

Spot Safety Project Evaluation

Order # 41000025867

Spot Safety Project # 04-06-222

**Spot Safety Project Evaluation of the
“Vehicle Entering When Flashing” Overhead Actuated Flasher
SR 1938 (Browns Pond Rd) at SR 2127 (Shoehel Rd)/SR 2131 (Rhondale Rd)
Johnston County**

Documents Prepared By:

Safety Evaluation Group
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Justin Green

11-6-2013

Date

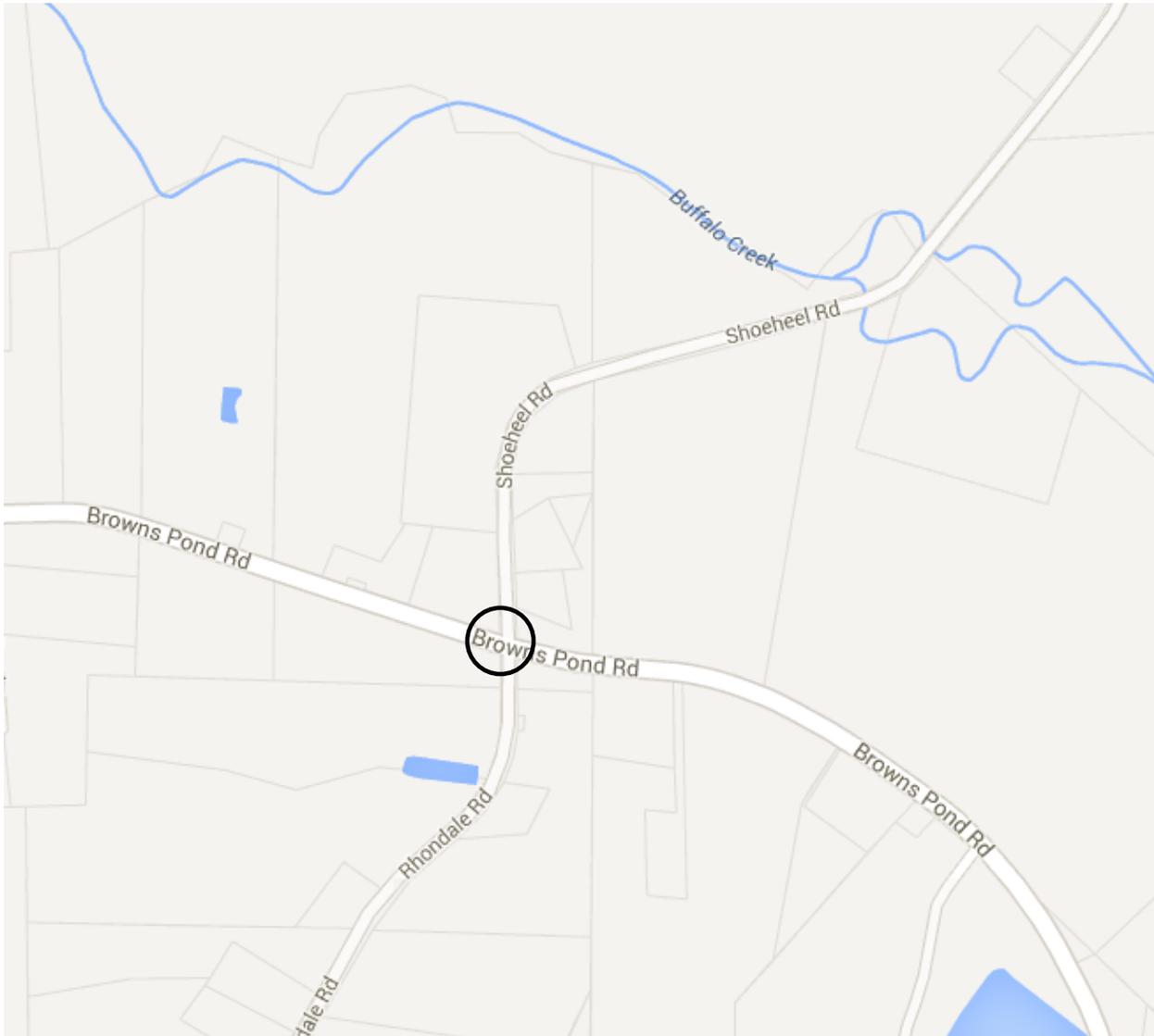
Traffic Safety Project Engineer

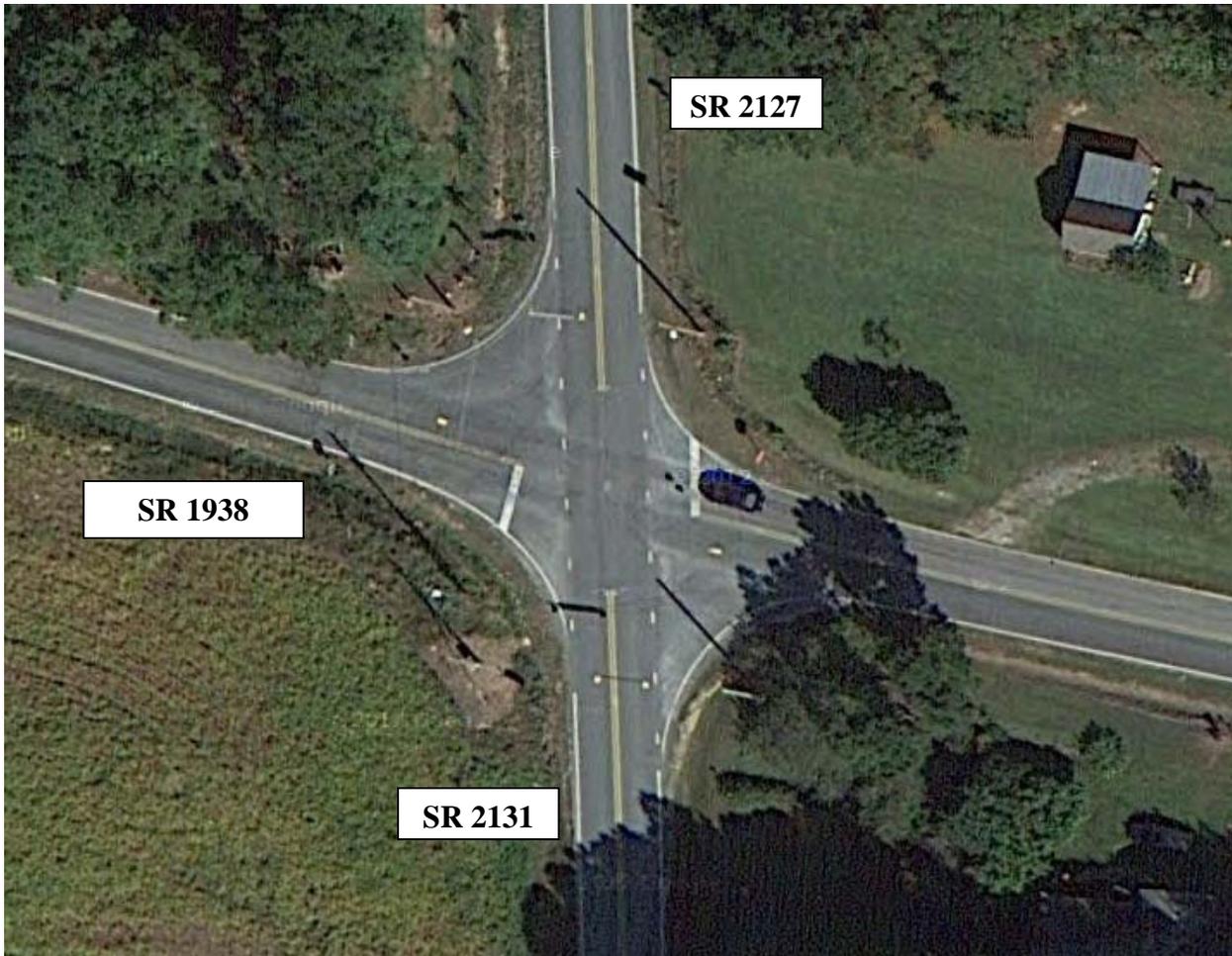
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 04-06-222 located at the Intersection of SR 1938 (Browns Pond Rd) at SR 2127 (Shoeheel Rd)/SR 2131 (Rhondale Rd) in Johnston County.

The Sig ID is 04-1405 for this actuated flasher Traffic Signal.





Aerial Provided from Google Maps

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was to add an actuated flasher and warning flasher which will flash red on SR 1938 (Browns Pond Rd) at all times. SR 2127 (Shoeheel Rd) and SR 2131 (Rhondale Rd) will feature a “vehicle entering when flashing” sign accompanied by yellow flashing lights that will alert motorists when vehicles approach the intersection. The removal of vegetation that limits the observance of the left shoulder stop sign on eastbound SR 1938 was another countermeasure taken.

SR 1938 and SR 2127/SR 2131 are two lane facilities. The posted speed limit for all legs is 55 mph. The subject location is a four-leg crossroads intersection, which is controlled by dual mounted stop signs on SR 1938.

The original statement of problem was due to poor sight distance, motorists on SR 2127/SR 2131 are unable to see those approaching the intersection on SR 1938. The initial crash analysis was completed from May 1, 2002 to April 30, 2012 with ten (10) reported crashes including one fatality. The final completion date for the improvement at the subject intersection was on September 22, 2008 with a total cost of \$43,500.

Naive Before and After Analysis

After reviewing the spot safety 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 were the months of July through September 2008. The before period consisted of reported crashes from October 1, 2003 through June 30, 2008 (4 years and 9 months); and the after period consisted of reported crashes from October 1, 2008 through June 30, 2013 (4 years and 9 months). The ending date for this analysis was determined by the date of available crash data at the time of analysis.

The treatment data consisted of all crashes within 150 feet of the subject intersection for the SR 1938 and SR 2127/SR 2131 approaches. *Please see attached location map and aerial map for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Frontal Impact Crashes were the target crashes for the applied 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; and Angle.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	6	4	- 33.3 %
Total Severity Index	16.10	4.70	- 70.8 %
Target Crashes	6	4	- 33.3 %
Target Crash Severity Index	16.10	4.70	- 70.8 %
Volume (2006, 2011)	1,800	1,600	- 11.1 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	1	0	- 100.0 %
Class A injury Crashes	0	0	N/A
Class B injury Crashes	1	0	- 100.0 %
Class C Injury Crashes	1	2	+ 100.0 %
Property Damage Only	3	2	- 33.3 %

The naive before and after analysis at the treatment location resulted in a 33 percent reduction in Total Crashes and a 33 percent reduction in Target Crashes. There was a 71 percent reduction in the Total Severity Index and Target Crash Severity Index. The before period ADT year was 2006 and the after period ADT year was 2011.

Results and Discussion

Referencing the *Collision Diagrams*, vehicles traveling westbound on SR 1938 were colliding with vehicles traveling northbound on SR 2127/SR 2131. This pattern resulted in four (4) of the six (6) total target angle crashes during the before period. During the after period there was a total of four (4) angle target crashes. One (1) of the four (4) total target crashes in the westbound-northbound pattern previously described was present in the after period. Every crash event in the before and after periods was a result of vehicles traveling on SR 1938 failing to yield the right of way.

Overall target angle crashes were reduced from six (6) total crashes at the intersection during the before period to four (4) total crashes in the after period. This evaluation displays a 33 percent reduction in total target angle crashes at the intersection of SR 1938 at SR 2127/SR 2131 in Johnston County.

It should be noted that the fatal angle crash (ID# 101885459) that occurred during the before period was described in the crash report as “failed to yield right of way”.

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all four approaches to the treatment intersection. 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.

Treatment Site Photos from Google Street View



Google Maps (February 2008) – Looking North from SR 2131



Google Maps (March 2009) – Looking South from SR 2127



Google Maps (March 2009) – Looking East from SR 1938



Google Maps (March 2009) – Looking West from SR 1938

SS# 04-06-222
 Order# 41000025867
 Johnston County
 BEFORE Period
 10/1/03 - 6/30/08

SR 2127 (Shoehel Rd)
 55 MPH
 ADT (Year)
 490 (2006)

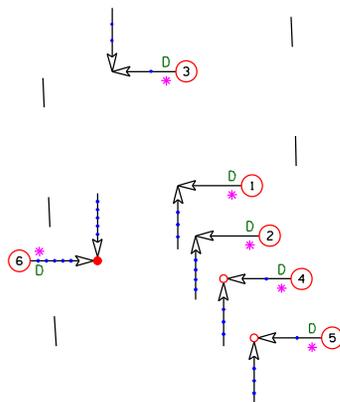
LEGEND							
	MOVING VEHICLE		ANGLE		5 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PARKING VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PARKING VEHICLE		SIDE-SWIPE		30 MPH TO 39		DRY
	FIXED OBJECT		REAR-END		40 MPH TO 49		WET
	HEAD-ON		REAR-END		50 MPH TO 59		ICY OR SNOWY
	REAR-END		REAR-END		60 MPH TO 69		ONLY
	RAN OFF ROAD		FATALITY		TO AND UP		
					SPEED UNKNOWN		



SR 1938 (Browns Pond Rd)
 55 MPH
 ADT (Year)
 1,300 (2006)

SR 1938 (Browns Pond Rd)
 55 MPH
 ADT (Year)
 1,300 (2006)

SR 2131 (Rhondale Rd)
 55 MPH
 ADT (Year)
 490 (2006)



Frontal
 Impact
 Crashes

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRANSPORTATION MOBILITY and SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 8-14-2013 Prepared By: J. Green

SS# 04-06-222
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 AFTER Period
 10/1/08 - 6/30/13

SR 2127 (Shoehel Rd)
 55 MPH
 ADT (Year)
 450 (2011)

LEGEND

	MOVING VEHICLE		ANGLE		5 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PARKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PARKING VEHICLE		SIDEWALK		30 MPH TO 39		DRY
	FIXED OBJECT		SLURRY		40 MPH TO 49		WET
	HEAD ON		FATALITY		50 MPH TO 59		ICE OR SNOW
	REAR END		TO AND UP		60 MPH TO 69		ONLY
	RAN OFF ROAD		SPEED UNKNOWN				



SR 1938 (Browns Pond Rd)
 55 MPH
 ADT (Year)
 1,100 (2011)

SR 1938 (Browns Pond Rd)
 55 MPH
 ADT (Year)
 1,100 (2011)

SR 2131 (Rhondale Rd)
 55 MPH
 ADT (Year)
 450 (2011)

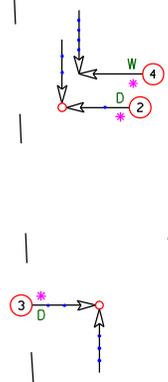


FIGURE 1



SIG ID 04-1405 (Actuated Flasher)

⊙ Denotes L.E.D.

TABLE OF OPERATION	
SIGNAL FACE	INTERVAL
	1 2
21, 22, 26	ON OFF
23, 24, 25	OFF ON
8, 13	ON OFF
12, 14	OFF ON

Frontal
 Impact
 Crashes

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SAFETY DIVISION

TRAFFIC SAFETY UNIT

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