



Signal Installations With and Without Left-Turn Lanes Evaluation

The University of North Carolina Highway Safety Research Center completed a safety study for NCDOT that analyzed data from over 100 two lane roads in rural and suburban areas in North Carolina to determine the safety effect of signalization with and without left turn lanes (Report No. FHWA/NC/2013-11).

Background

All study intersections were controlled by stop signs on the minor legs prior to signalization. The study included both three-leg and four-leg intersections. About half were signalized without adding left turn lanes and the remaining were signalized along with the addition of at least one left turn lane. Crashes were analyzed separately for both groups of treated sites. Total, Fatal and Injury, Rear-End, and Frontal Impact Crashes were investigated.

Results

Overall results from the study sites that were signalized with left turn lanes indicate a:

- 44% Reduction in Total Crashes,
- 52% Reduction in Fatal and Injury Crashes,
- 61% Reduction in Frontal Impact Crashes, and
- 29% Reduction in Rear End Crashes.

Overall results from the study sites that were signalized without left turn lanes indicate a:

- 36% Reduction in Total Crashes,
- 36% Reduction in Fatal and Injury Crashes,
- 58% Reduction in Frontal Impact Crashes, and
- 43% Increase in Rear End Crashes.

Other key points of the study:

- Fatal and Injury crashes and Rear End crashes benefited the most from the addition of left turn lanes.
- Overall, Frontal Impact Crashes did not benefit from the addition of the left turn lanes.



Top: Signalized intersection with left turn lanes;
Bottom: Signalized intersection without left turn lanes