

# The Scope of the U.S. Infrastructure Deficit

by the *EIR* Economics Staff

The Aug. 1 collapse of the I-35W bridge over the Mississippi River in Minneapolis, is the most dramatic and recent event of a process of decades-long deterioration of U.S. infrastructure. To provide an overview of the rebuilding tasks, we present here a snapshot of the dimensions of the decay and danger of bridges, dams, and a selection of other categories of infrastructure, with references.

The American Society of Civil Engineers has estimated that \$1.7 trillion is required merely to stabilize the condition of core infrastructure. If all the needs are factored in—including new water supplies, a modernized continental rail system, a nuclear power-based electricity supply, and so on—the costs then add up to \$8-9 trillion.

## Bridges, Highways, and Roads

There are a total of 592,473 road bridges in the United States, of which 26%, or 155,144 are deemed “structurally deficient and/or functionally obsolete,” according to the latest Bureau of Transportation statistical data. The office of Minnesota Congressman James Oberstar (D), chairman of the Transportation and Infrastructure Committee of the House, reports that up to 30% of the nation’s bridges that receive Federal funds have been deemed structurally deficient to some degree. Oberstar has scheduled a hearing Sept. 5 on the crisis, and has posted charts for review on the status of bridges, 1990-2006. His Committee website provides data on the classification of bridges by state, with a map for each Congressional District, as of 2003 (<http://transportation.house.gov/bridgemaps.shtml>).

The map of outmoded bridges (**Figure 1**) shows that 40 states have at least one in five bridges in the category of “structurally deficient and/or functionally obsolete” as of 2006. Of these, 11 states have more than 30% in this condition. And 4 states—Pennsylvania, Massachusetts, Hawaii, and Rhode Island—

plus the District of Columbia, have more than 40% of their bridges classified as decrepit.

In the absolute number of deficient bridges, Pennsylvania ranks highest in the nation. Of its total of 25,000 state-owned bridges, 6,250 need rehabilitation or replacement. In contrast, the state of Minnesota, where the Mississippi River bridge collapsed Aug. 1, ranks in the relatively “good” category, with only 12.2% (1,586) of its bridges considered in need of refurbishing or replacement. (Data on bridges are kept by the Bureau of Transportation Statistics at <http://www.bts.gov>.)

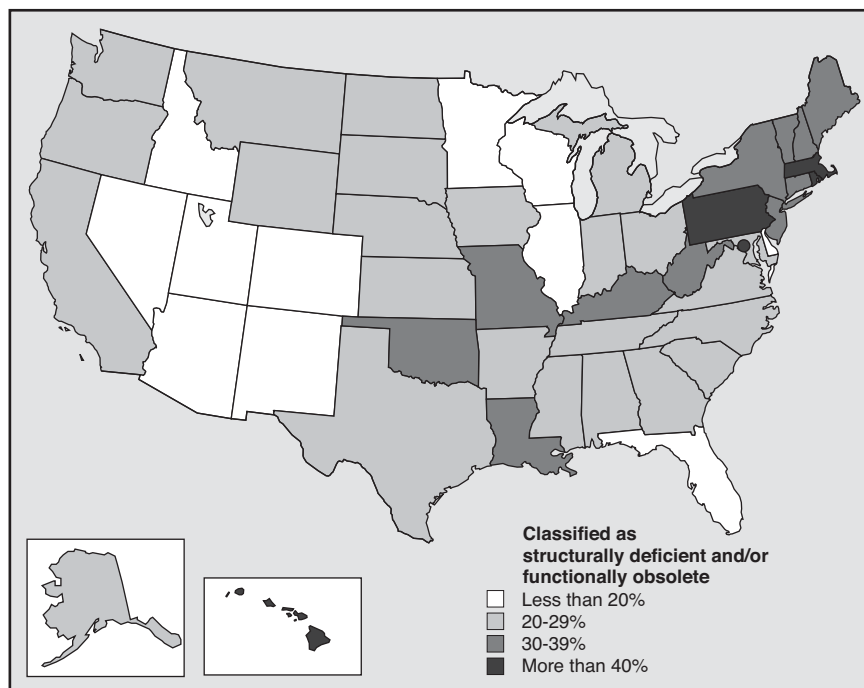
There are 756 other bridges in the country of the same vintage and design as the 40-year old I-35W bridge that collapsed in Minneapolis.

The U.S. Department of Transportation currently estimates that there is a \$461 billion backlog of needed road, highway, and bridge repair and improvements. The American Society of Civil Engineers, and the American Association of State Highway and Transportation Officials keep estimates on the loss to the economy from poor road conditions. For example, U.S. motorists spend at least \$54 billion a year in repairs and operating costs because of poor road conditions.

## Railways

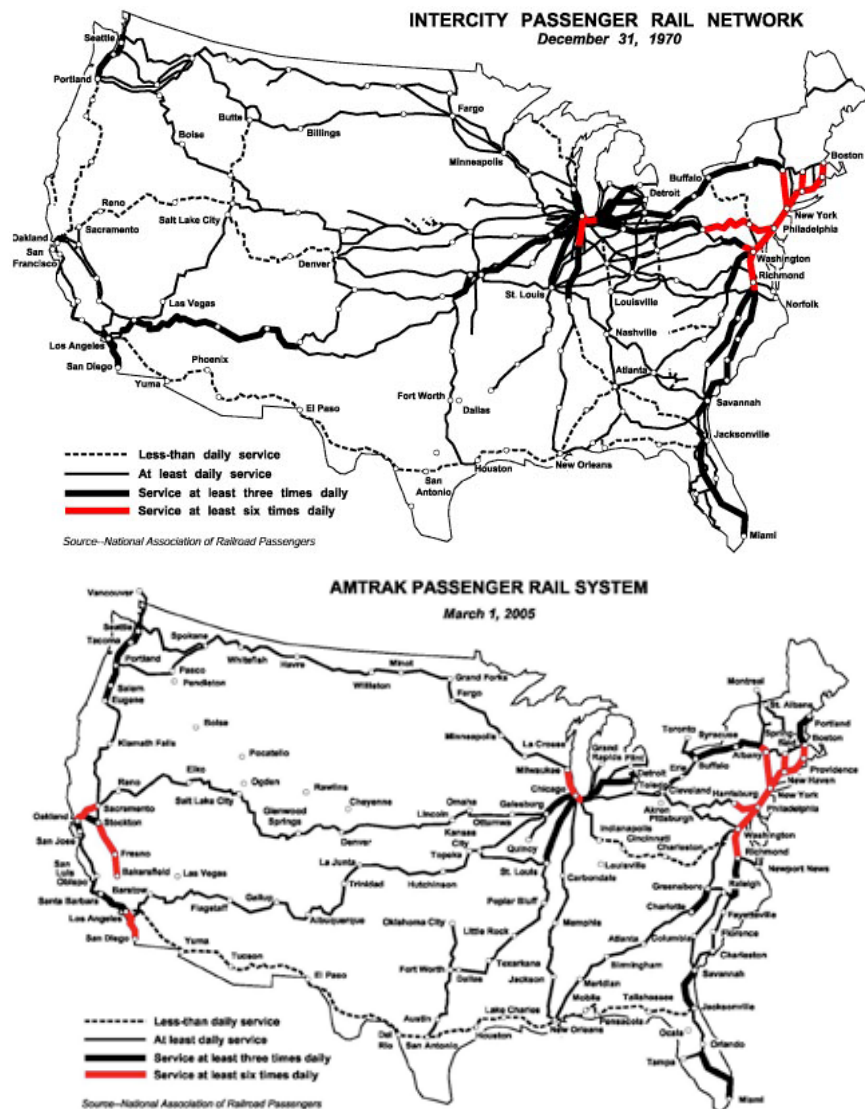
The U.S. rail system is a bare skeleton of its past operations, where route density peaked in the 1920s. Just taking

FIGURE 1  
**In 40 States, 20% or More of Bridges Need Repair or Replacement**



Source: U.S. Bureau of Transportation Statistics

FIGURE 2  
National Passenger Rail System Halved, 1970-2005



Source: National Association of Railroad Passengers; Amtrak.

In 1970, when Amtrak came into being, relieving freight railroads of their unwanted passenger rail services, the system's passenger route-miles had already been reduced from 88,717 miles in 1962 to the 44,020 pictured here. The Federal government and certain Wall Street "reform" advocates kept Amtrak on a starvation diet, resulting in a further takedown of the system as well as cannibalization of rolling stock and rail infrastructure, leaving a sparse passenger rail system. The 2005 map shows the remaining 21,807 route-miles left, a cut by half since 1970. Whole regions of the country are no longer served by rail despite increased demand for rail service.

the 20-year period from 1980 to 2000, here are the dimensions of contraction:

- A decline in Class I track mileage from 164,822 in 1980 (already far below its length of 229,530 route-miles in 1922), to 99,250 in 2000.
- A decline in the railroad workforce from 458,000 in 1980, to 168,000 in 2000—a drop of 63%.

- A 29% drop in the number of locomotives, from 28,094 in operation in 1980, to 20,028 in 2000.
- A 52% drop in freight cars in use, from 1,168,114 down to 560,154.

Figures 2a and 2b show the contraction in Amtrak passenger rail routes.

In addition to the shrinkage of the rail system, the condition of what remains is also inadequate, as the accident rate shows. In 2006, of 2,903 rail wrecks, 1,043 were caused by track defects.

The buildup that is required should be the occasion to shift to high-speed rail corridors, including magnetically levitated rail on priority lines.

## Dams

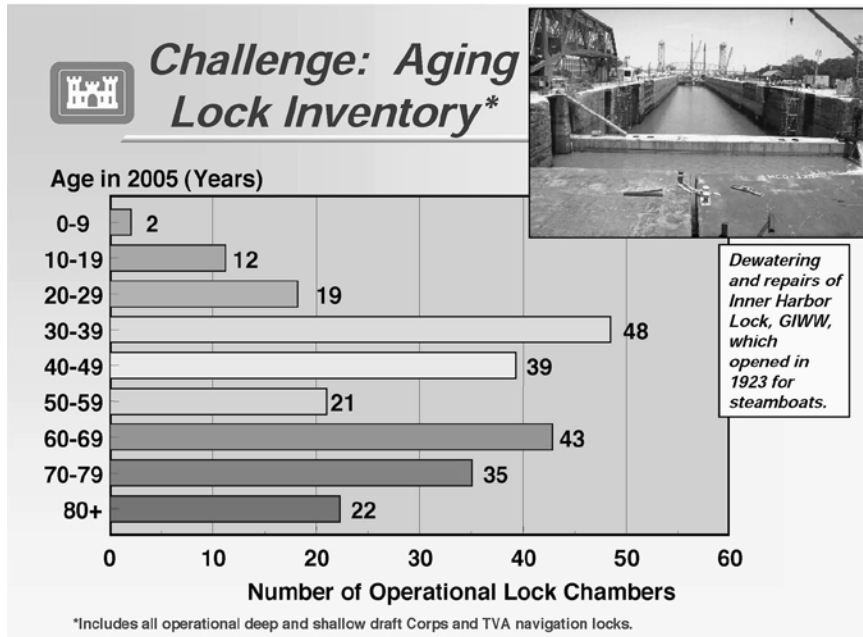
The nation has 82,642 dams recorded in the National Dam Inventory, serving purposes of flood control, navigation, hydroelectric power, irrigation, recreation, water supply, wildlife habitation, fire control, and other uses. The average age of these dams is 49 years, with tens of thousands of dams over 60 years old. Nearly 30% of dams are classified as hazardous—either high hazard (11,881) or significant hazard (13,549). The remainder, 57,194, are designated low hazard. The degree of hazard refers to the danger, especially threat of loss of life, to what is downstream. (A high-hazard dam can be one in decent condition, but at a site where there are many people residing downstream).

Of the 30,000 dams considered to be in some category of hazard, 3,000 are considered as actually unsafe. The "Report Card" of the American Society of Civil Engineers gives dam safety overall a "D," partially because of the lack of funding available to deal with these unsafe structures. In 2002, an estimate of \$10 billion was given by the Association of Dam Safety Officials for what it would have taken then to rehabilitate the most

critical high-hazard dams.

More than 70,000 dams are regulated by the dam safety officers of the 50 states. Various authorities have responsibility for the dams: Federal (3,382), state (4,189), local government (16,497), public utility (1,703), private (53,166), and some others. The Agriculture Department has 10,000 upper watershed dams. The U.S. Army Corps of Engineers' Nation-

FIGURE 3



way design, debris blockage of spillways, or settlement of the dam crest.

- 30% fail because of foundation defects.
- 20% fail because of piping (internal erosion caused by seepage). Seepage often occurs around hydraulic structures, from animal burrows, vegetation, cracks, and so on. See [www.damsafety.org](http://www.damsafety.org).

### Navigable Waterways

The need to upgrade the aging installations of locks and dams on the U.S. waterways, is indicated in **Figure 3** showing the aging of the lock inventory. **Figure 4** shows the map of the 12,000-mile system maintained by the Army Corps of Engineers. There are lock chambers in use that are over 80 years old. The backlog of Army Corps waterways work is well over \$3 billion.

Source: U.S. Army Corps of Engineers.

### Water Supply, Sewage Treatment

The United States has 54,000 community water supply systems and 16,000 publicly owned sewage treatment operations. All these systems are aging, and there is a huge repair and replacement deficit. In New York City, for example, there are water mains that are more than 150 years old, and they rupture with regularity.

There is also a need to provide new systems because of the 30 years of sprawl associated with real estate speculation, where housing has been located in areas with no central sewage infrastructure. In the former cornfields of suburban Washington, D.C., fecal bacteria counts in streams and run-off has reached the stage of a public health threat.

Replacing aging urban systems is going at a snail's pace. On July 16, 2007, the United States Conference of Mayors released the results of a study conducted by the Mayors' Water Council that showed that 48% of American cities are on a water and sewer pipe replacement

FIGURE 4



Source: U.S. Army Corps of Engineers.

al Inventory of Dams is available at: [www.tec.army.mil/NIDpublic](http://www.tec.army.mil/NIDpublic)

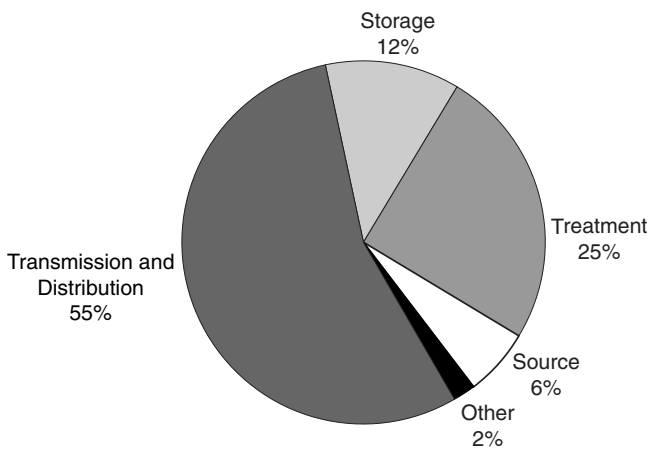
Of the dams tracked by the Association of State Dam Safety Officials, there are many causes of failure:

- 34% fail because of overtopping, from inadequate spill-

schedule of 20 to 100 years, and between 18% and 23% of cities are on a replacement schedule that will exceed 100 years. The estimated cost of overcoming the crisis, by making the repairs in the next 20 years, is in the range of minimally \$300 to \$500 billion.

FIGURE 5

## Pipes and Mains Are Biggest Area of 20-Year Restoration Projects for U.S. Drinking Water Systems



Source: Environmental Protection Agency Drinking Water Infrastructure Needs Survey, 1999.

The breakdown of those waterworks components in need of repair is shown in **Figure 5**. A 2003 study by the Congressional Budget Office concluded that over a 20-year period, it would require between \$178 billion and \$331 billion in pipe replacement costs alone.

The situation is urgent. The nation’s capital is typical. The Washington Suburban Sanitary Commission, which maintains freshwater and sewer pipes for two counties outside the District of Columbia—Montgomery and Prince George counties in Maryland—reported that during February 2007, there were a stunning 477 water main breaks—16 per day. Sixty percent of the system’s 5,300 miles of pipe is 30 years or older; another 25% is 50 years or older. With its current meager funding, the Washington Suburban Sanitary Commission will get around to replacing each mile of pipe only once in every 200 years!

### Schools

A survey completed in 2006 by the American Federation of Teachers (AFT) concluded that tens of thousands of public schools urgently need repairs, renovation, modernization, or new construction because of health problems and overcrowding. Nearly 20 years ago, the AFT

called for a Marshall Plan to upgrade public schools, because as Federal funds were dwindling, schools were deteriorating. This didn’t happen.

A Government Accountability Office report in 1995 concluded that at that time 25,000 public schools needed extensive repair and replacement, and that it would take \$112 billion to bring existing buildings into conformity with the minimum building standards. The same report concluded that the air was unfit to breathe in nearly 15,000 public schools. As of 2004, 8.5% of schools had exceeded their physical space capacities, according to a report that year from the National Center for Education Statistics of the Department of Education.

In its 35th Annual “Maintenance and Operations Cost Study,” American School and University found that in 2006 the median school district spent 7.58% of its total expenditures on maintenance and operations, well below the 9.59% spent ten years earlier.

In 2005, the American Society of Civil Engineers gave a “D” grade to American schools on its “infrastructure report card.” The Society noted that in 2000, \$268 billion was the expenditure necessary to bring schools into conformity with standards, according to the National Education Association estimates at that time. A 2006 AFT survey of what is needed for schools, “Building Minds, Minding Buildings,” is available at [www.aft.org](http://www.aft.org).

### Hospitals and Medical Equipment

The decline in the number of hospitals and the decrease in the ratio of hospital beds per 1,000 persons has reached the stage of crisis in many inner-city and rural areas. **Figure 6** shows that in 1980, 22 states were above or at the

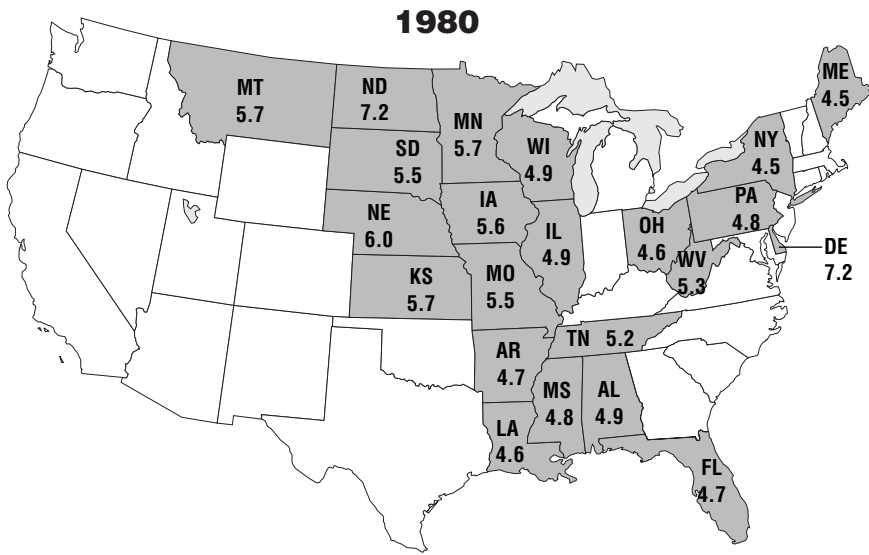


West Virginia Rural Water Association

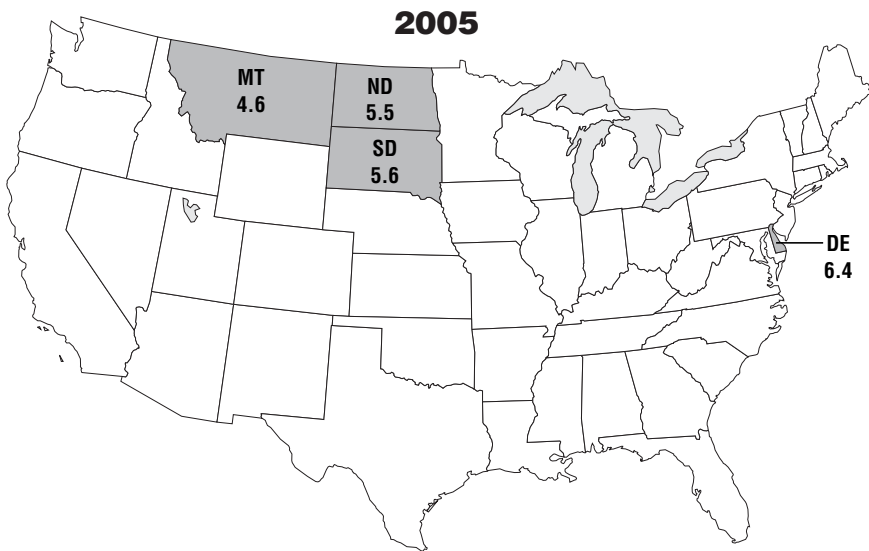
A flood in West Virginia in 2002 opened up this enormous sinkhole in a road. The U.S. Department of Transportation estimates that there is currently a \$461 billion backlog of needed repairs and improvements of roads and bridges; the poor condition of infrastructure costs motorists billions per year.

FIGURE 6

## Hospital Bed Ratios Decline, 1980 to 2005



Sources: U.S. Statistical Abstracts; EIR.



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*The 1946 Hill-Burton Act mandated the construction of and staffing of hospitals based on a county-by-county survey of the population's health-care needs. It set a ratio of 4.5 to 5.5 beds per 1,000 inhabitants as a baseline. In 1980, 22 states met this standard; but by 2005, the number had declined to only four!*

desired level of the ratio of 4.5 hospital beds per 1,000 persons. This is the “Hill Burton” standard, named after the 1946 law, “Hospital Survey and Construction Act”—co-sponsored by Rep. Lister Hill (D-Ala.) and Harold Burton (R-Ohio). Under this law, the U.S. hospital system was built up over the 1950s and 1960s, through Federal, state, and local funding, to have public hospitals in nearly all the

nation's 3,000 counties, and have a beds-per-1,000 persons ratio of 4.5 in urban areas, and 5.5 in rural areas.

Figure 6 shows that in 1980, most states were near this level. From 1958 to 1980, there was an increase of 583 community or general acute care hospitals, and 378,000 staffed community hospital beds. However, since 1980, there has been a dramatic reduction, to the point where only four states are at the “Hill Burton” standard. Hundreds of counties have lost their public hospital altogether, or their hospitals have been downgraded to a “critical access” operation, where they receive patients and ship them elsewhere for treatment.

Likewise, the availability of diagnostic and treatment equipment have declined for much of the population. Beginning in January 2007, Bush Administration cutbacks in Medicaid reimbursement payments for imaging technologies began to reduce the availability of lifesaving diagnoses of all kinds—MRI, CT, PET, DXA, and ultrasound scanning. This came on top of losses already under way. From 2001 to 2004, the number of mammography facilities nationwide decreased 6%, from 9,306 to 8,786. Forty states lost facilities during this period, and as of October 2004, 865 counties—one-fourth of the counties in the country, containing 3.4% of the U.S. population—had no mammogram machines.

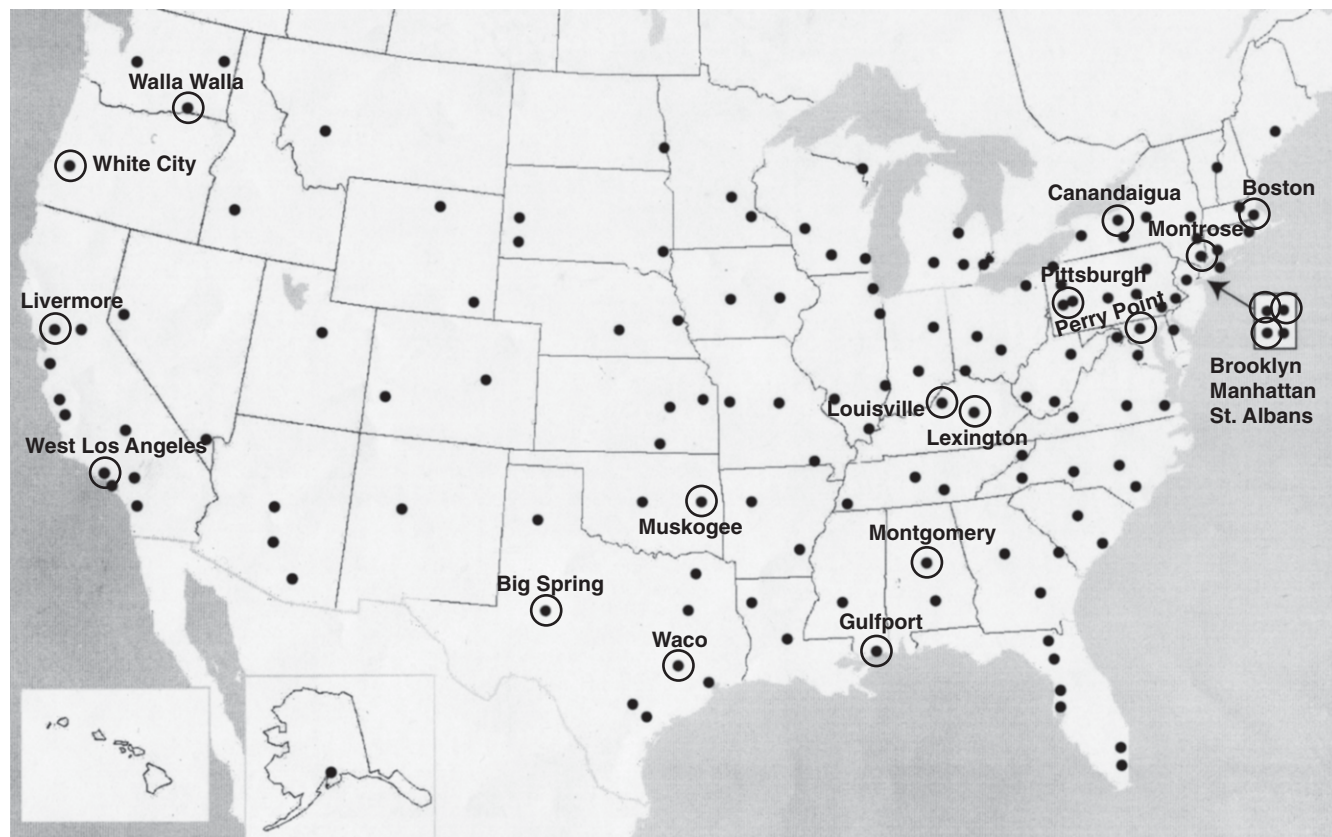
### Disaster Response, Medical Emergency Services

In 2006, the Institute of Medicine of the National Academy of Sciences released a three-volume report which concluded that the United States emergency and trauma care system is “at the breaking point.” A 2003 report by the Centers for Disease Control and Prevention found that emergency rooms in hospitals

diverted more than 1,300 patients a day, 365 days per year. The number of emergency departments in operation nationally decreased by 38% between 1995 and 2005. At the same time, the use of emergency rooms over this period increased by 20%, as much of the population came to be impoverished and without health insurance. The American College of Emergency Room Physicians warns that there is next to no

FIGURE 7

## The Bush Administration's Plan To Close 19 Veterans Hospitals



Source: Department of Veterans Affairs, CARES Decision, May 2004, Office of the Secretary; www.va.gov.

*The dots show most of the nation's 160 major Veterans Affairs Medical Centers. In February 2006, the 19 sites circled were placed on the Bush-Cheney Administration's short list for closure, relocation, or downsizing. The Iraq War has created increasing demand for health care for veterans, even as the availability of that care is being slashed.*

capacity to deal with surge demands of bioterrorism, or natural threats, like the next influenza pandemic.

### Veterans' Medical Care

The Veterans Health Administration is the largest direct provider of medical care in the nation, and it needs to be expanded, both for its unique mission, and as part of the overall medical base of the nation for emergency surge capacity, as in the Katrina disaster. The VA is now receiving a growing number of wounded returnees from service in Iraq and Afghanistan; also there are thousands of other veterans flocking to the VA because private insurance options have been withdrawn or have become unaffordable. Parts of the system are overwhelmed. As of March 2007, there was a backlog of 600,000 disability claims that had not yet been processed. **Figure 7** is a national map of 160 VA hospital sites, 19 of which were targeted for shutdown. A de facto construction moratorium was begun in 2001 under the Capital Asset Re-

alignment for Enhanced Services (CARES) process, which has had a terrible effect. The recent national scandal of the poor conditions at the venerable Walter Reed Hospital in Washington, D.C., makes the point. The number of VA hospitals and specialty centers should be increased, not decreased, and the whole system must be upgraded. In July 2004, then VA Secretary Antony Principi testified to a House Committee hearing that approximately \$1 billion a year for the next five years was needed to modernize the VA medical infrastructure.

The Veterans Coalition "Independent Budget" estimate for FY 2008 calls for \$1.602 billion in funding for major construction projects, and another \$541 million for minor construction projects. On top of this, another \$1.6 billion is needed for nonrecurring maintenance, such as upgrades of electrical systems, roof repairs, and so on, to make up for the lack of funding for such maintenance in previous years.