

# Advancing Sustainable Solutions—Together

by Emily Lorenz

The idea of incorporating sustainability into all phases of bridge design and asset management may seem daunting. With shorter schedules, lower budgets, and fewer employees, most agencies are reluctant to take on additional work. Yet the risks due to climate change and related policies have forced many to consider how to incorporate sustainability into bridge design, construction, maintenance, and end-of-life scenarios. For National Concrete Bridge Council (NCBC) members and others, the question is how to incorporate sustainability in the least painful and most expeditious way.

That question was advanced in November 2022, when NCBC members attended the Second Workshop of the Federal Highway Administration's (FHWA's) Concrete Pavement and Materials Technical Feedback Group (CPM-TFG) in Austin, Texas. Although the CPM-TFG hosted the workshop, NCBC members were invited by the FHWA Office of Bridges and Structures. Thus, the invitation demonstrates the partnerships among FHWA's various offices and points to the considerable challenge that all federal agencies face when it comes to the rapid implementation of more-sustainable solutions.

The work done to date on the pavement side of the FHWA may prove to be a perfect example for a similar program for bridges and structures.

### The Push to Reduce Negative Impact

Several recent federal, state, and local initiatives are driving the push toward more-sustainable solutions. Federal initiatives that involve FHWA include the following:

- FHWA issued a vision for pavements:

“To advance the knowledge and practice of designing, constructing, and maintaining more-sustainable pavements through stakeholder engagement, education, and development of guidance and tools.”<sup>1</sup>

- The White House has set economy-wide targets to reduce U.S. greenhouse gas emissions by 50% by 2030 and 100% by 2050 (based on 2005 baseline).<sup>2</sup>
- The Federal Buy Clean Initiative was announced in September 2022.<sup>3</sup>
- A carbon reduction program was created through the Bipartisan Infrastructure Law.<sup>4</sup>

These initiatives are spurring agencies, academia, consultants, and industry to share solutions and challenges related to implementing programs to reduce negative environmental impacts.

### Technical Working and Technical Feedback Groups

FHWA has a few tools available for collaboration with outside entities. Two of these options, Technical Working Groups and Technical Feedback Groups, are used within their Sustainable Pavements Program office.<sup>5</sup> The Sustainable Pavements Technical Working Group has been in existence for more than 10 years and is currently working on its third strategic plan. Through the Sustainable Pavements Program, resources have been developed for industry, including a pavement life-cycle assessment tool, webinars and technical presentations, technical documents, and funding to assist agencies in quantifying the emissions of sustainable pavements through the FHWA Climate Challenge.<sup>6</sup>

While not all of these resources are directly applicable to concrete bridges, many of them are. The remainder serve

as models for bridge-specific resources that could be valuable to the industry in its quest to quantify and reduce the negative sustainability-related impacts of bridges.

The FHWA pavements office has two Technical Feedback Groups: one for asphalt and one for concrete. The CPM-TFG was formed

*to discuss program-level challenges and opportunities concerning the performance and sustainability of concrete pavements. The CPM-TFG is a forum for discussion and for stakeholders to provide technical information to the FHWA.*<sup>7</sup>

### Sustainability Focus

Although the mission of the CPM-TFG is not specific to sustainability, its first two workshops (held in May and November 2022) focused on achieving sustainability throughout the pavement life cycle while ensuring that pavements meet and exceed performance requirements. The following are key action items for FHWA from the May 2022 workshop:

- Advocate for easier, low- to no-cost substitutes for portland cement, such as portland-limestone cement.
- Provide education for various stakeholders related to improving the sustainability of concrete pavements.
- Focus on life-cycle-based methods for quantifying the sustainability of concrete pavements.
- Supply or supplement funding for demonstration projects related to more-sustainable pavement solutions.

These take-aways shaped the FHWA's objectives for the November workshop, which were as follows:

- Learn about ongoing efforts across stakeholder groups (agencies, academia, consultants, and industry).
- Communicate FHWA's posture and direction.
- Advance strategies across the pavement life cycle into quantifiable, practical, and implementation-ready approaches to reduce climate impacts.

The value of the CPM-TFG is in encouraging stakeholder groups to communicate how they can help FHWA meet its goals, while identifying barriers and requirements for implementation.

### What about Bridges?

There is much to applaud in the pavement industry's efforts to improve its sustainability, and there is also much to learn. The Sustainable Pavements Program can serve as a model for the bridge community to create its own framework for quantifying environmental impacts and to develop practical and implementation-ready tools for all stakeholders.

This model for stakeholder engagement, technology and knowledge transfer,

and partnership between FHWA and the concrete bridge industry is a perfect starting point for change. There are several challenges ahead, such as resistance to change and lack of data, but we have also been given a gift. The greatest implication for all NCBC members is that we do not have to re-create a program. The basics are already there, in the Sustainable Pavements Program.

### References

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