Reimagining public infrastructure investment in the United States

Infrastructure agencies need to prepare for two very different scenarios—a sharp rise in funding or a precipitous drop.

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The need for more and better infrastructure in the United States is acute. In 2016, the American Society of Civil Engineers estimated that the United States had an unfunded infrastructure gap of more than $2 trillion (Exhibit 1).[1] And that figure may now be an underestimate: federal, state, and local spending on infrastructure was only 2.3 percent of GDP in 2017 (the latest year for which figures are available)—a record low.

Closing this gap can both create jobs and generate a positive return for the economy. The McKinsey Global Institute estimates that fully closing the infrastructure gap could translate into 1.2 percent more jobs across the economy, or roughly 13,000 job-years for each $1 billion invested,[2] while the Congressional Budget Office estimates that every dollar spent on infrastructure brings an economic benefit of up to $2.20.[3]

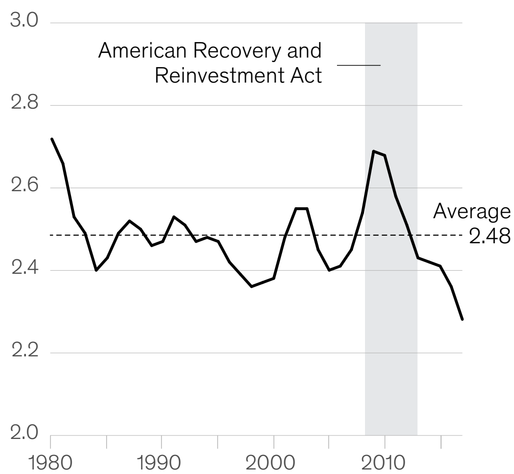
While Congress has passed five separate relief packages (totaling more than $3 trillion) to address the economic consequences of the COVID-19 crisis, the vast majority of funding supports operating expenses and revenue losses; no funding has yet been specifically designated for capital infrastructure projects. By contrast, China, the European Union, and Japan have all announced stimulus programs with infrastructure investment as a key component; like these markets, the United States could take advantage of low interest rates and available labor to rebuild and renew the nation's physical assets.

[1] *Failure to act: Closing the infrastructure investment gap for America's economic future*, American Society of Civil Engineers, 2016, asce.org.
[2] "Employment impacts of highway infrastructure investment," US Federal Highway Administration, June 18, 2020, fhwa.dot.gov.
[3] *Estimated impact of the American Recovery and Reinvestment Act on employment and economic output in 2014*, Congressional Budget Office, February 20, 2015, cbo.gov.

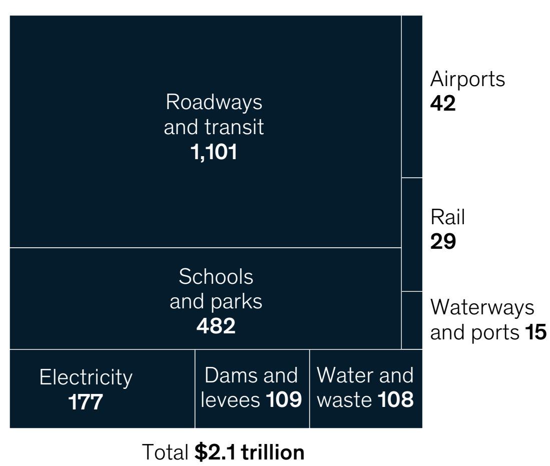
Exhibit 1

Public-infrastructure spending has fallen, and there is a backlog of more than $2 trillion.

Public spending on water and transportation infrastructure, 1980–2017, % of GDP



Estimated 10-year infrastructure-funding gap by asset type, 2016–25, $ billion



Source: *2017 infrastructure report card,* American Society of Civil Engineers, March 2017, infrastructurereportcard.org; *Public spending on transportation and water infrastructure,* 1956–2017, US Congressional Budget Office, October 2018, cbo.gov

President-elect Joe Biden has pledged "to build a modern, sustainable infrastructure,"[4] and there does appear to be bipartisan support for more stimulus. When and if this will happen, however, is uncertain. US infrastructure agencies therefore need to be ready to face one of two scenarios.

In the first, Congress passes a stimulus plan that includes spending specifically designated for infrastructure. This could unleash a rapid surge of capital deployment. In the second scenario, there is little or no dedicated infrastructure-stimulus spending from the federal government. Capital budgets would come under economic pressure, forcing a reevaluation of priorities.

Below are suggestions for how infrastructure agencies can reimagine their futures—whether they get stimulus funding or have to do without.

Scenario 1: Federal-stimulus spending bolsters capital budgets

In the first scenario, the Biden administration is successful in passing major infrastructure stimulus legislation. Public agencies would be expected to put funding to work immediately on projects that can help to revitalize local economies and improve service. The 2009 American Recovery and Reinvestment Act (ARRA), passed in response to the financial crisis, demonstrated that, given funding, infrastructure agencies can quickly complete many state-of-good-repair projects. However, ARRA focused on shovel-ready projects—those that can be completed in three years or less. Few large-scale, strategic projects were undertaken.

To get the most out of federal stimulus dollars, agencies should consider balancing projects that provide an immediate economic boost with ones that have transformational impact. To do so, they should consider the following principles:

— ***Be strategic about state-of-good-repair investments.*** With large maintenance backlogs prevalent throughout the United States, reinvesting in existing assets to ensure that they operate at peak levels is one of the quickest strategies for generating economic impact.

— ***Prioritize investments that reduce the cost of existing operations.*** Examples include automating workflows, replacing high-maintenance assets, investing in contact-less service operations, and upgrading energy efficiency.

— ***Accelerate transformational investments.*** To balance quick economic relief with long-term capital stock gains, agencies can focus stimulus funds on advancing projects that are in the final stages of development—for example, by finalizing environmental reviews, segmenting work into smaller, discrete work packages for early construction, and working with contractors to accelerate delivery.

— ***Capitalize technology investments.*** Digital investments can reduce the total cost of asset ownership and improve user outcomes without pouring any concrete—an integral and cost-effective component of capital budgets.

— ***Incorporate decarbonization.*** Stimulus spending on infrastructure could offer an opportunity to improve environmental performance and reduce greenhouse-gas emissions when proper carbon accounting is part of the decision-making process.[5]

One way to quickly allocate funds to their highest and best use is to adopt the "capital-portfolio optimization" methodology. This process entails ranking proposed projects based on their estimated benefits and prioritizing funds accordingly. Using this approach, one major US airport reduced its more than $20 billion capital budget by 40 percent.

Project benefits must be quantifiable and measurable against an agency's stated strategy.

[4] *The Biden plan to build a modern, sustainable infrastructure and an equitable clean energy future*, accessed December 4, 2020, joebiden.com.
[5] Hauke Engel, Alastair Hamilton, Solveigh Hieronimus, Tomas Nauclér, David Fine, Dickon Pinner, Matt Rogers, Sophie Bertreau, Peter Cooper, and Sebastien Leger, "How a post-pandemic stimulus can both create jobs and help the climate," May 27, 2020, McKinsey.com.

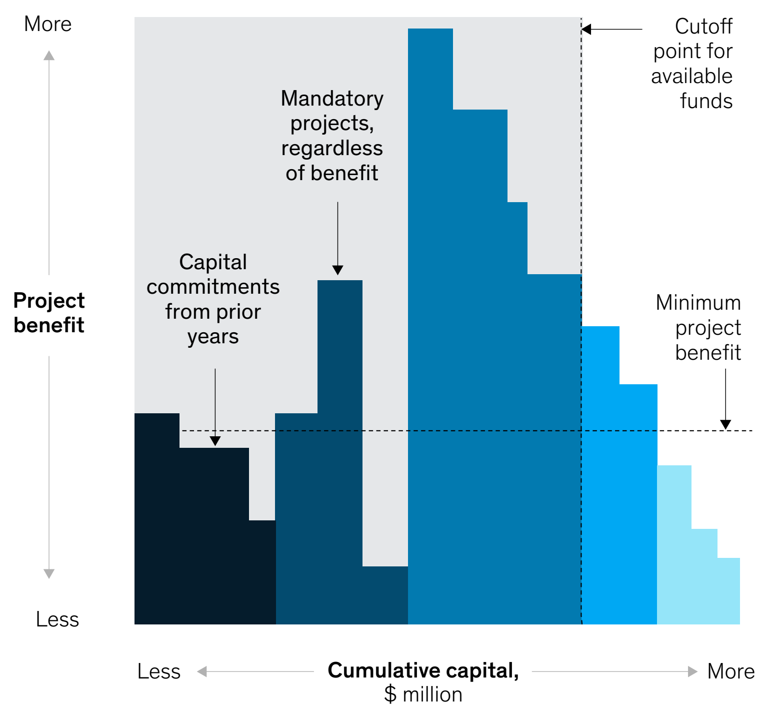
In addition, the benefits must be time-weighted by when the project will become operational—the public gains more from projects that will finish sooner. Funding is then allocated based on the expected project benefit compared with those of all other available options (Exhibit 2). The cutoff point between funded and unfunded discretionary projects depends on how much money is available.

Quantifying project benefits can, of course, be challenging. Measures could include operational or service metrics, financial goals, equity aspirations, environmental targets, and user-experience objectives. In the context of recovery from the COVID-19 crisis, agencies may also want to consider metrics around system resiliency and economic equity. Vulnerable communities in particular have borne the brunt of both the pandemic and past environmental discrimination; these same communities could see some of the highest benefits from infrastructure investments.

Exhibit 2

The cutoff point between funded and unfunded discretionary projects depends on how much money is available.

Scenario 1: Portfolio optimization with stimulus funding



Approved projects
Previously allocated funding
- Fully funded and authorized
- Underway

Compliance projects
Required, regardless of project benefit
- Required by regulation or safety related
- Often has nonfinancial return

Funded projects
Highest-benefit projects for capital
- Candidate for full funding allocation
- Delivers maximum public benefit for available funds

Unfunded projects
Next projects to receive capital
- Not funded at this time
- Top candidate if additional capital becomes available

Eliminated projects
Projects not meeting benefit thresholds
- Not pursued unless benefit increased
- Removed from capital plan

Source: McKinsey Capital Excellence Practice

Scenario 2: Capital budgets come under pressure because of poor economic conditions and no stimulus funding

If the Biden administration is not successful in passing major infrastructure stimulus legislation, agencies may face additional financial pressure, given likely downturns in the tax and user revenues that are important to their budgets. During the 2008 financial crisis, those revenue sources remained depressed for three to four years.[6] This could be exacerbated by longer-term changes in user behavior from COVID-19—such as more time spent working from home—that further reduce infrastructure asset income. In such circumstances, it is critical to use what capital there is for the greatest benefit. Agencies can still use the portfolio-optimization process but may need to reweight certain criteria to favor projects that increase asset resiliency and decrease the total cost of ownership.

On this basis, agencies may choose to delay projects that are not core to operations, eliminate those that may decline in value over the next decade, and take a broader view of what qualifies as a capital project (such as digitization). It may become prudent to defer some low-benefit projects that have been approved—or even for which early construction has begun—and shift that capital to higher-benefit priorities. Additional project delivery improvements through innovation, market improvements, and process redesign could further optimize infrastructure spending by up to 38 percent.[7]

Agencies can take steps to reposition capital budgets over the next 12 months to refocus on evolving priorities and improve operational resiliency.

Four priorities can help prepare for the next normal while managing current budget constraints:

— ***Enhance the user experience.*** Modernize service offerings to attract users back and manage future capacity needs.

— ***Transform operations.*** Use advanced analytics and flexible models to reduce life-cycle costs and increase asset productivity.

— ***Improve delivery.*** Take advantage of lower interest rates and accelerate projects to benefit from reduced asset utilization.

— ***Consider innovative revenue models.*** Look into alternative delivery mechanisms to unlock new revenue streams and consider the use of public–private partnerships to stretch funding.

How to apply these actions will vary depending on the type of asset and how its utilization has been affected by the crisis.

The road to full recovery after the COVID-19 crisis will likely be long and difficult. Whether there is substantial federal stimulus or not, US agencies have the chance to reimagine the country's infrastructure and create a more resilient and efficient future. This is a critical time that could define America's infrastructure for the next generation.

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[6] *2019 state expenditure report: Fiscal years 2017–2019*, National Association of State Budget Officers, November 2019, nasbo.org.
[7] Jonathan Woetzel, Nicklas Garemo, Jan Mischke, Priyanka Kamra, and Robert Palter, *Bridging the infrastructure gaps: Has the world made progress?*, October 2017, McKinsey.com.