

# **Spot Safety Project Evaluation**

Project Log # 200611074

Spot Safety Project # 09-00-213

**Spot Safety Project Evaluation of the Traffic Signal Installation at Jackson Avenue  
And Median Divider Installation at Dunleith Avenue at their Intersections with  
US 311 (New Walkertown Road) and the Eastway Shopping Plaza  
Forsyth County**

Documents Prepared By:

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

**Principal Investigator**

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Jason B. Schronce

2-2-2007  
Date

Traffic Safety Project Engineer

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

### **Subject Location**

Evaluation of Spot Safety Project Number 09-00-213 – The Intersection of US 311 (New Walkertown Road) with Dunleith Ave / Eastway Shopping Center Driveway and US 311 (New Walkertown Road) with Jackson Ave / Eastway Shopping Center Driveway in Forsyth County.

### **Project Information and Background from the Project File Folder**

The spot safety project improvement countermeasures chosen for the subject location were the installation of a fully actuated traffic signal at Jackson Avenue and raised median channelization at Dunleith Avenue. Jackson Avenue was also converted to a one-way street traveling north. An exclusive left-turn lane was constructed on US 311 (New Walkertown Road) to the Eastway Shopping Plaza at the signal of Jackson Avenue. US 311 (New Walkertown Road) is a 5-lane facility with a center turn lane and a speed limit of 35 mph. Jackson and Dunleith Avenues are downtown residential streets with little to no pavement markings and allow on-street parking.

The original statement of problem was that westbound US 311 motorists and Eastway Shopping Center patrons use Dunleith Avenue as a shortcut route to Fifth Street rather than making a left turn at the traffic signal at the intersection of US 311 and Martin Luther King, Jr. Boulevard. This results in angle collisions from steady traffic volumes and small traffic gaps. The proposed improvements were requested by the Winston-Salem DOT.

The initial crash analysis was completed from October 1, 1997 to October 1, 2000 with 23 reported crashes, including 15 that were considered correctable by the chosen countermeasures. The final completion date for the improvement at the subject intersection was on June 30, 2002 with a total cost of \$80,000.

### **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 April 1, 2002 to September 30, 2002. The before period consisted of reported crashes from May 1, 1998 through March 31, 2002 (3 years and 11 months) and the after period consisted of reported crashes from October 1, 2002 through August 31, 2006 (3 years and 11 months). The ending date for this analysis was determined by the available crash data at the time the analysis was completed.

The treatment data consisted of all crashes within 150 feet west of Dunleith Avenue and 150 feet east of Jackson Avenue. *Please see attached location 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, same roadway; Right turn, different roadways; Head on; and Angle.

<b>Treatment Information</b>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total crashes	21	17	- 19.05 %
Total Severity Index	4.17	2.74	- 34.29 %
Target Crashes	14	2	- 85.71 %
Target Crash Severity Index	4.70	1.00	- 78.72 %
Volume	15,800	16,900	6.96 %
<b>Injury Summary</b>			
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	1	1	0.00 %
Class C Injury Crashes	8	3	-62.50 %
Total Injury Crashes	9	4	- 55.56 %

The naive before and after analysis at the treatment location resulted in an 19 percent decrease in Total Crashes, an 86 percent decrease in Target Crashes, a 34 percent decrease in the Total Severity Index, and a 7 percent increase in Average Daily Traffic (ADT). The before period ADT year was 2000 and the after period ADT year was 2004.

## 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 19 percent decrease in Total Crashes and a 86 percent decrease in Target Crashes, with a 7 percent increase in ADT. The Total Severity Index decreased by 34 percent and the Target Crash Severity Index decreased by 79 percent. The summary results above demonstrate that both Total Crashes and Target Crashes appear to have decreased at the treatment location from the before to the after period.

Referencing the *Collision Diagram, Before Period*, there were patterns of Frontal Impact Crashes for all combinations of travel between US 311 (New Walkertown Road) and Dunleith Ave / West Entrance of Eastway Shopping Plaza. The countermeasure of raised median channelization eliminated the through and left turn movements and nearly abolished after period crashes. In the after period there was only one target “angle” crash between vehicles traveling on different roads at this intersection.

The other after period target crash included a vehicle traveling northbound on Jackson making a left turn and traveling the wrong direction on US 311 (New Walkertown Road). The vehicle collided

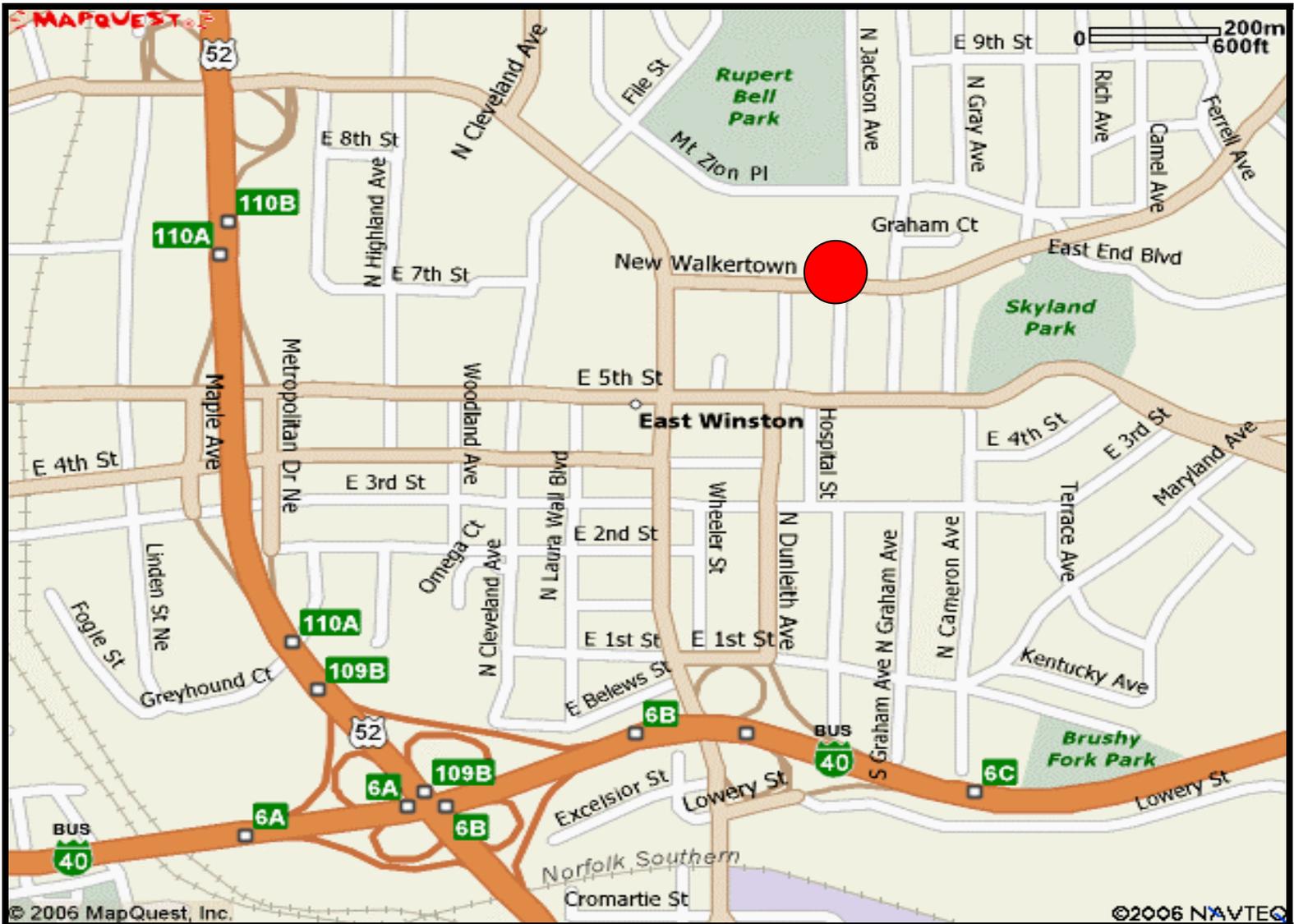
with another vehicle coming to a stop at the signal of Jackson Avenue. This crash pattern does not appear to be duplicated in the after period.

Patterns of Rear-End Crashes developed on both directions of travel on US 311 in the after period. Westbound Rear-End Crashes increased 400% (from 0 to 4) and eastbound Rear-End Crashes increased 300% (from 1 to 4). One other rear-end collision occurred on northbound Jackson Avenue during icy road conditions.

Please see the attached *Treatment Site Photos*. Photos are provided for all approaches to the treatment intersection.

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  
Forsyth County  
Evaluation of Spot Safety Project # 09-00-213**



**Treatment Location: US 311 (New Walkertown Road) and Jackson Ave / Eastway Shopping Center**



*Treatment Site Photos taken December 19, 2006*



Driving East on US 311 (New Walkertown Road)



Driving East on US 311



Driving West on US 311 with advanced warning signs of new signal



Driving West on US 311 at signal



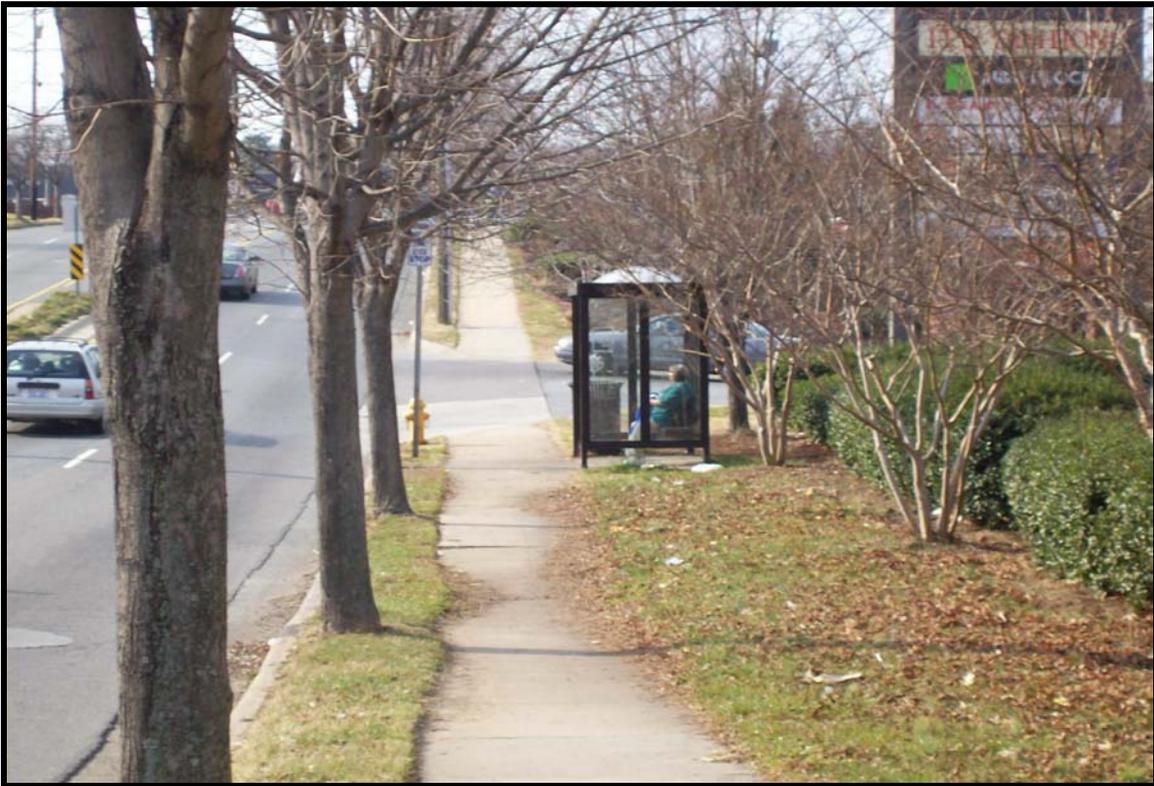
Driving West on US 311 at new median



Driving North on Jackson at new signal (Jackson converted to one-way street)



Driving South from Eastway Plaza (new traffic pattern)



Bus Hub along Roadway

EASTWAY SHOPPING CENTER

LEGEND

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PAKED VEHICLE		SIDESWIPE		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		HIT		50 MPH TO 59		ICY OR SNOW
	REAR END		FATALITY		60 MPH TO 69		70 AND UP
	RAN OFF ROAD		SPEED UNKNOWN		SPEED UNKNOWN		ONLY

SS# 09-00-213  
 FORSYTH COUNTY  
 BEFORE PERIOD  
 5/1/1998 - 3/31/2002  
 US 311 at JACKSON AVE

US 311  
 NEW WALKERTOWN RD

35 MPH

DUNLEITH AVE

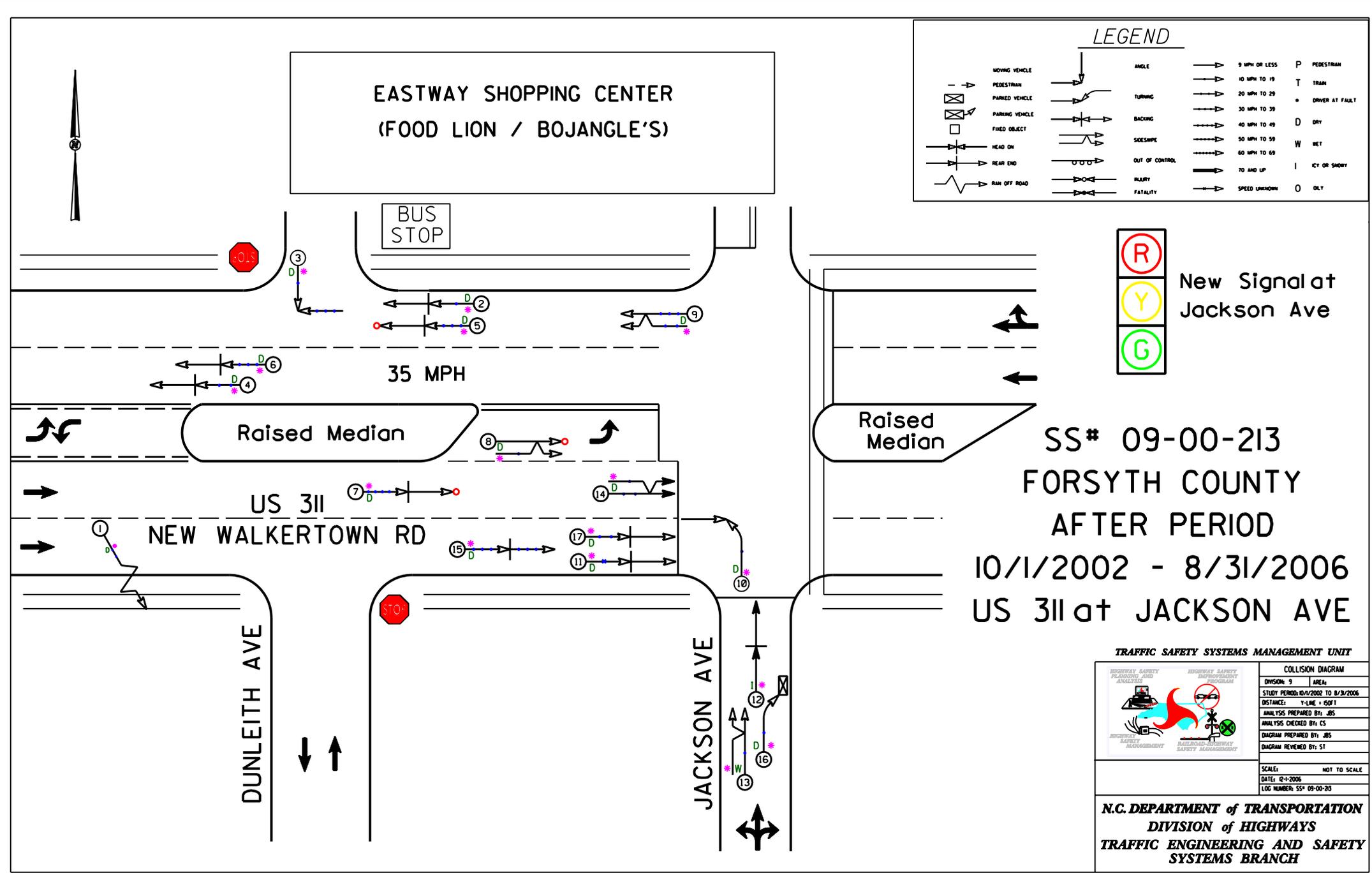
JACKSON AVE

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT



COLLISION DIAGRAM	
DIVISION: 9	AREA:
STUDY PERIOD: 5/1/1998 TO 3/31/2002	
DISTANCE: 1/4 MI + 150 FT	
ANALYSIS PREPARED BY: JBS	
ANALYSIS CHECKED BY: CS	
DIAGRAM PREPARED BY: JBS	
DIAGRAM REVIEWED BY: ST	
SCALE:	NOT TO SCALE
DATE:	12-1-2006
LOG NUMBER:	SS# 09-00-213

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



**TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT**

	<b>COLLISION DIAGRAM</b>
	DIVISION: 9 AREA: _____
	STUDY PERIOD: 10/1/2002 TO 8/31/2006
	DISTANCE: 1-LINE + 500 FT
	ANALYSIS PREPARED BY: JBS
ANALYSIS CHECKED BY: CS	
DIAGRAM PREPARED BY: JBS	
DIAGRAM REVIEWED BY: ST	
SCALE: NOT TO SCALE	
DATE: 12-1-2006	
LOG NUMBER: SS* 09-00-213	

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