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 RESEARCH UPDATE

U 96-12

 NEED FOR PAVEMENT SCARIFICATION

REFERENCES:

WP 86-R-3, Updates U87-6, U90-4

PURPOSE:

The purpose of the evaluation is to determine if it is necessary to scarify an existing bituminous pavement prior to overlaying it with an additional subbase material and a new pavement system. This procedure has been implemented in the past to ensure that there is no slippage or distortion of the overlay materials.

PROJECT DESCRIPTION:

During the summer of 1986, a portion of VT Route 100 was rehabilitated as part of the Stowe/Morristown F029-1(9)S project. This project consisted of several areas, each rehabilitated with the following treatments:

Area 1. Stowe MM 5.80 to MM 5.88	32 mm bituminous concrete pavement (BCP) overlay
Area 2. Stowe MM 5.88 to MM 6.70	Scarify existing pavement, 150 mm subbase of gravel 75 mm plant mixed base course 50 mm BCP
Area 3. Stowe MM 6.70 to Morristown MM 0.426	New road profile, 600 mm subbase 125 mm plant mixed base course 75 mm BCP
Area 4. Morristown MM 0.426 to MM 0.615	No scarification, 150 mm subbase of gravel 75 mm plant mixed base course 50 mm BCP
Area 5. Morristown MM 0.615 to MM 1.561	Same as Area 2
Area 6. Morristown MM 1.561 to MM 1.75	Same as Area 4
Area 7. Morristown MM 1.75 to MM 2.33	Same as Area 1

For this evaluation, two test sites, each 30 m in length, were established only in areas 4, 5, and 6, for a total of six test sites. The following locations have been monitored for the past 10 years:

Test Sites 1A and 1B in Area 4, which is in an unscarified area. They began at MM 0.477 and MM 0.589 respectively.

Test Sites 2A and 2B in Area 5, which is in a scarified area. These test sections began at MM 0.648 and 0.738 respectively.

Test Sites 3A and 3B in Area 6, which is in a unscarified area, These began at MM 1.582 and MM 1.625.

Pavement surveys of these test sites began in 1986 and they were resurveyed in 1989, and 1996. The table below provides a comparison of the performance of the scarified and unscarified pavement sections after 10 years in service.

SCARIFIED VS. UNSCARIFIED PAVEMENTS				
		1986 (Preconstruction)	1989	1996
Cracking (m/100m)	Scarified	776	94	605
	<i>Unscarified</i>	774	85	467
Rutting (mm)	Scarified	12	4	9
	<i>Unscarified</i>	12	5	10
MAYS (m/km)	Scarified	0.98	1.32	1.78
	<i>Unscarified</i>	1.07	1.26	1.73

After ten years of use, average cracking is considerably less (467 vs. 605 m/100m) in the unscarified pavement sections, while the other performance indicators are approximately equal. An overview inspection of the entire project area, during the summer of 1996, yielded no apparent signs of shoving, rippling, or other pavement distortions.

COSTS:

The costs for the four different treatments mentioned above were as follows :

Areas 1 and 7	\$2.43/sy	(\$2.03/m ²)
Areas 2 and 5	\$12.19/sy	(\$10.19/m ²)
Areas 4 and 6	\$10.69/sy	(\$8.93/m ²)
Area 3	Varied	

The cost of the treatment in areas 1, 2, 3 and 7 are just for information purposes since these areas were not part of the study.

SUMMARY:

After ten years in service, with the pavement approaching the end of its service life, it seems apparent that the scarification of certain sections of the F 029-1(9)S project did not result in any measurable improvements in pavement performance. Considering the additional cost required and the minimal performance improvement, it would not seem cost effective to routinely require scarification for pavement rehabilitation projects.