

# **Spot Safety Project Evaluation**

Project Log # 200610094

Spot Safety Project # 04-01-219

## **Spot Safety Project Evaluation of the Traffic Signal and Left Turn Lane Installation at SR 1010 and SR 1526 in Johnston County**

Documents Prepared By:

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North Carolina Department of Transportation

**Principal Investigator**

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Traffic Safety Project Engineer

2/6/07  
Date

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

## **Subject Location**

Evaluation of Spot Safety Project Number 04-01-219 – Traffic Signal Installation at SR 1010 and SR 1526 and Left Turn Lane Installation on SR 1010 in Johnston County.

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

Both SR 1010 and SR 1526 were two-lane roadways with speed limits of 45 mph. The intersection was controlled by stop signs on SR 1526.

A previous study identified 8 total crashes at the subject intersection between June 30, 1997 through June 30, 2000. There were 5 crashes that were considered correctable, 3 angle crashes, 1 left turn, and 1 rear end type crash. The problem at the intersection was stated to be heavy development and a sharp increase in ADT. The countermeasures chosen were to install a traffic signal and install left turn lanes for vehicles on SR 1010. The final completion date for the improvements at the subject location was on September 19, 2002 at a cost of \$115,000.

## **Naive Before and After Analysis**

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from August 2002 through October 2002. The before period consisted of reported crashes from September 1, 1998 through July 31, 2002 (3 years, 11 months) and the after period consisted of reported crashes from November 1, 2002 through September 30, 2006 (3 Years, 11 months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes within 150 feet of the subject intersection. The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact crashes for the entire intersection and Rear End crash types on SR 1010 were the target crashes for the applied countermeasures. These crash types considered are as follows: Left Turn, same roadway; Left Turn, different roadway; Right Turn, same roadway; Right Turn, different roadway; Head On, Angle; Rear End, slow or stop; and Rear End, turn.

<u>Treatment Information</u>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total Crashes	12	10	-16.7
Total Severity Index	11.6	4.0	-66.0
Frontal Impact Crashes	10	5	-50.0
Frontal Severity Index	13.0	5.4	-58.2
Rear End Crashes <sup>1</sup>	2	5	150.0
Rear End Severity Index	4.7	2.5	-47.2
Volume	10050	13820	37.5

<u>Treatment Injury Crashes</u>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Fatal	0	0	N/A
Class A	1	0	-100.0
Class B	4	1	-75.0
Class C	3	3	0.0
Property Damage Only	4	6	50.0

<u>Frontal Impact Injury Crashes</u>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Fatal	0	0	N/A
Class A	1	0	-100.0
Class B	4	1	-75.0
Class C	2	2	0.0
Property Damage Only	3	2	-33.3

<u>Rear End Injury Crashes</u>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Fatal	0	0	N/A
Class A	0	0	N/A
Class B	0	0	N/A
Class C	1	1	0.0
Property Damage Only	1	4	300.0

Table 1.

<sup>1</sup>All reported rear end crashes occurred on SR 1010 in the Before and After Period.

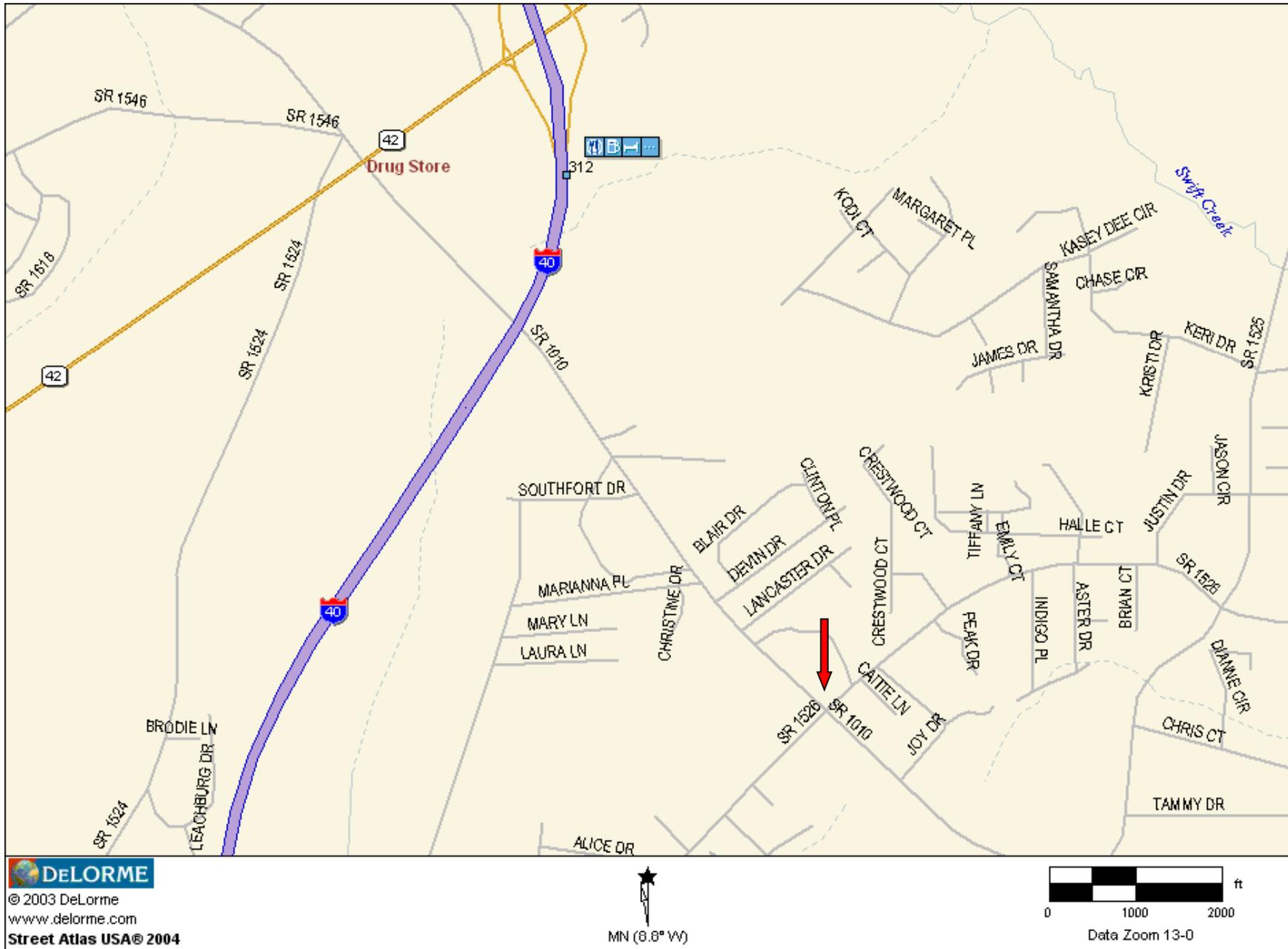
The naive before and after analysis at the treatment location resulted in a 17 percent decrease in Total Crashes, a 50 percent decrease in Frontal Impact Crashes, a 150 percent increase in Rear End Crashes, and a 38 percent increase in Average Daily Traffic (ADT). The before period ADT year was 2000 and the after period ADT year was 2004.

## **Results and Discussion**

The naïve before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 17 percent decrease in Total Crashes, a 50 percent decrease in Frontal Impact Crashes, and a 150 percent increase in Rear End Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in the number of Total Crashes, a decrease in the number of Frontal Impact Crashes and an increase in Rear End Crashes from the before to the after period.

From the data presented in Table 1 the project seems to be successful in reducing frontal impact crashes. Both the number and severity of the frontal impact crashes were reduced by at least 50 percent. There was an increase in rear end crashes, but the severity was reduced by 47 percent. From the 5 rear end crashes that occurred in the after period none of them occurred in the left turn lane on SR 1010. This information may point out that vehicles are following too close to the lead vehicle and that rear end crashes are not occurring because of left turning vehicles from SR 1010.

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 road.



Location Map: Johnston County, SR 1010 and SR 1526

*Treatment Site Photos taken January 22, 2007*



Traveling south on SR 1526



Traveling south on SR 1526



Traveling north on SR 1526



Traveling north on SR 1526



Traveling west on SR 1010

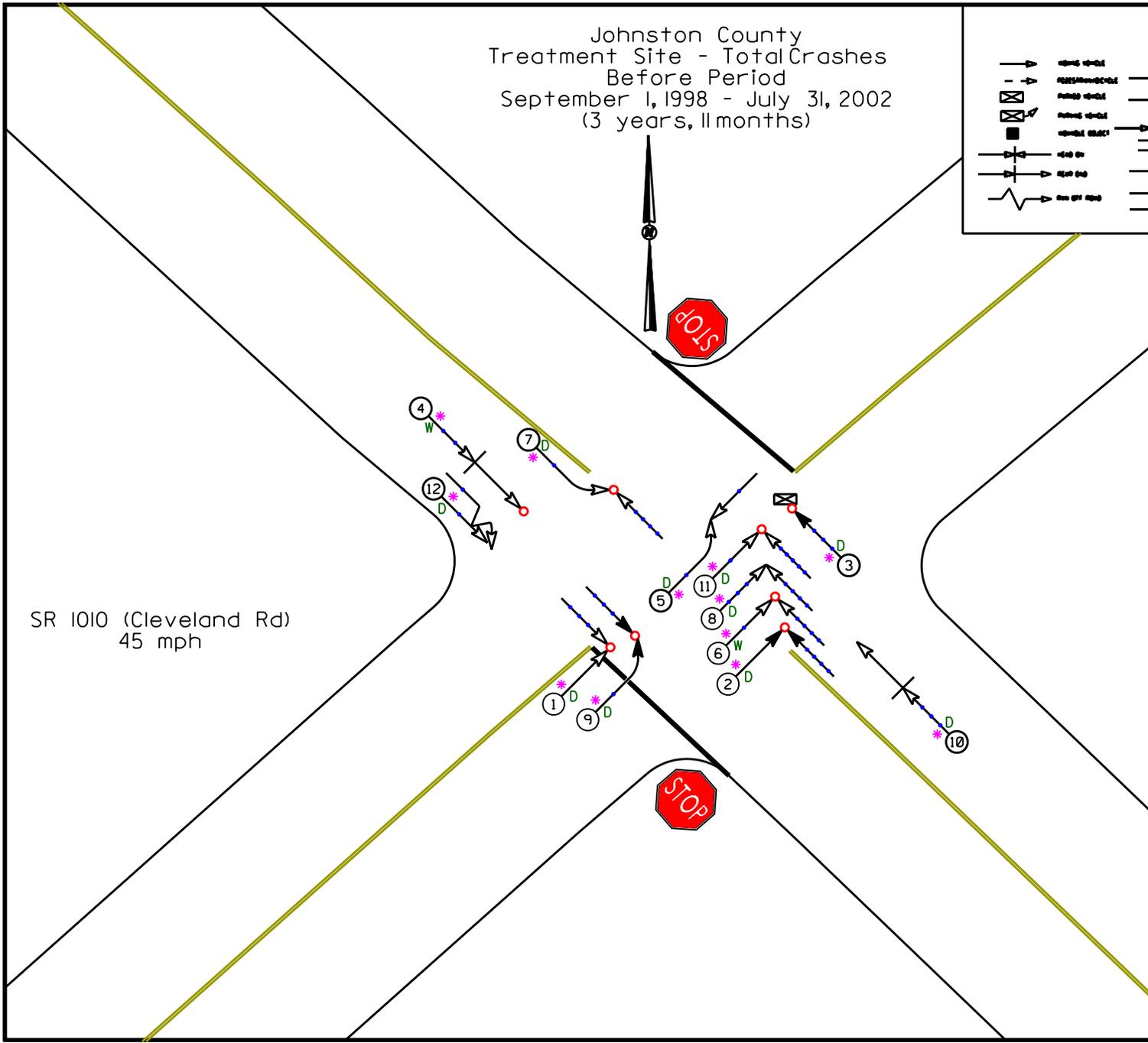


Traveling east on SR 1010

Johnston County  
 Treatment Site - Total Crashes  
 Before Period  
 September 1, 1998 - July 31, 2002  
 (3 years, 11 months)

### LEGEND

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SR 1526 (South Shiloh Rd)  
 45 mph

SR 1010 (Cleveland Rd)  
 45 mph

	<b>TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT</b> <small>HIGHWAY SAFETY MANAGEMENT PROGRAM SAFETY DOCUMENTATION MANAGEMENT AND SUPPORT</small>	<b>COLLISION DIAGRAM</b> Division: .. AREA: .. Study Period: 9/1/98 TO 7/31/02 Distance: ..+.. Miles: 0.01 Analysis Prepared By: S. Combs Diagram Prepared By: S. Combs Diagram Reviewed By: ..
	<small>SAFETY EVALUATION</small>	<small>TRAFFIC SAFETY</small>
	<b>REMOVE, TO BE EC, SIGNAL, AND TURN LAMPS</b>	SCALE: NOT TO SCALE DATE: OCT 2002 (Use number)
	<b>N.C. DEPARTMENT of TRANSPORTATION</b> <b>DIVISION of HIGHWAYS</b> <b>TRAFFIC ENGINEERING AND SAFETY</b> <b>SYSTEMS BRANCH</b>	

