

# Spot Safety Project Evaluation

Spot Safety Project # 05-05-205

## Spot Safety Project Evaluation of the Signal Installation SR 2000 (Falls of Neuse Rd) at Morrocroft Dr Wake County

Documents Prepared By:  
Stantec Consulting Ltd.  
for  
Safety Evaluation Group  
Traffic Safety Systems Management Section  
Transportation Mobility and Safety Division  
North Carolina Department of Transportation

### Principal Investigator



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Elizabeth S. Scott  
Transportation Designer

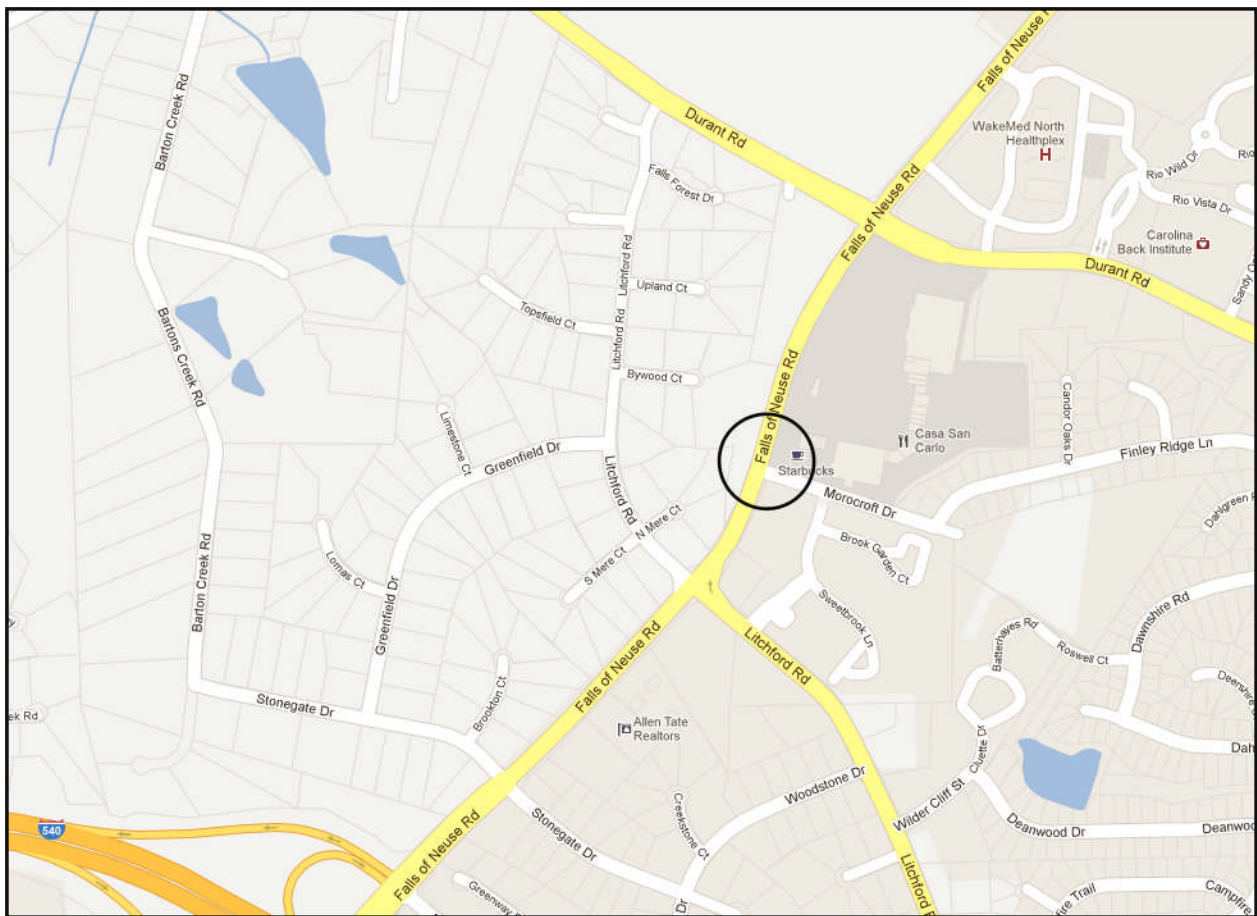
4-25-2013  
Date

# *Spot Safety Project Evaluation Documentation*

## **Subject Location**

Evaluation of Spot Safety Project Number 05-05-205 located at the Intersection of SR 2000 (Falls of Neuse Road) at Morrocroft Drive in Wake County, City of Raleigh.

The Sig ID is 05-2293 for this 3-Phase Actuated Traffic Signal.





Aerial Provided from Google Maps

### **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 signal.

SR 2000 (Falls of Neuse Rd) is a 5-lane-lane facility with a two-way left turn lane that becomes a left turn lane at the intersection. Morrocroft Dr is a two-lane road that widens into left and right turn lanes at the intersection. Morrocroft Dr provides access to an apartment complex and a shopping center. The speed limit on SR 2000 is 45-mph. The speed limit on Morrocroft Dr is not posted. The subject location is a three-leg intersection, which is stop-controlled on Morrocroft Dr.

The original statement of problem was the existence of left turn crash patterns. The initial crash analysis was completed from December 1, 2001 to November 30, 2004 with thirteen (13) reported crashes. The final completion date for the improvement at the subject intersection was on July 31, 2008 with a total cost of \$64,500.00.

## 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 were the months of March through August 2008. The before period consisted of reported crashes from September 1, 2003 through February 29, 2008 (4 years, 6 months); and the after period consisted of reported crashes from September 1, 2008 through February 28, 2013 (4 years, 6 months). The ending date for this analysis was determined by the date of available crash data at the time of analysis.

The treatment data consisted of all crashes within 150 feet of the subject intersection for the SR 2000 and Morrocroft Drive approaches. *Please see attached location map and aerial map 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. Frontal Impact crashes include: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; and Angle.

<b><u>Treatment Information</u></b>	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total Crashes	16	17	+ 6.25 %
Total Severity Index	2.39	3.61	+ 51.0 %
Target Crashes	9	7	- 22.2 %
Target Crash Severity Index	2.64	5.23	+ 98.1 %
Volume (2006, 2010)	40,000	40,500	+1.25 %

<b><u>Injury Crash Summary</u></b>	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	1	1	0.0 %
Class C Injury Crashes	2	5	+ 150.0 %
Property Damage Only	13	11	- 15.4 %

The naive before and after analysis at the treatment location resulted in a 6.25 percent increase in Total Crashes, a 22.2 percent reduction in Target Frontal Impact Crashes, and a 51 percent increase in the Total Severity Index. The before period ADT year was 2006 and the after period ADT year was 2010.

To further analyze the intersection crash patterns, the following chart shows different traffic movements and the change in crash totals through the study:

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Left Turn, Different Roadway (Target)	6	3	- 50.0 %
Left Turn, Same Roadway (Target)	1	2	+ 50.0 %
Westbound Rear End crashes	3	0	- 300.0 %
North & Southbound Rear End Crashes	4	7	+75.0 %

## Results and Discussion

Referencing the *Collision Diagrams*, the target crashes experienced a 22.2 percent reduction in frontal impact collisions. From the additional information chart above, the left turn, different roadway reduced from six (6) crashes to three (3) in the after period. Of the three left turn, different roadway crashes in the after period, two had placed fault on the northbound SR 2000 vehicle, the other was unable to determine. The left turn, same roadway crashes increased from one (1) to two (2) through the evaluation time frame.

The target severity index did increase by 98.1 percent. The B and C level crashes increased from two (2) to four (4) from the before period to the after period for target crashes.

Along Morrocroft Drive, the rear end crashes decreased from three (3) to zero (0) throughout the evaluation period. However, the rear-end crashes on SR 2000 increased from four (4) to seven (7).

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all three 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.



**Treatment Site Photos from Google Street View**



**Google Maps (August 2011) – Looking West on Morocroft Dr Approach**

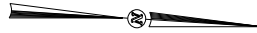


**Google Maps (August 2011) – Looking South from SR 2000 Approach**

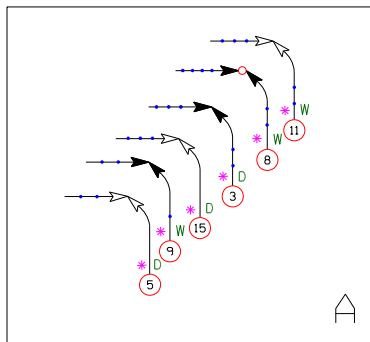
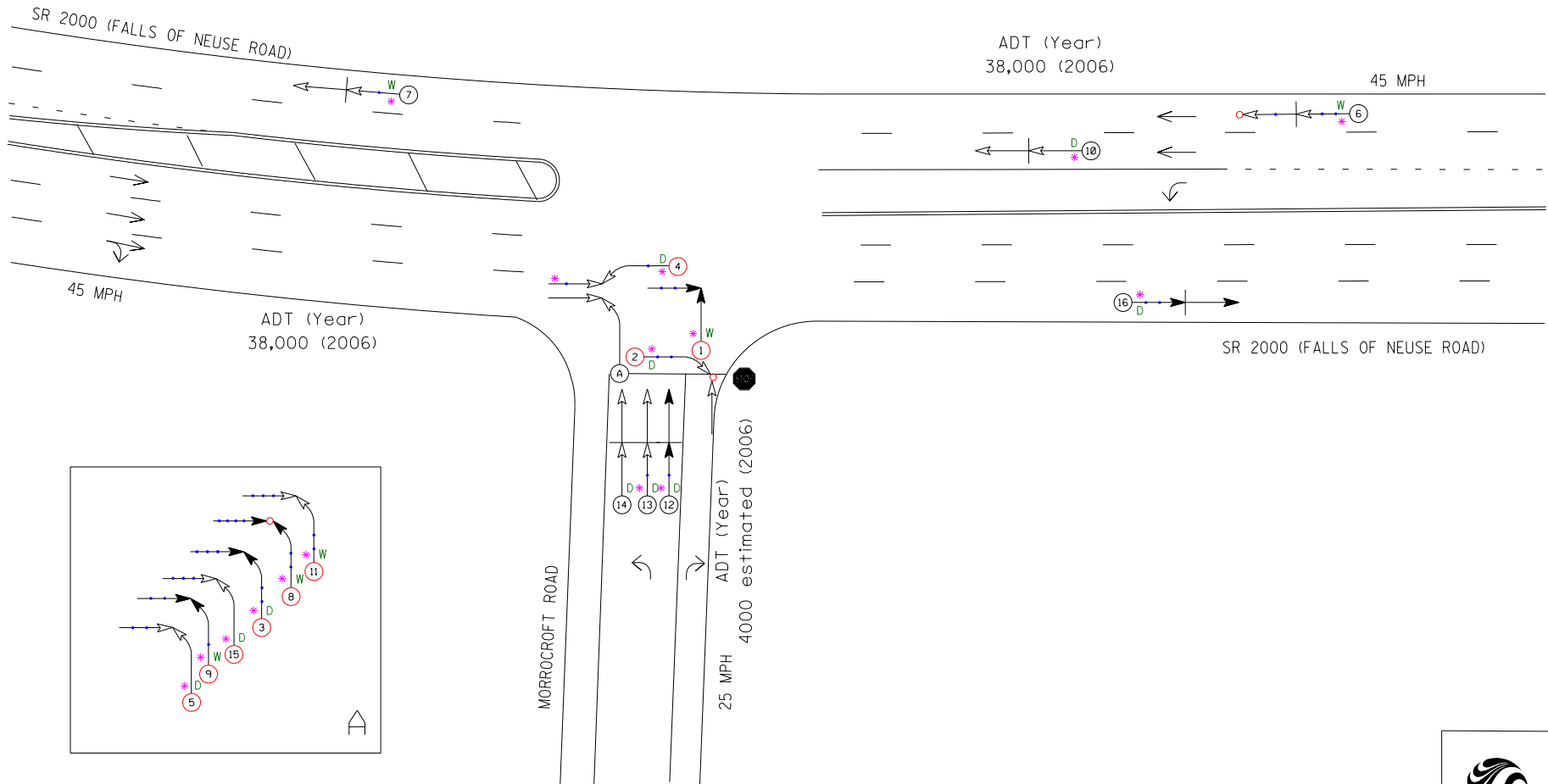


Google Maps (August 2011) – Looking North from SR 2000 Approach

SS# 05-05-205  
 Wake County  
 BEFORE Period  
 12/1/03 - 5/31/08



LEGEND			
	MOVING VEHICLE		ANGLE
	PARKED VEHICLE		TURNING
	MOVABLE OBJECT		BACKING
	HEAD ON		SIDESWIPE
	REAR END		INJURY
	RAN OFF ROAD		FATALITY
	DAYLIGHT CRASH		9 MPH OR LESS
	NIGHT CRASH		10 MPH TO 19
			20 MPH TO 29
			30 MPH TO 39
			40 MPH TO 49
			50 MPH TO 59
			60 MPH TO 69
			70 AND UP
			SPEED UNKNOWN
			A ANIMAL
			P PEDESTRIAN
			B BICYCLE
			T TRAIN
			• DRIVER AT FAULT
			D DRY
			W WET
			I ICY OR SNOWY
			O Other



Frontal Impact  
Target Crashes

PREPARED FOR  
**N.C. DEPARTMENT of TRANSPORTATION**  
 DIVISION of HIGHWAYS  
**TRANSPORTATION MOBILITY and SAFETY DIVISION**

Date: 4/25/2013

Prepared By: ESS

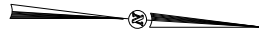


**Stantec**

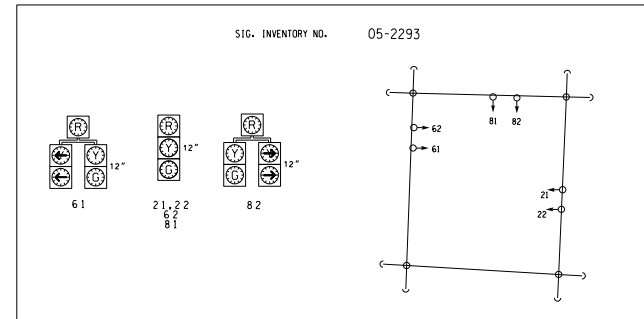
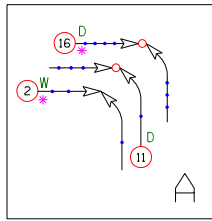
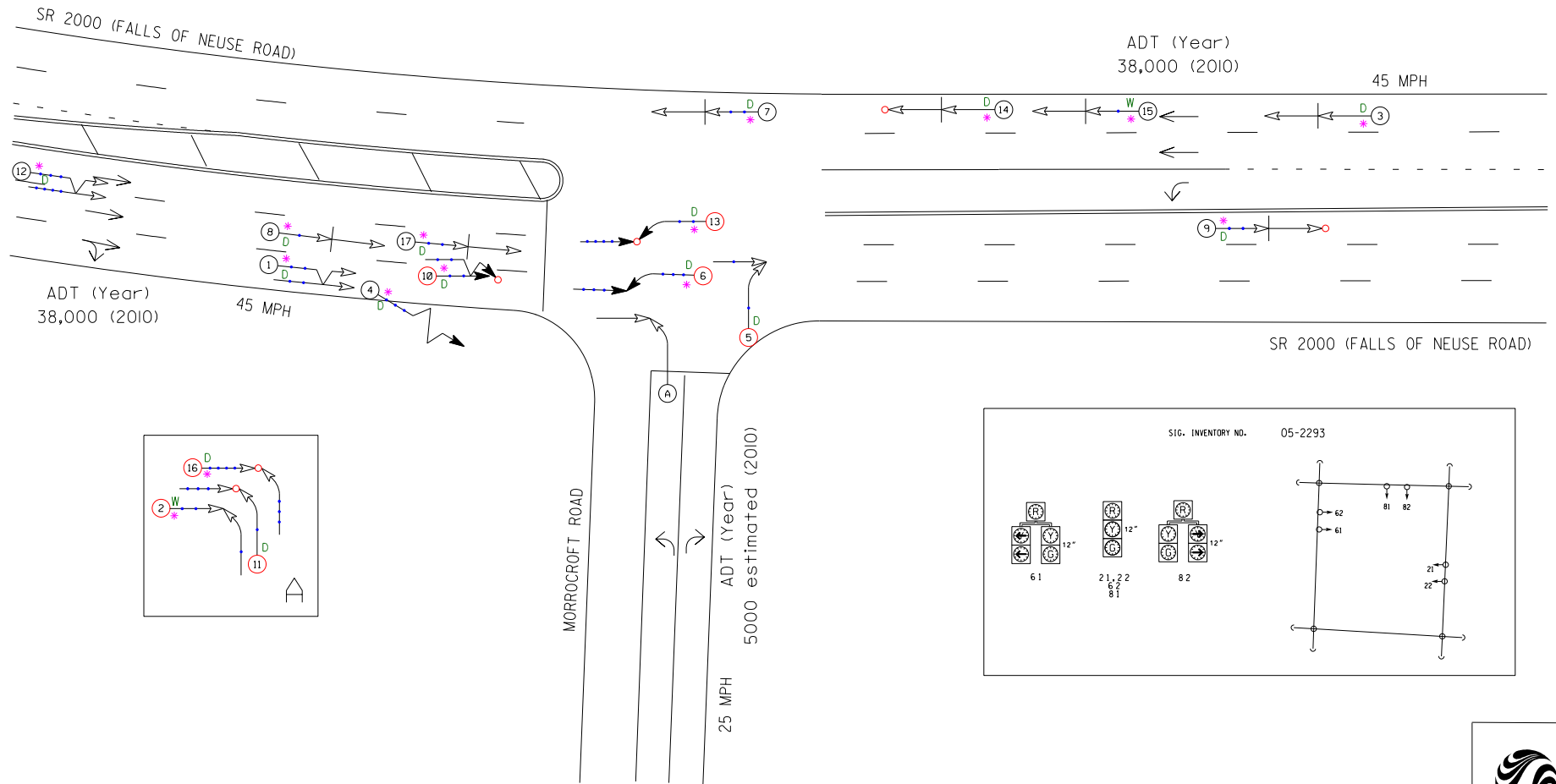
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SS# 05-05-205  
 Wake County  
 AFTER Period  
 9/1/08 - 2/28/13



LEGEND							
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		A ANIMAL
	PARKED VEHICLE		TURNING		10 MPH TO 19		P PEDESTRIAN
	MOVABLE OBJECT		BACKING		20 MPH TO 29		B BICYCLE
	HEAD ON		SIDESWIPE		30 MPH TO 39		T TRUCK
	REAR END		INJURY		40 MPH TO 49		* DRIVER AT FAULT
	RAN OFF ROAD		FATALITY		50 MPH TO 59		D DRY
	DAYLIGHT CRASH				60 MPH TO 69		W WET
	NIGHT CRASH				70 AND UP		I ICY OR SLODY
					SPEED UNKNOWN		O Other



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**SAFETY DIVISION**

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