

MATERIALS & RESEARCH DIVISION

Reviewed By:
J.R. Phalen
J. R. Phalen, P.E.
Materials & Research
Engineer



Prepared By: *P.C. Winters*
Peter C. Winters
March 14, 1988
Page 1 of 2

RESEARCH UPDATE

NUMBER 88-7

COST EFFECTIVENESS OF COLD RECYCLING ON U.S. 4 IN SHERBURNE

REFERENCE:

Initial Report 79-1, dtd. Jan. 1979 & Interim Report 82-8
dtd. Oct. 1982

HISTORY:

In 1978 1.5 miles of US Rte 4 in the town of Sherburne was recycled using a cold recycling process. The procedure was selected due to the poor condition of the roadway which included extensive cracking and rutting of up to 3-1/2" in depth. The pavement was pulverized to a depth of four inches with a Barber-Greene RX-75 Dynaplane and the material was stabilized with up to 2.9% CMS-2 asphalt emulsion using a Koehring Bomag MPH 100 stabilizing unit. The recycled base course was then overlaid with (2) 1" lifts of Type III bituminous pavement. As a control an adjacent 0.7 mile section was rehabilitated using the standard pavement maintenance procedure (A 1+/-" overlay). The cost of the recycled section was \$7.90 per S.Y., while the control section treatment cost \$1.83 per S.Y. Interim report 82-8 reported observations through July of 1982. These included: rutting of 5/16" or less over 90% of the recycled section (1" maximum) and of 1/16" to 5/16" in the control section; crack development of 186' per 100' in the recycled section and 447' per 100' in the control section (66% reflection); and riding quality, as measured with the Mays Meter, which was slightly better in the control section.

Status: Through 1986 the V.A.O.T.'s paving program was based in large part on Pavement Serviceability Ratings (PSR) established annually under the direction of the Road Maintenance Engineer. The ratings given to the recycled and control sections are as follows.

SECTION	PSR									
	1978	1979	1980	1981	1982	1983	1984	1985	1986	
Recycled	4.5	4.4	4.0	3.8	3.8	2.8	2.8	2.8	2.3	
Control	4.5	4.4	4.0	3.5	3.5	2.6	2.5	Overlaid		

The control section was overlaid in 1985 based on the 2.5 PSR given it in 1984. A contract was let in 1987 to overlay the recycled section based on the PSR of 2.3 given it in 1986.

CONCLUSION The control section cost \$1.83/sy in 1978 and was in use for 6 years. The annualized cost was therefore \$0.30/sy. The recycled section cost \$7.90/sy in 1978 and was in use for 9 years. The annualized cost was therefore \$0.88/sy. The annualized cost of this recycling project was 2.9 times greater than the standard procedure and therefore cold recycling was not a cost effective alternative.

Although the Rte 4 recycling project was not cost effective, experience gained from it and following projects has taught us that recycling is most effective when used in conjunction with the improvement of the subbase. Although such improvements raise the square yard cost, the improved performance will reduce the annualized cost, thus making cold recycling a cost effective treatment.