CHAPTER 5

Transportation Economics

Highlights

- The demand for transportation grew 3.8 percent from 2014 to 2015, down from 4.2 percent from 2013 to 2014.
- Freight transportation services, as measured by the freight Transportation Services Index (TSI), continue to lead the economy, including two economic accelerations following the recession—the first from June 2009 to December 2012 and the second from July 2013 to December 2014.
- Of the transportation modes included in the freight TSI, rail intermodal grew the fastest from June 2009 (the end of the economic recession) to December 2016, rising 50.6 percent.
- Employment in for-hire transportation and transportation-related industries rose steadily from 2011 to 2015, to 13.6 million, exceeding the 2007 pre-recession level of 13.5 million. Employment then declined in 2016 to 13.0 million.
- Total national expenditures on transportation accounted for roughly $1,196 billion of all personal expenditures, making it the fourth largest expenditure category (excluding other) after healthcare, housing, and food.
- Total government transportation revenues continue to fall short of government transportation expenditures. In 2014 government transportation revenues covered 56.7 percent of expenditures. The gap between transportation revenues and expenditures has declined since 2009, when revenues covered 52.5 percent of expenditures.
- The total costs faced by producers of transportation services declined during the 2007 to 2009 recession, and then climbed steadily through 2014. The average price of air, rail, and truck transportation services declined between 2014 and 2016, while water transportation service prices rose in 2015 before falling below their 2014 level in 2016.

Transportation Economics

Transportation plays a vital role in the American economy; it makes economic activity possible and serves as a major economic activity in its own right, contributing directly and indirectly to the economy. Households, businesses, and the government directly consume transportation goods (e.g., vehicles and motor fuel) and services (e.g., passenger and freight air transportation). Transportation indirectly contributes to the economy by enabling the production of goods and services (e.g., by connecting producers to the raw materials for baking bread, etc.) and employing workers in transportation occupations in both the transportation industry and non-transportation industries. Public (government) and private expenditures on transportation facilities, infrastructure, and systems contribute to the economy by enabling the movement of both people and goods domestically and internationally. Transportation not only enables international trade but also is a major good and service traded. The full scope of transportation's role in the economy is available in BTS's *Transportation Economic Trends* Report.

Transportation's Contribution and Role in the Economy

Transportation's Contribution to GDP

Transportation's contribution to the economy can be measured by transportation's contribution to gross domestic product (GDP). GDP is an economic measure of all goods and services produced and consumed in the country. The transportation component of GDP can be measured in terms of investments made and transportation goods and services consumed (collectively known as the demand for transportation) or in terms of the transportation services produced.

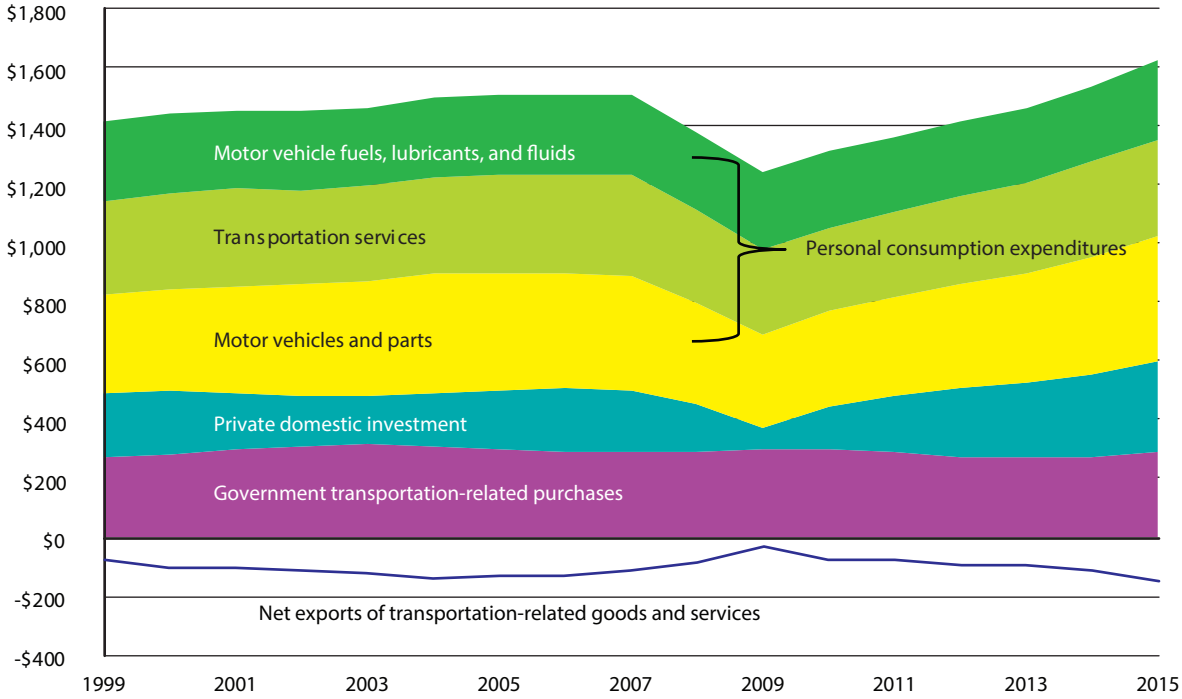
In 2015 the demand for transportation ($1,477.9 billion) included:

1. personal consumption, such as vehicle and motor fuel purchases ($1,020.7 billion, 69.1 percent of transportation demand),
2. private domestic investment in transportation structures and equipment ($314.4 billion, 21.3 percent),
3. government purchases of transportation goods and services ($289.1 billion, 19.6 percent), and
4. net exports (exports minus imports) related to transportation goods and services (-$146.3 billion, -9.9 percent) (as measured in chained 2009 dollars) (figure 5-1).

Altogether, the demand for transportation accounted for 9.0 percent of U.S. GDP.

The demand for transportation grew more slowly (3.8 percent) from 2014 to 2015 than it did from 2013 to 2014 (4.2 percent), when the demand for transportation reached its highest annual growth since the end of the December 2007 to June 2009 economic recession. Growth from 2014 to 2015 fell from the 2013 to 2014 level as imports increased. Imports of transportation related goods and services rose from $436.2 billion in 2014 to $467.4 billion in 2015, while net exports of transportation related goods and services fell from a deficit of $112.1 billion to a deficit of $146.3 billion (as measured in chained 2009 dollars) (figure 5-1).

FIGURE 5-1 U.S. Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand: 1999–2015 (billions of chained 2009 dollars)



NOTES: Total transportation-related final demand is the sum of total Personal consumption of transportation, total Gross private domestic investment, Net exports of transportation-related goods and services and total Government transportation-related purchases. Net exports is exports minus imports of civilian aircraft, engines, and parts; automotive vehicles, engines, and parts; and transport. Federal purchases and state and local purchases are the sum of consumption expenditures and gross investment. Defense-related purchases are the sum of transportation of material and travel. The Bureau Economic Analysis has changed the reference year for chained dollar estimates from 1999 onward as part of the comprehensive revision of the national income and product accounts in 2014.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, tables 1.1.6, 2.3.6, 2.4.6, 3.11.6, 3.15.6, 4.2.6, 5.4.6, and 5.5.6, available at http://www.bea.gov/National/nipaweb/SelectTable.asp?Selected=N as of May 2017.

Transportation's Role in Production

The contribution of transportation to the economy also can be found by examining transportation's role in production. The transportation services used to move wheat from farms to mills, flour from mills to bakers, and bread from bakers to grocery stores, exemplify how transportation enables the production and sale of nearly everything made and consumed in the United States. The U.S. Bureau of Economic Analysis (BEA) produces the U.S. Input-Output (I-O) accounts, which show the inputs each industry uses to produce output, the type of output produced by each industry, and the types of products purchased by final consumers.

With regards to transportation, the I-O accounts show the industries using transportation services provided by transportation firms on a fee basis, called for-hire transportation, and the contribution of for-hire transportation firms to the economy. In 2016 for-hire transportation

(including warehousing) contributed $562.9 billion (3.0 percent) to U.S. GDP (current dollars) [USDOC BEA 2017a]. While for-hire transportation contributes less to the economy than other industries, for-hire transportation delivers the raw materials other industries need to produce finished products and deliver finished products to wholesale and retail outlets.

In addition to using for-hire transportation services, many non-transportation industries also undertake transportation activities for their own purposes (called in-house transportation), which the I-O accounts do not explicitly show. BTS developed the Transportation Satellite Accounts (TSAs) to explicitly show in-house transportation operations and thereby estimate the full contribution of transportation to the economy.[1] The TSAs also show the contribution of transportation carried out by households through the use of a household vehicle.

In 2015, the latest year for which comprehensive data are available, transportation's total estimated contribution was $1,033.3 billion. For-hire transportation contributed $543.2 billion (3.0 percent) to the U.S. GDP of $18.4 trillion.[2] Transportation services (air, rail, truck, and water) provided by non-transportation industries for their own use (in-house transportation) contributed an additional $169.9 billion (0.9 percent). Total household transportation, measured by the depreciation associated with households owning motor vehicles, contributed $320.2 billion (1.7 percent). Total household transportation's contribution to GDP was larger than any of the other transportation modes. Trucking contributed the second largest amount, at $281.4 billion. In-house truck transportation operations contributed $138.4 billion, while for-hire truck transportation services contributed $143.0 billion (figure 5-2).

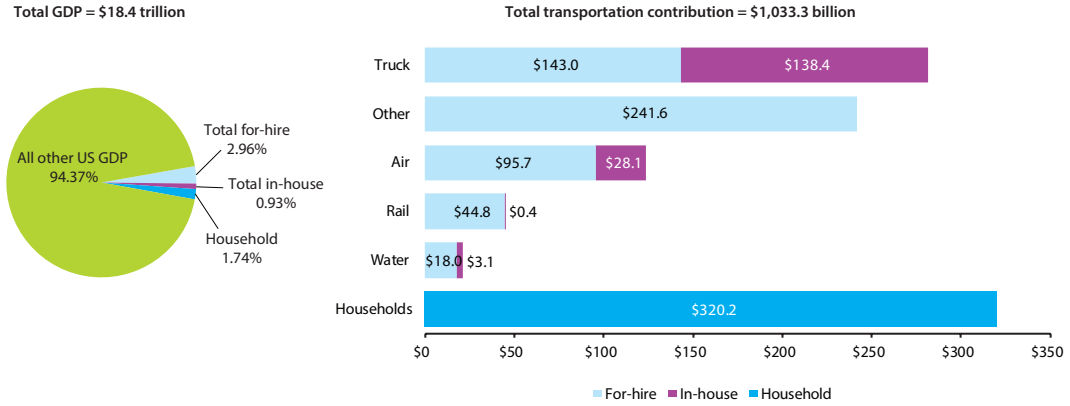
Transportation indirectly contributes to the economy by enabling the production of goods and services. *Industry Snapshots: Uses of Transportation* summarizes the transportation services and related resources used by the seven major non-transportation sectors to produce their goods and services [USDOT BTS 2017c]. Some sectors use more transportation than others. In 2015 the wholesale and retail trade sector used the largest amount of transportation services at $270.7 billion, followed by the information and services sector at $246.7 billion, the manufacturing sector at $202.5 billion, and the government sector at $136.9 billion (figure 5-3).

Looking at the amount of transportation required to produce one dollar of output shows how much a sector depends on transportation. In 2015 the wholesale and retail trade sector required more transportation services to produce one dollar of output than any other sector. The wholesale and retail trade sector required 9.0 cents of transportation services to produce one dollar of output (4.7 cents of in-house transportation operations and 4.3 cents of for-hire transportation services) in 2015 (figure 5-4).

[1] For more information about the Transportation Satellite Accounts, see U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Economic Trends*, chapter 2, available at: https://www.bts.gov/content/transportation-economic-trends as of November 2017.

[2] The GDP value in the TSAs is larger than the GDP value published in the National Accounts because it includes the contribution of household transportation. Household transportation covers transportation provided by household for their own use through the use of an automobile.

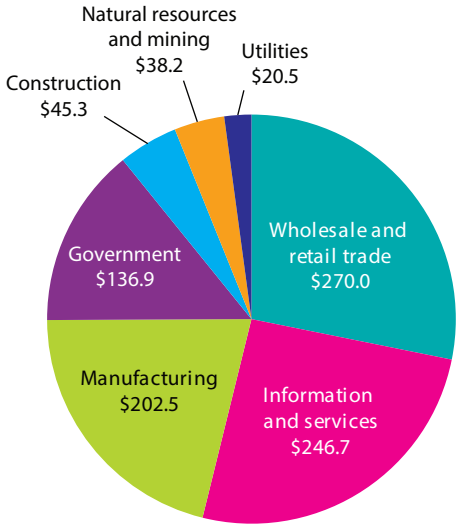
FIGURE 5-2 Contribution of For-Hire, In-House, and Household Transportation to U.S. Gross Domestic Product (2015 Dollars)



NOTES: (a) In-house transportation consists of the services provided by non-transportation industries, including households, for their use. Business in-house transportation includes privately owned and operated vehicles of all body types, used primarily on public rights of way, and the supportive services to store, maintain, and operate those vehicles. Household transportation covers transportation provided by households for their own use through the use of an automobile. (b) For-hire transportation consists of the services provided by transportation firms to industries and the public on a fee-basis. (c) Other for-hire transportation includes: pipeline, transit and ground passenger transportation, including state and local government passenger transit; sightseeing transportation and transportation support; courier and messenger services; and warehousing and storage. (d) Gross domestic product (GDP) increased from value reported by the Bureau of Economic Analysis in I-O use table by total output from the household production of transportation services.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Satellite Accounts, available at www.bts.gov, as of May 2017.

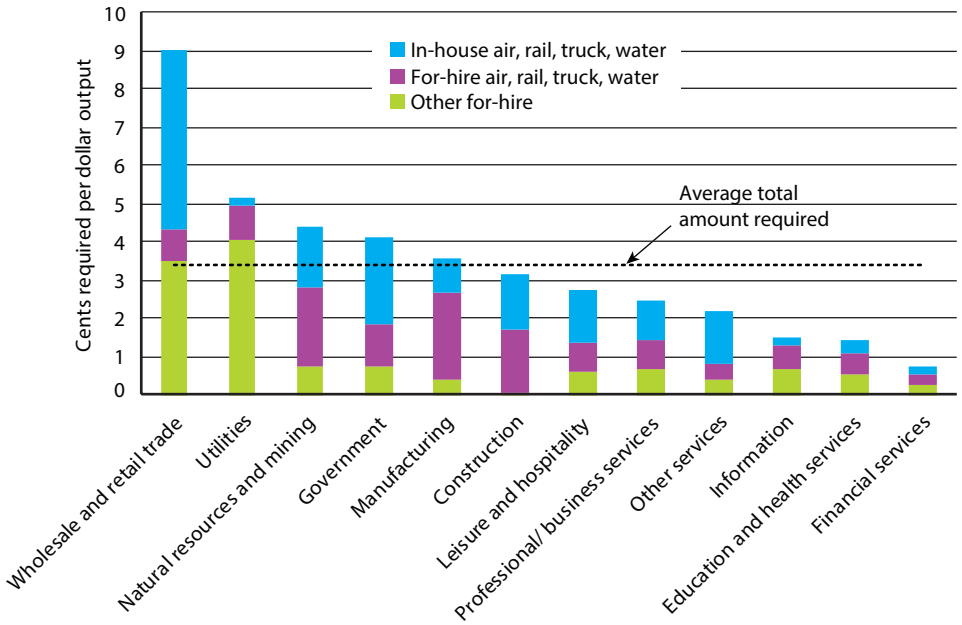
FIGURE 5-3 Use of Transportation by Industry, 2015 (current dollars, billions)



NOTES: In-house transportation consists of transportation services (air, rail, truck, and water) provided by non-transportation industries for their own use. For-hire transportation consists of the services provided by transportation firms to industries and the public on a fee-basis. Airlines, railroads, transit agencies, common carrier trucking companies, and pipelines are examples of for-hire transportation industries.
"Other" for-hire transportation includes: Transit and passenger ground transportation (excluding State and local government passenger transit); Pipeline; Sightseeing transportation and transportation support; Parcel delivery, courier, and messenger services (excluding U.S. Postal Service); Warehousing and storage; and Other transportation and support activities.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Satellite Accounts, available at http://www.bts.gov as of May 2017.

FIGURE 5-4 Transportation Required per Dollar of Output by Sector, 2015



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SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Satellite Accounts, available at http://www.bts.gov as of May 2017

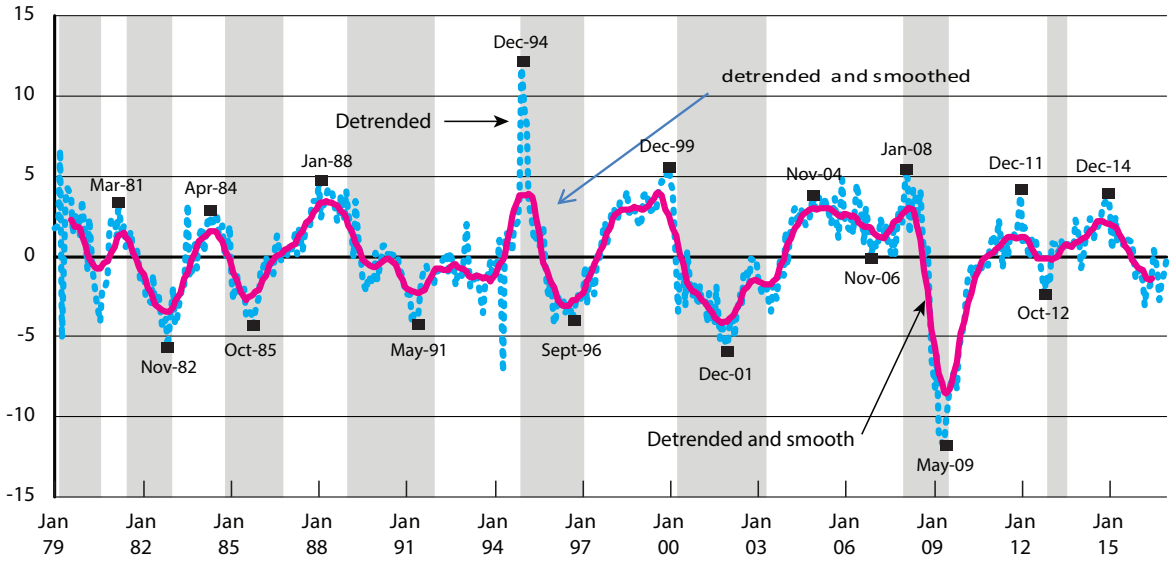
Transportation and Economic Cycles

Transportation activities have a strong relationship to the economy. BTS developed the Transportation Services Index (TSI) to measure the volume of freight and passenger transportation services provided monthly by the for-hire transportation sector.[3] BTS research shows that changes in the TSI occur before changes in the economy, making the TSI a useful potentially leading economic indicator [USDOT BTS 2014]. This relationship is particularly strong for freight traffic.

Figure 5-5 illustrates the relationship between the freight TSI and the national economy from 1970 to 2016. The dashed blue line shows the freight TSI detrended to remove long-term changes. The red line shows the freight TSI detrended and smoothed to eliminate month-to-month volatility. The gray bars represent economic slowdowns, or periods when economic growth slows below normal rates and unemployment rises as a result. The marked peaks and troughs show that the freight

[3] For more information about the Transportation Services, see U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Economic Trends, chapter 1, available at: https://www.bts.gov/content/transportation-economic-trends as of November 2017.

FIGURE 5-5 Detrended Freight TSI, Detrended and Smoothed Freight TSO and Growth Cycles: January 1979–December 2016



NOTE: Shaded areas indicate decelerations in the economy (growth cycles). Detrending and smoothing refer to a statistical procedure that makes it easier to observe changes in upturns and downturns of the data. Detrending removes the long term growth trend and smoothing eliminates month to month volatility.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Services Index, available at www.bts.gov as of May 2017.

TSI usually peaks before a growth slowdown begins and hits a trough before a growth slowdown ends.

BTS research shows two economic accelerations followed the Great Recession; the first from June 2009 to December 2012 and the second from July 2013 to December 2014 [USDOT BTS 2017e]. The freight TSI lead both of these accelerations; however, the relationship between the freight TSI and growth cycles changed somewhat. The freight TSI reached a peak in December 2011 and turned downwards 12 months in advance of an economic deceleration that began in December 2012. After the peak in December 2011, the freight TSI reached a trough in October 2012 and turned upwards. The trough in the freight TSI in October 2012 occurred before the growth cycle peaked in December 2012, which marked the start of an economic deceleration. Historically, the freight TSI has not hit a trough and turned upwards before the onset of an economic deceleration. The economic deceleration begun in December 2012 ended in July 2013. The freight TSI peaked in December 2014 and turned downwards at the same time as the growth cycle.

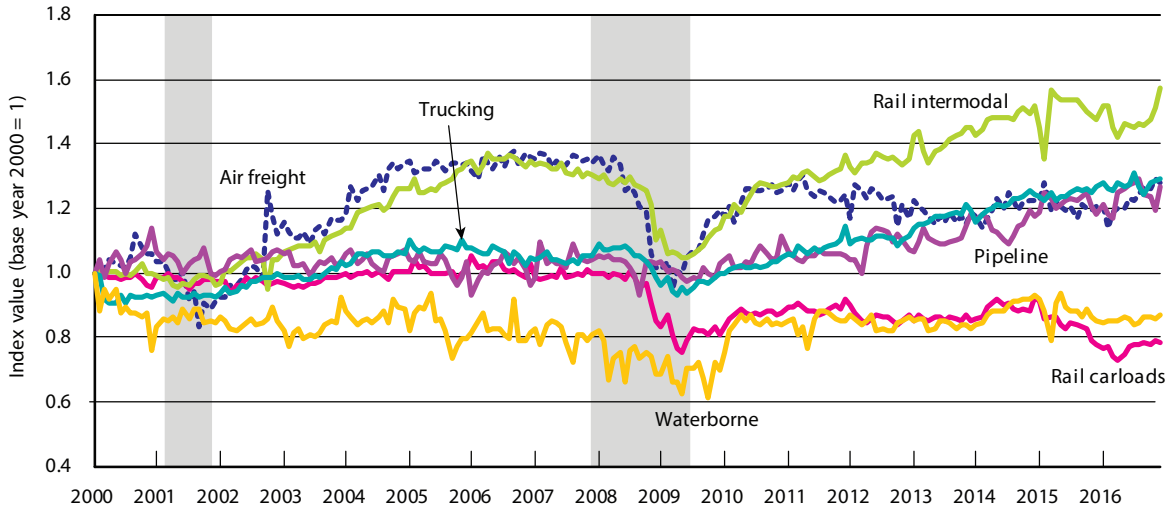
The Great Recession from December 2007 to June 2009 separated two distinct periods in the growth of freight transportation services. The freight TSI grew well above the long-term trend from the pre-recession November 2004 peak to the January 2008 peak. Post-recession growth from the December 2011 peak to the

December 2014 peak exceeded the long-term trend but less significantly and short of the fast-paced growth prior to the recession. This trend contrasts with the growth pattern of gross domestic product, which grew just as rapidly from December 2011 to December 2014 (a compound annual growth rate of 2.1 percent) as it did from November 2004 to January 2008 (a compound annual growth rate of 2.0 percent). The varying trends suggest that transportation has recovered more slowly than the economy as a whole [USDOT BTS 2017f].

Figure 5-6 shows the changes in freight movement by the transportation modes included in the freight TSI. Rail intermodal, trucking, and pipeline all have grown steadily since June 2009, whereas air freight and waterborne show little growth after initial recovery. Rail intermodal[4] grew the fastest, rising 50.6 percent from June 2009 (the end of the economic recession) to December 2016. Competitive pricing, track upgrades, and investment in rail intermodal terminals and other infrastructure all contributed to the rapid growth of rail intermodal traffic [AAR 2016]. Trucking grew the second fastest at 37.8 percent, followed by pipeline at 29.6 percent, waterborne at 23.2 percent, and air freight at 21.7 percent. Rail carloads declined 0.8 percent from June 2009 to December 2016. Data from *Railroads and Coal* suggests that the weakness in rail carload shipments is due to a weakness in coal shipments. Total coal shipped by Class I railroads peaked in 2008 at 878.6 million tons and dropped to 491.7 million tons in 2016 [AAR 2010 and 2017].

[4] Rail intermodal is the transporting of shipping containers and truck trailers on railroad flat cars.

FIGURE 5-6 Freight TSI Modal Data, January 2000–December 2016



NOTE: Data are seasonally adjusted and indexed

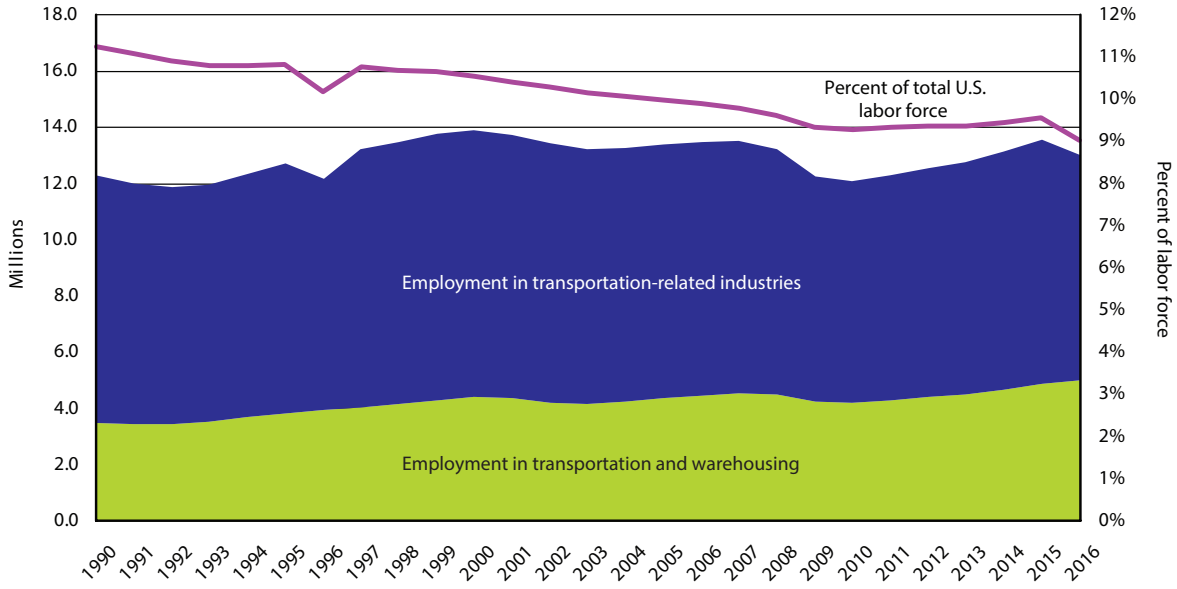
SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, seasonally adjusted transportation data, available at www.bts.gov as of May 2017.

Transportation-Related Employment and Wages

The transportation and warehousing sector and related industries employ over 13.0 million people in a variety of roles, from driving buses to manufacturing cars to building and maintaining ports and railroads. Figure 5-7 shows the number and percentage of workers employed by for-hire transportation and transportation-related industries in the United States from 1990 to 2016. In 1990, 12.3 million workers were employed in for-hire transportation and transportation-related industries. Employment rose to a high of 13.9 million workers in 2000 but declined to 13.2 million in 2003 due to the March to November 2001 economic recession and to the aftermath of September 11, 2001. Employment declined further to a low of 12.1 million in 2010 due to the 2007 to 2009 recession. Employment rose steadily from 2011 to 2015, rising to 13.6 million in 2015 to exceed the 2007 pre-recession level of 13.5 million. Employment declined to 13.0 in 2016 because the decline in transportation related employment more than offset increased employment in transportation industries. The percentage of American workers employed in for-hire transportation and transportation-related industries, however, has continued its decline from 11.3 percent of the U.S. labor force in 1990 to 9.0 percent in 2016. [USDOT BTS 2017d]

The for-hire transportation sector (transportation service providers and warehousing) is a major source of employment in the United States, employing 5.0 million

FIGURE 5-7 Employment in Transportation and Transportation-Related Industries in the United States: 1990–2016



SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 3-23, available at www.bts.gov as of May 2017.

in 2016 (figure 5-7). The sector's labor force declined during the 2007 to 2009 recession and continued to fall through 2010, after which it rose steadily. The sector's labor force rose above the 2007 level in 2014 and reached an all-time high of 5.0 million in 2016 [USDOT BTS 2017d]. Additional persons work as independent contractors for private transportation providers, such as drivers for independent, on-demand ride-services (e.g., Uber and Lyft) but are not counted in the totals (see box 5-A).

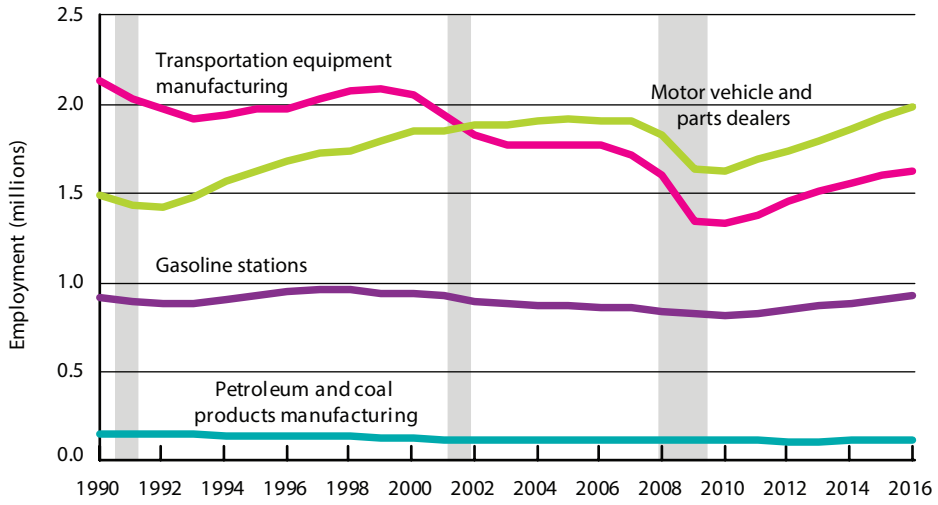
Transportation also leads to employment in related industries that provide the goods and services needed to produce transportation. These transportation industries include motor vehicle and parts dealers, transportation equipment manufacturing, gasoline stations, and petroleum and coal products manufacturing. A notable shift in transportation-related employment occurred between 1990 and 2016. From 1990 through 2001, transportation equipment manufacturing was the largest transportation-related industry. However, employment in transportation equipment manufacturing declined 9.0 percent during this period, while employment in the motor vehicle and parts dealers industry grew 24.1 percent. This led to motor vehicle and parts dealers becoming the largest transportation-related employer in 2002. Employment in motor vehicle and parts dealers overall grew by 32.6 percent from 1990 to 2016, while employment in transportation equipment manufacturing declined 23.9 percent (figure 5-8).

Workers with transportation occupations overall earned, at $30,730, a lower median wage than workers of all occupations ($37,040) in 2016 [USDOL BLS 2017b]. Annual wages earned by transportation and transportation-related workers vary widely across transportation occupations. For example, air traffic controllers, airline pilots, and aerospace engineers earned an annual median wage of more than $100,000 in 2016, while the largest transportation-related occupation, heavy and tractor-trailer truck drivers, earned an annual median wage of $41,340. The top-five highest wage transportation-related occupations collectively employ fewer workers (294,660), while the lowest-five wage occupations employ 3.6 times more workers (1.0 million). (figure 5-9)

Box 5-A Independent, On-Demand Ride Services Employment

The launch and spread of independent, on-demand ride-services (see box 2-A), such as Uber and Lyft, has created new employment opportunities in transportation. Persons who provide ride services are considered independent contractors. Independent contractors are not counted in official U.S. job counts. In 2005 the Bureau of Labor Statistics (BLS) estimated there were 403,000 independent contractors in the transportation and material moving occupations as compared to 7.8 million workers with traditional arrangements [USDOL BLS 2005]. BLS plans to include the Contingent Worker Supplement in the 2017 Current Population Survey to capture on-demand services employment.

FIGURE 5-8 Employment in Selected Transportation-Related Industries, 1990 to 2016



NOTE: Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 3-23, available at www.bts.gov as of May 2017.

FIGURE 5-9 Employment and Wages in Select Transportation and Transportation-Related Occupations, 2016

	Number employed	Median wage
Top 5 largest employers		
Truck drivers, heavy and tractor-trailer	1,704,520	$41,340
Truck drivers, light or delivery services	858,710	$30,580
Shipping, receiving, and traffic clerks	676,990	$31,180
Automotive service technicians and mechanics	647,380	$38,470
Bus drivers, school	515,020	$30,150
Bottom 5 lowest wage		
Ambulance drivers and attendants, except emergency…	17,300	$23,850
Driver/sales workers	426,310	$22,830
Automotive and Watercraft Service Attendants	109,790	$22,420
Cleaners of vehicles and equipment	348,770	$22,220
Parking lot attendants	146,350	$21,730
Top 5 highest wage		
Airline pilots, copilots, and flight engineers	81,520	$127,820
Air traffic controllers	23,240	$122,410
Aerospace engineers	68,510	$109,650
Marine engineers and naval architects	8,120	$93,350
Transportation, storage, and distribution managers	113,270	$89,190

KEY: SOC = Standard Occupational Classification

NOTE: Transportation and transportation-related occupations from U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 3-24, available at www.bts.gov

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment and Wages, available at http://www.bls.gov/oes as of May 2017.

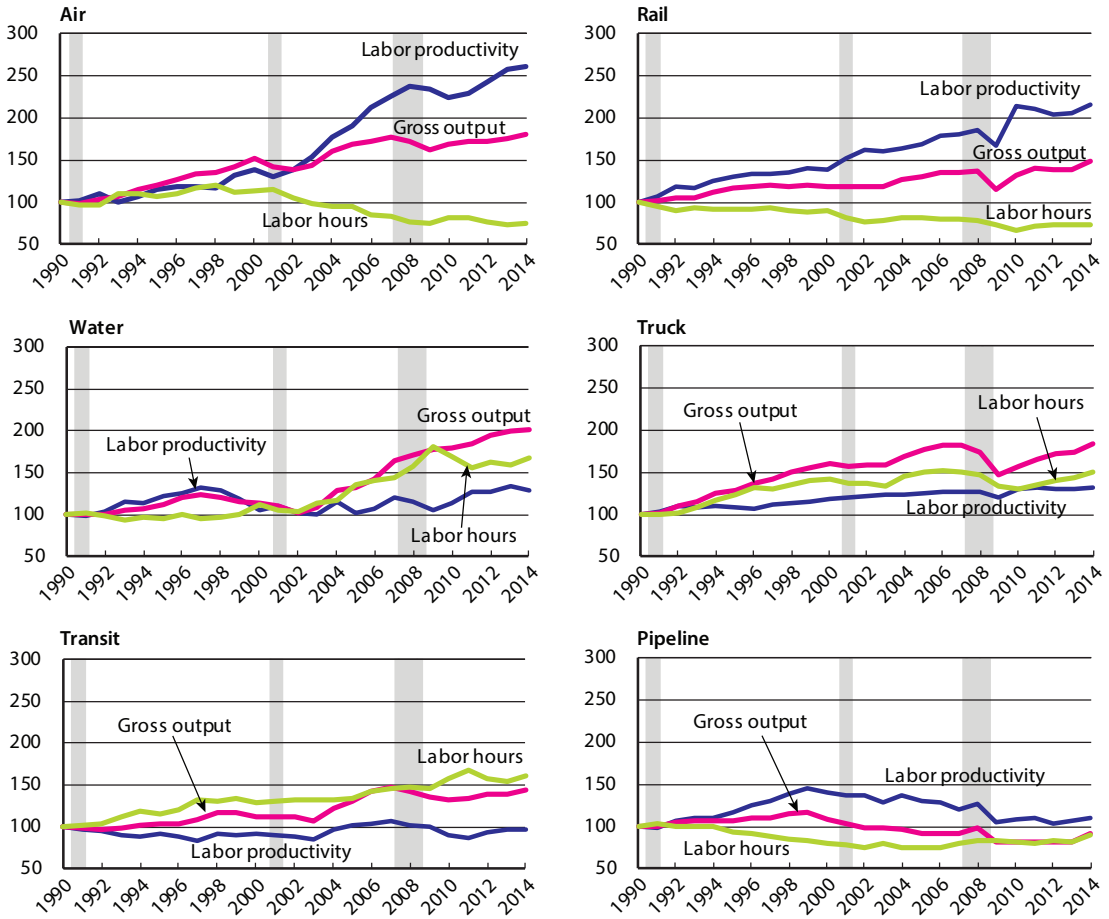
Transportation Productivity

The size of the transportation workforce depends on the demand for transportation and on firms' utilization of the workforce relative to other inputs, such as capital, energy, materials, and services. Economists measure how efficiently firms use inputs through economic productivity. Economic productivity is the ratio of total output to the inputs used in the production process.

Productivity increases when a business produces the same output using fewer (or lower-cost) inputs. The business may then choose to produce more output, lower prices, invest in the business, or return income to shareholders.

There are two main measures of transportation productivity: labor (single-factor) productivity and multifactor productivity (MFP). Labor productivity measures the output per unit of labor

FIGURE 5-10 Labor Productivity Indices for Selected Transportation Industries: 1990–2014 Index, 1990 = 100



NOTE: Data in this figure are not comparable to the data published in previous editions due to change in data used. Labor hours is the total number of number of hours worked by all workers in a sector to produce gross output. Gross output is the total value of goods and services produced by the sector. Gross output includes the value of the goods and services used to produce the sector output. Labor productivity measures a sector's output per unit of labor input.

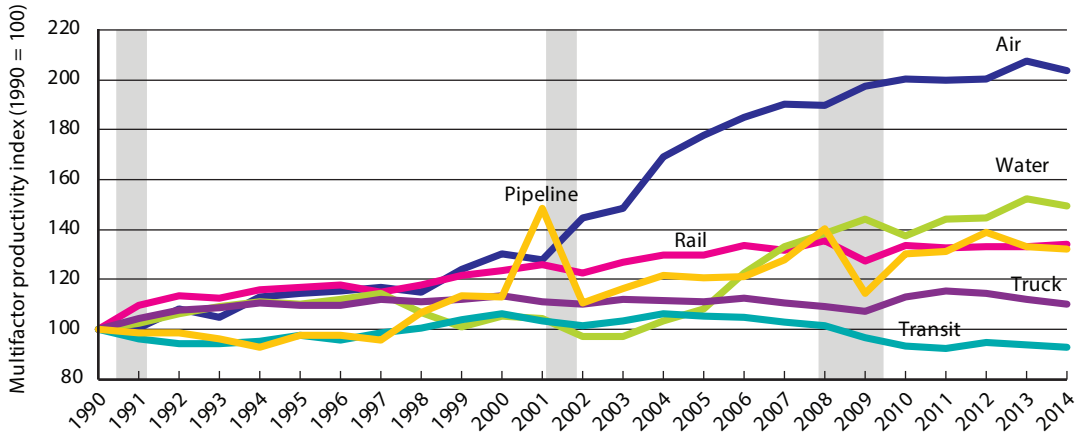
SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Major Sector Productivity, http://www.bls.gov as of May 2017.

input, while MFP measures the output per unit as a weighted average of multiple factors, such as fuel, equipment, and materials.

While MFP is a more comprehensive measure of economic performance, labor productivity is easier to measure and continues to have a broad appeal. Figure 5-10 illustrates changes in labor productivity for selected transportation sectors from 1990 to 2014. Air transportation experienced the largest increase in labor productivity among all, increasing 160.5 percent (figure 5-10). Air transportation's labor productivity grew most notably between 2001 and 2008. The gains during this period come from legacy carriers adopting aggressive labor-saving initiatives and from large output gains among low-cost carriers [USDOL BLS 2017c]. Rail transportation experienced the second largest gains in labor productivity, increasing by 116.3 percent. These gains are the result of labor-saving technologies automating operational and administrative tasks [Kriem]. Labor-saving initiatives in air and rail resulted in a decline in the labor hours required to produce a dollar of air and rail transportation services from 1990 to 2014. During the same period, smaller labor productivity increases occurred in truck (32.1 percent) and water (28.9 percent). Labor productivity in pipeline transportation grew 9.5 percent despite declining from 2000 through 2014. Labor productivity in transit transportation declined 3.0 percent due to the total amount of hours required to produce output (labor hours) rising faster than output.

From the perspective of output per unit of multiple inputs (e.g., fuel, equipment, and materials), air transportation had the largest increase from 1990 to 2014, growing 103.5 percent (figure 5-11). The gain in air transportation reflects an 80.1 increase in output and an 11.5 percent decline in combined inputs. Combined inputs fell, despite an increase in capital services, because of declines in labor inputs and intermediate inputs. The increase in capital services and the decline in labor follow from the air transportation sector adopting labor-saving technologies, such as self-service kiosks.

FIGURE 5-11 Multifactor Productivity Indices for Selected Transportation Sectors, 1990 to 2014



SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Major Sector Productivity, http://www.bls.gov as of May 2017.

Water transportation experienced the second largest increase in MFP, growing 49.3 percent from 1990 to 2014, despite declining 15.2 percent from 1997 to 2003 (figure 5-11). The MFP of rail transportation grew steadily over the entire period but more slowly, increasing 34.2 percent. MFP in pipeline transportation had a smaller increase of 31.9 percent over the same period and showed more year-to-year variation than other modes. Truck transportation's MFP grew marginally at 9.8 percent, while the transit sector experienced a decline of 7.2 percent.

The impact of productivity on transportation companies can be seen through changes in the price charged per unit of output. For for-hire passenger transportation, the unit of output is passenger-miles, and the measure of what travelers pay is the average revenue per passenger-mile. For for-hire freight transportation, the unit of output is ton-miles, and the measure of what freight shippers pay is the average freight revenue per ton-mile. For modes where users do not typically pay per use, like driving a personal vehicle, complete data are difficult to obtain. Increases in productivity often reduce business costs, which allow transportation companies to offer lower prices.

Figure 5-12 shows nominal changes in revenue per passenger-mile relative to the index for all consumer expenditures (CPI) for three industries: domestic air carriers, commuter rail, and Amtrak/intercity rail. Nominal changes that are greater than changes in the CPI indicate real increases in revenue. Amtrak/intercity rail experienced the largest growth in revenue per passenger-mile, increasing 165.8 percent from 1990 to 2015 (latest available year), while commuter rail increased 95.9 percent from 1990 to 2016. Both Amtrak/intercity rail and commuter rail experienced steady growth. In contrast, domestic air carrier revenue per passenger-mile fell after the September 2001 terrorist attacks, began to rise after reaching a low in 2002, and then fell again during the Great Recession to its 2002 level in 2009. Between 2009 and 2014, domestic air carrier revenue per passenger-mile rose 21.0 percent but then fell 7.3 percent between 2014 and 2016.

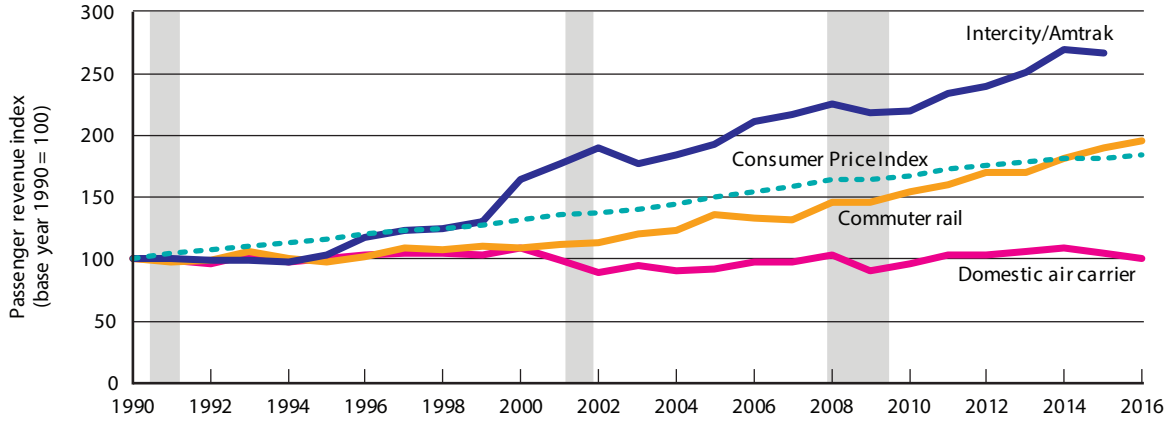
The increases in revenue per passenger-mile are partly due to an increase in the overall price of goods and services. The CPI, which measures overall changes in prices, increased by 83.6 percent from 1990 to 2016, indicating that Amtrak/intercity and commuter rail were the only industries with real increasing revenue per passenger-mile during the period.

Figure 5-13 shows the average freight revenue per ton-mile for air, truck, rail, and pipeline. Nominal freight revenue per ton-mile increased for all freight modes. Domestic air carriers experienced the largest increase in revenue per ton-mile, increasing 145.9 percent from 1990 to 2014 before falling 11.6 percent from the 2014 level between 2015 and 2016. Class I railroads experienced a smaller increase in revenue per ton-mile of 50.1 percent in the same period due to an initial decline.

Sources of Economic Growth

The BEA/BLS Integrated Production Accounts show the contribution of labor, capital, and MFP to economic growth. Based on the accounts, transportation's contribution has

FIGURE 5-12 Revenue per Unit of Output for Passenger Transportation Modes: 1990–2016



NOTE: Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

SOURCES: U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 3-20, available at www.bts.gov as of November 2017

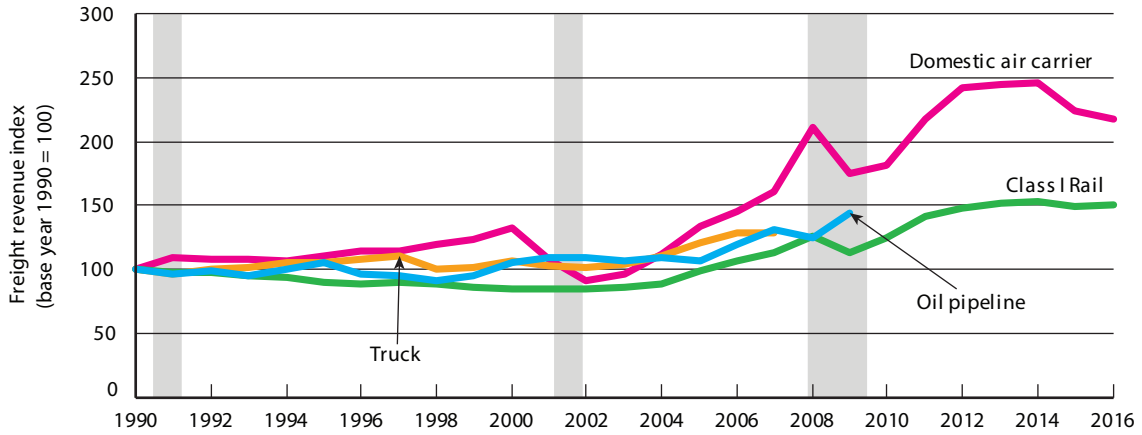
Air carrier, domestic, scheduled service (passenger): Domestic air carrier revenue includes baggage fees and reservation changes fees.
U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, TranStats Database, T1: U.S. Air Carrier Traffic and Capacity Summary by Service Class, available at http://www.transtats.bts.gov/DL_SelectFields.asp?Table_ID=264&DB_Short_Name=Air%20Carrier%20 Summary as of Aug. 31, 2015 and Air Carrier Financial Reports, Schedule P-1.2, available at http://www.transtats.bts.gov/databases.asp?Mode_ID=1&Mode_Desc=Aviation&Subject_ID2=0 as of November 2017.

Commuter rail: 1990-2001: American Public Transportation Association, 2011 Public Transportation Fact Book (Washington, DC: 2011), tables 2 and 42 (passenger fares / passenger-miles).
2002-14: U.S. Department of Transportation, Federal Transit Administration, National Transit Database, Data Tables 19 and 26 (Washington, D.C.: Annual reports), available at https://www.transit.dot.gov/ntd as of November 2017.
2015-16: U.S. Department of Transportation, Federal Transit Administration, National Transit Database, Annual Data Tables: Service and Annual Database: Fare Revenue, available at https://www.transit.dot.gov/ntdhtm as of November 2017.

Intercity / Amtrak: 1990-2002: National Passenger Rail Corporation (Amtrak), Amtrak Annual Report, Statistical Appendix (Washington, DC: Annual Issues) (transportation revenues / passenger-miles).
2003-13: Association of American Railroads, Railroad Facts (Washington, DC: Annual Issues), p. 77 and similar pages in previous editions (passenger revenue/revenue passenger-miles).
2014-15: Amtrak, Monthly Performance Review for September 2015 (November 13, 2015), Tables A.2-2, A4-2, available at https://www.amtrak.com/ccurl/322/821/Amtrak-Monthly-Performance-Report-September-2015-Preliminary-Unaudited.pdf as of Mar. 28, 2017.

Consumer Price Index: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index-Urban, U.S. All Items Indexes, available at http://www.bls.gov/cpi/ as of November 2017.

FIGURE 5-13 Revenue per Unit of Output of Freight Transportation Modes: 1990–2016



NOTE: Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

[a] For 1990 and later, air carriers that did not report both financial data and all months of traffic data for a given period were excluded from the calculations. Cargo revenue includes both scheduled and charter property revenue and mail revenue.
[b] General freight common carriers, most of which are LTL (less-than-truckload) carriers.

SOURCES: Air carrier, domestic, scheduled service (freight): U.S. Department of Transportation, Bureau of Transportation Statistics, TranStats Database, T-1, Schedule P-11, and Schedule P-12 data, available at http://www.transtats.bts.gov/ as of Sep. 1, 2015, special tabulation.
Truck: 1990-2003: Eno Transportation Foundation, Inc., Transportation in America (Washington, DC: 2007), p. 46.
2004-07: U.S. Department of Commerce, U.S. Census Bureau, 2009 Transportation Annual Survey (Washington, DC: January 2011), Table 2.1, available at http://www.census.gov/services/ as of Aug. 9, 2011, special tabulation.
Class I rail: Association of American Railroads, Railroad Facts (Washington, DC: Annual Issues), p. 34 and similar pages in previous editions.

been smaller than other sectors. Prior to the 2007 to 2009 economic recession and between 2003 and 2007, transportation—with an average annual growth rate of 0.14 percent—contributed significantly less than the manufacturing, service, and finance—which all had average annual growth rates in excess of 0.50 percent (figure 5-14). During that period, the U.S. economy grew on average 2.73 percent per year. During the 2007 to 2009 economic recession, almost all sectors, including transportation, experienced negative growth. Since the recession, transportation has contributed positively to economic growth. However, transportation's average annual contribution to economic growth of 0.06 percent from 2009 to 2014 (the latest available year) is below its 2003-2007 pre-recession level of 0.14 percent.

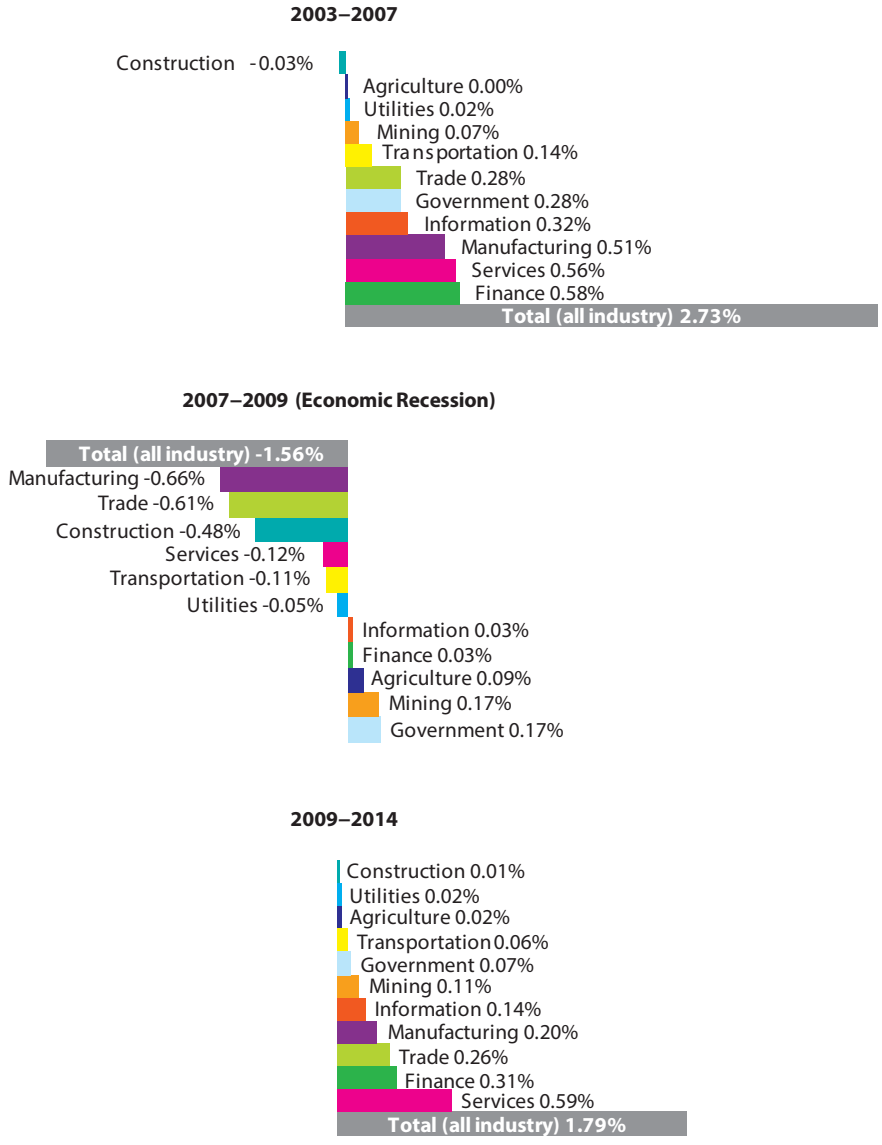
Transportation Expenditures and Revenues

Household Spending

In 2016 total national expenditures on transportation by and on behalf of U.S. households amounted to $1,196 billion, making it the fourth largest expenditure category (excluding other) after healthcare, housing, and food (figure 5-15). Ninety-one percent of personal transportation expenditures went to the purchase, operation, and upkeep of personal vehicles [USDOC BEA 2017b].

Between 2000 and 2016, household transportation expenditures increased 42.7

FIGURE 5-14 Sources of Economic Growth: Average Annual Growth Rate by Industry

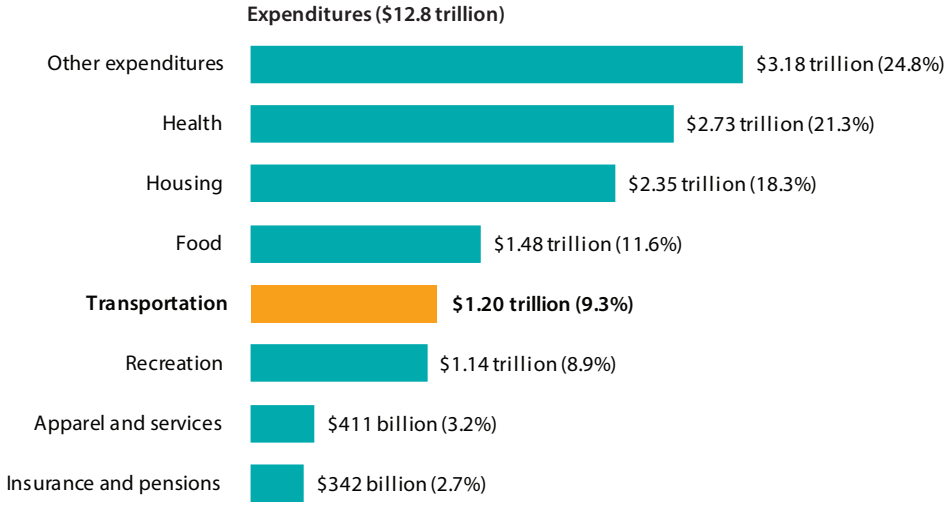


NOTES: Finance includes: Finance and insurance and Real estate rental and leasing. The service sector includes: Professional and business services; Education and health services; Leisure and hospitality; and Other services (NAICS 54-81).

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Integrated Industry-Level Productivity Account, http://www.bea.gov as of May 2017.

percent, from $838 billion to $1,196 billion. The growth in total expenditures outpaced the growth in transportation expenditures, increasing 88.8 percent, from $6.79 trillion to $12.82 trillion over the same period. Expenditure growth for healthcare (145.6 percent), housing (93.5 percent), and food (83.5 percent) outpaced expenditure growth for transportation. As a result, the percentage of total expenditures for transportation declined from 12.3 percent in 2000 to 9.3 percent in 2016. [USDOC BEA 2017b]

FIGURE 5-15 Total National Household Expenditures (major expenditure categories), 2016



NOTES: "Other expenditures" include alcoholic beverages purchased for off-premises consumption; furnishings, household equipment, and routine household maintenance; education; accommodations; financial services (excluding pension funds); other goods and services; net foreign travel and expenditures abroad by U.S. residents; and final consumption expenditures of nonprofit institutions serving households.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Table 2.5.5, 2.4.5U, available at http://www.bea.gov/iTable/index_nipa.cfm as of August 2017.

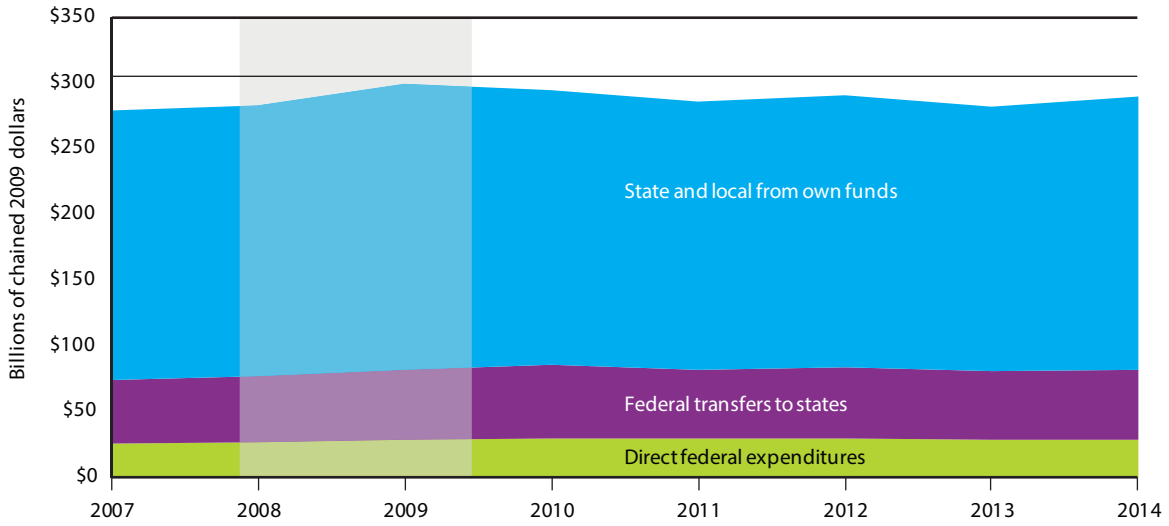
Public and Private Sector Expenditures and Revenue

Expenditures

Most government spending on transportation takes place at the state and local levels, although state and local capital expenditures are often paid for in part with federal funds (figure 5-16). In 2014 the Federal Government spent $32.8 billion on transportation (excluding federal grants to states), and state and local governments spent $291.2 billion (including expenditures paid with federal grants). In real 2009 dollars, transportation expenditures at all levels of government have increased since 2007. From 2007 to 2014, real direct federal expenditures increased by 10.4 percent (from $25.6 billion to $28.2 billion). Real federal transfers to states increased 10.7 percent (from $48.8 billion to $54.1 billion), while real state and local expenditures (excluding expenditures paid for with federal funds) increased by only 1.7 percent (from $204.3 billion to $207.8 billion). Governments increased transportation spending following the 2007 to 2009 recession to stimulate the economy. In 2009 the Federal Government enacted the American Recovery and Reinvestment Act of 2009, which authorized $48.1 billion in transportation stimulus spending. As a result, transportation expenditures by the Federal Government (direct federal expenditures and federal transfers to states) reached a peak in 2010 at $85.2 billion.

Most federal spending (excluding federal grants to states) is for aviation ($16.9 billion in 2014, or 51.7 percent) followed by water ($8.3 billion, or 25.3 percent) and highways ($3.2

FIGURE 5-16 Federal, State, and Local Government Expenditures, 2007 to 2014 (billions of chained 2009 dollars)



NOTES: Shaded area indicates economic recession.net foreign travel and expenditures abroad by U.S. residents; and final consumption expenditures of nonprofit institutions serving households.

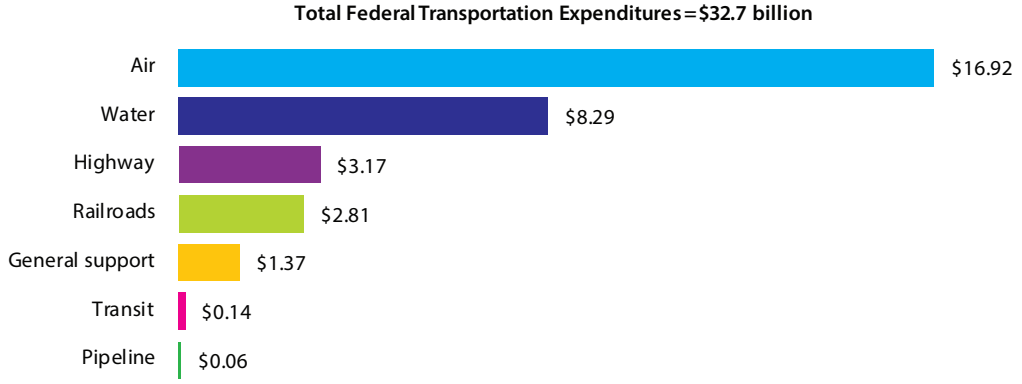
SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Government Transportation Financial Statistics, available at www.bts.gov.

billion, or 9.7 percent) (figure 5-17). In real 2009 dollars, federal highway peaked in 2011 with the recession stimulus spending, and then declined. [USDOT BTS 2017a]

In 2014, most state and local spending (including expenditures paid for with federal grants) on transportation went to highways ($203.9 billion, or 70.0 percent) and transit ($59.6 billion, or 20.5 percent) (figure 5-18). In real 2009 dollars, both state and local highway and transit expenditures have increased from 2007 to 2014—highways by 2.2 percent and transit by 12.0 percent. Highway and transit spending peaked in 2009 as a result of transportation stimulus spending. [USDOT BTS 2017a]

In 2016 private and public spending on transportation construction totaled $133.2 billion (figure 5-19). The public sector is the major funding source for transportation infrastructure construction, especially for streets and highways. In 2016 the value of government-funded (public) construction underway accounted for 90.8 percent ($120.9 billion) of total spending on transportation construction, and private transportation construction accounted for the remaining 9.2 percent ($12.2 billion). Approximately three-quarters of government-funded investment was for highways ($90.5 billion); the remainder supported the construction of air, land, and water transportation facilities ($30.4 billion). Investment has been growing since 2002

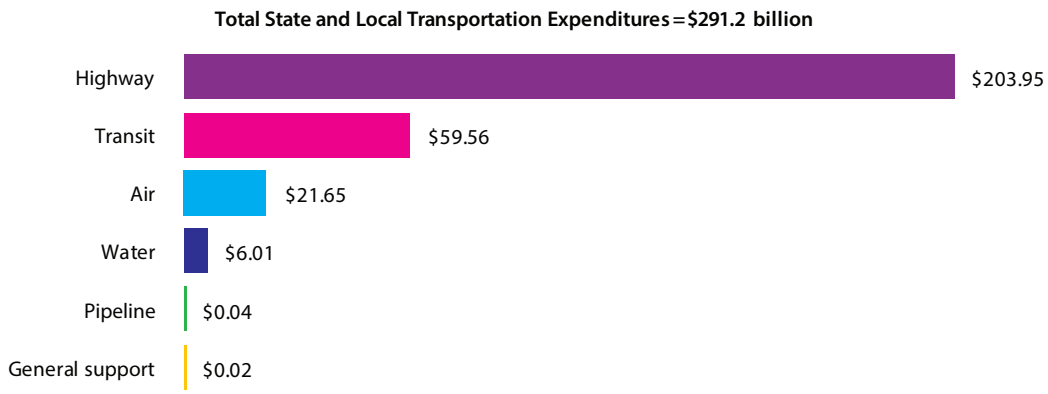
FIGURE 5-17 Federal Transportation Expenditures by Mode: 2014 (billions)



NOTES: Federal expenditure includes direct federal spending, excluding grants to state and local governments. State and local expenditure includes outlays from all sources of funds including funds from Federal grants.

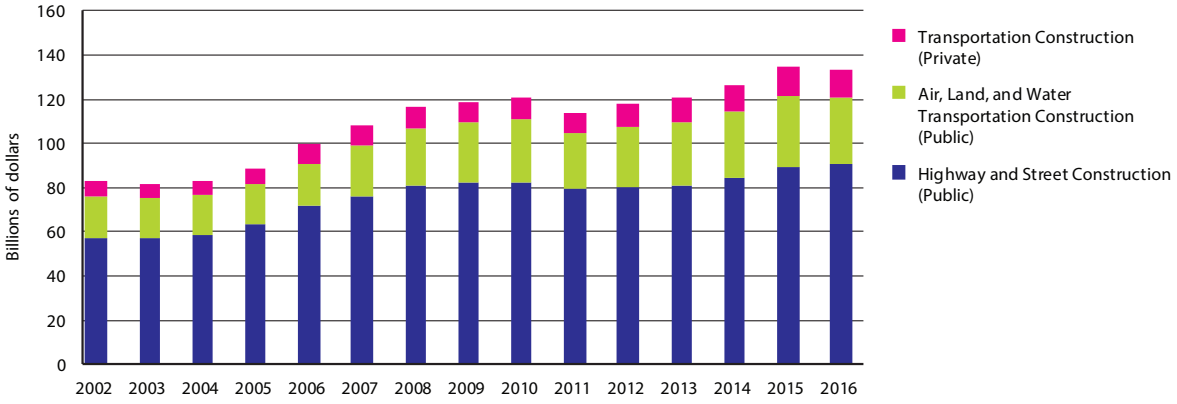
SOURCE: US Department of Transportation, Bureau of Transportation Statistics, Government Transportation Financial Statistics 2017, available at www.bts.gov as of December 2017.

FIGURE 5-18 State and Local Expenditures by Mode: 2014 (billions)



SOURCE: US Department of Transportation, Bureau of Transportation Statistics, Government Transportation Financial Statistics 2017, available at www.bts.gov as of December 2017.

FIGURE 5-19 Value of Transportation Infrastructure Construction Put in Plan (current dollars): 2002–2016



SOURCE: U.S. Department of Commerce, Census Bureau, Value of Construction Put in Place, Not Seasonally Adjusted (2002-2016), available at http://www.census.gov/ as of May 2017.

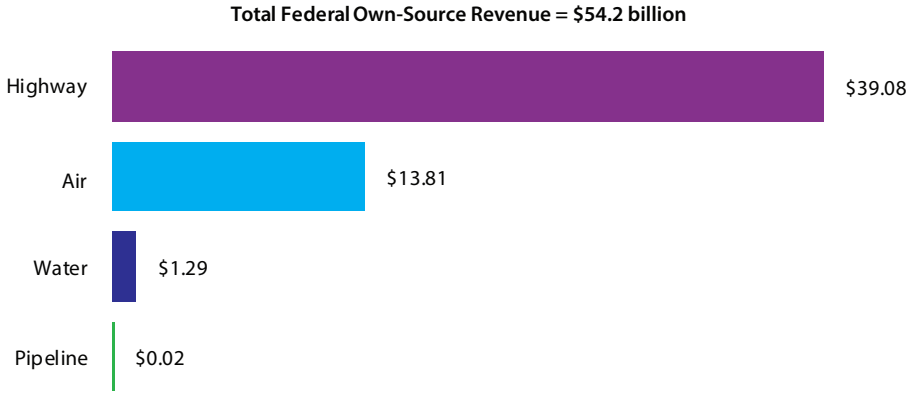
despite a slight decline in 2011 associated with the terminus of *American Recovery and Reinvestment Act of 2009* (Pub. L. 111–5) stimulus spending on transportation and a slight decline in 2016 ($1.8 billion decrease from 2015). [USDOC CENSUS 2017]

Revenue

Government transportation revenue comes from user taxes and fees, such as gasoline taxes and tolls, air ticket taxes and fees, and general revenues, as well as income from investing transportation funds and receipts from fines and penalties. In 2014 government revenue collected and dedicated to transportation programs totaled $355.7 billion. A portion of this revenue ($183.6 billion, or 51.6 percent) comes from taxes and charges levied on transportation-related activities, while $172.1 billion (48.4 percent) comes from non-transportation-related activities but supports transportation programs (e.g., state or local sales or property taxes used to finance transportation projects). In real 2009 dollars, total revenue collected by the government and dedicated to transportation programs increased by 9.9 percent from 2007 to 2014. [USDOT BTS 2017a]

Highway and air transportation, which have trust funds supported by dedicated taxes, accounted for 97.6 percent of federal transportation revenue in 2014. The Federal Government collected $39.1 billion (72.1 percent) in highway revenues (from the Highway Trust Fund) and $13.8 billion (25.5 percent) in aviation revenues (almost entirely from the Airport Airway Trust Fund), as well as $1.3 billion (2.4 percent) in water transportation revenues and $0.02 billion (0.03 percent) in pipeline revenues (figure 5-20). In real 2009 dollars, Highway Trust Fund revenues decreased by 16.9 percent from 2007 to 2014 [USDOT BTS 2017a]. The Federal Government has not increased the federal taxes for gasoline and diesel—18.4 cents per gallon for gasoline and 24.4 cents per gallon

FIGURE 5-20 Federal Own-Source Revenue by Mode: 2014 (billions)



NOTE: Own-source refers to taxes and charges levied on transportation-related activities and used specifically for transportation purposes.

SOURCE: US Department of Transportation, Bureau of Transportation Statistics, Government Transportation Financial Statistics 2017, available at www.bts.gov as of December 2017.

for diesel—since October 1997, causing real revenues to decline. Revenues also declined because vehicle gas mileage improved over the last two decades and because vehicle-miles traveled declined during the 2007 to 2009 recession.

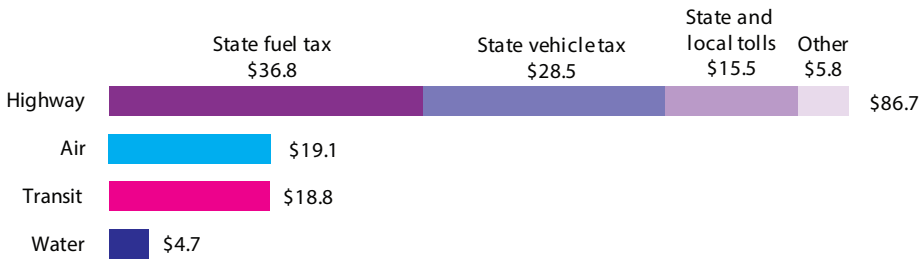
State and local governments collected $247.3 billion of the $355.7 billion government transportation revenues. Of this revenue, the state and local governments collected $129.4 billion from transportation-related activities, most of which is from highway revenue sources ($86.7 billion, or 67.0 percent of transportation revenue in 2014), which include fuel taxes, motor vehicle taxes, and tolls (figure 5-21). Aviation-related revenue ($19.1 billion, 14.8 percent) comes from landing fees, terminal area rentals, and several other sources. Transit revenue ($18.8 billion, 14.6 percent) is almost entirely from fares.

Revenue collected from transportation-related activity and dedicated to transportation programs continues to fall short of government transportation expenditures. In 2014 transportation revenues covered 56.7 percent of expenditures. The gap between transportation revenues and expenditures has declined since 2009 and 2010, when revenues covered 52.5 percent of expenditures [USDOT BTS 2017a]. When revenues do not cover expenditures, general tax receipts (e.g., from sales and property taxes), trust fund balances, and borrowing are needed to cover shortages.

Cost of Transportation

The movement of goods and people requires the use of resources—labor, equipment, fuel, and infrastructure. The use of these resources is the cost of transportation. Producers and users of transportation services pay for the resources. Users of transportation services include businesses, government, and households. Businesses pay for transportation to acquire inputs for the goods they make and to deliver final products to consumers. Households

FIGURE 5-21 State and Local Own Source Revenue by Mode: 2014 (billions)



NOTE: Own-source refers to taxes and charges levied on transportation-related activities and used specifically for transportation purposes.

SOURCE: US Department of Transportation, Bureau of Transportation Statistics, Government Transportation Financial Statistics 2017, available at www.bts.gov as of December 2017.

purchase resources, such as motor vehicles and motor vehicle fuel, for travel by automobile.

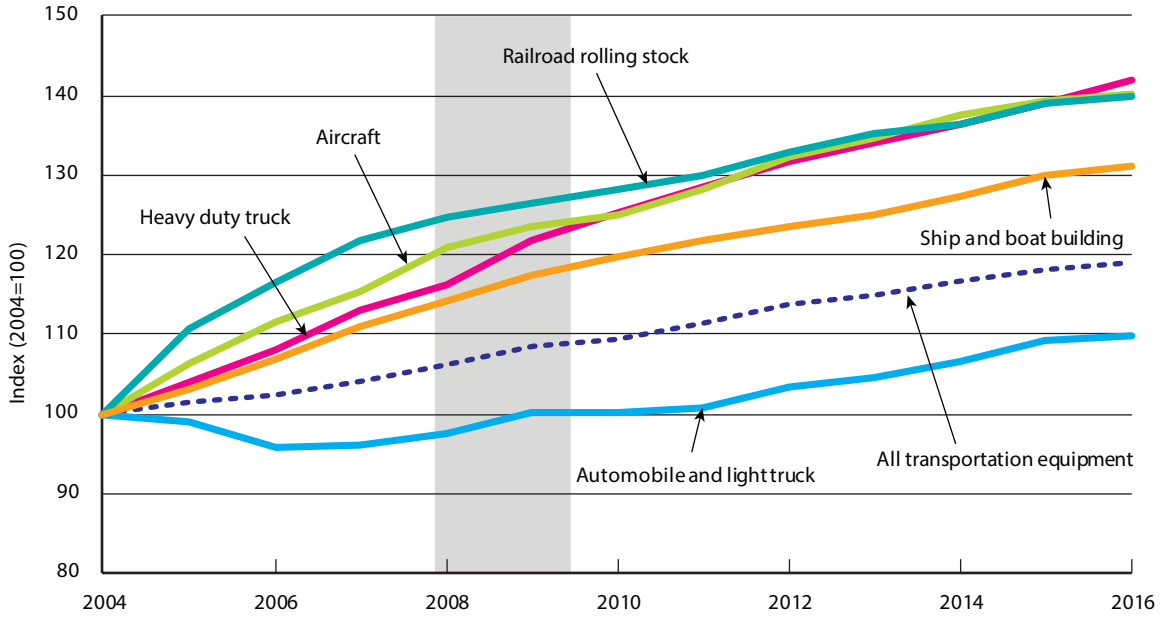
Costs Faced by Producers of Transportation Services

There are two types of transportation services provided: freight transportation services provided to producers of goods and service (e.g., trucking and air freight); and passenger transportation services provided to both producers and household consumers. The major inputs to produce transportation services include transportation equipment, fuel, labor, other materials and supplies, as well as the depreciation of items like airplanes, trucks, railroad locomotives and freight cars, trucking terminals, and railroad track and other infrastructure. The price of these inputs impacts the price of for-hire freight and passenger transportation services.

The costs faced by producers of transportation services for purchasing transportation equipment increased continuously between 2004 and 2016, except for automobiles and light-duty motor vehicles (figure 5-22).[5] The costs faced when purchasing automobiles and light-duty vehicles declined between 2004 and 2006, rose slightly in 2008 and 2009 (but remained below its 2004 level), leveled off in 2010, and finally increased in 2011 through 2016. The costs faced for railroad, aircraft, heavy-duty truck, and ship and boat manufacturing increased more than for all transportation equipment combined. This increase in equipment prices potentially impacts the profitability and purchase decisions of transportation sectors, the transportation costs for transportation users, and/or prices in other sectors that use transportation services, such as wholesale, retail, and warehousing and storage industries.

[5] The Bureau of Labor Statistic's Producer Price Index (PPI) for transportation equipment (which includes indexes for automobile and light motor vehicles, aircraft, railroad rolling stock, heavy-duty trucks, ships and boats, and all transportation equipment) reflects changes in transportation equipment prices faced by transportation service providers. The actual prices transportation service providers pay may differ from the prices sellers receive for the transportation equipment they sell because of government subsidies, sales and excise taxes, and distribution costs.

FIGURE 5-22 Average Price Change in Purchasing Transportation Equipment Faced by Transportation Providers: 2004–2016



NOTE: Annual averages. Rebased to 2004. 2016 data are preliminary and subject to revision. Aircraft are civilian aircraft only. Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

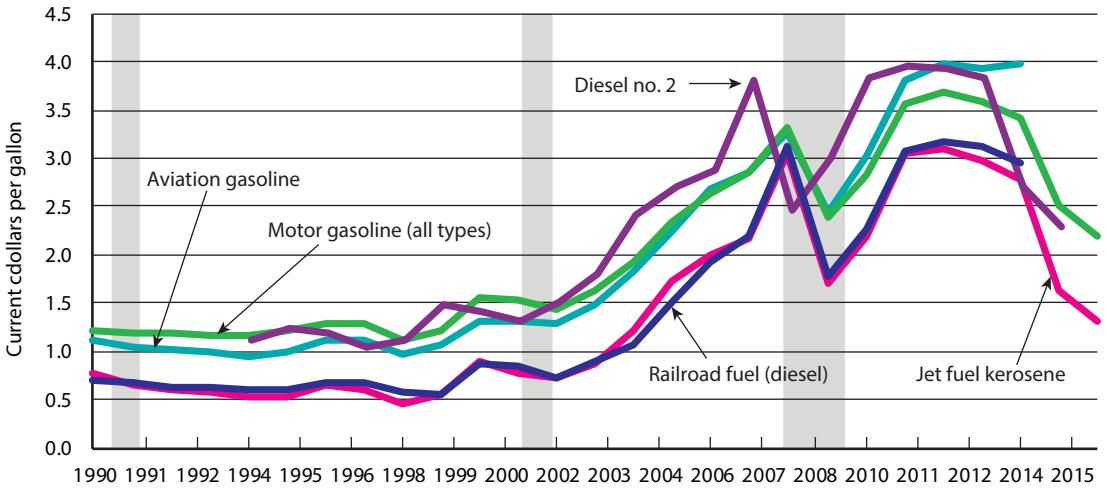
SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Industry Data, available at http://www.bls.gov as of May 2017.

Transportation fuel prices also impact the price of freight and passenger transportation and the demand for transportation. An increase in fuel prices, for instance, may reduce the demand for transportation modes reliant on that fuel and shift demand to transportation modes that use less costly fuels. Average annual fuel prices for all classes of transportation fuels, except aviation gasoline and railroad diesel fuel, peaked in 2012 and have since declined. The average annual fuel price for gasoline peaked at $3.70 in 2012 and declined 40.4 percent to $2.20 in 2016 (figure 5-23). The most recent data for aviation gasoline and railroad diesel fuel show little change in price between 2012 and 2014 (the most recent year for which data are available).

Costs Faced by Purchasers of Transportation Services

The prices that transportation companies charge for transportation impact freight shippers' and travelers' transportation decisions. Despite periods of modest decline, businesses purchasing transportation services saw an overall increase in the relative prices for air, rail, truck, water, and pipeline transportation services between 2004 and 2016. During that time the costs faced by businesses to purchase rail services grew by 54.7 percent, more rapidly than that for any other transportation mode, except pipeline, which grew 128.1 percent. The costs faced to purchase truck, water, and air transportation

FIGURE 5-23 Sales Price of Transportation Fuel to End-Users (dollars/gallon): 1990–2016



NOTE: Aviation and railroad fuel data through 2014. Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

SOURCE: All data except railroad fuel: U.S. Department of Energy, Energy Information Administration, Monthly Energy Review (Washington, DC: April 2016), tables 9.4 and 9.7, available at http://www.eia.doe.gov/emeu/mer/prices.html as of May 2017.
Railroad fuel: Association of American Railroads, Railroad Facts (Washington, DC: Annual Issues), p. 61.

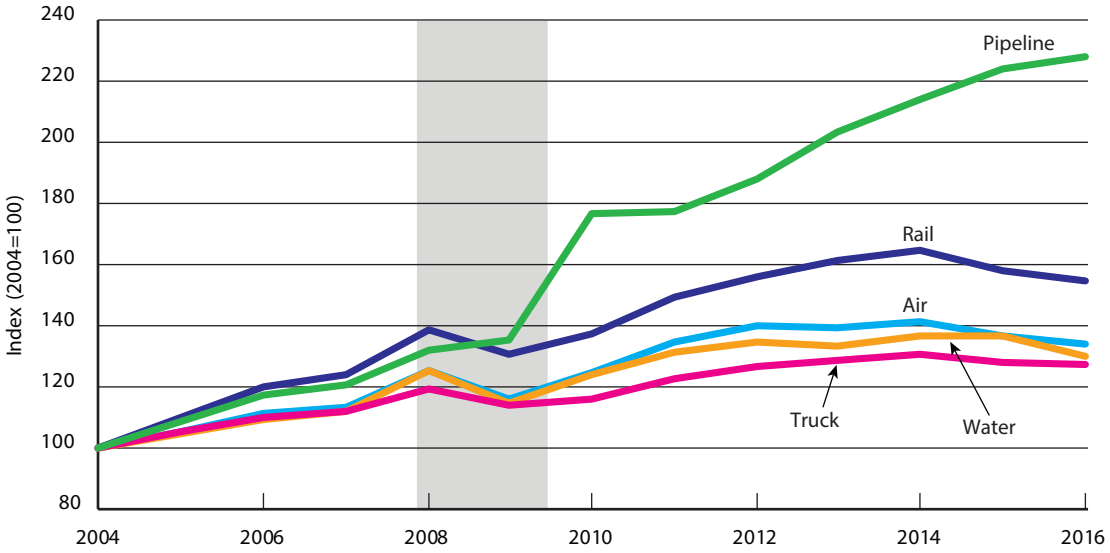
services also increased, with trucking services growing at a slightly slower rate (27.4 percent) than water (29.9 percent) and air (33.9 percent). Transportation service prices declined during the 2007 to 2009 recession, after which they climbed steadily through 2014. The average price of air, rail, and truck transportation services declined between 2014 and 2016, while water transportation service prices rose in 2015 but then declined below the 2014 level in 2016 (figure 5-24).

Costs Faced by Households

The costs households face for transportation services (e.g., air travel) and goods used for transportation (e.g., motor vehicle fuel) impact households' spending decisions. Most passenger travel in the United States is by personal motor vehicle. The cost of owning and operating personal motor vehicles impacts household travel behavior—what mode households choose, how often they travel, and how far.

The cost of owning and operating a personal motor vehicle includes insurance, license, registration, taxes, depreciation, and finance charges (ownership costs) as well as gasoline, tires, and maintenance (operating costs). In 2015 it cost 57.1¢ per mile to own and operate a personal motor vehicle. Ownership costs continue to account for nearly three-fourths of the total annual cost of owning and operating a personal motor vehicle on a cents-per-mile basis. Looking at operating costs, the cost of both gasoline (the largest operating cost) and maintenance grew from 1990 through 2015, while the cost of tires rose from 1990 through 2003, declined in 2004, and then increased

FIGURE 5-24 Average Changes to Transportation Prices Faced by Businesses Purchasing Transportation Services: 2004–2016



NOTE: Annual averages. Rebased to 2004. Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Industry Data, available at http://www.bls.gov as of May 2017.

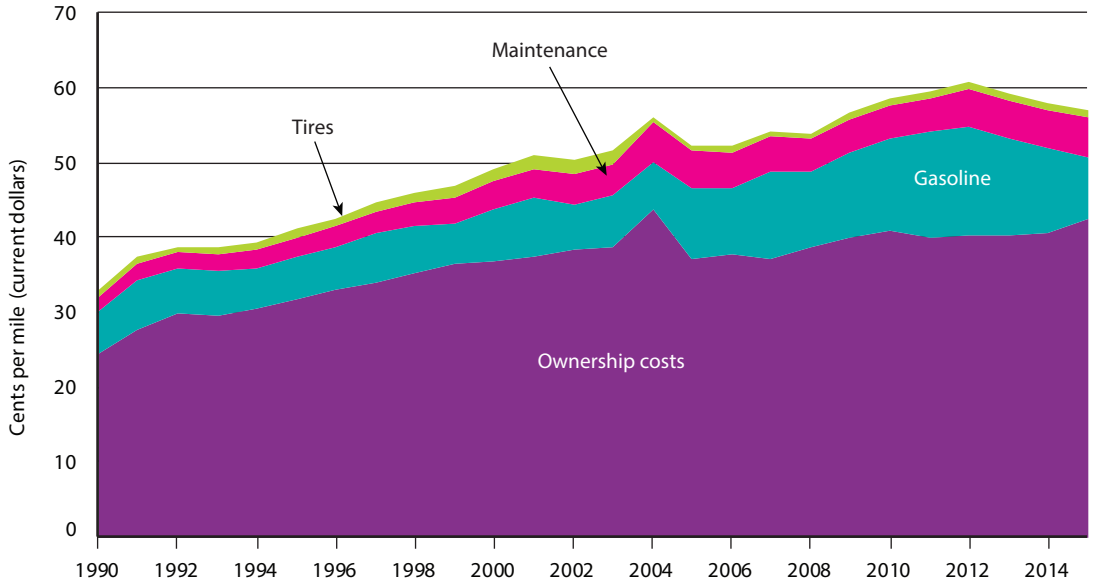
slightly between 2008 and 2015. In the most recent years, the average total cost of gasoline per mile fell from a high of 14.5¢ per mile in 2012 to 8.5¢ in 2015. This decline contributed significantly to the steady decline in the average total cost of owning and operating a personal motor vehicle (assuming 15,000 vehicle-miles per year), which peaked at 60.8¢ in 2012 and fell to 57.1¢ per mile in 2015 (figure 5-25).

According to the Consumer Price Index for Urban Consumers (CPI-U)[6], the average price of owning and operating a personal motor vehicle (private transportation in the CPI-U) rose 59.5 percent between 1990 and 2016, albeit less than for all goods and services (83.6 percent). Of personal motor vehicle ownership and operating costs, motor vehicle insurance prices increased the most between 1990 and 2016, growing 175.0 percent. The average price of new vehicles grew the least, increasing only 21.4 percent over the same period. [USDOL BLS 2017a]

The total average price of owning and operating a personal motor vehicle grew less (at 59.5 percent) than the average cost of public transportation (86.1 percent) between 1990 and 2016 [USDOL BLS 2017a]. The rise in airfare and intracity transportation prices drove the growth in public transportation prices between 1990 and 2016 (figure 5-26).

[6] The Consumer Price Index for Urban Consumers (CPI-U) measures the change in prices paid by urban consumers for particular goods and services, such as ones related to transportation.

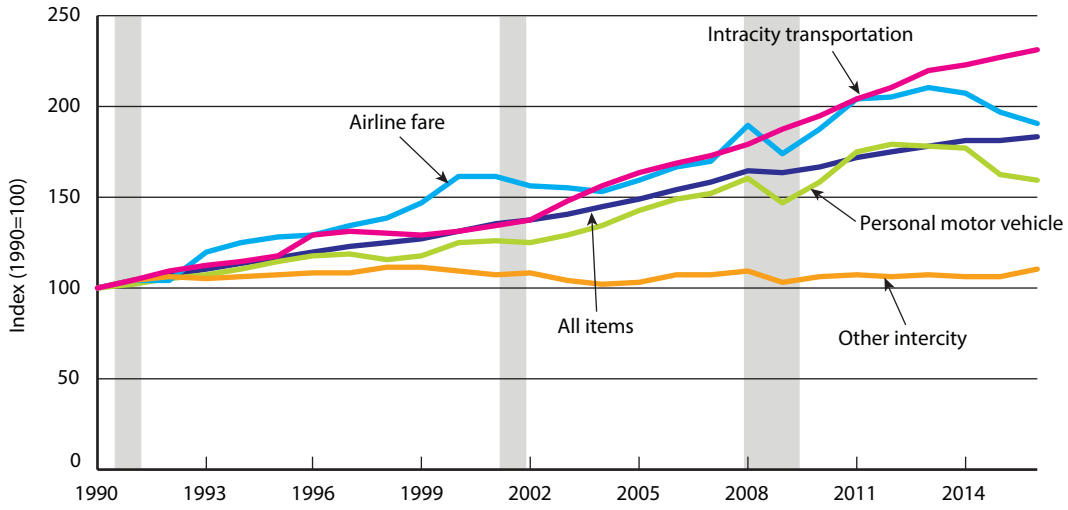
FIGURE 5-25 Average Cost of Owning and Operating an Automobile (assuming 15,000 vehicle-miles per year): 1990–2015



NOTE: Figure reflects the average cost of operating a vehicle 15,000 miles per year in stop and go conditions. Ownership costs include insurance, license, registration, taxes, depreciation, and finance charges.

SOURCE: American Automobile Association, Your Driving Costs (Heathrow, FL: Annual Issues), available at http://www.aaapublicaffairs.com as of August 2016.

FIGURE 5-26 Average Changes to Transportation Prices Paid by Urban Consumers: 1990–2016



NOTE: Annual averages. Rebased to 1990. Shaded areas indicate U.S recessions, as defined by the National Bureau of Economic Research.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index (CPI-U) Data, available at http://www.bls.gov as of May 2017.

Transportation as a Component of International Trade

Transportation and Trade

Transportation enables the export of American goods and services and connects U.S. businesses to sources of raw materials and consumers to imported goods. An efficient and reliable domestic transportation system with good connections to the international transportation system supports the United States in the global marketplace. Transportation not only enables international trade but also is a major good and service traded.

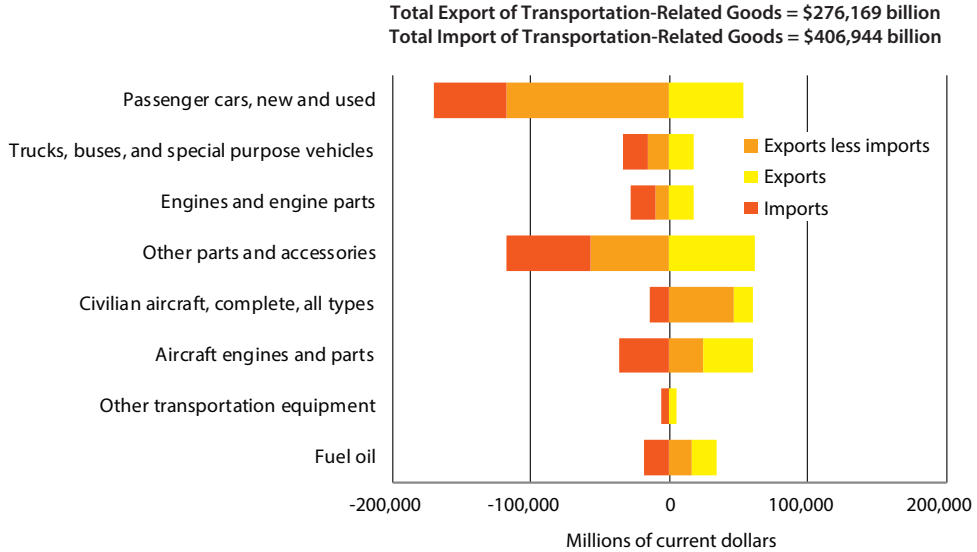
The value of goods traded (the total value of exports and imports) was $3.7 trillion in 2016 (current dollars). After accounting for inflation, the real value of goods traded grew from 2000 to 2016, despite a slight decline during the 2007 to 2009 recession. Exports account for an increasing share of the total value of goods traded, but imports in goods continue to exceed exports. In 2016 the goods deficit (exports minus imports) was $749.9 billion in current dollars [USDOC BEA 2017e].

In 2016, 18.6 percent ($683.1 billion) of all goods traded internationally were related directly to transportation.[7] Fuel oil comprised an additional 1.4 percent of all goods traded in 2016 [USDOC BEA 2017d]. Across all goods traded related to transportation, new and used passenger cars accounted for the largest share. In 2016 imports of transportation-related goods exceeded exports except for civilian aircraft, aircraft engines and parts, and fuel oil[8] (figure 5-27).

[7] Includes automotive vehicles, parts, and engines; civilian aircraft, engines, and parts; and other transportation equipment.

[8] Fuel oil is a petroleum product used, for example, to heat homes.

FIGURE 5-27 U.S. Trade of Transportation-Related Goods: 2016



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, International Transactions (ITA), Table 2.1 U.S. International Trade in Goods. Interactive, Annual. Available at http://www.bea.gov/itable/ as of May 2017.

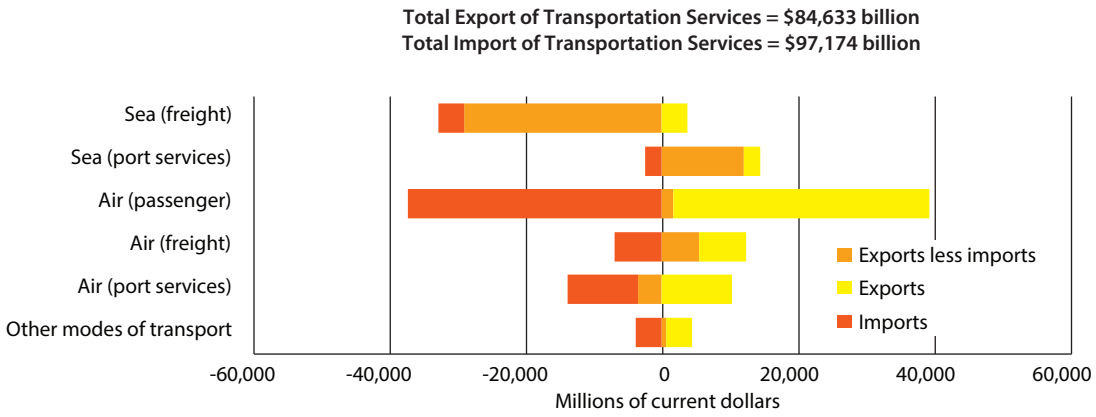
Transportation services are used to move goods from and to the United States. In 2016, $1.8 trillion (14.5 percent) of all services traded were related directly to transportation [USDOC BEA 2017c]. The value of transportation services traded captures:

1. passenger fares paid by U.S. residents to foreign airline carriers and foreign vessel operators as well as the passengers fares paid by foreign residents to U.S. airline carriers and U.S. vessel operators,
2. the freight charges for moving goods from and to the United States, and
3. the expenses that transportation companies incur in foreign ports (i.e., goods and services procured by foreign carriers in U.S. ports and by U.S. carriers in foreign ports) [USDOC BEA 2017f]

The fares and fees received by U.S. carriers to move goods and people to foreign countries exceeds the fares and fees received by foreign carriers bringing goods and people to the United States. However, since 2007 the amount received by foreign carriers for bringing goods and people to the United States accounts for an increasing share of total fares and fees paid to move goods and people to and from the United States [USDOC BEA 2017c].

Air passenger transportation accounted for the largest share of the total fares and fees paid to move goods and people to and from the United States, followed by sea freight transportation. For all modes except sea freight transportation, the fares and fees paid to move goods and people to foreign countries nearly equaled the fares and fees received by foreign carriers bringing goods and people to the United States. For goods moved by sea, the fares and fees received by foreign-operated vessels to bring goods to the United States exceeded the fares and fees paid to move goods to foreign countries (figure 5-28).

FIGURE 5-28 U.S. Trade of Transportation Services



NOTE: Port services are the expenses that transportation companies incur in foreign ports (i.e., goods and services procured by foreign carriers in U.S. ports and by U.S. carriers in foreign ports), excluding purchases of fuel which are counted in the goods exports and imports account.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, International Transactions (ITA), Table 3.1 U.S. International Trade in Goods. Interactive, Annual. Available at http://www.bea.gov/itable/ as of May 2017.

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