INTRODUCTION

Pavement preservation is an approach in enhancing pavement performance using a set of practices that extends the life of the pavement and improves safety and ride quality. According to the World Bank’s Pavement Deterioration Model, the cost of returning a pavement to good condition after deterioration may be four times the cost of maintaining it in good condition (Shahin, 2005). The results of a Utah Department of Transportation (UDOT) research study showed that it costs less to maintain roads in good condition than in poor condition (Zavitski, et al.). According to the National Cooperative Highway Research Program (NCHRP) Synthesis 223, every dollar spent on preventative maintenance at the correct time in a pavement’s life cycle saves $3–4 in future rehabilitation costs (Geoffroy, 1996). Later work by Galehouse, Moulthrop, and Hicks (2003) showed that future rehabilitation cost savings are $6–10 for every $1 spent on preventative maintenance. Some surface treatments are effective for maintaining pavements in good condition. They are applied to the entire surface of the pavement and are usually used for pavements with no major structural deterioration. The relatively low cost and simplicity of these techniques, besides their effectiveness in extending the life of the pavement and improving performance, has attracted many agencies into using them. Chip seal, slurry seal, microsurfacing, surface rejuvenation, fog seal, scrub seal, and thin overlays are among popular surface treatments.

SCOPE AND OBJECTIVE

This report aimed at researching asphalt surface treatments’ state of practice in the United States, particularly Southeastern Association of State Highway and Transportation Officials (SASHTO). The synthesis was designed to provide a reliable reference for those who are involved in surface treatment projects. Surface treatment techniques were described and recent research projects on this field were summarized. Best practices and implementation status were also addressed through a survey sent to SASHTO agencies.

METHODOLOGY

The general methodology of this research was two tiered: first, conduct a comprehensive literature review on asphalt surface treatments; second, send a survey to state and local agencies. The results from the survey were analyzed and presented in this report.

Survey questionnaires were developed to investigate actual surface treatment practices in southwestern states; three electronic questionnaires were prepared. The questionnaires were sent to southeastern state agencies as well as the local highway agencies involved in surface treatment projects.

The survey consisted of three electronic questionnaires as follows:

• Questionnaire 1, Administrative
• Questionnaire 2, Technical
• Questionnaire 3, Research Status
crack sealing/filling have been described briefly. The mechanism of each treatment as well as its application and general procedure were summarized. This was followed by a summary of recent research work. This literature review can help surface treatment practitioners be aware of recent finding in the practice in which they are involved in. Some techniques such as rejuvenator seal, sandwich seal, scrub seal, and cape seal are variation of major techniques like fog seal, chip seal or slurry seal.

Nineteen participants from Florida, Georgia, Louisiana, North Carolina, Virginia, West Virginia, and Arkansas participated in a survey designed to investigate state of practice. Crack sealing/filling, thin overlays, microsurfacing, chip seal, fog seal, and ultrathin bonded wearing course were found to be the most popular practices. There were not enough data from the survey to address state of practice for other techniques.

Delaying deterioration of the pavement and improving water infiltration are considered the main objectives for all treatments. In addition, practitioners often perform chip seals and ultrathin bonded wearing course (UBWC) to improve surface friction, microsurfacing and thin overlays to improve ride quality and fog seals to improve appearance of the pavement.

Social, legal, and political obstacles, as well as lack of skilled contractors, seem to be common problems of surface treatment constructions. In addition to these, some agencies reported suffering inefficient or inconsistent standard specifications and lack of knowledge and experience to perform surface treatments.

CONCLUSIONS

Preventive maintenance techniques delay deterioration of the pavements. Proper maintenance of pavements results in decreasing their life-cycle cost. Surface treatments are preventive maintenance techniques, which are applied on the whole surface of the road. This synthesis describes each technique, recent research work, and their implementation status in southeastern United States.

Ten surface treatment techniques including fog seal, rejuvenator seal, chip seal, sandwich seal, scrub seal, slurry seal, microsurfacing, cape seal, thin overlays, ultrathin bonded wearing course (Novachip), and...