

Proposed Changes in Traffic Signal Color Standards

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● WHILE SPECIFICATIONS for traffic signal glassware have been revised periodically during the past 25 years, there have been virtually no changes in basic chromaticity definitions. In recent years traffic engineers have become increasingly concerned over the variety of shades of reds, yellows, and greens that confront the motorist even on short trips in his own community.

The U. S. National Committee on Colors of Signal Lights, a committee of the International Commission on Illumination, has drafted proposals for standardizing definitions of colors of signal lights used by aviation, highway, marine, and railroad services. At the outset of the committee's deliberations, it was apparent that adjustments are desirable in definitions of colors of highway traffic control signals. The most notable deviation is in the description of the green boundary of the yellow signal.

Under current specifications sponsored by the Institute of Traffic Engineers, much greener yellows are permitted than by other agencies. In fact, the separation permitted between the yellowest green and the greenest yellow is less than separation between the yellowest red and the reddest yellow. Definitions proposed by the U. S. National Committee on Colors of Signal Lights call for a reversal in separations between colors.

The philosophy underlying the USNC spacing between colors is that yellow mistaken for red is safer than yellow mistaken for green. However, there are applications, particularly in flashing signals, where red identified as yellow can lead to disastrous consequences. Hence, it is important that an adequate separation be maintained between yellow and red.

Yellows used by railroads in wayside signals conform with proposed definitions. Use of similar standards in highway traffic control would result in a small, but tolerable, loss in transmittance of six percent.

At the present the American motorist is confronted by signals of three shades of red on the highway: In traffic signals as specified by the Institute of Traffic Engineers, in stop and tail lights of vehicles as specified by the Society of Automotive Engineers, and in railroad crossing flashers as specified by the Association of American Railroads. The railroad crossing signal falls approximately midway between the others in redness and is proposed for adoption for all highway applications.

The minimum required transmittance of the railroad crossing red is approximately 2.7 times the minimum required for highway traffic control red. Under current specifications the minimum transmittance for red traffic control glassware is only 0.047. This means that the amount of light transmitted by a red lens is less than five percent of the light transmitted by a clear lens with similar physical features. In contrast, the minimum required transmittances of green and yellow are 0.200 and 0.440, respectively.

Adoption of the railroad crossing red for highway traffic control purposes will bring about a better alignment in transmittances with little sacrifice in identity.

No changes are proposed for the boundaries of green signals in highway traffic control.

Table 1 is a comparison of boundaries (basic chromaticity definitions) for the red, yellow, and green as proposed by U. S. National Committee with those currently specified by Institute of Traffic Engineers in the CIE coordinate system.

Basic chromaticity definitions as proposed by USNC differ somewhat in form from ITE definitions. The principal reason for differences is the desire on the part of the USNC to reduce to a minimum the number of definitions under which colored signals are purchased and to bring definitions into accord with recommendations of the International Commission on Illumination.

TABLE 1

Color	USNC (Proposed)	ITE (Practice)
Red, intermediate: yellow boundary	Y = 0.310	Y = 0.288
Yellow, restricted: red boundary	Y = 0.400	Y = 0.411
green boundary	Y = 0.440	Y = 0.452
Green, intermediate: yellow boundary	Y = 0.730(1-X)	Y = 0.730-X
blue boundary	Y = 0.500-0.500X	Y = 0.400