

Spot Safety Project Evaluation

Spot Safety Project # 07-01-209

Spot Safety Project Evaluation for Installation of Northbound Left-Turn Lane on NC 86

**NC 86 at SR 1332 (Coleman Loop Road)
Orange County**

Documents Prepared By:

AECOM Technical Services of North Carolina, Inc.

For:

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

Principal Investigator

Heath Gore, PE

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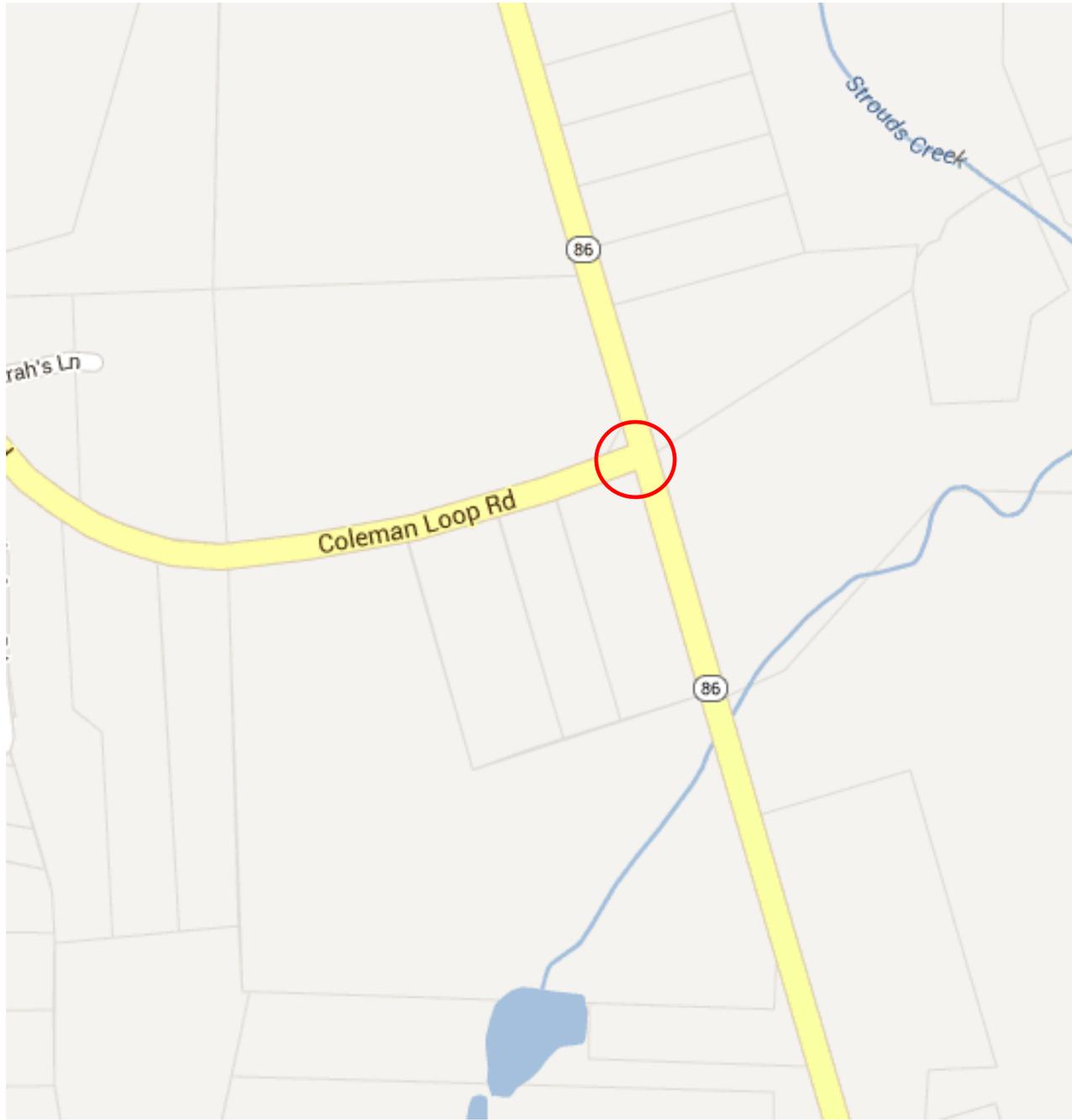
7-3-2013

Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-01-209 located at the unsignalized intersection of NC 86 and SR 1332 (Coleman Loop Road) in Hillsborough in Orange County.



Location Map Provided from Google Maps



Aerial Map Provided from Bing Maps

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was installation of a northbound left-turn lane on NC 86.

NC 86 is a two-lane roadway with a northbound left-turn lane and a speed limit of 55 mph. SR 1332 (Coleman Loop Road) is a two-lane roadway with a speed limit of 55 mph.

The original statement of problem was that the single-lane approach on northbound NC 86 causes left-turning traffic to queue which can potentially produce rear-end, ran off road and left-turn same roadway type crashes. The initial crash analysis was completed from April 1, 1998 to March 31, 2001 with four (4) total reported crashes, of which there were one (1) rear-end and one (1) ran off road-right. The final completion date for the improvement at the subject intersection was on June 18, 2008 with a total cost of \$121,000.00.

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 May through July 2008. The before period consisted of reported crashes from August 1, 2003 through April 30, 2008 (4 years 9 months); and the after period consisted of reported crashes from August 1, 2008 through April 30, 2013 (4 years 9 months).

The treatment data consisted of all crashes within 150 feet of the subject intersection for the NC 86 SR 1322 (Coleman Loop Road) 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 Northbound Rear End Crashes were the target crashes for the applied countermeasure.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	3	2	- 33.3 %
Total Severity Index	8.4	4.7	- 44.0 %
Target Crashes	2	0	- 100.0 %
Target Crash Severity Index	8.4	0	N/A
Volume (2005, 2010)	10,400	11,500	+10.6 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	0	1	+100.0 %
Class C Injury Crashes	3	0	-100.0 %
Property Damage Only	0	1	+100.0 %

The naive before and after analysis at the treatment location resulted in a 33 percent reduction in Total Crashes, a 100 percent reduction in Target Rear End Crashes, and a 44 percent reduction in the Total Severity Index. The before period ADT year was 2005 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 (+)
Ran Off Road	0	2	+100.0 %

Results and Discussion

Referencing the *Collision Diagrams*, target crashes (Northbound Rear End Crashes) experienced a reduction from 2 crashes in the before period to 0 crashes in the after period. The installation of the northbound left-turn lane was beneficial in reducing the target crashes at this location during the after period.

Ran Off Road Crashes increased from 0 crashes in the before period to 2 crashes in the after period.

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all four 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 (Image Date: 8/11) - Looking North on NC 86 Approach



Google Maps (Image Date: 8/11) - Looking South on NC 86 Approach



Google Maps (Image Date: 10/07) - Looking South on SR 1332 (Coleman Loop Road) Approach

SS# 07-01-209
 Orange County
 BEFORE Period
 8/1/03 - 4/30/08

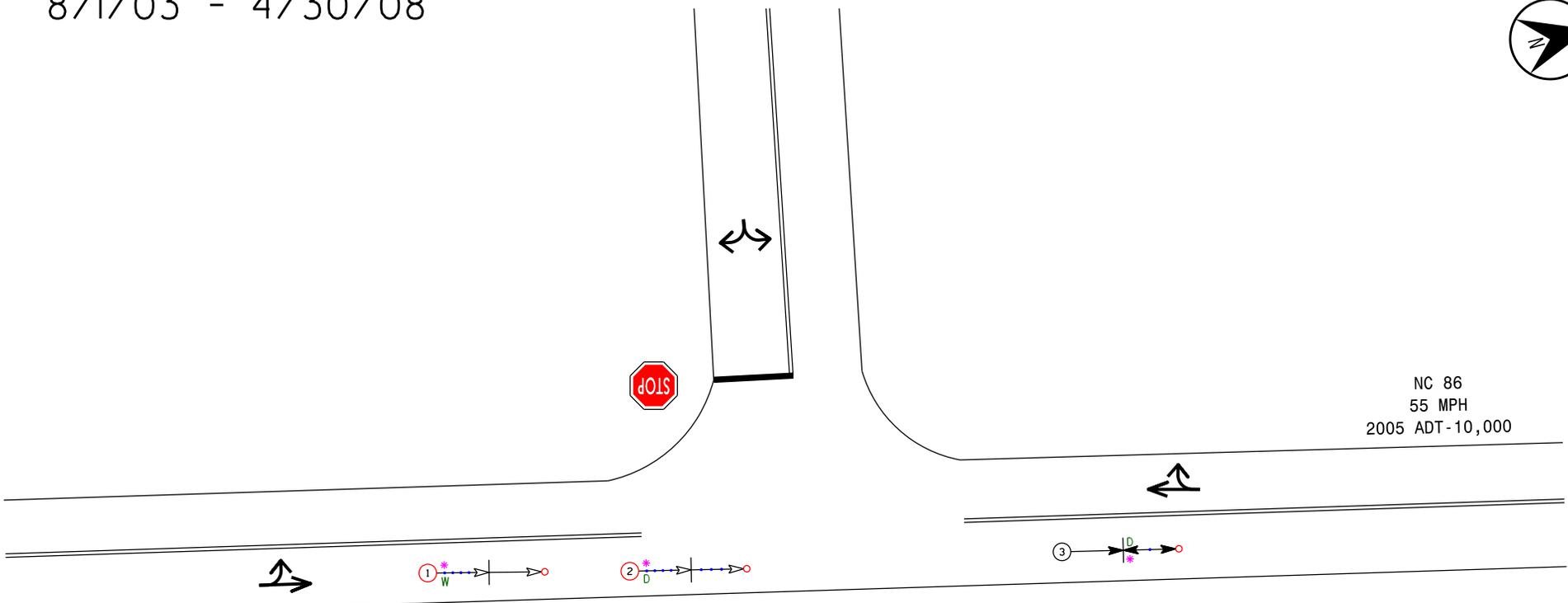
SR 1322 (Coleman Loop Road)
 55 MPH
 2005 ADT-875

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
	PARKED VEHICLE		SKIDMARK		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		HURRY		50 MPH TO 59		ICE OR SNOW
	REAR END		FATALITY		60 MPH TO 69		SPEED UNKNOWN
	RAN OFF ROAD				TO AND UP		ONLY



NC 86
 55 MPH
 2005 ADT-10,000

NC 86
 55 MPH
 2005 ADT-10,000



Northbound Rear
 End Crashes

AECOM

Prepared For:
 N.C. DEPARTMENT of TRANSPORTATION
 DIVISION of HIGHWAYS
 TRANSPORTATION MOBILITY and
 SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 7-3-2013 Prepared By: Heath Gore, PE

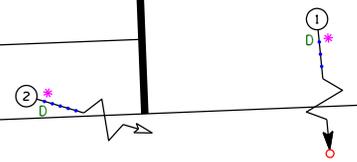
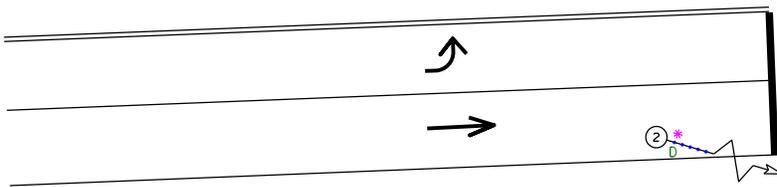
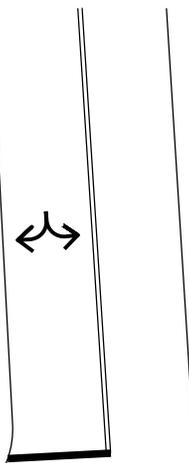
SS# 07-01-209
 Orange County
 AFTER Period
 8/1/08 - 4/30/13

SR 1322 (Coleman Loop Road)
 55 MPH
 2010 ADT-1,000

NC 86
 55 MPH
 2010 ADT-11,000

NC 86
 55 MPH
 2010 ADT-11,000

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		HURRY		50 MPH TO 59		ICY OR SNOWY
	REAR END		FATALITY		60 MPH TO 69		TO AND UP
	RAN OFF ROAD		SPEED UNINFORMED		TO AND UP		ONLY



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Northbound Rear
 End Crashes