

HR-154 Investigation of Highway Lighting

Key Words: Highway lighting, Highway safety, Nighttime travel

ABSTRACT

The Iowa State Highway Commission initiated this research to evaluate a new lowering device for tower luminaires and a new concept of tower luminaire light distribution. Lighting at the West interchange of I-80, I-35, and I-235 in Polk County was also designated as an FHWA experimental project.

As highway lighting has become more widely used, highway officials recognized the increasing importance of reducing safety hazards and improving aesthetic appearance of lighting installations. Also, lighting construction, energy, and maintenance costs were absorbing a larger share of the maintenance budget.

A search began for a method of lighting whereby the fixed objects by the roadside could be eliminated or reduced in number, the costs could be reduced and the quality of lighting improved over existing methods. Lack of design data in this area illustrated the need for research.

The research consisted of taking field measurements of lighting intensity and uniformity, pavement brightness and system glare. The data was evaluated to enable a comparison of tower lighting versus existing conventional installations. These measurements were supplemented by visual observations. Other comparisons included construction and maintenance operations with their resultant costs and the aesthetics of the installations.

Where large interchanges are to be lighted, and for special lighting requirements, it is concluded that tower lighting is advantageous. Tower installations incorporating a luminaire lowering device are superior to other systems for maintenance purposes. Overall safety, performance and appearance are considered to be better, and construction and maintenance costs less than conventional lighting.