

Summary Report  
Southeast Region Peer Exchange  
Atlanta, GA  
March 14–15, 2019

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## Summary

This report provides a summary of the Southeast Region Peer Exchange on Pavement Design Policy sponsored by the Federal Highway Administration (FHWA). The peer exchange took place at the Sam Nunn Federal Center in Atlanta, GA, on March 14–15, 2019. It focused on FHWA pavement design policy as defined by [Title 23 CFR Part 626](#) Pavement Policy (the “Policy”), Non-Regulatory Supplement NS 23 CFR Part 626 Pavement Design Considerations, and Technical Advisory T5040.39A Use of Alternate Bidding for Pavement Type Selection. Attendees included staff from State Departments of Transportation (DOTs) and FHWA Division Offices in Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Virginia, and West Virginia.

The FHWA presented several items for discussion regarding the current state of the Policy, using focus questions and prompts during moderated exchanges that enabled participants to offer comments and recommendations. Participants discussed current practices for designing new and rehabilitated pavements and for performing economic analysis. They were also provided an opportunity to express organizational needs in terms of research areas, training, guidance, etc. for future consideration by FHWA.

In general, the DOTs in this region have mission statements that align with FHWA’s Policy. A recurring theme during the peer exchange was that each DOT has individual needs as well as differences in availability of resources and materials to complete construction projects. They also have different factors to consider that sometimes do not always necessarily align with federally established policies. These include unique legislative requirements, processes, and procedures. In designing pavements, the DOTs often consider issues related to cost, materials and material availability, contractor market, and political and social environments.

The consensus among the DOTs in this region was that the current Policy is acceptable and meets their requirements, but some language could be clarified as to intent. Participants generally agreed the Policy is flexible, open to interpretation, and can be difficult to implement consistently.

Participants discussed the definition of the term “regulation” and that whether it is mandatory or guidance is being interpreted differently. They also discussed whether or not the regulation should remain in place, and if so, how to enforce it. The majority of participants reported the Policy should remain in effect, but discussed potential changes relevant to their States’ missions. In particular, they discussed incorporating additional elements pertaining to innovation, efficiency, reliability, education and research, environmental considerations, structural capacity, and quality of life.

Participants also suggested improvements or revisions be made to the economic analysis. Not all States uniformly use life-cycle cost analysis (LCCA) for pavement design projects. Some participants that use LCCA on applicable projects argued that using LCCA might not reduce overall costs of ownership. Some suggested a revision to economic analysis to make it more flexible, while others do not want to change it. Most participants from this region agree the LCCA should not be applied to every project. They requested guidance or tools to aid in LCCA application and in deciding on what projects it is best applied.

Most agreed FHWA should have a supporting role in pavement design and should emphasize innovation within the Policy. Participant States have little or no direct reviews from FHWA Division Offices for pavement design on individual projects, but the FHWA Division Offices review their overall pavement

design policies. As a result, there has been declining interaction between FHWA and DOT representatives in recent years concerning pavement design.

The relationships between the DOTs and consultants/contractors also vary from one State to another, in terms of the extent and type of pavement design work performed. The extent and type of work performed is influenced by legislation, State-selected pavement type preferences (either asphalt or concrete), and historical practices. This relationship can have both a positive and negative effect on individual States, specifically relating to staff retention and turnover, as well as education and training.

Collectively, participants from States in this region report DOT staff are receiving needed training on-the-job, but then tend to leave their State jobs for the private sector. This becomes problematic with State DOTs not having the necessary time to train new employees. As a result, States are reluctant to train new staff on products such as the Mechanistic-Empirical Pavement Design Guide (MEPDG) / AASHTOWare® Pavement ME Design. Another challenge has been that consultants sometimes do not want to take the time to do a proper pavement design and therefore end up proposing an overdesigned pavement structure.

Participants pointed out that the variety of design software available can be a barrier to proper and standard use. They noted the lack of standard use of these specific programs is often due to the cost of the software itself, training on the software, and/or the inconsistent and varying results produced by the software. As a result, States use software based on preference. In some cases, States have developed their own unique software or tool based on their specific needs.

They affirmed the idea of more education and training, including national and regional peer exchanges or conferences, to remain current and connected with leading industry practices, innovations, and other partnering opportunities. Participants also acknowledged positive results with Every Day Counts innovations, data driven safety analysis, and SHRP-2 programs promoted by FHWA. Future pavement design research topics suggested to FHWA included platooning truck fleets, automated vehicles, and detectable pavement markings.

## Introduction

[Title 23 CFR Part 626](#) establishes, “Pavements shall be designed to accommodate current and predicted traffic needs in a safe, durable, and cost-effective manner.” Regulations do not specify procedures to follow to meet the requirement. Instead, each State Highway Agency is expected to use a design procedure appropriate for its conditions.

The FHWA hosted a formal listening session in December 2018 to hear industry concerns regarding its pavement design policy and technical guidance. During the listening session, interpretations differed on how cost-effectiveness was considered in pavement design. One interpretation was that an agency must consider performing an LCCA on every pavement design project; another interpretation was that cost-effective does not necessarily mean LCCA as long as cost-effectiveness, or even LCCA, is one consideration in the decision-making process. Other issues mentioned were expected service life of a design, maintenance and rehabilitation, resiliency and sustainability, and relationships with other regulations, such as the asset management rule.

The information from the listening session was used to inform five regional peer exchanges during 2019, in which State DOT and FHWA Division Office representatives were provided the opportunity to discuss and document good practices and barriers to designing cost-effective pavements. FHWA plans to use feedback from the listening session and peer exchanges when it considers the need for future agency action in the pavement design area and to help identify policy changes, program needs, and other initiatives. At the end of the five regional peer exchanges, an executive summary will be developed and used to determine next steps. The FHWA will consider information from the peer exchanges if FHWA decides to pursue actions such as revised regulations, revised/additional technical guidance, proposed research initiatives, website updates, enhanced communication, and implementation activities. The emphasis of the peer exchanges is to identify solutions to the stated challenges that will support agencies in meeting their mission while designing, constructing, and maintaining National Highway System pavements in a cost-effective manner.

## Session Format

Peer exchange participants received electronic copies of the following documents in advance of the peer exchange: the Code of Federal Regulations, Title 23, Part 626; the Federal-aid Policy Guide Non-Regulatory Supplement NS 23 CFR Part 626 Pavement Design Considerations, dated April 8, 1999; and Technical Advisory T5040.39A, Use of Alternate Bidding for Pavement Type Selection, dated December 20, 2012. These documents had also been shared with and discussed by industry and FHWA at the industry listening session.

As preparation for the peer exchange, the following five discussion topics were provided in advance to peer exchange participants along with the agenda:

1. What is working with the FHWA pavement design Policy and technical guidance? What do you like?
2. What is not working with the FHWA pavement design Policy? Where are you having major issues and what challenges do you have?
3. What is needed to address some of the challenges and concerns?
4. Is there anything that, in your organization’s opinion, is missing from the pavement design Policy or technical guidance that is needed or needs updating?

5. Is there anything else you would like us to know, or be aware of, or add related to pavement design issues?

Each peer exchange was 1½-days long. The peer exchange format was designed to encourage participants to think outside the box when it comes to pavement design policy and to encourage interaction, dialog, and information exchange with FHWA and each other. The format was based on a “Why-How-What” structure. To start, the “Why” focused on the big picture: Why are we all here? This included the agencies’ high-level missions or goals for their transportation networks, specifically pertaining to pavements. The “How” focused on strategies needed to meet these missions and goals, as well as the barriers participants encounter to doing what is ideal, from a pavement design perspective. The “Why” and “How” helped prime participants for the central purpose of the peer exchange—the “What,” which included discussions on policy, guidelines, research needs, and other tools to achieve their agencies missions and goals.

During the morning session of the first day, following the initial welcome and introductions, the FHWA moderator presented meeting objectives and expectations from participants. The moderator mentioned that “parking lot” pads of paper were placed around the room for participants to note any ideas that needed to be discussed during the peer exchange, such as research needs, technical guidance, education or other issues. Participants were then divided into four groups for the first of three breakout sessions. To enhance dialog and offer a balanced viewpoint, moderators ensured that DOT and FHWA Division Office representatives from the same State were in the same breakout group.

During the first breakout, the groups were tasked with discussing the prompted focus question: “What is the State Department of Transportation’s mission?” An FHWA moderator was present in each group to facilitate the discussion. At the end of the breakout, one member from each group reported out the discussions that occurred within their group to the other peer exchange participants. During the second breakout, each group was tasked with discussing the prompted focus question: “What strategies are needed to meet the goals identified from the first breakout and overcome current barriers to accomplish these strategies?” Again, each of the four breakout groups was facilitated by an FHWA moderator, and one member from each group reported out the discussions that occurred within their group to the other peer exchange participants.

In the afternoon session of the first day, State DOT and FHWA Division Office representatives discussed key points made during the listening session held in December 2018. FHWA explained different tools (statute, guidelines, and future research) and summarized listening session observations. The rest of the afternoon was a moderated open discussion regarding the Policy, including whether the current Policy meets the goals and reflects the strategies discussed previously. Each participant was provided the opportunity to comment on the Policy and on what changes, if any, he or she would recommend be made to any of the Policy documents.

The morning session Day 2, the final session of the peer exchange, was dedicated to discussing current practices at the DOTs. This took place within the same moderated breakout groups from Day 1, and the current practice information was documented by the FHWA moderators. Finally, each peer exchange participant was provided the opportunity to express his or her agency’s needs in terms of research, guidance, training, etc. and to identify how FHWA could support those needs in the future.

## Peer Exchange Notes

### Mission, Strategies & Barriers

FHWA Division Office and State DOT representatives noted and discussed their State's mission in terms of pavements and the associated strategies and barriers.

Most of the DOT mission statements aligned with FHWA's existing mission and goals in terms of pavement policy: pavements should be designed in a safe, effective, economical, and durable manner. DOT representatives also suggested the following considerations: innovation, efficiency, reliability, education and research, environment, structural capacity, cost-effectiveness, and quality of life, in addition to a focus on preservation for extending life of pavements.

### *Strategies*

The following strategies were identified by one or more DOT peer exchange participants:

- Focus on proper design with maintenance.
  - Design for reliability and resilience. A better performing pavement will satisfy mission goals. It will be safer and without potholes, as well as smoother, and it should improve quality of life. With the system aging, the focus has shifted to maintenance – not only in design life but also in terms of how this approach affects policy and regulation.
  - FHWA's approach should also focus on maintenance. States like the flexibility to use Federal funds for preservation. "If you have something good, keep it in good shape."
  - Several agencies are moving toward balanced mix designs and performance-based mix designs that perform better and satisfy all requirements.
- Increase cost-effectiveness.
  - Balance safety while optimizing future user costs.
  - Ensure use of durable materials.
  - Economically, there is a need to balance the design life with the cost of construction.
  - Does cost-effective equal LCCA? If so, is that the best way to do things?
  - LCCA's are not necessarily cost effective after they produce the same results over and over. Material costs are considered for every project and each agency does their best to find a cost-effective and safe solution on a project level basis.
- Focus on safety.
  - One safety item discussed was using different color paint on mainlines or bike lanes. However, the pavement becomes slick after painting removes all pavement texture.
  - Weighing the costs of things an agency is supposed to be doing versus what is good and safe for road users sometimes depends on political swing.
  - Participants are looking at friction, as far as aggregate selection and quality of aggregates. Consider improving the ability to test for friction.
- FHWA can play a supportive role.
  - States collectively viewed data driven safety analysis, Every Day Counts, and SHRP-2 initiatives positively, saying they create synergies in work and are supportive without being directive.
- Take a proactive approach to education and outreach.
  - Educate those further down in the weeds as well as those with a 30,000-foot view.



## Barriers

- Industry and political pressure.
  - Political pressures are common. “Squeaky wheels are being greased, whether it’s the right thing to do for the road or not. The right thing to do may be full-depth reclamation, but we can only do a 1-inch asphalt overlay and move on.”
  - Political decisions affect efficiency of project selections and project types.
  - Safety items in pavement design: painting the bike lanes a different color than the mainline can take away from the texture of the road. Weighing the cost and safety for what should be done by engineers is sometimes hindered by politics.
  - A hurdle to overcome is increasing the understanding among agency personnel, management, legislators, and public of the value of proper design and level of effort on maintenance of pavements.
- Budget and workforce constraints.
  - As budget cuts occur within the DOTs, one of the first things affected is pavement design.
  - DOT purchasing divisions can sometimes be barriers to purchasing needed equipment.
  - Consultants are both good and bad.
  - It is good that some consultants are State retirees, as this keeps their experience and education within the industry. However, junior engineers are leaving State DOT work for better-paying private jobs. The DOT runs out of staff and needs to hire consultants. This is a “never ending” staffing issue.
- Inadequate communication.
  - Decentralized agencies may experience more communication challenges.
  - There may be low levels of interaction between the DOT and FHWA Division Office, particularly at project-level pavement design.
- Historical data.
  - What gets measured gets managed, and to measure, you have to have data. Some States have inadequate data.
  - One State has good pavement condition data but no project history data, subgrade or bridge data, or modulus data on the network. They test for friction at some locations, but do not have a network-level friction testing program.
  - Participants stated a need for better data on traffic, forecasting, and monitoring of overweight loads and overweight load enforcement.
  - Lack of historical data: the impacts of mistakes or successes can be 10 years out, so those making the decisions may not be there to reap the benefits or the consequences of their mistakes.
- Pavement design procedures.
  - Barriers with the use of Pavement ME Design include “building your database and knowing how to measure the appropriate level of distress and knowing what levels you want to design to and reliability – it doesn’t happen overnight.”
  - There is industry pressure to use data, but it takes time to collect the data and it is not always available.
  - One participant noted that their agency is not comfortable with results obtained from Pavement ME Design.

- Quality assurance (QA) on pavement preservation: preservation does not have the QA backing available for hot mix asphalt or other standard construction practices.

## FHWA Presentation & Open Discussion on Regulation and Policy

The following is a summary of participant comments and discussions related to the need for the Policy, and to what States are doing now and the barriers faced.

- General interpretation and overview.
  - The regulation, depending on who is reading it, is left open to interpretation and there are inconsistencies to how it is applied.
  - The simplicity of safe, durable, and cost-effective is good. Transportation Asset Management Plans (TAMP) can be overcomplicated, so keeping this regulation simple is favored.
  - Most participants did not know this CFR existed; some never used it directly but feel that it is okay if it remains in place.
  - States are doing what the CFR requires already; however they do not use this regulation directly.
  - Participants pointed out the phrase “project level activity” and asked how it is defined. In the definition statement *pavement design* means “a project level activity where detailed engineering and economic considerations are given to alternative combinations of sub-base, base, and surface materials that will provide adequate load carrying capacity. Factors considered include materials, traffic, climate, maintenance, drainage, and life-cycle costs.” This must be addressed, and not all States are or will be doing that.
  - Interpretation of this regulation is vague. It does say that it is a project level activity but does not explicitly say it must be applied to every project.
  - There was agreement that the wording could be changed in the regulation from “Factors which are considered” to “Factors which may be considered.”
- Cost analysis, cost-effectiveness, and competition.
  - Regarding the relationship to asset management regulations: Is this referring to TAMP? Does it mean lowest cost or most cost-efficient? The Policy should be consistent with other regulations, specifically with TAMP.
  - Most States are willing to conduct an LCCA. What States do not want is certain industries telling them how to conduct LCCAs and when.
  - The policy states that an agency must be cost-effective with pavement design, but LCCA is not always going to be cost-effective.
  - Detailed engineering and economic considerations are part of pavement design, but this does not always happen, currently.
  - AASHTO already has a policy on LCCA, which some States have adopted.
  - Some participants said they are frustrated because they have done many LCCAs and always get the same answers; so they stopped doing it.
  - Industry and some DOTs do not have a good relationship at this time due to LCCA requirements.

- Industry and consideration of competition of bids: There are differing interpretations of what competition of bids means. It could mean one industry over another or just multiple bids from the same industry.
- Agency impacts.
  - One participant said the Policy has not affected work accomplished in the last 20 years; there is no preference as to whether the regulation is in place or not.
  - Most participants agree that States have been doing the work in the same manner that the regulation calls for with or without the regulation in place, and several already have a similar State policy at hand.
  - Some participants said it could be risky to remove this regulation as there could be unintended consequences. They like to use it as leverage at times when local agencies need encouragement for a design.
  - When asked about changing any rules/regulations in the policy to help deal with some barriers, one participant said that a statement from the Federal Government acknowledging that it is not the State's job to support one industry over another would be helpful.
  - A participant said the Policy's language regarding safe, durable, and cost-effective is already included in the State's statutes and codes of regulation.
  - One participant suggested that each State look at their individual statutes and customize them as needed. If LCCA or other items are needed, it can be approved/disapproved depending on their State statute and should not be mandated at the Federal level.
- Miscellaneous specific items within the Policy.
  - The maintenance and drainage part of the Policy needs more attention in project design.
  - One participant does not want environmental regulations added to the CFR. They would not like it to be federally mandated.
  - It was suggested not to put dollar values on environmental design analysis decisions.
  - The pavement design ramifications of autonomous vehicles and platooning of freight trucks were discussed. These will affect pavement design and are something the highway community should be preparing for, but there is insufficient knowledge and information regarding what the exact impacts will be and how to consider them specifically in pavement design.

## What can FHWA do for you?

The following list summarizes discussions related to FHWA's role in helping agency pavement designers, particularly as it relates to research, education, or guidance needs in the pavement design arena.

- Research and guidance.
  - There is interest in new studies and research on differential friction. There is a need for better information on surface treatments to support use of open-graded friction course (OGFC) in turn lanes as opposed to older methods that do not last as long and are less safe. There is some research in this area, but it is outdated.

- OGFC service life/timeline uncertainty. One participant stated OGFC is only good for 3 to 4 years while others were pushing its use up to 13 and 14 years. There was agreement regarding the need for more definitive research on age and benefits of using OGFC for splash mitigation over time. States also want a way to overcome construction-related issues with the life of OGFC. Can service life be extended? There is research in using fog seal as a good candidate. In general, some States noted issues with maintaining OGFC and the overall cost impacts.
- Research support is needed on the traffic speed deflectometer (TSD) and how the data can be incorporated into design procedures. Also, there is a need to answer whether there is a direct correlation to normal subgrade modulus, or some other factor, to fit into the MEPDG. The DOT can get near 100-percent coverage on structural capacity versus stopping often to do a falling weight deflectometer (FWD) test.
- Research is needed on quality control (QC) and QA for design. In terms of ability to oversee design and ensure smart designs are put on the road, it is difficult to discriminate between good and bad designs as was done 5 years ago. The CFR has information about QA for construction and for material, but it does not have anything on QA for design. One State has a quality control bureau that checks plans before they go through construction review, and one of the major steps is QC on the design side.
- More attention could be placed on the actual structural numbers and recommendations for the recycling layers (hot in-place and cold in-place recycling). A synthesis could highlight what different States are doing and aid in developing further guidance. Becoming more formalized would be helpful for pavement design.
- Look into future research on platooning truck fleets, automated vehicles, and pavement markings. Pavement markings could assist in the guidance of automated vehicles, but pavement lines would need to be improved before this happens.
- Training and education.
  - Some training and education is needed to assist the next generation of workers; there are few pavement management training/college courses available. There are some college courses out there now, but another challenge for staff is finding time/being able to take them.
  - Secondary education/certification for consultants would help ensure they are equipped with the right education for this type of work.
  - Include pavement management courses, because it is otherwise not learned by someone until he or she is in that work section. One participant has discussed this issue with academia.
  - Training in the autonomous arena would be helpful in the future.
- Policy, supportive role, and miscellaneous needs.
  - Friction criteria should be part of the acceptance program. All States have some kind of smoothness requirement in their acceptance program, so a friction requirement should be in there for safety purposes. Switch from a reactive to a proactive friction program.
  - Data could potentially be collected in the future from automated vehicles or crowdsourcing to monitor pavement condition and support system management.

- Is there a formal process whereby States may solicit needed items/reports/guidance from FHWA? There is not a formal process to ask for assistance at this time. The way FHWA communicates with the States needs work, and FHWA is currently addressing that need.
- FHWA could provide names of key personnel that States can use to connect with when questions or issues arise.
- More peer exchanges with facilitated small and large breakout discussions would be helpful.

## Current Practice Exercise

The current practice exercise took place within the same moderated breakout groups from Day 1. FHWA moderators noted current agency practices in terms of pavement design procedures, economic analysis, and policy reviews and updates.

## Pavement Design Procedures

### *Structural Pavement Design Use*

In general, States require a structural pavement design on new construction, reconstruction, and rehabilitation projects. In some States, rehabilitation and structural overlays for either concrete or asphalt work are designed when transportation division offices request it, or when FWD data is available. Some States have reported specific limitations for low-volume or “minor” pavements. States reported using FWD data to justify mill and fill on interstates. States will often use a pavement management system decision matrix tree to determine need for structural pavement design.

### *Pavement Design Methodology*

States use a wide range of pavement design tools depending on individual needs and/or preferences. In this region, most States (8 out of 11) use AASHTO 93 or older, and only a few States have migrated to Pavement ME Design. Of the States that use Pavement ME Design, some have performed local calibration and a few use global calibration values.

### *Traffic Inputs*

States use a variety of strategies to determine traffic inputs for their pavement design. Some States will apply traffic forecasting using weigh-in-motion (WIM) data, while others use traffic count information from traffic units. Most States, particularly those using AASHTO 93 or older, use equivalent single axle loads (ESALs). Several agencies commented on the lack of reliability in the traffic data forecasting, which is generally not able to capture growth appropriately.

### *Pavement Foundations*

Not all States have a formal policy in place that addresses pavement foundation. Consideration of subgrade, sub-base materials, and drainage systems vary from State to State. While some agencies perform resilient modulus testing, others perform California bearing ratio (CBR) testing and correlate the values to resilient modulus. Agencies also varied on thickness for bases and subbases. While some specified minimum thicknesses, others did not. However, most States had typical designs or thicknesses for bases and sub-bases. Some States use a positive drainage system (longitudinal edge drains), particularly on interstates and the National Highway System, or where standing water problem areas have

been identified. However, others do not use edge drains due to the history of maintenance issues and clogging.

### *Shoulder Structure*

In most cases, the structural capacity and materials on shoulders is consistent with mainline interstates or higher volume roadways. States use rumble strips on shoulders, but there is no standard application and use is dependent on a variety of inputs such as existing travel lanes, traffic speeds, and interstates, or whether OGFC has been used in the area. Bike lanes are considered when applying rumble strips.

### *Rehabilitation*

In general, States address rehabilitation in their pavement design policies. Most States obtain condition data from Pavement Management Systems, FWD data, ground penetrating radar, or by visual means. Most States also use coring, boring, and trenching techniques; crash history; historical performance; and empirical data, or in some States, rehabilitation committees to identify rehabilitation needs.

### *Safety*

States in this region address safety issues, but not specifically in their design policies. Most States address safety concerns with other plans or with input from committees. Some States have a requirement for employees to wear class-3 reflective vests and whistles and participate in work zone safety training. Some have a policy restricting paving to nighttime only when appropriate; however, this has created challenges in construction continuity when weather impacts the ability to pave at night. Some States are using more OGFC or high-friction surface treatments where wet weather crashes have occurred frequently; however, maintenance was identified as an issue with these treatments. Some are looking at using portable rumble strips or applying other relatively low-cost safety items that can be included in design.

### *Environmental Considerations*

Most States do not address environmental considerations in their pavement design policies. Several States agreed that this should be an area of emphasis. Some States use determined percentages of recycled materials such as fly ash, recycled asphalt pavement, recycled asphalt shingles, and other recycled aggregates as incentives.

## **Economic Analysis**

### *Addresses Economic Analysis*

All States address economic analysis in their pavement design policies in some form or another. While some perform economic analysis for comparing alternatives, others do it for evaluating costs, or when needed to defend their pavement design policy.

### *Basis for Determining Need for Economic Analysis*

The basis for determining whether economic analysis is performed varies significantly from one agency to another. Typical considerations include project type and size, but in general, economic analysis is performed on most new construction and reconstruction projects.

### *Methodology for Cost-Effective Design*

States in this region widely use LCCA, and in some cases, will use historical data or past performance to ensure a cost-effective design.

### *Alternate Bidding*

Seven of the 11 States in this region allow for alternate bidding. In some States, there exists no true alternate bid process, or others will use alternate bids only for different Portland cement concrete shoulder options. One State allows alternate bids to include recycled materials.

### *LCCA Considerations*

In most cases, States consider initial, rehabilitation, and maintenance costs in addition to work zone/user costs. Most States in this region determine discount rate in policy at an average of 3 to 4 percent, or States will refer to [OMB circular A-94](#). Materials price adjustments are not performed by most States. Prices in one State are either historical or current costs. The analysis period ranges from 30 to 50 years, and all States account for at least one additional rehabilitation in determining the analysis period.

### *Tools and Documentation*

Most States use Microsoft Excel, while a few others use RealCost, to perform the LCCA. In general, States house their LCCA policy, guidelines, and requirements in their pavement design manuals. Some States only distribute this information internally. Some keep it as an appendix in their pavement design manuals.

## **Policy Review & Updates**

### *Updates to Pavement Policy Manual*

In general, States in this region have not updated their design policy recently. One State's has not been updated since 1979, and the table of design options was created in 1998. However, special provisions are approved and updated frequently, and they meet monthly with industry on related topics. One State keeps its policy internal and has no formal process for review. Two out of 11 States have updated their policy recently or are in the process of updating.

### *Review/Approval of Revisions by FHWA Division Office*

Most States have their policy reviewed and approved by FHWA Division Offices.

## Attendee List

### **Alabama DOT –**

Scott George, Bureau Chief, State Materials & Tests Engineer

John Jennings, Assistant Bureau Chief, Materials

### **Arkansas DOT – Brooke Perkins, Staff Design Engineer**

**Arkansas FHWA Division Office – Lester Frank, Transportation Engineer/Pavement**

**Florida DOT – Rhonda Taylor, State Pavement Design Engineer**

**Florida FHWA Division Office – Khoa Nguyen, Director, Office of Technical Services**

### **Georgia DOT –**

JT Rabun, Assistant State Materials Engineer

Ian Rish, State Pavement Engineer

**Georgia FHWA Division Office – David Painter, Pavements, Technology Application Team Leader**

**Mississippi DOT – William (Griffin) Sullivan, Materials Division, Lab Operations Engineer**

### **North Carolina DOT –**

Clark Morrison, State Pavement Design Engineer

Chris Peoples, Director of Field Support

**Puerto Rico Department of Transportation and Public Works – Freddy Gonzalez, Pavement Engineer**

### **Puerto Rico and U.S. Virgin Islands FHWA Division Office –**

Migdalia Carrión-Alers, Pavement Program Manager

**South Carolina DOT – Jesse (Jay) Thompson, State Pavement Design Engineer**

**South Carolina FHWA Division Office – Jim Garling, Pavement Materials Engineer**

**Tennessee DOT – Sampson Udeh, Pavement Design Manager**

**Tennessee FHWA Division Office – John Steele, Pavement & Materials Engineer**

**Virginia DOT – Affan Habib, Pavement Program Manager**

### **West Virginia DOT –**

Vince Allison, Staff Pavement Engineer

Travis Walbeck, State Pavement Engineer

**West Virginia FHWA Division Office – Matthew Daly, Pavement Materials Engineer**



**Moderators:**

Jennifer Albert, Pavement Materials Engineer – FHWA

Heather Dylla, Sustainable Pavement Engineer – FHWA

Shree Rao, Principal Engineer – Applied Research Associates

Christy Poon-Atkins, Pavement Management Engineer – FHWA

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**Note-Taker:**

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