

Spot Safety Project Evaluation

Spot Safety Project # 03-04-210

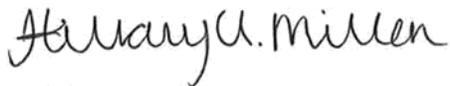
**Spot Safety Project Evaluation of the Traffic Signal Installation
NC 130 (Holden Beach Road) at
SR 1134 (Grey Bridge Road)/ SR 1136 (Red Bug Road)
Brunswick County**

Documents Prepared By:

Hatch Mott MacDonald For:

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

Principal Investigator



Hillary U. Millen

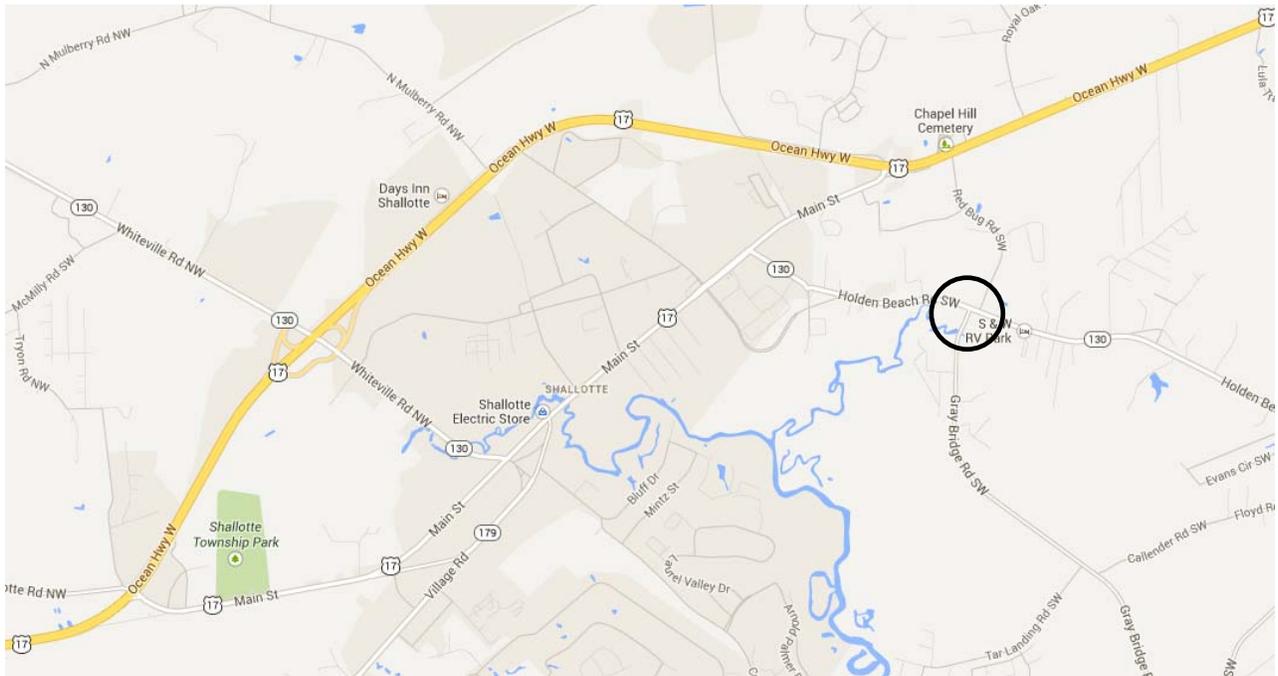
9/4/2013
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 03-04-210 located at the Intersection of NC 130 (Holden Beach Road SW) at SR 1134 (Grey Bridge Road SW) in Brunswick County.

The intersection is unsignalized in the before period.





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 install a traffic signal at the NC 130 (Holden Beach Road SW) and SR 1134 (Grey Bridge Road SW) intersection and add a northbound turn lane on SR 1134 (Grey Bridge Road SW). The intersection of NC 130 (Holden Beach Road SW) and SR 1136 (Red Bug Road SW) was included in this evaluation since it is approximately 200 feet from the intersection.

NC 130 (Holden Beach Road SW), SR 1134 (Grey Bridge Road SW) and SR 1136 (Red Bug Road SW) are all 2-lane facilities. Speed limits around the intersection are 55 mph. The subject location is two three-leg intersections where the eastern most intersection, NC 130 (Holden Beach Road SW) and SR 1134 (Grey Bridge Road SW), is controlled with a traffic signal in the after period and the western most intersection, NC 130 (Holden Beach Road SW) and SR 1136 (Red Bug Road SW), is stop controlled on the southbound approach in both the before and after periods.

The original statement of problem was the pattern of angle type collisions occurring due to vehicles entering the path of a vehicle traveling along NC 130 (Holden Beach Road SW) from SR 1134 (Grey Bridge Road SW). The initial crash analysis was completed from July 31, 1999 to July 31, 2004 with nineteen (19) reported crashes. The final completion date for the improvement at the subject intersection was on September 17, 2008 with a total cost of \$115,000.00.

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 December 2007 through October 2008. The before period consisted of reported crashes from April 1, 2003 through November 30, 2007 (4 years, 8 months); and the after period consisted of reported crashes from November 1, 2008 through June 30, 2013 (4 years, 8 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 both subject intersections including the strip of NC 130 (Holden Beach Road SW) in between them. *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 locations. Please note that frontal impact crashes at the NC 130 (Holden Beach Road SW) and SR 1134 (Grey Bridge Road SW) intersection are the target crashes for the applied countermeasure. Frontal impact crashes include: left-turn same roadway, left-turn different roadway, right-turn same roadway, right-turn different roadway, head on and angle type crashes.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	29	27	- 6.9 %
Total Severity Index	5.3	3.2	- 40.2 %
Target Crashes	12	4	- 66.7 %
Target Crash Severity Index	4.7	4.7	0.0 %
Volume (2005, 2010)	20,800	20,600	- 1.0 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	7	3	- 57.1 %
Class C Injury Crashes	10	5	- 50.0 %
Property Damage Only	12	19	+ 58.3 %

The naive before and after analysis at the treatment location resulted in a 6.9 percent reduction in Total Crashes, and a 40.2 percent reduction in the Total Severity Index. The analysis also resulted in a reduction in target crashes from 12 to 4 crashes. The before period ADT year was 2005 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:

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
NC 130 Read-End Crashes	4	13	+ 225.0%
Non-Frontal Impact Crashes involving a SR 1134 Vehicle	4	0	- 100.0%

Results and Discussion

Referencing the *Collision Diagrams*, the target crashes experienced a decrease from 12 to 4 crashes, a 66.7 percent decrease. The Target Crash Severity Index remains the same from the before period to the after period at 4.7. Additionally, rear-end type crashes on NC 130 (Holden Beach Road SW) experienced a 225% increase from the before period to the after period. Also, non-frontal impact crashes (i.e. rear-end and backing up type crashes) on SR 1134 (Grey Bridge Road SW) were eliminated in the after period.

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 (March 2008) – Eastbound Approach on NC 130 at SR 1134



Google Maps (March 2008) – Northbound Approach on SR 1134



Google Maps (December 2007) – Westbound Approach on NC 130 at SR 1134



Google Maps (December 2007) – Eastbound Approach on NC 130 at SR 1136



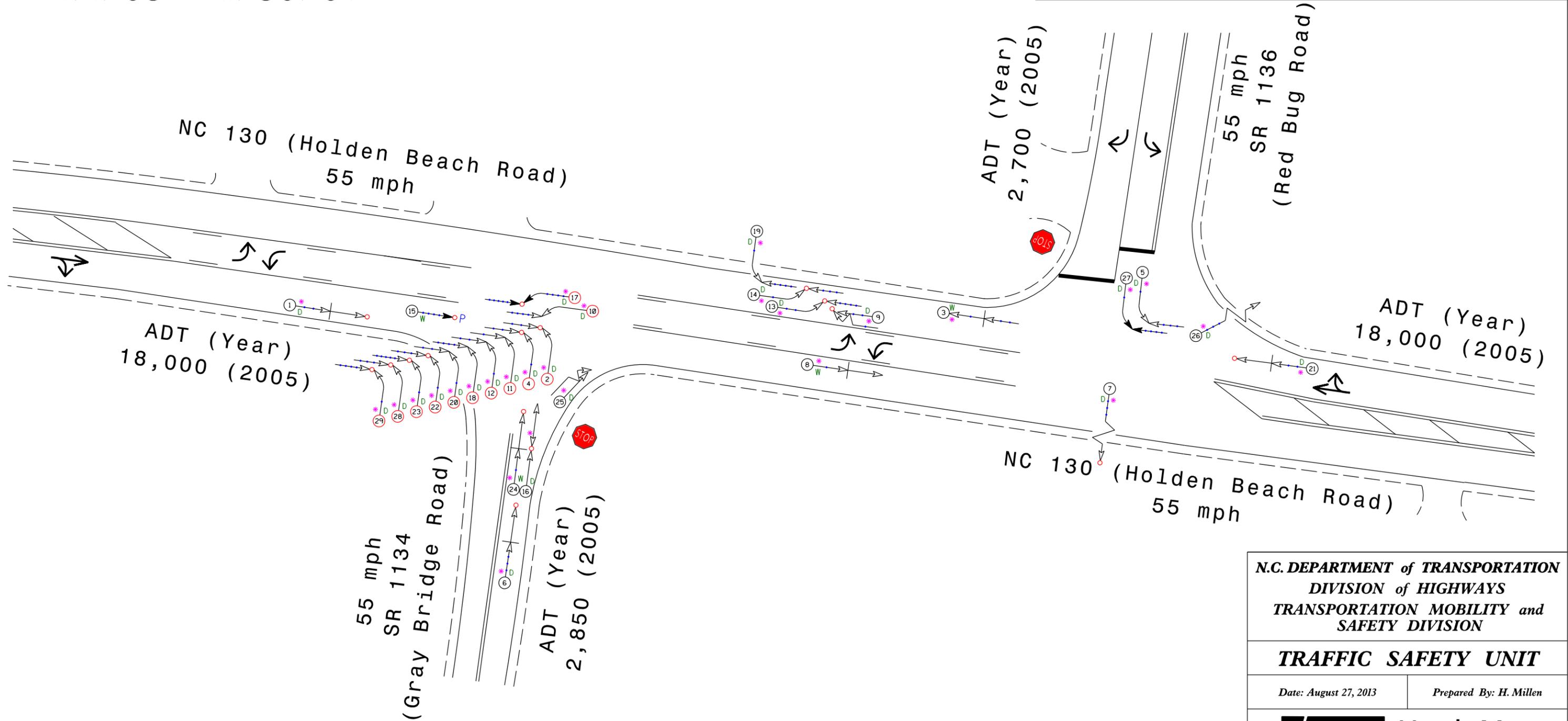
Google Maps (December 2007) – Looking North at SR 1136 from NC 130



Google Maps (December 2007) – Westbound Approach on NC 130 at SR 1136

SS# 03-04-210
 Brunswick County
 BEFORE Period
 4/1/03 - 11/30/07

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
	STOP SIGN		A ANIMAL
			P PEDESTRIAN
			B BICYCLE
			T TRAIN
			* DRIVER AT FAULT
			D DRY
			W WET
			I ICY OR SNOWY
			O Other



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 SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: August 27, 2013

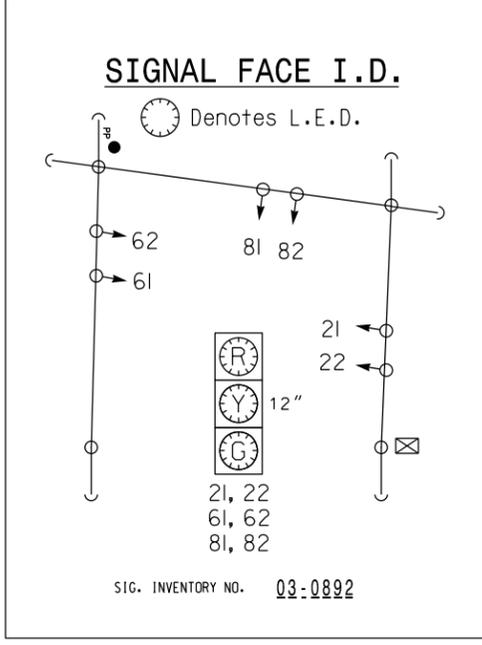
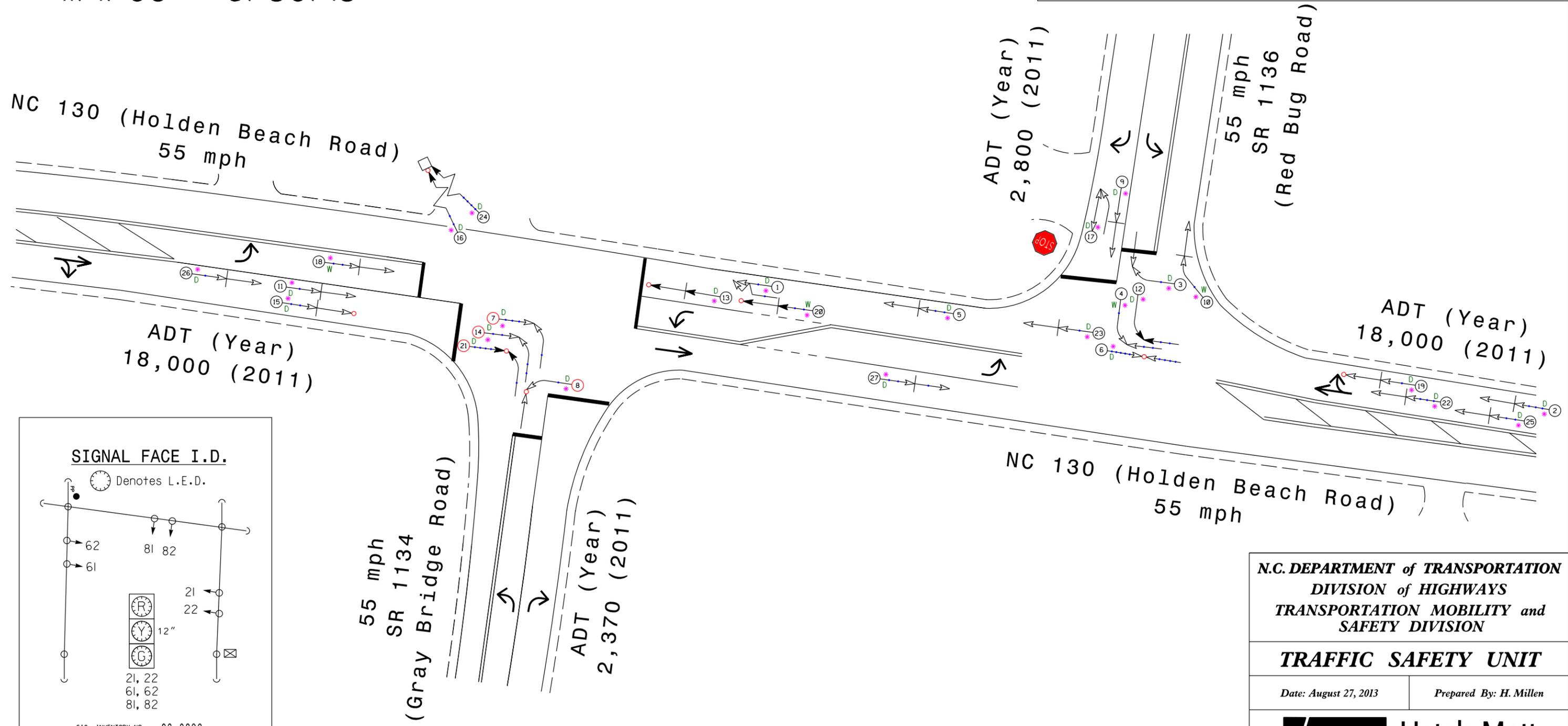
Prepared By: H. Millen

Frontal Impact
 Target Crashes

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 MacDonald

SS# 03-04-210
 Brunswick County
 AFTER Period
 11/1/08 - 6/30/13

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



Frontal Impact
Target Crashes

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