

# **Spot Safety Project Evaluation**

Project Log # 200408181

Spot Safety Project # 03-96-014

**Spot Safety Project Evaluation, of an Actuated Overhead Flashing Traffic Signal  
And Post Mounted “Vehicles Entering When Flashing” Signs  
At the Intersection of SR 1102-Charity Road and SR 1162-Bay Road, Duplin County**

Documents Prepared By:

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

**Principal Investigator**

\_\_\_\_\_  
Carrie L. Goodrich

Traffic Safety Project Engineer

4/8/2005  
\_\_\_\_\_  
Date

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

## **Subject Location**

Evaluation of Spot Safety Project Number 03-96-014 – The Intersection of SR 1102-Charity Road at SR 1162-Bay Road, Duplin 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 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 a vehicle actuated overhead flashing traffic signal and post mounted “Vehicle Entering When Flashing” signs (with flashers mounted atop them) posted on both SR 1102-Charity Road approaches. Cynthia B. Watson, a NC House Representative, originally requested the improvements. Both SR 1102-Charity Road and SR 1162-Bay Road are two-lane facilities at the treatment intersection. SR 1162-Bay Road is under stop sign control. Both have a posted speed limit of 55 mph.

SR 1102-Charity Road has a curvilinear alignment at the subject intersection, which creates an entering sight restriction for the southbound SR 1162-Bay Road approach. Charity Middle School and Wallace-Rose High School are located near the intersection. The initial crash analysis for this location was completed from July 1, 1992 through June 30, 1996 with a total of fifteen reported crashes. There were eleven Angle crashes, two Ran-Off-Road crashes, one Rear-End crashes, and one Head On crash, resulting in one class B injuries and sixteen class C injuries. The final completion date for the improvements at the subject intersection was on January 24, 1998.

## **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 was from December 1, 1997 through March 31, 1998. The before period consisted of reported crashes from April 1, 1992 through November 30, 1997 (5 Years, 8 Months) and the after period consisted of reported crashes from April 1, 1998 through November 30, 2003 (5 Years, 8 Months). The treatment data consisted of all crashes within 150 feet of the subject intersection. Please see attached *Location Map* for further detail.

The attached data Table 1 depicts the Naive Before and After Analysis for the above information. The data in Tables 1 consists of an overall crash summary and a crash type summary for the treatment intersection. The overall crash summary contains high level crashes, crash rates, and vehicle exposure statistics. The crash type summary contains crashes broken down by accident type. The before period ADT year was 1995, and the after period ADT year was 2001. Please note that Angle crashes were the target crashes for the applied countermeasure.

As shown in Table 1, the naive before and after analysis at the treatment location resulted in a 45.5 percent decrease in Total Crashes, a 55.0 percent decrease in the Total Crash Rate, a 0.9 percent decrease in the Severity Index, and a 21.2 percent increase in Average Daily Traffic (ADT). Analysis of the treatment location also resulted in a 57.1 percent decrease in Angle Crashes.

## **Results and Discussion**

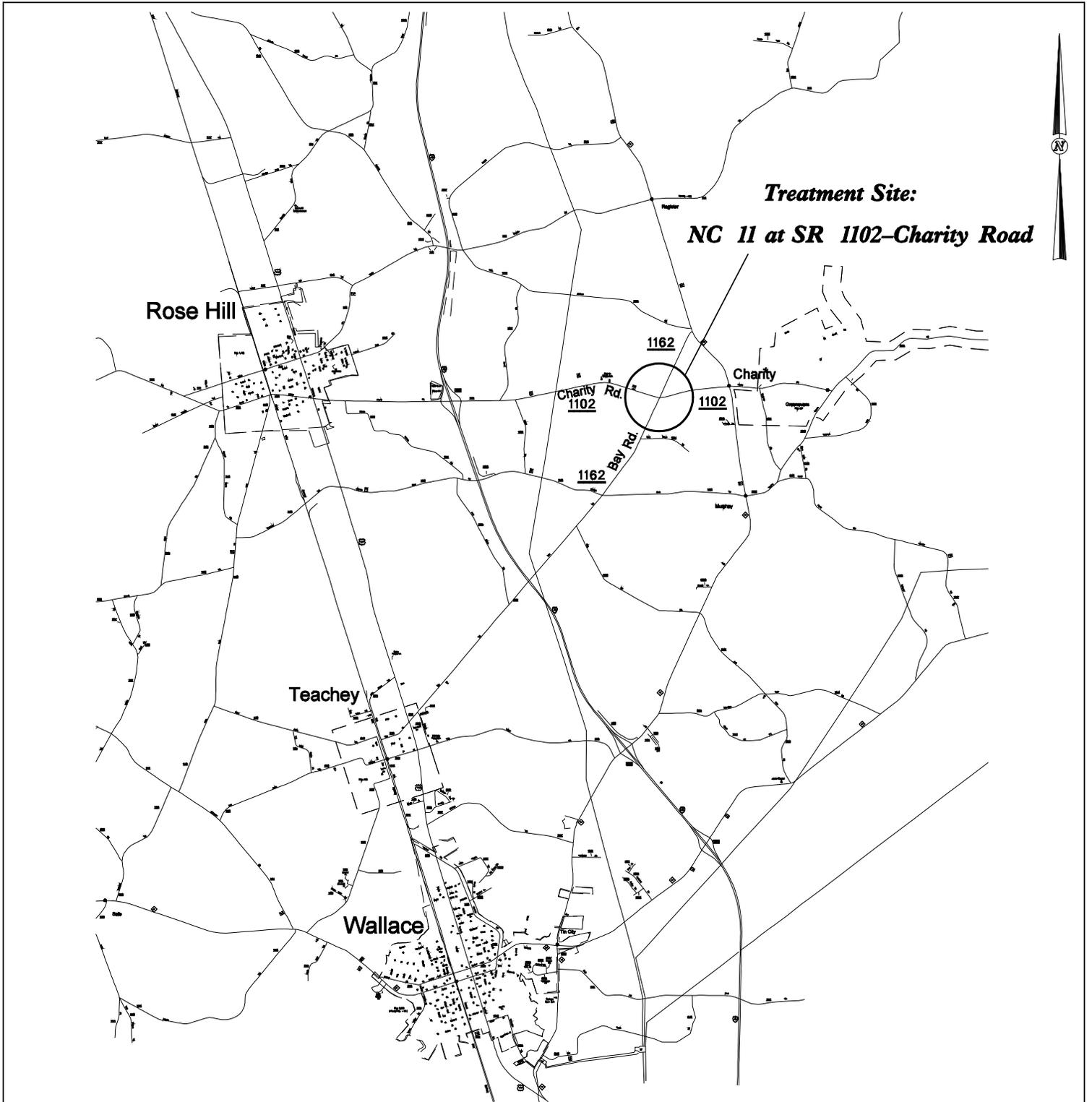
The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 45.5 percent decrease in Total Crashes and a 57.1 percent decrease in Angle Crashes. The summary results evaluating the spot safety project demonstrate that the treatment location appears to have a substantial decrease in Total Crashes and Angle Crashes from the before to the after period.

The countermeasure crash reduction for Total Crashes at the subject intersection is a 45.5 percent decrease in crashes. The countermeasure crash reduction for Angle Crashes at the subject intersection is a 57.1 percent decrease in crashes. 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.

Please see the attached *Treatment Site Location Photos*. Photos are provided for each leg of the treatment intersection. Please note that during my field investigation the flashers were not operating properly. The flashing traffic signal and the flashers located on each "Vehicle Entering When Flashing" sign were flashing continuously, even with no traffic present on SR 1162-Bay Road.

# *Location Map, Duplin County*

## *Evaluation of Spot Safety Project Number 03-96-014*



*Treatment Site Photo (Taken on December 15, 2004)*



Looking north on SR 1162-Bay Road



Looking south on SR 1162-Bay Road

*Treatment Site Photo (Taken on December 15, 2004)*



Looking west on SR 1102-Charity Road



Looking east on SR 1102-Charity Road

*Treatment Site Photo (Taken on December 15, 2004)*



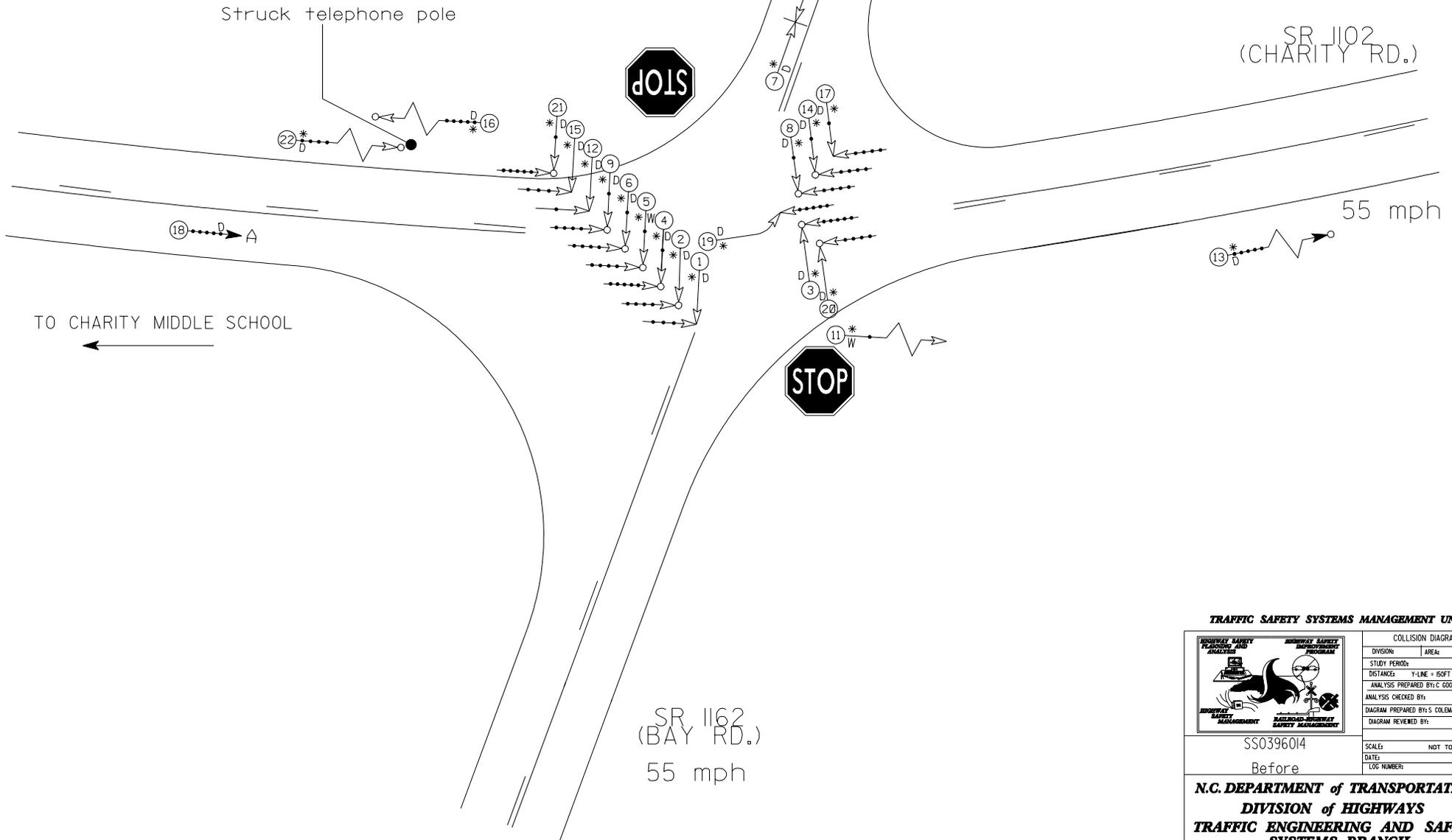
Approaching the subject intersection from eastbound SR 1102-Charity Road  
Notice the *Vehicle Entering When Flashing* sign.

Treatment Site  
 Before Period  
 4/1/1992 to 11/30/1997  
 (5 years 8 months)



**LEGEND**

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		10 MPH TO 19		T	TRAIN	
	PARKED VEHICLE		20 MPH TO 29		*	DRIVER AT FAULT	
	PARKING VEHICLE		30 MPH TO 39		D	DRY	
	DEER		40 MPH TO 49			50 MPH TO 59	
	FIXED OBJECT		60 MPH TO 69			TO AND UP	
	HEAD ON		OUT OF CONTROL			TO AND UP	
	REAR END		INJURY			TO AND UP	
	RAN OFF ROAD		FATALITY			SPEED UNKNOWN	



**TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT**

	COLLISION DIAGRAM	
	DIVISION:	AREA:
	STUDY PERIOD:	
	DISTANCE:	Y-LINE = 60FT
	ANALYSIS PREPARED BY: C. COOGRICH	
	ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: S. COLEMAN		
DIAGRAM REVIEWED BY:		
SS0396014		
Before		
SCALE:	NOT TO SCALE	
DATE:		
LOG NUMBER:		

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



Treatment Site  
 After Period  
 4/1/1998 to 11/30/2003  
 (5 years 8 months)

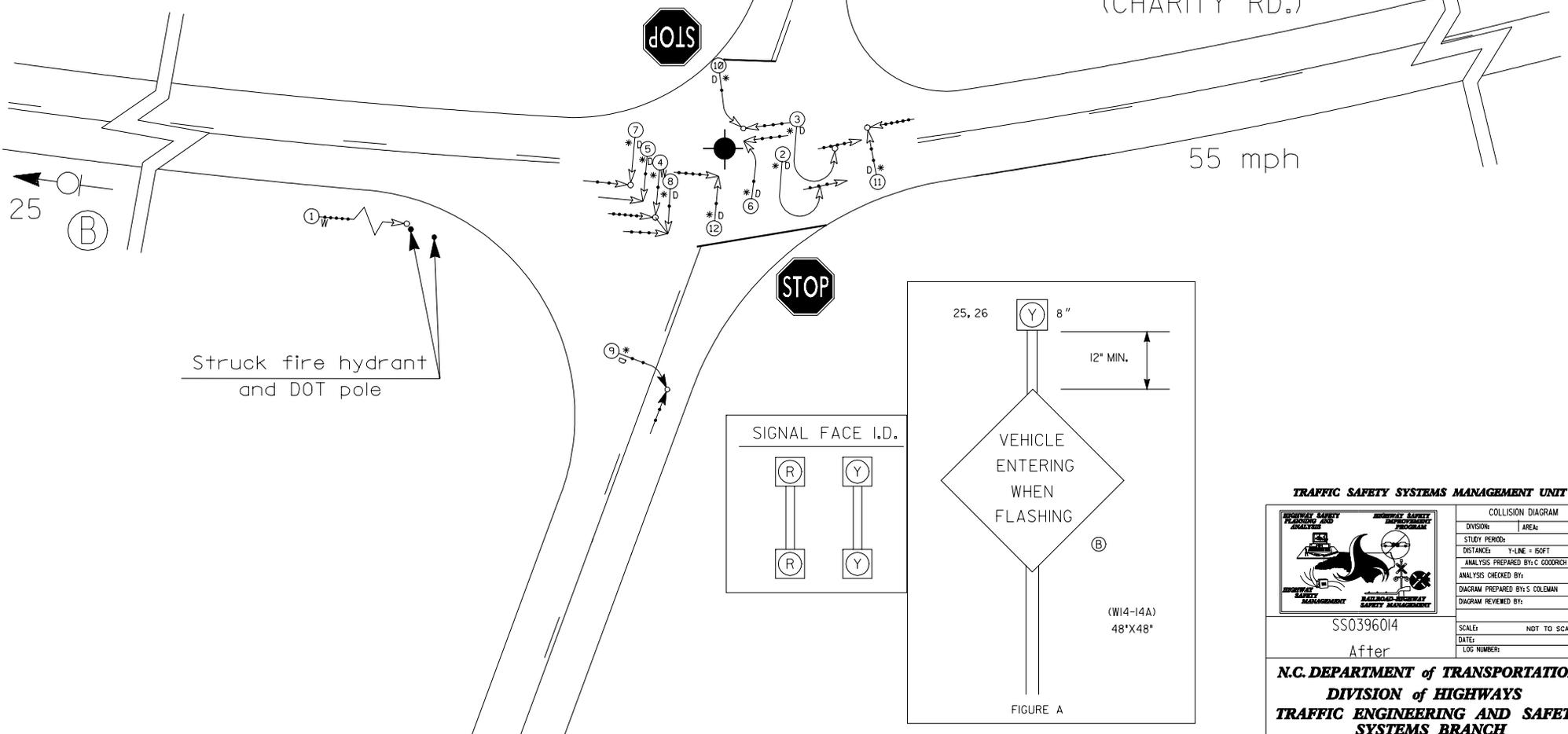
LEGEND			
	MOVING VEHICLE		ANGLE
	PEDESTRIAN		TURNING
	PARKED VEHICLE		BACKING
	PARKING VEHICLE		SIDESWIPE
	DEER		OUT OF CONTROL
	FIXED OBJECT		INJURY
	HEAD ON		FATALITY
	REAR END		SPEED UNKNOWN
	RAN OFF ROAD		U-TURN
	9 MPH OR LESS		P PEDESTRIAN
	10 MPH TO 19		T TRAIN
	20 MPH TO 29		* DRIVER AT FAULT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

55 mph

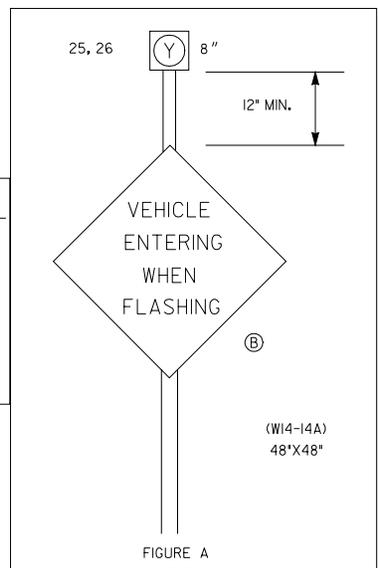
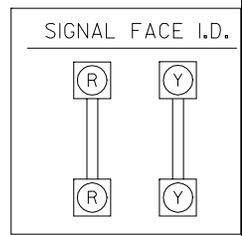
SR 1162  
 (BAY RD.)

TO CHARITY MIDDLE SCHOOL

SR 1102  
 (CHARITY RD.)



Struck fire hydrant  
 and DOT pole



**TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT**

	COLLISION DIAGRAM
	DIVISION: AREA:
	STUDY PERIOD:
	DISTANCE: Y-LINE = 60FT
	ANALYSIS PREPARED BY: C. COGORTH
	ANALYSIS CHECKED BY:
DIAGRAM PREPARED BY: S. COLEMAN	
DIAGRAM REVIEWED BY:	
SS0396014	SCALE: NOT TO SCALE
After	DATE:
	LOG NUMBER:

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