

Spot Safety Project Evaluation

Project Log # 200512154

Spot Safety Project # 08-00-202

Spot Safety Project Evaluation of the Traffic Signal Installation and Construction of Left Turn Lanes at the Intersection of SR 1640 (Wiregrass Rd) and SR 1624 (County Home Rd) Richmond County

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
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Principal Investigator

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2/5/07
Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 08-00-202 – The Intersection of SR 1640 (Wiregrass Rd) and SR 1624 (County Home Rd) in Richmond County.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasures chosen for the subject intersection were the installation of a traffic signal and the construction of left turn lanes on all approaches. SR 1640 (Wiregrass Rd) and SR 1624 (County Home Rd) were both 2-lane roads with no left-turn lanes in the before period and speed limits of 55 mph. The subject intersection is a 4-leg intersection which was controlled by stop signs on SR 1624 (County Home Rd) in the before period.

The initial crash analysis was completed from January 1, 1997 to December 31, 1999 with 12 reported crashes, including 10 that were considered correctable by the chosen countermeasures. The final completion date for the improvement at the subject intersection was on August 15, 2001 with a total cost of \$200,000.00. The Division provided \$100,000 of the total cost.

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 June 1, 2001 to October 31, 2001. The before period consisted of reported crashes from November 1, 1996 through May 31, 2001 (4 years and 7 months) and the after period consisted of reported crashes from November 1, 2001 through May 31, 2006 (4 years and 7 months). The ending date for this analysis was determined by the available crash data at the time the analysis was completed.

The treatment data consisted of all crashes within 450 feet of the subject intersection. This distance was chosen in order to include the 300 foot turn lanes and turn lane tapers, plus an additional 150 feet. *Please see attached location map for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that there were two types of Target Crashes chosen for the applied countermeasures. Rear-End Crashes involving vehicles approaching the intersection were the first type of Target Crash, and Frontal Impact Crashes were the second type. 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.

Treatment Information			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total crashes	17	12	-29.4
Total Severity Index	9.38	4.08	-56.5
Target Crashes I (Rear-End)	3	3	0
Target Crash I Severity Index	5.93	3.47	-41.5
Target Crashes II (Frontal Impact)	13	5	-61.5
Target Crash II Severity Index	10.82	6.92	-36.0
Volume	7,800	8,800	12.8
Crash Severity Summary			
Fatal Crashes	0	0	N/A
Class A Crashes	1	0	-100.0
Class B Crashes	3	0	-100.0
Class C Crashes	6	5	-16.7
PDO Crashes	7	7	0.0

The naive before and after analysis at the treatment location resulted in a 29 percent decrease in Total Crashes, no change Target Crashes I (Rear-Ends), a 62 percent decrease in Target Crashes II (Frontal Impacts), and a 13 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1999 and the after period ADT year was 2004.

Results and Discussion

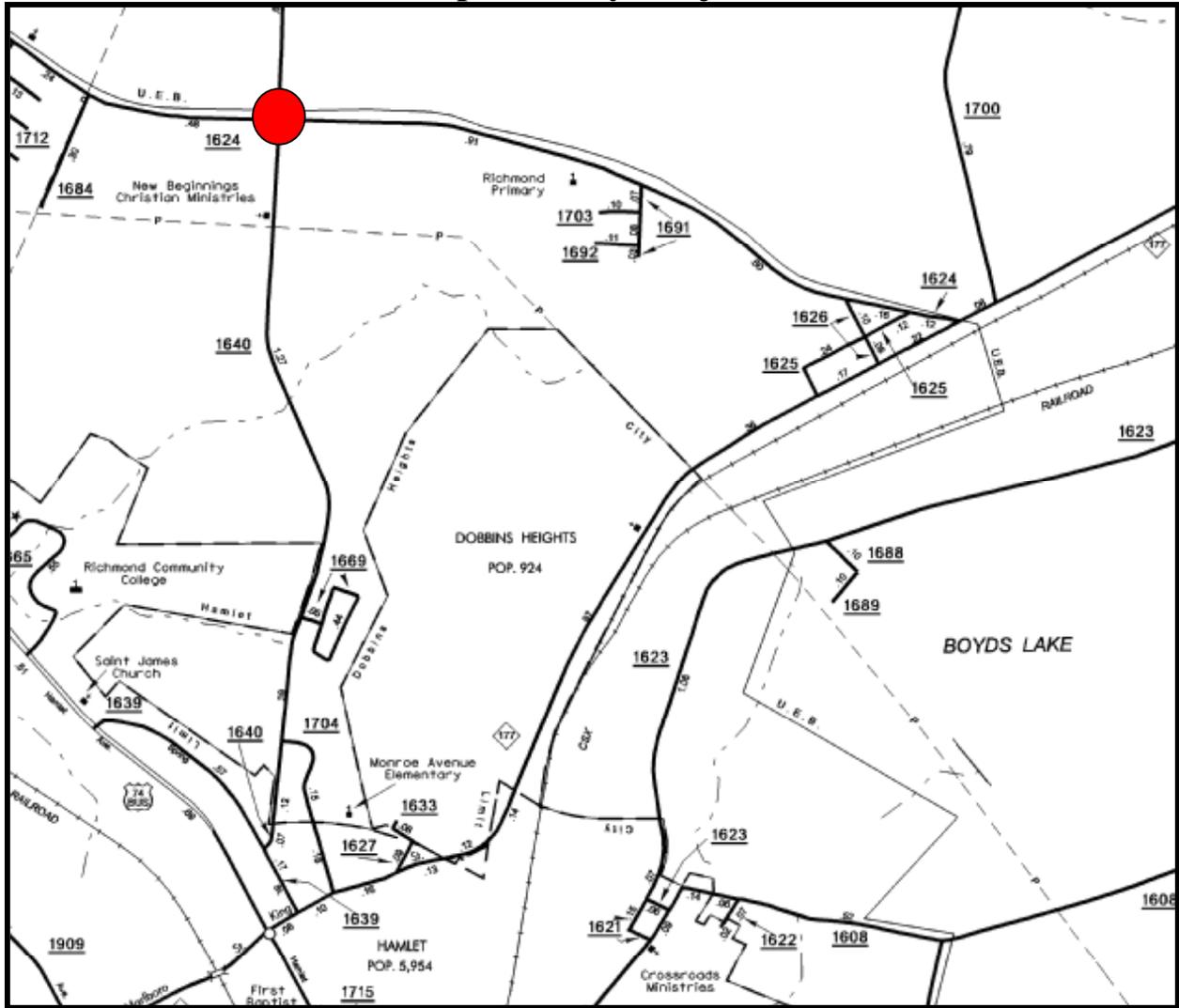
The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 29 percent decrease in Total Crashes, no change in Target Crashes I (Rear-Ends), and a 62 percent decrease in Target Crashes II (Frontal Impacts), with a 13 percent increase in ADT. The Total Severity Index decreased by 57 percent, the Target Crash I Severity Index decreased by 42 percent, and the Target Crash II Severity Index decreased by 36 percent. The summary results above demonstrate that both Total Crashes and Target Crashes appear to have decreased at the treatment location from the before to the after period.

Referencing the Collision Diagrams, it is apparent that the installation of the signal and the construction of the left turn lanes reduced or eliminated crash patterns at the intersection. Angle crashes between eastbound SR 1624 vehicles and northbound SR 1640 vehicles decreased from 5 to 0 and Angle Crashes between westbound SR 1624 vehicles and southbound SR 1640 vehicles decreased from 4 to 0.

Please see the attached *Treatment Site Photos*. Photos are provided for all 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.

**Location Map
Richmond County
Evaluation of Spot Safety Project #08-00-202**



Treatment Location: SR 1640 (Wiregrass Rd) at SR 1624 (County Home Rd)

Treatment Site Photos Taken October 18, 2006



Looking Eastbound on SR 1624 (County Home Rd)



Looking Westbound on SR 1624 (County Home Rd)



Looking Northbound on SR 1640 (Wiregrass Rd)



Looking Southbound on SR 1640 (Wiregrass Rd)

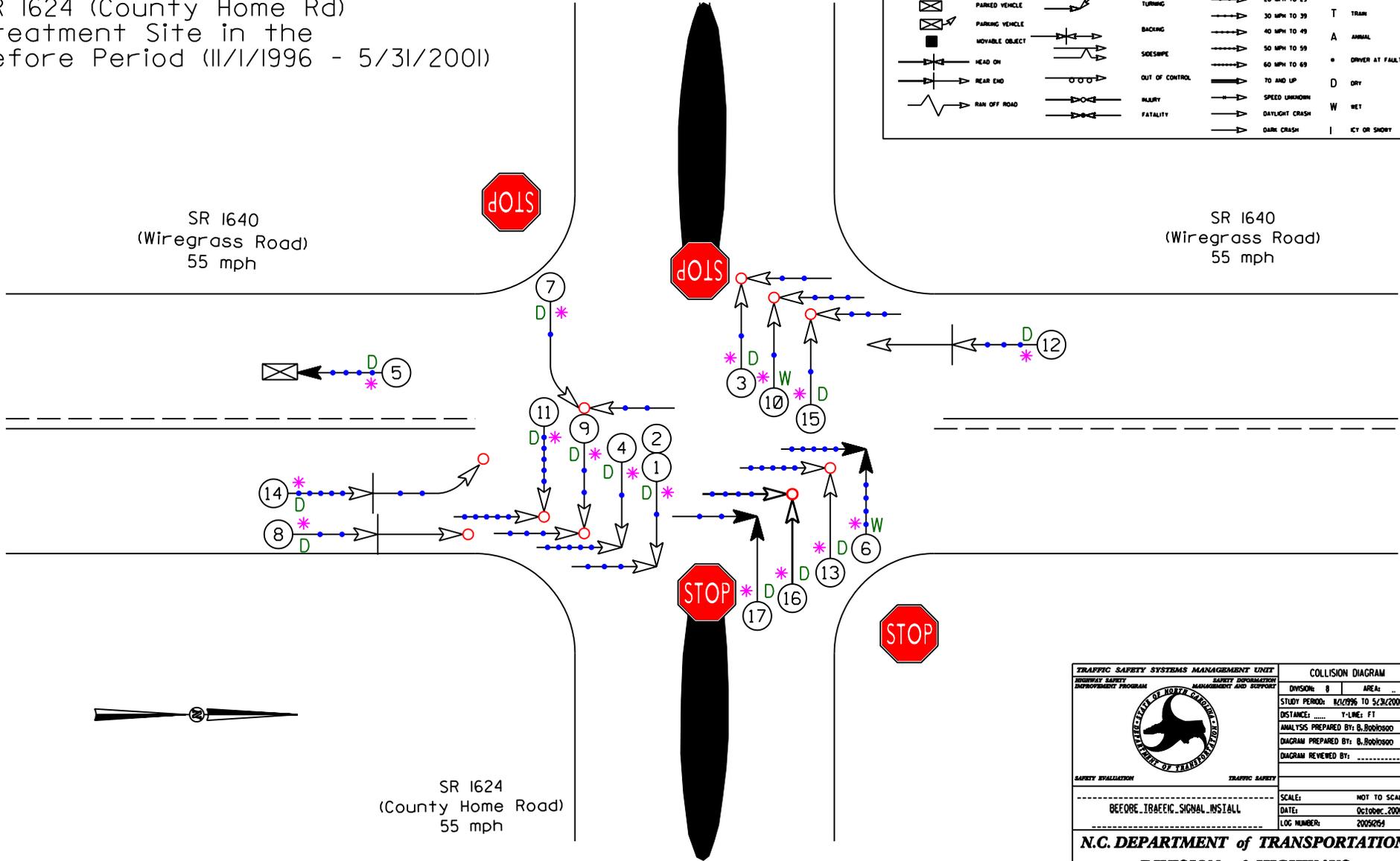
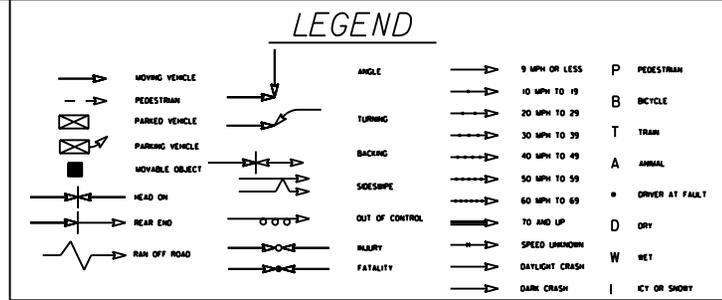
Richmond County
 SR 1640 (Wiregrass Rd) at
 SR 1624 (County Home Rd)
 Treatment Site in the
 Before Period (11/1/1996 - 5/31/2001)

SR 1624
 (County Home Road)
 55 mph

SR 1640
 (Wiregrass Road)
 55 mph

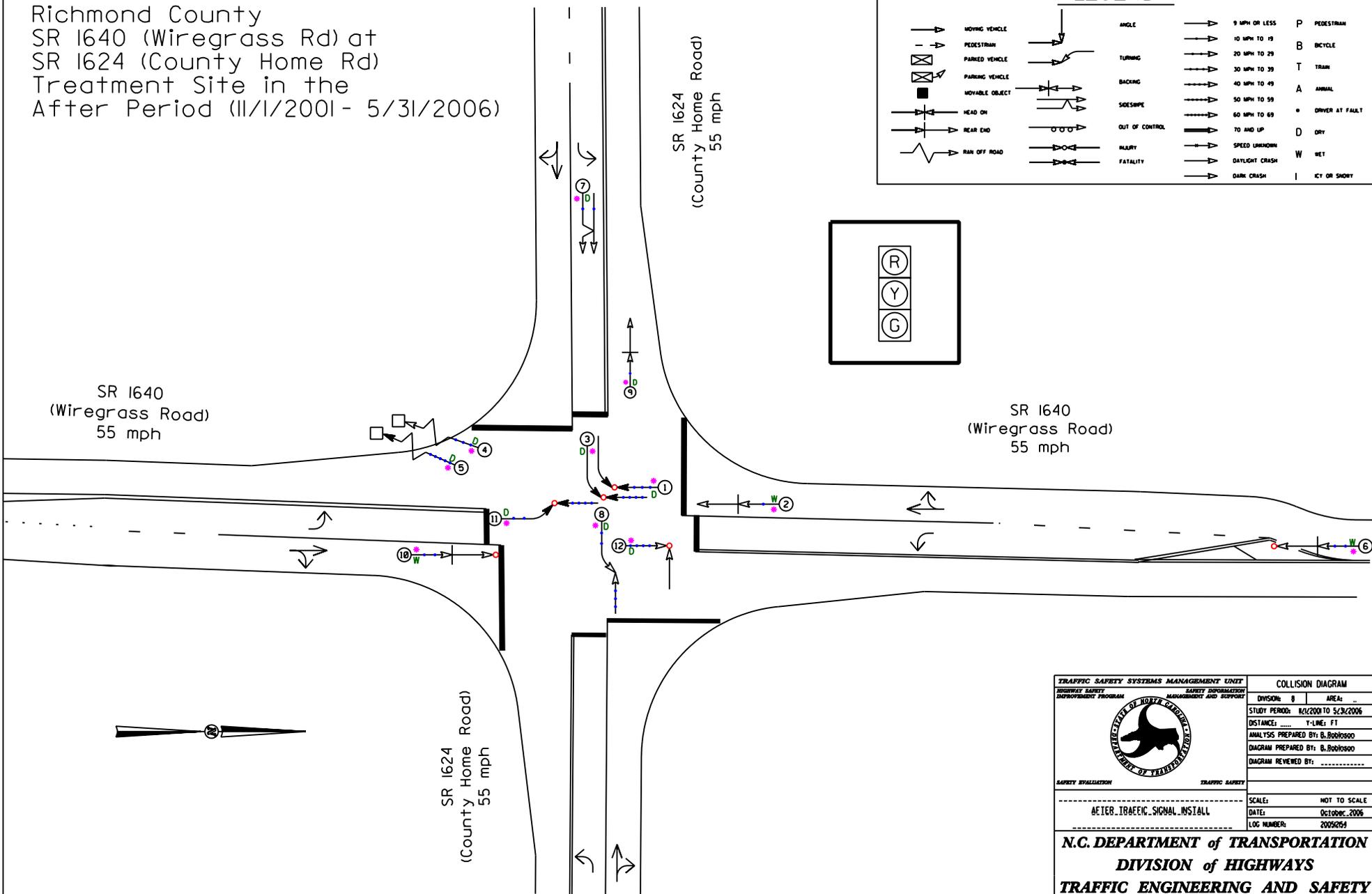
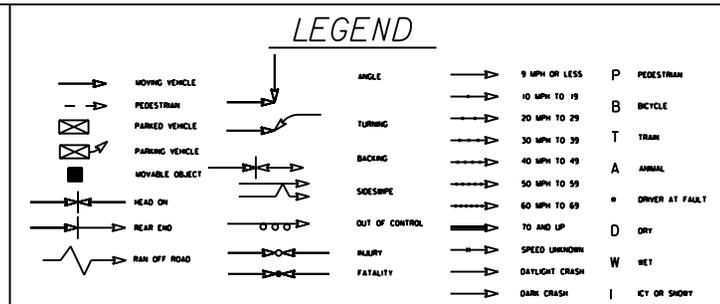
SR 1640
 (Wiregrass Road)
 55 mph

SR 1624
 (County Home Road)
 55 mph



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT <small>HIGHWAY SAFETY IMPROVEMENT PROGRAM SAFETY INFORMATION MANAGEMENT AND SUPPORT</small>		COLLISION DIAGRAM	
		DIVISION: 8	AREA: ..
		STUDY PERIOD: 11/1/1996 TO 5/31/2001	
		DISTANCE: Y-LINE: FT	
		ANALYSIS PREPARED BY: B. BOBOSOO	
		DIAGRAM PREPARED BY: B. BOBOSOO	
DIAGRAM REVIEWED BY:			
SAFETY EVALUATION		TRAFFIC SAFETY	
BECOME TRAFFIC SIGNAL INSTALL		SCALE:	NOT TO SCALE
		DATE:	Oct06c.2006
		LOG NUMBER:	2006054
N.C. DEPARTMENT of TRANSPORTATION DIVISION of HIGHWAYS TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH			

Richmond County
 SR 1640 (Wiregrass Rd) at
 SR 1624 (County Home Rd)
 Treatment Site in the
 After Period (11/1/2001- 5/31/2006)



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT <small>HIGHWAY SAFETY IMPROVEMENT PROGRAM SAFETY INFORMATION MANAGEMENT AND SUPPORT</small>		COLLISION DIAGRAM	
		DIVISION: 8	AREA: ..
		STUDY PERIOD: 11/1/2001 TO 5/31/2006	
		DISTANCE:	T-LINE: FT
		ANALYSIS PREPARED BY: B.Bojarski	
		DIAGRAM PREPARED BY: B.Bojarski	
		DIAGRAM REVIEWED BY:	
<small>SAFETY EVALUATION</small>		<small>TRAFFIC SAFETY</small>	
AFTER TRAFFIC SIGNAL INSTALL		SCALE:	NOT TO SCALE
		DATE:	October, 2006
		LOG NUMBER:	20060254
N.C. DEPARTMENT of TRANSPORTATION DIVISION of HIGHWAYS TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH			