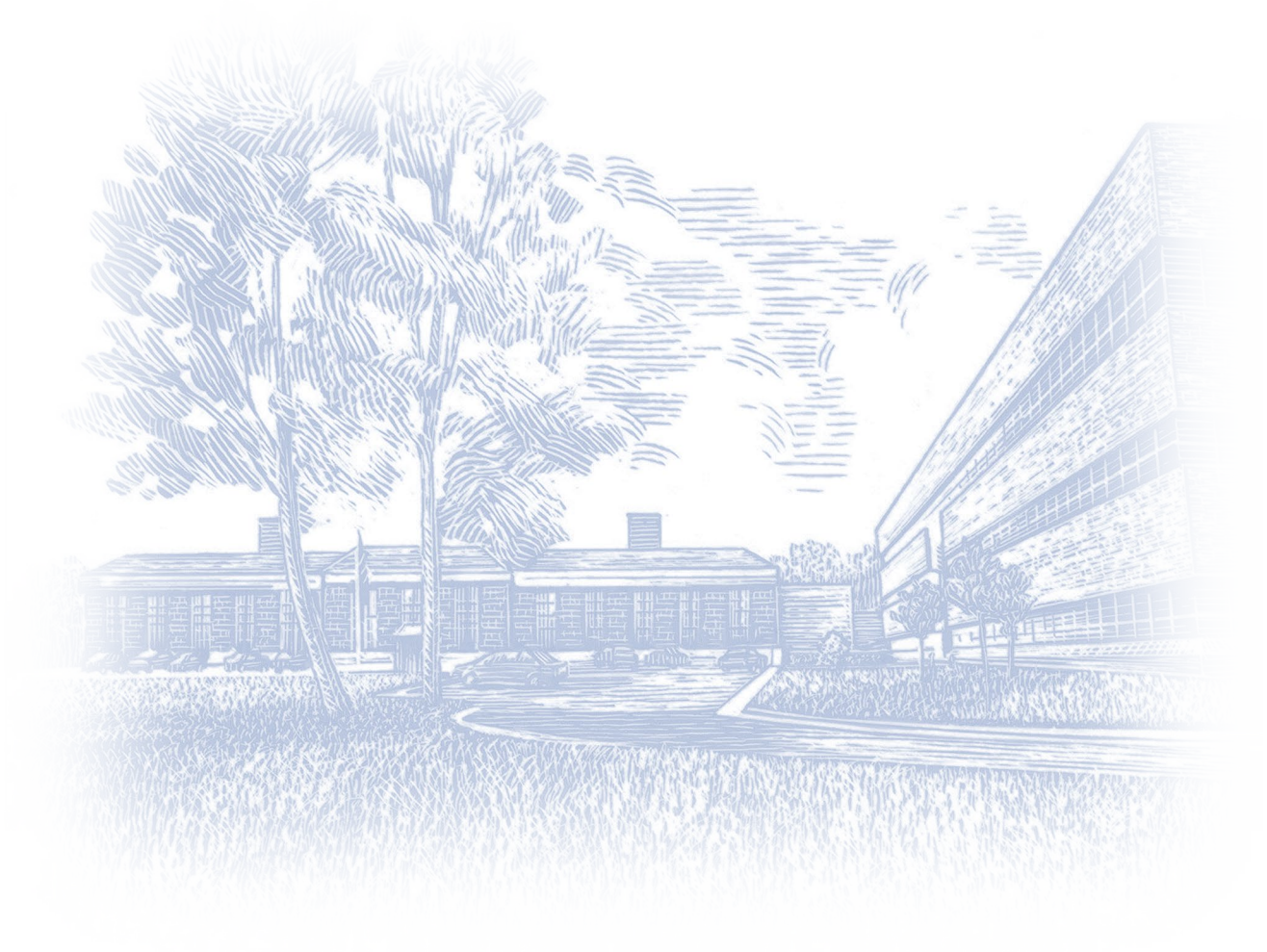
LTPP 1998 Year in Review

Publication No.: FHWA-RD-99-111 **1999**



U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
Turner-Fairbank Highway Research Center
6300 Georgetown Pike, McLean, VA 22101

THE LTPP MILESTONE CHART

The 1980's

1984
The Strategic Transportation Research Study recommends the creation of the Long-Term Pavement Performance (LTPP) program as an element of a Strategic Highway Research Program (SHRP).

1986
SHRP Research Plans published. LTPP experiment design established. It involves two study programs — General Pavement Studies (GPS) and Specific Pavement Studies (SPS) — along with the creation of an LTPP data base and analysis projects of the data collected from the studies.

1987
Surface Transportation Assistance Act (STAA) funds SHRP and LTPP.

1989
LTPP data collection begins.

The 1990's

1990
SHRP analysis begins.

1991
First public release of data from LTPP data base.

1992
ISTEA provides funds for continuation of LTPP. Research phase of SHRP ends, day-to-day management of LTPP is transitioned to FHWA.

1994
SHRP-LTPP analysis reports published. FHWA LTPP analysis begins..

1996
FHWA-LTPP product implementation efforts launched via Product Preview and the appointment of a formal implementation team. TRB-LTPP Committee establishes the LTPP Program Improvement Subcommittee.

1997
LTPP Program Improvement Subcommittee launches Data Resolution effort. FHWA-LTPP analysis reports published. AASHTO adopts LTPP-verified improved design procedures for jointed concrete pavements.

1998
Release of LTPP products: DataPave, LTPPBind, Rigid Pavement Design Software. Last phase of Data Resolution effort initiated. Transportation Equity Act for the 21st Century (TEA-21) reduces federal funding available to LTPP program. AASHTO Board of Directors unanimously approves additional funding for LTPP for FY99.

1999
Completion of Data Resolution Effort. Adoption of Revised Monitoring Schemes. LTPP data used for development and verification of *AASHTO 2002 Pavement Design Guide.*

Table of Contents

INTRODUCTION

The Long-Term Pavement Performance (LTPP) program is designed to provide answers to how and why pavements perform as they do. These answers can help highway engineers not only design longer lasting roads, but also protect the Nation's $30-billion-per-year investment in building and maintaining pavements.

When the program was initiated in 1987 by the Strategic Highway Research Program (SHRP), it was merely a vision, an idea: To create a comprehensive 20-year study of pavements that would provide the highway community with the information it needed to design, build, and maintain cost-effective and long-lived roads. The idea originated with State highway agencies across the Nation that needed to repair and replace a considerable amount of pavement due to the stress of increasing traffic loads and volume. Recognizing the need for an extensive long-term program of research into pavement performance, these agencies outlined a work plan, invested funds, and provided staff support to get the program rolling.

As the milestone chart shows, a lot has happened since 1987. The program was defined and structured, and the experiments were designed and built. Data from the experiments have been collected and housed in a national data base-the largest and most comprehensive of its kind in the world. Analysis of the data has enabled the verification of critical pavement design, construction, and rehabilitation parameters. Indeed, the data collected from the LTPP experiment over the past 10 years will be used for the evaluation and verification of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures.

Perhaps, most importantly, a strong partnership has been forged — a partnership in which the States and Provinces, the American Association of State Highway and Transportation Officials (AASHTO), the Canadian Strategic Highway Research Program (C-SHRP), the Transportation Research Board (TRB), and the Federal Highway Administration (FHWA) all play a critical role in helping LTPP achieve its potential.

Yes, a lot has happened since 1987. And in 1998, a lot more happened. LTPP introduced several new products, including DataPave and LTPPBind. Pavement engineers and managers can use these products on the job to help them make decisions that lead to more cost-effective and better performing pavements. LTPP also launched the next stage of its Data Resolution effort, which resulted in a 20-percent increase in the quantity of releasable data from the LTPP data base. Several data analysis projects were also completed by FHWA in 1998. Findings from these projects will help highway managers develop more effective traffic-monitoring schemes and will guide the design and construction of long-lived and cost-effective pavements. Fourteen reports documenting these findings were published by FHWA in 1998. And to help engineers, researchers, and others stay abreast of this new information, FHWA published several LTPP TechBriefs-summaries of LTPP's recent research that concisely report research findings and how they will affect current practices.

Indeed, 1998 was a productive year for LTPP. It was also a challenging year. With the passage of the Transportation Equity Act for the 21st Century (TEA-21), Federal funds available to continue the LTPP program were dramatically reduced. Concerned that this funding level fell far short of what was needed to effectively conduct LTPP research, the partners worked together to find a solution. These efforts led to a series of resolutions drafted by several AASHTO committees that resulted in the AASHTO Board of Directors approving additional funding for LTPP for fiscal year (FY) 1999.

The partnership on which LTPP was founded in 1987 remained steadfast in support of the program in 1998. The purpose of this report is to provide LTPP's partners with an overview of what the partnership achieved in 1998 and key initiatives the partnership will be pursuing in 1999.

LTPP-THE RESEARCH PLAN

In 1986, Strategic Highway Research Program: Research Plans was published. It presented plans for a concerted research effort to produce major innovations for increasing the productivity and safety of the Nation's highway system. One component of this effort was the LTPP program — a 20-year study of in-service pavements throughout North America. This original LTPP research plan set forth six objectives for the program:

Evaluate existing design methods.

Develop improved design methodologies and strategies for the rehabilitation of existing pavements.

Develop improved design equations for new and reconstructed pavements.

Determine the effects of loading, environment, material properties and variability, construction quality, and maintenance levels on pavement distress and performance.

Determine the effects of specific design features on pavement performance.

Establish a national long-term data base to support SHRP's objectives and to meet the future needs of the highway industry.

To support these objectives, the plan established two types of studies: General Pavement Studies (GPS) and Specific Pavement Studies (SPS).

General Pavement Studies focus on the most commonly used structural designs for pavement. Eight types of existing in-service pavements — in either original or rehabilitated condition — are being monitored throughout North America. The performance of these structural designs is tested against an array of climatic, geologic, maintenance, rehabilitation, traffic, and other service conditions.

In contrast, the pavement test sections in the Specific Pavement Studies have been specially constructed by the States and Provinces to investigate certain pavement engineering factors. These particular test sections allow critical design factors to be controlled and performance to be monitored from the initial date of construction. Results will provide a better understanding of how selected maintenance, rehabilitation, and design factors affect pavement performance.

1998 ACCOMPLISHMENTS

DATA

The LTPP program monitors more than 2,400 asphalt and portland cement concrete (PCC) pavement test sections throughout the United States and Canada. Data on distress, roughness, structural capacity, traffic, and a range of other variables are systematically collected from each test section. These data are then put through a number of quality control checks and are stored in the LTPP data base.

Data collection and management are core functions of the LTPP program. Indeed, data collection activities take up the lion's share of the program's financial and staffing resources. Why? LTPP is first and foremost a research program. As with any research effort, getting high-quality, statistically sound, comparable data is vital to its success. Only through an intensive, rigorous accumulation of high-quality data can LTPP provide the information needed to understand why and how pavements perform as they do.

LTPP's data collection activities began in 1988. Last year, to ensure that the data collected to date were of the quality and completeness needed, FHWA launched a multi-phased Data Resolution effort. Initial phases of the effort involved reorganizing LTPP's data processing procedures and upgrading its computer hardware and software.

In 1998, LTPP continued to make significant progress toward its Data Resolution goals. Early in the year, FHWA reviewed the status and completeness of LTPP data collected to date. The results of these reviews were compiled into data status reports that identified the gaps and questions regarding data from each State and Province.

In April, FHWA staff presented their findings to AASHTO's Standing Committee on Highways (SCOH). In response, SCOH issued a resolution calling on the States and FHWA to address the missing and questionable data in order to ensure that the LTPP program meets its goals.

With AASHTO's support, FHWA then conducted a series of meetings with the States, FHWA Regional Offices, and Provinces to review each one's data status report, discuss the completeness and quality of the data, and develop a data resolution action plan. Throughout the summer and fall of 1998, 60 data

resolution meetings were held that were attended by more than 1,200 representatives of the State and Provincial highway agencies and FHWA Division Offices.

In 1998, LTPP's data resolution efforts resulted in a 20-percent increase in the quantity of releasable data from the LTPP data base. This includes data collected and processed in 1998 and the processing of previous years' data. FHWA-LTPP staff also worked toward resolving two key issues related to data collected by FHWA-the asphalt resilient modulus test procedures and the backlog of photographic distress surveys. In addition, analysis of LTPP data collected to date and review of the results of this analysis with the States and Provinces enabled LTPP to identify those test sections that have the maximum potential for delivering complete, high-quality data sets. Now, the States, Provinces, and FHWA can reduce or eliminate monitoring for those test sections where critical data issues cannot be resolved, thus enabling all to allocate financial and human resources more effectively.

ANALYSIS

While the majority of LTPP resources are used for data collection and management activities, analysis of the data collected has been a critical part of LTPP from the outset. Analyses conducted thus far have addressed a broad array of topics from field validation of pavement design procedures, to studies of variability in traffic and materials data, to improved design procedures for jointed concrete pavements.

In 1997, LTPP set a strategic direction for its analysis efforts. Analysis efforts were organized into four major stages, with each stage building upon the foundation provided by the LTPP data and outcomes of the previous stages. Through-out all the stages, LTPP will coordinate with other national research initiatives to maximize the effectiveness of LTPP's contribution to pavement technology.

In 1998, FHWA completed six data analysis projects. Eleven additional analysis projects were ongoing and five new projects were initiated. Highlights of key findings from analysis projects completed in 1998 include:

Analysis of LTPP Roughness Data found that even thin overlays can yield substantial improvements in roughness. For example, International Roughness Index (IRI) values between 2.5 and 3 m/km were reduced to approximately 0.8 m/km through the application of a 50-mm overlay. This finding supports the common practice of using overlays to correct rough pavements, and suggests that structural rather than functional considerations should govern overlay thickness.

Analysis of LTPP Performance Data for Portland Cement Concrete Pavements found that the use of pre-placed baskets for dowel placement, the use of plastic inserts to form joints, and the use of concrete having a coarse aggregate content of more than 1800 kg/m3 and a fine aggregate content of less than 1300 kg/m3 are among the factors associated with good performance. This and other information presented in the report can be used to guide the design and construction of long-lived PCC pavements.

Analyses to Evaluate Existing Mechanistic Distress Prediction Models for Both Jointed Concrete and Asphalt Concrete represent the first-ever application of the LTPP data to what might be considered its ultimate use. As such, their greatest contribution is the feedback they provide to guide efforts in evaluating and validating the 2002 Guide for the Design of New and Rehabilitated Pavements, currently being developed under the National Cooperative Highway Research Program (NCHRP) Project 1-37A.

Analysis of LTPP Traffic Data

provided information on: (1) how traffic volumes vary by time of day, day of week, season, and type of roadway; and (2) how sampling plans for collection of vehicle classification and weigh-in-motion data affect the accuracy of annual loading statistics. This information can help in the development of traffic-monitoring schemes for highway agency planning and pavement management activities.

In addition to these findings, several of the analysis projects conducted in 1998 are producing "computed parameters." Computed parameters are engineering parameters or summary statistics derived from the raw LTPP data. Examples of computed parameters include IRI (derived from longitudinal profile data), backcalculated moduli (derived from pavement deflection data and supplemented by pavement cross-section information), various rut indices (derived from transverse profile data), and in situ moisture content and frost penetration estimates. Computed parameters that will soon be added to the LTPP data base as a result of the 1998 analysis include a series of rut indices, backcalculated moduli, and in situ moisture content and frost penetration estimates.

The availability of computed parameters will expedite and improve the efficiency of many future analysis projects, as individual researchers will no longer have to compute the parameters themselves before moving on to the central focus of their analysis.

PRODUCTS

LTPP products include information, computer software, analysis procedures, and guidelines on pavement monitoring, design, and materials testing. These products provide highway engineers with practical solutions to pressing technical problems.

Early in the program, LTPP products reflected the work that was being done. As the experiment was being built, pavement monitoring, materials testing, and equipment standards and calibration procedures were developed by LTPP. Many of these were adopted by AASHTO and are used by highway agencies in their day-to-day operations.

In 1996, FHWA published a Product Preview to provide its partners with information on the types of products emerging from the program. FHWA also formalized the program's product development process in 1996 by establishing an implementation team. The team's mission was to take LTPP research findings and turn them into practical engineering tools.

In 1998, the following LTPP products were introduced:

Resilient Modules Videotapes — A series of three videotapes that explain the hows and whys of LTPP's revised unbound resilient modulus laboratory tests and procedures.

FWD Calibration Videotapes — A series of videotapes that present LTPP's Falling-Weight Deflectometer (FWD) calibration procedures.

DataPave — A software package that presents LTPP data on an easy-to-use CD-ROM. Designed to put LTPP data directly into the hands of those responsible for the design, construction, maintenance, and rehabilitation of roadways, DataPave leverages the enormous potential of LTPP data for the development of products to improve pavement technology.

Rigid Pavement Design Software — A Microsoft Excel spreadsheet that automates the design and analysis procedures for improved guidelines for PCC pavements as published in the 1998 Supplement to the AASHTO Guide for the Design of Pavement Structures, Part II — Rigid Pavement Design & Rigid Pavement Joint Design. The spreadsheet was developed to make it easier for highway managers and engineers to implement the improved guidelines, which were developed under NCHRP research and validated with LTPP data.

LTPPBind — A Windows-based software program that provides users with the ability to apply regional temperature and traffic conditions to select Superpave performance-grade asphalt binders. The software was developed to assist State and Provincial highway agencies with the

selection of binder grades that are more cost-effective and less restrictive, while meeting Superpave performance-grade concepts.

GETTING THE WORD OUT

FHWA announces LTPP research activities and results through publications, its website, meetings, and working wherever possible in cooperation with State highway agencies, industry trade associations, and professional societies. In 1998, FHWA stepped up its communications activities to "spread the word" about the program and the promise it holds for improving pavement performance.

MEETINGS

In 1998, FHWA initiated a series of meeting with State and Provincial highway agencies. The purpose of these meetings was twofold: (1) to discuss data collection and monitoring issues, and (2) to provide an update on LTPP's progress over the past 10 years and its plans for the next 10 years. In total, LTPP staff and contractors met with more than 1,200 representatives of State and Provincial agencies and FHWA Division Offices.

Each year, FHWA-LTPP staff and contractors also make presentations at various industry, trade association, and government meetings throughout the United States. Highlights of the last year include the LTPP Box Session, State Coordinators Meeting, LTPP International Coordinators Meeting, and several other LTPP presentations at the 1998 Annual TRB meeting. In addition, at the May 1998 North American Travel Monitoring Exhibition and Conference in Charlotte, North Carolina, FHWA-LTPP sponsored a session on "Lessons Learned From the LTPP Project." In September 1998, LTPP presented results from two LTPP data analysis projects at the 1998 Annual Conference of the Transportation Association of Canada in Regina, Saskatchewan.

WORKSHOPS/CONTESTS

With the introduction of DataPave, LTPP data are now readily available to the entire highway community. To help users learn how to take advantage of the DataPave software, FHWA and the American Society of Civil Engineers (ASCE) co-sponsored a series of 16 demonstration workshops between June and October 1998.

FHWA and ASCE also launched an LTPP International DataPave contest in August 1998. Designed primarily for engineering students, the contest involves using DataPave in a research project. Students, who are encouraged to team with a highway agency or a consulting firm, determine the research objective, conduct research, and analyze the data. The findings are then submitted in the form of a paper for evaluation. Information about the contest can be found at LTPP's DataPave web page).

PUBLICATIONS

In 1998, LTPP kicked off its second decade. To keep the highway community apprised of its plans for the next 10 years, FHWA published a 12-page document entitled LTPP: The Next Decade. The document outlines LTPP's primary challenge over the next 10 years and describes efforts currently underway to address this challenge.

LTPP's TechBriefs bring concise summaries of recent LTPP data analysis projects to users. In addition to describing the objectives and key findings of the analysis project, each TechBrief presents how these

findings will affect current practices. TechBriefs are mailed to State and Provincial highway agencies, FHWA headquarters and field offices, members of TRB committees advising LTPP, and other interested parties. They are also available at LTPP's website (https://www.fhwa.dot.gov/research/tfhrc/programs/infrastructure/structures/ltbp/).

RESEARCH REPORTS

FHWA published 14 research reports documenting FHWA-sponsored analysis of LTPP data in 1998. The published reports contain research findings that are considered to be of broad interest. Copies of the reports are distributed to State and Provincial highway agencies, FHWA headquarters and field offices, members of TRB committees advising LTPP, and other interested parties. An annotated bibliography of these reports and reports from previous years is available on LTPP's website (https://www.fhwa.dot.gov/research/tfhrc/programs/infrastructure/structures/ltbp/).

WEBSITE

LTPP's website is designed to provide information on the program's ongoing research activities and the products and reports that result from these activities. In 1998, FHWA revised and updated the LTPP website. The redesigned website features several new sections, including a library that provides a complete bibliography of research reports from FHWA-LTPP sponsored data analysis, along with LTPP TechBriefs and a Products section from which users can download LTPPBind software or get the latest information on DataPave.

LTPP 1998 Publications

Brochure

LTPP: The Next Decade (FHWA-RD-98-109)

TechBriefs

Accuracy of LTPP Traffic Loading Estimates (FHWA-RD-98-124) LTPP Data Analysis: Improved Low Pavement Temperature Prediction (FHWA-RD-97-104) LTPP Data Analysis, Validation of Guidelines for k-Value Selection and Concrete Pavement Performance Prediction (FHWA-RD-97-035) Reducing Roughness in Rehabilitated Asphalt Concrete Pavements (FHWA-RD-98-149) Roughness Trends of Flexible Pavements (FHWA-RD-98-132) Understanding Traffic Variations by Vehicle Classification (FHWA-RD-98-117) What Makes Portland Cement Concrete (PCC) Pavements Rough? (FHWA-RD-98-148) Why Does LTPP Require Site-Specific Traffic Loading Data? (FHWA-RD-98-103) WIM Scale Calibration: A Vital Activity at LTPP Sites (FHWA-RD-98-104)

Research Reports

Analyses Relating to Pavement Material Characterizations and Their Effects on Pavement Performance (FHWA-RD-97-085) Assessment of the SPS-7 Bonded Concrete Overlays Experiment: Final Report (FHWA-RD-98-130) Common Characteristics of Good and Poorly Performing PCC Pavements (FHWA-RD-97-131) Concrete Pavement Maintenance Treatment Performance Review: SPS-4 5-Year Data Analysis (FHWA-RD-97-155) Design and Construction of PCC Pavements, Volume I: Summary of Design Features and Construction Practices That

Influence Performance of Pavements (FHWA-RD-98-052) Design and Construction of PCC Pavements, Volume II: Design Features and Practices That Influence the Performance of Pavements (FHWA-RD-98-127) Determining Soil Volumetric Moisture Content Using Time Domain Reflectometry (FHWA-RD-97-139) Investigation of Development of Pavement Roughness (FHWA-RD-97-147) Long-Term Monitoring of Pavement Maintenance Materials Test Sites (FHWA-RD-98-073) LTPP Seasonal Asphalt Concrete (AC) Pavement Temperature Models (FHWA-RD-97-103) Maintaining Flexible Pavements — The Long-Term Pavement Performance Experiment SPS-35-Year Data Analysis (FHWA-RD-97-102) Mechanistic Evaluation of Test Data from LTPP Flexible Pavement Test Sections, Volume I: Final Report (FHWA-RD-98-012) Mechanistic Evaluation of Test Data from LTPP Jointed Concrete Pavement Test Sections (FHWA-RD-98-094) Rehabilitation Performance Trends: Early Observations from Long-Term Pavement Performance (LTPP) Specific Pavement Studies (SPS) (FHWA-RD-97-099)

FUNDING

A major change in LTPP's funding situation occurred in 1998. For FYs 1992 through 1997, the budget for LTPP averaged $14.5 million per year. This changed dramatically with the passage of TEA-21 authorization legislation in May 1998. TEA-21 provides a $10-million-per-year line item for LTPP, effectively reducing the budget for LTPP by about one-third.

Several AASHTO committees were quick to recognize that a budget cut of this magnitude put LTPP's ability to deliver much needed and long-awaited results in jeopardy. As a result of their efforts, the AASHTO Board of Directors approved $4.7 million in supplemental funding for LTPP for FY 1999.

A total of $3.1 million of these funds will be used for LTPP data collection field operations and will be managed by FHWA. Without this funding, LTPP would not be able to collect all of the data that should be collected or purchase badly needed replacements for monitoring equipment. Among the data collection activities NOT covered by the TEA-21 funding are the collection of permanent (photographic) records of pavement distress, the conduct of seasonal monitoring on selected LTPP test sites, and several types of materials tests.

Similarly, $1.275 million of AASHTO supplemental funding will be used for LTPP analysis efforts; however, these funds will be managed through NCHRP. Hence, for FY 1999, FHWA and NCHRP will share responsibility for national analysis efforts focusing on LTPP data.

Without this additional analysis funding, the national LTPP analysis effort would have a budget of only $500,000 per year. At this level of funding, only the first stage in the LTPP data analysis strategy can be pursued. The more advanced analyses planned for the second and third stages cannot be pursued. A much higher level of investment in national LTPP analysis is needed to fully take advantage of the LTPP data base as a resource.

And finally, $100,000 of these funds have been allocated for product development and $225,000 have been allocated for communications and coordination activities to be conducted by TRB.

It is important to note that AASHTO supplemental funding for LTPP is only approved for FY 1999. Proposals for a similar package of supplemental funding for FY 2000 and the longer term are currently under consideration by AASHTO.

WORKING TOGETHER

One of the distinctive features of LTPP is the partnership on which it is built. The State and Provincial highway agencies, AASHTO, TRB, C-SHRP, and FHWA are deeply involved in LTPP's direction, resource allocation, and field activities.

GUIDANCE AND DIRECTION

TRB operates several committees that provide input and advice on LTPP's research and implementation activities. The members of these committees come from State and Provincial highway agencies, industry, and academia. They contribute valuable expertise and long hours of service to help steer the program's research toward usable results. The TRB-LTPP Committee guides program management, and several topic-specific Expert Task Groups provide technical review and input for key program areas.

In 1997, when the LTPP program reached the midway point of its 20-year life, a TRB-LTPP Program Improvement Subcommittee was set up to work with FHWA in assessing the program's progress and to provide advice and counsel as LTPP entered its second decade. The subcommittee played a major role in developing the strategy for LTPP's Data Resolution effort and in formalizing its product development and delivery processes.

IMPLEMENTATION

AASHTO has played a critical role in LTPP from its inception. From test section recruitment to the adoption of LTPP-developed methods, procedures, and guidelines as standards for pavement engineering, AASHTO has provided the collective leadership for many of the program's successes to date. Indeed, in 1998, when LTPP funding was drastically reduced under TEA-21, several AASHTO committees put forth resolutions that ultimately led to the AASHTO Board of Directors unanimously approving additional funding for LTPP in FY 1999.

RESEARCH PARTICIPATION

Only through the support and active participation of the State and Provincial highway agencies has LTPP become what it is today. Certainly, they have played a unique role as both owners and customers of the program. As owners, they have made significant investments in the program by designating the test sites, constructing and monitoring the test sections, supplying test materials, and collecting traffic and other data from the test sites. As customers, they have been the primary users of the results garnered from the program.

PROGRAM MANAGEMENT

FHWA's Office of Infrastructure Research and Development manages the day-to-day operation of LTPP. Specific activities include the collection, processing, and dissemination of data; national analysis activities; and working with the FHWA-LTPP implementation team on product development and delivery activities.

THE FUTURE

For LTPP, 1999 promises to be as productive and challenging a year as was 1998. Highlights of efforts in each of the LTPP's key programmatic areas for 1999 include:

DATA

In 1999, LTPP will complete its Data Resolution effort. In turn, these results will be used to revise LTPP data collection and monitoring schemes. Adoption of new LTPP monitoring schemes is targeted for mid-1999.

LTPP will also continue to contribute to the development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures. Data from the program will be provided for the evaluation and validation of pavement design procedures currently being developed under NCHRP Project 1-37A.

ANALYSIS

As of 1999, national analyses efforts focusing on LTPP data are now a shared responsibility between FHWA and NCHRP. As such, FHWA will continue its systematic review and analysis of the LTPP data. In addition to completing ongoing analyses (see page 6, LTPP Analysis Projects Ongoing in 1998), FHWA plans to initiate the following analyses: Review of LTPP Maintenance and Rehabilitation Data, Review of LTPP Laboratory Materials Data, Review of the SPS-1 Experiment, Review of the SPS-2 Experiment, Review of the SPS-5 Experiment, and Review of the SPS-6 Experiment.

Planned NCHRP 1999 analyses efforts include: Factors Affecting Roughness, Verification of Pavement Design Values, Procedures for Estimating Seasonal Variations, Efficacy of Sealing JPCP Joints, Timing and Effectiveness of Maintenance Surface, Determination of Service Life for Rehabilitation Options, Variability of Design Inputs for Mechanistic Design, and Validation of Performance Prediction Models.

PRODUCTS

An updated version of DataPave will be introduced by LTPP in 1999. This latest version will feature enhanced program functions, such as customized printout and export capabilities for individual section reports, in addition to tutorials that walk users through the program and provide data set examples.

In 1999, FHWA will also continue to explore new venues for "getting the word out" on LTPP. To alert the highway community about promising new products, LTPP will launch a series of Product Briefs. These Product Briefs will provide an overview of the product, including technical background information, key features, and product benefits.

FHWA will also hold regional LTPP meetings to brief the States and Provinces on the new monitoring schedules and will begin planning for a National LTPP Meeting in 2000.