

THE EFFECT OF  
NATURAL LIGHTING, WEATHER, AND SURFACE CONDITIONS  
ON THE DISTRIBUTION OF TRAFFIC ACCIDENTS AT INTERSECTIONS  
IN MACOMB, ILLINOIS, 1980-1989.

An Abstract of a Thesis  
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by  
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## ABSTRACT

The purpose of this thesis is to determine what effect lighting, road surface conditions, and weather conditions have upon the distribution of intersection traffic accidents in Macomb, Illinois, from 1980 to 1989. Statistical analysis was used to identify any intersections with exceptionally higher numbers of accidents than expected and to accept or reject the following hypotheses:

- 1) Driving during darkness will result in higher accident rates at intersections than driving during daylight hours.
- 2) Driving on road surface conditions other than dry will result in higher accident rates at intersections than driving on dry road surface conditions.
- 3) Driving during inclement weather will result in higher accident rates at intersections than driving during clear weather.

Cartographic analysis was used to determine patterns in the overall distribution of intersections with traffic accidents and the distributions of each of the conditions identified in the hypotheses. Twenty two intersections were identified as having much higher numbers of accidents than expected. These intersections occurred along either a highway arterial or a one-way street. All three hypotheses were rejected by difference-of-means (t) tests. Most accidents during the study period happened during daylight hours, clear weather, and during dry road surface conditions.

Intersections had higher accident rates in three areas of the city during each of the conditions analyzed, the residential areas around the periphery of the Western Illinois University campus, around the downtown square, and along the four one-way streets.