



# America's Trillion-Dollar Repair Bill:

CAPITAL BUDGETING AND THE DISCLOSURE OF  
STATE INFRASTRUCTURE NEEDS

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## EXECUTIVE SUMMARY

STATE AND LOCAL GOVERNMENTS PROVIDE about 80 percent of US public infrastructure spending. But reported infrastructure spending may not sufficiently address America's critical need to repair public assets, such as roads, highways, waterworks, and buildings, that are vital to the functioning and growth of the nation's economy. In its annual *Truth and Integrity in State Budgeting* studies, the Volcker Alliance has found that few states have disclosed the immense cost of these needed repairs in their budget documents. We estimate that the cost of making deferred repairs at the state level may be as large as \$873 billion, equivalent to 4.2 percent of US gross domestic product, or almost three times the value of all investment by states and localities in nonresidential fixed assets. Combined with a reported federal backlog of \$170 billion, the national total deferred maintenance cost may be at least \$1 trillion. The sum may be even larger because while states disclose voluminous information about their general fund budgets, the same cannot be said for their capital budgeting practices, which vary widely among states.

In contrast to general fund budgets, which pay for recurring operating expenditures such as education, public safety, and, sometimes, routine maintenance of infrastructure, capital budgets typically include costly, long-lived assets involving one-time expenses whose payment is spread over years to equalize funding needs over time and stabilize taxes. But reporting standards, such as the type of assets included and the information disclosed, differ from state to state, and few report infrastructure conditions and needs in their budget documents. To help states close this critical information gap and improve their decision-making processes, we offer a ten-point action plan based on best practices relied upon by several states and the District of Columbia. Implementing the plan will help policymakers set common standards; improve asset management; make information consistent, updated, and available; and build a better-informed decision-making process for capital projects.

## INTRODUCTION

CAPITAL BUDGETS FINANCE MOST public infrastructure projects, with state and local governments—through taxes, user fees, bonds, loans, and other financing mechanisms—responsible for about 80 percent of public infrastructure investment.<sup>1</sup> According to the US Bureau of Economic Analysis, state and local investment in government nonresidential fixed assets reached \$304.3 billion in 2018.<sup>2</sup> But this sum is likely insufficient to address America's critical need on deferred maintenance of roads, highways, waterworks, buildings, and other locally and state-owned assets that are vital to the functioning of the nation's economy. In its 2018 study, *Truth and Integrity in State Budgeting: Preventing the Next Fiscal Crisis*,<sup>3</sup> the Volcker Alliance found that few states reveal the cost of deferred maintenance in their general fund budget documents. According to the report, "Unfunded infrastructure maintenance is akin to underfunded pensions. The total liability for each may grow every year that spending is short of what is required."<sup>4</sup>

States' lack of disclosure of their deferred maintenance liability has helped reduce most of their budget transparency grades. Only three states—Alaska, California, and Tennessee, all of which publish deferred maintenance cost estimates—received a top A in the category for fiscal 2016 through 2018.<sup>5</sup> The poorer showing by other states show that while most disclose considerable information about their general fund, or operating, budgets, including processes, funding gaps, and program efficacy, the same cannot be said for their capital budgeting practices.

Although infrastructure is widely regarded as a national concern, capital budgeting practices differ widely from state to state, reflecting America's composition as a republic of fifty individual sovereign entities. State capital budgets typically include costly, long-lived assets that generally involve one-time expenses whose payment is spread over years to equalize funding needs and stabilize taxes. But reporting standards, such as the type of assets included and the information disclosed, vary among states. For instance, transportation assets are excluded from capital budgets in some states, and information on deferred maintenance is often limited. Capital budgets also may not include assets managed by government agencies, such as state infrastructure authorities.

Few states report on infrastructure conditions and needs in their budget documents. Most states refer to a document called a capital improvement plan (CIP) as a road map for future capital infrastructure needs. However, this document depicts more a revenue-oriented

than a needs-based planning process. The lack of available information about infrastructure condition forces the public and policymakers to rely on outside analysis of data to inform decision-making. While such sources are important and largely reliable, states should consider making data collection, distribution, and disclosure more of a priority in their capital budgeting processes.

This working paper examines the disclosure of infrastructure needs in state budgeting documents, building on *Truth and Integrity in State Budgeting: Preventing the Next Fiscal Crisis* and its 2017 predecessor, *Truth and Integrity in State Budgeting: What Is the Reality?*<sup>6</sup> The two reports evaluate the purpose of public spending and the manner in which funds are spent, and emphasize the importance of comprehensive and accurate accounting and transparent reporting to inform citizens, encourage responsible policymaking, and improve fiscal stability.

In this paper we delve deeper into capital budgeting practices, particularly the disclosure of infrastructure needs in the fifty states and the District of Columbia. We first present a review of literature on the topic and then discuss the methodology used in this paper. Following that, we present our findings in terms of capital budgeting processes, capital budgeting documentation, and infrastructure needs. We then lay out a ten-point infrastructure disclosure action plan, featuring examples of best practices from states and the District of Columbia.

## LITERATURE REVIEW

### Capital Budgeting Practices

Most literature on capital budgeting has focused on budgeting practices across the states. In their foundational 1963 work for the Council of State Governments, *State Capital Budgeting*, Albert Miller Hillhouse and S. Kenneth Howard<sup>7</sup> performed some of the most complete research. The authors used the term “central state capital budgeting” to describe a budgeting process that considered the submission of agencies’ capital requirements to a central review agency, the consolidation of these requests for submission to the legislature, and the existence of administrative arrangements for execution. In a 1988 study that appeared in *Public Budgeting and Finance*, researchers Lawrence W. Hush and Kathleen Peroff<sup>8</sup> summarized the results of a survey conducted in all fifty states that collected information on capital budgets, including how the capital budget appeared in the governor’s budget, the role of the state legislature, the elements included in the capital budget, and the way states financed capital projects. In a 2013 study published in *State and Local Government Review*, public finance scholar Natalia Ermasova<sup>9</sup> examined the effects of economic decline on changes in capital budgeting practices and evaluated capital budgeting processes in the states after the Great Recession.<sup>10</sup> Lastly, the National Association of State Budget Officers (NASBO) published a series of reports on budgeting procedures, including *Capital Budgeting Practices in the States*, with editions in 1992, 1997, 1999, and 2014. In its 2014 report, NASBO provided a comparative analysis of capital budgeting practices in the states, highlighting information on each state’s budget documents, process, and definitions.<sup>11</sup> While existing literature is thorough and reveals nuances in states’ capital budgeting practices, it does not provide a systematic analysis of these practices.

### Comparing Capital Budgeting Practices

The literature agrees that the lack of a standardized budget makes it difficult to compare capital budgeting practices across the states. Capital budgets differ in their contents and the time span they cover.<sup>12</sup> Each state (we treat the District of Columbia as a state throughout this paper) has its own definitions, measures, standards, and policies regarding capital expenditures included in the capital budget. Capital expenditures may include land acquisition, construction, buildings, equipment, renovations, and maintenance.<sup>13</sup>

Due to the variety of capital expenditures, states use additional criteria to consider them in the capital budget. These criteria, such as minimum expenditure thresholds, minimum

useful life, and nonrecurring nature, vary widely across states. Capital projects in Maryland, for instance, are “acquisitions, designs, construction and equipment with a fifteen-year life, excluding vehicles and supplies and projects under \$100,000,” while in Massachusetts they correspond to “expenditures related to the construction, substantial improvement or acquisition of capital assets.”<sup>14</sup> Even the definition of capital expenditures – particularly that of capital maintenance – changes. Ermasova<sup>15</sup> found that a quarter of states included some maintenance in their operating budgets, while almost a third distinguished between maintenance for building renewal, which is included in capital budgets, and routine maintenance, which is part of operating budgets.

### Similarities and Variations in Capital Budgeting Practices

Existing studies reveal some similarities in budgeting practices:

- States generally rely on long-term capital plans to forecast infrastructure and financial needs. Most states report such plans in the CIP, a document that includes capital needs, the costs of planned projects, and sources of financing. The life span of these plans usually ranges between three and ten years, with five years the most frequent.<sup>16</sup> In its 2014 capital budgeting report, NASBO found that forty-two states and the District of Columbia have a multiyear CIP.
- Most states estimate the fiscal impact of capital projects on future operating budgets. According to NASBO, capital project requests in forty-three states must include such information so that officials can better assess project affordability and facilitate coordination between operating and capital budgets.<sup>17</sup>
- States’ capital budgets may not include all capital expenditures. Hush and Peroff<sup>18</sup> found that the budgets frequently covered less than half of total capital spending. Transportation was the major exclusion, followed by higher education.<sup>19</sup> NASBO reported that nineteen states did not include capital expenditures for transportation in their capital budgets, mainly because transportation revenues came from earmarked resources.<sup>20</sup>
- Current revenues are the primary funding source for most state capital projects, despite their long life spans. Over the last two decades, current revenues have funded about 70 percent of capital projects, while bond proceeds have financed the remaining 30 percent.<sup>21</sup> In 1967, twenty states relied primarily on current revenues to fund capital projects.<sup>22</sup> The number has remained stable, with twenty-two states maintaining a formal or informal policy of funding capital projects with current revenues.<sup>23</sup>

Although there are some similarities in states' capital budgeting practices, the literature illustrates widely different procedures—most involving the agencies that prepare budgets. State agencies submit capital budget proposals to either the governor or the governor's budget staff, to the governor and the legislature simultaneously, or to the legislature.<sup>24</sup> The capital budget formulation usually includes recommendations from state agencies, suggestions from the capital budget staff, and governor's preferences. In most cases, the legislature becomes involved in the process after the proposed budget is submitted. According to NASBO, twenty-five states have a joint legislative and executive review board for capital projects, an approach that provides another layer of scrutiny before legislative consideration.<sup>25</sup> A number of states, including Delaware, Indiana, Oregon, Texas, Utah, Washington, and Wisconsin, have, in addition to the governor's proposal, a state board or advisory committee that submits capital development recommendations and priorities to the legislature.<sup>26</sup>

### Classification of States

Of the articles reviewed, Hillhouse and Howard<sup>27</sup> and Ermasova<sup>28</sup> categorized states using different criteria (see table 1). Hillhouse and Howard classified states into three groups according to the time span covered by the capital budget. The authors determined that the third category was the “ideal,” and they found just two states in it: Hawaii and Rhode Island. Ermasova also classified states in three categories, but according to their capital budgeting practices. She focused on multiyear capital planning, financial forecasting, financing sources, formal systems to present and track capital projects, evaluation of spending, project prioritization, separation of budget processes, and the CIP.

### Single-State Studies

Some authors have focused on single cases. For example, researcher Arwiphawee Srithon-

**TABLE 1: Categorization of State Capital Budgeting**

AUTHORS	CATEGORIES
<b>Hillhouse and Howard (1963)</b>	1) States preparing a capital budget that covers the same time period as the operating budget. 2) States with capital budget and operating budget covering the same period and a capital program covering a longer period. 3) States with a capital budget that covers the operating budget period as well as a longer period.
<b>Ermasova (2013)</b>	1) Capital budgeting as part of operations. 2) Capital budget as multiyear capital planning. 3) Capital budgeting as strategic capital management.

grung<sup>29</sup> and New York State Comptroller Thomas P. DiNapoli<sup>30</sup> examined capital budgeting processes in Illinois and New York, respectively, in 2010. Srithongrung found Illinois's technical practices for capital budgeting (including cost-benefit analyses, quantitative scoring systems, and statewide inventory accounting) were replaced by nonaccounting approaches, such as incremental appropriation, interactive discussions in priority ranking, and internal negotiations among policymakers. Departments usually ranked identified projects based on each agency's own criteria and did not use technical practices in prioritization. The author also found that not all agencies used the CIP, as their projects did not receive funding according to the CIP schedule; some agencies used the CIP only when obliged to by federal requirements. Moreover, most of the agencies Srithongrung interviewed stated that the final appropriations were not consistent with the original strategic plan because of limited resources, political influences, and the legal framework.

DiNapoli noted that agencies lacked a standardized approach to assess the condition of their capital assets. Without such an approach, agencies provide information with different degrees of specificity, which results in a CIP with inconsistent information. His report also stated that it was impossible to know how much agencies would spend on maintenance of capital assets, as that expense was often included within funds allocated for other capital purposes. The comptroller also highlighted a lack of integration and coordination in New York's capital budgeting and financing processes, which undermined long-term strategic planning and made it difficult for the state to assess its risks, needs, and opportunities.

### **NASBO, GFOA Recommended Practices**

While several academic studies and professional association publications help guide officials preparing operating budgets, less research has been done on best practices in public capital budgeting. At the national level, organizations such as NASBO and the Government Finance Officers Association (GFOA) have studied some of these practices.

In the 2014 edition of *Capital Budgeting in the States*, NASBO identified "good practices" that budget officers recognize as "effective and efficient tools" to better allocate operating and capital resources. The organization grouped best practices into five categories: identification of capital and maintenance expenditures; capital planning and budgeting; capital financing and debt management; capital budget development and execution; and capital asset management and evaluation (see table 2).

Complementing NASBO's best practices, GFOA brought attention to the presentation of

**TABLE 2: NASBO Recommendations for Good Practices**

CATEGORY	RECOMMENDATIONS
<b>Identification of capital and maintenance expenditures</b>	<ul style="list-style-type: none"> <li>• Clearly define capital expenditures.</li> <li>• Distinguish capital projects that are included in the capital budget from those that are not.</li> <li>• Define maintenance expenditures and develop maintenance funding mechanisms (by formula or statute).</li> <li>• Develop a formal system to rate and track major maintenance projects.</li> </ul>
<b>Capital planning and budgeting</b>	<ul style="list-style-type: none"> <li>• Identify institutional responsibilities and develop capital budget systems that target informational needs.</li> <li>• Maintain centralized oversight of capital projects or mechanisms to ensure consistency.</li> <li>• Ensure effective legislative involvement in the capital budget process.</li> <li>• Identify budgetary impacts on operating budget over a multiyear period.</li> </ul>
<b>Capital financing and debt management</b>	<ul style="list-style-type: none"> <li>• Analyze characteristics of capital projects to determine a suitable financing method.</li> <li>• Limit the number and types of state entities that can issue debt.</li> <li>• Develop clear debt policies.</li> <li>• Use alternative financing mechanisms.</li> <li>• Analyze term leases.</li> </ul>
<b>Capital budget development and execution</b>	<ul style="list-style-type: none"> <li>• Verify that the capital project helps achieve programmatic objectives.</li> <li>• Compile and analyze capital spending requests on a statewide basis.</li> <li>• Establish a reliable tracking system (project on schedule and within the budget).</li> <li>• Assess the probability of cost overruns and how they would be handled.</li> </ul>
<b>Capital asset management and evaluation</b>	<ul style="list-style-type: none"> <li>• Maintain an inventory of capital assets, and upgrade and audit it regularly.</li> <li>• Maintain a centralized database for state capital assets.</li> </ul>

**SOURCE** National Association of State Budget Officers, *Capital Budgeting in the States*.

the capital budget as part of the budget document. According to the association, “An exceptional capital presentation enhances the transparency and accountability to citizens.” It also provided guidelines for presentation of the capital budget document:<sup>31</sup> It should include the definition of capital expenditures it contains, as well as the funding sources and uses for all projects; it should communicate major steps in the decision-making processes, such as the schedule, and the evaluation, prioritization, and reporting processes; and it should include capital project details such as description and costs, time line, and operating impacts.<sup>32</sup> The association also recommends linking the capital budget to the multiyear CIP, which should be in a separate section of the budget document.

### State Infrastructure Needs

Economic growth and community development depend on high-quality, reliable infrastructure. Such infrastructure facilitates industrial production and the delivery of goods to consumers. The daily life of communities depends on water and sewer systems, highways and roads, and schools. Despite its importance, infrastructure in the US is seen as being in poor

condition, significantly deteriorated, and below standard.<sup>33</sup> This carries serious consequences, not only for economic growth but for quality of life.

In the literature, we identified three main ways that infrastructure needs are chronicled: the *Infrastructure Report Card* of the American Society of Civil Engineers (ASCE), an industry organization, as numerous reports and state documents on infrastructure refer to it or support its findings;<sup>34</sup> the state management report card,<sup>35</sup> which grades some areas of government management, including infrastructure; and infrastructure investment trends in recent decades in the US.<sup>36</sup>

The National Council on Public Works Improvement (NCPWI) originated the concept of a report card to grade US infrastructure. The NCPWI was created by congressional mandate as an ad hoc council with a two-year life and the mission of reporting to Congress and the president about the condition of the nation's infrastructure.<sup>37</sup> The council published a report in 1988, *Fragile Foundations: A Report on America's Public Works*, that assessed the quality of infrastructure for aviation, drinking water, hazardous waste, inland waterways, roads, schools, solid waste, transit, and wastewater. The US was given an overall grade of C because of signs of deterioration and significant deficiencies in conditions and functionality.

ASCE began performing a similar analysis and tracking of the condition of infrastructure in the US after the federal government indicated that the NCPWI's report would not be updated. ASCE issued its first *Infrastructure Report Card* in 1998, adding bridges and dams to NCPWI's original categories. Since then, ASCE has added energy, levees, ports, parks and recreation, and rail.

ASCE has updated the report every four years since 2001 and expanded its breadth. The report now includes a total cost estimate for improving America's infrastructure—specifically, the cost of upgrading to achieve a B grade in all areas. Since 2009, the report has also included estimated funding gaps (see table 3). According to the latest report, "Investment needs and funding are estimated by looking at past trends and future projections when available."<sup>38</sup> Government agencies, nonprofit corporations, and industry consortiums are the ASCE's main sources of information.

ASCE grades on a scale of A to F (see table 4). An A indicates that the infrastructure is in excellent condition, new or recently rehabilitated, and meets future needs. On average, however, US grades remain poor, exhibiting few signs of improvement over the decades. Ten years after the National Council on Public Works Improvement was issued, ASCE reduced the nation's overall grade to D. Since then, the grade has risen no higher than D-plus, its level in 2013 and 2017. The grades indicate that most US infrastructure is in poor condition,

**TABLE 3: The Cost of US Infrastructure Improvement**

YEAR	US GRADE	TOTAL INVESTMENT NEEDS	TOTAL FUNDING GAP	ANNUAL INVESTMENT NEEDS	ANNUAL FUNDING GAP
1988	C	N/A	N/A	N/A	N/A
1998	D	N/A	N/A	N/A	N/A
2001	D+	\$1.74 trillion	N/A	\$0.35 trillion	N/A
2005	D	\$1.94 trillion	N/A	\$0.39 trillion	N/A
2009	D	\$2.32 trillion	\$1.33 trillion	\$0.46 trillion	\$0.27 trillion
2013	D+	\$3.91 trillion	\$1.74 trillion	\$0.49 trillion	\$0.22 trillion
2017	D+	\$4.6 trillion	\$2.1 trillion	\$0.46 trillion	\$0.21 trillion

**SOURCE** National Council on Public Works Improvement (1998), American Society of Civil Engineers infrastructure report cards (1998–2017).

**NOTES** N/A: Not available. Values adjusted by authors to constant 2015 dollars.

**TABLE 4: ASCE Infrastructure Grading Scale**

GRADE	DEFINITION
<b>A</b>	<b>EXCEPTIONAL, FIT FOR THE FUTURE:</b> The infrastructure is generally in excellent condition, typically new or recently rehabilitated, and meets capacity needs for the future. A few elements have signs of deterioration that require attention. Facilities meet modern standards for functionality and are resilient to withstand most disasters and severe weather events.
<b>B</b>	<b>GOOD, ADEQUATE FOR NOW:</b> The infrastructure is in good to excellent condition, some elements show signs of general deterioration that require attention. A few elements exhibit significant deficiencies. Safe and reliable, with minimal capacity issues and minimal risk.
<b>C</b>	<b>MEDIOCRE, REQUIRES ATTENTION:</b> The infrastructure is in fair to good condition, it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, with increasing vulnerability to risk.
<b>D</b>	<b>POOR, AT RISK:</b> The infrastructure is in poor to fair condition and mostly below standard, with many elements approaching the end of their service life. A large portion of it exhibits significant deterioration. Condition and capacity are of serious concern with strong risk to failure.
<b>F</b>	<b>FAILING/CRITICAL, UNFIT FOR PURPOSE:</b> The infrastructure is in unacceptable condition with widespread advanced signs of deterioration. Many of the components exhibit signs of imminent failure.

**SOURCE** American Society of Civil Engineers, *2017 Infrastructure Report Card*.

with many facilities approaching the end of their useful life. Among the sixteen categories, transit receives the lowest grade (D-minus), while rail receives the best (B). Aviation, dams, drinking water, inland waterways, levees, and roads all receive Ds.

To assess the condition of infrastructure in categories and ultimately assign a grade, ASCE formed the twenty-eight-member Committee on America's Infrastructure. It calculates grades using eight criteria:<sup>39</sup>

**CAPACITY** Capacity to meet current and future demands.

**CONDITION** Existing and near-future physical condition of the infrastructure.

**FUNDING** Current level of funding from all levels of government compared to the estimated funding needed.

**FUTURE NEED** Cost to improve the infrastructure and the ability of future funding will to address the need.

**OPERATION AND MAINTENANCE** Owners' ability to operate and maintain the infrastructure properly, and the infrastructure's compliance with government regulations.

**PUBLIC SAFETY** The extent to which the condition of the infrastructure jeopardizes public safety, and the consequences of failure.

**RESILIENCE** Infrastructure system's capability to prevent or protect against significant multihazard threats and incidents, and ability to quickly recover and reconstitute critical services with minimum consequences for public safety and health, the economy, and national security.

**INNOVATION** The implementation of new and innovative techniques, materials, technologies, and delivery methods to improve the infrastructure.

The committee applies the grading criteria and metrics to reports about specific types of infrastructure – such as aviation, dams, bridges, and railroads. Instead of relying on state data, which can be scarce, scattered, and inconsistent, ASCE uses for its analysis data from the US government and professional societies. Reports from the Federal Aviation Administration, Federal Highway Administration, Association of State Dam Safety Officials, Environmental Protection Agency, Federal Emergency Management Agency, and National Parks Service all appear in ASCE work.

Since its inception, the *Infrastructure Report Card* has increased in use and popularity. Several individuals, organizations, and agencies rely on it for insights into the condition of infrastructure in the nation as well as in individual states. The administrations of Presidents' Barack Obama and Donald Trump have referenced it, as have international, national, state, and local news outlets. ASCE's state-level reports equip national and state legislatures, professional associations, and local government associations to make the case for new investment in infrastructure, in addition to helping them better understand the current condition of their infrastructure and the costs of delaying investment.

In a study for the Pew Center on the States published in 2008, Katherine Barrett and Richard Greene (currently special project consultants to the Volcker Alliance) assessed the quality of management in state government.<sup>40</sup> In particular, states were assigned a grade, on a scale from A to D, in four fundamental areas of government management, including infrastructure.<sup>41</sup>

The study graded states less on the physical condition of infrastructure than on the way it is managed. According to the authors, an A-graded state should “have excellent statewide and agency planning, be a leader in performance auditing, have outcome data for almost all government functions, show substantial use of performance information by the executive branch and some use by the legislature,” and electronically communicate the state’s performance to citizens. In assigning grades, the authors used data from several sources, including an online survey and public documents such as budgets, capital and workforce plans, auditor reports, and websites. They also conducted interviews with legislators and their staffs, fiscal analysts, controllers, treasurers, budget officers and auditors, human resource and transportation officials, managers in charge of nontransportation infrastructure, and representatives of agencies and departments. The authors then considered these criteria:

- The state regularly conducts a thorough analysis of its infrastructure needs and has a transparent process for selecting infrastructure projects.
- The state has an effective process for monitoring infrastructure projects throughout their design and construction.
- The state maintains its infrastructure according to generally recognized engineering practices.
- The state comprehensively manages its infrastructure.
- The state creates effective intergovernmental and interstate infrastructure coordination networks.

Barrett and Greene’s final report gave the fifty states an average infrastructure score of B-minus. Utah (A) and Florida and Michigan (both A-minus) performed best, while Massachusetts and New Hampshire (both D-plus) performed the worst. According to the authors, Utah had a good idea of what its infrastructure required in the way of maintenance and budgeted 1.1 percent of the total replacement value of state-owned buildings every year. Conversely, New Hampshire’s underfunding and lack of clear priorities for buildings, bridges, and roads left the state with tough deferred maintenance problems and outdated infrastructure.

## **US Infrastructure Investment**

State and local governments are responsible for most investment in US infrastructure. Over the years, their responsibility has increased as federal infrastructure investment has decreased; recently state and local governments accounted for about 80 percent of public infrastructure investment.<sup>42</sup> Infrastructure spending as a share of GDP has declined in the US over the last

decades. In a 2014 report for the National Association of Manufacturers, Jeffrey Werling and Ronald Horst<sup>43</sup> estimated that total real infrastructure investment, including that in the public and private sectors, had decreased from nearly 4.5 percent of GDP in the late 1960s to about 1.5 percent in 2012. Real public infrastructure investment had fallen especially rapidly since 2003.<sup>44</sup> From 2003 to 2008, such investment fell by 4 percent annually because of high construction costs; after that and because of the Great Recession, it continued to fall by an average of 2 percent a year. Between 2009 and 2010, there was a slight increase due to the American Recovery and Reinvestment Act, which provided state and local governments with funds for infrastructure spending.

These results are similar to those presented by Elizabeth McNichol of the Center for Budget and Policy Priorities,<sup>45</sup> who showed that, between 2002 and 2016, capital spending as a share of GDP fell in the vast majority of states. The author also found that in most states, the portion of total expenditures devoted to capital projects was less than 15 percent in 2014. Only North Dakota (22.7 percent), South Dakota and the District of Columbia (each 16.7 percent), Wyoming (15.7 percent), and Alaska (17 percent) exceeded that threshold. Overall, capital spending varied across states based on size, population density, and the age of infrastructure.

## Methodology

We performed a document analysis of governors' capital budget proposals, capital bills, budget instructions, budgeting processes and time lines, capital improvement plans, and infrastructure programs for all states and the District of Columbia. The analysis includes only publicly available documents and other information. The analysis is divided into three main categories: capital budgeting processes, capital budgeting documentation, and infrastructure needs.

For the capital budgeting processes analysis, we primarily reviewed the budget process document, the budget instructions document, and legislature's websites. For the capital budget documentation, we examined the governor's proposed plan and bills related to capital projects, the budget instructions document, and the capital improvement plan. We later analyzed the CIP, as many states noted the importance of this document as a road map for capital infrastructure needs. Finally, we reviewed infrastructure needs reports and the disclosure of deferred maintenance in capital budgets and CIPs. Deferred maintenance is particularly important because of increased costs and risks in an aging infrastructure system.

Because regular maintenance activities are less visible than the construction of new



facilities, they are often postponed. The failure to keep up with maintenance has significant negative impacts on asset life, leading to higher future maintenance costs and threatening the safety and health of those using the facility.<sup>46</sup>

## FINDINGS

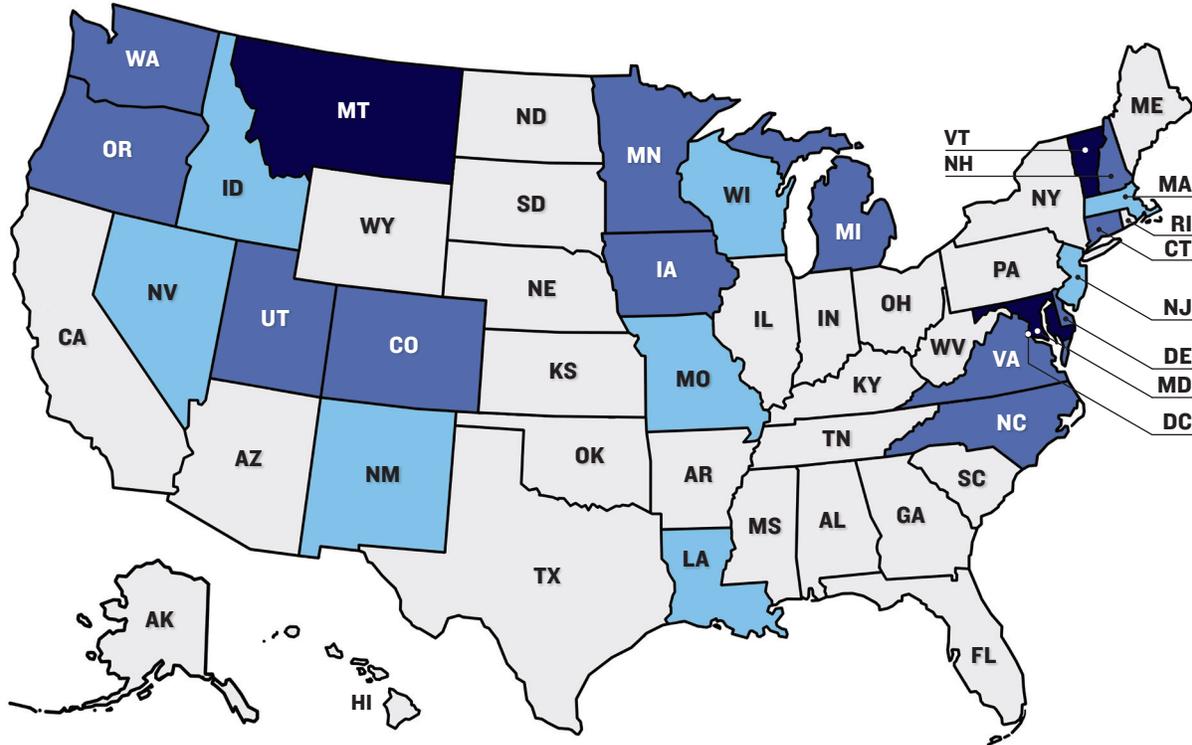
### Capital Budgeting Processes

We reviewed budgeting processes with the aim of assessing the level of separation between the capital and the operating budgeting processes. The budget cycle, which includes all the events in the budgeting and spending process, consists of four major phases: preparation, legislative consideration, execution, and audit and evaluation.<sup>47</sup> In this section, we consider the differences between capital and operating budgeting processes in terms of when these processes occur in budget cycles, the parties involved in their preparation, and legislative consideration (see figure 1).

Most of the literature does not distinguish between the timing for determining the operating and capital budgets but treats them as being decided simultaneously. We expand on the current literature by differentiating between the consideration of these two budget components. Budget cycles for the capital and operating budgets occur simultaneously in forty-eight states, with members of the legislature voting for the respective bills in the same legislative session. In the two exceptions, Minnesota and Ohio, budget cycles for the capital and the operating budgets are clearly separated. These states use a biennial budget, with the first year devoted to the operating budget and the second to the capital budget. Legislators vote for the operating and the capital bills in sessions held in alternating years.

Hillhouse and Howard<sup>48</sup> listed states according to where capital budget proposals were submitted: to the governor's operating budget staff, the governor directly, the legislature directly, or the governor and the legislature simultaneously. Ermasova,<sup>49</sup> meanwhile, presented a list of the agencies and committees responsible for preparing a capital budget. We expand the literature by looking at whether states have a governor's capital budgeting staff or a different agency that prepares the capital budget. In most states, the governor's budget office prepares the operating budget. Only eleven states clearly identify in their budget documents either an office or division dedicated to preparing the capital budget (see table 5). In Maryland, for instance, the Office of Capital Budgeting prepares the governor's annual capital budget.<sup>50</sup> In New Jersey, all departments requesting capital funding must submit their plan to the state Commission on Capital Budgeting and Planning, which includes representatives of the executive branch, the legislature, and the public.<sup>51</sup>

Most of the literature on the legislative consideration of the capital budget focuses on boards or committees that submit recommendations to the legislature that may be made in

**FIGURE I: Capital Budgeting Processes**
**Capital Budget Separation** ■ **Preparation and Consideration** ■ **Preparation** ■ **Consideration** ■ **Neither**

**SOURCE** Authors' research.

**TABLE 5: Office or Division for Capital Budget Preparation**

STATE	OFFICE OR DIVISION FOR CAPITAL BUDGET PREPARATION
Idaho	Permanent Building Fund Advisory Council, Division of Financial Management, and Legislative Services Office
Louisiana	Facility Planning and Control in the Division of Administration
Maryland	Office of Capital Budgeting in the Department of Budget and Management
Massachusetts	Division of Capital Asset Management and Maintenance in the Executive Office for Administration and Finance
Missouri	Division of Facilities Management, Design, and Construction in the Office of Administration
Montana	Architecture & Engineering Division of the Department of Administration
Nevada	State Public Works Division in the Department of Administration
New Jersey	New Jersey Commission on Capital Budgeting and Planning in the Office of Management and Budget
New Mexico	Capital Outlay Bureau in the Department of Finance and Administration
Vermont	Department of General Services
Wisconsin	Secretary of the State Building Commission

**SOURCE** Authors' research.

addition to the governor's proposal. In this paper, we examine the legislative committees or subcommittees that consider capital budget appropriations. In fifteen states, the capital budget is the responsibility of a single committee in each chamber of the legislature, either an appropriations panel or a subcommittee dedicated to capital projects; that committee or subcommittee is separate from the one that reviews operating budget appropriations (see table 6). In Michigan, for instance, the budget appropriation goes to the Appropriations Committee in each chamber,<sup>52</sup> and each committee has a Capital Outlay Subcommittee<sup>53</sup> to consider capital projects. In Washington, the House Capital Budget Committee oversees only the capital budget,<sup>54</sup> while the Senate Ways and Means Committee is responsible for both operating and capital budgets.<sup>55</sup>

### **Capital Budgeting Documentation**

To assess states' transparency in disclosing infrastructure needs, we examine key elements of the documentation and the information disclosed in it. We focus on the capital budget document, the disclosure of transportation expenses in capital budgets, and the use of a centralized capital improvement plan.

In its 2014 report, NASBO found that in thirty-two states the capital budget is distinct from the operating budget, while in eighteen states the capital budget is included in the operating budget.<sup>56</sup> In our study we expand the question by looking at those states that include the capital budget in the operating budget—particularly on how these states present the capital budget.

We find that thirty states and the District of Columbia have an individual document for the capital budget (see table 7). This document can be a proposal or a bill. All other states present their capital budget as part of the operating budget: Nine states clearly separate the capital and the operating budget in two different sections in the same document; four follow almost the same pattern but distinguish the capital and operating budgets as different subsections in accordance with the request of each department; and seven blur the boundary between capital and operating budgets. In these states, the capital budget is presented as a line item in the operating budget.

### **Is Transportation Spending Included in the Capital Budget?**

According to some studies, transportation expenditures are the major exclusion in the capital budget.<sup>57</sup> NASBO recently reported that nineteen states do not include capital expenditures

**TABLE 6: Committees for Legislative Consideration of Capital Budget**

STATE	COMMITTEE FOR LEGISLATIVE CONSIDERATION OF CAPITAL BUDGET
Colorado	Capital Development Committee (joint committee); forwards recommendations to Joint Budget Committee
Connecticut	Finance, Revenue, and Bonding Committee (joint committee)
Delaware	Joint Committee on Capital Improvement (Bond Committee)
Iowa	Senate Appropriation Committee, Transportation, Infrastructure, and Capital Appropriations Subcommittee House Appropriation Committee, Transportation, Infrastructure, and Capital Appropriations Subcommittee
Maryland	Senate Budget and Taxation Committee, Capital Budget Subcommittee House Appropriation Committee, Capital Budget Subcommittee
Michigan	Senate Appropriation Committee, Capital Outlay Subcommittee House Appropriation Committee, Capital Outlay Subcommittee
Minnesota	Senate Capital Investment Committee House Capital Investment Committee
Montana	Senate Finance and Claims, Long-Range Planning Subcommittee <sup>1</sup> House Appropriation Committee, Long-Range Planning Subcommittee <sup>1</sup>
New Hampshire	Senate Capital Budget Standing Committee House Public Works and Highways Standing Committee
North Carolina	House Appropriation Committee on Capital <sup>2</sup>
Oregon	Joint Committee on Ways and Means, Subcommittee on Capital Construction
Utah	Senate Appropriations Committee, Infrastructure and General Appropriations Subcommittee House Appropriations Committee, Infrastructure and General Appropriations Subcommittee
Vermont	Senate Committee on Institutions House Committee on Corrections and Institutions
Virginia	Senate Finance Committee, Capital Outlay and General Government Subcommittee House Appropriation Committee, General Government and Capital Outlay Subcommittee
Washington	House Capital Budget Committee <sup>3</sup> Senate Ways and Means Committee <sup>3</sup>

**SOURCE** Authors' research.

1) Joint subcommittee. 2) The Senate Appropriations/Base Budget Committee. 3) The Senate Ways and Means Committee consider both operating and capital budget bills.

**TABLE 7: Capital Budget Document**

CAPITAL BUDGET DOCUMENT	STATES
Individual capital budget	Alaska <sup>1</sup> , Arkansas <sup>1</sup> , Colorado <sup>1</sup> , Delaware <sup>1</sup> , District of Columbia <sup>1</sup> , Illinois <sup>1</sup> , Iowa <sup>1</sup> , Kansas <sup>1</sup> , Kentucky <sup>1</sup> , Louisiana, Maryland, Massachusetts <sup>1</sup> , Minnesota <sup>1</sup> , Missouri, Montana, Nebraska, Nevada, New Hampshire <sup>1</sup> , New Mexico <sup>1</sup> , New York <sup>1</sup> , Ohio, Oklahoma, Oregon, Pennsylvania <sup>1</sup> , Rhode Island <sup>1</sup> , South Carolina, Tennessee, Vermont, Washington, Wisconsin, Wyoming
Capital budget in the operating budget with some separation	<i>Separate section:</i> Arizona, Connecticut <sup>1</sup> , Idaho, Indiana, Michigan, Mississippi, North Carolina, North Dakota, Virginia  <i>Separate section under agency request:</i> Hawaii, New Jersey, Texas, Utah
Capital budget as an operating budget line item	Alabama, California, Florida, Georgia, Maine, South Dakota, West Virginia

**SOURCE** Authors' research.

1) Discloses transportation expenses in capital budget.

for transportation in their capital budgets, mainly because transportation revenues often come from dedicated sources like motor fuel taxes.<sup>58</sup> In this study, we look closely at information on transportation service expenses, which typically include expenditures on highways, local roads, and transit.

Almost half of the states with a CIP include in it the cost of transportation services. Ohio, Vermont, and Washington prepare independent transportation bills. The other states present transportation expenses in their operating budgets.

### **The Capital Improvement Plan**

While it is not a legally binding document, the CIP assesses capital needs using a multiyear planning horizon. The document typically comprises two parts: a capital budget and a capital program.<sup>59</sup> Usually, the first year or two of the CIP covers the capital budget. The remaining years are the capital program, which includes projects for which funding may not have been obtained.

According to NASBO, the CIP serves as a medium- or long-term roadmap for capital infrastructure requirements. In this document, states identify capital spending needs, the costs of planned projects, sources of financing, and the impact that planned projects will have on current and future operating budgets.<sup>60</sup> NASBO found that forty-two states and the District of Columbia maintain a multiyear CIP. We expand the literature by focusing on the disclosure of a centralized capital improvement plan. We define a centralized, multiyear CIP as a document that is unique to each state, issued by a central office, and includes requests from all state agencies. Such a document reflects an enhanced level of analysis and coordination by the budget office. It implies that the office is taking the time to analyze and gather all the data available to have an informed decision-making process about the state's capital projects.

We find that thirty-seven states and the District of Columbia use a CIP (see table 8). Eighteen states and the District of Columbia have a centralized CIP. In eighteen other states, the central budget office asks state agencies to submit a CIP through the budget instruction document, but a centralized document is not available. In most of these cases, the central budget office provides a link for each agency's CIP. The remaining fourteen states do not provide any information related to long-term capital planning. A few states, such as Massachusetts, publish a document that is called a multiyear report but that in fact presents information only for the current budget cycle.

We further concentrate on the states that have a centralized CIP. We focus on the number

**TABLE 8: Where Centralized Capital Improvement Plans Are Used**

STATE	CENTRALIZED CAPITAL IMPROVEMENT PLAN	NO CAPITAL IMPROVEMENT PLAN CONSOLIDATING INDIVIDUAL AGENCY PLANS	NEITHER
Alabama			✓
Alaska			✓
Arizona	✓		
Arkansas			✓
California	✓		
Colorado		✓	
Connecticut	✓		
Delaware		✓	
District of Columbia	✓		
Florida		✓	
Georgia			✓
Hawaii			✓
Idaho		✓	
Illinois			✓
Indiana			✓
Iowa	✓		
Kansas		✓	
Kentucky	✓		
Louisiana		✓	
Maine			✓
Maryland	✓		
Massachusetts			✓
Michigan		✓	
Minnesota		✓	
Mississippi		✓	
Missouri		✓	
Montana			✓
Nebraska	✓		
Nevada		✓	
New Hampshire		✓	
New Jersey	✓		
New Mexico	✓		
New York	✓		
North Carolina		✓	
North Dakota			✓
Ohio		✓	
Oklahoma	✓		
Oregon		✓	
Pennsylvania			✓
Rhode Island	✓		
South Carolina	✓		
South Dakota	✓		
Tennessee		✓	
Texas	✓		
Utah	✓		
Vermont	✓		
Virginia	✓		
Washington		✓	
West Virginia			✓
Wisconsin		✓	
Wyoming			✓

SOURCE Authors' research.

**TABLE 9: Centralized Capital Improvement Plan Details**

STATE	PERIOD	CONNECTION WITH CAPITAL BUDGET	COVERAGE	PRIORITIZATION SCHEMES	DISPLAYS FUNDS	DISPLAYS FINANCING SOURCES	FUNDING GAP
Arizona	2 years		Buildings only	✓	✓		✓
California <sup>1</sup>	5 years		Comprehensive		✓	✓	
Connecticut	5 years		Buildings only				
District of Columbia <sup>1</sup>	6 years	✓	Comprehensive		✓	✓	
Iowa	5 years		Limited				
Kentucky <sup>1</sup>	6 years		Limited		✓	✓	
Maryland	5 years	✓	Comprehensive		✓	✓	
Nebraska	6 years		Buildings only	✓	✓		
New Jersey	7 years	✓	Comprehensive		✓		✓
New Mexico	5 years		Limited				
New York <sup>1</sup>	5 years	✓	Comprehensive		✓	✓	
Oklahoma	8 years	✓	Limited	✓	✓	✓	
Rhode Island	5 years	✓	Comprehensive		✓	✓	
South Carolina	5 years		Limited		✓	✓	
South Dakota	5 years		Limited		✓		
Texas	5 years		Comprehensive		✓	✓	
Utah	5 years		Buildings only	✓	✓		
Vermont	10 years	✓	Limited		✓		✓
Virginia	6 years		Limited		✓	✓	✓

**SOURCE** Authors' research.

<sup>1</sup>) Financing sources include bond history.

of years covered by the centralized CIP, the connection between CIPs and capital budgets, the coverage of asset types, the availability of a scheme to prioritize capital projects, information about finance choices, and the provision of actual infrastructure needs (see table 9). More than 60 percent of centralized CIPs cover a five-year period, although the duration of plans can range from two to ten years. The asset coverage of the centralized CIP is limited in most states. As table 9 shows, we group states into three categories of asset coverage: buildings only, limited, and comprehensive. While building only refers to CIPs that include only structures, comprehensive refers to CIPs that contain all types of assets, including highways and roads. Limited includes states that exclude transportation assets or that include or exclude specific capital projects.

In CIPs with more comprehensive coverage, capital projects in transportation and education usually comprise a higher proportion of assets than other sectors. For instance, in Rhode Island's 2018–22 CIP, those two categories account for 67.5 percent of total recommended appropriations for future years.<sup>61</sup> In California, transportation service represents 91 percent of total proposed funding.<sup>62</sup> In most cases, states offer detailed explanations of their recommended appropriations for future years. South Dakota, Iowa, New Mexico, and Virginia CIPs contain only limited explanations, however.

Just a handful of states use a standardized method to prioritize capital projects. This typically includes a single agency or committee taking a lead role in project evaluation. Nebraska, for example, relies on its Comprehensive Capital Facilities Planning Committee to take charge of evaluating appropriations. The committee offers suggestions from three different perspectives: critical issues related to threat to human life and immediacy of the need; financial and economic goals related to operating cost savings and asset preservation; and values related to project significance, improved services, and mission relevance.<sup>63</sup>

While many CIPs fall short in terms of their scope, 84 percent provide details of revenue sources, including general funds, federal funds, and other specific funds. The CIPs of eleven states disclose the availability of financing sources, such as general obligation bonds, but only five of those states include their bond history.

Arizona, New Jersey, Vermont, and Virginia also indicate whether an infrastructure funding gap may exist. In all four states, the gap reflects the difference between the revenue available for appropriation and total requests from state departments. The planning of future capital projects, or at least the preparation of the CIP, is developed primarily by considering the amount of future revenues. Therefore, the information in CIPs allows us to observe a pattern of a revenue-oriented planning process in capital budgets. (Further information on which state agencies issue centralized CIPs can be found in appendix A.)

### **Disclosure of Infrastructure Needs**

Disclosure of infrastructure needs is limited. Several states refer to the capital improvement plan as the road map for planning, but the CIP usually considers only infrastructure needs that will be funded in the future. We define infrastructure needs as the sum of three components: deferred maintenance, operation and maintenance, and additional construction (see figure 2). These elements represent investments that would be needed for current and future capacity, as well as investments that have been deferred and accumulated over the years and

**FIGURE 2: Components of Infrastructure Needs**

INFRASTRUCTURE NEEDS				
DEFERRED MAINTENANCE		OPERATION & MAINTENANCE	ADDITIONAL CONSTRUCTION	
Deferred Maintenance Unfunded	Deferred Maintenance Appropriation	Operation and Maintenance Appropriation	Additional Construction Appropriation	Additional Capacity Unfunded
Gap		Capital Appropriation		Gap

SOURCE Authors' research.

that affect present and future investments. We find that capital budgeting documents consider all the needs in operations and maintenance but only a portion of those in additional construction and deferred maintenance—usually the portion that will be funded. The portion that is unfunded constitutes a gap in the data on infrastructure needs.

As many accounts of infrastructure needs refer to ASCE report cards, we looked at whether states themselves produce reports on their infrastructure needs. We searched documents providing comprehensive information for various infrastructure assets, along with their condition and any funding gaps.

We found that Tennessee, New Jersey, Michigan, and the District of Columbia have released information on infrastructure needs in centralized reports. Although most state governments do not publicly disclose estimates of their infrastructure needs, some non-governmental organizations (NGOs) and academic institutions produce reports in this area (see table 10).

The Tennessee Advisory Commission on Intergovernmental Relations (TACIR), for example, is tasked with compiling and maintaining an inventory of needed infrastructure as well as with presenting those needs and associated costs to the General Assembly during its regular legislative session. Created by statute in 1978, TACIR includes representatives from the executive and legislative branches and counties and municipalities, as well as the state comptroller. By law, TACIR issues an annual report on infrastructure needs covering a five-year period, including projects involving a capital cost of at least \$50,000. Information in the report come from data from the Tennessee Department of Transportation, capital budget requests submitted by state agencies, and state and local officials, although localities may provide only partial information or may decline to participate without penalty.<sup>64</sup>

According to TACIR's January 2018 report, the total estimated cost of needed infrastructure improvements in the state is about \$45 billion, with about two-thirds of this cost

**TABLE IO: Reports on Infrastructure Needs**

STATE	ISSUED BY	PERIOD	COVERAGE	ANNUAL AVERAGE TOTAL NEEDS (BILLIONS)	ANNUAL AVERAGE TOTAL GAP (BILLIONS)
Tennessee	State	5-year (2016–21)	6 sectors	\$9.0	\$6.0
District of Columbia	DC government	6-year (2018–23)	5 sectors	\$1.1	\$0.8
New Jersey	State	20-year (2000–20)	3 sectors	\$4.9	N/A
Michigan	State	20-year (2016–36)	4 sectors	N/A	\$3.0
Hawaii	University	5-year (2010–15)	5 sectors	\$2.9	N/A
Kentucky	NGO	20-year (2017–37)	12 sectors	N/A	N/A
Washington	NGO	20-year (2017–37)	11 sectors	\$9.5	N/A

**SOURCE** Authors' research.

**NOTES** N/A: Not available. NGO: Nongovernmental organization. Figures in 2018 dollars.

unfunded. The total amount includes projects in six categories<sup>65</sup> that will be completed during the five-year period of July 2016 to June 2021.<sup>66</sup>

In the District of Columbia, the Office of the Chief Financial Officer is required to develop an annual report on a replacement schedule for capital assets. The office's *Long-Range Capital Financial Plan Report* includes capital asset replacement needs beyond the normal six-year capital planning period. To determine total capital needs, the district completes a comprehensive review of governmental agencies' capital and asset maintenance requirements, and scores and ranks each project to ensure that the highest-priority projects were funded.

To analyze needs, the District of Columbia developed the capital asset replacement scheduling system (CARSS). It involved creating a centralized database of all district-owned assets and their condition to calculate maintenance and replacement costs.<sup>67</sup> For 2018–23, the district plans to fund \$6.7 billion in capital projects, about \$5 billion more than its financing capacity (amounting to an average primary capital needs gap of \$700 million a year, or 8 percent of the district's general fund). Of this gap, 52.5 percent corresponds to facilities (mainly elementary, middle, and high schools) and 36.8 percent to so-called horizontal infrastructure, principally repairs to streets.<sup>68</sup>

In a report last issued in 2000 and not updated since, the New Jersey State Planning Commission<sup>69</sup> compiled and summarized information provided by state agencies since the adoption of the first *Infrastructure Needs Assessment* in 1992. According to the 2000 report, the state's total needs for 2000–20 were \$65.5 billion (in constant 1999 dollars), of which \$45.8 billion corresponded to present needs<sup>70</sup> and \$19.7 billion to prospective ones.<sup>71</sup> These amounts included seventeen components of infrastructure in three categories: transporta-

tion and commerce (44 percent), health and environment (33 percent), and public safety and welfare (23 percent).

In 2016, the governor of Michigan created the 21st Century Infrastructure Commission to address infrastructure needs. It estimated that the state infrastructure investment gap over the next 20 years exceeded \$60 billion, with an annual investment deficit of almost \$4 billion. The commission concluded that the state had an annual gap of \$1 billion in water, \$2.7 billion in transportation, and almost \$70 million in communications infrastructure. The panel also advanced more than 100 recommendations to improve communications, energy, transportation, and water infrastructure. The advice revolved around four main subjects: asset management, coordinated planning, sustainable funding, and emerging technologies. Some of the recommendations were pilot-testing a regional infrastructure asset management process; instituting a database system; implementing a long-term strategy to address asset condition, needs, and priorities; and creating the Michigan Infrastructure Council to coordinate infrastructure-related goals.<sup>72</sup> The commission ceased operating in 2017, with its recommendations unfulfilled.<sup>73</sup>

In some states—including Hawaii, Kentucky, and Washington—NGOs rather than official bodies produce infrastructure needs reports. The Hawaii Institute for Public Affairs<sup>74</sup> consolidated in a report the state's projected infrastructure costs for fiscal 2010–15. It included projects in water and environment, transportation, public facilities, energy, and disaster resiliency, with data coming from an inventory survey of twenty governmental agencies. The institute found that a total of \$14.3 billion of infrastructure was planned for the six-year period, 53 percent of which was for new projects. Almost 55 percent of the total related to transportation projects.

The Kentucky Chamber of Commerce released a report in 2017 on the condition of infrastructure.<sup>75</sup> The report did not provide an exact total to cover needs but listed gaps of about \$2 billion in bridges, \$6.2 billion in drinking water facilities, and \$6.2 billion in wastewater assets.<sup>76</sup>

A 2017 report from the Association of Washington Business, the Association of Washington Cities, the Washington State Association of Counties, and the Washington Public Ports Association<sup>77</sup> presented the state's infrastructure needs and benefits. Data came from federal and state departments, cities, and the ASCE. The associations determined total infrastructure needs of about \$190 billion over twenty years, including \$134 billion for highways and roads, about \$13 billion for aviation, and \$5 billion each for ports, energy, water, wastewater, and bridges.

### Disclosure of Deferred Maintenance in Capital Budget Documents

In the literature, only the Volcker Alliance discusses the disclosure of deferred maintenance in budget documents. The Alliance<sup>78</sup> in 2017 reported that only two states, Alaska and California, estimated the costs of deferred infrastructure maintenance in their operating budget or equivalent documents; in 2018 it updated the total to include Hawaii and Tennessee.<sup>79</sup> We expand the field by looking at disclosure in capital budgets or supplemental documents and find that twenty-three states and the District of Columbia disclose some information about deferred maintenance (see table 11). We emphasize the definition of deferred maintenance in documents, coverage, estimation methods, and size of the total maintenance gap or appropriation.

States have similar definitions for deferred maintenance. At the national government level, the Federal Accounting Standards Advisory Board defines deferred maintenance as “maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period.”<sup>80</sup> In addition, it recognizes the use of two measurement methodologies: condition assessment surveys and life-cycle cost forecasts. Condition assessment surveys are periodic visual inspections of property, plants, and equipment to determine their condition and the estimated cost to correct deficiencies. Life-cycle costing is an acquisition or procurement technique that considers operating, maintenance, and other costs as well as the acquisition cost of assets.<sup>81</sup> State agencies use similar definitions but often add that deferred maintenance occurs because of lack of funds, other pressing expenses, and priority projects. In addition, the definition of deferred maintenance varies among states. We identify the three main variations as maintenance appropriation, maintenance gaps, or a combination of both:

**MAINTENANCE APPROPRIATION** The amount allocated or requested by an agency to fund maintenance that has been deferred in previous years.

**MAINTENANCE GAP** The maintenance need that has been deferred. This information is disclosed as a total (for example, the total deferred maintenance is estimated to be \$X million) or as a portion (this project will reduce deferred maintenance by \$X million) in which the total maintenance gap is unknown.

**COMBINATION OF BOTH** Deferred maintenance is defined as an appropriation and as a gap interchangeably throughout the document.

**TABLE II: How Deferred Maintenance Is Reported**

STATE	USAGE OF DEFERRED MAINTENANCE	DOCUMENT CONTAINING DEFERRED MAINTENANCE INFORMATION	PLACEMENT THROUGHOUT THE DOCUMENT	COVERAGE	CALCULATION	COORDINATION
Alaska	Maintenance Gap; Maintenance Appropriation	<i>Project Listing with Funding Detail (IIGI) Final Total SLA 2017</i>	Scattered	Limited <sup>1</sup>		
Arizona	Maintenance Gap	<i>ADDA Building System CIP FY2018</i>	Centralized	Limited <sup>1</sup>	✓	
Arkansas	Maintenance Appropriation	<i>Capital Projects Request for the 2017-19 Biennium</i>	Centralized	Limited		
California	Maintenance Gap; Maintenance Appropriation	<i>2017 California Five-Year Infrastructure Plan</i>	Centralized	Comprehensive		
Delaware	Maintenance Appropriation	<i>FY2019 Governor's Recommended Capital Budget</i>	Scattered	Limited <sup>1</sup>		
District of Columbia	Maintenance Gap	<i>FY2018-23 Long-Range Capital Financial Plan</i>	Centralized			
Hawaii	Maintenance Appropriation	<i>FY 2017-19 Executive Operating and Capital Budget, Appendix 5</i>	Centralized	Comprehensive		
Illinois	Maintenance Gap; Maintenance Appropriation	<i>Capital Budget FY 2019</i>	Centralized	Comprehensive		✓
Indiana	Maintenance Appropriation	<i>List of Appropriations Biennium 2017-19</i>	Scattered	Limited		
Iowa	Maintenance Appropriation	<i>Budget Report FY 2018-19</i>	Scattered	Limited		
Kentucky	Maintenance Appropriation	<i>2016-22 Statewide Capital Improvements Plan</i>	Scattered	Limited		
Louisiana	Maintenance Appropriation	<i>2018 House Bill No. 2</i>	Scattered	Limited <sup>2</sup>		
Maryland	Maintenance Gap	<i>Capital Budget Volume FY2019-23</i>	Scattered	Limited <sup>2</sup>		
Massachusetts	Maintenance Appropriation	<i>FY2018-22 Five-Year Capital Investment Plan</i>	Scattered	Limited		

**SOURCE** Authors' research.

**1)** Excludes transportation assets. **2)** Includes only universities and colleges.

**TABLE II: How Deferred Maintenance Is Reported**

STATE	USAGE OF DEFERRED MAINTENANCE	DOCUMENT CONTAINING DEFERRED MAINTENANCE INFORMATION	PLACEMENT THROUGHOUT THE DOCUMENT	COVERAGE	CALCULATION	COORDINATION
Minnesota	Maintenance Gap	2018 Governor's Capital Budget Recommendations	Scattered	Limited	✓	
Montana	Maintenance Appropriation	Governor's Executive Budget FY2018-2019, Long-Range Building Program	Scattered	Limited		
Nebraska	Maintenance Appropriation	Biennial Budget information, 2017-19 biennium	Scattered	Limited		✓
Nevada	Maintenance Appropriation	Executive Budget 2017-19	Scattered	Limited		
New Jersey	Maintenance Gap; Maintenance Appropriation	Fiscal 2018-24 Seven-Year Capital Improvement Plan	Scattered	Limited <sup>2</sup>		
North Dakota	Maintenance Gap	Legislative Appropriations 2017-19 Biennium	Scattered	Limited <sup>2</sup>		
Oregon	Maintenance Appropriation	Enrolled Senate Bill 5506 (2017)	Scattered	Limited		
Pennsylvania	Maintenance Appropriation	Senate Bill 651 (2017-18)	Scattered	Limited <sup>2</sup>		
South Carolina	Maintenance Appropriation	Executive Budget FY2017-18	Scattered	Limited		
Texas	Maintenance Appropriation	Sec. 17.14 in General Appropriations Act 2018-19 Biennium	Centralized	Limited		✓

**SOURCE** Authors' research.

1) Excludes transportation assets.

2) Includes only universities and colleges.

Only twenty-three states and the District of Columbia disclose information about deferred maintenance. Of these, fifteen states refer to deferred maintenance as “maintenance appropriation,” four refer to it as “maintenance gaps,” and four use the definitions interchangeably. Most of the information is available in the capital budget (such as a plan or bill) or CIP and is usually scattered throughout the document. Only six states and the District of Columbia provide centralized information about deferred maintenance.

The coverage of deferred maintenance is mostly limited. Coverage is related to the state

departments or agencies that issue information related to deferred maintenance and the quality of that information. We classify states to have comprehensive or limited coverage.

Comprehensive coverage means that most state departments or agencies issue deferred maintenance information and that this information relates not only to state-owned buildings but to other state assets, including transportation assets. In our analysis, California, Hawaii, and Illinois provide comprehensive coverage. The other states have limited coverage, as they disclose deferred maintenance only on state-owned buildings or do not include transportation assets. Louisiana, Maryland, New Jersey, North Dakota, and Pennsylvania provide information on deferred maintenance only for colleges and universities.

There is also a lack of information about how deferred maintenance estimates are arrived at. Of the twenty-three states that disclose information about deferred maintenance, only Minnesota and Arizona disclose their calculation methods. In Minnesota, the higher education system uses a facilities reinvestment and remodeling forecasting tool to maintain the system's projected backlog and renewal needs.<sup>82</sup> This tool is critical for estimating building needs and projected life expectancy as structures wear out and need replacement. Arizona uses a building renewal formula (BRF) that was approved by the legislature and follows the Sherman-Dergis Formula, developed at the University of Michigan in 1981, to model structures' upkeep and replacement costs. The BRF is used to determine the annual appropriation required for renewal for state administrative buildings.<sup>83</sup> It is expressed as

$$BRF = \frac{2/3 (BV) BA}{n}$$

where *BV* is the building value, *BA* is the building age, and *n* the life expectancy of the structure. According to the Arizona Department of Administration, the BRF reflects the current-year replacement value by updating the original construction cost using the Marshall & Swift Valuation Service's building cost index.<sup>84</sup> The state defines the deferred cost in a given year as

$$\text{Deferred cost} = BRF - \text{appropriation}$$

Based on this formula, the department reported \$532 million of deferred costs in 2010 dollars accumulated from 1988 to 2017.<sup>85</sup>

Only three states (Illinois, Nebraska, and Texas) have a central agency in charge of coordinating deferred maintenance information. In Illinois, the Capital Development Board is responsible for renovation and rehabilitation projects at more than 8,700 state buildings.<sup>86</sup> The board's 2019 report shows \$7.4 billion in deferred maintenance needs, with the Department of Corrections and the Department of Human Services accounting for 53.4 percent of

that sum. Nebraska's Task Force for Building Renewal addresses the state's sizable backlog of deferred building repairs and improvements. The task force evaluates, prioritizes, and allocates funds for requested deferred building renewal projects.<sup>87</sup> Its process typically includes a team of architectural, mechanical, and electrical professionals, and requires inspections of the highest-priority requests of the campus, institution, or agency. Such allocations may not exactly follow those priorities. In Texas, the Education Code requires the Higher Education Coordinating Board to collect information on deferred maintenance needs, including at public universities, colleges, and health care-related institutions.<sup>88</sup>

Many states appropriate less than 1 percent of annual expenditures to address deferred maintenance (see table 12). Only Illinois and Indiana appropriate more than 2 percent, while Hawaii, in contrast, appropriates close to 10 percent. But overall, the nation's total maintenance gap is unknown. Only California reports complete data on deferred maintenance, providing comprehensive asset coverage and the total maintenance gap. The governor's 2017 five-year infrastructure plan reports statewide deferred maintenance needs of \$78 billion, including for the Department of Transportation (72.9 percent), Department of Water Resources (16.6 percent), and the University of California (4.0 percent).<sup>89</sup>

Considering that the total maintenance gap as a share of California's expenditures is about 44 percent and assuming this share is similar across all states, the total state maintenance gap for the nation can be estimated at \$873 billion (with a general expenditure of \$1.98 trillion in the US for fiscal 2017<sup>90</sup>). This amount, combined with a federal maintenance gap of \$170 billion,<sup>91</sup> produces a national total deferred maintenance cost of more than \$1 trillion. The amount is almost three times the value of all state and local investment nonresidential fixed assets in 2018<sup>92</sup> and is equivalent to 4.2 percent of US gross domestic product.

The estimated size of the gap and inconsistency of reporting methods cry out for the adoption of common standards for the disclosure of deferred maintenance. The Governmental Accounting Standards Board (GASB), which recommends financial reporting practices for states and localities, has provided a single standard for disclosure of deferred maintenance costs.<sup>93</sup>

Through its Statement 34, GASB requires capital assets to be reported in the statement of net assets included in state and local governments' comprehensive annual financial reports.<sup>94</sup> This statement allows governments to report on their assets by using either the depreciation method or the so-called modified approach.<sup>95</sup> With the former approach, states can report how much of the estimated original cost of the asset has been lost during its estimated useful life. With the latter, states can report the cost of maintaining the asset throughout the year.

**TABLE 12: Deferred Maintenance as a Percentage of Annual Expenditures**

STATE	PERIOD	TOTAL MAINTENANCE GAP <sup>1</sup>	TOTAL MAINTENANCE APPROPRIATION <sup>1</sup>
Alaska <sup>2</sup>	2018	18.24%	0.19%
Arizona	2017	0.31%	0.34%
Arkansas	2017-19	N/A	0.20%
California	2016-17	43.87%	0.46%
Delaware	2018	N/A	0.21%
District of Columbia	2017	3.62%	N/A
Hawaii	2018-19	N/A	9.95%
Illinois	2019	8.22%	0.53%
Indiana	2018-19	N/A	2.31%
Iowa	2019	N/A	0.04%
Kentucky	2019	N/A	0.04%
Louisiana <sup>3</sup>	2018	N/A	0.10%
Maryland <sup>3</sup>	2019	2.33%	N/A
Massachusetts	2018	N/A	0.09%
Minnesota	2018	2.11%	N/A
Montana	2018-19	N/A	0.15%
Nebraska	2017-18	N/A	0.28%
Nevada	2018	N/A	0.02%
New Jersey <sup>3</sup>	2018	0.34%	0.13%
North Dakota <sup>3</sup>	2018-19	0.25%	N/A
Oregon	2017	N/A	0.05%
Pennsylvania <sup>3</sup>	2018	N/A	0.38%
South Carolina	2018	N/A	0.00%
Texas	2018-19	N/A	0.21%

**SOURCE** Authors' research.

1) Deferred maintenance gaps and appropriations as percentages of combined operating budget and capital budgets.

2) Excluding transportation assets.

3) Includes only universities and colleges.

**NOTE** N/A: Not available.

Adopting the modified method as the sole option would set a standard for calculating and managing deferred maintenance.

Such a systematic approach should at a minimum meet the following requirements: 1) have an inventory of eligible assets; 2) document the condition of those assets; 3) demonstrate that assets are being preserved at a predetermined level; and 4) estimate the actual cost to



maintain and preserve the assets.<sup>96</sup> If a state does not appropriate enough funds to meet the cost of maintaining its assets in a fiscal year, the gap becomes the deferred maintenance. Most states disclose depreciation in their comprehensive annual financial reports, but the reported information may not reflect the real cost of maintenance and, therefore, maintenance that is being deferred.<sup>97</sup>

## CALL TO ACTION: Ten Steps Toward Better Disclosure

BASED ON OUR IDENTIFICATION of best practices among states as well as the Volcker Alliance's research findings, in this section we identify ten steps that states should take to promote fiscal transparency in the process of capital budgeting. Adoption of these measures will help set common standards; improve asset management; make information consistent, updated, and available; and contribute to having a better-informed decision-making process regarding capital projects. The recommended actions are organized into three groups: capital budgeting processes, capital budgeting documentation, and infrastructure needs disclosure.

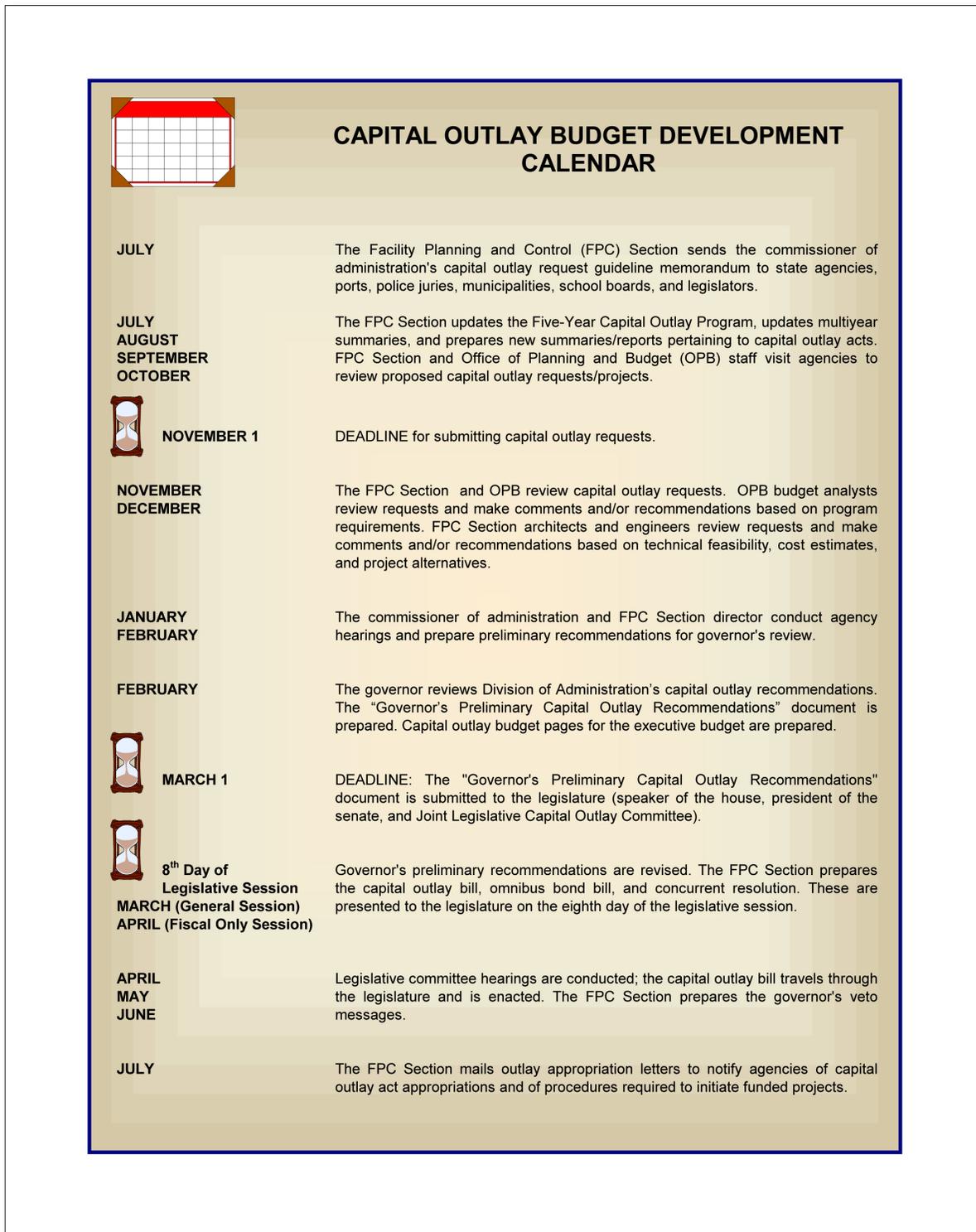
### Capital Budgeting Processes

**1. Present the capital budgeting process graphically.** Most states provide a diagram explaining the steps in the budget process, their timing, and the agency in charge of every step. But these diagrams commonly depict only the operating budget. States should also produce a diagram with the capital budget process, explaining the steps, their timing, and the agency in charge of each step, and explain how capital and operating budgets are related. Some states, including Texas, Maryland, and Louisiana, have already implemented this practice (see figures 3 and 4). Displaying the process for the capital budget will facilitate the public understanding of the budgeting process.

**2. Designate an agency in charge of preparing the statewide capital budget.** This agency could be different than the one in charge of preparing the operating budget, as is the case in Nevada, or a separate office or division within the agency that prepares the operating budget, as in Maryland and New Mexico. States should clearly display this information in their capital budgeting documents. In addition, states should include explanations regarding the coordination between divisions or agencies in charge of the capital and operating budget preparation. This practice will help guarantee the independence of the capital budget from other processes inside the state agencies and allow for greater transparency.

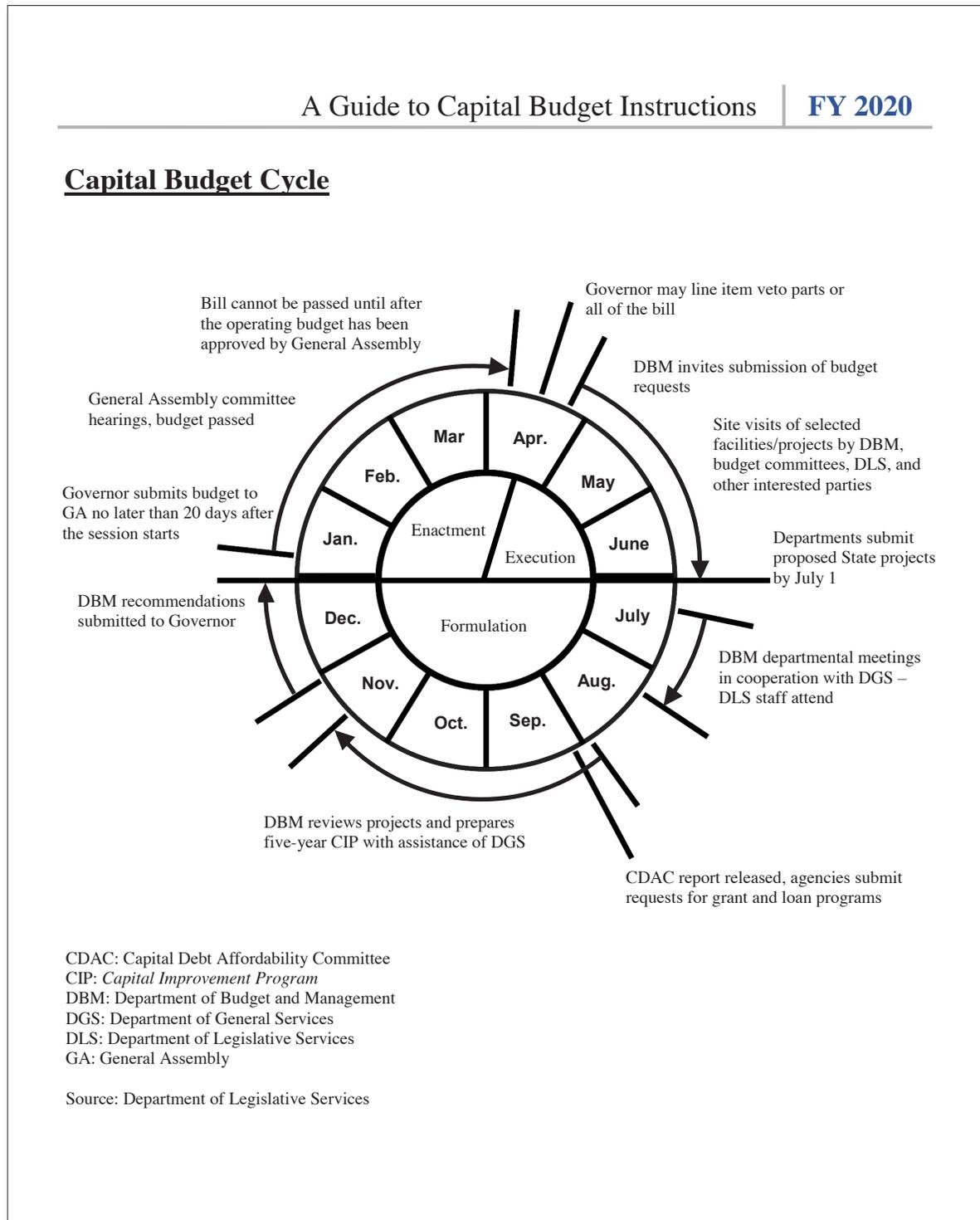
**3. Designate a legislative committee to oversee the capital budget.** States should designate a legislative committee to oversee budgets for capital projects. This committee could be different than the one in charge of operating budget appropriations—the rule in Minnesota and New Hampshire—or a separate subcommittee of the appropriations committee, as in Michigan and Virginia. States should clearly display this information in their capital budgeting documents. In addition, they should include explanations about the coordination between this

FIGURE 3: Louisiana's Capital Budget Process



SOURCE Louisiana Division of Administration, Office of Planning and Budget, [https://www.doa.la.gov/opb/pub/MW\\_Capital%20Outlay.pdf](https://www.doa.la.gov/opb/pub/MW_Capital%20Outlay.pdf).

FIGURE 4: Maryland's capital budget process



SOURCE State of Maryland, *Guide to Capital Budget Instructions, FY2020*, <https://dbm.maryland.gov/budget/Documents/capbudget/Instructions/FY2020CapitalBudgetInstructions.pdf>.

committee or subcommittee and the one in charge of the operating budget. This practice will contribute to identifying institutional responsibilities and thus increase accountability and transparency for the public.

### **Capital Budgeting Documentation**

**4. Separate the capital budget from the operating budget.** Some states display the capital budget as a line item in the operating budget. This practice fails to give enough importance to capital budgeting, as it does not provide enough detail about capital projects to be funded during a fiscal year. States should present the capital budget either as a separate document or separate section of the operating budget. In addition, there should be clear explanation of the coordination between the capital and operating budgets. The separation of the capital and the operating budgets will contribute to enhanced public engagement on management of capital assets.

**5. Describe asset coverage and display capital budget–related documents in one place online.** States should provide descriptions of the assets covered in their capital budgeting documentation. Such asset coverage should be consistent across all capital budget–related documents, such as the capital budget and the capital improvement plan. The descriptions should include a definition of capital expenditures—citing the state constitution, statutes, or other documents—and capital expenditures by program area. This will help standardize capital project information among documents and facilitate coordination among agencies. To improve public understanding, states should also display on one website all capital budgeting–related documents from the legislature and executive branch or other agency in charge of preparing the capital budget. At minimum, the website should include links to all pertinent capital budget documentation.

**6. Standardize the Capital Improvement Plan.** States should follow the examples set by California and Maryland by providing a more comprehensive and standardized format for CIPs that comprises a presentation of all capital projects needed for the period under review—including those that will not receive funding—as well as annual appropriations to address deferred maintenance. Other components should include a comprehensive justification for all capital projects needed (some states provide only tables, with no explanation about the need for future projects); estimates of total future expenditures (some states provide future expenditures for various years but not subtotals or totals, which makes it difficult to understand and quantify the funding available and the gaps for future projects); and funding as well as financing sources.

**7. Connect the capital budget and the capital improvement plan.** The CIP should inform capital budgets for future fiscal years. States should connect the capital budget and the CIP either by displaying present and future capital plans in the same document or by having two documents and explaining the connection between them. In either case, the asset coverage should be consistent and the information about the assets comprehensive. This connection will contribute to enhancing short- and long-term strategies for capital asset management.

### **Disclosure of Infrastructure Needs**

**8. Develop a centralized statewide asset inventory.** States should emulate the examples of Tennessee and the District of Columbia and develop a centralized statewide asset inventory and update it regularly. Such an inventory—creation of which has been proposed recently by California's treasurer and Michigan's 21st Century Infrastructure Commission—should comprise all state-owned assets, as well as all the assets totally or substantially funded by state revenues, such as buildings, transportation assets, and assets owned by state authorities. It should contain information regarding the assets' condition and accumulated deferred maintenance costs, provide estimates of the cost to maintain assets or bring them to good condition, and establish the definition of *good condition*.

**9. Produce a statewide report on infrastructure needs.** States should develop a report on infrastructure needs that includes accumulated deferred maintenance and additional capacity, as well as details on how to calculate infrastructure needs and deferred maintenance. The report should be updated regularly, and the asset coverage should be comprehensive and consistent with all capital budgeting documents. This practice will contribute to setting standards for estimating and disclosing information of infrastructure needs and deferred maintenance. Better disclosure of infrastructure needs, including deferred maintenance costs and gaps, will improve decision-making regarding appropriations and contribute to reducing maintenance backlogs.

**10. Create an agency to address infrastructure needs.** Each state should consider establishing a coordination agency to address the critical condition of America's infrastructure. This agency should work side by side with the state's budget office and take responsibility for creating an asset inventory; assessing asset conditions; setting criteria for prioritizing projects; developing reports on infrastructure needs and gaps; and giving recommendations to the executive and legislative branches regarding appropriations to improve and maintain statewide infrastructure. The Tennessee Advisory Commission on Intergovernmental Relations and



the Office of the Chief Financial Office in Washington, DC, currently take on some of these responsibilities to assist in capital infrastructure planning. (For more information on these agencies, see appendix B.)

## CONCLUSION: Turning Best Practices into Infrastructure Policy

CONSIDERING THE POOR CONDITION of America's infrastructure, the nation's trillion-dollar deferred maintenance deficit and the dominant role that states play in financing construction and maintenance, states need to give high priority to improving how they identify and disclose their infrastructure needs. Table 13 presents a summary of best practices that states may wish to adopt in the areas of capital budgeting processes, documentation, and disclosure of infrastructure needs. The table assesses the feasibility of implementing each practice, taking into consideration the additional costs associated with implementation.

Practices we deem to have high administrative feasibility are easy to implement because information is already available and needs only to be incorporated in budget-related documents. These practices should be regarded as a first step toward adopting additional reforms. Practices we identify as having low administrative feasibility should not be ignored, however. While adopting them may require creating information sets or hiring specialized personnel to perform a new function, they are still useful for helping policymakers identify critical infrastructure needs and determine their cost.

**TABLE 13: Implementing Best Practices**

CAPITAL BUDGETING	PROCEDURE	FEASIBILITY	PRIORITY
<b>Capital Budgeting Processes</b>	Display the processes for the capital budget	High	High
	Designate an agency in charge of preparing the capital budget	Medium	Medium
	Designate a committee in the legislature to oversee the capital budget	High	Medium
<b>Capital Budgeting Documentation</b>	Separate the capital budget from the operating budget	High	Medium
	Describe asset coverage and display capital budget-related documents in one place online	High	High
	Standardize the capital improvement plan	Low	Medium
	Connect the capital budget and the capital improvement plan	Medium	Medium
<b>Disclosing Infrastructure Needs</b>	Develop a statewide asset inventory	Low	High
	Develop a statewide report on infrastructure needs	Low	Medium
	Create an agency or commission to address infrastructure needs	Low	Medium

**SOURCE** Authors' research.

## APPENDIX A: States that Post Centralized Capital Improvement Plans

STATE	AGENCY	DOCUMENT	URL
Arizona	Arizona Department of Administration	<i>ADOA Building System CIP</i>	<a href="https://gsd.az.gov/sites/default/files/ADOA%20Capital%20Improvement%20Plan%20FY2018.pdf">https://gsd.az.gov/sites/default/files/ADOA%20Capital%20Improvement%20Plan%20FY2018.pdf</a>
California	Governor's Office	<i>Infrastructure Plan</i>	<a href="http://www.ebudget.ca.gov/2017-Infrastructure-Plan.pdf">http://www.ebudget.ca.gov/2017-Infrastructure-Plan.pdf</a>
Connecticut	Office of Policy and Management	<i>State Facility Plan</i>	<a href="http://www.ct.gov/opm/lib/opm/assets/state_facility_plans/state_facility_plan_2017_to_2022.pdf">http://www.ct.gov/opm/lib/opm/assets/state_facility_plans/state_facility_plan_2017_to_2022.pdf</a>
District of Columbia	Government of the District of Columbia	<i>Proposed Budget and Financial Plan</i>	<a href="https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachments/DCOCFO_Volume_6_web.pdf">https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachments/DCOCFO_Volume_6_web.pdf</a>
Iowa	Department of Management	<i>Infrastructure Five Year Plan</i>	<a href="https://www.legis.iowa.gov/docs/publications/SD/852566.pdf">https://www.legis.iowa.gov/docs/publications/SD/852566.pdf</a>
Kentucky	Capital Planning Advisory Board of the Kentucky General Assembly; Legislative Research Commission	<i>Statewide CIP</i>	<a href="https://apps.legislature.ky.gov/moreinfo/cpab/O16-22syp/2016-2022completeplan.pdf">https://apps.legislature.ky.gov/moreinfo/cpab/O16-22syp/2016-2022completeplan.pdf</a>
Maryland	Department of Budget and Management	<i>Capital Budget Volume</i>	<a href="https://dbm.maryland.gov/budget/Documents/capbudget/FY2019CapitalBudgetBook.pdf">https://dbm.maryland.gov/budget/Documents/capbudget/FY2019CapitalBudgetBook.pdf</a>
Nebraska	State Comprehensive Facilities Planning Committee and the Administrative Services/ State Building Division	<i>Comprehensive Capital Facilities 6-year Plan</i>	<a href="http://das.nebraska.gov/building/capitalplanning.html">http://das.nebraska.gov/building/capitalplanning.html</a>
New Jersey	Commission on Capital Budgeting and Planning	<i>Seven Year CIP</i>	<a href="https://state.nj.us/treasury/omb/publications/20capital/CIP2020.pdf">https://state.nj.us/treasury/omb/publications/20capital/CIP2020.pdf</a>
New Mexico	Department of Finance and Administration	<i>Local Infrastructure CIP</i>	<a href="http://www.nmdfa.state.nm.us/Capital_Outlay_Bureau.aspx">http://www.nmdfa.state.nm.us/Capital_Outlay_Bureau.aspx</a>
New York	New York State Division of the Budget	<i>Capital Program and Financing Plan</i>	<a href="https://www.budget.ny.gov/pubs/archive/fy18archive/enactedfy18/FY2018EnactedCPFP.pdf">https://www.budget.ny.gov/pubs/archive/fy18archive/enactedfy18/FY2018EnactedCPFP.pdf</a>
Oklahoma	Long-Range Capital Planning Commission	<i>CIP and Capital Budget</i>	<a href="https://apps.ok.gov/dcs/searchdocs/app/manage_documents.php?id=1396">https://apps.ok.gov/dcs/searchdocs/app/manage_documents.php?id=1396</a>
Rhode Island	Office of Management and Budget	<i>Capital Budget and CIP</i>	<a href="http://www.omb.ri.gov/documents/Prior%20Year%20Budgets/Operating%20Budget%202018/2_FY%202018%20-%202022%20Capital%20Budget.pdf">http://www.omb.ri.gov/documents/Prior%20Year%20Budgets/Operating%20Budget%202018/2_FY%202018%20-%202022%20Capital%20Budget.pdf</a>
South Carolina	Executive Budget Office	<i>Comprehensive Permanent Improvement Plan</i>	<a href="https://www.admin.sc.gov/budget/cpip">https://www.admin.sc.gov/budget/cpip</a>
South Dakota	Bureau of Finance and Management	<i>Capital Expenditure Plan</i>	<a href="https://bfm.sd.gov/lftp/cp_2019.pdf#view=fit">https://bfm.sd.gov/lftp/cp_2019.pdf#view=fit</a>
Texas	Texas Bond Review Board	<i>Capital Expenditure Plan</i>	<a href="http://www.brb.state.tx.us/programs_capital_planning.aspx">http://www.brb.state.tx.us/programs_capital_planning.aspx</a>
Utah	Utah State Building Board	<i>Five-Year Building Program</i>	<a href="https://das.utah.gov/wp-content/uploads/2018-Building-Board-Five-Year-Plan.pdf">https://das.utah.gov/wp-content/uploads/2018-Building-Board-Five-Year-Plan.pdf</a>
Vermont	Department of Finance and Management	<i>Capital Construction Proposal</i>	<a href="https://ljfo.vermont.gov/assets/docs/capital_bill/bdaa6f5652/Capital-Bill-FY-18-and-19-1-24-2017.pdf">https://ljfo.vermont.gov/assets/docs/capital_bill/bdaa6f5652/Capital-Bill-FY-18-and-19-1-24-2017.pdf</a>
Virginia	Department of Planning and Budget	<i>Agency Capital Budget Requests</i>	<a href="http://publicreports.dpb.virginia.gov/rdPage.aspx?rdReport=MC_ag_CapitalSummary">http://publicreports.dpb.virginia.gov/rdPage.aspx?rdReport=MC_ag_CapitalSummary</a>

SOURCE Authors' research.

## **APPENDIX B: Agencies Addressing Infrastructure Needs**

### **District of Columbia Office of the Chief Financial Officer**

The position of the chief financial officer (CFO) was created through the District of Columbia Financial Responsibility and Management Assistance Act of 1995 (Public Law 104-8, 109 Stat. 142). The CFO has direct control over daily financial operations of each district agency and is independent of the mayor's office. The CFO's independence and authority were reasserted through the 2005 District of Columbia Omnibus Authorization Act (Public Law 109-356, 120 Stat. 2019). The CFO, who has considerable power in enforcing strict guidelines for capital asset evaluation and management, is nominated by the mayor and approved by the DC Council; the nomination is then transmitted to the US Congress for review.<sup>98</sup> The CFO manages the district's financial operations, which include the staff in tax and revenue administration; the treasury, comptroller, and budget offices; economic and fiscal analysis and revenue estimation; agency financial operations; and the DC Lottery.

### **Tennessee Advisory Commission on Intergovernmental Relations**

The Tennessee Advisory Commission on Intergovernmental Relations (TACIR) was created by Chapter 939 of the Public Acts of 1978 to fill a need for a permanent intergovernmental body to study and act on questions of organizational patterns, powers, functions, and relationships among all levels of government – federal, state, and local. The commission consists of public officials from state and local government and private citizens. Twenty-two of its twenty-five members are appointed to four-year terms, while three are statutory members.<sup>99</sup> Statutory members are the chairs of the House and Senate Finance, Ways and Means Committees, as well as the Comptroller of the Treasury.

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**97.** Depreciation reported in the comprehensive annual financial report could be mathematical rather than physical estimates and may not be comparable from state to state because of different accounting treatments. More research would be needed in this matter.

**98.** Information from a conversation between William Glasgall and Jeff DeWitt.

**99.** The members include four state senators and four State Representatives appointed by the speaker of each chamber of the TN General Assembly, four elected county officials, one official nominated by the County Officials Association of Tennessee, four elected city officials, one development district nominee, two private citizens, and two executive branch officials.

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