

The State of U.S. Infrastructure

NATIONAL COUNCIL ON PUBLIC WORKS IMPROVEMENT

The Public Works Improvement Act of 1984 created the National Council on Public Works Improvement to assess the condition of U.S. infrastructure. The Council's conclusion, in brief, is that this infrastructure will not sustain a stable and growing economy. The nation needs to renew its commitment to the future by making significant investments now. The following summarizes those parts of the Council's latest and final report to President Reagan and Congress—*Fragile Foundations; A Report on America's Public Works*—that are of the greatest interest to the development community.

Convincing Evidence of Need

After two years of study, the Council has found convincing evidence that the quality of America's infrastructure is barely adequate to fulfill current requirements, and insufficient to meet the demands of future economic growth and development. Most major categories of public works in the United States are performing at only passable levels. A few, such as water supply and water resources, remain in reasonably good shape. But others, such as solid waste and hazardous waste disposal, have serious and growing problems. In addition, smaller systems—in all categories and in nearly all regions of the country—face especially acute difficulties.

Part of the problem is financial. Overall investment in public works has slowed in the last two decades in relation to the demands of growth and environmental concerns. The pattern of decline in investment is shown in Figure 1. With nearly \$1 trillion of public works assets (the approximate

cumulative depreciated value of highway, mass transit, aviation, water resources, water supply, wastewater, solid waste, and hazardous waste facilities), infrastructure collapse is not imminent. But a declining infrastructure inevitably will jeopardize economic productivity and quality of life.

The current level of capital investment is barely enough to offset annual depreciation, much less meet new demands. The U.S. Department of Commerce estimates that infrastructure use by industry alone will increase by at least 30% over the next 10 years as a result of economic growth, the dispersion of population and economic activity, and technological and structural changes. Infrastructure capacity must keep pace with this increase. Better service—

reduced congestion, improved water quality, higher safety levels—will require even greater capacity expansion, as well as extensive operational improvements.

The Council recommends a commitment to vastly improve the infrastructure, a commitment that could require an increase of up to 100% in the amount of capital the nation invests each year in new and existing public works. In 1985, this amount was approximately \$45 billion. Upgrading U.S. infrastructure will require, in addition to increased investment, clarification of the respective roles of the federal, state, and local governments in the construction and management of facilities; performance improvements in existing facilities; a rational capital budgeting process at all levels of government; strong incentives for adequate maintenance and for the adoption of new technologies; and the more rigorous and widespread use of low capital techniques—such as demand management, land use planning, and waste recycling—for meeting service needs.

Finding the Money

Financing options—revolving loan funds, intergovernmental grants, tax-exempt debt techniques, or various forms of privatization—may differ in terms of their attractiveness to public officials, but they all draw on two basic sources of funds; general tax revenues and user fees. Mobilizing adequate financing requires participation by all levels of government. The Coun-

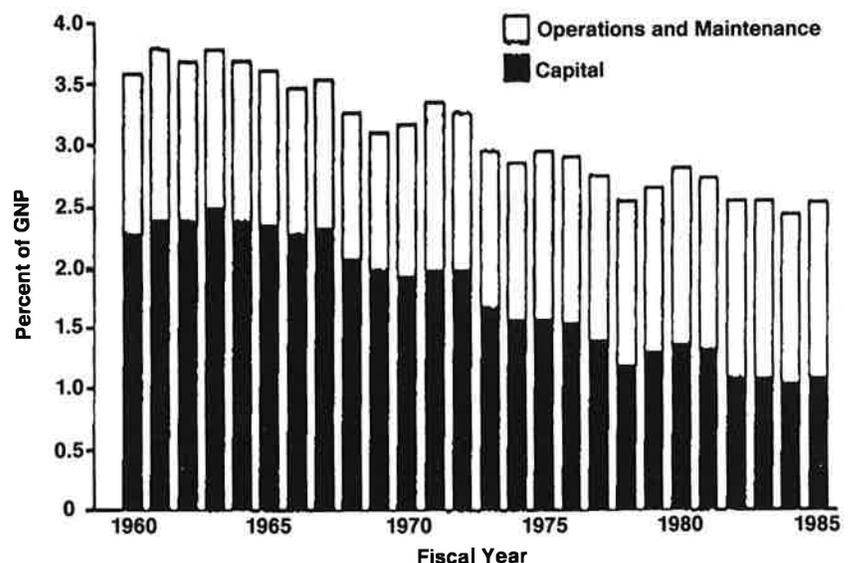


Figure 1. Public works outlays as a percent of GNP. Sources: U.S. Office of Management and Budget, Budget Appendices of the United States; U.S. Department of Commerce, Bureau of the Census, Government Expenditure Series; and The Economic Report of the President, for various years.

REPORT CARD ON THE NATION'S PUBLIC WORKS

Subject Category	Grade	Successes/ Recent Changes	Problems/ Future Weaknesses
Highways	C +	Federal and state gas tax increases have injected new capital into the system. This, along with increased operations and maintenance spending, has improved pavement conditions. However, quality of service in terms of congestion is declining.	Spending for system expansion has fallen short of need in high-growth urban and suburban areas. Many roadways and bridges are aging and require major work. Needs of most rural and smaller systems exceed available resources. The Highway Trust Fund has a sizable cash balance.
Mass Transit	C -	Federal capital grants have helped improve quality of service in some areas, but overall productivity of the system has declined. Growth of transit vehicles is double the rate of increase in ridership.	Mass transit is overcapitalized in many smaller cities and inadequate in large, older cities. Systems rarely are linked to land use planning and broader transportation goals. Maintenance has been erratic and inadequate, especially in older cities.
Aviation	B -	In general, the aviation system has handled rapid increases in demand safely and effectively. Service has begun to decline in the face of increasing congestion as a result of strong traffic growth. The air traffic control system is undergoing a \$16 billion modernization.	Congestion is the system's primary problem. Despite recent increases in authorizations, a sizable cash balance remains unspent in the Airport and Airway Trust Fund. The air traffic control system needs substantial upgrading to maintain safety.
Water Resources	B	The Water Resources Act of 1986 made cost-sharing mandatory for many types of water projects. This change should improve the selection of projects and reduce overall project costs.	Cost-sharing will improve efficiency but also increase local costs of water projects. Poorer communities may find it difficult to finance projects. Implementation is often excessively slow.
Water Supply	B -	While regional performance varies, water supply stands out as an effective, locally operated program. Strict new standards created by the 1986 Safe Drinking Water Act will require drastic increases in water rates over the next decade.	Many public water systems suffer from pricing below costs, inability to meet purity standards, or source contamination. Storage and distribution systems are deteriorating in some older cities and supplies are limited in some parts of the country.
Wastewater	C	Over 75 percent of the U.S. population is served by secondary treatment plants. The shift from federal grants to state revolving loans may improve efficiency of plant construction. Broadened focus on nonpoint source pollution and groundwater contamination may accelerate progress toward cleaner water.	Despite a \$44 billion federal investment in sewage treatment since 1972, water quality has not improved significantly. This is due in part to uncontrolled sources of pollution, such as runoff from farmland and roadways. Overall productivity of secondary treatment facilities is declining, resulting in an increase in water quality violations.
Solid Waste	C -	Testing and monitoring of solid waste facilities are more rigorous as a result of tougher environmental standards. Waste-to-energy technology is growing as an alternative to landfills. More aggressive waste reduction, separation, and recycling efforts are beginning at the local level.	The nation faces significant costs for adequate and safe facilities. Limited data suggest trends toward fewer but safer landfills, rapid growth in resource recovery, and little progress toward waste reduction. Public opposition to siting all types of facilities is a major problem.
Hazardous Waste	D	Funding for site cleanup has increased fivefold since 1986, but progress has been slower than expected. Only a small fraction of the two tons of waste per capital produced in America each year is being treated safely. Major challenges are still ahead of us.	The nation has forfeited much of its opportunity to reduce waste before it is produced. Waste control legislation promotes "end-of-pipe" rather than source reduction solutions. Congressional mandates and schedules may be overly optimistic, given administrative resources. A massive backlog of poisons and projects needing cleanup exists.

Source: National Council of Public Works Improvements.

cil endorses four principles to guide this effort;

- Users and other beneficiaries should pay a greater share of the cost of infrastructure service.

- The federal government should be a reliable partner in financing public works.
- States should develop comprehensive strategies for financing infrastructure.

- Local governments should give budgetary priority to funding the maintenance of existing facilities.

Significant elements of transportation, water supply, waste-water treatment, and

solid and hazardous waste systems serve identifiable consumers on a continuing basis. Use can be measured and priced; those who do not pay can be excluded from services. Linking financing to use can produce a steady and predictable revenue stream, encouraging better maintenance, rehabilitation, and replacement. The costs of new facilities should be shared by indirect beneficiaries as well. The user fee principle has significant limitations: many smaller communities lack the financial base necessary to finance a facility, and fees for essential services can be excessively expensive for low-income consumers and for hard-to-serve areas.

The Council endorses the general principle that developers should pay an equitable portion of the cost of new facilities necessary to service development. State and local officials should exercise due care to see that the allocation of such costs is fair and reasonable and does not result in undue private influence over public development policies and priorities.

The accumulation of unspent balances in the federal highway, transit, aviation, and waterways trust funds—nearly \$24 million in the 1987 budget—is at odds with the principle that user fees paid to preserve and protect public works systems be spent for that purpose. The Council supports efforts to use these funds for infrastructure improvement.

The Tax Reform Act of 1986 drastically limits arbitrage earnings on borrowed funds and restricts the use of municipal bond proceeds for quasi-public projects by imposing ceilings on allowable issues. These and other provisions are expected to limit the growth of tax-exempt bonds, and to increase state and local borrowing costs. The Council urges removal of unwarranted limitations on the power of state and local governments to finance public works. It also urges state governments to examine the impact of their restrictions on local taxation and bonding powers, and, where these hinder localities' ability to deliver essential services, to remedy the situation or provide compensatory assistance.

The unit of government responsible for service delivery should be the one that levies the fees or taxes to the extent possible and practical. Local governments already bear the lion's share of operating and maintenance costs and a growing share of capital costs.

What the most equitable and efficient mechanisms for financing public works im-

Table 2. Possible Sources of New Public Works Revenues

Source	Level of Government	Current Rate	Possible Increment	Potential Revenues (Millions of Dollars/Year)
Motor Fuels Tax				
Flat Tax	F, S, L	\$0.23/gallon ¹	\$0.10/gallon	\$12,000
Ad Valorem	F, S, L	(²)	10% of fuel costs	9,500
Repeal Exemptions from Highway Taxes	F	(³)	—	1,000
Heavy Truck Taxes	F, S			1,000
Aviation Ticket Tax	F	8% of value	2% of value	800
Airport Service Charge	L	None ⁴	\$3/passenger	1,500
Inland Barge Fuel	F	\$0.10/gallon ⁵	\$0.10/gallon	50
Port Tax	F	0.04% of cargo value	0.06% of cargo value	250
Cash Balances in Trust Fund Cash	F	—	(⁶)	2,000
Water Supply	F, S	None ⁷	\$0.10/1,000 gallons	750
Waste-End Taxes	F, S			
Generation		None	\$5/ton	1,500
Disposal by Hazard		None	\$0-\$60/ton	2,600
Disposal by Method		None	\$4-\$25/ton	3,200
Local Impact Fees on Developers	L	(⁸)	(⁹)	10,000-15,000

Note: Revenue estimates show gross receipts and have not been adjusted for potential reductions in other taxes. These offsets could reduce gross receipts by as much as 25%.

¹ The current federal tax is \$0.09 per gallon of gasoline. State taxes average \$0.14 per gallon. The federal government taxes diesel fuel at an additional 6 cents per gallon.

² Some states currently collect sales taxes on motor fuel.

³ State and local vehicles, transit buses, and users of gasohol are exempt from certain federal and state taxes despite the wear and tear they cause on roads and bridges.

⁴ This charge, commonly referred to as a "head tax," currently is prohibited by federal law.

⁵ Scheduled to increase to \$0.20 per gallon by 1995.

⁶ Assumes the current trust fund cash balances will be used over the next 10 years.

⁷ None at the federal level: Washington is one of the few states with a water excise tax.

⁸ Many local governments already impose some form of negotiated fee for the infrastructure costs resulting from new development.

⁹ Assumes that impact fees and related techniques are increased to equal 20 to 30 percent of capital spending. Potential revenues are not likely to be realized until the mid-1990s.

Source: Apogee Research.

provements are will depend on the type of infrastructure problem being addressed and on local conditions, traditions, and institutions. Tradeoffs are made through the political process at all levels of government. The menu of possible revenue sources in Table 2 provides a starting point for assembling a program of new fees and taxes to finance improvements. Many of the options shown in this table represent simple expansions of existing fees or related excise taxes. The largest potential sources of funding are motor fuel taxes used by the federal and state governments to support highways and some transit spending, and developer exactions and related fees imposed by many local governments. Local exactions are perhaps the fastest growing means of infrastructure finance, as well as the least known.

Apportioning Responsibility

One community's failure to provide good roads or adequate sewage treatment has impacts beyond its boundaries. Stewardship of the infrastructure demands some degree of accountability by all levels of government. The basic principle advocated by the Council is that state and federal infrastructure policy should support local self-sufficiency to the greatest extent possible.

The Council notes that opportunities for private participation in the provision of infrastructure should be considered actively by all levels of government, but should not be regarded as a panacea.

Governments are responsible for getting the maximum value out of every dollar spent. In many cases, it may be possible

and prudent to postpone some new investment by increasing efficiency through improved operations, more aggressive maintenance procedures, and various demand management techniques such as full-cost pricing, land use policies, or waste recycling. Maintenance is perhaps the single most important element of the stewardship obligation of governments—and also the element easiest to defer and most likely to be cut from the current expense budget.

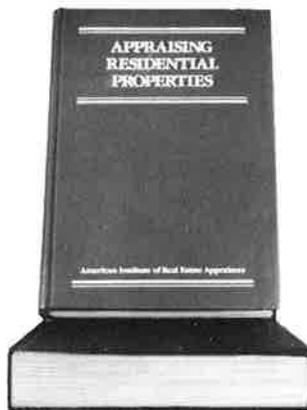
The Council strongly urges all levels of government to upgrade the quality and quantity of basic public works management information in order to measure and improve system performance. While the up-front costs and paperwork required to set up data collection, management, and reporting systems can appear formidable, the absence of this information means that public officials must make multimillion-dollar investment decisions on an ad hoc, seat-of-the-pants basis. The costs of estimating a required capacity incorrectly or selecting a project ill-suited to needs can be staggering.

Also, the scope and complexity of infrastructure problems merit a far more intense national focus on public works R&D to accelerate technological innovation. This attention should be comprehensive, encompassing all types of infrastructure; cooperative, involving all levels of government, professional organizations, and the private sector; and coordinated. Federal leadership and funding are necessary, as is, in all likelihood, federal support (risk-sharing) for the operational testing of new technologies. (IRWA)

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Available for \$13 from the U.S. Government Printing Office, the 226-page *Fragile Foundations* contains considerable basic information on public works—the components of changing demand for facilities, the adequacy of supply and performance of various categories of public works (see "Report Card" for a capsule look at performance measures), the financing picture, the details of the provision of facilities (who does what), and issues surrounding the management and technological improvements of infrastructure.

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