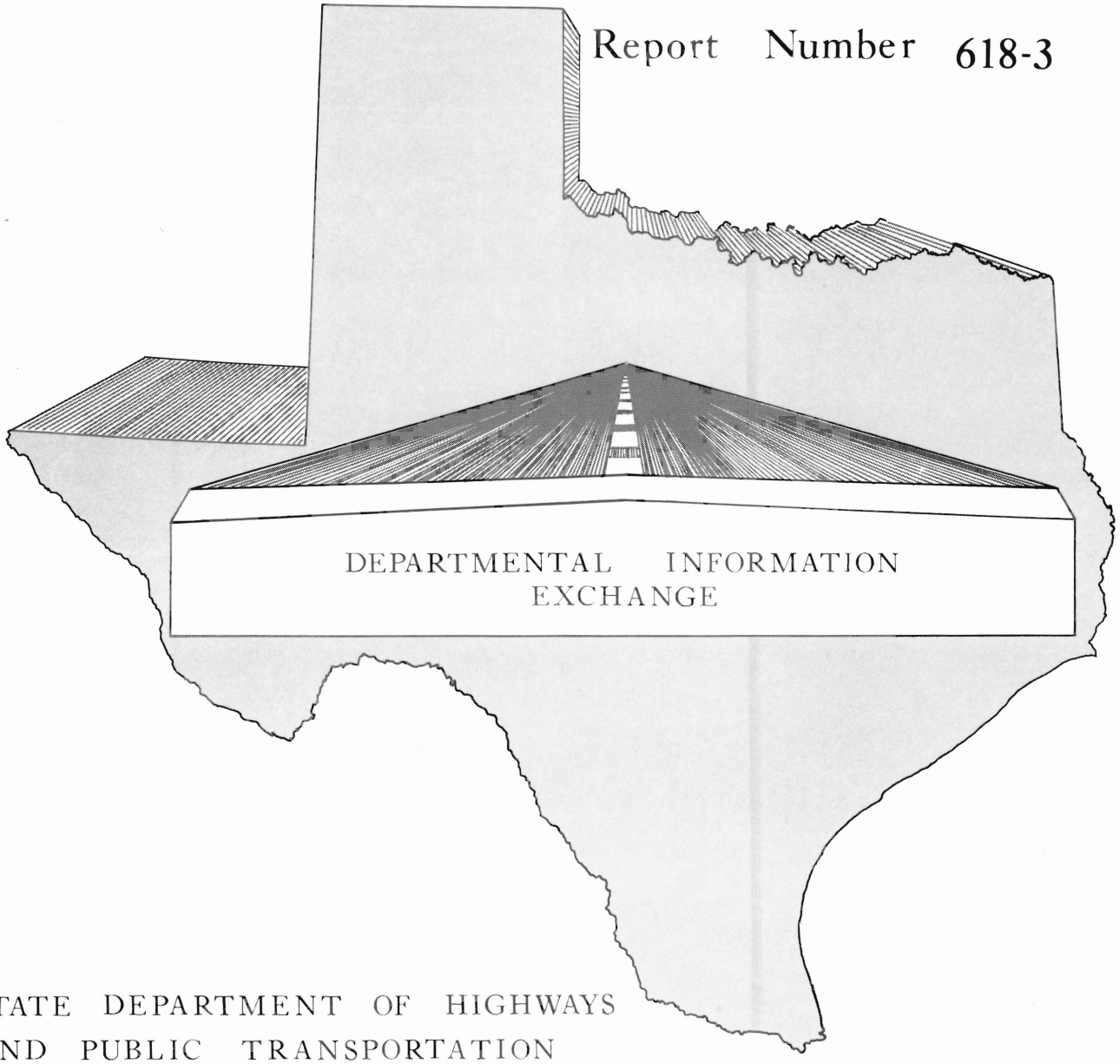
EXPERIMENTAL PROJECTS

HEATER SCARIFIER RECYCLING OF LIMESTONE ROCK ASPHALT PAVEMENT AND SANDSTONE SPRINKLE TREATMENT

Report Number 618-3



STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

HEATER SCARIFIER RECYCLING

OF

LIMESTONE ROCK ASPHALT PAVEMENT

AND

SANDSTONE SPRINKLE TREATMENT

on
U.S. 90 West
Control 24, Section 4

in

D'Harris, Texas
Medina, County

A Narrative Report
No. 618-3

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DISCLAIMER STATEMENT

The material contained in this report is experimental in nature and is published for informational purposes only. Any discrepancies with official views or policies of the DHT should be discussed with the appropriate Austin Division prior to implementation of the procedures or results.

A NARRATIVE REPORT

On May 26th and 27th, 1976, we used the Jackson Heater Scarifier to recycle, in place, a 2.3 mile section of U.S. 90 West at D'Hanis in Medina County. Within this area, we also applied raw Sandstone Sprinkle Treatment to a 1.25 mile portion of the Westbound Lane.

The recycling effort attempted was not recycling in the conventional sense of the word. The pavement was not physically removed, rejuvenated, and re-layed on the roadway. The recycling consisted of heating and scarifying the pavement surface. Re-mixing was accomplished by the scarified particles tumbling against each other within the mass of material. Re-laying was done by means of a floating, oscillating screed at the rear end of the machine.

The existing pavement in this area consisted of a succession of individual 1" to 1½" layers of Limestone Rock Asphalt. The surface of the pavement was glazed and appeared to be either a bleeding seal coat or other aggregate rolled into a flushed surface. Less than desirable Skid Numbers through this area had prompted our concern and decision to attempt to restore good surface quality by means of this particular in place recycling procedure.

Work began on May 26, 1976 at Seco Creek, 0.5 Mile West of FM 1796 (in D'Hanis). The Eastbound Lane was worked first, proceeding to a point 1.8 Miles East of FM 1796, or immediately East of Parker Creek, this being a total of 2.3 miles.

A very strong wind blew from the South during this first day's operation. Even though the heating area was skirted with sheets of corrugated metal roofing we had difficulty in getting the heat applied to the outside three feet of pavement. It was necessary to move the machine to the right and we then were able to heat the twelve feet of pavement being worked. We were not able to prosecute the work with one continuous forward movement because the excess asphalt on the surface would catch on fire and billow upward with such force that it would tend to carry upward the flames that were being applied downward to the pavement surface.

Under these conditions, the operator was forced to go to a pre-heating program in which the machine would travel about 200 feet forward, applying heat so as not to catch the surface on fire. He would then back up and go forward again, applying heat and scarifing the heated surface.

It had been our intent to heat, scarify and recycle the top 1" of pavement surface. However, close observations during both day's operations revealed that the scarifying metal tines penetrated only 5/8" to 3/4" into the surface.

After completion of the work on the Eastbound Lane, it was decided to place some Sandstone Sprinkle Treatment the next day on the Westbound Lane. The sandstone aggregate was left over from some sprinkle treatment work in San Antonio on IH 10 East. It had a Polish Value of 43 and conformed to the following grading requirements:

Retained 1/2" =	0%
Retained 3/8" =	8-35%
Retained # 4 =	70-100%
Retained # 10 =	92-100%

The general operations on the second day ran about like for the first day. Again, a strong wind blew all day, this time from the North. Again, we had to move the machine upwind to heat the pavement surface full width.

We had hauled 10 C.Y. of sandstone aggregate from San Antonio and also brought out our spreader box, modified so as to straddle a twelve foot mat of asphalt. Upon its arrival on the job site, we found that we could not rig a satisfactory attachment to pull it behind the laydown screed without shutting down all day while an attachment yoke was being made.

It was decided to go ahead with the Sprinkle Treatment with the aggregate being applied by hand, using shovels to spread the rock. A fairly uniform coverage was obtained, although rather sparse, averaging a rate of 1:880 over the 1.25 mile long portion of the Westbound Lane. Applied directly behind the screed, the raw aggregate was then rolled into the fresh mat.

Throughout the two day's work with this particular machine we observed one point that, in our opinion, needs to be improved. There was no means of applying heat immediately in front of and on the vertical strike-off plate of the floating oscillating screed. The scarified material had a tendency to cool at this area and cake upon the strike-off plate. Hand shovel work was necessary to loosen the material so that the screed could ride over it without tearing the mat or producing irregularities in the cross slope of the roadway.

Cost records kept on this work showed a unit cost for the total 32,557 Sq. Yds. of Heater Scarifier operations to be $0.266/Sq.Yd. The additional 8,800 Sq. Yds. of Sprinkle Treatment cost $0.049/Sq.Yd. Thus the total

cost for the Sprinkle Treated area was $0.315/Sq.Yd.

The A.D.T. on this section of US 90 West is 4160, or 2,080 vehicles per lane per day. The Skid History to date on this experimental work is as follows:

Lane	Treatment of Surface	SN Lo-Av-Hi Date 6-7-76	SN Lo-Av-Hi Date 6-30-76	SN Lo-Av-Hi Date 7-29-76
E.B.L.	Htr.Scrfr.	26-36-45	33-41-52	26-35-47
W.B.L.	" "	29-36-42	32-39-45	25-33-41
W.B.L.	w/Sprk.Trt.	37-44-48	39-45-49	34-40-47

The above Skid Data represent a tremendous increase of friction quality of the pavement surface. The Sprinkle Treated area shows to be an even greater improvement and apparently well worth the additional cost of 5¢ per square yard.

We know that the pavement surface that we treated by this manner was very rich. We do not know if, or when, it will begin to glaze. We believe that we should have gotten closer to a rate of 1:400 on the application of Sprinkle Aggregate. Had we done so, the additional cost would have been about 8¢ per square yard.

In our opinion, based on cost data and resultant skid data to date, work of this nature has merit and deserves consideration for future use.

We will continue to monitor this work and will publish additional Skid Data as it is obtained.