



UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

PROJECT TITLE: Improving the Safety Left-Turn Operations at Signalized Intersections for High-Risk

PRINCIPAL INVESTIGATOR: Ahmed Abdel-Rahim (UI)

INSTITUTION: SINGLE-INSTITUTION PROJECT

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Background

Intersections pose a particular safety problem for many drivers. Navigating through intersections requires the ability to make rapid decisions, react quickly, and accurately judge speed and distance. As these abilities can deteriorate through aging, distraction, or impairments. Several driver groups, such as mature drivers, young drivers, and impaired and distracted drivers face more difficulties at signalized intersections and are more likely to be involved in a fatal crash at these locations. The primary objective of this research is to investigate signalized intersection design and operation alternatives that have the potential of improving the safety of signalized intersection operations for all users. Idaho crash data along with the geometric, control, and operational characteristics of different signalized intersections in Idaho will be used to assess the potential crash reduction benefits of different measures and intersection treatments. This research effort will result in data-driver guidelines to assist ITD in identifying and prioritizing measures to improve the safety at different signalized intersections in Idaho. This research is divided into three main focus areas. The first focus area is left-turn treatment at signalized intersection approaches (permitted, protected, and permitted and protected operations). The analysis will also examine the safety impact of using flashing yellow arrow in permitted left turn operations at intersections in Idaho. The second focus area is advance warning flashing signals at high speed intersections. The third focus area is nighttime flashing operation. Three different driver groups will be considered in this project: mature drivers, young drivers, and impaired and distracted drivers. Current fatality and injury rates at intersections as well as the underlying factors which affect the level of these rates will be examined and discussed.

Furthermore, the crash types which prevail among different driver groups will be analyzed and documented. The research tasks also involve a conducting a comparative analysis between intersections at which frequent crashes occur and those at which few crashes occur to identify intersection design and control elements that might have contributed to such reduction in crashes.

Research Project

The objectives of this research project are: 1) describe and document the characteristics of signalized intersection based on Idaho's crash experience, 2) analyze different factors that may influence crash rates at signalized intersections in Idaho, and 3) identify intersection design and control measures that can be implemented to reduce crash rates at signalized intersections in Idaho.

The research will focus on three signalized intersections operational areas: 1) left-turn treatment 2) advance warning flashing signals at high speed intersections, and 3) nighttime flashing operations. Measures to improve the safety for three different high-risk driver groups: mature drivers, young drivers, and impaired drivers will be considered for this study.

