

Spot Safety Project Evaluation

Spot Safety Project # 05-07-230

Spot Safety Project Evaluation of the Restriping of SR 1315 (Buck Jones Road) for Left Turn Lanes SR 1315 (Buck Jones Road) at Farm Gate Road Wake County

Documents Prepared By:
Stantec Consulting Services, Inc.
for
Safety Evaluation Group
Traffic Safety Systems Management Section
Transportation Mobility and Safety Division
North Carolina Department of Transportation

Principal Investigator



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Transportation Designer

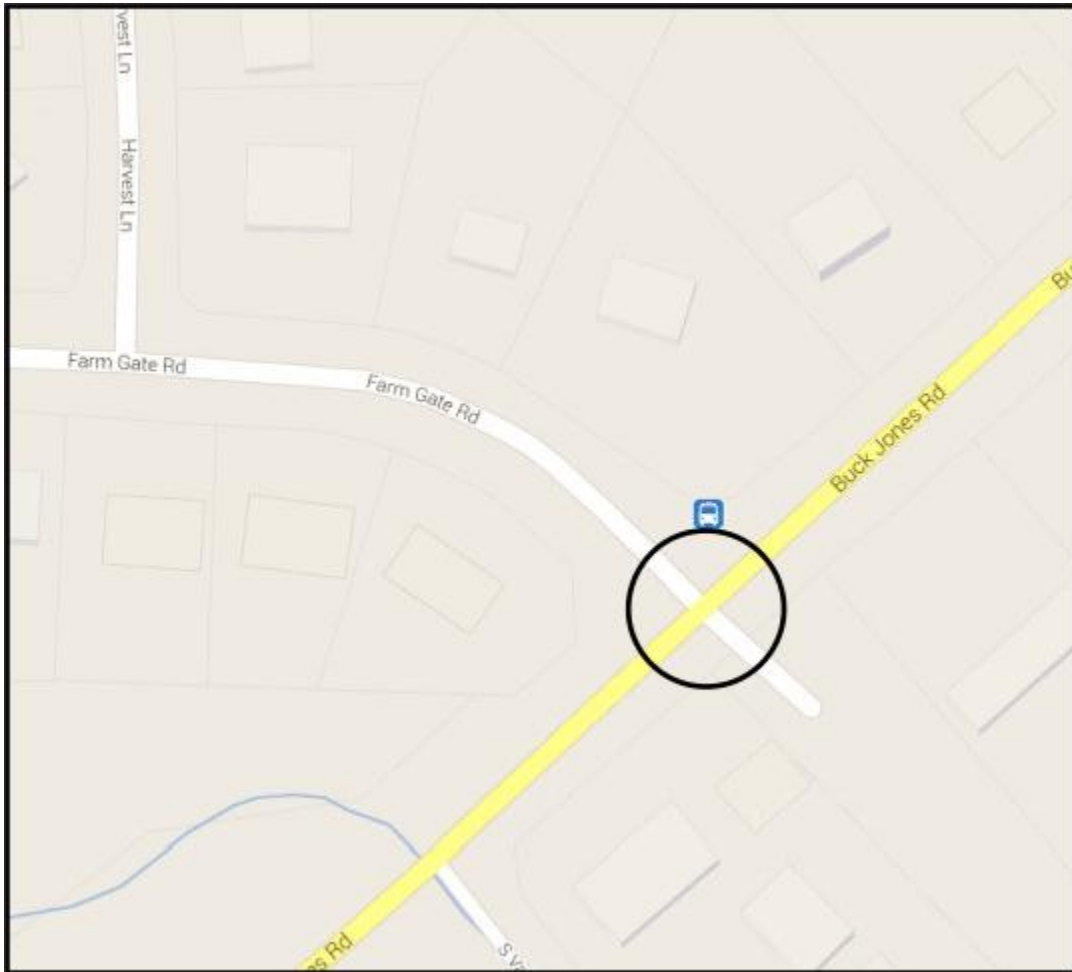
9-24-2013
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 05-07-230 located at intersection of SR 1315 (Buck Jones Road) at Farm Gate Road in Wake County.

This intersection is stop-controlled.





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 the re-striping of SR 1315 (Buck Jones Road) to include left turn lanes.

SR 1315 (Buck Jones Road) and Farm Gate Road are both two-lane roadways. Just south of the intersection, SR 1315 (Buck Jones Road) widens into a four-lane roadway. The speed limit on SR 1315 (Buck Jones Road) is 35 mph, and the speed limit on Farm Gate Road is 30 mph. The subject location is a three leg stop-controlled intersection, which is stop-controlled on Farm Gate Road.

The original statement of problem was that northbound vehicles turning left onto Farm Gate Road were being rear ended by motorists failing to stop. Also, southbound vehicles turning right were being sideswiped as motorists attempt to pass improperly in the wide southbound lane. The initial crash analysis was completed from July 1, 2002 to June 30, 2007 with thirty-five (35) reported crashes. The final completion date for the improvement at the subject intersection was on September 8, 2008 with a total cost of \$7,500.00.

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 2008 through September 2008. The before period consisted of reported crashes from September 1, 2003 through June 30, 2008 (4 years, 10 months); and the after period consisted of reported crashes from October 1, 2008 through July 31, 2013 (4 years, 10 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 1315 (Buck Jones Rd) and Farm Gate Road 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 Northbound Rear End Crashes and Southbound sideswipe crashes were the target crashes for the applied countermeasure.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	29	8	- 72.4 %
Total Severity Index	5.4	4.70	- 12.9 %
Target Crashes	12	1	- 91.7 %
Target Crash Severity Index	3.47	8.4	+ 142.1 %
Volume (2006, 2011)	11,100	11,500	+ 3.6 %

<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	6	4	- 33.3 %
Property Damage Only	21	4	- 80.9 %

The naive before and after analysis at the treatment location resulted in a 72.4 percent decrease in Total Crashes, and a 12.9 percent decrease in the Total Severity Index. The before period ADT year was 2006 and the after period ADT year was 2011.

To further analyze the intersection crash patterns, the following chart shows different traffic movements and the change in crash totals through the study:

Additional Information	Before	After	Percent Reduction (-) Percent Increase (+)
Northbound Rear End Crashes	9	1	- 88.9 %
Southbound Sideswipe crashes	3	0	- 100.0 %
Left Turn, Different Roadway Crashes	3	4	+ 33.3 %
Right Turn, Same Roadway Crashes	1	1	0.0 %
Left Turn, Same Roadway Crashes	2	0	- 100.0 %

Results and Discussion

Referencing the *Collision Diagrams*, there were twelve (12) target crashes in the before period. There was one (1) target crash in the after period. The target crash severity index was increased from 3.47 to 8.4 from the before to the after period. However, there was only one (1) target crash in the after period and it was an Injury C crash.

The number of northbound rear end crashes, which is one of the target crashes for this study, was reduced from nine (9) to one (1) from the before to the after period. Southbound sideswipe crashes decreased from three (3) to zero (0), which were also target crashes. Overall, in the entirety of the study area, there were twelve (12) rear ends and six (6) sideswipes in the before period. In the after period, there was one (1) rear end crash and no sideswipe crashes.

From the additional information chart above, the number of left turn, different roadway crashes increased with three (3) crashes the before period and four (4) crashes in the after period. In both the before and after period, there was one (1) right turn, same roadway crash occurring on the southbound leg. There were two (2) left turn, same roadway crashes in the before period located on the northbound leg. In the after period, there were no left turn, same roadway crashes.

There was a fatal crash in the before period involving a bicycle. Additionally, there was one (1) Injury B crash and six (6) Injury C crashes in the before period, which decreased to four (4) Injury C crashes in the after period.

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all three 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 (October 2011) – Looking South from SR 1315 Approach



Google Maps (October 2011) – Looking North from SR 1315 Approach



Google Maps (October 2011) – Looking East from Farm Gate Rd Approach

SS# 05-07-230
 Wake County
 Before Period
 9/1/2003 - 6/30/2008

LEGEND							
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		ANIMAL
	PARKED VEHICLE		10 MPH TO 19		10 MPH TO 19		PEDESTRIAN
	PARKING VEHICLE		20 MPH TO 29		20 MPH TO 29		BICYCLE
	MOVABLE OBJECT		30 MPH TO 39		30 MPH TO 39		TRAIN
	HEAD ON		40 MPH TO 49		40 MPH TO 49		DRIVER AT FAULT
	REAR END		50 MPH TO 59		50 MPH TO 59		DRY
	RAN OFF ROAD		60 MPH TO 69		60 MPH TO 69		WET
	DAYLIGHT CRASH		70 AND UP		70 AND UP		ICY OR SNOWY
	NIGHT CRASH		SPEED UNKNOWN		SPEED UNKNOWN		Other

30 mph

Farm Gate Rd

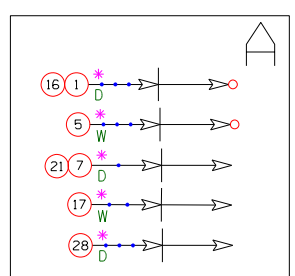
ADT (Year)
2,000 (est.) (2006)

ADT (Year)
10,875 (2006)

SR 1315 (Buck Jones Rd)

SR 1315 (Buck Jones Rd)

ADT (Year)
9,375 (2006)



Target Crashes

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

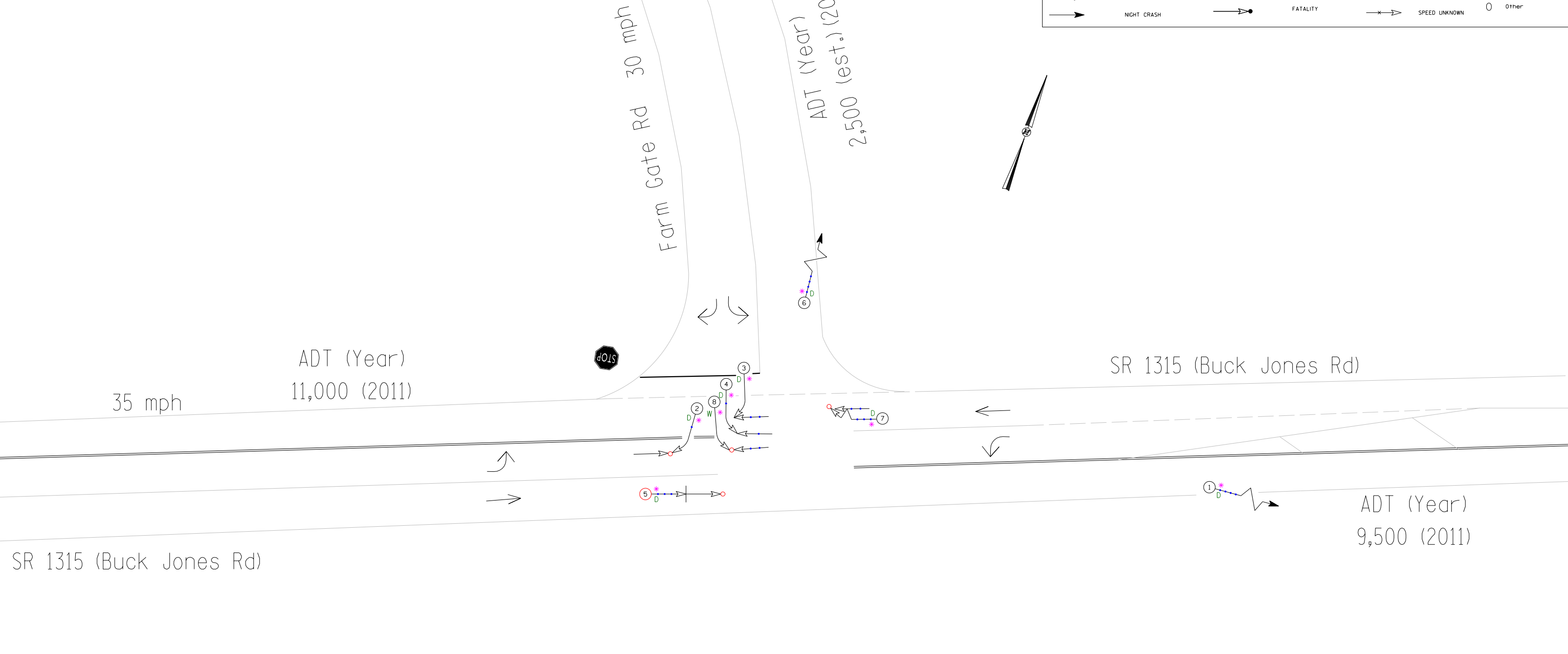
Date: 9/18/2013

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SS# 05-07-230
 Wake County
 After Period
 10/1/2008 - 7/31/2013

LEGEND			
	MOVING VEHICLE		ANGLE
	PARKED VEHICLE		TURNING
	PARKING VEHICLE		BACKING
	MOVABLE OBJECT		SIDESWIPE
	HEAD ON		INJURY
	REAR END		FATALITY
	RAN OFF ROAD		9 MPH OR LESS
	DAYLIGHT CRASH		10 MPH TO 19
	NIGHT CRASH		20 MPH TO 29
			30 MPH TO 39
			40 MPH TO 49
			50 MPH TO 59
			60 MPH TO 69
			70 AND UP
			SPEED UNKNOWN
			A ANIMAL
			P PEDESTRIAN
			B BICYCLE
			T TRAIN
			* DRIVER AT FAULT
			D DRY
			W WET
			I ICY OR SNOWY
			O Other



Target Crashes

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

Date: 9/18/2013

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