

Spot Safety Project Evaluation

Project Log # 200812269

Spot Safety Project # 07-02-232

**Spot Safety Project Evaluation of the Traffic Signal Installation
At the Intersection of SR 2147 (Friendly Avenue) and
Friendway Road / Coble Farm Drive
City of Greensboro, 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



Jason B. Schronce

2-19-2009

Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-02-232 located at the Intersection of SR 2147 (Friendly Avenue) and Friendway Road / Coble Farm Drive in 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 of an actuated traffic signal (Sig ID 07-2044). The subject intersection is crossroads type with stop conditions on the side streets of Friendway Road and Coble Farm Drive. SR 2147 (Friendly Ave) is a five-lane cross section with a continuous center turn lane and a posted speed of 40 mph. Friendway and Coble Farm Drive are both single lane approaches with posted speed limits of 30 mph and 18 mph respectively. In late 2008, Friendway Road was widened at the subject location to include a dedicated left turn lane by a new residential development in the southeast quadrant.

The original statement of problem was that volumes have increased at this location to where motorists can no longer enter the roadway safely. The intended purpose for this project was to alleviate congestion and delay issues. The intersection met signal warrants 2 and 3B.

The initial crash analysis was completed from June 1, 1999 to May 31, 2002 with six (6) reported crashes, two (2) of which were deemed correctable. The final completion date for the improvement at the subject intersection was on September 30, 2003 with a total cost of \$28,005.00.

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 August and September 2003. The before period consisted of reported crashes from July 1, 1998 through July 31, 2003 (5 years and 1 month); and the after period consisted of reported crashes from October 1, 2003 through October 31, 2008 (5 years and 1 month). 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 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, different roadways; Head on; and Angle.

<u>Treatment Information</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total crashes	12	21	75.0 %
Total Severity Index	4.70	6.29	33.8 %
Target Crashes	5	10	100.0 %
Target Crash Severity Index	6.92	6.18	- 10.7 %
Volume	22,500	25,900	15.1 %
<u>Injury Crash Summary</u>			
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	0	5	200+ %
Class C Injury Crashes	6	10	66.7 %
Total Injury Crashes	6	15	150 %

The naive before and after analysis at the treatment location resulted in a 75 percent increase in Total Crashes, a 100 percent increase in Target Crashes, and a 34 percent increase in the Total Severity Index. The before period ADT year was 2001 and the after period ADT year was 2006.

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 75 percent increase in Total Crashes and a 100 percent increase in Target Crashes. The summary results above demonstrate that both Total Crashes and Target Crashes appear to have significantly increased at the treatment location from the before to the after period.

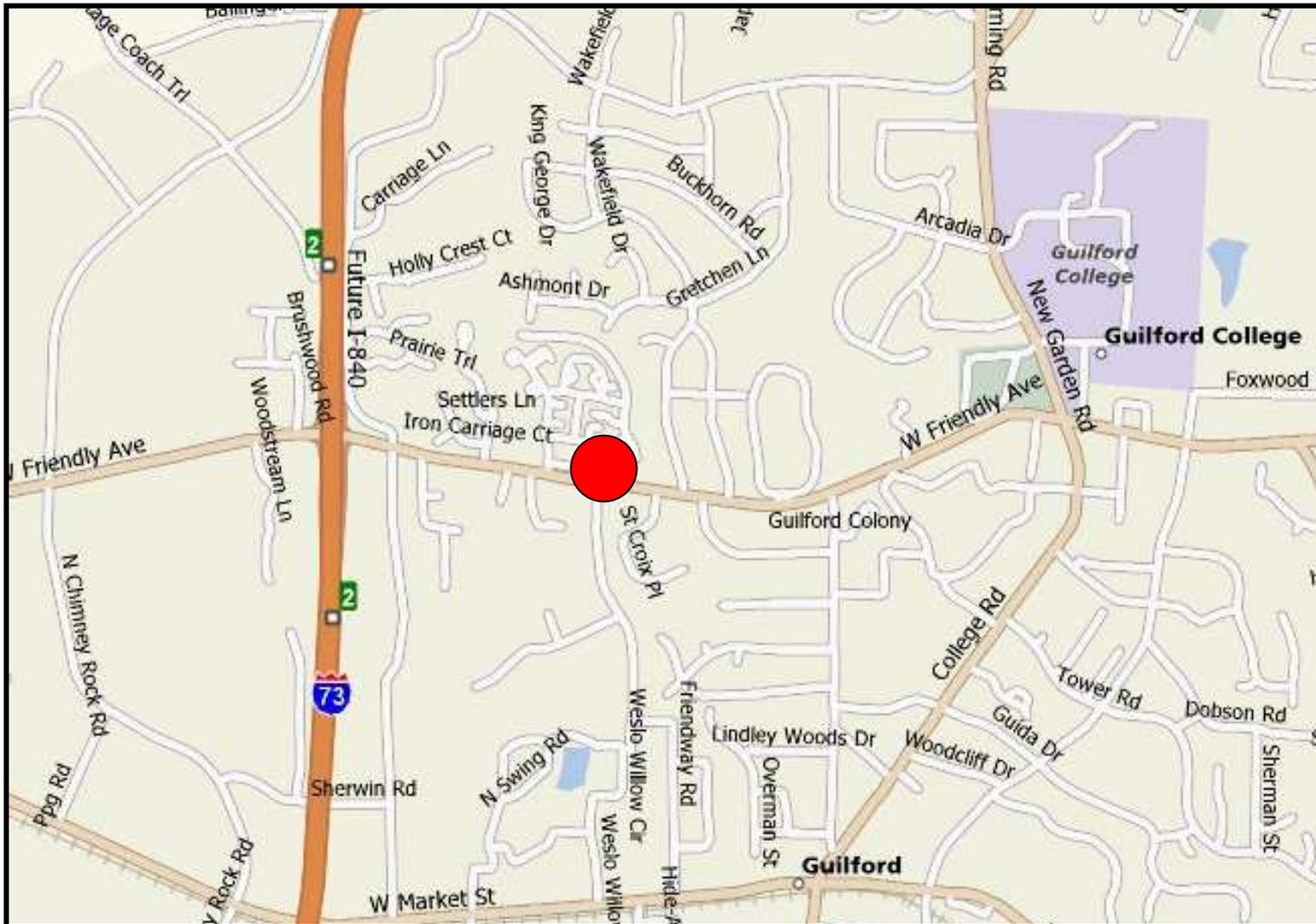
Referencing the *Collision Diagrams*, westbound SR 2147 left turn crashes have increased from one (1) in the before period to five (5) in the after period. Since the signal installation, there have been three red light run crashes from vehicles on SR 2147 (Friendly Ave). Also, rear-end collisions approaching the intersection have increased slightly from three (3) to five (5).

The calculated benefit to cost ratio for this project is **(-4.38) considering total crashes**. The benefit to cost ratio **considering only target crashes is (-1.67)**. 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 for all approaches to the treatment intersection, although the configuration of Friendly Road shown is different from the configuration that was analyzed for this study, as explained in the *Project Background* section.

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
Guilford County, City of Greensboro
Evaluation of Spot Safety Project # 07-02-232



Treatment Location: SR 2147 (Friendly Ave) at Friendway Drive / Coble Farm Drive

**SS# 07-02-232 Aerial Map
Guilford County**



Coble Farm Drive

SR 2147
Friendly Ave

Friendway Road

TREATMENT SITE PHOTOS TAKEN 1-26-2009



Traveling East on SR 2147 (Friendly Avenue)



Traveling East on SR 2147



Traveling South on Coble Farm Drive



Traveling West on SR 2147 (Friendly Avenue)



Traveling North on Friendway Road



Traveling North on Friendway Road
Double lanes approaching intersection recently added by
new residential development on the right

Coble Farm Drive
Residential Community
18 MPH

FLOWER MEDIAN



LEGEND

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	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		INJURY		50 MPH TO 59		ICY OR SNOWY
	REAR END		FATALITY		60 MPH TO 69		SPEED UNKNOWN
	RAN OFF ROAD				70 AND UP		OILY

SS# 07-02-232
Guilford County
City of Greensboro
BEFORE Period
7/1/98 - 7/31/03

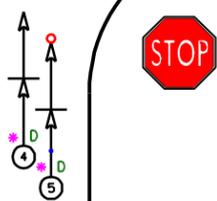
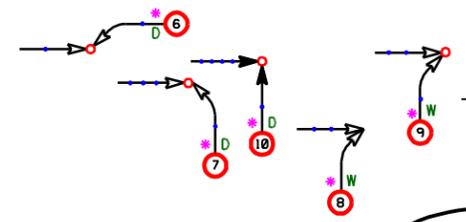
W 11

D 2

D 3

SR 2147
Friendly Ave
40 MPH

D 1



Friendway Rd
30 MPH



Target Crashes

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

	COLLISION DIAGRAM	
	DIVISION: 7	AREA:
	STUDY PERIOD: 7/1/1998 - 1/31/2003	
	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: 2-11-2009		
LOG NUMBER: SS* 07-02-232 BEFORE		

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

Coble Farm Drive
Residential Community
18 MPH

FLOWER MEDIAN



LEGEND

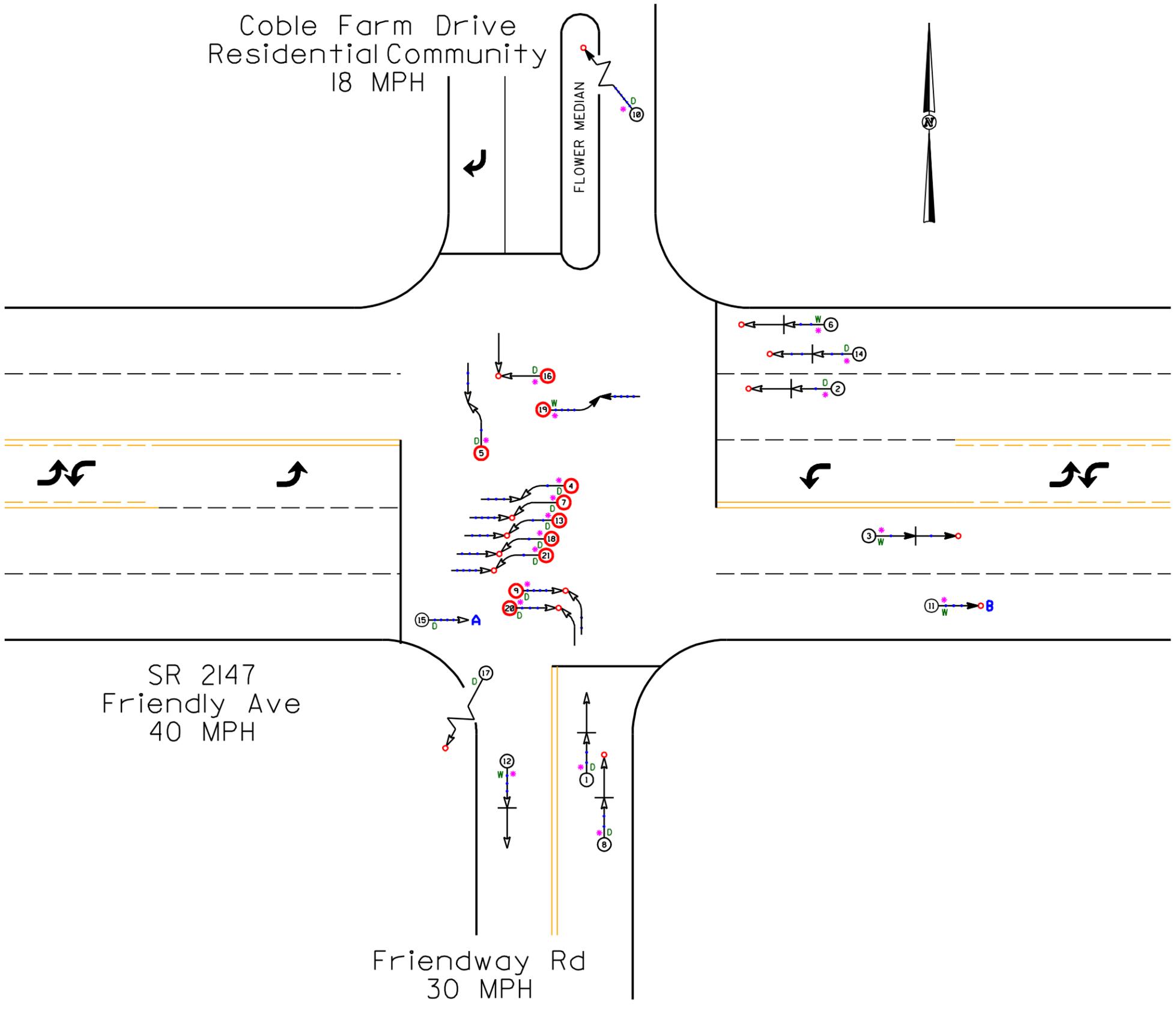
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	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PARKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PARKING VEHICLE		SIDESWIPE		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		INJURY		50 MPH TO 59		ICY OR SNOWY
	REAR END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

SS# 07-02-232
Guilford County
City of Greensboro
AFTER Period
10/1/03 - 10/31/08

New Signal
Installation
ID: 07-2044

SR 2147
Friendly Ave
40 MPH

Friendway Rd
30 MPH



Target Crashes

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

	COLLISION DIAGRAM	
	DIVISION: 7	AREA:
	STUDY PERIOD: 10/1/2003 - 10/31/2008	
	DISTANCE: Y-LINE = 150FT	
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DIAGRAM PREPARED BY: JBS		
DIAGRAM REVIEWED BY: ST		
SCALE: NOT TO SCALE		
DATE: 2-11-2009		
LOG NUMBER: SS* 07-02-232 AFTER		

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
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