

Spot Safety Project Evaluation

Order # 41000025663

Spot Safety Project # 08-06-215

**Spot Safety Project Evaluation of the
“Vehicle Entering When Flashing” Overhead Actuated Flasher
US 401 at SR 1207 (John Russell Rd)
Hoke County**

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Transportation Mobility and Safety Division
North Carolina Department of Transportation

Principal Investigator



Justin Green

8-1-2013
Date

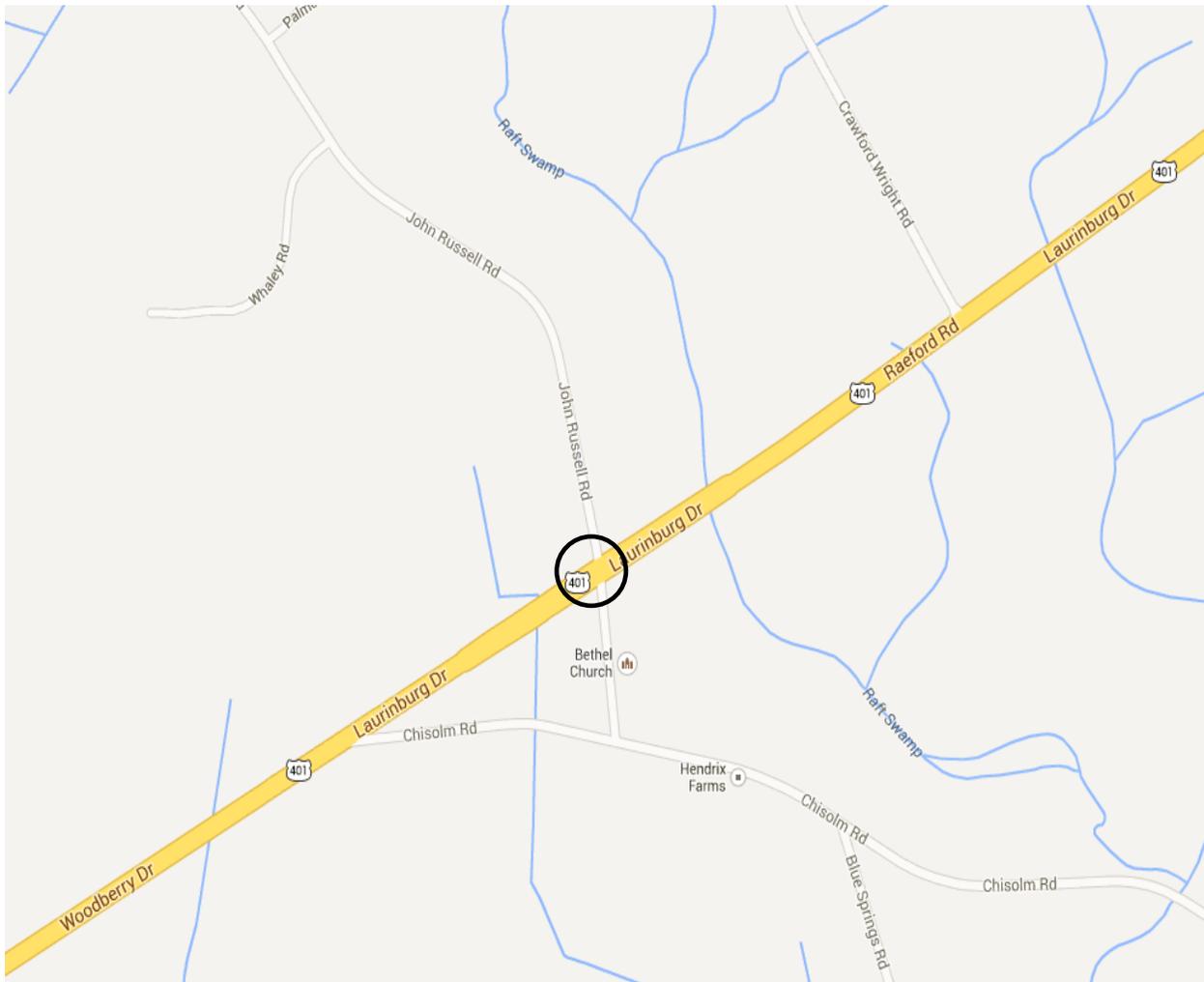
Traffic Safety Project Engineer

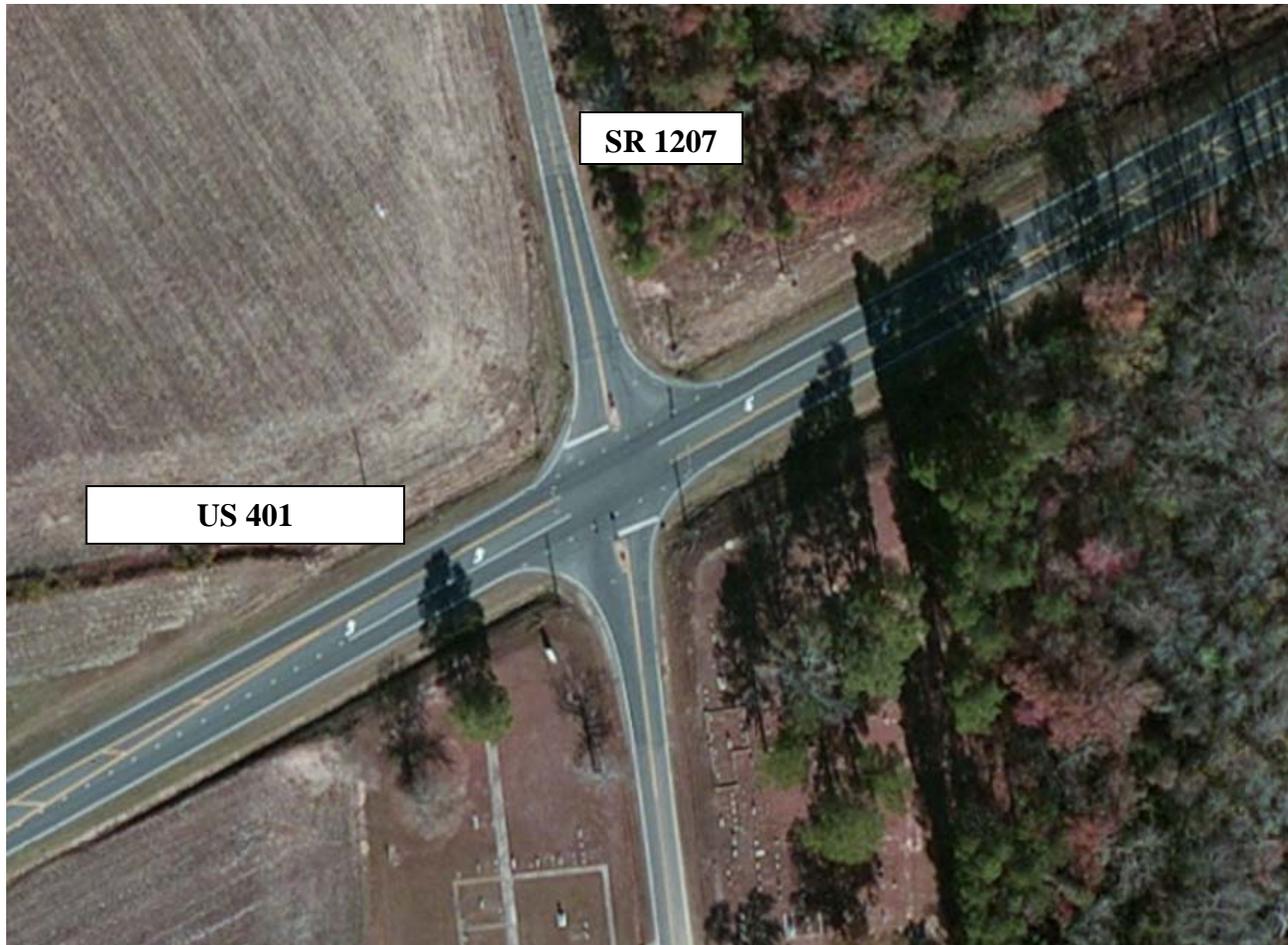
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 08-06-215 located at the Intersection of US 401 at SR 1207 (John Russell Rd) in Hoke County, Southwest of Raeford.

The Sig ID is 08-0801 for this actuated flasher Traffic Signal.





Aerial Provided from ArcGIS

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 “vehicle entering when flashing” signs to the existing stop conditioned crossroads type intersection on US 401. SR 1207 (John Russell Rd) will maintain a red indication at all times.

US 401 and SR 1207 (John Russell Rd) are two lane facilities with US 401 having left turn lanes in both directions. The posted speed limit for US 401 is 55 mph. The Northern leg of SR 1207 has a posted speed limit of 35 mph while the Southern leg is 25 mph. The subject location is a four-leg crossroads intersection, which is controlled by dual mounted stop signs on SR 1207.

The original statement of problem was vehicles traveling on SR 1207 are failing to yield to vehicles traveling on US 401. Sight distance for motorist on SR 1207 Westbound approach is limited due to high embankments creating a potential safety problem. The initial crash analysis was completed from September 1, 2001 to August 31, 2006 with six (6) reported crashes including two fatalities. The final completion date for the improvement at the subject intersection was on July 26, 2008 with a total cost of \$33,200.

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 May through July 2008. The before period consisted of reported crashes from June 1, 2003 through April 30, 2008 (4 years and 11 months); and the after period consisted of reported crashes from August 1, 2008 through June 30, 2013 (4 years and 11 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 US 401 and SR 1207 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	3	- 50.0 %
Total Severity Index	28.73	3.47	- 87.9 %
Target Crashes	5	3	- 40.0 %
Target Crash Severity Index	34.28	3.47	- 89.9 %
Volume (2005, 2011)	7,300	7,300	N/A

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

The naive before and after analysis at the treatment location resulted in a 50 percent reduction in Total Crashes, a 40 percent reduction in Target Angle Crashes, and a 88 percent reduction in the Total Severity Index. The before period ADT year was 2005 and the after period ADT year was 2011.

Results and Discussion

Referencing the *Collision Diagrams*, vehicles traveling on SR 1207 were colliding with vehicles traveling on US 401 resulting in five (5) target crashes during the before period. Crash 5 (ID #102226350) was considered a fifth target crash since the run off road crash was in avoidance of an angle crash. During the after period there was a pattern of three (3) angle target crashes. This pattern consisted of vehicles traveling EB on SR 1207; these vehicles were failing to yield the right of way to vehicles traveling NB on US 401.

Overall total crashes were reduced from six (6) total crashes at the intersection during the before period to three (3) total crashes in the after period. This evaluation displays a fifty percent reduction in total crashes at the intersection of US 401 at SR 1207 in Hoke County.

It should be noted that the two fatal angle crashes (ID# 101050510 & ID #101819351) that occurred during the before period were 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 (May 2012) – Looking North from SR 1207



Google Maps (May 2012) – Looking South from SR 1207



Google Maps (April 2013) – Looking East from US 401



Google Maps (May 2012) – Looking West from US 401

SS# 08-06-215
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 Hoke County
 BEFORE Period
 6/1/03 - 4/30/08

SR 1207 (John Russell Rd)
 35 MPH
 ADT (Year)
 470 (2005)

US 401
 55 MPH
 ADT (Year)
 6,800 (2005)

US 401
 55 MPH
 ADT (Year)
 6,800 (2005)

SR 1207 (John Russell Rd)
 25 MPH
 ADT (Year)
 470 (2005)

Crash # 5: Vehicle one ran off roadway to the right in avoidance of vehicle two traveling SB on SR 1207

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



Frontal
 Impact
 Crashes

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

TRAFFIC SAFETY UNIT

Date: 7-31-2013 Prepared By: J. Green

SS# 08-06-215
 Order# 41000025663
 Hoke County
 AFTER Period
 8/1/08 - 6/30/13

SR 1207 (John Russell Rd)
 35 MPH
 ADT (Year)
 370 (2011)

US 401
 55 MPH
 ADT (Year)
 6,900 (2011)

US 401
 55 MPH
 ADT (Year)
 6,900 (2011)

SR 1207 (John Russell Rd)
 25 MPH
 ADT (Year)
 370 (2011)

LEGEND

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

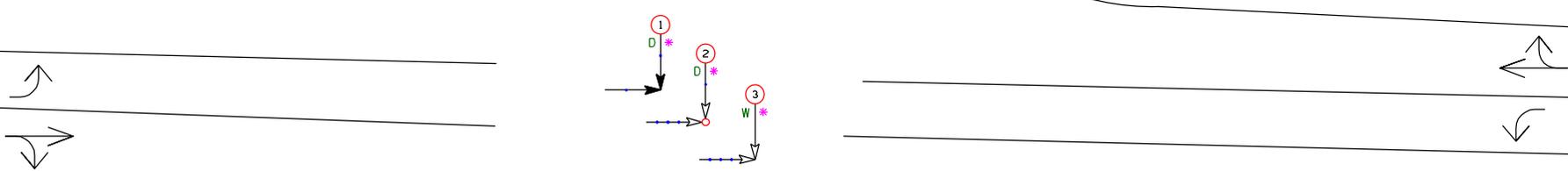


FIGURE 1



SIG ID 08-0801 (Actuated Flasher)

Denotes L.E.D.

TABLE OF OPERATION		
SIGNAL FACE	INTERVAL	
	1	2
11,12	ON	OFF
13,14	OFF	ON
21,23	ON	OFF
22,24	OFF	ON

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