



Evaluating Local Road Rehab Alternatives

Project Number 2013-06

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Problem The use of cold in-place recycling (CIR) to completely recycle distressed asphalt pavements has been an efficient and cost-effective strategy for the county for several years. The CIR roads are typically surfaced with a 2-inch hot-mix asphalt (HMA) overlay. On low-volume roads, Brown County has tried chip seals as a less expensive, lightly surfaced alternative. Determining when and where to apply the lightly surfaced alternative and helping define expectations is highly desirable for Brown County and many other counties throughout the state.

Solution Brown County conducted pavement strength and performance analysis on thin HMA overlays and chip-seal surface treatments over recycled stabilized bases. The county also identified pertinent research to characterize the various stabilization treatments and how they might perform in relation to the overlay or chip seal.

Procedure The county conducted non-destructive pavement assessments along with coring for strength analysis to better define the differences between a lightly surfaced CIR pavement and one that is overlaid. Non-destructive testing included ground penetrating radar (GPR) and falling weight deflectometer (FWD) analysis. The GPR was used to look at pavement section thicknesses, and the FWD was used for strength determinations.

Results The analysis showed the overlay section had a 10.2-ton rating, while the seal-coat section had a 7.6-ton rating. Past projects using seal coats over CIR have shown between 9- and 10-ton ratings, with the difference being the subgrade R value. Since the road has an annual average daily traffic of 170, the 7.6-ton rating on the chip-seal section would normally be adequate. However, heavier loads from trucks and agricultural traffic could overstress the road, resulting in premature failure. This is especially true at the edge of the CIR pavement, which is typically weaker than the center of the road. Therefore, it may be desirable to use the lightly surfaced strategy with higher subgrade R values. Also, when using the chip-seal option, the CIR pavement should be widened a few feet to push the unconfined edge further into the shoulder, beyond where traffic runs on the pavement.

Approximate Cost More than \$100,000

OPERA Funding \$10,000

Implementation The county has shared its findings in a geotechnical report. This report also provides guidance for evaluating other recycling processes and materials and how they might perform under the same surfacing comparisons. This project is the first step toward a comprehensive method for determining rehab strategies using various materials, processes, and surfacing methods on low-volume roads.

Status Complete

View the complete project report online at www.mnltap.umn.edu/opera.

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