

A Nonproprietary Road Performance Data Collection Tools for Local Public Agencies

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The overall ride quality of pavement is affected by pavement roughness (or smoothness) which also has an influence on fuel consumption and emission levels. Due to the high costs associated with pavement roughness data collection (characterized through the International Roughness Index [IRI]) on an annual basis, a low-cost nonproprietary collection system is desired by local public agencies (LPAs) to collect their pavement distress data on an annual basis. Modern smartphones come with a number of sensors such as multi-axis accelerometers, high-resolution digital image sensors, temperature sensors, gyroscopes, light intensity sensors, magnetic field sensors, and so on, as well as the Global Positioning Systems (GPS). These sensors, particularly the 3-axis accelerometers and GPS, offer an efficient and cost-effective means of collecting vehicle vertical acceleration data and estimated pavement roughness leading to significant cost savings for the LPAs in terms of road performance data collection. Therefore, a smartphone-based or nonproprietary collection system can be used to accomplish LPA needs of efficient and cost-effective road performance data collection. The data collected can then be transferred (over wireless networks) to and used directly with other pavement and operational management tools already being developed by the Iowa County Engineers Association (ICEA) Service Bureau (e.g., Iowa Pavement Analysis Tool [IPAT], Pavement Structural Analysis Tool [PSAT], and Operations Management System [OMS]).

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