Advances in Fiber-Reinforced Polymer (FRP) Composites

NCHRP 20-68A U.S. Domestic Scan Program

Domestic Scan 13-03

SCOBS 2017

Spokane, WA
Advances in FRP Composites

- Scan conducted as a part of National Cooperative Highway Research Program (NCHRP) Project 20-68A, the U.S. Domestic Scan program

- The program was requested by the American Association of State Highway and Transportation Officials (AASHTO), with funding provided through the NCHRP

AASHTO / NCHRP
U.S. Domestic Scan Program
What is a Domestic Scan?

- Information exchange
- Identifies state of practice
- Identification of barriers
- Recommendations
- Dissemination of Information
Scan Team

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AASHTO / NCHRP  
U.S. Domestic Scan Program
Scan Team & Host States

West coast scan
Mid July, 2015

East coast scan
1st week of June, 2015

Team Member Home State
Host Agency State
Focus is on Owners’ Needs
not technology for technology’s sake

What did we find - DOTs using composites as a tool
to solve common problems:
• Service life
• Preserving existing bridges
• Mitigating or preventing corrosion
• Reducing delays
• Versatile material affords unique opportunities

FRP is not a product; it is a class of material that can be tailored and deployed in
different ways to solve infrastructure problems
What’s in a Scan Report?

Intended to be a practical resource identifying:
• Uses on new construction (22)
• Uses on existing infrastructure (14)
• Which uses are “practice-ready”
• Barriers / lessons learned
• Suggestions to T-6
• Resources:
  – Case studies, specs, plans
  – Contacts
  – Bibliography

www.domesticscan.org
How are DOTs using FRP?

**Existing Bridges**
- Concrete repair
  - Truck impacts
  - Corrosion
- Concrete Strengthening
  - Design issues
  - Increase capacity
- Seismic retrofit
- Heritage structures
- Preservation activities
- Timber, steel, aerodynamic

**New construction**
- Deck reinforcement
- P/S strands (in beams & piles)
- Beams & slabs
- Fender piles
- Bridge components – drains, fairings
- Unique problems
## Readiness

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<th>Status of the Technology</th>
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Existing Bridges
Strengthening & Repair of damaged Structures
Existing Bridges
Strengthening & Repair of damaged Concrete
Existing Infrastructure
Repair of impact-damaged ancillary structures
Existing Bridges
Culvert liner
New Components & Systems
Concrete reinforcement
New Components & Systems
Concrete prestressing
Hybrid superstructure systems, concrete-filled FRP tubes
New Components & Systems
Bridge Drains and Scuppers
New Components & Systems
Marine Fenders (piles & wales)
What’s holding us back?

- Guidelines & examples
- Training and experience
- Education
- Proprietary products
- Information sharing
- Collaboration
- Performance history
- Research
Scan Team suggestions

1. Guidelines
2. Design examples
3. Training
4. Track FRP use
5. Share information
6. Webinars
7. Targeted Research
8. Team on an FRP strategy