



## TEAM UPDATES – NOVEMBER 2016

### Carbon Fiber Reinforced Polymer Strands (CFRP)

#### Activity by Lead States Team Member Agency:

- **VDOT:**
  - **FHWA Approval** – VDOT is actively pursuing use of CFCC or CFRP, particularly in marine areas. Sole source and other requirements for approval, including FHWA, are nearly complete. Approval for use is expected by January 2017. Approval will allow VDOT projects to routinely incorporate CFRP reinforcement. Agency is also working with producers on cylindrical spun and static cast pile applications.
- **Michigan DOT:**
  - **Status of Projects:**
    - **M-66 over West Branch River** (12" CFCC prestressed box beam superstructure) – Bridge construction was complete in October 2015.
    - **M-100 over the Sharp Drain** (17" CFCC prestressed box beam superstructure) – Bridge is currently set for beam fabrication to commence in May 2016, with a final bridge completion scheduled for October 2016.
    - **M-86 over Prairie Creek** (42" CFCC prestressed bulb-T beam superstructure) – Fabrication of beams complete, project currently under construction, with beams scheduled to be set in late October 2016.
    - **I-75 SB over Sexton Killfoil Drain** (72" CFCC prestressed bulb-T beams) – Completed design, and material procurement contract for CFCC prestressing strands. Beams scheduled to be fabricated in April/May 2017.
    - **M-3 over I-94** (72" CFCC prestressed bulb-T beams) – Design nearly complete, will be putting together a materials procurement contract for early 2017, with construction anticipated in 2018.
  - **Additional Bridges Under Study** – Working on the study/design of an additional bridges along the I-94 and I-75 corridors for construction in 2018.
  - **New Laboratory Work** – Dr. Nabil Grace, through a research project for Michigan DOT, has conducted a battery of laboratory experiments and numerical simulations to support the flexural and shear for prestressed beam design guidelines. Dr. Grace has also provided QA on the designs done thus far.
  - **Guide Specification Status** – NCHRP 12-97: Guide Specification for the Design of Concrete Bridge Beams Prestressed with CFRP Systems is roughly 60% complete, and the research advisory panel will be meeting in Houston, Texas, May 19-20, 2017. The specification, when complete, will go to AASHTO SCOBS for ballot.
  - **Presentations** – Updated All effort at AASHTO SCOBS 2015 annual meeting (Chynoweth), 2016 ACI meeting (Grace), and Michigan DOT innovations meetings (Chynoweth/Chaput).
  - **New Vendor Facility** – Working with MDOT, and the Michigan Economic Development Corporation (MEDC), Tokyo Rope USA will be opening a CFCC manufacturing facility in Canton, MI, in October 2016.



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- **Ohio DOT:**
  - **New Bridge Project** – Ohio DOT’s first CFCC prestressed side-by-side box-beam bridge is now under construction.
  - **Pooled Fund Participation** – Agency’s executive management agreed to participate in a pooled fund re: development of 7/10’s diameter carbon fiber strand that can better compete with the steel equivalent strand.
  - **New Test Under Consideration** – Ohio DOT is considering a scenario in which steel and CFRP options are used on the same project to develop comparative analysis in an identical setting. Preliminary activity to identify a project and work out details is underway.
- **Maine DOT**
  - **Pooled Fund Participation Pending** – Maine DOT is seeking funds to participate in the new 7/10’s diameter carbon fiber strand development pooled fund.

### General:

- **New SCOBS Activity** – Working on the AASHTO Subcommittee on Bridges and Structures (SCOBS) technical subcommittee T-6 – FRP Composites strategic plan. Working with American Composite Manufacturing Association (ACMA) to including industry input, and resources to assist with execution. Matt Chenoweth will brief a representative of ACMA on A.I.I. effort, inviting participation in appropriate team outreach, research or other development efforts. Rolled out draft T-6 strategic plan at AASHTO SCOBS 2016 annual meeting, and facilitated meeting (Chynoweth). Presentation of research and design specification progress (Dr. Nabil Grace)
- **A.I.I. Website Enhancements** – The team is preparing a query template to populate brief synopses of active/ complete projects nationwide (and possibly internationally). Team is also culling existing video footage and recent internal media for new video resources to post to website.
- **State Project Spotlights/Specification Resources** – Florida DOT is continuing comparisons using CFRP as retrofit on certain bridges along with steel strands with wax-filled tendon duct.
- **Conference Attendance/Presentations** – Dr. Nabil Grace/MI attended ACI, and participated in ACI 440 (Fiber Reinforced Composite Committee) meeting.
- **AASHTO Committee Activities** – See Michigan DOT SCOBS activities, above.

### Watershed Resources Registry (WRR)

#### Outreach:

- **East Coast Bay States** –
  - Two meetings have been held with Delaware.
  - One meeting has been held with West Virginia and one more is planned in December 2016.



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- Pennsylvania outreach continues, with several meetings taking place. Team member, U.S. Environmental Protection Agency (EPA), is leading this outreach. Pennsylvania has held multiple meetings internally and is making progress in building an effective team.
- Virginia has had some issues with incorporating existing GIS mapping tools with WRR, so continues to work through that phase/challenge.
  - The team is supporting expansion of the use of WRR within Maryland DOT to get other business units within the agency engaged. A training workshop was held in October and one more is to be held on November 9. The latter includes 43 registrants, representing a mix of consultants and State agency representatives, including resource and regulatory agencies, as well as variety of business units within Maryland DOT. New data layers are being added to Maryland's existing platform.
- **New Workshop Planned** – The team is evaluating a West Coast workshop in May 2017 as a tag-on to the National Mitigation and Ecosystem Banking Conference (<http://mitigationbankingconference.com/>). Federal agencies such as NOAA, EPA, Corps of Engineers, and Fish & Wildlife are among sponsors. The team may request that WRR become the subject of a conference workshop session. If not, the workshop may be offered as an adjunct session the day before or after the conference, helping limit reimbursable travel expenses for attendees to a hotel night extension.

### General:

- **Website** – The team is reviewing its existing web page for updates, including a planned interactive map of States engaged in adopting or investigating.
- **Wrap Up** – The WRR team expects to begin to wrap up in December 2017. It will meet at least quarterly until then, or more often as needed for the possible West Coast workshop or other outreach.

## e-Construction

### Outreach:

- **Peer Exchanges** – Michigan DOT has participated in approximately seven peer exchanges (includes virtual and on-site) to date.
- **Contacts** –
  - Total contacts under EDC3 / AASHTO Innovation Initiative activities include all 50 State DOTs plus Ontario and Nova Scotia, as well as FHWA reps from multiple States.
  - States/agencies contacting MDOT directly include 30 DOTs plus Western Federal Lands
- **Webinars** – Michigan DOT has so far hosted four out of the eight planned EDC-3 [webinars](#). The last four will occur during Fall 2016 and Winter/Spring 2017.
- **Workshop** – Michigan DOT hosted a regional e-Construction workshop in 2016. The total number of participants was 119, which included people from eighteen State DOTs, six FHWA Regional offices, AASHTO, one Local government, six consultant/industry companies and thirteen vendor companies.



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- **Pilots/Partnering** – Michigan DOT is partnering with local agencies to continue the e-Construction initiative. In Summer 2016, MDOT had approximately 50 local agency pilot projects across the State. The pilots were successful and MDOT will continue to encourage local agencies to participate in upcoming electronic submittals.

### General:

- **ROI** – The team is partnering with FHWA and other State agencies on FHWA’s research project, to investigate an ROI framework for e-Construction.
- **In Practice** – Michigan DOT has applied e-Construction routinely to design-bid-build projects, while the Minnesota, Florida, Utah, Texas, Pennsylvania, and North Carolina DOT have applied this technology to design-build projects. Wisconsin and Iowa DOT have applied e-Construction to design-bid-build projects.

## Plans on Demand (POD)

### Outreach:

- **Survey** – The team conducted a survey of target agencies and compiled results in the first half of 2016, through which to determine outreach activities.
- **Presentation** – The team also presented at the ESRI Users Conference in July 2016.
- **Engagement** – As of mid-year, New Hampshire, Colorado, California, Utah, and the District of Columbia were identified by (now former) team member, Nina Safavi, as implementing Plans on Demand or using it to inform their agencies’ current systems, with Missouri, Nebraska, Ohio and Wyoming considering the possibility (demonstrations have been provided and follow up conducted). Arizona Lead States Team members recently contacted other POC’s who had shown interest; no further uptake was reported.

### General:

- **Close-Out** – The team is preparing its close-out report.