

In March 2001, ASCE released a *Report Card for America's Infrastructure*, grading 12 infrastructure categories at a discouraging D+ overall and estimating the need for a \$1.3 trillion investment to bring conditions to acceptable levels. In Sept. 2003, ASCE released a *Progress Report* that examines the current trends for addressing the nation's deteriorating infrastructure and discusses actions the federal government should take to bring conditions up to acceptable levels. ASCE did not issue new grades because the condition and performance have not changed significantly in two years.

Subject	2001 Grade	2003 Trends
<b>Roads &amp; Bridges</b>	<b>D+/C</b>	↓/↔

The nation is failing to even maintain the substandard conditions we currently have, a dangerous trend that is affecting highway safety, as well as the health of the economy. According to the Federal Highway Administration's (FHWA) "2003 Conditions and Performance Report," traffic congestion costs the economy \$67.5 billion annually in lost productivity and wasted fuel. Passenger and commercial travel on our highways continues to increase dramatically. The average rush hour grew more than 18 minutes between 1997 and 2000. The American Association of State Highway and Transportation Officials' (AASHTO) "Bottom Line Report" estimates that capital outlays by all levels of government would have to increase by 42% to reach the projected \$92 billion Cost to Maintain level, and by 94% to reach the \$125.6 billion Cost to Improve level. This is in contrast to the FHWA which estimates that outlays by all levels of government would have to increase by 17.5% to reach their projected \$75.9 billion Cost to Maintain level, and 65.3% to reach their \$106.9 billion Cost to Improve level.

As of 2000, 27.5% of the nation's bridges (162,000) were structurally deficient or functionally obsolete, an improvement from 29% in 1998. A structurally deficient bridge is closed or restricted to light vehicles because of its deteriorated structural components, which require speed and weight restrictions. A functionally obsolete bridge has older design features and while it is not unsafe for all vehicles, it cannot safely accommodate current traffic volumes, vehicle sizes and weights. These restrictions not only contribute to traffic congestion, they also pose major inconveniences such as in Warren, Pa., where the local hospital has stationed an ambulance crew on the other side of town to avoid a time-consuming three-mile detour around the Hickory Street Bridge while the town awaits construction of a new \$10-million span. It is estimated that it will cost \$9.4 billion a year for 20 years to eliminate all bridge deficiencies. Present funding trends of state DOTs call into question future progress on addressing bridge deficiencies.

While the enactment of the Transportation Equity Act of the 21st Century (TEA-21), which authorized \$218 billion for the nation's highway and transit programs in 2001, has helped, America continues to shortchange funding for much needed road and bridge repairs.

**FEDERAL ACTION NEEDED:** On Sept. 30, 2003, TEA-21 expires, along with funding to state highway and transit programs. Congress and the Administration must act to reauthorize this important legislation with sufficient funding to address the significant needs identified for America's surface transportation systems. The House Transportation and Infrastructure Committee's draft TEA-21 proposal provides \$375 billion over 6 years for the nation's surface transportation program – the amount identified as the Cost to Maintain by the FHWA in the 2002 Conditions and Performance Report.

Subject	2001 Grade	2003 Trends
<b>Transit</b>	<b>C-</b>	↓

Despite increased spending resulting from TEA-21, our transit systems show signs of decline. Efforts to maintain the systems are outpaced by growth in ridership, which has increased faster than airline or highway transportation. According to the American Public Transit Association, public transportation ridership has increased 22% since 1998 – the highest level in 40 years.

Roads and transit systems are in peril. Funding at the federal, state and local levels is in danger of drying up and citizens are failing to invest in their communities' futures. In Virginia, where vehicle travel has increased by 21% from 1991 to 2001 and its population grew by 16% between 1990 and 2001, voters in Northern Virginia and Hampton Roads, Va., failed to pass a sales tax proposal last fall that would have raised billions for its overburdened road and transit system. On the positive side, in Las Vegas, where freeway congestion has grown from 5% to 55% in the past 20 years, voters approved a tax plan to fund local transportation projects.

The federal government invests \$7.66 billion annually in mass transit capital improvements. According to AASHTO, capital outlays by all governments would have to double to reach the projected \$18.9 billion Cost to Maintain level, and increase by 362% to reach the \$43.9 billion Cost to Improve level. The Federal Transit Administration estimates the Cost to Maintain at \$14.8 billion and the Cost to Improve at \$20.6 billion.

**FEDERAL ACTION NEEDED:** On Sept. 30, 2003, TEA-21 expires, along with funding to the nation's surface transportation programs. Congress and the Administration must act to reauthorize this important legislation with sufficient funding to address the significant needs identified for America's surface transportation systems.

Subject	2001 Grade	2003 Trends
<b>Aviation</b>	<b>D</b>	↔

Despite economic and post 9/11 related decline in passenger travel, the FAA expects dramatic growth in aviation demand over the next decade. Total U.S. enplanements in 2001 were 683 million and are expected to reach 1 billion by 2014. Air cargo is expected to grow by 5.3% a year for the next 12 years. The FAA states that a minimum of an additional \$2 billion a year is necessary to meet needs.

When aviation infrastructure was graded a D in 2001, airport capacity had increased only 1% from 1991 to 2001, yet air traffic had increased 35% during that same period. Despite the current lows in passenger travel, the continued resurgence in passenger and cargo air travel to previous levels, combined with current airport spending trends, translates into a "No Progress" arrow for our nation's aviation infrastructure. Little is being done to capitalize on the low growth period after 9/11 to address the nation's aviation infrastructure needs.

Officials are choosing to invest funds in strengthening airline security measures instead of infrastructure. Los Angeles Mayor James K. Hahn's recently proposed a \$9 billion plan for Los Angeles International Airport would enhance security, in part by decreasing the number of gates from 163 to 153, but allows for no significant airfield capacity increases.

**FEDERAL ACTION NEEDED:** On Sept. 30, 2003, AIR-21 expires, along with funding for programs such as the Airport Improvement Program (AIP). Both the House and Senate have passed versions of the Second Century of Flight Act (H.R. 2271 & S. 788); however, Congress and the Administration must work out their differences to allow President Bush to sign into law an airport bill.

Subject	2001 Grade	2003 Trends
<b>Schools</b>	<b>D-</b>	↔

Due to either aging, outdated facilities, severe overcrowding, or new mandated class sizes, 75% of our nation's school buildings remain inadequate to meet the needs of school children. The average cost of capital investment needed is \$3,800 per student, more than half the average cost to educate a student for one year. Population growth is outpacing investment in our schools. While school construction spending has increased, the cost to remedy the situation remains more than \$127 billion.

Many school districts are mandating a lower student to teacher ratio in an effort to improve test scores. In Florida, there is now a statewide constitutional amendment limiting class sizes causing the Hillsborough County school district to put a freeze on moving dilapidated portable classrooms from school property.

There has been no new comprehensive needs assessment since the last report card. The increased attention on K-12, along with increased funding, has highlighted the issue, but the underlying problems remain.

**FEDERAL ACTION NEEDED:** Funding for schools is a state and local function. However, federal educational standards and mandates on classroom size do have costs. The federal government should do more to assist local school districts in maintaining their facilities. One way would be to enact the America's Better Classroom Act of 2003 (H.R. 930 & S. 856), which would help states and localities by using tax credits to pay the interest on school modernization bonds. It is a sensible, cost-effective and efficient measure that creates no new bureaucracy

Subject	2001 Grade	2003 Trends
<b>Drinking Water</b>	<b>D</b>	↓

While drinking water quality remains good, the infrastructure of the nation's 54,000 drinking water systems is aging rapidly. Federal funding remains flat, while the infrastructure needs continue to increase. There is an annual shortfall of \$11 billion needed to replace or rehabilitate facilities that are nearing the end of their useful life and to comply with federal water regulations.

The forecast for our nation's drinking water systems indicates a downward slope. Drinking water received a D on the *2001 Report Card*, yet the situation continues to worsen as aging systems – some developed more than a century ago – continue to service our ever-growing population.

**FEDERAL ACTION NEEDED:** Reauthorization of the Safe Drinking Water Act at \$25 billion over a five-year period would go a long way toward improving our nation's water infrastructure.

Subject	2001 Grade	2003 Trends
<b>Wastewater</b>	<b>D</b>	↓

The nation's 16,000 wastewater systems face enormous needs. Some sewer systems are 100 years old and many treatment facilities are past their recommended life expectancy. Currently, there is a \$12 billion annual shortfall in funding for infrastructure needs; however, federal funding has remained flat for a decade. Because of this continuing shortfall, more than 1/3 of U.S. surface waters do not meet water quality standards.

America's farmers, fishermen, manufacturers and tourism industries rely on clean water to carry out activities that contribute over \$300 billion to our economy each year. However, the challenge to continue providing clean water remains, as our existing national wastewater

infrastructure is aging, deteriorating and in need of repair, replacement and upgrading. In fact, EPA has reported that without improvements to the nation's wastewater treatment infrastructure, we face the very real risk of losing the environmental gains we have achieved over the last three decades since the passage of the Clean Water Act of 1972.

**FEDERAL ACTION NEEDED:** Reauthorization of the Clean Water Act at \$25 billion over a five-year period would begin to improve our nation's wastewater infrastructure. Congress should pass H.R. 1560, the Water Quality Financing Act of 2003, or S. 170, the Clean Water Infrastructure Financing Act of 2003, at the recommended funding level.

<i>Subject</i>	<i>2001 Grade</i>	<i>2003 Trends</i>
<b>Dams</b>	<b>D</b>	↓

The number of unsafe dams has risen by 23% to nearly 2,600. Because of downstream development, the number of "high-hazard potential dams" – those whose failure would cause loss of life – has increased from 9,921 in 2001 to 10,049 in 2003. There have been 21 dam failures in the past two years.

Some progress is being made through the repair of small watershed dams constructed with assistance from the USDA since 1948. This is only a small portion of the total number of non-federal dams. On the federal side, the federally-owned dams are in good condition; however, continuing budget restrictions are placing pressure on and limiting many agency dam safety programs.

Despite the recent passage of the *National Dam Safety and Security Act of 2002* (HR 4727), which provides funding through grants to improve state dam safety programs, it is estimated that \$10.1 billion is needed over the next 12 years to address all critical non-federal dams – dams that pose a direct risk to human life should they fail. In the meantime, the 78,000 dams in the U.S. National Inventory of Dams continue to age and deteriorate.

**FEDERAL ACTION NEEDED:** Introduction and passage of legislation to create a loan fund for the repair, rehabilitation and removal of non-federal dams would provide seed money to advance the process of rehabilitating the most critical dams.

<i>Subject</i>	<i>2001 Grade</i>	<i>2003 Trends</i>
<b>Solid Waste</b>	<b>C+</b>	↔

The amount of solid waste sent to landfills has declined 13% since 1990, while the amount of waste recovered through recycling has nearly doubled and waste-to-energy plants manage now 17% of the nation's trash. Most states have 10 years' worth of landfill capacity.

Solid waste disposal received a C+, the highest grade on the *2001 Report Card for America's Infrastructure*. In the two years since, solid waste is holding steady with average performance. Sanitary land filling in the United States has made monumental strides in the last 20 years, moving from open dumps with little or no control to "state of the art" facilities with sophisticated containment systems, environmental monitoring, improved operational practices and increased regulation. The amount of solid waste sent to landfills has declined by 13%, while the amount of waste recovered through recycling has nearly doubled, an option that many municipalities, including the city of New York, have found to be cost effective.

However, despite the progress with traditional solid waste concerns, the rapid development of new technology has created an electronic waste stream (computer hardware and other electronic components) that, according to the U.S. Environmental Protection Agency (EPA), currently accounts for 1% of the nation's 210 million tons of solid waste each year and is growing rapidly. Because of a lack of an efficient, U.S.-based management system for this new

waste category, much of our nation's electronic waste is being stockpiled or sent overseas for disposal.

**FEDERAL ACTION NEEDED:** An efficient management system based in the United States is needed to handle the growing volume of electronic waste (e-waste). Congress should authorize regional e-waste management compacts to assist states in managing this emerging solid waste concern.

<i>Subject</i>	<i>2001 Grade</i>	<i>2003 Trends</i>
<b>Hazardous Waste</b>	<b>D+</b>	↔

Since 2001, brownfields redevelopment has increased, with the restoration of 922 sites resulting in increased tax revenue and jobs. The rate of Superfund site clean-up has quickened. Unfortunately, in both arenas, the clean-up rate is not able to keep up with the rate at which new sites are identified and the backlog of potential sites is assessed.

According to a June 2003 report from the U.S. Conference of Mayors, 205 cities have 24,987 brownfield sites awaiting redevelopment. Of those, 148 cities reported that 576,373 new jobs and as much as \$1.9 billion annually could be generated if their brownfield sites were redeveloped. The Government Accounting Office (GAO) estimates that there are 400,000 to 600,000 brownfield sites nationwide.

Nearly 10,000 contaminated sites could end up in the Superfund program. Nearly 800 high-priority hazardous-waste sites were fully cleaned up between 1980 and 2000. However, more than 1,200 sites remain to be addressed and another 3,000 sites still need to be assessed for possible action under Superfund. The Superfund program could encompass as many as 10,000 contaminated sites. The U.S. GAO estimates that, after nearly 20 years and outlays of more than \$14 billion, the Superfund program has yet to complete clean-ups for 42% of the nation's most severely contaminated hazardous waste sites. Cleanups at 85% of these sites will be completed by the end of calendar year 2008. The remainder will not be completed until well after 2008.

**FEDERAL ACTION NEEDED:** The Bush administration has asked Congress to add \$150 million to next year's Superfund program budget, which averages \$3 billion a year. Yet with so many brownfields waiting to be decontaminated and rehabilitated, prime economic opportunities continue to languish. Congress should enact H.R. 239, the Brownfields Redevelopment Enhancement Act; H.R. 402, the Brownfield Cleanup Enhancement Act of 2003; H.R. 2535, the Economic Development Administration Reauthorization Act of 2003; and S. 645, the Brownfields Redevelopment Assistance Act of 2003.

<i>Subject</i>	<i>2001 Grade</i>	<i>2003 Trends</i>
<b>Navigable Waterways</b>	<b>D+</b>	↓

As the world's leading maritime and trading nation, the United States relies on an efficient and effective marine transport system to maintain its role as a global economic superpower. The waterway system is also vital to U.S. national security interests. The nation's 25,000 miles of waterways, 238 lock chambers and 1,000 harbor channels serve 300 U.S. ports and over 3,700 terminals by moving 2.4 billion tons of commerce annually, and by providing critical intermodal links to 152,000 miles of rail; 460,000 miles of pipelines; and 45,000 miles of interstate highways. Despite the significance of the waterway link to the global economy, national investment in water resources projects has not kept pace with U.S. economic and social expansion, resulting in the nation's waterway infrastructure being in urgent need of modernization to accommodate present and future levels of waterborne traffic.

Half of the navigation locks on inland waterways exceed their 50-year design life. System capacity has been impacted by deferred maintenance, which has led to a doubling of out-of-service times at navigation locks over the last 10 years. Funding shortfalls have delayed completion of many ongoing capital improvement projects by 5 to 10 years, resulting in construction cost increases of \$300 million and lost benefits of over \$2 billion. The unexpended balance in the Inland Waterway Trust Fund has grown to \$360 million.

Additionally, key deep-draft channels at the nation's gateway ports are inadequate for the mega-container ships, which are the world standard for international trade, and intermodal connectors to ports are in poor condition. Transportation demand through navigation channels, especially for vessels carrying containerized cargoes, is expected to more than double by the year 2020. Maintaining authorized levels of service at harbor channels is challenged by a growing maintenance funding backlog, with the unexpended balance in the Harbor Maintenance Trust Fund now at \$1.73 billion.

Over the last 30 years the U.S. population has increased more than 40% while the GDP has grown from \$2.5 to \$10.8 trillion. Meanwhile, capital investment in public water resources infrastructure has decreased by 70%. For example, in the 1970s the U.S. Army Corps of Engineers' civil works construction appropriations were in the \$4 billion range. However, in the 1990s the funding dropped to an average of \$1.6 billion a year. The combination of declining investment, coupled with an expanding population and economy, has created an "investment gap."

**FEDERAL ACTION NEEDED:** A bi-annual water resources authorization act was not enacted in 2002, postponing needed environmental and business process improvements for waterway programs. It is imperative that Congress and the Administration pass the Water Resources Development Act of 2003 (H.R. 2557) to address these future needs. In addition, the investment gap needs to be addressed through aggressive modernization and maintenance programs, including spending down the trust fund balances for the purposes the monies were intended.

<b>Subject</b>	<b>2001 Grade</b>	<b>2003 Trends</b>
<b>Energy</b>	<b>D+</b>	↓

Over the last two decades, transmission investment has decreased by \$115 million a year, dropping from \$5 billion annually in 1975 to \$2 billion in 2000. The electric transmission line grid capacity has not been upgraded to meet growth demands.

In August 2003, millions of Americans and Canadians were left without electricity. Two years after the nation's energy infrastructure received a D+, the nation experienced an electrical system failure that not only left tens of millions in the dark, but also brought other infrastructure areas to a halt. Transit in New York City was stopped in its tracks leaving millions stranded and access to drinking water in Cleveland was interrupted.

Since 1990, actual capacity has increased by only about 7,000 megawatts (MW) per year, an annual shortfall of 30%. More than 10,000 MW of capacity will have to be added each year until 2008 to keep up with the 1.8% annual growth in demand. The U.S. energy transmission infrastructure relies on older technology, raising questions of long-term reliability.

Proposals to build more generators and adding transmission lines are often met with serious obstacles, including voter opposition. The Department of Energy estimates that consumers will pay up to \$50 billion in higher electric bills to modernize the U.S. power grid. Still, government has been slow to adopt regulations to improve transmission capacity.

**FEDERAL ACTION NEEDED:** Investments in the transmission grid have diminished significantly in recent years. Investment barriers include lack of regional integrated planning, difficulty in siting new transmission lines, and uncertainty regarding investment risks and returns. The Federal Energy Regulatory Commission (FERC) has called for the development of five Regional Transmission Organizations (RTOs). These RTOs, when implemented, will be used to better determine weaknesses in the transmission grid and allow better regional planning. The RTOs will ultimately be responsible for the efficient managed growth of the regional transmission system.

<b>Bottom Line – All Categories</b>		<b>2001 GPA</b>
<b>Total Investment Needs: \$1.6 Trillion</b> <i>(estimated 5-year need)</i>		<b>D+</b>
A = Exceptional B = Good C = Mediocre D = Poor F = Inadequate	<b>Trends</b> ↑ = Improving ↔ = No Progress ↓ = Declining	Each category was evaluated on the basis of condition and performance, capacity vs. need, and funding vs. need. Assessments do not include security enhancements as no authoritative data is available.

In 2001, the estimated cost for infrastructure renewal was \$1.3 trillion over a five-year period. Today, that cost has risen to \$1.6 trillion over a five-year period. While solutions to repair our crumbling infrastructure can be addressed through a renewed partnership between citizens, the private sector, and local, state and federal governments, reauthorization of TEA-21, and passage of the Clean Water Act and the Safe Drinking Water Act can provide critical funding to repair our transportation, water and dam infrastructure.

The trends for renewal of the 12 infrastructure areas were assessed by a panel comprised of 20 eminent civil engineers representing the broad spectrum of civil engineering. The forecasted trends were based on the condition and performance of each infrastructure area as reported by federal sources; capacity of infrastructure versus need; and current and pending investment of state, local and federal funding for infrastructure versus need.