Spot Safety Project Evaluation

Spot Safety Project # 13-07-211

Spot Safety Project Evaluation of the Signal Installation
US 19-23 (Smokey Park Highway) at SR 1210-1135 (Fairmont Rd- Justice Ridge Rd)
Buncombe 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

Elizabeth S. Scott
Transportation Designer

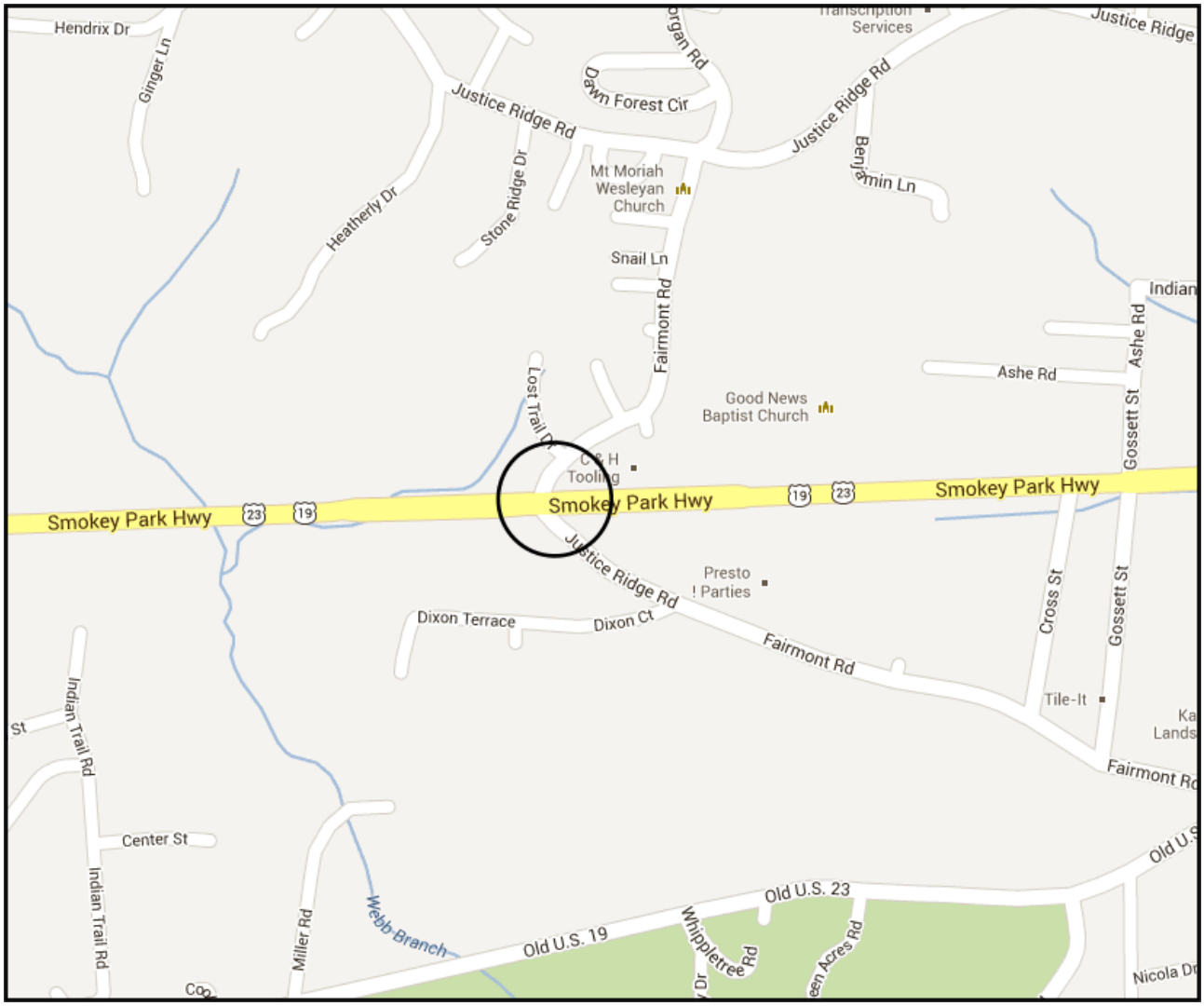
6-25-2013
Date

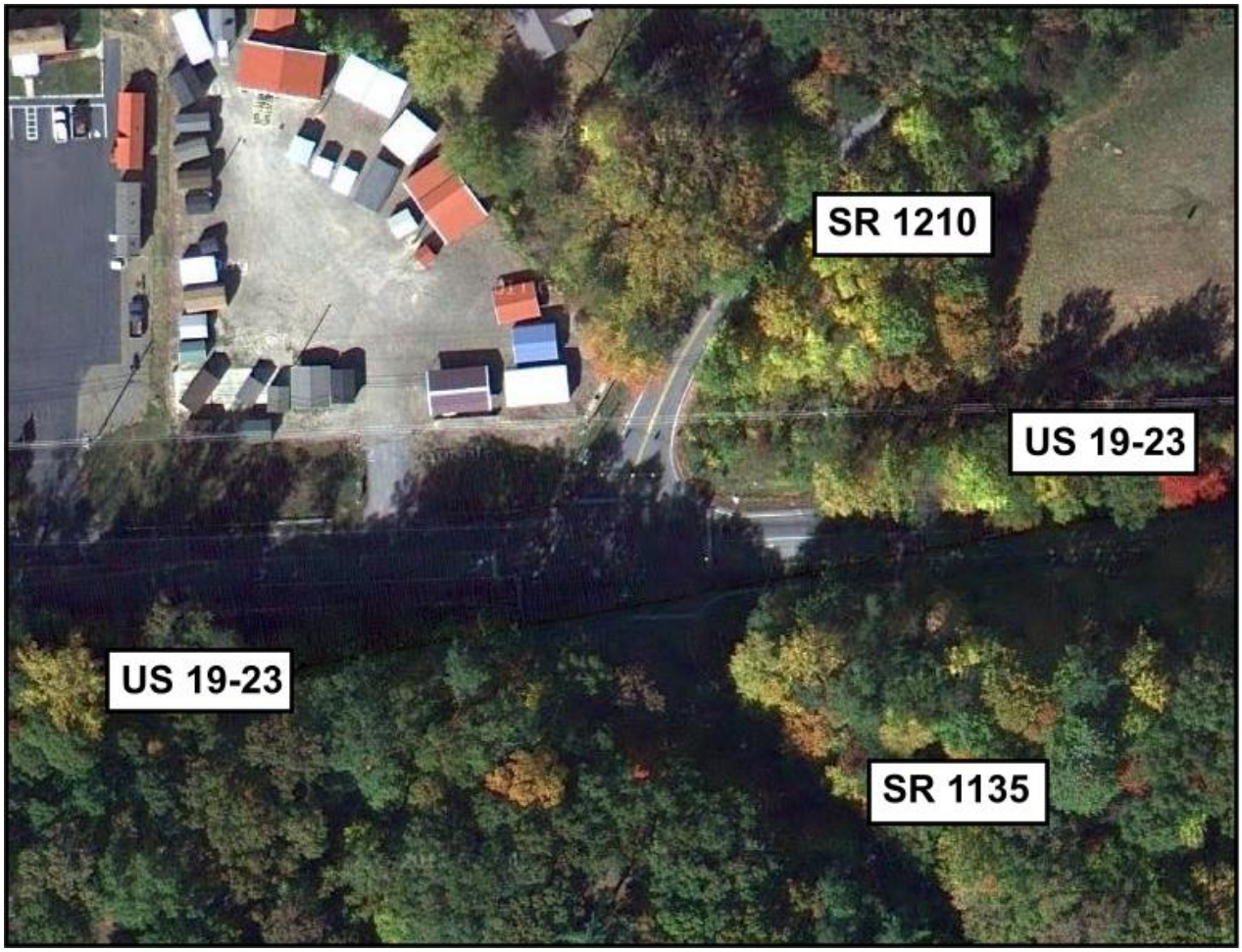
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 13-07-211 located at the Intersection of US 19-23 (Smokey Park Highway) at SR 1210-1135 (Fairmont Road-Justice Ridge Road) in Buncombe County.

The Sig ID is 13-1282 for this 2-Phase Fully 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 19-23 (Smokey Park Highway) is a 2-lane facility with a two-way left turn lane. SR 1210- SR 1135 is a two-lane road. The speed limit on US 19-23 is 55-mph. SR 1210 – SR 1135 does not have a posted speed limit. The subject location is a four-leg intersection, which is stop-controlled on SR 1210 and SR 1135.

The original statement of problem was the insufficient gaps in traffic resulting in an angle crash pattern. The initial crash analysis was completed from May 1, 2002 to April 30, 2007 with sixteen (16) total reported crashes. The final completion date for the improvement at the subject intersection was on October 17, 2008 with a total cost of $75,000.00.

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 allow for an adequate construction period were the months of September through November 2008. The before period consisted of reported crashes from April 1, 2004 through August 31, 2008 (4 years, 5 months); and the after period consisted of reported crashes from December 1, 2008 through April 30, 2013 (4 years, 5 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 US 19 - 23 and SR 1210 - 1135 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.

Treatment Information	**Before**	**After**	**Percent Reduction (-) Percent Increase (+)**
Total Crashes	17	9	- 45.1 %
Total Severity Index	13.4	3.47	- 74.1 %
Target Crashes	12	8	- 33.3 %
Target Crash Severity Index	16.72	2.73	- 83.7 %
Volume (2006, 2011)	12,700	10,000	- 32.7%

Injury Crash Summary	**Before**	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal injury Crashes	2	0	-200.0 %
Class A injury Crashes	0	0	N/A
Class B injury Crashes	1	1	0.0 %
Class C Injury Crashes	7	2	- 71.4 %
Property Damage Only	7	6	- 14.3 %

The naive before and after analysis at the treatment location resulted in a 45.1 percent reduction in Total Crashes, a 74.1 percent reduction in the Total Severity Index, and a 83.7 percent reduction in the Target Crash Severity Index. The before period ADT year was 2006 and the after period ADT year was 2011.

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

Additional Information	Before	After	Percent Reduction (-) Percent Increase (+)
Left Turn, Different Roadway	4	2	- 50.0 %
Angle	6	3	- 50.0 %
Left Turn, Same Roadway	2	3	+ 50.0 %
Run Off Road	3	0	- 300.00 %

Results and Discussion

Referencing the *Collision Diagrams*, there were no Fatal or Injury A crashes in the after period. This is reduced from two (2) fatal crashes in the before period. The number of Injury C crashes also reduced from seven (7) to two (2) crashes. Both target crashes and the target severity were decreased. The total number of crashes and the severity index were both reduced in the after period.

Though severity and total crashes have decreased in the after period, 87.5 percent of the crashes occurring in the after period were target crashes. Left turn, same roadway crashes along SR 1210-1135 remained the same from before to after, with two (2) crashes in each period. However, both angle and left turn, different roadway crashes were reduced by 50 percent within the evaluation 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 (May 2008) – Looking North on SR 1210 Approach (May 2008)

Google Maps (May 2008) – Looking South on SR 1135 Approach

Google Maps (May 2008) – Looking West from US 19-23 Approach

Google Maps (May 2008) – Looking East on US 19-23 Approach

SS# 13-07-211
Buncombe County
BEFORE Period
4/1/04 - 8/31/08

LEGEND

MOVING VEHICLE
PARKED VEHICLE
PARKING VEHICLE
MOVABLE OBJECT
HEAD ON
REAR END
RAN OFF ROAD
DAYLIGHT CRASH
NIGHT CRASH

ANGLE
TURNING
BACKING
SIDESWIPE
INJURY
FATALITY

9 MPH OR LESS
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

Warrens Utility Buildings

55 MPH
ADT (Year) 8,800 (2006)

ADT (Year) 1,700 (2006)
55 MPH
SR 1210 (Fairmont Road)

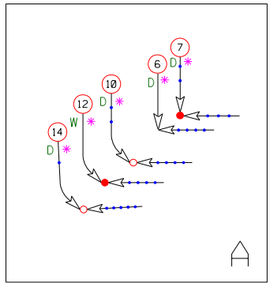
US 19-23 (Smokey Park Highway)

US 19-23 (Smokey Park Highway)

ADT (Year) 14,000 (2006)
55 MPH

STOP

ADT (Year) 940 (2006) 55 MPH
SR 1135 (Fairmont Road)



Target Crashes

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

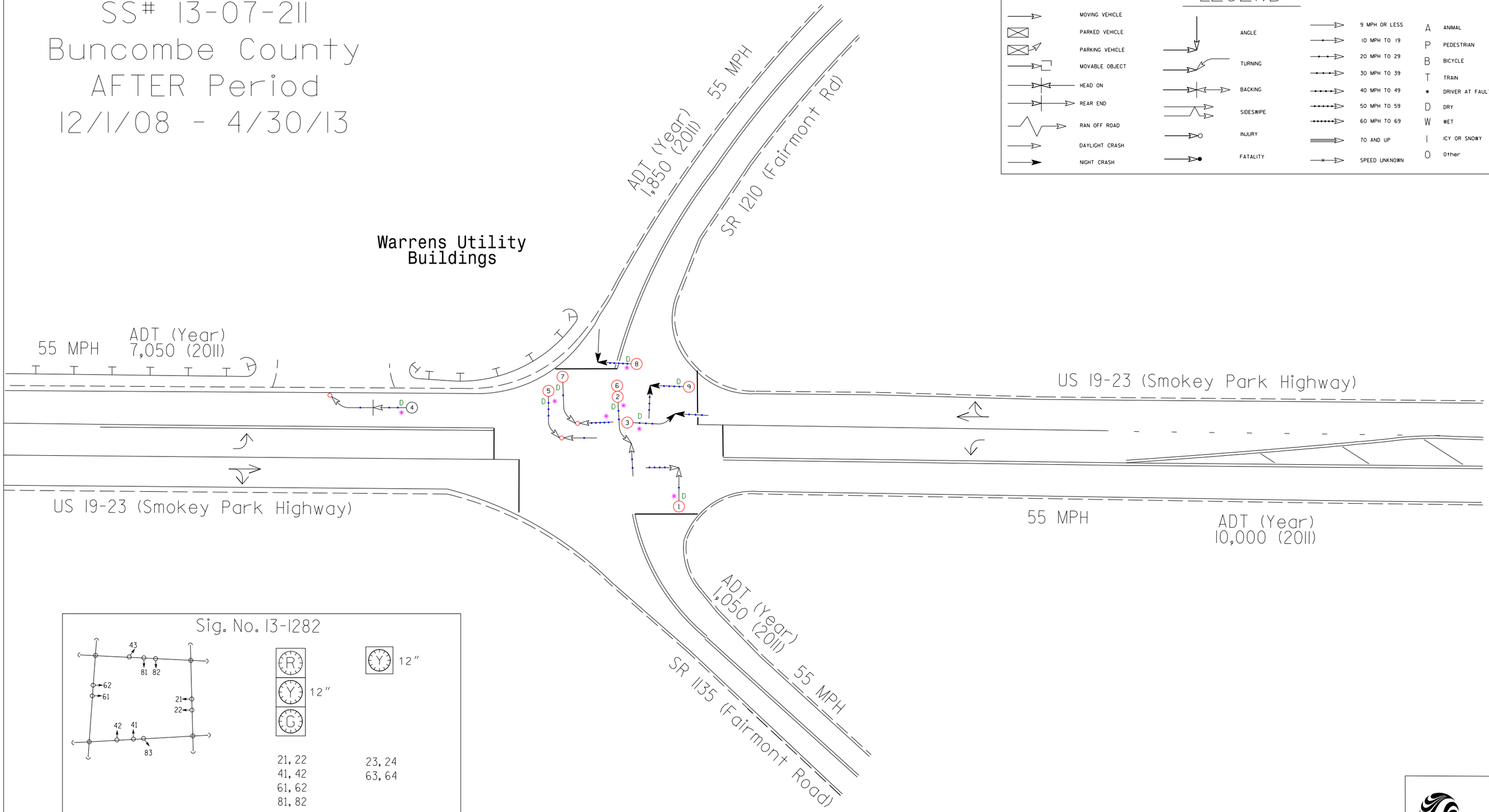
Date: 6/25/2013
Prepared By: ESS

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SS# 13-07-211
Buncombe County
AFTER Period
12/1/08 - 4/30/13

LEGEND

- MOVING VEHICLE
- PARKED VEHICLE
- PARKING VEHICLE
- MOVABLE OBJECT
- HEAD ON
- REAR END
- RAN OFF ROAD
- DAYLIGHT CRASH
- NIGHT CRASH
- ANGLE
- TURNING
- BACKING
- SIDESWIPE
- INJURY
- FATALITY
- 9 MPH OR LESS
- 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



Sig. No. 13-1282

R
Y 12"
G

Y 12"

21, 22
41, 42
61, 62
81, 82

23, 24
63, 64

Target Crashes

PREPARED FOR

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

Date: 6/25/2013

Prepared By: ESS

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672