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Infrastructure Investment and the Federal Government

The condition and performance of infrastructure are generally thought to be important for the nation's health, welfare, and economy. More contentious are the optimal level of infrastructure investment, the effectiveness of this investment, and the appropriate role of the federal government. The current federal role in infrastructure investment is important but limited in size and scope.

What Is Infrastructure?

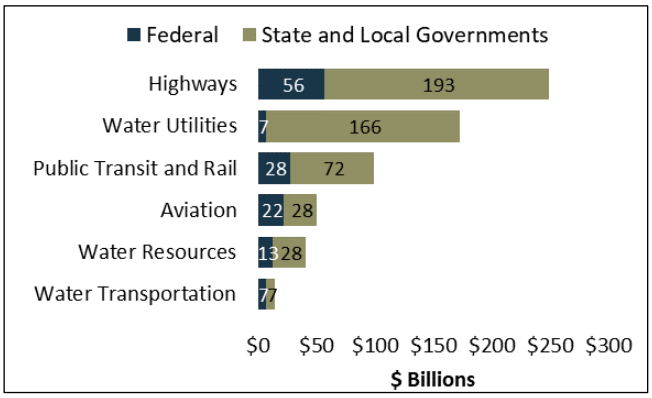
There is no agreed meaning of "infrastructure." The term generally refers to long-lived, capital-intensive systems and facilities. Some definitions are limited to systems and facilities that have traditionally been provided largely by the public sector directly, such as highways and drinking water systems. Others add predominantly private facilities, such as electricity production and distribution, reflecting both their importance to the economy and the different public-private arrangements through which services can be provided. Some definitions include a narrow range of "core" systems, typically transportation, energy, water, and telecommunications, whereas others include facilities for such purposes as education, recreation, and health.

The concept of infrastructure has become more malleable with the emergence of two other concepts, "critical infrastructure" and "green infrastructure." The idea of critical infrastructure is a reaction to the threat of terrorist attacks, both physical and through computer networks, and to natural disasters. According to the Department of Homeland Security, there are 16 critical infrastructure sectors whose physical or virtual assets, systems, and networks are vital to national security, the economy, and public health or safety. Among them are chemical facilities, critical manufacturing, defense industrial base, and financial services. Green infrastructure encompasses a range of facilities that some consider environmentally friendly, such as wind and solar energy production. As applied to stormwater management, the term refers to facilities that deal with urban runoff at the source, such as rain gardens, bioswales, and permeable pavements.

Federal Infrastructure Investment

The federal government is an important investor in at least two infrastructure sectors: transportation and water resources, which includes dams and levees. In 2023, according to the Congressional Budget Office, the federal government spent $112 billion on transportation and $13 billion on water resources, whether directly or by making grants to nonfederal entities. These data reflect spending on capital investment as well as operations and maintenance. State and local governments spent far more than the federal government on transportation and water resources infrastructure. State and local governments also spent much more than the federal government on drinking water and wastewater utility infrastructure (**Figure 1**).

Figure 1. Public Spending on Transportation and Water Infrastructure, 2023

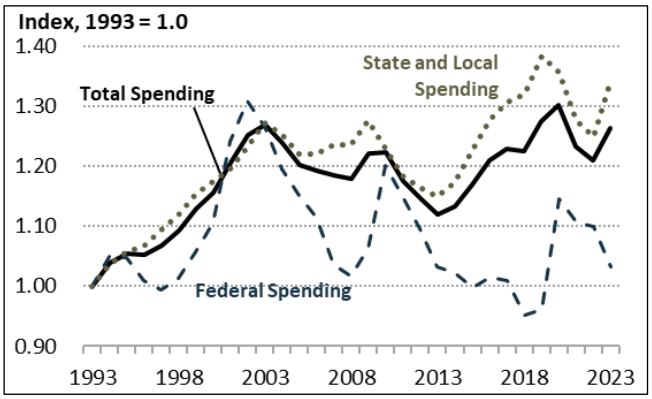


Source: Congressional Budget Office, *Public Spending on Transportation and Water Infrastructure, 1956 to 2023*, February 2025.

Notes: Federal grants to state and local governments are counted as federal spending. Data exclude tax expenditures.

Inflation-adjusted public spending on both transportation and water infrastructure increased over the past 10 years, mainly due to higher state and local spending (Figure 2).

Figure 2. Annual Public Investment in Transportation and Water Infrastructure (Adjusted for Inflation)



Source: Congressional Budget Office, *Public Spending on Transportation and Water Infrastructure, 1956 to 2023*, February 2025.

Investment in energy and telecommunications infrastructure comes largely from private companies that own the infrastructure. Oil pipelines, natural gas transmission and distribution systems, and fiber-optic networks are mostly in private ownership. Federal involvement through activities such as construction of federally owned hydroelectric projects and grants to support the deployment of broadband in rural communities accounts for a smaller proportion of total investment in these sectors.

Types of Federal Infrastructure Investment

There are four main ways in which the federal government invests in infrastructure:

Direct spending on infrastructure it owns and operates. This includes spending on the inland waterway system, roads and bridges on federal lands, the air traffic control system, and federally owned dams and levees.

Grants to nonfederal entities, especially state and local governments. For example, the Department of Agriculture's Rural Utilities Service provides grants to low-income rural areas for water supply systems and waste disposal facilities.

Loans to nonfederal entities. For example, the Department of Transportation provides loans and other types of credit assistance to public and private sponsors of transportation projects and lends directly to small freight railroads.

Tax preferences that forgo federal revenue to provide incentives for nonfederal investment in infrastructure. These include the authority granted state and local governments to issue tax-preferred bonds to finance capital spending on infrastructure and the ability of private investors to depreciate infrastructure assets over short time periods to reduce taxes.

Assessing Infrastructure Investment Needs

Estimating infrastructure needs is fraught with difficulties. Key assumptions can make major differences in estimates of the amount required to bring infrastructure to a state of good repair or to meet a public health or reliability standard. Estimates of need in such cases will vary based on the standards set and on assumptions about construction costs that may subsequently prove inaccurate. Different estimates may result from analyzing investment needs on the basis of anticipated costs and benefits that are necessarily imprecise. For example, whether a new highway bridge will reduce travel times and improve safety sufficiently to warrant its cost of construction and maintenance over its design life depends heavily on a travel demand forecast that might look 30 years into the future and include many assumptions subject to change over that time period.

Another difficulty with estimating infrastructure needs is that, for some categories, consumer demand can be met and managed in various ways. Demand in such cases can depend on how a service is priced. For example, compared with "flat" pricing of electricity that does not change by time of day or season, dynamic pricing that relies on advanced metering infrastructure can reduce peak loads and overall demand. Technological changes and public education efforts may also help to reduce demand for infrastructure.

There is no optimal percentage of gross domestic product that every country should invest in infrastructure. Countries with less developed infrastructure are more likely to benefit from a relatively high level of investment. Countries with well-developed infrastructure, such as the United States, might benefit much less from a disproportionately large investment.

Policy Options

Infrastructure investment is a means to satisfy demand for the services provided by infrastructure facilities. Three main policy options for helping to meet the demand for such services are federal spending, improving the cost-effectiveness of investment, and improving management of infrastructure demand. The federal (versus state, local, or private) role in these policy options varies by sector.

Federal Spending

Increasing federal spending on infrastructure facilities may lead to more investment overall, especially if the spending leverages additional infrastructure investment from nonfederal entities. For instance, state and local governments typically need to contribute 20% to a federally funded highway project. However, increased federal spending could result in little or no change in infrastructure investment if state and local governments use federal funds to substitute for their own funds.

More federal spending would increase the federal deficit proportionally unless more revenue is generated, due to higher tax rates or more economic activity, or funding in other areas is cut. Greater highway and transit spending, for example, could be supported by raising the taxes that flow into the Highway Trust Fund, such as the federal fuels tax. Federal loans and tax preferences are typically less generous than grants and rely heavily on the actions of nonfederal entities. More loan capacity could entail enlarging existing programs or creating a new entity like a national infrastructure bank. The federal government could also provide more support for the issuance of state and local government bonds. Investment tax credits for private equity investment are another possibility.

Promote Infrastructure Cost-Effectiveness

The federal government could attempt to improve the cost-effectiveness of infrastructure investment by supporting certain project selection methods. This might involve requiring or improving the use of benefit-cost analysis, asset management, and performance management when delivering and operating federally funded projects. It could also mean relying more on public-private partnerships that can, in some situations, improve project selection, construction management, operation, and maintenance. Relying more heavily on state and local government can sometimes improve cost-effectiveness. Another possibility is reducing the costs of infrastructure projects by improving the processes for selecting, designing, and building projects.

Promote Demand Management

Infrastructure provision in many sectors is inefficient because infrastructure use is not priced in ways that limit demand. For example, motorists in urban areas impose costs on other motorists by crowding roads during the morning and evening peak travel periods. Variable tolls can be used to persuade some people to drive at a different time or switch to another form of transportation, alleviating congestion without expanding highway infrastructure.

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