

Hazard Elimination Project Evaluation

Project Log # 200502110

Hazard Elimination Project W-3412

Evaluation of Traffic Signal Installation with Railroad Preemption and Turn Lanes at the Intersection of SR 1318 (Blue Clay) and SR 1322 (Kerr), New Hanover County

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

Brian G. Murphy, PE

Traffic Safety Project Engineer

Date 3/1/06

Hazard Elimination Project Evaluation Documentation

Subject Location

Evaluation of Hazard Elimination Project W-3412 – Traffic Signal Installation with Railroad Preemption and Turn Lanes at the Intersection of SR 1318 (Blue Clay) and SR 1322 (Kerr) in New Hanover County

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naïve before and after analysis has been completed to measure the effectiveness of this hazard elimination project. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The safety countermeasure chosen for the subject location was to install a traffic signal with railroad preemption and turn lanes at the intersection of SR 1318 (Blue Clay) and SR 1322 (Kerr). The project was let in April of 1998 and closed out in December of 1998 at an estimated cost of \$870,000.

There was no information in the project folder regarding the crash history or the development of this project.

Naïve Before and After Analysis

After reviewing the hazard elimination project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from April 1, 1998 through February 28, 1999. The before period consisted of reported crashes from January 1, 1992 through March 31, 1998 (6 Years, 3 Months) and the after period consisted of reported crashes from March 1, 1999 through May 31, 2005 (6 Years, 3 Months). The ending date for this analysis was determined by the available after period crash data.

The treatment data consisted of all crashes on the approximately 200 foot strip of SR 1322 (Kerr) from SR 1318 (Blue Clay) to SR 1319 (Old Wrightsboro) with a 150 foot y-line. The intersection of SR 1319 (Old Wrightsboro) was included in the study due to its close proximity to the traffic signal and railroad crossing. Please see the attached *Location Map* for further detail.

The following table depicts the Naïve Before and After Analysis for the Total Crashes and Target Crashes at the treatment location. Please note that Frontal Impact and Rear End Crashes were the

target crashes for the applied countermeasure. Frontal Impact Crashes at the SR 1319 (Old Wrightsboro) intersection were not included as they were not directly addressed by the chosen countermeasure. The Frontal Impact Crash types considered are as follows: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; Sideswipe, opposite direction; and Angle.

Treatment Information

	Before	After	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	75	36	-52.0%
Total Severity Index	5.76	4.7	-18.4%
Rear End Crashes	30	13	-56.7%
Rear End Severity Index	4.45	3.28	-26.3%
Frontal Impact Crashes	34	12	-64.7%
Frontal Impact Severity Index	7.36	4.7	-36.1%
Target Crashes	64	25	-60.9%
Target Severity Index	6	3.96	-34.0%
Volume	11,500	12,000	4.3%

Target Crash Information

	Before	After	Percent Reduction (-)/ Percent Increase (+)
Fatal Injury Crashes	0	0	N/A
Non-Fatal Injury Crashes	34	10	-70.6%
Total Injury Crashes	34	10	-70.6%
Night Crashes	6	5	-16.7%
Wet Crashes	13	5	-61.5%

The naïve before and after analysis at the treatment location resulted in a 52 percent decrease in Total Crashes, a 61 percent decrease in Target Crashes, and a 4 percent increase in Average Daily Traffic (ADT). Further investigation shows there was an 18 percent decrease in Severity Index for Total Crashes and a 34 percent decrease in Target Crashes. The before period ADT year was 1995 and the after period ADT year was 2002.

Results and Discussion

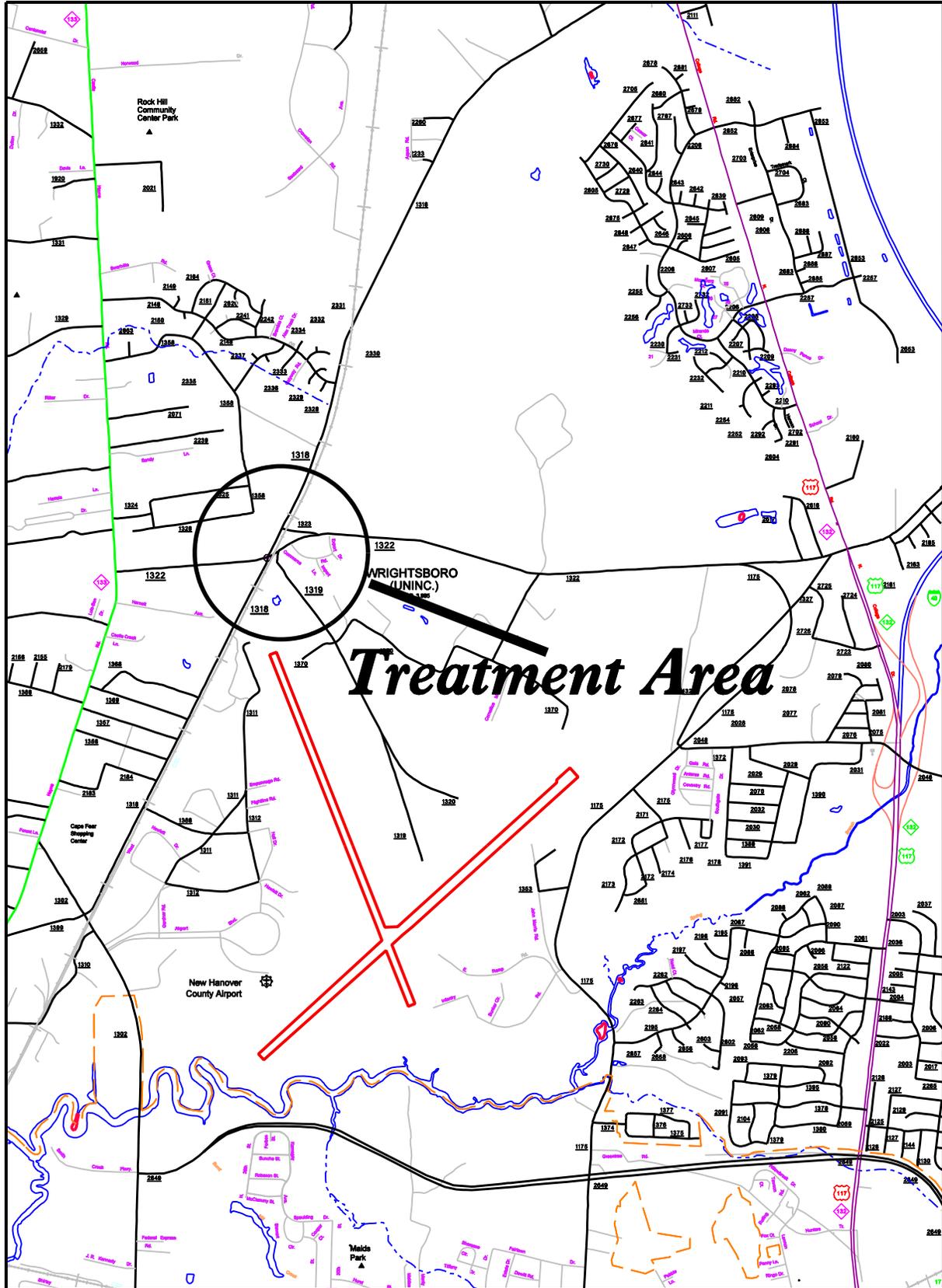
The naïve before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 52 percent decrease in Total Crashes and 61 percent decrease in Target Crashes. Further investigation shows that the Severity Index of Total Crashes decreased by 18 percent and the Severity Index of Target Crashes decreased by 34 percent. The summary results above demonstrate that the Treatment Location appears to have had a substantial decrease in both the Total and Target Crashes and the Severity Index from the before to after using naïve methodologies.

A more detailed look at the Target Crashes show that Rear End Crashes have decreased by 57 percent and the Severity Index of Rear End Crashes has decreased by 26 percent using naïve methodologies. It appears the turn lanes have been successful in providing space for turning vehicles to move out of the way of through traffic, thereby minimize the potential for Rear End Crashes.

Further analysis of Target Crashes show that Frontal Impact Crashes have decreased by 65 percent and the Severity Index of Frontal Impact Crashes has decreased by 36 percent. While Frontal Impact Crashes still exist to some degree, it appears the signal has been effective at controlling traffic moving through the intersection.

As the Safety Evaluation Group completes additional reviews for this type of countermeasure, we will be able to provide more objective and definite information regarding actual crash reduction factors.

Location Map, New Hanover County Evaluation of W-3412



Treatment Location: SR 1322 (Kerr) AT SR 1318 (Blue Clay)

Treatment Site Photos (Taken on December 5, 2005)



Looking East on SR 1322 (Kerr Ave)



Looking West on SR 1322 (Kerr Ave)

Treatment Site Photos (Taken on December 5, 2005)



Looking North on SR 1318 (Blue Clay Rd)



Looking South on SR 1318 (Blue Clay Rd)

Treatment Site Photos (Taken on December 5, 2005)



Signal Heads on SR 1318 (Blue Clay Rd) Southbound Approach. Notice railroad preemption display for left turning vehicles.



Looking North on SR 1319 (Old Wrightsboro Rd)

