

Spot Safety Project Evaluation

Spot Safety Project # 07-06-205

**Spot Safety Project Evaluation of the
Installation of a Left Turn Lane on NC 54
NC 54 at SR 1952 (White Cross Road)
Orange County**

Documents Prepared By:
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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

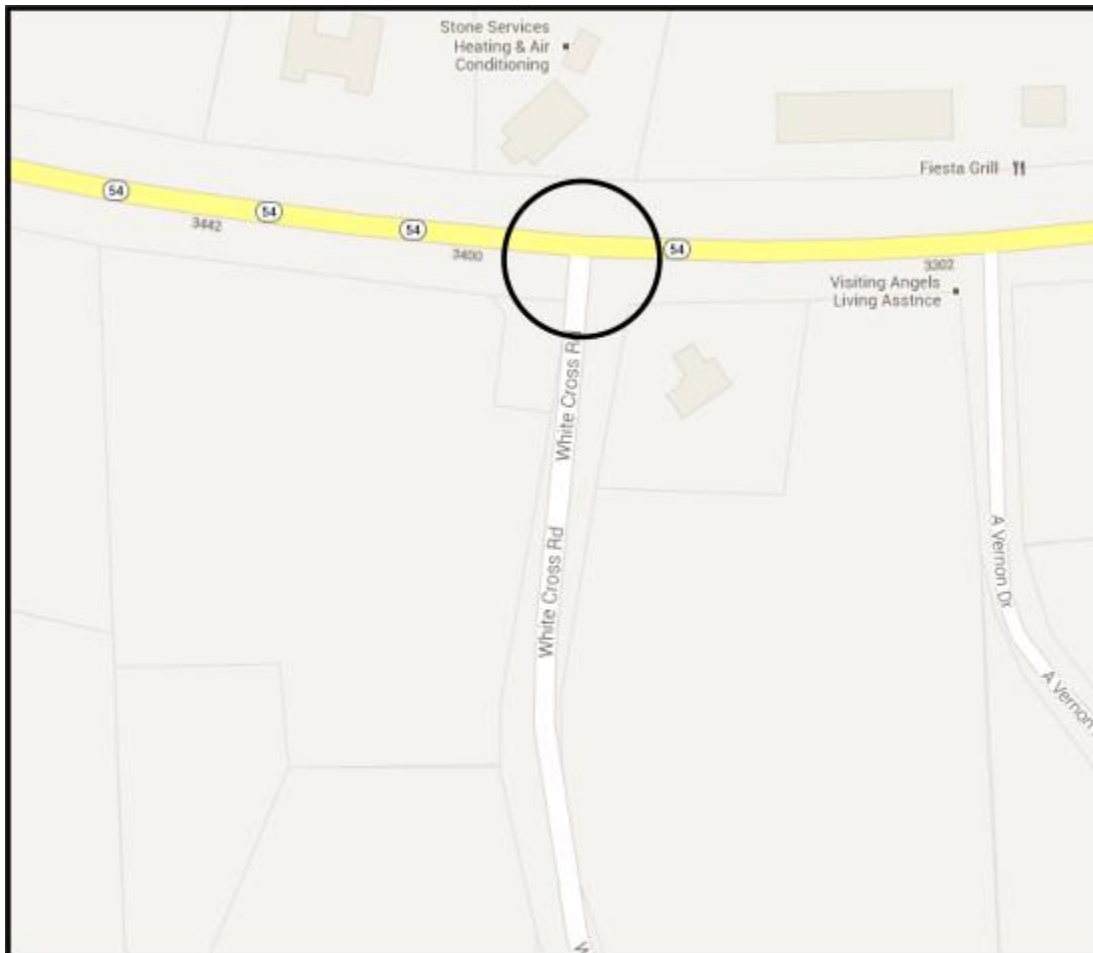
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Date

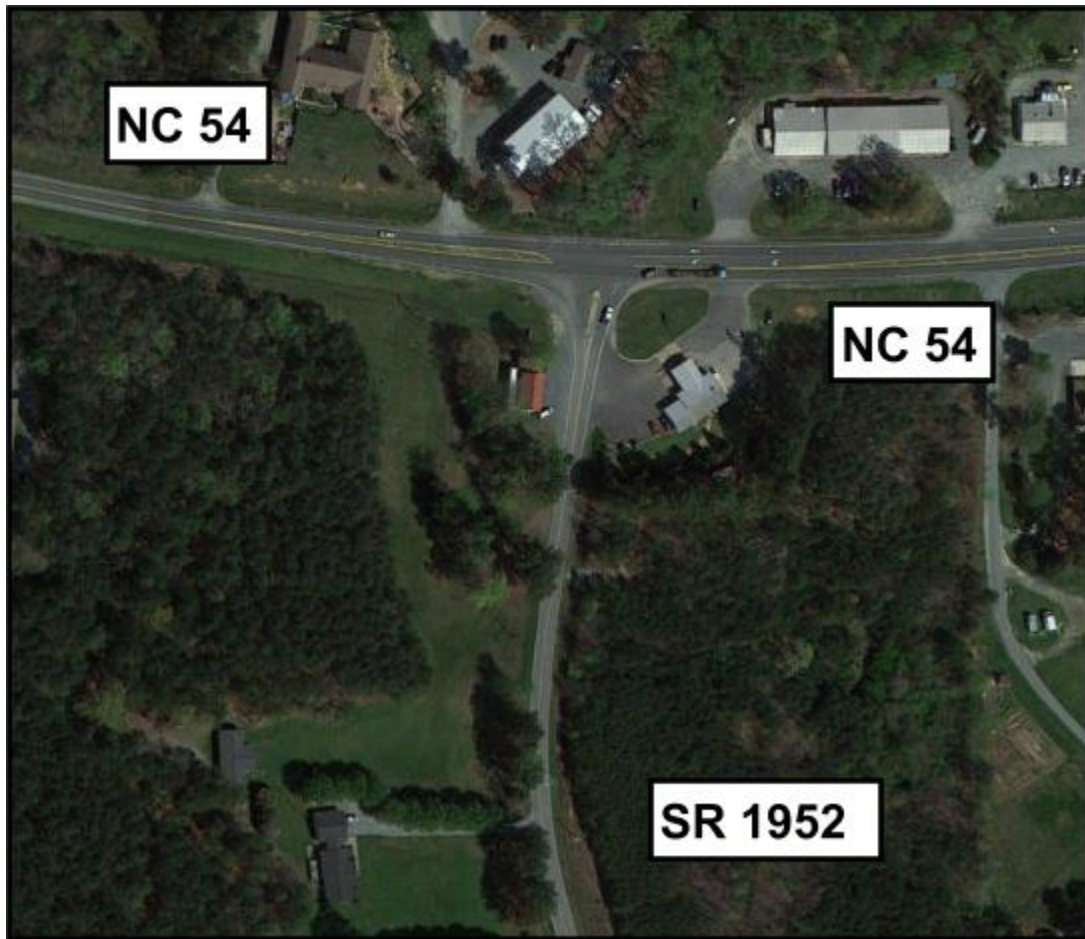
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-06-205 located at intersection of NC 54 at SR 1952 (White Cross Road) in Orange 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 installation of a left turning lane on westbound NC 54, which includes 100 feet of storage with 50 feet full storage for deceleration.

NC 54 and SR 1952 (White Cross Road) are both two-lane roadways. The speed limits on NC 54 and SR 1952 (White Cross Rd) are 55 mph. The subject location is a three leg stop-controlled intersection, which is stop-controlled on SR 1952 (White Cross Road).

The original statement of problem was vehicles attempting to turn left onto SR 1952 (White Cross Rd) from NC 54 were being rear ended while waiting for a gap to turn. The initial crash analysis was completed from December 1, 2000 to November 30, 2005 with seventeen (17) reported crashes. The final completion date for the improvement at the subject intersection was on October 14, 2008 with a total cost of \$187,000.00.

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 August 2008 through October 2008. The before period consisted of reported crashes from November 1, 2003 through July 31, 2008 (4 years, 8 months); and the after period consisted of reported crashes from November 1, 2008 through July 31, 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 the subject intersection for the NC 54 and SR 1952 (White Cross 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 Rear End Crashes were the target crashes for the applied countermeasure.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	8	2	- 75.0 %
Total Severity Index	14.18	1.00	- 92.9 %
Target Crashes	8	0	- 800.0 %
Target Crash Severity Index	14.18	0	- 100.0 %
Volume (2006, 2011)	2,900	3,000	+ 3.45 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	1	0	- 100.0 %
Class B injury Crashes	2	0	- 200.0 %
Class C Injury Crashes	2	0	- 200.0 %
Property Damage Only	3	2	- 33.3 %

The naive before and after analysis at the treatment location resulted in a 75 percent decrease in Total Crashes, and a 92.9 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:

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Rear End, Slow or Stop Crashes	4	0	- 400.0 %
Rear End, Turn Crashes	4	0	- 400.0 %
Left Turn, Different Roadway Crashes	0	1	+ 100.0 %

Results and Discussion

Referencing the *Collision Diagrams*, there were eight (8) target crashes in the before period. There were no target crashes in the after period. The target crash severity index was reduced from 14.18 to 0 from the before to the after period.

From the additional information chart above, the number of left turn, different roadway crashes in increased from zero (0) to one (1) crash from before period to the after period. However, there were no rear end crashes in the after period.

In the before period, there was one (1) Injury A crash, four (4) Injury B & C crashes. In the after period, there were no injury crashes.

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 (June 2012) – Looking West from NC 54 Approach



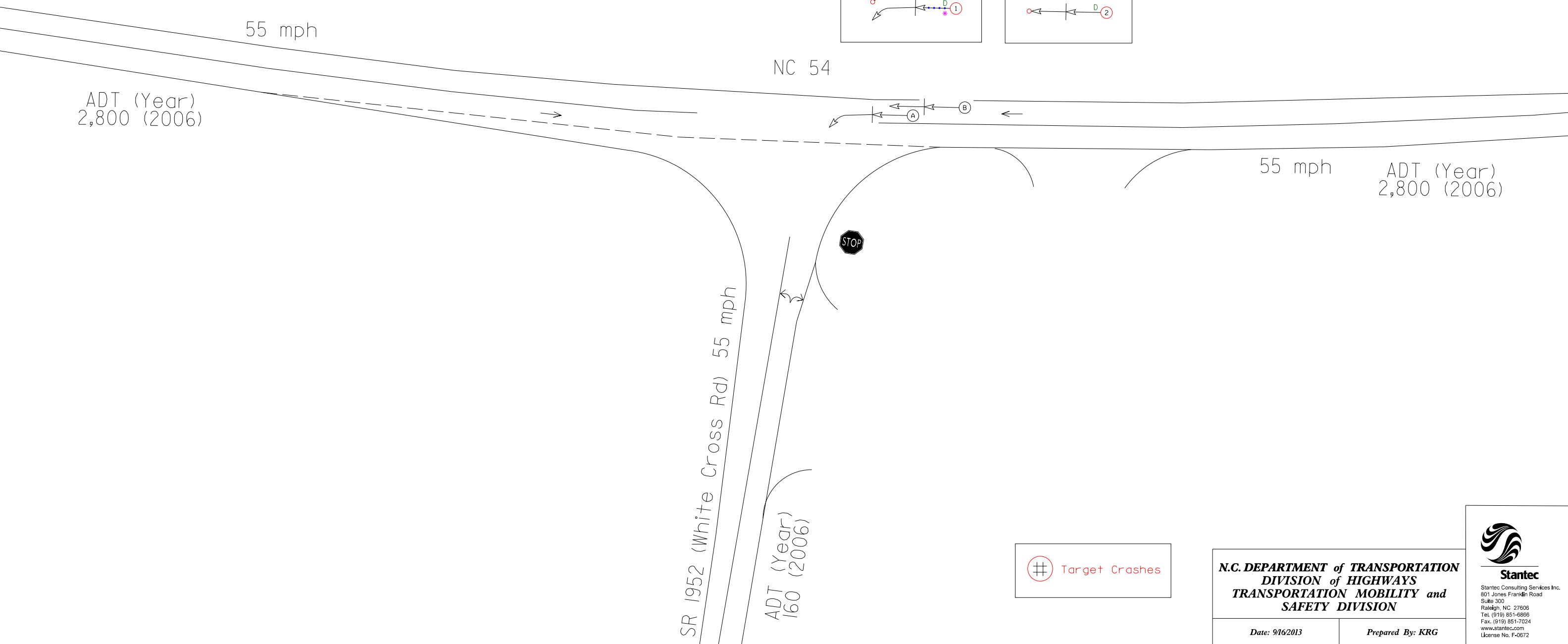
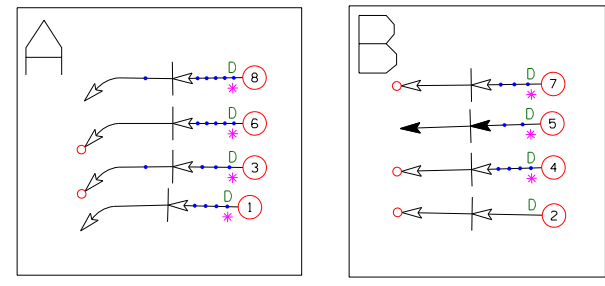
Google Maps (June 2012) – Looking East from NC 54 Approach



Google Maps (May 2008) – Looking North from SR 1952 (White Cross Rd) Approach

SS# 07-06-205
 Orange County
 Before Period
 11/1/2003 - 7/31/2008

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



Target Crashes

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

Date: 9/16/2013

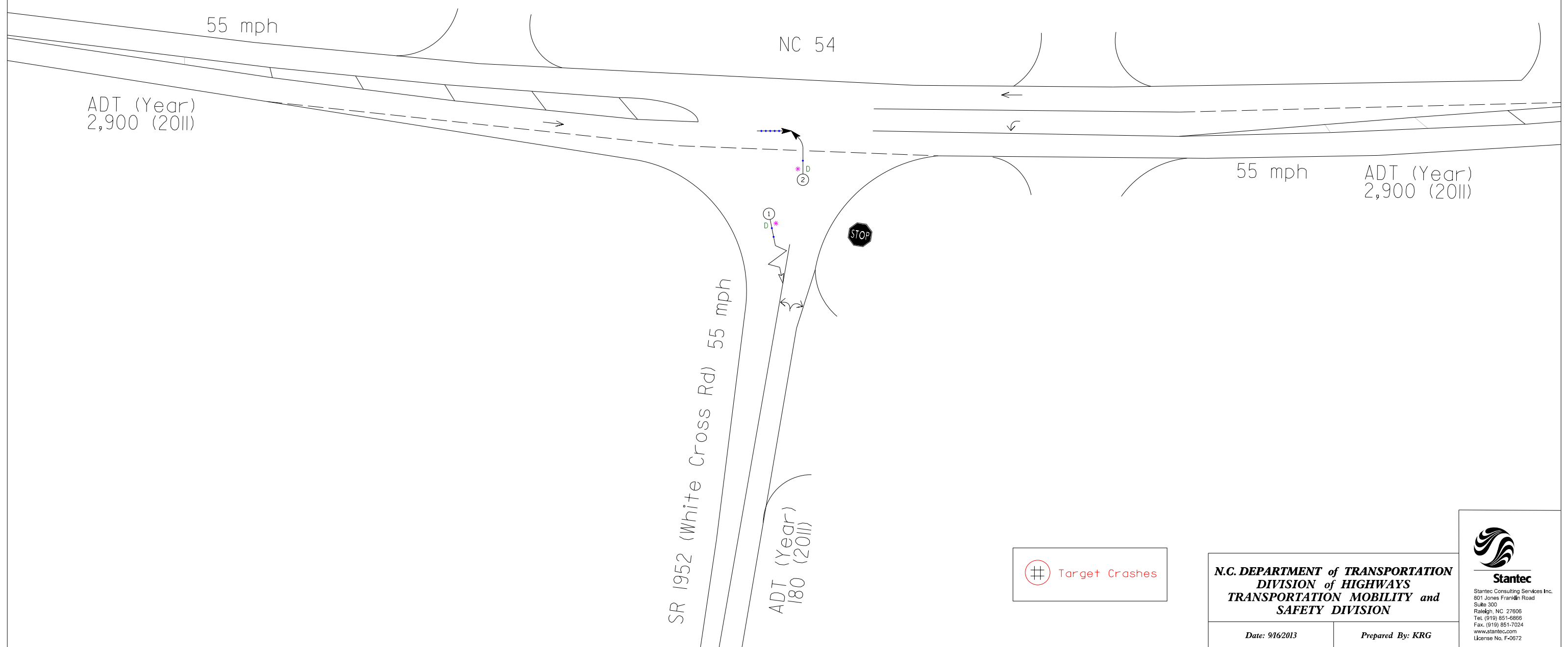
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SS# 07-06-205
 Orange County
 After Period
 11/1/2008 - 7/31/2013



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



Target Crashes

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