Methodology

To develop this *Report Card*, we assembled a panel of 24 of the nation's leading civil engineers, analyzed hundreds of studies, reports and other sources, and surveyed more than 2,000 engineers to determine what was happening in the field. We added three new categories to the 12 we graded in 2001, including one for infrastructure security.

Grades were assigned on the basis of condition and capacity, and funding versus need, generally following a traditional grading scale (e.g., if 77% of our roads are in good condition or better, that would earn a grade of C). Base grades were then reviewed by the Advisory Council and adjusted, usually with a plus or minus but sometimes as much a full letter grade, to reflect positive or negative trends or the critical consequences should a catastrophic failure occur. For example, the failure of a bridge or dam would have much more immediate and deadly consequences than a problem related to solid waste disposal.

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Report Card FOR AMERICA'S Infrastructure

ASCE American Society of Civil Engineers

Subject	2001 Grade	2005 Grade	Comments
Aviation	D	D+	Gridlock on America's runways eased from crisis levels earlier in the decade due to reduced demand and recent modest funding increases. However, air travel and traffic have reportedly surpassed pre-Sept. 11 levels and are projected to grow 4.3% annually through 2015. Airports will face the challenge of accommodating increasing numbers of regional jets and new super-jumbo jets.
Bridges	C	C	Between 2000 and 2003, the percentage of the nation's 590,750 bridges rated structurally deficient or functionally obsolete decreased slightly from 28.5% to 27.1%. However, it will cost $9.4 billion a year for 20 years to eliminate all bridge deficiencies. Long-term underinvestment is compounded by the lack of a Federal transportation program.
Dams	D	D	Since 1998, the number of unsafe dams has risen by 33% to more than 3,500. While federally owned dams are in good condition, and there have been modest gains in repair, the number of dams identified as unsafe is increasing at a faster rate than those being repaired. $10.1 billion is needed over the next 12 years to address all critical non-federal dams—dams which pose a direct risk to human life should they fail.
Drinking Water	D	D-	America faces a shortfall of $11 billion annually to replace aging facilities and comply with safe drinking water regulations. Federal funding for drinking water in 2005 remained level at $850 million, less than 10% of the total national requirement. The Bush administration has proposed the same level of funding for FY06.
Energy (National Power Grid)	D+	D	The U.S. power transmission system is in urgent need of modernization. Growth in electricity demand and investment in new power plants has not been matched by investment in new transmission facilities. Maintenance expenditures have decreased 1% per year since 1992. Existing transmission facilities were not designed for the current level of demand, resulting in an increased number of 'bottlenecks' which increase costs to consumers and elevate the risk of blackouts.
Hazardous Waste	D+	D	Federal funding for 'Superfund' cleanup of the nation's worst toxic waste sites has steadily declined since 1998, reaching its lowest level since 1986 in FY05. There are 1,237 contaminated sites on the National Priorities List, with possible listing of an additional 10,154. In 2003, there were 205 U.S. cities with 'brownfields' sites awaiting cleanup and redevelopment. It is estimated that redevelopment of those sites would generate 576,373 new jobs and $1.9 billion annually for the economy.
Navigable Waterways	D+	D-	A single barge traveling the nation's waterways can move the same amount of cargo as 58 semi-trucks at one-tenth the cost—reducing highway congestion and saving money. Of the 257 locks on the more than 12,000 miles of inland waterways operated by the U.S. Army Corps of Engineers, nearly 50% are functionally obsolete. By 2020, that number will increase to 80%. The cost to replace the present system of locks is more than $125 billion.
Public Parks & Recreation	--	C-	Many of our nation's public parks, beaches and recreational harbors are falling into a state of disrepair. Much of the initial construction of roads, bridges, utility systems, shore protection structures and beaches was done more than 50 years ago. These facilities are anchors for tourism and economic development and often provide the public's only access to the country's cultural, historic and natural resources. The National Park Service estimates a maintenance backlog of $6.1 billion for their facilities. Additionally, there is great need for maintenance, replacement and construction of new infrastructure in our nation's state and municipal park systems.
Rail	--	C-	For the first time since World War II, limited rail capacity has created significant chokepoints and delays. This problem will increase as freight rail tonnage is expected to increase at least 50% by 2020. In addition, the use of rail trackage for intercity passenger and commuter rail service is increasingly being recognized as a worthwhile transportation investment. Congestion relief, improved safety, environmental and economic development benefits result from both freight and

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			passenger market shifts to rail creating a rational for public sector investment. The freight railroad industry needs to spend $175-$195 billion over the next 20 years to maintain existing infrastructure and expand for freight growth. Expansion of the railroad network to develop intercity corridor passenger rail service is estimated to cost approximately $60 billion over 20 years. All told, investment needs are $12-13 billion per year.
Roads	D+	D	Poor road conditions cost U.S. motorists $54 billion a year in repairs and operating costs—$275 per motorist. Americans spend 3.5 *billion* hours a year stuck in traffic, at a cost of $63.2 billion a year to the economy. Total spending of $59.4 billion annually is well below the $94 billion needed annually to improve transportation infrastructure conditions nationally. While long-term Federal transportation programs remain unauthorized since expiring on Sept. 30, 2003, the nation continues to shortchange funding for needed transportation improvements.
Schools	D-	D	The Federal government has not assessed the condition of America's schools since 1999, when it estimated that $127 billion was needed to bring facilities to good condition. Other sources have since reported a need as high as $268 billion. Despite public support of bond initiatives to provide funding for school facilities, without a clear understanding of the need, it is uncertain whether schools can meet increasing enrollment demands and the smaller class sizes mandated by the No Child Left Behind Act.
Security	--	I	While the security of our nation's critical infrastructure has improved since Sept. 11, the information needed to accurately assess its status is not readily available to engineering professionals. This information is needed to better design, build and operate the nation's critical infrastructure in more secure ways. Security performance standards, measures and indices need to be developed, and funding must be focused on all critical infrastructure sectors, beyond aviation.
Solid Waste	C+	C+	The nation's operating municipal landfills are declining in total numbers, but capacity has remained steady due to the construction of numerous regional landfills. In 2002, the United States produced 369 million tons of solid waste of all types. Only about a quarter of that total was recycled or recovered.
Transit	C-	D+	Transit use increased faster than any other mode of transportation—up 21%—between 1993 and 2002. Federal investment during this period stemmed the decline in the condition of existing transit infrastructure. The reduction in federal investment in real dollars since 2001 threatens this turnaround. In 2002, total capital outlays for transit were $12.3 billion. The Federal Transit Administration estimates $14.8 billion is needed annually to maintain conditions, and $20.6 billion is needed to improve to "good" conditions. Meanwhile, many major transit properties are borrowing funds to maintain operations, even as they are significantly raising fares and cutting back service.
Wastewater	D	D-	Aging wastewater management systems discharge billions of gallons of untreated sewage into U.S. surface waters each year. The EPA estimates that the nation must invest $390 billion over the next 20 years to replace existing systems and build new ones to meet increasing demands. Yet, in 2005, Congress cut funding for wastewater management for the first time in eight years. The Bush administration has proposed a further 33% reduction, to $730 million, for FY06.

America's Infrastructure G.P.A. = D

Total Investment Needs = $1.6 Trillion

(estimated 5-year need—does not include security investment needs)

A = Exceptional
B = Good
C = Mediocre
D = Poor
F = Failing
I = Incomplete

Each category was evaluated on the basis of condition and performance, capacity vs. need, and funding vs. need.

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AVIATION

Gridlock on America's runways eased from crisis levels earlier in the decade due to reduced demand and recent modest funding increases. However, air travel and traffic have reportedly surpassed pre-September 11, 2001, levels and are projected to grow 4.3% annually through 2015. Airports will face the challenge of accommodating increasing numbers of regional jets and new super-jumbo jets.

D+

Background

September 11, 2001, had a profound affect on the nation's aviation industry, one which will be felt for many years to come. One effect has been to divert attention from airport infrastructure issues; however, airport capacity issues must be brought back to the forefront if we are to avoid costly delays in the future. Demand for air travel is on the rebound, and the nation's aviation system must be ready to accommodate the projected growth. The demand will continue to outpace our ability to fund capacity improvements at our nation's air-carrier airports.

Conditions

In 2000, air travel in the United States was at an all-time high, with record numbers of flight delays and cancellations. This began to change in late 2000/early 2001 with the economic slowdown and, finally, the terrorist attacks of September 11, 2001. Passenger demand rebounded slowly in 2002 and 2003, in the face of the war in Iraq and the Severe Acute Respiratory Syndrome (SARS) epidemic. In September 2004, U.S. airlines carried 47.8 million passengers, an increase of 7.2% from September 2003.

Demand for air travel service is experiencing increases in passenger and air traffic levels that are predicted by the Federal Aviation Administration (FAA) to return to pre-September 2001 levels by 2005. Large carriers and regional/commuter airlines are projected by the FAA to grow an average of 4.3% per year through 2015. This equates to a 52% increase above the 2005 passenger demand. The tremendous growth in regional/commuter carriers and low-cost carriers will affect the number of aircraft operations at our busiest airports.

Additionally, airports face the new challenge in the anticipated growth of corporate jets that seat four to six passengers; a shift of 2% of today's commercial passengers to corporate jets would result in triple the number of flights. At the other extreme, larger planes carrying 800 or more passengers would represent a significant challenge for airports' current infrastructure.

The nation's air traffic control system remains a looming issue of concern. In the mid-1980s, the FAA estimated that it would take 10 years and $12 billion to modernize the nation's air traffic control systems. Twenty years and $35 billion later, the task is not complete, and the FAA

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expects that it will take at least 3 additional years and an additional $16 billion. Meanwhile, the number of aircraft handled by air traffic control is expected to increase from 45.1 million in 2004 to 58.4 million by 2015.

Airport and Aviation Facts:

- There are 510 U.S. airports with commercial service, accounting for 99.88% of passenger enplanements.
- The number of runway incursions has decreased from a peak of 407 in 2001 to 324 in 2003.
- In 2004, the FAA designated 3,344 airports as part of the National Plan of Integrated Airport Systems (NPIAS), including commercial service airports, reliever airports and selected general aviation airports.
- The FAA sets a performance goal of ensuring that 93% of NPIAS airport runways are maintained in good or fair condition—in 2003, the FAA rated 75% as good, 21% as fair, and 4% as poor. At commercial service airports, the runways faired better, with 80% good, 18% fair, and 2% poor.
- Accessibility—66% of Americans live within 20 miles of a commercial service airport.

There is general consensus that maintaining the integrity of the national airport system requires continual updates and a steady and predictable flow of capital. The FAA has estimated that planned capital development of $9 billion annually is necessary to meet expanding demand. The Airport Council International (ACI) puts that number at $15 billion. Neither the FAA nor ACI estimates include terminal modifications needed to accommodate new explosives-detection systems required for baggage screening.

One challenge to airport capacity-building is the fragmented nature of airport ownership. Local governments and the private sector represent the majority of owners and investors in air transportation infrastructure; they tend to focus on their own needs, and only secondarily on national, system-wide concerns.

There has been recent progress on airport infrastructure issues. In 2000, Congress passed and President Clinton signed the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century—FAIR-21. This multi-year FAA reauthorization bill included authorizations of $9.9 billion for the Airport Improvement Program (AIP) for fiscal years 2001–2003, a significant increase over previous years. The bill also increased the Passenger Facility Charge to $4.50 per boarding passenger. Congress followed this in 2003 by reauthorizing the AIP for 2004–2007 at $14.2 billion for 4 years.

Airport funding comes from several sources:

- Airport bonds 59%
- AIP grants 21%
- Passenger Facility Charge 13%
- State and local funding 4%

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- Airport revenue 4%

The median time to open a new runway is 10 years. The challenges faced when building new runways include reaching stakeholder agreement on purpose and need for the runway, completing the environmental review process, reaching agreement on noise mitigation and other issues, and designing and constructing the runway. New Administration and congressional actions are intended to streamline the environmental review process. New runways can increase an airport's capacity by as much as 30–60%.

Policy Options

The national aviation system faces a number of major challenges in the coming years. The old business model for airlines is being replaced by a newer, low-fare, low-cost model. Newer aircraft, some much smaller and some much larger, will soon be operational. In order to meet these challenges, the national aviation infrastructure must find ways to become more flexible, and must ensure that the necessary expenditure of capital to meet the infrastructure need is available.

The American Society of Civil Engineers (ASCE) supports the permanent extension and increase of user fees as necessary for continued funding of AIP through the Airport and Airway Trust Fund. All monies collected from these user fees should be deposited in the Airport Trust Fund, and the Airport Trust Fund should be removed from the unified federal budget. Revenue Aligned Budget Authority (RABA), which allows for the allocation of all trust fund revenues, should be established in the airport trust funds. Additionally, Congress must provide continued but separate non-AIP and non-PFC funding for security operations.

Specific ASCE recommendations:

- Full funding for the Airport Improvement Program (AIP) at authorized levels
- Removal of the Airport Trust Fund from the federal budget
- Increase in the cap on the Passenger Facility Charge (PFC)
- Full implementation of environmental streamlining
- Modernization of Air Traffic Control Systems

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BRIDGES

C

Between 2000 and 2003, the percentage of the nation's 590,750 bridges rated structurally deficient or functionally obsolete decreased slightly from 28.5% to 27.1%. However, it will cost $9.4 billion a year for 20 years to eliminate all bridge deficiencies. Long-term underinvestment is compounded by the lack of a Federal transportation program.

Conditions

As of 2003, 27.1% of the nation's bridges (160,570) were structurally deficient or functionally obsolete, an improvement from 28.5% in 2000. In fact, over the past 12 years, the number of bridge deficiencies has steadily declined from 34.6% in 1992 to 27.1% in 2003. The Federal Highway Administration's (FHWA's) strategic plan states that by 2008, less than 25% of the nation's bridges should be classified as deficient. If that goal were met, 1 in 4 bridges in the nation would still be deficient. There were 590,750 bridges in the United States in 2000; however, one in three urban bridges (31.2% or 43,189) was classified as structurally deficient or functionally obsolete, much higher than the national average. In contrast, 25.6% (118,381) of rural bridges were classified as structurally deficient or functionally obsolete.

A structurally deficient bridge is closed or restricted to light vehicles because of its deteriorated structural components. While not necessarily unsafe, these bridges must have limits for speed and weight. A functionally obsolete bridge has older design features and, while it is not unsafe for all vehicles, it cannot safely accommodate current traffic volumes, and vehicle sizes and weights. These restrictions not only contribute to traffic congestion, they pose such major inconveniences as school busses or emergency vehicles taking lengthy detours. It is estimated that it will cost $9.4 billion per year for 20 years to eliminate all bridge deficiencies. The annual investment required to prevent the bridge investment backlog from increasing is estimated at $7.3 billion. Present funding trends of state departments of transportation call into question future progress on addressing bridge deficiencies.

Adding to these problems is the inability of the Administration and Congress to reauthorize the nation's Transportation Equity Act of the 21st Century (TEA-21), which has now had six extensions since the program expired on September 30, 2003. The progress made in the TEA-21, which authorized $218 billion for the nation's highway and transit programs in 2001, is beginning to slip as America continues to shortchange funding for much-needed road and bridge repairs.

Even with uncertain funding due to the lack of a federal transportation funds reauthorization bill, additional revenues from state and local governments have begun to make an impact on bridge projects in all 50 states. Total bridge expenditures by all levels of government for capital outlays (including system preservation and system expansion) was at $8.8 billion in 2003.

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Policy Options

Solutions intended to ease the increasing demands on our transportation system and to improve highway conditions, capacity and safety are multifaceted, and do not always mean simply building more roads and bridges. America must change its transportation behavior, increase transportation investment at all levels of government, and make use of the latest technology. Cities and communities should be better planned to reduce dependence on personal vehicles for errands and work commutes, and businesses must encourage more flexible schedules and telecommuting.

By 2010, all levels of government should ensure that fewer than 15% of the nation's bridges are classified as structurally deficient or functionally obsolete.

Congress must fully re-authorize TEA-21 before it expires again in May 2005. Congress also must use all of the money that accumulates in the Highway Trust Fund to support investment in the nation's surface transportation program and protect the trust fund from abuse by removing it from the unified budget. Congress must provide adequate funding to meet current highway and transit bridge needs, and include enough funding for research and development of civil engineering innovations that offer cost-effective solutions to our transportation needs. Other solutions include private-public partnerships where appropriate, and multi-year capital and operating budgets.

Specific Recommendations Supported by the American Society of Civil Engineers:

- Set a national goal that fewer than 15% of the nation's bridges be classified as structurally deficient or functionally obsolete by 2010
- Reauthorize TEA-21 for at least five years, using a needs-based approach to arrive at the funding level
- Remove the Highway Trust Fund from the unified federal budget
- Increase funding for long-term fundamental highway research efforts at the national level
- Establish of a federal, multi-year capital budget for public works infrastructure construction and rehabilitation, similar to those used by state and local governments
- Encourage the use of life-cycle cost analysis principles to evaluate the total costs of projects
- Support environmental streamlining of transportation projects

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DAMS

Since 1998, the number of unsafe dams has risen by 33% to more than 3,500. While federally owned dams are in good condition, and there have been modest gains in repair, the number of dams identified as unsafe is increasing at a faster rate than those being repaired. $10.1 billion is needed over the next 12 years to address all critical non-federal dams—dams which pose a direct risk to human life should they fail.

D

Background

Dams provide tremendous benefits, including water supply for drinking, irrigation and industrial uses; flood control; hydroelectric power; recreation; and navigation. However, dams also represent one of the greatest risks to public safety, local and regional economies and the environment. Historically, some of the largest disasters in the United States have resulted from dam failures. In 1889, 2,209 lives were lost when the South Fork Dam failed above Johnstown, Pennsylvania. The 1928 St. Francis Dam failure killed 450. During the 1970s, the failures of the Buffalo Creek Dam in West Virginia, Teton Dam in Idaho and the Toccoa Falls Dam in Georgia collectively cost 175 lives and more than $1 billion in losses. Such dam failures as Silver Lake Dam in Michigan in 2003 ($100 million in damages and economic losses of $1 million per day) and the Big Bay Lake Dam in Mississippi in March 2004 (100 homes destroyed) are current reminders of the potential consequences of unsafe dams.

In order to provide safe, continuing service, dams require ongoing maintenance, monitoring, frequent safety inspections and rehabilitation. Aging dams often require major rehabilitation to assure their safety. Downstream development below dams is increasing dramatically, and continuing scientific research of dam failure mechanisms, such as earthquakes and major flood events, frequently demand repairs to dams constructed long before these advances were realized. Many state dam safety programs do not have sufficient funding or qualified staff to effectively regulate dams under their authority. State programs regulate 95% of the 79,000 dams in the United States, while the federal agencies own or regulate only 5% of the nation's dams.

Conditions

Like all man-made structures, dams deteriorate. Deferred maintenance accelerates deterioration and causes dams to be more susceptible to failure. As with other critical infrastructure, a significant investment is essential to maintain the benefits and assure the safety that society demands.

In the past two years, more than 67 dam incidents, including 29 dam failures, were reported to the National Performance of Dams program, which collects and archives information on dam performance as reported by state and federal regulatory agencies and dam owners. Dam incidents are such events as large floods, earthquakes or inspections that alert dam safety engineers to

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deficiencies that threaten the safety of a dam. Due to limited state staff, many incidents are not reported; therefore, the actual number of incidents is likely to be much greater.

The number of high-hazard potential dams (dams whose failure would cause loss of human life) is increasing dramatically. Since 1998, the number of high-hazard-potential dams has increased from 9,281 to 10,213, with 1,046 in North Carolina alone. As downstream land development increases, so will the number of high-hazard potential dams. As these dams often require major repair to accommodate more stringent inspection, maintenance and design standards, financial support for state dam safety programs must keep pace.

Even more alarming, states presently report more than 3,500 "unsafe" dams, which have deficiencies that leave them more susceptible to failure. Many states have large numbers of unsafe dams, including Pennsylvania (725), New Jersey (583), and New Hampshire (357). Many state agencies do not report statistics on unsafe dams; therefore the actual number is potentially much higher.

The combined effect of rapid downstream development, aging/non-compliant structures and inadequate past design practices, coupled with a predicted increase in extreme events, demands fully funded and staffed state dam safety programs, as well as substantial and proactive funding for dam repairs.

Some progress is being made through the repair of small watershed dams constructed with assistance from the United States Department of Agriculture (USDA), beginning in 1948. This is only a small portion of the total number of non-federal dams. On the federal side, federally owned and federally regulated hydropower dams are in good condition; however, continuing budget restrictions and increased attention to security are placing pressure on and limiting many agency dam safety programs.

While the recent passage of the National Dam Safety and Security Act of 2002 (Public Law No: 107-310), which provides funding through grants, has improved state dam safety programs, it does not provide funding for needed repairs. 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 79,000 dams in the U.S. National Inventory of Dams continue to age and deteriorate, yet there is no national funding program to fund the repair of unsafe dams.

Since the last ASCE Report Card, the National Dam Safety Act of 1996 was reauthorized in 2002, increasing the authorization to $8.0 million. To date, however, funding has remained at pre-reauthorization levels of $5.5 million. Under this program, state dam safety agencies have received grants totaling nearly $22 million to assist with improving dam safety regulatory programs by procuring equipment, implementing new technology, and enabling more-frequent inspections. The program also provided opportunities for continuing education to dam safety engineers, and funding for research to advance the technology of investigations, construction, and rehabilitation of dams, but no funding to repair unsafe dams.

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According to results of a study by the Association of State Dam Safety Officials, the total investment to bring U.S. dams into safety compliance or to remove obsolete dams tops $30 billion. Except for a handful of state programs offering low-interest loans to dam owners, there are no funding sources for dam rehabilitation or repair. Private owners have the greatest need for funding. The Small Watershed Rehabilitation Act addresses less than 10% of the nation's dams—the remaining 90% demand similar attention.

On March 3, 2005, Representative Sue Kelly introduced H.R. 1105, the Dam Rehabilitation and Repair Act of 2005. The bill would provide $350 million over 4 years for the repair, rehabilitation or removal of non-federal, high-hazard, publicly owned dams.

Four years ago, few state dam safety programs were adequately funded or staffed. Today, that situation remains the same. On average nationwide, there are 268 state-regulated dams per full-time equivalent (FTE) staff. In 13 states, this number exceeds 500, and four report more than 1200 dams per FTE staff. In 1998, a Texas House Committee recommended adding 15 staff members to that state's six-member dam safety team; today, there are still only six staff members responsible for inspecting nearly 7500 dams. One Texas official commented that, "because of inadequate staffing, some dams would not be examined for three centuries."

Since the last Report Card, Delaware has created a dam safety program, leaving Alabama as the last remaining state that has not passed dam safety legislation. As a result, an estimated 2,100 dam structures—perhaps more—are unregulated. At last count, 171 of these structures were classified as high-hazard.

Policy Options

There is still an alarming lack of public support and education about the need for proper maintenance and repair of dams. Unless a dam fails, dam safety is not usually in the public view, although it is an issue that affects the safety of millions of people who could be living and working in the path of a sudden, deadly dam failure.

Specific recommendations supported by ASCE:

- Establishment of comprehensive and fully funded dam safety programs in all 50 states, especially Alabama, the only state without an authorized dam-safety program
- 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
- Full funding and expansion of the Small Watershed Rehabilitation Act
- Development of a comprehensive, Internet-based information resources system to support the maintenance and improvement of dam safety in the United States
- Reauthorization of the National Dam Safety Program Act in 2006
- Funding program in each state to assist with loans and matching grants

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DRINKING WATER

America faces a shortfall of $11 billion annually to replace aging facilities and comply with safe drinking water regulations. Federal funding for drinking water in 2005 remained level at $850 million, less than 10% of the total national requirement. The Bush administration has proposed the same level of funding for FY06.

D-

Conditions

The nation's 54,000 drinking water systems face staggering public investment needs over the next 20 years. Although America spends billions on infrastructure each year, drinking water faces an annual shortfall of at least $11 billion to replace aging facilities that are near the end of their useful life and to comply with existing and future federal water regulations. The shortfall does not account for any growth in the demand for drinking water over the next 20 years.

In 2001, the U.S. Environmental Protection Agency (EPA) released a national survey of drinking water infrastructure needs. The survey results concluded that approximately $151 billion would be needed over 20 years to repair, replace, and upgrade the nation's 55,000 community drinking water systems to protect public health.

A year later, the agency issued *The Clean Water and Drinking Water Infrastructure Gap Analysis*, which identified potential funding gaps between projected needs and spending from 2000 through 2019. This analysis estimated a potential 20-year funding gap for drinking water capital, and operations and maintenance, ranging from $45 billion to $263 billion, depending on spending levels. Capital needs alone were pegged at $161 billion, a $10 billion increase from the 2001 estimate.[1]

The Congressional Budget Office (CBO) concluded in 2003 that "current funding from all levels of government and current revenues generated from ratepayers will not be sufficient to meet the nation's future demand for water infrastructure." The CBO estimated the nation's needs for drinking water investments at between $10 billion and $20 billion over the next 20 years.[2]

Federal assistance has not kept pace with demand. Since FY 1997, Congress has appropriated only between $700 million and $850 million annually for the Safe Drinking Water Act State

[1] Operation and maintenance (O&M) costs are paid for by the local water utilities, not the federal government.

[2] The CBO approximation does *not* include the $178 billion to $331 billion in anticipated pipe replacement costs over the same 20-year period.

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Revolving Loan Fund (SRF) program, enacted in 1987. The enacted funding level for FY 2005 was $850 million, less than 10% of the total national requirements.

The Bush Administration has proposed an appropriation of $850 million for FY 2006.

Policy options

New solutions are needed for what amounts to nearly $1 trillion dollars in critical drinking water and wastewater investments over the next two decades. Not meeting the investment needs of the next 20 years risks reversing the public health, environmental and economic gains of the past three decades.

Without a significantly enhanced federal role in providing assistance to drinking water infrastructure, critical investments will not occur. Possible solutions include grants, trust funds, loans and incentives for private investment. The question is not *whether* the federal government should take more responsibility for drinking water improvements, but *how*.

The case for federal investment is compelling. Needs are large and unprecedented; in many locations, local sources cannot be expected to meet this challenge alone, and because waters are shared across local and state boundaries, the benefits of federal help will accrue to the entire nation. Clean and safe water is no less a national priority than are national defense, an adequate system of interstate highways, and a safe and efficient aviation system. These latter infrastructure programs enjoy sustainable, long-term federal grant programs; under current policy, water and wastewater infrastructure do not.

Equally compelling is the case for flexibility in the forms of federal investment including grants, loans, and other forms of assistance. Grants will be needed for many communities that simply cannot afford to meet public health, environmental and/or service-level requirements. Loans and credit enhancements may be sufficient for communities with greater economies of scale, wealthier populations and/or fewer assets per capita to replace.

- The American Society of Civil Engineers (ASCE) supports enactment of a federal water infrastructure trust fund act that would provide a reliable source of federal assistance for the construction and repair of water treatment plants to reduce the enormous funding gap.
- In the interim, ASCE supports annual appropriations from the federal general fund for the State Revolving Loan Fund (SRF) program at a minimum of $1 billion annually.
- In addition, ASCE supports the establishment of a federal capital budget to create a mechanism to help reduce the constant conflict between short-term and long-term needs. The current federal budget process does not differentiate between expenditures for current consumption and long-term investment. This causes major inefficiencies in the planning, design and construction process for long-term investments. A capital budget system would help increase public awareness of the problems and needs facing this country's physical infrastructure, and would help Congress to focus on programs devoted to long-term growth and productivity.

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- The American Society of Civil Engineers supports the funding of research into improved water reuse and purification technology, which may reduce capital, operations and maintenance costs for producing safe drinking water.

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U.S. ELECTRIC POWER GRID

The U.S. power transmission system is in urgent need of modernization. Growth in electricity demand and investment in new power plants has not been matched by investment in new transmission facilities. Maintenance expenditures have decreased 1% per year since 1992. Existing transmission facilities were not designed for the current level of demand, resulting in an increased number of 'bottlenecks' which increase costs to consumers and elevate the risk of blackouts.

D

Conditions

In 2003, the most recent year for which complete data are available, the total U.S. net generation of electricity rose slightly to 3.883 billion kilowatt hours. This represents a 0.6% growth in electricity generation over the 2002 level; however, it is significantly below the average annual growth rate of 2.4% between 1992 and 2003.[3]

To distribute that power, the U.S. electric transmission grid consists of nearly 160,000 miles of high-voltage (230 kilovolts and greater) transmission lines. In 1999, America's electric utilities spent more than $3 billion maintaining and operating these links to customers, and $2.3 billion on construction expenditures (including replacements, additions and improvements).[4]

Despite these investments, the state of the grid remains a cause for deep concern among experts. The Consumer Energy Council of America (CECA), a national association of utility officials, state regulators and consumer advocates, warned this winter that support for new investment in the transmission grid is declining.

The CECA noted that investment in the transmission grid was at a low of $83 million per year from 1975 to 1999. It increased to $286 million annually from 1999 through 2003. Although the investment increases are good, total U.S. transmission capacity decreased by approximately 19% per year between 1992 and 2002. Investment in transmission lines during the next 10 years is expected to be $3 billion to $4 billion per year, while the line-miles of transmission added will be only one third the rate of electricity demand. In addition, transmission maintenance expenditures have decreased at a rate of one percent annually since 1992, which can affect the reliability of the system.

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[3] In 2001, the U.S. actually experienced a decrease of two percent over all in electric power production. The decrease was unusual, in that net U.S. generation has historically increased from year to year. It was only the second time in more than 50 years that there was a decrease in net generation, according to the Energy Information Administration of the U.S. Energy Department (EIA).

[4] Investor-owned utilities own 73% of the transmission lines, federally owned utilities own 13%, and public utilities and cooperative utilities own 14%, according to data from the EIA.

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In 2002, the U.S. Department of Energy was equally blunt:

> "There is growing evidence that the U.S. transmission system is in urgent need of modernization. The system has become congested because growth in electricity demand and investment in new generation facilities have not been matched by investment in new transmission facilities. Transmission problems have been compounded by the incomplete transition to fair and efficient competitive wholesale electricity markets. Because the existing transmission system was not designed to meet present demand, daily transmission constraints or 'bottlenecks' increase electricity costs to consumers and increase the risk of blackouts."

Those fears were realized in August 2003, when the grid failed during the blackout that hit the Midwest, Northeast and portions of Canada. A series of power plants and transmission lines went offline because of instability in the transmission system in three states. The loss of these plants and transmission lines led to greater instability in the regional power transmission system; within four hours, there was a rapid cascade of additional plant and transmission line outages and widespread power outages. The blackout affected as many as 50 million customers in the United States and Canada, as well as a wide range of vital services and commerce. Air and ground transportation systems shut down, trapping people far from home; drinking water systems and sewage processing plants stopped operating, manufacturing was disrupted and some emergency communications systems stopped functioning. The lost productivity and revenue have been estimated in the billions of dollars.

In a letter to Congress in February 2004, the North American Electric Reliability Council (NERC), a consortium of public and private power producers that seeks to enforce compliance with voluntary reliability standards, was blunt in its assessment of the performance of the North American transmission grid:

> "NERC's analysis of the actions and events that led to the blackout showed that several violations of NERC operating policies contributed directly to the August [2003] outage. This is yet another clear signal that voluntary compliance with reliability rules is no longer adequate, and underscores the urgent need for Congress to authorize the creation of a mandatory reliability system that provides for the establishment and enforcement of reliability rules by an independent, industry-led electric reliability organization, subject to oversight by the Federal Energy Regulatory Commission (FERC) within the United States."[5]

Not all utilities own transmission lines (that is, they are not vertically integrated), and no independent power producers or power marketers own transmission lines. Over the years, these transmission lines have evolved into three major national networks (power grids), which also

[5] In November 2004, 15 months after the Northeast blackout, FERC announced plans to "[o]versee the development and enforcement of mandatory grid-reliability standards to protect the bulk power supply."

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include smaller groupings or power pools. The major networks consist of extra-high-voltage connections between individual utilities designed to permit the transfer of electrical energy from one part of the network to another. These transfers are restricted, on occasion, because of a lack of contractual arrangements or because of inadequate transmission capability.[6]

Over the past 10 years, utilities have been reluctant to put major investment into transmission lines without knowing how deregulation would affect these assets; therefore, the growth of the grid was slow and remains so. While the level of new transmission lines being constructed is low, the upgrading of existing transmission assets for a number of utilities is a major effort. Upgrades would provide the fastest and most economical approach to improvement of the grid, but there is a limit to the improvement using this approach.

Thus, the future of the U.S. transmission network is uncertain and is a continuing concern. Overall use of the transmission system is growing without significant additions of new construction or upgrades. Approval of new projects and the acquisition of new rights-of-way have been difficult. Many customers oppose having new transmission facilities built nearby. These transmission facilities support interstate commerce; but the siting and approval are generally a state and local governmental responsibility. In addition, the prelude to deregulation created and continues, to some degree, to cause limited investment in the transmission system.

The transmission grid is intended to be flexible, reliable and open to all exchanges, regardless of where the suppliers and consumers of energy are located. But neither the existing transmission grid nor its current management infrastructure can fully support this diverse and open exchange. The existing system was built for local needs, and is struggling to meet the demands of a global system brought about by deregulation. Electricity transactions that are highly desirable from a market standpoint may be quite different from the transactions for which the transmission grid was designed, and may stress the limits of safe operation.

The risks that they pose may not be recognized in time to avert major system emergencies, and, when emergencies occur, they may be of unexpected types that are difficult to manage without loss of customer load.

Meanwhile, new technology may alleviate the worst of the problem. Distributed generation—the small-scale production of electricity in fuel cells located at or near customers' homes and businesses—has the potential to improve the reliability of the power supply, reduce the cost of electricity and lower emissions of air pollutants, according to the Congressional Budget Office.

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[6] The three networks are the Eastern Interconnect, the Western Interconnect and the Texas Interconnect. The Texas Interconnect is not interconnected with the other two networks (except by certain direct current lines). The other two networks have limited interconnections to each other. Both the Western and the Texas Interconnect are linked with different parts of Mexico.The Eastern and Western Interconnects are completely integrated with most of Canada or have links to the Quebec Province power grid. Virtually all U.S. utilities are interconnected with at least one other utility by these three major grids; the exceptions are utilities in Alaska and Hawaii. The interconnected utilities within each power grid coordinate operations, and buy and sell power among themselves. Within each of these power grids, different types of equipment and facilities are owned by many different entities.

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Policy Options

A safe, reliable electrical transmission grid is vital to the security and the economic health of the nation. The U.S. grid can no longer be allowed to operate under weak voluntary reliability guidelines from industry. The nation cannot afford to continue a piecemeal approach to the siting, construction and repair of the national transmission grid.

- Congress must require strict federal oversight of the conditions and operation of the grid by the FERC. In turn, FERC must adopt stringent, mandatory national standards for the safe operation, construction and maintenance of the transmission grid nationwide.

- Right-of-way acquisition must be accelerated under federal oversight.

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HAZARDOUS WASTE

Federal funding for 'Superfund' cleanup of the nation's worst toxic waste sites has steadily declined since 1998, reaching its lowest level since 1986 in FY05. There are 1,237 contaminated sites on the National Priorities List, with possible listing of an additional 10,154. In 2003, there were 205 U.S. cities with 'brownfields' sites awaiting cleanup and redevelopment. It is estimated that redevelopment of those sites would generate 576,373 new jobs and $1.9 billion annually for the economy.

D

Conditions

Superfund

Despite nearly 25 years of effort and billions of dollars in federal expenditures, the cleanup of chemically contaminated waste sites remains a perplexing problem.

"Although substantial [cleanup] progress has been made over the past quarter century, a considerable amount of cleanup work remains," said the U.S. Environmental Protection Agency (EPA) in late 2004.

Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) in December 1980. The program was initially intended to clean up about 400 high-priority hazardous waste sites nationally.

CERCLA also established the Superfund Trust Fund, which was created primarily from a corporate environmental income tax, and excise taxes on petroleum and specified chemicals. The Trust Fund received about $1.5 billion per year before the legislative authority to collect the taxes expired on December 31, 1995.

Between Fiscal Year 1981 and Fiscal Year 2005, Congress appropriated $29.3 billion to aid in the cleanup of hazardous waste sites under Superfund. Billions more were appropriated to clean up leaking underground storage tanks and "brownfields" sites. The states also have contributed billions to hazardous-waste cleanups.

But progress toward completing the nation's cleanup program for chemically contaminated properties has been sluggish. As many as 350,000 contaminated sites will require cleanup over the next 30 years, assuming that current regulations and practices remain the same, according to a recent EPA report. The national bill for this cleanup may amount to as much as $250 billion.[7]

[7] Approximately $32 billion of this total will be needed for more than 700 sites on the NPL, which is reserved for the worst Superfund sites. The great preponderance of the total expenditure will be borne by

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As of November 2004, there were 1,237 civilian waste sites on the National Priorities List (NPL), with another 10,154 still to be evaluated for possible listing.[8]

Even as needs have grown, annual congressional appropriations for Superfund have steadily declined in recent years, after topping $2 billion in FY 1998. The appropriation for FY 2005 is $1.257 billion, the lowest since FY 1986. The Bush administration has proposed a budget of $1.279 billion for FY 2006, an increase of less than 2%.

Meanwhile, the pace of cleanups is slowing. For much of the 1990s, EPA averaged more than 70 construction-complete sites per year, but the number of newly completed sites has decreased dramatically since 2000. In FY 2003, there were just 40 NPL sites deemed to be complete, according to Resources for the Future, a nonpartisan environmental policy research organization.

Policy Options

The American Society of Civil Engineers recommends the following policies:

- Congress must 1) reauthorize the federal Superfund taxes on chemicals, petroleum, and corporations; or 2) create another federal funding mechanism to revive the Hazardous Substance Superfund cleanup program and remove the cost of cleanup from the general fund.

- Congress and the Environmental Protection Agency must develop and implement legislation, including economic incentive programs, that consider environmental costs and encourage hazardous waste reduction "at the source" (point of generation) and the design of reuse programs.

Brownfields

In 2003, a total of 205 U.S. cities had 24,987 brownfield sites awaiting redevelopment, according to a survey by the U.S. Conference of Mayors. In addition, more than 150 cities had successfully redeveloped 922 brownfield sites, returning more than 10,000 acres to economic productivity. These actions resulted in $90 million in new municipal revenues to 45 cities, and more than 83,000 jobs to 74 cities, the survey found.

Of the 205 cities with idle brownfields, 148 reported that 576,373 new jobs and as much as $1.9 billion annually could be generated were brownfield sites redeveloped.

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the owners of the properties (private entities and various government agencies) and those potentially responsible for the contamination, according to the EPA.

[8] The Defense Department and the Department of Energy list another 11,400 sites that must be cleaned up using annual department appropriations.

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"[T]he most frequently identified impediment[s] to redevelopment of these sites [are] lack of cleanup funds, liability issues, and the need for environmental assessments," the survey reported. "Three-quarters of respondents said that additional resources are needed to attract greater private-sector investment."

The American Jobs Creation Act, which the President signed on October 22, 2004, contains two brownfields provisions. One authorizes tax-exempt facility bonds for "green building and sustainable design projects" that include a brownfield and that meet other requirements. The other allows tax-exempt entities to invest in the cleanup and redevelopment of brownfields without incurring unrelated business income taxes when the property is sold.

Another law, the Working Families Tax Relief Act, signed on October 4, 2004, reinstated the brownfields tax incentive through December 31, 2005. The incentive allows property developers to fully deduct the costs of environmental cleanup in the same year that the costs are incurred.

Finally, the Small Business Liability Relief and Brownfields Revitalization Act, signed in January 2002, provides for: 1) a program to provide assessment grants to characterize, assess, and conduct planning at brownfield sites, and to perform targeted site assessments; and 2) a program to provide remediation grants to capitalize revolving loan funds, or to be used directly to clean up one or more sites.

Assessment grants are limited to $200,000, which EPA may increase to $350,000 based on the anticipated level of contamination, the size, or the ownership status of a site. The remediation grants may be awarded on a community-wide or site-by-site basis, and are limited to $1 million. The law authorizes $200 million for each of five years for these programs, and dedicates $50 million per year (or 25% of the amount appropriated, if less than $200 million) for the assessment and cleanup of relatively low-risk sites contaminated with petroleum or petroleum products. Technical assistance, training and research are also authorized.

The law also authorizes $50 million per year for five years to assist states in establishing or enhancing their voluntary cleanup programs, which addresses contaminated sites that do not require federal action, but require cleanup before they can be considered for reuse. States may also use these grants to capitalize a revolving loan fund or to develop a risk-sharing pool, an indemnity pool, or insurance mechanism to provide financing for response actions.

The 2002 Act clarifies the Superfund law's "innocent landowner" defense. CERCLA provides a defense against liability for a person who unknowingly purchases contaminated land, provided that the person made "all appropriate inquiry" prior to the transaction. It spells out what comprises all appropriate inquiry that a purchaser must perform in order to qualify as an innocent landowner under the law. These provisions apply to all contaminated sites, not just brownfields.

In August 2004, EPA published a proposed rule that would require all appropriate inquiries to be signed by an environmental professional. The professional would be required to either have a

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current professional engineer's license or to hold an engineering degree in addition to a minimum of five years of relevant experience.[9]

Policy Options

The American Society of Civil Engineers (ASCE) supports:

- Existing federal programs to finance the revitalization of America's brownfields
- A Brownfields Redevelopment Action Grant (BRAG) program within EPA to provide investment funds for local governments to leverage private investment in brownfields redevelopment in order to help preserve farmland and open spaces

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[9] The American Society of Civil Engineers was one of 25 parties that negotiated the proposed rule with EPA in 2003-2004.

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NAVIGABLE WATERWAYS

A single barge traveling the nation's waterways can move the same amount of cargo as 58 semi-trucks at one-tenth the cost—reducing highway congestion and saving money. Of the 257 locks on the more than 12,000 miles of inland waterways operated by the U.S. Army Corps of Engineers, nearly 50% are functionally obsolete. By 2020, that number will increase to 80%. The cost to replace the present system of locks is more than $125 billion.

D-

Background

The U.S. Army Corps of Engineers maintains more than 12,000 miles (19,200 kilometers) of inland waterways, and owns or operates 257 locks at 212 sites on inland waterways. These waterways—a system of rivers, lakes and coastal bays improved for commercial and recreational transportation—carry about one-sixth of the nation's intercity freight, at a cost per ton-mile about half that of rail, or one-tenth that of trucks.

Waterways are excellent ways to move large volumes of bulk commodities over long distances. The cargo capacity of a typical barge is equivalent to that of 15 large railroad cars, or 58 semi-trucks. A representative 15-barge tow on a main stem waterway moves the same cargo as 870 trucks stretching 35 miles on the interstate highway system. That same 15-barge tow would require two 100-car unit trains, extending nearly three miles in length.

Locks and dams can affect the environment. They slow the natural velocity immediately upriver from their locations, so that organisms adapted to fast-flowing water are replaced by those adapted to slow-flowing water, and dams trap sediments that would otherwise flow farther downstream. More dredging may be necessary to keep the navigation channels open.

The 12,000 miles of inland and intracoastal waterways, as do highways, operate as a system, and much of the commerce moves on multiple segments. They serve as connecting arteries, much as neighborhood streets help people reach interstate highways. These waterways are operated by the Corps of Engineers as multi-purpose, multi-objective projects. They not only serve commercial navigation, but, in many cases, also provide hydropower, flood protection, municipal water supply, agricultural irrigation, recreation and regional development.

Conditions

Forty-one states, 16 state capitals and all states east of the Mississippi River are served by commercially navigable waterways. Domestic companies operating vessels on U. S. waterways increased 19.6% from 2002 to 2003.

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Waterway usage is increasing, but the facilities are aging; many Corps-owned or -operated locks are well past their planned design life of 50 years. Of the 257 locks still in use in the United States, 30 were built in the 19th Century, another 92 locks are more than 60 years old. In other words, nearly 50% of all Corps-maintained locks were functionally obsolete by the beginning of 2005. Assuming that no new locks are built in the next 20 years, by 2020, another 93 existing locks will be obsolete—rendering more than 8 of every 10 locks now in service archaic.

As the system ages, the infrastructure cannot support the growing traffic loads, resulting in frequent delays for repairs. At the same time, the repairs become more expensive due to long-deferred maintenance.

The Inland Waterway Trust Fund, created in 1978, pays half the cost of the construction and major rehabilitation costs for specified federal inland waterways projects. It receives money from a tax on fuel (currently set at 20 cents per gallon) on vessels engaged in commercial transportation on inland waterways.

In recent years, there has been a number of major inland waterway infrastructure failures—a few years ago, the entire Ohio River system was closed for a time due to infrastructure breakdowns.

The fund earned $106 million in FY 2005, including approximately $91 million paid by the barge and towing industry, and $15 million in interest. The Corps of Engineers received $149 million for construction projects, leaving a balance of approximately $307 million. In FY 2006, the Corps is planning to spend $394 million on current maintenance projects, a sum that will not reduce the backlog of pending repairs that exceed $600 million.

In addition, the Bush administration proposed in February to spend $184 million from the trust fund for new construction in FY 2006. The trust fund balance remaining at the end of the year is expected to be $228 million—enough to begin addressing a significant portion of the maintenance backlog.

The Corps estimates that it would cost more than $125 billion to replace the present inland waterway system.

Policy Options

- Congress should amend the Inland Waterways Trust Fund Act of 1978 to allow all funds collected to be used for repair and construction of dams and locks. Congress should then appropriate the full fund balance each year to pay for the cost of rehabilitating the nation's oldest locks. The government needs to set a priority system for restoring locks that have outlasted their design lives, with an initial focus on all locks built in the 19th century. The current federal budget process does not differentiate between expenditures for current consumption and long-term investment. This causes major inefficiencies in the planning, design and construction process for long-term investments.
- In the interim, Congress must appropriate the full amount in the Inland Waterway Trust Fund to begin reducing the maintenance backlog.

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- The American Society of Civil Engineers (ASCE) supports the creation of a federal capital budget to create a funding mechanism that would help reduce the constant conflict between short-term and long-term maintenance needs. This would help to increase public awareness of the problems and needs facing this country's physical infrastructure, and would help Congress to focus on specific programs devoted to long-term growth and productivity.

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PUBLIC PARKS & RECREATION

Many of our nation's public parks, beaches and recreational harbors are falling into a state of disrepair. Much of the initial construction of roads, bridges, utility systems, shore protection structures and beaches was done more than 50 years ago. These facilities are anchors for tourism and economic development and often provide the public's only access to the country's cultural, historic and natural resources. The National Park Service estimates a maintenance backlog of $6.1 billion for their facilities. Additionally, there is great need for maintenance, replacement and construction of new infrastructure in our nation's state and municipal park systems.

C-

Conditions

The National Park System

The U. S. National Park System (NPS) entertained more than 266 million recreational visits in 2003. The system consists of 388 park units, including more than 18,000 permanent structures, 12,000 miles of roads, 1,800 bridges and tunnels, 4,246 housing units, roughly 1,527 water and wastewater systems, more than 400 dams, and 200 solid waste operations.

The NPS is nearing completion of an effort to accurately evaluate the conditions of all NPS assets and has estimated the maintenance backlog for its facilities at as much as $6.1 billion. However, as noted by the General Accounting Office (GAO) in a 1998 report, it has no formal method for evaluating the conditions of its assets. The NPS has since developed an asset-management program designed to assess the conditions of all of its assets in a standardized, consistent manner in two phases. First, in a basic review evaluation, intended to be conducted at all parks on an annual basis and second, a more in-depth review to take place every three to five years. The basic evaluations have been conducted at all but the four largest parks in the system, and the remaining four are expected to be completed by FY 2006.

The Bush Administration's FY 2006 budget request includes $1.1 billion for the National Park Service, completing a $4.9 billion commitment over 5-years for park facility maintenance and construction that began in FY 2002. During FY 2001-2002, the majority of nearly $350 million in funding to address the maintenance backlog was spent on buildings, safety and utilities.

In 2001, just 35% of park roads were in good condition. The Administration's legislative proposal to reauthorize the nation's surface transportation systems included $320 million in funds for park roads; however, the reauthorization process remains stalled in Congress, with significant action not likely until late spring 2005.

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U.S. Army Corps of Engineers Facilities

The nation's largest provider of public outdoor recreation opportunities is the U.S. Army Corps of Engineers. The Corps works with states, counties, cities, concessionaires and other federal agencies by leasing lands to them for the development of public park and recreation facilities. At the Corps' 456 lake projects, there are roughly 4,300 public recreation areas. The Corps shares some of these costs with local governmental entities on a 50/50 basis.

The condition of Corps -managed recreation areas and those of its partners is a nationwide issue. More than 90% of the Corps lake projects were constructed before 1980. In fact, 40% of those same projects were constructed prior to 1960. A mix of Corps, public, and private sector providers has traditionally provided recreation opportunities at Corps lakes. Both Corps areas and other public recreation areas on Corps lands have borne the brunt of many years of heavy recreational use and lack of proper maintenance.

Further, modern recreational equipment and recreational use patterns of today's diverse population no longer fit Corps recreational areas. Equipment has changed drastically both in size and in infrastructure requirements. New uses for Corps lakes like sail boarding were never anticipated when Corps facilities were designed. Even more significant is the rapid diversification of this nation's population. While we know that use patterns and recreation preferences vary according to population segments, Corps facilities continue to provide recreation for the much less diverse population of the 1960s.

These public recreation areas are in need of modernization. Whether it is a problem with accessibility, inadequate RV hook-ups, meeting the needs of today's diverse population, or an issue with safety, these recreation areas require modernization to meet the needs of present customers, underserved populations, and future generations.

State, Local and Urban Parks

State parks represent less than two percent of the total outdoor recreation areas, but more than 29% of all visitors at outdoor recreation areas, state or federal.

Many large urban areas are using publicly funded parks, beaches and recreational harbors as focal points and amenities for redevelopment of blighted urban areas. These projects often use funding from multiple sources, including the federal, state and local governments, private companies and philanthropists, to clean up and revitalize neglected areas.

These success stories have made a huge difference in these communities, and demonstrate an ideal cost-sharing model for infrastructure renewal. There are, however, simply too few success stories.

There is also an opportunity to make use of our nation's urban open space to provide "green infrastructure" alternatives for transportation and stormwater management. Bicycle paths and walkways provide alternative urban transportation while stormwater greenways and wetlands help to prevent overflowing sewers and floods. These interconnected systems of green spaces

would conserve natural ecosystems; preserve biodiversity; sustain clean air and water; and reduce flood control, stormwater management and road construction costs.

Recreational Boating Facilities

Recreational boating infrastructure such as breakwaters, harbor dredging, fishing piers, boat slips and launch ramps serve as public gateways to our nation's waterways. Annual boat registrations have more than doubled in the past three decades. In fact, since 1988, annual boat registrations have steadily increased from 10 million to nearly 13 million boats – an increase of 23 percent. Approximately 78 million Americans enjoy recreational boating each year and are dependent on these facilities for public access. While boating continues to be a popular recreational choice among Americans, federal and state investment in boating infrastructure has generally declined in the last few years, in part because of federal and state budgetary issues. The public access opportunity provided by many of these facilities is being lost to more profitable land uses as existing marinas and boatyards are being sold for their land value and redeveloped for non-water dependent land uses. The need for public boating access is simply not keeping pace with the nation's growing population.

California's Department of Boating and Waterways recently determined that statewide, boating contributed approximately $16.5 billion to the Gross State Product annually. In addition, boating contributed $1.6 billion in state and local taxes annually. There were 8,500 boating related businesses in the state that provided more than 284,000 jobs to the economy.

The study concluded that there is a need for investment in the development of new facilities to accommodate the anticipated growth amounting to $695 million through 2020. In addition to this amount, there is a need for upgrade or replacement of the existing facilities (approximately 2/3 of the inventoried facilities will need such work within the next 10 years) totaling more than $1.8 billion over the next 10 years. The federal, state and local expenditures for these items are not even close to meeting this need.

Beaches

Coastal areas are vital to Americans, providing a home for 53% of the nation's population on just 17% of the land area, as well as popular vacation destinations for American and foreign tourists. In fact, coastal areas generate almost 31% of the U.S. gross national product. Beaches provide shore protection in these areas, and have a tremendous national economic impact.

Travel and tourism is the United State's largest industry, employer and earner of foreign exchange. Spending by foreign tourists alone supports 2.7 million U.S. jobs. The popularity of beaches dominates tourism, with 75% of summer travelers planning to visit beaches. In the U.S., coastal states receive about 85% of the country's tourist-related revenues, largely because of the popularity of beaches.

Beach erosion and shore protection are of major concern to tourism and, for more than 60 years, the federal government has worked in concert with state and local entities to maintain and restore the nation's beaches to benefit all Americans.

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Policy Options

- Maintain a strong commitment to invest in the national parks, including appropriate cost-sharing between park visitors and the nation's taxpayers.
- Support legislation to allow the Corps to retain user fees generated by visitors and to use them to make improvements where the fees are generated, without offsets to its budget.
- Fully fund the Corps Recreation Modernization program to allow it to improve its own facilities and those of its partners, and to allow incentives for private-sector developers to take over Corps-managed areas.
- Support the Federal Shore Protection Program as established by Congress, including the ongoing nourishment and environmental restoration components of the program.
- Support State boating programs that have been established to direct the spending of user fees, motor boat fuel taxes and other taxes collected from Boaters towards the improvement of boating facilities and preservation of public access to the nation's waters for recreational pursuits.
- Support legislation that encourages access to beaches and coastal areas.

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RAIL

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For the first time since World War II, limited rail capacity has created significant chokepoints and delays. This problem will increase as freight rail tonnage is expected to increase at least 50% by 2020. In addition, the use of rail trackage for intercity passenger and commuter rail service is increasingly being recognized as a worthwhile transportation investment. Congestion relief, improved safety, environmental and economic development benefits result from both freight and passenger market shifts to rail creating a rational for public sector investment. The freight railroad industry needs to spend $175-$195 billion over the next 20 years to maintain existing infrastructure and expand for freight growth. Expansion of the railroad network to develop intercity corridor passenger rail service is estimated to cost approximately $60 billion over 20 years. All told, investment needs are $12-13 billion per year.

Conditions

Rail is a vital component in the nation's freight transportation system. Since deregulation of the railroad industry in 1980, railroads have streamlined their operations to reduce costs and provide competitive service to shippers. If current trends continue, however, railroads will be unable to maintain the current network or to expand the network to meet the challenge of growing freight traffic while still maintaining profitability. The result will be increased shipping costs and the shift of freight to trucks traveling on already overburdened highways. This will lead to increased traffic congestion, increased highway and bridge maintenance costs, increased frequency of highway bridge and roadway replacement, leading to increased air pollution, fuel consumption and travel times for passengers and freight traffic.

The U.S. freight rail system is comprised of three groups of railroad companies: seven Class I freight railroad systems, defined as systems with annual operating revenue of about $272 million or more; 31 regional railroads, which are line-haul railroads operating at least 350 miles of road and that have annual revenues from $40 million to about $272 million; and more than 500 local railroads, line-haul railroads smaller than regional railroads. In 2000, these companies operated 220,000 miles of track held to high safety standards by the Federal Railroad Administration. Freight rail carried 40% of intercity ton-miles in 2000.

Railroads are capital-intensive businesses, with many track, structures, signal systems, rolling stock and other infrastructure elements to be installed, maintained, inspected and secured to guarantee safe operation. Deregulation allowed railroads to decrease some of these costs by selling and discarding underutilized components. Railroads also have shifted some infrastructure elements to shippers, reducing the capacity of their car fleet by 14% between 1990 and 2002, even while total car capacity increased 20%. Class I railroads have streamlined businesses, cutting labor costs and shedding under-utilized track, decreasing the overall network by 39%.

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Railroads have passed most of these savings on to shippers in an effort to remain competitive with other modes of transportation and maintain their market share in the freight industry. Rail freight rates have been cut by up to 2% per year on average in the past 20 years.

This trend cannot continue. Ton-miles carried have increased by 64% since 1980, and the U.S. Department of Transportation (DOT) estimates that rail tonnage will increase by well more than 50% by 2020. Capacity has already become a problem in some areas for the first time since World War II, especially at intermodal facilities that represent the fastest growing segment of rail traffic.

Since deregulation, railroads have spent $349 billion on capital improvements and maintenance of track and equipment. Capital expenditures have grown 56%, from $3.6 billion in 1990 to $5.7 billion in 2002, while the price level of railroad purchases of inputs rose only 38%. Expenditures on railroad and structures jumped 76%, from $2.6 billion in 1990 to $4.6 billion in 2002.

Class I railroads currently invest about $2 billion annually for improvements above and beyond repair and maintenance. Continued investment at this level will result in freight losing freight market share over the next 20 years as the industry will not be able to keep up with growing demand. Most within the railroad industry agree that even with these continued substantial investments by the railroad industry, it will be unable to generate the revenues needed to sufficiently reinvest in tracks and equipment. Short-line and regional railroads face major needs for track and bridge upgrades to carry the newer 286,000-pound rail car. Without assistance, small railroads are unable to make upgrades and will cease to exist.

To simply maintain current share of freight carried, and anticipated increase in total freight carried, railroads would require $175 billion to $195 billion in investments over the next 20 years. The expenditures would break down like this: safety, $13.8 billion; short-line improvements, $11.8 billion; Class I infrastructure repair and maintenance, $4-$5 billion annually or $80 billion to $100 billion over 20 years; Class I infrastructure improvements (above and beyond repair and maintenance), $3.5 billion annually or $70 billion over 20 years. Up to $142 billion would be available from freight railroad revenues and borrowing, but the remainder would have to come from other forms of public sector participation.

The consequences of inadequate rail infrastructure investment will be borne by the public, not just by the rail industry. The American Association of State Highway and Transportation Officials (AASHTO) has estimated that shifting all freight currently carried by rail to trucks would cost shippers an additional $69 billion annually; this would mean higher prices for U.S. consumers. Increased truck traffic on the nation's highways will result in an additional $54 billion in highway funds over the next 20 years required to maintain the roads.

In addition to freight transportation, the nation's rail infrastructure supports intercity passenger operations. Intercity rail operations are currently provided over a 23,000 mile network serving more than 500 cities in 47 states, with a train service level of approximately 260 trains per day. Most of this service is a basic system operated by Amtrak, with 13 states providing support for selected train service. While Amtrak operates most of its network over rail lines owned by the freight-rail companies, it owns and operates approximately 600 miles of track in the northeast, including the Northeast Corridor, which has endured years of deferred maintenance and

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investment backlog on the Northeast Corridor. Amtrak and the DOT Inspector General have noted that this deficiency can no longer be ignored. Amtrak estimates the cost of infrastructure investment at more than $2 billion in the next 5 years, only a portion of an estimated backlog of $4 billion. Without this level of investment, Amtrak and the eight commuter railroads that use the Amtrak-owned infrastructure will be subject to increasing delays due to inspection-based slow orders or infrastructure problems. Beyond infrastructure renewal, the costs to expand the Corridor to support commuter and Amtrak service expansions necessary to support demand are estimated to exceed $6 billion.

In addition to Amtrak's existing intercity operations, there is considerable interest in the development of corridor (less than 500 miles) railroad services—both high speed and conventional railroad service. Investments have already been made in more than a half-dozen states in instituting corridor passenger rail service; a total of 36 states are actively planning to expand corridor rail service. Costs to develop the projected corridor needs are estimated by AASHTO to approach $60 billion—substantially less than the cost of adding equivalent highway capacity.

Amtrak and its funding partners provide vital transportation services in many parts of the country. For example, without regular intercity passenger rail service between Washington, DC and Boston, highways and airports would become even more crowded, and travel between these cities would be more cumbersome. Longer-distance trains add network connectivity and accessibility for many towns and cities in states that would otherwise not have access to transportation service.

Policy Options

Rail should be an important component in a national transportation infrastructure plan. While maintaining the freight-rail industry's right to operate as profitable businesses, there is a role for public involvement in expanding the rail network in critical areas.

Making appropriate cross-modal investments for a national network is a national planning issue that must be recognized and highlighted. ASCE supports the AASHTO recommendation to develop a national transportation plan. This will result in a cross-modal transportation plan and policy, including investment strategies to support the existing and growing need for investment in both rail freight and rail passenger systems. From a national investment standpoint, a strong argument can be made that a role for public funding exists, as public benefits result.

In addition, ASCE supports the establishment of a federal capital budget to create a mechanism to help reduce the constant conflict between short-term and long-term needs. This conflict often results from a lack of clarity between simply replacing aged and underperforming assets and providing for needed expansion to support future transportation demand—both freight and passenger. The current federal budget process does not differentiate between expenditures for current consumption (asset replacement or renewal to perpetuate the existing level of service) and long-term investment (to add capacity and improve performance in travel time and service frequency). This causes major inefficiencies in the planning, design and construction process for long-term investments. A capital budget system would help to increase public awareness of the needs facing this country's physical infrastructure and help Congress to focus on programs

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ROADS

Poor road conditions cost U.S. motorists $54 billion a year in repairs and operating costs—$275 per motorist. Americans spend 3.5 billion hours a year stuck in traffic, at a cost of $63.2 billion a year to the economy. Total spending of $59.4 billion annually is well below the $94 billion needed annually to improve transportation infrastructure conditions nationally. While long-term Federal transportation programs remain unauthorized since expiring on Sept. 30, 2003, the nation continues to shortchange funding for needed transportation improvements.

D

Conditions

The nation is failing to maintain even the current substandard conditions, a dangerous trend that is affecting highway safety and the health of the economy. While passenger and commercial travel on our highways has increased dramatically in the past 10 years, America has been seriously under-investing in needed road and bridge repairs.

Americans traveled 2.85 trillion vehicle-miles in 2002. While highway mileage is mostly rural, a majority of road travel (60%) occurred in urban areas in 2002. As vehicle-miles traveled continues to increase for all vehicles, it increased at a greater rate for commercial trucks, which has caused increased wear and tear on roads and bridges throughout the United States.

While some progress has been made in recent years, the current stalemate on the reauthorization of the nation's surface transportation programs is causing uncertainty that affects the long-term prospects for our nation's roads and bridges.

As the nation's highway users await enactment of long-term legislation, America continues to shortchange funding for much-needed road and bridge repairs. 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 commute grew more than 18 minutes between 1997 and 2000.

The American Association of State Highway and Transportation Officials (AASHTO) estimates that capital outlay 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. In contrast the Federal Highway Administration estimates that outlay by all levels of government would have to increase by 17.5% to reach its projected $75.9 billion cost-to-maintain level, and 65.3% to reach its $106.9 billion cost-to-improve level. In 1999, the total capital investment by all levels of government was $59.4 billion, well short of the needed $94 billion.

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In 2003, the bipartisan leadership of the House Transportation & Infrastructure Committee introduced legislation which would have invested $375 billion in state highway and transit improvement programs over the six-year period FY 2004-09, based on meeting the national concerns and investment requirements outlined in FHWA's 2002 report to Congress. Congressional leadership failed to bring this legislation to a vote before the full congress.

In 1998, the enactment of the Transportation Equity Act for the 21st Century (TEA-21), provided $218 billion for the nation's highway and transit programs. Even with this added attention, 33% of America's urban and rural roads are in poor, mediocre or fair condition, according to FHWA. Although this is a slight improvement from previous years, conditions remain at substandard levels. Driving on roads in need of repair costs U.S. motorists $54 billion per year in extra vehicle repairs and operating costs—$275 per motorist.

FHWA ranks "poor" roads as those in need of immediate improvement. "Mediocre" roads need improvement in the near future to preserve usability. "Fair" roads will likely need improvement. "Good" roads are in decent condition and will not require improvement in the near future. "Very good" roads have new or almost-new pavement.

Substandard road conditions are dangerous. Outdated and substandard road and bridge design, pavement conditions, and safety features are factors in 30% of all fatal highway accidents, according to FHWA. On average, more than 43,000 fatalities occur on the nation's roadways every year. Motor vehicle crashes cost U.S. citizens $230 billion per year, or $819 for each resident for medical costs; lost productivity; travel delay; and workplace, insurance and legal costs.

Americans' personal and commercial highway travel continues to increase at a faster rate than highway capacity, and our highways cannot sufficiently support our current or projected travel needs. Between 1970 and 2002, passenger travel nearly doubled in the United States, and road use is expected to increase by nearly two-thirds in the next 20 years. Growth can be attributed to changes in the labor force, income, makeup of metropolitan areas and other factors.

More than 67% of peak-hour traffic occurs in congested conditions. The cost to the economy—in wasted time and fuel—in the 85 largest urban areas is $63.2 billion each year. In addition, poor highway conditions hinder the effective transport of goods that help support the American economy.

Policy Options

Solutions designed to ease the increasing demands on our transportation system and to improve highway conditions, capacity and safety, are multifaceted and do not always mean simply building more roads and bridges. America must change its transportation behavior, increase transportation investment at all levels of government, and make use of the latest technology. Cities and communities should be better planned to reduce dependence on personal vehicles for errands and work commutes, and businesses must encourage more flexible schedules and telecommuting.

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Congress must fully re-authorize TEA-21 at an appropriate level of investment before it expires for a sixth time in May 2005. Congress also must use all of the money collected for the Highway Trust Fund to support investment in the nation's surface transportation program and protect the trust fund from abuse by removing it from the unified budget. Congress must provide adequate funding to meet current highway and transit bridge needs, and include enough funding for research and development of civil engineering innovations that offer cost-effective solutions to our transportation needs. Other solutions include private-public partnerships where appropriate, and multi-year capital and operating budgets.

Specific recommendations supported by the American Society of Civil Engineers:

- Reauthorize TEA-21 for at least five years, using a needs-based approach to arrive at the funding level
- Remove the Highway Trust Fund from the unified federal budget
- Increase funding for long-term fundamental highway research efforts at the national level
- Establish a federal, multi-year capital budget for public works infrastructure construction and rehabilitation, similar to those used by state and local governments.
- Encourage the use of life-cycle cost analysis principles to evaluate the total costs of projects
- Support the environmental streamlining of highway projects.
- Address the long term viability of fuel taxes for transportation funding, and explore the viability of the most-promising options to strengthen this funding. In particular, the effects of fuel cell technology should be studied, as should creating a mileage-based system for funding our nation's surface transportation system as this technology comes to market and lessens the nation's dependence on gasoline as a fuel source for automobiles.

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SCHOOLS

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The Federal government has not assessed the condition of America's schools since 1999, when it estimated that $127 billion was needed to bring facilities to good condition. Other sources have since reported a need as high as $268 billion. Despite public support of bond initiatives to provide funding for school facilities, without a clear understanding of the need, it is uncertain whether schools can meet increasing enrollment demands and the smaller class sizes mandated by the No Child Left Behind Act.

Background

In the United States, the funding, construction and operation of public kindergarten through 12th grade school facilities (K-12) is primarily a state and local responsibility. While there is an increasing federal role in school performance, there remains little to no federal role for school facilities. Just getting a clear nationwide picture of K-12 public education facilities is difficult. There has been no authoritative report since the Department of Education's report, "*Condition of America's Public School Facilities: 1999.*" Other sources tend to vary widely and focus primarily on construction, without providing needs data.

While most states collect and report information on school facilities, some maintain information only on conditions; fewer, still, collect information on an ongoing basis. This leaves, at best, a hard-to-find and fragmented picture.

Conditions

The 1999 Department of Education report stated that school construction totaled $24.7 billion in 1997. However, the report concluded that, as of 1999, $127 billion was needed to bring the nation's school facilities into good overall condition. The National Education Association (NEA) reported in 2000 that the need was even greater, more than $268 billion.

American Schools and Universities' *30th Annual Official Education Construction Report* provides construction numbers that are most in line with the Department of Education report, stating the most recent numbers as $28.6 billion (up from the 2002 figure of $24.3 billion) in K-12 in construction, additions and renovations for 2003, with $17.4 for new structures, $5.2 billion for additions, and $5.9 for renovations.

According to School Planning and Management, whose numbers are generally lower, school construction fell below $20 billion in 2003 to $19.9 billion, down from its 2003 $21.6 billion estimate. For 2004, the figure is expected to drop to $19.7 billion. The 2004 spending would be broken out as $12.8 billion in new structures, $4.1 billion for expansions and $2.8 billion for renovation.

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Public school enrollments increased from school year 2002-03 to school year 2003-04 by 394,000, to a total of 48,174,924.

Lacking an overall national picture of the condition of public schools, it is necessary to look state by state and, in some cases, school district by school district.

- Arizona—A state court ruled that funding school construction and repair through local property taxes was unconstitutional. This caused the state to shift hundreds of millions of dollars from other sources to fund school facilities.
- Arkansas—A report ordered by the state supreme court concluded that between $2.9 billion and $4.5 billion was needed over five years to bring the state's 6,569 school buildings up to specifications.
- California—A Rand Corporation report concluded that California has made progress in addressing K-12 public school facilities needs; however the state lagged behind the nation and other large industrial states in dealing with facility needs.
- Chicago—The City Board of Education recently informed the City Council that most public school construction and expansion projects will be indefinitely postponed; school capital funding would be diverted to basic building maintenance. The cutbacks are due to the loss of $110 million in state construction funding for 2005.
- Colorado—The state is currently under a consent decree requiring that more funds be spent on school construction.
- Hawaii—The only state in the nation that runs its public schools is addressing a 10-year backlog of maintenance and repair with $600 million in funding.
- Maryland—A state task force on public school facilities concluded at the end of 2002 that the proposed state school construction funding level of $425 million is seriously inadequate to meet the state's needs.
- New Jersey—The New Jersey Education Law Center says that needed upgrades and new construction projects in the state's poorest districts could be as high as $15 billion, well above the $8.7 billion funded level of the New Jersey Schools Construction Corp.
- New York City—A court-appointed panel found that $9.2 billion in new classrooms, laboratories, libraries and other facilities are needed in order to relieve crowding, reduce class sizes, and give the city's 1.1 million public school students adequate school facilities.
- Ohio—The state has instituted a $23 billion school building project that will permit schools considerable access to upgraded facilities.

Policy Options

The first step in addressing the condition of the nation's schools is a realistic and ongoing needs evaluation. While school operations and facilities are primarily state and local concerns, their performance is an issue of national importance. A regular update of the Office of Education

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Research and Improvement report, *Condition of America's Public School Facilities: 1999,* would provide a clear view of conditions nationwide.

Efforts to repair, rehabilitate or modernize the nation's schools face many hurdles. The complex relationships between local school districts and state and federal governments are constantly evolving. Coupled with other serious problems faced by the nation's school systems and new academic standards, school infrastructure must compete for both attention and money.

Given that children are our most precious commodity, we should accept nothing less than the best conditions for our schools. ASCE strongly believes that governments at all levels should make primary and secondary education a priority, and should provide the resources to support the necessary infrastructure.

Specifically, ASCE supports the following recommendations:

- Expand federal tax credits to support increased use of school construction bonds
- Continue and increase federal grants for high-poverty, high-need school districts
- Encourage school districts to explore alternative financing, including lease financing, and financing/ownership/use arrangements to facilitate construction
- Encourage school districts to adopt regular, comprehensive construction and maintenance programs
- Increase emphasis on research and development for design and construction to meet the rapidly changing teaching environment
- Establish a federal, multi-year capital budget for public works infrastructure construction and rehabilitation, similar to those used by state and local governments
- Encourage the use of life-cycle cost analysis principles to evaluate the total costs of projects.
- Consider direct federal funding for school construction

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SECURITY

I

While the security of our nation's critical infrastructure has improved since September 11, 2001, the information needed to accurately assess its status is not readily available to engineering professionals. This information is needed to better design, build and operate the nation's critical infrastructure in more secure ways. Security performance standards, measures and indices need to be developed, and funding must be focused on all critical infrastructure sectors, beyond aviation.

Background

Protecting assets against security risks has always been a priority for the owners and operators of the nation's critical infrastructure. However, before the attacks of September 11, 2001, most efforts were focused on isolated, relatively minor infractions such as vandalism, and not on high-profile, high- consequence attacks by well-organized terrorist groups. Now, a different kind of protection is needed, involving counter-terrorism (e.g., intelligence gathering, analysis, strategies, and tactics) and anti-terrorism (e.g., hardening of infrastructure through the use of surveillance systems, barriers, and operating procedures). An "all hazards" approach is warranted, with the inclusion of these new malevolent threats added to the list of hazards that our critical infrastructure must be prepared to endure and survive.

Conditions

There are numerous challenges to securing the nation's infrastructure. Beyond the enormous cost implications of security measures in all sectors, there is the fundamental difficulty of coordinating efforts across infrastructure sectors, jurisdictional boundaries, and geographic locations. Issues related to differences in equipment standards are solvable with sound engineering practices, but resolving differences in chains of command and cultural attitudes is much more complex and difficult. Information sharing is critical—but what information should be shared, and with whom? There is also the challenge of developing a thorough and comprehensive national response to terrorism against the backdrop of a deep-rooted desire of all Americans to preserve the basic constitutional freedoms that we hold dear, including the freedom of speech and assembly, and the right to be secure against unreasonable searches and seizures. Perhaps the most disturbing challenge is the difficulty in measuring progress. Is the absence of a large-scale attack the consequence of effective counter-measures, or simply the period of time between planned attacks? Regardless of the answer to this question, it is important to invest in protecting our infrastructure against these new threats, for without the additional layers of security, the occurrence and consequences of attacks would surely be more frequent and greater in scale.

Actions Taken

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The Homeland Security Act of 2002 established a new Department of Homeland Security (DHS). The Information Analysis and Infrastructure Protection (IAIP) Directorate within the DHS developed the requirements for a National Critical Infrastructure Protection (CIP) Program. The vision for the National CIP Program was initially communicated through the July 2002 "National Strategy for Homeland Security." In February 2003, the President issued more specific strategies for physical protection of critical infrastructure and key resources and for the protection of cyberspace. In December 2003, the President issued Homeland Security Presidential Directive 7 (HSPD-7) to further direct and strengthen the CIP effort.

More recently, in February 2004, DHS launched its Protected Critical Infrastructure Information (PCII) Program. The PCII Program enables the private sector to voluntarily submit infrastructure information to the federal government to assist the nation in reducing its vulnerability to terrorist attacks.

To help develop ways of better protecting our critical infrastructures and to help minimize vulnerabilities, DHS established Information Sharing and Analysis Centers (ISACs) to allow critical sectors to share information and work together.

DHS also has led the development of the National Response Plan (NRP), which consolidates and reconciles multiple national-level incident-response plans into a single, focused, universally understood strategy. This effort includes the development of a new catastrophic incident response protocol that will greatly accelerate the delivery of critical federal assistance to domestic venues suffering from a mass casualty/mass evacuation incident.

In addition, DHS initiated the National Incident Management System (NIMS) and established the NIMS Integration Center, which ensures that federal, state, and local governments, and private-sector organizations, are all using the same criteria to prepare for, prevent, respond to, and recover from a terrorist attack or other major disaster.

Several information-sharing vehicles exist today that did not exist before September 11, 2001. The Homeland Security Information Network, which is available in all 50 states, makes threat-related information available to law enforcement and emergency managers, as well as to private-sector stakeholders through a web-based system.

The Customs-Trade Partnership Against Terrorism (C-TPAT) is a joint government-business initiative to build cooperative relationships that strengthen overall supply chain and border security. C-TPAT recognizes that U.S. Customs and Border Protection (CBP) can provide the highest level of security only through close cooperation with the ultimate owners of the supply chain: importers, carriers, brokers, warehouse operators, manufacturers, border infrastructure crossing facilities, and operators, and it asks businesses to ensure the integrity of their security practices and communicate their security guidelines to business partners within the supply chain.

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (the Bioterrorism Act), which President Bush signed into law June 12, 2002, addresses the enhancement of controls on dangerous biological agents and toxins, protecting the safety and security of food and drug supply, and drinking water security and safety.

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The Federal Transit Administration spearheaded efforts after September 11 to prepare for future attacks by focusing on three areas: (1) training all transit employees and supervisors, (2) improving emergency preparedness, and (3) increasing public awareness of security issues.

Recognizing the critical importance of the security of our nation's water infrastructure — particularly in the post-September 11 environment,—ASCE, the American Water Works Association (AWWA) and the Water Environment Federation (WEF), with a grant from the U.S. Environmental Protection Agency (EPA), developed a set of three security guidance documents addressing the design of online contaminant monitoring systems, and the physical security enhancements of drinking water, wastewater and stormwater infrastructure systems. The voluntary guidelines aim to assist drinking water and wastewater utilities in mitigating system vulnerabilities to man-made threats through the design, construction, operation, and maintenance of both new and existing systems of all sizes.

Professional organizations and public agencies formed The Infrastructure Security Partnership (TISP) as a forum for U.S.-based public and private sector non-profit organizations to collaborate on issues related to the security of the nation's built environment, including protection from both natural and man-made disasters. TISP acts as a national asset, facilitating dialogue on physical infrastructure security, by leveraging members' technical expertise and research and development capabilities in the design and construction industries. TISP offers extensive opportunities to its members and sponsors through its forums, education and training opportunities, communication and outreach mechanisms, and networking opportunities. TISP membership currently includes more than 180 organizations and agencies, reaching more than two million individuals and firms involved in the planning, design, construction, and operation of the nation's built infrastructure.

The National Commission on Terrorist Attacks Upon the United States (also known as the 9/11 Commission), an independent, bipartisan commission created by congressional legislation and the signature of President. Bush in late 2002, was chartered to prepare a full and complete account of the circumstances surrounding the September 11, 2001, terrorist attacks, including preparedness for and the immediate response to the attacks. The Commission was also mandated to provide recommendations designed to guard against future attacks. On July 22, 2004, the Commission released its public report.

Funding

The 2005 budget request of $40.2 billion for homeland security is $9 billion (29%) more than the 2003 level, and $20.4 billion more than the 2001 level—an increase of 103% over the 2001 level of homeland security funding. The vast majority of this funding is slated for airport screening and deployment of existing technologies. The Government Accountability Office (GAO) has published numerous reports recommending more attention to vulnerabilities other than air travel, and a broader, more coordinated, and better-managed program of research and development of new technologies.

Since September 11, 2001, most critical infrastructure owners and operators have conducted preliminary vulnerability assessments of their facilities, and have updated and modified their security procedures to enhance deterrence, protection, response, and recovery. In addition,

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training exercises and drills have been conducted with employees and contractors, and public outreach programs have been implemented at health, medical and research facilities; energy plants; water facilities; employment centers; public and private schools; and on public transportation systems, including bridges, tunnels, highways, and public transit. Industry has also invested heavily in protecting supply chains and the transport of hazardous materials.

Collectively, these steps have certainly improved the security of our nation's critical infrastructure systems since September 11, 2001; however, enormous challenges remain. Overcoming them will require a steadfast willingness to acknowledge the threats, think "outside the box," and to work with other sectors of the economy and professional disciplines. Sacrifices must be made in deference to a coordinated, integrated, and comprehensive public/private effort to prevent, protect, respond to, and recover from terrorist attacks. The security of our critical infrastructures, key resources, and our people depend on it.

Policy Options

America must design, build, and operate critical infrastructure by incorporating security as part of an "all hazards" approach. We must increase investment at all levels of government, and then spend that money wisely, leveraging the use of standards and protocols to enable interoperability between and among systems.

Congress must provide adequate funding to meet current infrastructure needs, and must include enough funding for research and development. Public and private partnerships must be forged, and professional and competitive differences must be managed, to ensure collective improvement in the security of the nation's infrastructures.

Specific recommendations supported by ASCE:

- Making information more readily available to professionals who can use the knowledge to better design, build, and operate critical infrastructures in more secure ways
- Continuing to conduct periodic vulnerability assessments in all infrastructure sectors
- Continuing to implement plans for security improvements, including education, training, exercises, and drills
- Increasing funding for long-term infrastructure security research efforts at the national level
- Establishing a federal, multi-year capital budget for critical infrastructure protection
- Encouraging the use of life-cycle cost analysis principles to evaluate the total costs of projects
- Supporting the Infrastructure Security Professional Advisory Network (I-SPAN) goals of bringing together state and local homeland security offices, other state and local

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government officials, and TISP member organizations, to review and assess needs for public-private sector collaboration, and to address infrastructure protection and recovery from natural and man-made disasters through robust partnerships at the sub-national level

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SOLID WASTE

The nation's operating municipal landfills are declining in total numbers, but capacity has remained steady due to the construction of numerous regional landfills. In 2002, the United States produced 369 million tons of solid waste of all types. Only about a quarter of that total was recycled or recovered.

C+

Conditions

In 2002, the United States produced 369 million tons of solid waste of all types, according to unofficial industry estimates. This included municipal solid waste (MSW) that was generated by households, businesses, construction sites, and other sources.[10] While per capita waste production has been fairly constant over time, MSW continues to increase with population growth.

Of the 369 million tons of solid waste generated in 2002, 98.7 million tons (26%) were recycled or composted, 28.5 million tons (8%) were burned in waste-to-energy (WTE) plants, and 242 million tons (66%) went to landfill.[11]

In 1986, the Environmental Protection Agency (EPA) counted 7,683 municipal solid waste landfills in the United States. In October 1991, the EPA adopted stringent new federal regulations for landfill design and operation. By 1992, the number of U.S. landfills had declined to 5,345 facilities. By 1995, the EPA landfill census recorded only 3,581 facilities. In 2001, the agency counted 1,858 landfills—a decline of 78% in 15 years.

The nation's disposal capacity, however, has remained relatively constant, because new landfills are much larger than in the past, according to EPA. Nationally, states have disposal capacity for another 19–20 years, according to the National Solid Wastes Management Association (NSWMA). Nevertheless, a number of states are nearing the end of their ability to manage MSW within their borders. In 2000, five states reported that they had less than 10 years of landfill capacity. Two other large states—Massachusetts and New York—had 5–10 years of capacity remaining.

[10] In 2001, the last year for which official government data are available, approximately 229 million tons of MSW were produced in the United States, according to the EPA, a decrease from 2000. The industry estimates are greater because they include a larger universe of wastes, such as construction debris, agricultural wastes, wastes from overseas, industrial wastes, and other non-hazardous wastes.

[11] A growing contributor to the waste stream is consumer electronics. Approximately 20.6 million personal computers became obsolete in the United States in 1998. Of those, only 11%—about 2.3 million units—were recycled, according to the National Safety Council. The EPA has begun a nationwide program to address the issue.

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In addition, such waste-to-energy facilities as incinerators are at capacity and growing older, with little potential for the construction of new facilities.

The closing of thousands of landfills, and the construction of regional mega-landfills, have contributed to the increased shipment of municipal wastes across state lines for disposal. In 2003, states shipped 39 million tons of MSW to other states. Pennsylvania was the largest importer of MSW in 2003; New York, the largest exporter.

In order to maximize capacity, the nation must also experiment with newer technologies for solid waste management. One promising technology involves the use of bioreactor landfills to manage a growing volume of waste. A bioreactor landfill rapidly transforms and degrades organic waste. The increase in waste degradation and stabilization is accomplished through the addition of liquid to enhance microbial processes. This bioreactor concept differs from the traditional "dry tomb" municipal landfill approach.

Given the reduction in the number of landfills and the need to extend the life and capacity of the existing landfills, the operation of the landfills as bioreactors is a growing trend. Decomposition and biological stabilization of the waste in a bioreactor landfill can take place much more quickly than it can in a traditional "dry tomb" landfill, providing a potential decrease in long-term environmental risks and landfill operating and post-closure costs.

According to EPA, the potential advantages of bioreactors include:

- Decomposition and biological stabilization in years vs. decades in "dry tombs"
- Lower waste toxicity and mobility due to both aerobic and anaerobic conditions
- Reduced leachate disposal costs
- A 15– 30% gain in landfill space due to an increase in density of waste mass and to waste degradation
- Significantly increased landfill gas generation that, when captured, can be used for energy onsite or sold
- Reduced post-closure care

Policy Options

- The American Society of Civil Engineers opposes legislation that would restrict the interstate movement of municipal solid wastes to new regional landfills that meet all the requirements of federal law.
- ASCE supports legislation and regulations that would allow the use of alternative covers, the introduction of non-indigenous liquids, and other operational changes, to increase the effectiveness of solid-waste landfills.
- Project XL (eXcellence and Leadership), an EPA program begun in 1995 to provide limited regulatory flexibility for U.S. businesses to conduct pilot projects to operate bioreactor landfills, stopped receiving project applications in January 2003. Although

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research projects approved for funding before 2003 are continuing, EPA should reopen the bioreactor research program to new projects, in order to build upon the progress made in the 1990s.

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TRANSIT

Transit use increased faster than any other mode of transportation—up 21%—between 1993 and 2002. Federal investment during this period stemmed the decline in the condition of existing transit infrastructure. The reduction in federal investment in real dollars since 2001 threatens this turnaround. In 2002, total capital outlays for transit were $12.3 billion. The Federal Transit Administration estimates $14.8 billion is needed annually to maintain conditions, and $20.6 billion is needed to improve to "good" conditions. Meanwhile, many major transit properties are borrowing funds to maintain operations, even as they are significantly raising fares and cutting back service.

D+

Conditions

The Transportation Equity Act for the 21st Century (TEA-21), which expired in 2003, authorized more than $41 billion in transit investments. However, the increased popularity of transit, as evidenced by robust increases in transit ridership and strong support for local funding initiatives, has led to growth in both the number and size of transit systems in the United States. While new investment brings badly needed transit service to more Americans, existing systems continue to require reinvestment to replace aging infrastructure; thus, the revenue that is available is spread more thinly. These conditions, together with an uncertain federal funding future, raise serious concerns for transit.

In recent years, transit use has increased faster than any other mode of transportation. An estimated 14 million Americans ride public transportation each weekday, and an additional 25 million use it on a less-frequent but regular basis.

In 2000, there were 614 local public transit operators serving 408 large and small urbanized areas, 1,215 operators serving rural areas, and 3,673 specialized services for the elderly and disabled in both urban and rural areas. These systems operate more than 106,395 vehicles; rail operators controlled 10,572 miles of track and served 2,825 stations. Between 1997 and 2000, the number of urban transit vehicles increased by 2.6%, track mileage grew by 6.6% and the number of stations grew by 5.4%. The number of passenger miles traveled by all transit passengers grew at an annual rate of 2.1% between 1991 and 2000. Passenger growth on transit rail lines grew even faster, at 3.2%.

Funding has increased during this period. In response to citizen demand for service, 42 of a total of 53 (79%) local ballot initiatives for public transportation, or with a public transit component, were passed in 2004. Much of this local revenue is intended to match federal investment. Total capital spending, from all sources, was $12.3 billion in 2002, up from $11.7 billion in 2001 and up 140% over the past 12 years. The federal contribution reached $6.5 billion in 2001 before

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slipping to $6.2 billion in 2002. Ridership increased by 21.3% from 1993 to 2002—to more than 9 billion trips.

The Federal Transit Authority (FTA) rates system conditions on a five-point scale, 1 being poor and 5 being excellent. The most recent data found available show that federal investment through ISTEA and TEA-21 was beginning to stem the decline in the condition of the existing infrastructure:

- The estimated average condition of the urban bus fleet was 3.07 in 2000, up from 2.96 in 1997.
- Average bus age was reported to be 6.8 years in 2000, up slightly from an average age of 6.6 years in 1997.
- The estimated average condition of rail vehicles was 3.55 in 2000, down slightly from 3.7 in 1997.
- Track conditions are estimated to have remained constant since 1997, with 83% of all track estimated to be in adequate or better condition in both 1997 and 2000.
- The average condition of power systems improved slightly, with 88% of substations and overhead wire (power system component) estimated to be adequate or better, compared to 82% and 84% in 1997. Third rail (power system component) conditions improved dramatically, with 83% rated adequate or better in 2000, compared to 75% in 1997.
- Rail transit station conditions are mixed; while the percentage of stations rated adequate or better has increased by 77% in 1997 to 84% in 2000, the percentage in good or better has dropped from 54% in 1997 to 34% in 2000.
- The condition of other structures, such as tunnels and elevated structures, has improved, with 77% in adequate or better condition in 2000 compared to 72% in 1997.
- More than 50% of rural transit fleets are past their expected life-span.

The reduction in federal investment in real dollars since 2001 in the face of increased demand for transit service threatens the progress that has been made to stabilize the condition of our transit infrastructure.

The FTA uses the Transit Economic Requirements Model (TERM), based on economic and engineering concepts to estimate future transit capital investment needs. Using this data, $14.8 billion is needed annually to maintain the conditions and performance of the nation's transit systems at the 2000 level. This assumes an annual increase in ridership of 1.6%. To improve the systems to "good" by 2020 would require an additional $5.8 billion per year or a total of $20.6 billion. The most recent data shows actual spending from all sources, was $12.3 billion in 2002.

Policy Options

Solutions that would ease the increasing demands on our transportation system and improve transit conditions, capacity and safety are multifaceted. America must change its transportation

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behavior, increase transportation investment at all levels of government, and make use of the latest technology. Cities and communities should be better planned to reduce dependence on personal vehicles for errands and work commutes, and businesses must encourage more flexible schedules and telecommuting. If one in ten Americans regularly used transit, U.S. reliance on foreign oil could decline by more than 40%, or nearly the amount of oil imported from Saudi Arabia each year.

Congress must focus its full attention on reauthorizing the nation's surface transportation programs when the chance arises again in early 2005. Congress also must use all of the money that accumulates in the Highway Trust Fund and protect it from abuse by removing it from the unified budget. Congress must provide adequate funding to meet current highway and transit bridge needs, and include enough funding for research and development of civil engineering innovations that offer cost-effective solutions to our transportation needs. Other solutions include private-public partnerships where appropriate, and multi-year capital and operating budgets.

Specific recommendations supported by ASCE:

- Reauthorization of TEA-21 for at least five years, using a needs-based approach to arrive at the funding level.
- Realize the full intent of transportation trust funds by removing them from the unified federal budget.
- Establish a federal, multi-year capital budget for public works infrastructure construction and rehabilitation, similar to those used by state and local governments.
- Encourage the use of life-cycle cost analysis principles to evaluate the total costs of projects.
- Continue research and development of new technologies to reduce construction and operating costs.

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WASTEWATER

D-

Aging wastewater management systems discharge billions of gallons of untreated sewage into U.S. surface waters each year. The EPA estimates that the nation must invest $390 billion over the next 20 years to replace existing systems and build new ones to meet increasing demands. Yet, in 2005, Congress cut funding for wastewater management for the first time in eight years. The Bush administration has proposed a further 33% reduction, to $730 million, for FY06.

Conditions

The federal government has directly invested more than $72 billion in the construction of publicly owned sewage treatment works (POTWs) and their related facilities since passage of the Clean Water Act in 1972. Nevertheless, the physical condition of many of the nation's 16,000 wastewater treatment systems is poor, due to a lack of investment in plant, equipment and other capital improvements over the years.

Many systems have reached the end of their useful design lives. Older systems are plagued by chronic overflows during major rain storms and heavy snowmelt and, intentionally or not, are bringing about the discharge of raw sewage into U.S. surface waters. The U.S. Environmental Protection Agency (EPA) estimated in August 2004 that the volume of combined sewer overflows (CSOs) discharged nationwide is 850 billion gallons per year. Sanitary sewer overflows (SSOs), caused by blocked or broken pipes, result in the release of as much as 10 billion gallons of raw sewage yearly, according to the EPA.

Federal funding under the Clean Water Act State Revolving Loan Fund (SRF) program has remained flat for the past decade. With one exception, Congress appropriated between $1.2 billion and $1.35 billion from 1995 to 2004.[12] But in FY 2005, Congress cut wastewater SRF funding for the first time in eight years, reducing the total investment to $1.1 billion.

The Bush administration has proposed further cuts for FY 2006, with a budget submittal calling for an appropriation of only $730 million, a reduction of 33% from the FY 2005-enacted level.

Federal assistance has not kept pace with the needs, yet virtually every authority agrees that funding needs remain very high: the United States must invest an additional $181 billion for all types of sewage treatment projects eligible for funding under the Act, according to the most recent needs survey estimate by the EPA and the states, completed in August 2003.

[12] The appropriation for state SRF programs was reduced to $625 million in FY 1997.

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A more recent report from the staff of the House Transportation and Infrastructure Committee stated the issue bluntly: "Without increased investment in wastewater infrastructure, in less than a generation, the U.S. could lose much of the gains it made thus far in improving water quality, and wind up with dirtier water than existed prior to the enactment of the 1972 Clean Water Act."

That is only part of the story. In September 2002, EPA released a detailed gap analysis, which assessed the difference between current spending for wastewater infrastructure and total funding needs. The EPA Gap Analysis estimated that, over the next two decades, the United States must spend nearly *$390 billion* to replace existing wastewater infrastructure systems and to build new ones (the total includes money for some projects not currently eligible for federal funds, such as system replacement, which are not reflected in the EPA State Needs Survey).

According to the Gap Analysis, if there is no increase in investment, there will be a roughly $6 billion gap between current annual capital expenditures for wastewater treatment ($13 billion annually) and projected spending needs. The study also estimated that, if wastewater spending increases by only 3% per year, the gap would shrink by nearly 90% (to about $1 billion annually).

In 2000, the Water Infrastructure Network, a consortium of water and wastewater providers, researchers, environmentalists, engineers (including the American Society of Civil Engineers [ASCE]) and product manufacturers, released a study concluding that the annual investment need for all sewer treatment facilities is $12 billion.

The Congressional Budget Office (CBO) released its own gap analysis in 2002, in which it determined that the gap for wastewater ranges, from $23 billion to $37 billion annually, depending on various financial and accounting variables..[13]

Policy Options

If the nation fails to meet the investment needs of the next 20 years, it risks reversing the public health, environmental, and economic gains of the past three decades.

The case for increased federal investment is compelling. Needs are large and unprecedented; in many locations, local sources cannot be expected to meet this challenge alone and, because waters are shared across local and state boundaries, the benefits of federal help will accrue to the entire nation. Clean and safe water is no less a national priority than are national defense, an adequate system of interstate highways, and a safe and efficient aviation system. Many other highly important infrastructure programs enjoy sustainable, long-term sources of federal backing, often through the use of dedicated trust funds; under current policy, water and wastewater infrastructure do not.

- The American Society of Civil Engineers supports enactment of a federal water infrastructure trust fund act that would provide a reliable source of federal assistance for the construction and repair of POTWs to reduce the enormous funding gap.

[13] None of the estimates cited includes the costs of operation and maintenance (O&M), costs that are borne entirely by the local utilities and are not eligible for federal funding. The 2002 Gap Analysis, for example, put the total O&M cost at $161 billion for the 20-year study period.

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- In the interim, ASCE supports annual appropriations of $1.5 billion from the federal general fund for the State Revolving Loan Fund (SRF) program.
- In addition, ASCE supports the establishment of a federal capital budget to create a mechanism to help reduce the constant conflict between short-term and long-term needs. The current federal budget process does not differentiate between expenditures for current consumption and long-term investment. This causes major inefficiencies in the planning, design and construction process for long-term investments. A capital budget system would help to increase public awareness of the problems and needs facing this country's physical infrastructure, and would help Congress to focus on programs devoted to long-term growth and productivity.
- ASCE supports funding research into wastewater treatment technology, which may reduce capital expenditures, as well as operation and maintenance cost. An example of technology that needs further study is membrane bioreactors.

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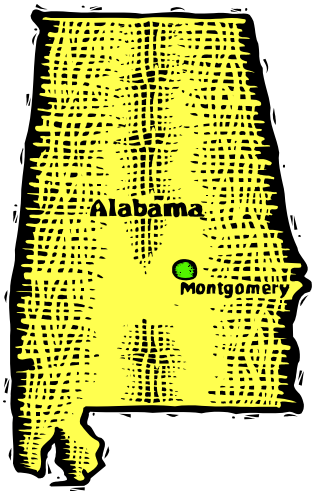

Alabama

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

Key Infrastructure Facts

- 32% of Alabama's major urban roads are congested.
- Vehicle travel on Alabama's highways increased 38% from 1990 to 2003. Alabama's population grew 11% between 1990 and 2003.
- In 2004, Governor Riley withdrew $48.2 million from the transportation trust fund to balance the state budget.
- Driving on roads in need of repair costs Alabama motorists $368 million a year in extra vehicle repairs and operating costs—$102 per motorist.
- Congestion in the Birmingham area costs commuters $468 per person in excess fuel and lost time.
- 30% of Alabama's bridges are structurally deficient or functionally obsolete.
- Alabama is the only state without a dam safety program.
- Alabama's drinking water infrastructure needs $1.08 billion over the next 20 years.
- Alabama has $2.72 billion in wastewater infrastructure needs.
- 59% of Alabama's schools have at least one inadequate building feature.
- 63% of Alabama's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Maintenance is the key to an aging infrastructure." —a civil engineer from Birmingham, AL

"There is too little emphasis on 'life-cycle-costs' for public improvements and almost never a fund for rehab and/or replacement included in the financing." —a civil engineer from Lillian, AL

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From the Headlines

A large spill of raw sewage from a broken sewer line was followed by fecal bacteria levels at least 170 times as high as the levels considered safe by federal regulators for freshwater recreation areas. Tests conducted by the Alabama Coastal Foundation on water samples from Eight Mile Creek showed concentrations of enterococcus and fecal bacteria that were among the worst recorded in the Mobile area. Concentrations of enterococcus bacteria—often considered the best indicator of fecal matter associated with humans and animals—were 11,400 colonies per 100 milliliters of creek water. Associated Press, 2/10/04

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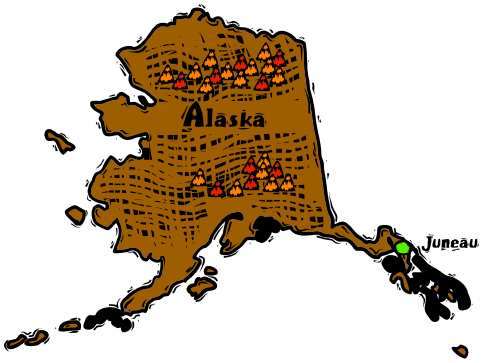

Alaska

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Aviation**

Key Infrastructure Facts

- 33% of Alaska's major roads are in poor or mediocre condition.
- Vehicle travel on Alaska's highways increased 24% from 1990 to 2003. Alaska's population grew 18% between 1990 and 2003.
- The Alaska Department of Transportation estimates that the agency's maintenance needs are under-funded at least $40 million annually.
- Driving on roads in need of repair costs Alaska motorists $102 million a year in extra vehicle repairs and operating costs—$212 per motorist.
- Congestion in the Anchorage metropolitan area costs commuters $87 per person in excess fuel and lost time.
- 30% of Alaska's bridges are structurally deficient or functionally obsolete.
- There are 26 state-determined deficient dams in Alaska.
- Alaska has 18 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Alaska's most critical dams is estimated at $7.3 million.
- Alaska's drinking water infrastructure needs $585.2 million over the next 20 years
- Alaska has $560 million in wastewater infrastructure needs.
- 69% of Alaska's schools have at least one inadequate building feature.
- 80% of Alaska's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Anchorage has an ambitious long-range plan (Anchorage 2020) which the community is trying to follow as a yardstick to making it a better place to live." —a civil engineer from Anchorage, AK

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From the Headlines

With the Valley growing faster than the Matanuska-Susitna Borough School District can build new schools, officials are examining dramatic changes to the school day. The changes under review include year-round classes, double shifts, and sending students from bulging classrooms in the Wasilla and Palmer areas to roomier schools in Big Lake or Sutton. Crowded classes are already a problem, especially at Wasilla High School and several elementary schools, where students as young as first graders attend school in portable classrooms. Next year, about 3,070 children are expected to crowd a group of core-area elementary schools built to hold about 2,700. *Anchorage Daily News,* 11/23/04

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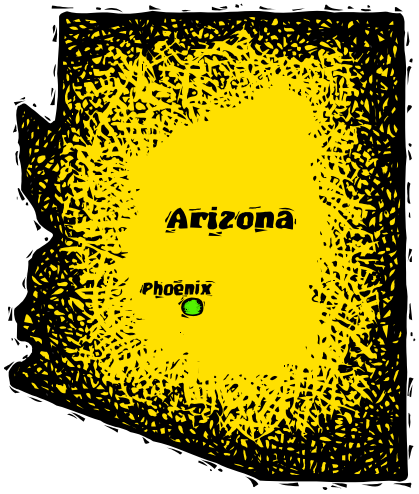

Arizona

Top Three Infrastructure Concerns*

1. **Roads**
2. **Drinking Water**
3. **Mass Transit**

Key Infrastructure Facts

- 29% of Arizona's major urban roads are congested.
- Vehicle travel on Arizona's highways increased 52% from 1990 to 2003. Arizona's population grew 52% between 1990 and 2003.
- Driving on roads in need of repair costs Arizona motorists $459 million a year in extra vehicle repairs and operating costs—$120 per motorist.
- Congestion in the Phoenix metropolitan area costs commuters $812 per person per year in excess fuel and lost time.
- Congestion in the Tucson area costs commuters $507 per person per year in excess fuel and lost time.
- There are 38 state-determined deficient dams in Arizona.
- Arizona has 91 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Arizona's most critical dams is estimated at $64 million.
- Arizona's drinking water infrastructure needs $1.62 billion over the next 20 years.
- Arizona has almost $6.2 billion in wastewater infrastructure needs.
- Arizona generates 1.10 tons of solid waste per capita.
- Arizona recycles 17.5% of the state's solid waste.
- 64% of Arizona's schools have at least one inadequate building feature.
- 69% of Arizona's schools have at least one unsatisfactory environmental condition.

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Field notes from civil engineers in the state

"Population growth creates problems for infastructure needs." —a civil engineer from Gilbert, AZ

"Lack of public support for sales tax application to roadways is significant reason for lack of finances." —a civil engineer from Tucson, AZ

"The state of Arizona has made some progress in the areas of water supply. Also, the voters approved additional funding for light rail, bus service and road construction, which is becoming a concern with Phoenix's continued growth. Also, in the energy area, a second supplier of gasoline fuel is coming to AZ via Texas, which will help alleviate this problem area because AZ has only had one gasoline pipeline supplier, and this supplier's pipelines are becoming old and undersized." —a civil engineer from Phoenix, AZ

From the Headlines

The Pima County Board of Supervisors has voted to keep negotiating with the state over a proposed financial settlement of charges that raw sewage spills violated water-quality laws. Records released show that more than 51 million gallons of raw sewage overflowed from the county's sewer lines in 175 spills from 2001-2003. Nearly all of that total came from a single spill—the September 2002 sewer line break that forced 90 families to evacuate their homes and closed parts of a busy city street for six weeks. Several county supervisors said the overflows show that the county is failing to maintain its sewer lines adequately. Associated Press, *2/2/05*

Phoenix's 1.4 million residents were told to continue boiling water, but the water alert that occurred when high sediment levels were found appears to be nearing an end. Water flowing from the contaminated Val Vista water treatment plant in Mesa was testing safe, but dirty water was still working its way through the 18-mile pipeline. City officials said there was no lethal risk to people who drink the water; however, health officials said potential symptoms from dirty water include gastrointestinal problems. The end to the alert will come as a relief to Phoenix residents who have turned off water sprinklers, took shorter showers or skipped them altogether and bought bottled water, some hoarding it by the cases, as they awoke to find the city's water system under unusual strain. Schoolchildren went without physical education classes and recess, and there were no sips from water fountains or traditional hot meals at the cafeteria. *Arizona Republic,* 1/26/05

For nearly three years, state regulators have skipped inspections of some dams in the Phoenix metro area, even as continued growth has put more houses and people at risk if a dam fails during a flash flood. Instead, the state turned over the task of ensuring dam safety to the people who own and maintain the dams: the Maricopa County Flood Control District. These flood control dams protect areas from storm runoff and serious flash floods that can cause millions of dollars in damage and threaten lives. An analysis of

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county inundation maps shows that if McMicken Dam northwest of Phoenix failed, about 5,000 to 20,000 people in the Surprise area would be at risk, depending on where the failure occurred. If the Dreamy Draw Dam in north Phoenix failed, approximately 8,000 people could be affected. Budget cuts at the Water Resources Department forced staff reductions, including dam inspectors. At one point, the department had only two full-time dam safety engineers. *Arizona Republic,* 12/8/04

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Arkansas

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Bridges**

Key Infrastructure Facts

- 23% of Arkansas' major urban roads are congested.
- 47% of Arkansas' major roads are in poor or mediocre condition.
- Vehicle travel on Arkansas' highways increased 46% from 1990 to 2003. Arkansas' population grew 16% between 1990 and 2003.
- Driving on roads in need of repair costs Arkansas motorists $720 million a year in extra vehicle repairs and operating costs—$360 per motorist.
- Congestion in the Little Rock area costs commuters $159 per person in excess fuel and lost time.
- 25% of Arkansas' bridges are structurally deficient or functionally obsolete.
- There are 24 state-determined deficient dams in Arkansas.
- Arkansas has 102 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Arkansas' most critical dams is estimated at $135.6 million.
- Arkansas' drinking water infrastructure needs $1.5 billion over the next 20 years.
- Arkansas has $500 million in wastewater infrastructure needs.
- Arkansas generates 1.24 tons of solid waste.
- Arkansas recycles 36.3% of the state's solid waste.
- 42% of Arkansas' schools have at least one inadequate building feature.
- 62% of Arkansas' schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"This state is finishing a multiyear interstate rehabilitation that has essentially rebuilt every mile of interstate highway in the state. This has greatly improved our highway system. Now the state is starting to focus on the state and national highway system." —a civil engineer from Little Rock, AR

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From the Headlines

Ten of Arkansas' lakes and 1,010 miles of its streams violate federal water quality standards, according to a report released by the state Department of Environmental Quality. Additionally, 59 stream segments and 5,530 acres of lakes do not meet Clean Water Act standards. Arkansas prepared a report to satisfy U.S. EPA requirements that states revise their list of impaired waters every two years. The state relied on data from a network of more than 200 monitoring stations where water is tested for contaminants that include silt, gypsum, salt, copper, and fecal bacteria. EPA regulations mandate that affected lakes and streams be put on a 13-year probation period, during which time state officials must show improvements in water quality. *Democrat Gazette,* 2/23

As vendors greet the masses at the War Eagle Fall Arts and Crafts Gala, county officials will keep close watch on the bridge visitors must cross to get there. War Eagle Bridge on Benton County Road 98 is in bad shape, according to an Arkansas Highway and Transportation Department inspection and a low federal ranking of the bridge's sufficiency. The bridge has a bar to keep out trucks taller than 10 feet and cement poles on either side to keep out vehicles wider than 10 feet. Benton County Administrator Travis Harp wants to build a new bridge and turn the old single-lane, county-maintained bridge into a pedestrian walkway, because he thinks the bridge is no longer safe. "The metal is so deteriorated. No matter how much work we do on it, that thing will never be rated for enough weight to handle the traffic. The average trailer already exceeds it." *Arkansas Democrat-Gazette,* 10/14/04

The bridge did not fall, but parts of it did. Bits of concrete fell from an overpass of Interstate 40 in Carlisle. The hole started small. The hole grew to the size of a basketball, on a bridge about 8 to 10 inches thick. Traffic on the bridge was stopped to allow crews to patch the hole. State police said the bridge already has plenty of patchwork on it and it gets plenty of truck traffic. KARK-TV, 8/30/04

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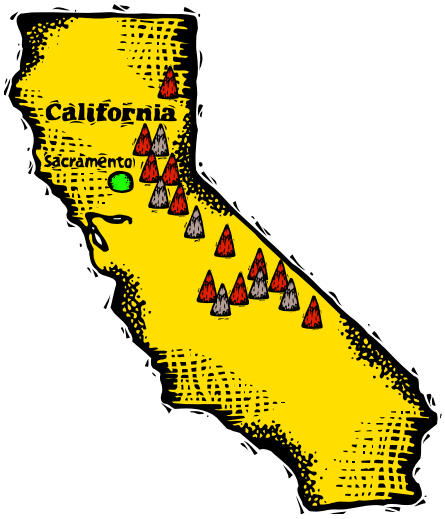

California

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Wastewater**

To view the local infrastructure report cards of ASCE's California Sections, please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 60% of California's major urban roads are congested.
- 71% of California's major roads are in poor or mediocre condition.
- Vehicle travel on California's highways increased 25% from 1990 to 2003. California's population grew 19% between 1990 and 2003.
- The state has transferred $3.1 billion from the transportation trust fund to the general fund.
- Driving on roads in need of repair costs California motorists $12.6 billion a year in extra vehicle repairs and operating costs—$554 per motorist.
- Congestion in the Bakersfield area costs commuters $130 per person per year in excess fuel and lost time.
- Congestion in the Fresno area costs commuters $270 per person per year in excess fuel and lost time.Congestion in the Los Angeles metropolitan area costs commuters $1,668 per person per year in excess fuel and lost time.
- Congestion in the Ventura area costs commuters $574 per person per year in excess fuel and lost time.
- Congestion in the San Bernadino area costs commuters $1,043 per person per year in excess fuel and lost time.
- Congestion in the Sacramento area costs commuters $650 per person per year in excess fuel and lost time.
- Congestion in the San Diego area costs commuters $865 per person per year in excess fuel and lost time
- Congestion in the San Francisco area costs commuters $1,325 per person per year in

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excess fuel and lost time.

- Congestion in the San Jose area costs commuters $964 per person per year in excess fuel and lost time.
- 28% of California's bridges are structurally deficient or functionally obsolete.
- There are 44 state determined deficient dams in California.
- California has 336 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The estimated rehabilitation cost for California's most critical dams is estimated at $679 million.
- California's drinking water infrastructure needs $17.5 billion over the next 20 years.
- California loses 222 million gallons of drinking water a day due to leaking pipes.
- California has $14.4 billion in wastewater infrastructure needs.
- California generates 1.55 tons of solid waste per capita.
- California recycles 40.2% of the state's solid waste.
- 71% of California's schools have at least one inadequate building feature.
- 87% of California's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"As a city engineer I get calls from the residents that our infrastructure is on its way to becoming that of a third-world country."—a civil engineer from Berkeley, CA

"We have now a Governor who is intent on returning the money which has both been taken from and diverted from transportation needs. Although he will return $1 billion this coming year, there is much more owed." —a civil engineer from Redding, CA

"Funding for new infrastructure projects is missing from state budget crisis." —a civil engineer from Marysville, CA

"The general maintenance of our local streets has been neglected for so long, that Petaluma received the worst rating in the State of California, which, I believe, received the worst rating in the United States; thus, by default, Petaluma, at that time, had the worst roads in the United States." —a civil engineer from Petaluma, CA

"California's diversion of funds has almost halted the bridge replacement program in most jurisdictions, including our shaky wooden truss bridge with a 3-ton load limit, that provides the only access to a hundred square miles of land, people, and forests. Ever tried to take a 12-ton fire engine over a 3-ton bridge?" —a civil engineer from Modoc, CA

"We need to upgrade several freeways in the area, but state funding has evaporated. Some need to be upgraded for safety reasons." - a civil engineer from Chico, CA"Community lacks minimum public works infrastructure. Roads are inadequate, no sidwalks, storm drains or sewer system." —a civil engineer from Los Osos, CA

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From the Headlines

A ruptured pipe in Rubidoux unleashed about 4 million gallons of untreated sewage into the Santa Ana River, which spills into the ocean. As a result, Orange County health officials closed a large stretch of shoreline in Huntington Beach and Newport Beach. Other spills contributed to shore closures in Corona del Mar, San Clemente and Dana Point. Newport Harbor High School surfing coach Scott Morlan warned his students not to enter the water and has canceled four events because of the rain. "I can't justify putting the kids in the water with the pollution out there," Morlan said. "The ocean right now looks like chocolate milk. If we let them go in and practice, they risk becoming ill." At the Surfrider Foundation's national headquarters in San Clemente, staff members were trying to keep up with the shoreline closures for Orange, Los Angeles and San Diego counties. "[The list] just runs on and on," said spokesman Matt McClain. "Dozens and dozens of beaches, from Imperial Beach in the south, north up to Malibu. This is the most closures I've seen in any one time. Every watershed is contaminated right now." *Los Angeles Times,* 1/13/05

Recent rains have exposed another serious weakness in San Diego's infrastructure: 33 miles of corrugated metal drainage pipes that are obsolete and routinely collapse. A corroded metal drainage pipe was the culprit when a section of Fashion Valley Road collapsed, creating a massive sinkhole and closing a heavily used Mission Valley road. City officials estimate that it will take three months and cost about $1 million before the repair is completed and the road reopened. The city is a long way from fixing the overall pipe problem, even though officials have been aware of the deficiency for years. In 1998, city engineers issued a report emphasizing the need to replace the entire inventory of metal pipes at an estimated cost of $30 million. But San Diego balked at the cost of the project, putting it instead on the city's "unfunded needs" list of deferred maintenance projects. Corrugated metal drainage pipes typically last 30 to 35 years. Most of what's in the ground in San Diego is at or near the end of its design life span. *San Diego Union-Tribune,* 1/7/05

The Victoria Avenue Bridge, which dates to 1928, will be retrofitted to withstand an earthquake of magnitude 7.4- if the City Council approves the $9 million project. The bridge was not built to handle a major earthquake and has deteriorated over the years. "The work must be done," said Councilman Art Gage, who lives nearby and drives across the bridge several times a day. "It's a little scary looking," he said of the span. "You see the concrete cracked everywhere." *The Press Enterprise,* 12/7/04

Crowding continues to dog the Mt. Diablo district, where seven schools have suffered crammed classes and jammed corridors so far this year. "In my history class, students have to sit on the floors and desktops," Andy Luo, Mt. Diablo High School's student representative to the school board, told trustees. "Every student deserves a chair." College Park parent organization president Jodi Wagner said there's no room to "spread" students at the high schools. "The hallways are so crowded, they can hardly move to class," she

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said. She invited the trustees to join the school's 2,111 students and eat lunch on the ground because there aren't enough tables or chairs. *Contra Costa Times,* 9/30/04

A chunk of the Richmond-San Rafael Bridge fell into the bay yesterday afternoon, forcing the closure of a lane and causing major traffic tie-ups in the county that lasted for hours. The 3-foot-wide, 1-foot long hole opened along the trestle section of the bridge exposing the bay below. The span has been bedeviled by holes in recent years. Opened in 1956, the decks on the span have never been replaced and are showing signs of age. *Marin Independent Journal,* 4/24/04

City crews struggled to clear a clogged sewer line in Balboa Park that sent 4.6 million gallons of raw waste into San Diego Bay, the city's worst sewage spill in four years. Signs warning swimmers of the contamination and telling them to stay out of the water have been posted at the bay's beaches. The overflow came from a 40-year-old clay sewer pipe. The spill was spotted by a city wastewater employee. Sewage was flowing out of a manhole and down a concrete storm drain culvert near the intersection of Pershing Drive and 26th Street. *San Diego Union-Tribune,* 2/25/04

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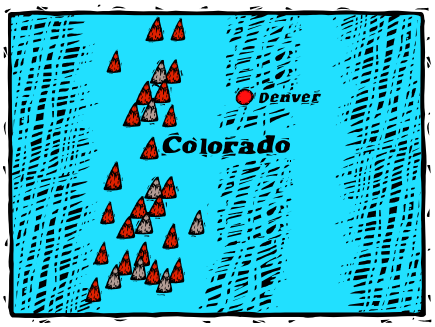

Colorado

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

To view the local infrastructure report card of ASCE's Colorado Section please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 30% of Colorado's major urban roads are congested.
- 43% of Colorado's major roads are in poor or mediocre condition.
- Vehicle travel on Colorado's highways increased 60% from 1990 to 2003. Colorado's population grew 38% between 1990 and 2003.
- Driving on roads in need of repair costs Colorado motorists $955 million a year in extra vehicle repairs and operating costs—$321 per motorist.
- Congestion in the Boulder area costs commuters $167 per person in excess fuel and lost time.
- Congestion in the Colorado Springs area costs commuters $404 per person in excess fuel and lost time.
- Congestion in the Denver metropolitan area costs commuters $786 per person in excess fuel and lost time.
- 17% of Colorado's bridges are structurally deficient or functionally obsolete.
- There are 186 state-determined deficient dams in Colorado.
- Colorado has 332 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Colorado's most critical dams is estimated at $369.4 million.
- Colorado's drinking water infrastructure needs $2.5 billion over the next 20 years.
- Colorado has $1.34 billion in wastewater infrastructure needs.
- Colorado generates 1.12 tons of solid waste per capita.
- Colorado recycles 2.8% of the state's solid waste.
- 58% of Colorado's schools have at least one inadequate building feature.
- 63% of Colorado's schools have at least one unsatisfactory environmental condition.
- Colorado is currently under a consent decree requiring more spending on school construction.

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Field notes from civil engineers in the state

"A tax increase was recently passed to dramaticly increase our light rail and commuter rail infrastructure (FasTrax). A $3 billion project over 12 years. But, it was passed without the blessing of CDOT who says it forces them to make infrastructure improvements they don't have money for." —a civil engineer from Denver, CO

"El Paso County has been a no-tax increase community for many years, but this year came together to pass the largest transporation sales tax increase in recent history. This was a result of a rigorous campaign spearheaded by a very active and very concerned citizen volunteer group, working in harmony with local municipal representatives to develop a clear and concise plan to solve local transporation deficiencies. This organization was able to rally the business community, local charities, unions, and Republican and Democratic politicians to form unified support for this ballot issue." —a civil engineer from Colorado Springs, CO

"Lack of an adequate federal transportation bill is inexcusible." —a civil engineer from Denver, CO

"New Mexico was able to construct about 150 miles of 4 lane US Highway (550) from Albuquerque to the stateline near Durango, Colorado, but Colorado does not have the funds to construct the last 15 miles from the stateline to Durango." —a civil engineer from Durango, CO

From the Headlines

Unless legislators come up with new methods of paying for highway improvements over the next 25 years, Colorado will be short a staggering $103 billion to meet all the transportation needs of an expanding population. That was the message state transportation officials took to members of the legislature's Joint Budget Committee on Tuesday. CDOT projects that there will be about $64 billion from all sources to spend on state and local transportation projects through 2030. Yet Colorado will need $123 billion over that same period just to sustain current levels of mobility, safety and "system quality," and it will need $167 billion if it wants to improve service and performance levels and expand the system. *Denver Post,* 12/15/04

Last session, as it grappled with an overall budget crunch, the legislature stripped more than $2 million a year from the water quality division of the Colorado Department of Public Health and Environment. The cut left the division 40 % understaffed compared with similar programs. In real terms, it meant the state isn't able to effectively enforce some regulations that keep Colorado's waters clean. *Denver Post*, 11/2/04

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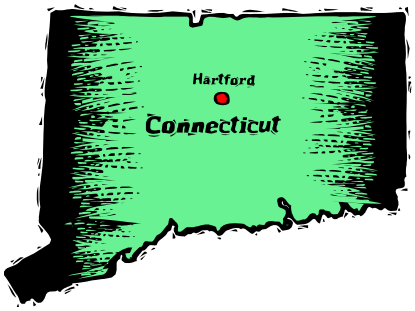

Connecticut

Top Three Infrastructure Concerns*

1. **Bridges**
2. **Roads**
3. **Rail**

Key Infrastructure Facts

- 38% of Connecticut's major urban roads are congested.
- 53% of Connecticut's major roads are in poor or mediocre condition.
- Vehicle travel on Connecticut's highways increased 19% from 1990 to 2003. Connecticut's population grew 6% between 1990 and 2003.
- Driving on roads in need of repair costs Connecticut motorists $887 million a year in extra vehicle repairs and operating costs—$334 per motorist.
- Congestion in the Hartford area costs commuters $309 per person per year in excess fuel and lost time.
- Congestion in the Bridgeport-Stamford area costs commuters $566 per person per year in excess fuel and lost time.
- Congestion in the New Haven area costs commuters $390 per person per year in excess fuel and lost time.
- 33% of Connecticut's bridges are structurally deficient or functionally obsolete.
- There are 12 state-determined deficient dams in Connecticut.
- Connecticut has 238 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Connecticut's most critical dams is estimated at $150.7 million.
- Connecticut's drinking water infrastructure needs $1 billion over the next 20 years.
- Connecticut has $2.35 billion in wastewater infrastructure needs.
- Connecticut generates 1.37 tons of solid waste per capita.
- Connecticut recycles 18.8% of the state's solid waste.
- 58% of Connecticut's schools have at least one inadequate building feature.
- 68% of Connecticut's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"A vast majority of funding for infrastructure, specifically in the transportation sector comes from the federal government. With out a long term funding package in place the states are not able to create the necessary plans. Infrastructure plans are generally long term and can not proceed on continuing resolutions at or below previous years' spending limits." —a civil engineer from

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Bolton, CT

"Areas are growing faster than the infrastructure can absorb. Traffic is an ongoing problem and the mass transit hasn't been sufficient to decrease the problem." —a civil engineer from Danbury, CT

"Past gas tax reduction in Connecticut and lack of a federal transportation bill have significant negative impact all modes of transportation." —a civil engineer from Marlborough, CT

From the Headlines

Amtrak is using three deteriorating bridges on a portion of the Northeast rail corridor as an example of how badly the railroad needs more federal funding. The bridges are located over the Thames, Niantic and Miamicock rivers within 20 miles of New London, Conn. Unless they are repaired, they probably will be shut down within two years, which also would force a shutdown of Northeast Corridor rail traffic between New York City and Boston, Amtrak officials said. If the bridges are shut down, Amtrak would need to consider busing travelers to a waiting train on the other side of the waterway. Amtrak engineers say there is no immediate safety risk for passengers crossing over the bridges, but railroad officials also say the infrastructure would not have so many problems if Congress provided adequate funding. *U.S. Rail News*, 6/30/04

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District of Columbia

Top Three Infrastructure Concerns*

1. **Mass Transit**
2. **Drinking Water**
3. **Roads**

Key Infrastructure Facts

- Congestion in the Washington, DC metropolitan area costs commuters $1,212 per person per year in excess fuel and lost time
- The District of Columbia has $1.47 billion in wastewater infrastructure needs.
- 91% of the District of Columbia's schools have at least one inadequate building feature.
- 73% of the District of Columbia's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Metro subway system suffering from significant underinvestment as oldest parts of civil and mechanical elements are now nearly 30 years old; lack of dedicated tax/revenue to support system; bus service even worse off." —a civil engineer from Washington, D.C.

"You can't drink the water in Washington, D.C., for lead, colforms or pathogens. Most everyone I know who does not have an in-house purification system drinks bottled water at home and at work." —a civil engineer from Washington, D.C.

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Delaware

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Schools**

Key Infrastructure Facts

- 26% of Delaware's major urban roads are congested.
- 29% of Delaware's major roads are in poor or mediocre condition.
- Vehicle travel on Delaware's highways increased 38% from 1990 to 2003. Delaware's population grew 23% between 1990 and 2003.
- Driving on roads in need of repair costs Delaware motorists $160 million a year in extra vehicle repairs and operating costs—$273 per motorist.
- 14% of Delaware's bridges are structurally deficient or functionally obsolete.
- Delaware has nine high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Delaware's most critical dams is estimated at $3.7 million.
- Delaware's drinking water infrastructure needs $304 million over the next 20 years.
- Delaware has $288 million in wastewater infrastructure needs.
- Delaware generates 1.32 tons of solid waste per capita.
- Delaware recycles 20.4% of the state's solid waste.
- 70% of Delaware's schools have at least one inadequate building feature.
- 65% of Delaware's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"New Castle County has just implemented curbside pickup for recycle materials. Although it is still voluntary in Delaware, this will be a big step forward to help solve the state's garbage problem." —a civil engineer from Middleton, DE

"Newark is located in a water short area and we have been working on improving the water capacity for 50 years. Finally, an off stream storage facility (317 million gallons) is being built with a completion date in December 2005." —a civil engineer from Newark, DE

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From the Headlines

Recent bridge inspections showed that some of the concrete from the First Street bridge over Lake Gerar in Rehoboth Beach is flaking and falling into the lake and metal bars inside the bridge's deck are rusting. City officials say the bridge is safe for cars, minivans and lighter SUVs, and it remains open to traffic. But city commissioners did approve a 3-ton weight limit last month for traffic on the bridge, saying that bigger vehicles such as delivery vans, tractor-trailers, even firetrucks, must avoid crossing the bridge and use other streets to get around the lake on Rehoboth's north end. Rehoboth Beach Fire Company Chief Harry Miller said trucks responding to fire calls can use back streets to easily navigate around the bridge, sometimes more quickly if downtown traffic is heavy. Officials said the point of the weight limit is to ease stress on the bridge, which is believed to be 70 to 90 years old. Keeping heavier loads off the 14-foot-long span will minimize further cracking and crumbling. About 35% to 40% of the reinforcing skeleton is exposed on the underside of the bridge. None of it should be exposed. *News Journal,* 2/12/05

Across the state, residents, businesses and government officials are facing increasingly tough choices as Delaware's water quality continues to decline. Nearly 99% of the state's streams fail to meet full Clean Water Act standards. Most areas bordering state waters are or will be required to cut pollution. Most of the ponds where native Delawareans splashed as children are so choked by pollution from runoff and septic systems that they aren't fit for swimming. *The News Journal,* 11/10/04

On almost any hot summer day, children play in the streams and rivers that slice through northern Delaware. Often they're in danger, ignoring signs posted by state officials to warn about health risks associated with sewage in the water. In northern Delaware, the biggest problems involve untreated sewage that runs into the Brandywine in Wilmington when it rains, along with pollution from cesspools and deteriorating septic systems. The state needs about $200 million in improvements. State regulators are struggling to get the resources and authority needed to protect the environment from failing septic systems, holding tanks and cesspools. The state's four septic-system inspectors cannot keep up with recommended schedules for inspections and pumpouts. Across Delaware, state scientists rate only 1 percent of rivers and streams and just 13% of ponds and lakes as fully safe for swimming. Bacteria and other pollutants, many originating in wastewater, cause the most problems. *The News Journal,* 11/8/04

City and state officials contend CSX Transportation owns three deteriorating bridges in Wilmington and have tried for years to get the railroad to repair or replace the spans. CSX filed its latest suit against the city earlier this year, rejecting ownership of the bridges. The Sixth and Seventh Street bridges have been closed for about two years. Nearby homes and businesses have suffered from delayed response times by police and firefighters because they have to take longer routes to get there. The Ninth Street Bridge is open, but has a three-ton weight limit, not enough for a firetruck. The bridge has fist-

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sized holes in it, through which the railroad tracks below can be seen. *The News Journal,* 10/12/04

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Florida

Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Schools**

Key Infrastructure Facts

- 34% of Florida's major urban roads are congested.
- Vehicle travel on Florida's highways increased 69% from 1990 to 2003. Florida's population grew 32% between 1990 and 2003.
- Driving on roads in need of repair costs Florida motorists $1.1 billion a year in extra vehicle repairs and operating costs—$82 per motorist.
- Congestion in the Cape Coral area costs commuters $249 per person per year in excess fuel and lost time.
- Congestion in the Jacksonville area costs commuters $558 per person per year in excess fuel and lost time.
- Congestion in the Miami metropolitan area costs commuters $927 per person per year in excess fuel and lost time.
- Congestion in the Orlando area costs commuters $904 per person per year in excess fuel and lost time.
- Congestion in the Pensacola area costs commuters $332 per person per year in excess fuel and lost time.
- Congestion in the Sarasota area costs commuters $353 per person per year in excess fuel and lost time.
- Congestion in the Tampa area costs commuters $742 per person per year in excess fuel and lost time.
- 18% of Florida's bridges are structurally deficient or functionally obsolete.
- There are about 20 state-determined deficient dams in Florida.
- Florida has 100 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Florida's most critical dams is estimated at $9.5 million.
- Florida's drinking water infrastructure needs $3.7 billion over the next 20 years.
- Florida loses 364 million gallons of drinking water a day due to leaking pipes.
- Florida has $9.96 billion in wastewater infrastructure needs.
- Florida generates 1.18 tons of solid waste per capita.
- Florida recycles 24% of the state's solid waste.

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- 57% of Florida's schools have at least one inadequate building feature.
- 80% of Florida's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Several new schools have been built, but population continues to grow faster than school construction." —a civil engineer from Lakeland, FL

"Port Everglades has implemented a $44 million security improvement program to protect the vital assets of this thriving port. These improvements included access control, closed circuit television installation, security operations center construction, perimeter security, identification badge center, and waterside security." — civil engineer from Fort Lauderdale, FL

"We have had several funding initiatives on the ballots in recent years for parks/recreation and transportation funding which have failed. The public sentiment is that we should be doing more with the current funding allocations rather than asking for more funding. During the course of the year, the majority of the complaints from the public are regarding the congestion, potholes, deteriorated condition of parks, lack of recreational facilities." —a civil engineer from Gainesville, FL

From the Headlines

A half-mile long river of raw sewage ran parallel to Bee Ridge Road on Friday after a sewage pipe burst, spewing 500,000 gallons of waste. Commuters in east Sarasota County began noticing the raw sewage near the Laurel Oak Country Club. County workers discovered that a pipe had ruptured, but the force of the flow prevented workers from getting near enough to stop the spill. By noon, the rank sewage had formed a pungent stream that measured 15 feet across in some spots down the public right of way along Bee Ridge Road. About 300 residents in the area will receive an advisory telling them to avoid contact with standing water because of high bacteria. The county may never know what caused the approximately 5-foot-long crack. It's possible that the 10-year-old pipe, sitting about 5 feet underground, rested on a rock that caused it to crack over the years. *Sarasota Herald Tribune,* 2/26/05

More than 70 have transferred from Ocean City Elementary because an aging and outmoded sewage treatment plant next door is emitting a foul odor. "The smell affects us physically as well as the operation of our school," said Principal Debbie Boutwell. She said the school's budget is affected because of the 77 children who received zoning waivers not to attend the school, 70 cited the smell as the reason. "We get roughly $3,800 per student, so that's a lot of money that we aren't able to use for staffing," Boutwell said. "We have to write grants to get extra programs like PE and music." She and her staff had hoped that Okaloosa County, which operates the treatment plant just outside Fort Walton Beach, would close it soon. But officials last week said that it will be another three years before that could happen. Associated Press, 2/1/05

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Portable classrooms have doubled at Camelot Elementary during the past two years, to the point that students have no place to play outdoors other than a basketball court and a pavilion. The 35 boxy buildings have taken over softball fields and recess areas as the east Orange County school tries to educate 1,200 students on a campus built for 750. Camelot isn't alone. In the past two years, the number of portable classrooms in Orange County has grown by 30 percent. With 4,280 of the units throughout the district, about half of Orange County's classes are in portables—more than anywhere else in Central Florida. In Orange, 80,000 to 100,000 students spend at least part of their day in the structures. *Orlando Sentinel,* 10/22/04

Every month, city engineers walk across the deteriorating Causeway bridge and test it with a hammer. A hollow sound is bad. It means there's not enough concrete supporting the bridge and the Causeway will be closed immediately. The bridge's life expectancy is that dicey. Built in 1939, the bridge is now rated a 2 out of 100 on a national sufficiency scale. "Zero would be in the water," said Don Hambidge, the city's public works director and the overseer of the bridge project. In the past six years, the city has spent about $2.5-million to keep the bridge open. It has severe cracks on the surface and corrosion underneath. The city has imposed a weight limit—no heavier than four tons. Lowering the weight limit any further would be impractical and unsafe, Hambidge said. Most SUVs would be unable to cross. The damage is worse on the south side—the side with the bridge tender's tower and the half the city needs to keep the drawbridge operational until the new bridge is complete. *St. Petersburg Times,* 8/22/04

Health officials have confirmed dangerously high levels of bacteria in Lake Ida and other area waterways, and urged residents to find other recreation spots following the area's largest sewage spill in years. Lake Ida in Delray Beach will stay closed to boaters for at least the next several days as environmental officials monitor levels of fecal coliform. The bacteria can lead to gastrointestinal illnesses such as diarrhea and vomiting, and diseases such as hepatitis A. Those waterways were contaminated after a 16-inch pipe cracked, dumping about 200,000 gallons of untreated sewage. Near the original spilltests revealed a fecal coliform count of 64,000 organisms per 100 milliliters of water—160 times the bacterial level considered potentially dangerous. In other areas, the count hovered around 11,000, still above the danger level of 400. *Palm Beach Post,* 6/21/04

Ambulances, large trucks and buses will be prohibited from using the Treasure Island Causeway Bridge because of severe surface cracking that led city officials to lower the weight limit for crossing vehicles. UPS trucks, Fed Ex vans, school buses and the beach trolley will have to enter and exit the city from the Blind Pass Bridge in St. Pete Beach or the John's Pass Bridge in Madeira Beach. Engineers have inspected the bridge regularly in recent years as its deterioration has accelerated. Inspectors noticed deep new cracks on the road bed and recommended that the old 10-ton limit be lowered to 4 tons. The inconvenience probably will last until a new bridge is constructed in about three years. *St. Petersburg Times,* 2/21/04

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Georgia

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Mass Transit**

To view the local infrastructure report card of ASCE's Georgia Section please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 21% of Georgia's major urban roads are congested.
- Vehicle travel on Georgia's highways increased 50% from 1990 to 2003. Georgia's population grew 34% between 1990 and 2003.
- Driving on roads in need of repair costs Georgia motorists $255 million a year in extra vehicle repairs and operating costs—$44 per motorist.
- Congestion in the Atlanta metropolitan area costs commuters $1,065 per person in excess fuel and lost time.
- 20% of Georgia's bridges are structurally deficient or functionally obsolete.
- There are 105 state-determined deficient dams in Georgia.
- Georgia has 399 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Georgia's most critical dams is estimated at $288.4 million.
- Georgia's drinking water infrastructure needs $2.4 billion over the next 20 years.
- Georgia has $2.34 billion in wastewater infrastructure needs.
- Georgia generates 1.31 tons of solid waste per capita.
- Georgia recycles 8.3% of the state's solid waste.
- 37% of Georgia's schools have at least one inadequate building feature.
- 48% of Georgia's schools have at least one unsatisfactory environmental condition.

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From the Headlines

Like so many students in fast-growing areas, Kaitlin Haley spent the third grade in a trailer, outside a year-old school in north Fulton County. Going in and out of the school building to use the restroom caused her asthma to flare up in the winter. Perpetual trailers on school grounds are reminders that school systems are failing to get ahead of the growth curve. Education officials say their schools bear the effects of rapid residential growth. But school systems have no veto power when residential rezonings come before county commissions or city councils. *Atlanta Journal Constitution,* 11/29/04

Money used in the past for hazardous waste remediation has instead gone toward filling holes in the state budget, forcing Georgia this year to temporarily drop efforts to clean up eight high-priority sites because it lacked the cash to finish the work, officials say. Until last year, the cleanup money was available in the state's Hazardous Waste Trust Fund, which was created in 1992 by the Legislature to monitor, inspect and oversee hundreds of dormant hazardous waste sites, including old junkyards and chemical plants. The hazardous waste fund is supposed to reimburse local governments up to $2 million to investigate and clean up contamination. Dozens of cities and counties have been waiting since last year for a total of $11 million to help pay for their cleanups, but only $1.2 million will be reimbursed. *Macon Telegraph,* 10/15/05

The Atlanta area is planning to spend $50 billion on transportation improvements over the next 25 years, only to see gridlock get worse. After expanding highways, transit and bike paths and so on, the Atlanta Regional Commission predicts that traffic delays will be worse, but not disastrously worse. The drive from Marietta to Hartsfield-Jackson Airport takes 48 minutes today. In 2030 it will take 70 minutes but if Atlanta doesn't spend the money, it will take 84 minutes. There are two factors in Atlanta's traffic woes. First, in the next 25 years, 2 million more people will be pouring into the region, overwhelming all that is being done to relieve gridlock. Second, there simply isn't enough money available for roads and transit to stay even with the demand. To actually get some relief, experts estimate it would cost $75 billion over the next 25 years. *Governing Magazine,* 10/1/04

The Tucker Road bridge over Rocky Creek will close indefinitely after a routine inspection found rotted supports. The problems were found Wednesday when a DOT inspector gave the bridge its two-year checkup. The inspection revealed "severe deterioration" to two wooden supports, according to a letter from the department. School buses will be rerouted. *Macon Telegraph,* 2/27/04

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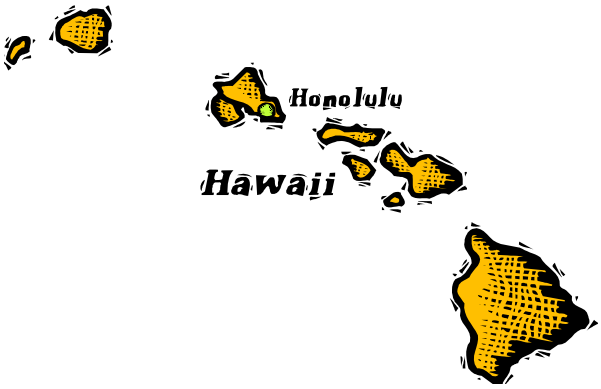

Hawaii

Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Schools**

Key Infrastructure Facts

- 23% of Hawaii's major urban roads are congested.
- 65 percent of Hawaii's major roads are in poor or mediocre condition.
- Vehicle travel on Hawaii's highways increased 15% from 1990 to 2003. Hawaii's population grew 13% between 1990 and 2003.
- Driving on roads in need of repair costs Hawaii motorists $289 million a year in extra vehicle repairs and operating costs—$347 per motorist.
- Congestion in the Honolulu metropolitan area costs commuters $331 per person in excess fuel and lost time.
- 47% of Hawaii's bridges are structurally deficient or functionally obsolete.
- There are 22 state-determined deficient dams in Hawaii.
- Hawaii has 77 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- Hawaii's drinking water infrastructure needs $146 million over the next 20 years.
- Hawaii has $1.74 billion in wastewater infrastructure needs.
- Hawaii generates 1.37 tons of solid waste per capita.
- Hawaii recycles 25.2% of the state's solid waste.

Field notes from civil engineers in the state

"It is difficult to get public energized about infrastructure until there is a failure. Condition of roads on Oahu was a high-visibility issue, particularly increased traffic congestion during recent Honolulu mayoral campaign. Potholes emerged as an annoying complaint! It is now a top priority of the new mayor but whether it is merely a bandaid fix or more permanent planned improvement remains to be seen." —a civil engineer from Kailua, HI

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From the Headlines

After a sewer line under Kalaniana`ole Highway broke for the third time in a month, the city is planning a more permanent solution—replacing the faulty section of pipe instead of continuing to patch it. City crews yesterday completed repairs at the site of the latest break by replacing a 20-foot section of pipe on the 16-inch sewer force main that ruptured, spilling 3,000 gallons of untreated wastewater into nearby storm drains. Warning signs were posted and the public is advised to avoid affected areas. The city said corrosion cracks again appear to be the cause of the sewage spill. To make sure that another rupture doesn't occur, the city is making plans to install a bypass line until it can permanently replace the 45-year-old underground sewer line. *Honolulu Advertiser*, 2/28/05

Beachgoers were told to stay out of the ocean at Kailua Beach for a third day because of a sewage spill that polluted the water. Heavy rains caused 5,000 gallons of rain-diluted raw sewage to overflow Saturday night from a manhole into Kaelepulu Stream. Water quality samples showed bacteria levels remained high. Associated Press, 11/10/04

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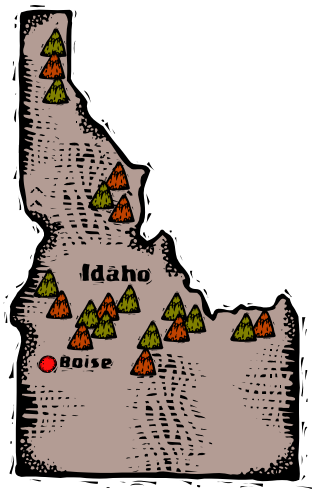

Idaho

Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Wastewater**

Key Infrastructure Facts

- 26% of Idaho's major urban roads are congested.
- 25% of Idaho's major roads are in poor or mediocre condition.
- Vehicle travel on Idaho's highways increased 45% from 1990 to 2003. Idaho's population grew 36% between 1990 and 2003.
- The Idaho Transportation Department reports that the backlog for deferred maintence in the state is $690 million for roads and $44 million for bridges.
- Driving on roads in need of repair costs Idaho motorists $199 million a year in extra vehicle repairs and operating costs—$216 per motorist.
- 18% of Idaho's bridges are structurally deficient or functionally obsolete.
- There are 13 state-determined deficient dams in Idaho.
- Idaho has 95 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Idaho's most critical dams is estimated at $105.5 million.
- Idaho's drinking water infrastructure needs $515 million over the next 20 years.
- Idaho has $207 million in wastewater infrastructure needs.
- Idaho generates .81 tons of solid waste per capita.
- Idaho recycles 8.4% of the state's solid waste.
- 56% of Idaho's schools have at least one inadequate building feature.
- 64% of Idaho's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"We want a high level of service from our infrastructure, we want someone else to pay for it." —a civil engineer from Boise, ID

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From the Headlines

Mary Duckett, president of Southernside Neighborhoods In Action, said the West Washington Street bridge will not give residents there the access they need. What the community needs, she said, is restoration of the nearby Hampton Avenue bridge, which was once an important link connecting the Southernside community. That bridge was closed in August 1994 due to structural problems, according to the DOT. There are no known plans to reopen it, officials said. But its closing caused the community to die, residents said. Duckett said loss of the bridge didn't leave residents with many ways in and out of the community, so many residents moved. Houses were neglected and eventually torn down. *Greenville News,* 1/18/05

Idaho's state transportation board has approved a quarter-million dollars in emergency repairs to a bridge over the Coeur d'Alene River at Harrison, but the 74-year-old bridge still may be restricted to one lane of traffic. After a routine inspection found broken beams, crushed timbers and seriously deteriorated pilings, the old bridge was restricted two weeks ago to vehicles under 10,000 pounds. That allows for just a single lane of passenger cars or light trucks. Flaggers were called in, and then a traffic signal was installed to regulate traffic on the bridge, so the direction of travel can alternate. But the weight limit is so low that most school buses, firetrucks and snowplows currently couldn't cross the bridge.To detour around it requires a 15-mile roundabout that takes traffic over another bridge with a similar narrow steel truss structure. *The Spokesman-Review,* 6/24/04

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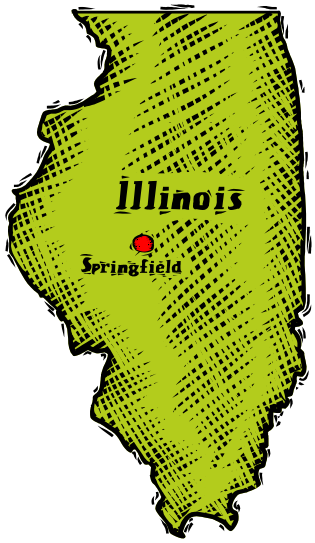

Illinois

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- 45% of Illinois' major urban roads are congested.
- 39% of Illinois' major roads are in poor or mediocre condition.
- Driving on roads in need of repair costs Illinois motorists $2.2 billion a year in extra vehicle repairs and operating costs—$271 per motorist.
- Congestion in the Chicago metropolitan area costs commuters $985 per person in excess fuel and lost time.
- 17% of Illinois' bridges are structurally deficient or functionally obsolete.
- There are 31 state-determined deficient dams in Illinois.
- Illinois has 176 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Illinois most critical dams is estimated at $171.3 million.
- Illinois' drinking water infrastructure needs almost $6.15 billion over the next 20 years.
- Illinois has $11.89 billion in wastewater infrastructure needs.
- Illinois generates 1.27 tons of solid waste per capita.
- Illinois recycles 32.5% of the state's solid waste.
- 62% of Illinois' schools have at least one inadequate building feature.
- 70% of Illinois' schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"Deteriorating bridge conditions are making the local news more frequently. Also, every once in a while there will be a series of water main breaks in the city (Chicago) which then draws the attention of local media." —a civil engineer from Chicago, IL

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"Many areas of our nation's infrastructure need upgrading. I work with the freight railroad segment and there is a much greater need for upgrading of the old system to handle curent demands, but return on investment is insufficient to fund capital projects." —a civil engineer from Ringwood, IL

"The reconstruction of Palatine Road throught the NW suburbs has been "de-prioritized" in the last several reconstruction plans due to diversions of "road funds" to the general IL budget. The road and associated bridges are in a shambles and are deteriorating rapidly." —a civil engineer from Arlington Heights,IL

"Traffic is appalling during all times of the day." —a civil engineer from Chicago, IL

"While not directly related to my line of work, I feel that municipalities and school districts need to create additional legislation, perform studies, etc., to require additional contributions to the school districts, by developers, are necessary to address the school construction and school operations funding crisis caused by rapid residential development." —a civil engineer from West Chicago, IL

From the Headlines

Facing deep funding cuts, Chicago will indefinitely postpone most public school construction and expansion projects. The loss of $110 million in state construction money this year—with no clear source for restored funding in future years—forced the change in plans. Over the last seven years, Chicago relied on the state to bolster its capital budget by $625 million. But Springfield's construction money dried up this year, leaving hundreds of school systems in the lurch. Law makers have yet to agree on a plan to extend the program. Illinois schools have an estimated $6 billion in unmet construction needs. *Chicago Tribune,* 1/22/05

For nearly 15 hours, Northbrook was a community of dry faucets after a massive water main break spilled 1.5 million gallons of water and forced public works crews to shut down the water plant. The cast-iron main was installed in 1963, and Saturday's break was its second in 30 years. *Chicago Tribune,* 9/13/04

Large chunks of old concrete dislodged from above and crashed to the ground—but it was on the Dan Ryan Expressway this time, not at Wrigley Field. As the city keeps a close eye on the North Side ballpark, where concrete has fallen three times over six weeks this season, the new problem developed on the South Side. Concrete pieces as long as 2 feet rained down from the 33rd Street bridge onto the inside southbound local lane of the Ryan, missing passing cars but blowing out the tires on at least four vehicles.The incident comes less than two weeks after a 2-pound chunk of concrete fell off a bridge over Interstate 57 and slammed into the windshield of a passing car, slightly injuring its occupants. The bridge was built in 1961, and is slated for an overhaul as part of the $430 million rebuild of the Ryan. The original plan called for the work at 33rd Street to kick off this fall, but it has since been delayed. The best IDOT could say was that the

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rebuilding of the bridge will be done in the next several years. *Chicago Sun Times,* 8/25/04

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Indiana

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Bridges**

Key Infrastructure Facts

- 32% of Indiana's major roads are in poor or mediocre condition.
- Vehicle travel on Indiana's highways increased 35% from 1990 to 2003. Indiana's population grew 12% between 1990 and 2003.
- Driving on roads in need of repair costs Indiana motorists $1.2 billion a year in extra vehicle repairs and operating costs—$258 per motorist.
- 22% of Indiana's bridges are structurally deficient or functionally obsolete.
- Indiana has 238 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Indiana's most critical dams is estimated at $199.2 million.
- Indiana's drinking water infrastructure needs $1.7 billion over the next 20 years.
- Indiana has $7.22 billion in wastewater infrastructure needs.
- Indiana generates 1.55 tons of solid waste per capita.
- Indiana recycles 35% of the state's solid waste.
- 56% of Indiana's schools have at least one inadequate building feature.
- 67% of Indiana's schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"Owners of dams are frustrated that they have no control on downstream development. For example, an owner previously owned a low hazard dam, residential development has occurred forcing the dam into a high hazard classification. The State regulatory agency that provided inspections of the dam, with lack of funding and staff, now outsources high hazard inspections with costs to the owner." —a civil engineer from Indianapolis, IN

"The wastewater treatment plant is long overdue for renovation and expansion. Currently it is keeping up with the treatment process, but at the rate that Evansville is expanding, it will require

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an expansion in order to treat large amounts of waste." —a civil engineer from Evansville, IN

From the Headlines

Allen County Surveyor Al Frisinger recently presented a five-year stormwater management ordinance and program to county commissioners. The ordinance is just one part of a larger plan to reduce stormwater pollution. According to environmental and government experts, runoff pollution is one of the top sources of water contamination. Managing stormwater runoff is essential not only to protect water quality but also to prevent state authorities from interceding and federal authorities from imposing penalties for non-compliance. The county could face $27,500-a-day fines if it fails to comply with federal mandates regulating National Pollution Discharge Elimination Permits. As stormwater flows into rivers, it carries with it pesticides from fields, chemicals from roads and any other debris that crosses its path. Because it brings so much pollution into the rivers, the federal government is cracking down on the problem. Frisinger says the five-year cost for the program is about $4.5 million, which will mean $2.1 million in new spending. He had asked the County Council for $500,000 to implement the stormwater management program. Council members gave him $200,000. *Water and Wastes Digest,* 2/28/2005

As the Indiana Department of Natural Resources presses dam owners to make safety improvements, the state itself owns dams needing significant repairs and lacking a way to warn residents of an emergency. About half of the high and significant hazard dams owned by the state – those that could cause loss of life or property damage if breached—need significant repairs or maintenance. Although the DNR has been urging owners of high hazard dams for years to develop plans that would warn residents of an emergency, only about a dozen have them, and none of the 15 state-owned high hazard dams do. The percentage of Indiana dams with emergency plans is near the bottom among the states. With repairs of Indiana's high hazard dams alone estimated to cost between $200 million and $300 million and only two full-time inspectors, the state shifted the responsibility and considerable cost of inspecting high hazard dams every two years to dam owners in 2002. The state still inspects 231 significant hazard dams every three years and about 600 low hazard dams every five years. Of course, simply inspecting doesn't upgrade dams in poor condition, and as a role model the state finds itself without much credibility among the private dam owners they regulate. About half of the 43 state-owned dams are rated either conditionally poor or poor. Of the 44 state-owned dams, only one—a significant hazard dam in Brown County—has an emergency action plan. *Journal Gazette,* 2/11/05

First Street remains closed to all forms of traffic under an old train bridge in LaPorte the city has deemed unsafe. Gradually, the concrete and metal bridge deteriorated to the point where the city recently ordered an outside structural engineer to do a thorough inspection. LaPorte City Engineer Hesham Khalil said the primary concern is the small pieces of concrete and metal that have already fallen to the pavement, which could graduate to larger chunks dropping from the bridge. *South Bend Tribune,* 8/16/04

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Known simply as No. 335, it is one of the lowest-rated and most heavily traveled of the state's crumbling bridges. On the surface, 25,000 vehicles pass over daily on West Jefferson Boulevard near Time Corners in Allen County. Underneath, concrete is falling and steel is rusting. On a national scale of 0 to 100—with 0 being the worst—this is a 4, a rating the bridge has carried for at least the past three years. Minerals and salt, freezing and thawing have taken their toll on steel-reinforced concrete girders running its length. Underneath, chunks of concrete crumble and fall, exposing the steel bars that have given the bridge its strength for the past 56 years. Highway officials wanted to replace it last year, but the money wasn't there. A bridge tax that once paid all repairs and replacements was eliminated more than a year ago, and interest bearing bonds, historically used every three or four years for major bridge repairs, have not been issued since 1995. *Journal Gazette,* 4/3/04

The Marshall County Board of Commissioners got a good look at the state of a bridge on Baker Street in Plymouth and determined it needs to be fixed. Marshall County Commissioner John Zentz had said the board would meet in emergency session. Following the meeting, Zentz acknowledged the bridge is "really in bad shape." The bridge was closed after concrete underneath the deck crumbled away. Highway crews repaired a large hole in the westbound lane of the bridge and reopened it. Engineers explained they cannot see inside the concrete box beams that make up much of the bridge to see what the reinforcing steel strands look like. Underneath the bridge a couple of the steel strands are broken and can be seen hanging like rusty strands of hair from a concrete scalp. *South Bend Tribune,* 3/9/04

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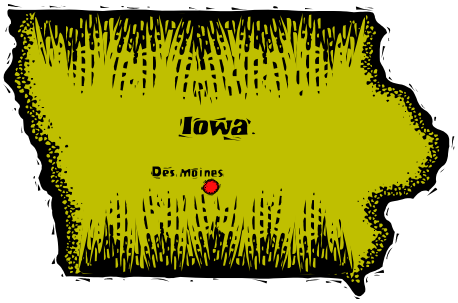

Iowa

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Wastewater**

Key Infrastructure Facts

- 28% of Iowa's major urban roads are congested.
- 35% of Iowa's major roads are in poor or mediocre condition.
- Vehicle travel on Iowa's highways increased 35% from 1990 to 2003. Iowa's population grew 6% between 1990 and 2003.
- Driving on roads in need of repair costs Iowa motorists $568 million a year in extra vehicle repairs and operating costs—$287 per motorist.
- 28% of Iowa's bridges are structurally deficient or functionally obsolete.
- There are 25 state-determined deficient dams in Iowa.
- Iowa has 74 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Iowa's most critical dams is estimated at $76.8 million.
- Iowa's drinking water infrastructure needs $2.85 billion over the next 20 years.
- Iowa has $1.95 billion in wastewater infrastructure needs.
- Iowa generates 1.16 tons of solid waste per capita.
- Iowa recycles 41.7% of the state's solid waste.
- 50% of Iowa's schools have at least one inadequate building feature.
- 67% of Iowa's schools have at least one unsatisfactory environmental feature.

From the Headlines

The Southwest Ninth Street bridge over Yeader Creek is about to get its first major makeover in more than three decades. City officials plan to expand the bridge from four to five lanes, with construction beginning in April. The bridge, which is more than 100 years old, is being reconstructed because it doesn't meet current safety standards. Because of the bridge's age it had suffered some deterioration and isn't able to allow water to pass under it naturally, sometimes causing floods. *Des Moines Register*, 2/13/04

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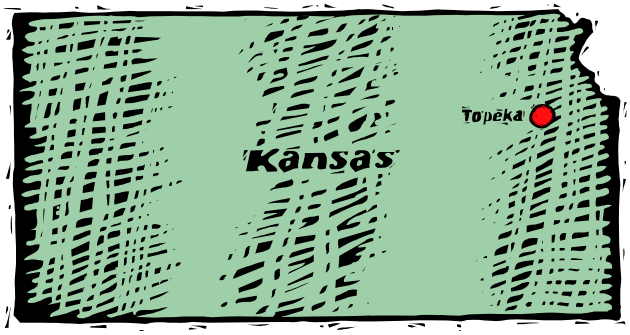

Kansas

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- Vehicle travel on Kansas' highways increased 25% from 1990 to 2003. Kansas' population grew 10% between 1990 and 2003.
- Driving on roads in need of repair costs Kansas motorists $295 million a year in extra vehicle repairs and operating costs—$149 per motorist.
- 23% of Kansas' bridges are structurally deficient or functionally obsolete.
- There are 42 state-determined deficient dams in Kansas.
- Kansas has 192 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Kansas' most critical dams is estimated at $145.6 million.
- Kansas' drinking water infrastructure needs $1.65 billion over the next 20 years.
- Kansas has $1.42 billion in wastewater infrastructure needs.
- Kansas generates 1.73 tons of solid waste per capita.
- Kansas recycles 11.5% of the state's solid waste.
- 55% of Kansas' schools have at least one inadequate building feature.
- 74% of Kansas' schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"Our community is suffering from a lack of support and serious committment from Congress on our infrastructuire needs. By not providing a reauthorized transportation act they are allowing the infrastructure to further deteriorate." —a civil engineer from Topeka, KS

"Apparently, the water supply lines are so old, they break under the higher pressures needed to reach the expanding outer limits of the infrastructure. Flooding issue have been addressed to a degree, but street stormsewers are undersized." —a civil engineer from Kansas City, KS

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From the Headlines

The Route DD bridge over Holland Branch near Dearborn has closed indefinitely because of its deterioration. The concrete-slab bridge was built in 1958 but had a 20-year life span. Temporary repairs are not possible, officials said, so the bridge will remain closed until a new bridge is built. *Kansas City Star,* 12/15/04

Jackson County will break ground on a Noland Road bridge to replace one built in the early days of the Great Depression. The $1.3 million bridge will be one mile north of Bannister Road in south Kansas City. The 200-foot, two-lane bridge will replace one built in 1932 that was closed six years ago because of deterioration. *Kansas City Star,* 1/12/04

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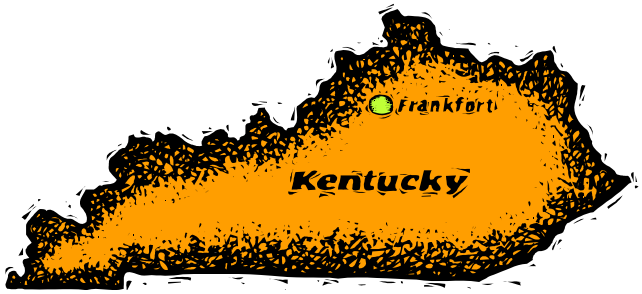

Kentucky

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Bridges**

To view the local infrastructure report card of ASCE's Kentucky Section, please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 39% of Kentucky's major urban roads are congested.
- 24% of Kentucky's major roads are in poor or mediocre condition.
- Vehicle travel on Kentucky's highways increased 39% from 1990 to 2003. Kentucky's population grew 12% between 1990 and 2003.
- Driving on roads in need of repair costs Kentucky motorists $514 million a year in extra vehicle repairs and operating costs—$184 per motorist.
- Congestion in the Louisville area costs commuters $672 per person per year in excess fuel and lost time.
- 30% of Kentucky's bridges are structurally deficient or functionally obsolete.
- There are 88 state-determined deficient dams in Kentucky.
- Kentucky has 175 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Kentucky's most critical dams is estimated at $153.9 million
- Kentucky's drinking water infrastructure needs $1.77 billion over the next 20 years.
- Kentucky has $2.80 billion in wastewater infrastructure needs.
- Kentucky generates 1.34 tons of solid waste per capita.
- Kentucky recycles 11.4% of the state's solid waste.
- 59% of Kentucky's schools have at least one inadequate building feature.
- 63% of Kentucky's schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"All state funded highway work has diminshed significantly due to the lack of a state budget last year. Legislatures have not yet passed a budget this year. Transportation projects are nearing a crisis mode. Limited projects are being constructed now and very limited design work is being

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performed for future projects." —a civil engineer from Mt. Sterling, KY

From the Headlines

Vital to the river industry, the expansion of outdated Kentucky Lock is in serious jeopardy under a new federal budget-review process favoring projects such as Olmsted Locks and Dam that are much further along. This fiscal year, the U.S. Army Corps of Engineers changed its cost-benefit formula for funding ongoing lock work to be based on the remaining cost of a project, rather the total cost from start to finish. As a result, Kentucky Lock—begun six years ago and 25 percent finished—has no money in the Bush administration budget for fiscal year 2006, starting Oct. 1. Olmsted, which started in 1993 and is half-finished, received $90 million. The formula change only affects a few lock projects nationwide. Another with no budgeted money is aging Chickamauga Lock near Chattanooga, Tenn., which is deteriorating and could fail, threatening about 318 miles of Tennessee River traffic north to Knoxville. The Tennessee River alone handles at least 50 million tons of cargo a year. According to Corps of Engineers estimates, doubling Kentucky Lock to 1,200 feet is expected to save the river industry $70 million a year in towing fuel and related expenses by eliminating long locking-through delays. The current undersized lock requires that barge tows be broken into sections to pass through. *Paducah Sun,* 2/20

Despite a reduction in the number of straight pipes dumping raw sewage into eastern Kentucky streams, water quality is still bad in many locations. According to the Kentucky Division of Water, the number of straight pipes has fallen from an estimated 34,000 to 28,500 since 1997, when the state began a major push to stop people from flushing their toilets directly into creeks. Despite the efforts, the state is still warning residents along several streams not to swim in the water because of high levels of fecal coliform bacteria. In Harlan County, portions of the Cumberland River and several of its tributaries have been declared unsafe for human contact. Some county streams detected fecal bacteria levels 10 times higher than the safe levels. *Water & Wastes Digest,* 8/17/04

A two-week closing of the Ohio River at Louisville, Ky., for the emergency repair of a navigation lock is expected to halt the transport of more than 2 million tons of cargo as well as affect tourism and shipping-dependent industries both up and down the river. Calling the closing a crisis, critics claim the economic disruption is the direct result of chronic under-funding of infrastructure on the nation's waterways. Divers inspecting the 250-ton gates at McAlpine Lock and Dam in late April or May discovered "a pretty significant crack" in one of the lower gates on the north side. Subsequent dives persuaded officials that conditions warranted completely closing the lock for emergency repairs to forestall failure of the structure. Instead of 14 days to repair the gates, complete replacement would take 45 days. *Engineering News Record,* 8/16/04

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Louisiana

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Wastewater**

Key Infrastructure Facts

- 29% of Louisiana's major urban roads are congested.
- 54% of Louisiana's major roads are in poor or mediocre condition
- Vehicle travel on Louisiana's highways increased 17% from 1990 to 2003. Louisiana's population grew 7% between 1990 and 2003.
- Driving on roads in need of repair costs Louisiana motorists $1.3 billion a year in extra vehicle repairs and operating costs—$425 per motorist.
- Congestion in the New Orleans metropolitan area costs commuters $299 per person per year in excess fuel and lost time.
- 32% of Louisiana's bridges are structurally deficient or functionally obsolete.
- There are 16 state-determined deficient dams in Louisisana.
- Louisiana has 17 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Louisiana's most critical dams is estimated at $9 million.
- Louisiana's drinking water infrastructure needs $1.27 billion over the next 20 years.
- Louisiana has $2.37 billion in wastewater infrastructure needs.
- Louisiana generates 1.10 tons of solid waste per capita.
- Louisiana recycles 8.1% of the state's solid waste.
- 50% of Louisiana's schools have at least one inadequate building feature.
- 66% of Louisiana's schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"Our community is currently investigating the feasibility of creating a regional wastewater system due to unprecedented growth in the outlying rural areas. With an estimated price tag of approximately $90 million, federal assistance is an absolute necessity." —a civil engineer from Lake Charles, LA

"There has been some success in road capacity increases when the local parish (county) has stepped in with significant funding assistance (20%-30%) of project cost or they have paid for the

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design of the improvement both as means of moving a project forward to an earlier completion." —a civil engineer from Mandeville, LA

"Tremendous success in drainage and flood improvements have come to a halt with lack of federal money. Corps of Engineers are broke and we can't fix coastal erosion alone." —a civil engineer from New Orleans, LA

From the Headlines

When water rises over Louisiana 1 during foul weather, the dilapidated road that connects the nation to a critical energy port simply disappears into the marshy expanse of Lafourche Parish. When that happens, a truck driver who knows every curve of the road slowly leads convoys treading water on the invisible highway to Port Fourchon. It's a tenuous path, especially considering the $1 billion in public and private investment it took to create an intermodal port complex that provides vital services to offshore platforms populated with 11,000 workers. It's also an embarrassing image for Louisiana, which for years fruitlessly has sought federal dollars for a major upgrade. Passing over miles of desolate marsh and bayous, Louisiana 1 is the only land route to Port Fourchon, which provides the port services used by 75 percent of the deepwater drilling prospects in the Gulf. With the growth in deepwater mining, the port has grown substantially in the past 10 years. It has extensive ship loading and maintenance facilities, and it serves as a center for oil and gas pipelines coming onshore, including the Louisiana Offshore Oil Port, or LOOP, 20 miles southeast. Twenty percent of Louisiana's seafood comes through there, according to the port. Louisiana 1 also provides the sole land route to Grand Isle and is the area's only evacuation route. A group called the LA 1 Coalition has documented the poor condition of the highway and its bridges. The winding road has no shoulder in places, and guardrails are deteriorated. The weakest link probably is the bridge over Bayou Lafourche in Leeville, an important passage for marine vessels. The bridge is hit frequently by ships—11 times in the past year—partly because tugs and other boats have trouble navigating the narrow passage between its pilings on waters prone to riptides and unexpected currents. *Times Picayune,* 1/3/05

Incoming Department of Transportation and Development Secretary Johnny Bradberry knew he was in for a tough job when he took over, but he didn't realize how tough. Along with maintaining 16,705 miles of roadway, including 894 miles of interstate, Bradberry's agency is responsible for maintaining 7,938 bridges, 64 general aviation airports, seven commercial airports, 2,300 miles of navigable waterways and 22 shallow- and deep-draft ports.Bradberry said the most pressing problem is the $10.6 billion backlog of road projects around the state. The department's annual budget is about $1.6 billion. "Even if we can make available an additional $400 million, we could only address 4 percent of our needs", Bradberry said, "at that rate it would take 25 years to address the backlog." *New Orleans City Business Journal,* 10/18/04

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Denham Spring's utilities have a huge unfunded infrastructure problem, facilities manager Jay Labarre told City Council members. Mayor Jimmy Durbin added that the city's sewer system is crumbling. City utilities, which generate their own income and operate separately from the general fund, don't have sufficient revenue to meet operating expenses, let alone to replace infrastructure, Labarre and Durbin told the council. Durbin said the city will have to face the costs of upgrading poor sewer infrastructure,"Sewer gas has eaten away the mortar," and concrete in the sewer system, he said. Ground water intrudes into lines and makes sewage more difficult and expensive to treat, the mayor said. The city needs to rehabilitate 10 to 15 lift stations and needs to add lines to reach all areas of the city, Durbin told the council. In some cases, sewage is going into road ditches which flow into our streams,the mayor said. *The Advocate,* 10/21/04

It may cost $250,000 to fix a wall that collapsed, dumping 800,000 to more than 1 million gallons of sewage onto the ground and into the Red River. The broken wall is 90 feet long and 14 feet high, on the south side of the 12-year-old plant in the area where raw sewage enters the plant and is separated into pits for treatment. The plant treats about 24 million to 27 million gallons of raw sewage a day. Associated Press, 2/21/04

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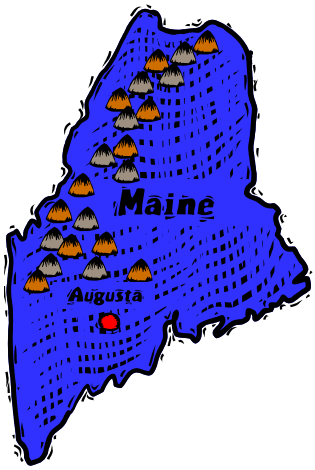

Maine

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

Key Infrastructure Facts

- 31% of Maine's major roads are in poor or mediocre condition.
- Vehicle travel on Maine's highways increased 26% from 1990 to 2003. Maine's population grew 6% between 1990 and 2003.
- Driving on roads in need of repair costs Maine motorists $263 million a year in extra vehicle repairs and operating costs—$282 per motorist.
- 36% of Maine's bridges are structurally deficient or functionally obsolete.
- There are 68 state-determined deficient dams in Maine.
- Maine has 26 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Maine's most critical dams is estimated at $9.2 million.
- Maine's drinking water infrastructure needs $500 million over the next 20 years.
- Maine has $1.1 billion in wastewater infrastructure needs.
- Maine generates 1.03 tons of solid waste per capita.
- Maine recycles 49% of the state's solid waste.
- 60% of Maine's schools have at least one inadequate building feature.
- 71% of Maine's schools have at least one unsatisfactory environmental feature.

From the Headlines

The replacement of the Davis Narrows Bridge over the Bagaduce River is scheduled for 2005. The 74-year-old bridge is showing signs of its age. The bridge's sufficiency rating, a federal measurement that analyzes a number of factors including structural soundness, bridge alignment and safety. was a 31.7 out of a possible 100. Any rating less than 50 would target a bridge for replacement. The bridge's substructure is built of stacked stones. There has been some movement in those stones, mainly due to the tidal river ripping

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through the bridge opening in two directions. *Bangor Daily News*, 8/11/04

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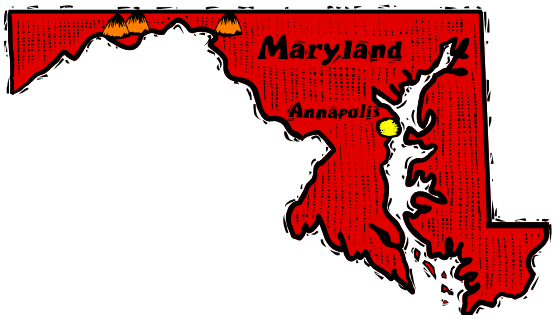

Maryland

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Mass Transit**

Key Infrastructure Facts

- 49% of Maryland's major urban roads are congested.
- 45% of Maryland's major roads are in poor or mediocre condition.
- Vehicle travel on Maryland's highways increased 35% from 1990 to 2003. Maryland's population grew 15% between 1990 and 2003.
- Driving on roads in need of repair costs Maryland motorists $1.4 billion a year in extra vehicle repairs and operating costs—$402 per motorist.
- Congestion in the Baltimore metropolitan area costs commuters $866 per person in excess fuel and lost time.
- Congestion in the Washington, D.C., metropolitan area costs commuters $1,212 per person per year in excess fuel and lost time.
- 29% of Maryland's bridges are structurally deficient or functionally obsolete.
- There are 12 state-determined deficient dams in Maryland.
- Maryland has 64 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Maryland's most critical dams is estimated at $64.6 million.
- Maryland's drinking water infrastructure needs $1.7 billion over the next 20 years.
- Maryland loses 66 million gallons of drinking water a day due to leaking pipes.
- Maryland has $4.78 billion in wastewater infrastructure needs.
- Maryland generates 1.63 tons of solid waste per capita.
- Maryland recycles 29.2% of the state's solid waste.
- 67% of Maryland's schools have at least one inadequate building feature.
- 65% of Maryland's schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"Lead in the drinking water is a continuing problem. The public schools are testing every fountain and faucet in each school on a regular basis and sending home the test results to parents." —a

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civil engineer from Olney, MD

"Local governments are struggling with the need to expand capacity by adding new infrastructure with the fact the existing assets require funding to maintain performance. Due to revenue constraints and no innovation in securing funds (e.g. user-based fees, partnerships, 3rd-party management, etc) the strugggles will continue." —a civil engineer from Baltimore, MD

"The biggest controversy is the red line on the Metrorail system. As stated above, the fares have increase twice in the last year and service has declined. The fares were recently increased by 40 cents. Parking increased 75 cents. As some one who is a daily commuter I pay almost $12 a day only to be frustrated with constant delays. I've even had to deboard a train twice, because it was malfunctioning." —a civil engineer from Potomac, MD

"The main sewer lines in Baltimore are collapsing with little or no financing to repair same. D.C. still has combined sewer system with no plans for separation." —a civil engineer from Baltimore, MD

"The traffic at I270 and I495 around Washington,DCis choking the life out of commuters." —a civil engineer from Mt. Airy, MD

From the Headlines

Male fish that are growing eggs have been found in the Potomac River near Sharpsburg, a sign that a little-understood type of pollution is spreading downstream from West Virginia, a federal scientist says. The so-called intersex abnormality may be caused by pollutants from sewage plants, feedlots and factories that can interfere with animals' hormone systems. Nine male smallmouth bass taken from the Potomac near Sharpsburg, about 60 miles upstream from Washington, were found to have developed eggs inside their sex organs, said Vicki S. Blazer, a scientist overseeing the research for the U.S. Geological Survey. Authorities say the problems are likely related to a class of pollutants called endocrine disruptors, which short-circuit animals' natural systems of hormone chemical messages. Officials are awaiting the results of water-quality testing that might point to a specific chemical behind the fish problems. The Potomac River is the main source of drinking water for the Washington metropolitan area and many upstream communities. It provides about 75 percent of the water supply to the 3.6 million residents of Washington and its Maryland and Virginia suburbs. WTOP News, 12/21/04

Chris Ashker once could drive 20 to 30 mph on southbound I-270 during his morning commute. That was four years ago. Now, Ashker said, southbound traffic comes to a halt two miles earlier. "It's a dead stop at 6:30 in the morning. If I leave [work] a moment after 4:30 p.m., everything gets proportionally worse." From 1999 to 2003, traffic on parts of I-270 grew by 20 percent. One section of the highway, near Exit 6, carried 260,000 vehicles, up from 217,000. What do 43,00 more vehicles every day look like? If that many Toyota Camerys were placed bumper to bumper, they would stretch from the White House to Philadelphia. Since 1993, Montgomery County has added 110,000 jobs

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and 42,000 housing units. The county followed through on development plans, but failed to build key links in the transportation system. "These traffic volumes were projected years ago," said Richard Parsons, president of the County Chamber of Commerce. "We planned a road and transit network, but we didn't build it. So now we're seeing the natural consequences." *The Washington Post,* 11/18/04

Health officials are warning people to stay out of the Patapsco River near Brooklyn Park following a massive sewage spill. The Patapsco Pumping Station in Baltimore County overflowed, releasing 700,000 gallons of sewage into the river. As a result of the spill, officials in both Baltimore and Anne Arundel counties are warning against direct water contact in the river. *The Capital,* 11/9/04

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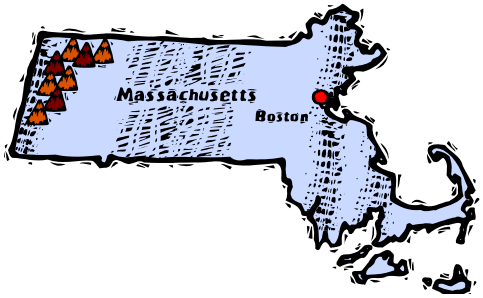

Massachusetts

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

Key Infrastructure Facts

- 31% of Massachusetts' major urban roads are congested.
- 71% of Massachusetts' major roads are in poor or mediocre condition.
- Vehicle travel on Massachusetts' highways increased 16% from 1990 to 2003. Massachusetts' population grew 7% between 1990 and 2003.
- Driving on roads in need of repair costs Massachusetts motorists $2.3 billion a year in extra vehicle repairs and operating costs—$501 per motorist.
- Congestion in the Boston metropolitan area costs commuters $958 per person per year in excess fuel and lost time.
- Congestion in the Springfield area costs commuters $163 per person per year in excess fuel and lost time.
- 51% of Massachusetts' bridges are structurally deficient or functionally obsolete.
- There are 40 state-determined deficient dams in Massachusetts.
- Massachusetts has 333 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Massachusetts' most critical dams is estimated at $143.5 million.
- Massachusetts' drinking water infrastructure needs $5.88 billion over the next 20 years.
- Massachusetts has $4.68 billion in wastewater infrastructure needs.
- Massachusetts generates 1.29 tons of solid waste per capita.
- Massachusetts recycles 31.1% of the state's solid waste.
- 75% of Massachusetts' schools have at least one inadequate building feature.
- 80% of Massachusetts' schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"The backlog to improve infrastructure remains solid. Communities are having a difficult time keeping up." —a civil engineer from Quincy, MA

"We are wrapping up the Big Dig which seems to have negatively impacted other public works projects. It remains to be seen if the deferred work will get done in a timely manner." —a civil

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engineer from Hingham, MA

From the Headlines

One of Duxbury's landmarks is deteriorating and needs repairing.The Powder Point Bridge, the half-mile-long, all-wood bridge no longer can safely accept 8 tons of weight, state officials determined. The 112-year-old bridge is now considered capable of bearing 4 tons. If the figure drops to 3 tons, the bridge will be closed. There is no money in the municipal budget for repairs to the bridge. *Patriot Ledger,* 10/21/04

The number of decaying bridges owned by the state hit a two-year high despite official pledges that the Big Dig won't shortchange other road projects. In Chester, one of two spans over the Westfield River to Main Street has been closed for years. As it is the town can't send heavy-duty snow plows over six deteriorating bridges owned by Chester. Most of the houses on the far sides of those spans are used as summer homes anyway because bulky fuel oil trucks are barred from crossing. *Boston Herald,* 8/26/04

Fix the school or lose accreditation. That is the stern warning Plymouth has received from the New England Association of Schools and Colleges regarding the deteriorating Plymouth North High School. Representatives of the association, which judges the quality of secondary schools, previously expressed concerns about Plymouth North's physical condition, overcrowding and curriculum options, but the official warning makes loss of accreditation a real possibility. The concerns that prompted the accreditation warning include: Limited options in art, business education, family and consumer science, and technology education because of staffing cuts and space needs, increased tension in the hallways because of overcrowding, inadequate music, gymnasium, cafeteria and library space, continued use of dilapidated temporary classrooms, leaking windows, outdated bathrooms, broken berms and potholes in the parking lot, and other building concerns. *Patriot Ledger,* 8/24/04

The saying "You can't get there from here" usually applies to rural areas in Maine, but it might soon describe a trip from Town Hall to the post office, only a few hundred yards apart. In between the two points are the Blackstone River and the crumbling iron bridge that allows passage over the river. The Massachusetts Highway Department will recommend that the town close the bridge because of its weakened condition. The recommendation is based on a state inspection of the bridge earlier this week. Such a measure will force residents and public safety personnel to take lengthy detours through Blackstone and North Smithfield, R.I., or through Uxbridge to get to any point south of the bridge to the Rhode Island line. Both the police and fire stations are on the north side of the bridge. The iron bridge was built between 1935 and 1938. The condition of the iron bridge has long been known to local and state officials. *Telegram & Gazette,* 8/26/04

With pothole repairs to the northbound side of the Neponset River Bridge completed last month, work crews began patching the southbound lanes. The project is slated to last only two to three weeks, but it should give anyone trying to leave or enter Dorchester via

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Quincy an idea of what to expect over the next three years. The 34-year-old span, a vital commuter link between Boston and the South Shore, has been deteriorating in recent years. Trucks now are prohibited in one lane where the bridge has weakened. Eroding concrete and exposed metal supports are visible from John Paul II Park in Dorchester. *Boston Globe,* 5/16/04

The Massachusetts Highway Department presented plans to replace the Route 122A bridge that spans the Blackstone River and leads into the historic downtown district, having declared the bridge structurally deficient several years ago. The existing Providence Street bridge was built in 1906 as a narrow railroad bridge, with two steel girders encased in cement. In 1917, the bridge was widened to accommodate road traffic, and six beams were added to the support structure. That is the bridge that exists today. The bridge has deteriorated over the years, and was identified as deficient in a 2000 state inspection report. The concrete of the two original beams has peeled away, exposing the steel. The exposure has, in turn, weakened the bridge. The most serious damage was caused by the waters of the Blackstone River, which have eroded the concrete surface of the bridge abutments. The highway department did a major underwater repair in 1991 to stabilize the abutments, but the bridge is now past its prime. *Telegram & Gazette,* 3/25/04

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Michigan

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Bridges**

Key Infrastructure Facts

- 29% of Michigan's major urban roads are congested.
- 38% of Michigan's major roads are in poor or mediocre condition.
- Vehicle travel on Michigan's highways increased 24% from 1990 to 2003. Michigan's population grew 8% between 1990 and 2003.
- Driving on roads in need of repair costs Michigan motorists $2.1 billion a year in extra vehicle repairs and operating costs—$294 per motorist.
- Congestion in the Detroit metropolitan area costs commuters $939 per person per year in excess fuel and lost time.
- Congestion in the Grand Rapids area costs commuters $360 per person per year in excess fuel and lost time.
- 29% of Michigan's bridges are structurally deficient or functionally obsolete.
- There are 25 state-determined deficient dams in Michigan.
- Michigan has 79 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Michigan's most critical dams is estimated at $31.1 million.
- Michigan's drinking water infrastructure needs $6.79 billion over the next 20 years.
- The Detroit metropolitan area loses 96 million gallons of drinking water per day due to leaking pipes. Detroit area residents pay an estimated $23 million for water that never reaches homes or businesses.
- Michigan has $4.09 billion in wastewater infrastructure needs.
- Michigan generates1.68 tons of solid waste per capita.
- Michigan recycles 15.1% of the state's solid waste.
- 52% of Michigan's schools have at least one inadequate building feature.
- 61% of Michigan's schools have at least one unsatisfactory environmental feature.

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Field notes from civil engineers in the state

"The two primary urban freeways in Grand Rapids are between 40 and 50 years old. They need to be replaced for physical, safety and capacity improvements. One is on the radar screen and the other isn't. The huge outlay to improve the second must be planned for at least 10 to 15 years in advance for planning and environmental impact reviews. We need to start planning and thinking about needs years in advance and prepare funding for that as well. Urban schools must be improved. The funding for these school improvements are difficult to obtain through millages. Alternative funding mechanisms for urban district improvements must be considered. Sewer separation work in the City of Grand Rapids is ongoing. The beaches at Lake Michigan still close a few times each year because of sewage overflows from Grand Rapids and other communities. Sewer and wastewater improvements are an ongoing need." —a civil engineer from Grand Rapids, MI

"Roads are so bad, visitors to the area have joked about "accidentally renting a car with square tires" on local radio stations. Local rivers are so polluted that many believe it very dangerous to have any physical contact with the water." —a civil engineer from Lincoln Park, MI

"We have had two lake communities recently decline the opportunity to build sorely-needed sewers because the cost of providing them was well over $10,000 per household, and whose rates, even with low-interest financing was over $100/month. We desperately need to do a better job of either communicating to people the benefits of public or community sewers or giving them enough grant funding to where the cost equals the perceivced value." —a civil engineer from Grand Rapids, MI

From the Headlines

Aging bridges and scarce funds have Albion between a rock and a hard place, but a new state-funded bridge program may help the city. For several years, three of Albion's nine bridges have been on the state's critical bridge list. Inspections are required every other year by the state. A recent inspection by Scott Civil Engineering Co. forced city officials to severely decrease the weight load the bridges can tolerate. Two additional bridges are in very poor condition, according to the engineers. Of the three, the East Erie Street bridge, constructed in 1908, is in the worst shape and needs to be replaced. Scott's report indicates visible damage to the rail, serious deterioration from steel corrosion under the bridge and small holes in the steel support beams. The bridge has a cobblestone foundation, but portions of the stone are loose or missing. He estimated the bridge has about five years of life left. Records show that it was last restored in 1930. It's fourth on Michigan Department of Transportation's statewide list of 213 bridges in critical shape. Repairing the bridges will cost up to $500,000 each—money the city does not have. *Battle Creek Enquirer,* 12/13/04

Mary Zdrojkowski sat in her Parkwood Avenue house last week trying to hold back the

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tears. A month ago, a water main break in front of her Ann Arbor house sent raw sewage shooting out of her dishwasher, sinks, toilets and shower drains. Her dishwasher was ruined. When the raw sewage came out through her sink, it got into the pots, pans and utensils. The city picked up the $24,000 cleaning bill but says it is not liable to pay for $39,000 in damages. Zdrojkowski represents the human side of years of neglect of the city's water pipes. Ann Arbor Utilities Director Sue McCormick estimates it would cost the city about $200 million to replace all the pipes that are 50 years or older—about 250 miles of aging pipes the city let go unchecked for decades. And that doesn't include the cost of digging up the city streets and repaving them when finished. McCormick quickly learned about Ann Arbor's water system woes when she took over in 2001. She has said the only data she found on the maintenance of the water pipes were hand-written records that recorded what decade the pipes had been installed. The city has 450 miles of underground water pipes. About 75 percent of the system was put in prior to the 1960s. McCormick said the pipes have a life expectancy of 50 years. *Ann Arbor News,* 11/28/04

State and local agencies have spent billions of dollars to repair Michigan sewer systems over the last 15 years, but millions of gallons of raw sewage continue to flow into lakes and streams after heavy rainstorms and snow melts. Local officials say they're working to rehabilitate sewage systems that are crumbling due to age and overuse, but they concede they're not able to complete the work because they don't have the money to do it. Environmentalists say the financial challenges municipalities face will get worse in 2005 with Congress and the Bush administration trimming nearly $260 million from a federal loan fund that helps finance sewage system repairs and construction. Moreover, they fear that without the federal government putting sewer system repairs at the top of the agenda, water pollution from sewage overflows will continue unabated. The Bush administration proposed trimming the Clean Water State Revolving Fund, which finances water infrastructure projects, from $1.3 billion in 2004 to $850 million in 2005. Congress pared back the cut, leaving the program at about $1 billion for fiscal 2005. To combat the overflows, local governments spent $47 billion nationally and more than $2 billion in Michigan to repair and rework their combined and sanitary sewer systems between 1989 and 2004. Combined sewers, which are generally older and found in large cities, carry storm water and domestic sewage in the same pipes. When too much storm water enters the system, the pipes overflow, sending raw sewage into lakes and rivers. Sanitary sewers have separate pipes for domestic sewage and storm water, but overflows do occur when pipes break or pumps aren't large enough. These overflows often result in basement backups. Raw sewage in local rivers or lakes poses a serious health threat, say environmentalists, noting that sewage overflows have closed dozens of beaches along the Great Lakes in the last year. To keep the work moving forward, especially in tight budget times when cities are often forced to choose between the fire department and sewer overhauls, the public needs to understand the challenge ahead. *Booth Newspapers,* 11/22/04

The Bridge Street Bridge—Belding's main thoroughfare—will close three months ahead of schedule, because of safety concerns. Another hole in the deck was discovered,

prompting the closure. The structure was determined to be unsafe after an inspection by boat. The inspection found that 30 percent of the deck is deteriorated. *Grand Rapids Press,* 9/29/04

Michigan officials have spent more than $3 billion since 1997 on a 10-year effort to get 90 percent of the state's roads into good condition, but experts say little money will be left to build new roads or expand existing ones. That means motorists, particularly in urban and suburban areas, can expect little relief from gridlock. The scramble for money to address road maintenance and congestion will worsen over the next two decades. In southeast Michigan alone, the state Department of Transportation and county road commissions will need $70 billion over the next quarter-century to keep up with maintenance but will get just $40 million. Associated Press, 9/29/04

The Middlebelt Road bridge over the Rouge River will be closed most of next summer as Oakland County tries to save it. The 35-foot bridge is beginning to crumble and county officials hope a $400,000 bridge deck replacement project will keep it standing for at least another decade. "It's an intermediary step in hoping to not replace the bridge," said Craig Bryson, a spokesman for the county road commission. "The concrete surface is in bad shape. It's cracked and falling apart." An estimated 20,200 cars travel over the bridge every day. Although the bridge's surface will be replaced, motorists still will have to navigate around the potholes on either side of the bridge. *Detroit News,* 9/22/04

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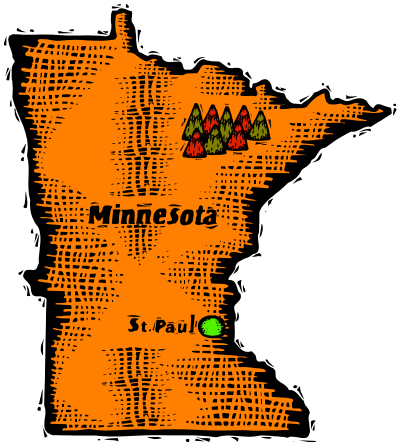

Minnesota

Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Wastewater**

Key Infrastructure Facts

- 69% of Minnesota's major urban roads are congested.
- 25% of Minnesota's major roads are in poor or mediocre condition.
- Vehicle travel on Minnesota's highways increased 42% from 1990 to 2003. Minnesota's population grew 16% between 1990 and 2003.
- Driving on roads in need of repair costs Minnesota motorists $690 million a year in extra vehicle repairs and operating costs—$227 per motorist.
- Congestion in the Minneapolis–St. Paul metropolitan area costs commuters $740 per person per year in excess fuel and lost time.
- There are 40 state-determined deficient dams in Minnesota.
- Minnesota has 40 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Minnesota's most critical dams is estimated at $20.1 million.
- Minnesota's drinking water infrastructure needs $3.01 billion over the next 20 years.
- Minnesota has $2.31 billion in wastewater infrastructure needs.
- Minnesota generates 1 ton of solid waste per capita.
- Minnesota recycles 25.1% of the state's solid waste.
- 57% of Minnesota's schools have at least one inadequate building feature.
- 66% of Minnesota's schools have at least one unsatisfactory environmental feature.

Field notes from civil engineers in the state

"Our infrastructure is still declining when demand is greatly increasing. Population of the Twin Cities will increase 1 million in the next 20 years." —a civil engineer from Minneapolis, MN

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From the Headlines

The Minnesota Department of Transportation must devote the bulk of its budgets over the next 25 years to preserving highways and bridges that already exist in Northeastern Minnesota rather than new construction. Unfortunately, the needs keep outpacing the funding availability across the state, said Denny Johnson, MnDOT planning director for the region. And without changes to increase funding from the state legislature, that also means that some major improvement projects will be pushed back even further, he said. *Duluth News Tribune*, 12/16/04

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Mississippi

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

Key Infrastructure Facts

- 25% of Mississippi's major roads are in poor or mediocre condition.
- Vehicle travel on Mississippi's highways increased 54% from 1990 to 2003. Mississippi's population grew 12% between 1990 and 2003.
- Driving on roads in need of repair costs Mississippi motorists $453 million a year in extra vehicle repairs and operating costs—$240 per motorist.
- 28% of Mississippi's bridges are structurally deficient or functionally obsolete.
- There are 46 state-determined deficient dams in Mississippi.
- Mississippi has 307 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Mississippi's most critical dams is estimated at $82.5 million.
- Mississippi's drinking water infrastructure needs $1.36 billion over the next 20 years.
- Mississippi has $856 million in wastewater infrastructure needs.
- Mississippi generates 1.02 tons of solid waste per capita.
- Mississippi recycles .3% of the state's solid waste.
- 50% of Mississippi's schools have at least one inadequate building feature.
- 54% of Mississippi's schools have at least one unsatisfactory environmental condition.

From the Headlines

The city of Madison is considering shoring up the ailing Madison Avenue bridge so it can reopen to school bus traffic. A school bus loaded with children weighs about 30,000 pounds. The city placed a reduced weight limit of 10,000 pounds on the bridge shortly before school opened in August. The Madison Avenue bridge was one of six Madison County bridges rated critical in the past few months. The lower limit meant that buses were re-routed off of a major corridor serving six schools in the Madison area. Traffic tie-

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ups on Mississippi 463, the alternate route, resulted. Two bridges used by buses transporting students to the Velma Jackson high and elementary schools near Camden also are impassable by school buses and must be replaced. *Clarion Ledger,* 9/21/04

There are some 10,924 small, locally-owned bridges in Mississippi Upkeep for them is the responsibility of the counties. Each year, the legislature appropriates $20 million to help counties rebuild bridges in the worst condition, the ones that could become imminent safety hazards - except for this year, when the budget-cutting legislature failed to approve the money. "This means that many bridges, the ones in the worst shape, won't get repaired this year," according to Fred Hollis, an engineer with Mississippi's Local System Bridge Program (LSBP) program, which administers the $20 million to eligible bridges. In 2002, some 128 bridges across the state were replaced or repaired, and 109 in 2003. There are a total of 1,856 eligible bridges in the state, which means they have a rating of below 50. Four hundred and fifty-two of these bridges have a rating of less than 25 and 1,404 have a rating of 25 to 50. Engineers' reports, according to Hollis, show that some of the bridge pilings "aren't even carrying a load. They may have already rotted or fallen to the point where the other pilings have to carry more weight." *Mississippi Business Journal,* 8/9/04

The Amtrak passenger train that derailed crashed on a section of track where several freight trains have derailed in recent years. A train carrying hazardous chemicals crashed in 1997, forcing the evacuation of about 4,000 Flora-area residents. Three other freight trains have derailed on those tracks within a five-mile stretch—in 1986 and twice in 1994. In the 1986 derailment, about 1,500 residents were evacuated after a chemical-laden freight train crashed. A tanker car containing propane burst into flames, shooting a 200-foot fireball into the sky. In February 1994, two 100-car freight trains collided, killing one of the engineers. In April 1994, 30 residents were evacuated after a 12-car derailment. Amtrak switched to the western route through Yazoo City in the mid-1990s. Before that, the train traveled the eastern route through Grenada. It switched because of concerns the tracks might be abandoned or be allowed to deteriorate while the track was still owned by Illinois Central. *Clarion Ledger* 4/7/04

Heavy commercial and 18-wheeler trucks are prohibited from traveling on the Cedar Lake Road bridge after an inspection showed it is in poor condition, city officials announced. Officials closed the bridge to trucks indefinitely after structural engineers told them the support beams under the 31-year-old swing bridge are deteriorating. Gulf Regional Planning Commission traffic counts show more than 4,100 vehicles use the bridge on an average day. Cars and pickups are allowed on the two-lane bridge, which is north of Interstate 10. However, 18-wheelers, school buses and other heavy trucks must use a detour such as the Cedar Lake exit off I-10 to access areas south of the bridge. *Sun Herald,* 3/31/04

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Missouri

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

To view the local infrastructure report card of ASCE's St. Louis Section, please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 30% of Missouri's major urban roads are congested.
- 46% of Missouri's major roads are in poor or mediocre condition.
- Vehicle travel on Missouri's highways increased 34% from 1990 to 2003. Missouri's population grew 11% between 1990 and 2003.
- Driving on roads in need of repair costs Missouri motorists $1.5 billion a year in extra vehicle repairs and operating costs—$383 per motorist.
- Congestion in the Kansas City metropolitan area costs commuters $503 per person in excess fuel and lost time.
- Congestion in the St. Louis metropolitan area costs commuters $647 per person per year in excess fuel and lost time.
- 35% of Missouri's bridges are structurally deficient or functionally obsolete.
- There are 16 state-determined deficient dams in Missouri.
- Missouri has 447 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Missouri's most critical dams is estimated at $374.1 million.
- Missouri's drinking water infrastructure needs $2.18 billion over the next 20 years.
- Missouri has almost $5 billion in wastewater infrastructure needs.
- Missouri generates 1.28 tons of solid waste per capita.
- Missouri recycles 38.9% of the state's solid waste.
- 54% of Missouri's schools have at least one inadequate building feature.
- 58% of Missouri's schools have at least one unsatisfactory environmental condition.

From the Headlines

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The bridge on Joachim Avenue at the entrance to Herculaneum needs to come down, says the Missouri Department of Transportation. The state said that stress tests conducted by Bucher, Willis and Ratliff in St. Louis determined that the bridge should be torn down. Built in 1910, the concrete-and-steel bridge has a significant amount of damage with rusting beams and deterioration underneath, says Mike Abram, public works coordinator. It is flooded at least once a year. So far, Herculaneum has not been told to close the bridge completely, but Abram plans to meet with state officials this week on their recommendation. In the meantime, a maximum weight limit of five tons has been placed on traffic using the bridge. While this will not affect most cars or pickup trucks, it will place a burden on the Doe Run Co., which uses the bridge as a route for hauling lead concentrate from the mine. About 50 trucks a day use that route to deliver material to the lead smelter. Trucks will be rerouted along Wall Street, up Hill Street by the high school or through the north end of town. Either way the heavy loads will be diverted through residential neighborhoods. *St. Louis Post-Dispatch,* 9/21/04

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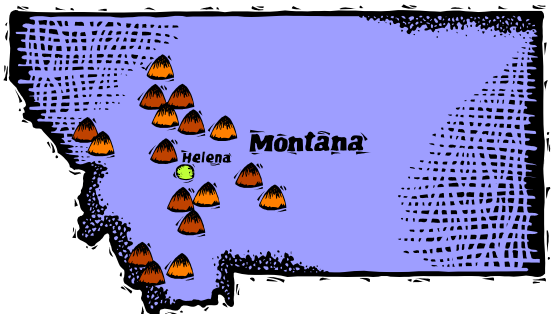

Montana

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Energy**

Key Infrastructure Facts

- 18% of Montana's major roads are in poor or mediocre condition.
- Vehicle travel on Montana's highways increased 31% from 1990 to 2003. Montana's population grew 15% between 1990 and 2003.
- Driving on roads in need of repair costs Montana motorists $117 million a year in extra vehicle repairs and operating costs—$167 per motorist.
- 21% of Montana's bridges are structurally deficient or functionally obsolete.
- There are about 11 state-determined deficient dams in Montana.
- Montana has 102 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Montana's most critical dams is estimated at $126.4 million.
- The drinking water infrastructure in Montana needs $872 million over the next 20 years.
- Montana has $516 million in wastewater infrastructure needs.
- 45% of Montana's schools have at least one inadequate building feature.
- 69% of Montana's schools have at least one unsatisfactory environmental condition.

From the Headlines

Sen. Max Baucus, who is trying to secure money for repairs to the aging St. Mary Canal near here, says his tour of the facility has raised even more concern that the structure isn't going to last much longer without extensive work. Baucus, D-Mont., toured the canal with local officials and leaders of the Blackfeet tribe. The nearly 90-year-old system of steel tubes, concrete waterfalls, canals and reservoirs takes water from the St. Mary River basin that is headed northeast into Canada and moves it over a divide east of Glacier National Park into the Milk River drainage. The system supplies irrigation to roughly 110,000 acres of farmland along the Montana Hi-Line, and is a main water source for some 14,000 households, including the communities of Havre, Chinook and Harlem. Baucus marveled at the engineering of the system, but said he was troubled at some of the disrepair he saw, including crumbling concrete and buckled metal. Baucus is seeking

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a $6.25 million appropriation for the 2006 fiscal year to help launch repair work, including replacing a county bridge that carries siphon tubes over the St. Mary River. That would be only a drop in the bucket. Estimates for the repairs needed on the canal operated by the federal Bureau of Reclamation top $100 million. Associated Press, 2/24

Crews will demolish the Eden Bridge south of Ulm soon and build a new bridge during the next four months. The 50-year-old bridge, which spans the Smith River on Boston Coulee Road, is closed to traffic, and it isn't expected to reopen until October. Wooden planks on the bridge are in bad shape, and the wooden approaches also are weathered and cracking. Because of the problems, the bridge only can carry about half the capacity it was designed to carry. With the reduced capacity, emergency vehicles have been unable to use the bridge. *Great Falls Tribune,* 6/20/04

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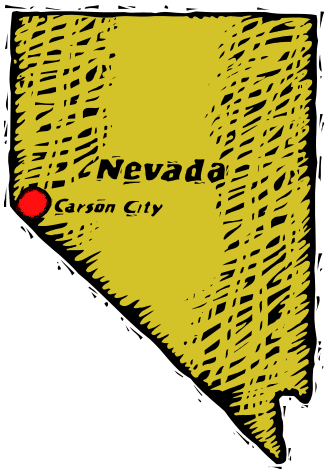

Nevada

Top Three Infrastructure Concerns*

1. **Roads**
2. **Drinking Water**
3. **Mass Transit**

Key Infrastructure Facts

- 44% of Nevada's major urban roads are congested.
- Vehicle travel on Nevada's highways increased 89% from 1990 to 2003. Nevada's population grew 86% between 1990 and 2003.
- The Nevada Department of Transportion has a $387 million maintenance backlog.
- Nevada faces a $2.8 billion shortfall in transportation funding over the next 10 years.
- Driving on roads in need of repair costs Nevada motorists $120 million a year in extra vehicle repairs and operating costs—$81 per motorist.
- Congestion in the Las Vegas area costs commuters $494 per person in excess fuel and lost time.
- There are about 58 state-determined deficient dams in Nevada.
- Nevada has 134 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Nevada's most critical dams is estimated at $30.2 million.
- Nevada's drinking water infrastructure needs $602 million over the next 20 years.
- Nevada faces a $2.8 billion shortfall in transportation funding over the next 10 years.
- Nevada generates 1.55 tons of solid waste per capita.
- Nevada recycles 15.8% of the state's solid waste.
- 42% of Nevada's schools have at least one inadequate building feature.
- 57% of Nevada's schools have at least one unsatisfactory environmental condition

Field notes from civil engineers in the state

"In the late 80's, the Mayor of Reno eliminated all road maintenance for a period of about three years as a means to balance the city's budget. The primary consequence is that the city will not catch up on maintenance until 2010." —a civil engineer from Reno, NV

"New development is not paying for its share of infrastructure, including schools." —a civil

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engineer from Las Vegas, NV

From the Headlines

The century-old Virginia Street bridge that spans the Truckee River is in sorry shape and could be closed if it continues to deteriorate, Reno's public works director said. "It's imminent," Steve Varela told downtown business leaders, "We may have to close the bridge down because it is unsafe." But a state highway engineer, while agreeing the bridge should be replaced, said it is inspected every six months and records show it is safe. Hossein Hatefi said inspectors are keeping a close eye on any settling problems that would indicate the structure is falling apart. Hatefi said the arched concrete bridge is very heavy and strong. But the superstructure has exposed, rusted iron rods and deep concrete cracks, rating near-failing scores. A major rehabilitation of the bridge built in 1905 was planned in 1997. But that was put on hold after a New Year's Day flood that caused nearly $700 million in damage. Associated Press, 2/4/05

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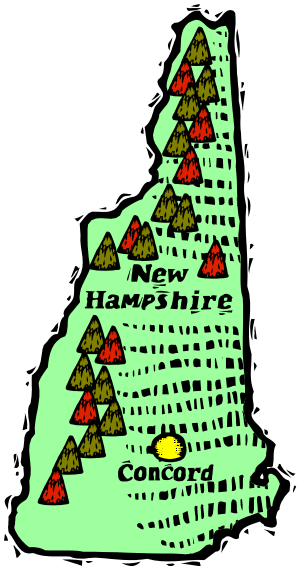

New Hampshire

Top Three Infrastructure Concerns*

1. **Roads**
2. **Drinking Water**
3. **Bridges**

To view the local infrastructure report card of ASCE's New Hampshire Section please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 24% of New Hampshire's major urban roads are congested.
- 30% of New Hampshire's major roads are in poor or mediocre condition.
- Vehicle travel on New Hampshire's highways increased 34% from 1990 to 2003. New Hampshire's population grew 16% between 1990 and 2003.
- Driving on roads in need of repair costs New Hampshire motorists $236 million a year in extra vehicle repairs and operating costs—$243 per motorist.
- 33% of New Hampshire's bridges are structurally deficient or functionally obsolete
- There are 357 state-determined deficient dams in New Hampshire.
- New Hampshire has 86 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for New Hampshire's most critical dams is estimated at $43 million.
- New Hampshire's drinking water infrastructure needs $499 million over the next 20 years.
- New Hampshire has $906 million in wastewater infrastructure needs.
- New Hampshire generates .95 tons of solid waste per capita.
- New Hampshire recycles 23.7% of the state's solid waste.
- 59% of New Hampshire's schools have at least one inadequate building feature.
- 78% of New Hampshire's schools have at least one unsatisfactory environmental condition.

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Field notes from civil engineers in the state

"Manchester has invested over $100 million into their schools, are doing a $30 million upgrade to their WTP, have a $100 million CSO abatement program, has the fastest growing airport in New England, widen portions of the interstate ring around the city, recently built a 10,000 seat civic center and are now building a new 5,000 seat baseball park. Life is great in Manchester, and the quality of our infrastructure reflects it." —a civil engineer from Manchester, NH

"Our local communities are very concerned with degradation of water quality in our lakes and streams as developments occur in close proximity to them." —a civil engineer from Wakefield, NH

From the Headlines

Residents on the west end of the deteriorating Vilas Bridge over the Connecticut River between New Hampshire and Vermont worry that it's taking too long for repairs. The historic bridge connects North Walpole, New Hampshire, to downtown Bellows Falls, Vermont. It is on a list of spans in serious need of repair but work is likely to be years away. The bridge was built in 1930 and is the only remaining reinforced concrete open spandrel arch bridge in New Hampshire. It is historically important because it sits where the first bridge anywhere on the Connecticut River was built in 1785. Maintenance on the bridge isn't scheduled until 2008 and renovation isn't expected until 2010. Associated Press, 11/16/04

E. coli bacteria found in the water supply in Franklin, N.H., prompted officials to issue an order instructing residents to boil their water. The contamination was found at the Babbitt Road pumping station. E. coli bacteria indicates the water has not been sufficiently treated to remove fecal waste. If ingested, it can cause diarrhea, cramps, nausea and headaches. The order instructs users to boil their water for at least two minutes or use bottled water for drinking, making ice, brushing teeth, washing dishes and/or food preparation. Franklin Regional Hospital ordered nearly 200 gallons of bottled water and plenty of bagged ice from nearby Laconia, according to a press release. Nurses placed bottled water at each patient's bedside, and the hospital shut down the water supply to individual rooms to prevent any accidental exposure. Patients will be bathed with pre-soaped and pre-moistened washcloths, the release said, and waterless foam soap will be available in all public restrooms. Paper and plastic products will be used in the dining areas. Also, all surgical equipment will be sterilized at Lakes Region General Hospital in Laconia, and surgeons will use bottled water to scrub with before entering the operating room. *Water and Wastes Digest,* 11/1/04

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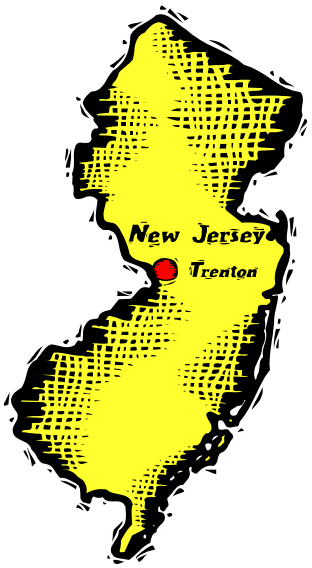

New Jersey

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

Key Infrastructure Facts

- 51% of New Jersey's major urban roads are congested.
- 71% of New Jersey's major roads are in poor or mediocre condition.
- Vehicle travel on New Jersey's highways increased 18% from 1990 to 2003. New Jersey's population grew 12% from 1990 to 2003.
- The New Jersey Department of Transportation is facing a backlog of $12 billion in deferred maintenance.
- Driving on roads in need of repair costs New Jersey motorists $3.2 billion a year in extra vehicle repairs and operating costs—$554 per motorist.
- 37% of New Jersey's bridges are structurally deficient or functionally obsolete.
- There are 583 state-determined deficient dams in New Jersey.
- New Jersey has 196 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for New Jersey's most critical dams is estimated at $103.8 million.
- New Jersey's drinking water infrastructure needs $3.66 billion over the next 20 years.
- New Jersey loses 20 million gallons of drinking water per day due to leaking pipes.
- New Jersey has $12.83 billion in wastewater infrastructure needs.
- New Jersey generates 1.23 tons of solid waste per capita.
- New Jersey recycles 37.9% of the state's solid waste.
- 53% of New Jersey's schools have at least one inadequate building feature.
- 69% of New Jersey's schools have at least one unsatisfactory environmental condition.
- New Jersey has an $8 billion program for school construction which includes funding for court mandated infrastructure repair and maintenance.

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Field notes from civil engineers in the state

"Infrastructure needs are not addressed until there is a failure." —a civil engineer from Haddon Township, NJ

"Most of the suburban communities in New Jersey are facing a phenomenal growth in popoulation and retail development. These suburbs are basically designed for automobile traffic only and therefore the existing roads and bridges are unable to handle the increased load." —a civil engineer from Succasunna, NJ

"NJ DOT, NJ Transit and NY MTA are using capital funds for operating expenses. Funds for capital projects and operations are way below needs. New Jersey needs a dedicated fuel tax. New Jersey, in cooperation with PA, NY and federal government set aside hundreds of thousands of acres in the Highlands from development, and designated areas to be developed. New Jersey and New York are completing multi-billion school construction programs. New funding is needed to complete these programs and bring schools up to acceptable levels." —a civil engineer from Morristown, NJ

"NJ Transportation Trust Fund is now near the point of insolvency where the total revenue from all sources (gas tax, etc.) will be equal to the interest payments on the trust fund's debt leaving ZERO for capital program projects." —a civil engineer from Edison, NJ

From the Headlines

Want a good scare? Take a look at the concrete flakes falling into the Hackensack River from the Route 4 bridge in Teaneck. Never mind the makeshift cables holding up the wall that separates cars from oblivion. State Department of Transportation engineers consider this span in satisfactory condition, although "functionally obsolete." *The Record,* 1/6/05

School officials and board trustees are asking voters in a referendum to approve a $15.5 million project to fix the deteriorating high school. The plan entails work only on the high school, which is more than 70 years old. It was scaled back from a $23.7 million proposal, rejected by voters in September, that included work on the middle school. If approved, the money will pay for a new gym and locker rooms, two classrooms, an elevator and new science labs. Repairs would include upgrades to the ventilation, heating, electrical and fire systems. A new entrance to the administration area will be built for security purposes, as well as a bridge connecting the two sides of the second floor. The current weight room would be converted into a music suite. School officials say the additions are needed because the current building is too small to educate the 655 students now enrolled, and a projected increase in students will exacerbate the problem. *The Record,* 12/13/04

Engineers and traffic experts say a variety of factors made heavy rains from a severe storm such a pervasive mess on the roads. In urban areas, antiquated drainage systems on old roads were overwhelmed by the deluge. In the suburbs, open space that used to absorb heavy rains has been paved over in the building boom of recent decades. New

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Jersey Transportation Commissioner Jack Lettiere said his agency a few years ago began compiling a computer database on roads that have chronic flooding problems so the state can invest money wisely on drainage. At present, the state has about 200 projects on the list that would cost hundreds of millions of dollars. But the state only spends tens of millions of dollars on road drainage improvements per year. *Star Ledger,* 8/9/04

The Nevius Street bridge over the Raritan River will remain closed indefinitely after engineers discovered rusted pieces of the bridge that reduced the weight it could safely carry to below three tons. The bridge was closed two weeks ago after engineers found cracks in the stone pier in the middle of the Raritan River that supports the two steel truss bridges. Further inspection revealed rust to the metal superstructure that holds the bridge and the bridge deck up. Now, the bridge can't support three tons, which is less than the weight of a large sport utility vehicle such as a Ford Expedition, which weighs from 3.3 to 3.8 tons, depending on options. Photos showed severe rust damage at the foot of a bridge truss and large cracks in the stone pier. *Courier News,* 3/26/04

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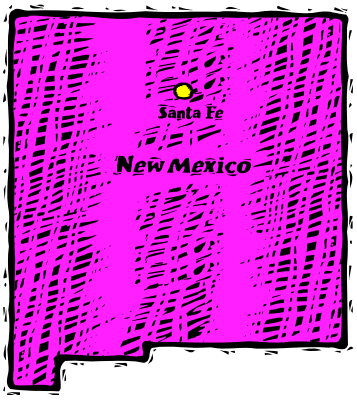

New Mexico

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Drinking Water**

Key Infrastructure Facts

- 22% of New Mexico's major roads are in poor or mediocre condition.
- Vehicle travel on New Mexico's highways increased 41% from 1990 to 2003. New Mexico's population grew 24% from 1990 to 2003.
- Driving on roads in need of repair costs New Mexico motorists $288 million a year in extra vehicle repairs and operating costs—$233 per motorist.
- Congestion in the Albuquerque metropolitan area costs commuters $503 per person in excess fuel and lost time.
- 19% of New Mexico's bridges are structurally deficient or functionally obsolete.
- There are 61 state-determined deficient dams in New Mexico.
- New Mexico has 164 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for New Mexico's most critical dams is estimated at $152.9 million.
- New Mexico's drinking water infrastructure needs $1.04 billion over the next 20 years.
- New Mexico has $206 million in wastewater infrastructure needs.
- New Mexico generates 1.13 tons of solid waste per capita.
- New Mexico recycles 6.5% of the state's solid waste.
- 69% of New Mexico's schools have at least one inadequate building feature.
- 75% of New Mexico's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Many creative partnerships have been entered into with local developers. The quality and quantity of infrastructure is improving as our community continues to experience phenominal growth." —a civil engineer from Rio Rancho, NM

"We discovered that key Federal flood control facilities were not being adequately maintained, significantly compromising flood protection." —a civil engineer from Albuquerque, NM

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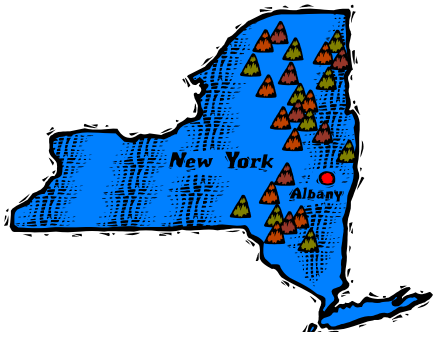

New York

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Mass Transit**

Key Infrastructure Facts

- 34% of New York's major urban roads are congested.
- 35% of New York's major roads are in poor or mediocre condition.
- Vehicle travel on New York's highways increased 26% from 1990 to 2003. New York's population grew 7% between 1990 and 2003.
- Driving on roads in need of repair costs New York motorists $3.2 billion a year in extra vehicle repairs and operating costs—$285 per motorist.
- Congestion in the Albany area costs commuters $208 per person per year in excess fuel and lost time.
- Congestion in the Buffalo area costs commuters $182 per person per year in excess fuel and lost time. Congestion in the New York City metropolitan area costs commuters $893 per person per year in excess fuel and lost time.
- Congestion in the Rochester area costs commuters $103 person per year in excess fuel and lost time.
- 38% of New York's bridges are structurally deficient or functionally obsolete.
- There are about 54 state determined deficient dams in New York.
- New York has 383 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for New York's most critical dams is estimated at $303.1 million.
- New York's drinking water infrastructure needs $13.15 billion over the next 20 years.
- New York has $20.42 billion in wastewater infrastructure needs.
- New York generates 1.29 tons of solid waste per capita.
- New York recycles 17.1% of the state's solid waste.
- 67% of New York's schools have at least one inadequate building feature.
- 76% of New York's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Increase the gas tax and dedicate those funds for purely road and bridge improvements." —a civil engineer from New York, NY

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"I am a bridge inspector for NYSDOT. I see the poor condition that our bridges and roadways are everyday. However, the general public is not aware and does not wish to be made aware service is interrupted. There needs to be an awareness campaign for the public. The public wants/deserves a better infrastructure but no one wants to pay for it. We need a medicare/medicaid funding system for our aging bridges." —a civil engineer from Wappinger Falls, NY

"I find it more than a little scary that the average person living in my area is so used to seeing corroded rebar easily visible in most concrete bridges, that he/she might think it is supposed to be there!" —a civil engineer from Syracuse, NY

"The October fire/power failure in the Amtrak/LIRR East River tunnels highlighted a strategic infracture weakness and critical safety deficiency which everyone has known about, and which had been highly publicized, yet the responsible agencies continue to move at a glacial pace in upgrading the tunnels." —a civil engineer from New York, NY

"Unfortunately, most people do not understand the hazard that aging dams present since they do not drive on them or see tham every day. However, the destructive potential of these particular structures is immense." —a civil engineer from Rochester, NY

From the Headlines

More than 11,100 city classrooms are overstuffed—with 10,000 of them in high schools—a new teachers union survey shows. Queens high schools, where overcrowding has been a chronic problem, were the most packed on average. The union found 4,490 Queens high school classes had more than 34 students—the cap outlined in the union's contract with the city. *New York Post,* 9/24/04

A downpour immobilized much of the New York City subway system and highlighted how an otherwise durable transit network still finds itself particularly vulnerable to an altogether predictable threat: a quick, heavy rainfall. Most of New York City's 6,000 miles of sewage lines are dual use, which means they handle rain runoff as well as sewage and industrial wastewater in the same pipe before delivering it to one of the city's 14 treatment plants. But heavy rains perennially overwhelm the pipes, causing the flow to back up, dumping everything from fecal matter and household trash to industrial pollutants like oil, grease and heavy metals into the city's waterways and streets. *The New York Times,* 9/2/04

A 60-foot-long slab of concrete fell from a bridge over the Grand Central Parkway in Queens, critically injuring a man in a van. Police said the unidentified victim was taken to Elmhurst Hospital Center with head injuries and two broken legs. The concrete chunk, 4 feet wide and 3 feet thick, suddenly dropped from the underbelly of the Steinway St. bridge in Astoria in a V shape. The van rammed into it, crushing the vehicle's front end. The badly deteriorating bridge is in the process of being replaced. *Daily News,* 7/24/04

Officials at the Town of Babylon, which maintains New Highway, cannot say when the shoulders of the highway were last repaired. Several times a year, the holes are filled with

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dirt and gravel. But rain—and wear and tear—soon knocks it loose and the ruts and holes return. The town cannot afford permanent repairs. A rebuild of the badly deteriorated road is out of the question, town highway department officials said. *Newsday,* 7/21/04

Built in 1930, the Bridge Street overpass at the New Hamburg Metro-North train station is located just north of the station and serves vehicular traffic entering and exiting the New Hamburg community west of the tracks. And while most commuters park in the station lot east of the tracks and access the southbound platform by way of an underground pedestrian tunnel, others that are driven to the station cross the overpass and are dropped off on the southbound side. In addition to commuter traffic, the overpass services fuel trucks that access an oil company located in the hamlet as well as school buses and, in warmer weather, a large amount of vehicles en route to a marina. There is considerable corrosion and rust on the underside of the overpass. A continual stream of water can be seen dripping from a large pipeline that traverses the top of the structure, bringing water to the New Hamburg community from the Town of Poughkeepsie. *Poughkeepsie Journal,* 3/13/04

A deteriorating creek wall could create traffic headaches for residents of one city neighborhood for the next few months. The city's Department of Public Works closed the intersection of South Cascadilla Avenue and Sears Street Tuesday due to cracks in the pavement resulting from advanced deterioration in the underlying creek wall. Rick Ferrel, the city's assistant superintendent of public works for streets and facilities, said the crumbling creek wall could be as much as a century old. Crews have known for a few years that it needed to be repaired, he said, but the work was delayed for various reasons. The pavement started sinking a few years ago. *Ithaca Journal,* 3/10/04

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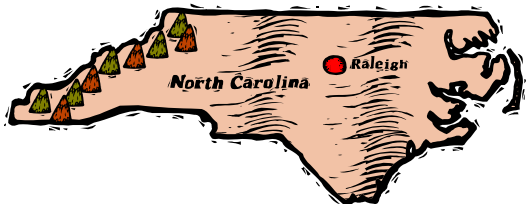

North Carolina

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Bridges**

Key Infrastructure Facts

- 42% of North Carolina's major urban roads are congested.
- 34% of North Carolina's major roads are in poor or mediocre condition.
- Vehicle travel on North Carolina's highways increased 50% from 1990 to 2003. North Carolina's population grew 27% between 1990 and 2003.
- The state has a $28 billion shortfall over the next 25 years in needed highway and bridge funding.
- Driving on roads in need of repair costs North Carolina motorists $1.7 billion a year in extra vehicle repairs and operating costs—$282 per motorist.
- Congestion in the Charlotte metropolitan area costs commuters $791 per person per year in excess fuel and lost time.
- Congestion in the Raleigh metropolitan area costs commuters $460 per person per year in excess fuel and lost time.
- 30% of North Carolina's bridges are structurally deficient or functionally obsolete.
- There are about 81 state-determined deficient dams in North Carolina.
- North Carolina has 1,046 high hazard dams. high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for North Carolina's most critical dams is estimated at $394.8 million.
- North Carolina's drinking water infrastructure needs $2.7 billion over the next 20 years.
- North Carolina has $5.92 billion in wastewater infrastructure needs.
- North Carolina generates 1.08 tons of solid waste per capita.
- North Carolina recycles 11% of the state's solid waste.
- 55% of North Carolina's schools have at least one inadequate building feature.
- 68% of North Carolina's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

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"Nothing has been done to improve roads and bridges due to apathy on the part of the public and infrastructure administrators." —a civil engineer from Sylva, NC

From the Headlines

North Carolina's public water, sewer and stormwater infrastructure needs will reach $7 billion within five years, according to early results of a water-resource study. The $800 million in bonds N.C. voters approved in 1998 will be exhausted in February, said the N.C. Rural Economic Development Center, the nonprofit that produced the report. The bond money was used to help rural and poor communities build or repair their water and sewer systems. The report is part of a larger, $2 million study of state water and infrastructure needs through 2030. One in four N.C. public water systems expect to be near the end of their ability to expand their water systems by 2010, the center said. *Charlotte Observer,* 12/16/04

This fall 10 to 12 bridges were washed out during heavy flooding from the remnants of several hurricanes that dumped rain on the N.C. mountains. The majority of the 13,261 bridges in North Carolina are inspected once every two years. But across the state, inspectors have found about 40 percent of bridges to be substandard—either structurally deficient or inadequate to handle traffic volume. A couple usually collapse each year, Don Idol, assistant state bridge maintenance engineer, said. *Charlotte Observer,* 12/11/04

By next year, Charlotte will be $9.5 million short of the necessary amount for maintaining city streets, according to a report presented to the City Council. The condition of Charlotte's streets has declined steadily over the past decade, and without a steady infusion of cash, the problem will only get worse. Next year, after depleting the reserves in its resurfacing fund, the city will be on a 34-year cycle, with just $5.1 million in the resurfacing budget but $14.6 million needed. *Charlotte Observer,* 11/2/04

In Iredell-Statesville, one elementary school is so overcrowded, the fifth-graders were shifted to a middle school. A Union County elementary is now larger than two of the district's high schools. And crowding has forced some Charlotte-Mecklenburg schools to hold classes in computer labs or libraries. Growth continues to overwhelm schools across the Charlotte region, recently released data show, and the problem will likely worsen. Districts cannot add mobiles or build schools fast enough, and the number of newcomers is still ballooning. "Next year, (classes) will be in the cafeteria and the auditorium—I will not have a choice," said Joel Ritchie, principal of Butler High School in Matthews. "I'm just not going to have additional space." *Charlotte Observer,* 6/10/04

The Charlotte-Mecklenburg school board reached a thoughtful decision in a 7-2 vote where members overwhelmingly acknowledged this reality: Serious problems in some older facilities demand attention now. The litany of substantial problems at many of those schools—sewage fouling hallways, serious mold problems, lack of air-conditioning, inadequate or no science labs, overcrowded classrooms and buildings—influenced their

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votes. They agreed to scale back construction plans for two middle schools where enrollment declines no longer justify them—an estimated $7.5 million in savings—and to further evaluate reducing the scope of projects at three elementaries. The board's vote does little to address the serious overcrowding in some schools, a condition that will only get worse without some action if the suburban student population continues to boom as expected. But the shifting of a portion of bond money would not solve the problem. The needs are simply too big. *Charlotte Observer,* 6/10/04

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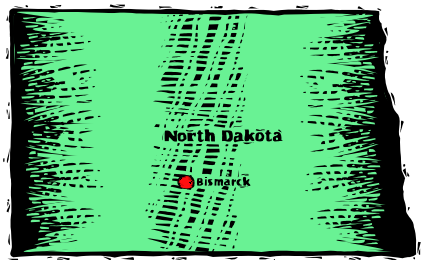

North Dakota

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Bridges**

Key Infrastructure Facts

- Vehicle travel on North Dakota's highways increased 26% from 1990 to 2003.
- The North Dakota Department of Transportation has a $1.45 billion maintenance backlog.
- Driving on roads in need of repair costs North Dakota motorists $62 million a year in extra vehicle repairs and operating costs—$135 per motorist.
- 24% of North Dakota's bridges are structurally deficient or functionally obsolete.
- There are 17 state-determined deficient dams in North Dakota.
- North Dakota has 20 high hazard dams. high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for North Dakota's most critical dams is $25.7 million.
- North Dakota's drinking water infrastructure needs $490 million over the next 20 years.
- North Dakota has $52 million in wastewater infrastructure needs.
- North Dakota generates 1.01 tons of solid waste per capita.
- North Dakota recycles 9.4% of the state's solid waste.
- 49% of North Dakota's schools have at least one inadequate building feature.
- 62% of North Dakota's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Two major drinking water supply projects are underway in rural western North Dakota, but progress is slow due to the level of funding, low population densities, and the great distances involved." —a civil engineer from Beulah, ND

From the Headlines

North Dakota lawmakers may support raising the state's fuel tax instead of the $15 increase in motor vehicle registration fees that Gov. John Hoeven prefers, an Associated

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Press survey says. Backing for a higher state tax on gasoline and diesel fuel, which is now 21 cents a gallon, is stronger in the North Dakota House, the survey indicates. Senators are more equally divided about whether to raise the fuel tax or increase the registration fee that North Dakotans pay each year to license their cars and trucks. In recent years, the Republican-controlled House and Senate have squabbled about the best way to raise money to repair North Dakota's roads. A number of respondents to the AP's survey said they would favor a combination of increased registration fees and a higher gas tax. The AP survey was distributed to the Legislature's 47 senators and 94 House members, asking them if they preferred a higher fuel tax, increased registration fees or a combination of the two to raise more highway funds. Of the 141 lawmakers surveyed, 110 responded, or 78 percent. *Grand Forks Herald,* 1/3/05

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Ohio

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Bridges**

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Key Infrastructure Facts

- 36% of Ohio's major urban roads are congested.
- 25% of Ohio's major roads are in poor or mediocre condition
- Vehicle travel on Ohio's highways increased 25% from 1990 to 2003. Ohio's population grew 5% between 1990 and 2003.
- Driving on roads in need of repair costs Ohio motorists $1.6 billion a year in extra vehicle repairs and operating costs—$203 per motorist.
- Congestion in the Akron-Canton area costs commuters $219 per person per year in excess fuel and lost time.
- Congestion in the Cincinnati area costs commuters $687 per person per year in excess fuel and lost time.
- Congestion in the Cleveland area costs commuters $204 per person per year in excess fuel and lost time.
- Congestion in the Columbus area costs commuters $514 per person per year in excess fuel and lost time.
- Congestion in the Dayton area costs commuters $261 per person per year in excess fuel and lost time.
- Congestion in the Toledo area costs commuters $233 per person per year in excess fuel and lost time.
- 25% of Ohio's bridges are structurally deficient or functionally obsolete.
- Ohio has 462 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Ohio's most critical dams is estimated at $384.7 million.
- Ohio's drinking water infrastructure needs $4.95 billion over the next 20 years.
- Ohio has $8.72 billion in wastewater infrastructure needs.
- Ohio generates 1.42 tons of solid waste per capita.
- Ohio recycles 23.5% of the state's solid waste.
- 76% of Ohio's schools have at least one inadequate building feature.
- 83% of Ohio's schools have at least one unsatisfactory environmental condition.

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Field notes from civil engineers in the state

"Roadways continue to get reparied in a helter skelter fashion, without sufficient thought or attention to current engineering practices and improved methods and materials that would greatly improve the service life of these roads—case in point, lack of attention to adequate subgrade drainage and lack of attention to surface cracking problems." —a civil engineer from Middletown, OH

"We just need the Federal Transportation bill to pass at the $300 billion figure. We need about $1billion of that just for the Cleveland Innerbelt Project." —a civil engineer from Cleveland, OH

From the Headlines

The emergency closing of the bridge carrying Four Mile House Road over Indian Creek this week points directly to continued financial problems across the state and the apparent growing need to give higher priority to bridge safety. The bridge, however, began to cave in early this week, creating a dangerous situation and prompting the county to close it until it can be replaced. High water and freezing and thawing conditions are believed to have caused the rapid damage to the support structure. The county had planned to replace the bridge, which was built in the 1940s, last summer but chose to replace the Portage River South Road bridge in Salem Township instead because it had even more problems. Money simply is not available to keep up with maintenance, a situation that can create an environment in which deteriorating bridges are dangerously kept in use for too long of a time. *News Herald,* 1/25/05

More than 60 percent of the trash filling up Ohio's landfills could be recycled instead of thrown away. That's the conclusion of a new study released by the Ohio Department of Natural Resources. It found that recyclable paper and cardboard makes up 41 percent of the stuff being tossed into landfills across the state. Another 16 percent of Buckeye trash consists of recyclable plastic, from soda bottles to milk jugs. *Cincinnati Enquirer, 1/5/05*

There is a new reason for swimmers, waders and paddlers to take note of the Cuyahoga River: the hepatitis A virus. The U.S. Geological Survey, in a final report looking at pathogens in the stretch of river between Akron and Cleveland, confirmed the presence of the virus, which the report said appears to be entering the waterway through the city of Akron's sewage system. Other bacteria, viruses and parasites that can trigger diseases also were found in the Cuyahoga River sampling. Finding the virus in the water was not surprising because combined sanitary and storm sewers that overflow into America's urban streams can make those waterways home to numerous health-threatening pathogens. *Beacon Journal,* 12/17/04

Corrosion in steel support beams in the Brent Spence Bridge has prompted emergency repairs that will close lanes of the span. The deterioration and drainage problems were detected during a recent bridge inspection. The problems are not severe enough to warrant closing the bridge before the repairs are made but serious enough to have

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expedited repairs. The corrosion is just the latest problem associated with the overused and aging 41-year-old bridge, which carries Interstates 75 and 71 across the Ohio River. Government, business and civic leaders in Greater Cincinnati and Northern Kentucky have prioritized replacement of the double-deck bridge for economic and safety reasons. The bridge carries about 160,000 vehicles a day and regularly gridlocks during morning and afternoon rush hours. It was modified in 1987 to four lanes in each direction from three lanes to accommodate more traffic. But that left narrower lanes—11 feet instead of 12—and no emergency lanes for disabled cars. *Cincinnati Post,* 10/30/04

Mogadore is seeking funds to build a combined junior high and high school and dropped—for now—plans to renovate the elementary building. Mogadore students now must crisscross a busy parking lot to go to and from classes in the junior high and high school. Both schools are more than a half-century old, with outdated electrical systems and plumbing. A football player who injured his knee recently had to change his schedule because there was no elevator to take him to the school's second floor. *Akron Beacon Journal,* 10/19/04

The crumbling 72-year-old Fulton Road Bridge over the Cleveland Metroparks Zoo has suffered another blow en route to its demise. The city of Cleveland closed two of the four lanes and won't restore traffic to all four before the bridge is torn down in nearly three years. A new $50 million bridge is to open at the same spot in late 2008. The concrete columns supporting the outer lanes have deteriorated too much to keep those lanes open, officials said. The landmark bridge spans railroad tracks, Big Creek and the zoo. Some 22,000 vehicles travel the bridge daily, or about twice the amount that two-lane roads normally are designed to handle. *Plain Dealer,* 3/30/04

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Oklahoma

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- 23% of Oklahoma's major urban roads are congested.
- 42% of Oklahoma's major roads are in poor or mediocre condition.
- Vehicle travel on Oklahoma's highways increased 38% from 1990 to 2003. Oklahoma's population grew 12% between 1990 and 2003.
- The Oklahoma Department of Transportation has a $583.4 million backlog of deferred maintenance.
- Driving on roads in need of repair costs Oklahoma motorists $969 million a year in extra vehicle repairs and operating costs—$413 per motorist.
- Congestion in the Oklahoma City area costs commuters $245 per person per year in excess fuel and lost time.
- Congestion in the Tulsa area costs commuters $247 per person per year in excess fuel and lost time.
- 38% of Oklahoma's bridges are structurally deficient or functionally obsolete.
- There are 31 state-determined deficient dams in Oklahoma.
- Oklahoma has 185 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Oklahoma's most critical dams is estimated at $161.3 million.
- Oklahoma's drinking water infrastructure needs $2.34 billion over the next 20 years.
- Oklahoma has $586 million in wastewater infrastructure needs.
- Oklahoma generates 1.28 tons of solid waste per capita.
- Oklahoma recycles 1% of the state's solid waste.
- 54% of Oklahoma's schools have at least one inadequate building feature.
- 64% of Oklahoma's schools have at least one unsatisfactory environmental condition.

From the Headlines

State funding for highways and bridges has settled around the $200 million mark for the past 20 years while the state's transportation infrastructure has crumbled, freshman House members were told. State transportation Director Gary Ridley said Oklahoma leads the

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nation in bad bridges. Of 6,700 bridges in the state highway system, he said, 1,600 have been found structurally deficient or functionally obsolete. Ridley said this represents a $3 billion backlog of needs. The Oklahoma Department of Transportation has scheduled 32 bridge replacements per year under current funding levels. However, Ridley said, the agency needs to replace at least 80 bridges each year to improve the overall condition of system bridges by 10% over the next decade. He said that would cost about $82 million annually. Ridley said $10 million more needs to be spent to maintain and rehabilitate the remaining structures. Oklahoma's highways also are in poor shape, Ridley said. He said more than 4,300 miles of the state's 12,266 highway miles are in need of immediate repair. Adding 400 miles of pavement rehabilitation each year for the next 10 years will cost about $50 million per year, he added. *Tulsa World,* 12/9/04

Oklahoma City Council members agreed to seek construction bids to rebuild the Walnut Avenue bridge—even though they have no assurance of recovering up to half the cost from the Union Pacific Railroad. The bridge is a main entry to Bricktown and a key link between the entertainment district and nearby Deep Deuce. The span was closed last week after engineers determined failing steel beams and crumbling concrete made it unsafe for motorists and pedestrians. "The roadway surface has holes in it, and it's very deteriorated," City Engineer Paul Brum said. *The Oklahoman,* 8/18/04

Lew Miebergen's grain truck drivers have to go dozens of miles out their way, and into Kansas, to ship wheat from Renfrow to Enid, a 30-mile trip south. The detour costs time and money, but is the only way to get the freight around some of Oklahoma's worst bridges, which likely would not bear the heavy loads. "Over time, it'll add a terrific amount to our operating expenses," said Miebergen, owner of grain elevator operator Johnson Enterprises. About 1,100 Oklahoma bridges are structurally deficient, and nearly 500 more are functionally obsolete. Of these, more than 150 have a weight limit, and several dozen are not safe for vehicles weighing more than 15 tons. State Transportation Department Director Gary Ridley, who is pleading for more money for bridge rehabilitation, said the deterioration is astounding. Oklahoma Transportation Department engineers inspect 60 to 70 bridges a week in an effort to monitor their safety. The department reduces weight limits on more and more bridges each year. Occasionally, the bridges are closed. Oklahoma is the leader in the nation in the number of structurally deficient and functionally obsolete bridges. Decades of inadequate funding for maintenance have taken a toll. In fact, 135 bridges in the state system were built before 1920, and one was constructed in 1896. It's been moved but not rebuilt. Oklahoma needs $180 million in additional money to improve its state road and bridge system by just 10% in the next 10 years. Ridley advocates increasing fuel taxes to improve roads and bridges. He said Kansas, which has significantly higher gas and diesel taxes, spends twice as much per mile to build and maintain roads and has less than 5 percent of its roads in poor condition. Thirty percent of Oklahoma roads are in poor condition. Meibergen says he'd rather spend a few more cents for diesel than detour around the bridges. He's angry the state hasn't maintained its transportation system. "I guess they don't care about the businesses," he said. *The Oklahoman,* 4/25/04

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Oklahoma's transportation problems continue to grow worse. The bridge on Oklahoma 88 over Dog Creek near Claremore was in such bad shape that state Transportation Director Gary Ridley ordered an engineer to check it every day. A weight limit of 15 tons already had been imposed and then a few weeks ago the weight limit was dropped to five tons. But even then the bridge worried Ridley so much that he ordered it closed for emergency repairs. This bridge is one of the state's worst, but unfortunately, the entire Oklahoma transportation system is in such terrible shape that Ridley and his staff stay awake nights worrying about dozens of locations. The conditions grow worse by the day. These roads are Ridley's biggest concern because they are responsible for 56 percent of the accidents in the state. *Tulsa World,* 3/14/04

Oklahoma Department of Transportation Director Gary Ridley said that he is concerned that some state bridges might not be able to handle the increasing weights of state school buses. Ridley's office has set up a process to notify districts when bridges in their area are downgraded to carry less weight. In 1996, the average weight of a school bus was 12 tons. That increased to 15 tons in 2003, according to the Oklahoma Department of Transportation. The state has 6,700 bridges, of which 1,100 are structurally deficient, meaning they will not hold the loads they were designed to carry, Ridley said. Oklahoma has 33 bridges that will carry 15 tons or less, he said. *Tulsa World,* 1/13/04

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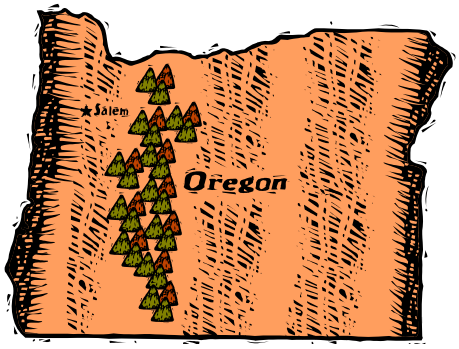

Oregon

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- 51% of Oregon's major urban roads are congested.
- 38% of Oregon's major roads are in poor or mediocre condition.
- Vehicle travel on Oregon's highways increased 31% from 1990 to 2003. Oregon's population grew 25% between 1990 and 2003.
- Driving on roads in need of repair costs Oregon motorists $684 million a year in extra vehicle repairs and operating costs—$264 per motorist.
- Congestion in the Eugene area costs commuters $162 per person per year in excess fuel and lost time.
- Congestion in the Portland area costs commuters $733 per person per year in excess fuel and lost time.Congestion in the Salem area costs commuters $258 per person per year in excess fuel and lost time.
- 25% of Oregon's bridges are structurally deficient or functionally obsolete.
- Oregon has 122 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Oregon's most critical dams is estimated at $98.8 million.
- Oregon's drinking water infrastructure needs $2.7 billion over the next 20 years.
- Oregon has almost $1.48 billion in wastewater infrastructure needs.
- Oregon generates 1.16 tons of solid waste per capita.
- Oregon recycles 48.8% of the state's solid waste.
- 63% of Oregon's schools have at least one inadequate building feature.
- 84% of Oregon's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Due to drain failures in the earthen dam, the pool for Fernridge Dam has been lowered enough to adversly affect the economics of the surrounding businesses for the next 3 or more years. In addition, the benefits for flood control are greatly reduced." —a civil engineer from Portland, OR

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"My community implemented a 3 cents/gal local fuel tax for road operation, maintenance and preservation, which will address road deterioration problem. This makes us less reliant upon uncertain and inadequate state and county road funding—i.e., giving us local control." —a civil engineer from Eugene, OR

"Traffic is increasing. Highway capacity and available funds are decreasing." —a civil engineer from Portland, OR

From the Headlines

Rotting timbers and shifting pilings discovered under a busy Farmington Road bridge have forced fire engines, school buses, gravel trucks and other heavy vehicles to start taking miles of detours around the site just west of River Road. After state and Washington County bridge experts examined the Phillip Harris Bridge's underpinnings, county officials slapped a 5-ton weight restriction on the bridge about three miles south of Hillsboro. The restriction bars most vehicles heavier than an unloaded pickup. Major problems include a heavily rotted 16- inch-thick cross-timber that holds up the bridge's east side. In one spot, a test drilling found two inches of wood that wasn't rotten. On the bridge's west end, a few support pilings into the river bank have started leaning, splitting or bulging. The Hillsboro School District's bus for high school and middle school students in the Scholls and Midway areas has added "quite a bit of miles" and about 20 minutes to its schedule, said Robin Biden, the district's transportation manager. The bus must follow Oregon 19 to reach Farmington Road addresses from the west, then double back to 19 and continue north, she said. For Washington County Fire District 2, which normally responds first in the area south of Farmington from its Midway station, the bridge closure to heavy engines means asking the Hillsboro Fire Department to go farther south on River Road. *Oregonian,* 11/18/04

State inspectors examining the girders that hold up Fords Bridge on the Umqua River in southwest Oregon noticed a gunpowder like smell—a telltale sign of metal fatigue. For the next three weeks, 2000 big rigs a day were forced off of Interstate 5 while construction crews rebuilt the bridge. Along the West Coast, transportation costs increased by as much as $200 per shipment. The state has proposed a $4 billion bond program to repair bridges across the state. About $830 million is needed to fix bridges on Interstate 5 alone. *Los Angeles Times,* 7/5/04

Portland firefighters get an emergency exemption to a new 10-ton rule on Multnomah County's cracked concrete span Portland fire engines will be allowed to continue using the Sellwood Bridge for emergencies despite a new 10-ton weight restriction. Multnomah County, which owns and maintains the 79-year old bridge, and the Portland Fire Bureau reached an agreement allowing engines to use the bridge in emergencies while obeying a 20 mph speed limit. The county is imposing a reduction in weight limits from 32 tons maximum vehicle weight to 10 tons after detecting new cracks in concrete girders in

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approaches at both ends of the bridge. Fire Bureau engines exceed the new limit. Portland Fire Bureau statistics suggest that engines use the Sellwood about 30 times a month for emergencies. *The Oregonian,* 6/24/04

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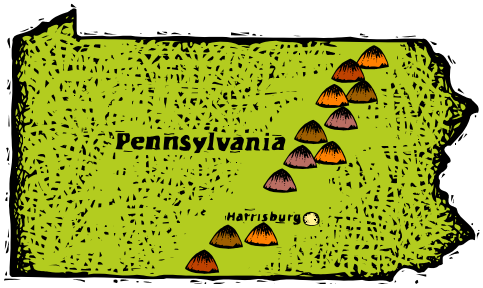

Pennsylvania

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Mass Transit**

Key Infrastructure Facts

- 23% of Pennsylvania's major urban roads are congested.
- 46% of Pennsylvania's major roads are in poor or mediocre condition.
- Vehicle travel on Pennsylvania's highways increased 24% from 1990 to 2003. Pennsylvania's population grew 4% between 1990 and 2003.
- The Pennsylvania Department of Transportation has a $2.3 billion maintenance backlog for roads and an $8 billion maintenance backlog for bridges.
- Driving on roads in need of repair costs Pennsylvania motorists $2.8 billion a year in extra vehicle repairs and operating costs—$333 per motorist.
- Congestion in the Allentown area costs commuters $241 per person per year in excess fuel and lost time.
- Congestion in the Philadelphia metropolitan area costs commuters $716 per person per year in excess fuel and lost time.
- Congestion in the Pittsburgh metropolitan area costs commuters $210 per person per year in excess fuel and lost time
- 42% of Pennsylvania's bridges are structurally deficient or functionally obsolete.
- There are about 725 state-determined deficient dams in Pennsylvania.
- Pennsylvania has 768 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Pennsylvania's most critical dams is estimated at $646.2 million.
- Pennsylvania's drinking water infrastructure need is $5.26 billion over 20 years.
- Pennsylvania has $8.06 billion in wastewater infrastructure needs.
- Pennsylvania generates 1.03 tons of solid waste per capita.
- Pennsylvania recycles 26.8% of the state's solid waste.
- 42% of Pennsylvania's schools have at least one inadequate building feature.
- 57% of Pennsylvania's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

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"We drive in the left lane of the local highways because the passenger lanes are so deteriorated." —a civil engineer from Bethlehem, PA

"Recently had a major project for road and bridge reconstruction cancelled due to lack of funding. We had been working on the project for nearly 3 years and were nearly complete with the design." —a civil engineer from Pittsburgh, PA

"Recently it was discovered that a great amount of bridges within the county were in need of emergency repair. It would have been appreciated had this been noticed sooner, so that so many bridges would not have had to have been closed at the same time." —a civil engineer from Ephrata, PA

"Something needs to be done in the near future about the Schuylkill river corridor. Whether it is improving the existing I-76 expressway or adding light rail that would connect center city to the Reading area. The congestion is becoming unbearable." —a civil engineer from Philadelphia, PA

"Transit funding is in jeopady in PA. We need to develop a consistent and separate revenue source for transit that makes sense and is a user fee, e.g. it doesn't make sense to raise automobile registration fees to pay for transit since auto users typically don't drive transit—nor is this legal under PA's present legislation. Other states have a seperate tax that pays for transit. Pennsylvania is also a key state in terms of linking the rust belt to the eats coast and ports along the east coast. Changing the fedreal gas tax allocation formal, as is being proposed, doesn't make sense—this will make PA's roadway and bridges decline further. This is a matter of national security as well—the maintainence of our infrastructure is critical to national security." —a civil engineer from Pittsburgh, PA

From the Headlines

For the longest time officials weren't sure if the channel wall at Kiwanis Lake would be repaired before it collapsed, possibly draining the three-acre lake on York's northwest end. Over the years, the city's public works crews unsuccessfully tried to patch and repair the wall and dam head area, near North Newberry Street, across from the Farquhar Park Pool. The wall has been in bad shape for years but the city did not have the funds to do the work right. City officials had committed $88,000 for the project this year but later cut the funding to help minimize the impact of a nearly 10 percent tax hike. The channel wall had deteriorated to the point where the work could no longer wait, forcing the city to borrow money from the city's sewer fund. *York Daily Record,* 11/12/04

Big SUVs are now banned from the Washington Crossing Bridge. Officials say the 100-year-old bridge can't handle vehicles weighing more than three tons. Among the banned SUVs: the Cadillac Escalade, Chevrolet Suburban, Dodge Durango, Ford Expedition, GM Sierra, Hummer, Range Rover and Toyota Land Cruiser. WPVI TV, 6/21/04

In Milford Township, most people seem to think Campbell's Bridge is historic and scenic—and dangerous. The bridge is 72 feet long and just over 15 feet wide. In addition to its poor condition, crumbling concrete and narrow lane, the bridge is being replaced because of an extreme vertical curve, which is basically a big hump in the middle.

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According to Township Manager Jeffrey Vey, the hump creates a visibility problem—and accidents—for motorists on either side of the bridge. Campbell's Bridge is believed to be the first open spandrel concrete arch bridge in the state. Spandrels are the areas between the curve of the arches of a bridge and the horizontal road decks they hold up. In the early 1900s, several single-lane, concrete bridges were constructed throughout Bucks County. A century later, they are obsolete, unable to handle today's increased traffic and wide vehicles. Many are in sorry shape. *The Morning Call,* 6/24/04

When tow boat Capt. Steve Lumpkins moves coal through the century-old locks and dam on the Monongahela River at Elizabeth, he gingerly avoids weakened concrete walls and jutting metal rods that could gash and sink the 195-foot barges he pushes. "There are big chunks out of the wall as we approach from the upper end and three spots that we avoid touching that could cause a crash. That metal could rip the whole side of a barge open," Lumpkins said from the Richard C., a tow boat he operates for Campbell Transportation, a major commercial river line. The situation is likely worse under water. The U.S. Army Corps of Engineers has a real concern that the locks and dam at Elizabeth, built on oak timbers driven through the river bottom and stone-filled wooden cribbing, are so badly deteriorated that they could fail and cripple commercial navigation and recreational boating. A failure at the dam, which opened in 1907, could drop water levels below minimum requirements for safe navigation and cause transporters of commercial goods significant economic loss, said engineer William Karaffa, acting project manager for the Corps. In addition to the new dam at Braddock, 70-year-old undersize locks at Charleroi also must be replaced with larger modernized locks before the crumbling infrastructure at Elizabeth can be demolished and removed. The Charleroi locks—chambers that allow boats to change elevation and navigate past the dams—also are based on wooden timbers and can sway enough under water pressure to pinch a large barge between its walls. In a 1990 study done to justify the need for the lower Mon reconstruction, the Corps said it could not guarantee the structural integrity of older facilities such as Elizabeth beyond 2000. Because of the progressive effects of usage and weather, Elizabeth is considered by the Corps to be one of the most deteriorated structures on the inland waterways navigation system, Karaffa said. He called the condition of Elizabeth and its continued ability to properly function a "grave concern" of critical importance for the transportation of coal, chemicals, fuel, steel and other commodities into and out of this region. The eventual removal of Elizabeth's small locks would erase a bottleneck that requires boat operators to disassemble large tows of barges, send them through the locks in segments and reassemble them before moving on—a costly delay for the barge operators. The concrete flume used to empty water from the locks at Elizabeth is so fragile to the touch that a finger poke can turn it into gray dust. If the dam and locks were to fail and were out of commission for a year, the Corps estimates that delays and the subsequent need for alternative transportation would increase shipping costs to industry by at least $143 million. But with the problem left unresolved, it still will cost the industry about $10 million a year because of the small and inefficient size of the old locks. *Pittsburgh Post Gazette,* 4/25/04

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Residents of two western Lancaster County townships are upset about the closing of a deteriorated bridge they complained about three years ago. The Koser Road Bridge, which spans the Conewago Creek, connects Conewago and Mount Joy townships, with each municipality sharing ownership. The one-lane bridge was closed recently by Mount Joy officials after their engineer declared it structurally unsafe. Motorists and a school bus en route to Elizabethtown must now drive a few miles out of their way to cross the creek. There haven't been any major repairs to the bridge since about 1960. It could be at least two or three years until the bridge is replaced. *Patriot News,* 3/14/04

Chunks of concrete falling from a deteriorating bridge forced the closing of a westbound interstate through downtown, snarling morning rush hour traffic. The South Street bridge, which spans I-76 and the Schuylkill River, also was closed as crews worked to install a safety grid under the bridge. Officials closed one westbound lane of the expressway during the rush hour and later closed both lanes, forcing the backed-up traffic to exit and then re-enter the highway. The aging bridge had been repaired repeatedly. It dropped a slab of concrete that disrupted expressway traffic in June. Associated Press, 2/4/04

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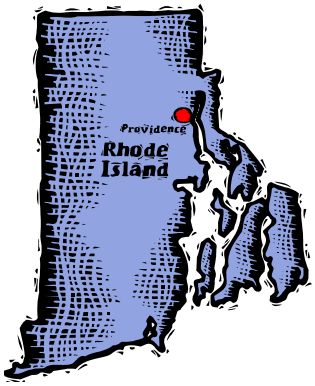

Rhode Island

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- 40% of Rhode Island's major urban roads are congested.
- 54% of Rhode Island's major roads are in poor or mediocre condition.
- Vehicle travel on Rhode Island's highways increased 19% from 1990 to 2003. Rhode Island's population grew 7% between 1990 and 2003.
- Driving on roads in need of repair costs Rhode Island motorists $253 million a year in extra vehicle repairs and operating costs—$346 per motorist.
- Congestion in the Providence area costs commuters $583 per person per year in excess fuel and lost time.
- 54% of Rhode Island's bridges are structurally deficient or functionally obsolete.
- Rhode Island has 17 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Rhode Island's most critical dams is $13.2 million.
- Rhode Island's drinking water infrastructure need is $577 million over the next 20 years.
- Rhode Island has $1.42 billion in wastewater infrastructure needs.
- Rhode Island generates 1.17 tons of solid waste per capita.
- Rhode Island recycles 12.8% of the state's solid waste.
- 61% of Rhode Island's schools have at least one inadequate building feature.
- 75% of Rhode Island's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Major projects in state have limited funds available for other projects. Garvee funding is big hope for improvement." —a civil engineer from Tiverton, RI

"School needs are currently our largest problem. Projected pupil growth over the next ten years will require expanded educational facilities and require well planned decisions on expansion of existing facilities as well as new schools at new locations in the town. Some tough decisions for our town and major tax increases may result to fund these facilities." —a civil engineer from

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Lincoln, RI

From the Headlines

A collapsed pipe caused more than a million gallons of raw sewage to spill into the Woonasquatucket River. Officials said it was leaking into the shallow river west of the Providence Place Mall for at least a day and a half. The Department of Environmental Management told *The Providence Journal* the amount of sewage spilled was comparable to that discharged due to combined sewer overflows during a moderate rainstorm. As a result, the DEM ordered the upper bay closed to shellfishing through sunrise, Feb. 11. The upper bay usually is closed to shellfishing for seven days after a rainfall of a half inch or more. The combined stormwater and sewage system periodically sends a mix of stormwater and sewage into the river during and after heavy rainstorms. The difference this time was that the outflow was diluted by only a small amount of snowmelt. Associated Press, 2/4/05

The state is about to close a third of the lanes of Route 195 near the Massachusetts state line, squeezing all the traffic onto one side of the highway through next year to rebuild a bridge crumbling with age, heavy use and lack of maintenance. A short span easily missed by drivers whizzing across it, the Warren Avenue Bridge nonetheless carries about 72,000 vehicles a day. The 135-foot-long bridge, built in 1959 and widened in 1983, is anything but prominent. Crossing it at 60 mph takes less than two seconds. Concrete-filled steel pipes, called piles, driven into the ground under the bridge, hold it up. The rest of the structure, above ground, is concrete reinforced with steel. The tops of the piles are encased in concrete at about ground level. The bases of the vertical bridge columns rest on that concrete. The tops of those columns hold up the main structure of the bridge. Resting on top of the columns are pier caps that support reinforced concrete beams, running lengthwise beneath the bridge's deck, the surface that holds the asphalt that vehicles drive on. Officials say that like other crumbling state bridges, the Warren Avenue Bridge was not well maintained—in the form of washing and protection from salt. Salt is the chemical enemy of bridges because it corrodes concrete and steel. Like the steel in many other Rhode Island bridges, the metal in the Warren Avenue Bridge is mostly in the form of reinforcing bars inside its concrete columns, beams and decking. The concrete and steel deck is about 5 1/2 inches thick. On top, potholes have opened up. Underneath, an inch to an inch and a half of concrete peeled off the bottom of the deck in places, exposing the steel reinforcing, officials said. Early last year, the bridge deck "fell through," one official said, although it's unclear whether enough concrete fell out to make a hole all the way through the deck. About $100,000 was used last year to patch the deck and strengthen the westbound side. There is still some exposed reinforcing steel, rusting, visible under the bridge. *Providence Journal,* 5/6/04

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South Carolina

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Bridges**

Key Infrastructure Facts

- 39% of South Carolina's major urban roads are congested.
- 22% of South Carolina's major roads are in poor or mediocre condition.
- Vehicle travel on South Carolina's highways increased 40% from 1990 to 2003. South Carolina's population grew 19% between 1990 and 2003.
- The South Carolina Department of Transportation has a $5.3 billion maintenance backlog.
- Driving on roads in need of repair costs South Carolina motorists $574 million a year in extra vehicle repairs and operating costs—$197 per motorist.
- Congestion in the Charleston metropolitan area costs commuters $385 per person in excess fuel and lost time.
- Congestion in the Columbia metropolitan area costs commuters $140 per person in excess fuel and lost time.
- 23% of South Carolina's bridges are structurally deficient or functionally obsolete.
- There are 3 state-determined deficient dams in South Carolina.
- South Carolina has 153 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for South Carolina's most critical dams is $75 million.
- South Carolina's drinking water infrastructure need is $820 million over the next 20 years.
- South Carolina has $1.31 billion in wastewater infrastructure needs.
- South Carolina generates 1.45 tons of solid waste per capita.
- South Carolina recycles 28.4% of the state's solid waste.
- 52% of South Carolina's schools have at least one inadequate building feature.
- 66% of South Carolina's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"SCDOT is completing a program of "27 in 7", which means 27 years of roads in 7 years. They did this by federal, and state funding as well as bonds. The problem is the massive amount of highway miles with no change in M & R dollars. Adding these new roads and widening some just

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will add to the future M & R burden. Dollars are needed from increased gas tax/user fees. Security does not seem to be recognized which means an incident or event will be required to raise public/political interest." —a civil engineer from Columbia, SC

"Public private partnerships such as the Southern Connector toll road, the Governors School for the Arts, Clemson University's International Center for Automotive Research, and privatizing the accelerated construction of public schools have all contributed to the success of this community and the related upgrading of the infrastructure. Fast growth is keeping the need ever in front of us however." —a civil engineer from Greenville, SC

"Rural, secondary and local roads are deteriorating rapidly. Many were designed and constructed based upon truck sizes and traffic flow of the early 50's. Lack of proper maintenance accelerates this breakdown. Asphalt is not patched, pot holes get larger and deeper. Ditches are not cleaned out, preventing proper drainage away from the road subgrade. Lack of proper roadside mowing allows trees as large as 12 inches in diameter to grow in the ditches. Once they become trees and no longer just a bush, environmental extremists create opposition to keeping the roads maintained. We are losing the existing assets of the roads we have. Their rehabilitaion gets costlier every year. " —a civil engineer from Moncks, SC

From the Headlines

South Carolina has abandoned its 25,000 miles of secondary roads in recent years in what residents are calling a maintenance "crisis" in a state that now leads the nation in the rate of deaths on secondary roads. Larger and faster cars have been crowding onto narrow, deteriorating roads designed decades ago. At least a third of the state's traffic deaths are attributed to road conditions or design. The lack of maintenance affects you even if you don't travel secondary roads. In addition to loss of life, the problem has cost millions of dollars in damage, medical bills and increased insurance premiums for everyone. Although secondary roads make up the majority of roadways in the state, their care has not been a priority among lawmakers, officials say, and the state has little money to devote annually to them. The state Department of Transportation says its maintenance shortfall is $560 million a year and its shortfall for construction is $1.3 billion. In an effort to fix the problem, the state Transportation Commission has proposed lawmakers enact a $15-per-axle fee on all vehicles estimated to generate $90 million to $100 million—enough to cover about two-thirds of the maintenance need. The state spends $10,500 per mile on roads, the lowest rate in the nation. And the source of those funds is almost entirely the state's 16-cent-a-gallon gas tax, which is fifth-lowest in the nation. *Greenville News,* 11/28/04

New weight limits on the Ben Sawyer Memorial Bridge prohibit the heaviest fire trucks from Mount Pleasant and Sullivan's Island from crossing the 59-year-old structure to come to each other's aid during fire emergencies. Normally, each municipality sends fire engines to the other to help fight fires or to cover unprotected areas when trucks are sent elsewhere during emergencies. On May 6, the state Department of Transportation lowered the gross weight of vehicles allowed to cross the bridge from 30 to 20 tons. The

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department made the move to extend the life of the bridge. Under the new weight limits, overweight trucks must use the Isle of Palms connector rather than the Sawyer bridge. If a 25-ton fire truck has to take a detour, it would add as much as much as 15 minutes to the response time, officials say. An inspection of the bridge found "fairly significant deterioration" of floor beams and stringers. Engineers reduced the weight limit to slow the rate of deterioration. *Post and Courier,* 5/16/04

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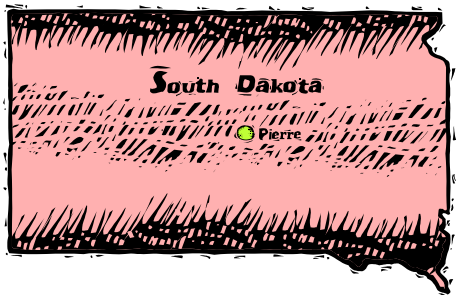

South Dakota

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- 48% of South Dakota's major roads are in poor or mediocre condition.
- Vehicle travel on South Dakota's highways increased 22% from 1990 to 2003. South Dakota's population grew 10% between 19920 and 2003.
- Driving on roads in need of repair costs South Dakota motorists $169 million a year in extra vehicle repairs and operating costs—$311 per motorist.
- 25% of South Dakota's bridges are structurally deficient or functionally obsolete.
- There are 3 state-determined deficient dams in South Dakota.
- South Dakota has 47 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for South Dakota's most critical dams is $37.1 million.
- South Dakota's drinking water infrastructure need is $439 million over the next 20 years.
- South Dakota has $142 million in wastewater infrastructure needs.
- South Dakota generates .68 tons of solid waste per capita.
- South Dakota recycles 3% of the state's solid waste.
- 45% of South Dakota's schools have at least one inadequate building feature.
- 50% of South Dakota's schools have at least one unsatisfactory environmental condition.

From the Headlines

All of the 1,811 bridges on South Dakota's state and federal highways are in solid structural shape, according to a report delivered to the state Transportation Commission. Every one can carry the weight it was designed to handle. But file this next item away for future reference: Starting in roughly the year 2030, more than half of those bridges will approach the end of their expected 75-year life spans. Many were built as part of the original generation of South Dakota's interstate highways. *Aberdeen American News,* 11/19/04

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Tennessee

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Schools**

Key Infrastructure Facts

- 32% of Tennessee's major urban roads are congested.
- Vehicle travel on Tennessee's highways increased 48% from 1990 to 2003. Tennessee's population grew 20% between 1990 and 2003.
- Driving on roads in need of repair costs Tennessee motorists $636 million a year in extra vehicle repairs and operating costs—$152 per motorist.
- Congestion in the Memphis area costs commuters $547 per person per year in excess fuel and lost time.
- Congestion in the Nashville area costs commuters $730 per person per year in excess fuel and lost time
- 21% of Tennessee's bridges are structurally deficient or functionally obsolete.
- There are 8 state-determined deficient dams in Tennessee.
- Tennessee has 147 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Tennessee's most critical dams is estimated at $23.5 million.
- Tennesse's drinking water infrastructure need is $1.4 billion over the next 20 years.
- Tennessee has $604 million in wastewater infrastructure needs.
- Tennessee generates 1.27 tons of solid waste per capita.
- Tennessee recycles 26.4% of the state's solid waste.
- 56% of Tennessee's schools have at least one inadequate building feature.
- 64% of Tennessee's schools have at least one unsatisfactory environmental condition.

From the Headlines

State road officials have determined that the Moores Lane bridge that crosses over Interstate 65 has deteriorated so much it won't make it through another winter. The Tennessee Department of Transportation is working with the city of Brentwood on a major repair project for the state route. TDOT Assistant Director of Construction David Layhew said the agency has been watching the aging bridge for some time. He said "pop-outs" about a month ago—occurrences similar to potholes on a road—alerted TDOT that

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repairs need to be made. *The Tennessean,* 7/28/04

The Demonbreun Street Bridge will take three years to tear down and rebuild and will cost $8.3 million, officials say. Officials said the 74-year-old structure, shut down after it failed a safety inspection, will need to be removed and replaced. The decaying bridge had been of concern to state and local officials for years. In 2002, Metro closed the bridge to all bus traffic and other heavy vehicles in an effort to prolong its life. The bridge's weight limit was set at 5 tons, which basically limited it to cars and pickup trucks. The bus moratorium forced the Metro Transit Authority to reroute buses and close its Clement Landport bus terminal that connects to the bridge. A June 10, 2003, TDOT inspection report found the bridge in "poor condition" and said parts of it had "worsened significantly." *The Tennessean,* 7/16/04

Concrete pieces from the underside of the Briley Parkway bridge fell onto Interstate 40 in Donelson causing delays. The concrete fragments were from a 4- to 5-foot-wide piece of patching on the bottom of the bridge that broke off in pieces, the majority landing close to the interstate median. Mark Holloran, regional director of the Tennessee Department of Transportation, estimated that some of the falling pieces were an inch to 2 inches thick. He said the pieces he saw were about as big as a fist. To his knowledge, no injuries or damage had been reported, Holloran said. Holloran said the concrete fell because of the bridge's age. *The Tennessean,* 5/21/04

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Texas

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Mass Transit**

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Key Infrastructure Facts

- 40% of Texas' major urban roads are congested.
- 29% of Texas' major roads are in poor or mediocre condition.
- Vehicle travel on Texas' highways increased 38% from 1990 to 2003. Texas' population grew 30% between 1990 and 2003.
- Driving on roads in need of repair costs Texas motorists $3.8 billion a year in extra vehicle repairs and operating costs—$294 per motorist.
- Congestion in the Austin metropolitan area costs commuters $867 per person per year in excess fuel and lost time.
- Congestion in the Beaumont area costs commuters $263 per person per year in excess fuel and lost time.Congestion in the Corpus Christi area costs commuters $111 per person per year in excess fuel and lost time.
- Congestion in the Dallas-Ft.Worth metropolitan area costs commuters $1,080 per person per year in excess fuel and lost time.
- Congestion in the El Paso area costs commuters $330 per person per year in excess fuel and lost time.
- Congestion in the Houston metropolitan area costs commuters $1,027 per person per year in excess fuel and lost time.
- Congestion in the San Antonio area costs commuters $640 per person per year in excess fuel and lost time.
- 21% of Texas' bridges are structurally deficient or functionally obsolete.
- There are 113 state determined deficient dams in Texas.
- Texas has 857 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Texas' most critical dams is estimated at $667 million.
- Texas' drinking water infrastructure need is $13 billion over the next 20 years.

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- The Houston metropolitan area loses 83 million gallons of drinking water per day due to leaking pipes.
- Texas has $9.15 billion in wastewater infrastructure needs.
- Texas generates 1.31 tons of solid waste per capita.
- Texas recycles 24.9% of the state's solid waste.
- 46% of Texas's schools have at least one inadequate building feature.
- 60% of Texas's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Roads are in bad condition." —a civil engineer from Houston, TX

"Transportation should probably be the number one concern in Austin. A plan to begin limited light rail service and initiate rapid bus service for mass transit is in place that may help. Emphasis should be placed on developing alternative methods of transportation to mitigate the increasing demand on the city's freeways and major arterials. The second largest concern should be the hill country dams. The series of dams on the Colorado river are aging and in need of repairs and upgrades. As people continue to develop the area, storm water management must be emphasized to prevent overloading a system that has already reached capacity." —a civil engineer from Austin, TX

"We have launched a long term initiative to replace more than 9 square files of old, ie 50 years plus, of existing 2" watermains in our city from city funding sources. We are also upgrading portions of our sewer system with city funding." —a civil engineer from Amarillo, TX

From the Headlines

Scattered across western Rockwell County on farmland and in subdivisions are 30 to 40 earthen dams nearing the end of their proejcted lifespan. Though officials say there's no imminent danger of dam failure, some concrete spillways have cracked. And silt and debris have reduced the capacity of other lakes. Upgrading and modernizing the dams, which were designed to control flooding and reduce soil loss from farmland during rainstorms, could become a years-long process. The expense could become enormous some dams could cost $1 million of more to reconstruct or upgrade. *Dallas Morning News,* 9/2/04

A deteriorated bridge on Longwood Street over Mary's Creek in Pearland will be rebuilt this fall. Construction will begin in September to turn the timber bridge, with severe decay in its support columns, into a concrete box culvert crossing. The load limit of the bridge has been reduced to 5,000 pounds, which is the weight a vehicle can carry on each axle when crossing. The bridge is among four spans east of Texas 35 identified as having critical structural deterioration in a Texas Department of Transportation report. *Houston Chronicle,* 8/5/04

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Four deteriorating Manvel bridges will receive temporary to avoid being closed. The four bridges were found to have severe deterioration in vertical support columns and between the columns and the deck on which traffic travels. Two of the bridges cross Chocolate Bayou—one on Masters Road and the other on Clark Street. The other two are on Louisiana Street and Furnace Lane and cross Mustang Bayou. The city will fix the Masters Road bridge first because he deterioration may cause the traffic lanes on the bridge's deck to sink. The bridge also has a broken horizontal support beam. The bridge on Louisiana has been weakened by severe deterioration between support beams and the deck. At the Furnace Lane bridge, 75 % of the timber in a column has rotted out, Mosaffa said. Six columns of the Clark Road bridge were reported as decayed. *Houston Chronicle,* 7/8/04

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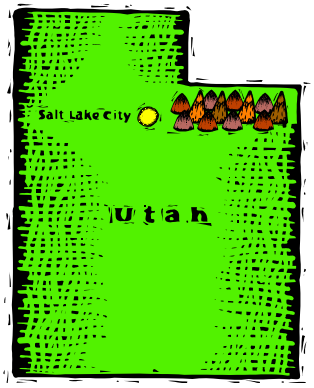

Utah

Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Bridges**

Key Infrastructure Facts

- 38% of Utah's major urban roads are congested.
- 21% of Utah's major roads are in poor or mediocre condition.
- Vehicle travel on Utah's highways increased 64% from 1990 to 2003. Utah's population grew 36% between 1990 and 2003.
- Driving on roads in need of repair costs Utah motorists $300 million a year in extra vehicle repairs and operating costs—$200 per motorist.
- Congestion in the Salt Lake City area costs commuters $573 per person per year in excess fuel and lost time.
- 18% of Utah's bridges are structurally deficient or functionally obsolete.
- There are 82 state-determined deficient dams in Utah.
- Utah has 192 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Utah's most critical dams is estimated at $203 million.
- Utah's drinking water infrastructure need is $513 million over the next 20 years.
- Utah has $848 million in wastewater infrastructure needs.
- Utah generates 1.07 tons of solid waste per capita.
- Utah recycles 4.8% of the state's solid waste.
- 62% of Utah's schools have at least one inadequate building feature.
- 72% of Utah's schools have at least one unsatisfactory environmental condition.

From the Headlines

The state's economy will be "crippled" unless taxes are raised for transportation and a 30-year plan for construction of new transit and transportation systems is expedited, according to some state lawmakers and business officials. Speaking to members of the Legislative Transportation Interim Committee, Lane Beattie, president of the Salt Lake Chamber of Commerce, was adamant that lawmakers, transit and transportation officials work together to prevent a future congestion crunch in Utah. The population along the

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Wasatch Front is expected to grow by an additional 1 million people by 2030. *Salt Lake Tribune,* 8/19/04

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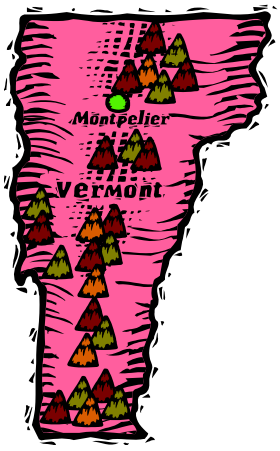

Vermont

Top Three Infrastructure Concerns*

1. **Roads**
2. **Bridges**
3. **Wastewater**

Key Infrastructure Facts

- 35% of Vermont's major roads are in poor or mediocre condition.
- Vehicle travel on Vermont's highways increased 42% from 1990 to 2003. Vermont's population grew 10% between 1990 and 2003.
- Driving on roads in need of repair costs Vermont motorists $171 million a year in extra vehicle repairs and operating costs—$331 per motorist.
- 35% of Vermont's bridges are structurally deficient or functionally obsolete.
- Vermont has 57 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Vermont's most critical dams is estimated at $42.5 million.
- Vermont's drinking water infrastructure need is $307 million over the next 20 years.
- Vermont has $144 million in wastewater infrastructure needs.
- Vermont generates .99 tons of solid waste per capita.
- Vermont recycles 29.8% of the state's solid waste.
- 53% of Vermont's schools have at least one inadequate building feature.
- 58% of Vermont's schools have at least one unsatisfactory environmental condition.

From the Headlines

Mold found in the basement of the Newport Town School has prompted drastic measures. Half the school is now sealed behind plastic barriers, with students' musical instruments, books and snowshoes stuck inside the old gym that was converted into classrooms. On the other side are jammed nearly 130 students in kindergarten through eighth grade, creating what Principal Dick Spaulding called unreal conditions. In November, voters defeated a proposed school expansion. The mold problem would still have needed resolution if voters had approved the $4.3 million bond request. The school board also has to deal with the chronic water leaks around the foundation and sewer leaks, or else

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the mold will grow back. *Caldonian Record,* 12/14/04

The melting snow and falling rain of the past few days might work in Missisquoi Bay's favor. The added water should help flush the bay of more than 650,000 gallons of untreated sewage that recently spilled into the Missisquoi River when a pipe burst at Swanton's wastewater treatment plant. Waste spewed into the waterway for more than a day. The broken sewage pipe was discovered about three miles upstream from the bay. Officials estimate 657,720 gallons of raw sewage from Swanton Village were discharged into the river. Raw sewage includes anything dumped down sinks, bathtubs and toilets. *Burlington Free Press,* 4/1/04

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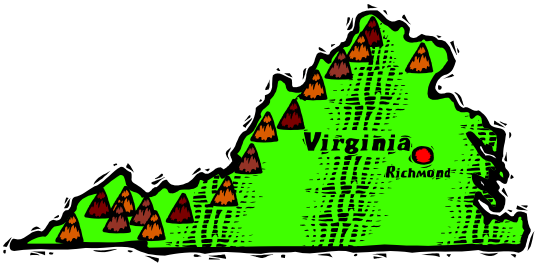
Virginia



Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Wastewater**

Key Infrastructure Facts

- 29% of Virginia's major urban roads are congested.
- 26% of Virginia's major roads are in poor or mediocre condition.
- Vehicle travel on Virginia's highways increased 28% from 1990 to 2003. Virginia's population grew 19% between 1990 and 2003.
- Driving on roads in need of repair costs Virginia motorists $1.2 billion a year in extra vehicle repairs and operating costs—$248 per motorist.
- Congestion in the Richmond area costs commuters $272 per person per year in excess fuel and lost time.
- Congestion in the Virginia Beach area costs commuters $501 per person per year in excess fuel and lost time.Congestion in the Washington, DC metropolitan area costs commuters $1,212 per person per year in excess fuel and lost time.
- 26% of Virginia's bridges are structurally deficient or functionally obsolete.
- There are 74 state determined deficient dams in Virginia.
- Virginia has 126 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Virginia's most critical dams is estimated at $147.2 million.
- Virginia's drinking water infrastructure need is $2.05 billion over the next 20 years.
- Virginia has $3.52 billion in wastewater infrastructure needs.
- Virginia generates 1.49 tons of solid waste per capita.
- Virginia recycles 29.1% of the state's solid waste.
- 60% of Virginia's schools have at least one inadequate building feature.
- 58% of Virginia's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Needed roads and tunnels cannot be built for lack of funds." —civil engineer from Norfolk, VA

"The traffic gets worse every day and with Metro's problems there isn't always an alternative." — a civil engineer from Fairfax, VA

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From the Headlines

More than 400 million gallons of raw sewage—and possibly as much as 750 million gallons - spilled into Roanoke's waterways, streets and back yards after recent floodwaters shut down the regional wastewater treatment plant. The spill was enough to fill 1,000 Olympic-size swimming pools or to bury the entire town of Vinton under more than a foot of sewage. The sewage spills are caused by storm water overtaxing the sewage system, tree roots breaking aging pipelines, sporadic blockages, and homes' gutters being incorrectly hooked into the public wastewater system. According to water authority reports, one of the largest spills was at Tinker Creek, where sewage spilled out at an estimated 1,000 gallons a minute. At that rate, as much as 13 million gallons of sewage—which gushed more than 10 feet into the air and left toilet paper hanging in the trees—went into the creek near its junction with the Roanoke River. *Roanoke Times,* 10/23/04

A fence on the east catwalk of the Herbert C. Bonner Bridge's south side broke off when a fisherman leaned on it. The man fell through the fence at the north end of the catwalk and was in at least 8 feet of water when impromptu rescuers got to him about 15 minutes later. The 1,000 feet or so of walkway running along the side of the bridge suffers from the same problems the rest of the 40-year-old bridge does: deterioration and corrosion. The reinforcement steel that was holding the base of the fence post to the narrow slab of concrete that made the catwalk had corroded. Some of the concrete around the post also was cracked and broken. *Virginian Pilot,* 9/19/04

Construction on more than a half-dozen heavily traveled local routes in Northern Virginia has been delayed by suburban governments left with little choice but to put off the projects after state officials significantly reduced money for secondary roads. The cuts in the secondary road funding are part of a more than $1 billion slashing of the state's transportation program. Among the projects delayed by the cuts is the rehabilitation of two crumbling bridges in Arlington County. *The Washington Pos,t* 7/28/04

When Bob Potter makes the trip to his downtown barber shop each morning, he often takes precautions: He unlocks the doors, rolls down the windows and snaps back the seat belt. Just in case. To get to the tiny island from his home, Potter has to cross the only portal to the city, two bridges notorious for their deteriorating condition. When traffic is thick, he sometimes worries that the constant weight will cause one of the bridges to collapse. Sometimes, the 65 -year-old swinging draw bridge gets jammed open for hours, backing up traffic for miles and making it impossible for an ambulance to pass through on its way to a hospital about 45 minutes away on the mainland. Transportation department officials say it could be five or six years before a new, longer bridge is finished. In the meantime, they say the Chincoteague Channel and the Black Narrows bridges are safe enough for the 9,000 cars that cross it daily. The Black Narrows bridge was built in 1940 , three years after the swing bridge. At first glance, the bridges look fine, but VDOT photos show they have holes peeking through the bottom. Some locals

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say they have seen pieces of cement breaking off the swing bridge. A few say they feel it shake when they cross it. *Virginian Pilot,* 7/26/04

There aren't many better places to be at 8 o'clock in the morning than on a golf cart. The sun is moving upward. The cooling breeze meets your face. The Chickahominy River flows beneath you. Yes, beneath. This is no golf course. This is the state Route 5 bridge. Golf carts are the mode of travel these days now that the bridge is considered, well, really more of a thrill ride than a bridge. The Barretts Ferry Bridge, officially known as the Judith Stewart Dresser Memorial Bridge, carries state Route 5, unofficially known as the Richmond-to-Williamsburg road, between Charles City County and the Williamsburg/James City County area. Now, though, one section of the 1939 wooden-piling bridge, near the pivoting center section, is sinking. Dangerously. Rapidly. Car travel has been eliminated. The 65-year-old bridge is deteriorating faster than crews can rush to repair it. Bridge restrictions have included lowering the speed limit to 15 mph, then restricting traffic to one lane, then closing the bridge entirely and finally opening it up for walkers and the carts. And a planned new bridge is four years away. But at least there are the golf carts. *Richmond Times Dispatch,* 7/8/04

VDOT's budget woes practically assure that the dilapidated Kings Highway Bridge will be closed before it can be replaced. The obsolete Kings Highway Bridge topped Suffolk's wish list of road projects this year. But the Virginia Department of Transportation budget is so tight that new money wasn't approved to begin designing a new span. The lack of funds nearly cinches the likelihood that the deteriorating structure on Route 125 in north Suffolk will have to be closed before a new one is built. The existing 74-year-old span on Route 125 connects Driver and Chuckatuck across the Nansemond River. It carries up to 3,500 vehicles a day. If VDOT closed the bridge, residents who rely on it would have to add about 20 minutes to their daily commutes by taking other routes. VDOT estimates that it will cost about $4.6 million to design a new crossing and an additional $32.5 million to build it. The state transportation department has just $3 million in previously approved money to begin the design and received no new money from the General Assembly this year to finish the job or build the bridge. Earlier this year, the state approved realigning the Chuckatuck end of the bridge across the Nansemond River about a mile upstream from its current location to link up with Route 10 near Five Mile Road. The existing bridge is in such bad shape that it rates a zero on a state bridge-rating scale that goes up to 100. Trucks, buses and other vehicles weighing more than 10 tons were restricted from using it in recent years. That limit was recently lowered to 5 tons. VDOT officials say heavy trucks run the risk of damaging the bridge beyond repair. In 2000, a truck hauling earth-moving machinery that exceeded the 10-ton weight limit caused a section of roadway to drop. The damage closed the bridge for several months. A recent report said the bridge could use another $450,000 in work. That work won't be done, because VDOT officials have decided to close the span if the cost of any future repairs exceeds $10,000. *Daily Press,* 7/7/04

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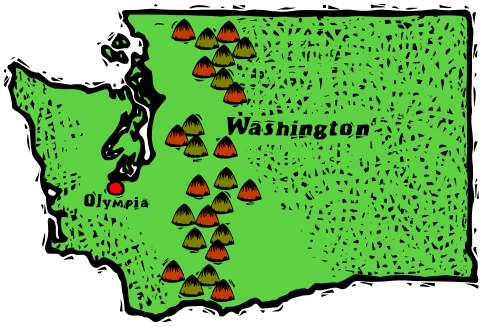

Washington

Top Three Infrastructure Concerns*

1. **Roads**
2. **Mass Transit**
3. **Bridges**

Key Infrastructure Facts

- 34% of Washington's major urban roads are congested.
- 28% of Washington's major roads are in poor or mediocre condition.
- Vehicle travel on Washington's highways increased 23% from 1990 to 2003. Washington's population grew 26% between 1990 and 2003.
- Driving on roads in need of repair costs Washington motorists $838 million a year in extra vehicle repairs and operating costs—$198 per motorist.
- Congestion in the Seattle metropolitan area costs commuters $820 per person per year in excess fuel and lost time.
- Congestion in the Spokane area costs commuters $166 per person per year in excess fuel and lost time.
- 26% of Washington's bridges are structurally deficient or functionally obsolete.
- There are 31 state determined deficient dams in Washington.
- Washington has 140 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Washington's most critical dams is estimated at $75.9 million.
- Washington's drinking water infrastructure need is $4 billion over the next 20 years.
- Washington has $2.74 billion in wastewater infrastructure needs.
- Washington generates 1.43 tons of solid waste per capita.
- Washington recycles 34.1% of the state's solid waste.
- 60% of Washington's schools have at least one inadequate building feature.
- 74% of Washington's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Purdy Bridge is grossly functionally obsolete and deteriorating but isn't even programmed for a future replacement. Many neighborhoods around me need sewer extensions because of the increased density but there is no planning for this." —a civil engineer from Gig Harbor, WA

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From the Headlines

Before school started this fall, Mount Vernon High School administrators gave brightly colored T-shirts to the 17 teachers who work in the portable classrooms that sit on what once was the student parking lot. "Welcome to Pebble Beach," the shirts read. Pebble Beach is a bit of a misnomer. The four rows of 17 portables look more like a grid of worn-down, summer-camp bunkers than a peaceful beach scene with palm trees and lapping waves. Skagit County students, teachers and parents are becoming increasingly familiar with portable classrooms. Altogether, the county's school districts have at least 81 portables. No one wants more portables, but enrollments are rising. Adding new schools isn't the easy answer—it requires persuading the community to vote for tens of millions of dollars in bond money. The immediate solution, then, is to add portables. But, while they are billed as temporary student housing, portables tend to become a permanent part of school campuses. Sedro-Woolley has the oldest portables in the county—some have been in place since the 1960s. Shayla Lanz, 15, said she doesn't like the portables because they are either too hot or too cold, and because of the long walk between her classes. Plus, she said, "they're really small. And there's no bathroom." In fact, toilets are available for the portables. To the far corner of the lot is a short row of portable toilets. *Seattle Post Intelligencer,* 10/26/04

The cost of cleaning Seattle Public Schools' contaminated water could cost $6.3 million to $9 million, but where the money will come from hasn't yet been determined. Estimates do not include the costs of testing water and replacing fixtures in restrooms ($1.2 million), complying with iron standards in every location ($4 million) or reducing the standard for lead from the EPA limit of 20 parts per billion to 10 parts per billion. A drinking water policy being considered by the School Board would require that school drinking water meet EPA limits for lead, copper and cadmium, and Seattle Public Utilities standards for iron, zinc, turbidity and color. It may also be necessary to scale back or delay school construction projects to address a projected capital budget shortfall between now and 2012. The district's Building Excellence I program, which would include building or renovating 19 schools, is expected to finish $11.2 million in the red. Administrators forecast an additional $2.4 million shortfall for Building Excellence II. *Seattle Post-Interlligencer,* 9/28/04

Members of the Seattle business community presented leaders witht a grim report that said the city has a maintenance backlog of $500 million that would grow by roughly $50 million a year unless Seattle found new sources of transportation revenue. The 12-member transportation advisory committee was hand-picked by the City Council and Mayor Greg Nickels in November. The group recommended several solutions, including a local property-tax increase, to address what its chairman Darryl Smith called "dire" and "scary" problems. Seattle's maintenance backlog stands at $500 million. To reduce the backlog would require about $40 million to $50 million in additional funding each year over the next 20 years. *Seattle Times,* 5/26

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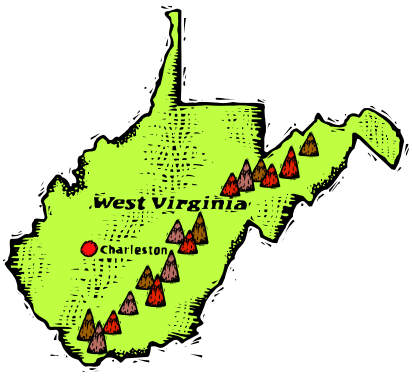

West Virginia

Top Three Infrastructure Concerns*

1. **Roads**
2. **Wastewater**
3. **Schools**

Key Infrastructure Facts

- 27% of West Virginia's major roads are in poor or mediocre condition.
- Vehicle travel on West Virginia's highways increased 30% from 1990 to 2003.
- Driving on roads in need of repair costs West Virginia motorists $368 million a year in extra vehicle repairs and operating costs—$279 per motorist.
- 37% of West Virginia's bridges are structurally deficient or functionally obsolete.
- There are 38 state-determined deficient dams in West Virginia.
- West Virginia has 366 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for West Virginia's most critical dams is estimated at $324.2 million.
- West Virginia's drinking water infrastructure needs $1 billion over the next 20 years
- West Virginia has $2.52 billion in wastewater infrastructure needs.
- West Virginia generates .97 tons of solid waste per capita.
- West Virginia recycles 3.4% of the state's solid waste.
- 67% of West Virginia's schools have at least one inadequate building feature.
- 82% of West Virginia's schools have at least one unsatisfactory environmental condition.

From the Headlines

A broken structural beam has forced the West Virginia Division of Highways to shut down the 5th Avenue bridge into Guyandotte. Inspectors found that the lower chord on the bridge's upstream side, a longitudinal support beam that runs the length of the span under its sidewalk, has rusted in two. The span, built in 1924, tentatively is scheduled to be replaced in 2007. Several years ago, barriers were placed along both sides of the deck to keep the weight of traffic off the deteriorating longitudinal chords. *Herald Dispatch,* 12/23/04

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A deteriorating bridge on the east end of Chesapeake has forced the state to reduce the loads that coal trucks are allowed to carry on that portion of W.Va. 61. Some of the concrete on the sides of the bridge has fallen away and portions of the concrete still there easily crumble at the touch of a finger. But state officials believe the bridge can continue to bear traffic safely at least for another year, as long as that traffic isn't too heavy. *Charleston Daily Mail,* 8/6/04

For the second time in less than a week, a sewer line break has caused thousands of gallons of untreated sewage to contaminate the Ohio River. A break in a 20-inch pipe at a pump station was discovered a during a daily inspection. The leak stopped when the station was shut down. But the sewage was diverted into a relief line that empties into the river at a rate of 1,000 gallons per minute. To avoid possible health hazards, swimmers were asked to stay away from that section of the river. The pipe is part of a line that was built in 1959. Vibration and corrosion were the most likely causes of the break. A half-mile away along the same line, the pipe in an interceptor ruptured Thursday, releasing 400 gallons of wastewater per minute into the river. Associated Press, 5/25/04

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Wisconsin

Top Three Infrastructure Concerns*

1. **Roads**
2. **Drinking Water**
3. **Wastewater**

To view the local infrastructure report card of ASCE's Wisconsin Section please visit http://www.asce.org/reportcard

Key Infrastructure Facts

- 25% of Wisconsin's major urban roads are congested.
- 32% of Wisconsin's major roads are in poor or mediocre condition.
- Vehicle travel on Wisconsin's highways increased 35% from 1990 to 2003. Wisconsin's population grew 12% between 1990 and 2003.
- Driving on roads in need of repair costs Wisconsin motorists $921 million a year in extra vehicle repairs and operating costs—$251 per motorist.
- Congestion in the Milwaukee metropolitan area costs commuters $413 per person per year in excess fuel and lost time.
- 19% of Wisconsin's bridges are structurally deficient or functionally obsolete.
- Wisconsin has 187 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Wisconsin's most critical dams is estimated at $82.5 million.
- Wisconsin's drinking water infrastructure needs $3.1 billion over the next 20 years.
- Wisconsin has $3.33 billion in wastewater infrastructure needs.
- Wisconsin generates 1.03 tons of solid waste per capita.
- Wisconsin recycles 24.6% of the state's solid waste.
- 49% of Wisconsin's schools have at least one inadequate building feature.
- 60% of Wisconsin's schools have at least one unsatisfactory environmental condition.

Field notes from civil engineers in the state

"Reconstuction of major interstate interchange is budgeted at $800-1000 million but has funding of $244 million." —a civil engineer from Milwaukee, WI

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From the Headlines

Prior to its chlorination, viruses from human sources occur in the La Crosse, Wisc., groundwater used for the municipal drinking water supply, a new report revealed. Although the city's treated water meets or exceeds state and federal standards for drinking water, researchers and public health officials agree that more study is needed to pinpoint the exact sources of the viruses and to determine if some viruses are surviving the chlorination process. The study found enteroviruses, rotavirus, hepatitis A virus and noroviruses. La Crosse's source of water is an aquifer consisting of a deposit of glacial outwash sand and gravel approximately 170 feet deep, bounded on the east by the bluffs and on the west by the Mississippi River. Sand and gravel aquifers are among the most vulnerable to fecal contamination. *Water & Wastes Digest,* 10/7/04

The sewerage district dumped an unprecedented 4.6 billion gallons of raw sewage in May—exceeding any annual dumping tally since the deep tunnel system opened in late 1993. Milwaukee Metropolitan Sewerage District officials blamed intense back-to-back storms and almost unrelenting rain for the massive sewage overflows. To visualize how much sewage was dumped by the district, consider these calculations: The 4.6 billion gallons would fill Miller Park 15 times over, from its base to its retractable roof. The sewage spill would also fill the U.S. Bank office tower on the lakefront 41 times. *Milwaukee Journal Sentinel,* 5/29/04

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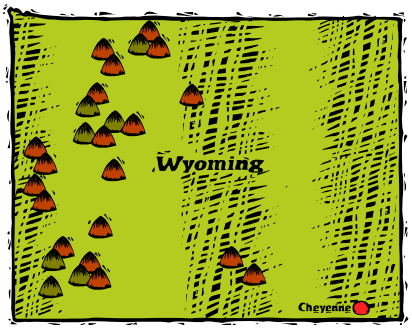

Wyoming

Top Three Infrastructure Concerns*

1. **Roads**
2. **Schools**
3. **Bridges**

Key Infrastructure Facts

- Vehicle travel on Wyoming's highways increased 58% from 1990 to 2003. Wyoming's population grew 11% between 1990 and 2003.
- Driving on roads in need of repair costs Wyoming motorists $30 million a year in extra vehicle repairs and operating costs—$82 per motorist.
- 21% of Wyoming's bridges are structurally deficient or functionally obsolete.
- There are 3 state-determined deficient dams in Wyoming.
- Wyoming has 79 high hazard dams. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- The rehabilitation cost for Wyoming's most critical dams is estimated at $71.5 million.
- Wyoming's drinking water infrastructure need is $80 million over the next 20 years.
- Wyoming generates 1.39 tons of solid waste per capita.
- Wyoming recycles 1.7% of the state's solid waste.
- 49% of Wyoming's schools have at least one inadequate building feature.
- 68% of Wyoming's schools have at least one unsatisfactory environmental condition.

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ASCE Leaders

William P. Henry, P.E., F.ASCE
President, ASCE
William P. Henry's area of technical expertise is water resources planning and engineering. He co-founded the small business Aqua Resources, Inc. Currently he is the marketing manager for the Seattle office of Schaaf & Wheeler Consulting Civil Engineers, a small water resources engineering firm. Henry has served as an ASCE director and has been president of the San Francisco Section.

Patrick J. Natale, P.E., M.ASCE, C.A.E
Executive Director, ASCE
In November 2002, Patrick J. Natale began his tenure as the executive director of the American Society of Civil Engineers. In January of 1999, Natale was appointed the executive director of the National Society of Professional Engineers (NSPE). Prior to joining NSPE, Natale held numerous top-level management positions with the Public Service Electric and Gas Company (PSE&G) of New Jersey. During his 28-year career with PSE&G, he was responsible for managing sales, marketing, strategic planning and customer service.

2005 Advisory Council

C. Michael Walton, Ph.D., P.E., F.ASCE
Advisory Council Chair
Dr. Michael Walton is professor of civil engineering and holds the Ernest H. Cockrell Centennial Chair in Engineering at the University of Texas at Austin (UT). Walton's distinguished career in transport policy and engineering analysis spans more than 30 years and is highlighted by his contributions to many transportation professional societies and technical publications.

Donald L. Basham, P.E.
Donald Basham is the U.S. Army Corps of Engineers Chief of Engineering and Construction. Basham's career in engineering, construction, and program and project management spans 36 years. In his current assignment, he is responsible for policy, program and technical expertise in the execution of over $10 billion of design and construction programs for the U.S. Army, U.S. Air Force, Department of Defense, other federal agencies and over sixty foreign nations.

Jeanette A. Brown, P.E, DEE, F.ASCE
Jeanette A. Brown is the executive director of Stamford Water Pollution Control Authority. She is also an adjunct professor of Environmental Engineering Manhattan College. Brown has 30 years experience in wastewater treatment; she is considered an authority on operations of biological nitrogen removal processes and sludge management. She is currently vice-president of the Environmental and Water Resources Institute of ASCE.

John Bennett, P.E.
John Bennett is currently serving as vice president with AECOM Consult, Inc. He has over three decades of experience in rail and public transportation policy, planning and management/organization development. He also has extensive experience in capital program development and management including multi-year rail investment programs involving multiple agencies such as the $100 million Penn Station Central Control project.

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Charles C. Calhoun, Jr., P.E., F.ASCE
Charles C. Calhoun is a consultant in the private sector. He retired after over 35 years of distinguished service as the deputy director of the U.S. Army Waterways Experiment Station's Coastal and Hydraulics Laboratory. Calhoun is the immediate past-president of the Board of Governors of the American Society of Civil Engineers (ASCE) Coasts, Oceans, Ports, and Rivers Institute (COPRI) and has served as the chairman of ASCE's Waterway Committee. He is also a vice president and commissioner of the U.S. Section of the International Navigation Association.

Edward J. Hecker
Edward J. Hecker has been with the U. S. Army Corps of Engineers for 31 years. Ed has spent most of his career engaged in the Corps emergency management program. Selected as chief of the Readiness Branch at Headquarters in 1991, Ed has been a key leader in managing the Corps' preparedness and response to numerous major disasters over the past 10 years from Hurricane Andrew in 1992 to the events of September 11. He has played a central role in building the Corps' outstanding relationship with FEMA.

W. Craig Helms, P.E., F.ASCE
W. Craig Helms is founder and manager of Civil Engineering of The Carolinas, LLC which deals in all phases of various infrastructure systems including water, sewer, roads, landfills, and facilities. Mr. Helms has worked for federal and state governments as well as private practice for the last 28 years. He has served in numerous positions with ASCE and other professional organizations. He has received numerous professional honors and awards for his dedicated, continuous service.

Andrew W. Herrmann, P.E., F.ASCE
Andrew Herrmann is the Managing Partner of Hardesty and Hanover LLP, Consulting Engineers, headquartered in New York, and serves as partner-in-charge for many of the firm's bridge projects. During his 30 plus years with the firm he has been responsible for the design, inspection, rehabilitation, construction support, analysis, and rating of fixed and movable bridges, highways, railroads and major transportation projects He is past chair of ASCE/SEI's Committee on Bridges and their Steel Bridge Committee. He is presently co-chair of ASCE/SEI's 2005 Structures Congress in NYC.

Brad Iarossi, P.E., M.ASCE
Brad Iarossi served as Chief of the Dam Safety Program for Maryland's Department of the Environment for over 16 years. With expertise in environmental regulation and water projects, Iarossi served as chair of ASCE's National Water Policy Committee, served on the CGA Committee, is past president of the Association of State Dam Safety Officials (ASDSO) and has been the Chairman of ASDSO's Legislative Committee since 1992.

Leon Kempner, Jr., Ph.D. P.E., M.ASCE
Dr. Kempner has 31 years experience as a structural engineer for the Bonneville Power Administration. Career assignments include structural engineering analysis, design and research of transmission line facilities. Kempner is active in many national and international Electrical Transmission Engineering professional organizations and has contributed to many technical publications addressing transmission line structural engineering issues.

Conrad G. Keyes, Jr., Sc.D., P.E. /P.S., Hon.M. ASCE, F. NSPE
Conrad Keyes is the Founding President of ASCE's Environmental and Water Resources Institute (EWRI), a Professor & Department Head Emeritus of Civil, Agricultural, & Geological Engineering of New Mexico State University, and proudly serves as consultant to the US Corps of Engineers - Albuquerque District and Sandia National Laboratories. He has been involved in numerous water resource projects throughout the southwest and is a former member of the U.S. International Boundary &

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Water Commission, the Rio Grande Compact Commission, and the New Mexico Water Quality Control Commission. He currently is on the Paso del Norte Watershed Council in the El Paso and southern New Mexico region.

Fred Klancnik, P.E., F.ASCE
Fred Klancnik is president of the planning, design and engineering firm of JJR. He has 33 years of experience designing recreational development projects, specializing in urban waterfront regeneration. He has been responsible for planning and engineering of national parks/lakeshores; state/regional parks and beaches; and urban parks, plazas and promenades. Notable projects include the Apostle Islands National Lakeshore, Milwaukee Lakeshore State Park, City of Lake Forest Park, and Chicago's Navy Pier. Mr. Klancnik received his Bachelor of Science in Civil Engineering and Master of Business Administration in Finance from the University of Wisconsin. He is a fellow of ASCE and the editor and co-author of the ASCE Planning and Design Guidelines for Small Craft Harbors (Manual 50).

Margaret E. Layne P.E., M.ASCE
Margaret E. (Peggy) Layne, P.E., directs the Advance program, a National Science Foundation sponsored program to increase the number of women faculty in science and engineering, at Virginia Tech. She spent a year as ASCE's Congressional Fellow in the office of Senator Bob Graham, where she was responsible for water, wastewater, and solid and hazardous waste policy issues. Ms. Layne has 17 years of environmental engineering experience, and was formerly a principal at Harding Lawson Associates in Tallahassee, FL, where she managed the office and directed hazardous waste site investigation and cleanup projects

Kathi Littmann
Kathi has over 25 years of experience in construction project and program management. This experience includes general contracting/at-risk construction, and the development and leadership of successful project teams. Kathi is currently Vice President, Director of Program Management for HNTB Architecture Inc. and responsible for the development and expansion of the HNTB program management practice nationwide.

Eva Lerner-Lam M.ASCE
Eva Lerner-Lam has 27 years of experience in transportation planning, operations, research and policy making. Founder and President of the Palisades Consulting Group, Inc., she is also the publisher of a bi-weekly electronic newsletter, "Palisades Transit Security Newsletter," and serves on numerous professional society and homeland security-related committees and panels dealing with transportation security issues. Eva has received numerous professional achievement awards, including the 1995 ITE Metropolitan Section New York/New Jersey Engineer of the Year and the 1998 ASCE Frank M. Masters Engineering Achievement Award.

Roger M. Millar, Jr., P.E., F.ASCE
Roger Millar is vice president of DMJM+Harris, Inc. He has over 25 years of professional experience with an extensive background in public and private sector transportation, land use and environmental projects. Millar is chair of the ASCE National Infrastructure and Research Policy Committee and past chair of the Pacific Northwest Council of ASCE.

Peter G. Nicholson, Ph.D., P.E., M.ASCE
Dr. Peter Nicholson is a professor of civil engineering and graduate chair for the Dept. of Civil & Environmental Engineering at the University of Hawaii at Manoa. He chairs the Embankments, Dams & Slopes Committee for the Geo-Institute of ASCE of which he has been an active member for the past 12 years. Nicholson has been consulting on dam safety, design and rehabilitation for almost 20 years in Hawaii and California.

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Robert E. Nickerson, P.E., M.ASCE
Robert Nickerson is an independent consulting structural engineer specializing in the design, analysis and upgrading of electrical transmission systems and has over 25 years of experience in the electrical utility industry. This experience includes three key areas: analysis and design of transmission structures, research and full-scale testing of transmission structures, and currently as a consultant working with utilities in development of transmission models for system analyses and upgrades.

Randall S. Over, P.E., F.ASCE
Randall Over is the Ohio Department of Transportation's (ODOT) District 12 construction engineer. He is responsible for construction contracts for the Cleveland, Ohio, metro area. He also serves on the ODOT statewide committees for Specifications for Construction Contract Administration, Agency Cost Accounting, and local let federal-aid project administration.

Thomas M. Rachford, Ph.D., P.E., F.ASCE
Dr. Thomas M. Rachford is a vice president with Gannett Fleming, Inc., an engineering and planning firm with 50 offices nationwide. Rachford has been with Gannett Fleming for 30 years and currently serves as corporate quality manager. He is also the immediate pas president of ASCE's Environmental and Water Resources Institute.

Debra R. Reinhart, Ph.D., P.E., DEE, F.ASCE
Debra Reinhart is a professor and interim chair of the Civil and Environmental Engineering Department at the University of Central Florida. Reinhart is a member of seven national professional and technical organizations; four national committees; and chair of ASCE External Organizations Coordination Committee. She is the author of over 100 books, papers and presentations.

Thomas S. Slater, P.E., M. ASCE
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