

Drivers and Barriers of Asphalt Rubber in Sweden

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Abstract : Asphalt rubber (AR) was initially developed in Sweden in the 1960s by replacing crumb rubber (CR) as aggregates in asphalt pavement. The AR produced by this method had better mechanical properties than conventional asphalt pavement but was very expensive. Since then, different technologies and methods have been developed to use CR in asphalt pavements, including blending CR with bitumen at a high temperature in the mixture, called the wet method, and blending CR with bitumen in the refinery, called the terminal blending method. In 2006, the wet method was imported from the USA to Sweden to evaluate the potential of using AR on Swedish roads. 154 km AR roads were constructed by the wet method in Sweden. The evaluation showed that the AR had, in most cases, better mechanical performance than conventional asphalt pavements. However, the terrible smoke and smell led the Swedish Transport Administration (STA) to stop using AR in Sweden. Today, there are few focuses on AR, despite its good mechanical properties and environmental aspects. Hence, there is a need to study the drives and barriers of using AR mixture in Sweden. The aims of this paper are: (i) to study drivers and barriers of using AR pavements in Sweden and (ii) to discover knowledge gaps for further research in this area. The study was done using a literature review and completed by interviews with experts, including three researchers from Swedish National Road and Transport Research Institute (VTI) and two experts from STA. The results showed that AR can be an alternative not only for conventional asphalt pavement but also for polymer modified asphalt (PMA) due to the same mechanical properties but the lower cost for production. New technologies such as terminal blending and using warm mix asphalt (WMA) methods can lead to reducing the energy and temperature during production processes. From this study, it is found that there is not enough experience and knowledge about AR in Sweden, and more research is needed, including the lifespan of AR, mechanical properties of AR using new technologies, and the impact of AR on spreading and leaching substances into nature. More studies can lead to standardization of using AR in Sweden, a potential solution for the use of end-of-life tyres, with better mechanical properties and lower costs, in comparison with conventional asphalt pavements and PMA.

Keywords : asphalt rubber, crumb rubber, terminal blending method, wet method

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