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December 5, 1989

RESEARCH UPDATE

NUMBER U89-6

WIRTGEN HOT IN PLACE RECYCLE

REFERENCE: Work Plan 88-R-8

HISTORY: This evaluation involves the comparison of two pavement rehabilitation techniques performed during the 1988 construction season on a 6.8 mile segment of US Route 4 in Sherburne Vt. The control section is Project Sherburne F020-2(23)s, a standard overlay, which began at MM 0.71 and proceeded easterly to mile marker 3.21. At that point a recycle project, Sherburne HMA 2979, began and proceeded easterly 4.5 miles to mile marker 7.51 near the Sherburne - Bridgewater town line. This portion of US-4, completed in 1933 with a 24" base, was resurfaced in 1965 and 1982. The 1987 ADT was approximately 6800.

EVALUATION PROCEDURE: Six 100' representative test sections were established prior to construction to record rut depths and the amount and type of cracks in the pavement. In addition, Mays roughness readings were taken of both projects before and after construction.

DISCUSSION OF TREATMENT: The WIRTGEN recycling process involves infrared heating and milling of the existing pavement to the designated depth. The remixer then combines and mixes the milled material with new hot mix. This remixed material is then spread as a pavement course and rolled similarly to a normal hot mixed pavement course. New bituminous mix was added at a rate of 24.6 lbs per sy. for a total of 16% new material.

The only problem encountered during the rehabilitation was the generation of smoke of varying intensity during the preheating process. Such smoking may have signaled overheating of the old pavement and could shorten the overall pavement life.

One 2000' section was recycled to a depth of 1" and one 2000' section was recycled to a depth of 3" for evaluation purposes. The 72707 sy of recycling was completed in 13 working days between July 14, 1989 and August 9, 1989, for an average production rate of 5,593 sy per day.

COST: Due to differences in the scope of work between the two projects, the cost of items such as shoulder treatment, guardrail, traffic markings, and engineering costs were not included in the project cost figures used for comparison.

The cost of in-place remixing to an average depth of 1-1/2"$\pm$ was $2.85 per sy. Additional costs included 895 Tons of type III bituminous mix for $21,699, hauling costs of $7,592 and placement of signs at $500 . The total cost was $3.26 per sy of roadway treated or $45,900.00 per 24' wide, two lane mile.

COST: Continued

The adjacent standard overlay project received a .25"± leveling course and a 1.45"± surface course for a pavement cost of $2.78 per sy. Additional costs were, $6,291.25 for traffic control, $1,440.00 for field testing and $6,480.00 for mobilization. The final cost of the overlay project was $2.96 per sy. or $42,000.00 per 24' wide, two lane mile. or 16% less than the cost of the recycle treatment.

INITIAL PERFORMANCE:

The table below displays the initial performance data of the two pavement types through the first winter.

	Preconstruction	Post Construction	After 1 Winter
MAYS Roughness (In inches per mile)			
Overlay	185	102	109
Recycle	124	70	83
Pavement Cracking (In LF per 100LF)			
Overlay	258	0	21
Recycle	273	0	34
Rut Depths (Average In 16ths inch)			
Overlay	7	Not Measured	1
Recycle	6	Not Measured	1

PRELIMINARY CONCLUSIONS

The findings to date suggest that:

1) There was no initial cost saving by using recycling rather than a standard overlay;

2) There has been no significant difference in performance between the two treatments during the first year of service;

3) The hot in-place recycle will have to provide a 16% longer maintenance free life to be as cost effective as the standard overlay.

FOLLOW UP:

Annual surveys will continue to document the performance of the two treatments until life cycle costs can be determined.

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