

## **Maximization of waste recycling in pavement maintenance project**

### **ABSTRACT**

The most common method of recycling in road maintenance projects in Malaysia is in situ recycling. To maximize waste recycling, plant recycling can be an option since previous studies indicated good performance using reclaimed asphalt pavement (RAP). However, variability in RAP and mixing temperature are the main concerns in plant recycling. Hence, this study investigates the maximization of waste recycling from road maintenance projects in Malaysia for plant recycling in terms of quality control and the environment. The experimental design consists of materials characterization for three sources of RAP, determination of mixing temperature, analysis of environmental and energy consumption, and optimization of RAP production. The findings showed that based on RAP gradation the quality control in terms of RAP variability was less than 15% coefficient of variance and considered acceptable. The addition of RAP stiffened the RAP mixture which result in increased viscosity and mixing temperature. Higher mixing temperatures produced more greenhouse gas emissions and energy consumption. Optimization of RAP production indicated that in order to maximize the RAP usage, 50%RAP content added with RH-WMA at 140°C mixing temperature was the most ideal. The proposed design approach and evaluation of waste materials adopted in this study are beneficial for assessing the essential criteria for maximizing waste recycling in the pavement.