

TRIENNIAL STRATEGIC PLAN (TSP)

Evaluation Period: February 1, 2017 to January 31, 2020

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 *	AFD60
Committee Name *	Standing Committee on Design and Rehabilitation of Asphalt Pavements
- Date(s) reviewed	January 12, 2015 ^x
- Change, if proposed***	Not Applicable
- No. of official members approving change/total number of members **	
Committee Scope *	This committee is concerned with the design and rehabilitation of asphalt pavement structures. Areas of interest include design, performance modeling and the selection of rehabilitation strategies.
- Date(s) reviewed	January 11, 2016 ^{xx}
- Change, if proposed ***	Not Applicable
- No. of official members approving change/total number of members **	

* 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

^x *The Committee Name was revised during the reorganization of the AFD Section. The name was voted on during the 2015 annual meeting.*

^{xx} *The Committee Scope was revised during the reorganization of the AFD Section. The scope was voted on during the 2016 annual meeting.*

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	2017	2018	2019	2020
Number of Members in Attendance at Annual Meeting		16	20	21
Number of Visitors in Attendance at Annual Meeting		36	39	33
Number of Papers Reviewed		24	23	24
Total Number in Attendance at Mid-Year Meeting	NA	24	17	

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).

NONE

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

- Mechanistic Analysis-Design of Pavements by Two-Way Linking: Materials – Pavements | Yong Rak Kim
- CalME Version 3 | Jeremy Lea

2019 Annual Meeting

- Structural Coefficients of Highly Modified Asphalt Mixtures | Jhony Habbouche
- Impact of Platooning on Pavement Structure | Imad Al-Qadi

2020 Annual Meeting

- Establishing Links between Balanced Mix Design and Structural Pavement Design? | Randy West
- Performance Engineered Mix Design (PEMD) | Shane Underwood

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.

2017

- Benefits of Subsurface Drainage System in Airport Pavement Performance
- Evaluation of the Impact of Aircraft Lateral Turning Forces on Pavement Design and Performance

2020 (note: developed and submitted in 2018 and 2019, but not uploaded until 2020)

- New Materials & Technology Deployment in Asphalt Pavement Structural Design
- Redesigning Pavement Rehabilitation Design
- Determination of the Impacts of Connected and Automated Vehicles (CAV) on Pavement Design, Rehabilitation, and Materials Selection

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).

RNS: New Materials & Technology Deployment in Asphalt Pavement Structural Design

Funded Project Title: Under Review 2019/2020

Funding Organization: National Cooperative Highway Research Program

RNS: Redesigning Pavement Rehabilitation Design

Funded Project Title: Declined for funding 2019

Funding Organization: National Cooperative Highway Research Program

RNS: Determination of the Impacts of Connected and Automated Vehicles (CAV) on Pavement Design, Rehabilitation, and Materials Selection

Funded Project Title: Declined for funding 2018

Funding Organization: National Cooperative Highway Research Program

2.6

Provide titles of synthesis topics submitted (by year):

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 membership is fairly well distributed geographically, and better than during the last TSP review. However, the Southeast is still over-represented which should be taken into consideration during the next committee rotation. Female membership has increased from 3 to 8 since the last TSP but focus should still remain on adding more female members at the next rotation. Minority representation is also an area of need. To address these needs, committee members will be asked to proactively identify individuals for possible membership. In addition, the committee will continue to cultivate diversity among its friends to provide a pool of potential future members. Adding members from local government (e.g., city, county) would also help bring broader perspective to the committee and is considered an area of opportunity. Outreach should be made to local agency representatives that serve in national organizations (e.g., APWA, NACE) to maximize the impact (in terms of broader dissemination of technical information to local agencies and their consultants) of adding local agency members, and to increase the chances (i.e., due to funding the travel) of these types of members to attend TRB. Academia is currently over-represented on the committee, so efforts should be made to find other stakeholders during the next rotation. The committee may also need to revisit international membership. Over the last three years, only 2 of the 9 international members have attended the annual meeting, and those two are typically not the same people year-to-year. Online meeting tools have been available for international attendees to participate during the annual meeting for the past three years, but renewed emphasis may increase participation. This is an area of concern as the international perspective, which is so valuable to the committee's activities, may not be adequately captured. Some attention should be placed on either increasing the number of international members to ensure greater participation or to consider rotations after 3 years if there is no activity. There is acknowledgement, however, that international members may be active in other ways by serving in task groups, reviewing documents, etc. Another idea would be to ask a small group of committee members reach out to international professionals in our field who are particularly active, and who have experience with research areas that are of particular interest (see Part 3 of this TSP) to the committee. This idea may help to ensure more consistent participation by international members over time. Finally, the international membership has primarily come from the Middle East and Africa, North America, and Western Europe in the past several years. It is recommended to consider targeted recruiting of international members from other regions such as Australia, New Zealand, and Asian countries (Korea, Thailand, China, and Japan) that are also active in asphalt pavement research.

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)

2017

- TRB Workshop: Pavement Design & Construction in D-B/P3 | Sponsored by AFD60
- TRB Webinar: Flexible Pavement Rehabilitation: Looking Back, Looking Forward | Co-Sponsored by AFD60

2018

- TRB Webinar: Structural Design of Porous Asphalt Pavements | Sponsored by AFD60
- TRB Webinar: An Introduction to Engineering Asphalt Mixtures to Meet Pavement Design and Construction Needs - Pavement Design Role Reversal | Co-Sponsored by AFD60

2019

- TRB Centennial Paper: Design and Rehabilitation of Asphalt Pavements: History and Future
- TRB Webinar: Evaluation of Superheavy Load Movement on Flexible Pavements | Co-Sponsored by AFD60

2020

- TRB Workshop: Impact of CAV on Pavement Design and Performance | Co-Sponsored by AFD60

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).*

Emerging, Critical & Cross Cutting Issues Within the Committee Scope

Transportation infrastructure resiliency is becoming a larger issue as extreme events and changing weather patterns become more frequent. This is of particular importance for asphalt pavements used in all types of roads, airports and port facilities as they often serve as vital conduits for emergency response and recovery. The design of future asphalt pavements to be more resilient and rehabilitating pavements after events, or to improve their resiliency, are critical issues to be addressed by AFD60 in both the short- and long-term.

Providing common linkages between the many phases of the pavement life cycle is an emerging need that should be addressed by AFD60. Evolving methods of materials design, structural design, pavement management and rehabilitation facilitate needing seamless interaction between the phases to improve the overall life cycle. Currently, these phases are often isolated within agencies and better linkages using common metrics, measurements and performance expectations could improve the process from start-to-finish.

Use of non-conventional materials, often considered sustainable materials, is a continued critical area. For example, the use of reclaimed asphalt pavement, ground tire rubber, reclaimed asphalt shingles, polymer modification and plastics in asphalt pavements is on the rise, but the methods for appropriately incorporating them in a structural design is lagging. Designers must often make assumptions, due to the lack of field validation for performance, that may be inaccurate when using non-conventional materials, which presents an on-going challenge.

Another critical need is the implementation of mechanistic-empirical design approaches. Though the new AASHTO design approach was adopted in 2011, only about half the U.S. state departments of transportation use the Mechanistic-Empirical Pavement Design Guide and the accompanying design software, and to varying degrees of use. The remaining either use older AASHTO empirical approaches or have state-specific design codes. AFD60 recognizes that M-E approaches, in their various forms, are generally considered more advanced and more robust and should become the standard for modern pavement design, but also have a number of necessary implementation activities which include verification, calibration and validation.

Urban freight corridors are a critical part of our roadway infrastructure but are often overlooked in terms of the unique design conditions they present, such as lower traffic speeds combined with heavy truck loads. There is a need for guidance and best practices to improve the performance of asphalt pavements in these applications from a structural design perspective.

Emerging, Critical & Cross Cutting Issues Outside the Committee Scope

There is an abundance of non-destructive test devices for monitoring pavement structures (e.g., ground penetrating radar, falling weight deflectometers, traffic speed deflectometers, laser profilers) that provide tremendous volumes of data. Turning the data into knowledge and information to improve pavement design and rehabilitation is an emerging need that will require advanced tools and techniques (e.g., machine learning, artificial neural networks) to maximize their utility. AFD60 will work toward strategic use of these tools to better inform future pavement design and rehabilitation decisions.

Automated and connected vehicles (ACV) is another emerging area that is considered cross-cutting as it involves many other facets of transportation. Point-to-point ACV delivery systems are already in operation and as these networks grow, there will be a need to design roadway infrastructure specifically for ACV. This will include a host of challenges including accommodating limited wheel wander, changing rest periods between trucks and platooning of vehicles.

Outside the scope of this committee is composite pavement design (i.e., asphalt over concrete sections). Cooperation and collaboration with the rigid pavement design committee will be needed to further research and knowledge dissemination for this unique pavement type.

Also outside the scope is life cycle cost analysis and life cycle analysis of asphalt pavements. Again, collaboration among various committees will be needed to develop and promulgate best practices in this arena.

Finally, and somewhat related to the common linkages between the many phases of the pavement life cycle described above, but outside the committee scope, is the variation of key performance indices (KPI) used in pavement design and pavement management groups. For example, pavement designers using ME pavement design are concerned with top-down cracking while pavement management engineers focus on pavement condition index as a performance indicator. These variations tend to create technical communication barriers within various DOT groups that leads to less than optimal efficiency. Development of empirical relationships between KPIs used by both groups could help close this gap.

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.*

For the next three years, AFD60 will put emphasis on asphalt structural pavement design and rehabilitation for resiliency through calls for papers, developing synthesis statements and RNS's relevant to the topic. It will be important to collaborate with other committees and stakeholders to cover roads, airport and port facility pavement structures as well as to bridge the gap between materials and structural design. Focus will be placed on risk management to balance structural needs with resource allocation.

Working toward better linkages between components of the pavement life cycle will be initiated with a workshop and accompanying e-Circular. This effort may be followed by RNS's once the gaps between components are better understood, along with the delivery of webinars to disseminate information.

Research needs statements and syntheses dedicated to M-E design implementation will be developed, with particular emphasis on incorporation of non-conventional material integration into existing design methodologies. Adding international membership with advanced research experience in this area may help to provide insight which could increase the chances for acceptance of these RNSs. Again, collaboration with other committees is important to ensure materials and structural designers are working toward the same end. Additionally, engagement with the asphalt industry through the national and state asphalt pavement associations is key to having the interests of owners and suppliers/builders well represented.

Adding city or large county engineers to the committee in the next membership rotation will help put concentrated emphasis on the urban freight corridor topic described above. Synthesis statements can then be developed to chronicle the current state of the practice from which future RNS's may be written, in collaboration with other TRB committees focused on freight.

Embracing and applying available technology, whether ACV or non-destructive testing equipment, through advanced techniques such as machine learning will require a diverse set of experts from various committees. A workshop and accompanying e-Circular is a logical starting point followed by RNS's, as needed to fill the research gaps. The addition of specialists, possibly from international members, in this and in the sustainable materials area, may increase the likelihood of RNS's being funded and increase the focused emphasis on research direction in these areas.

Finally, AFD60 will peruse the existing TRB RNS database to re-evaluate existing AFD60 RNS's and remove or update on a case-by-case basis. AFD60 will also review other RNS's for linkages to the topics described above to ensure the research and dissemination agenda does not duplicate effort.

Attachment A

2020 Annual Meeting

AFD60 – Design and Rehabilitation of Asphalt Pavements

Committee Code	Session type	Title of Session
AFD60	Published Meeting - Gathering	Young Professionals in Asphalt Pavement Design and Rehabilitation
AFD60	Lectern Session	Parameters and Methods for Asphalt Pavement Design
AFD60	Lectern Session	Impact of External Factors on Asphalt Pavement Design and Performance
AFD60	Published Meeting - Committee	Design and Rehabilitation of Asphalt Pavements Committee
AFD60	Poster Session	Calibration of Mechanistic- Empirical Asphalt Pavement Design Systems

2019 Annual Meeting
AFD60 – Design and Rehabilitation of Asphalt Pavements

Committee Code	Session type	Title of Session
AFD60	Published Meeting - Committee	Design and Rehabilitation of Asphalt Pavements Committee
AFD60	Lectern Session	Asphalt Concrete Cracking: Testing, Modeling, and Field Studies
AFD60	Lectern Session	Asphalt Concrete Material Properties for Thickness Design
AFD60	Poster Session	Asphalt Concrete Mechanistic-Empirical Design: Calibration, Climate, and Loading Considerations
AFD60	Published Meeting - Gathering	Design and Rehabilitation of Asphalt Pavements Younger Members Forum

2018 Annual Meeting
AFD60 – Design and Rehabilitation of Asphalt Pavements

Committee Code	Session type	Title of Session
AFD60	Published Meeting - Gathering	Design and Rehabilitation of Asphalt Pavements Younger Members Forum
AFD60	Published Meeting - Committee	Design and Rehabilitation of Asphalt Pavements Committee
AFD60	Lectern Session	Asphalt Pavement Cracking: Testing, Modeling, and Prediction for Structural Pavement Design
AFD60	Lectern Session	Asphalt Pavement Recycling and Rehabilitation
AFD60	Poster Session	Asphalt Pavement Structural Design, Modeling, and Calibration of Design Systems

Attachment B**Research Needs Statements****Determination of the Impacts of Connected and Automated Vehicles (CAV) on Pavement Design, Rehabilitation, and Materials Selection**

Committee: AFD60, Flexible Pavement Design

Date Posted: 2/12/2020

Date Modified: 2/21/2020

New Materials & Technology Deployment in Asphalt Pavement Structural Design

Committee: AFD60, Flexible Pavement Design

Date Posted: 2/12/2020

Date Modified: 2/21/2020

Redesigning Pavement Rehabilitation Design

Committee: AFD60, Flexible Pavement Design

Date Posted: 2/12/2020

Date Modified: 2/21/2020

Benefits of Subsurface Drainage System in Airport Pavement Performance

Committee: AFD60, Flexible Pavement Design

Date Posted: 10/4/2017

Date Modified: 10/16/2017

Evaluation of the Impact of Aircraft Lateral Turning Forces on Pavement Design and Performance

Committee: AFD60, Flexible Pavement Design

Date Posted: 10/4/2017

Date Modified: 10/16/2017

MEPDG – Linking Pavement Design Assumptions and Asphalt Quality Assurance

Committee: AFD60, Flexible Pavement Design

Date Posted: 1/27/2014

Date Modified: 1/28/2014

Optimized Flexible Pavement Structure – Maximizing Life and Reducing Life Cycle Costs

Committee: AFD60, Flexible Pavement Design

Date Posted: 1/27/2014

Date Modified: 1/28/2014

Develop Guidelines for the Design and Construction of Ultra-Thin Asphalt Concrete Overlays

Committee: AFD60, Flexible Pavement Design

Date Posted: 1/27/2014

Date Modified: 1/28/2014

Enhancing DARWin ME to Design Pavements with thin Asphalt Surface Layers

Committee: AFD60, Flexible Pavement Design

Date Posted: 1/27/2014

Date Modified: 1/28/2014

A Strategic Plan (Roadmap) For Pavement Research

Committee: AFD60, Flexible Pavement Design

Date Posted: 8/3/2007

Date Modified: 8/14/2007

Development of University Level Training Modules for Pavement Design, Pavement Management and Pavement Rehabilitation

Committee: AFD60, Flexible Pavement Design

Date Posted: 8/3/2007

Date Modified: 8/14/2007

Attachment C**Count of Committee Members**

U.S. Members	28
Non-US Members	8
Minority	7
Female	8

Membership Make-up

Region

Northwest	Southwest	Central	Northeast	Southeast	International
4	5	5	5	9	8

Slots

International	Emeritus	Young	Main	DOT
5	3	4	23	1

Employer

Federal	State	Academia	Industry	Consultant	Local	Other
2	5	18	4	5	0	2