Figure 1 - Computational Steps for a Computerized Overhead Guidesign Conspicuity/Legibility Analysis

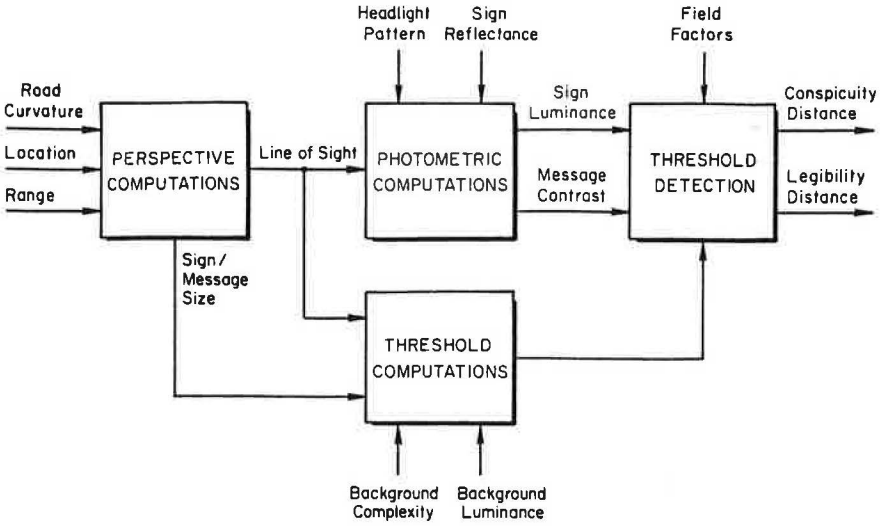
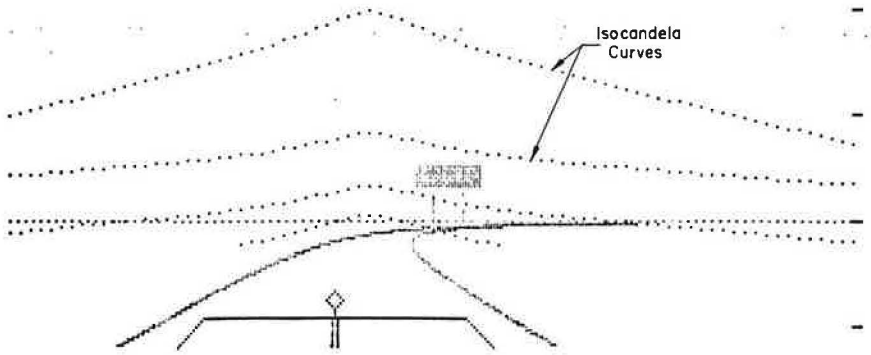


Figure 2 - Computer Graphics Plot Showing Overhead Guidesign Relative to Vehicle Heading Direction and Headlight Beam Pattern



LUMINANCE OF TRAFFIC SIGNS AT NIGHT

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The luminance of traffic signs was investigated in a 1:10 scale model experiment and the ranges of the minimum, sufficient, and otimum luminance of traffic signs at night were determined. The measurements were done with the threshold, the visual acuity and a rating scale as criteria.

These results were compared with those in the real street situation. The following parameters were among others considered:

- European/American low beam light distribution
- Class I/Class II retroreflective materials
- Indirect illumination by luminous flux reflected on the pavement surface

These tests and observations show that sign luminance (white area) of between 3.5 cd/m^2 and 10 cd/m^2 is quite sufficient. The luminance range between 10 cd/m^2 and 35 cd/m^2 is rated as 8n optimum luminance. The upper limit increases up to $\approx$ 60 cd/m^2 with glare of opposing vehicles.

TRAFFIC SIGNAL BRIGHTNESS REQUIREMENTS FOR THE NIGHTTIME DRIVING ENVIRONMENT

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The objective of this FHWA-sponsored research project is to determine the traffic signal brightness levels needed to satisfy the perceptual requirements of motorists for signal conspicuity, especially at night. The research techniques included analytical studies of the effects of driver age on the need for signal visibility, a laboratory study to determine the particular needs of color-vision-deficient drivers, a controlled field study to expand and validate the laboratory investigations, and a set of observational field experiments at six signalized intersections to determine the traffic operations and safety impacts of reduced brightness levels. Guidelines and criteria were developed to determine whether signal dimming is desirable at particular intersections. The economic impacts of a variety of dimming techniques were evaluated.

The analytical study of the brightness needs of the elderly driver (70-74 chosen as design age) indicated that while a traffic signal must be about