



## CHAPTER

# State Capacity for Building Infrastructure

by Zachary Liscow

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**Suggested Citation:** Liscow, Zachary., 2024. "State Capacity for Building Infrastructure" In *Strengthening America's Economic Dynamism*, edited by Melissa S. Kearney and Luke Pardue. Washington, DC: Aspen Institute. <https://doi.org/10.5281/zenodo.14036826>.

# State Capacity for Building Infrastructure

## AUTHOR

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Zachary Liscow\*

## ABSTRACT

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Recent legislation has brought the goal of getting the most out of public infrastructure funds to the fore. The high cost of building major infrastructure in the US is a longstanding challenge, but it is not inevitable. This paper highlights three elements of state capacity that underlie the high costs and slow timelines the US faces. The first challenge is *personnel*: government pay has not kept up with private pay, and the public workforce has not kept up with the workload; public-sector work is instead increasingly privatized, raising costs. The second challenge is *procedure*: government workers operate under onerous procedures and in a litigation environment that makes construction slow and expensive. The third challenge is a *lack of adequate tools*, including data systems and long-term planning abilities. This paper highlights reforms to deliver better, more cost-effective public infrastructure. Regarding personnel, hiring more government planners and managers, paying them in line with the private sector, and insourcing more planning could help. Regarding procedure, reducing permitting and procurement burdens, promoting faster but more representative public participation, improving coordination, and centralizing certain decisions at the federal level could help. Regarding tools, improving internal data systems and data availability would create a better evidence base, and better long-term planning could improve decision-making quality.

\* Professor of Law, Yale Law School

*Acknowledgements*: Thanks to Melissa Kearney, Luke Pardue, David Schleicher, and Steve Teles for helpful comments. Thanks to Raj Bhargava, Ashlee Fox, Joe Goode, Saki Long, Deja Morehead, Manav Singh, Nick Whitaker, and Taylor Wurts for excellent research assistance. This paper builds in part on previous work by the author, including Brooks and Liscow 2023, Liscow 2024, and Liscow, Nober, and Slattery 2023.

## Introduction

The Biden administration passed three historic bills in 2021 and 2022, totaling an estimated \$1.6 trillion of investments over the next decade, largely in building infrastructure (Politico 2024). The Bipartisan Infrastructure Law (BIL), Inflation Reduction Act (IRA), and CHIPS and Science Act direct these funds to building transportation, energy, and manufacturing infrastructure.

The US move to build more infrastructure raises the questions: How good is the US's state capacity for building infrastructure? And what can be done to improve weaknesses?

State capacity is defined here as the ability of the government to attain its policy goals (Mann 1986). This concept includes the size and quality of the government workforce; the organization, management, and rules the workforce operates under; and the tools available to the workforce. These factors all impact the ability of the state to get the most effective use out of government funds. Capacity impacts all parts of government. One recent example is the effort, via IRS personnel expansion, to build up the government's capacity to collect more unpaid taxes. Capacity issues were also at play in the failures of the FAFSA computer system, which delayed access to federal financial aid for millions of students.

I focus here on the state capacity for building physical infrastructure, especially for transportation and energy. I also focus on effectiveness *per dollar*, rather than on the adequacy of overall spending. The possible goals here are multiple and also subjective, but they may include choosing an overall project and specific design that have high net benefits; minimizing cost; increasing speed of construction; mitigating harm to people and the environment; and using a participatory and consultative process.

After describing how state capacity matters for infrastructure construction, I begin by laying out the challenge: the US is an expensive place to build major public infrastructure, both in international comparison and compared to past US construction. I then describe what we know about issues with US state capacity for building infrastructure, organized around three issues: personnel, procedures, and tools.

Personnel challenges are the first issue for US state capacity. Employment levels of some types of government workers important for state infrastructure capacity have barely increased or have declined over time, even as the scope of what government does has expanded greatly. And, based on newly collected data across dozens of government reports, federal government pay has increasingly fallen behind private-sector pay, possibly drawing workers, especially higher-quality workers, away from government.

As there are fewer government workers per dollar of work done, planning and management are increasingly outsourced. Experts (contractors and government officials) think that state capacity—in the form of the size of the workforce—is a problem that drives up costs, in part because outsourcing planning and management is expensive. The very slow and expensive construction of the California High-Speed Rail project exemplifies the costs of this approach to personnel.

Cumbersome procedures are the second issue. One indication of weak state capacity is the long—and increasing—amount of time it takes to acquire infrastructure permits. Another is the substantial volume and slow speed of litigation around infrastructure permitting, even when the lawsuits fail. Indeed, one notable aspect of the US in international comparison is its level of litigiousness; among a sample of rich countries, the US has the second-highest number of lawyers. Extreme litigiousness can hamstring government capacity.

A lack of tools is the third issue. Data infrastructure and transparency are weak, making it hard for government and the public alike to even get a firm grasp of the challenges at hand. Coordinated long-term planning is also lacking, hampering the deployment of renewables and the development of transportation infrastructure, processes that both typically require coordination across multiple government entities.

The last part of the paper considers potential legislative and administrative solutions to these three sets of challenges at the federal, state, and local levels. Regarding personnel, several reforms could help, including hiring more government planners and managers, paying them in line with the private sector, and insourcing more planning. Regarding procedure, reducing permitting and procurement burdens, reducing litigation, promoting faster but more representative public participation, improving coordination within government, and centralizing certain kinds of decision-making at the federal level could help. And regarding tools, governments should improve their data infrastructure and transparency and do more long-term planning.

## **1. How state capacity matters for infrastructure construction**

Building up state capacity has historically been important to the development of strong states (Scott 1998). For example, the ability to raise revenue through taxation and field a capable military has been essential to economic development. This section describes how state capacity is essential to another important aspect of economic development: building infrastructure.

Of course, more state capacity can threaten the public (Acemoglu and Robinson 2020). There's a long history of skepticism in the US in particular toward government power, and state capacity expands that power. State planning could empower bureaucrats or politicians who may lack the aggregate, decentralized information provided by price signals (Hayek 1945).

Bureaucrats could have nonrepresentative views that edge out the demands of other groups. And, to the extent that increasing state capacity is about increasing *federal* state capacity, disempowering state and local governments—who may be more responsive to local constituencies and have more localized knowledge—could be costly, notwithstanding efficiency benefits from greater interstate coordination. This skepticism has been reflected in recent decades through calls on the political right to shrink the size of government,<sup>1</sup> and on the left to introduce procedures to constrain civil servants and ensure citizens' ability to object to the executive branch through courts (Lindsey 2021; Sabin 2021).

But if having good public infrastructure is the goal, then strong state capacity is essential for choosing good projects, permitting them expeditiously and carefully, designing projects well, and contracting with and monitoring builders. State capacity is especially important because of the tremendous technical sophistication required to build infrastructure. More capacity can lead to faster planning by increasing agencies' ability to perform technical tasks. More capacity can result in better information about public preferences too.

Capacity can also mitigate another issue: that markets tend to be a poor source of information about infrastructure needs. For example, most roads are free to drive on and therefore do not provide price signals; for clean energy infrastructure, the complex web of regulatory structures gives good reasons to think that price signals will be distorted and that some sort of government activity will be required. Accordingly, more capacity can partially fill in information that the market is not supplying, via the systematic collection of data on costs, benefits, and public preferences.

The importance of state capacity is borne out by the economic evidence. For example, Best, Hjort, and Szakonyi (2023) estimate that improving the performance of Russian procurement officers by one standard deviation would lower prices paid for off-the-shelf goods by 30.2 percent. And Decarolis et al. (2020) look at procurement in the US context and examine competency across specific offices of federal agencies. They find that an increase in competence reduces time delays, cost overruns, and the number of renegotiations for federal works and services contracts.

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1 For example, Grover Norquist famously said that he wanted to make the government so small it could be drowned in a bathtub (Thorndike 2020).

For building infrastructure, strong state capacity is important at each stage of the process (some of which can proceed in parallel).

First, there must be adequate money to fund infrastructure projects and maintenance. In the US, transportation infrastructure, for example, is funded jointly by the federal, state, and local governments. In 2021, the federal government funded approximately 31 percent of all government transportation-related expenditures, with state and local governments funding the remaining 69 percent (Bureau of Transportation Statistics 2024). Energy infrastructure, in contrast, is usually privately financed and owned by utilities and other developers. Especially after the IRA, however, the federal government is playing an increasing role in indirectly financing energy projects through tax credits and other means like loan guarantees.

While funding levels are obviously extremely important, they are not the focus of this piece, which focuses on the effectiveness per dollar. I focus on effectiveness because determining the optimal spending level requires a different set of considerations, and because Glaeser and Poterba's 2021 AESG policy paper, "Economic Perspectives on Infrastructure Investment," already takes up that question. A key point in that paper is that the optimal level of infrastructure investment should be determined via a project-by-project consideration of the costs of acquiring infrastructure capital and the benefits of using it. This approach contrasts with the typical engineering approach, which defines infrastructure needs without reference to the costs of meeting them.

Second, there must be a process for deciding what to pursue building—for example, a new rail line in the Upper East Side of Manhattan or a new highway between city A and city B. For transportation, this decision is typically made by state or local governments, sometimes subject to discretionary federal grantmaking (Schleicher and Bagley 2024). Again, for energy infrastructure, decisions about what projects to pursue are typically private.

Third, projects must go through a permitting process. For example, since 1970, major projects with federal funding, on federal land, or subject to other federal regulations (like the Endangered Species Act) have gone through National Environmental Policy Act (NEPA) review. The NEPA review for major projects produces a document that discusses the project's impacts on the "human environment," including both people and the natural environment. This document is then subject to judicial review to ensure that the proper process was carried out.

Essentially all major transportation projects go through NEPA, as do many energy projects. In addition to the procedural requirements of NEPA, other federal statutes may lead to permit requirements, such as the Clean Water Act (if wetlands are being

filled in) and the National Historic Preservation Act. There are also state and local permits—for example, local ordinances for siting solar farms.

Fourth, the project must be designed at a nuanced level, with precise locations, materials, and methods specified. For energy infrastructure, this design work is typically done privately. For transportation, in-house design teams typically work with external consultants. They outsource this work because of a lack of internal capacity to handle it; capacity is low partly because big projects may only arise sporadically and partly because it may be challenging for public-sector employers to keep up with private-sector pay. Importantly, this transportation design work is almost entirely done by state and local governments, rather than by the federal government, even if the federal government is funding a large share of the project (Schleicher and Bagley 2024).

Fifth, the project must be built, typically (for transportation) via a state or local government contracting with the private sector. This contracting process involves a set of procurement rules. For example, “Made in America” rules have become more important for transportation projects since the passage of the BIL.<sup>2</sup> After choosing a bidder, the government must then monitor its construction contractors; it may renegotiate the contract as project needs change or unexpected issues arise.

## 2. The problem of US infrastructure construction

This section describes the problematic state of infrastructure construction: US costs are high in international context; costs have gone up over the course of decades; construction timelines are slow; and input prices have recently shot up.

### 2.1 Building major infrastructure in the US costs much more than it does abroad

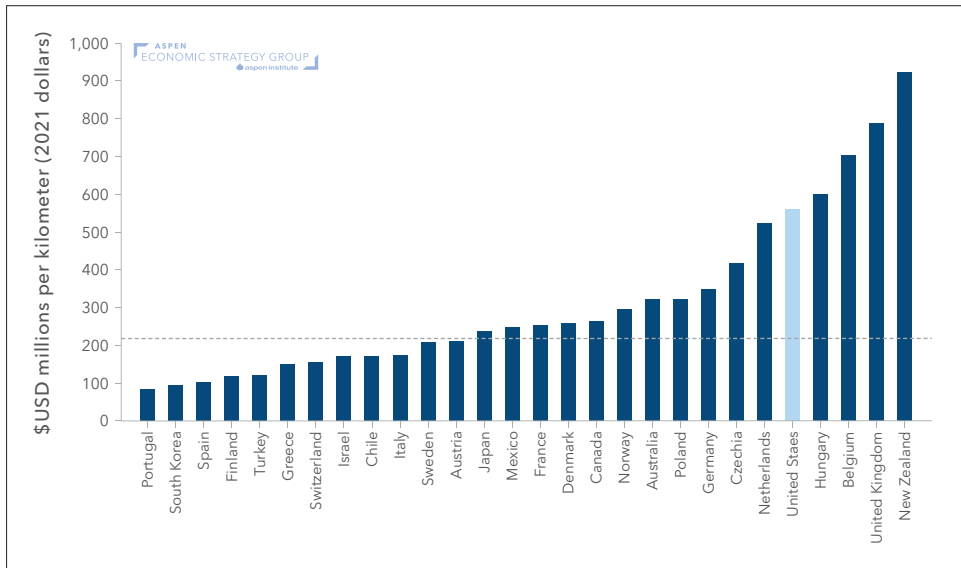
Construction costs in the US, at least for its urban transit megaprojects, are among the highest—if not *the* highest—in the world. Figure 1 shows per-kilometer spending (in 2021 dollars, adjusted for purchase price parity) on new urban transit across countries.

It costs approximately \$560 million to build a kilometer of urban transit infrastructure in the US, the fifth-highest rate in a sample of 28 OECD countries. Adjusting for the fact that infrastructure in the US uses relatively little tunneling, US costs may be higher than those of all the other countries in the sample (NYU Transit Costs Project 2020). US costs are two-and-a-half times as high as the OECD average of

2 For example, the BIL includes the Build America, Buy America Act, which mandates that federally funded infrastructure projects use American-made iron, steel, manufactured products, and construction materials (US Department of Commerce n.d.).

\$218 million per kilometer (represented by the horizontal dashed line in figure 1). (This OECD average is very close to the average of all 59 countries for which data are available.) Building urban transit in the United States is about six times as expensive as building urban transit in Portugal, South Korea, or Spain.

**Figure 1: Average spending per kilometer on urban transit, across countries**



**Source:** Author calculations using data from NYU Transit Costs Project 2020.

**Notes:** The Y-axis displays mean cost per kilometer for each country using a purchase-price-parity adjustment. This mean is weighted by project length. The dashed horizontal line displays the overall kilometer-weighted mean for all countries in the figure. There are 237 projects in total. The sample includes all OECD countries with available data.

These divergent costs are not limited to transit; they also apply to highway construction. Based on available data, US highways built since 2010 are far more expensive than highway projects elsewhere in the world at any time (Liscow 2024).

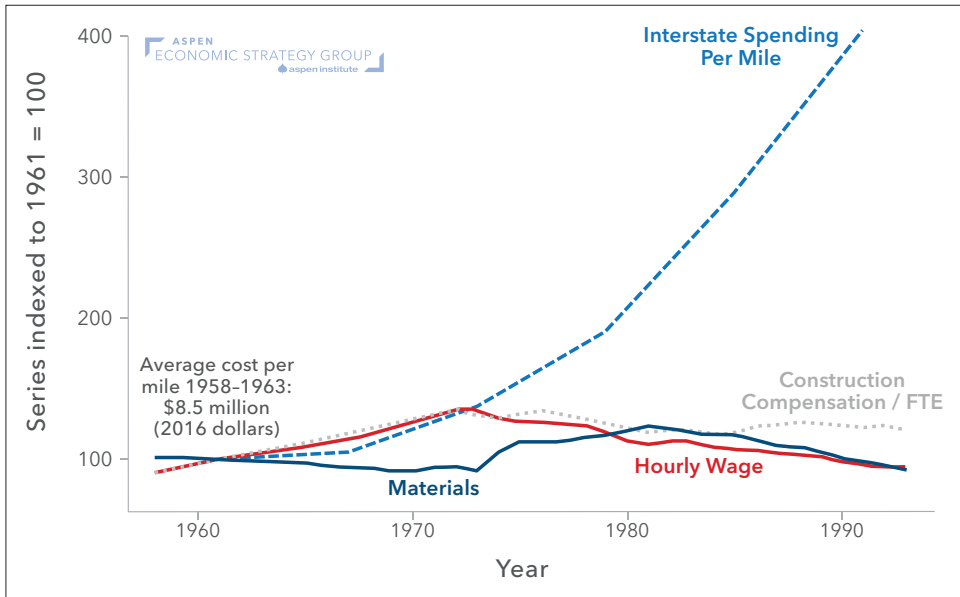
These high costs in international comparison suggest distinctive issues with the US that should be addressed.

## 2.2 Major infrastructure construction has gotten more expensive over time

In the US, the real costs of interstate highway construction more than tripled between the 1960s and 1980s (Brooks and Liscow 2023). Highway construction costs continued going up after that (Liscow 2024). As figure 2 shows, changes in construction wages and material prices do not explain this increase. Brooks and Liscow (2023) also show that building in more expensive places over time does not drive the increase.



**Figure 2: Average spending per mile to build new US interstate highways, construction wages, and materials prices, over time**



**Source:** Brooks and Liscow 2023.

**Note:** Construction compensation / FTE is construction compensation per full-time equivalent employee.

Costs started skyrocketing around 1970. Brooks and Liscow (2023) link this cost increase to the rise of “citizen voice,” a change in statutes (such as the passage of the National Environmental Policy Act in 1970), judicial doctrine, and civil society that increased the ability of citizens to directly impact government actions. For example, at this time, highways got “wigglier,” possibly to avoid recalcitrant landowners.

Brooks and Liscow (2023) also show that, before 1970, there was no relationship between the median family income of a community and the cost of its highways; after 1970, there was a strong positive relationship. This divergence suggests that some institutional change allowed richer communities to demand more expensive highways, whereas lower-income communities lacked the resources to take advantage of these new tools.

### 2.3 Timelines for building energy infrastructure are slow

Crucially for the green transition, the timelines for building energy infrastructure are slow. The International Energy Agency (2022) reports that the typical deployment timeline for offshore wind in the US is between three and five years. For extra-high-

voltage power lines, which are essential to transport electricity from the often-remote areas where renewables are abundant to cities where they are needed, the typical timeline is between five and 13 years. Given the Biden administration's aggressive 2030 decarbonization goals of reducing emissions to half their 2005 levels, such long timelines would likely prevent the US from achieving those goals (Bistline et al. 2023).

#### **2.4 The new era of industrial policy has coincided with skyrocketing input prices**

At least judging by the inputs into highways, the price of inputs into infrastructure has dramatically increased, with an index of these prices going up a remarkable 57 percent between the end of 2019 and the third quarter of 2023 (much greater than the 19 percent inflation for the overall economy over that period). Figure 3 shows an index of these prices over time; the price increases continue unabated through the third quarter of 2023 (the latest available data).

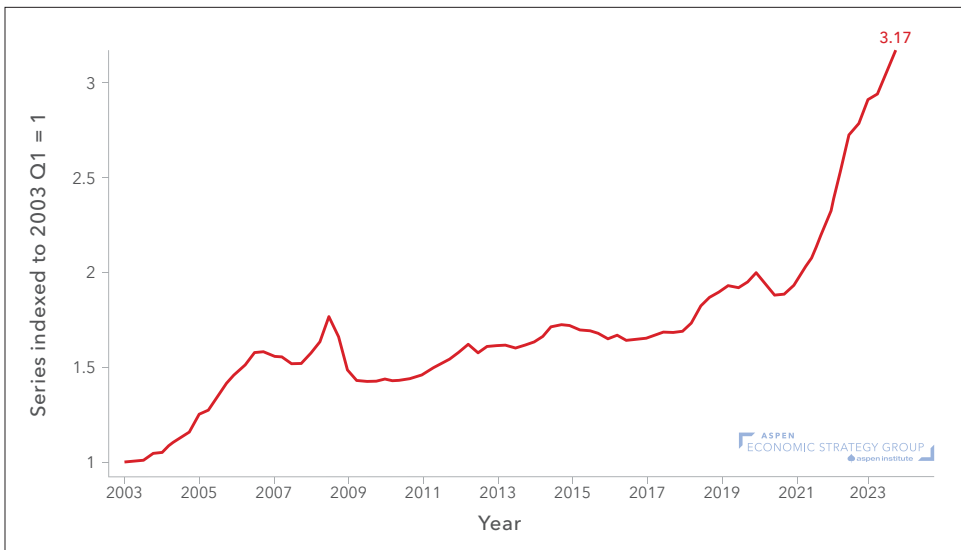
Largely due to the price increases, US real spending on infrastructure was actually considerably lower in 2023 than in 2020 (*Economist* 2023). The supply chain challenges brought on by COVID-19 helped lead to these price spikes. And the increase in funding for infrastructure may then have increased prices further. In any case, while the link between the government's actions and higher prices is unclear, it is the case that the federal government has chosen a particularly expensive time to expand spending.

### **3. Issues with US state capacity and infrastructure**

This section describes what is known about issues with state capacity for building infrastructure.

First, on personnel: state-government highway employment has declined over time; civil-engineering employment by governments has not nearly kept up with that by the private sector; and government wages have not kept up with the private sector. Relatedly, private contractors and state officials alike report that state capacity is a problem and drives up costs, and both groups agree that consultant use drives up overall costs.

Second, on procedural requirements for building: environmental review for major projects is lengthy and has gotten lengthier; litigation is a significant risk and is time-consuming; and the US is characterized internationally by a very high concentration of lawyers.

**Figure 3: National highway construction cost index**

Source: US Department of Transportation, Federal Highway Administration 2023b.

Third, there are challenges with the tools that the government can use, in particular its data infrastructure and its long-term planning abilities.

### 3.1 Personnel

Personnel in adequate number and quality are essential for good policy implementation. Otherwise, projects will be badly chosen, designed, and contracted for. Yet while these personnel expenditures are not small in absolute terms, they are small relative to the cost of construction. For example, estimates of planning, research, and administrative costs as the interstate system was being constructed in 1975 were at less than 3 percent of total costs (Comptroller General of the US 1976); in 1991, after most of the construction was complete, planning, engineering, research, and other miscellaneous expenses ended up at less than 10 percent of total costs (Brooks and Liscow 2023).

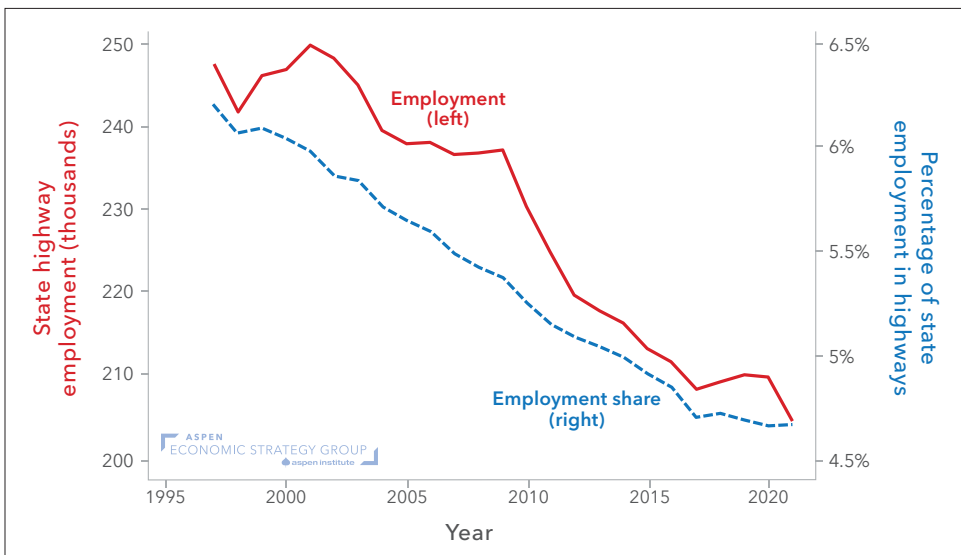
In absolute terms, the Federal Highway Administration's personnel expenses totaled \$350 million in 2022 (US Department of Transportation, Federal Highway Administration 2023a). Yet, while modest in cost, government personnel are essential. This subsection reviews what we know about the status of personnel.

3.1.1 State-government highway employment has declined over time; contractors and state officials agree that state DOTs are understaffed; and lower state capacity correlates with higher overall costs

State department of transportation (DOT) highway employment has declined substantially over the last quarter-century, as shown by Liscow, Nober, and Slattery (2023). Figure 4 shows that, between 1997 and 2020, the number of people employed in state DOT highway divisions shrank by 40,000, or about 20 percent, while total state public-sector employment grew. As a result, the share of state public-sector employees working at state DOT highway divisions shrank from over 6 percent to about 4.5 percent.

Liscow, Nober, and Slattery (2023) also surveyed state DOT officials and construction contractors about their views. The authors find wide agreement about weak state capacity: 89 percent of state officials and 59 percent of contractors reported that state DOTs were understaffed. Notably, states that experienced the largest losses in employment were most likely to report being understaffed (Liscow, Nober, and Slattery 2023).

**Figure 4: State-government highway employees, total and as a share of all state public-sector employment, 1997-2021**



**Note:** Data on state-government highway employment in both absolute numbers (left) and as a share of public-sector employment (right) comes from the US Census Bureau. See Liscow, Nober, and Slattery (2023) for details.

Evidence suggests that increasing capacity—as measured by state DOT employment—actually reduces construction costs. Recall that contractors, rather than government employees, perform the construction work; government workers design or supervise design of the project, put it out to bid, and manage the contractor. Hiring more government workers could thus enable better project management. Liscow, Nober, and Slattery (2023) find a significant negative correlation between per-capita state DOT employment in transportation and the per-mile construction cost of highways: increasing employment by one person per thousand in a population reduces costs by 26 percent.

Similarly, specific aspects of capacity correlate with costs. In particular, “change orders,” (changes to a contract after the beginning of the contract) and concerns about administrative processes are both significantly correlated with costs. It seems likely that lower capacity leads to both worse contract-writing (and thus to more change orders) and more-onerous administrative processes. Notably, 57 percent of highway contractors state that cost overruns are caused by problems in state DOT planning (state DOTs disagree).

The decline in employment may have a variety of potential causes. State governments have been under particular stress since the Great Recession; gradual debt accumulation may lead some governments to skimp on hiring, sometimes not even filling open positions (Gordon 2012; Phaneuf 2022). Cumbersome hiring practices may also make it challenging to fill open positions; for example, the Greater Cleveland Regional Transit Authority’s hiring process recently had 86 steps and averaged five months, leading it to lose applicants (American Public Transportation Association 2023).

Workforce shortages can also snowball. To cover staffing shortfalls, remaining employees may have to take on extra responsibilities or work longer hours, leading to even more workforce attrition (TransitCenter 2022).

### **3.1.2 *Civil-engineering employment has grown little in government, while it has grown a large amount in the private sector***

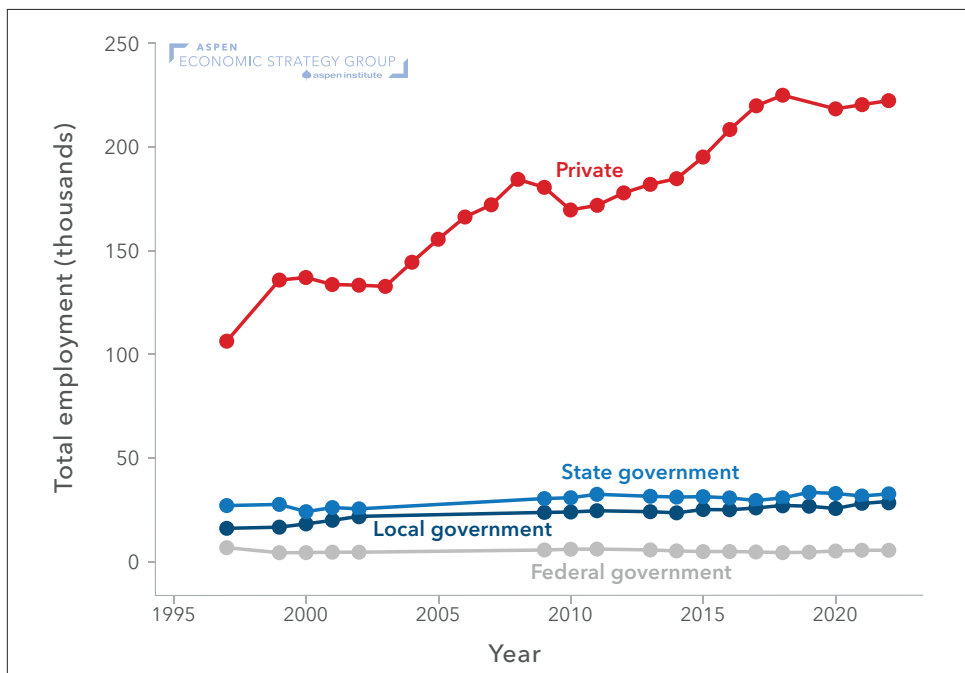
Figure 5 plots employment of civil engineers, who tend to be in charge of planning infrastructure projects (Perez and Ardaman 1988). It tells a story similar to that for state government highway employment: between 1997 and 2022, the number of public-sector civil engineers barely budged. This is so even as the amount spent on public-infrastructure construction has increased dramatically since the late 1990s, rising from about \$597 billion in 1997 to \$857 billion in 2022 (in 2022 dollars).<sup>3</sup> In

3 The figures include the total infrastructure spending by federal, state, and local governments (US Bureau of Economic Analysis 2023).

fact, it appears that federal-government civil-engineering employment has even declined somewhat, falling from 11,550 in 1997 to 9,880 in 2022.

At the same time, private-sector employment of civil engineers has more than doubled. Assuming that there has not been a large expansion of civil-engineering work done for the private sector relative to the public sector, these numbers suggest that more and more civil engineering for public-sector projects has been outsourced to the private sector. Such outsourcing is not necessarily a bad thing, but it does suggest that state capacity, at least relative to the private sector—and likely absolutely, given the expansion of public construction—has declined over time. That supposition—of declining government capacity—does not follow directly from the data, as outsourcing can work well; but the employment trends do raise at least the possibility that government has insufficient staff to manage its contracts.

**Figure 5: Civil-engineering employment, by sector**



**Note:** See the online data appendix for the exact data sources from the Bureau of Labor Statistics' (BLS) Occupational Employment and Wage Statistics. Note that BLS generally cautions against using these data to compare employment over time because of definitional changes in the classification systems and changes to survey methodology. But a close examination of definitions and methodologies, described in further detail in the data appendix, does not reveal major definitional changes, providing some reassurance that the comparison here has no major errors. Note as well that the BLS did not separate public-sector employment into local, state, and federal government categories between 2003 and 2008.

Note that figure 5 also shows the importance of state and local governments relative to the federal government: In 2022, the federal government employed 9,880 civil engineers, while state and local governments combined employed far more: 70,330. This phenomenon is part of a larger phenomenon: the total number of federal executive-branch civilian employees has changed little since 1960, even as federal spending more than quadrupled between 1960 and 2019 in inflation-adjusted dollars and as the number of pages in the federal register (a measure of regulatory activity) similarly quadrupled (Lindsey 2021).

### 3.1.3 *The private-public wage gap has increased over time*

Another way of understanding the capacity of the public sector is to compare the pay in the public and private sectors. When pay is higher in the private sector than in the public sector, it tends to draw away talent from the public sector and weaken state capacity—and the greater the pay difference, the more talent will likely move into the private sector.

Figure 6 measures the wage gap over time between the federal government and private sector for comparable work. (This measure excludes fringes like retirement benefits.) I hand-collected the data, which was mostly produced by the President’s Pay Agent, which compares pay for federal workers with average private-sector rates for the same levels of work (US General Accounting Office 1987). There have been changes in methodology over time—such as refinements to more comprehensively cover the private sector and reweighting to make the composition of the public and private sectors more comparable—and statistical agencies caution against over-time comparisons. (See the data appendix for full details.)

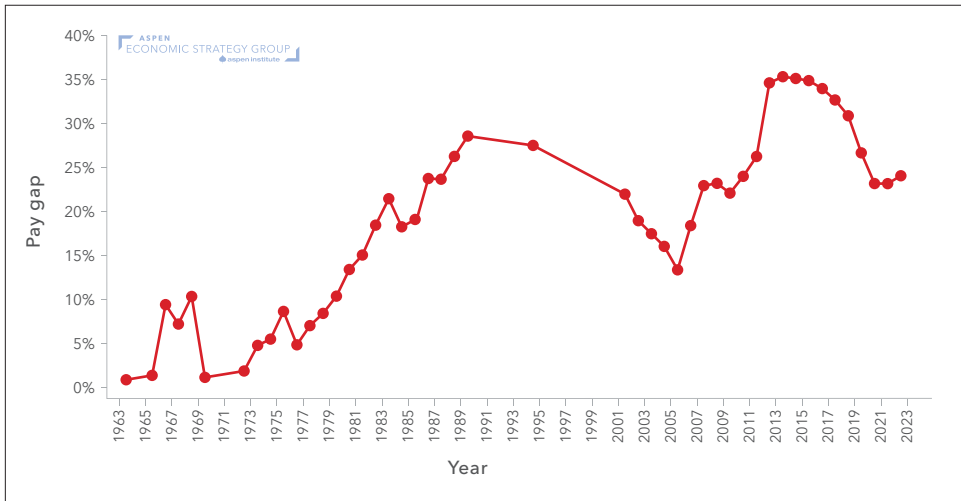
With those caveats in mind, the data show a large increase in the private-public pay differential over time, from almost no difference in the early 1960s with a difference as high as 35 percent in the mid-2010s.<sup>4</sup> And, as of 2022, the private- public wage difference is still remarkably large, at 24 percent. This finding raises concerns about the ability to attract a high-quality federal workforce.

*“The data show a large increase in the private-public pay differential over time.”*

Note a final implication as well: While infrastructure construction costs have gone up, public-sector wages have not kept up with private-sector wages. So it is not the high wages of public-sector workers (at least from the federal government) that have driven the increasing construction costs.

<sup>4</sup> Reassuringly, the Office of Management and Budget (2023) produces a series going back to 1990, which shows broadly similar trends.

**Figure 6: Pay-gap percentage between private sector and federal government, 1963-2023**



**Note:** See the data appendix for the exact sources, which are usually annual reports of the President's Pay Agent. The appendix also describes methodological changes over time that make the figures not perfectly comparable.

### 3.1.4 Contractors and state officials report that consultants drive up costs, and data show that consultant use correlates with higher costs

In Liscow, Nober, and Slattery's 2023 survey, the consensus among procurement officials and contractors alike is that the use of consultants increases costs, as shown in figure 7: 77 percent of state DOT officials and 82 percent of contractors think that consultant use increases costs at least moderately. Moreover, among all survey responses, the strongest correlation with costs is consultant use. The issues with using consultants could come from several sources, including consultants' incentive to bill more by planning larger projects and understaffed agencies' indecision and poor management.

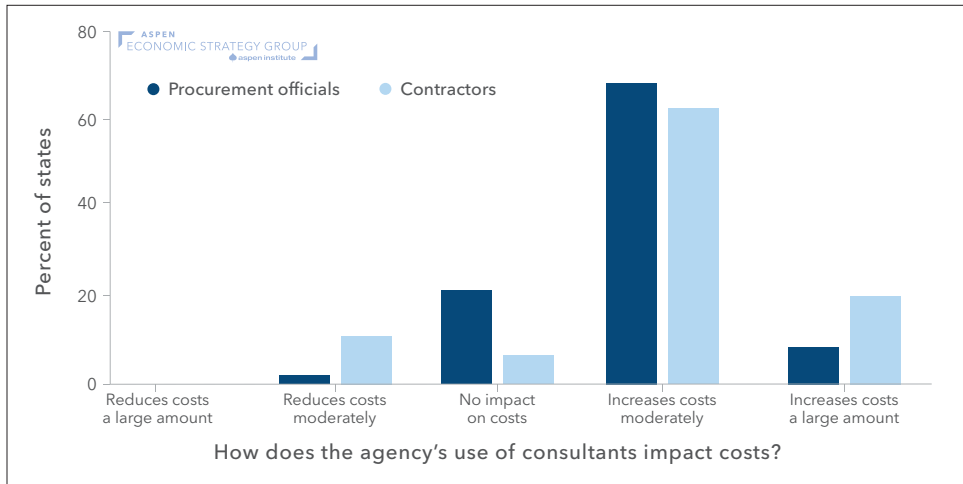
Costly as it may be, some use of consultants may be unavoidable because state DOTs are understaffed and do not have the capacity to complete the work in-house, especially for the types of projects they build infrequently. Even taking this inevitability into account, DOT staffing may currently be far from ideal.

Issues with outsourcing extend beyond infrastructure. For example, in the 2013 Healthcare.gov rollout debacle, the 3:1 ratio of contractors to employees at the Center for Medicare and Medicaid Services (CMS) helped lead to the website breakdown (Verkuil 2017). The Government Accountability Office said that CMS had



operated “without effective planning or oversight practices,” including by trying to direct contractors “when key technical requirements were unknown” (Government Accountability Office 2014).

**Figure 7: Cost impact of consultant use, as assessed by procurement officials and contractors, across states**



Source: Liscow, Nober, and Slattery 2023.

In the context of infrastructure, countries comparable to the US often have relatively higher planning capacity in local transit agencies. In Italy, for example, a country with low construction costs (and one not usually known for excellent government), Milan’s transit agency has built up so much planning and design capacity that it consults on not only other Italian projects but also projects abroad (Goldwyn et al. 2023). By contrast, Boston’s transit agency initially had only four to six full-time employees managing its Green Line extension—“the largest capital project in the agency’s history” (Goldwyn et al. 2023, 24)—leading to poor design choices and higher costs.

Forced to rely on consultants for the bulk of planning, design, and construction, “project scope ballooned and consultants studied project alternatives that were obviously unviable” because “there was no one at the [MBTA] to rein in the consultants” (Goldwyn et al. 2023, 24–25). In countries like France, with greater in-house capacity for planning, “the typical range” of project management and design contracts as a percentage of construction costs “is 5–10%, with 7–8 percent most common, and in Italy and Istanbul, it is typically 10%” (Goldwyn et al. 2023, 25). “In New York, where consultants largely designed and managed construction for Phase 1 of the Second Avenue Subway,” on the other hand, management and design contracts totaled 21 percent of construction costs.

### 3.1.5 *An example of the costs of weak personnel*

One example of weak personnel driving up project costs and causing delays, partly through excessive outsourcing of planning, is California High-Speed Rail. A 2018 audit of that project highlighted poor contract management (Howle 2018). For example, one mistake was that construction began before essential pre-construction tasks—such as acquiring necessary land, relocating utility systems, and securing agreements with external stakeholders—had been completed. This decision led to over \$600 million in cost overruns. The audit linked decisions like this one to two key facts: first, that many contract managers did not serve in full-time roles, and second, that oversight was often delegated to outside consultants, whose priorities might not have aligned with the state’s interests.

The audit found that the consultants were not subjected to the same level of scrutiny as state workers, potentially leading to conflicts of interest and less effective oversight. An *LA Times* investigation further showed the significant role of private consultants in managing the project, handling tasks that would typically be managed by state employees (Vartabedian 2019). Indeed, the article noted, “in some cases, they said, state employees report[ed] to consultants, rather than the other way around.”

## 3.2 **Procedure**

There are many reasons for government agencies overseeing infrastructure projects to have detailed procedures. For example, procurement rules requiring the lowest-cost bidder, or the bidder meeting some combination of technical and cost-based criteria, to win the bid help prevent bribes to government officials by worse bidders. “Hard-look” judicial review of environmental permitting helps ensure that government officials consider various impacts of construction by creating the threat that judges will send projects back to the drawing board if they find any stones left unturned.

Thorough permitting helps prevent the kind of situation that was common in the 1950s, when Robert Moses could bulldoze neighborhoods of New York with little consultation and substantial harm to local communities (Caro 1974). At the same time, the resulting thicket of procedures may have substantially slowed construction and made it more expensive—and sometimes made projects infeasible altogether. So building state capacity by creating rules that provide appropriate requirements for government officials is important, especially amid concerns about “over-proceduralization” (Bagley 2019; Pahlka 2023).

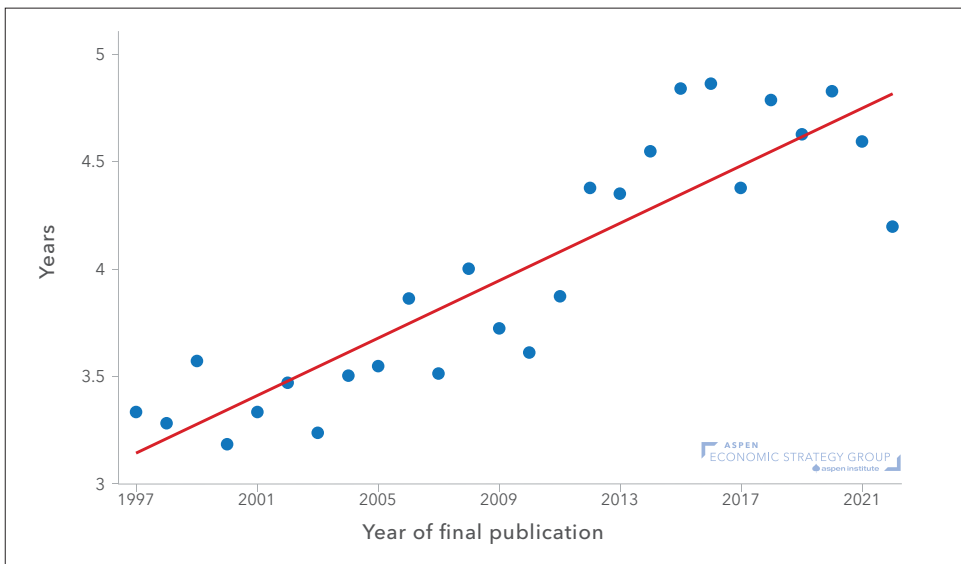
Here is some of what we know about procedure for infrastructure, using the example of the permitting process.

### 3.2.1 Permitting projects is slow and has gotten slower over time

Permitting projects is slow and has gotten slower over the last few decades, though there have been recent improvements. As described earlier, the National Environmental Policy Act has required since 1970 that any proposal for a large project with significant impacts on people or the environment (roughly 100–200 per year) must include an environmental impact statement (EIS).

Figure 8 shows how preparation time has increased since the late 1990s—from around 3.4 years in the late 1990s to around 4.8 years in the past several years. That is an increase of about 25 days per year. At the same time, the past few years have seen a decline in duration, falling back to 4.2 years in 2021. This drop comes as the Biden Administration implemented a variety of reforms and capacity improvements (Brugger 2022).

**Figure 8: Environmental impact statement preparation time**



**Source:** DeWitt and DeWitt (2008), extended courtesy of the authors. There are 5,165 EISs in the sample. The line of best fit with year-level data is: preparation time (in years) =  $0.0672 * \text{year} - 131.017$ .

Part of why environmental review is time-consuming is that the written reports themselves are lengthy. Final environmental impact statements released between 2013 and 2017 had an average length of 668 pages and a median length of 445 pages, excluding appendices, and an average of 1,703 pages and median of 962 pages, including appendices (Council on Environmental Quality [CEQ] 2019).

This tally reflects a big change from a random sample of 50 environmental impact statements I collected from 1977 and 1978, which had an average length of 270 pages without the appendix and 414 pages with the appendix. So, between the late 1970s and the 2010s, page length without the appendix increased two-and-a-half fold, and with the appendix increased fourfold, perhaps reflecting a ratchet in which, once an issue is litigated or otherwise become part of ordinary practice, subsequent environmental impact statements include that issue.<sup>5</sup>

These permitting challenges relate to the personnel challenges discussed earlier. As in other construction-related areas, the US lacks institutional capacity when it comes to federal permitting coordination. The federal Permitting Council, charged with coordinating multi-agency permitting processes, had only six permanent staff members in 2020 (Brugger 2020); 16 full-time equivalent staff worked there in 2023 (Permitting Council 2024). When he started in 2023, the head of said council emphasized that “[o]ne of the key bottlenecks is staff capacity at agencies” (Siegel 2023).

Concerns have been raised about permitting for projects using CHIPS funding, among other parts of the Biden ramp-up in spending (Singerman and Kersten 2023). For example, construction on Micron’s planned memory chip facility in upstate New York has been slowed by the permit process and the need to navigate complex regulations (Hawkins 2024).

### 3.2.2 *There is substantial and lengthy litigation around infrastructure projects*

Large infrastructure projects are subject to substantial and lengthy litigation, as judged by litigation under the National Environmental Policy Act. Though many projects are not litigated, according to a sample collected by Bennon and Wilson (2023), the absence of litigation does not imply that the threat of litigation had no impact. Projects can easily become more costly and slower as proposing agencies try to preempt litigation. Or projects can be cancelled—or not even contemplated—altogether. Because it is difficult to measure how often litigation is avoided via an agency’s preemptive efforts, the real cost of litigation threats is not reflected in the statistics.

When there is litigation, it can add substantial time to the permitting process. Studying a sample of about two hundred National Environmental Policy Act cases from the George W. Bush administration, Adelman and Glicksman (2018) found that the median length of litigation was 23 months, with 75 percent of cases resolved in 39 months and 90 percent in five years. When the government prevailed (as it did in

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<sup>5</sup> NEPA reforms enacted in 2023 limit the length of environmental impact statements to 300 pages, excluding appendices, tables, figures, and maps.

about 62 percent of cases between 2001 and 2013, according to my analysis of CEQ [n.d.] data), the median duration was 18 months, with 75 percent of cases resolved in 36 months. When the plaintiff prevailed “on at least one claim, 50 percent of the cases are resolved within 2.5 years; 75 percent resolved within about 4.3 years; and 90 percent of the cases are resolved within 6.2 years.” These lawsuits therefore constitute long additions to project timelines, especially given the amount of time it takes even when a lawsuit fails.

This large amount of litigation is consistent with the uniquely large role lawyers play in both processes of adjudication and the political culture of the US. Ours has been called a system of “adversarial legalism,” in which policy is often made through decentralized litigation (Kagan 2019). As Alexis de Tocqueville wrote in 1835, “There is hardly any political question in the United States that sooner or later does not turn into a judicial question” (de Tocqueville 1835).

The lawyer-intensive nature of the US has, if anything, increased over time: between 1960 and 1987, the share of GNP going to legal services almost tripled (Sander and Williams 1989). This trend is particularly reflected in the amount of private litigation to enforce federal statutes (defined as number of cases per 100,000 people), which increased from 3 in 1967 to 13 in 1976, 21 in 1986, 29 in 1996, and 40 in 2014 (Burbank and Farhang 2017).

Compared with a sample of European countries, the US has the second-highest number of lawyers per capita, at 400 lawyers per 100,000 people—much higher than countries at the bottom of the distribution, which have between 40 and 83 lawyers per 100,000 people (Liscow 2024).

Ramseyer and Rasmusen (2010) find that the US has significantly more suits filed per capita than each of Australia, Canada, France, Japan, and England, and far more judges than the other countries excepting France. Reportedly, “European and Japanese multinational corporations generally maintain larger staffs of in-house attorneys in their U.S. subsidiaries than in their corporate headquarters and other subsidiaries combined, and they spend more in the United States for reporting, testing, and certifying to regulators that their companies are complying with the law” (Kagan 2019, 36).

The saga of Cape Wind illustrates the combination of permitting challenges and litigation that can slow infrastructure development, if development happens at all. In 2001, the developer Cape Wind proposed building the United States’s first offshore wind-energy project in federal waters in the Nantucket Sound and commenced environmental review under the National Environmental Policy Act and the Massachusetts Environmental Policy Act (Kimmell and Stalenhoef 2011).

After opposition from parties including those (like Senator Edward Kennedy) who would see the turbines from their homes, Cape Wind received state permits in 2009 and federal permits in 2010, almost ten years into the project. Even after that, multiple lawsuits continued. Partly because of the long delay, Cape Wind failed to meet a construction deadline and lost several contracts; the project was shuttered after costing Cape Wind \$100 million (Seelye 2017).

Cape Wind led a former Massachusetts environment and energy secretary (and Cape Wind supporter) to say, “The project unfortunately demonstrated that well-funded opposition groups can effectively use the American court system to stop even a project with no material adverse environmental impacts” (Seelye 2017). Recent steps taken by the Biden Administration to streamline regulations for offshore wind permits, however, have significantly accelerated the permitting process (EnergyNews 2024).

### **3.3 Tools**

Government personnel must also have the appropriate tools to plan and design infrastructure. This subsection discusses two areas of concern: data infrastructure and long-term planning.

#### ***3.3.1 Data infrastructure and transparency are weak***

US data and transparency on infrastructure construction are weak. The situation for infrastructure construction is part of a larger weakness in US government information technology—including, for example, the old computer systems, sometimes written in old and now rarely used computer languages, that helped undermine the rollout of pandemic unemployment insurance (Lindsey 2021). The costs of weak data infrastructure to effective infrastructure construction may be less visible than the issues with unemployment insurance, but they are similarly corrosive. Consider three examples.

First and most basically, little data is systematically available on what each transportation infrastructure project costs overall—or what the components of those costs are. For example, Brooks and Liscow (2023) had to spend years finding, digitizing, and cleaning data on spending on the half-trillion-dollar interstate highways. Goldwyn et al. (2023) had to hand-collect data on recent transit projects. Some states make some construction cost data available on their websites, but many do not. This dearth of data is not conducive to public accountability or to analysis of cost drivers.

Second, when data are available, measures of costs are often not consistent across states. Even something as simple as reports to the federal government about the

amount of money spent on maintenance are not consistent across states (Liscow, Nober, and Slattery 2023). As a result, it's difficult for states to learn from each other or for researchers to help states learn. Since the national data were not helpful, Liscow, Nober, and Slattery (2023)—in order to see how procurement practices relate to construction costs across states—had to go state-by-state to collect data on five repaving projects, often through state Freedom of Information Act requests. These kinds of high barriers to entry deter much good analysis.

A third example is permit tracking. There have been advances in this area; a federal dashboard now tracks the status of major projects. And the Council on Environmental Quality at the White House now tracks the timing on environmental impact statements written for the one hundred to two hundred biggest projects each year. However, a far greater number of projects—an estimated 12,000—are not expected to have a significant environmental impact; rather than including environmental impact statements, proposals for these projects merely include “environmental assessments” (CEQ 2016). Little is known about these latter projects.

### 3.3.2 *There is a lack of coordinated long-term planning*

Coordinated long-term planning for infrastructure is often lacking, despite the fact that infrastructure assets are very long-lived and often involve the cooperation of multiple levels of government and multiple jurisdictions. Though state and local agencies have plans, the issues that arise from the tendency not to develop coordinated plans can be seen through two examples.

First, experts agree broadly that the slow construction of new long-distance electricity transmission is the “Achilles’ heel of the transition to cleaner energy,” since renewables are often produced far from population centers (Plumer 2024). New transmission often needs to cross multiple states, requiring signoff from many state and local governments. But remarkably, though one is under development, there is currently no national transmission plan, despite the need to coordinate generation, transmission, and consumption across wide spaces and substantial time (Grid Deployment Office n.d.).

*“Coordinated long-term planning for infrastructure is often lacking.”*

This lack of planning contrasts with the case of interstate highways, for which the federal government produced a detailed plan in consultation with the states in the 1940s, well before the bulk of construction began in the mid-1950s. Interstate electricity transmission is in a sense the interstate highway system of the twenty-first century, with big networks needed across state lines. The consequence of having no transmission plan is that it is harder for producers to know where to site

electricity generation, since they don't know if there will be transmission, and for potential builders of transmission to know where to site transmission lines, since they don't know if there will be generation—or if other competing lines will also be built (National Academies of Sciences 2021).

Similarly, for transportation infrastructure, a lack of long-term planning coordinated between the federal government and state and local agencies creates challenges for transit construction partially funded by the federal government. Without having more sense today of what the federal government will fund down the road, it is hard to know what to plan for (National Academies of Sciences 2022). Federal funding uncertainty therefore leads local transit agencies to delay projects until that uncertainty is resolved, even though they fund substantial chunks of transit themselves (Kline 2018).

As well, returning to the issue of personnel, when grants are intermittent, local agencies are reluctant to hire permanent staff when the funding may dry up, leading to the weaker staffing described above; many agencies instead have turned to consultants (Goldwyn et al. 2023).

Finally, without a clear pipeline, local agencies have an incentive to layer into the projects that actually are funded a host of other amenities, like parks and housing. This lack of planning contrasts with a system in which agencies know that they have access to a stream of money for a particular infrastructure program and that, if they spend less on the current project and built it more quickly, they can move onto the next project with federal funding, providing more transit infrastructure to their constituents sooner.

## **4. Potential solutions to state capacity challenges**

This section links the problems highlighted above with potential solutions.

### **4.1 Personnel**

#### **4.1.1 Hire more government infrastructure experts as employees**

Governments at all levels may simply have too few infrastructure experts as employees to optimally decide what to build, permit the project, supervise design the project, put the contract out to bid, and monitor construction contractors. Counterintuitively, hiring more workers may reduce overall costs.

Recall the evidence that more state DOT employment is strongly correlated with lower construction costs, as found by Liscow, Nober, and Slattery (2023), perhaps a result of better project management. This finding is not a surprise, as the benefits



of adequate staffing have been shown in a variety of settings, from IRS agents paying for themselves twice over (Swagel 2021) to the number of municipality-level bureaucrats causing higher municipality public-utilities coverage in Colombia (Acemoglu, García-Jimeno, and Robinson 2015).

Most basically, Congress and state legislatures could simply appropriate more money to hire more planning and management staff. Doing so is particularly challenging at the federal level because domestic appropriations for staffing often face a squeeze, since they (unlike the big social-insurance programs) typically must be appropriated annually. For permitting, the federal government has increased funding in the BIL and IRA. Indeed, the administration estimates that with such funding, federal permitting staffing has now increased by 14 percent, which may have resulted in quicker permitting (The White House 2024). But various levels of government could increase their hiring yet more, including in the other stages of the process, like project design and contract management.

Needless to say, such hiring increases are all the more important with all the new spending in the BIL, the IRA, and the CHIPS Act. One small illustration is the ramp-up of formal benefit-cost analysis at the US Department of Transportation (DOT) for its discretionary grant funding. The department is now doing vastly more benefit-cost analysis because BIL dramatically increased the funds that USDOT allocates subject to benefit-cost analysis.

But the DOT's staff size for conducting these reviews has not changed greatly, despite its now having to review a vastly expanded number of grant applications. In addition, benefit-cost analysis is hard, and with ever more variables to consider (for example, those on climate mitigation), the need for skilled personnel is even higher.

Finally, to help fill the personnel gap, the federal government could offer fellowships to strengthen the pipeline of talented planners, designers, and engineers. One such government program, the Dwight David Eisenhower Transportation Fellowship Program, supports students who are pursuing transportation-related degrees (US Department of Transportation, Federal Highway Administration 2024).

A fellowship focused on government service, such as one modeled on the successful US Digital Corps program for early career technologists or the Presidential Management Fellows for work in the federal government more generally, but focused on infrastructure and crucially including placement at the state and local levels (where most of the work happens), could also improve capacity. Universities can help as well; for example, Yale places roughly a dozen people per year in Connecticut state government in technical and policy roles (Yale University n.d.).

#### 4.1.2 *Bring public workers' pay in line with that of their private-sector counterparts*

A second reform is paying government workers in line with their private-sector counterparts, especially given the apparently rising gap between private-sector and public-sector pay. Evidence suggests that paying public-sector workers more produces better output. For instance, Krueger (1988) documents an improvement in the average quality of federal workers when the ratio of government pay to private-sector pay is increased. Mas (2006) documents that when New Jersey police officers lose in final arbitration and receive a lower wage than requested, arrest rates decline and crime reports rise, as compared to when they win.

Higher pay would also help employers to fill empty slots, which is increasingly a problem at state departments of transportation and local transit agencies (Curry 2024; Kobin 2023). It would especially help with recruiting high-skilled employees, like engineers. Being able to hire more high-skill employees would aid governments in finding the right mix of insourcing and outsourcing design, which they plausibly do not have now in light of challenges in competing with private-sector employers—especially for higher-skilled employees above the top of the government pay scale (Kobin 2023).<sup>6</sup>

#### 4.1.3 *Insource more planning*

As described earlier, surveys of state transportation officials and the contractors point to consultant use as a cost driver (Liscow, Nober, and Slattery 2023). And concern about consultant use strongly correlates with higher construction costs. Case studies comparing lower-cost transit construction to higher-cost US construction also point to the importance of in-house expertise. These findings are not surprises, given a long economics literature showing that, where outputs can be clearly contracted over (as in the case of repaving or construction more generally), outsourcing works well, whereas where they cannot (as in the case of deciding what to build and in managing contracts), outsourcing often does not work well (Hart, Schleifer, and Vishny 1997; Andersson, Jordahl, and Josephson 2019).<sup>7</sup>

External metrics of design quality and contract management are quite hard to contract over, partly because so many factors intervene between the stage of design and the final product, including a myriad of construction contractors, unknown

6 There is a long literature on revising how workers are paid, with conflicting evidence about how pay structure affects performance. For that reason, my proposal is about the level of pay—for which evidence is stronger—and I do not attempt to propose a revision in pay structure.

7 For example, Knutsson and Björn (2022) find that quasi-randomized private ambulances in Sweden reduce costs and perform better on contracted measures such as response time, but they perform worse on non-contracted measures such as mortality. They frame the issue as a moral hazard problem—outsourced firms have strong incentives to comply with contracted measures and neglect unmeasured responsibilities.

site conditions, and government-induced design changes. Likewise, Mazzucato and Collington (2023) note that “the use of consultants to develop or deliver a core function . . . assumes learning in the contracting organization is not an incremental and collective process, but a transaction,” leaving organizations lacking the capacity to plan well over the long term.

“Insourcing” more workers on project design could help solve incentive problems in which consultants have an incentive to design more complicated projects because they then get paid more. This issue has come up repeatedly in American transit development, given that few American transit agencies have adequate in-house expertise in building rail projects (Goldwyn et al. 2023, 24).

For example, consultants hired for New York’s Second Avenue subway extension “stud[ied] every challenge that emerged multiple times” and even studied “basic problems that should have been determined prior to hiring a consultant,” in large part because the agency lacked in-house expertise to effectively direct them (Goldwyn et al. 2023, 364–65). And, as described earlier, Boston’s Green Line transit extension was initially severely understaffed, helping lead to poor design choices that drove up expenses—that is, before Boston’s transit authority staffed up, redesigned the project, and brought down costs. More places should learn from Boston’s lesson by increasing staffing, in part to exert greater control over consultants.

Several possible reforms exist, beyond simply choosing to insource rather than outsource planning and management where possible. First, as noted, outsourcing occurs partly because—especially in highly paid professions—government wages cannot compete with those in the private sector. Thus, allowing a higher pay scale for at least some employees would help. Recall: compared to the costs of construction, the personnel costs of planning and managing are typically relatively small.

Second, the often-cumbersome process for hiring government employees could be streamlined, which would generally help agencies to hire more and better employees.

Third, federal rules could be changed to make insourcing planning at the state and local levels easier. The current rules typically provide federal funding for projects rather than permanent overhead, making it easier for employers to pay for consultants to plan than to build up their own long-term internal capacity (Kirk 2022; Mallett 2024).

Federal funds could therefore come with fewer strings attached, particularly with regards to state and local government capacity-building. Doing so would build on funding in the 2021 American Rescue Plan and BIL that has been directed toward building up state and local personnel (Ross et al. 2023). Especially as project-based

funds from the recent spate of legislation expire, it will be all the more important to add flexibility to allow the retention of government capacity to implement government funding programs.

## **4.2 Procedure**

### **4.2.1 Reduce procedural requirements for procurement and permitting, and reduce litigation**

Another set of reforms could help modify the internal administrative procedures and rules of judicial review to enhance the ability of government to do its job well. These reforms would respond to the claim that the government has become over-proceduralized (Bagley 2019; Pahlka 2023). There are many possibilities—and I won't attempt to do a comprehensive review.

Regarding administrative rules, Glaeser and Poterba (2021) point to procurement rules as a promising place of reform. These rules often have an admirable goal of reducing corruption and generally shepherding public resources. But many critics think that the balance between, on the one hand, constraining civil servants to prevent them from doing bad things and, on the other, giving them flexibility to allow them to do good things is not currently set right. For example, rules typically require that the lowest-cost bid be taken, even when the company with the bid has a history of poor performance. Rules could be changed to focus more on past performance and bid quality. And simplifying procurement rules more generally could attract more bidders and increase competition.

Indeed, evidence suggests that allowing government actors in the US more discretion could improve outcomes. Bosio et al. (2022) find that, across countries, regulation of procurement is effective in countries with low educational levels (a proxy for the quality of government workers), whereas it is not as effective in high-education countries, arguably because the rules stop the use of discretion that could produce better outcomes. The US is a high-education country, suggesting that more flexible procurement rules would be good.

Similarly, the various forms of environmental review have the admirable goal of preserving the environment and ensuring public participation. But many experts think that the current rules achieve neither of these goals but do considerably slow development and increase costs. As Liscow (2024) explains, a wide variety of potential reforms exist. Many of these reforms would empower the executive branch relative to the judiciary by making it harder for litigation to hold up projects or send them back to the drawing board by invalidating environmental reviews.

For example, courts could be directed to invalidate an environmental review only if a consideration that was not adequately discussed would likely have changed the decision in a project, compared to now, when the likely “materiality” of such considerations to an ultimate decision has little bearing on courts’ verdicts. Similarly, the power of courts to stop projects from proceeding during litigation could be curtailed. The Biden Administration has taken steps in this direction, including expanding the categories of project categorically excluded from environmental review under NEPA (Dabbs 2023, NTIAA 2024).

Proposals to rein in the judiciary might be attractive only insofar as other mechanisms can hold the executive branch accountable. Kagan (2019) describes the “administrative supervision and political oversight” that in “most democratic countries” holds decision-makers accountable—particularly when they are forced to defend decisions in front of political leaders (who wish to be reelected), federal agency funders, legislative appropriation committees, public meeting attendees, and the press.

Finally, sometimes the US can build important things quickly. For example, after an Interstate 95 bridge in Philadelphia collapsed in June 2023, the governor declared a state of emergency, under which any statutes and rules were suspended that “would in any way prevent, hinder, or delay necessary action in coping with this emergency event.” Time-consuming procurement rules were waived, and contractors who could do the work quickly were hired without the regular bidding process. Remarkably, the road was rebuilt and reopened in just 12 days.

This experience raises the question whether there are lessons here that could be applied elsewhere. Those procurement rules are designed to prevent corruption and ensure that the lowest-cost bidder is chosen. But the savings from reduced corruption might be outweighed by the increased monetary cost and the delay imposed by the rules.

#### **4.2.2 Improve coordination within the government**

More coordination within the government—even within one level of government—would improve state capacity for infrastructure building. Take the example of permitting by the federal government. New Zealand, for example, issues permits through “one-stop shopping” (Schumacher 2019). The US system, reflecting the American penchant for fragmenting power (Kagan 2019), gives each federal agency its own distinct grant of jurisdiction and authority. However, agency jurisdictions often overlap—with the result that federal agencies are liable to coordination failures and duplication. For example, when projects require multiple permits (as

**“More coordination within the government—even within one level of government—would improve state capacity for infrastructure building.”**

almost every significant project does), agencies often have a policy not to begin permitting until other permitting authorities complete their own processes, which causes delay.

These problems, endemic to the structure of the American administrative state, have remained persistent despite attempts to mitigate them. Recent changes, such as the establishment of the Federal Permitting Improvement Steering Council and of coordination requirements (in the Fiscal Responsibility Act of 2023) that could in principle unify multi-agency projects under a common procedural framework,

have helped. But this deep structural problem likely requires additional statutory fixes alongside changes to normal practice.

#### ***4.2.3 Promote public participation that captures more representative views more efficiently***

An important part of state capacity is public participation, both to discern the preferences of the public and, more broadly, to legitimate the state. Yet the tools used in the name of promoting better public participation often bog things down. Can reforms accomplish the seemingly conflicting goals of both capturing more representative public views and speeding construction? Perhaps so.

The tools for getting public feedback today are often cumbersome. For example, surveying the public requires going through the ironically named “Paperwork Reduction Act,” which many argue actually increases paperwork (Rahman 2024; Bourns, Nou, and Shapiro 2018). Producing a survey would require following a lengthy intra-government process to write the survey, putting the survey out for public review, responding to comments from the public review, then likely undergoing another intra-government review process—all before fielding it.

Another example is the way that environmental review functions for getting public input under the National Environmental Policy Act. Many practitioners argue that environmental reviews are more oriented around litigation-proofing a project by saying something about every possible concern than they are invested in legitimately soliciting public feedback and getting better outcomes (CEQ 1997). For example, former EPA general counsel E. Donald Elliott says that he thinks that most of the detail in a typical environmental review is driven by the desire to litigation-proof a project (Howard 2015).

The current structure actually creates incentives to not get good public feedback because doing so would yield more comments to address and possibly open up more avenues of litigation. In any case, practitioners say that the design of projects is sometimes already largely set before environmental review begins, meaning that the environmental review can often just be window dressing (CEQ 1997).

Both of these issues could be partially addressed by simultaneously (a) loosening the procedural requirements driven by regulation and litigation, and (b) setting up procedures to legitimately solicit good public feedback, especially at early stages before the decisions are made. This strategy raises the question of how proposal-writers might facilitate more public participation in project development without adding more time-consuming procedures and litigation to the process.

One way would be to develop procedures that seek out representative participation at an early stage—but then not make them judicially enforceable. Rules could instead depend on the combination of bureaucratic practice and political incentives to do what the public wants, as tends to be the case in European countries (Kagan 2019).

None of this is to say that changes here would be easy. For example, who is to say what is “good” versus “bad” feedback? A bike lane might be a godsend to some and a hindrance to others. So we can’t speak here to substantive policy outcomes. But on grounds of social welfare and democratic theory, it is valuable for public participation in the development of any project to be broad and meaningful—and then for project planners to be able to expeditiously make a decision and proceed accordingly. And it is plausible that the current situation is bad enough—privileging well-heeled parties, taking a long time, and driving up costs—that reforms to public-participation processes could improve both participation and efficiency.

In other words, as I have argued elsewhere in the context of speeding the green transition by building renewable energy and transit infrastructure, there could be a “green bargain” that improves environmental outcomes, reduces costs, speeds timelines, and results in more democratically representative processes (Liscow 2024).

#### 4.2.4 *Centralize certain kinds of decision-making at federal level*

In some cases, centralizing decision-making in the federal government could reduce the number of hoops that project planners must jump through. Whether such an approach is appropriate is a case-by-case determination, but in some situations, basic economic principles point toward centralization.

Take the example of interstate electricity transmission, which is essential for the green transition. Currently, the Federal Energy Regulatory Commission (FERC) approves interstate natural-gas pipelines in a process that preempts local permitting.

For building electricity transmission projects, however, FERC only categorically preempts state and local regulations for hydropower; other transmission projects, including transport electricity produced by wind or solar power, are subject to state and local permitting requirements (with some limited exceptions). Extending federal preemption to more or all transmission projects would enhance the ability of the federal government to approve interstate clean-energy transmission lines.

In the absence of the federal government deciding, an expansion of centralized decision-making power could be modeled on the Federal Communications Commission's permitting process for cell towers. Since the Telecommunications Act of 1996, local governments have had the authority to regulate cell towers but not to ban them entirely (Dodge 2023); furthermore, decisions have to be made within a reasonable amount of time and with "substantial evidence" in writing, with expedited court proceedings offered as a remedy. More generally, centralization could also help create economies of scale in decision-making, thereby improving efficiency.

## **4.3 Tools**

### *4.3.1 Improve data systems and make them more transparent*

Government data systems for tracking and analyzing timelines and costs could be dramatically improved. To solve a problem, one must understand it, and it is hard to understand a problem without good data. As described above, the data now are quite poor.

Data-systems performance matters for multiple reasons. First, any individual federal, state, or local agency will best be able to understand how to build effectively if it has a good grasp of its own projects. Second, state and local agencies will learn from each other if they share data, an external benefit that no individual agency captures. Third, with better data that is also transparently available to the public, researchers can better analyze it and advise all agencies. Fourth, with better data and transparency, the public will be better positioned to push for effective spending.

One solution is for state DOTs to band together to agree on standard-setting. Another solution would be for the federal government to condition their large transfer payments on greater data uniformity and transparency to state and local governments. Finally, the 2026 reauthorization of the surface transportation bill could be a good opportunity to require more public accounting, at all levels of government, of how the public's funds are spent; doing so would require funding, but that funding would constitute only a tiny portion of what is spent on construction, and it could have huge potential payoffs by reducing costs.



### 4.3.2 Increase government planning where appropriate

The US has a longstanding skepticism of government power, going back to the American Revolution to oust a despotic king. This skepticism manifests itself in a variety of efforts to reduce government capacity, and it includes a distrust of government planning. To be sure, mid-twentieth-century US urban planning is widely regarded as having been disastrous, ripping out the hearts of cities at great expense and harm to the largely disadvantaged communities who were displaced with little apparent gain in economic vitality. But the US has long engaged in planning and continues to do so. The US military engages in a great deal of planning, which is important when we are building aircraft carriers that are expected to be part of the fleet until year 2105 (Thompson 2022).

As described earlier, even as it is doing little planning today for the interstate electricity transmission crucial for the green transition, the federal government did a great deal of planning for an earlier, large cross-state network: the interstate highways, which were planned to a quite detailed level before the act authorizing most funding for them passed in 1956—and which were then largely implemented as planned. The federal government should similarly plan today for interstate electricity transmission.

For permitting, the federal government could engage in more so-called programmatic reviews, in which one review approves activity for a large class of activities. For example, the Department of the Interior has developed such a plan for developing solar-power infrastructure in the western US (US Department of the Interior 2024). Broader planning could not only cut down on litigation but also allow consideration of a broader range of interests, possibly diminishing the power of NIMBYs. Doing so would follow recent EU moves (European Parliament and Council of the European Union 2023).

Similarly, regarding transit construction, it would be helpful to have long-term plans agreed upon between the federal, state, and local levels. That way, local agencies would know what funding they are likely to get and where they can get started planning. They could hire the appropriate personnel for the long-term vision. They could engage in joint procurement for vehicles, driving down costs. And they could reduce costs and increase speed for each project with more assurance that, the less expensively and more quickly they finish one project, the sooner they can move onto the next, creating better incentives.

Of course, many kinds of planning exist. Urban redevelopment came with coercion (eminent domain) and funding, greatly increasing state capacity but also increasing the risk of harm. The coordinating function of planning is helped by coercion and

funding, but need not have any coercion and need not have much funding. For example, the Department of Energy is leveraging a few billion dollars for transmission deployment (Grid Deployment Office 2024). It will be helpful to have a national plan to best deploy it.

## **5. Conclusion**

State capacity is essential to the effective use of government infrastructure-construction dollars. Unfortunately, some warning signs are flashing about US state capacity. It increasingly appears that the US has too few government planning and management personnel—and pays them too little. Relying on outsourcing of planning and management is a risky strategy. Likewise, government personnel are burdened by procedures for things like procurement and permitting—and then subsequent litigation—that are arguably excessive. And government often lacks needed data and planning tools.

The stakes are high. The US spends far more than similar countries do on infrastructure construction. Building state capacity is very cheap by comparison; improving it could yield big returns.

State capacity is not just an issue for infrastructure. Other high-profile failures of state capacity abound, like the Healthcare.gov meltdown and the IRS's failure to collect revenue from tax cheats. So, in infrastructure construction and elsewhere too, hiring enough government personnel, paying enough to attract talent, having an appropriate number of procedural rules, and giving personnel the tools to succeed can help make government work better—producing better outcomes for the public and building trust in government.

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