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TRANSPORTATION RESEARCH BOARD

February 26, 2016

Mr. Gregory G. Nadeau
Administrator
Federal Highway Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
HOA-1, Room E87-314
Washington, DC 20590-9898

Mr. Frederick G. (Bud) Wright
Executive Director
American Association of State Highway
and Transportation Officials
444 North Capitol Street, NW
Suite 225
Washington, DC 20001

Re: 37th Letter Report of the Transportation Research Board Long-Term Pavement
Performance Committee

Dear Mr. Nadeau and Mr. Wright:

This letter reports the findings and recommendations that were developed at the meeting of the Transportation Research Board (TRB) Long-Term Pavement Performance (LTPP) Committee on October 28–29, 2015. The meeting was convened to review progress in the continuation of the LTPP studies. A roster of members indicating those who attended the meeting is enclosed.

As explained in earlier letter reports, the LTPP studies were initiated as part of the Strategic Highway Research Program and have been managed by the Federal Highway Administration (FHWA) since 1992. Throughout its existence, the LTPP program has been guided by an arrangement between FHWA, the American Association of State Highway and Transportation Officials (AASHTO), and the National Research Council (NRC) of the National Academies. By agreement of the three parties and through a contractual arrangement with FHWA, NRC continues to provide advice and assistance on the conduct of the LTPP studies through the work of its TRB LTPP Committee.

The agenda of the meeting consisted of informational briefings and status reports by members of the FHWA LTPP Research Team and the chair of the committee's Expert Task Group on LTPP Special Activities, each followed by a question-and-answer period and discussion. Among the matters addressed were forensic analysis of pavements reaching the completion of their roles as test sites, the pavement preservation experiment pooled fund study, documentation of the history of the program, visits to state agencies by program personnel, outreach to states' chief engineers and others, review and revision of the role and activities of the program's state coordinators, the ASCE¹-LTPP international data analysis

¹ American Society of Civil Engineers

contest, new experiments, and the Information Management System and InfoPave² software.

At the conclusion of the open session, the committee held a closed session to deliberate on its findings and formulate its consensus advice. This advice is organized below into sets, each labeled³ for reference and consisting of “finding” paragraphs in regular type, sometimes followed by “recommendation” paragraphs in underlined italic type. Our findings and recommendations are given below:

LR37/1

We commend FHWA for the following:

- Incorporation of WesTrack⁴ pavement performance data into the LTPP database. We look forward to the addition of similar data from other research programs.
- Successful completion of the ASCE-LTPP International Data Analysis Contest for 2015. We look forward to future editions of this annual contest and its spin-off benefits to LTPP. Among such benefits are products suggested by contestants' papers that are developed through additional work funded by the program.
- Publication of a high-quality history of the LTPP program. The book is a comprehensive record of all of the work to date by all of the contributors to date in this ongoing research and development program. LTPP is still vibrant, and we anticipate a continuous effort to keep this document up to date.
- Continued improvement in the functionality of the LTPP InfoPave software, particularly with the addition of MERRA⁵ climate data and MEPDG⁶ input parameters. We look forward to the addition of MEPDG analyses that can serve as samples for state engineers seeking to develop their own state-based input data sets.

LR37/2

We are pleased to learn that the development and delivery of LTPP's products are now the responsibility of Mr. Hari Kalla, Director of FHWA's Office of Asset Management, Pavement, and Construction. We understand that Mr. Kalla will confer periodically with

² LTPP InfoPave is the web interface for the LTPP database, a “one-stop access point for all data collected within the program.”

³ The label takes the form “LRn/m,” where “n” is the number of the letter report and “m” is the number of the finding–recommendation set.

⁴ WesTrack is FHWA's hot-mix asphalt, accelerated loading, performance-related specification test facility in Nevada.

⁵ The Modern-Era Retrospective Analysis for Research and Applications (MERRA) places observations from the National Aeronautics and Space Administration's Earth Observing System satellites into a climate context and improves on the hydrologic cycle represented in earlier generations of reanalysis.

⁶ The *Mechanistic–Empirical Pavement Design Guide* (MEPDG) computer software provides a mechanistic–empirical highway pavement design methodology based on pavement responses to detailed traffic loading, material properties, and environmental data. The responses are used to predict incremental damage over time. Design is an iterative process using analysis results based on trial designs postulated by the analyst. A trial design is analyzed for adequacy against user input performance criteria. These criteria represent the amount of distress that would trigger some major rehabilitation or reconstruction activity. The output is a prediction of distresses against set reliability values. If the predictions do not meet the desired performance criteria at the given reliability value, the trial design is revised and the evaluation is repeated. The MEPDG method allows the analyst to match the quality and level of detail of the design inputs to the level of importance of the project or to utilize available input data in the best way. The MEPDG requires more than 100 inputs for characterizing traffic loading, material properties, and environmental factors in addition to those for quantifying a trial pavement structure.

the LTPP Team and others within FHWA to identify potential LTPP products meeting the expressed needs of state highway agencies as candidates for further development. It has been suggested that, consistent with funding, resources, and his other responsibilities, Mr. Kalla will initiate efforts to develop those products.

We look forward to interacting with Mr. Kalla at future meetings where the status of incipient LTPP products will be reported. However, we are concerned that LTPP research and development activities are now divided among FHWA units, and that an over-arching plan for product development and delivery is lacking. At present, LTPP products will be developed if and when ideas for them emerge from ongoing data collection and analysis, and then only if unbudgeted resources are available.

In view of Mr. Kalla's new responsibilities, we request a briefing at our next meeting on the status of LTPP product development and delivery. The briefing should address incipient LTPP products that have been identified and the efforts planned to develop them.

LR37/3

We regret the misunderstanding caused by LR36/4 in our previous letter report, which appeared to fault the Strategic Plan for LTPP Data Analysis for lacking efforts to coordinate its many projects and to enable, through synthesis, the development of improved explanations of how pavements perform.

We failed to state our recognition that the plan, when first developed, was intentionally focused on near-term analyses. The first version of the plan was intended to jump-start data analysis. Coordination of activities and synthesis of results were to be deferred until later versions were written, when understanding of pavement performance would be improved by the early results and the database would be more robust and capable of more sophisticated analysis.

We have taken the opportunity to apologize and to clarify our advice, which is that the plan be updated now.

We recommend that the Strategic Plan for LTPP Data Analysis be reviewed, updated, and extended. A new version of the plan should emphasize coordination of individual projects and development of outcomes and products needed by state highway agencies. The goal of this plan remains the development of a better understanding of the causes (the "why") and mechanisms (the "how") of pavement deterioration. We request a briefing at our next meeting on the status of this review.

LR37/4

We are pleased to learn of the actions begun by the LTPP Team to review the role of the LTPP State Coordinators and the LTPP State Coordinators' Meeting, as was suggested in the previous letter report. We applaud the establishment of an FHWA-committee task group to lead this review and look forward to briefings on its recommendations.

If the purpose served by convening a meeting and its desired work output were defined, and a meeting agenda, task assignments, and breakout sessions were provided, the state coordinators would be better able to provide feedback on their states' needs for products and their opinions concerning whether LTPP's current activities are likely to develop them. In a parallel FHWA research program, the Long-Term Bridge Performance Program, products such as these are termed "data-driven decision-making tools." Helping to define these tools and to comment on the projects that are planned to develop them would be suitable new roles for the task group to consider assigning to the state coordinators.

We recommend that the state coordinators be given a voice in defining the data-driven decision-making tools the states need to design, operate, and maintain their highway pavements and a mechanism for articulating these needs and tools. In effect, this new role for the coordinators would redefine the states not just as owners of the pavements being studied by LTPP but also as partners in the efforts to collect and analyze the data taken from these pavements and the products developed from these analyses. We request a briefing at our next meeting on the status of the task group's review.

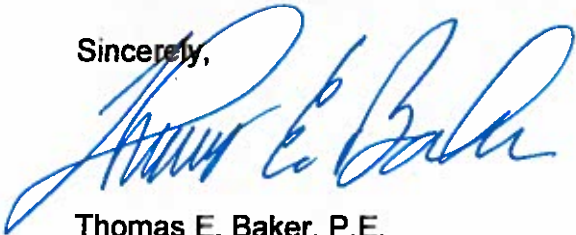
LR37/5

We are pleased by the participation in our recent meetings of AASHTO staff members Mr. Jim McDonnell, or Mr. Keith Platte, or Mr. Evan Rothblatt who contributed significantly to the productivity of this meeting. Their contributions have been helpful. They have offered assistance on many items, including the implementation of a pooled fund forensic study of LTPP test sections going out of service, and have offered to host webinars to broadcast the pooled fund information.

We apologize for the lateness of this report—4 months after the meeting—and we congratulate the LTPP Team for not waiting for its issuance to act on the suggestions voiced in the meeting's open sessions. The contents of future meetings will be summarized in a more timely manner.

In conclusion, the meeting was highly productive thanks to the active participation of AASHTO and to the preparations of Aramis López, the FHWA LTPP Research Team leader, and the members of his team. FHWA and AASHTO are fortunate to have professionals possessing such dedication to the LTPP program as staff members.

Sincerely,



Thomas E. Baker, P.E.
Chair, TRB LTPP Committee

Enclosure: Roster of the TRB Long-Term Pavement Performance Committee Indicating Attendance at the Meeting of October 28–29, 2015

Enclosure

**Roster of the TRB Long-Term Pavement Performance Committee
Indicating¹ Attendance at the Meeting of October 28–29, 2015**

Thomas E. Baker, *Chair*
State Bridge and Structures Engineer
Washington State Department of
Transportation

Carlos Braceras
Executive Director
Utah Department of Transportation

Colin A. Franco
Associate Chief Engineer
Rhode Island Department of
Transportation

Gary L. Hoffman
Executive Director
Pennsylvania Asphalt Pavement
Association

Patricia S. Hu
Associate Administrator and Director
Bureau of Transportation Statistics
Research and Innovative Technology
Administration
U.S. Department of Transportation

Randell H. Iwasaki
Executive Director
Contra Costa Transportation Authority

Mostafa Jamshidi
Chief Engineer
Nebraska Department of Roads

Robert L. Sack
Deputy Chief Engineer
New York State Department of
Transportation

Larry A. Scofield
Director of Engineering and Research
International Grooving and Grinding
Association

Ted M. Scott II
Director of Engineering
American Trucking Associations, Inc.

Gary C. Whited
Program Manager, Construction and
Materials Support Center
University of Wisconsin–Madison

James Williams
Assistant Chief Engineer
Mississippi Department of Transportation

¹ Attendees of the meeting are indicated in boldface.