

Study Sustainability of Warm Mix Asphalt

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EXTENDED ABSTRACT

This paper investigates sustainability of warm mix asphalt in comparison with the conventional hot mix asphalt. The comparison has been conducted through studying laboratory performance of warm mix asphalt as well as analyzing the environmental and economic impact of warm mix asphalt in comparison with hot mix asphalt. The trend toward sustainable construction has led state departments of transportation (DOTs) to place more emphasis on reducing the carbon footprints of pavements by reducing mixing and compaction temperature of asphalt paving mixtures. This has been conducted by using chemical and organic additives in asphalt mixtures to reduce shearing resistance of the mixtures during mixing and compaction. This in turn allow HMA production be conducted at 30° to over 100°F (16 to over 55°C). This particular technology labeled as Warm Mix Asphalt (WMA), was initiated by the German Bitumen Forum in 1997. Later in 2002, National Asphalt Pavement Association began to investigate the usefulness of this technology in the U.S.

In the U.S., The reduction in mixing and compaction temperature is achieved usually by adding synthetic zeolites, Sasobit wax, or asphalt emulsions to the overall mix. This allows a significant reduction in the temperature when mixing and laying the material and also results in lower consumptions of fossil fuels, thus releasing less carbon dioxide, aerosols, and vapors. Not only are the working conditions improved, but the temperature reduction also leads to more rapid availability of the surface for use, which is important for constructions sites with time schedules that are at a critical closing due date. Therefore, WMA is cost efficient, sustainable, and overall excellent product to utilize when managing a critical highway construction project.

Keywords: Bituminous, synthetic zeolites, Sasobit wax, asphalt emulsions, warm mix asphalt (WMA)