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Report on I-35W collapse raises new concerns

Barry B. LePatner

It's been more than a year since the collapse of the I-35W Bridge in Minneapolis. And now, the National Transportation Safety Board (NTSB) has concluded from its investigation that the steel gusset plates originally designed in the mid-1960s to reinforce the bridge's joints were half an inch too thin; and that the probable causes for the collapse were additional modifications to the original design, which added substantial weight to the bridge, and the weight added by construction materials placed on the bridge by a contractor just prior to the collapse. That's it. And if you're thinking, "Surely, there was more to the collapse than that," you are right. And by ignoring the other (extremely critical) factors, the NTSB is perpetuating a problem that puts millions of Americans in danger every day. (See articles elsewhere in this issue of *Bridges* about NTSB recommendations and the University of Minnesota's study of the I-35W Bridge collapse.)

The NTSB is severely neglecting its duty to protect Americans. By placing the sole blame for the bridge collapse on the gusset plates and the added weight factor, the Board has ignored the inefficiency and irresponsibility among the government agencies responsible for the bridge, which also contributed to the disaster.

At the heart of many of these problems is the Minnesota Department of Transportation (MnDOT), which (and here's a scary thought!) has long been considered one of the better state transportation departments in the country. Basically, MnDOT failed to protect the public from a preventable disaster that was long in the making. And the problems faced by MnDOT are far from isolated. Transportation departments everywhere are struggling to keep the highways and byways that connect this nation in working order.

We must put these struggles in perspective: There are 12,000 bridges in our country whose designs are similar to the I-35W Bridge. Furthermore, according to statistics from a 2007 U.S. Department of Transportation/Research and Innovative Technology Administration report, there are more than 72,000 bridges that are labeled "structurally deficient" and more than 81,000

bridges identified as "functionally obsolete." Every one of these bridges needs detailed inspections to ensure its safety.

One important factor contributing to the poor state of America's infrastructure is the seeming irresponsibility and inefficiency exhibited by those who have been elected or appointed to government positions that supposedly exist to ensure the safety of the public. To illustrate, following are several red flags that should have warned MnDOT and other officials that the I-35W bridge was in trouble, but instead were ignored, misunderstood, or simply not acted upon in time:

- The I-35W Bridge was first rated as "structurally deficient" in 1990. Despite annual reports describing a continuing section loss and build up of corrosion at key places, as well as the attention of a number of consultants who recommended substantial remedial action be taken, at no time between 1990 and its collapse in 2007 was the I-35W Bridge's condition ever raised above its "poor" rating.
- Photographs exist of gusset plates "bowing and arcing" as early as 2003, but the photos, taken by MnDOT consultants, were apparently dropped into a file folder and forgotten. MnDOT inspecting engineers did not deem these red flags to be serious enough to command attention.
- In 1996, a bridge on I-90 outside of Cleveland with a structure similar to the I-35W Bridge collapsed as a result of improper gusset plate design. But although a) federal officials investigated this serious failure, b) an official report from outside engineers was filed indicating that the gusset plates did indeed contribute to the bridge's collapse, and c) Civil Engineering magazine published an article in 1997 detailing the Ohio bridge collapse, officials at MnDOT denied ever having heard of the Ohio bridge failure and said they were unaware of any prior problems with gusset plate design.
- Discussions concerning the need to add redundancy to the I-35W Bridge had been underway years earlier—but action was never taken. And, in fact, MnDOT instead scheduled redecking work that overloaded sections of the bridge, and, according to the NTSB, contributed to the eventual failure of the gusset plates.

Of course, none of this is meant to imply that Minnesota is the only state experiencing serious problems with its infrastructure. The Colorado Department of Transportation has acknowledged that the cost to replace or rehabilitate 125 state bridges rated in poor condition in the state is \$1.4 billion. Yet, bridge repair funding, a critical element in reducing the number of bridges that are considered structurally deficient, has been reduced from \$32 million in 2007 to \$18 million for 2009.

Or consider a story out of Georgia in which reports identifying several bridges as hazardous were thrown away. Why? Because the official in charge said handling the problem would have required too much paperwork and involved too many people. Stories like this one are clear indications that Minnesota isn't the only state that has had its political head in the sand regarding its infrastructure problems.

Clearly, solving our infrastructure crisis will require more than a few patches here and there. In 2005, the American Society of Civil Engineers (ASCE) estimated that the cost of making the

upgrades, repairs, and expansions needed on the U.S. bridge system will be \$9.4 billion per year for 20 years. The report also said the U.S. road system required \$92 billion per year for maintenance and \$125.6 billion per year for improvements—an updated report from the ASCE in 2009 will likely reflect an even larger cost for these repairs.

And even if our cash-strapped government could come up with the money and ensure that it's properly applied, there's little indication that builders could get it done at that price. The construction industry itself has been rife with problems for quite some time now, wasting an estimated \$120 billion each year. Those problems have easily flooded over into public projects, the prime example being the Big Dig and its billions of dollars in cost overruns.

We must begin taking steps, right now, to shore up America's infrastructure. Not to do so is to invite more death and destruction. Every engineer in the field of bridge design can testify that the corrosive effects of inadequate maintenance of our bridges and tunnels will only get worse—they are not self-healing. And while the problem is far too massive and widespread to repair overnight, we can take steps now to start chipping away at it.

We must do everything in our power to end the downward spiral of our nation's infrastructure. As the incoming Obama Administration prepares to tackle America's ailing economy, it should make repairing the nation's infrastructure an important part of those plans. Doing so will not only help prevent future catastrophes; it will actually contribute to our nation's prosperity.

Every \$1 billion in infrastructure spending is estimated to create 47,000 new jobs, a critical factor at a time when our unemployment rate is at a 14-year high. By taking the steps necessary to tackle our infrastructure problem now, we have an opportunity to improve our economy with the great return on investment of a better, safer infrastructure system that will lead to a stronger nation."

Barry B. LePatner is founder of the New York City-based law firm LePatner & Associates LLP. For three decades, he has advised clients on business and legal issues affecting the real estate, design, and construction industries. He is coauthor of *Structural & Foundation Failures* (McGraw-Hill, 1982, coauthored with Sidney M. Johnson, P.E.) and author of *Broken Buildings, Busted Budgets: How to Fix America's Trillion-Dollar Construction Industry* (The University of Chicago Press, 2007).