

Spot Safety Project Evaluation

Spot Safety Project # 10-02-209

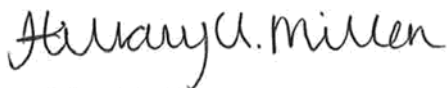
**Spot Safety Project Evaluation of the
Road Realignment and
Signal Installation
SR 2805 (Harrisburg Road) and
SR 2822 (Robinson Church Road)
Mecklenburg County**

Documents Prepared By:

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

Principal Investigator



Hillary Millen

11-14-2013

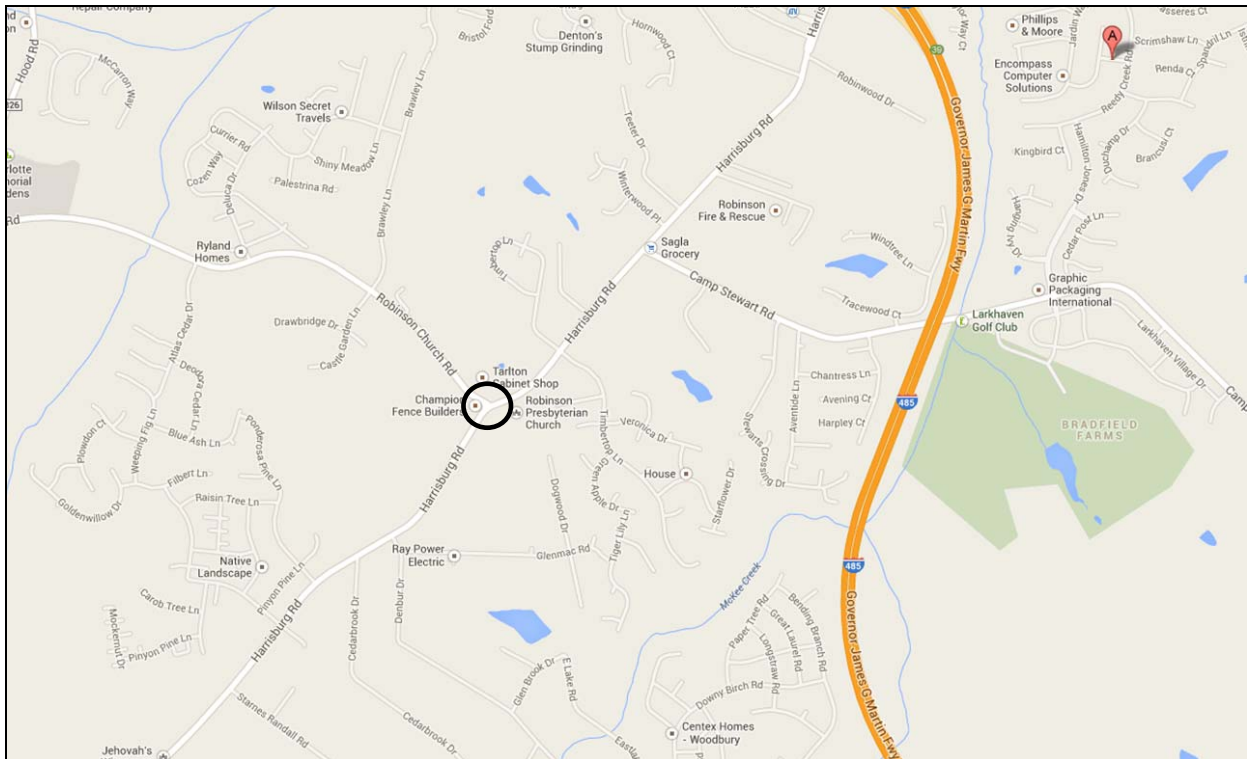
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Spot Safety Project Evaluation Documentation

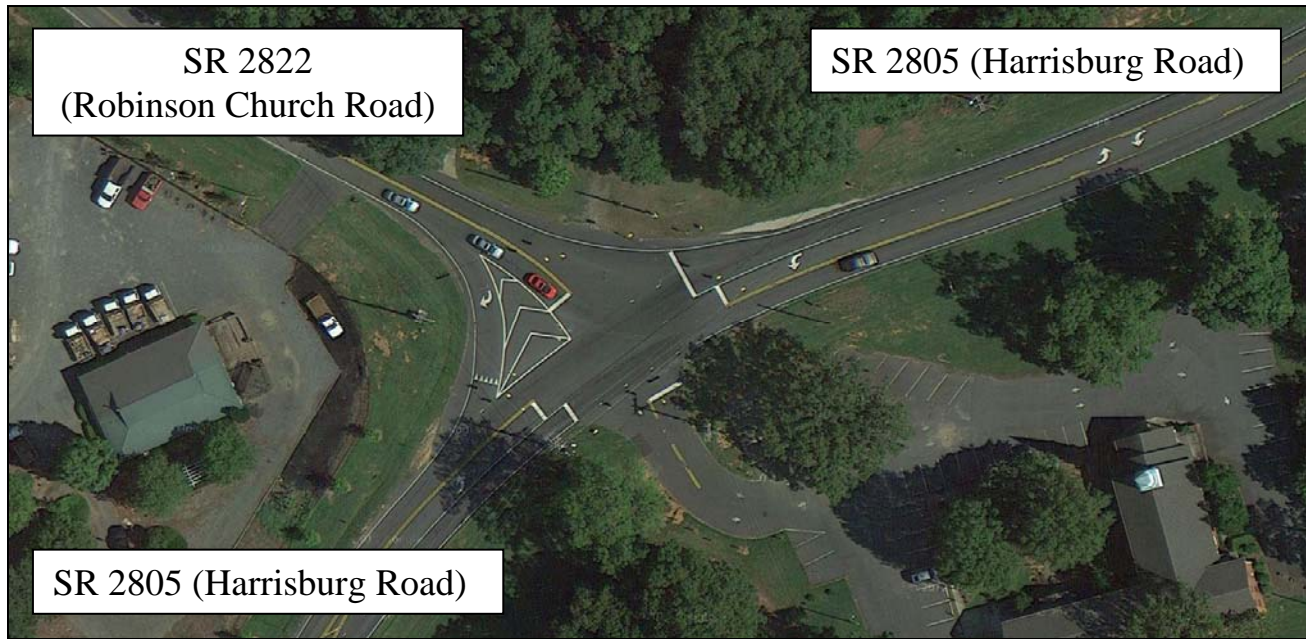
Subject Location

Evaluation of Spot Safety Project Number 10-02-209 located at the intersection of SR 2805 (Harrisburg Road) and SR 2822 (Robinson Church Road) in Mecklenburg County.

The Signal Inventory Number of the signal that was installed is 10-1254. The signal is a two-phase fully actuated traffic signal.



Location 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 installation of an actuated traffic signal, the straightening of the curve on SR 2805 (Harrisburg Road) at the intersection, and the realignment of the Robinson Presbyterian Church driveway.

SR 2805 (Harrisburg Road) is a two-lane facility that now has a northeast bound left-turn lane at the intersection and a center turn lane north of the intersection. SR 2822 (Robinson Church Road) is a two-lane facility that has a right-turn flare at the intersection. Speed limits around the intersection are 45 mph. The subject location is a three-leg intersection, which was stop controlled on SR 2822 (Robinson Church Road) before the project was implemented.

The original statement of problem was the existence of poor intersection geometrics and vehicles turning left from the through lane of a high volume road. The initial crash analysis was completed including data from September 1, 1998 to September 1, 2001 with fourteen (14) reported crashes during that time frame. The final completion date for the improvement at the subject intersection was between November 1, 2006 and December 31, 2006 with a total cost of \$150,000.00.

Naïve 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 includes the months of November and December of 2006. These months were determined by the last reported crash with the before period geometry and intersection control and the first reported crash with the after period geometry and intersection control. The before period consists of reported crashes from March 1, 2000 through October 31, 2006 (6 years, 8 months). The after period consists of reported crashes from January 1, 2007 through August 31, 2013 (6 years, 8 months). The ending date for the analysis was determined by the date of the most recent available crash data at the time of analysis.

The treatment data consists of all crashes within 150 feet of the subject intersection. *Please see the above location map and aerial photo for further details.*

The following data table depicts the Naïve Before and After Analysis for the treatment location. Please note frontal impact crashes were considered the target crashes for this type of 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	71	23	-67.6%
Total Severity Index	3.50	3.57	+2.1%
Target Crashes	24	5	-79.2%
Target Crash Severity Index	3.78	3.96	+4.9%
Volume (2003, 2010)	16,700	15,200	-9.0%

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	n/a
Class A injury Crashes	0	1	n/a
Class B injury Crashes	5	5	0.0%
Class C Injury Crashes	19	2	-89.5%
Property Damage Only	47	15	-68.1%

The Naïve Before and After Analysis at the treatment location shows a 67.6 percent reduction in the total crashes and a 79.2 percent decrease in target crashes. The total severity index increased from the before period to the after period by 2.1 percent. The before period ADT year was 2003 and the after period ADT year was 2010. Also, Class C type injury crashes and Property Damage Only crashes saw a considerable decline between the before and after periods.

To further analyze the intersection crash patterns, the following chart shows additional types of crashes and the change in crash totals through the study:

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Rear End Type Crashes	17	10	-41.2%
Run Off Road Crashes	23	3	-87.0%

Results and Discussion

Referencing the *Collision Diagrams*, the target crashes (frontal impact crashes) decreased from 24 to 5 crashes which equates to a 79.2 percent decrease. Also shown in the *Additional Information* table above, rear end type crashes experienced a 41.2 percent decrease and run off road type crashes experienced an 87 percent decrease.

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 facilitates additional spot safety review 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 (October 2011) – Looking Southwest on SR 2805



Google Maps (October 2011) – Looking Northeast on SR 2805



Google Maps (October 2011) – Looking Southeast on SR 2822

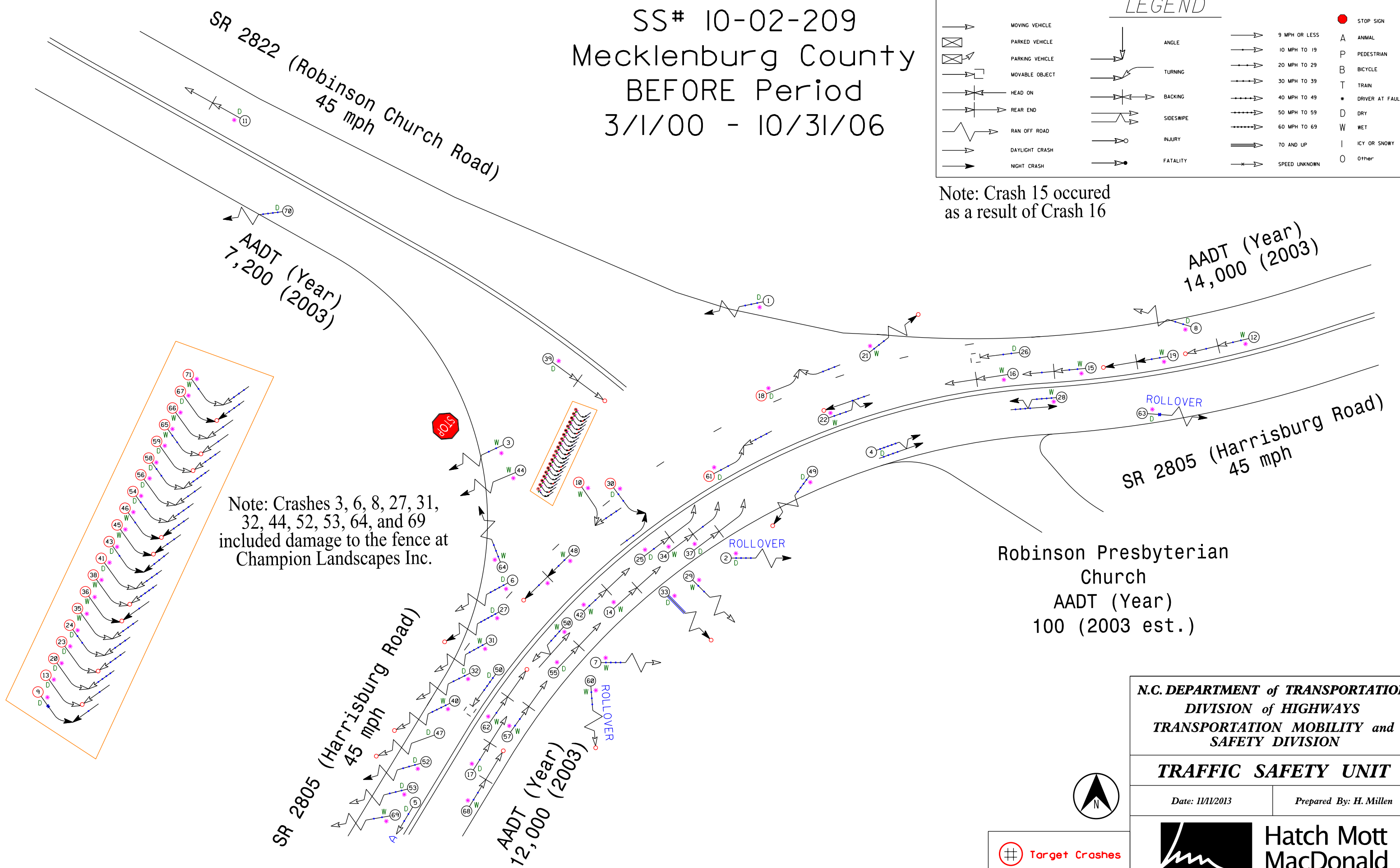


Google Maps (October 2011) – Looking at realigned church driveway

SS# 10-02-209
 Mecklenburg County
 BEFORE Period
 3/1/00 - 10/31/06

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
	STOP SIGN		30 MPH TO 39
	ANIMAL		40 MPH TO 49
	PEDESTRIAN		50 MPH TO 59
	BICYCLE		60 MPH TO 69
	TRAIN		70 AND UP
	DRIVER AT FAULT		SPEED UNKNOWN
	DRY		
	WET		
	ICY OR SNOWY		
	Other		

Note: Crash 15 occurred as a result of Crash 16



Note: Crashes 3, 6, 8, 27, 31, 32, 44, 52, 53, 64, and 69 included damage to the fence at Champion Landscapes Inc.

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

TRAFFIC SAFETY UNIT

Date: 11/11/2013

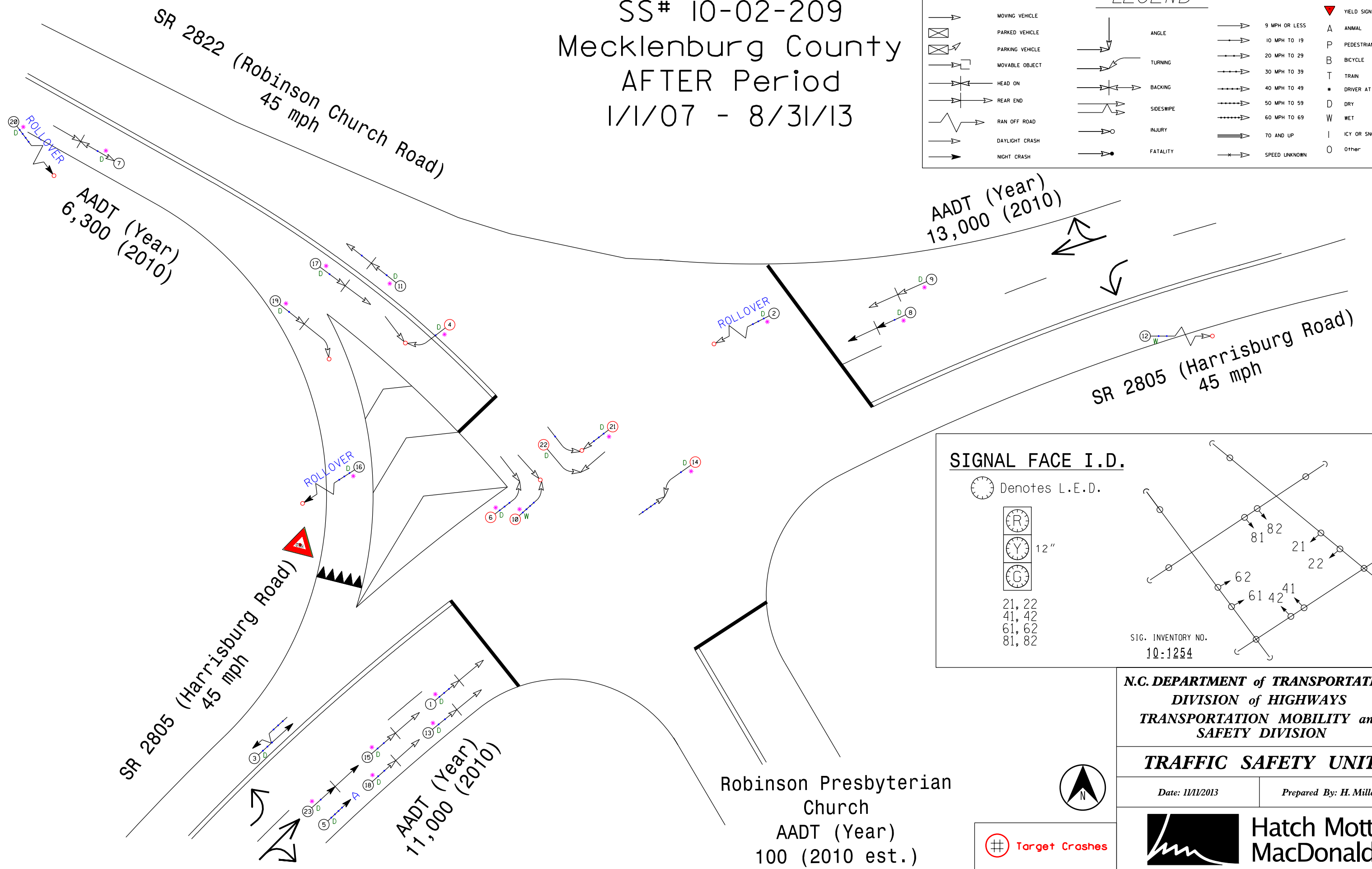
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SS# 10-02-209
 Mecklenburg County
 AFTER Period
 1/1/07 - 8/31/13

LEGEND

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



AADT (Year)
13,000 (2010)

AADT (Year)
6,300 (2010)

SR 2805 (Harrisburg Road)
45 mph

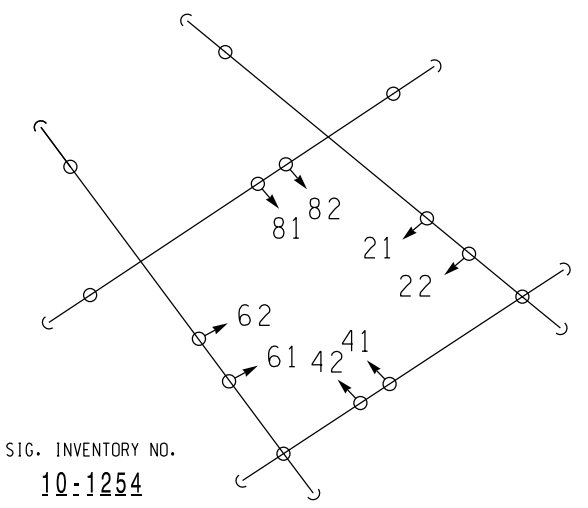
AADT (Year)
11,000 (2010)

SIGNAL FACE I.D.

Denotes L.E.D.

12"

21, 22
41, 42
61, 62
81, 82



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 SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 11/1/2013

Prepared By: H. Millen

