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Iowa Granular Road Structural Design Tool

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Abstract

Over 71,000 miles of county roads in Iowa are aggregate-surfaced roads. Aggregate-surfaced roads carry low daily traffic volumes which are usually less than 200 vehicles per day and frequently support farm equipment movements. Iowa county engineers have a specific set of criteria based on their own experiences when designing and managing granular roads. Most of aggregate-surfaced roads design in Iowa are based on the engineering judgment. Thus, significant research is needed to develop a comprehensive and practical structural design tool for cost-effective design and construction of aggregate-surfaced roads systems in Iowa. The primary objective of this study is to meet such research needs. This will be achieved through the execution of five concurrent research studies. Some of research studies has been already initiated: So far, ISU PROSPER research team has conducted forensic investigations, and laboratory tests to identify the best practices for Iowa granular roads around the state. Also, interviews have also been made with some county engineers and surveys are prepared for distribution. The team is planning to continue up on construction, instrumentation, and performance monitoring of field demonstration sites, development of deterioration prediction models subjected to Iowa granular roadways, conduct a cost-effectiveness analysis; and development of a structural design tool and additional guidance documents. The outcomes of this research will substantially improve overall performance, save on maintenance and operation costs, and enhance the safety and mobility of Iowa aggregate-surfaced roads by addressing key performance indicators through the granular road design procedure.