Spot Safety Project Evaluation

Spot Safety Project # 04-05-220

Spot Safety Project Evaluation for Installation of Left-Turn Lanes and a Traffic Signal

SR 1604 (Hunter Hill Road) at SR 1544 (Halifax Road)
Nash 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

Heath, Gore, PE
AECOM

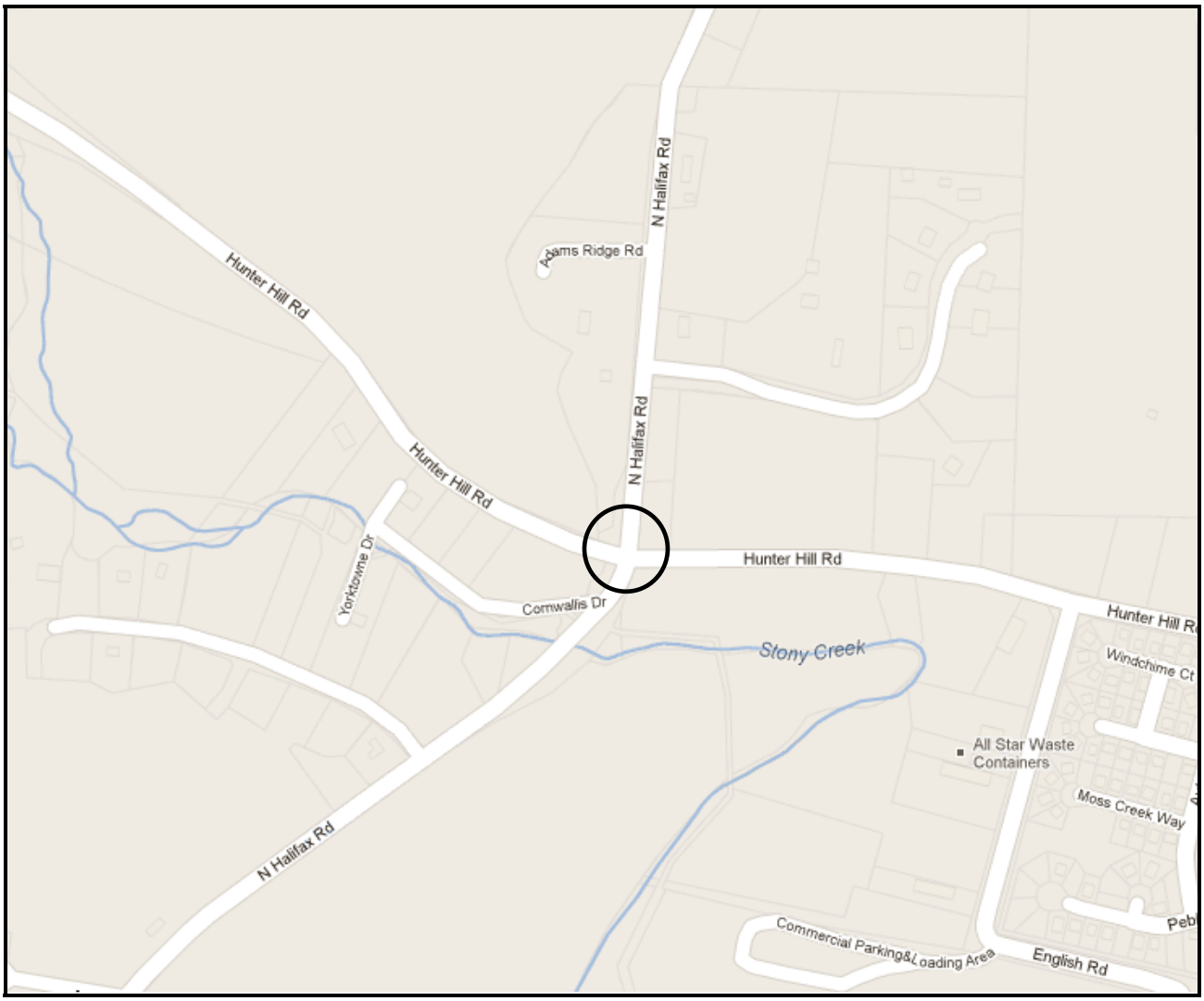
5-8-2013
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 04-05-220 located at the intersection of SR 1604 (Hunter Hill Road) at SR 1544 (Halifax Road) in the City of Rocky Mount, Nash County.

The Sig ID is 04-0848 for this 2-Phase Actuated Traffic Signal.



Location Map Provided from Google Maps

Aerial Map 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 left-turn lanes on all approaches and a traffic signal. It should be noted that a flasher was installed at this intersection in 1992.

SR 1604 (Hunter Hill Road) is a two-lane facility with left-turn lanes on both approaches and a speed limit of 45 mph. SR 1544 (Halifax Road) is a two-lane facility with left-turn lanes on both approaches and a speed limit of 45 mph.

The original statement of problem was that the lack of signal control resulted in many frontal impact crashes. The initial crash analysis was completed from July 1, 2000 to June 30, 2005 with fourteen (14) angle crashes and 1 left-turn different roadway. The final completion date for the improvement at the subject intersection was on September 24, 2008 with a total cost of $128,000.00.

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 August through October 2008. The before period consisted of reported crashes from April 1, 2004 through July 31, 2008 (4 years 4 months); and the after period consisted of reported crashes from November 1, 2008 through February 28, 2013 (4 years 4 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 1604 (Hunter Hill Road) and SR 1544 (Halifax 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 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.

Treatment Information	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	23	7	- 69.6 %
Total Severity Index	8.16	12.89	+ 58.0 %
Target Crashes	16	5	- 68.8%
Target Crash Severity Index	9.9	17.64	+ 78.2 %
Volume (2006, 2010)	8,500	8,900	+ 4.7 %

Injury Crash Summary	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	1	1	0.0 %
Class B injury Crashes	4	0	- 100.0 %
Class C Injury Crashes	8	1	- 87.5 %
Property Damage Only	10	5	- 50.0 %

The naive before and after analysis at the treatment location resulted in a 70 percent reduction in Total Crashes, a 69 percent reduction in Target Frontal Impact Crashes, and a 58 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:

Additional Information	**Before**	**After**	**Percent Reduction (-) Percent Increase (+)**
Frontal Impact Crashes (Target)	16	5	- 68.8 %
Left Turn, Different Roadway	2	0	- 100.0 %
Left Turn, Same Roadway	1	3	+ 200.0 %
Angle	11	1	- 90.9 %

Results and Discussion

Referencing the *Collision Diagrams*, the overall target crashes (Frontal Impact) experienced a reduction from sixteen (16) crashes in the before period to five (5) crashes in the after period. The installation of the signal was beneficial in reducing the target crashes at this location during the after period.

From the additional information chart above, left turn, different roadway crashes decreased from two (2) crashes in the before period to zero (0) crashes in the after period. Left turn, same roadway crashes increased from one (1) crash in the before period to three (3) crashes in the after period. Angle crashes decreased from eleven (11) crashes in the before period to one (1) crash in the after period.

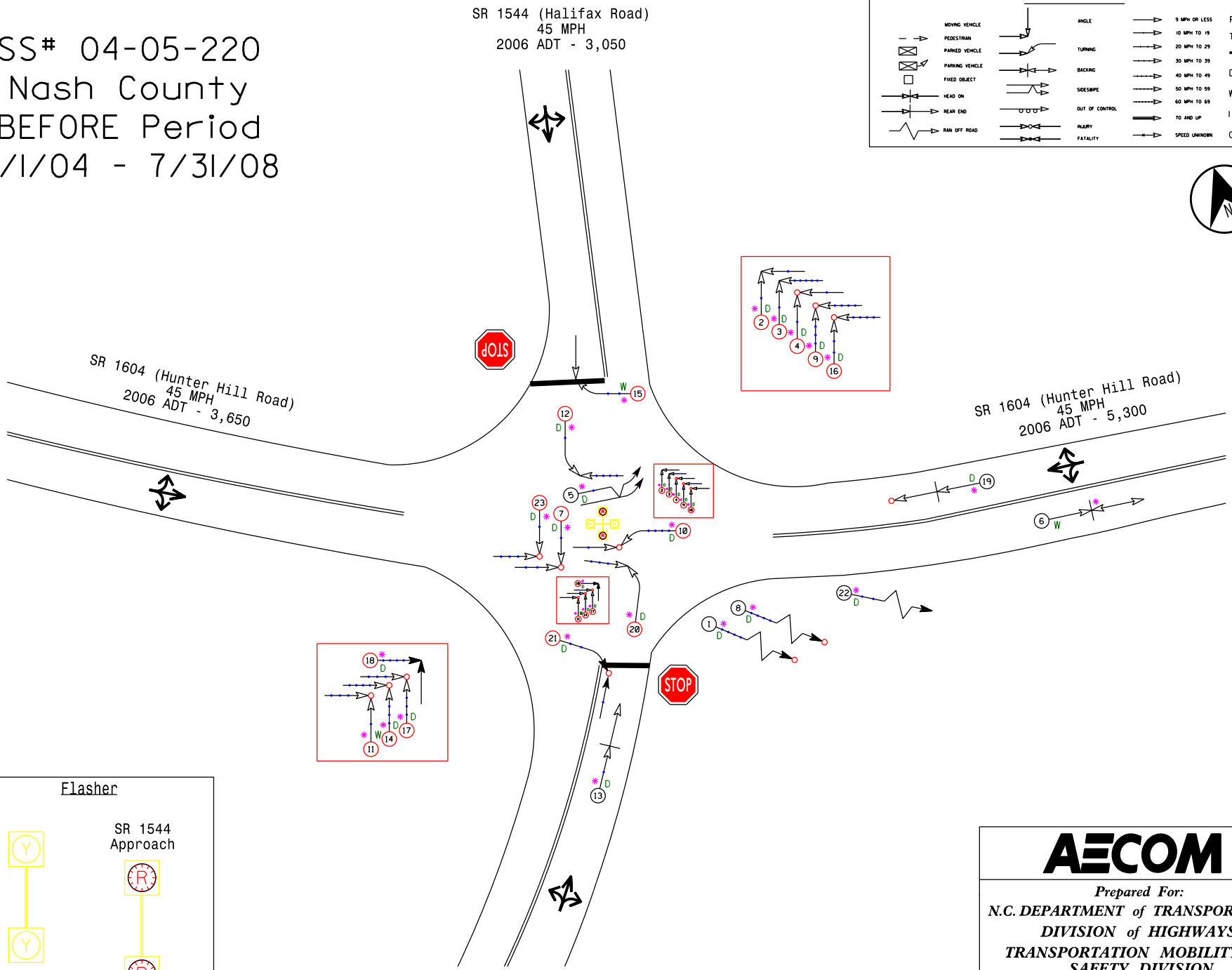
Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for all four approaches to the treatment intersection. As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.

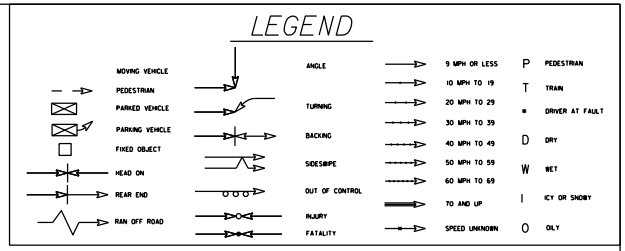
Treatment Site Photos from Google Street View (North and West Images were not available)

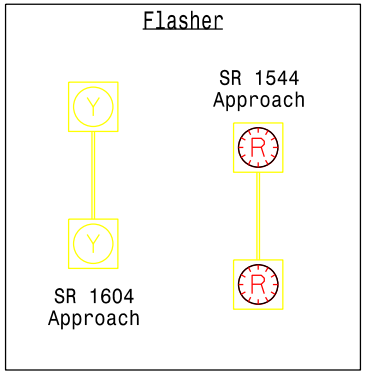
Google Maps (Image Date: 4/08) – Looking South on SR 1544 Approach (Before Period)

Google Maps (Image Date: 4/08) – Looking East on SR 1604 Approach (Before Period)

SS# 04-05-220
Nash County
BEFORE Period
4/1/04 - 7/31/08







Frontal Impact Crashes

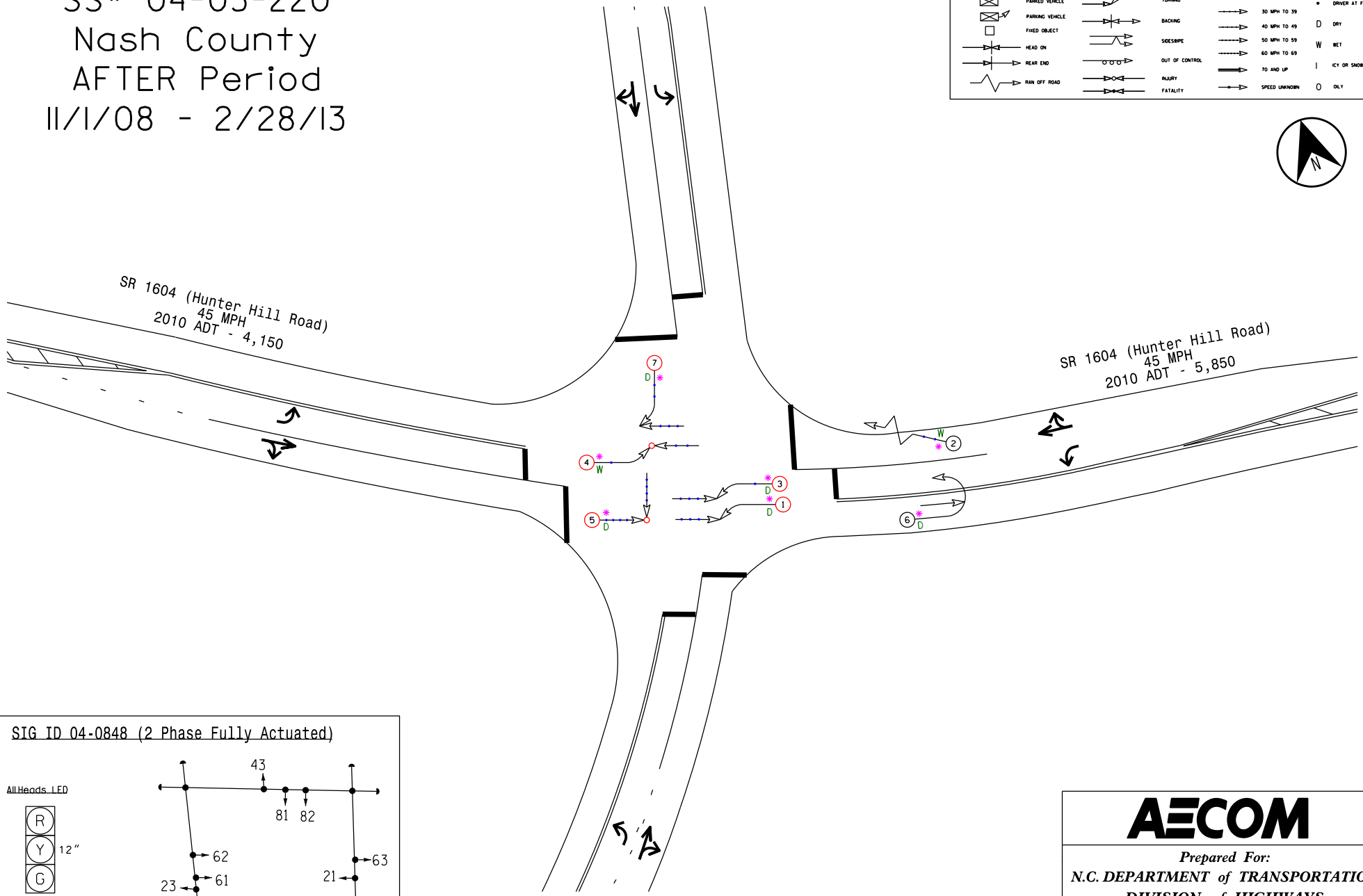
AECOM

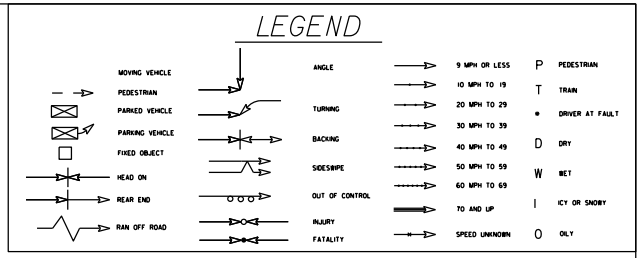
Prepared For:
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRANSPORTATION MOBILITY and SAFETY DIVISION

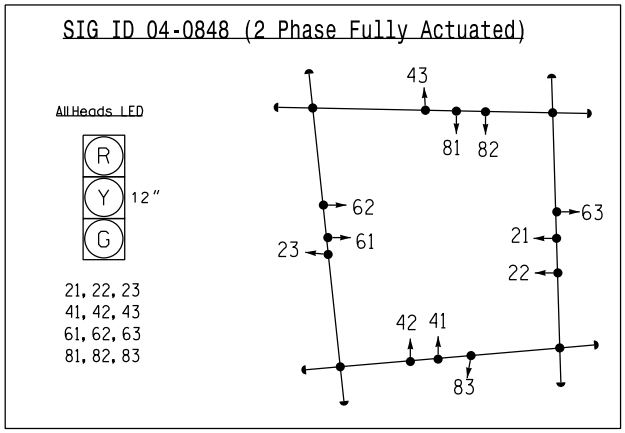
TRAFFIC SAFETY UNIT

Date: 5–8–2013 | *Prepared By: Andrew Covington*

SS# 04-05-220
Nash County
AFTER Period
11/1/08 - 2/28/13







Frontal Impact Crashes

AECOM

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

TRAFFIC SAFETY UNIT

Date: 5–8–2013 | *Prepared By: Andrew Covington*