Spot Safety Project Evaluation

Spot Safety Project # 01-07-200

Spot Safety Project Evaluation of the Flashing Signal Revision
(Revise Flashers and Revise/Add Warning Signs: Vehicle Entering,
Watch for Approaching Vehicle, and Stop Ahead)
US 158 (Shortcut Road) at SR 1147 (Indiantown Road)
Currituck County

Documents Prepared By:

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Safety Evaluation Group
Traffic Safety Systems Management Section
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Principal Investigator

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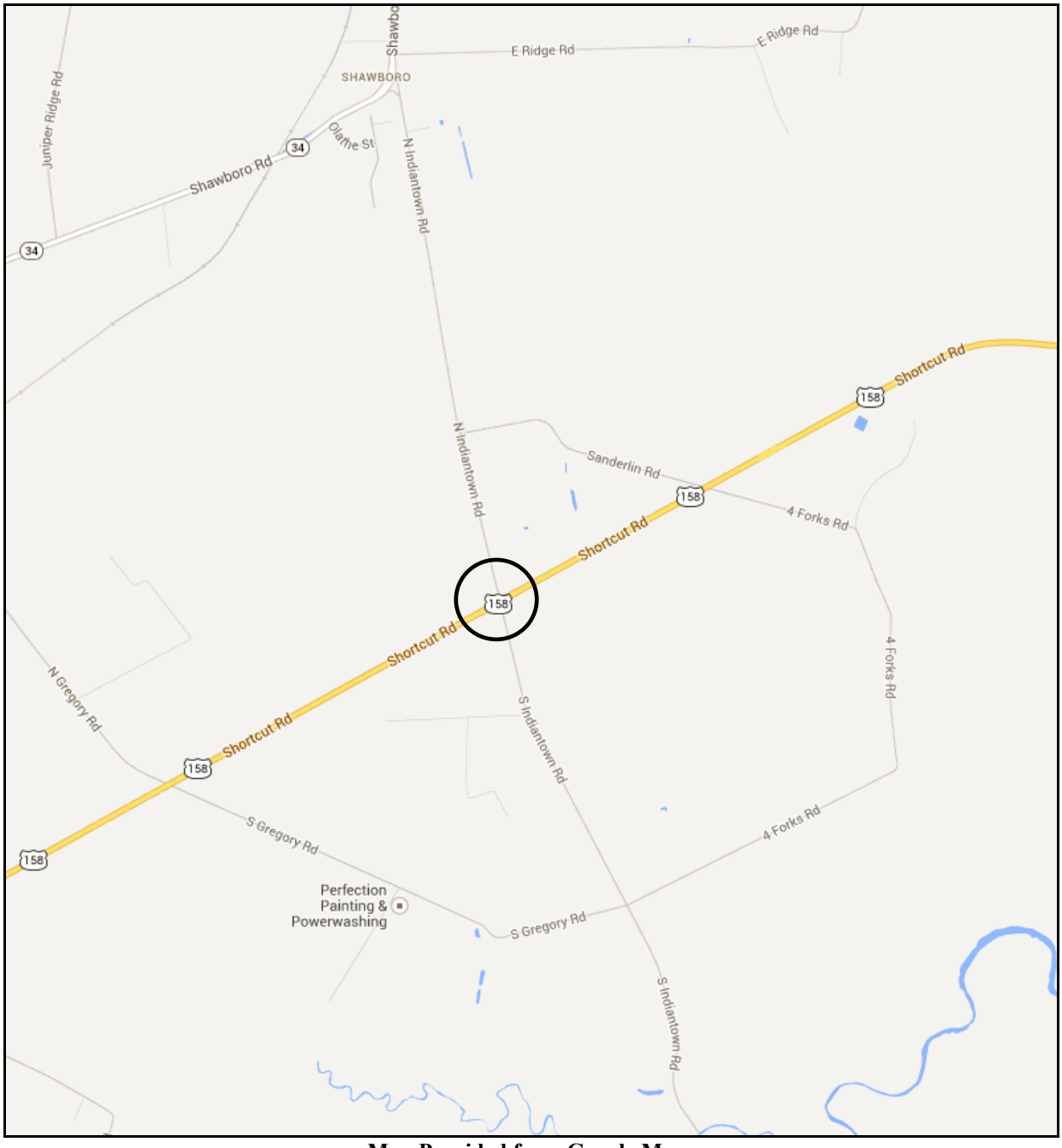
9-3-2013
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 01-07-200 located at the intersection of US 158 (Shortcut Road) at SR 1147 (Indiantown Road) in Currituck County.

The Sig ID is 01-0341 for this fully actuated flashing signal.



Map Provided from Google Maps

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 revision of the flashing signal and the addition of warning signs. Prior to the improvement, there were existing yellow flashers and "Vehicle Entering when Flashing" signs on US 158 (Shortcut Road). There were also existing red flashers on SR 1147 (Indiantown Road). The improvement included the revision of the signs on US 158 to "Vehicle Entering." The red flashers on SR 1147 were revised to accommodate "Watch for Approaching Vehicle" signs. Stop Ahead signs with yellow flashers were also installed on the SR 1147 approaches.

The subject location is a four-leg crossroads intersection. US 158 (Shortcut Road) and SR 1147 (Indiantown Road) are both 2-lane facilities. US 158 widens to include left turn lanes on both approaches at the intersection. The speed limit on all four legs of the intersection is 55 mph.

The original statement of problem was the ongoing occurrence of Frontal Impact Crashes between vehicles entering from SR 1147 (Indiantown Road) and vehicles traveling on US 158 (Shortcut Road) despite the fact that the flashing signal was installed with the "Vehicle Entering when Flashing" signs in January 1996. The initial crash analysis was completed from December 1, 2001

to November 30, 2006 with eighteen (18) reported crashes. The final completion date for the improvement at the subject intersection was on April 7, 2008 with a total cost of $63,000.00.

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 March through April 2008. The before period consisted of reported crashes from January 1, 2003 through February 29, 2008 (5 years, 2 months); the after period consisted of reported crashes from May 1, 2008 through June 30, 2013 (5 years, 2 months). The ending date for this analysis was determined by the date of available crash data at the time of analysis.

The treatment data consists of all crashes within 150 feet of the intersection of US 158 (Shortcut Road) at SR 1147 (Indiantown Road) for all 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 between vehicles entering from SR 1147 and vehicles traveling on US 158 were the target crashes for the applied countermeasure. The Frontal Impact Crash Types considered are as follows: Left-turn, different roadways; Right-turn, different roadways; and Angle.

Treatment Information	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	23	10	- 56.5 %
Total Severity Index	7.83	7.66	- 2.2 %
Target Crashes	20	8	- 60.0 %
Target Crash Severity Index	8.49	7.48	- 11.9 %
Volume (2005, 2010)	8200	7100	- 13.4 %

Injury Crash Summary	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	6	4	- 33.3 %
Class C Injury Crashes	5	5	0.0 %
Property Damage Only	11	1	- 90.9 %

The naive before and after analysis at the treatment location resulted in a 56.5 percent reduction in Total Crashes, a 60.0 percent reduction in Target Crashes, and a 2.2 percent reduction in the Total Severity Index. The before period ADT year was 2005 and the after period ADT year was 2010.

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 (+)
Angle (Target)	17	8	- 52.9 %
Left Turn, Different Roadways (Target)	3	0	- 100.0 %
Right Turn, Different Roadways (Target)	0	0	N/A
Right Turn, Same Roadway	0	2	N/A

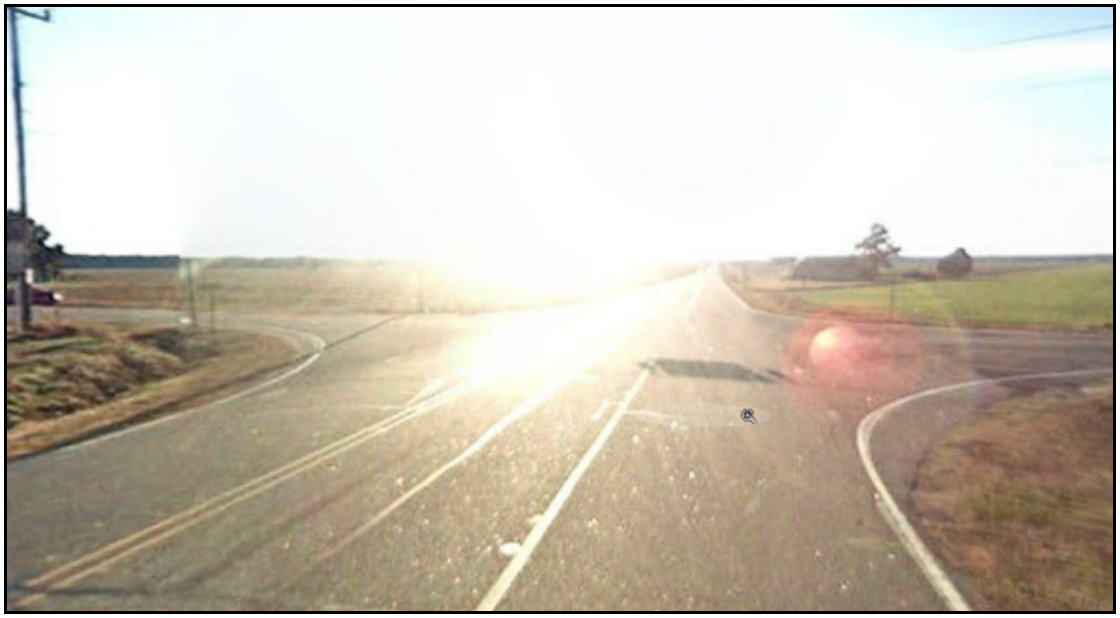
Results and Discussion

Referencing the *Collision Diagrams* and the above tables, the Target Crashes (Frontal Impact Crashes between vehicles entering from SR 1147 and vehicles traveling on US 158) were reduced from twenty (20) in the before period to eight (8) in the after period. The severity index for these target crash types decreased from 8.49 in the before period to 7.48 in the after period. The study shows a 52.9 percent decrease in Angle crashes and a 100 percent decrease in Left Turn, Different Roadway crashes for the intersection. Right Turn, Same Roadway crashes increased from zero (0) to two (2) crashes from the before period to the after period, but these two crashes do not appear to be related to the applied countermeasure.

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all four approaches to the study intersection. As the Safety Evaluation Group facilitates additional spot safety reviews for these types of countermeasures, it is the goal to be able to provide objective and definite information regarding actual crash reduction factors for these types of treatments.

Treatment Site Photos from Google Street View

Google Maps (January 2008) – Looking East on US 158 Approach

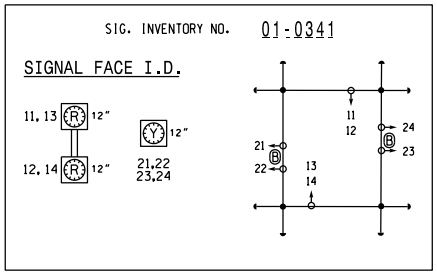


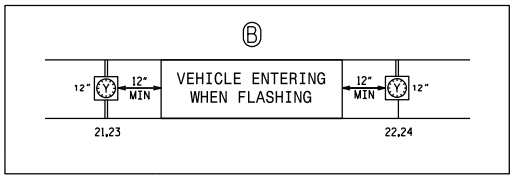
Google Maps (January 2008) – Looking West on US 158 Approach

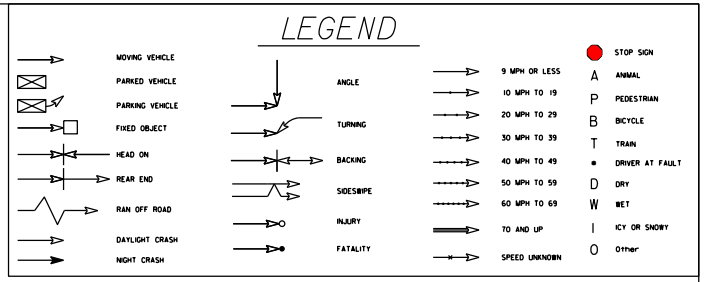
Google Maps (January 2008) – Looking at the northern leg of SR 1147 from US 158

Google Maps (January 2008) – Looking at the southern leg of SR 1147 from US 158

SS# 01-07-200
Currituck County
BEFORE Period
1/1/03 - 2/29/2008







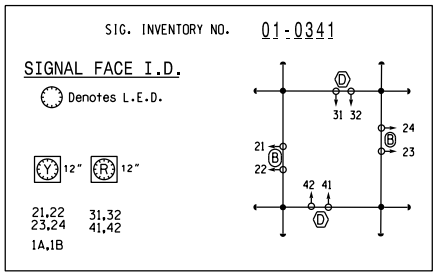
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRANSPORTATION MOBILITY and SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 8-23-13 | *Prepared By: Amy Faulkner, EI*

Hatch Mott MacDonald

SS# 01-07-200
Currituck County
AFTER Period
5/1/08 - 6/30/13



1B
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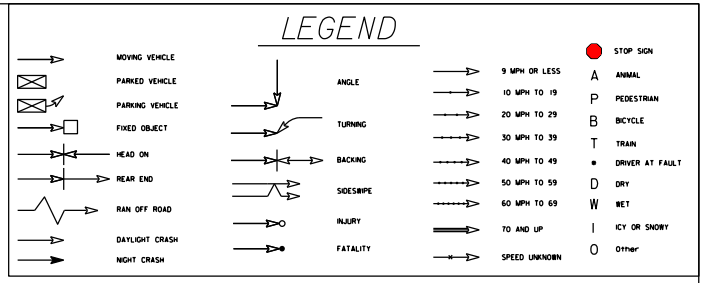
ADT (Year)
1100 (2010)

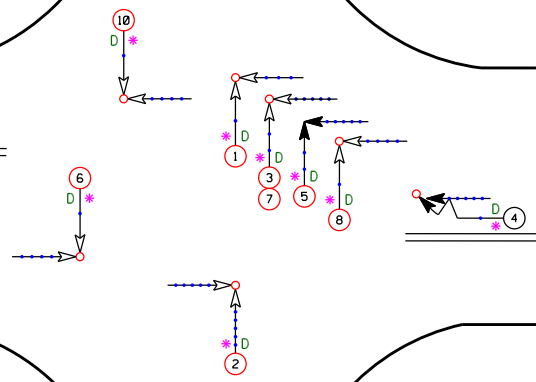
STOP

SR 1147
(INDIANTOWN ROAD)
55 MPH



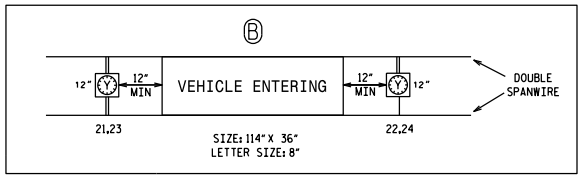
US 158
55 MPH

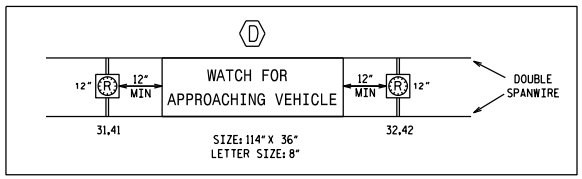
ADT (Year)
5500 (2010)



ADT (Year)
6100 (2010)

US 158
55 MPH

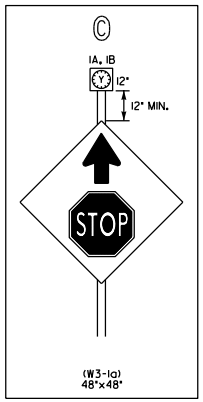




SR 1147
(INDIANTOWN ROAD)
55 MPH

ADT (Year)
1450 (2010 est.)

STOP



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1A

Frontal Impact
Target Crashes

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TRAFFIC SAFETY UNIT

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