OFFICE MEMORANDUM
MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 19, 1968

To: H. H. Cooper, Director
Traffic Division

From: L. T. Oehler

Subject: U. S. Rubber "UNIROYAL" Advertising Sign, I 94, Detroit. Research Project 54 G-73. Research Report No. R-655A. An addendum to Research Report No. R-655, October 2, 1967.

Certain remedial steps have been taken with regard to the "UNIROYAL" advertising sign. This sign was investigated at your request due to a complaint received from a motorist concerning the excessive brightness of the sign. The initial report (R-655, October, 1967) recommended that either the luminance of the subject sign be reduced to approximately half its measured value or that the lane skip-lines and edge marking lines be restriped and the delineators be replaced.

According to a letter from J. H. Emison, Uniroyal, Inc., 4500 Enterprise Drive, Allen Park, Michigan to J. S. Marlow, District 10 Traffic Engineer, dated March 18, 1968, the Townsend Sign Co., who constructed the sign, replaced the original fluorescent lamps with fluorescent lamps of lower light output in the second week of March.

The delineators, which had been rendered nearly invisible by weathering, have been replaced by new ones and the roadway paint striping has been renewed. It must be noted, however, that the delineator post--which should be approximately 200 ft in front of the sign--is missing.

The following table compares present sign luminance values in foot-Lamberts with the previous sign luminance given in Report No. R-655.

TABLE 1

Section of Sign	Average, ft-L		Minimum, ft-L		Maximum, ft-L	
	8-24-67	5-2-68	8-24-67	5-2-68	8-24-67	5-2-68
"UNIROYAL" Legend	129	100	113	90	151	112
Blue Background	30	32	22	26	35	39
White Border (and background)	155	138	102	80	210	187

The data show that there has been a reduction in luminance of the white areas of the sign of from 11 to 23 percent.

In talking with Mr. Allen of the Townsend Sign Co., we learned that the General Electric Cool White High Output fluorescent lamps originally installed in the sign had been replaced with G. E. Sign White High Output fluorescent lamps. The Sign White lamps have a light output 27 percent less than the Cool White lamps at the time of installation. After 40 percent of rated life (4800 hr) the Sign White lamps output falls to 82 percent of their initial output. Therefore, further reductions in sign luminance from the levels presented in Table 1 would be expected. Corresponding reductions in glare at the driver's eyes would occur.

Because the May 1968 measurements were taken when the air temperature was 15 degrees lower than the August 1967 temperature, the output of the fluorescent lamps would have been approximately 10-percent higher in May than in August. This temperature dependent characteristic of fluorescent lamps may account for the rise in luminance of the blue area of the sign which Townsend Sign Co. states was not affected by the lamp change. An advertising sign in the same area as the U. S. Rubber sign also had a 10-percent rise in luminance in the same period of time. Therefore, the decrease in sign luminance is probably greater than shown in Table 1.

The delineation of roadway edge is now more evident at night (Fig. 1). This, coupled with the lower luminance of the sign, with further reductions of around 20 percent as the lamps age will result in a satisfactory level of roadway visibility.

TESTING AND RESEARCH DIVISION

L. T. Oehler

L. T. Oehler, Director
Research Laboratory Section

LTO/GMS:sjt

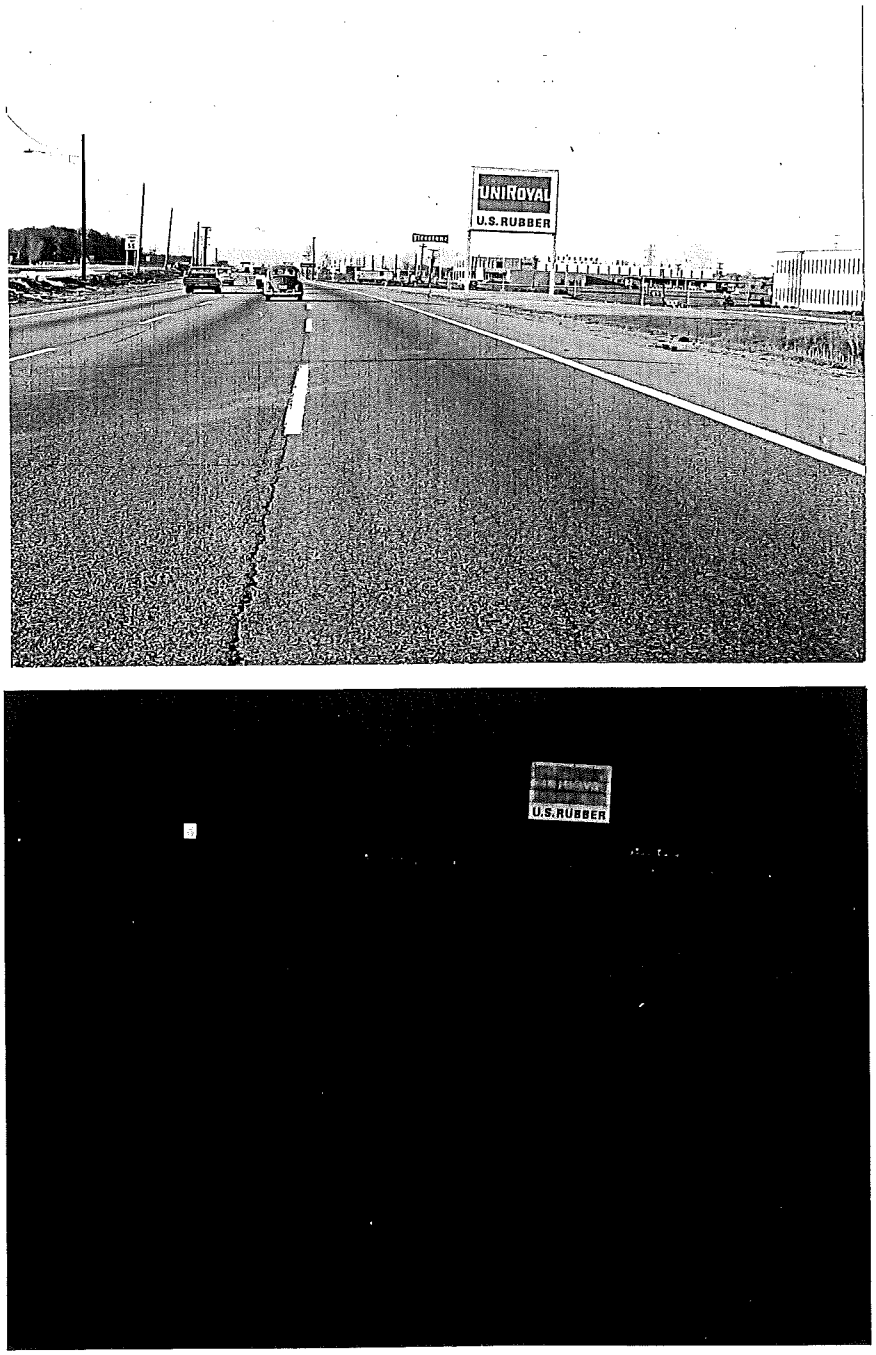

Figure 1. Day and night views of sign taken at 400 ft (May 2, 1968).