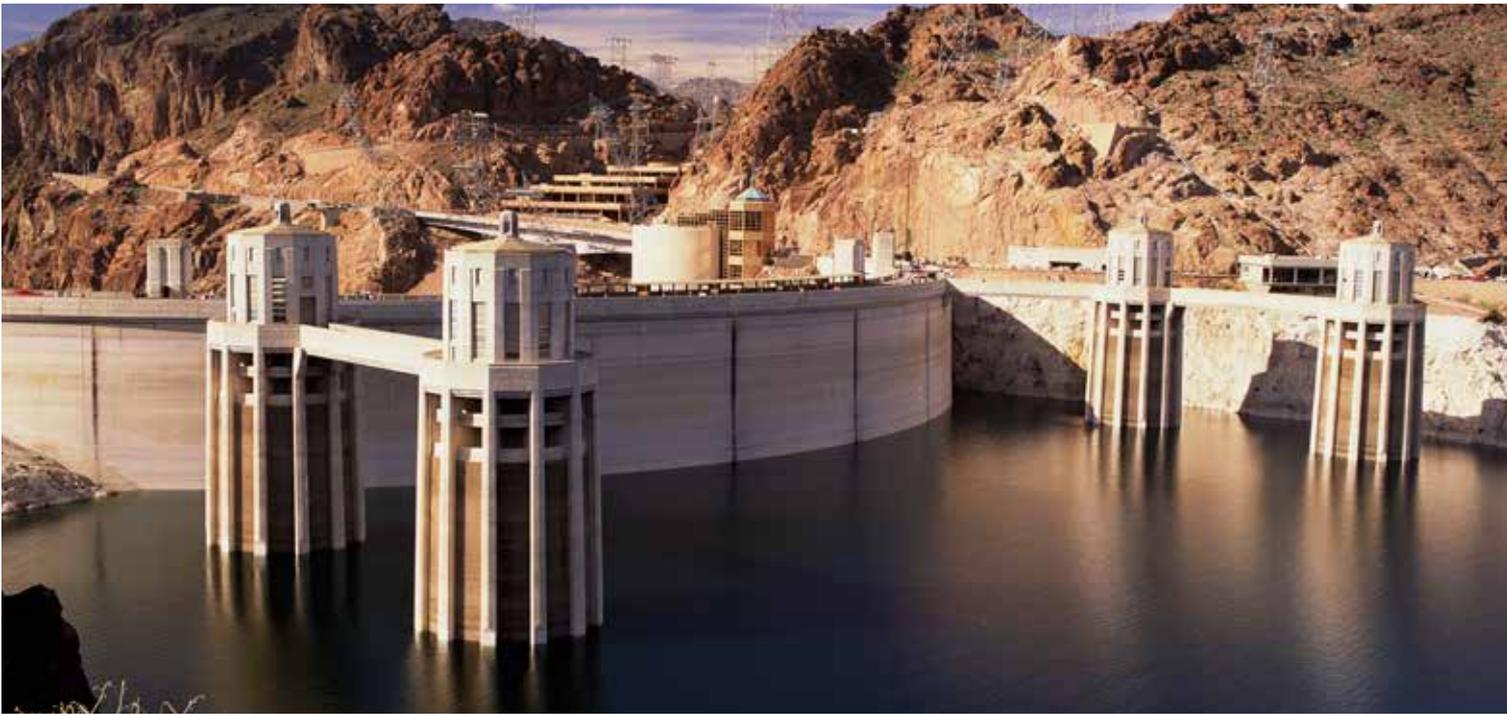




Working better: infrastructure

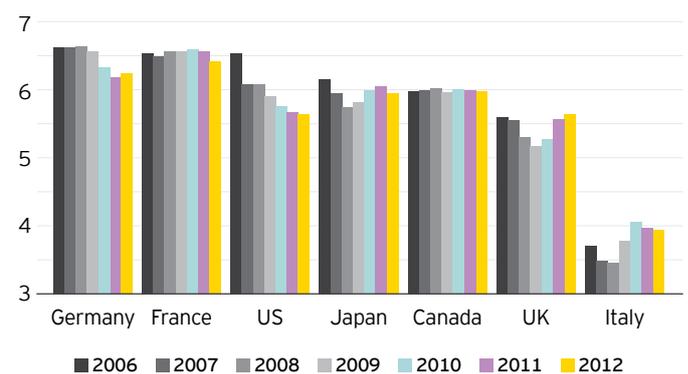


The US has benefited from the foresight and willingness of earlier generations to develop world-leading public and private infrastructure. Myriad public and private investments, many made following the Great Depression and World War II, helped to achieve remarkable growth in competitiveness, mobility, safety, quality of life and overall economic expansion.

More recently, America's infrastructure lead over other countries has declined. Annual US capital investment across types of infrastructure consists of hundreds of billions of dollars but, in many categories, levels have stagnated or declined on a real basis while operations and maintenance spending has increased. A growing portion of US infrastructure is nearing the end of its useful life and needs replacing, refurbishing or reimagining.

The national backlog has become evident in key elements of the interstate highway system, locks, dams and spillways, schools and civic buildings, municipal water systems, electrical grids and essential transit. Recent natural disasters underscore the need and opportunity to increase resiliency. Even the Washington DC Metro, a quintessentially modern system, was conceived in the 1950s and its challenged core is now more than 40 years old. Some facilities may no longer be beneficial while new ones, reflecting the country's future needs and potential, have yet to be developed.

Quality of US infrastructure relative to G7



Quality rated on scale from 1-7; higher is better

Source: IMF Staff, "Figure 3.4," *World Economic Outlook*, October 2014
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Are there opportunities to bend the cost curve as well as the funding curve?

Infrastructure in the US vs. internationally

Over the previous century, the US developed world-leading public and private infrastructure. So while recent investment has lagged, our current situation is very different from that of developing countries, where such a strong foundation didn't exist. At the same time, this also means we have more infrastructure to maintain or replace.

In the US, the private sector owns significant infrastructure assets, such as power, utilities, and most of the assets in the energy, telecommunications and freight railroad sectors. US states and municipalities are the main owners of many other types of infrastructure assets, particularly roads, airports, ports, mass transit, municipal water systems and civic facilities.

Increasingly, institutional, foreign and other investors are trying to put capital into infrastructure assets, with strong

interest in the US market. Our municipal governments and public authorities undertake their own financing, and access deep, federally subsidized and tax-exempt capital markets. And occasionally, when budgets, laws and policymakers allow, they also enter into public-private partnerships. Tax policy has shaped the investor base and helped fuel opportunity in some categories of infrastructure.

Federal funding for civil infrastructure is often provided on a block grant basis (so it can be controlled locally) and has represented a declining share of overall domestic infrastructure funding. Even with private capital available, many new projects require public planning dollars as well as some level of funding commitments, off-take agreements or other subsidy arrangements.

A renewed appetite for investment

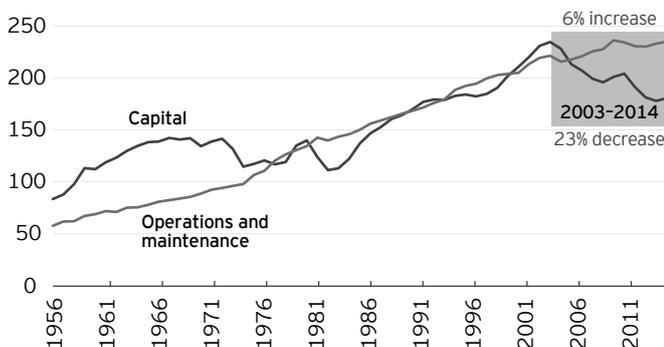
From the nation's capital to many of our largest cities and states, there's been a groundswell of interest in increasing investment in productive US infrastructure. In November 2016, a number of jurisdictions voted to raise local funding for infrastructure, including increases in sales and other taxes. In total, more than 70% of these ballot measures passed, comprising over US\$200b of new funding commitments.¹ Hurricane and fire recovery and broader resiliency will require sizable investment. Attention is now turning to federal lawmaking for both disaster relief and broader infrastructure plans.

¹ Source: "Transportation Ballot Measures," Center for Transportation Excellence, www.ctfe.org/elections, accessed 7 November 2017.

As consensus emerges on the need for increased investment (beyond disaster relief), there remains significant debate over how to spur it. Discussions around how to fund and prioritize areas of investment loom large, but resolving them won't be enough to bring the intended results. New and retooled programs must be structured wisely and implemented effectively. Even emergency spending entails real choices. How will new programs work in practice, what incentives could they create, do they leverage innovation and are they focused on the problems of the future? Being ready to address these types of questions may be critical to building the confidence to commit new funding in the first place.

US public sector spending on transportation and water infrastructure

Real spending using infrastructure-specific inflation indices (US\$b)



Source: Congressional Budget Office, "Exhibit 5" Publication 49951, March 2015.

US infrastructure construction put in place

Average annual amount, 2008-2015 (US\$m)

Transportation and roads	121,495
Power	89,543
Educational	88,552
Water supply, sewage and waste	38,298
Communication	19,176
Office*	10,920
Public safety	10,817
Health care*	9,934
Amusement and recreation*	9,861
Residential*	7,258
Conservation and development	6,648
Commercial*	2,952

*Includes public sector spending only.

Source: EY analysis, US Census Bureau.

Ask better questions as we rebuild our infrastructure

Well-structured programs should create incentives and lead to results that match the goals that inspired them – in the short and long term.

Whether you're following the debate, directly involved in designing new programs or helping to transform (or fund) existing programs, asking questions is critical.



Will the program lead to a net increase in domestic infrastructure investment?

Changes in how we or who manages or funds infrastructure can change incentives, reallocate risks and produce powerful results. But they don't automatically lead to greater or more worthwhile investment.

- ▶ Will a new federal spending program attract and reward or displace investment from states, cities and/or the private sector?
- ▶ Are we overstating an initiative's impact (or cost) if it primarily supplants existing programs or tax subsidies, or is inefficient? Will a new credit program, tax policy or incentive bring additional investment or primarily change who invests?
- ▶ Will a new program result in new investments within the next two to five years? Are projects ready? Can the time to set up the program and to make awards be reduced?

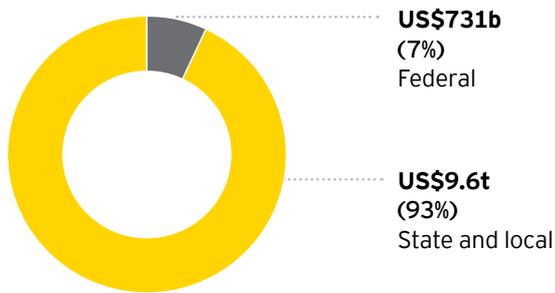
Will new investment be targeted to more worthwhile projects?

Poor investment decisions will limit the benefits of any program. Not every project will best meet its objectives – and not everyone shares the same ones. Meanwhile, we're increasingly able to understand our infrastructure as part of wider systems and environments.

- ▶ Is there a transparent approach to allocate spending? If decision-making is required, will it happen at the appropriate level of government? Will funding be predictable?
- ▶ Will seeking or awarding funding require complex processes? Could different or more streamlined approaches be used when funding or financing a portion of a project instead of the entirety?
- ▶ Will the program encourage developing and managing infrastructure as a cohesive and resilient network? Does it encourage projects that improve (or preserve) overall system performance as well as projects that expand systems? Are definitions broad enough to allow new approaches or technology that bend the cost curve downward?

US public sector infrastructure ownership (2015)

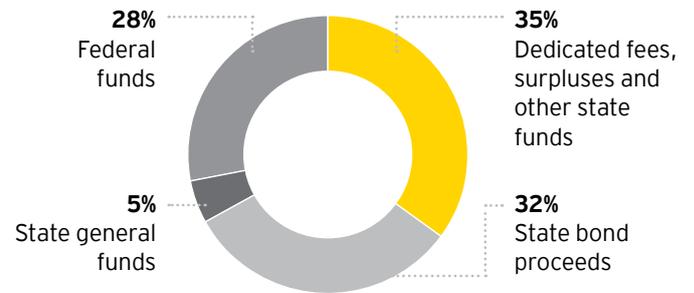
Value of public non-defense buildings and other structures



Source: *It's Time for States to Invest in Infrastructure*, Centre on Budget and Policy Priorities, August 2017 (based on information sourced from the US Bureau of Economic Analysis and Fixed Assets).

Sources of states' funds for infrastructure uses (2015)

Excluding private finance and PPPs

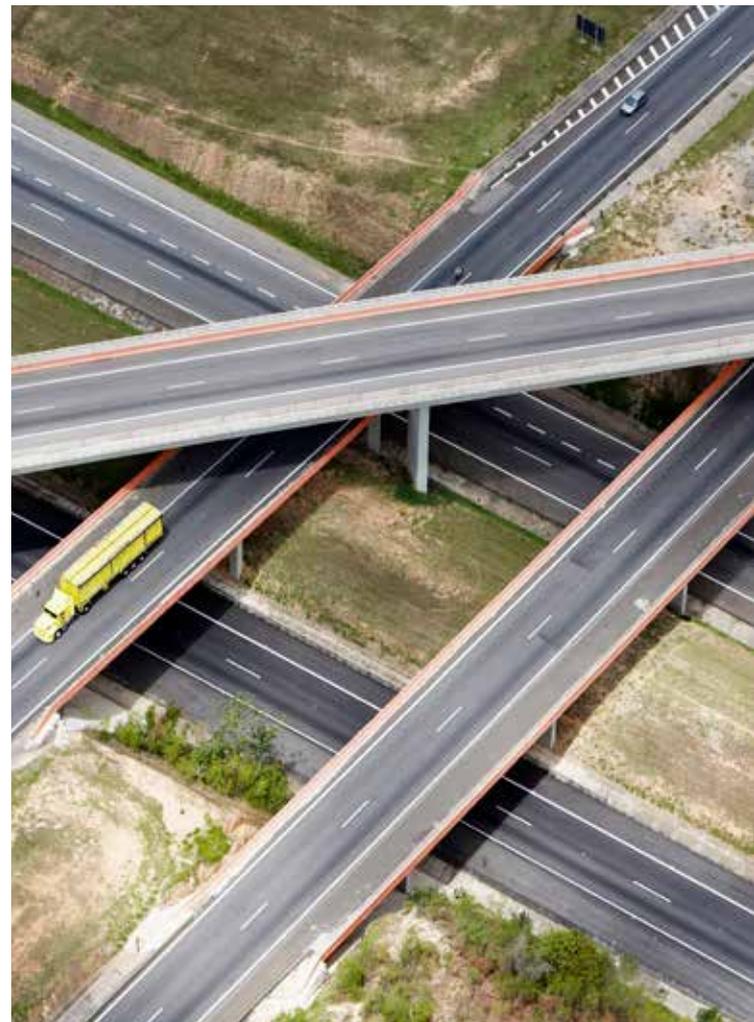


Source: *It's Time for States to Invest in Infrastructure*, Centre on Budget and Policy Priorities, August 2017 (based on information sourced from the National Association of State Budget Officers State Expenditure Survey, 2016).

Will projects be completed, maintained and perform as promised?

The confidence to continue investing will be undermined if initial projects are poorly planned, delivered or operated. There can be limited incentives (or even disincentives) for parties involved in a project to estimate well, control costs, schedule and impacts, or even design the project to perform optimally and efficiently over its entire lifecycle.

- ▶ Will a program encourage projects to be completed on time and on budget? Are there clear standards for accountability and transparency?
- ▶ Will the project owner have incentives to consider lifecycle costs and maintain new infrastructure properly – or for high quality and efficient operation? Will it support the use of analytics and sophisticated asset management?
- ▶ Are there ways to assure results and long-term accountability without burdensome oversight? Could the level of oversight be different or delegated depending on the portion of funding that is federal? Or if funding is disbursed based on performance?



Many of the US's iconic infrastructure facilities require reinvestment and, in some cases, reimagining. This presents challenges but also new opportunities.

Building together

A renewed commitment to funding infrastructure creates an opportunity to conceive new programs, and to help existing programs work better. Demonstrating that we can also may be crucial to earning the confidence needed to secure investment.

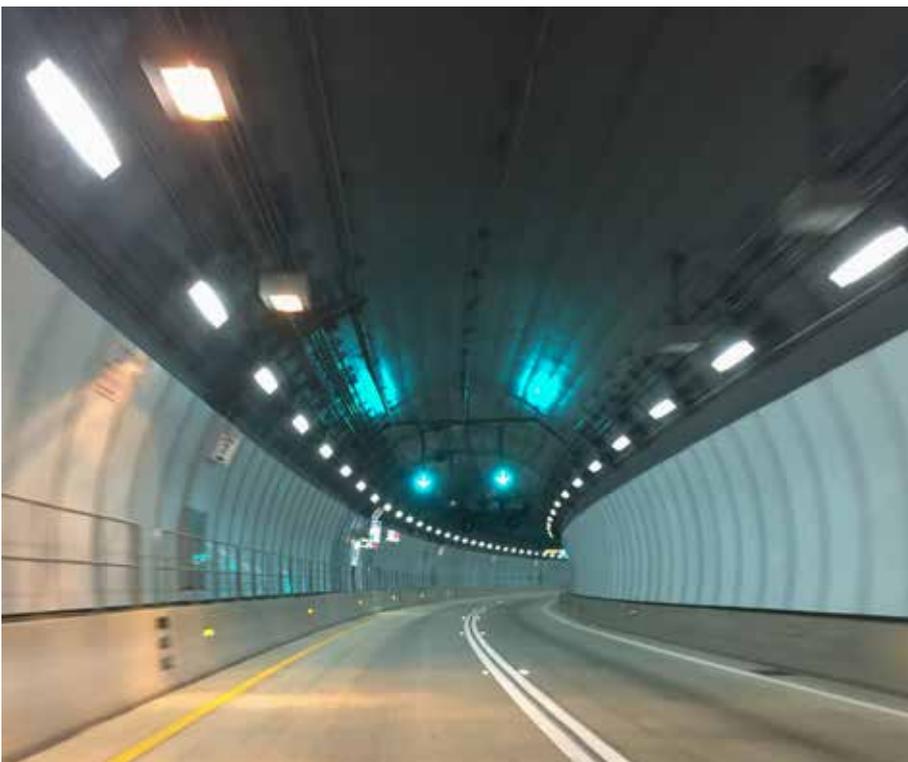
There's also a bigger picture to consider. As we renew our infrastructure, do we simply aspire to rebuild? Or should new technologies, demographic changes and better understanding of our needs shift what we build and how we build it? Would less focus on individual projects and more on enhancing overall system performance make infrastructure investment even more impactful?

The private sector will be integral for the development of our infrastructure – both as vendors, lenders, investors and partners to government; and as the outright owner of significant categories of infrastructure, such as energy, freight and communications. Programs and contracts can be better designed to align the incentives of all parties, so that the private sector maximizes its profits by meeting public policy goals.

Allowing new business models and technology could increase the utility of existing systems and improve the benefit-to-cost ratio for new projects. New financing tools may attract new sources of capital to the US infrastructure market and ensure competitive financing for projects over the long term.

While we must always be prepared to respond to natural and man-made disasters, a more predictable and reliably funded national pipeline of projects would allow planning and management capacity, industry, investor and labor markets to scale sustainably. In return, we should expect and encourage capital productivity to increase. Projects should be procured through professionally and thoughtfully run procurement processes, which harness the power of competition and encourage innovation.

EY is focused on helping clients ensure that when funding for infrastructure becomes available, it is invested wisely, accountably and innovatively – on projects that improve economic outcomes, resiliency and quality of life.



In Miami, the new Port of Miami Tunnel provides a world-class example of the power of performance-based contracts and public-private collaboration to deliver infrastructure that supports economic growth and improves quality of life. The tunnel is the largest-diameter bored tunnel completed in the US. Since it opened, the project has removed thousands of trucks daily from the streets of downtown Miami while improving the efficiency of the Port, a major national hub for both trade and tourism. Meanwhile, the project itself opened below budget and within weeks of planned completion, with investors bearing the risk of its operating performance for 30 years.



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EYG no. 06772-174Gbl

BMC Agency
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