

Spot Safety Project Evaluation

Spot Safety Project # 10-05-202

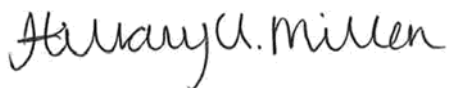
**Spot Safety Project Evaluation of the
Signal Installation
SR 3632 (Ardrey Kell Road) and
SR 3630/4919 (Community House Road)
Mecklenburg County**

Documents Prepared By:

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Transportation Mobility and Safety Division
North Carolina Department of Transportation

Principal Investigator



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11-26-2013

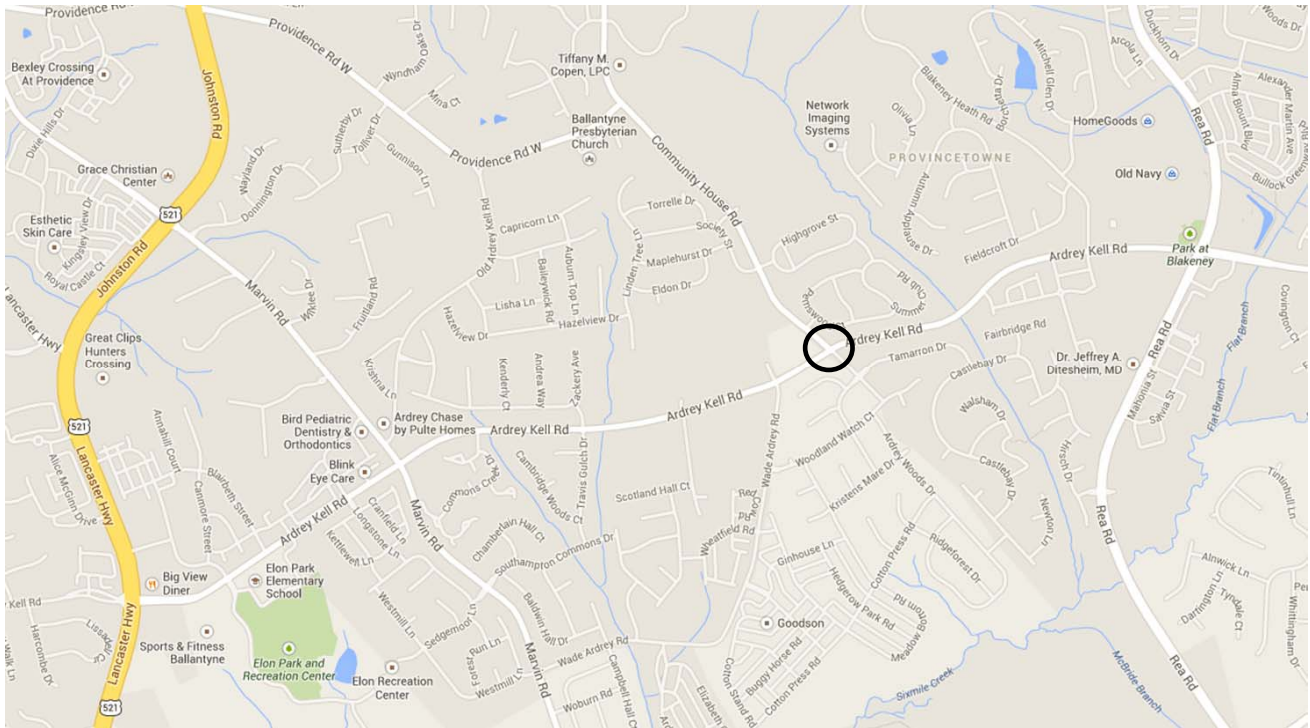
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Spot Safety Project Evaluation Documentation

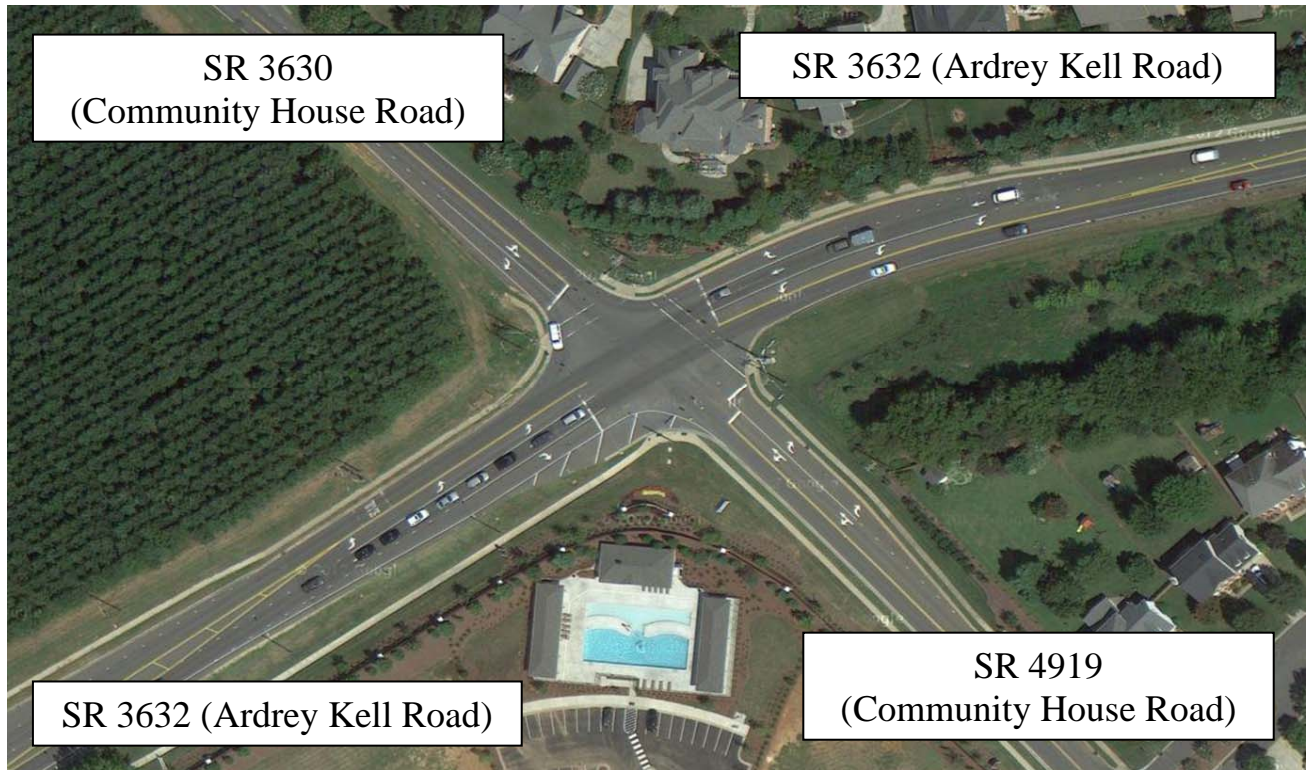
Subject Location

Evaluation of Spot Safety Project Number 10-05-202 located at the intersection of SR 3632 (Ardrey Kell Road) and SR 3630/4919 (Community House Road) in Mecklenburg County.

The Signal Inventory Number of the signal that was installed is 10-1947. 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.

SR 3632 (Ardrey Kell Road) is a two-lane facility that widens at the intersection for left and right turn lanes. SR 3630/4919 (Community House Road) is a two-lane facility that has right-turn lanes at the intersection. Speed limits on SR 3632 (Ardrey Kell Road) are 45 mph and on SR 3630/4919 (Community House Road) are 35 mph. The subject location is a four-leg intersection, which was stop-controlled on SR 3630/4919 (Community House Road) before the project was implemented.

The original statement of problem was the existence collisions due to high volume traffic with insufficient gaps available. The initial crash analysis was completed including data from February 1, 2000 to January 31, 2005 with twelve (12) reported crashes during that time frame. The final completion date for the improvement at the subject intersection was between March 1, 2006 and February 28, 2007 with a total cost of \$65,000.00.

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 March 2006 through February 2007. These months were determined by the last reported crash with the before period intersection control and the first reported crash with the after period intersection control. Because there is a year of construction period and the uncertainty of when the countermeasure was implemented, a before period of three years was used. The before period consists of reported crashes from March 1, 2003 through February 28, 2006 (3 years).

The after period consists of reported crashes from March 1, 2007 through September 30, 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 (3 yrs)	After (6 yrs, 8 mo)	Percent Reduction (-) Percent Increase (+)
Total Crashes	22	42	N/A
Crashes per year	7.3	6.4	-13.08%
Total Severity Index	5.4	3.6	-32.20%
Target Crashes	21	18	N/A
Target Crashes per year	7.0	2.7	-60.97%
Target Crash Severity Index	5.2	4.3	-17.97%
Volume (2004, 2010)	11,100	23,500	+111.71%

<u>Injury Crash Summary</u>	Before (3 yrs)	After (6 yrs, 8 mo)	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes per year	0.0	0.0	N/A
Class A injury Crashes per year	0.0	0.0	N/A
Class B injury Crashes per year	1.0	0.3	-69.65%
Class C Injury Crashes per year	3.3	2.0	-40.81%
Property Damage Only per year	3.0	4.1	+36.59%

The Naïve Before and After Analysis at the treatment location shows a 13.08 percent reduction in the total crashes per year and a 60.97 percent decrease in target crashes per year. The total severity index decreased from the before period to the after period by 32.2 percent. The before period ADT year was 2004 and the after period ADT year was 2010.

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 Crashes per year	0.0	2.9	N/A

Results and Discussion

Referencing the *Collision Diagrams*, the target crashes (frontal impact crashes) decreased from 7 to 2.7 crashes per year which equates to a 60.97 percent decrease. Also shown in the *Additional Information* table above, rear end type crashes experienced an increase of 2.9 crashes per year.

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 (August 2013) – Looking Southwest on SR 3632



Google Maps (August 2013) – Looking Northeast on SR 3632



Google Maps (August 2013) – Looking Northwest on SR 4919

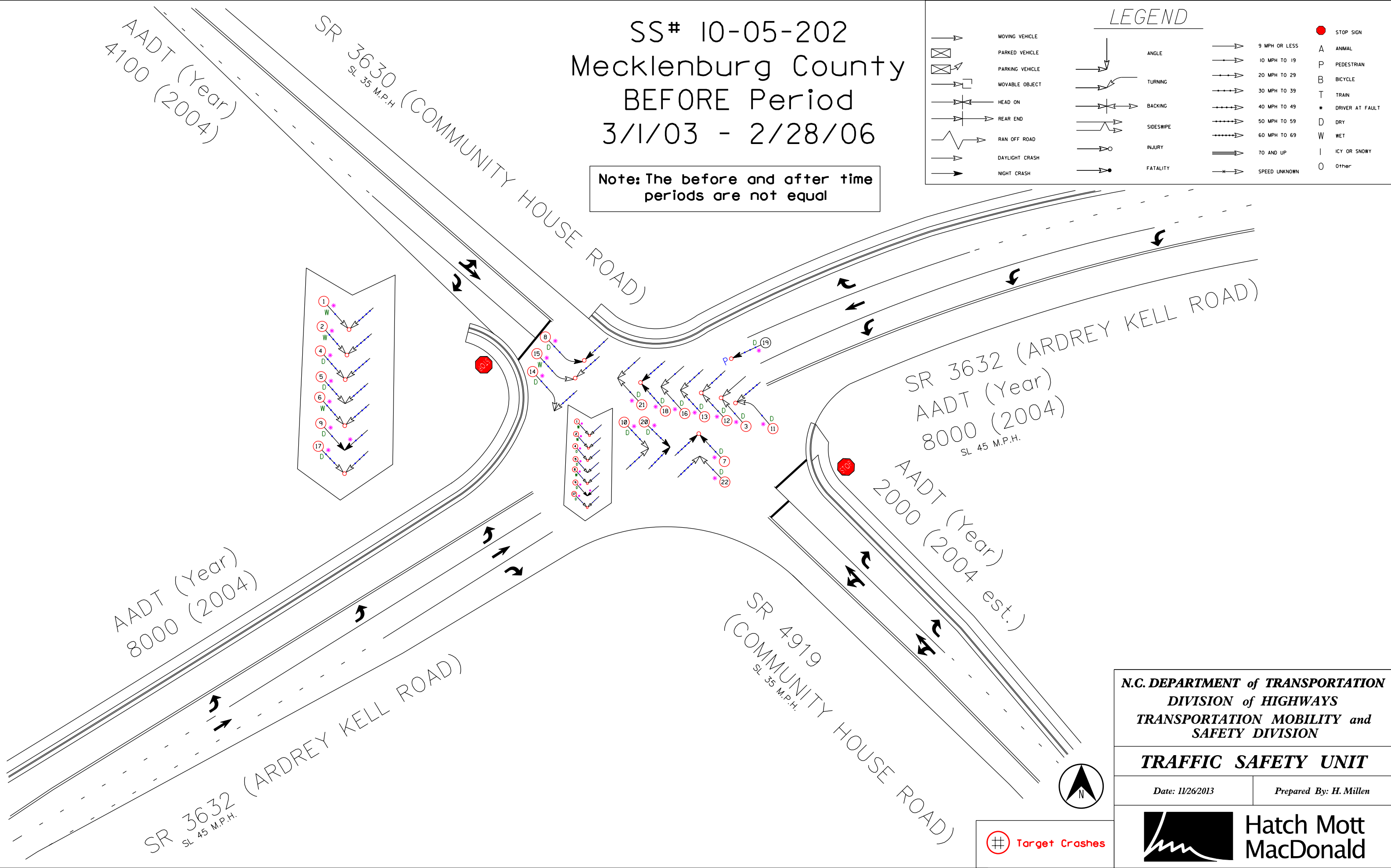


Google Maps (August 2013) – Looking Southeast on SR 3630

SS# 10-05-202
 Mecklenburg County
 BEFORE Period
 3/1/03 - 2/28/06

Note: The before and after time periods are not equal

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		



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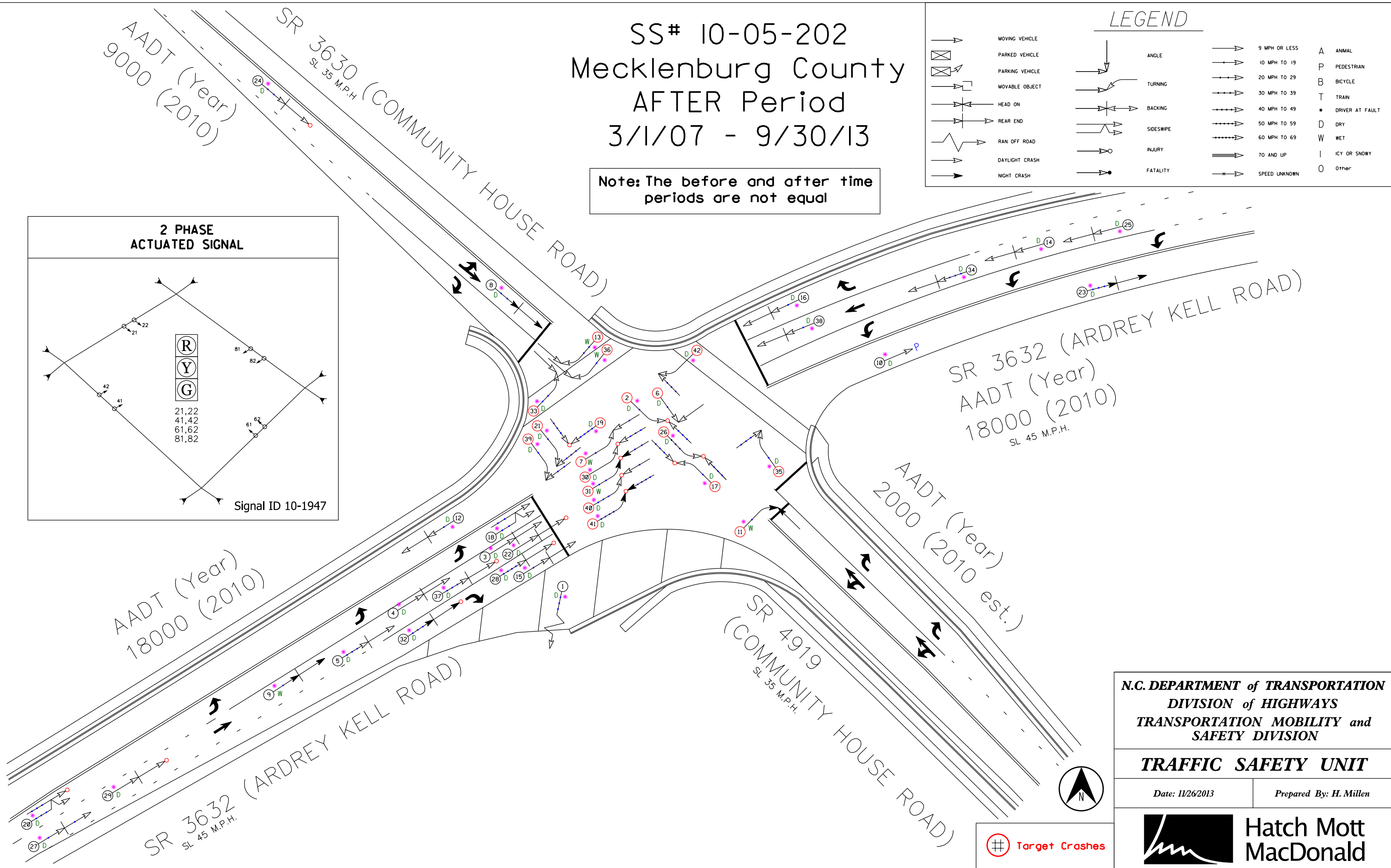
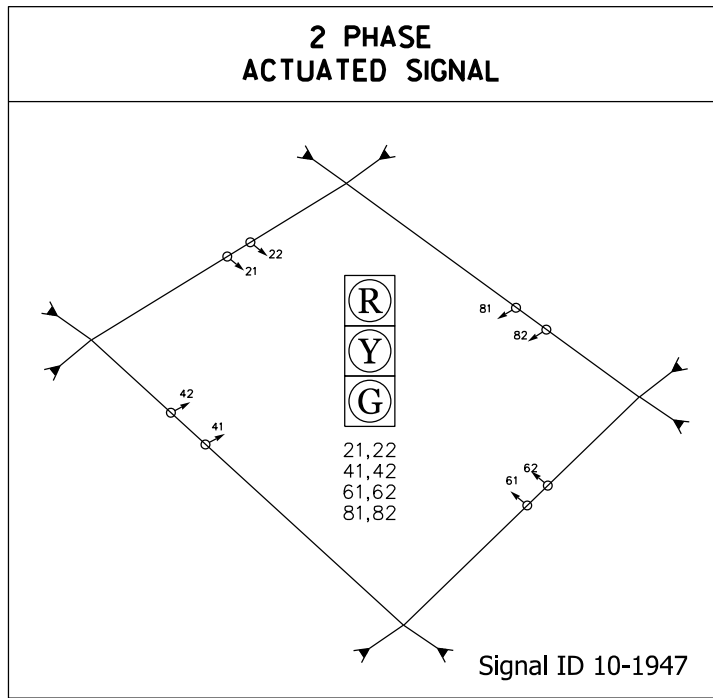
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SS# 10-05-202 Mecklenburg County AFTER Period 3/1/07 - 9/30/13

Note: The before and after time periods are not equal

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



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