

Spot Safety Project Evaluation

Project Log # 200512139

Spot Safety Project # 07-99-201

**Spot Safety Project Evaluation of the Left Turn Lanes and Traffic Signal Installation
At the Intersection of NC 68 and SR 2028 / Haw River Rd in Guilford County.**

Documents Prepared By:

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Date

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03/01/2006
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-99-201 - The Intersection of NC 68 and SR 2028 / Haw River Rd in Guilford 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 and an Odds Ratio comparison analysis has been completed to measure the effectiveness of the spot safety improvement. 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 countermeasures chosen for the subject location were the widening of NC 68 to provide left turn lanes and the installation of a traffic signal. The improvements were requested by a private citizen. Prior to the project, the intersection was controlled by stop signs on SR 2028. NC 68 has a speed limit of 55 mph. SR 2028 has a speed limit of 45 mph on the eastbound approach and 40 mph on the westbound approach. The Project Justification Sheet states that vehicles on SR 2028 could not safely cross the intersection due to insufficient gaps in traffic.

The initial crash analysis for this location was completed from October 1, 1995 through September 30, 1998 with a total of four reported crashes. There were two Angle crashes and one Left Turn crash that were deemed correctable by the improvement. One class B injury and five class C injuries resulted from these crashes. The completion date for the improvement was on February 22, 2000 with a total cost of \$145,000.

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 January 1, 2000 through March 31, 2000. The before period consisted of reported crashes from July 1, 1994 through December 31, 1999 (5 Years, 6 Months) and the after period consisted of reported crashes from April 1, 2000 through September 30, 2005 (5 Years, 6 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The analysis also consisted of two different sets of data, the treatment and the comparison data. The treatment data consisted of all crashes within 150 feet of the treatment intersection. The comparison data consisted of all crashes within 150 feet of the intersection of NC 68 and SR 2056 / SR 2101. The following data tables depict the Naive Before and After Analysis for the treatment and comparison intersections. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasure. 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.

Crash Data Summary:

<u>Treatment Information</u>			
	Before	After	Percent Reduction (-) / Percent Increase (+)
Total Crashes	13	11	-15.4
Total Severity Index	16.1	6.4	-60.3
Frontal Impact Crashes	11	5	-54.5
Frontal Severity Index	11.9	6.9	-42.0
Volume	14600	17000	16.4
<u>Comparison Information</u>			
	Before	After	Percent Reduction (-) / Percent Increase (+)
Total Crashes	35	30	-14.3
Total Severity Index	7.0	3.2	-53.8
Frontal Impact Crashes	4	4	0.0
Frontal Severity Index	23.7	1.0	-95.8
Volume	15000	18000	20.0
<u>Odds Ratio: Treatment versus Comparison</u>			
	Before	After	Percent Reduction (-) / Percent Increase (+)
Treatment Total Crashes	13	11	-1.3
Comparison Total Crashes	35	30	
Treatment F.I. Crashes	11	5	-54.5
Comparison F.I. Crashes	4	4	

Treatment Data Summary:

	Before Period	After Period	Percent Reduction (-) / Percent Increase (+)
Total Crashes	13	11	-15.4
Fatal Crashes	0	0	N/A
Non Fatal Injury Crashes	8	8	0.0
Total Injury Crashes	8	8	0.0
PDO Crashes	5	3	-40.0
Night Crashes	0	0	N/A
Wet Crashes	1	1	0.0
Alcohol/ Drug Crashes	0	2	N/A
Fatal Injuries	0	0	N/A
Class A	2	0	-100.0
Class B	2	5	150.0
Class C	17	9	-47.1
Non-Fatal Injuries	21	14	-33.3
Total Injuries	21	14	-33.3
Total Target Crashes	11	5	-54.5
Fatal Crashes	0	0	N/A
Non Fatal Injury Crashes	7	4	-42.9
Total Injury Crashes	7	4	-42.9
PDO Crashes	4	1	-75.0
Night Crashes	0	0	N/A
Wet Crashes	0	0	N/A
Alcohol/ Drug Crashes	0	0	N/A
Fatal Injuries	0	0	N/A
Class A	1	0	-100.0
Class B	2	3	50.0
Class C	11	4	-63.6
Non-Fatal Injuries	14	7	-50.0
Total Injuries	14	7	-50.0

The naive before and after analysis at the treatment location resulted in a 15.4 percent decrease in Total Crashes, a 60.3 percent decrease in the Total Severity Index, a 54.5 percent decrease in Target Crashes, a 42.0 percent decrease in the Target Severity Index, and a 16.4 percent increase in the Average Daily Traffic (ADT). The comparison location experienced a 14.3 percent decrease in Total Crashes, a 53.8 percent decrease in the Total Severity Index, a 0.0 percent change in Target crashes, a 95.8 percent decrease in the Target Severity Index, and a 20.0 percent increase in ADT. The before period ADT year was 1997 and the after period ADT year was 2002.

The Odds Ratio is used as another means of calculating the treatment effect. The number of crashes in the before and after period from the comparison location is used to calculate the percent reduction in crashes for the Treatment Intersection. As shown in the previous table, using the Odds Ratio calculation, there is a 1.3 percent decrease in Total Treatment Intersection crashes and a 54.5 percent decrease in the Target Treatment Intersection crashes from the before to the after period.

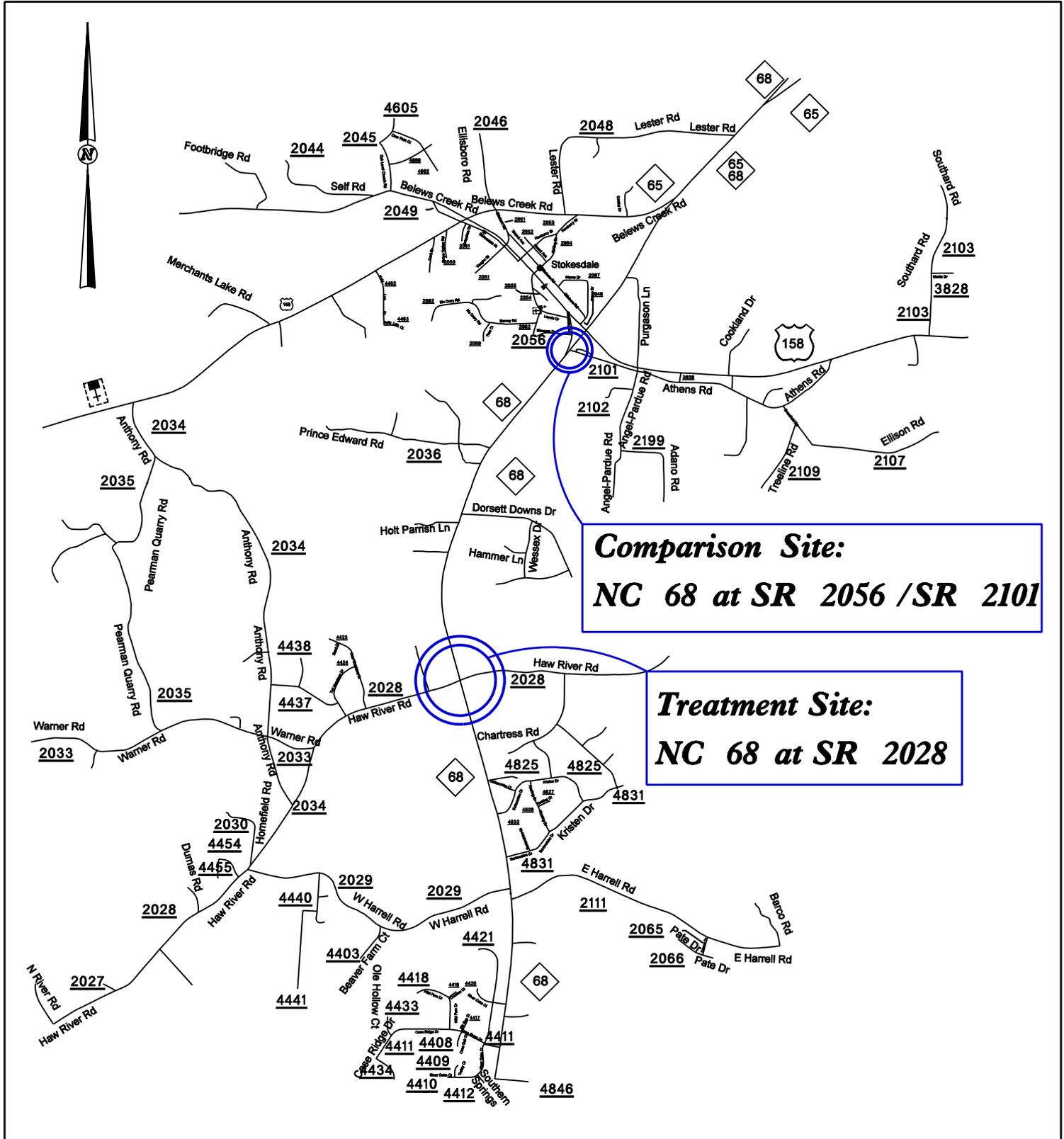
Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 15.4 percent decrease in Total Crashes and a 54.5 percent decrease in Frontal Impact Crashes. Using the Odds Ratio to calculate the treatment effect resulted in a 1.3 percent decrease in Total Crashes and a 54.5 percent decrease in Frontal Impact crashes at the Treatment Intersection. The summary results above demonstrate that the treatment location appears to have had a decrease in both the number of Total Crashes and Frontal Impact Crashes from the before to the after period using both analysis methods. Further analysis of crash types in the before and after period reveals that the number of Left Turn crashes decreased by 62.5 percent, Angle crashes decreased by 50.0 percent, and Rear End crashes increased by 150.0 percent at the Treatment Intersection. *Please see the attached photos and collision diagrams.*

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.

Evaluation of Spot Safety Project Number 07-99-201

Location Map, Guilford County



Treatment Site Photos Taken on February 9, 2006



Travelling South on NC 68



Travelling South on NC 68



Travelling South on NC 68



Travelling North on NC 68



Travelling North on NC 68



Travelling North on NC 68



Travelling West on SR 2028 / Haw River Rd



Travelling West on SR 2028 / Haw River Rd



Travelling East on SR 2028 / Haw River Rd



Travelling East on SR 2028 / Haw River Rd

Guilford County

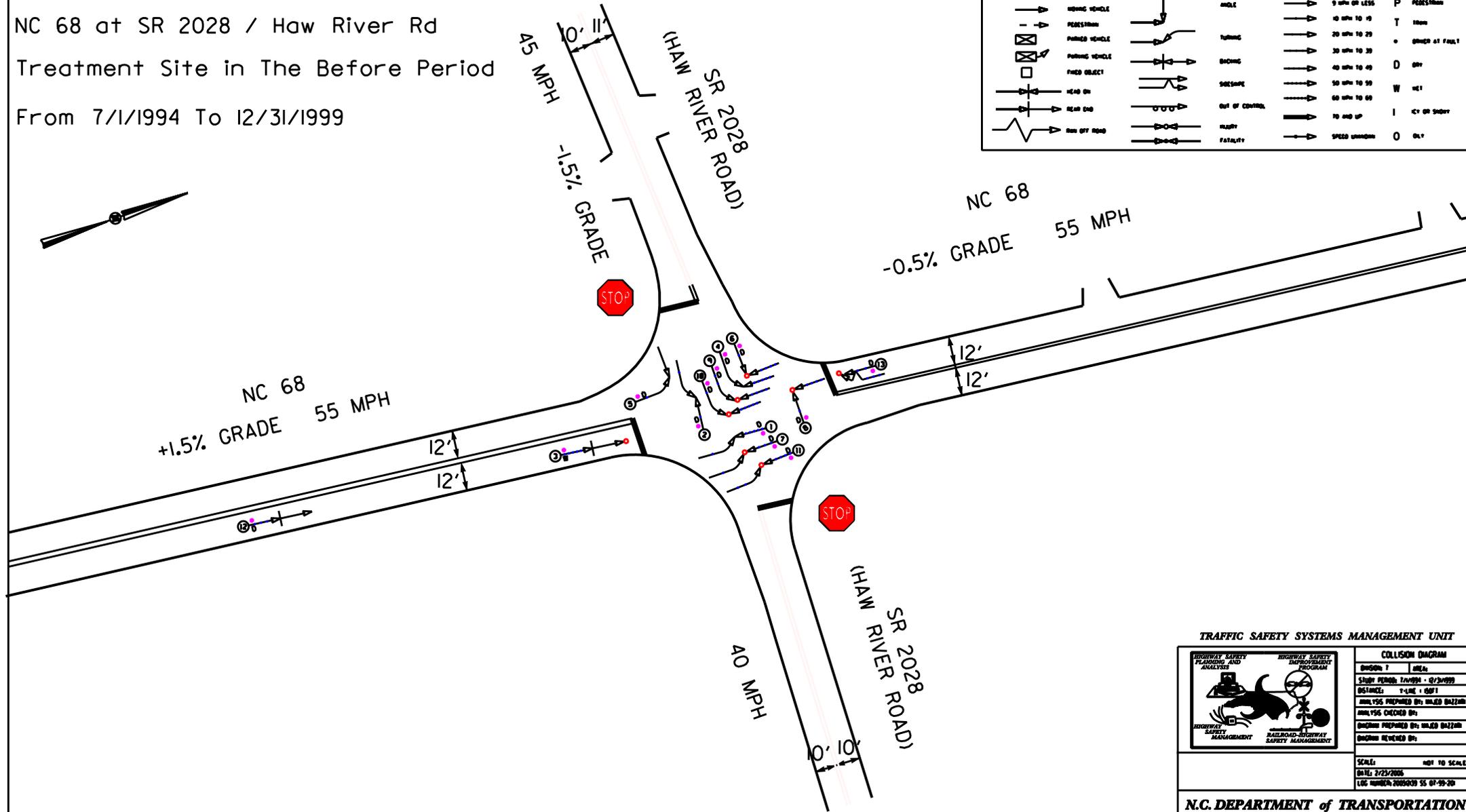
NC 68 at SR 2028 / Haw River Rd

Treatment Site in The Before Period

From 7/1/1994 To 12/31/1999



LEGEND			
	MOVING VEHICLE		MIDDLE
	PEDESTRIAN		TURNING
	PAKED VEHICLE		BACKING
	FIXED OBJECT		SUBSIDED
	HEAD ON		OUT OF CONTROL
	NEAR END		HABIT
	RUN OFF ROAD		FATALITY
	9 MPH OR LESS		P PEDESTRIAN
	10 MPH TO 19		T TRUCK
	20 MPH TO 29		O OTHER AT FAULT
	30 MPH TO 39		D DRIVER
	40 MPH TO 49		W WHEEL
	50 MPH TO 59		I ICY OR SLIPY
	60 MPH TO 69		O OTHER
	70 AND UP		
	SPEED UNKNOWN		



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

	COLLISION DIAGRAM	
	Diagram: 1	Scale:
	Study Period: 7/1/94 - 12/31/99	
	Distance: 1-LINE + 60 FT	
	Analysis Prepared By: MILD BAZZAN	
	Analysis Checked By:	
Diagram Prepared By: MILD BAZZAN		Scale: NOT TO SCALE
Diagram Reviewed By:		Date: 2/23/2006
LOG NUMBER 20050303 SS 01-99-20		

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

