

Spot Safety Project Evaluation

Project Log # 200408072

Spot Safety Project # 03-97-402

**Spot Safety Project Evaluation, of the Traffic Signal Upgrades
At the Intersection of NC 11 and NC 41 near Wallace, 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

4/11/2005
Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 03-97-402 – The Intersection of NC 11 at NC 41 near Wallace, 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. The evaluation also analyzes additional countermeasures made at the subject intersection since the spot safety project improvement was completed. 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 to actuate the existing standard flasher and to add post mounted “Vehicle Entering When Flashing” signs on NC 41. The improvements were originally requested through the 1996 Safety Program. NC 11 was a two-lane facility with dually posted Stop signs at the intersection with NC 41. NC 41 had exclusive left turn lanes for traffic accessing NC 11 and a standard flasher to warn motorists of the intersection. Both have a speed limit of 35 mph.

The improvements were chosen due to a pattern of motorists on NC 11 entering the path of westbound vehicles on NC 41. Sight distance is limited looking west from the NC 11 approaches due to a slight horizontal curve. The initial crash analysis for this location was completed from February 1, 1993 through January 31, 1997 with a total of 26 reported crashes. There were six Left Turn crashes, eleven Angle crashes, four Rear-End crashes, four Run Off Road crash, and one Animal related crash. Three class A, seven class B, and 21 class C injuries resulted. The final completion date for the improvements at the subject intersection was on January 31, 1998.

After the spot safety project improvement, a five-phase fully actuated traffic signal was installed at the treatment intersection. In addition, NC 11 was re-striped to provide exclusive left-turn lanes on each approach. These improvements took place in the April 2001.

Naive 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 December 1, 1994 through November 30, 1997 (3 Years) and the after period consisted of reported crashes from April 1, 1998 through March 31, 2001 (3 Years). The latest improvements made at the intersection were also analyzed. The present period consisted of reported crashes from June 1, 2001 through May 31, 2004 (3 Years). 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 Analysis for the above information. The data in Table 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. Before period crash data, after period crash data, present period crash data, the percent change in crashes from the before to the after period, and the percent change in crashes from the after to the present period are also included. The before period ADT year was 1996, the after period ADT year was 1999, and the present period ADT year was 2002. Please note that Frontal Impact crashes were the target crashes for the spot safety countermeasure and for the improvements completed in 2001 at the intersection. 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.

As shown in Table 1, the naive analysis of the spot safety project improvement resulted in a 56.0 percent decrease in Total Crashes, a 71.8 percent decrease in the Total Crash Rate, a 73.1 percent decrease in the Severity Index, and a 55.9 percent increase in Average Daily Traffic (ADT). Analysis of the spot safety improvement at the treatment location also resulted in a 71.4 percent decrease in Angle Crashes and a 68.4 percent decrease in Frontal Impact Crashes. The naive analysis of the improvements completed in 2001 resulted in a 36.4 percent decrease in Total Crashes, a 45.2 percent decrease in the Total Crash Rate, a 38.1 percent increase in the Severity Index, and a 16.0 percent increase in ADT. Analysis of the improvements completed in 2001 at the treatment location also resulted in a 25.0 percent decrease in Angle Crashes and a 16.7 percent decrease in Frontal Impact Crashes.

Results and Discussion

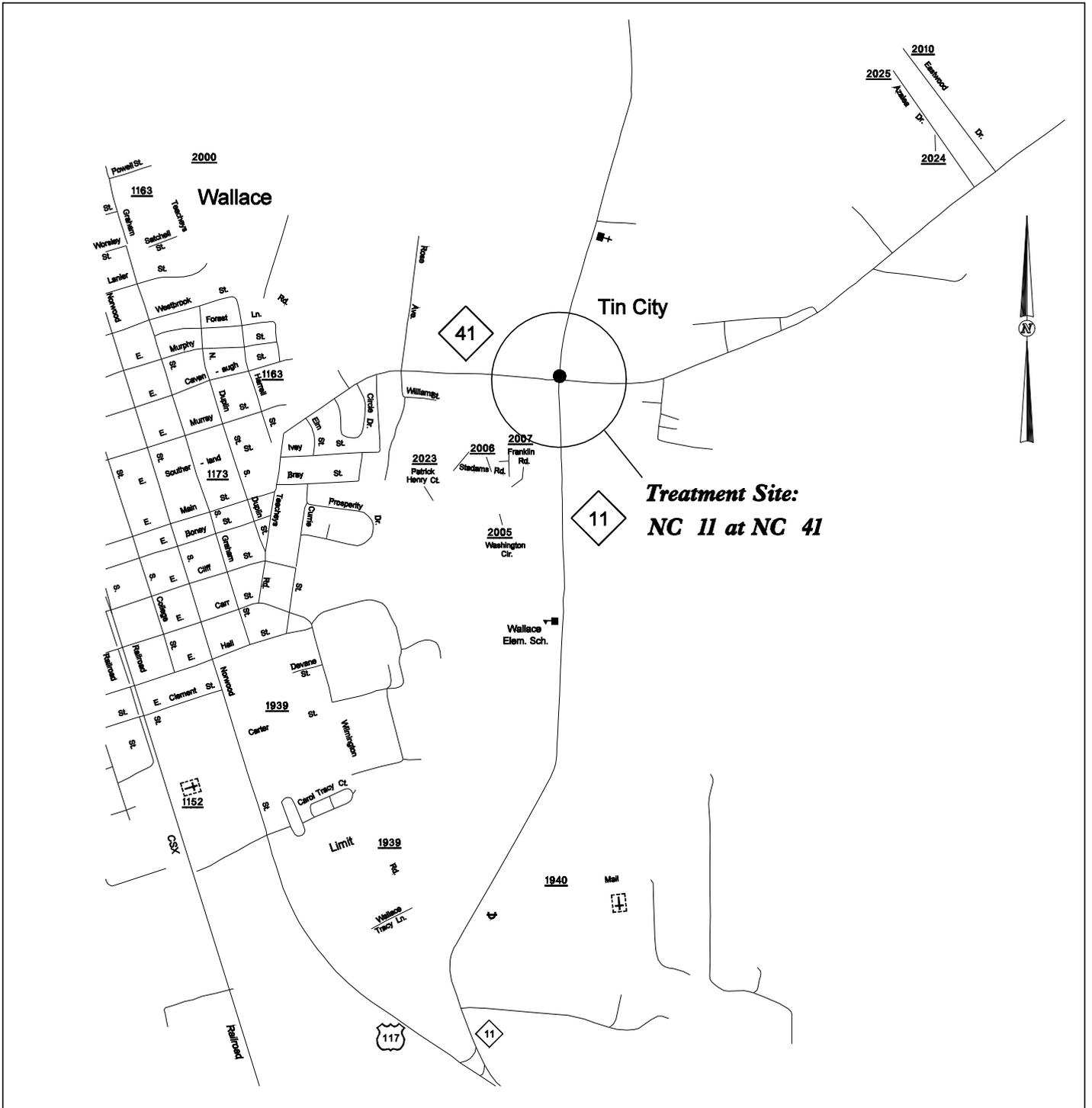
The naive analysis involving the comparison of treatment before data versus treatment after data resulted in a 56.0 percent decrease in Total Crashes and a 68.4 percent decrease in Frontal Impact Crashes. The summary results evaluating the spot safety project demonstrate that the treatment location appears to have a decreases in Total Crashes and Frontal Impact Crashes from the before to the after period. The Severity Index also decreased by 73.1 percent from the before to the after period.

The naive analysis involving the comparison of treatment after data versus treatment present data resulted in a 36.4 percent decrease in Total Crashes and a 16.7 percent decrease in Frontal Impact Crashes. The Severity Index also increased by 38.1 percent from the after to the present period. The summary results evaluating the installation of a 5-phase fully actuated traffic signal completed in 2001 demonstrate that the treatment location appears to have a decreases in Total Crashes and Frontal Impact Crashes from the after to the present period. Please take into account that the before period, after period, and present period data consisted of only three years of crash data.

Please see the attached *Treatment Site Location Photos*. Current photos are provided for each leg of the treatment intersection.

Location Map, Duplin County

Evaluation of Spot Safety Project Number 03-96-014



Treatment Site Photo (Taken on November 12, 2004)



Looking north on NC 11



Looking south on NC 11

Treatment Site Photo (Taken on November 12, 2004)



Looking west on NC 41

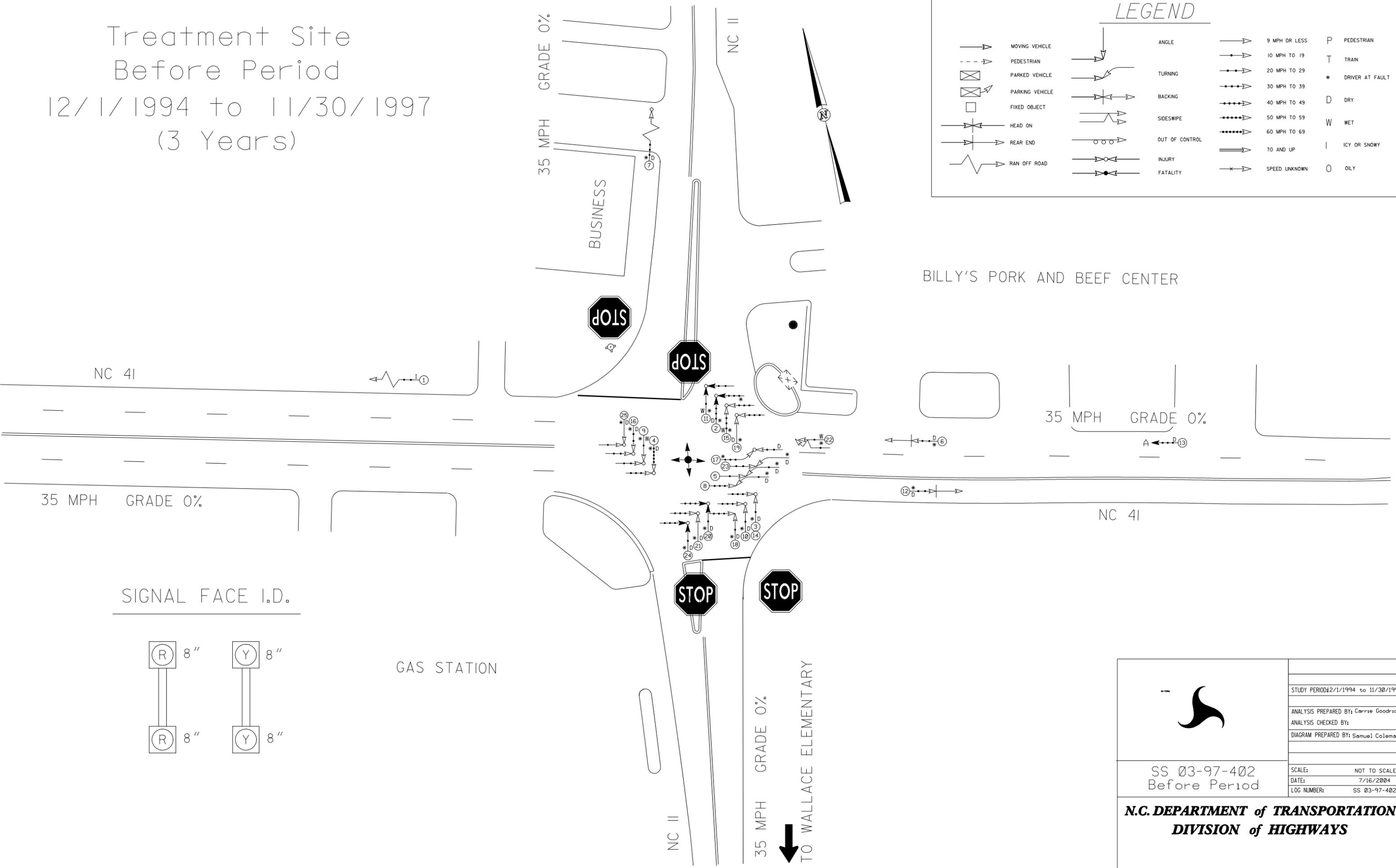


Looking east on NC 41

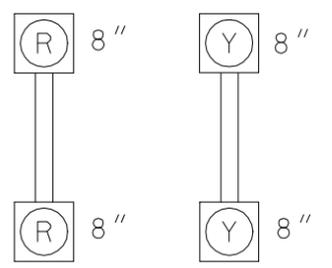
Treatment Site
Before Period
12/1/1994 to 11/30/1997
(3 Years)

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		OILY
	RAN OFF ROAD		70 AND UP		SPEED UNKNOWN		



SIGNAL FACE I.D.



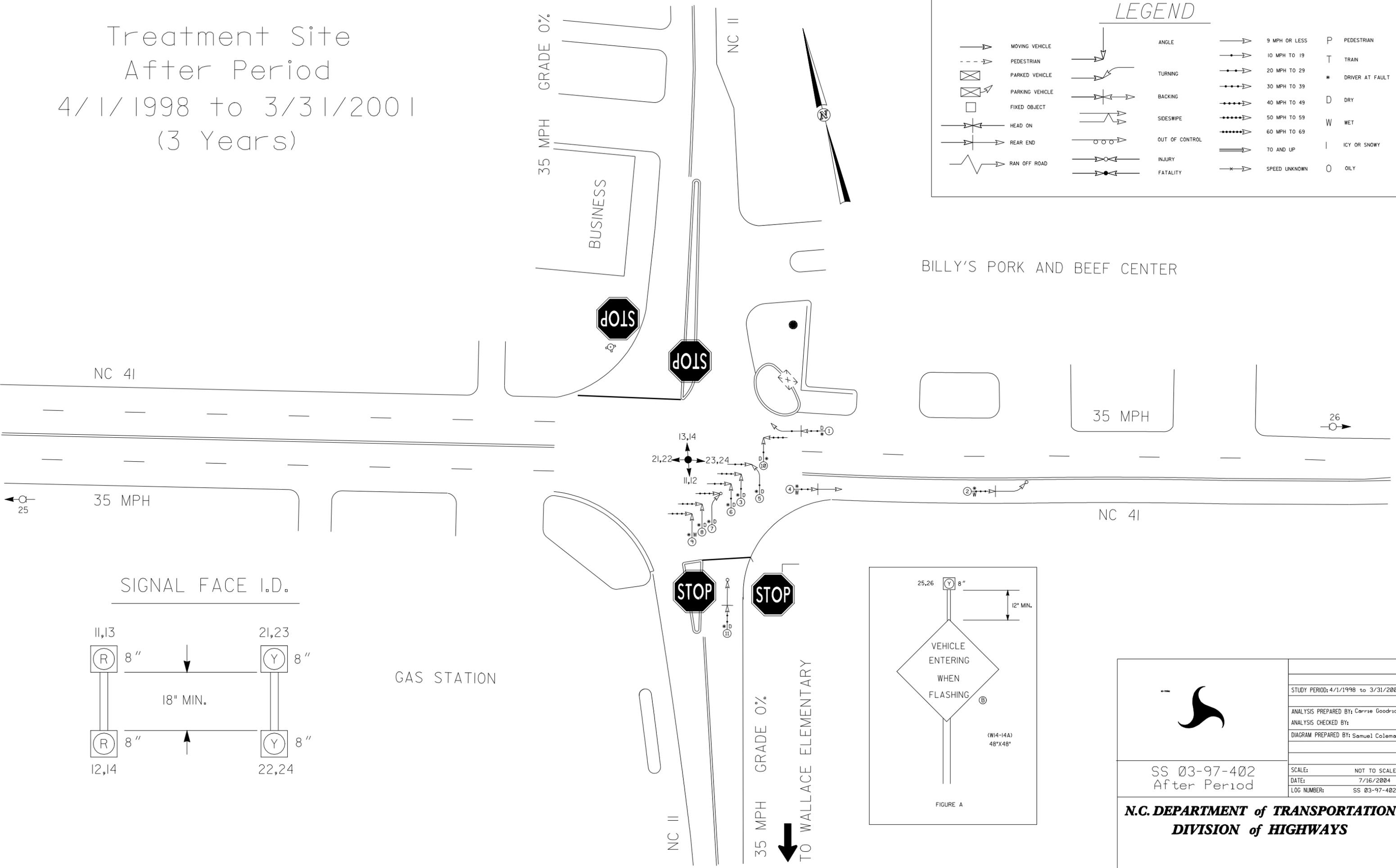
GAS STATION

35 MPH GRADE 0%
↓ TO WALLACE ELEMENTARY

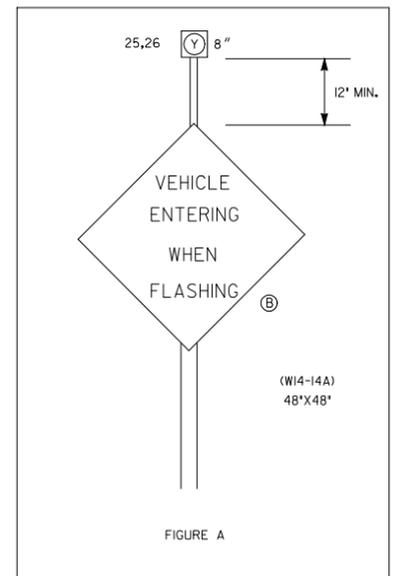
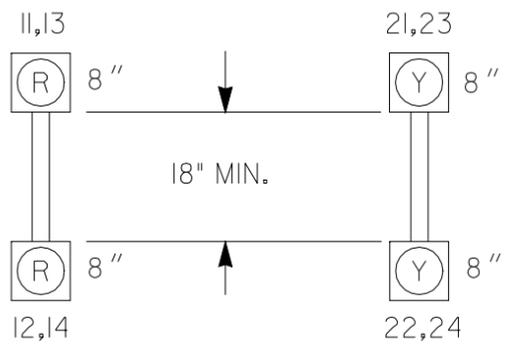
	STUDY PERIOD: 12/1/1994 to 11/30/1997
	ANALYSIS PREPARED BY: Carrie Goodrich ANALYSIS CHECKED BY: DIAGRAM PREPARED BY: Samuel Coleman
SS 03-97-402 Before Period	SCALE: NOT TO SCALE DATE: 7/16/2004 LOG NUMBER: SS 03-97-402
N.C. DEPARTMENT of TRANSPORTATION DIVISION of HIGHWAYS	

Treatment Site
After Period
4/1/1998 to 3/31/2001
(3 Years)

MOVING VEHICLE		ANGLE		9 MPH OR LESS		P PEDESTRIAN	
	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		OILY
	RAN OFF ROAD		70 AND UP		SPEED UNKNOWN		



SIGNAL FACE I.D.



	STUDY PERIOD: 4/1/1998 to 3/31/2001
	ANALYSIS PREPARED BY: Carrie Goodrich
	ANALYSIS CHECKED BY:
	DIAGRAM PREPARED BY: Samuel Coleman
SS 03-97-402 After Period	SCALE: NOT TO SCALE
	DATE: 7/16/2004
	LOG NUMBER: SS 03-97-402

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS