

## On the Road to Long Lasting Pavements

Across the U.S., pavements often require major maintenance and rehabilitation prior to the end of their design life. To solve this dilemma, the Strategic Highway Research Program was funded in 1987 as part of the Surface Transportation Act. One of the key elements of the program was the Long-Term Pavement Performance (LTPP) project, a 20-year study of in-service highway pavements. From 1987 to 2001, about \$187 million has been invested nationally in LTPP.

The goal of LTPP is to provide information and products needed to extend pavement life. LTPP gathers and processes data describing the structure, service conditions, and performance of over 2,300 highway test sections throughout the United States and Canada. The 8 test sections in Oregon are listed in the table below.

Test sections are approximately 160 m in length. Each site has piezo sensors in the right lane that are connected to weigh-in-motion equipment to record vehicle counts and truck weights.

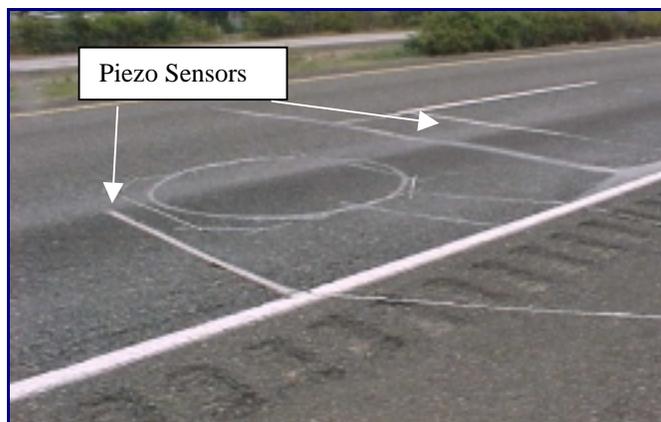
### National Database

Data on distress, roughness, structural capacity, traffic (volume and loading), climate, pavement

### Oregon LTPP Sites

Route	Milepost	Direction	Pavement Type
I-5	234.94	South	AC / JRCF
I-5	232.35	South	CRCP
I-5	185.99	South	CRCP
I-5	181.84	North	CRCP
I-84	264.07	West	CRCP
I-84	265.87	East	CRCP
I-82	8.70	East	CRCP
US26	56.33	East	AC

condition and material properties are collected at each test section. For the Oregon sites, ODOT's Research Group compiles the statistics. The FHWA maintains the data in a comprehensive database of site-specific information on pavement performance. The data has been used to explain how pavements perform and to develop new design procedures and products.



LTPP Site on I-5 SB at MP 234.94

### LTPPBind

One product developed as a result of the LTPP is LTPPBind, a software program used to select the correct Superpave asphalt binder for specific environmental conditions.

The American Association of State Highway and Transportation Officials (AASHTO) has adopted LTPPBind as a standard component of the Superpave mix design system. The software has produced significant cost savings because over-designing pavements with modified binders is reduced. A nationwide comparison of LTPPBind and the original Superpave system showed an annual construction cost savings of \$50 million for highway agencies using LTPPBind.

## **FALLING WEIGHT DEFLECTOMER CALIBRATION**

Another tool resulting from the LTPP research is the calibration procedure for the falling-weight deflectometer (FWD). Pavement engineers use FWDs to determine pavement structural capacity and remaining life in overlay design. Accurate calibration are critical in making final design decisions. LTPP's calibration procedure is the only nationally accepted means to ensure the FWD data collected by the states is accurate. There are national calibration centers in Minnesota, Nevada, Pennsylvania, and Texas.

## **RIGID PAVEMENT DESIGN**

LTPP researchers also have developed rigid pavement design software. The software uses a Microsoft Excel spreadsheet to automate the procedures developed for AASHTO in 1998. Engineers use this software to design for special

conditions at each job location. Considerations such as available material, traffic loading and climate are included, making the designs more cost effective and reliable. These guidelines are of particular importance to Oregon because of the Department's widespread use of continuously reinforced concrete pavement (CRCP).

## **PAVEMENT DESIGN GUIDE**

LTPP data has also been used in the development of an improved pavement design manual. A working draft of The 2002 Guide for the Design of New and Rehabilitated Pavement Structures is currently under review by the AASHTO Joint Task Force on Pavements. When complete, this guide will reflect state-of-the-art pavement design procedures and will give designers greater flexibility to apply local design options and approaches to account for differing climate and subgrade conditions.

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*For more information on ODOT's Research Program and Projects,  
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**<http://www.odot.state.or.us/tddresearch/>**