

Spot Safety Project Evaluation

Spot Safety Project # 05-03-012

Spot Safety Project Evaluation for Installation of Traffic Signal

SR 1319 (Jones Franklin Road) at Crossroads Boulevard/Entrance to Apartment Complex

Wake 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

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AECOM

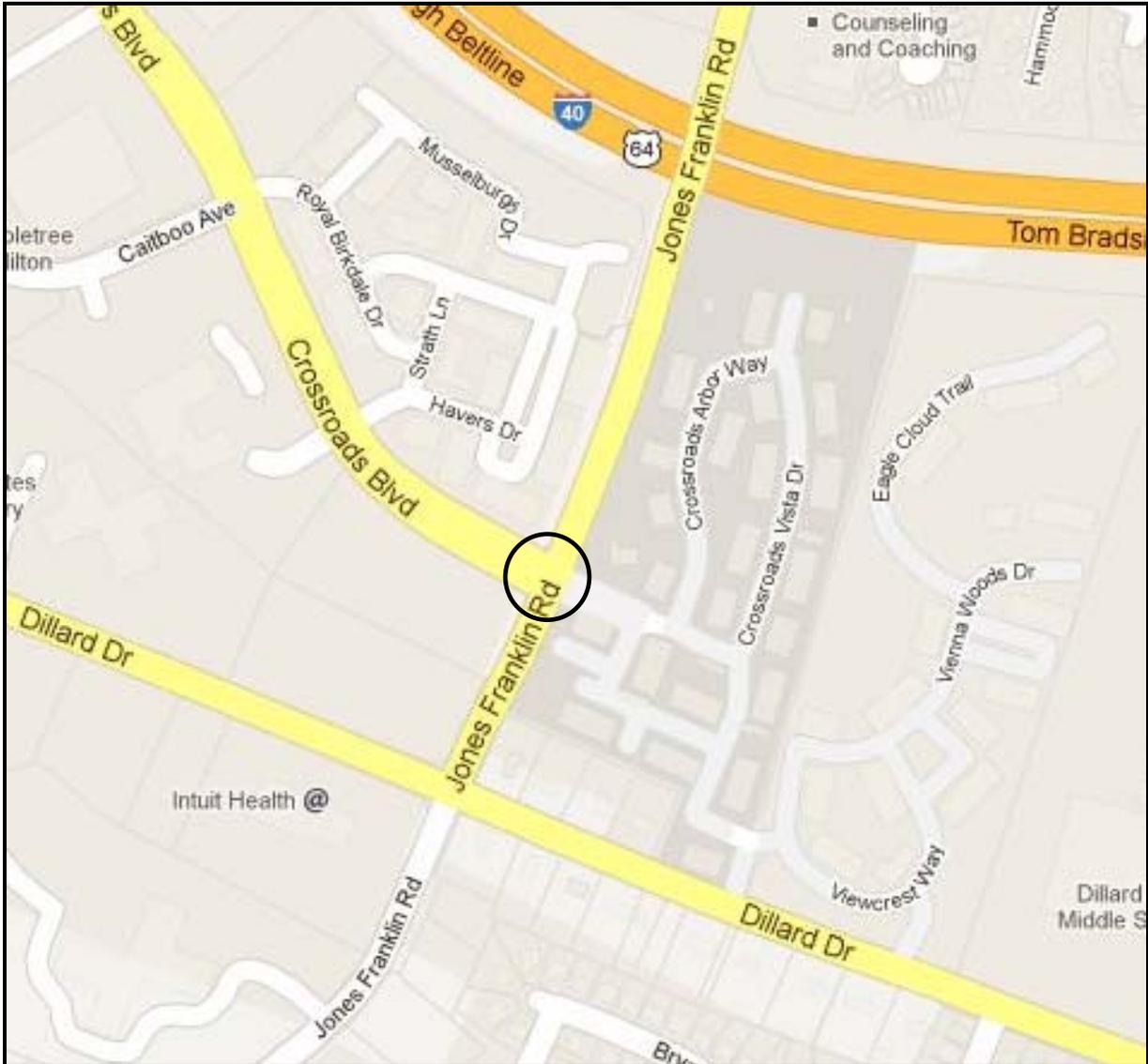
5-8-2013
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 05-03-012 located at the intersection of SR 1319 (Jones Franklin Road) at Crossroads Boulevard/Entrance to Apartment Complex in the Town of Cary, Wake County.

The Sig ID is 05-1815 for this 3-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 a traffic signal with a protected permitted left-turn phase for northbound SR 1319 (Jones Franklin Road).

SR 1319 (Jones Franklin Road) is a two-lane facility with left-turn lanes on both approaches, a right-turn lane on the northbound approach and a speed limit of 45 mph. Crossroads Boulevard is a four-lane divided facility serving a large shopping center with a speed limit of 35 mph. The apartment complex entrance has a speed limit of 25 mph.

The original statement of problem was that vehicles on Crossroads Boulevard could not cross or enter the intersection due to insufficient gaps in traffic. Also, northbound vehicles on SR 1319 (Jones Franklin Road) had difficulty turning left due to insufficient gaps in traffic. The initial crash

analysis was completed from August 1, 2000 to July 31, 2003 with thirteen (13) total reported crashes, of which there were 2 angle and 2 left-turn different roadway crashes. The final completion date for the improvement at the subject intersection was on April 18, 2008 with a total cost of \$104,000.00.

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 March through May 2008. The before period consisted of reported crashes from June 1, 2003 through February 29, 2008 (4 years 9 months); and the after period consisted of reported crashes from June 1, 2008 through February 28, 2013 (4 years 9 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 1319 (Jones Franklin Road) and Crossroads Boulevard/Entrance to Apartment Complex 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.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	39	30	- 23.1 %
Total Severity Index	3.28	2.23	- 32.0 %
Target Crashes	22	7	- 68.1 %
Target Crash Severity Index	3.35	3.11	- 7.2%
Volume (2005, 2010)	23,300	23,300	0.0 %

<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	2	1	- 50.0 %
Class C Injury Crashes	10	4	- 60.0 %
Property Damage Only	27	25	- 7.4 %

The naive before and after analysis at the treatment location resulted in a 23 percent reduction in Total Crashes, a 68 percent reduction in Target Frontal Impact Crashes, and a 32 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 (+)
Frontal Impact Crashes (Target)	22	7	- 68.1 %
Left Turn, Different Roadway	11	1	- 90.9 %
Angle	8	4	- 50.0 %
Rear End Slow or Stop	12	20	+ 66.7 %

Results and Discussion

Referencing the *Collision Diagrams*, target crashes (Frontal Impact Crashes) experienced a reduction from 22 crashes in the before period to 7 crashes in the after period. The installation of the signal was beneficial in reducing the target crashes at this location during the after period.

Left turn, different roadway crashes decreased from 11 crashes in the before period to 1 crash in the after period. Angle crashes decreased from 8 crashes in the before period to 4 crashes in the after period.

Although the target crashes were reduced, the number of rear end crashes at the intersection increased. Rear end crashes increased from 12 crashes in the before period to 20 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 SR 1319 Approach



Google Maps (Image Date: 9/11) – Looking South on SR 1319 Approach



Google Maps (Image Date: 9/11) – Looking East on Crossroads Boulevard Approach



Google Maps (Image Date: 9/11) – Looking East on Crossroads Boulevard Approach

SS# 05-03-012
 Wake County
 BEFORE Period
 6/1/03 - 2/29/08

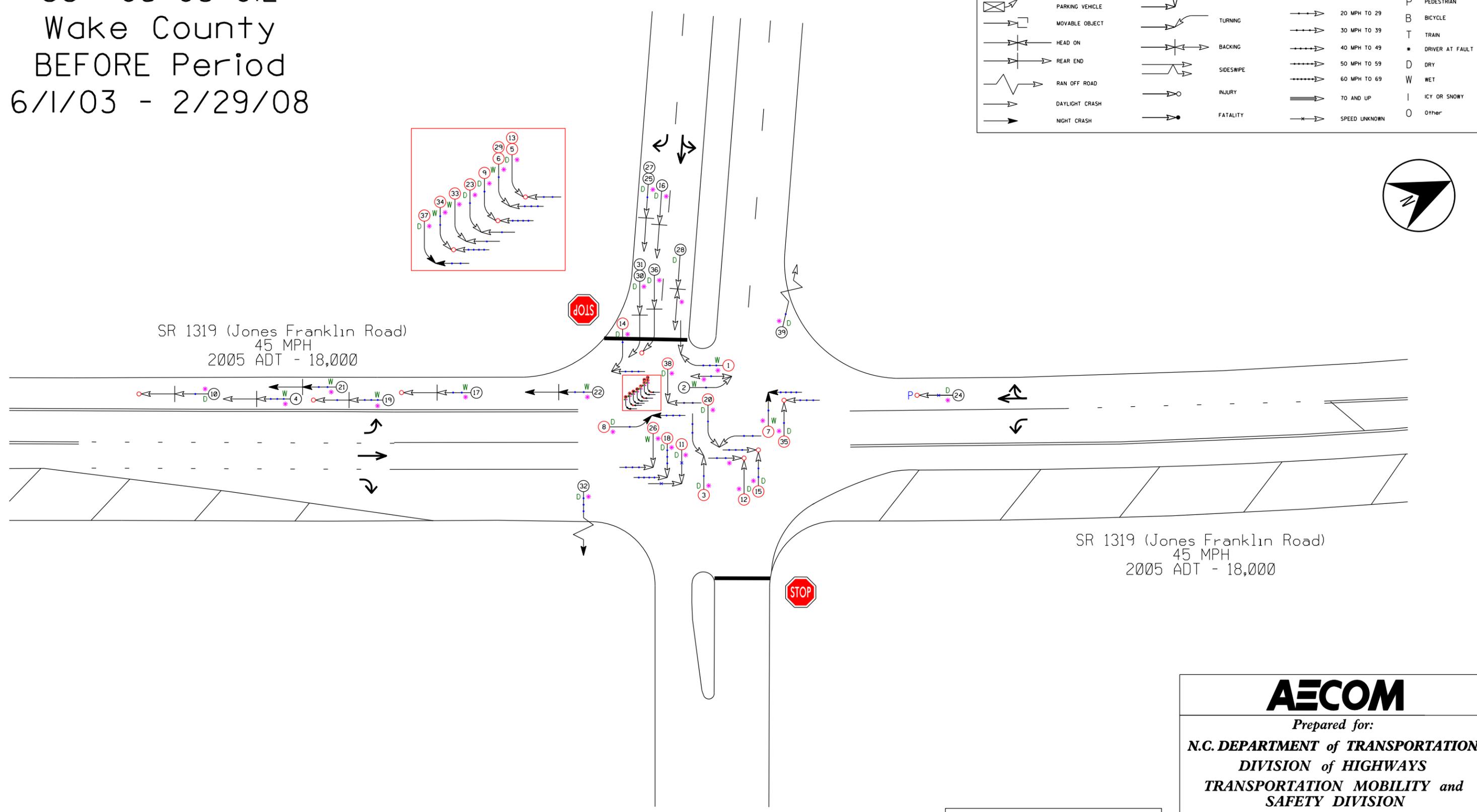
Crossroads Boulevard
 35 MPH
 2005 ADT - 8,000 (estimated)

SR 1319 (Jones Franklin Road)
 45 MPH
 2005 ADT - 18,000

SR 1319 (Jones Franklin Road)
 45 MPH
 2005 ADT - 18,000

Entrance to Apartment Complex
 25 MPH
 2005 ADT - 2,500 (estimated)

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 TRAIN
	HEAD ON		INJURY		40 MPH TO 49		* DRIVER AT FAULT
	REAR END		FATALITY		50 MPH TO 59		D DRY
	RAN OFF ROAD				60 MPH TO 69		W WET
	DAYLIGHT CRASH				70 AND UP		I ICY OR SNOWY
	NIGHT CRASH				SPEED UNKNOWN		O Other



Frontal Impact Crashes

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

TRAFFIC SAFETY UNIT

Date: 5-8-13 Prepared By: Heath Gore, PE

SS# 05-03-012
 Wake County
 AFTER Period
 6/1/08 - 2/28/13

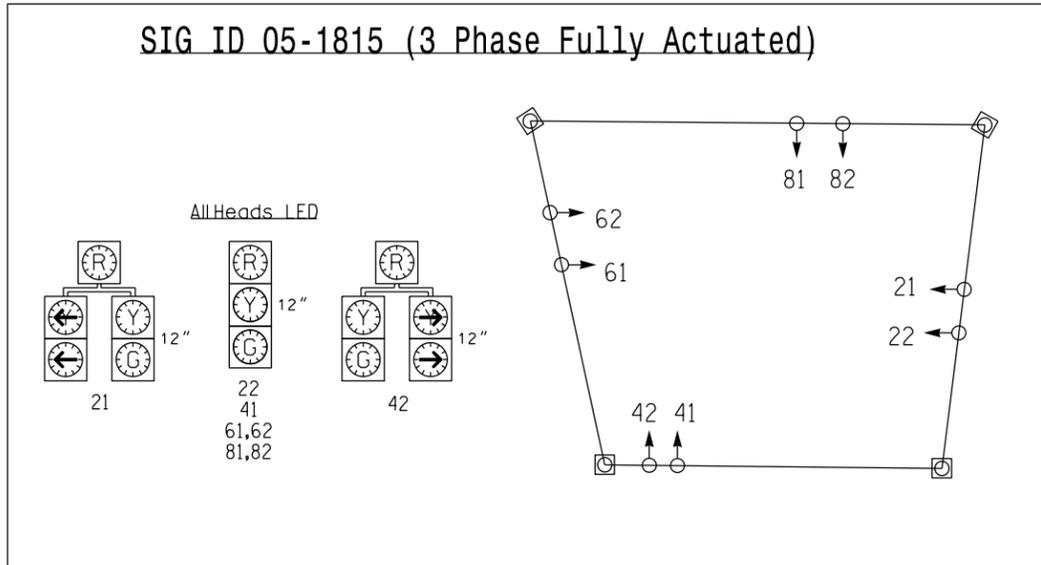
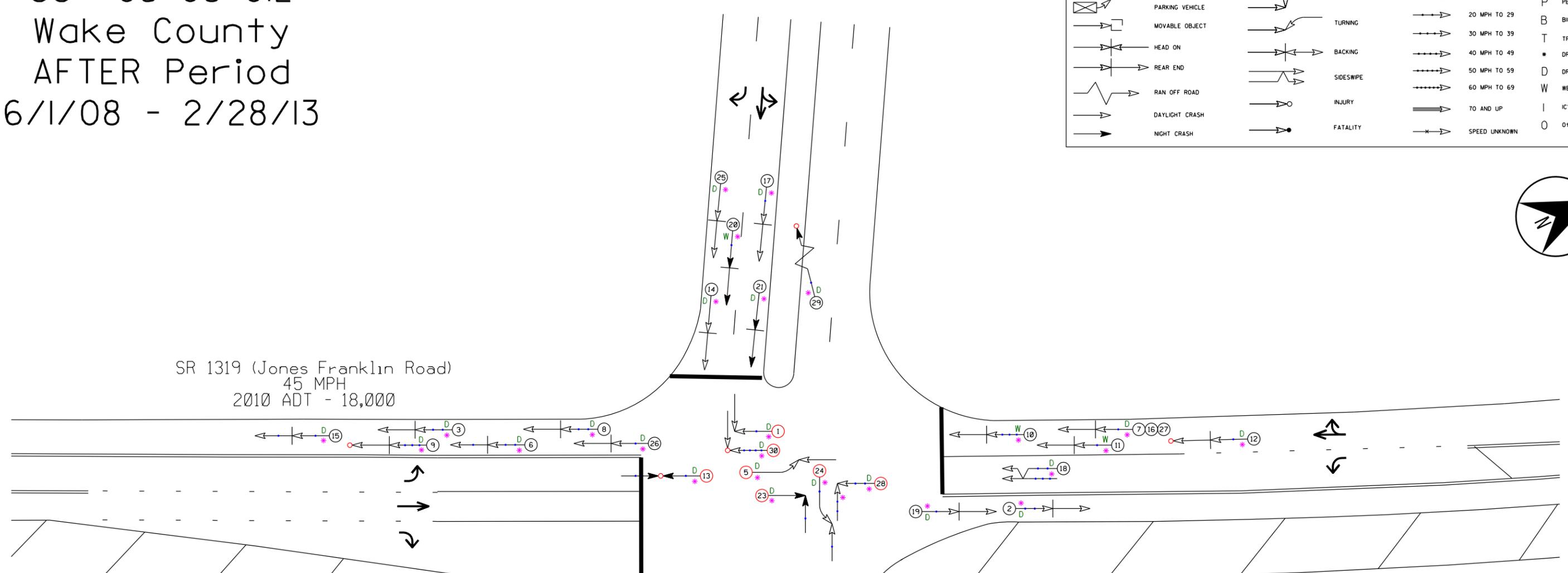
Crossroads Boulevard
 35 MPH
 2009 ADT - 8,000 (estimated)

SR 1319 (Jones Franklin Road)
 45 MPH
 2010 ADT - 18,000

SR 1319 (Jones Franklin Road)
 45 MPH
 2010 ADT - 18,000

Entrance to Apartment Complex
 25 MPH
 2010 ADT - 2,500 (estimated)

LEGEND							
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		A ANIMAL
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	INJURY						
	FATALITY						



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