

Spot Safety Project Evaluation

Spot Safety Project # 11-06-206

**Spot Safety Project Evaluation of the Signal Installation
US-221 Business (Main St) at SR 1149 (Mount Jefferson Rd)
Ashe 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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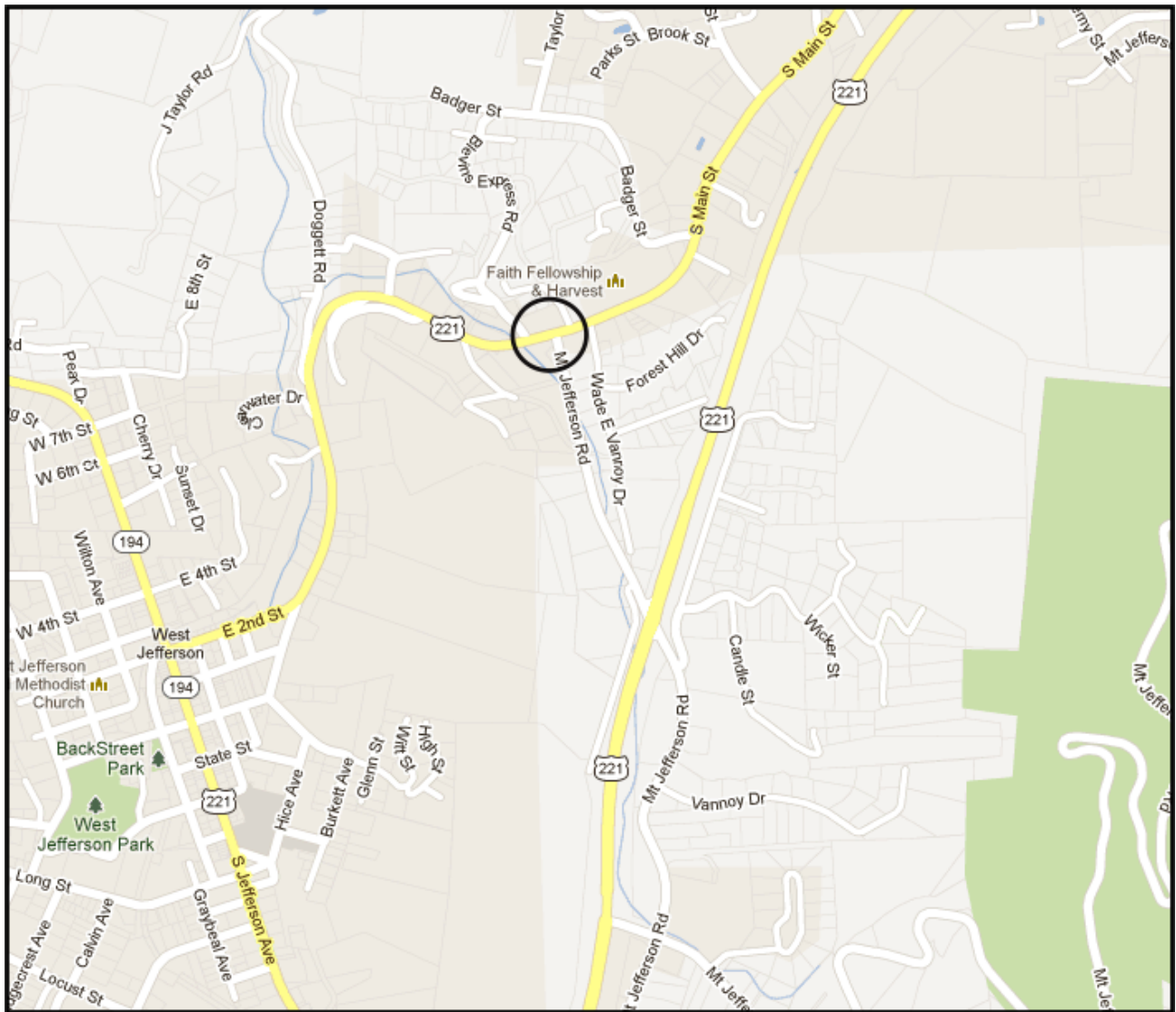
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Date

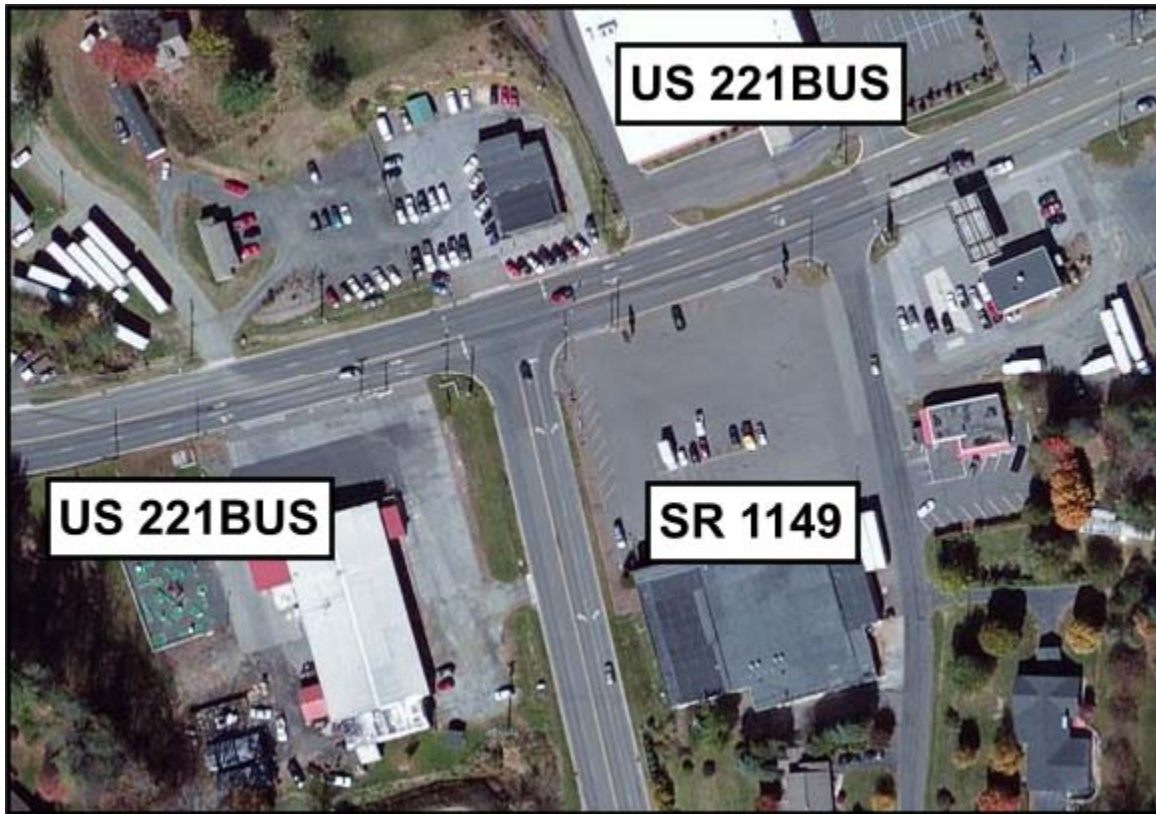
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 11-06-206 located at the Intersection of US-221 (Main Street & Second Avenue) at SR 1149 (Mount Jefferson Road) in Ashe County, City of West Jefferson.

The Sig ID is 11-0026 for this 2-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.

US-221 Business and SR 1149 (Mount Jefferson Rd) are both 4-lane roads. Speed limits on all approaches are 35-mph. The subject location is a three-leg intersection with a fourth leg that gives access to High County Motors Used Cars. The intersection was stop-controlled on SR 1149.

The original statement of problem was the existence of frontal impact crashes. The initial crash analysis was completed from July 1, 2001 to June 30, 2006 with eleven (11) reported crashes. The final completion date for the improvement at the subject intersection was on February 14, 2008 with a total cost of \$52,000.00.

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 December 2007 through February 2008. The before period consisted of reported crashes from December 1, 2002 through November 30, 2007 (5 years); and the after period consisted of reported crashes from March 1, 2008 through February 28, 2013 (5 years). 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 1149 and US 221 Business 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.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	9	11	+ 22.2 %
Total Severity Index	3.47	3.69	+ 6.3 %
Target Crashes	6	8	+ 33.3 %
Target Crash Severity Index	4.7	3.78	- 19.6 %
Volume (2005, 2010)	11,900	11,100	- 6.7 %

<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	1	1	0.0 %
Class C Injury Crashes	2	3	+ 50.0 %
Property Damage Only	6	7	+ 16.7 %

The naive before and after analysis at the treatment location resulted in a 22.2 percent increase in Total Crashes, a 33.3 percent increase in Target Crashes, and a 6.3 percent increase 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 (+)
Left Turn Different Roadway (Target)	5	2	- 60.0 %
Left Turn Same Roadway (Target)	0	6	+ 600.0 %
Northbound Rear-End Crashes	2	0	- 200.0 %

Results and Discussion

Referencing the *Collision Diagrams*, the target crashes experienced a 33.3 percent increase in frontal impact collisions. From the additional information chart above, the left turn, different

roadway was reduced by 60 percent. Left turn, same roadway crashes saw an increase of 600 percent, however. The rear-end crashes along SR 1149 were reduced from two (2) to zero (0) 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 (June 2009) – Looking East on US 221 Business Approach



Google Maps (June 2009) – Looking South on SR 1149/Mount Jefferson Rd Approach



Google Maps (June 2009) – Looking West on US 221 Business Rd Approach



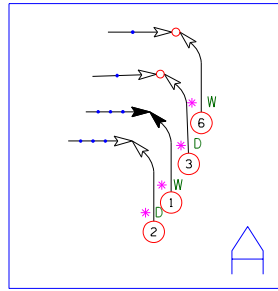
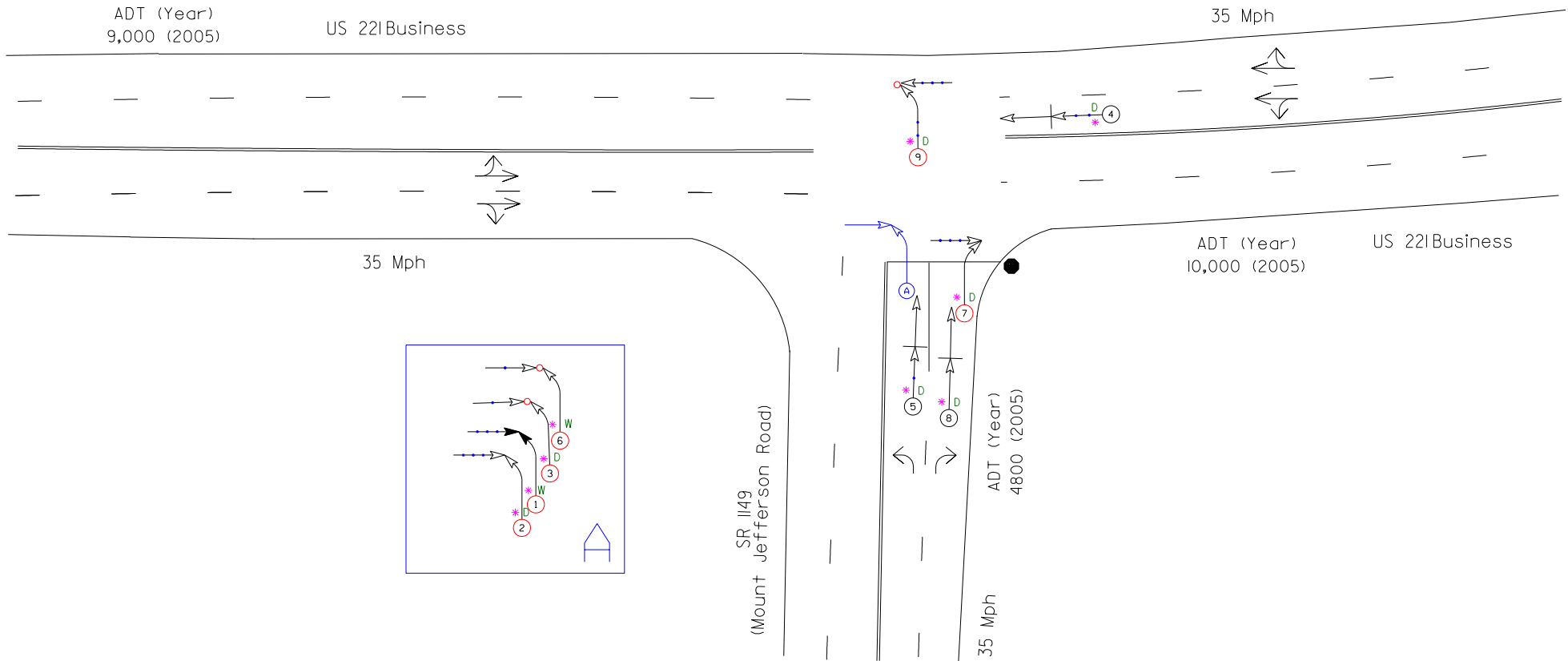
Google Maps (June 2009) – Looking North on SR 1149/Mount Jefferson Approach

SS# 11-06-206
 Ashe County
 BEFORE Period
 12/1/02 - 11/30/07



High County Motors
 Used Cars

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



Frontal Impact
 Target Crashes

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRANSPORTATION MOBILITY and
SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 4-11-2013

Prepared By: ESS



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SS# 11-06-206
 Ashe County
 AFTER Period
 3/1/08 - 2/28/13



High County Motors
 Used Cars

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

ADT (Year)
 8,400 (2010)

US 221 Business

35 Mph

35 Mph

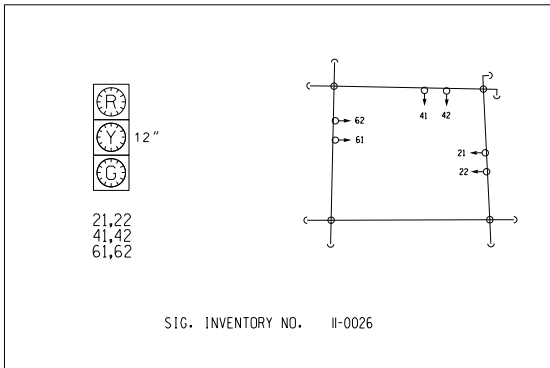
ADT (Year)
 8,800 (2010)

US 221 Business

ADT (Year)
 4950 (2010)

35 Mph

SR 1149
 (Mount Jefferson Road)



SIG. INVENTORY NO. 11-0026

Frontal Impact
 Target Crashes

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
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SAFETY DIVISION



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