



Testimony

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INFRASTRUCTURE

Funding Trends and  
Federal Agencies'  
Investment Estimates

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G A O

Accountability \* Integrity \* Reliability

Mr. Chairman and Members of the Subcommittee:

A sound public infrastructure plays a vital role in encouraging a more productive and competitive national economy and meeting public demands for safety, health, and improved quality of life. In addition, public office buildings, courthouses, and other facilities support noneconomic goals and allow federal agencies to carry out their missions. When problems occur with the performance of infrastructure, they can be very visible, and their effects can be widespread. For example, traffic congestion in the nation's 50 most populous urban areas is estimated to cost over \$39 billion a year in time and wasted fuel.

I am here today to discuss the federal government's role in ensuring a sound public infrastructure and the estimates of future investment requirements developed by seven federal agencies: the Appalachian Regional Commission (ARC), Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), General Services Administration (GSA), and U.S. Army Corps of Engineers.<sup>1</sup> My testimony will focus on the major areas of public infrastructure covered by these seven agencies<sup>2</sup> and the federal government's role and funding trends regarding civilian infrastructure.

In summary, we found:

- The federal government exerts an important influence on infrastructure investment and development. The federal government's influence can be seen in several ways, including acquiring and maintaining various federally-owned assets, providing funding for infrastructure that is owned and operated by others, and influencing the way infrastructure projects are designed and built through legislation and regulations.

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<sup>1</sup> This testimony is based on our recent work in the area of infrastructure investment trends and investment estimates. See *U.S. Infrastructure: Agencies' Approaches to Developing Investment Estimates Vary* (GAO-01-835, July 20, 2001) and *U.S. Infrastructure: Funding Trends and Opportunities to Improve Investment Decisions* (GAO/RCED/AIMD-00-35, Feb. 7, 2000).

<sup>2</sup> The seven agencies develop infrastructure estimates for highways (ARC and FHWA), water supply and wastewater treatment (EPA), airports (FAA), mass transit (FTA), public buildings (GSA), and water resources and hydropower (Army Corps).

The federal government has spent an average of about \$59 billion annually since the 1980s on the nation's civilian infrastructure. This spending showed a slightly upward trend through the 1990s. Similarly, spending by state and local governments continued an upward trend that began in the 1980s and exceeded federal spending in certain areas.

- The seven agencies we reviewed each estimated billions of dollars for future investment in infrastructure. The estimates focused on investment in the areas of water resources, hydropower, water supply, wastewater treatment, airports, highways, mass transit, and public buildings. The estimates ranged from GSA's calculation of \$4.58 billion (in current dollars)<sup>3</sup> to repair public buildings over the next 5 years to FHWA's estimate of \$83.4 billion (in constant 1997 dollars)<sup>4</sup> per year over 20 years to improve highways. Certain estimates, such as those prepared by the Army Corps (for water resources and hydropower) and GSA, are for federal spending; other estimates involve all levels of government and the private sector.
- Some perspective is called for in reviewing the investment estimates developed by the seven agencies. While these estimates encompass major areas of public infrastructure, they cannot be easily compared or simply "added up" to produce a national estimate of infrastructure investment needs because, for example, they were developed using different methods and were for different time periods. In addition, the seven agencies all had procedures for developing investment estimates that reflect some practices used by leading private sector and government organizations, although some agencies followed more practices than other agencies. Nonetheless, following the leading practices does not ensure a quality investment estimate and each estimate had limitations associated with the quality of the data used in developing it. Furthermore, some of these investment estimates span several decades and investment needs can change significantly over time due to changes in the efficiency of delivering infrastructure services or pricing strategies that alter the demand for services. Finally, these estimates mostly focus on the condition of infrastructure rather than the desired outcomes (e.g., less traffic congestion) that can

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<sup>3</sup> "Current dollar" is the dollar value of a good or service expressed in terms of prices current at the time the good or service is sold.

be expected from additional infrastructure investments. We caution against relying on estimates of need that are based primarily on the condition of existing infrastructure if desired outcomes are not clearly articulated and the costs and benefits of alternative approaches (such as using strategies to manage demand rather than building new infrastructure) for achieving those outcomes are not fully considered.

We did not independently verify the seven agencies' investment estimates, but we did rely on past reviews of these data by us and others that examined the soundness and completeness of the methodology and/or data used to develop the estimates. We reviewed agencies' documentation of their procedures to develop the estimates, but we did not verify whether these procedures were followed. In addition, we compared agencies' procedures with some of the capital decisionmaking practices used by leading government and private sector organizations that we identified and reported on in 1998.<sup>5</sup> Those leading practices are identified in appendix I.

### **The Federal Role in Civilian Infrastructure Investment and Development and Trends of Government Spending**

While most spending on civilian infrastructure takes place at the state, local, or private-sector level, the federal government exerts an important influence on infrastructure investment and development in several ways. First, the federal government is directly responsible for acquiring and maintaining various federally-owned assets. These include, for example, federal office buildings, dams and flood control structures, and the nation's air traffic control system. The Congress directly appropriates the funding for such infrastructure. Second, the federal government provides funding—such as grants, loans, or loan guarantees—for infrastructure that is owned and operated by others such as mass transit systems and municipal water supply systems. In these cases, federal funds cover a portion of the capital development and improvements required. For example, the Department of Transportation provides states, localities, and others with grants that

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<sup>4</sup> "Constant dollar" is a dollar value adjusted for changes in the average price level (i.e., adjusted for inflation) for a base year.

<sup>5</sup> *Executive Guide: Leading Practices in Capital Decision-Making* (GAO/AIMD-99-32, Dec. 1998).

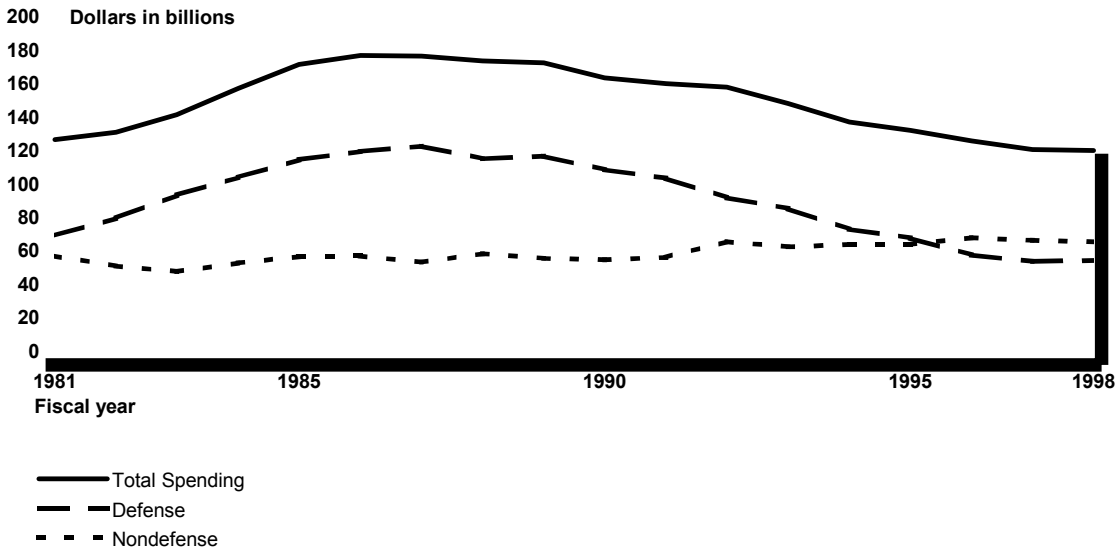
partially fund the construction and improvement of urban and rural highways and bridges, including major maintenance of interstate highways; the states generally provide a 20-percent match for these funds and determine how to spend the money within broad federal guidelines. Third, the federal government influences infrastructure investment through tax incentives. For example, the interest on municipal bonds, which are primarily used for infrastructure purposes, is exempt from federal taxes. Finally, federal legislation and regulation influence both the need for and the way infrastructure projects are designed and built. For example, meeting safe drinking water standards may often require the construction or modification of local water systems.

The federal government has spent an average of \$150 billion (in constant 2000 dollars) annually since the early 1980s for civilian and defense infrastructure. Of this amount, about \$59 billion was spent annually for spending on civilian infrastructure.<sup>6</sup> As figure 1 shows, federal spending for civilian infrastructure showed a slightly upward trend through the 1990s.

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<sup>6</sup> We used information from OMB's budget database to analyze actual federal infrastructure outlays (spending) for fiscal years 1981 through 1998, using a broad definition for infrastructure spending that included the physical structure and facilities that are intended to enhance the private sector's long-term productivity, as well as spending for physical capital designed to achieve federal agencies' goals or improve the government's efficiency. OMB's budget database does not contain state and local spending for infrastructure. See *U.S. Infrastructure: Funding Trends and Opportunities to Improve Investment Decisions* (GAO/RCED/AIMD-00-35, Feb. 7, 2000).

Figure 1: Federal Spending on Infrastructure in 2000 Dollars, Fiscal Years 1981 Through 1998

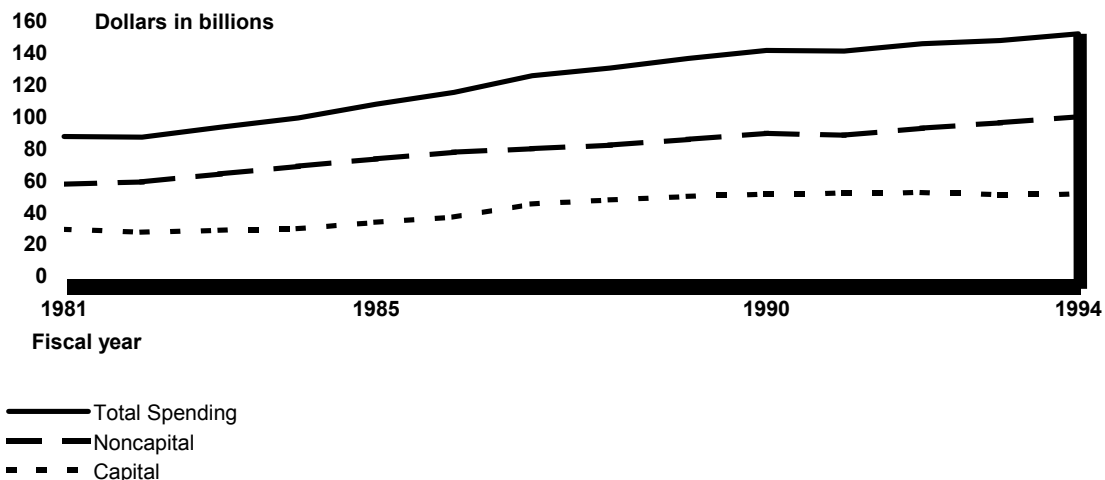


Source: GAO's analysis of OMB's data.

Similarly, as figure 2 shows, spending by state and local governments continued an upward trend after netting out inflation that began in the 1980s and exceeded federal spending in certain infrastructure areas. A 1999 Congressional Budget Office (CBO) study reported that state and local spending for transportation and water resources, supply, and treatment rose from over \$88 billion (in 2000 dollars) in fiscal year 1981 to \$152 billion in fiscal year 1994.<sup>7</sup>

<sup>7</sup> See *Trends in Public Infrastructure Spending*, Congressional Budget Office (May 1999). CBO defined infrastructure to include spending for highway, mass transit, rail, aviation, water transportation, water resources, water supply, and wastewater treatment. State and local spending excludes federal grants and loans.

**Figure 2: State and Local Spending for Selected Infrastructure Areas in 2000 Dollars, Fiscal Years 1981 through 1994**



Note: The selected infrastructure areas are highways, mass transit, rail, aviation, water transportation, water resources, water supply, and wastewater treatment. State and local spending excludes federal grants and loans.

Source: CBO.

### **Federal Estimates of Future Infrastructure Investment**

The seven agencies we reviewed each estimated that billions of dollars were needed for investment in infrastructure. The estimates focused on investments in the areas of water resources, hydropower, water supply, wastewater treatment, airports, highways, mass transit, and public buildings and spanned from several years to several decades. The investment amounts vary from GSA’s estimate of \$4.58 billion over the 5 years to repair public buildings to FHWA’s estimate of \$83.4 billion each year over 20 years to preserve and improve the nation’s highways. The investment estimates are summarized in table 1.

**Table 1: Selected Agencies' Infrastructure Investment Estimates**

Agency	Activities and assets included in estimate	Activities and assets excluded from estimate	Time period covered	Total estimate (in billions)
ARC	Construction of highways within portions of 13 states	Maintenance, retrofit, or improvements to completed highways	1997-completion	\$8.5 (current 1995 dollars)
Army Corps	Construction and major rehabilitation of water resources projects and major rehabilitation of hydropower projects nationwide	Nonconstruction costs, projects not under construction, and critical operations and maintenance work	2001-completion	\$38.0 <sup>a</sup>
EPA	Construction and upgrade of drinking water supply systems nationwide	Costs due solely to population growth and costs not eligible for federal funding	1999-2018	\$150.9 (current 1999 dollars)
EPA	Construction and upgrade of wastewater treatment collection facilities nationwide	Costs due solely to population growth and costs not eligible for federal funding	1996-2016	\$139.5 (current 1996 dollars)
FAA	Construction, replacement, and rehabilitation of airport facilities nationwide	Costs not eligible for federal funding	1998-2002	\$35.1 (constant 1998 dollars)
FHWA	Improvements to the nation's highways based on several scenarios <sup>b</sup>	Costs to construct new roads	1998-2017	\$50.8-\$83.4 per year for 20 years <sup>b</sup> (constant 1997 dollars)
FTA	Replacement and refurbishing of mass transit vehicles and facilities nationwide based on four scenarios <sup>c</sup> and construction of new systems	--	1998-2017	\$10.8-\$16.0 per year for 20 years <sup>c</sup> (constant 1997 dollars)
GSA	Repair and alteration of public buildings	Buildings owned by federal agencies other than GSA	Up to 5 years	\$4.58 <sup>a</sup>
GSA	Construction of border stations, federal office buildings, and courthouses	--	Up to 7 years	\$0.75 to \$0.8 per year for 5 to 7 years <sup>a</sup>

<sup>a</sup> Current year dollars from different dates.

<sup>b</sup> FHWA modeled several scenarios—including cost beneficial investment needed to maintain the current physical condition—that provided a range of estimates.



<sup>o</sup>FTA's analysis included scenarios that produced estimates ranging from investments needed to maintain current condition and performance of mass transit to investments needed to improve its current condition and performance.

Note: Estimates for the Army Corps and GSA are federal investments. Estimates for the remaining agencies are a combination of federal, state, and other investment sources.

Source: GAO's analysis of agencies' data.

Each of the seven agencies used data from various localities, states, or agency regional offices and aggregated those data to produce a national estimate for infrastructure investment. Each agency's estimate is described below.

### Appalachian Regional Commission

In 1997, ARC estimated that it would cost \$8.5 billion from state and federal sources to complete the Appalachian Development Highway System, a 3,025-mile system of highways in 13 states.<sup>8</sup> The estimate includes costs for project design, environmental mitigation, rights of way access, and construction. These costs were not adjusted for inflation. They do not include maintenance, retrofits, or safety improvements to completed segments of the highway system. According to ARC officials, the estimate is probably understated due to the limited amount of detailed information available in 1997 and because the estimate was prepared before obtaining public input or identifying and addressing environmental or historic preservation concerns about specific highway corridors. To produce the estimate, each of the 13 states estimated the cost to complete the system within their state using instructions provided by ARC and FHWA. ARC and FHWA reviewed the states' estimates to ensure uniformity and accuracy and assessed the reasonableness of the cost estimates by comparing them to the costs of similar highway projects within the state.<sup>9</sup> ARC uses this estimate as the basis for allocating federal funds appropriated for the Appalachian Development Highway System. ARC distributes the funds to the 13 states on the basis of their percentage share of the cost to complete the highway system. ARC plans to issue an updated estimate in 2002.

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<sup>8</sup> Appalachia includes all of West Virginia and parts of 12 states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia. The

## U.S. Army Corps of Engineers

As of March 30, 2001, the Army Corps estimated that \$38 billion in federal funds was required to complete water resources and hydropower infrastructure projects already under construction.<sup>10</sup> That amount includes about \$37 billion for construction of new water resource projects, \$582 million for work at hydropower plants, and \$217 million for major rehabilitation of water resource projects. These amounts were not adjusted for inflation. The overall estimate does not include critical operations and maintenance work for water resources and related land projects; for fiscal year 2002, the Army Corps estimated it would require \$915 million for such work. The \$38 billion estimate excludes projects that are not under construction, such as those in the design stage, and costs not related to construction, such as feasibility studies and evaluations. Army Corps officials believe that the overall estimate might be understated because it does not consider increases in the cost of completing a project over time due to changing economic conditions. The estimate is the aggregate of individual infrastructure projects. Local governments, groups, and/or private citizens who requested assistance from the Army Corps initially identified the water resources projects included in the estimate. Engineers and other professionals using existing industry data estimated project costs. The agency also uses cost-benefit analysis to determine which water resources projects are economically justified and would assist the agency in reaching its goals, such as improving navigation and flood mitigation.<sup>11</sup> The evaluation and cost estimate is sent to the agency's headquarters, and selected projects are submitted for funding as part of the Department of Defense's annual budget. Funded projects undergo several lengthy reviews by the Army Corps, including a feasibility study to investigate and recommend solutions to water resources problems.<sup>12</sup> The estimate for hydropower investment projects is based on the Army Corps' inspections, tests, and evaluations of that

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Appalachian Highway System is funded by the federal Highway Trust Fund and a state match of no less than 20 percent.

<sup>9</sup> This activity reflects a leading practice.

<sup>10</sup> The Congress provides funding to the Army Corps on a project-by-project basis and each project has a nonfederal cosponsor that shares in the cost. In addition, fees from vessel operators are used to fund half the cost of new construction and major rehabilitation of the commercial fuel-taxed inland waterway system.

<sup>11</sup> This activity reflects a leading practice.

<sup>12</sup> This activity reflects a leading practice.

equipment. The Army Corps uses the investment estimates to determine the financial resources needed to manage and repair assets under its jurisdiction and for new construction.<sup>13</sup>

### Environmental Protection Agency

In February 2001, EPA reported an estimated \$150.9 billion in federal, state, and local funds was needed to construct and upgrade drinking water facilities between 1999 and 2018.<sup>14</sup> The estimate excludes costs ineligible for funding under the Drinking Water State Revolving Fund (DWSRF), such as costs arising solely from population growth. The costs were not adjusted for inflation. EPA reported that the estimate may be understated because some needs covered only 2 to 5 years, not the 20-year period. To develop the estimate, EPA surveyed all of the large water systems in the United States and a sample of the medium water systems. In addition, EPA conducted site visits to 599 small systems and extrapolated data from these surveys and site visits to compute the total investment estimate. The states and EPA reviewed the surveys and supporting cost documentation for medium and large systems.<sup>15</sup> The agency uses the results of this estimate to allocate monies to the states for the revolving fund based on each state's share of the total investment amount.

In 1996, EPA estimated that \$139.5 billion in federal and state funds was needed between 1996 and 2016 for capital investment in water pollution control facilities. The total included \$44.0 billion for wastewater treatment, \$10.3 billion for upgrading existing wastewater collection systems, \$21.6 billion for new sewer construction, and \$44.7 billion for controlling combined sewer overflows. These costs were not adjusted for inflation. The estimate did not include annual costs for operations and maintenance and

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<sup>13</sup> The Army Corps also had procedures reflecting the following leading practices: establishing a baseline inventory of assets; considering alternative ways to address unmet investment needs, including non-capital approaches; ranking and selecting projects for funding based on established criteria; and developing a long-term capital plan that defines capital asset decisions.

<sup>14</sup> EPA provides funding for the construction and improvement of drinking water and wastewater treatment facilities through grants to capitalize state revolving funds. States provide a matching amount into their revolving funds equal to 20 percent of the total grant. The revolving funds provide several types of financial support, including loans at or below market interest rates, guarantees for the issuance of new local bonds, and purchase of existing bonds.

<sup>15</sup> This activity reflects a leading practice.

projects that were not eligible for funding under Title VI of the Clean Water Act, such as house connections to sewers and costs to acquire land that is not a part of the treatment process. EPA reported that the estimate may be understated because some needs accounted for only 5 years, not the 20-year period. EPA developed the estimate from a nationwide database of wastewater treatment facilities that is periodically updated by surveying the states.<sup>16</sup> The states provided revised estimates of capital investment needs from their documented plans, which were supplemented by costs modeled by EPA when the state lacked this information. EPA reviewed all documentation submitted by the states to ensure compliance with its established criteria.<sup>17</sup> In addition, EPA modeled the costs for each state for combined sewer overflows and activities to control stormwater runoff and nonpoint sources of pollution. According to EPA, the estimate is also used to assist the states and federal government in program planning and evaluation and to inform the Congress of the magnitude of the needs.<sup>18</sup>

### Federal Aviation Administration

In 1999, FAA reported that \$35.1 billion in federal and nonfederal funds was required for airport infrastructure investment projects from 1998 to 2002.<sup>19</sup> The estimate primarily includes projects to bring existing airports up to current design standards, develop passenger terminal buildings, and add capacity to congested airports. The estimate only includes projects that are eligible for funding under FAA's Airport Improvement Program.<sup>20</sup> The estimate was developed by aggregating the projects contained in FAA's National Plan of Integrated Airport Systems database. The projects originate primarily from airport master plans. FAA officials review projects to determine if they are eligible for funding and justified, and then the approved projects are included in the database.<sup>21</sup>

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<sup>16</sup> This activity partially reflects a leading practice.

<sup>17</sup> This activity reflects a leading practice.

<sup>18</sup> EPA also has procedures that partially reflect the following practice: considering alternative ways to address unmet investment needs, including non-capital approaches.

<sup>19</sup> FAA provides airports with grants for capital development. FAA allocates most grants on the basis of (1) a legislated formula that is tied to the number of passengers that an airport enplanes and (2) categories earmarked for specific types of airports and projects.

<sup>20</sup> Generally, the Airport Improvement Program allows for all types of airport development except for automobile parking structures, hangars, air cargo buildings, or the revenue producing areas of large terminals.

<sup>21</sup> This activity reflects a leading practice.

Because this estimate is not a spending plan, FAA has reported that it makes no attempt to prioritize the projects or determine if the benefits of specific projects would exceed their cost. This estimate is prepared and submitted to the Congress biennially, as required by statute.<sup>22</sup>

### Federal Highway Administration

In May 2000, FHWA issued investment estimates for highways for the years 1998 through 2017.<sup>23</sup> These estimates ranged from \$50.8 billion per year for cost-beneficial improvements that would maintain the current physical condition of highways to \$83.4 billion per year for all improvements that would improve pavement condition and reduce highway users' travel costs. The estimates included both federal and nonfederal portions of funding; they do not include the costs to construct new roads. To determine the estimates, FHWA used data from a statistically drawn national sample of 125,000 highway segments as well as information from the states on forecasts such as travel growth. FHWA officials reviewed the data submitted by the states and asked the states to correct serious flaws and improve some data submissions.<sup>24</sup> FHWA used a computer model to simulate the effects of infrastructure improvements on a sample of highway sections and used a benefit-cost analysis to identify economically justified highway improvements.<sup>25</sup> While FHWA's model analyzes these sample highway sections individually, the model is designed to provide estimates of investment requirements valid at the national level and does not provide improvement recommendations for individual highway segments. In June 2000, we found that the model was reasonable despite some limitations concerning the computations.<sup>26</sup> FHWA's estimate is used by legislative and

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<sup>22</sup> FAA also has procedures that reflect the following leading practices: considering alternative ways to address unmet investment needs, including non-capital approaches and ranking and selecting projects for funding based on established criteria. In addition, FAA has procedures that partially reflect one leading practice: developing a long-term capital plan that defines capital asset decisions.

<sup>23</sup> FHWA provides grants that partially fund the construction and improvement of urban and rural highways and bridges, including major maintenance of interstate highways. States generally provide a 20-percent match and determine how to spend the money within broad federal guidelines.

<sup>24</sup> This activity reflects a leading practice.

<sup>25</sup> This activity reflects a leading practice.

<sup>26</sup> For example, the model cannot completely reflect changes occurring among all highways in the transportation network at the same time, since the model analyzes each highway segment independently. See *Highway Infrastructure: FHWA's Model for Estimating Highway Needs Is Generally Reasonable, Despite Limitations* (GAO/RCED-00-133, June 5, 2000).

executive branch offices to obtain general information on the nation's overall need for investment in highways.<sup>27</sup>

### Federal Transit Administration

In May 2000, FTA estimated investment requirements of \$10.8 billion to \$16.0 billion per year for mass transit systems (include buses, railcars, and ferries) from 1998 to 2017, depending on whether the condition and performance of mass transit systems would be maintained or improved.<sup>28</sup> The estimates include the cost to replace and refurbish existing vehicles and facilities and the cost to construct new mass transit systems. The estimates cover both federal and nonfederal shares of costs. FTA used data from local urban transit agencies to determine the age and condition of mass transit infrastructure and then estimated the cost of either maintaining or improving that infrastructure. FTA developed the estimates using its Transit Economic Requirements Model. The model compares costs and benefits to determine if replacing an asset was economically justified.<sup>29</sup> The model then aggregated the costs of all the projects that were justified by benefit-cost analysis to determine the total investment estimate for the nation's mass transit systems. The accuracy of the estimates is limited by missing data and imprecise predictions due to the difficulty in predicting travel growth. FTA uses the estimates to provide general support for its budget and information on changes in mass transit systems.<sup>30</sup>

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<sup>27</sup> In addition, FHWA has procedures that partially reflect the following leading practice: conducting a comprehensive assessment of the resources needed to meet an agency's mission and results-oriented goals and objectives.

<sup>28</sup> FTA provides funding for mass transit primarily through formula and capital investment grants that generally require a state/local match of at least 20 percent.

<sup>29</sup> This activity reflects a leading practice.

<sup>30</sup> In addition, FTA has procedures that reflect the following leading practices: establishing a baseline inventory of assets and establishing procedures to review data developed by others. FTA also has procedures that partially reflect the following leading practices: conducting a comprehensive assessment of the resources needed to meet an agency's mission and results-oriented goals and objects and budgeting for projects in useful segments.

## General Services Administration

In May 2001, GSA's data indicated that \$4.58 billion in federal funds was required over the next 5 years to meet the repair and alteration needs of public buildings.<sup>31</sup> This estimate does not include investment amounts for federal buildings owned by other federal agencies, including the Departments of Defense and Energy and the Postal Service. In addition, GSA estimated that \$250 million to \$300 million was required annually over the next 5 years to construct new border stations and federal office buildings and \$500 million annually was required over 5 to 7 years to construct new courthouses. Regional offices identify investment projects, and cost data are derived from various sources, including contractors, safety inspectors, and building engineers. Projects that have estimated costs of \$1.99 million or more are evaluated by headquarters officials and ranked for funding using weighted criteria that include economic return, project risk, and project urgency.<sup>32</sup> In 2000, we reported problems with the quality of data contained in GSA's database of repair and alteration projects—including incorrect data, missing projects, and cost estimates that were not current.<sup>33</sup> GSA is taking action intended to address the problems we identified and improve the database, but we have not assessed the agency's progress in this regard. In addition, the sources of cost information vary, so the estimates for individual projects may be inconsistent. GSA's cost data are used as input in determining funding priorities.<sup>34</sup>

### **Overall Comments About the Estimates**

Some perspective is called for in reviewing the investment estimates by the seven agencies. First, the investment estimates encompass major areas of public infrastructure, but they cannot be easily compared or simply "added up" to produce a national estimate of all infrastructure investment needs because they were developed

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<sup>31</sup> The primary means of financing the operating and capital costs associated with federal space that is owned or managed by GSA is the Federal Building Fund, a revolving fund supported by rental assessments to federal agencies and annual appropriations.

<sup>32</sup> This activity reflects a leading practice.

<sup>33</sup> *Federal Buildings: Billions Are Needed for Repairs and Alterations* (GAO/GGD-00-98, Mar. 30, 2000.)

<sup>34</sup> In addition, GSA has procedures that reflect the following leading practices: establishing a baseline inventory of existing assets and establishing procedures to review data developed by others. GSA also has procedures that partially reflect the following practices: considering alternative ways to address unmet investment needs, including non-capital approaches, and budgeting for projects in useful segments.

using different methods and were for different time periods. A fundamental reason that the estimates were prepared differently and lack comparability is that they are developed and used for different purposes. Some agencies use the information to determine the financial resources needed to manage and/or repair their own assets, while other agencies develop estimates at the request of the Congress to provide general information to decisionmakers or to help direct federal funding to states, localities, and other parties.

Second, the seven agencies all had procedures for developing investment estimates that reflect some practices used by leading private sector and government organizations. Those practices include establishing a baseline inventory of assets, using cost-benefit analysis to identify economically justified investments, and ranking and selecting projects for funding based on established criteria. (See app. I for additional information on eight leading practices that pertain to developing and using investment estimates.) Some agencies followed more leading practices than other agencies. For example, the Army Corps had procedures that reflected six of the eight practices, which included establishing an inventory of assets; considering alternative ways to address unmet investment needs, including noncapital approaches; using cost-benefit analysis; and developing a long-term capital plan that defines capital asset decisions. Nonetheless, following the leading practices does not ensure a quality investment estimate and each estimate had limitations associated with the quality of the data used in developing it. Correcting such limitations will improve the quality and reliability of the agencies' investment estimates.

Third, some investment estimates span several decades and investment needs can change significantly over time with changes in the efficiency of delivering infrastructure services or pricing strategies that alter the demand for services. For example, the consolidation of smaller water systems or the introduction of user charges can reduce the need to expand or replace infrastructure. Fourth, many of these estimates are totals for the entire infrastructure network—involving all levels of government and the private sector. The federal government's role in financing these amounts should be recognized and, in some cases, this role might be small compared to other levels of government or



the private sector. Finally, these estimates mostly focus on the condition of infrastructure rather than the desired outcomes (e.g., less traffic congestion) that can be expected from additional infrastructure investments. We caution against relying on estimates of need that are based primarily on the condition of existing infrastructure if desired outcomes are not clearly articulated and the costs and benefits of alternative approaches (such as using strategies to manage demand rather than building new infrastructure) for achieving those outcomes are not fully considered.

Mr. Chairman, this concludes my statement. I will be happy to answer any questions from you or any Member of the Subcommittee.

### **Contacts and Acknowledgement**

For additional information or questions about this testimony, please contact Peter F. Guerrero, at (202) 512-2834. Individuals making key contributions to this testimony include Sharon Dyer, Phillis Riley, John Shumann, and Teresa Spisak.

### Leading Practices in Capital Decision-Making Concerning Investment Estimates

In 1998, we identified the practices of leading government and private-sector organizations in capital decision-making.<sup>35</sup> The following eight practices relate to developing and using investment estimates.

- conduct a comprehensive assessment of the resources needed to meet an agency's mission and results-oriented goals and objectives;
- establish a baseline inventory of existing assets, evaluate their condition, determine if they are performing as planned, and identify excess capacity;
- consider alternative ways to address needs, including noncapital alternatives;
- use cost-benefit analysis as a primary method to compare alternatives and select economically justified investments;
- rank and select infrastructure projects for funding based on established criteria;
- budget infrastructure projects in useful segments;
- develop a long-term capital plan that defines capital asset decisions; and
- establish procedures to review data developed by others and use independent reviews of data and methods to further enhance the quality of estimates.<sup>36</sup>

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<sup>35</sup> *Executive Guide: Leading Practices in Capital Decision-Making* (GAO/AIMD-99-32, Dec. 1998).

<sup>36</sup> This practice was identified as a result of information collected during our review of the seven agencies' investment estimates.