

# **Spot Safety Project Evaluation**

Project Log # 200505101

Spot Safety Project # 11-98-200

**Spot Safety Project Evaluation of the Actuated Flasher Installation at the Intersection of NC 16/18 and SR 2467 (Country Club Rd) in Wilkes Co.**

Documents Prepared By:

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

**Principal Investigator**

\_\_\_\_\_  
Samuel D. Coleman, EI

4/20/06  
Date

Traffic Safety Project Engineer

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

## **Subject Location**

Evaluation of Spot Safety Project Number 11-98-200 - Actuated Flasher Installation at the intersection of NC 16/18 and SR 2467 (Country Club Rd) south of Wilkesboro in Wilkes County.

## **Introduction**

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis of the treatment data has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

## **Project Information and Background from the Project File Folder**

NC 16/18 is a two-lane 55 mph facility with right turn lanes. SR 2467 is a two-lane 45 mph facility with left turn lanes. The intersection was controlled by a stop condition on SR 2467. Crashes were occurring at the intersection due to a high volume of traffic at a stop sign controlled intersection. The initial crash analysis for this section was completed from September 1, 1994 to October 18, 1997. There were a total of 10 crashes reported at this location including 4 angle, 3 left turn, same roadway; and 3 rear end crashes. The spot safety project improvement countermeasure chosen for the subject location was the installation of an actuated flasher at the intersection since the volume did not warrant a traffic signal. The final completion date for the flasher installation at the treatment intersection was on June 17, 1998 at a cost of \$13,000.

## **Naive Before and After Analysis**

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from May 1998 through July 1998. The before period consisted of reported crashes from June 1, 1994 through April 30, 1998 (3 years, 11 Months) and the after period consisted of reported crashes from August 1, 1998 through June 30, 2002 (3 Years, 11 Months). The ending date for this analysis was determined by the installation of a standard traffic signal in August 2002. The crash data from July 2002 was omitted to allow for an adequate construction period.

The analysis consisted of the treatment data at the intersection of NC 16/18 and SR 2467 with a 150' y-line. The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact Crashes were the target crashes for the applied

countermeasure. These 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>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total crashes	10	6	-40.0
Total Severity Index	10.8	3.5	-67.9
Frontal Impact Crashes	7	5	-28.6
Frontal Severity Index	15.0	4.0	-73.6
Volume	7950	9150	15.1
<u>Treatment Injuries</u>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Fatal	0	0	0.0
Class A	1	0	-100.0
Class B	2	1	-50.0
Class C	1	1	0.0
Property Damage Only	6	4	-33.3
<u>Frontal Impact Injuries</u>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Fatal	0	0	0.0
Class A	1	0	-100.0
Class B	2	1	-50.0
Class C	1	1	0.0
Property Damage Only	3	3	0.0

Table 1.

The naive before and after analysis at the treatment location resulted in a 40.0 percent decrease in Total Crashes, a 28.6 percent decrease in Frontal Impact Crashes, and a 15.1 percent increase in Average Daily Traffic (ADT). The Treatment Injuries resulted in a 100.0 percent decrease for Class A, a 50.0 percent decrease for Class B, a 0.0 percent change for Class C, and a 33.3 percent decrease for Property Damage Only crashes. The Frontal Impact Injuries resulted in a 100.0 percent decrease for Class A, a 50.0 decrease for Class B, and a 0.0 percent change for Class C and Property Damage Only crashes. The before period ADT year was 1995 and the after period ADT year was 2000.

## 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 40.0 percent decrease in Total Crashes and a 28.6 percent decrease in Frontal Impact Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in the number of Total Crashes and a decrease in the number of Frontal Impact Crashes from the before to the after period.

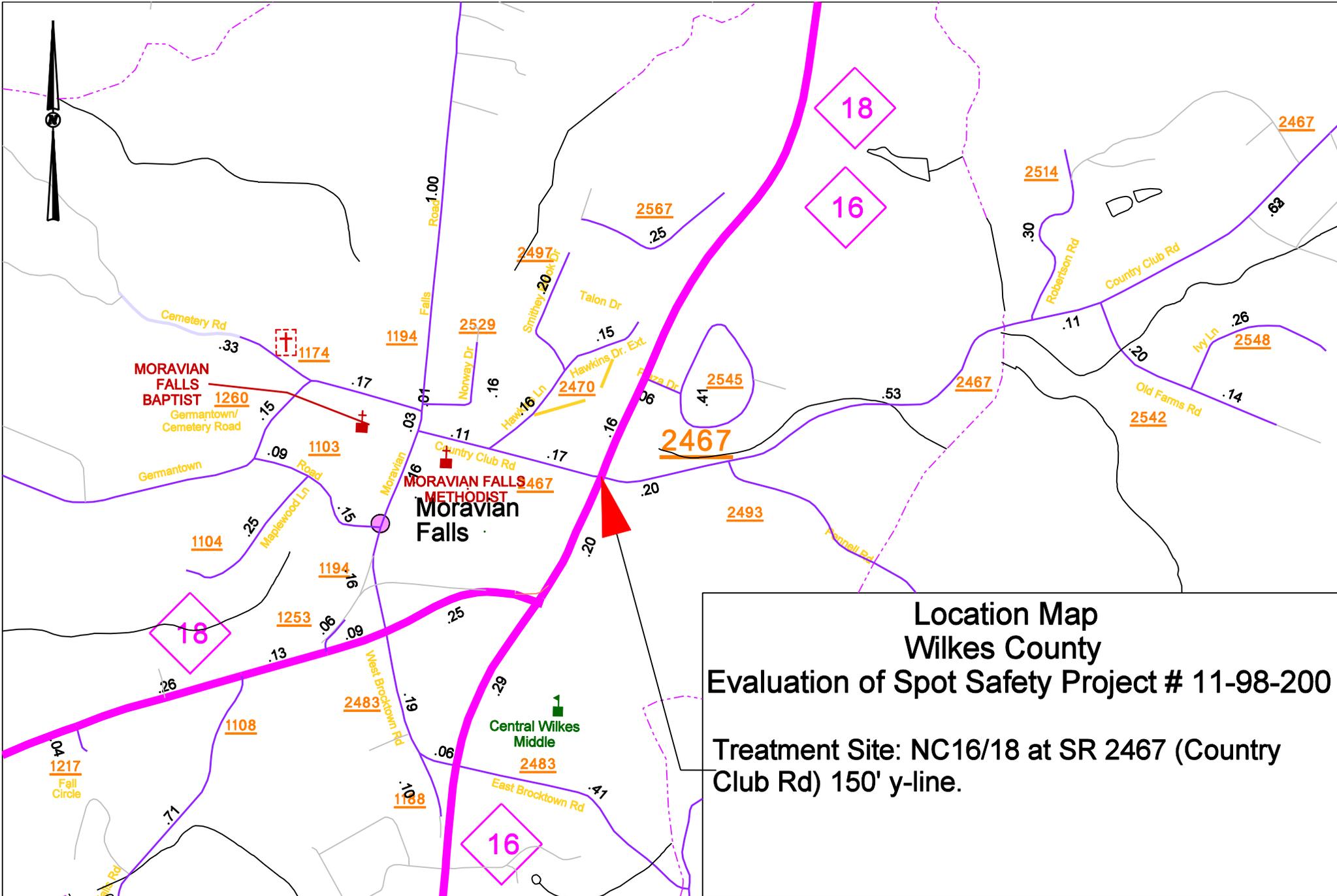
The information from the project file folder indicates that traffic volumes were high at the time the initial crash analysis was completed. The volume, however, was not significant enough for a standard signal. After the flasher installation the severity was significantly reduced but frontal impact crashes were still occurring. Once the intersection met traffic signal warrants, a signal was installed. A separate crash report, collision diagram, and table is provided for the standard traffic signal crash data.

After Full Phase Signal 8/1/02 to 11/30/05			
Total crashes	9	Fatal	0
Total Severity Index	4.3	Class A	0
Frontal Impact Crashes	3	Class B	2
Frontal Severity Index	5.9	Class C	2
Volume	9150	Property Damage Only	4

Table 2.

Although the severity and number of crashes went up for the signal period the frequency of crashes has decreased. After the signal installation there were 4 crashes in 2003, 4 crashes in 2004, and 1 crash from January 2005 through November 2005.

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  
Wilkes County  
Evaluation of Spot Safety Project # 11-98-200**

**Treatment Site: NC16/18 at SR 2467 (Country Club Rd) 150' y-line.**

*Treatment Site Photos Taken January 2006*



Facing west on SR 2467



Facing west on SR 2467



On SR 2467 looking south



On SR 2467 looking north



Facing east on SR 2467



Facing east on SR 2467



On SR 2467 looking south



On SR 2467 looking north



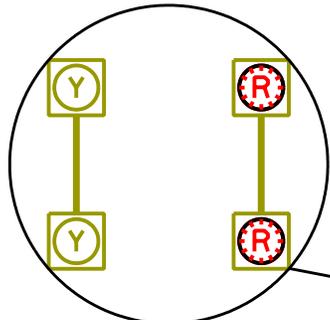
Driving north on NC 16/18



Driving south on NC 16/18

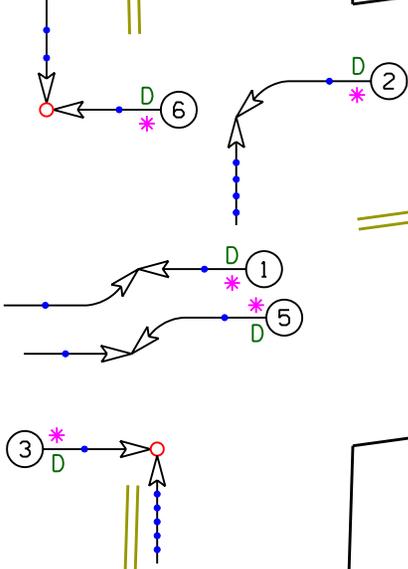
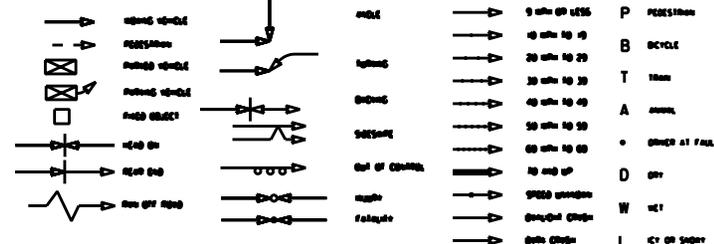


Wilkes County  
 Treatment Site - Total Crashes  
 After Period  
 August 1, 1998 - June 30, 2002  
 (3 years 11 months)



Standard Flasher

**LEGEND**



SR 2467 (Country Club Rd)  
 45 mph

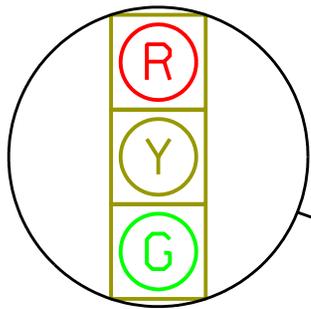


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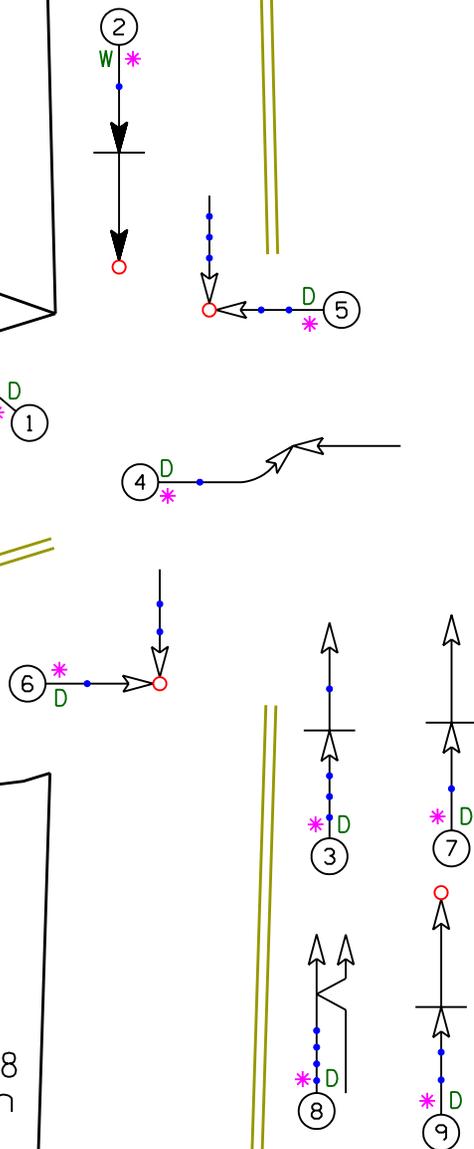
NC 16-18  
 55 mph

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
ROADWAY SAFETY IMPROVEMENT PROGRAM	SAFETY PROMOTION MANAGEMENT AND SUPPORT	DIVISION	AREA
		STUDY PERIOD: 8/1/98 TO 6/30/2002	T-LINE: 150 FT
		DISTANCE	ANALYSIS PREPARED BY: S. COLEMAN
SAFETY EVALUATION		TRAFFIC SAFETY	DATE: NOV 2002
METER FLASHER INSTALLATION		SCALE: NOT TO SCALE	LOG NUMBER
<b>N.C. DEPARTMENT of TRANSPORTATION</b> <b>DIVISION of HIGHWAYS</b> <b>TRAFFIC ENGINEERING AND SAFETY</b> <b>SYSTEMS BRANCH</b>			

Wilkes County  
 Treatment Site - Total Crashes  
 Signal Period  
 August 1, 2002 - November 30, 2005  
 (3 years 4 months)



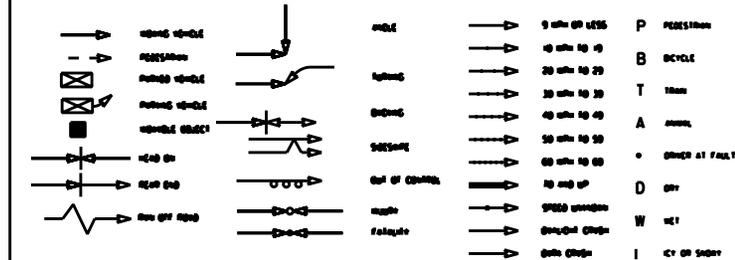
Standard Signal



NC 16-18  
 55 mph

SR 2467 (Country Club Rd)  
 45 mph

**LEGEND**



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
ROADWAY SAFETY IMPROVEMENT PROGRAM	SAFETY RECOGNITION MANAGEMENT AND SUPPORT	DATE:	AREA:
		STUDY PERIOD:	8/1/2002 TO 11/30/2005
		DISTANCE:	T-LINE: 150 FT
SAFETY EVALUATION		ANALYSIS PREPARED BY:	S. COLEMAN
TRAFFIC SAFETY		DIAGRAM PREPARED BY:	S. COLEMAN
SIGNAL PERIOD		DIAGRAM REVIEWED BY:	
SCALE:		NOT TO SCALE	DATE:
DATE:		NOV 2005	LOG NUMBER:
<b>N.C. DEPARTMENT of TRANSPORTATION</b> <b>DIVISION of HIGHWAYS</b> <b>TRAFFIC ENGINEERING AND SAFETY</b> <b>SYSTEMS BRANCH</b>			