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U. S. RUBBER "UNIROYAL" ADVERTISING SIGN,
I 94, DETROIT



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MICHIGAN DEPARTMENT OF STATE HIGHWAYS

U. S. RUBBER "UNIROYAL" ADVERTISING SIGN,
I 94, DETROIT

G. M. Smith

Research Laboratory Division
Office of Testing and Research
Research Project 54 G-73
Research Report No. R-655

State of Michigan
Department of State Highways
Lansing, October 1967

OFFICE MEMORANDUM



MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 2, 1967

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-655.

In response to your request of June 19, 1967 concerning a motorist's complaint that a large "UNIROYAL" advertising sign on I 94 near Detroit was too bright, the sign was investigated by G. M. Smith. It is located about 60 ft from the pavement edge on the eastbound lanes of I 94, approximately a mile east of the Southfield interchange

The illuminated portion of the sign is 35 ft wide and 24 ft high. It consists of the word "UNIROYAL" in 5-ft high white letters on a 15-ft high blue background (Fig. 1). The blue background is enclosed on the top and sides by a white border approximately 2 ft wide. At the bottom, a white background approximately 8 ft high contains the words "U. S. Rubber" in 3-1/2-ft high letters. The bottom of the sign is 25 ft above the ground.

The luminance values in foot-Lamberts of the three portions of the sign are given below:

Section of Sign	Average Luminance ft-L	Minimum Luminance ft-L	Maximum Luminance ft-L
"UNIROYAL" Legend	129	113	151
Blue Background	30	22	35
White Border (and background)	155	102	210

The legend luminance of another advertising sign in the same general area as the subject sign was 45 ft-L.

Figure 2 shows the sign as seen from a point 400 ft away. Figure 3 shows the general area with the subject sign in the far left background. Both figures give a fair representation of the appearance of the area to a driver.

There is evidence that signs above 100 ft-L luminance may impair the driver's ability to discriminate objects on the roadway in rural areas where the ambient lighting is low. Since the sign is located in a dark rural surrounding (Figs. 2 and 3), it is recommended that the luminance of the entire sign, or at least the white background, be reduced to approximately half its present value.

Disability veiling glare caused by the subject sign was also measured. Disability veiling glare reduces the visual performance of a driver. It is produced by the presence of some object in the field of view which is very bright, compared to the general level of brightness to which the eye is adapted; or when an object—such as the sign in this case—is much brighter than the area upon which the driver's attention is concentrated—in this instance the asphalt pavement. The most severe disability veiling glare from this sign was 0.8 ft-L.

The amount of glare produced by this sign, while not reducing the driver's visual acuity, or ability to see fine detail, does have an adverse effect on the driver's ability to distinguish differences in brightness of various objects in this field of view, such as the brightness difference between the pavement and the shoulder. The glare produced by the sign, 0.8 ft-L, reduces contrast between brightness of the various objects to less than one-tenth of the normal levels, resulting in a dangerous loss of roadway visibility.

In addition, a sign of such large size and high brightness causes a certain discomfort for most drivers. It would not be of sufficient duration, however, to cause fatigue.

Delineators consisted of silver reflective sheeting on 3- by 12-in. plaques, spaced approximately every 200 ft on the shoulder. The delineators and the skip-line stripes were covered with dirt from nearby construction areas and were nearly invisible under illumination from dimmed headlights (Figs 2 and 3).

As mentioned above, it is recommended that the sign luminance be reduced to about one-half its present value. Without any decrease in sign brightness, roadway visibility could be improved to a satisfactory level by replacing the inadequate reflective sheeting delineators with reflector button delineators, and by restriping the lane skip-lines and edge marking line.

OFFICE OF TESTING AND RESEARCH

L. T. Oehler

L. T. Oehler, Director
Research Laboratory Division

LTO: GMS:slt



Figure 1. U. S. Rubber subject sign, I 94, Detroit.



Figure 1. U. S. Rubber subject sign, I 94, Detroit.



Figure 2. Day and night views of the sign from 400 ft.

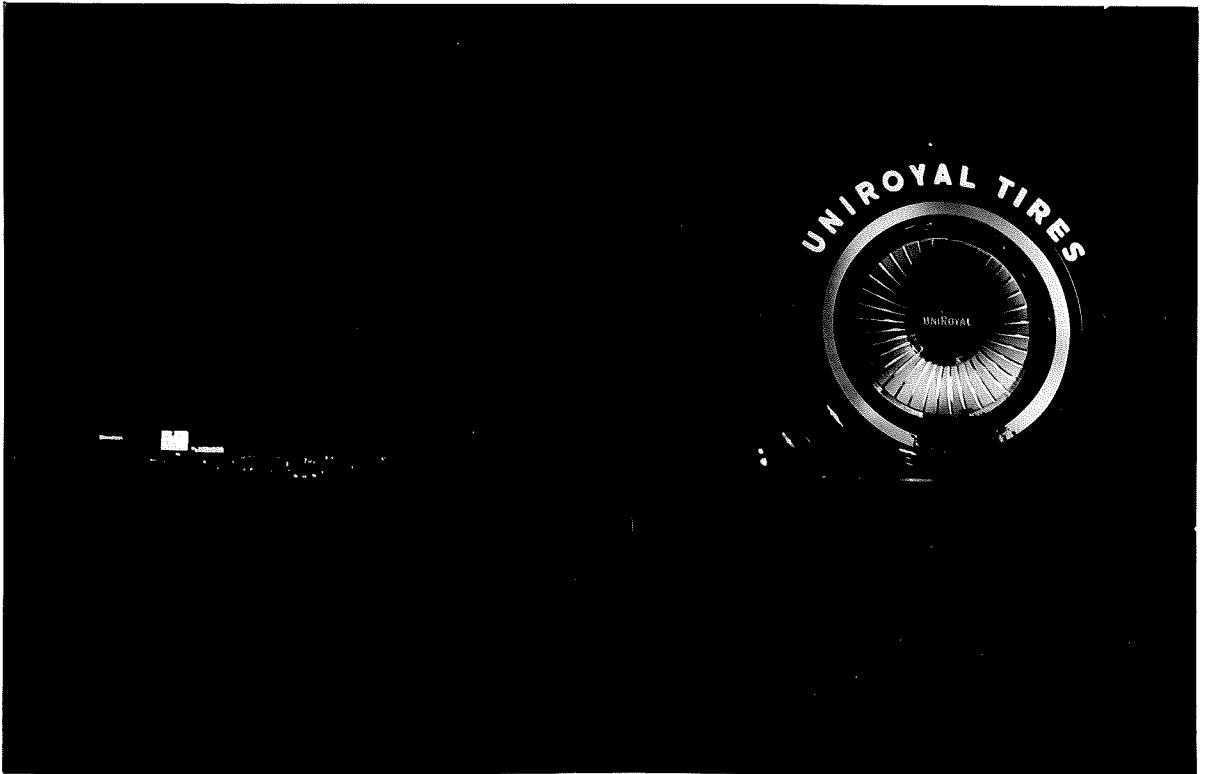


Figure 3. Day and night views of the sign about 1/2 mile distant (left background).