

Spot Safety Project Evaluation

Project Log # 200501243

Spot Safety Project # 11-00-200

**Spot Safety Project Evaluation, of the Flashing Traffic Signal Installation,
At the Intersection of NC 268 and SR 1003-Siloam Rd., Surry County**

Documents Prepared By:

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Principal Investigator

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04/12/2005
Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 11-00-200 – The Intersection of NC 268 and SR 1003-Siloam Rd., Surry 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 of the treatment data 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 countermeasure chosen for the subject location was the installation of an overhead flashing traffic signal. W.E. Hoke, P.E., Division Engineer, originally requested the improvements in an attempt to increase motorist awareness of the intersection. Both NC 268 and SR 1003-Siloam Rd are two-lane facilities at the treatment intersection. The posted speed limit on NC 268 is 45 mph and on SR 1003-Siloam Rd is 55 mph within the vicinity of the intersection. The subject location is controlled by dually posted stop signs on SR 1003-Siloam Rd. Previous treatments included speed limit reduction, installation of intersection warning signs with advisory speed, and commercial channelization.

The initial crash analysis for this location was completed from October 1, 1996 through September 30, 1999 with a total of seventeen reported crashes. Nine “possibly correctable” Angle crashes were included within the initial crash analysis, resulting in three class B injuries and eight class C injuries. The final completion date for the improvement at the subject intersection was on July 20, 2001.

Comparison 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 June 1, 2001 through August 31, 2001. The before period consisted of reported crashes from June 1, 1998 through May 31, 2001 (3 Years) and the after period consisted of reported crashes from September 1, 2001 through August 31, 2004 (3 Years). 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 subject intersection. The comparison data consisted of a sum of all crashes within 150 feet of seven intersections located near the treatment intersection. The intersections that comprise the comparison data are as follows:

- NC 268 at US 601,
- NC 268 at SR 2225-Bear Creek Church Rd,
- NC 268 at SR 2221-Rockford Rd,
- NC 268 at SR 2209-Copeland School Rd,
- NC 268 at SR 2227-Brayford Rd,
- NC 268 at SR 2037-Pratt Rd, and
- NC 268 at SR 2038-Anderson Rd-Eldora Rd

Please see attached *Location Map* for further detail. The following data table depicts 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.

Treatment Information

	Before	After	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	11	6	- 45.5
Total Severity Index	4.36	4.70	7.8
Frontal Impact Crashes	10	5	- 50.0
Frontal Severity Index	3.96	3.96	0.0
Volume	5400	5600	3.7

Comparison Information

	Before	After	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	31	34	9.7
Total Severity Index	13.65	7.15	- 47.6
Frontal Impact Crashes	21	23	9.5
Frontal Severity Index	17.90	8.16	- 54.4
Volume	3000	3000	0.0

Odds Ratio: Treatment versus Comparison

	Before	After	Percent Reduction (-)/ Percent Increase (+)
Treatment Total Crashes	11	6	---
Comparison Total Crashes	31	34	- 50.3 %

The naive before and after analysis at the treatment location resulted in a 45.5 percent decrease in Total Crashes, a 7.8 percent increase in the Total Severity Index, and a 3.7 percent increase in Average Daily Traffic (ADT). The comparison locations experienced a 9.7 percent increase in Total Crashes, a 47.6 percent decrease in the Total Severity Index, and a 0.0 percent increase in ADT. The before period ADT year was 1999 and the after period ADT year was 2003.

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 are 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 50.3 percent decrease in Total Treatment Intersection crashes.

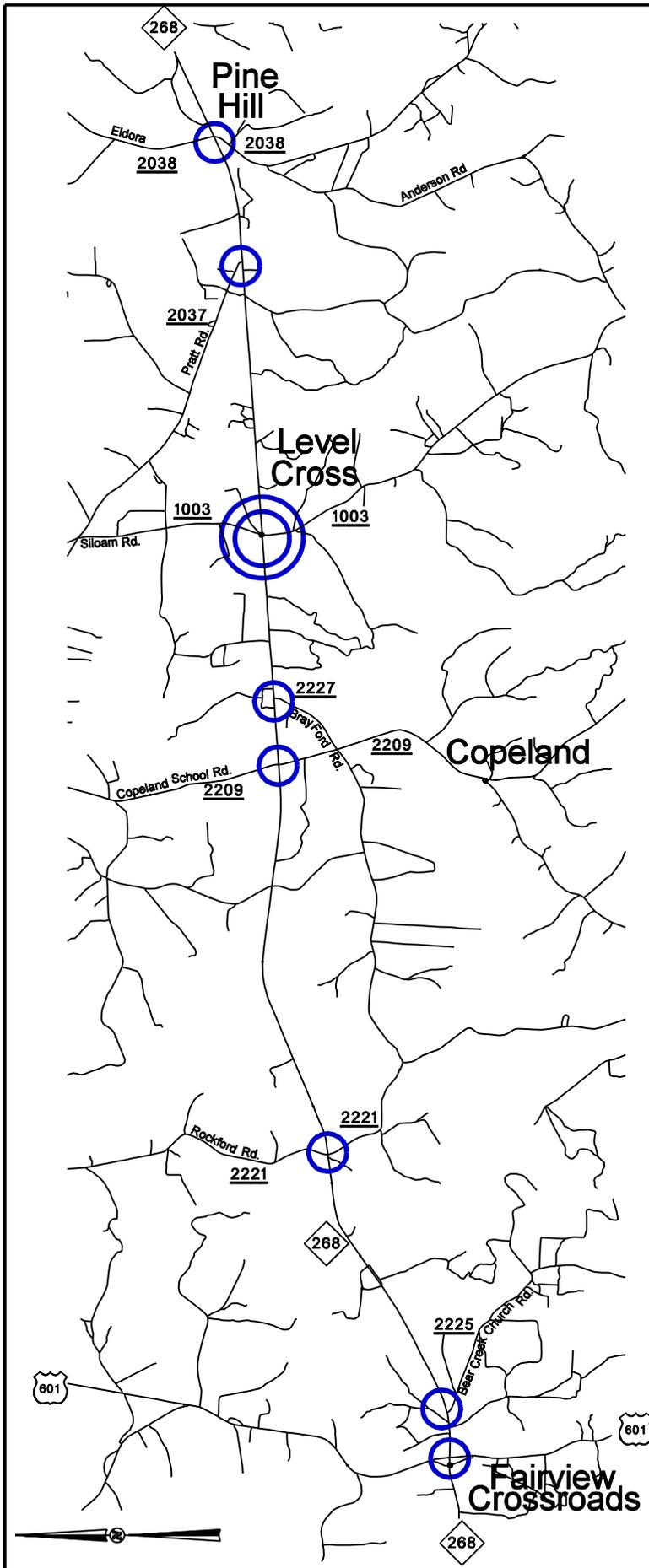
Results and Discussion

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 50.0 percent decrease in Frontal Impact Crashes. Using the Odds Ratio to calculate the treatment effect resulted in a 50.3 percent decrease in Total Crashes at the Treatment Intersection. The summary results above demonstrate that the treatment location appears to have had a decrease in the number of Total Crashes and a decrease in the number of Frontal Impact Crashes from the before to the after period. Please see the attached Treatment Site Photos. Photos are provided for each leg of the intersection. In addition, a photo is included which depicts the poor driveway channelization at the treatment location.

The countermeasure crash reduction for Total Crashes at the subject intersection can be in the range of a 45.5 percent decrease to a 50.3 percent decrease in crashes. The countermeasure crash reduction for Frontal Impact Crashes at the subject intersection is a 50.0 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.

Evaluation of Spot Safety Project Number 11-00-200

Location Map, Surry County



Treatment Site:

NC 268 at SR 1003-Siloam Rd

Comparison Sites:

NC 268 at US 601

NC 268 at SR 2225-Bear Creek Church Rd

NC 268 at SR 2221-Rockford Rd

NC 268 at SR 2209-Copeland School Rd

NC 268 at SR 2227-Brayford Rd

NC 268 at SR 2037-Pratt Rd

NC 268 at SR 2038-Anderson Rd-Eldora Rd

Treatment Site Photos (Taken on February 17, 2005)



Looking north on SR 1003-Siloam Rd



Looking south on SR 1003-Siloam Rd.
Notice the lack of channelization at the church parking lot adjacent to the roadway.

Treatment Site Photos (Taken on February 17, 2005)



Looking east on NC 268



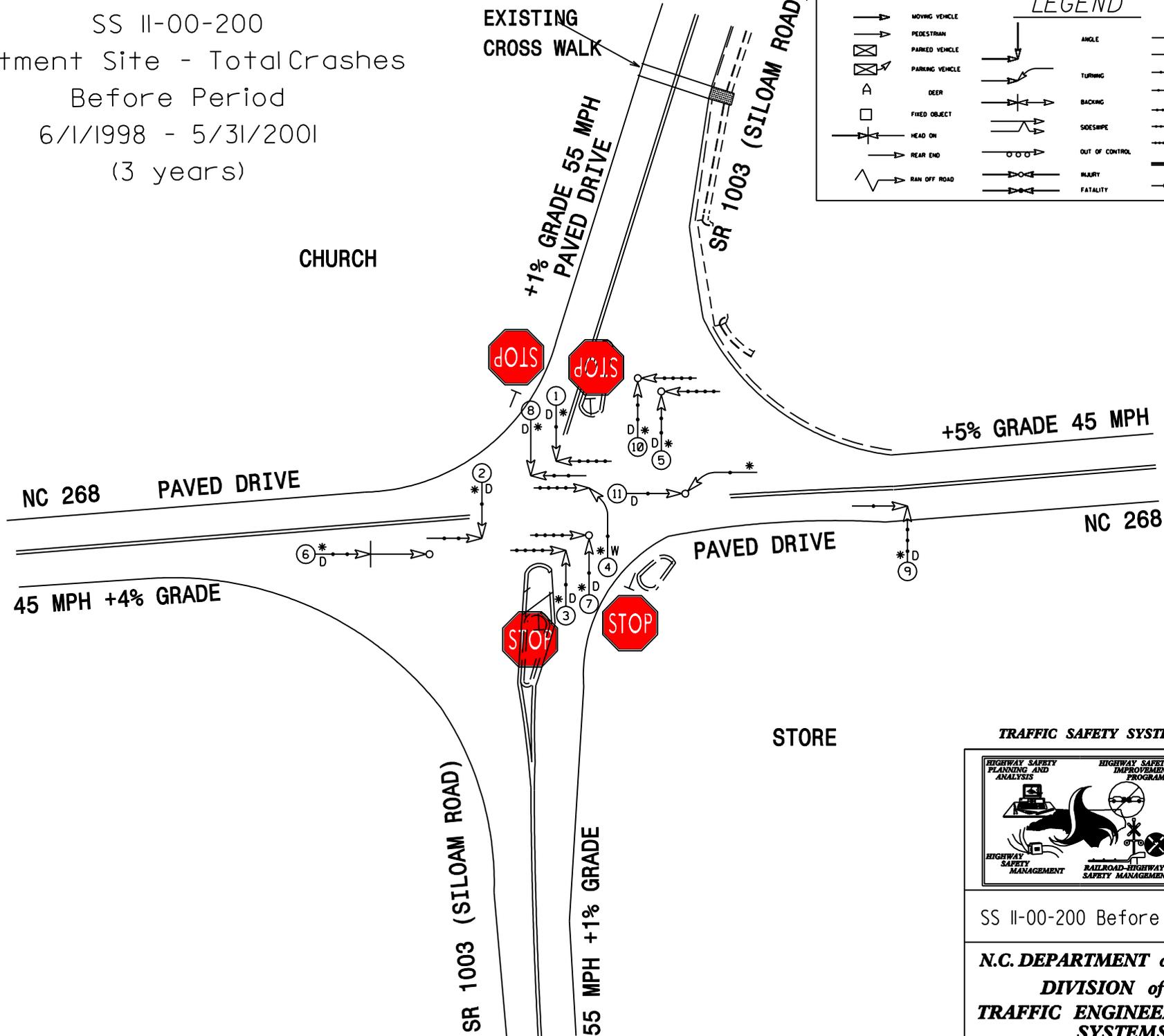
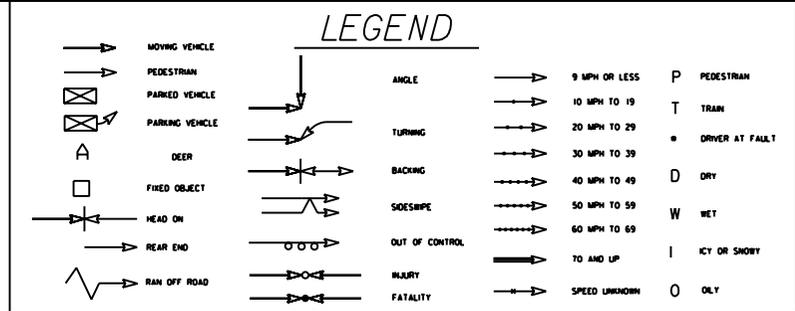
Looking west on NC 268

Treatment Site Photos (Taken on February 17, 2005)



Another photo (looking west) taken from Level Cross General Store parking lot.
Notice the “No Parking” pavement markings in front of the store.

SS II-00-200
 Treatment Site - TotalCrashes
 Before Period
 6/1/1998 - 5/31/2001
 (3 years)



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

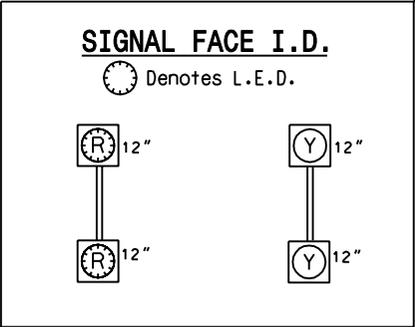
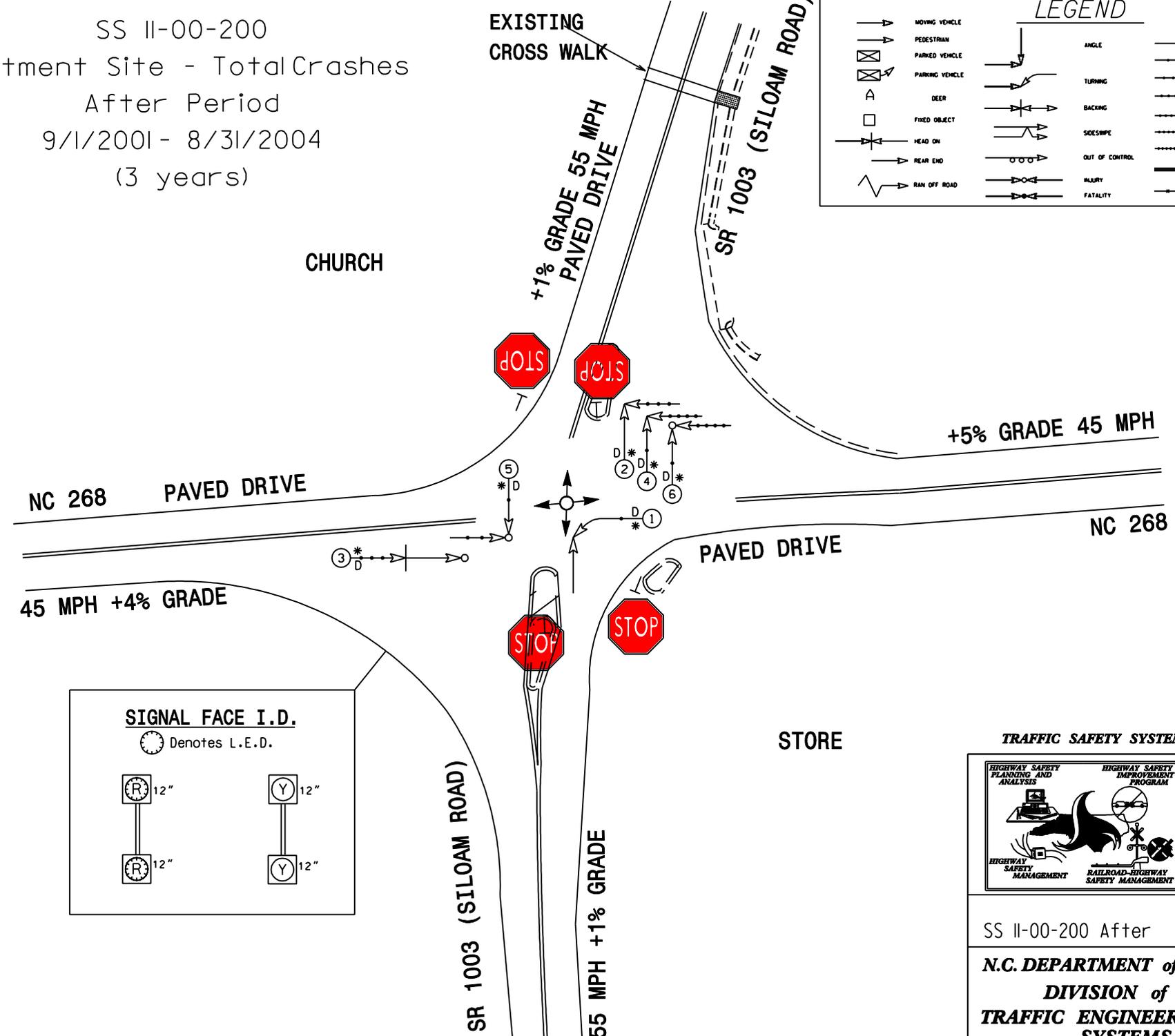
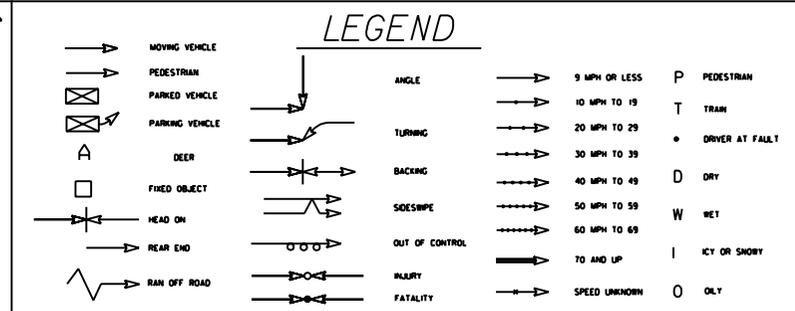
	COLLISION DIAGRAM	
	DIVISION:	AREA:
	STUDY PERIOD: 06/01/1998 - 05/31/2001	
	DISTANCE: Y-LINE : 150 ft	
	ANALYSIS PREPARED BY: CLG	
ANALYSIS CHECKED BY:		
DIAGRAM PREPARED BY: CLG		
DIAGRAM REVIEWED BY:		

SS II-00-200 Before

SCALE: NOT TO SCALE
 DATE: 3/14/05
 LOG NUMBER: 20050243

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

SS II-00-200
 Treatment Site - TotalCrashes
 After Period
 9/1/2001 - 8/31/2004
 (3 years)



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

COLLISION DIAGRAM	
DIVISION:	AREA:
STUDY PERIOD: 09/01/2001 - 08/31/2004	
DISTANCE: Y-LINE = 150 ft	
ANALYSIS PREPARED BY: CLG	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: CLG	
DIAGRAM REVIEWED BY:	
SCALE: NOT TO SCALE	
DATE: 3/14/05	
LOG NUMBER: 20050243	

SS II-00-200 After

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