

FHWA Partnerships to Advance Bridge State of Practice



by Reggie Holt, Federal Highway Administration

The Federal Highway Administration's (FHWA's) responsibility is to provide infrastructure policy, investment, management, stewardship, and oversight leadership as it expands and preserves the nation's multi-trillion dollar investments in highways with a priority on public safety. FHWA positions itself and the transportation community for the future by executing coordinated research efforts and promoting technologies that modernize project development, materials testing, construction practices, and the transportation workforce. This includes training the FHWA workforce to understand and embrace new and innovative ways to achieve the results that the public expects and deserves.

Need for Partnering

FHWA's Office of Bridges and Structures routinely partners with its stakeholders to fulfill the role stated previously. These stakeholders typically include bridge owners/departments of transportation, industry, academia, contractors, and design practitioners. Partnerships with these stakeholders are essential in identifying and developing technologies that can effectively advance the state-of-practice. FHWA typically engages its stakeholders by including them on technical working groups that give input to strategic planning and on technical review panels that guide and review progress on specific work initiatives. Cooperative agreements are another mechanism used by FHWA to facilitate partnerships with its stakeholders. Cooperative agreements are contractual agreements in which both parties agree to share the cost and technical development responsibilities for a particular project.

Recent Partnering Successes

FHWA's Office of Bridges and Structures has many technology deployment projects that are either under development or recently

completed and that engage our stakeholders. A technology needs to satisfy many diverse requirements to be successful. It needs to

- address an important need,
- be technically sound,
- perform well, and
- be implementable with our nation's workforce.

These requirements cannot be met without interaction and input from stakeholders representing multiple groups in the bridge community.

The following sections list a few recently completed projects that benefited greatly from having stakeholder involvement. Using the four projects listed as a sample to gauge stakeholder involvement reveals that a total of 32 stakeholders were used with representation from bridge owners, academia, practitioners, and industry. This stakeholder outreach is actually greater than the numbers shown due to inter-relationships between many stakeholders, for example, industry organizations

include multiple practitioners, owners, and academic members.

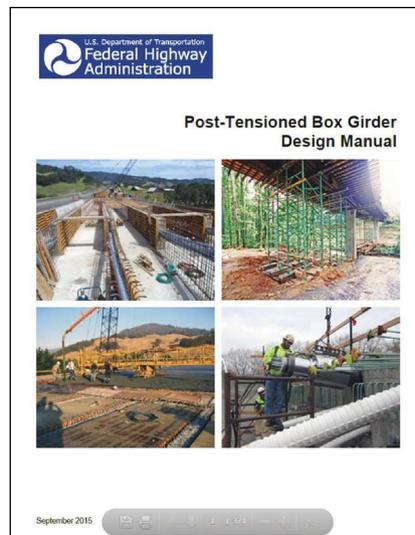
Post-Tensioned Box Girder Design Manual

Many within the bridge design community expressed the need for up-to-date design guidance on post-tensioned (PT) box girders. The last published guidance on this topic was the *Post-Tensioning Institute's (PTI) Manual* published in 1972. The design of this type of bridge has significantly changed since the publication of this design manual and new guidance on the current state-of-practice was greatly needed.

To address this need, FHWA developed a new comprehensive manual through a cooperative agreement with Lehigh University and Corven Engineering. Stakeholders were involved in the review and development of this manual through review panel participation and a cooperative agreement contract.

Another partnering feature for this manual will be its future maintenance. Two industry partners, PTI and the American Segmental Bridge Institute (ASBI), will be forming a new joint committee on PT bridges, which will maintain and expand the content in this manual.

An electronic version of this manual is available at <http://www.fhwa.dot.gov/bridge/concrete/hif15016.pdf>.



All Figures: Federal Highway Administration.

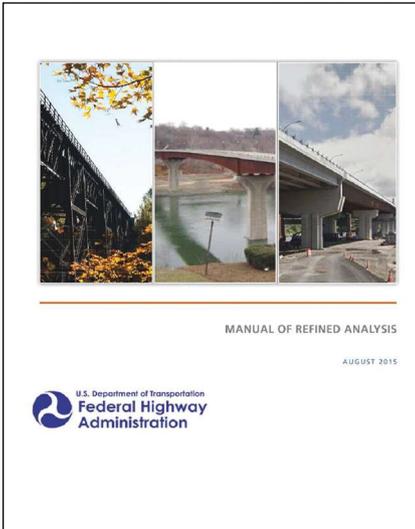
List of Stakeholders

Academia: Lehigh University

Departments of Transportation: California (CALTRANS) and Kansas (KSDOT)

Practitioners: Corven Engineering, Michael Baker, Buckland and Taylor

Industry: PTI and ASBI



Manual on Refined Analysis

A international scan (whose study team was made up of multiple U.S. stakeholders) determined that engineers in the United States lagged behind their European counterparts in the use of advanced modeling tools and procedures to design and assess bridges. In an effort to expand the use of refined analysis in the United States, FHWA is developing a new comprehensive manual on refined analysis through a cooperative agreement with Lehigh University and Modjeski and Masters.

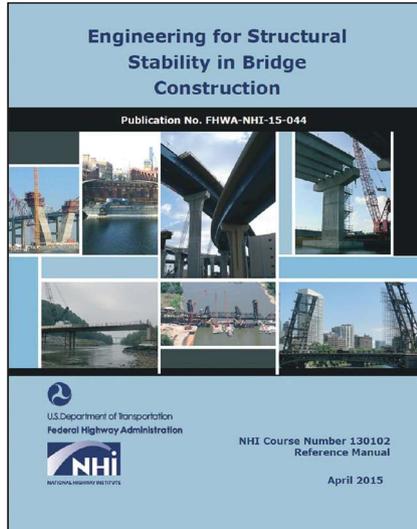
Stakeholders were involved in the review and development of this manual through review-panel participation and a cooperative agreement contract. A draft version of the *Manual on Refined Analysis* is currently available online for review and comment https://www.fhwa.dot.gov/bridge/refined_analysis.pdf. For more information, see the article by Holt and Kozy in the Fall 2015 issue of *ASPIRE*.™

List of Stakeholders

Academia: Lehigh University
 Departments of Transportation: California (CALTRANS) and North Carolina (NCDOT)
 Practitioners: Modjeski and Masters, HDR
 Industry: Precast/Prestressed Concrete Institute (PCI) and National Steel Bridge Alliance (NSBA)

Engineering for Structural Stability in Bridge Construction Manual and Training

There is large disparity in the standard of care that different engineering professionals will employ for the verification of bridge



erection procedures. The bridge community identified a need to develop and disseminate guidance and criteria to improve structural safety in the construction process. The objective of this guidance and course is to educate engineers on the behavior of steel and concrete girder bridges during construction.

It also endeavors to teach them to identify vulnerabilities and engineering methods to investigate the structure's strength and stability at each critical stage. This is done within the practical context of engineering, development, verification, or review of erection plans. Stakeholders were involved in the review and development of this manual and training through review panel participation.

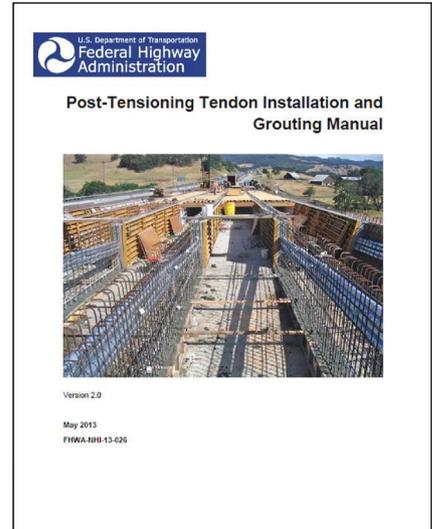
An electronic version of this manual is available at <http://www.fhwa.dot.gov/bridge/pubs/nhi15044.pdf>. In addition, training can be scheduled through the National Highway Institute (NHI) at http://www.nhi.fhwa.dot.gov/training/training_products.aspx (enter course 130102).

List of Stakeholders

Academia: University of Texas
 Departments of Transportation: Pennsylvania (PENNDOT), Florida (FDOT), and Kansas (KDOT)
 Practitioners: Collins, Genesis Structures, HDR
 Industry: PCI, High Steel/Concrete, NSBA

Post-Tensioning Tendon Installation and Grouting Manual and Training

FHWA published the first version of this manual back in 2004, however many



advancements have been made in PT systems and testing since this publication. In order to provide guidance on the most recent PT technologies, this manual was recently updated and released along with new web-based training.

This guidance and training deploys the latest in PT technology to individuals involved in the design, installation, grouting, and inspection of PT tendons in prestressed concrete bridges. Stakeholders were involved in the review and development of this manual and training through review panel participation.

An electronic version of this manual is available at <https://www.fhwa.dot.gov/bridge/construction/pubs/hif13026.pdf>. In addition, training can be scheduled at http://www.nhi.fhwa.dot.gov/training/training_products.aspx (Enter course number 130103).

List of Stakeholders

Departments of Transportation: Minnesota (MNDOT) and Texas (TXDOT)
 Practitioner: Corven Engineering
 Industry: ASBI, PTI, PCI, GTI, and VSL

Future Partnering Opportunities

A large number of stakeholders were involved with the previously listed projects. FHWA understands that in order to effectively advance the state-of-practice for our nation's bridge community it needs to maximize engagement and collaboration with its stakeholders. FHWA has had great success working collaboratively with its stakeholders on past projects and plans to continue to keep our stakeholders significantly involved in future projects. ▲