

Reduced Conflict Intersection (RCI) Evaluation

NCDOT completed a safety study of 31 intersections in North Carolina under minor road stop sign control that were converted to unsignalized reduced conflict intersections (RCIs).

Background

A RCI is an intersection where a direct left turn or a through movement is prohibited by channelization on the minor leg(s) and/or major leg(s). Where these movements are prohibited, travelers who want to cross or turn left at the intersection must first turn right and then make a U-turn to return to their desired route.

The study locations included in this analysis were unsignalized RCIs that were installed from 2009 to 2017. All of the study locations were located along multilane major roadways and eliminated through and left turning movements from the minor road(s) alone. The total volume of the studied locations ranged from 8,200 to 44,000 vehicles per day, with an overall average of 23,000 vehicles per day.

The before-after analysis was conducted using an Empirical Bayes methodology in order to provide a more robust statistical analysis of the data. The purpose of the evaluation is to measure changes in total intersection crashes and frontal impact crashes after the intersections were converted to a RCI's configuration.

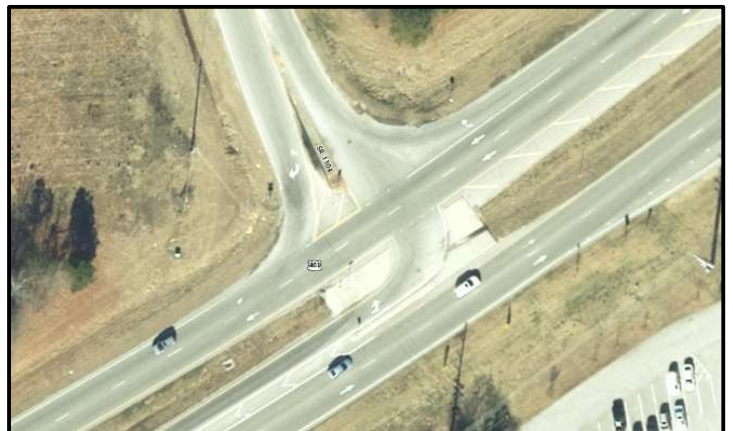
Results

The overall results from all study locations indicate a:

- **50% Reduction** in Total Crashes
- **80% Reduction** in Frontal Impact Crashes.
 - *Frontal Impact Crashes include crash types associated with higher severities such as head-on, angle, left-turn, and right-turn crashes.*

Other key points of the study:

- For the entire dataset there was a reduction of 3.1 Frontal Impact Crashes per study year to 0.6 Frontal Impact Crashes per study year (80% reduction).
- Downstream U-turn Crashes were reviewed for 27 locations. The majority experienced no downstream U-turn Crashes post-RCI. There were 0.2 U-turn Crashes per study year in the after period. A dramatic reduction is still seen if downstream U-turn Crashes and Frontal Impact Crashes are considered together.
- There were similarly strong reductions in Total Crashes and Frontal Impact Crashes when comparing rural vs. urban and 3-leg vs. 4-leg study locations, with slightly higher reductions for rural and 4-leg locations.



Top: Aerial view of a 4-Leg study site
Bottom: Aerial view of a 3-Leg study site