July 24, 2000

Mr. Kenneth R. Wykle
Administrator
Federal Highway Administration
U.S. Dept. of Transportation
400 Seventh Street, S.W.
Room 4218
Washington, DC 20590

Mr. John Horsley
Executive Director
American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W.
Suite 225
Washington, DC 20001

Dear Mr. Wykle and Mr. Horsley:

This is the ninth letter report of the Transportation Research Board (TRB) Long-Term Pavement Performance (LTPP) Committee.

The LTPP studies initially were a part of the Strategic Highway Research Program (SHRP), and now are managed by the FHWA. Throughout its existence, SHRP was guided by a tripartite arrangement among the FHWA, AASHTO, and the National Research Council (NRC). By mutual agreement of the three parties, and through a contractual arrangement with the FHWA, the NRC continues to provide advice and assistance on the conduct of the LTPP studies through the work of its TRB LTPP Committee. In fiscal year 1999, AASHTO authorized the use of National Cooperative Highway Research Program (NCHRP) funds in support of LTPP operations, and initiated LTPP data analysis and product development within NCHRP.

On June 8-9, 2000, the TRB LTPP Committee ("the committee") met and discussed progress in the continuation of the LTPP studies. A committee roster indicating the members who attended this meeting is attached as Attachment 1, and the agenda of the meeting is Attachment 2.

At the conclusion of the open session, the committee held a closed session to deliberate on its findings and to come to a consensus. The recommendations presented below were developed by the committee at its closed session and represent its best collective judgement.

Ruggedness of the Resilient Modulus Test of Asphalt Concrete. The committee received a report from the ETG on LTPP Materials Data Collection and Analysis concerning ruggedness testing of the modified Roqué resilient modulus test for hot-mix asphalt concrete. The committee was advised that funds budgeted within LTPP for precision and bias testing was insufficient for ruggedness testing to American Society for Testing and Materials (ASTM) standards that would comply with the recommendation contained in the committee's 7th letter report dated July 13, 1999. It was reported further that the FHWA LTPP Team is developing a test plan and modifying equipment for single-laboratory repeatability testing of the Roqué method in place of ruggedness testing. The committee has asked the ETG to consider, purely on technical merit, whether the repeatability testing

proposed by the FHWA will be sufficient for the purposes of LTPP. The committee recommends to the FHWA that further work on repeatability testing be suspended until the committee receives the ETG's technical advice and provides a more comprehensive recommendation. In the interim, the preparation of test specimens for ruggedness testing to ASTM standards should be continued.

Preparation for a New Round of Authorizing Legislation. The planned duration of LTPP activities will extend beyond the lifetime of the Transportation Equity Act for the 21st Century (TEA-21). The committee recommends that the FHWA begin now to formulate information pertaining to LTPP for consideration in new Federal-aid transportation authorization legislation. This information should quantify the current and future benefits of LTPP, define the future programmatic requirements, and outline plans for preservation of LTPP assets (database, distress film library, and materials samples) at the conclusion of the studies. As this information gathering effort is likely to be brief and intense, the committee has established an *ad hoc* subcommittee to review, comment upon, and advise the committee on the information the FHWA prepares. The members of this new subcommittee are Allan Abbott, Larry Cole, Carl Monismith, Ray Moore, Gary Sharpe, and Gary Taylor.

Revised Recommendations for Remedy of Traffic Data Collection Issues. In our letter of December 27th, 1999, we provided a long series of recommendations that we termed "An Action Plan for Improving Quality of Traffic Loading Data on Specific Pavement Studies Projects." This recommended action plan was designed to correct significant deficiencies in collection of axle weight data without which the value of the Specific Pavement Studies (SPS) would be significantly diminished. In response to our letter, AASHTO's Task Force on SHRP Implementation ("the Task Force") undertook to determine the current status of traffic data collection in each state Department of Transportation (SDOT) participating in the SPS. The Task Force further sought to determine the willingness of each SDOT to participate in a more centralized data collection program as recommended in our December letter report. The committee deeply appreciates this rapid and useful response on the part of AASHTO and the Task Force.

The Task Force has shared with the committee and with the FHWA LTPP Team the responses received from the individual SDOTs. The FHWA LTPP Team has provided careful tabulations of the responses to all of our organizations, which I will not repeat in this letter. These responses provided definitive information for a more thorough examination of the technical and practical issues related to traffic load data collection for SPS. In brief, 19 of the 39 SDOTs that possess SPS test sites responded positively to the action plan and indicated a willingness to participate in a pooled fund to finance a centrally managed program. Nine SDOTs indicated that they choose not to participate in a centrally managed program, but intend to meet their commitments to provide the required data. These departments are either confident in their current data collection procedures or financially constrained from contributing to a pooled fund. Six SDOTs have not yet formally responded and the two Canadian provinces participating in SPS are developing responses through the Canadian Strategic Highway Research Program. While the committee regards all responses received to date to be positive, it appears that some modification of our earlier recommendations is necessary to accommodate those agencies that will attempt to collect these data independently. In addition, technical queries that warrant further examination were included in the SDOT responses. We have consulted

with our Expert Task Group on Traffic Data Collection and Analysis and offer the following revisions to the action plan.

Standardized performance requirements, test methods, and calibration procedures should be prepared for performance validation of existing and new weigh-in-motion traffic data collection systems in use or planned for use at SPS test sites. A plan should be prepared for implementation by the FHWA LTPP Team of these test methods at all SPS sites. While the LTPP Committee is not recommending selection of specific weigh-in-motion sensors, we relay the technical finding of the ETG that bending plate and load cell systems, installed in concrete, are the more reliable technologies for acquisition of the research-quality traffic loading data needed for the success of LTPP. It appears other systems will probably require more frequent calibration, malfunction more often, and be likely to yield more variable data. More frequent communication may be required between the FHWA LTPP Team and the states using systems other than bending plates or load cells (see discussion of Communications with States later in this letter).

Independent of the technology used, only data that have passed the LTPP quality checks should be used in LTPP data analysis or released to LTPP data users. While this applies to all traffic data, if volume and classification data pass the quality checks, they should be placed in the LTPP database and released to users even if the axle weight data do not pass the checks.

If a national pooled fund is created to support centralized data collection for those SDOTs that wish it, the fund should be open to voluntary contribution from all states and provinces. Several states with little or no SPS traffic data collection obligations have expressed a willingness to participate in a national pooled fund, as all states will be beneficiaries of these studies.

Should a centrally managed data collection effort be implemented and funded through establishment of a pooled-fund study, it seems logical that the FHWA LTPP Team should manage the effort and assume responsibility for monitoring, calibration, collection, processing, and quality control of this traffic data. The FHWA LTPP Team already has responsibility for most LTPP data collection and has a well organized system for doing so. Furthermore, the Team is already responsible for management of traffic data. Assigning this new task to the Team will dramatically reduce start-up time and permit streamlining of the entire traffic data collection and management sequence.

The FHWA LTPP Team should meet with senior representatives of the individual SDOTs possessing SPS test sites that have opted not to participate in the centrally managed effort to clarify what those agencies will need to do to conform to LTPP's SPS traffic data collection requirements. All agencies that responded to the Task Force's inquiries restated their commitments to fulfill the traffic data collection obligations they assumed when they volunteered to build SPS test sites. For these agencies to succeed, they must have a clear understanding of the data collection requirements and of the standards that will be used to assess the quality of the data submitted.

All SDOTs that are providing traffic data to LTPP should receive monthly feedback on the quality and quantity of the data they provide. This feedback should be immediate if suspect data are encountered. In our review of the current SPS traffic data collection procedures, we noted very long delays between the times when the SDOTs collected data and the times when data quality was assessed. These delays mean that WIM sensors might have been malfunctioning for a substantial period before the problem was discovered, and considerable data "lost" as a result. To overcome this loss, data collectors, either the individual SDOTs or the managers of the recommended centralized system, must submit data promptly after collection and the FHWA LTPP Team data managers must perform the data quality checks just as promptly.

Questions and concerns raised by SDOTs in their responses to the Task Force should be addressed, and individual responses should be prepared. The committee has asked its ETG on LTPP Traffic Data Collection and Analysis to work with the Task Force and the FHWA LTPP Team in the preparation of these responses.

The FHWA LTPP Team should inform the ASTM Subcommittee on Traffic Monitoring ("the Subcommittee") of its progress in developing standards for weigh-in-motion installations. The Subcommittee is currently engaged in revising its existing standard for determination of weight-in-motion (Standard E1318). Although the purpose and use of the LTPP standards vary from that of the ASTM standard, the exchange of information may prove valuable to both efforts.

Communication with the States. In our review of the responses of the SDOTs to Mr. Conrad's letter on the status of SPS traffic data collection, we noted apparent discrepancies between statements of individual SDOTs and the FHWA LTPP Team with respect to the quantity of data provided. Similar misunderstandings have been noted regarding other state-provided data, such as materials test data for SPS. The committee is concerned that such misunderstandings will erode the FHWA LTPP Team's credibility with the SDOTs. To forestall such erosion, we recommend that the FHWA enhance communication links with appropriate personnel in each state to assure that all parties have a common understanding of the completeness and quality of the data the state has provided to LTPP. These understandings should be confirmed before any public presentations are made or reports issued regarding data deficiencies.

LTPP Product Plan. The FHWA LTPP Team briefed the committee on its latest draft of a product plan responding to the TEA-21 requirement that programs such as LTPP develop products fulfilling program objectives and meeting pavement technology needs. The committee endorses this effort and appreciates the opportunity to review and comment on the plan during its gestation. The committee requests a prioritized estimate of the resources (staff and funding) needed to implement the plan. The committee also requests information describing how these needs will be met, especially when they are added to the resources needed to implement the product plans of other programs competing for attention by the FHWA's Office of Pavement Technology. The committee has asked its Subcommittee on Product Development and Delivery to review and comment on this draft plan. The committee's recommendation will be included in its next letter report.

Interaction with AASHTO Joint Task Force on Pavements. The committee will send the draft FY2002 program of LTPP data analysis to be developed this summer and fall by the ETG on LTPP Data Analysis and to be considered for adoption at the committee meeting in November to the AASHTO Joint Task Force on Pavements for comments. This action was suggested by Mr. Gary Carver, current chair of the Joint Task Force.

I want to express my thanks to AASHTO's Haleem Tahir for his many contributions to the work of the committee and its ETGs and subcommittees. He serves as the AASHTO liaison to the committee, the chairman of the ETG on LTPP Materials Data Collection and Analysis, and a member of the Subcommittee on Product Development and Delivery. I value his wise counsel and insightful suggestions.

Finally, I also want to express my thanks to the FHWA's Charles Churilla, Aramis López, and Tommy Beatty for the professional and collegial way in which they provided information to and interacted with the committee. Without their active involvement in the planning for and conduct of the meeting, it would not have been as productive as it was.

Sincerely,

Allan L. Abbott
Chairman
TRB LTPP Committee

Attachments:

1. Roster of Committee Members Showing Attendance at the Meeting of June 8-9, 2000
2. Agenda, TRB LTPP Committee Meeting, June 8-9,2000

ATTACHMENT 1

TRB LONG-TERM PAVEMENT PERFORMANCE (LTPP) COMMITTEE

ROSTER OF COMMITTEE MEMBERS
INDICATING ATTENDANCE AT THE MEETING OF June 8-9, 2000
(Attendees are indicated in BOLD CAPITAL LETTERS)

ALLAN L. ABBOTT
Public Works Director
Lincoln, Nebraska

GARY S. CARVER
Chief Engineer
Wyoming Department of Transportation

LAWRENCE W. COLE
Vice President, Engineering & Research
American Concrete Pavement Association

CHARLES E. DOUGAN
Consultant
Enfield, Connecticut

Ralph Haas
Norman W. McLeod Engineering Professor
University of Waterloo

GARY HOFFMAN
Chief Engineer - Highway Administration
Pennsylvania Department of Transportation

JOHN R. HOSANG
Assistant Deputy Minister
Manitoba Dept of Highways and Transportation

William J. MacCreery
Consulting Engineer- Highways
East Lansing, Michigan

CARL L. MONISMITH
Robert Horonjeff Professor of Civil Engineering
University of California, Berkeley

RAYMOND K. MOORE
Professor and Chair, Department of Civil, Engineering
University of Nebraska - Lincoln

CHARLES A. PRYOR, JR.
Vice President, Engineering
National Stone Association

Frederick R. Ross
Consulting Engineer
Madison, Wisconsin

TED M. SCOTT
Director, Highway Policy
American Trucking Associations

Gary W. Sharpe
Transportation Engineering Branch Manager
Department of Transportation, Kentucky

GARY D. TAYLOR
Chief Engineer/Deputy Director
Michigan Department of Transportation

KENNETH I. WARREN
Executive Director
Mississippi Department of Transportation

ATTACHMENT 2

AGENDA
TRB LTPP COMMITTEE MEETING
J. Erik Jonsson Woods Hole Center
Woods Hole, Massachusetts
June 8-9, 2000

THURSDAY, JUNE 8

07.30-08.30 Breakfast at Jonsson Center

08.30-08.45 Call to Order (Abbott)
- Introductions
- Review/Modification of Agenda
- Review/Approval of Minutes of Last Meeting

08.45-09.45 Committee Reports
- ETG on Materials Data Collection and Analysis (Tahir)
- ETG on Distress and Profile Data Collection and Analysis (Cable)
- ETG on Traffic Data Collection and Analysis (Tweedie)
- ETG on Data Analysis (Corley-Lay)
- Subcommittee on Product Development and Delivery (Taylor)

09.45-10.00 Break

10.00-11.00 Traffic Data Action Plan (Tweedie)
- Response from states
- Technical assessment of responses
- Recommended action

11.00-12.00 Product Development and Delivery
- Product Plan (Ferragut)
- Status of current products (Larson)

12.00-01.00 Lunch

01.00-01.30 NCHRP Funding of LTPP
- Overview of NCHRP funding of LTPP, FY1999-FY2001 (Hanna)
- Q&A on FHWA FY1999 expenditures and FY2000 spending plan (López)

01.30-02.30 LTPP Brainstorming (Hawks)
- SCOR's consideration of pavement research for FY2001
- Alternative mechanisms
- Essential plan
- Recommended action

02.30-03.0 Process for Developing the Recommendation to AASHTO for FY2002 NCHRP-Funded LTPP Data Analysis and Product Development (Abbott)

03.00-03.15 Break

03.15-03.45 Coordination with NCHRP 1-37A (Hanna)

03.45-04.15 Coordination with Joint Task Force on Pavements (Carver/Sharpe)

04.15-05.15 Planning for the End of LTPP (Churilla/López)

05.15	Close of meeting for the day
05.30-06.30	Reception at Jonsson Center
06.30	Dinner at Jonsson Center

FRIDAY, JUNE 9

07.30-08.30	Breakfast at Jonsson Center
08.30-09.00	Staff Report (Raab) Membership
09.00-09.15	Feedback from Newport SPS Workshop (Churilla)
09.15-09.30	Status of Data Resolution (Dougan)
09.30-10.00	Recap of Issues (Abbott)
10.00-10.15	Break
10.15-12.00	Closed Session
12.00-01.00	Lunch at Jonsson Center
01.00	Close of Meeting