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Concrete Technologies Are Not Standing Still: Let's Ensure Any Changes Are Improvements

William N. Nickas, *Editor-in-Chief*

Recently, at the midyear meeting of the American Association of State Highway and Transportation Officials (AASHTO) Technical Committee on Concrete (T-10), someone asked me which changes in the bridge industry have me most excited. That is a tough question.

Concrete technologies are not standing still. Early adopters are trying out the newest admixtures that may enhance concrete placement, densify the concrete, or increase its strength. Researchers, owners, and contractors are also exploring the use of fibers that change the structural behavior of concrete. Combining these sorts of innovative materials with traditional ones, and with some new strand and reinforcing bar technologies, will likely increase the service life of newly constructed structures.

Today, there is an urgent need to improve our productivity. When comparing staff hours per unit of solution or service provided, industries such as agriculture, manufacturing, and logistics have far outpaced construction. Clearly, there is a business case to be made for new tools and technological changes that will help construction concrete staff work more efficiently and improve the infrastructure of the concrete bridge sector of the economy.

One exciting area of innovation is artificial intelligence (AI). Rebar-tying machines and three-dimensional printing are already applying AI. These new technologies show that AI does have place in our bridge construction and operating world—we just have to figure out what its role will be and where AI fits best in our work processes.

We also have to make sure that those who will work in our industry are educated and trained appropriately to apply logic and good judgment in their work decisions, particularly as they encounter new technologies, new tools, and new ideas. Today, our newest workforce members have access to lots of data, but they may not be able to make sense out of

all the information. As we equip our workforce, our challenge is to communicate the right information and at the right time. To upgrade our bridge construction workforce, we must take full advantage of information technology. For example, a project control system using Bridge Information Modeling gives everyone working on a project the opportunity to sequence the information to match the workflow and systematically retrieve data for decades to come.

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I firmly believe our bridge community should always evaluate the possible advantages and risks involved in technological changes in the context of predetermined goals toward improvement. The newest materials that are becoming available for improving concrete structural performance offer a tremendous opportunity to simplify many details, but new technologies may require rethinking some structural tenets such as phi factors, redundancy, or ductility. We must understand how the newest details and materials work, and what costs and risks are associated with their use.

In a perspective published in the Summer 2014 issue of *ASPIRE*[®], Dr. Ben Greybeal predicted that certain “transformational innovations” would dramatically improve concrete construction in the near future. I can see now that his envisioned future is coming true. Thank you for your readership and the opportunity to showcase concrete bridge solutions. In 2019, *ASPIRE* will continue to share the news of our industry and help you understand the latest standards, technologies, and trends that affect us all. 

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Cover
The Ted Williams Parkway Pedestrian Overcrossing features unique columns that match the wall structures in the neighborhood.
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