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SUMMARY REPORT

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DEVELOPMENT OF IMPROVED RIDEABILITY SPECIFICATIONS FOR RIGID PAVEMENTS AND BRIDGE DECKS

In early 2004, a study was begun to develop improved rideability specifications for rigid pavements and bridge decks for the South Carolina Department of Transportation (SCDOT). As originally proposed, the study was intended to replace Rainhart profilograph testing procedures with California-style profilographs and to investigate the ability of the SCDOT's high-speed profiler to produce meaningful and consistent simulated profilograph Profile Index (PI) values. As the study progressed, the SCDOT discontinued use of their Rainhart profilographs and implemented new California-style profilograph rideability specifications for bridge decks (PI ≤ 10 in/mi, 0.2-inch blanking band) and new, unground rigid pavement surfaces (PI ≤ 12 in/mi, 0.2-inch blanking band). As this occurred, the emphasis of the project changed to investigate the feasibility of using high-speed inertial profilers and IRI-based rideability specifications for new diamond ground and rehabilitated PCC pavement surfaces.

This report summarizes a literature review and a survey of other state highway agencies (SHA). A limited amount of profiler testing was conducted on in-service pavements. The limited testing program demonstrated a high level of IRI repeatability using the SCDOT's Dynatest high-speed inertial profilers. Based on the literature review, SHA survey results and observed good to excellent profiler performance, it was concluded that inertial profiler IRI-based rideability testing is feasible for PCC pavement surfaces. Elements for interim rideability specifications are proposed.

Trial implementation of a profiler-based rideability testing program using the proposed specification elements is recommended. The proposed metric for quantifying rideability is mean wheelpath IRI computed for each 0.1-mile length segment. Several important issues warrant further investigation before final implementation. The proposed elements for interim rideability specifications do not address the measurement of localized roughness. Diurnal changes in jointed concrete pavement roughness have been reported by other investigators and were observed during day-long testing for this project. The limited testing program considered only repeatability to assess profiler performance. Profiler measurements obtained using the SCDOT's high-speed inertial profilers were not compared to output from different profiling devices or to reference measurements. It is recommended that additional investigations to address these issues be undertaken concurrent with the implementation of any trial profiler-based rideability specifications for PCC pavement surfaces.

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