

Spot Safety Project Evaluation

Work Order #41000008231

Spot Safety Project # 01-01-256

**Spot Safety Project Evaluation of the Traffic Island Elimination and Upgrading of the Signal Phasing and Equipment at the Intersection of US 64A/NC 125 and SR 1123/1434
Martin County**

Documents Prepared By:

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

Principal Investigator



Brad Robinson, PE

10/4/2010

Date

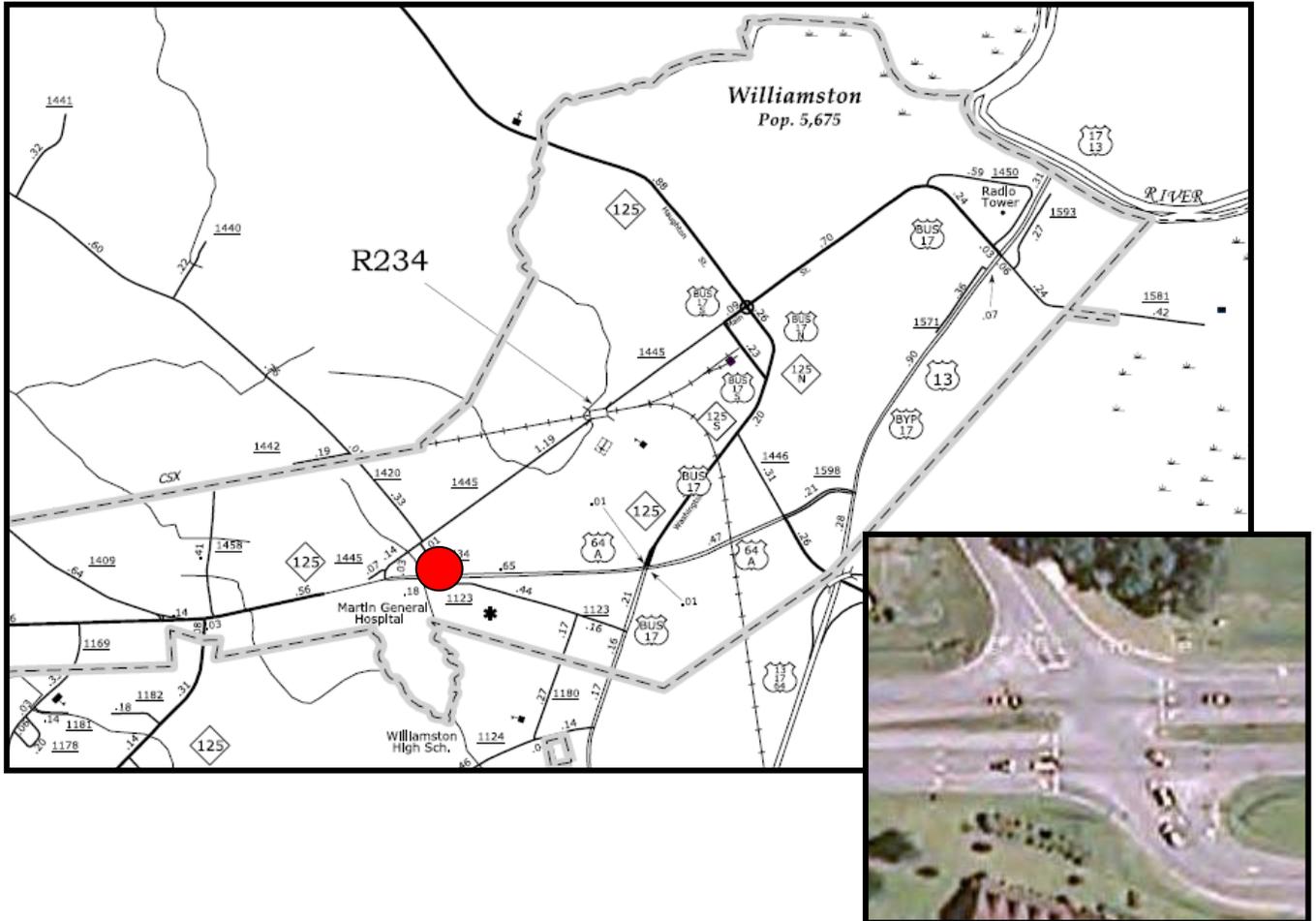
Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 01-01-256 – The intersection of US 64A/NC 125 (West Blvd) and SR 1123/1434 (McCasky Rd).

The signal number for this location is 01-0213.



Project Information and Background from the Project File Folder

The spot safety project improvement countermeasures chosen for the subject location were to revise the geometrics to eliminate traffic islands on SR 1123/1434 in order to replace them with turn lanes and to upgrade the signal phasing and equipment.

The subject intersection is a four leg intersection which was controlled by a signal in both the before and the after periods. US 64A/NC 125 is a four-lane divided facility with left and right turn lanes at the intersection and a speed limit of 45 mph. SR 1123 and 1434 are both two lane roads that had right turn slip ramps in the before period. In addition to the raised median islands for the slip ramp

there were also raised islands in the center of the roadway separating the two directions of travel. The median islands were removed and left turn lanes were added on both roadways as part of the project.

The original statement of problem was that the existing geometrics and raised islands forced split side street signal phasing, which decreased the efficiency of the operation.

The initial crash analysis was conducted from August 1, 1998 to July 31, 2001 with a total of six reported crashes, one of which was considered correctable by the chosen countermeasure. The final completion date for the improvements at the subject intersection was on January 20, 2006 with a total cost of \$25,000.00.

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 was from December 1, 2005 to February 28, 2006. The before period consisted of reported crashes from July 1, 2001 through November 30, 2005 (4 years and 5 months) and the after period consisted of reported crashes from March 1, 2006 through July 31, 2010 (4 years and 5 months). The ending date for this analysis was limited by the available crash data at the time the analysis was conducted.

The treatment data consisted of all reported crashes within 150 feet of the subject intersection. The following data table depicts the Naive Before and After Analysis for the treatment location. There were no Target Crashes selected for the chosen countermeasure.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	7	2	-71.4
Total Severity Index	5.23	4.7	-10.1
Volume	14,300	14,800	3.5
<u>Crash Severity Summary</u>			
Fatal Crashes	0	0	N/A
Class A Crashes	0	0	N/A
Class B Crashes	1	1	0.0
Class C Crashes	3	0	-100.0
PDO Crashes	3	1	-66.7

The naive before and after analysis at the treatment location resulted in a 71 percent decrease in Total Crashes and a 4 percent decrease in Average Daily Traffic (ADT). The before period ADT year was 2003 and the after period ADT year was 2008.

Results and Discussion

Crashes decreased by 71 percent from the before to the after period. In the before period there were a total of four angle crashes and three rear-end crashes at the intersection. In the after period there was one angle crash and one left turn-same roadway crash.

As described in the *Project Background* section, the project was more for operational benefits than for safety reasons. The naïve before and after analysis can not measure the effect the signal had on traffic operations at the intersection.

The calculated benefit to cost ratio for this project is 4.17 considering total crashes. The benefits are calculated using the change in annual crash costs from the before to the after period. Operational and other benefits related to the project are not considered in this analysis. The costs of the project include the actual construction costs as well as the increase in annual maintenance and utility costs.

Please see the attached *Treatment Site Photos*. Photos were obtained from Google Street-view. 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.

BENEFIT-COST ANALYSIS WORKSHEET

LOCATION: US 64A at SR 1123/1434
 COUNTY: Martin
 FILE NO.: SS 01-01-256

BY: bdr
 DATE: 9/22/2010

DETAILED COST: TYPE IMPROVEMENT - **geometrics revision and signal upgrade**

ITEMS	TOTAL	SERVICE	CRF	ANNUAL COST
Construction	\$0	0	0.000	\$0
Right-of-Way	\$25,000	10	0.149	\$3,726
	\$0	0	0.000	\$0
TOTALS	\$25,000	10	0.149	\$3,726

ESTIMATED INCREASE IN ANNUAL MAINT. COST = \$0
 ESTIMATED INCREASE IN ANNUAL UTILITY COST = \$0
 TOTAL ANNUAL COST= \$3,726
 TOTAL COST OF PROJECT= \$25,000

COMPREHENSIVE COST REDUCTION:

TIME PERIOD	YEARS	ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES						ANNUAL COSTS
		K & A CRASHES	K & A CRASHES PER YR	B & C CRASHES	B & C CRASHES PER YR	PDO CRASHES	PDO CRASHES PER YR	
BEFORE	4.42	0	0.00	4	0.90	3	0.68	\$21,018
AFTER	4.42	0	0.00	1	0.23	1	0.23	\$5,498

Annual Benefits from Crash Cost Savings \$15,520

NET AVG. ANNUAL BENEFITS = AVG. ANNUAL BENEFITS - TOTAL ANNUAL COST = \$11,795

BENEFIT-COST RATIO = AVG ANNUAL BENEFITS/TOTAL ANNUAL COST = 4.17

TOTAL COST OF PROJECT - \$25,000 COMPREHENSIVE B/C RATIO - 4.17

Treatment Site Photos from Google Street-View



Looking east on US 64/NC 125



Looking west on US 64/NC 125

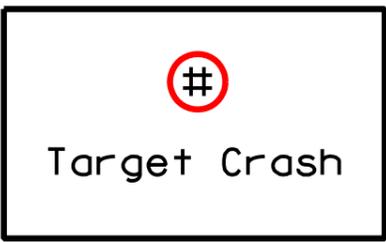
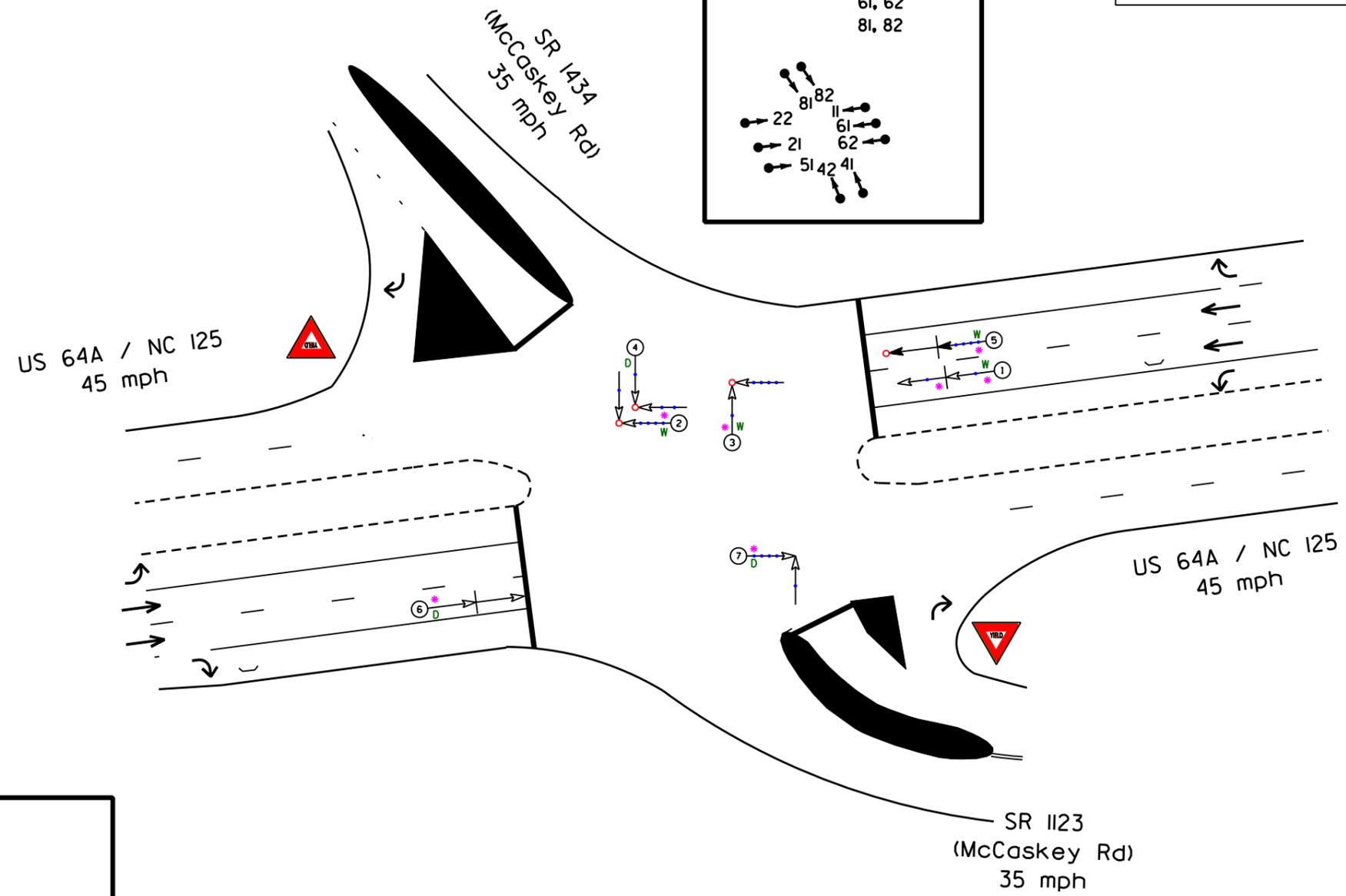
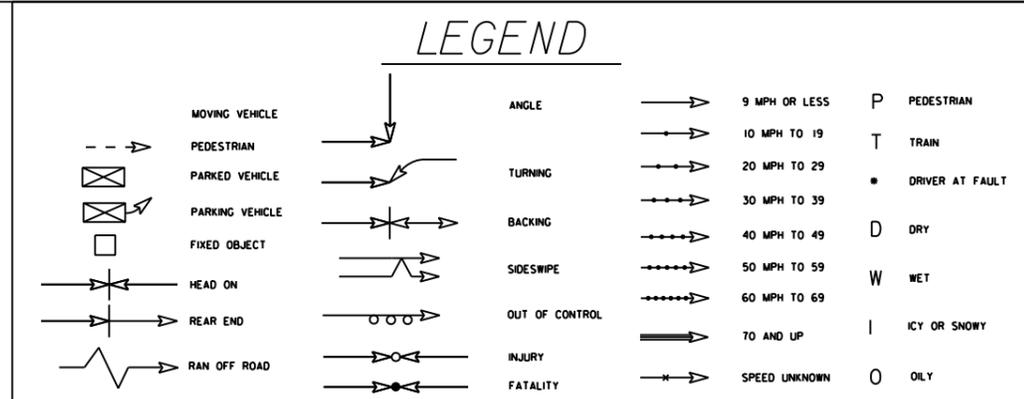
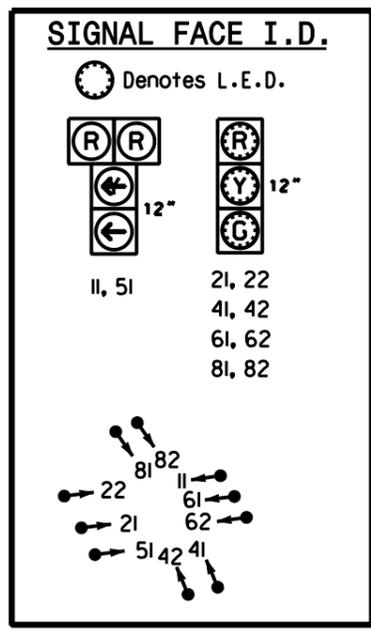


Looking south on SR 1434 (McCaskey)



Looking south from intersection toward SR 1123 (McCaskey)

Martin County
 US 64 Alt. at SR 1123/1434
 BEFORE Period
 7/1/2004-11/30/2005

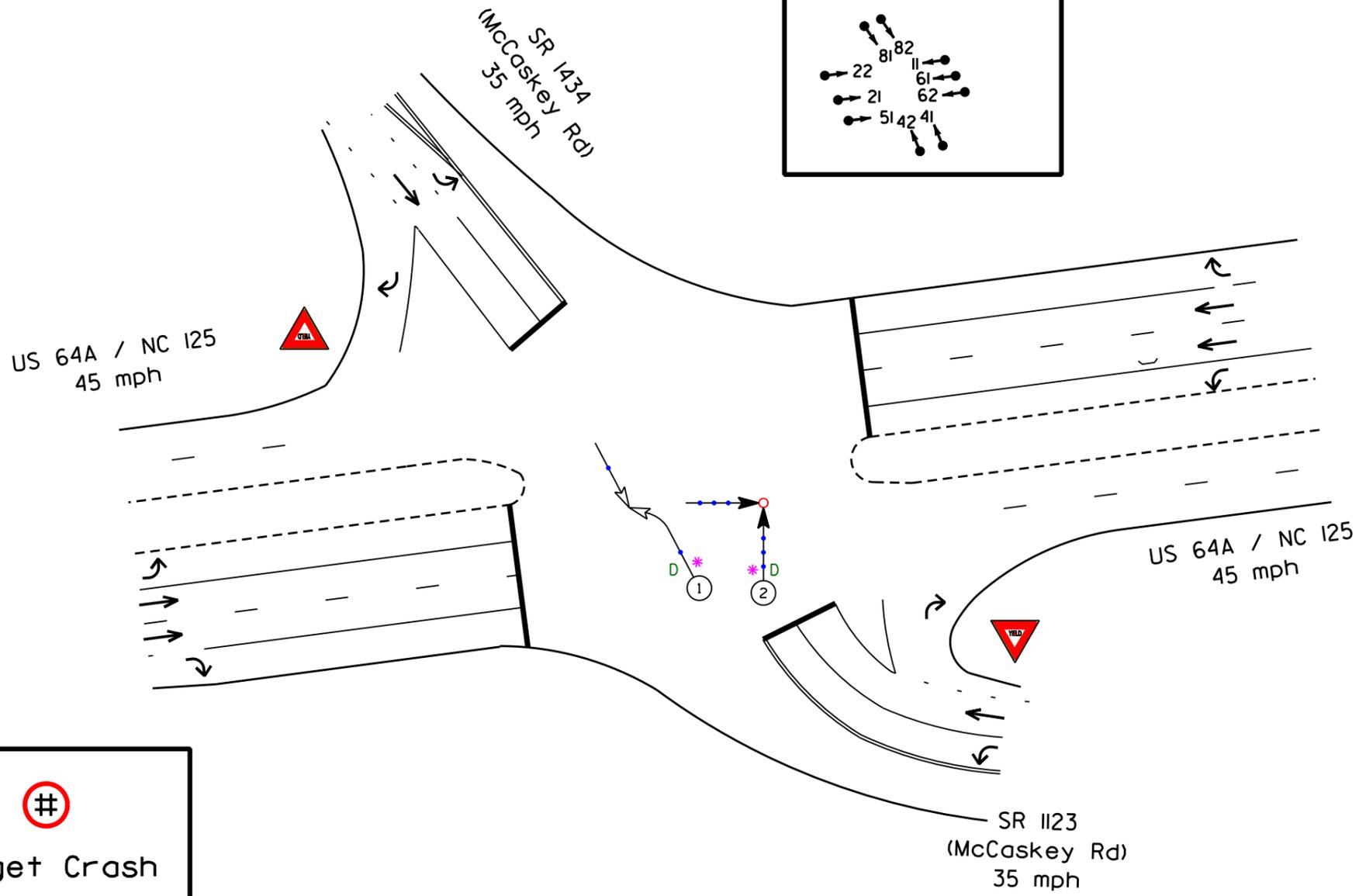
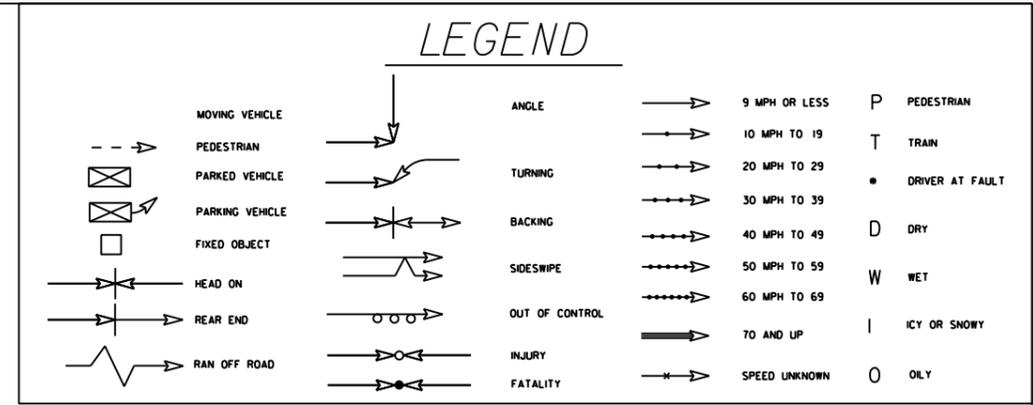
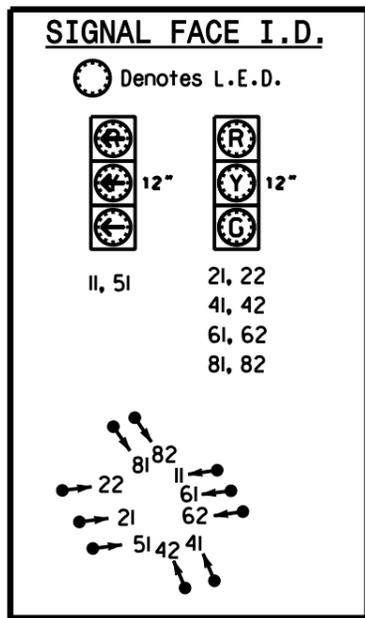


N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRANSPORTATION MOBILITY and SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: September 2010 Prepared By: BDR

Martin County
 US 64 Alt. at SR 1123/1434
 AFTER Period
 3/1/2006-7/31/2010



Target Crash

N.C. DEPARTMENT of TRANSPORTATION
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