

TECHBRIEF



The Long-Term Pavement Performance (LTPP) program is a 20-year study of inservice pavements across North America. Its goal is to extend the life of highway pavements through various designs of new and rehabilitated pavement structures, using different materials and under different loads, environments, sub-grade soil, and maintenance practices. LTPP was established under the Strategic Highway Research Program, and is now managed by the Federal Highway Administration.



U.S. Department of Transportation
Federal Highway Administration

Research and Development
Turner-Fairbank Highway
Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

Pavement Treatment Effectiveness, 1995 SPS-3 and SPS-4 Site Evaluations, National Report

PUBLICATION NO. FHWA-RD-96-208

FHWA Contact: Bill Bellinger, HNR-30 703 - 285-2530

Introduction

The SPS-3 and SPS-4 experiments were constructed in 1990 under the Strategic Highway Research Program (SHRP) to evaluate the effectiveness of and to determine the optimum timing for applying preventive maintenance treatments for flexible and rigid pavements. Documentation of conclusions from recent field reviews to evaluate the performance of the maintenance treatments is presented. The opinions of State Expert Task Groups (ETG's) on each of four Long-Term Pavement Performance (LTPP) regional reviews are reported, along with a summary of data compiled by these ETG's to quantify the level of the treatment performance. One tour was conducted in each LTPP region for this purpose.

Each LTPP regional ETG developed a report summarizing their observations. The final report, Pavement Treatment Effectiveness, 1995 SPS-3 and SPS-4 Site Evaluations, National Report, combines the findings of all four regional groups.

SPS-3 Treatment Summary

The subsections below summarize the findings on the performance of the SPS-3 test sections.

Treatment Performance

The summarized conclusions of the ETG groups, with respect to treatment performance, are as follows:

- There was consensus among all four regional ETG groups that the thin overlay treatments have performed best after 5 years.
- In general, the chip seal treatments have also performed well. Chip seal performance was best in the Southern Region.
- Slurry seal performance varied from region to region. It was again best in the Southern Region, with the performance in the North Central Region being the poorest.

■ The crack seal treatment performed very well in the North Atlantic and North Central Regions where the wide shallow sealant reservoir was routed (38.1 mm width by 9.5 mm depth). Crack seal performance in the other two regions was not as successful. Revisions to specifications regarding routing and reservoir shape appear to have been key to the lesser performance.

Treatment Timing

The originally constructed experiment included pavements in Good, Fair, and Poor conditions.

The purpose of this was to be able to assess performance and develop recommendations regarding the timing of applications of the various treatments.

Evaluation of data gathered on the site visits indicates that after 5 years, a change in performance of the test pavements can be detected. As a result of these observations, the maintenance treatments contribute to the preservation of the test sections. Variations in the level of this performance can be observed from one treatment to another, and from one climatic region to another. The combina-

tion of climate and treatment performance levels provides some indication of which treatments agencies should consider and when to apply them.

The question of timing cannot be totally resolved from the visual observation information, but indications are that earlier application of the maintenance treatments, in general, provides greater benefit than later application.

Treatment Performance Life

Using the ETG's estimates of expected performance, an average life expectancy was developed for each treatment for three levels of initial pavement condition: Good, Fair, and Poor. This was done assuming both a continuation of maintenance activities on the sections and also with no further maintenance.

In general, the continued application of future maintenance treatments added 2 to 3 years to the expected life of the pavement compared to the life expectancy without further maintenance treatments.

SPS-4 Treatment Summary

After 5 years of performance, it is still too soon to draw conclusions regarding the performance of the

SPS-4 test sections. All test sections generally remain in good condition. The presence of incompressibles and early evidence of joint spalling have been observed in unsealed joint test sections. Very little of this is evident in the sealed joint sections. Sealed joints have remained sealed better than sealed cracks, which often become working cracks. A degree of faulting has been observed in some of the undersealed sections. A more detailed evaluation of the joint sealant and undersealing performance is provided.

Conclusions

The field review and evaluation of the SPS-3 and SPS-4 test sections have been valuable technology transfer tools. A sharing of experiences among the States has occurred as a part of the process. As a result maintenance treatments are better understood throughout the industry, and improved materials and construction specifications have been identified.

Future Activities

Analysis of pavement performance data collected by the LTPP program is ongoing. A report of this analysis will be released in 1997.

Researcher: This study was performed by Nichols Consulting Engineers, 1885 S. Arlington Avenue, Suite 111, Reno, Nevada, 89509. Phone Number 702-329-4955. Contract No. DTFH61-93-C-00060.

Distribution: This technical summary is being distributed according to a standard distribution. Direct distribution is being made to the Regions and Divisions.

Availability: The publication will be available in May 1997. Copies will be available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. A limited number of copies will be available from the R&T Report Center, HRD-11, FHWA, 9701 Philadelphia Court, Unit Q, Lanham, MD 20706, Telephone: 301- 577-0818, Fax: 301- 577-1421.

Key Words: Preventive maintenance, chip seal, slurry seal, crack seal, thin overlay, spalling, undersealed, faulting.

Notice: This technical summary is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The summary provides a synopsis of the study's final publication. The summary does not establish policies or regulations, nor does it imply FHWA endorsement of the conclusions or recommendations. The U.S. Government assumes no liability for the contents or their use.