

# **Spot Safety Project Evaluation**

Project Log # 200611071

Spot Safety Project # 09-01-210

## **Spot Safety Project Evaluation of the Installation of Left Turn Lanes at NC 150 (Main Street / Oak Ridge Road) and SR 2037 (County Line Rd) Forsyth County**

Documents Prepared By:

Safety Evaluation Group  
Traffic Safety Systems Management Section  
Traffic Engineering and Safety Systems Branch  
North Carolina Department of Transportation

**Principal Investigator**

\_\_\_\_\_  
Jason B. Schronce

2-1-2007  
Date

Traffic Safety Project Engineer

# ***Spot Safety Project Evaluation Documentation***

## **Subject Location**

Evaluation of Spot Safety Project Number 09-01-210 – NC 150 (Main Street / Oak Ridge Road) at SR 2037 (County Line Rd) in Forsyth County.

## **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 turn lanes on the southbound approach of NC 150 and the westbound approach of SR 2037 (County Line Road). NC 150 and SR 2037 are two-lane facilities at the subject location with speed limits of 50-mph and 45-mph respectively.

The initial statement of problem was that accidents and congestion were due to a high-speed roadway with a high volume of through traffic and left turning traffic from a single approach lane on NC 150. The subject location is a three-leg intersection which is controlled by a stop sign on SR 2037 (County Line Road).

The initial crash analysis was conducted from January 1, 1998 to December 31, 2000, which included 18 crashes; 14 Rear-End crashes, 1 Left Turn-Same Roadway crashes, 1 Angle crashes, and 2 Ran-Off-Roadway crashes. Through this improvement project, 9 of these crashes are determined as correctable.

The final completion date for the improvement at the subject intersection was on February 26, 2002 with a total cost of \$102,000.

## **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 was from January 1, 2002 through April 30, 2002. The before period consisted of reported crashes from September 1, 1997 through December 31, 2001 (4 years, 4 months) and the after period consisted of reported crashes from May 1, 2002 through August 31, 2006 (4 years, 4 months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes on NC 150 and SR 2037 located within 150 feet of the intersection. *Please see attached location map and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Rear-End Crashes on the southbound approach of NC 150, were the target crashes for the applied countermeasure.

<b>Treatment Information</b>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total crashes	23	6	- 73.90%
Total Severity Index	10.81	4.7	- 56.52%
Target Crashes	11	0	- 100%
Target Crashes Severity Index	18.33	0	- 100%
Volume	13,700	13,600	- 0.73%

<b>Injury Crash Summary</b>		
	<b>Before</b>	<b>After</b>
Fatal Crashes	0	0
Class A Crashes	2	0
Class B Crashes	1	1
Class C Crashes	9	2
Total Injury Crashes	12	3

The naive before and after analysis at the treatment location resulted in a 74 percent decrease in Total Crashes, a 100 percent decrease in Target Crashes, and a small percent decrease in Average Daily Traffic (ADT). The before period ADT year was 1999 and the after period ADT year was 2004.

## **Results and Discussion**

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 74 percent decrease in Total Crashes and a 100 percent decrease in Target Crashes, while the ADT slightly decreased. The total severity index decreased 57 percent while the target crash severity index decreased 100 percent due to zero target crashes in the after period. The summary results above demonstrate that the treatment location appears to have successfully decreased crashes in both Total and Target Crashes from the before to the after period.

This site is also located directly south of an elementary school zone. From the target crashes identified in the before period, five out of the eleven crashes occurred during or in close time proximity to the school zone times listed. A secondary advantage to the turn lane addition on NC 150 was the congestion release it provided to eliminating traffic holdups during this high volume period.

Referencing the *Collision Diagrams* and the previous table, it is apparent that the installation of the left turn lane helped to decrease Rear-End crashes involving southbound vehicles either traveling through or turning left onto SR 2037. In the before period there were 11 Rear-End crashes at the intersection, and in the after period there were none.

Please see the attached *Treatment Site Photos*. Photos are provided for all three approaches to the subject location including sight distance shots from SR 2037 (County Line Road) and the County Line Grocery Parking Lot.

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 TAKEN 12/13/2006**



**Traveling North on NC 150 (Main Street / Oak Ridge Road)**



**Traveling North on NC 150**



**Traveling West on SR 2037 (County Line Rd)**



**Traveling West on SR 2037 (County Line Rd)**



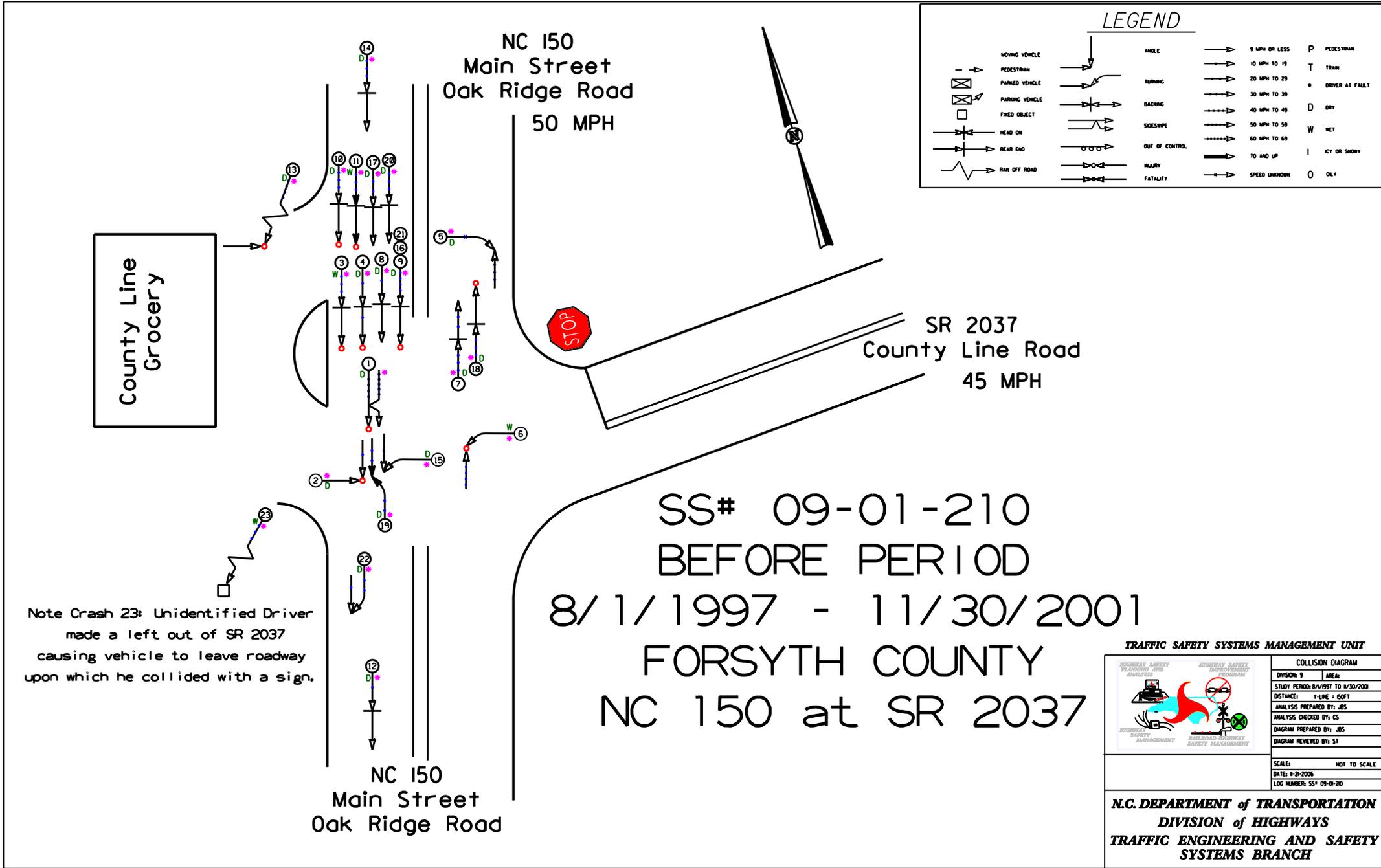
**Traveling South on NC 150**



**Sight Distance from SR 2037 looking North for oncoming Southbound Traffic**



**Sight Distance from County Line Grocery PVA looking North**



Note Crash 23: Unidentified Driver made a left out of SR 2037 causing vehicle to leave roadway upon which he collided with a sign.

SS# 09-01-210  
 BEFORE PERIOD  
 8/1/1997 - 11/30/2001  
 FORSYTH COUNTY  
 NC 150 at SR 2037

**LEGEND**

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		P PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		T TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		D DRIVER AT FAULT
	PARKING VEHICLE		SIDESWIPE		30 MPH TO 39		D DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		W WET
	HEAD ON		FATALITY		50 MPH TO 59		I ICE OR SNOW
	REAR END		SPEED UNKNOWN		60 MPH TO 69		O ONLY
	RAN OFF ROAD				70 AND UP		

**TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT**

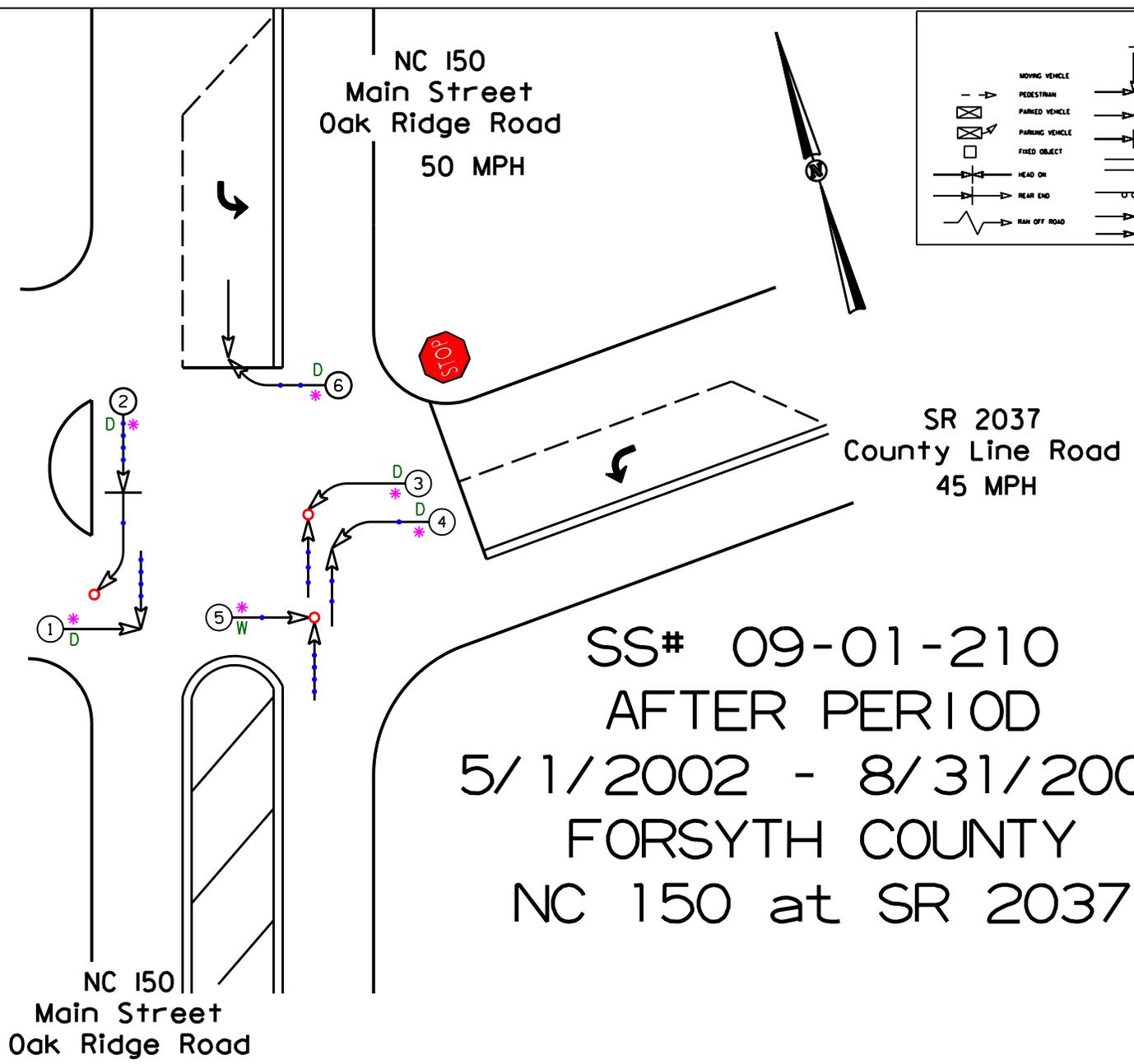
<b>COLLISION DIAGRAM</b>	
DIVISION: 9	AREA:
STUDY PERIOD: 8/1/1997 TO 11/30/2001	
DISTANCE: 1-LINE + 150 FT	
ANALYSIS PREPARED BY: JBS	
ANALYSIS CHECKED BY: CS	
DIAGRAM PREPARED BY: JBS	
DIAGRAM REVIEWED BY: ST	
SCALE: NOT TO SCALE	
DATE: 8-21-2006	
LOG NUMBER: SS-09-01-20	

**N.C. DEPARTMENT of TRANSPORTATION**  
 DIVISION of HIGHWAYS  
 TRAFFIC ENGINEERING AND SAFETY  
 SYSTEMS BRANCH

**LEGEND**

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PAKED VEHICLE		SIDESWIPE		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		RAN OFF ROAD		50 MPH TO 59		ICY OR SNOWY
	REAR END		RAN OFF ROAD		60 MPH TO 69		TO AND UP
	RAN OFF ROAD		INJURY		SPEED UNKNOWN		ONLY
	FATALITY						

County Line Grocery



**TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT**

	<b>COLLISION DIAGRAM</b>
	DIVISION: 9    AREA: _____ STUDY PERIOD: 5/1/2002 TO 8/31/2006 DISTANCE: 1-LINE + 150 FT ANALYSIS PREPARED BY: JBS ANALYSIS CHECKED BY: CS DIAGRAM PREPARED BY: JBS DIAGRAM REVIEWED BY: ST
SCALE: NOT TO SCALE DATE: 8-2-2006 LOG NUMBER: SS* 09-01-20	
<b>N.C. DEPARTMENT of TRANSPORTATION</b> <b>DIVISION of HIGHWAYS</b> <b>TRAFFIC ENGINEERING AND SAFETY</b> <b>SYSTEMS BRANCH</b>	