

## TRIENNIAL STRATEGIC PLAN (TSP)

**Evaluation Period: February 1, 2015 to January 31, 2018**

*Please note that rows and boxes below expand as you enter the information*

### PART 1: Committee Name and Scope

*This is an opportunity to review the officially approved name and scope that are posted on the TRB website and consider any necessary changes. If changes are needed, include the proposed scope statement and/or name and justification for the changes.*

**NOTE: A proposed committee name and/or scope change must have the approval of 2/3 of the official members of the committee. The balloting done at a committee meeting that has less than 2/3 of the members in attendance must be augmented with e-mail balloting of the members not in attendance.**

Committee Code *	AFF10
Committee Name *	Standing Committee on General Structures
- Date(s) reviewed	1/8/18
- Change, if proposed***	N/A
- No. of official members approving change/total number of members **	N/A
Committee Scope *	The committee is concerned with the factors that affect the physical behavior, service life, economy, appearance and safety, including the security, of bridges and structures for transportation systems, and the accounting of these factors and their interactions in design procedures and criteria. The specific objectives of this committee include the advancement of new knowledge as it relates to: application of vehicular and environmental loadings; structural movement; safety aspects, operation, maintenance, and natural phenomena; economic considerations including optimization, automation of designs and systems building; aesthetics; and other structure appurtenances. The committee also supports the development of new design concepts and systems.
- Date(s) reviewed	3/3/15 (and concurred at 1/8/18 meeting)
- Change, if proposed ***	The committee is concerned with applications, processes, procedures, practices and research that help better understand and improve bridges and other transportation structures. The committee is interested in technology development and the advancement of knowledge to help address industry challenges. Areas of interest include bridge aesthetics; traffic structures; accelerated bridge construction; bridge safety features, including bridge railing; structural loads and design procedures, including optimization and automation of design methodologies and information modeling; bridge sustainability; and additional topics that do not fit in other specific standing committees.
- No. of official members approving change/total number of members **	25/30

\* Show current, as it currently appears in the [TRB Online Directory](#)

\*\* Includes Chair, Standing Committee Members, Emeritus Members, and Young Members

\*\*\* Show proposed, or Not Applicable

**PART 2: Committee Accomplishments**

NOTE: We have provided much of the information you need for boxes 2.2, 2.4, and 2.7 below and in attachments A, B, and C. We ask that you provide the remaining information.

**2.1**

Year	2015	2016	2017	2018
Number of Members in Attendance at Annual Meeting		20	17	17
Number of Visitors in Attendance at Annual Meeting		34	38	28
Number of Papers Reviewed		15	14	9
Total Number in Attendance at Mid-Year Meeting	NA	NA	NA	

**2.2**

Sessions and workshops sponsored/cosponsored at the Mid-Year meeting, including name of co-sponsoring committee(s) if applicable (by year):

- No Mid-year meetings were sponsored

NOTE: Sessions and workshops sponsored/cosponsored at the Annual Meeting are listed in attachment A. **List** below all sessions and workshops sponsored/cosponsored at Mid-Year meeting, including name of co-sponsoring committee(s) if applicable (by year).

**2.3**

**Provide** title(s) and presenter(s) for informal presentations made at Annual Meeting and Mid-Year Committee meetings (by year):

**2018**

**Design & Full-Scale Testing of M50/P1 Bolt-Down Removable Bollard System – William Williams, Texas A&M Transportation Institute**  
**Scan 15-02: Bridge Scour Risk Management – Hani Nassif, Rutgers University**  
**Bridging the Gap Africa (Update) – Kelley Severns, WSP**

**2017**

**New Approach for Screening Overweight Vehicles – Allowable Ranges of Axle Configuration – Mark Bowman, Purdue University**  
**Impacts of Overweight Trucks on the Service Life of Bridges – Peng Lou, Rutgers University & Paul Truban, NJDOT**  
**Elastomeric Concrete Plug Joints: A New Durable Bridge Expansion Joint Design – Todd Springer & Soundar Balakumaran, Virginia DOT**  
**Bridging the Gap Africa – Bridges for the Walking World – Matt Bowser, WSP & Nate Bloss, CH2M**

**2016**

**Field Investigation of the Performance of Three Bridge Approach Slabs in Oklahoma Using Falling Weight Deflectometer and Dynamic Cone Penetrameter – Dan Zollinger, University of Illinois**  
**Monitoring of a Bascule Bridge during Construction – Matthew Yarnold, Drexel Universtiy**  
**Bridge Operations – Sandra Larson and Ahmad Abu-Hawash, Iowa DOT**  
**Bridge Rail Issues Associated with MASH Implementation – Roger Bligh, Texas A&M Transportation Institute**

**2.4**

**Provide** titles of new research need statements (RNS) posted in TRB's RNS database (by year):

*ID 12520, Bridge Information Modeling for the Lifecycle.2007*

NOTE: Attachment B shows all statements currently posted in TRB's RNS database.

**2.5**

**Provide** title(s) of RNS submitted for funding consideration: None

NOTE: If funded, include research project title/number and name of funding organization(s).

**2.6**

**Provide** titles of synthesis topics submitted (by year): None

NOTE: **List** any synthesis topic(s) funded in a research program.

**2.7**

Membership Make-up: Please see Attachment C provided by TRB for summary details.

NOTE: **Comment** on demographics, balance or lack of balance of membership. Provide an action plan to address any deficiencies. See attachment C for summary details.

The committee is moderately balanced for geography; participation from the Northeast is slightly heavy, the Southeast, South and Central are good, but membership from the West and International is light.

The committee is well balanced with respect to gender and minority participation. Also, the committee is doing well with four young member slots filled and two emeritus members.

The committee is fairly well-balanced with respect to type of affiliation represented, except that there is no local government member.

Action Plan:

Review the attendance lists from 2017 & 2018 to identify individuals who have attended both meetings and based on their location, diversity (including younger members) and affiliation invite them to become members during this next rotation period.

(See Attachment C & 2018 Roster also Attached)

**2.8**

Provide any of the following: None

- Any special publications, such as TR circular, and conference proceedings
- Sponsored or co-sponsored specialty conferences, symposia, workshops, webinars or other joint efforts with other TRB committees, other TRB entities, or other organizations (i.e. AASHTO, FHWA, State DOTs, ASTM, ASCE, and/or other modes of transportation)

### **PART 3: Committee Future Outlook Statement and Committee Three-Year Plan (Limit 1,500 words total)**

#### **Committee Future Outlook Statement**

*The committee future outlook statement should include a discussion of the primary factors and influences that will shape the transportation community and topic(s) within the committee's scope over the short- (one to three years) and long-term (four to seven years). This statement should include:*

- *identification of emerging, critical, and cross-cutting issues **within the committee scope** (these issues could have been identified by the committee, Section, Group, Technical Activities Council, TRB Executive Committee, or other transportation committees and organizations);*
- *identification of emerging, critical, and cross-cutting issues **outside the committee scope** that provide opportunities for liaison and collaborative efforts (these issues could also come from a wide range of sources).*

As the committee that addresses all structures topics that do not fall within the purview of other standing committees, the General Structures Committee will continue to be on the lookout for focus areas that it should incorporate. This will be done with close interaction with the AASHTO SCOBS committee as well as the input from the committee's diverse members.

Factors and influences related to AFF10 present scope are listed below and are categorized according to the parent committee or subcommittee.

#### AFF10 Purview

1. Interest in historic preservation is growing, resulting in a greater need for bridge rail solutions that both provide historic preservation and satisfy safety performance standards.
2. Bridge owners are looking for more effective suicide fences.
3. All stake holders, including designers, owners, and contractors, desire a transition from paper-based project delivery and control to data-based project delivery and control (BIM for Bridges & Structures) including governance issues.
4. Owners face a growing need a desire to achieve sustainability in bridge design and construction.
5. Owners face a growing need a desire to achieve resiliency in bridge design and construction.
6. Owners need to understand how the Connected and Autonomous Vehicles (CAVs) will impact their bridges. CAV truck platoons need to be evaluated against current design code loads – including involvement with Truck Size & Weight.
7. MASH compliant bridge rails, luminaires and small (roadside/ground mounted) sign supports need to be developed.
8. Contribute to TRB Centennial Celebration.

#### AFF10(1) Traffic Structures Purview

9. AASHTO recently adopted an LRFD design approach for traffic structures, assist the traffic structures community in transitioning to the newer design codes (2013 or 2015).
10. The traffic structure community is adopting new fatigue design provisions
11. Concerns about suitability of galvanizing complex weldments persist
12. Safety feature of traffic structures need to be brought up to date with current standards (MASH)
13. Owners need to establish and implement improved construction inspection methods (bolt tightening) for traffic structures.
14. Vibration and durability (i.e., corrosion) are cutting traffic structure life short.
15. Take a leadership role in the maintenance and asset management of traffic structures.
16. Decorative & fluted design shapes need to be incorporated into the design standards.

AFF10(2) Bridge Aesthetics Purview

17. The public is increasingly expectation aesthetic bridge solution, but broad understanding of how to achieve these solutions is lacking.
18. Despite demand, there is a shortage of readily available guidelines for achieving aesthetics on alternate delivery projects.
19. The AFF10(2) Sourcebook is becoming dated.

**Committee Three-Year Plan**

*The committee plan is a short, focused statement of where the committee wants to go and how to get there. The committee plan may include, but is not limited to:*

- *projects, activities and products that the committee will undertake during the next three years to address the emerging, critical, and cross-cutting issues identified above;*
- *how the current or proposed changed membership composition will respond to issues identified above;*
- *strategies to encourage significant involvement by the committee's Young Members, state DOT members, and other key constituents, both during committee meetings and at other times;*
- *committee's communication activities, and efforts to provide assistance and technology transfer to the transportation community;*
- *research – for the TRB committees, “research” is a very broad concept that can begin with providing the user perspective on research needs, writing research needs statements, tracking research, understanding the funding available for research in their topic area, developing case studies, lessons learned, disseminating research, technology transfer, and other activities that will advance the state of the practice. Potential research activities are:*
  - *research directions, results, and needs or gaps;*
  - *plan for maintaining and augmenting the Research Need Statements (RNS) database;*
  - *efforts to address research implementation and user needs, and ways to identify research use and implementation.*

AFF10, General Structures

The below bullets indicate how we will attack each of the specific actions noted above. However, in looking at our accomplishments for the past three years, while we have had successful annual meetings, including papers reviewed, workshops sponsored and co-sponsored, papers presented and webinars; we have not been feeding the research needs “pools” in any of the three ways research can be accomplished: straight up research, synthesis research or the “20-7” or “20-5” research. I plan to review the past meeting minutes and survey our members with potential topics, in advance of the AASHTO Bridge Subcommittee meeting in Vermont in June 2018. At the AASHTO Bridge meeting I will discuss the topics with the State Bridge engineers to find out which topics resonate with them. This short-list of topics will then frame our agenda for the Annual Meeting in 2019.

- Call for papers on bridge rail solutions that provide historic preservation and satisfy safety performance standards; depending upon the results from this call, take further action on possible conference session presentations, webinars, or other means of implementation (outlook item 1)
- Invite a speaker to address the AFF10 committee about bridge suicide fences and associated technology gaps; adopt further strategies based on this presentation (outlook item 2)
- Call for papers related to electronic (paper less) project delivery; consider developing a Session – perhaps co-sponsored by AFH40 Construction of Bridges and Structures (outlook item 3)
- Call for papers about achieving sustainability in bridges (outlook item 4)

- Call for papers about achieving resiliency in bridges; co-sponsor a Workshop with Harry Capers & Jeff Western's committee (outlook item 5)
- Develop a RNS requesting the evaluation of Connected and Autonomous Truck loads versus the LRFD lane loading (outlook item 6)
- Co-Sponsor a Workshop or Session on Truck Size & Weight (outlook item 6)
- Call for papers on MASH compliant bridge rails (parapets), luminaires and small (roadside/ground mounted) sign supports (outlook item 7)
- Contact emeritus members and other long time AFF10 participants for items/topics for Centennial (item 8)

#### **AFF10 (1) Traffic Structures**

- Pursue opportunities to facilitate implementation of the new AASHTO LRFD from the research presented in NCHRP 10-80 project, especially with respect to challenges owners will face with the new requirements during transition for design, fabrication and cost changes, particularly with respect to fatigue. Issues arise during implementation should be addressed. (outlook item 6 and 7)
- Monitor ongoing research projects, including:
  - NCHRP 10-94 - \$499,975 - Active "Mitigation of Weldment Cracking of Highway Steel Structures due to the Galvanizing Process" (not limited to traffic structures; outlook item 11)
  - NCHRP 03-119 - \$600,000 - Active "Application of MASH Test Criteria to Breakaway Sign and Luminaire Supports and Crashworthy Work-Zone Traffic Control Devices" (outlook item 12)
  - NCHRP 12-111 - \$ \$400,000 - Active "Evaluation the Effectiveness of Vibration-Mitigation Devices for Structural Supports of Signs, Luminaires, and Traffic Signals" (outlook items 10 and 14)
  - NCHRP 15-67 - \$300,000 – Active – "Improve Methodology to Accurately Determine Wind Drag Coefficients for Highway Signs and Their Supports Structures" (outlook items 10 and 14)
  - Wyoming DOT Funded Research – "Fatigue Issues Caused by Wind Induced First Mode Vibration of Highmast Pole Structures". (outlook item 14)
  - Iowa DOT Funded Research – "Fatigue Evaluation of Reinforced and Unreinforced Hand Holes in Light Poles". (outlook item 14)
  - NCHRP-IDEA Project 196 – "Smart Installation and Monitoring System for Large Anchor Bolts of Support Structures for Highway Signs, Luminaries, and Traffic Signals". (outlook item 13)
- Develop new RNS statements, including decorative fluted pole design criteria (outlook item 16), use of limit-cycle analysis to predict the maximum vortex-induced-vibration translations and stresses in luminaire poles (outlook item 14), and fatigue resistance of clamp-type connections (outlook item 14).
- Closely collaborate with others to better achieve committee goals, such as AASHTO SCOBS T-12 and industry. The AFF10(1) subcommittee chair, Carl Macchietto of Valmont, is proposed to help facilitate this relationship and activities with industry.

#### **AFF10(2) Bridge Aesthetics**

Plans for next three years

- Develop RNSs and synthesis topics as needed, including
  - Synthesis – Public Agency Best Practices for Bridge Aesthetics (outlook item 17)
  - RNS – Bridge Aesthetics Design Guidelines for Alternate-Delivery Projects (outlook item 18)
- Working with the AFF10 Communications Coordinator, develop a website to improve communications with subcommittee members and friends and the broader transportation community (outlook item 17)
- Utilize a Sunday Workshop to update and ascertain the applicability of the Sourcebook (AFF10(2)) publication to DOT and Transportation Agency's projects (outlook item 19)
- Identify opportunities and conduct training workshops at state DOTs, transportation agencies, conferences, and other appropriate venues (outlook item 17 & 19)

## TRB 97th Annual Meeting

January 7–11, 2017

## Standing Committee on General Structures

Session Type	Committee Code (including sponsoring committees)	Title
Published Meeting	AFF10	Bridge Aesthetics Subcommittee, AFF10(2)
Published Meeting	AFF10	General Structures Committee
Published Meeting	AFF10	Traffic Structures Subcommittee, AFF10(1)
Lectern Session	AFF10	Additional Bridge Assessment, Bridge Rating, and Bridge Design
Workshop	AFF10	Truck Size and Weight: What You Need to Know



**TRB 96th Annual Meeting**

January 8–12, 2017

**Standing Committee on General Structures**

<b>Session Type</b>	<b>Committee Code (including sponsoring committees)</b>	<b>Title</b>
Published Meeting	AFF10	Bridge Aesthetics Subcommittee, AFF10(2)
Published Meeting	AFF10	Traffic Structures Subcommittee, AFF10(1)
Published Meeting	AFF10	General Structures Committee
Workshop	AFF10	Latest Accelerated Bridge Construction Innovations from Research
Lectern Session	AFF10	Recent Research in Traffic Structures- Specifically Sign Structures and High Mast Light Poles

**TRB 95th Annual Meeting**

January 10–14, 2016

**Standing Committee on General Structures**

<b>Session Type</b>	<b>Committee Code (including sponsoring committees)</b>	<b>Title</b>
Published Meeting - Committee	AFF10	Traffic Structures Subcommittee, AFF10(1)
Published Meeting - Committee	AFF10	Bridge Aesthetics Subcommittee, AFF10(2)
Published Meeting - Committee	AFF10	General Structures Committee
Published Meeting - Committee	AFF10	Accelerated Bridge Construction Subcommittee, AFF10(3)
Workshop	AFF10	Designing Pole Structures to New AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals
Lectern Session	AFF10	Advances in Bridge Loads and Safety Features
Lectern Session	AFF10	Advances in Accelerated Bridge Construction

**ATTACHMENT B**

**Bridge Information Modeling for the Lifecycle**

Committee: AFF10, General Structures

Date Posted: 12/15/2006

Date Modified: 9/19/2007

**ATTACHMENT C**  
**COUNT OF COMMITTEE MEMBERS**  
 Committee Members as of December 4, 2017

<b>Main Members</b>	20
<b>International Members</b>	3 (includes 1 young member)
<b>Minority</b>	7
<b>Female</b>	9
<b>Room for more Members</b>	<p><b>Available Slot: 10 to be allocated as follows:</b></p> <p>Main Member: 5                      International Member: 3                      State DOT Member: 2</p>

**Membership Make-up**

<b>Northwest</b>	<b>Southwest</b>	<b>Central</b>	<b>Northeast</b>	<b>Southeast</b>
7	7	6	7	2

<b>Women</b>	<b>Non-US</b>	<b>Emeritus</b>	<b>Young</b>
9	2	2	4

<b>Federal</b>	<b>Local</b>	<b>Academia</b>	<b>Industry</b>	<b>Consultant</b>	<b>Other</b>
1	6	6	3	9	N/A

## TRIENNIAL STRATEGIC PLAN (TSP)

**Evaluation Period: February 1, 2015 to January 31, 2018**

*Please note that rows and boxes below expand as you enter the information*

### PART 1: Committee Name and Scope

*This is an opportunity to review the officially approved name and scope that are posted on the TRB website and consider any necessary changes. If changes are needed, include the proposed scope statement and/or name and justification for the changes.*

**NOTE: A proposed committee name and/or scope change must have the approval of 2/3 of the official members of the committee. The balloting done at a committee meeting that has less than 2/3 of the members in attendance must be augmented with e-mail balloting of the members not in attendance.**

Committee Code *	AFF80
Committee Name *	Standing Committee on Structural Fiber Reinforced Polymers
- Date(s) reviewed	Committee name was last reviewed in 2016
- Change, if proposed***	Committee
- No. of official members approving change/total number of members **	In 2016 nineteen (19)/25 members voted in favor. None of the members was against the change.
Committee Scope *	This committee is concerned with the application of fiber-reinforced polymer (FRP) composites in transportation structures and other appurtenances.
- Date(s) reviewed	Committee scope was last reviewed and changed in 2016
- Change, if proposed ***	Not Applicable
- No. of official members approving change/total number of members **	In 2016 nineteen (19)/25 members voted in favor. None of the members was against the change.

\* Show current, as it currently appears in the [TRB Online Directory](#)

\*\* Includes Chair, Standing Committee Members, Emeritus Members, and Young Members

\*\*\* Show proposed, or Not Applicable

## PART 2: Committee Accomplishments

NOTE: We have provided much of the information you need for boxes 2.2, 2.4, and 2.7 below and in attachments A, B, and C. We ask that you provide the remaining information.

### 2.1

Year	2015	2016	2017	2018
Number of Members in Attendance at Annual Meeting		10*	14*	13*
Number of Visitors in Attendance at Annual Meeting		14	14	18
Number of Papers Reviewed		13	5	4
Total Number in Attendance at Mid-Year Meeting	NA	NA	NA	

\* The Committee roster had many members from academia three years ago, many of which did not show up in the annual meetings. Changes have been made to the roster where the Committee Chair rotated off the members who were not as active in the Committee. Attendance of members is expected to increase starting from the 2019 Annual Meeting.

### 2.2

Sessions and workshops sponsored/cosponsored at the Mid-Year meeting, including name of co-sponsoring committee(s) if applicable (by year):

NOTE: Sessions and workshops sponsored/cosponsored at the Annual Meeting are listed in attachment A. **List** below all sessions and workshops sponsored/cosponsored at Mid-Year meeting, including name of co-sponsoring committee(s) if applicable (by year).

#### 2018 Annual Meeting

- Published Meeting, Structural Fiber Reinforced Polymers Committee
- Lectern Session 277 (SMS18-0018), FRP Composites Innovations and Applications, Part 1 (Part 2, Session 679)
- Lectern Session 679 (SMS18-0019), Innovative Applications of FRP Composites, Part 2 (Part 1, Session 277)

#### 2017 Annual Meeting

- Published Meeting, Structural Fiber Reinforced Polymers Committee
- Lectern Session 570 (SMLS17-0039), FRP Composites Innovations and Applications
- Lectern Session 838 (SMLS17-0027), FRP Composites Innovations and Applications

#### 2016 Annual Meeting

- Published Meeting, Structural Fiber Reinforced Polymers Committee
- Lectern Session 840 (SMLS16-0001), FRP Composite Field Applications, Part 2: New Structures (Part 1, Session 273)
- Lectern Session 273 (SMLS16-0002), FRP Composite Field Applications, Part 1: Existing Structures (Part 2, Session 840)
- Poster Session 314 (FHP16-0004), Select Papers on Basic Research and Emerging Technologies Related to Concrete

**2.3**

**Provide** title(s) and presenter(s) for informal presentations made at Annual Meeting and Mid-Year Committee meetings (by year):

**2018 Annual Meeting**

Underwater FRP Wrap around Corroded Steel Pipe Piles in Maine  
By: Dale Peabody (Maine DOT)

*Seismic Strengthening of RC Columns with Large Aspect ratio and without Shape Modifications*

By: Alagusundaramoorthy Paramasivan (Indian Institute of Technology)

[EveryDayCounts EDC-5](#) (2019-2020) EDC-5: FRP for Reinforced & Prestressed Concrete

By: Jamal Elkaissi (FHWA), Steven Nolan (FDOT), John Busel (American Composites Manufacturers Assoc.), Sam Fallaha (FDOT)

Briefing on: "Fast-Facts Sheets for FRP projects in Florida"

By: Steven Nolan/William Potter (FDOT)

**2017 Annual Meeting**

Reliability of Non-Destructive Testing in FRP-Concrete Bond Assessment  
By: Michael Stokes, Danny Winters, Julio Aguilar, Gray Mullins, and Rajan Sen

Grout-filled Fiber Reinforced Polymer Jackets for Repair of Steel H-piles with Severe, but Localized Corrosion

By: Mina Dawood (University of Houston), Hossein Karagah (University of Houston), and Abdeldjelil Belarbi (University of Houston)

The Halls River Bridge in Citrus County, Florida

By: Antonio Nanni (University of Miami), Steven Nolan (FDOT), Sam Fallaha (FDOT), and Will Potter (FDOT)

Research on Infrastructure for Offshore Wind Generation

By: Monssef Drissi-Habti (IFSTTAR-France)

**2016 Annual Meeting**

Field Performance of Improved Bridge Parapet Designs (16-2141)  
Amy Kalabon (E. L. Robinson Engineering Company)

Lauren Hedges, E. L. Robinson Engineering Company  
Norbert Delatte (Cleveland State University)

Domestic scan: advances in FRP Composites (P16-1313)  
Jamal Elkaissi, Federal Highway Administration (FHWA)  
Jerome O'Connor (University at Buffalo)

Developments in the durability of FRP-concrete bond (P16-1750)  
Rajan Sen (University of South Florida)

**2.4**

**Provide** titles of new research need statements (RNS) posted in TRB's RNS database (by year):

NOTE: Attachment B shows all statements currently posted in TRB's RNS database.

Repairing Concrete Bridge Girders and Guardrails with Carbon Fiber Reinforced Polymers (CFRP) after a Second Impact Event  
Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 3/18/2017  
Date Modified: 3/20/2017

Developing Endurance Characterization Curves for GFRP Reinforcing Bars Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 3/18/2017  
Date Modified: 3/20/2017

Strengthening Steel Bridge Beams with Fiber Reinforced Polymers (FRP) Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 3/18/2017  
Date Modified: 3/20/2017

Aging of In-Service FRP Bridge Components Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 4/16/2015  
Date Modified: 3/18/2017

Development of Simplified Design Guidelines for Reinforced Self-Consolidating Concrete Bridge Piers Confined with CFRP Grids  
Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 2/19/2010  
Date Modified: 2/20/2010

A Decision Support System for FRP Laminate Strengthening of Bridge Girders Based on Lifecycle-Cost Analysis  
Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 10/29/2010  
Date Modified: 03/18/2017

Distribution Factors for Design of Bridge Girder with FRP Decks  
Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 10/29/2010  
Date Modified: 03/18/2017

Rapid Construction of Pre-Fabricated Substructure Systems for Durable and Sustainable Bridges Committee: AFF80, Structural Fiber Reinforced Polymers  
Date Posted: 12/28/2006  
Date Modified: 7/18/2011



2.5

**Provide** title(s) of RNS submitted for funding consideration:  
 NOTE: If funded, include research project title/number and name of funding organization(s).

- Strengthening Steel Bridge Beams with Fiber Reinforced Polymers (FRP) (Submitted in 2017)
- Aging of In-Service FRP Bridge Components (Submitted in 2016)
- Behavior and Design of Steel Bridges Strengthened with FRP Materials (Submitted in 2015)

2.6

**Provide** titles of synthesis topics submitted (by year):

NOTE: **List** any synthesis topic(s) funded in a research program.

- 1) NCHRP Synthesis 512 Project: 20-05/Topic 47-12  
 Completed and Published in 2017  
 Title: Use of Fiber Reinforced Polymers in Highway Infrastructure  
 By: Yail Jimmy Kim, University of Colorado – Denver
- 2) Domestic Scan on Advances in FRP Composites
- 3) FRP Rebars as Column Reinforcement

2.7

Membership Make-up: Please see Attachment C provided by TRB for summary details.

NOTE: **Comment** on demographics, balance or lack of balance of membership. Provide an action plan to address any deficiencies. See attachment C for summary details.

It should be noted that The Committee roster three years ago had many members from academia and a minimal number of state and federal employees. It did not have a good balance among the different geographical areas. We have been able to aggressively address these challenges and the Committee roster looks, for the most part, balanced at this point. Changes have been made to the roster and the membership count shown below is as of end of February 2018. The Committee will further address the balance by adding more young members and female members. Few young members have already been invited to join the committee and two more female will be considered for membership.

U.S. Members	21
Non-US Members	5
Minority	5
Female	3

Northwest	Southwest	Central	Northeast	Southeast	
1	4	4	1	7	
Women	Non-US	Emeritus	Young		
3	5	1	0		
Federal/State	Local	Academia	Industry	Consultant	Other
12		9	2	3	0

**2.8**

Provide any of the following:

- Any special publications, such as TR circular, and conference proceedings
- Sponsored or co-sponsored specialty conferences, symposia, workshops, webinars or other joint efforts with other TRB committees, other TRB entities, or other organizations (i.e. AASHTO, FHWA, State DOTs, ASTM, ASCE, and/or other modes of transportation)
  - AFF80 supported the Every Day Counts EDC-5 submittal to AASHTO on behalf of AASHTO T-6. The innovation category/name is: “Fiber Reinforced Polymer (FRP) systems for extending bridge service life, by preventing corrosion”.
  - AFF80 supported the Every Day Counts EDC-5 submittal by Florida DOT to AASHTO. The innovation category/name is: “Fiber Reinforced Polymer (FRP) systems for bridge construction”.
  - AFF80 supported the 2<sup>nd</sup> Winter FRP-Reinforced Concrete Workshop that was held at the Florida Turnpike Headquarters, Orlando, Florida, February 9, 2018.

<b>Committee / Society / Organization</b>	<b>Names of Liaison Members</b>
TRB AFF00	Wael Zatar
AASHTO T-6	Mathew Chynoweth (AASHTO T-6 Chair)
AASHTO T-6	William Potter
AASHTO T-6	Jamal Elkaissi
AASHTO T-10	William Potter
AASHTO T-10	Bijan Khaleghi
ACI Committee 440	Maria Lopez deMurphy
PCI FRP Composites Committee	Wael Zatar
FHWA FRP Composites Virtual Team	Jamal Elkaissi
TRB AFF20	Mina Dawood
TRB AFF30	John Myers and Sam Fallaha
TRB AFF40	Abheetha Nisal Peiris
TRB AFF30	John Myers and Sam Fallaha
TRB AFF70	Abheetha Nisal Peiris
TRB ABG10	Dale Peabody
TRB ABG30	Dale Peabody
American Composites Manufacturers Assoc.	John Busel
IIFC	Issam Harik
IIFC ASCE	Wael Zatar
ACI	Antonio Nanni
FHWA	Jamal Elkaissi
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### **PART 3: Committee Future Outlook Statement and Committee Three-Year Plan (Limit 1,500 words total)**

#### **Committee Future Outlook Statement**

*The committee future outlook statement should include a discussion of the primary factors and influences that will shape the transportation community and topic(s) within the committee's scope over the short- (one to three years) and long-term (four to seven years). This statement should include:*

- *identification of emerging, critical, and cross-cutting issues **within the committee scope** (these issues could have been identified by the committee, Section, Group, Technical Activities Council, TRB Executive Committee, or other transportation committees and organizations);*
- *identification of emerging, critical, and cross-cutting issues **outside the committee scope** that provide opportunities for liaison and collaborative efforts (these issues could also come from a wide range of sources).*

#### **The Goals of the Committee were modified in 2015 and the new goals are:**

- Goal #1-** Provide a platform to identify and exchange information on problems, solutions, missing information, research, and implementation needs in the area of structural uses of FRP composites.*
- Goal #2-** Encourage the presentation and publication of relevant research studies related to FRP composites.*
- Goal #3-** Foster the development of courses and training programs related to FRP composites.*
- Goal #4-** Work with other TRB Committees, FHWA, AASHTO, ASTM, ASCE, ACI, International Institute for FRP in Construction (IIFC), the American Composites Manufacturers Association (ACMA), Society for the Advancement of Material and Process Engineering (SAMPE), and other organizations in educating the transportation community in the state of the art and practice of FRP composites.*
- Goal #5-** Involve international representatives on the Committee and promote an exchange of information between U.S. and other countries on structural uses of FRP composites.*

#### **Short Term Goals**

- The strategy to establish cross-cutting goals is based on the wide expertise of the existing, and the ones who will be added, Committee members and friends. They are members numerous national and international committees and organizations dealing with FRP. Cooperation between AFF80 and each of these committees and organizations (FHWA, AASHTO, ASTM, DOTs, ARTBA, ACI, PCI, IIFC, ACMA, SAMPE, etc.) will continue to grow.
- The Committee Name and Scope changed during the 2016 Annual meeting, the Committee Chair requested reexamining these pre-mentioned five goals. Voting on these goals will be completed during the 2019 Annual Meeting.
- At least two sessions will be proposed in each of the coming three annual meetings (2019, 2020, and 2021). During the 2018 TRB meeting, the Committee agreed that topics for the 2019 TRB Annual Meeting should be planned to attract more papers/presentations. Two Sessions are planned for the 2019 TRB Annual Meeting. They are:

- 1) Session on “FRP Deployment in US Bridges”. The presentation topics may include: thirty years of FRP deployment in US Bridges, twenty-five years’ of FRP deployment in Florida, twenty years of FRP deployment in Missouri, twenty years of FRP deployment in Kentucky, and 2017 NCHRP Synthesis Project: 20-05/Topic 47-12 on the use of fiber reinforced polymers in highway infrastructure.
  - 2) Session on “FRP Deployment in Bridges around the World”. The presentation topics may include: thirty years of FRP deployment in Europe, twenty-five years’ of FRP deployment in Canada, Central and South America, twenty years of FRP deployment in Asia and Australia, twenty years of FRP deployment in Africa and the Middle East.
- The Committee will vote on supporting/endorsing two synthesis studies from the following synthesis ideas:
    - Fiber Reinforced Polymers for Prolonging Service life of Transportation Assets
    - FRP Strengthening of Steel Bridge Girders (LRFD)
    - FRP Reinforcement for Concrete Bridge Decks (LRFD)
    - FRP Strengthening of Reinforced Concrete Bridge Girders for Shear
    - FRP Strengthening of Reinforced Concrete Bridge Girders and Decks for Flexure
  - The strategy towards attaining an even more balanced Committee membership will primarily focus on inviting qualified individuals and experts from the manufacturing and consulting industries, state DOTs, and female and young members. An active ASTM member will be invited to join the Committee. International members focusing on structural fiber reinforced polymer composites in emerging transportation applications will be invited to join the Committee. The Committee Chair prefers adding members representing the northeast and the northwest regions. One young member from state DOTs, one young member from Academia, one young member from industry, and one young member from Industry/Research/Non-Profit will be invited to join the Committee. A recently completed NCHRP Synthesis, 20-05/Topic 47-12, demonstrated the sort of limited use of fiber reinforced polymers in highway infrastructure. This was mainly due to the less familiarity of many stake holders with the various benefits and advantages of composites in transportation infrastructure. Adding these four young members, who could potentially end up representing important stakeholders groups, should generate more enthusiasm, introduce other members to the Committee, and produce a positive long-term effect.
  - A new Communication Coordinator will be selected. The Committee members will be involved in reviewing the Committee website. Suggestions for modifying the communication protocol will be implemented for the purpose of enhancing the communication amongst the Committee members. The communication protocol will assist sharing the Committee’s activities with individuals in the FRP Composite arena who are neither members nor friends of the Committee.
  - As for the strategy to identify emerging areas and trends, the Committee members and friends are at the forefront of the FRP technologies, research, and deployment. Information disseminated through presentations at TRB, publications, etc., assist the Committee identifying the emerging areas and trends. The Committee experts will continue interacting with their colleagues and counterparts in other countries and in Federal and state agencies to define these emerging trends and needs.
  - During the 2019 and 2020 TRB Annual Meetings, the Committee will discuss, and make decisions on, the need to prepare Circulars and the time frame for developing them.
  - During the next three years, the Committee will make decisions on future webinars. Two webinars have already been planned for 2020 and 2021. They are:

- Design of FRP Systems for Strengthening Concrete Girders in Shear
  - Strengthening of Transportation Steel Structures using FRP Composites
- With regard to the potential for sponsoring or co-sponsoring conferences with target dates, AFF80 Committee members are very active on a number of national and international committees that actively participate in organizing conferences. AFF80 Committee will be seeking sponsorship/co-sponsorship of some of these conferences.
- The Committee Chair was recently able to add the Chair of AASHTO T-6 and several active members from T-6 and T-10 to the Committee roster. They would greatly assist initiating excellent RNSs that could be supported by AASHTO T-6 and AASHTO T-10 for receiving funding.
- During the 2018 Annual Meeting, the Committee identified more liaisons with other TRB Committees including AFF0, AFF20, AFF30, AFF40, AFF70, ABG10, and ABG30. The Committee liaisons will assist suggesting co-sponsorship of workshop opportunities with other TRB Committees.
- The Committee Chair will continue interacting with the Committee members, state DOTs, AASHTO T-6, AASHTO T-10, and academia to generate excellent ideas and innovation categories and names for the Every Day Counts, a program for “Accelerating Innovation” of the Office of Innovative Program Delivery, FHWA.
- The Committee has added few RNSs in the past three years. The Committee will continue to add RNSs to the list of newly-generated ones. The Committee Chair will request reviewing and updating the following RNSs, which are included in the TRB website. The Committee will, then, go through a prioritization exercise of all RNSs.
  - Rapid Construction of Pre-Fabricated Substructure Systems for Durable and Sustainable Bridges Committee:  
Date Modified: 7/18/2011
  - Development of Simplified Design Guidelines for Reinforced Self-Consolidating Concrete Bridge Piers Confined with CFRP Grids  
Date Modified: 2/20/2010
  - A Decision Support System for FRP Laminate Strengthening of Bridge Girders Based on Lifecycle-Cost Analysis  
Date Modified: 03/18/2017
  - Distribution Factors for Design of Bridge Girder with FRP Decks  
Date Modified: 03/18/2017
- The Committee has supported the 2<sup>nd</sup> Winter FRP-Reinforced Concrete Workshop that was held at the Florida Turnpike Headquarters, Orlando, Florida, February 2018. It was an excellent event that was aimed at closing/narrowing the gap amongst academia, practitioners, industry, and stake holders. The Committee will continue supporting the FDOT Annual Winter FRP-Reinforced Concrete Workshops for the coming three years (2019, 2020 and 2021). The FDOT 2019 Winter Workshop is planned to be combined with the 2nd International Workshop on GFRP for the Internal reinforcement of concrete, and possibly adjacent to the 2019 Florida Transportation Builders’ Association (FTBA) Construction Conference in order to engage the Contracting community. The Committee will sponsor a mini-symposium at the Bridge Engineering Institute (BEI) Conference that will be organized in Hawaii, July 2019. Special emphasis will be placed on efforts to address research implementation, user needs, and ways to identify research use and implementation as the organizers plan for the 2019, 2020, and 2021 annual winter

workshops. The topics will be aimed at advancing the FRP composites state of the practice and presentations will cover research tracking, case studies, and lessons learned.

- The Committee will support the request for the TRB sponsorship of the: “Bridge Engineering Institute Conference 2019 (BEI-2019),” [www.beibridge.org](http://www.beibridge.org), which will be held from July 22 to 25, 2019, Honolulu, Hawaii, USA.

**Long-term plans should provide specific and/or general information on:**

- The Committee discussed before few topics that they support as prepare Circulars and State-of-the-Art reports. They identified the following areas: FRP Decks, Strengthening of Reinforced Concrete Bridge Piers, FRP Strengthening of Reinforced Concrete Bridge Pier Caps, and FRP Piles. These topics will be re-examined during the 2019 Annual Meeting and a definite plan for their production and dissemination will be developed.
- The Committee will always continue to consider the potential for sponsoring or co-sponsoring conferences with target dates.
- Participation in development of Section’s strategic plan on how to address concerns of practitioners. AFF80 Chair will participate in the development of the Section’s strategic plan.
- Identification of emerging areas and their impact on transportation, and thoughts on creation of subcommittees, task forces to address such concerns: AFF80 has created the following subcommittees that will continue their activities in the future, and additional subcommittees will be added as the need arises:
  - a) FRP Strengthening of Steel Bridge Girders
  - b) FRP Reinforcement for Concrete Bridge Decks
  - c) FRP Decks
  - d) FRP Strengthening of Concrete Bridge Girders and Decks for Flexure
  - e) FRP Strengthening of Concrete Bridge Girders for Shear
  - f) FRP Strengthening of Concrete Bridge Piers
  - g) FRP Strengthening of Concrete Bridge Pier Caps
  - h) FRP Strengthening of Highway Sign Supports
  - i) FRP Piles
- Plans on *outreach regarding dissemination of information well beyond the TRB audience, e.g. national and international conferences: In addition to being posted online, publications generated by the subcommittees will be presented at national and international conferences.*
- *The Committee Chair will promote an exchange of information between the United States and other countries on structural uses of FRP composites.*
- *Cross-cutting goals to increase the interaction among committees, societies, and organizations (e.g., state DOTs): The majority of the members and Friends of the committee are very active in national and international societies. This will facilitate interaction between the AFF80 Committee and other TRB Committees and the AFF80 Committee will be taking advantage of such interactions.*

**Committee Three-Year Plan**

*The committee plan is a short, focused statement of where the committee wants to go and how to get there. The committee plan may include, but is not limited to:*

- *projects, activities and products that the committee will undertake during the next three years to address the emerging, critical, and cross-cutting issues identified above;*
- *how the current or proposed changed membership composition will respond to issues identified above;*
- *strategies to encourage significant involvement by the committee’s Young Members, state DOT members, and other key constituents, both during committee meetings and at other times;*
- *committee’s communication activities, and efforts to provide assistance and technology transfer to the transportation community;*
- *research – for the TRB committees, “research” is a very broad concept that can begin with providing the user perspective on research needs, writing research needs statements, tracking research, understanding the funding available for research in their topic area, developing case studies, lessons learned, disseminating research, technology transfer, and other activities that will advance the state of the practice. Potential research activities are:*
  - *research directions, results, and needs or gaps;*
  - *plan for maintaining and augmenting the Research Need Statements (RNS) database;*
  - *efforts to address research implementation and user needs, and ways to identify research use and implementation.*

- The Committee Chair will continue to reexamine the membership and will invite additional female members and members from the manufacturing and consulting industries. The geographical location will be specifically considered as the Committee would prefer to add members representing the northeast and the northwest regions. One young member from state DOTs, one young member from Academia, one young member from industry, and one young member from Industry/Research/Non-Profit will be invited to join the Committee. A recently completed NCHRP Synthesis, 20-05/Topic 47-12, shows the limited use of fiber reinforced polymers in highway infrastructure. This was mainly due to the less familiarity of stake holders with the many benefits, advantages, and limitations of composites in transportation infrastructure. The plan to have four young members representing all stakeholders groups should generate more enthusiasm, introduce other members to the Committee, and have a long-term positive effect.
- The Committee Chair will continue interacting with the Committee members, state DOTs, AASHTO T-6, AASHTO T-10, and academia to generate excellent ideas and innovation categories and names for the Every Day Counts, a program for “Accelerating Innovation” of the Office of Innovative Program Delivery, FHWA.
- The revisited Committee membership roster, which is supported by an excellent list of Committee friends, added some of the world-renowned experts in the field. The employment of FRP systems to strengthen and rehabilitate critical infrastructure has matured in the past decade. The Committee Chair will advocate for writing a joint paper that could possibly make its way to the Practice Ready Paper (PRP) Awards Nomination Process.
- The Committee has supported the 2<sup>nd</sup> Winter FRP-Reinforced Concrete Workshop that was held at the Florida Turnpike Headquarters, Orlando, Florida, February 2018. It was an excellent event that was aimed at closing/narrowing the gap amongst academia,



practitioners, industry, and stake holders. The Committee will continue supporting the FDOT Annual Winter FRP-Reinforced Concrete Workshops for the coming three years (2019, 2020 and 2021). Most of the organizers of the workshop are members and friends of the AFF80 Committee. The FDOT 2019 Winter Workshop is planned to be combined with the 2nd International Workshop on GFRP for the Internal reinforcement of concrete, and possibly adjacent to the 2019 Florida Transportation Builders' Association (FTBA) Construction Conference in order to engage the Contracting community. The Committee will sponsor a mini-symposium at the Bridge Engineering Institute (BEI) Conference that will be organized in Hawaii, July 2019. Special emphasis will be placed on efforts to address research implementation, user needs, and ways to identify research use and implementation as the organizers plan for the 2019, 2020, and 2021 annual winter workshops. It should be noted that the future annual winter workshops will schedule presentations to identify and address the research gaps and implementation obstacles/bottle necks. They will shed some light on understanding the funding available for FRP research based on the specific needs of the United States geographical regions. The topics will be aimed at advancing the FRP composites state of the practice. The presentations will cover research tracking, case studies, and lessons learned.

- During the 2018 TRB meeting, the Committee agreed that topics for the 2019 TRB Annual Meeting should be planned to attract more papers/presentations. Two Sessions are planned for the 2019 TRB Annual Meeting. They are:

- 1) FRP Deployment in US Bridges

Presentation Topics:

30+ Years of FRP Deployment in US Bridges

25+ Years of FRP Deployment in Florida

20+ Years of FRP Deployment in Missouri

20+ Years of FRP Deployment in Kentucky

2017 NCHRP Synthesis 512 Project: 20-05/Topic 47-12: "Use of Fiber Reinforced Polymers in Highway Infrastructure"

- 2) FRP Deployment in Bridges around the World

Presentation Topics:

30+ Years of FRP Deployment in Europe

25+ Years of FRP Deployment in Canada, Central and South America

20+ Years of FRP Deployment in Asia and Australia

20+ Years of FRP Deployment in Africa and the Middle East

- The Committee will continue to organize at least two sessions for the following years.
- The Committee will provide a webinar on: "Design of FRP Systems for Strengthening Concrete Girders in Shear".
- The Committee will provide a webinar on: "Strengthening of Transportation Steel Structures using FRP Composites".
- The Committee Chair will seek reviewing and updating the following RNS, which are included in the TRB website. The Committee will add these RNSs to the list of newly-generated, or the modified ones in the past year, and will go through a prioritization exercise.

- 1) Development of Simplified Design Guidelines for Reinforced Self-Consolidating Concrete Bridge Piers Confined with CFRP Grids

Date Modified: 2/20/2010

- 2) A Decision Support System for FRP Laminate Strengthening of Bridge Girders Based on Lifecycle-Cost Analysis

Date Modified: 03/18/2017

- 3) Distribution Factors for Design of Bridge Girder with FRP Decks

Date Modified: 03/18/2017

- 4) Rapid Construction of Pre-Fabricated Substructure Systems for Durable and Sustainable Bridges Committee: AFF80, Structural Fiber Reinforced Polymers

Date Modified: 7/18/2011

- The Committee Chair was recently able to add the Chair of AASHTO T-6 and several active members from T-6 and T-10 to the Committee roster. These members would greatly assist initiating excellent RNSs that could be supported by AASHTO T-6 and AASHTO T-10 for receiving funding.
- The Committee will support the request for the TRB sponsorship of the: “Bridge Engineering Institute Conference 2019 (BEI-2019),” [www.beibridge.org](http://www.beibridge.org), which will be held from July 22 to 25, 2019, Honolulu, Hawaii, USA.
- After the successful completion of NCHRP Synthesis 512 Project: 20-05/Topic 47-12 on: “Use of Fiber Reinforced Polymers in Highway Infrastructure” in 2017, the Committee will discuss and vote on producing two new synthesis studies geared towards “Fiber Reinforced Polymers for Prolonging Service life of Transportation Assets” and “FRP Reinforcement for Concrete Bridge Decks (LRFDP)”.
- A number of subcommittees were formed to address the needs of stake holders. The Committee members and friends are the core of these subcommittees. These subcommittees will continue to focus on identifying research gaps and directions. They will discuss the results of completed research and finding the best implementation mechanism and suitable protocols for technology transfer. The subcommittees also augment the RNSs. The Committee will continue discussing the tasks of the subcommittees and decide on a plan for producing state of webinars. A plan to consolidate the subcommittees will be discussed. E-mail messages, in addition to the Annual Committee Meetings, will keep the committee members and friends up to date with the subcommittee activities.
- The Committee members and friends are at the forefront of the FRP technologies, research, and deployment. Information will be disseminated through presentations during the TRB annual Meetings, mid-term meetings, TRB, publications, etc. Committee members and friends are members of numerous national and international committees and organizations dealing with FRP. These organizations include AASHTO, FHWA, ASCE, ARTBA, ACI, PCI, IIFC, and many international organizations. Cooperation between AFF80 and these committees and organizations will continue to grow. Communication with other members of the industry, other professional organizations, and Federal and State agencies should greatly assist the Committee identify the emerging needs, areas and trends.

**TRB 95th Annual Meeting  
January 7–11, 2018**

Structural Fiber Reinforced Polymers Committee

<b>Session Type</b>	<b>Committee Code (including sponsoring committees)</b>	<b>Title</b>
Published Meeting	AFF80	Structural Fiber Reinforced Polymers Committee
Lectern Session	AFF80	Innovative Applications of FRP Composites, Part 1 (Part 2, Session 679)
Lectern Session	AFF80	Innovative Applications of FRP Composites, Part 2 (Part 1, Session 277)

**TRB 96th Annual Meeting**

January 8–12, 2017

Structural Fiber Reinforced Polymers Committee

<b>Session Type</b>	<b>Committee Code (including sponsoring committees)</b>	<b>Title</b>
Lectern Session	AFF80	Fiber Reinforced Polymer Composites Innovations and Applications
Published Meeting	AFF80	Structural Fiber Reinforced Polymers Committee

**TRB 95th Annual Meeting**

January 10–14, 2016

Structural Fiber Reinforced Polymers Committee

<b>Session Type</b>	<b>Committee Code (including sponsoring committees)</b>	<b>Title</b>
Published Meeting - Committee	AFF80	Structural Fiber Reinforced Polymers Committee
Lectern Session	AFF80	FRP Composite Field Applications, Part 2: New Structures (Part 1, Session 273)
Lectern Session	AFF80	FRP Composite Field Applications, Part 1: Existing Structures (Part 2, Session 840)

**Attachment B****Repairing Concrete Bridge Girders and Guardrails with Carbon Fiber Reinforced Polymers (CFRP) after a Second Impact Event**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 3/18/2017

Date Modified: 3/20/2017

**Developing Endurance Characterization Curves for GFRP Reinforcing Bars**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 3/18/2017

Date Modified: 3/20/2017

**Strengthening Steel Bridge Beams with Fiber Reinforced Polymers (FRP)**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 3/18/2017

Date Modified: 3/20/2017

**Aging of In-Service FRP Bridge Components**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 4/16/2015

Date Modified: 3/18/2017

**Development of Simplified Design Guidelines for Reinforced Self-Consolidating Concrete Bridge Piers Confined with CFRP Grids**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 2/19/2010

Date Modified: 2/20/2010

**A Decision Support System for FRP Laminate Strengthening of Bridge Girders Based on Lifecycle-Cost Analysis**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 12/28/2006

Date Modified: 10/29/2010

**Distribution Factors for Design of Bridge Girder with FRP Decks**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 12/28/2006

Date Modified: 10/29/2010

**Rapid Construction of Pre-Fabricated Substructure Systems for Durable and Sustainable Bridges**

Committee: AFF80, Structural Fiber Reinforced Polymers

Date Posted: 12/28/2006

Date Modified: 7/18/2011

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## ATTACHMENT C COUNT OF COMMITTEE MEMBERS

Committee Members as of December 4, 2017

<b>Main Members</b>	16
<b>International Members</b>	5
<b>Minority</b>	5
<b>Female</b>	1
<b>Room for more Members</b>	15 Available slots Main Member: 9 International Member: 0 State DOT Member: 2 Young Member: 4

### Membership Make-up

<b>Northwest</b>	<b>Southwest</b>	<b>Central</b>	<b>Northeast</b>	<b>Southeast</b>
1	3	2	1	7

<b>Women</b>	<b>Non-US</b>	<b>Emeritus</b>	<b>Young</b>
1	16	1	0

<b>Federal</b>	<b>Local</b>	<b>Academia</b>	<b>Industry</b>	<b>Consultant</b>	<b>Other</b>
0	5	12	2	2	-

[Type text]