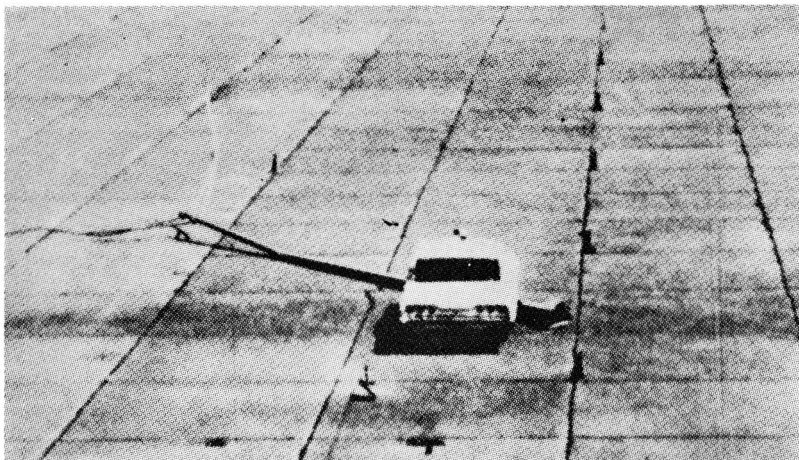


SUMMARY REPORT 146-5(S)

EVALUATION OF BREAKAWAY LIGHTPOLES FOR USE IN HIGHWAY MEDIANS

SUMMARY REPORT
of
Research Report Number 146-5
Study 2-8-68-146

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Vehicle easily traverses downed
pole in traffic lane.

Cooperative Research Program of the
Texas Transportation Institute and the Texas Highway Department
In Cooperation with the
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TEXAS TRANSPORTATION INSTITUTE

Texas A&M University
College Station, Texas

Evaluation of Breakaway Lightpoles for Use in Highway Medians

by

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Median-mounted luminaires have become very popular for the illumination of freeway facilities. Objection has been voiced, however, to the use of median mountings where the height of support exceeds the median width. The objection has been based on the premise that secondary collisions may occur with a downed pole occupying a traffic lane. The research summarized here was in response to this objection. Objectives were to (1) investigate the impact behavior of median-mounted luminaire supports, (2) investigate the behavior of secondary vehicle-support impact, and (3) develop a hazard index to describe the relative hazard created by the proximity and frequency of luminaire supports.

Three full-scale crash tests were conducted to determine the impact behavior of median-mounted supports and secondary vehicle-downed pole collisions. The first test revealed that a 20° impact by a 2900 lb vehicle at 45 mph would probably not cause a pole to encroach on the opposing traffic lane if the median width is 40 ft wide (including shoulders). The second test, involving a 4000 lb vehicle impacting at 25° and 60 mph, indicated an approximate encroachment of 11 ft into the opposing inside traffic lane, if the median is 40 ft wide (including shoulders). The third test, involving a medium size vehicle at 60 mph impacting a downed pole across the traffic lane, revealed that this secondary collision would be no worse than the original vehicle-pole impact. The vehicle would probably be able to continue straight ahead until control is regained.

A relative hazard index was developed to describe the relative hazard created by the proximity and frequency of luminaire supports. The alternative lighting systems considered were basically "median-mounted" and "house-side" lighting systems at mounting heights of 30, 40, 45, and 50 ft at a 5:1 spacing-to-mounting height ratio.

The relative hazard index is computed as the product of:

1. The relative index of a vehicle impacting a luminaire support based on lateral distance from the traveled way;
2. The relative number of hazards per unit length of roadway; and
3. The relative number of traffic streams (directions) to which the luminaire supports are exposed.

The index suggests that median-mounted luminaire systems produce less hazard than house-side systems for median widths of 30 ft or greater.

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