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Sustainable and Cost-Effective Stabilization of Granular-Surfaced Roads in Iowa

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Abstract

In Iowa Highway Research Board (IHRB) Project TR-721, several methods for stabilizing Iowa granular-surfaced roads were examined using extensive laboratory tests, field demonstration sections, and field tests performed over a period of two years. The project goal was to identify cost-effective methods for reducing freeze-thaw related damage, using materials and construction equipment that are readily available to county engineer's offices.

To study a range of representative subgrade soil types, aggregate sources, and weather conditions, a total of thirty-one test sections were constructed in four counties distributed around Iowa, using various chemical and mechanical stabilization methods. The performance of the test sections was then evaluated over two year project duration using extensive field and laboratory tests, as well as photo surveys and Surface Condition Rating Reports completed by the grader operators. The construction and maintenance costs were tracked to compare the relative cost-effectiveness of the different stabilization methods.

Among the stabilization methods examined, the most economical and potentially effective were the Optimized Gradation with Clay Slurry (OGCS) method, 4 Cement-Treated Surface course, and three liquid chemical stabilizers known as Base One, EMC Squared, and Claycrete.