

# Spot Safety Project Evaluation

Order # 41000005230

Spot Safety Project # 07-02-223

**Spot Safety Project Evaluation of the  
Raised Median Channelization Installation with Dual Posted Stop Signs  
NC 62 at SR 3336 / SR 3343 (Coble Church Road)  
Guilford County**

Documents Prepared By:

Safety Evaluation Group  
Traffic Safety Systems Management Section  
Transportation Mobility and Safety Division  
North Carolina Department of Transportation

**Principal Investigator**



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Jason B. Schronce

3-26-2010

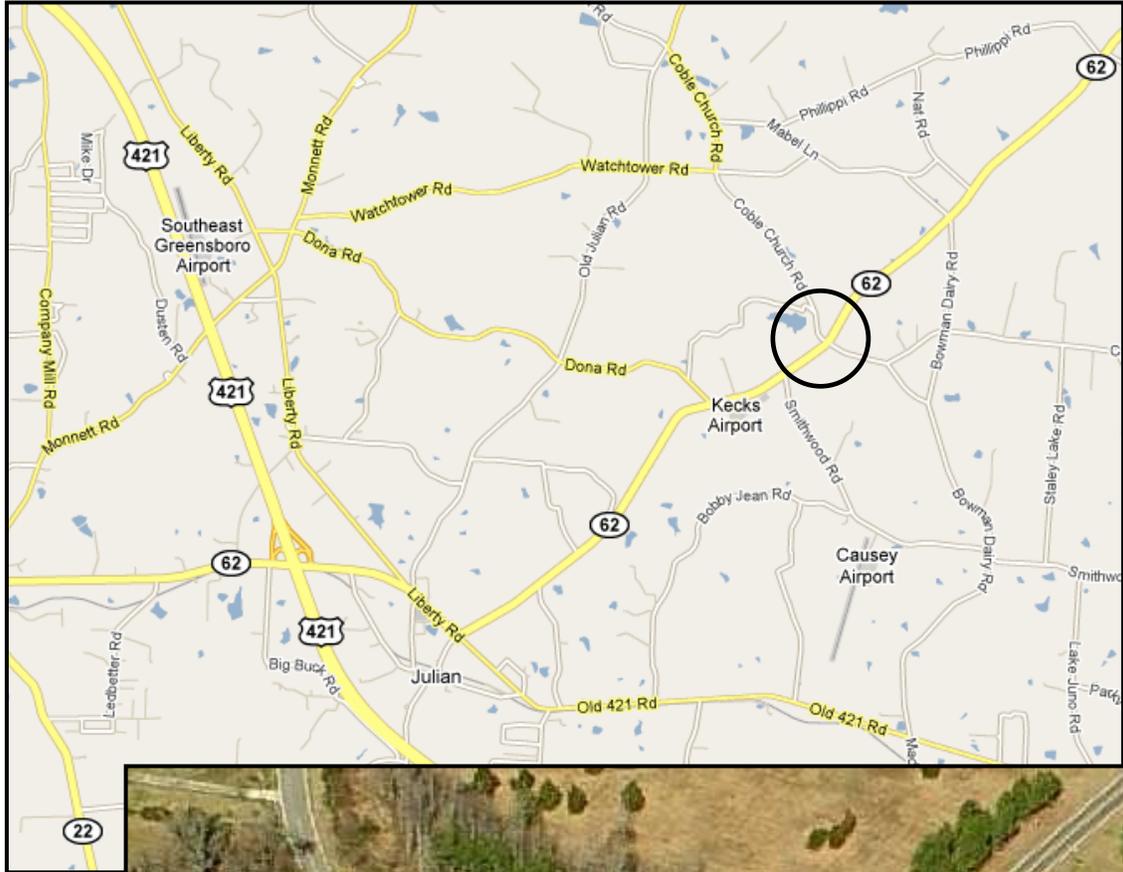
Date

Traffic Safety Project Engineer

# Spot Safety Project Evaluation Documentation

## Subject Location

Evaluation of Spot Safety Project Number 07-02-223 located at the Intersection of NC 62 and SR 3336 / 3343 (Coble Church Road) in rural Guilford County.



## Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation raised concrete median channelization islands with additional dual posted stop signs on the SR 3336 / 3343 approaches. Also, some trees were removed and a fence relocated in the northwest quadrant of the intersection to improve sight distance for SR 3336 drivers. NC 62 and SR 3336 / 3343 are both two-lane facilities at the subject intersection with speed limits of 55 mph on all approaches. The subject location is a four-leg crossroads intersection, which is controlled by stop signs on the Coble Church Road approaches.

The original statement of problem was the existing crash pattern of side street vehicles either running the stop sign or pulling out into on-coming traffic both resulting in angle collisions at this location. The intended purpose of the intersection improvements is to alleviate the intersection angle crash pattern by enhancing sight distance and bringing more awareness to the crossroads.

The initial crash analysis was completed from January 1, 1999 to December 31, 2001 with five (5) reported crashes, three (3) of which were deemed correctable angle collisions. The final completion date for the improvement at the subject intersection was on June 30, 2004 with a total cost of \$75,000.

## 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 were the months of June through July 2004. The before period consisted of reported crashes from December 1, 1998 through May 31, 2004 (5 years and 6 months); and the after period consisted of reported crashes from August 1, 2004 through January 31, 2010 (5 years and 6 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. *Please see attached location map, aerial map, and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Intersection Angle Crashes were the target crashes for the applied countermeasure.

<b><u>Treatment Information</u></b>	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total crashes	8	1	- 87.5 %
Total Severity Index	12.33	8.40	- 31.9 %
Target Crashes	6	0	- 100.0 %
Target Crash Severity Index	16.10	0.00	- 100.0 %
Volume	2,600	2,500	- 3.8 %

<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	1	1	0.0 %
Class C Injury Crashes	1	0	- 100.0 %
Total Injury Crashes	3	1	- 66.7 %

The naive before and after analysis at the treatment location resulted in an 87.5 percent decrease in Total Crashes, a 100 percent decrease in Target Crashes, and a 32 percent decrease in the Total Severity Index. The before period ADT year was 2001 and the after period ADT year was 2007.

## Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in an 87.5 percent decrease in Total Crashes and a 100 percent decrease in Target Crashes. The summary results above demonstrate that both Total and Target Crashes appear to have decreased at the treatment location from the before to the after period.

Referencing the *Collision Diagrams*, the before period intersection angle crash pattern at the intersection consisted of six (6) collisions. Three (3) crashes consisted of the Coble Church Road motorists running the stop sign, of which one (1) resulted in an A-injury collision. The remaining three (3) angle crashes were the result of vehicles improperly entering the intersection after coming to a complete stop. After the intersection improvements, including dual posted stop signs and sight distance enhancements, this pattern was completely eliminated. The only after period crash resulted from a northbound NC 62 motorist running off the roadway in the curve near this location.

The calculated benefit to cost ratio for this project is **7.65 considering total crashes**. The benefit to cost ratio **considering only target crashes is 7.79**. The benefits are calculated using the change in annual crash costs from the before to the after period. Operational and other benefits related to the project are not considered in this analysis. The costs of the project include the actual construction costs as well as the increase in annual maintenance and utility costs.

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 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



Traveling South on NC 62 approaching intersection  
Tree Removal and Fence Relocation to the right



Traveling North on NC 62 approaching intersection



Traveling East on SR 3336 (Coble Church Road) – Median with Dual Stop Signs



Traveling West on SR 3343 (Coble Church Road) – Median with Dual Stop Signs

**BENEFIT-COST ANALYSIS WORKSHEET - Total Crashes**

LOCATION: NC 62 at SR 3336 / 3343		BY: JBS						
COUNTY: Guilford		DATE: 3/23/2010						
FILE NO.: SS 07-02-223		NOTES: Total Crashes						
DETAILED COST:	TYPE IMPROVEMENT - Median Channelization Isalnds, Remove Trees, Relocate Fence							
	ITEMS	TOTAL	SERVICE	CRF	ANNUAL COST			
	Construction	\$75,000	10	0.149	\$11,177			
	Right-of-Way	\$0	0	0.000	\$0			
	TOTALS	\$75,000	10	0.149	\$11,177			
	ESTIMATED INCREASE IN ANNUAL MAINT. COST =				\$1,600			
	ESTIMATED INCREASE IN ANNUAL UTILITY COST =				\$0			
	TOTAL ANNUAL COST=				\$12,777			
	TOTAL COST OF PROJECT=				\$75,000			
COMPREHENSIVE COST REDUCTION:								
	ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES							
TIME PERIOD	YEARS	K & A CRASHES	K & A CRASHES PER YR	B & C CRASHES	B & C CRASHES PER YR	PDO CRASHES	PDO CRASHES PER YR	ANNUAL COSTS
BEFORE	5.50	1	0.18	2	0.36	5	0.91	\$101,000
AFTER	5.50	0	0.00	1	0.18	0	0.00	\$3,273
						Annual Benefits from Crash Cost Savings		\$97,727
NET AVG. ANNUAL BENEFITS = AVG. ANNUAL BENEFITS - TOTAL ANNUAL COST					=	\$84,950		
BENEFIT-COST RATIO = AVG ANNUAL BENEFITS/TOTAL ANNUAL COST					=	7.65		
TOTAL COST OF PROJECT		-	\$75,000	COMPREHENSIVE B/C RATIO		-	7.65	

**BENEFIT-COST ANALYSIS WORKSHEET - Target Crashes**

LOCATION: NC 62 at SR 3336 / 3343		BY: JBS						
COUNTY: Guilford		DATE: 3/23/2010						
FILE NO.: SS 07-02-223		NOTES: Target Crashes - Intersection Angles						
DETAILED COST:	TYPE IMPROVEMENT - Median Channelization Isalnds, Remove Trees, Relocate Fence							
	ITEMS	TOTAL	SERVICE	CRF	ANNUAL COST			
	Construction	\$75,000	10	0.149	\$11,177			
	Right-of-Way	\$0	0	0.000	\$0			
	TOTALS	\$75,000	10	0.149	\$11,177			
	ESTIMATED INCREASE IN ANNUAL MAINT. COST =				\$1,600			
	ESTIMATED INCREASE IN ANNUAL UTILITY COST =				\$0			
	TOTAL ANNUAL COST=				\$12,777			
	TOTAL COST OF PROJECT=				\$75,000			
COMPREHENSIVE COST REDUCTION:								
	ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES							
TIME PERIOD	YEARS	K & A CRASHES	K & A CRASHES PER YR	B & C CRASHES	B & C CRASHES PER YR	PDO CRASHES	PDO CRASHES PER YR	ANNUAL COSTS
BEFORE	5.50	1	0.18	2	0.36	3	0.55	\$99,582
AFTER	5.50	0	0.00	0	0.00	0	0.00	\$0
						Annual Benefits from Crash Cost Savings		\$99,582
NET AVG. ANNUAL BENEFITS = AVG. ANNUAL BENEFITS - TOTAL ANNUAL COST					=	\$86,805		
BENEFIT-COST RATIO = AVG ANNUAL BENEFITS/TOTAL ANNUAL COST					=	7.79		
TOTAL COST OF PROJECT		-	\$75,000	COMPREHENSIVE B/C RATIO		-	7.79	

LEGEND

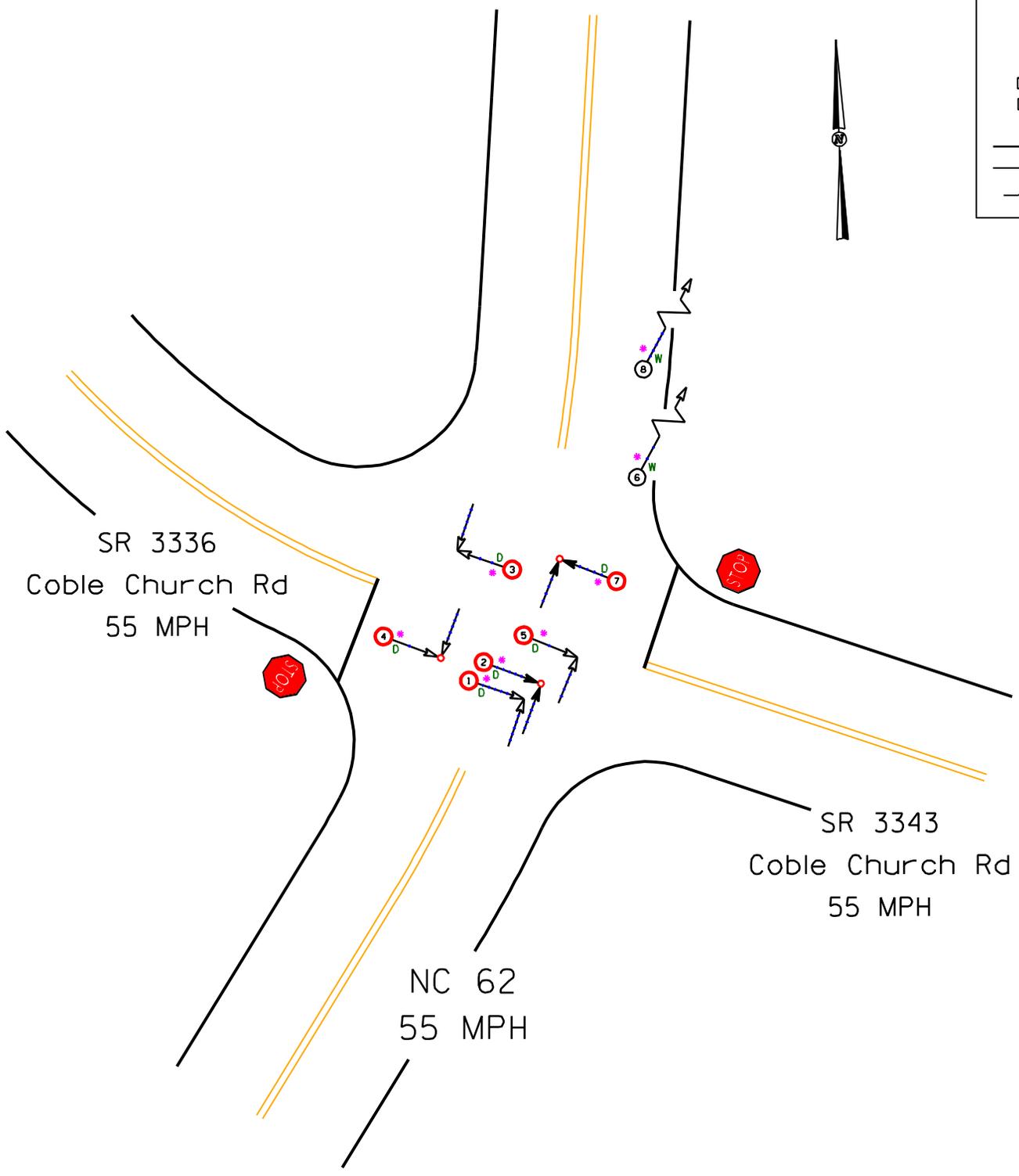
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAM
	PARKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PARKING VEHICLE		SIDESWIPE		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		HAZARD		50 MPH TO 59		ICY OR SNOWY
	REAR END		FATALITY		60 MPH TO 69		SPEED UNKNOWN
	RAN OFF ROAD				70 AND UP		

SS# 07-02-223  
 Guilford County  
 BEFORE Period  
 12/1/98 - 5/31/04

SR 3336  
 Coble Church Rd  
 55 MPH

SR 3343  
 Coble Church Rd  
 55 MPH

NC 62  
 55 MPH



Intersection Angle  
 Target Crashes

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

	COLLISION DIAGRAM	
	DIVISION 7	AREA:
	STUDY PERIOD: 2/1/1998 - 5/31/2004	
	DISTANCE: Y-LINE + 150 FT	
ANALYSIS PREPARED BY: JBS		
ANALYSIS CHECKED BY: BR		
DIAGRAM PREPARED BY: JBS		
DIAGRAM REVIEWED BY: ST		
SCALE: NOT TO SCALE		
DATE: 3-23-200		
LOG NUMBER: SS* 07-02-223 BEFORE		

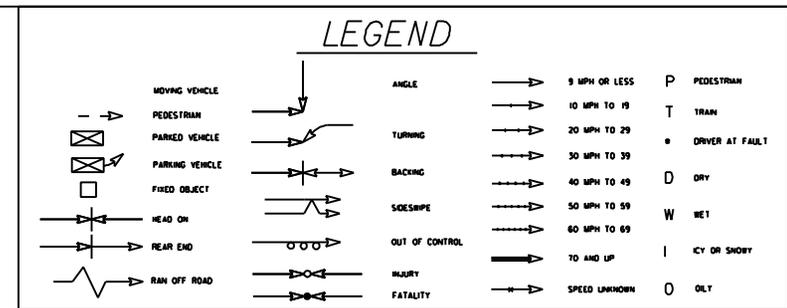
**N.C. DEPARTMENT of TRANSPORTATION**  
**DIVISION of HIGHWAYS**  
**TRANSPORTATION MOBILITY and**  
**SAFETY DIVISION**

Quadrant Improvements  
 1. Remove Trees blocking view  
 2. Relocate Fencing

SR 3336  
 Coble Church Rd  
 55 MPH

SR 3343  
 Coble Church Rd  
 55 MPH

NC 62  
 55 MPH



SS# 07-02-223  
 Guilford County  
 AFTER Period  
 8/1/04 - 1/31/10

Intersection Angle  
 Target Crashes

**TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT**

	<b>COLLISION DIAGRAM</b>	
	DIVISION: 7	AREA:
	STUDY PERIOD: 8/1/2004 - 1/31/2010	
	DISTANCE: Y-LINE + 150 FT	
	ANALYSIS PREPARED BY: JBS	
ANALYSIS CHECKED BY: BR		
DIAGRAM PREPARED BY: JBS		
DIAGRAM REVIEWED BY: ST		
SCALE: NOT TO SCALE		
DATE: 3-23-2010		
LOG NUMBER: SS* 07-02-223 AFTER		

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