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Evaluation of effects of pavement characteristics on the OBSI levels using Principal Components Regression

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Tire/pavement noise is a major contributor to traffic noise at highway speeds. Tire/pavement noise is affected by different pavement properties. A study conducted in California measured the noise levels of different mix types and the mix characteristics affecting noise levels. In this study, tire/pavement noise was measured using the on-board sound intensity (OBSI) method. Data was collected on four different types of pavement mixes: conventional open graded asphalt concrete (OGAC), rubberized asphalt concrete that are open graded (RAC-O), rubberized asphalt concrete that are gap graded (RAC-G), and dense graded asphalt concrete mixes (DGAC). A total of 72 field pavement sections were included in the study, all of which were less than 8 years old at the time of the measurements. This paper evaluates the pavement characteristics affecting noise levels using principal components regression. This technique was used due to the multicollinearity found among the variables. Two principal components were extracted from the measured parameters such as air void content, gradation properties, pavement roughness, age, and pavement surface condition.