Wait Before First Slurry Seal Application

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The application of a single slurry seal immediately after or one year after construction of the asphalt layer is not effective in terms of both the benefit to the users and the benefit cost ratio for the agency, our research found. For uniformity purposes, we recommend agencies apply slurry seal three years after the construction of the asphalt layer for both new and overlay constructions.

Local agencies and the Regional Transportation Commission in northern Nevada use slurry seal as a main preventive maintenance for their flexible pavements. However, due to the lack of a standard specification, the time of slurry application to asphalt pavements has been according to the project engineer's standard of practice, which resulted in an inconsistency in the timing of application between and even among the agencies themselves.

Recognizing the significance of optimal time at which a roadway would most benefit from a preventive maintenance treatment, in 2010 RTC sponsored research at University of Nevada-Reno (UNR) to evaluate and assess the optimum time of slurry seal application on asphalt pavements within the RTC region.

We evaluated long-term pavement performance and the cost-effectiveness of slurry seals applied to new and existing flexible pavements with respect to the time of slurry seal application.

A total of 2,700 pavement sections from minor arterials, collectors and residential streets were evaluated in this study, with the latter having by far the highest number of pavement sections. Only pavement sections that were slurry-sealed once during their intended performance lives were evaluated and were grouped as follows:

- Do-nothing: a slurry seal was not applied to the pavement
- Slurry seal applied immediately after construction, and
- Slurry seal applied at: 1, 3, 5, 7 and 9 years after construction.

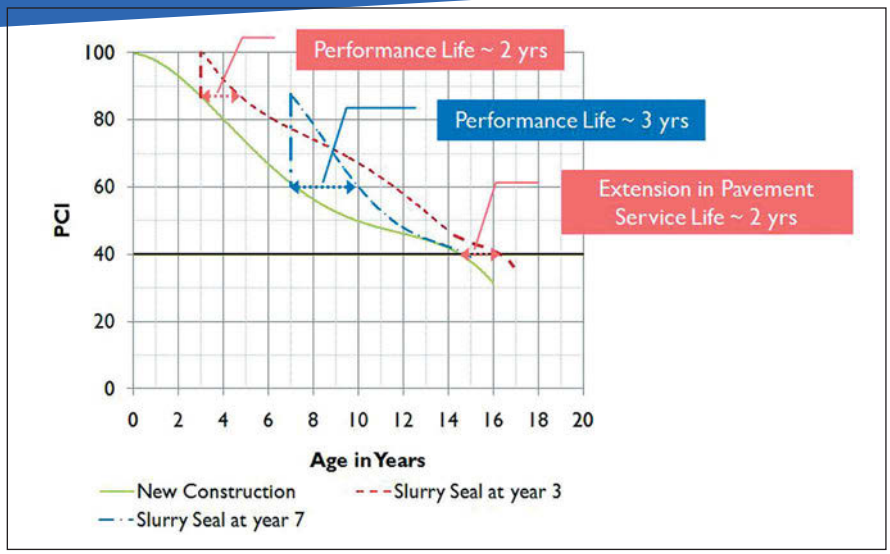

Fig. 1: Effect of slurry seal on the performance of a newly constructed pavement when applied at three or seven years after construction

Fig. 1 illustrates the effect of slurry seal on the performance of a newly constructed pavement when applied at 3 or 7 years after construction. Slurry seal performance life and the extension in pavement service life were determined for the various slurry seal applications. The slurry seal performance life was defined as the number of years for the slurry seal performance curve to reach the PCI of the existing pavement before treatment application.

The extension in pavement service life was defined as the number of additional years the pavement will have at the end of its service life (i.e., PCI = 40; threshold value for reconstruction) due to the application of the slurry seal. In other words, the extension in pavement service life is the number of years a pavement reconstruction is delayed. In this study, the slurry seal performance life ranged from 2.0 to 4.0 years, except when applied at years 0 and 1 (ranged from 0.0 to 1.0 years). The pavement service life was only extended in few cases by 0.5 to 2.0 years.

Based on the relative benefit and benefit cost ratio observations, user satisfaction and agency cost effectiveness were maximized when slurry seals were applied as follows:

- Year 3 for newly constructed arterials and newly constructed residential streets
- Years 3 and 5 for newly constructed collectors
- Years 3 and 5 for arterials, collectors and residential streets with overlays.

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