

Spot Safety Project Evaluation

Project Log # 200505117

Spot Safety Project # 09-97-212

**Spot Safety Project Evaluation of the Guardrail Installation
on NC 65 West of SR 1933 - Easley Rd in Stokes County.**

Documents Prepared By:

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Traffic Safety Systems Management Section
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Principal Investigator

Majed Bazzari

11/28/2005
Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 09-97-212 – The Guardrail Installation on NC 65 west of SR 1933 – Easley Rd, west of Walnut Cove city in Stokes 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 naïve before and after analysis 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

The spot safety project improvement countermeasure chosen for the subject location was the installation of guardrails along both sides of NC 65 from SR 1933-Easley Rd to approximately 300 ft west of SR 1933 on both sides. NC 65 is a rural two-lane facility with a speed limit of 55 mph. The improvement was requested by the highway patrol through the division office.

The initial crash analysis was completed from January 1, 1995 through January 1, 1998 with a total of twelve (12) reported crashes. There were 5 Ran Off Road crashes, 3 Left Turn crashes, 2 Rear End crashes, 1 angle crash and 1 Sideswipe crash. Five Ran Off Road Crashes were deemed to be correctable by the improvement. The statement of the problem was vehicles running off the road down a steep embankment. The final completion date for the improvement at the subject location was on December 16, 1998 at a cost of \$15,000.

Naïve 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 November 1, 1998 through January 31, 1999. The before period consisted of reported crashes from September 1, 1992 through October 31, 1998 (6 Years, 2 Months) and the after period consisted of reported crashes from February 1, 1999 through March 31, 2005 (6 Years, 2 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 65 from MP 3.93 to MP 4.38. A 0 feet Y-line was used in the analysis. Please see attached *Location Map* for further detail.

The following data Table 1 depicts the Naive Before and After Analysis for the Total Crashes and Target Crashes at the treatment location. Table 2 provides an in depth examination of the Naïve Before and After Analysis of the Total Crashes and Table 3 provides an in depth examination of the Naïve Before and After Analysis for the Guardrail Installation Target Crashes. Please note that the guardrail installation Target Crashes include the following crash types: Ran Off Road - Right, Ran Off Road - Left, Ran Off Road - Straight, Overturn/Rollover, Fixed Object, Head On, Sideswipe - Same Direction, and Sideswipe - Opposite Direction. Target Crashes are all potential Ran-Off Road crashes and include those crash types where at least one vehicle was involved in a lane departure.

Table 1. Treatment Information

	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	15	17	13.3
Total Severity Index	18.13	8.51	-53.1
Total Target Crashes	7	6	-14.3
Target Severity Index	12.89	19.8	53.6
Volume	4500	5900	31.1

Table 2. Total Crashes Information

	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	15	17	13.3
Fatal Crashes	0	0	N/A
Non Fatal Injury Crashes	7	8	14.3
Total Injury Crashes	7	8	14.3
PDO Crashes	8	9	12.5
Fatal Injuries	0	0	N/A
Non-Fatal Injuries	12	12	0.0
Total Injuries	12	12	0.0
Night Crashes	7	6	-14.3
Wet Crashes	4	2	-50.0
Alcohol/ Drug Crashes	1	1	0.0

Table 3. Target Crashes Information

	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Target Crashes	7	6	-14.3
Fatal Crashes	0	0	N/A
Non Fatal Injury Crashes	2	6	200.0
Total Injury Crashes	2	6	200.0
PDO Crashes	5	0	-100.0
Fatal Injuries	0	0	N/A
Non-Fatal Injuries	2	10	400.0
Total Injuries	2	10	400.0
Night Crashes	4	3	-25.0
Wet Crashes	1	0	-100.0
Alcohol/ Drug Crashes	0	1	N/A
Guardrail Struck	0	1	N/A
Ran Off Road Down an Embankment	2	0	-100.0

The naive before and after analysis at the treatment location resulted in a 13.3 percent increase in Total Crashes, a 53.1 percent decrease in the Total Severity Index, and a 31.1 percent increase in Average Daily Traffic (ADT). There was also a 14.3 percent decrease in Target Crashes and a 53.6 percent increase in the Severity Index for Target Crashes. The before period ADT year was 1995 and the after period ADT year was 2002.

Results and Discussion

The naive before and after analysis involving the comparison of the treatment actual before data versus the treatment actual after data resulted in a 13.3 percent increase in Total Crashes and a 14.3 percent decrease in Target Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in Total crashes and a decrease in Target Crashes from the before to the after period.

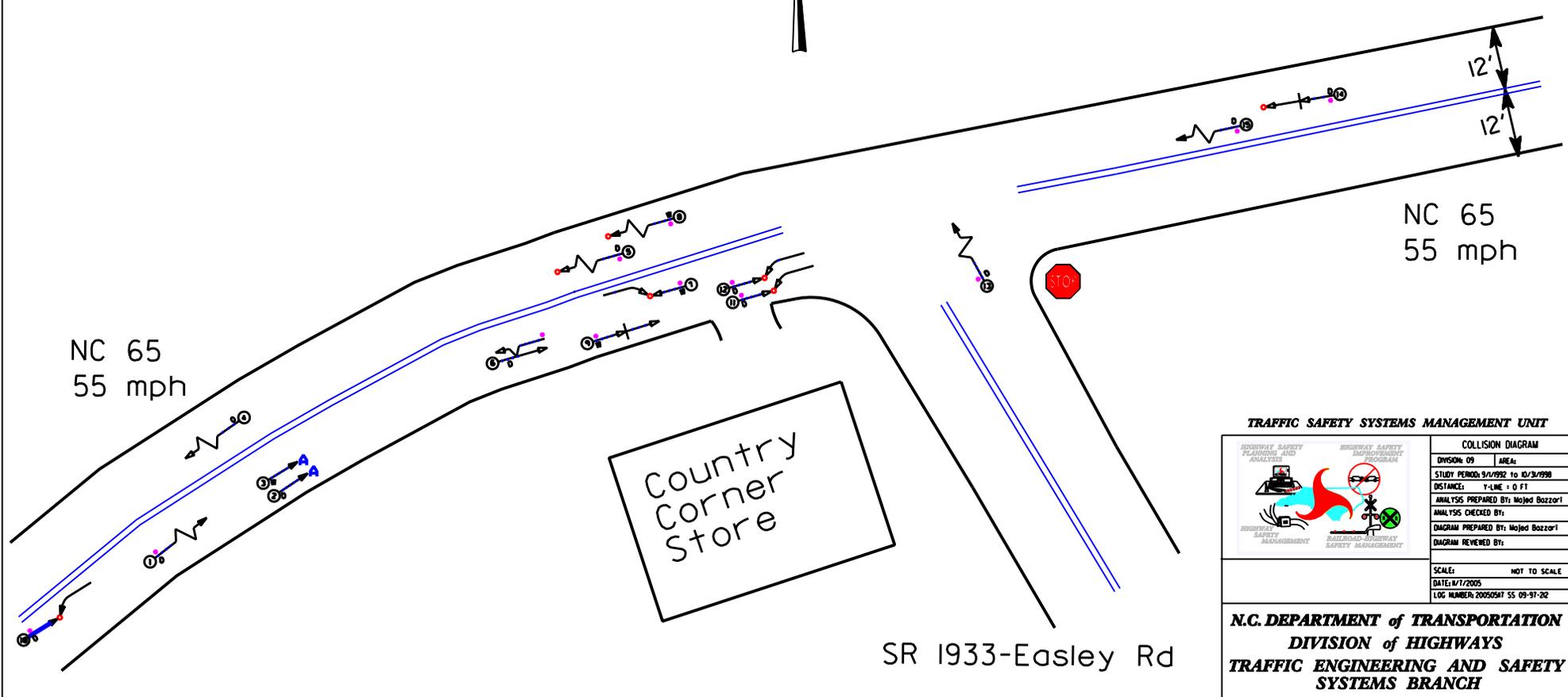
As previously stated, the guardrail was installed to reduce the number and severity of vehicles running off the road down a steep embankment over a creek. The crash analysis included all crashes on NC 65 within 1000 ft of both ends of the guardrail. Looking at the Ran Off Road Crashes down an embankment they were decreased by a 100 percent mean while there was one crash that struck the guardrail in the after period. From the statistics it can be seen that the guardrail installation had a positive impact on preventing vehicles from running off the road down an embankment at the subject location.

Stokes County
 NC 65 West of SR 1933-Easley Rd
 Treatment Site in The Before Period
 From 9/1/1992 To 10/31/1998



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		• DRIVER AT FAULT
	PAKING VEHICLE		SIDE-SLOPE		30 MPH TO 39		D DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		W WET
	HEAD ON		REAR END		50 MPH TO 59		I ICE OR SNOW
	REAR END		RAN OFF ROAD		60 MPH TO 69		0 ONLY
	RAN OFF ROAD		FATALITY		70 AND UP		



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

		COLLISION DIAGRAM	
		DIVISION 09	AREA:
		STUDY PERIOD: 9/1/1992 TO 10/31/1998	
		DISTANCE: TIME = 0 FT	
		ANALYSIS PREPARED BY: Mojed Bozzori	
		ANALYSIS CHECKED BY:	
		DIAGRAM PREPARED BY: Mojed Bozzori	
		DIAGRAM REVIEWED BY:	
		SCALE:	NOT TO SCALE
		DATE: 1/7/2005	
		LOG NUMBER: 200505AT 55 09-91-22	

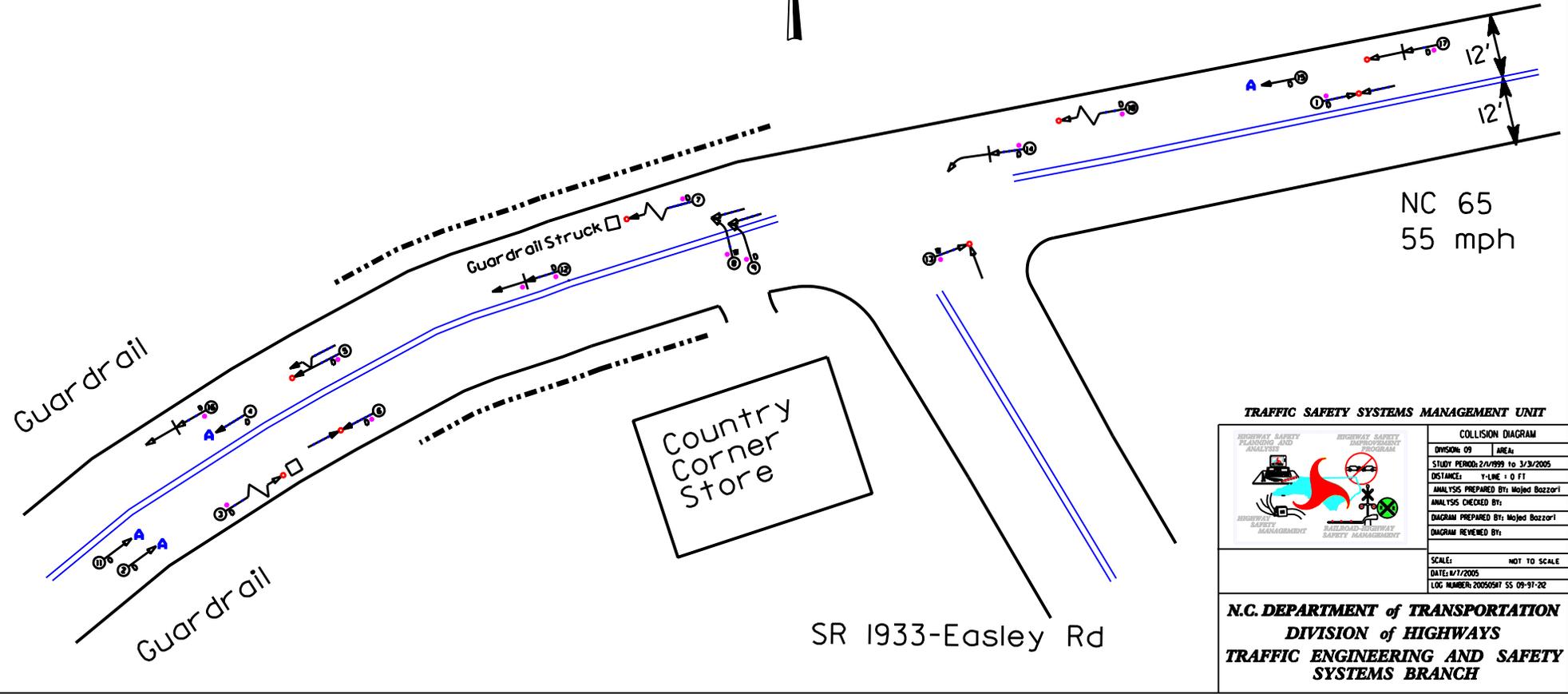
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH

Stokes County
 NC 65 West of SR 1933-Easley Rd
 Treatment Site in The After Period
 From 2/1/1999 To 3/31/2005



LEGEND

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



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

	COLLISION DIAGRAM	
	DIVISION: 09	AREA:
	STUDY PERIOD: 2/1/1999 to 3/31/2005	
	DISTANCE: 1+LINE + 0 FT	
ANALYSIS PREPARED BY: Mojib Bozzori		
ANALYSIS CHECKED BY:		
DIAGRAM PREPARED BY: Mojib Bozzori		
DIAGRAM REVIEWED BY:		
SCALE: NOT TO SCALE		
DATE: 8/7/2005		
LOG NUMBER: 20050517 SS 09-91-20		
N.C. DEPARTMENT of TRANSPORTATION DIVISION of HIGHWAYS TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH		