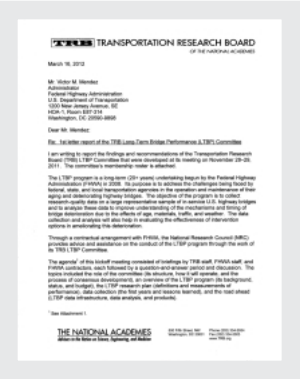

Long-Term Bridge Performance Committee Letter Report: March 16, 2012

DETAILS

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TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

March 16, 2012

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

Dear Mr. Mendez:

Re: 1st letter report of the TRB Long-Term Bridge Performance (LTBP) Committee

I am writing to report the findings and recommendations of the Transportation Research Board (TRB) LTBP Committee that were developed at its meeting on November 28–29, 2011. The committee's membership roster is attached.

The LTBP program is a long-term (20+ years) undertaking begun by the Federal Highway Administration (FHWA) in 2008. Its purpose is to address the challenges being faced by federal, state, and local transportation agencies in the operation and maintenance of their aging and deteriorating highway bridges. The objective of the program is to collect research-quality data on a large representative sample of in-service U.S. highway bridges and to analyze these data to improve understanding of the mechanisms and timing of bridge deterioration due to the effects of age, materials, traffic, and weather. The data collection and analysis will also help in evaluating the effectiveness of intervention options in ameliorating this deterioration.

Through a contractual arrangement with FHWA, the National Research Council (NRC) provides advice and assistance on the conduct of the LTBP program through the work of its TRB LTBP Committee.

The agenda[1] of this kickoff meeting consisted of briefings by TRB staff, FHWA staff, and FHWA contractors, each followed by a question-and-answer period and discussion. The topics included the role of the committee (its structure, how it will operate, and the process of consensus development), an overview of the LTBP program (its background, status, and budget), the LTBP research plan (definitions and measurements of performance), data collection (the first years and lessons learned), and the road ahead (LTBP data infrastructure, data analysis, and products).

[1] See Attachment 1.

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At the conclusion of these open sessions, the committee held a closed session to deliberate on its findings and formulate its consensus recommendations, which are summarized here:

- [LR01/01][2] We thank the members and contractors of FHWA's LTBP program ("the program") for their extensive efforts in preparation for this initial meeting of the committee. Their briefings were detailed and highly informative, and they provided us with a comprehensive introduction to the program.

  Now that the committee has been established, we look forward to supporting this effort by offering comments and suggestions for program improvement for FHWA's consideration. We trust that this first meeting and letter report are just the beginning of a long and fruitful collaboration.

- [LR01/02] The briefing materials present graphically a wealth of information about the program that would be much more valuable to program stakeholders and the public if they were translated into concise prose.

  One way of explaining LTBP concisely as part of this prose is as follows: "LTBP's goal is to foster improved bridge performance, health, and stewardship and management through the analysis of data collected over a 20-year period on a large representative sample of U.S. highway bridges. To achieve this goal, the program is designed to produce or support improved deterioration models, reliable life-cycle cost and forecasting models, design procedures, and decision-making tools."

  We suggest that LTBP's goals, and the objectives to be achieved to reach these goals, be stated concisely. The statement should also connect the goals and objectives to the work that has been undertaken since 2008 and to the plans for new work that are now being developed.

- [LR01/03] The period from 2009 to 2011 was a pilot phase of LTBP. Protocols and procedures for data collection and data storage and analysis were developed and validated, testing methodologies were refined, and data collection began on a set of seven pilot bridges. This phase is coming to a close, and a draft report is being edited. The experiences gained in and the results of inspecting, instrumenting, testing, and monitoring these bridges will be major determinants in the design of the larger program for

[2] Each recommendation is given a unique designator of [letter report number/recommendation number] to facilitate future referencing.

long-term data collection and analysis.

We look forward to receiving the report of this pilot test and learning how the experience gained therefrom is translated into plans for gathering and analyzing the data to be collected on the program's larger set of bridges. The sooner we receive this report, the sooner we will be able to offer suggestions concerning the design of the larger study.

We request receipt of other related reports that are being drafted on performance issues, cluster and reference methodology, and sampling methodology.

Furthermore, we encourage a general release of these reports.

- [LR01/04] The LTBP staff and contractors conducted a comprehensive examination of the factors affecting bridge performance and mounted a number of outreach efforts (focus groups across the United States, a workshop on geotechnical issues, the LTBP state coordinators meeting, and others) to identify and prioritize performance issues. This effort has culminated in a list of more than 20 high-priority performance topics, and five of them have been proposed for initial study, all pertaining to new construction:
  - Performance of untreated concrete bridge decks,
  - Performance of bridge deck treatments,
  - Performance of bridge deck joints,
  - Performance of bridge bearings, and
  - Performance of coatings for steel superstructure elements.

  We concur with the selection of these five topics but suggest that "performance of foundation scour countermeasures" be added to the list because scour is a leading cause of bridge failure.

  Furthermore, we recommend that the study include bridges of all ages that are likely to remain in service throughout the lifetime of the program. The program must collect and analyze performance data gathered throughout the service life of the bridges being studied, and thus their early years are as important as their later years. However, the study of bridges whose deterioration began before initiation of the program is equally important. Concentrating on new construction alone would ignore the reality that many "old" bridges will remain in service for extended periods of time. Selective data mining of existing databases such as the National Bridge Inventory might provide highly useful information concerning which bridges to study and what data to collect and analyze.

- [LR01/05] Stakeholder access to information about LTBP and its data is a critical component of the program and can be its principal product. The "bridge portal" is the key mechanism for providing this access. This Internet portal will not only support the development of the program's information management system but also facilitate data exchange with and delivery to the bridge community.

  We understand that the portal is being beta tested by some state departments of transportation and FHWA offices while Version 2.0 is under development. We recommend that this testing be expedited and that the fully vetted version be made operational and released. The state departments of transportation should be alerted sufficiently far in advance of the public release, so that they can prepare for the questions from the public and the press that may ensue.

  In addition, to sustain state support of LTBP, we recommend that the program's data collection protocols be provided to the states. We recognize that these protocols may have to be rewritten to be useful to those outside of LTBP, but this product development and dissemination work will yield many benefits to the program in terms of stakeholder support.

- [LR01/06] The LTBP staff and contractors recognize the importance of outreach to the success of the program. Keeping the states and other stakeholders informed of the program's progress and seeking feedback with regard to their needs and expectations will continue as high-priority activities.

  LTBP's outreach activities include presentations at TRB Annual Meetings, meetings of the American Association of State Highway and Transportation Officials (AASHTO) Subcommittee on Bridges and Structures, and meetings of the AASHTO Regional Bridge Preservation Partnerships. We recommend that outreach activities be expanded to encompass the use of state visits by LTBP personnel, Accelerated Bridge Construction Center webinars, LTBP newsletters and webinars, and results-oriented LTBP state coordinators meetings, all on a regular and predictable schedule throughout the year.

- [LR01/07] FHWA has requested the formation of three expert task groups (ETGs) to support our review of the program and development of consensus recommendations. The ETGs will be full-fledged NRC advisory committees. They will hold periodic meetings with LTBP staff and contractors to receive briefings on specific technical issues and to deliberate on the findings and advice that they will submit to us as part of

our information-gathering activity at each of our meetings. Each ETG will have a specific subject area:

- Bridge durability and preservation,
- Bridge evaluation and monitoring, and
- Bridge traffic and truck weights.

We concur with the decision to request the formation of these ETGs and with the indicated subject areas. We suggest that the ETGs be established in time to hold their first meetings at least 2 weeks before our next meeting in May 2012, so that their chairs will have sufficient time to prepare their reports to us for presentation and discussion.

In closing, we recognize that the preparations for this meeting required extensive effort by many people, and we express our thanks to them individually and collectively. The LTBP team functions well and has a common purpose—to ensure the success of the LTBP program. We willingly join the team and enthusiastically support the purpose.

Finally, I thank Dr. Firas Ibrahim, Dr. Hamid Ghasemi, and their colleagues for a highly informative and productive first meeting.

Sincerely,

Ananth K. Prasad
Chair
TRB LTBP Committee

Attachment 1: Meeting agenda

Attachment 2: Roster of committee members indicating attendance at the meeting of November 28–29, 2011

Attachment 1

Meeting Agenda
TRB Long-Term Bridge Performance Committee
Room 109, The National Academies' Keck Center
500 Fifth Street, NW, Washington, D.C., 20001

This committee provides an ongoing peer review of the Long-Term Bridge Performance (LTBP) program, which is a 20-year research effort to measure and monitor the performance of a nationally representative sample of bridges. The committee reviews the LTBP program's plans, operations, progress, and products and provides advice to FHWA on the program's strategic plan; data definition, standardization, quality control, and collection efforts; sampling plan; and overall R&D program management and direction.

Monday, November 28, 2011

7:30–8:00 a.m.	Continental Breakfast	
8:00–8:30 a.m.	Welcome - Introductions - Meeting Objectives - Administrative Matters	Prasad, Raab
8:30–9:00 a.m.	Role of the Committee - Structure - Operations - Advice	Raab
9:00–9:15 a.m.	LTBP Program Remarks	Ibrahim
9:15–9:45 a.m.	Introductory Overview of LTBP Program - Background and Status - Budget, Schedule, Milestones	Ghasemi
9:45–10:15 a.m.	Break	
10:15–11:00 a.m.	LTBP Research Plan	Maher
11:00 a.m.–noon	Defining and Measuring Bridge Performance	Hooks
Noon–1:00 p.m.	Lunch	
1:00–2:45 p.m.	Bridge Data Collection - First Years and Lessons Learned - The Road Ahead	Foden Moon, Gucunski
2:45–3:15 p.m.	Break	
3:15–4:15 p.m.	Knowledge Creation	Mertz
4:15–5:00 p.m.	Closed Session—Biases and Conflicts of Interest	Godwin
5:00 p.m.	Adjourn for the Day	

Tuesday, November 29, 2011

7:30–8:00 a.m.	Continental Breakfast	
8:00–8:45 a.m.	LTBP Data Infrastructure—Bridge Portal	Jensen
8:45–9:30 a.m.	Data Analysis and Data Fusion	Moon
9:30–10:15 a.m.	Break	
10:15–11:00 a.m.	LTBP Products and Knowledge Transfer	Maher
11:00 a.m.–noon	Specific Requests for Feedback	Ghasemi
Noon–1:00 p.m.	Lunch	
1:00–2:30 p.m.	Closed Session—Committee Consensus	
2:30–3:00 p.m.	Concluding Remarks	Prasad, Raab
3:00 p.m.	End of Meeting	FHWA

Attachment 2

ROSTER OF THE TRB LONG-TERM BRIDGE PERFORMANCE COMMITTEE INDICATING ATTENDANCE[1] AT THE MEETING OF NOVEMBER 28–29, 2011

ANANTH K. PRASAD, Chair
Secretary
Florida Department of Transportation

MALCOLM T. KERLEY, Vice Chair
Chief Engineer
Virginia Department of Transportation

JOHN E. BREEN
Nasser I. Al-Rashid Chair Emeritus
University of Texas

HARRY A. CAPERS, JR.
Vice President (Corporate Bridge Engineer)
Arora and Associates, P.C.

R. SCOTT CHRISTIE
Deputy Secretary for Highway Administration
Pennsylvania Department of Transportation

W. GENE CORLEY
Senior Vice President
CTL Group

KARL H. FRANK
Chief Engineer
Hirschfeld Industries

BRUCE V. JOHNSON
State Bridge Engineer
Oregon Department of Transportation

JUGESH KAPUR
State Bridge and Structures Engineer
Washington State Department of Transportation

JOHN M. KULICKI
Chairman and CEO
Modjeski and Masters, Inc.

RICHARD D. LAND
Chief Deputy Director (Interim)
California Department of Transportation

SANDRA Q. LARSON
Research and Technology Bureau Director
Iowa Department of Transportation

ANDRZEJ S. NOWAK
Professor
University of Nebraska

KENNETH D. PRICE
Vice President, National Bridge Practice
HNTB Corporation

[1] Attendees of the meeting are indicated in underlined bold capital italics.