3	72.8	72.8	73.2	72.7	72.9	74.7	78.2	79.2	80.5
Gross private domestic investment	11.1	12.6	13.9	14.7	14.5	14.9	15.4	16.6	15.5	13.8	12.5
Net exports (exports minus imports)	–2.5	–4.1	–5.3	–5.5	–5.1	–4.5	–5.2	–7.9	–10.1	–10.0	–10.6
Government purchases	19.8	19.2	18.6	18.0	17.5	17.0	16.9	16.7	16.4	17.1	17.6

NOTES: *Total transportation-related final demand* is the sum of all consumer, private business, and government purchases of transportation-related goods and services, and net exports (i.e., transportation imports subtracted from transportation exports). *Gross private domestic investment* covers railroad and petroleum pipelines only.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, available at http://www.bea.doc.gov/bea/dn/nipaw, as of February 2004.

TABLE 13-3b Transportation-Related Final Demand by Type: 1992–2002
Billions of chained 2000 dollars

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Personal consumption	544.0	568.3	603.6	617.4	657.1	696.0	725.8	785.1	842.2	857.1	867.0
Gross private domestic investment	84.0	98.8	115.3	124.6	130.2	142.4	153.0	174.2	167.4	149.2	134.6
Net exports (exports minus imports)	–19.2	–32.5	–43.7	–46.9	–46.1	–43.3	–51.3	–83.5	–109.0	–108.5	–114.5
Government purchases	150.5	151.0	154.3	153.0	157.0	162.8	168.1	175.8	176.8	184.8	189.8
Total	**759.3**	**785.6**	**829.5**	**848.1**	**898.2**	**957.9**	**995.6**	**1,051.6**	**1,077.4**	**1,082.6**	**1,076.9**

NOTES: *Total transportation-related final demand* is the sum of all consumer, private business, and government purchases of transportation-related goods and services, and net exports (i.e., transportation imports subtracted from transportation exports). *Gross private domestic investment* covers railroad and petroleum pipelines only.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on chained 2000 dollars data from U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, available at http://www.bea.doc.gov/bea/dn/nipaw, as of February 2004.

TABLE 13-4a Value Added by For-Hire Transportation Services to U.S. GDP and Share of GDP: 1991–2001
Billions of chained 2000 dollars, except as noted

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Value added	206.4	215.0	223.4	242.7	249.9	270.3	276.4	286.4	298.2	313.7	300.2
Share of GDP (percent)	2.9	2.9	3.0	3.1	3.1	3.2	3.2	3.2	3.1	3.2	3.0

KEY: GDP = Gross Domestic Product.

NOTES: *For-hire transportation* includes railroad transportation, local and interurban passenger transit, trucking and warehousing, water transportation, transportation by air, pipelines (except natural gas), and transportation services. *Transportation services* cover establishments furnishing services incidental to transportation (e.g., forwarding and packing services and the arrangement of passenger and freight transportation).

Current dollar amounts (see table 13-4b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, “Gross Domestic Product by Industry,” available at http://www.bea.gov/bea/dn2/gpo.htm, as of February 2004.

TABLE 13-4b Value Added by For-Hire Transportation Services to U.S. GDP and Share of GDP: 1991–2001
Billions of current dollars, except as noted

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Value added	186.1	193.4	206	223.2	233.4	243.4	261.8	288.7	301.9	313.7	306.1
Share of GDP (percent)	3.1	3.1	3.1	3.2	3.2	3.1	3.1	3.3	3.3	3.2	3.0

KEY: GDP = Gross Domestic Product.

NOTES: *For-hire transportation* includes railroad transportation, local and interurban passenger transit, trucking and warehousing, water transportation, transportation by air, pipelines (except natural gas), and transportation services. *Transportation services* cover establishments furnishing services incidental to transportation (e.g., forwarding and packing services and the arrangement of passenger and freight transportation).

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, “Gross Domestic Product by Industry,” available at http://www.bea.gov/bea/dn2/gpo.htm, as of February 2004.

TABLE 13-5a Share of For-Hire Transportation Value Added by Mode: 1991–2001
Percentage of total for-hire transportation value added

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Railroad transportation	10.2	9.0	9.0	10.0	9.6	9.3	9.0	9.0	8.6	8.2	7.9
Local and interurban passenger transit	6.9	7.3	6.7	6.4	6.1	6.0	5.6	5.6	5.3	5.6	5.7
Trucking and warehousing	42.1	41.9	40.5	41.4	42.0	42.2	41.9	41.3	40.6	39.1	39.8
Water transportation	4.9	5.4	5.7	5.7	5.4	5.3	5.2	5.1	5.0	5.4	5.1
Air transportation	22.4	23.3	25.4	23.6	24.8	25.2	26.6	27.3	28.4	29.5	29.1
Pipelines, except natural gas	3.4	3.4	2.8	2.9	2.7	2.7	2.2	2.0	2.1	2.2	2.2
Transportation services	10.2	10.4	10.3	10.1	9.6	9.6	9.6	9.9	10.0	10.1	10.2

NOTES: Percents may not add to 100 due to rounding. *Transportation services* cover establishments furnishing services incidental to transportation (e.g., forwarding and packing services and the arrangement of passenger and freight transportation).

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, “Gross Domestic Product by Industry,” available at http://www.bea.gov/bea/dn2/gpo.htm, as of February 2004.

TABLE 13-5b For-Hire Transportation Services Value Added by Mode: 1991–2001
Billions of chained 2000 dollars

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Railroad transportation	20.7	20.6	20.8	21.9	22.5	23.3	22.6	22.6	22.2	24.8	24.8
Local and interurban passenger transit	13.2	13.2	13.4	13.6	14.0	14.2	15.6	16.4	17.8	18.3	18.2
Trucking and warehousing	85.4	90.3	94.3	101.7	103.3	109.8	107.9	113.9	119.5	123.3	118.5
Water transportation	11.8	11.6	11.8	12.7	12.6	13.6	14.8	14.7	13.4	15.0	14.9
Air transportation	48.7	53.3	56.2	64.6	68.2	76.7	81.5	83.2	87.5	91.9	84.8
Pipelines, except natural gas	6.1	5.8	5.9	5.4	4.9	5.6	6.1	6.2	6.4	6.3	5.9
Transportation services	20.8	20.7	21.5	23.3	24.6	27.1	27.8	29.3	31.4	34.1	32.8
Total	**206.4**	**215.0**	**223.4**	**242.7**	**249.9**	**270.3**	**276.4**	**286.4**	**298.2**	**313.7**	**300.2**

NOTES: *Transportation services* cover establishments furnishing services incidental to transportation (e.g., forwarding and packing services and the arrangement of passenger and freight transportation).

Current dollar amounts were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, calculations based on data from U.S. Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product by Industry," available at http://www.bea.gov/bea/dn2/gpo.htm, as of February 2004.

TABLE 14-1a Federal, State, and Local Government Transportation Revenues: Fiscal Years 1990–2000
Billions of chained 2000 dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Federal	28.4	32.8	32.2	32.7	31.5	33.8	33.7	33.7	41.3	53.7	46.8
State	44.8	45.9	48.1	49.7	50.1	51.1	51.2	52.2	53.8	53.9	54.1
Local	17.8	18.6	18.9	19.7	20.6	21.2	22.0	23.4	24.0	24.4	24.9
Total	**90.9**	**97.4**	**99.2**	**102.1**	**102.2**	**106.1**	**106.9**	**109.3**	**119.1**	**132.0**	**125.9**

NOTE: Current dollar amounts (see table 14-1b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

TABLE 14-1b Federal, State, and Local Government Transportation Revenues: Fiscal Years 1990–2000
Billions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Federal	21.4	26.0	25.9	27.4	27.2	30.2	30.7	31.4	38.9	52.0	46.8
State	34.6	36.6	39.1	41.4	42.9	44.8	46.0	47.7	50.0	51.6	54.1
Local	13.7	14.8	15.4	16.4	17.6	18.6	19.7	21.3	22.3	23.3	24.9
Total	**69.8**	**77.4**	**80.3**	**85.2**	**87.6**	**93.7**	**96.4**	**100.5**	**111.2**	**126.9**	**125.8**

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

TABLE 14-2 Federal, State, and Local Government Transportation Revenues by Mode: Fiscal Year 2000

	Chained 2000 dollars (millions)	Percentage of total
Highway	87,800	69.75
Transit	12,674	10.07
Air	21,627	17.18
Water	3,717	2.95
Pipeline	40	0.03
General support	25	0.02
Total	**125,883**	**100.00**

NOTES: Current dollars were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time. Current dollars in fiscal year 2000 are equal to the chained 2000 dollars shown.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

TABLE 14-3a Federal, State, and Local Government Transportation Expenditures: Fiscal Years 1990–2000
Billions of chained 2000 dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
State and local	90.2	94.5	97.6	95.1	100.9	102.2	103.2	105.7	112.3	116.0	117.9
Federal	41.1	41.7	43.9	44.6	46.0	45.7	44.8	44.9	43.9	45.2	49.5
Total	**131.3**	**136.3**	**141.5**	**139.7**	**146.9**	**147.9**	**148.0**	**150.6**	**156.2**	**161.2**	**167.5**

NOTES: *Federal transportation expenditures* consist of outlays of the federal government including not only direct spending but also grants made to state and local governments. To avoid double counting, state and local transportation expenditures include their outlays from all sources of funds except federal grants received. State and local data are reported together, because disaggregated federal grants data are not available. Data may not add to total due to rounding.

Current dollar amounts (see tables 14-3b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

TABLE 14-3b Federal, State, and Local Government Transportation Expenditures: Fiscal Years 1990–2000
Billions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
State and local	69.8	75.3	79.3	79.2	86.2	89.8	92.6	96.6	104.4	110.9	117.9
Federal	30.9	32.9	35.3	37.3	39.7	40.8	40.8	41.8	41.3	44.0	49.5
Total	**100.6**	**108.3**	**114.6**	**116.5**	**125.9**	**130.5**	**133.4**	**138.4**	**145.7**	**154.8**	**167.5**

NOTES: *Federal transportation expenditures* consist of outlays of the federal government including not only direct spending but also grants made to state and local governments. To avoid double counting, state and local transportation expenditures include their outlays from all sources of funds except federal grants received. State and local data are reported together, because disaggregated federal grants data are not available. Data may not add to total due to rounding.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

TABLE 14-4 Federal, State, and Local Government Transportation Expenditures by Mode: Fiscal Year 2000

	Chained 2000 dollars (millions)	Percentage of total
Highway	103,952	62.1
Transit	32,387	19.3
Rail	768	0.5
Air	22,107	13.2
Water	7,946	4.7
Pipeline	36	0.02
General support	260	0.2
Total	**167,455**	**100.0**

NOTES: *Federal transportation expenditures* consist of outlays of the federal government including not only direct spending but also grants made to state and local governments. To avoid double counting, state and local transportation expenditures include their outlays from all sources of funds except federal grants received. State and local data are reported together, because disaggregated federal grants data are not available. Pipeline data only include federal-level expenditures, as state and local data are not available.

Current dollars were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time. Current dollars in fiscal year 2000 are equal to the chained 2000 dollars shown.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002,* forthcoming.

TABLE 14-5a Gross Government Investments in Transportation Infrastructure and Rolling Stock: Fiscal Years 1990–2000
Billions of chained 2000 dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Infrastructure	59.6	60.1	60.5	64.9	68.3	65.0	65.7	69.3	72.4	78.1	76.4
Rolling stock	7.8	6.4	7.7	7.8	8.1	8.3	8.3	8.6	9.3	9.6	9.6
Total	**67.4**	**66.5**	**68.2**	**72.7**	**76.4**	**73.3**	**73.9**	**78.0**	**81.6**	**87.7**	**86.1**

NOTES: *Investment in transportation infrastructure* constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. *Investment in rolling stock* data consist of government outlays for motor vehicles only, because data for other rolling stock (e.g., aircraft, vessels, and boats) are not available.

Current dollar amounts (see table 14-5b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, “Transportation Investment-Concepts, Data and Analysis,” draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, “Value of Construction Put in Place Statistics,” Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

TABLE 14-5b Gross Government Investments in Transportation Infrastructure and Rolling Stock: Fiscal Years 1990–2000
Billions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Infrastructure	44.8	46.1	46.5	50.6	54.6	54.6	57.4	62.9	67.0	74.5	76.4
Rolling stock	6.2	5.2	6.6	7.0	7.5	7.9	7.9	8.3	9.0	9.4	9.6
Total	**51.0**	**51.3**	**53.1**	**57.6**	**62.1**	**62.5**	**65.3**	**71.2**	**76.0**	**84.0**	**86.1**

NOTES: *Investment in transportation infrastructure* constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. *Investment in rolling stock* data consist of government outlays for motor vehicles only, because data for other rolling stock (e.g., aircraft, vessels, and boats) are not available.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, “Transportation Investment-Concepts, Data and Analysis,” draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, “Value of Construction Put in Place Statistics,” Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

TABLE 14-6a Gross Government Investment in Transportation Infrastructure by Level of Government: Fiscal Years 1990–2000
Billions of chained 2000 dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Federal (direct)	2.7	3.3	3.1	4.0	4.5	4.3	4.4	3.8	4.2	4.4	4.4
State and local	56.9	56.8	57.4	60.9	63.8	60.7	61.2	65.5	68.2	73.7	72.1
Total	**59.6**	**60.1**	**60.5**	**64.9**	**68.3**	**65.0**	**65.7**	**69.3**	**72.4**	**78.1**	**76.4**

NOTES: *Investment in transportation infrastructure* constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. State and local transportation investment data are not available separately.

Current dollar amounts (see table 14-6b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Investment-Concepts, Data and Analysis," draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, "Value of Construction Put in Place Statistics," Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

TABLE 14-6b Gross Government Investment in Transportation Infrastructure by Level of Government: Fiscal Years 1990–2000
Billions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Federal (direct)	2.0	2.6	2.4	3.1	3.7	3.7	3.9	3.5	3.9	4.3	4.4
State and local	42.8	43.6	44.1	47.4	50.9	50.9	53.4	59.4	63.1	70.3	72.1
Total	**44.8**	**46.1**	**46.5**	**50.6**	**54.6**	**54.6**	**57.4**	**62.9**	**67.0**	**74.5**	**76.4**

NOTES: *Investment in transportation infrastructure* constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. State and local transportation investment data are not available separately.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Investment-Concepts, Data and Analysis," draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, "Value of Construction Put in Place Statistics," Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

TABLE 14-7a Gross Government Investment in Transportation Infrastructure by Mode: Fiscal Years 1990–2000
Billions of chained 2000 dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Highway	44.4	44.0	44.1	46.0	48.7	46.4	47.2	50.5	53.0	57.5	55.5
Air	6.2	7.2	7.7	9.0	8.4	7.3	7.3	7.8	8.6	9.2	8.7
Water	1.8	1.7	1.6	1.7	1.7	1.7	1.9	1.9	2.0	2.2	2.3
Transit	7.2	7.2	7.1	7.8	9.0	9.1	8.9	8.7	8.2	8.2	8.5
Railroad	U	U	U	0.4	0.5	0.5	0.4	0.4	0.5	1.0	1.4
Total	**59.6**	**60.1**	**60.5**	**64.9**	**68.3**	**65.0**	**65.7**	**69.3**	**72.4**	**78.1**	**76.4**

KEY: U = data are unavailable.

NOTES: *Investment in transportation infrastructure* constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. State and local transportation investment data are not available separately.

Current dollar amounts (see table 14-7b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Investment-Concepts, Data and Analysis," draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, "Value of Construction Put in Place Statistics," Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

TABLE 14-7b Gross Government Investment in Transportation Infrastructure by Mode: Fiscal Years 1990–2000
Billions of current dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Highway	33.2	33.5	33.6	35.4	38.5	38.7	41.0	45.6	48.8	54.7	55.5
Air	4.7	5.6	6.1	7.2	6.9	6.2	6.4	7.2	8.1	8.8	8.7
Water	1.4	1.3	1.3	1.4	1.4	1.5	1.7	1.7	1.9	2.1	2.3
Transit	5.5	5.7	5.6	6.2	7.3	7.7	7.9	8.0	7.7	7.9	8.5
Railroad	U	U	U	0.3	0.5	0.5	0.4	0.4	0.6	1.0	1.4
Total	**44.8**	**46.1**	**46.6**	**50.6**	**54.6**	**54.6**	**57.4**	**62.9**	**67.0**	**74.5**	**76.4**

KEY: U = data are unavailable.

NOTES: *Investment in transportation infrastructure* constitutes the purchase or construction value of transportation facilities and structures. Data include all modes except pipeline. In addition, federal government data on rail infrastructure investments are not available, and state and local rail infrastructure investment data are only available from 1993–2000. State and local transportation investment data are not available separately.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Investment-Concepts, Data and Analysis," draft, May 29, 2003. U.S. Department of Commerce, U.S. Census Bureau, "Value of Construction Put in Place Statistics," Detailed Construction Expenditures Tables, available at http://www.census.gov, as of February 2003.

TABLE 15-1 U.S. Energy Consumption by Sector: 1993–2003
Quadrillion British thermal units (Btu)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Transportation	22.9	23.5	24.0	24.5	24.8	25.4	26.1	26.7	26.3	26.7	26.9
Residential	18.2	18.1	18.7	19.6	19.1	19.1	19.6	20.5	20.3	21.1	21.2
Commercial	13.8	14.1	14.7	15.2	15.7	16.0	16.3	17.1	17.3	17.7	17.6
Industrial	32.7	33.6	33.9	34.9	35.2	34.8	34.7	34.6	32.5	32.9	32.5
Total	**87.6**	**89.3**	**91.2**	**94.2**	**94.7**	**95.1**	**96.8**	**98.9**	**96.3**	**98.3**	**98.2**
Transportation as a % of total	26.1	26.3	26.3	26.0	26.2	26.6	27.0	27.0	27.3	27.2	27.4

SOURCE: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, table 2.1, available at http://www.eia.doe.gov/mer/consump.html, as of June 2004.

TABLE 15-2a Change in Transportation Sector Energy Use and Gross Domestic Product: 1993–2003
Index 1993 = 1.00

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Transportation sector energy use	1.00	1.03	1.05	1.07	1.08	1.11	1.14	1.17	1.15	1.17	1.17
Gross Domestic Product (GDP)	1.00	1.04	1.07	1.11	1.16	1.20	1.26	1.30	1.31	1.34	1.38
Transportation energy use per dollar GDP	1.00	0.99	0.98	0.97	0.94	0.92	0.91	0.90	0.88	0.87	0.85

SOURCES: Transportation sector energy use—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, available at http://www.eia.doe.gov/mer/consump.html, as of June 2004. **GDP—**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Account tables, available at http://www.bea.gov/bea/dn/nipaweb/TableView.asp#Mid, as of June 2004.

TABLE 15-2b Transportation Sector Energy Use and Gross Domestic Product: 1993–2003

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Transportation sector energy use (quadrillion Btu)	22.9	23.5	24.0	24.5	24.8	25.4	26.1	26.7	26.3	26.7	26.9
Gross Domestic Product (GDP) (billions of chained 2000 dollars)	7,533	7,836	8,032	8,329	8,704	9,067	9,470	9,817	9,867	10,083	10,398
Transportation energy use per dollar GDP	3,120	3,000	2,983	2,943	2,850	2,797	2,757	2,720	2,663	2,647	2,584

KEY: Btu = British thermal units. The average heat content of motor gasoline is 129,024 Btu per gallon. One quadrillion Btu is equivalent to 7.75 billion gallons of motor gasoline.

SOURCES: Transportation sector energy use—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review,* available at http://www.eia.doe.gov/mer/consump.html, as of June 2004. **GDP—**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Account tables, available at http://www.bea.gov/bea/dn/nipaweb/TableView.asp#Mid, as of June 2004.

TABLE 15-3 U.S. Petroleum Use by Sector: 1992–2002
Million barrels per day

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Transportation	10.9	11.1	11.4	11.7	11.9	12.1	12.4	12.8	13.0	12.9	13.1
Industry	4.5	4.4	4.7	4.6	4.8	5.0	4.8	5.0	4.9	4.9	4.9
Buildings	1.2	1.2	1.2	1.1	1.2	1.2	1.1	1.2	1.3	1.3	1.3
Utilities	0.4	0.5	0.5	0.3	0.4	0.4	0.6	0.5	0.5	0.6	0.4
Total	**17.0**	**17.2**	**17.7**	**17.7**	**18.3**	**18.6**	**18.9**	**19.5**	**19.7**	**19.6**	**19.7**
Transportation as a percentage of total	63.9	64.5	64.4	65.8	65.1	65.0	65.7	65.4	66.1	65.8	66.5

NOTE: 2002 data are estimates, except for utilities, which are preliminary.

SOURCE: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2002,* table 5.12, available at http://www.eia.doe.gov/aer, as of November 2003.

TABLE 15-4a Average Transportation Fuel Prices by Type: 1993–2003
Chained 2000 dollars per gallon

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Aviation gasoline	1.12	1.06	1.09	1.19	1.18	1.01	1.08	1.31	1.29	1.24	1.41
Jet fuel, kerosene	0.66	0.59	0.59	0.69	0.64	0.47	0.55	0.90	0.76	0.69	0.82
Motor gasoline, all types	1.33	1.30	1.31	1.37	1.35	1.16	1.25	1.56	1.50	1.39	1.55
Diesel no. 2	0.68	0.61	0.61	0.73	0.67	0.51	0.60	0.94	0.82	0.73	0.89
Railroad diesel	0.71	0.66	0.65	0.72	0.71	0.59	0.57	0.87	0.83	0.71	U
Crude oil	0.44	0.41	0.45	0.53	0.48	0.31	0.43	0.67	0.53	0.55	0.64

KEY: U = data are unavailable.

NOTES: Except for motor gasoline, data do not include taxes. Motor gasoline data are retail prices, U.S. city average. Aviation, jet, and diesel no. 2 data are refiner prices to end users. Crude oil data are refiner acquisition costs.

Current dollars (see table 15-4b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: Except railroad diesel—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, tables 9.1 (crude oil), 9.4 (motor gasoline), and 9.7 (aviation, jet, and diesel no. 2), available at http://www.eia.doe.gov/mer/prices.html, as of May 2004. **Railroad diesel—**Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 61.

TABLE 15-4b Average Transportation Fuel Prices by Type: 1993–2003
Current dollars per gallon

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Aviation gasoline	0.99	0.96	1.01	1.12	1.13	0.98	1.06	1.31	1.32	1.29	1.49
Jet fuel, kerosene	0.58	0.53	0.54	0.65	0.61	0.45	0.54	0.90	0.78	0.72	0.87
Motor gasoline, all types	1.17	1.17	1.21	1.29	1.29	1.12	1.22	1.56	1.53	1.44	1.64
Diesel no. 2	0.60	0.55	0.56	0.68	0.64	0.49	0.58	0.94	0.84	0.76	0.94
Railroad diesel	0.63	0.60	0.60	0.68	0.68	0.57	0.55	0.87	0.85	0.73	U
Crude oil	0.39	0.37	0.41	0.49	0.45	0.30	0.42	0.67	0.55	0.57	0.68

KEY: U = data are unavailable.

NOTES: Except for motor gasoline, data do not include taxes. Motor gasoline data are retail prices, U.S. city average. Aviation, jet, and diesel no. 2 data are refiner prices to end users. Crude oil data are refiner acquisition costs.

SOURCES: Except railroad diesel—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, tables 9.1 (crude oil), 9.4 (motor gasoline), and 9.7 (aviation, jet, and diesel no. 2), available at http://www.eia.doe.gov/mer/prices.html, as of May 2004. **Railroad diesel—**Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 61.

TABLE 15-5 Average Motor Gasoline Prices and Highway Vehicle-Miles of Travel per Capita: 1993–2003

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gasoline price (chained 2000 dollars)	1.33	1.30	1.31	1.37	1.35	1.16	1.25	1.56	1.50	1.39	1.55
Vmt per capita	8,835	8,960	9,098	9,228	9,396	9,540	9,644	9,733	9,804	9,903	U

KEY: U = data are unavailable; vmt = vehicle-miles of travel.

NOTE: Current dollars (see table 15-4b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time.

SOURCES: Motor gasoline prices—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, table 9.4, available at http://www.eia.doe.gov/mer/prices.html, as of May 2004. **Vmt per capita—**U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations using data from USDOT, BTS, *National Transportation Statistics 2003*, table 1-32, available at http://www.bts.gov, as of May 2004. U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract 2003*, Mini Historical Statistics, available at http://www.census.gov/statab/www/minihs.html, as of May 2004.

TABLE 15-6 Average Jet Fuel Prices and Aircraft-Miles of Travel per Capita: 1993–2003

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Jet fuel price (chained 2000 dollars)	0.66	0.59	0.59	0.69	0.64	0.47	0.55	0.90	0.76	0.69	0.82
Aircraft-miles of travel per capita	16.0	16.7	17.4	17.9	18.0	18.3	19.1	20.1	19.5	19.5	U

KEY: U = data are unavailable.

NOTES: Current dollar amounts of fuel prices (see table 15-4b) were converted to chained 2000 dollars by the Bureau of Transportation Statistics to eliminate the effects of inflation over time. Aircraft-miles of travel pertain to large carriers only.

SOURCES: Jet fuel prices—U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, table 9.7, available at http://www.eia.doe.gov/mer/prices.html, as of May 2004. **Aircraft-miles of travel per capita—**U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations using data from USDOT, BTS, *National Transportation Statistics 2003*, table 1-32, available at http://www.bts.gov, as of May 2004. U.S. Department of Commerce, U.S. Census Bureau, *Statistical Abstract 2003*, Mini Historical Statistics, available at http://www.census.gov/statab/www/minihs.html, as of May 2004.

TABLE 15-7a Change in Passenger-Miles of Travel, Energy Consumption, and Energy Efficiency: 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Passenger-miles of travel	1.00	1.03	1.05	1.07	1.08	1.11	1.15	1.18	1.21	1.24	1.24
Energy consumption	1.00	1.04	1.07	1.09	1.10	1.13	1.16	1.19	1.23	1.23	1.23
Energy efficiency	1.00	0.99	0.98	0.98	0.98	0.98	0.99	0.99	0.99	1.01	1.01

NOTES: *Passenger-miles of travel* (pmt) is the sum of pmt for certificated air carriers (domestic), passenger cars, motorcycles, light trucks (other 2-axle, 4-tire vehicles), bus, transit (excluding bus), and intercity/Amtrak rail. *Energy consumption* is the sum of that for commercial aviation (passenger), gasoline fuel (passenger cars, light trucks, and buses), and Amtrak (which includes electricity and distillate/diesel fuels). Passenger commercial domestic aviation fuel consumption data were estimated from total commercial domestic aviation fuel consumption data. General aviation data are excluded because passenger and freight operations data cannot be disaggregated.

SOURCES: Pmt and energy use (except transit)—U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003,* tables 1-34, 4-6, and 4-8, available at http://www.bts.gov/, as of March 2004. **Transit energy use—**American Public Transportation Association, *Public Transportation Fact Book 2003* (Washington, DC: 2003), tables 33 and 35.

TABLE 15-7b Passenger-Miles of Travel, Energy Consumption, and Energy Efficiency: 1991–2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Passenger-miles of travel (billions)	3,815	3,925	3,996	4,082	4,120	4,247	4,376	4,497	4,620	4,732	4,743
Energy consumption (trillions of Btu)	14,167	14,668	15,123	15,404	15,631	16,033	16,399	16,787	17,416	17,373	17,370
Energy efficiency (pmt/thousand Btu)	0.27	0.27	0.26	0.26	0.26	0.26	0.27	0.27	0.27	0.27	0.27

KEY: Btu = British thermal units; pmt = passenger-miles of travel.

NOTES: *Pmt* is the sum of pmt for certificated air carriers (domestic), passenger cars, motorcycles, light trucks (other 2-axle, 4-tire vehicles), bus, transit (excluding bus), and intercity/Amtrak rail. *Energy consumption* is the sum of that for commercial aviation (passenger), gasoline fuel (passenger cars, light trucks, and buses), and Amtrak (which includes electricity and distillate/diesel fuels). Passenger commercial domestic aviation fuel consumption data were estimated from total commercial domestic aviation fuel consumption data. General aviation data are excluded because passenger and freight operations data cannot be disaggregated.

SOURCES: Pmt and energy use (except transit)—U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2003,* tables 1-34, 4-6, and 4-8, available at http://www.bts.gov/, as of March 2004. **Transit energy use—**American Public Transportation Association, *Public Transportation Fact Book 2003* (Washington, DC: 2003), tables 33 and 35.

TABLE 15-8a Change in Freight Ton-Miles, Energy Consumption, and Energy Efficiency: 1991–2001
Index: 1991 = 1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Ton-miles	1.00	1.04	1.04	1.11	1.15	1.17	1.16	1.16	1.19	1.21	1.20
Energy consumption	1.00	1.01	1.01	1.06	1.12	1.14	1.13	1.20	1.25	1.31	1.27
Energy efficiency	1.00	1.02	1.04	1.04	1.03	1.03	1.02	0.97	0.95	0.92	0.95

NOTES: *Ton-miles* is the sum of individual ton-miles for air carriers, intercity trucks, Class I rail, and domestic water transportation. *Energy consumption* is the sum of usage by air carriers, single unit 2-axle 6-tire trucks, combination trucks, Class I rail (distillate/diesel fuel), and water transportation (residual and distillate/diesel fuel oil). Truck 2001 ton-miles data are preliminary. Marine gasoline use data are excluded because marine gasoline is used primarily in recreational vehicles. Commercial domestic aviation fuel consumption data were estimated from total commercial domestic aviation fuel consumption. General aviation data are excluded because passenger and freight data cannot be disaggregated. Pipeline data are excluded because ton-miles data include all types of petroleum products, and energy consumption data are available for natural gas only.

SOURCE: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on USDOT, BTS, *National Transportation Statistics 2003*, tables 1-44, 4-6, and 4-8, available at http://www.bts.gov/, as of March 2004.

TABLE 15-8b Freight Ton-Miles, Energy Consumption, and Energy Efficiency: 1991–2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Ton-miles (billions)	2,654	2,748	2,771	2,935	3,047	3,106	3,066	3,090	3,163	3,201	3,181
Energy consumption (trillions of Btu)	5,571	5,654	5,606	5,898	6,220	6,326	6,315	6,706	6,959	7,272	7,061
Energy efficiency (ton-miles/thousand Btu)	0.48	0.49	0.49	0.50	0.49	0.49	0.49	0.46	0.45	0.44	0.45

KEY: Btu = British thermal units.

NOTES: *Ton-miles* is a sum of individual ton-miles for air carriers, intercity trucks, Class I rail, and domestic water transportation. *Energy consumption* is the sum of usage by air carriers, single unit 2-axle 6-tire trucks, combination trucks, Class I rail (distillate/diesel fuel), and water transportation (residual and distillate/diesel fuel oil). Truck 2001 ton-miles data are preliminary. Marine gasoline use data are excluded because marine gasoline is used primarily in recreational vehicles. Commercial domestic aviation fuel consumption data were estimated from total commercial domestic aviation fuel consumption. General aviation data are excluded because passenger and freight data cannot be disaggregated. Pipeline data are excluded because ton-miles data include all types of petroleum products, and energy consumption data are available for natural gas only.

SOURCE: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), calculations based on USDOT, BTS, *National Transportation Statistics 2003*, tables 1-44, 4-6, and 4-8, available at http://www.bts.gov/, as of March 2004.