

# Spot Safety Project Evaluation

Order # 41000023359

Spot Safety Project # 14-07-004

**Spot Safety Project Evaluation of the Intersection Realignment  
NC 225 (Greenville Highway) and SR 1114 (Pinnacle Mountain Road)  
Henderson County**

Documents Prepared By:

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

**Principal Investigator**



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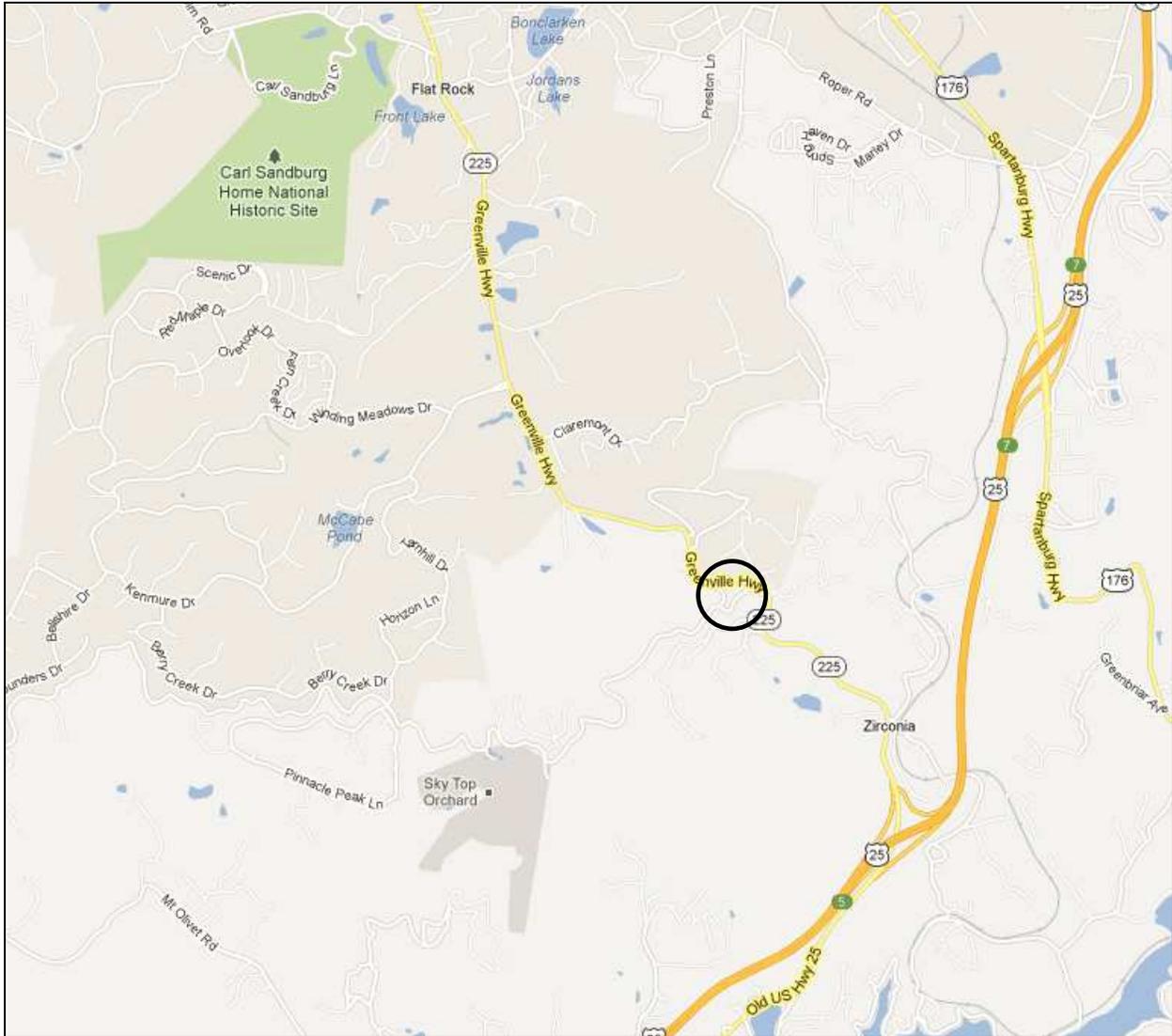
Jason B. Schronce  
Traffic Safety Project Engineer

6/4/2013  
Date

# *.Spot Safety Project Evaluation Documentation*

## **Subject Location**

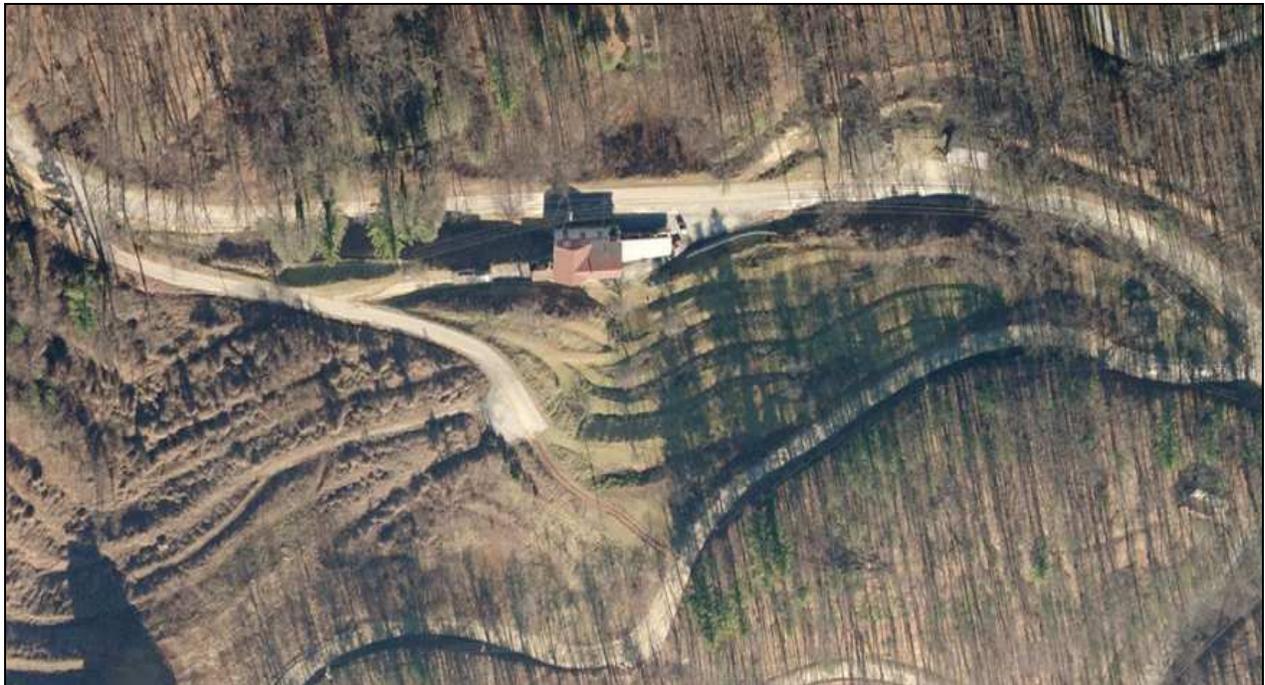
Evaluation of Spot Safety Project Number 14-07-004 located at the Intersection of NC 225 (Greenville Highway) and SR 1114 (Pinnacle Mountain Road) in Henderson County, near the City of Flat Rock.



**Area Map provided from Google Maps**



**Aerial Map from Google Maps – Showing the New Alignment of SR 1114**



**Aerial Photo found from GIS Map – Showing the Old Alignment during construction**

## Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was a realignment of the SR 1114 (Pinnacle Mountain Road) intersection with NC 225 (Greenville Highway) approximately 1,250 feet to the west. NC 225 and SR 1114 are both two-lane facilities at the subject intersection with speed limits of 45 mph on all approaches. The subject location is a three-leg intersection, which is controlled by a stop sign on SR 1114.

This intersection is located in a mountainous region with sharp horizontal and vertical curves which limit sight distance. The original statement of problem listed the realignment as a fix to improve the sight distance on all approaches.

The initial crash analysis was completed from March 1, 2002 to February 28, 2007 with one (1) reported angle crash. The final completion date for the improvement at the subject intersection was on September 24, 2008 with a Spot Safety Cost of \$65,000. The Spot Safety funds were spent to obtain right-of-way and an additional \$50,000 of construction funds were used to build the new intersection.

### 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 July through September 2008. The before period consisted of reported crashes from April 1, 2004 through June 30, 2008 (4 years and 3 months); and the after period consisted of reported crashes from October 1, 2008 through December 31, 2012 (4 years and 3 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. This includes both locations and the approximate 1,250 feet in between the re-alignments. *Please see attached location map, aerial 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.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	1	3	200.0 %
Total Severity Index	8.40	1.00	- 88.1 %
Target Crashes – Frontal Impact	1	1	0.0 %
Target Crash Severity Index	8.40	1.00	- 88.1 %
Volume (2006, 2010)	3,700	3,400	- 8.1 %

<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	0	- 100.0 %
Class C Injury Crashes	0	0	N/A
Property Damage Only	0	3	100+ %

The naive before and after analysis at the treatment location resulted in a 200 percent increase in Total Crashes, a zero percent change in Target Crashes, but an 88 percent reduction in the Total Severity Index. The before period ADT year was 2006 and the after period ADT year was 2010.

### **Results and Discussion**

Referencing the *Collision Diagrams*, the before period experienced one (1) left turn crash due to limited sight distance. With the intersection realignment, there was one (1) frontal impact left turn crash at the new intersection. Also, the after period showed one (1) sideswipe as a tractor-trailer attempted a sharp left turn onto SR 1114 and additionally one (1) trailer rollover from a truck making the right turn off of SR 1114. There were no injury crashes in the after period.

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for both approaches to the treatment intersection on NC 225. 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 countermeasure.

**Treatment Site Photos**



**Google Maps (March 2009)  
Looking South/Southeast on NC 225 at SR 1114 New Alignment**



**Google Maps (March 2009)  
Looking North/Northwest on NC 225 at SR 1114 New Alignment**

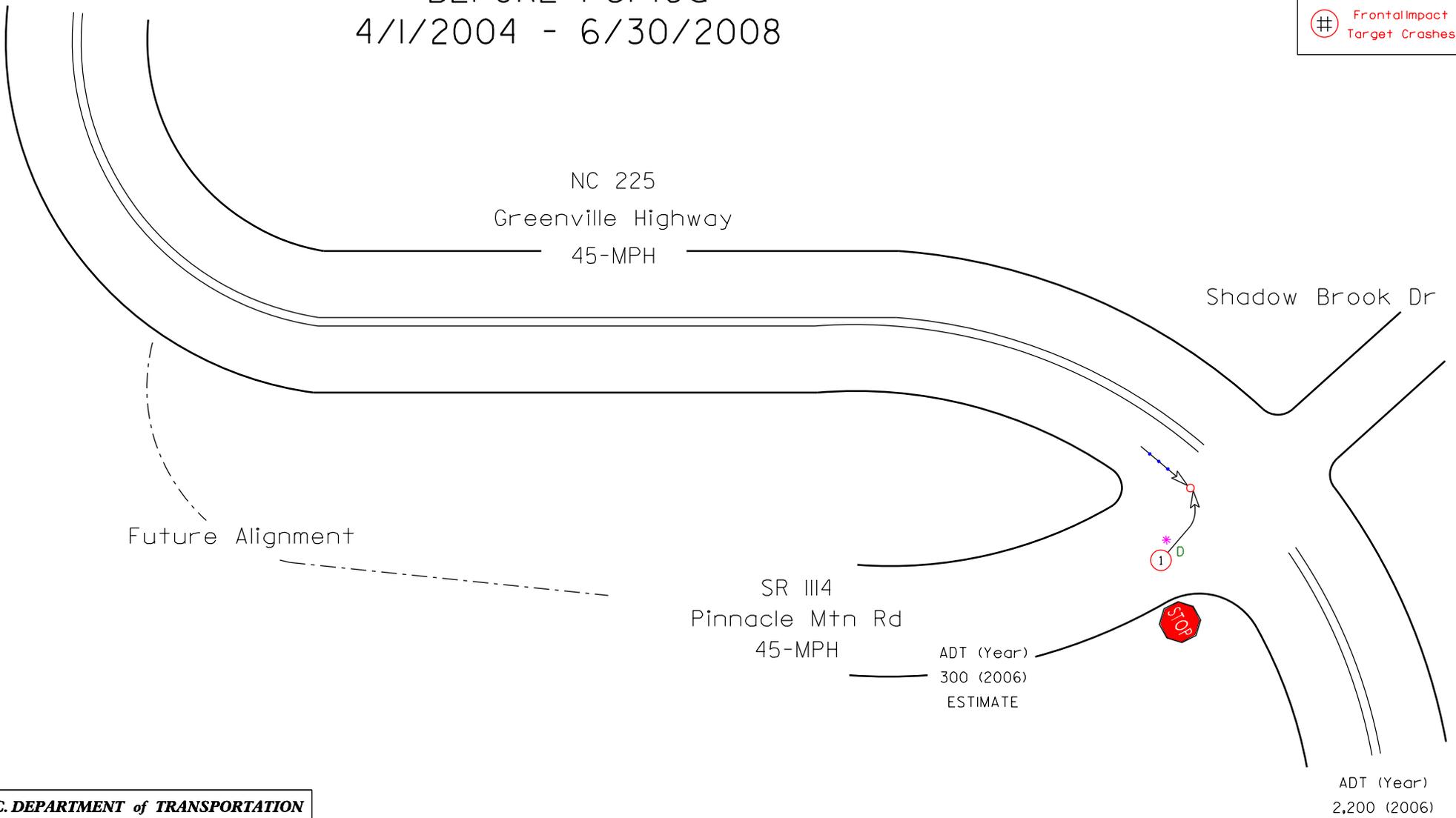
SS# 14-07-004  
 Order# 41000023359  
 Henderson County  
 BEFORE Period  
 4/1/2004 - 6/30/2008

ADT (Year)  
 4,000 (2006)



LEGEND							
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PARKED VEHICLE		TURNING		10 MPH TO 19		TRAIN
	FIXED OBJECT		BACKING		20 MPH TO 29		DRIVER AT FAULT
	HEAD ON		SIDESWIPE		30 MPH TO 39		DRY
	REAR END		RUNAWAY		40 MPH TO 49		WET
	RAN OFF ROAD		FATALITY		50 MPH TO 59		ICY OR SNOWY
			SPEED UNKNOWN		60 MPH TO 69		OTHER

Frontal Impact  
 Target Crashes



ADT (Year)  
 300 (2006)  
 ESTIMATE

ADT (Year)  
 2,200 (2006)

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**DIVISION of HIGHWAYS**  
 TRANSPORTATION MOBILITY and  
 SAFETY DIVISION

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**TRAFFIC SAFETY UNIT**

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Date: 5-30-2013      Prepared By: J. Schronce

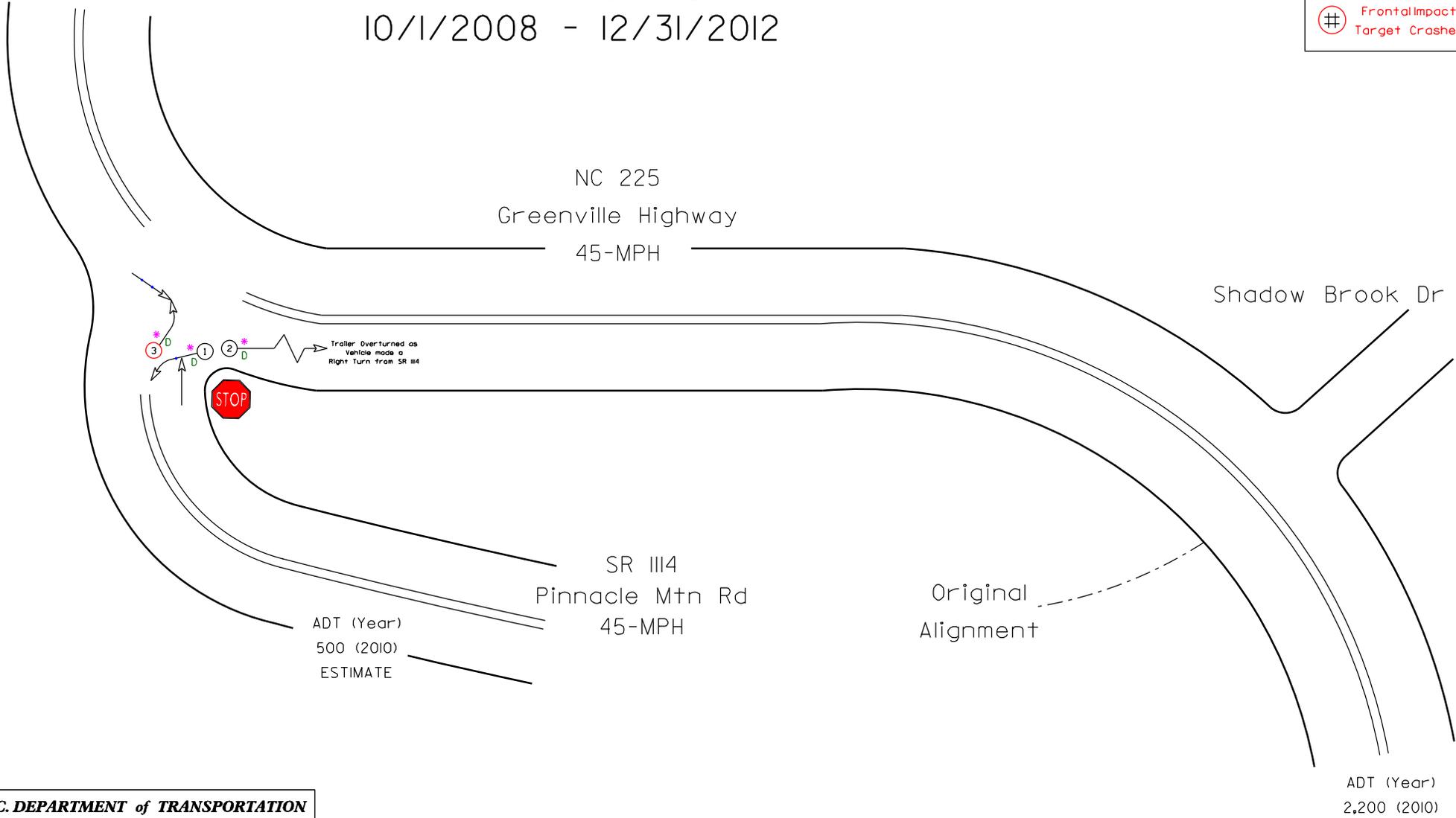
SS# 14-07-004  
 Order# 41000023359  
 Henderson County  
 AFTER Period  
 10/1/2008 - 12/31/2012

ADT (Year)  
 4,100 (2010)

LEGEND							
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PAIRED VEHICLE		TURNING		10 MPH TO 19		TRAIN
	PARKING VEHICLE		TURNING		20 MPH TO 29		DRIVER AT FAULT
	FIXED OBJECT		TURNING		30 MPH TO 39		DRY
	HEAD ON		TURNING		40 MPH TO 49		WET
	REAR END		TURNING		50 MPH TO 59		ICY OR SNOWY
	RAN OFF ROAD		TURNING		60 MPH TO 69		ICY OR SNOWY
			TURNING		70 AND UP		OTHER
			TURNING		80 AND UP		
			TURNING		90 AND UP		
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Frontal Impact  
 Target Crashes



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