

Spot Safety Project Evaluation

Project Log # 200610099

Spot Safety Project # 06-99-218

Spot Safety Project Evaluation of the Standard Flasher and Double Posted Stop Sign Installation at the Intersection of SR 1500 (Benson Rd) and SR 1006 (Old Stage Rd) in Harnett Co.

Documents Prepared By:

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Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 06-99-218- Standard Flasher and Double Posted Stop Sign Installation at the Intersection of SR 1500 (Benson Rd) and SR 1006 (Old Stage Rd) in Harnett County.

Project Information and Background from the Project File Folder

Both SR 1500 and SR 1006 are 55 mph two lane facilities without left turn lanes. The intersection is controlled by stop signs on SR 1006.

The original problem statement was that motorists were unable to come to a complete stop before entering SR 1500 resulting in crashes. The initial crash analysis was completed from 8/1/1990 through 7/31/1999 with 31 reported crashes. There were 2 Fataals, 3 Class A, 3 Class B, and 13 Class C injuries. The spot safety project improvement countermeasures chosen for the subject location was the installation of a standard flasher and dual stop signs on SR 1006. The final completion date for the standard flasher and stop sign installation at the subject intersection was on February 1, 2002 at a cost of \$10,000.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from January 2002 to March 2002. The before period consisted of reported crashes from July 1, 1997 through December 31, 2001 (4 years, 6 Months) and the after period consisted of reported crashes from April 1, 2002 through September 30, 2006 (4 Years, 6 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes within 150 feet of the subject intersection. The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasures. Frontal Impact Crash types are as follows: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; and Angle.

<u>Treatment Information</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	19	20	5.3
Total Severity Index	21.2	13.4	-37.0
Frontal Impact Crashes	18	16	-11.1
Frontal Severity Index	22.0	15.1	-31.2
Volume	3240	3910	20.7
<u>Treatment Injury Crashes</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	1	0	-100.0
Class A	3	2	-33.3
Class B	4	2	-50.0
Class C	7	11	57.1
Property Damage Only	4	5	25.0
<u>Frontal Injury Crashes</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	1	0	-100.0
Class A	3	2	-33.3
Class B	4	1	-75.0
Class C	6	9	50.0
Property Damage Only	4	4	0.0

Table 2.

The before and after analysis at the treatment location resulted in a 5 percent increase in Total Crashes, a 11 percent decrease in Frontal Impact Crashes and a 21 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1999 and the after period ADT year was 2004.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 5 percent increase in Total Crashes and an 11 percent decrease in Frontal Impact Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes, and a decrease in the number of Frontal Impact Crashes from the before to the after period.

The original problem statement was that vehicles were having trouble coming to a complete stop at the treatment intersection. Upon reviewing the before period crash reports and collision diagram below, it appears that 4 of the 18 (22%) frontal impact crashes in the before period had a vehicle running the stop sign. Three occurred on the northbound leg of SR 1006 and 1 occurred on the southbound leg on SR 1006 resulting in a fatal crash. Referencing Figure 1 again, a majority of the angle crashes are occurring after a vehicle has crossed one lane of travel. This information suggests there may be more of an issue than vehicles not coming to a complete stop, such as poor gap selection.

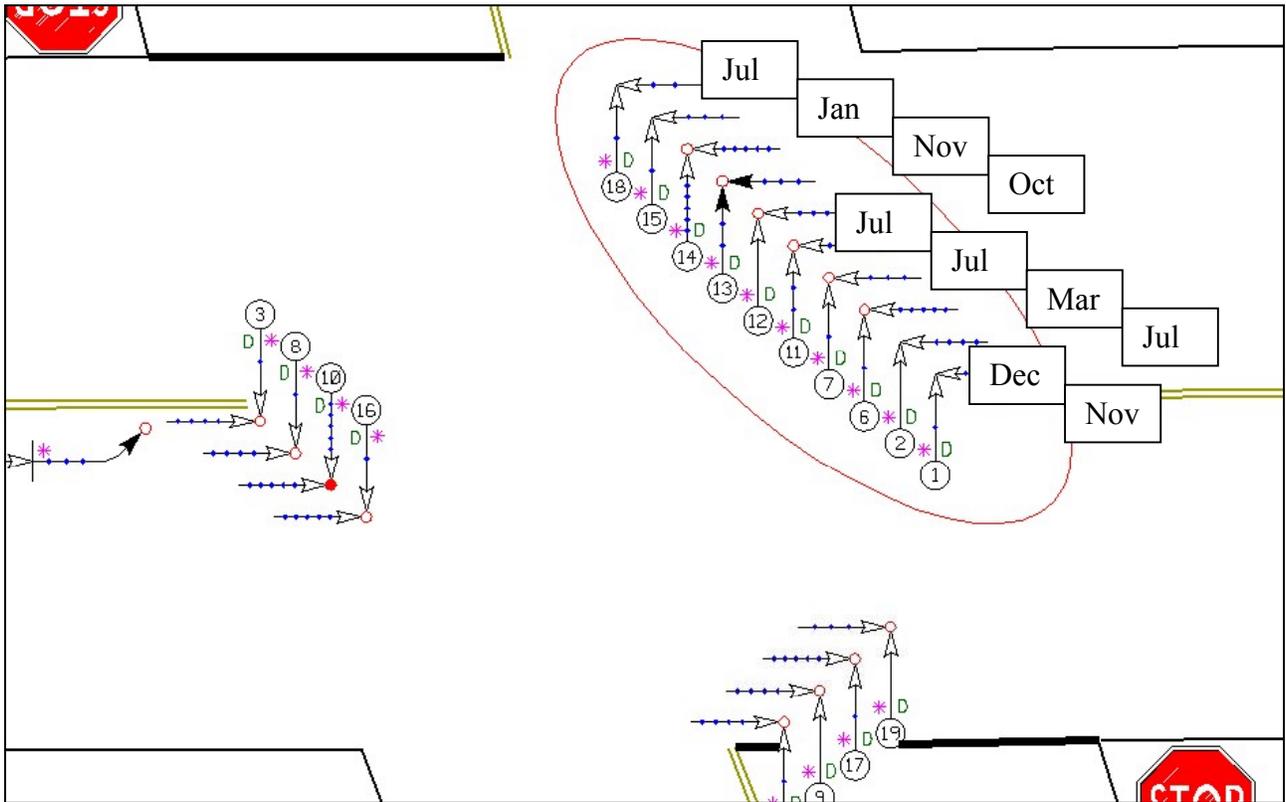


Figure 1.

The same pattern also exists in the after period (Figure 2) along with lower estimated speeds by the “vehicle at fault”. Upon reviewing the after period crash reports and collision diagram, it appears that 5 of the 16 (31%) frontal impact crashes had a vehicle running the stop sign. Three occurred on the northbound leg of SR 1006 and two occurred on the southbound leg of SR 1006. Again, this information suggests there may be more than just a problem with stop sign running.

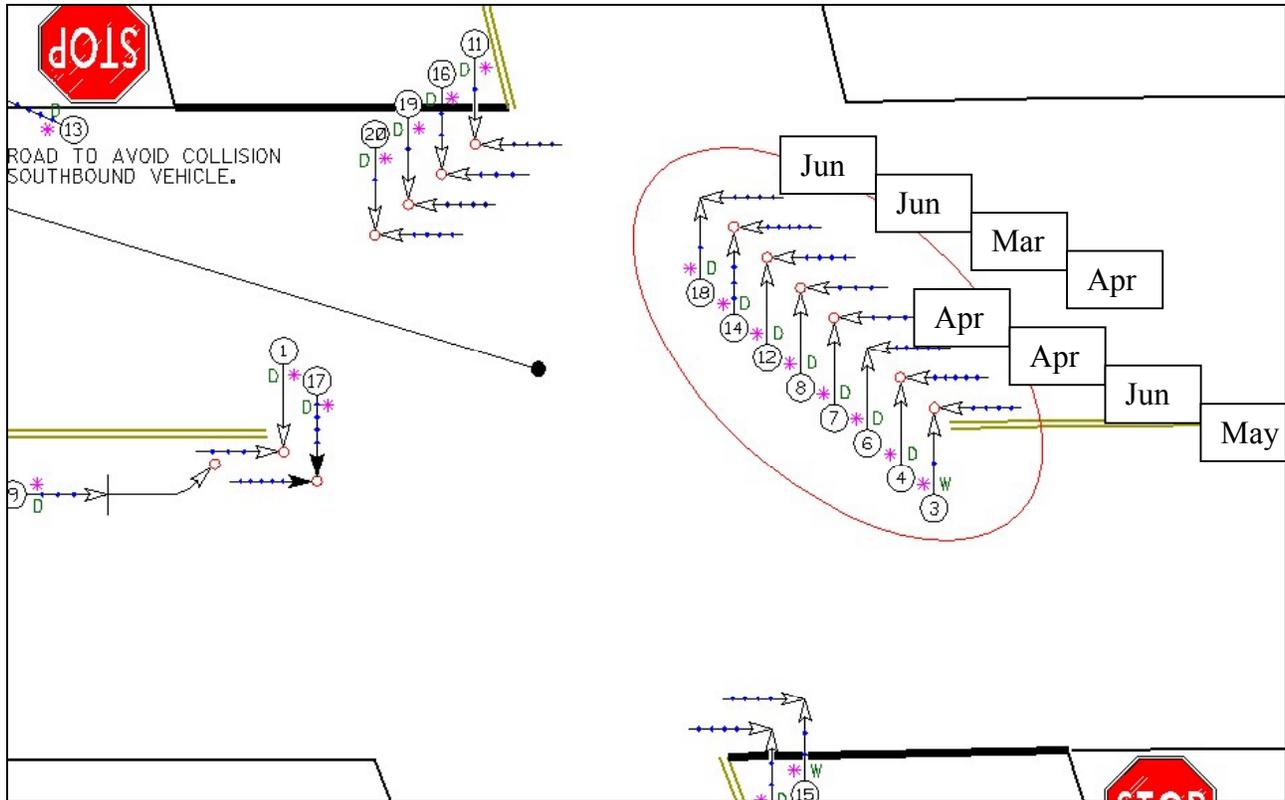
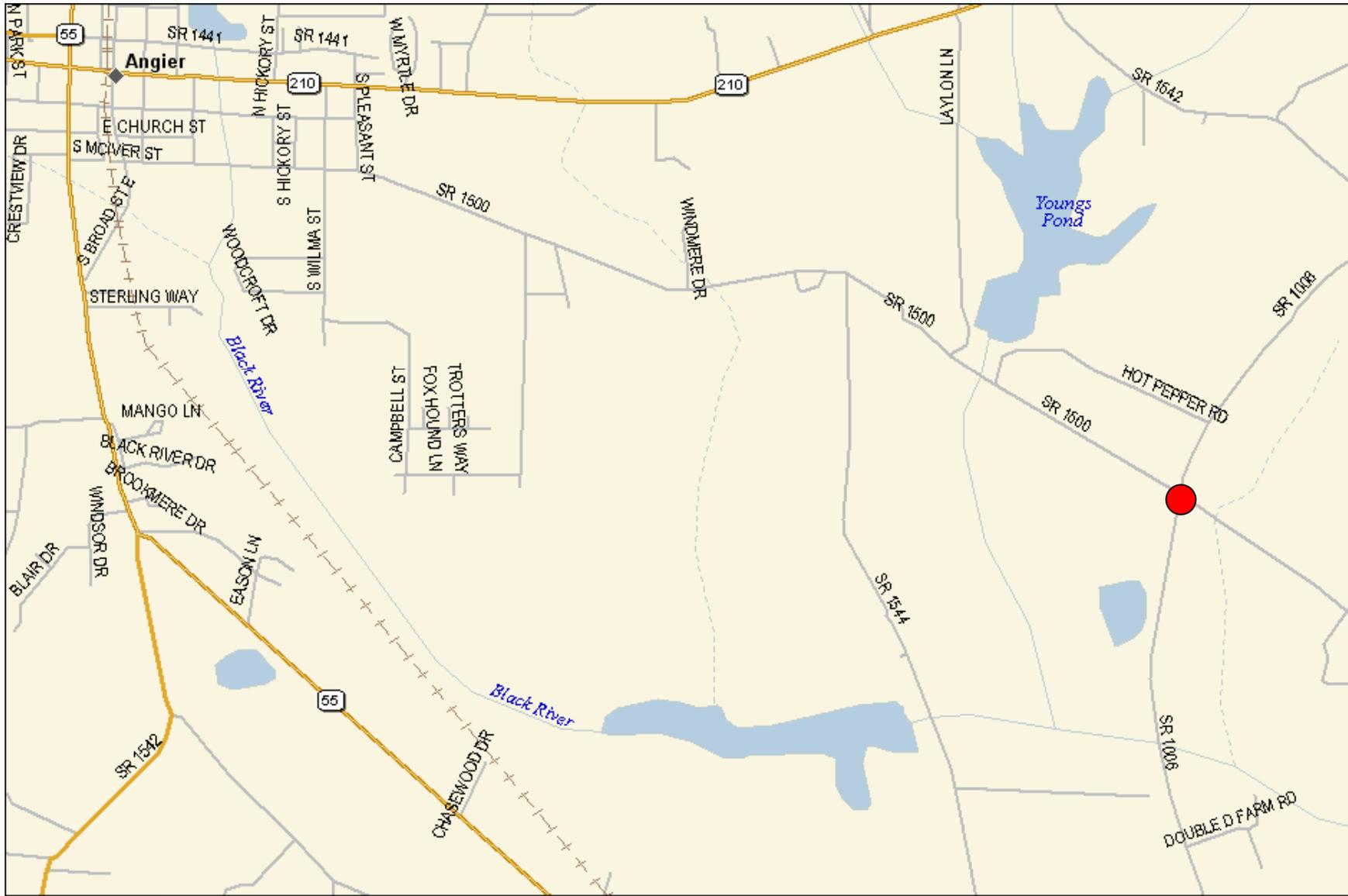


Figure 2.

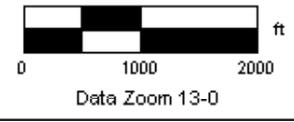
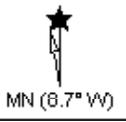
Upon further investigation of the after period crash data, all crashes in the circled area of Figure 2 occur in the spring and early summer months. This may indicate that the foliage in the southeast quadrant causes a potential sight distance problem when the foliage is in the growth period and out of the dormant cycle. If this is true, foliage maintenance in the southeast quadrant may be needed.

During the field investigation there was some overgrowth that seemed to be dormant in the southeast quadrant of the intersection. It was also noted in the project background folder that overgrowth was cut in the northeast quadrant, although no time frame was specified. This foliage maintenance of the northeast quadrant is apparent in the photo located on page 3 of the photos (see red circled area). Referencing the first picture in the included photo section, sight distance appears adequate when the foliage is dormant or maintained (see red circled area).

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



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Location Map: SR 1006 (Old Stage Rd) and SR 1500 (Benson Rd)

Treatment Site Photos taken January 22, 2007



On SR 1006 driving north looking east



On SR 1006 driving north looking west



On SR 1006 driving south



On SR 1006 driving south



On SR 1006 driving south looking west



On SR 1006 driving south looking east



On SR 1006 driving north



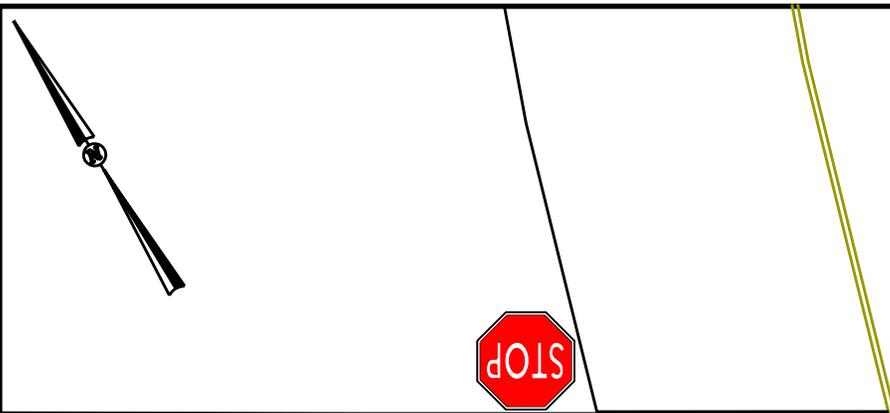
On SR 1006 driving north



On SR 1500 driving east



On SR 1500 driving west



SR 1006
55 MPH

