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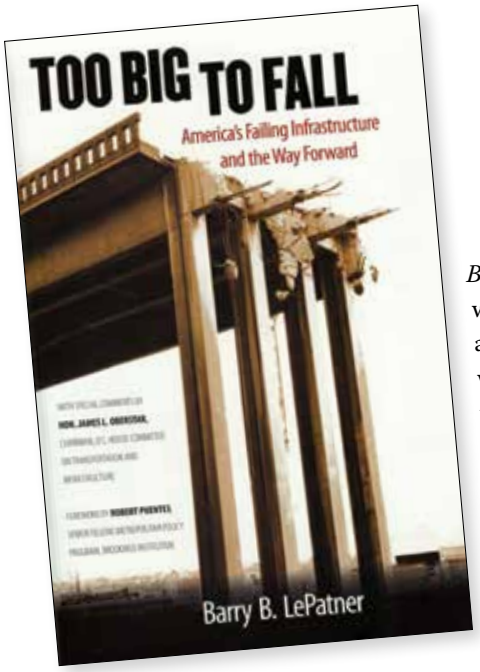
Although this may seem like a broken record, we never get enough funding for capital renewal needs (and APPA members are not the only ones with the complaint.) The federal government temporarily "solved" the problem in December 2015 by passing the Fixing America's Surface Transportation (FAST) Act. Unsurprisingly, they didn't solve much.

For decades, those of us in educational facilities have been talking about the growing problem of deferred maintenance, now called "accumulated capital renewal" (ACR) by APPA. Beginning in the mid-1980s, Harvey Kaiser wrote about the topic extensively and developed a manual to determine capital renewal needs for a building or campus. In 1997, Matt Adams studied and described nine different approaches to addressing the problem in *Successful Funding Strategies for Facility Renewal*. Then in 2010, Harvey Kaiser and Eva Klein wrote *Strategic Capital Development: The New Model for Campus Investment,* which described six principles for facility stewardship and which they applied in a highly successful program for the University of North Carolina system. Despite all this great writing, the problem hasn't been solved. We continue to talk about the deferral (or ignorance of) maintenance by others that we identify as both a "ticking time bomb" and a threat to our education delivery system.

In general, higher education has been fortunate. Deferred maintenance has, for the most part, been viewed as an issue of image and very seldom resulted in major injury or loss of life. These organizations, with limited resources and a much larger primary mission (teaching, research, and public service), have been able to avoid the sort of catastrophes described in *Too Big to Fall*. Needless to say, the problems are similar and ongoing.



TOO BIG TO FALL: AMERICA'S FAILING INFRASTRUCTURE AND THE WAY FORWARD

Barry B. LePatner, Foster Publishing, New York, NY, 2010, 185 pp., hardcover, softcover, and Kindle.

Previously, I reviewed LePatner's *Broken Buildings, Busted Budgets*, which described and attempted to analyze the problems associated with the construction industry. In that book, he claimed problems and cost overruns arise in large part from an industry that has not seen fundamental changes in how its product is delivered for millennia. He recommended the use of the design-build (DB) project delivery method to control project costs.

The DB has become more common in public settings. But DB should not be the only tool one uses to control construction costs—there are other tools.

As educational facility professionals know, the accumulation of capital renewal over time is a result of Mother Nature wearing out what architects and engineers design, constructors build, and occupants use. It is a complex problem requiring sophisticated solutions.

In *Too Big to Fall*, LePatner presents in extensive detail, with a very nice set of footnotes and references, the challenges the U.S. bridge and highway infrastructure faces. There are some significant parallels between this infrastructure and higher education facilities.

These problems are not new. LePatner uses a great deal of information from state departments of transportation and the American Society of Civil Engineers (ASCE), which has produced a regular report card of public infrastructure including roads and bridges for many years. Their reports present the same enormous, unmanageable costs to address infrastructure needs that APPA members have presented with the same results: "The costs are too great, the infrastructure is working well enough anyway, there are other things to spend money on; it's not a priority." It's the same story, just on a different scale.

Interestingly, LePatner cites inspection proto-

cols as an area in need of significant improvement. While some states have developed and acquired sophisticated systems to assess road surfaces, the method to inspect bridges where a catastrophic failure has resulted in significant loss of life is still often handled by nonprofessionals (and in LePatner's opinion) using insufficiently scientific methods. Maybe APPA and its members have a leg up on local DOTs and can provide some assistance.

LePatner provides several recommendations to solve our road and bridge infrastructure needs. Although the need for additional funds is mentioned repeatedly, the recommendations also include protocol improvements for inspections, identification of problems, development of a national database of problems (to learn from the failures of others), and increased professionalism in highway departments. These are all logical and needed recommendations. Unfortunately, I think he misses one important recommendation—in an area where APPA has taken a lead role.

Politicians, like trustees and donors, like having their picture taken at a ribbon cutting, but they usually stop being involved when renewal costs are needed. As described in *Buildings...The Gifts That Keep on Taking* (Rose *et al.,* 2007), the cost of new building construction is less than one-third the cost of having the facility available for its intended life. Though I know of no similar study of road and bridge ownership costs, the total cost of ownership (TCO) should be discussed before a new road or bridge is approved and constructed—just as some APPA leaders have advocated TCO be considered before a building is approved.

There may be limited use of *Too Big to Fall* for most facility officers; there are few campuses with extensive road networks and a small number have bridges. Given that LePatner has only written about two major public infrastructure types, I'm waiting to see if he tackles other infrastructure that has similar problems with decay and lack of funding: dams, levees, marine structures, water distribution, collection, and treatment systems, and other systems that serve the public and economy but which are ignored (out of sight, out of mind) until the system fails. Maybe he's working on the topic already.

If you're looking for a well-written but somewhat tedious book on infrastructure, particularly if you're a facility officer who has many or all of these systems in your purview, read *Too Big to Fall*. Get scared, consider the implications of non-building deferred renewal needs, and then start thinking of solutions that will solve your problems.

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