



BRIEFING PAPER

Investment in Transportation Assets

Highways, streets, railroad lines, transit systems, ports, and other transportation fixed assets enable the movement of people and goods. Investment in transportation fixed assets helps build and maintain these critical resources. The pattern of transportation investment has varied over time. Federal, State, and local governments, the private sector, and households all invest in transportation. Investment is defined as spending on assets that take more than a year to consume and include transportation structures, motor vehicles, and other equipment (aircraft, ships and boats, etc.). Investment in transportation structures comprises transportation assets that have a fixed location, such as highways and streets.

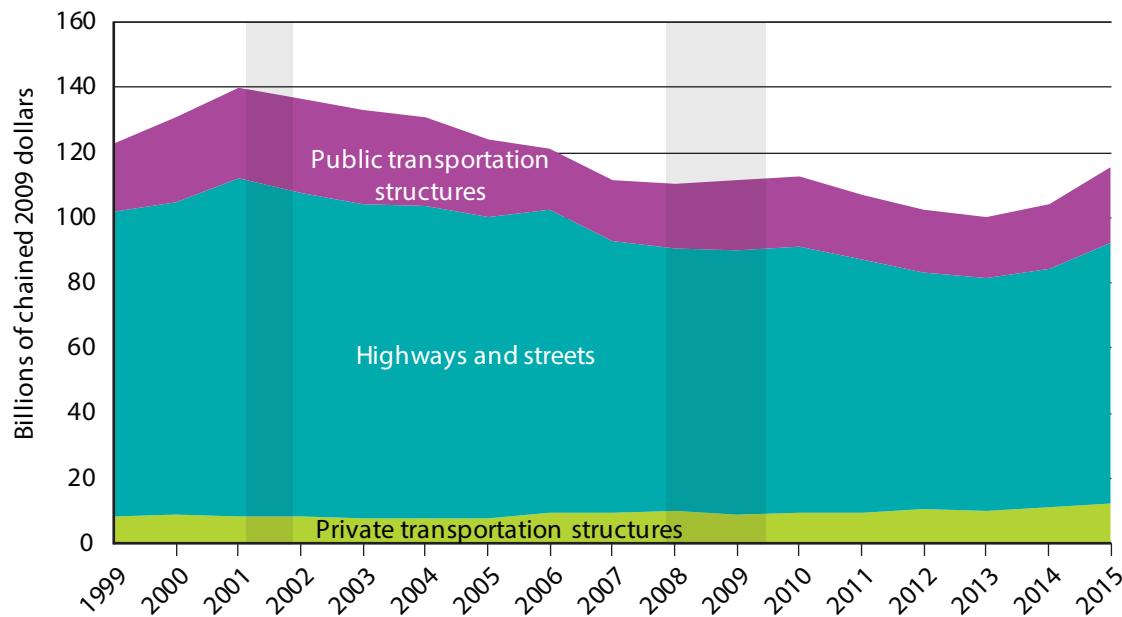
The Bureau of Economic Analysis (BEA) provides data on fixed investment in new transportation assets (structures and equipment) and household purchase of transportation assets in the National Income and

Product Accounts. The BEA data on fixed investment in new transportation assets cover all public and private (business) investments in transportation, except pipeline and natural gas. Spending on pipeline infrastructure is embedded in mining infrastructure investment. All public and private investment data are on new structures and equipment and do not include maintenance and repair of existing structures or equipment.

The Federal Highway Administration (FHWA) also publishes investment data using a different set of definitions that are described at the end of this paper. BEA data are reported here, however, because they are part of a national accounting system that allows comparisons with other investments.

Figure 1 shows that investment in new transportation structures peaked in 2001 at \$139.8 billion and then fell continuously through 2008 (as measured in chained 2009 dollars). From 2001 to 2008, investment in new

Figure 1. Investment in New Transportation Structures (billions of chained 2009 dollars)



NOTE: Shaded bars are economic recessions as defined by the National Bureau of Economic Research

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Private Fixed Investment in Equipment by Type, Chained dollars (Table 5.5.6U), Private Fixed Investment in Structures by Type, Chained dollars (Table 5.4.6U) and Real Gross Government Fixed Investment by Type, Chained Dollars (Table 5.9.6B), available at <http://www.bea.gov> as of January 2017.

transportation structures declined 21.0 percent to a low of \$110.3 billion in 2008. Transportation infrastructure spending increased in 2010 as a result of the *American Recovery and Reinvestment Act of 2009* (Pub. L. 111–5), which authorized \$48.1 billion in transportation stimulus spending. The end of the stimulus spending caused investment in new transportation structures to decline again in 2011. Investment in new transportation structures fell continuously from 2011 through 2013, falling to \$100.3 billion before increasing to \$115.7 billion in 2015. This left investment in new transportation structures at 17.2 percent below its 2001 peak.

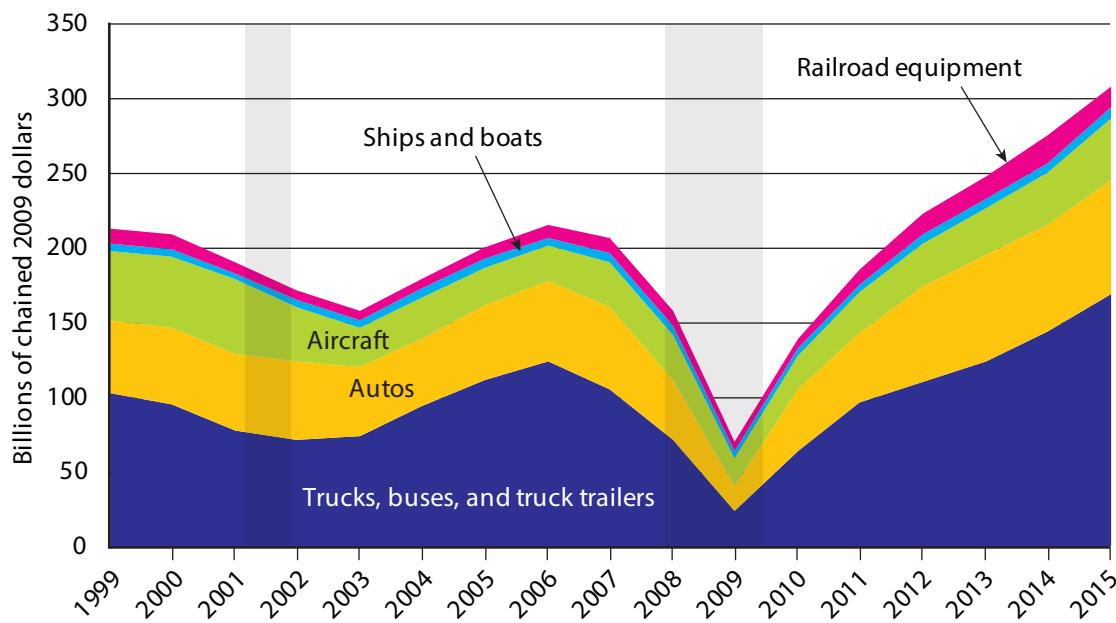
Public investment in new transportation structures consists of investment in highways and streets as well as on other publicly owned transportation structures, such as airports, ports, and transit facilities. Public spending on highways and streets dominates investment in new transportation structures (figure 1). In 2015 public highway and streets spending was \$80.3 billion (in chained 2009 dollars), which accounted for 69.4 percent of the \$115.7 billion invested in new transportation structures and 77.6 percent of the \$103.5 billion invested in new public transportation structures.

While public investment in new transportation structures has declined since 2001, private investment in new transportation structures increased by 40.7 percent from 2001 to 2015, reaching \$12.2 billion (in chained 2009 dollars) in 2015 (figure 1). Private investment in new transportation structures hit a low point in 2003 at \$7.7 billion (in chained 2009 dollars). Private investment in new transportation structures consists of investment in new air and land structures (primarily railroads).

Nearly all investment in new publicly owned transportation structures occurs at the State and local level—99.4 percent in 2015 (although much was federally funded).

Investment in transportation equipment consists of private (i.e., business) spending on motor vehicles (trucks, buses, autos, etc.), aircraft, ships, and railroad equipment as well as household spending on transportation assets (motor vehicles, motor vehicle parts, bicycles, etc.). Private investment in transportation vehicles and other transportation equipment reached a low during the Great Recession (December 2007 to June 2009) at \$70.6 billion in 2009 and then climbed to \$302.2 billion in 2015 (in chained 2009 dollars) (figure 2). Private spending on

**Figure 2. Private (Business) Investment in Transportation Equipment
(billions of chained 2009 dollars)**



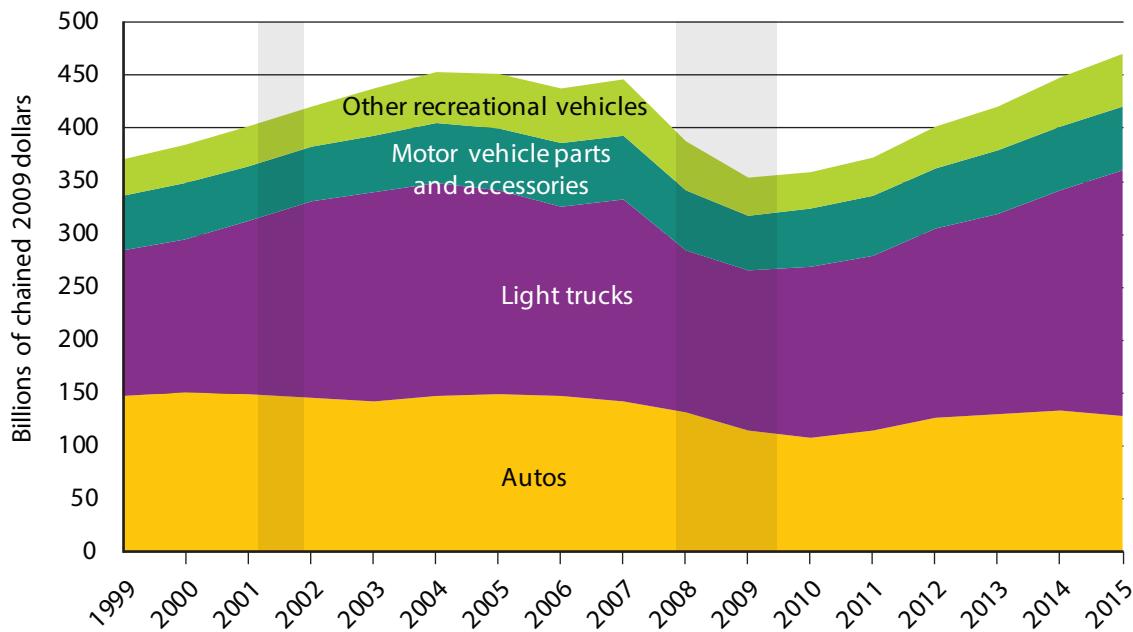
NOTE: Shaded bars are economic recessions as defined by the National Bureau of Economic Research. Value for trucks, buses, and truck trailers and autos includes net purchases of used vehicles.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Private Fixed Investment in Equipment by Type, Chained dollars (Table 5.5.6U), Private Fixed Investment in Structures by Type, Chained dollars (Table 5.4.6U) and Real Gross Government Fixed Investment by Type, Chained Dollars (Table 5.9.6B), available at <http://www.bea.gov> as of January 2017.

motor vehicles (trucks, buses, truck trailers, and autos) accounts for the largest portion (roughly three-quarters) of this investment. Private investment in transportation vehicles and other transportation equipment accounts for over a quarter (28.4 percent in 2015) of all private investment in non-residential equipment.

Household spending on transportation assets likewise declined during the Great Recession, reaching a low of \$354.0 billion in 2009 before climbing to \$470.8 billion in 2015 (in chained 2009 dollars) (figure 3). Household spending on transportation assets accounts for a declining share of spending on durable goods by

**Figure 3. Household Purchase of Transportation Assets
(billions of chained 2009 dollars)**



NOTE: Shaded bars are economic recessions as defined by the National Bureau of Economic Research. Value for trucks, buses, and truck trailers and autos includes net purchases of used vehicles.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Real Personal Consumption Expenditures by Type of Product, Chained Dollars (Table 2.4.6U) available at <http://www.bea.gov> as of January 2017.

Figure 4. Investment in New Transportation Structures and Equipment as a Percent of Overall Investment in Transportation Assets



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Private Fixed Investment in Equipment by Type (Table 5.5.5U), Private Fixed Investment in Structures by Type (Table 5.4.5U) and Real Gross Government Fixed Investment by Type (Table 5.9.5B), available at <http://www.bea.gov> as of January 2017.

households. In 1999 transportation assets accounted for 50.5 percent of household spending on durable goods and gradually declined through 2015, when transportation assets accounted for 43.1 percent of household spending on durable goods.

Transportation is a small but important share of total public and private investment (figure 4). In 2015 public and private transportation investment on new transportation structures represented 4.7 percent of all public and private investment. Public investment on new transportation structures accounted for 19.6 percent of all public investment and excluding defense spending, accounted for 42.2 percent of all public investment in 2015. Private investment in new transportation structures accounted for less than one percent of all

private investment in new structures and equipment. Private investment in new transportation equipment accounted for 13.7 percent of all private investment in new structures and equipment.

The BEA data provide a broad, nearly comprehensive accounting of the investment in transportation structures and the transportation equipment that use the infrastructure. To be comprehensive, investment in pipelines needs to be extracted from investment in mining and added to transportation investment. A break out of investment in transportation structures by mode would be a further enhancement along with the inclusion of repair and maintenance in existing structures and equipment.

Different Measures of Capital Outlay

The data in this report are capital expenditures published by BEA in fixed asset tables 2.4.6U, 5.4.6U, 5.5.5U, 5.5.6U, and 5.9.6B. The fixed asset tables use U.S. Census Bureau data on capital outlays. The Federal Highway Administration (FHWA) publishes capital outlays on highways and streets in their *Highway Statistics* report. The FHWA data serve different purposes and are not comparable to BEA estimates because BEA modifies capital outlay data from the Census Bureau, and Census Bureau and FHWA have different definitions.

The Census Bureau defines capital outlays as direct expenditure for purchase or construction, by contract or force account, of buildings and other improvements; for purchase of land, equipment, and existing structures; and for payments on capital leases. Certain terms (e.g., rehabilitate, remodel, resurface, renovate, etc.) can denote either construction or maintenance and repair (i.e., current operations). Their classification is based on the circumstances surrounding each situation. If the term refers to activities that materially extend the life or add value to the property, then they are classified under construction; otherwise, they are classified under current operations. No other practical standard (such as dollar amounts) can be uniformly applied to all levels of government.

The Census definition excludes expenditure for maintenance and repairs to existing structures or service facilities for the purpose of keeping property in an ordinarily efficient operating condition and which are not considered permanent structural alterations that materially extend the life of the asset – e.g., painting, cleaning, patching, refurbishing, reconditioning, etc. (report under current operations). It also, excludes identifiable payments to other governments for construction work (classified under intergovernmental expenditure) as well as purchase or installation

of machinery and equipment not integral to fixed structures. In addition, excludes costs attributable to the capitalization of net interest expense incurred during the construction period (report under interest on debt).

BEA documentation refers to “structures” (a subset of fixed assets) as products that are usually constructed at the location where they will be used and that typically have long economic lives. BEA data is based on Census data, and thus uses the Census definition; however, BEA data excludes costs for acquisition of land.

FHWA groups expenditures for highways into the following major classes: capital outlay, maintenance, highway and traffic services, administration, highway law enforcement and safety, debt service, and intergovernmental payments.

Capital outlays are those costs associated with highway improvements, including: land acquisition and other right-of-way costs; preliminary and construction engineering; construction and reconstruction; resurfacing, rehabilitation, and restoration costs of roadway and structure; system preservation activities; and installation of traffic service facilities such as guard rails, fencing, signs, and signals.

Maintenance costs are those required to keep highways in usable condition and do not extend the service life of a highway if not extended beyond the original design.

One area in which States have difficulty in compiling data is in defining types of capital improvements. Project records in some States do not contain a full breakdown of work types. This forces these States to assign projects to categories based on narrative descriptions of each project. Such narratives are of varying levels of detail and are subject to interpretation. This may cause data classification to be less consistent.

States use a variety of definitions for capital outlay and physical maintenance. In some States, work performed by maintenance crews may be classified as physical maintenance, even if the project was extensive enough to meet the FHWA definition of capital outlay.

Another problem area is the assignment of indirect costs. FHWA requests that States assign incidental costs related to specific construction and maintenance projects to those categories. For example, salaries and benefits for engineers and construction workers detailed to a construction project should be assigned as construction expenditures. However, many State accounting systems do not assign costs in this manner. For example, salaries may be assigned to capital outlay while employee benefits may be assigned to general administration

FHWA's definition of Capital Outlays includes: the cost of acquiring right-of-way, preliminary and construction engineering and construction. More specifically, the definition of construction, which is driven largely by an activity's eligibility for federal-aid, includes "all expenditures for construction, relocation, resurfacing, restoration, rehabilitation and reconstruction (3R/4R), widening, safety and capacity improvements, restoration

of failed components, additions and betterments of roads and bridges." The 3R/4R expenditures appear to be classified as "current operations" under the Census' definition.

FHWA's *A Guide to Reporting Highway Statistics* states that "States may report on either a calendar or State fiscal year basis. That choice determines the due date for most FHWA forms." BEA converts fiscal years to calendar years for both State and local governments.

In summary, FHWA includes the value of land in capital outlays whereas BEA excludes it. Additionally, BEA and FHWA's treatment of construction and maintenance differ. FHWA's definition of construction, which is driven largely by an activity's eligibility for federal-aid, includes "all expenditures for construction, relocation, resurfacing, restoration, rehabilitation and reconstruction (3R/4R), widening, safety and capacity improvements, restoration of failed components, additions and betterments of roads and bridges." A substantial portion of the 3R/4R expenditures are classified as "current operations" under the Census' definition (which in turn informs the BEA data). Finally, FHWA and BEA treatment of reporting periods differs.