INDOT Research

TECHNICAL *Summary*

Technology Transfer and Project Implementation Information

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Traffic Signals in School Zones

Introduction

The Manual of Uniform Traffic Control Devices (http://mutcd.fhwa.dot.gov/) defines engineering guidelines to determine if a traffic signal is warranted. These guidelines are based upon decades of work by national committees that have rigorously evaluated the conditions under which a traffic signal should or should not be installed. The Indiana Department of Transportation, along with virtually all public agencies, follows these procedures defined in that document to determine if a traffic signal should be installed.

The scope of the Joint Transportation Research Program (JTRP) study at Purdue University involved reviewing before and after crash data at signals recently installed adjacent to schools to determine if there were statistically significant changes in crash rates after a traffic signal was installed at a location where the traffic signal warrants were marginally satisfied.

Due to crash database limitations, accident data was only available for the period 1991 to 1999. Signals installed during the period 1992 to 1997 were considered. The construction year was excluded from the study so that any crashes associated with the construction work zone would not bias the data. A maximum of 5 years of before data and 5 years of after data were tabulated for each intersection studied. Data was adjusted to account for changes in average daily traffic and varying number of years of before and after data. INDOT typically only evaluates crash rates within 200' of a signalized intersection. However, schools are a special case and school zones are often more than 200' from a signalized intersection. Consequently, this study evaluated crash rates within 200', 500' and 1000' of signalized intersections. Seven signals with 51 years of data were identified as installed adjacent to Indiana schools during the period 1992-1997. The traffic volumes at these intersections were sufficiently low that engineering guidelines (warrants) for signal installation were marginal. To augment this data, twelve additional signals not in school zones, but for which the engineering guidelines (warrants) were marginal, were used to create a second data set. That data set of 19 intersections provided 135 years of data for analysis.

Findings

Table 1 indicates that for the 7 locations where signals were installed at intersections adjacent to schools that marginally met the warrants, there were no statistically significant reductions in crashes for any of the crash categories. Furthermore, there were statistically significant increases in crash rates for the following crash categories: Rear End, Head On, Off Road, Left Turn, Total, and Property Damage Only.

Table 2 indicates that for the 19 marginally warranted signal installations, there were statistically significant reductions in Right Angle and Right Turn crashes. However, there were also statistically significant increases in crash rates for the following categories: Rear End, Head On, Off Road, Left Turn, Other, and Personal Injury.

Implementation

The data summarized in Tables 1 and 2 do not indicate it is beneficial to install traffic signals in school zones when the warrants defined by the Manual on Uniform Traffic Control Devices have not been met. In fact, they suggest that for intersections not meeting the warrants, traffic signals should not be installed. Based upon these findings, it is recommended that the Indiana Department of Transportation continue following nationally prescribed warrants for determining when a traffic signal should be installed.

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