

Spot Safety Project Evaluation

Order # 41000023245

Spot Safety Project # 04-05-217

**Spot Safety Project Evaluation of the 1.5-Foot Paved Shoulders Installation
SR 1003 (Buffalo Rd) / SR 1908 (Fire Department Road)
Johnston County**

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
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Principal Investigator



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8/15/2013

Date

Traffic Safety Project Engineer

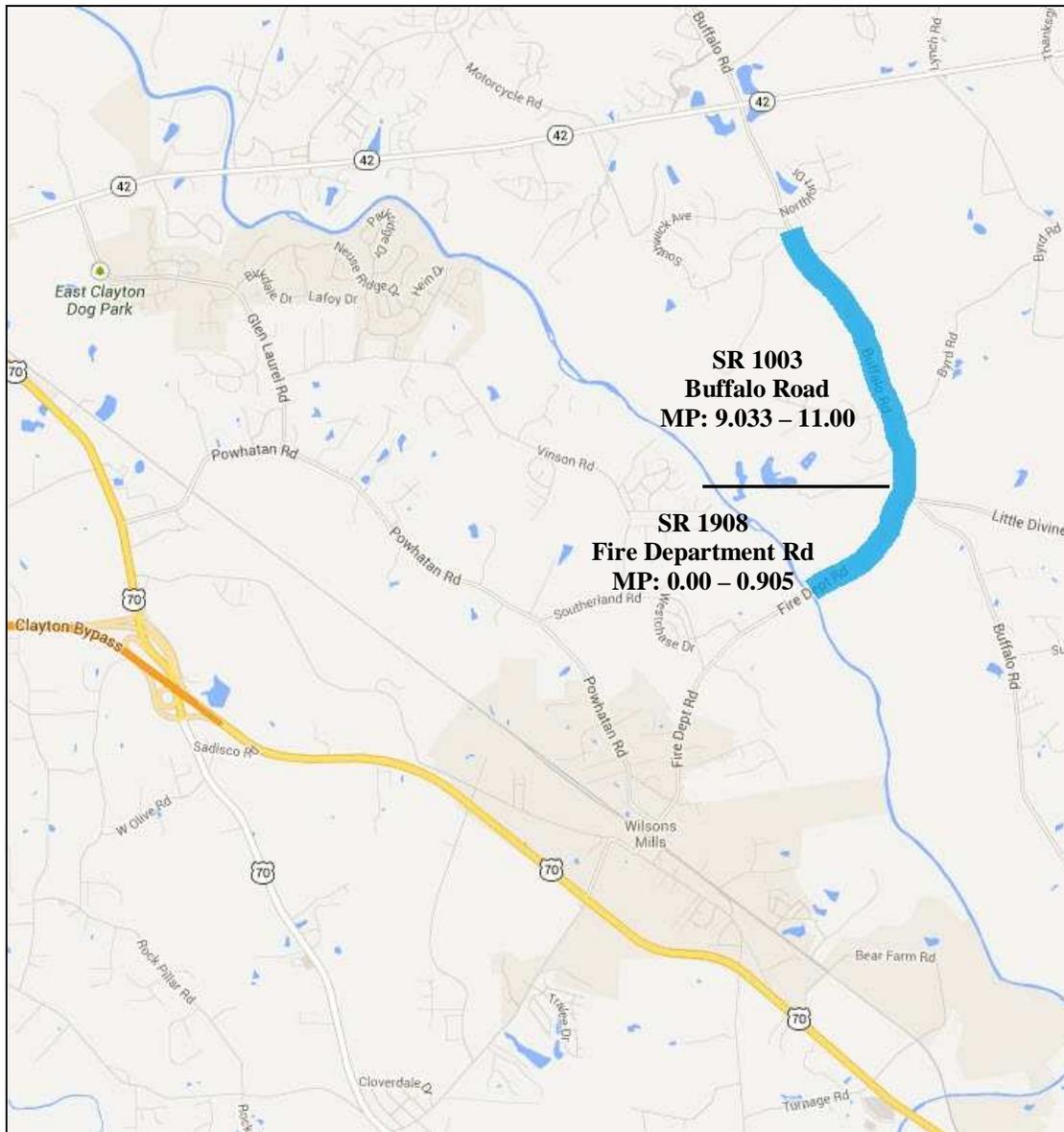
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 04-05-217 located along the route of SR 1908 (Fire Department Road) / SR 1003 (Buffalo Road) from the Neuse River Bridge on SR 1908 to the eastern SR 2040 (Southwick Ave) intersection in Johnston County, near the Town of Wilson Mills.

SR 1908 Milepost 0.00 to 0.905 (SR 1003 to Neuse River Bridge)

SR 1003 Milepost 9.033 to 11.000 (SR 1908 to eastern SR 2040 intersection)



Map Overview – Google Maps



Aerial Overview – BING Maps – Located near SR 1905 (Clark Pond Rd)

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of 1.5-Foot Paved Shoulders on both sides of the roadway segment. Along with adding paved shoulders, the roadway edgelines and centerline were to be re-stripped at the same time. This section of SR 1003/1908 is a 22-foot roadway with no paved shoulders and a 55-mph speed limit. The route name of SR 1003 (Buffalo Road) makes a left turn at the intersection of 1908 (Fire Department Road) but the through (non-stop) movement is onto SR 1908. This segment has approximately eight (8) intersections, multiple residential driveways, and a long sweeping horizontal curve.

The original statement of problem concluded that the existing shoulders were in poor condition due to erosion and vehicles running off the roadway creating a low shoulder situation. The lack of paved shoulders and poor drainage, coupled with the existing vertical and horizontal alignment along this route results in run-off road crashes, especially in wet road conditions. This site was identified in the 2005 Highway Safety Improvement Program under HSIP# 50S00026/27.

The initial crash analysis was completed from May 1, 2000 to April 30, 2005 with thirty-nine (39) reported run-off roadway crashes. The final completion date for the improvement at the subject roadway was on February 1, 2008 with a total cost of \$101,500.

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 January through February 2008. The before period consisted of reported crashes from November 1, 2002 through December 31, 2007 (5 years and 2 months); and the after period consisted of reported crashes from March 1, 2008 through April 30, 2013 (5 years and 2 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 the SR 1908 Milepost Range of 0.00 to 0.905 and SR 1003 Milepost Range of 9.033 to 11.00 with a 0-foot y-line of the subject roadways. *Please see attached location map, aerial map, and photo for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Lane Departure Crashes were the target crashes for the applied countermeasure. The Lane Departure Crash types considered are as follows: Ran-off Roadway (Left, Right, and Straight); Sideswipe (Opposite Direction); Fixed Object; Overturn/Rollover; and Head-on.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	73	50	- 31.5 %
Total Severity Index	8.19	2.78	- 66.1 %
Target Crashes – Lane Departure	40	21	- 47.5 %
Target Crash Severity Index	8.49	3.47	- 59.1 %
Lane Departure Wet Crashes (Codes 2-5)	28	6	- 78.6 %
LD-Wet Crash Severity Index	7.41	5.93	- 20.0 %
Volume (2005, 2011)	5,300	4,700	- 11.3 %
Total Crash Rate (100 Mil Vehicle Miles)	254.15	196.30	- 22.8 %
Non-Fatal Crash Rate (100 Mil Veh Miles)	118.37	47.11	- 60.2 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	4	0	- 100.0 %
Class B injury Crashes	7	5	- 28.6 %
Class C Injury Crashes	23	7	- 69.6 %
Property Damage Only	39	38	- 2.6 %

The naive before and after analysis at the treatment location resulted in a 32 percent reduction in Total Crashes, a 48 percent reduction in Target Crashes, and a 66 percent reduction in the Total Severity Index. The before period ADT year was 2005 and the after period ADT year was 2011.

Note-1: Lane Departure WET Crashes include crashes with Codes 2 (Wet), 3 (Water Standing), 4 (Ice), and 5 (Snow)

Note-2: The TEAAS Reports (Before & After) were conducted as “Dummy Routes” that combined the two separate routes (SR 1003 and SR 1908) into a single route for simplicity with the Milepost Limits of 8.128 (Neuse River Bridge) to 11.000 (SR 2040 Intersection). Also, the Milepost Features were added to these reports.

Results and Discussion

Referencing the *GIS Collision Diagrams*, the before period presented a strong pattern of twenty-nine (29) lane departure crashes between SR 1905 (Clark Pond Rd) and Hidden Acres Drive on SR 1003 (Buffalo Rd), which is 1.097 mile segment. During the after period, this same segment only experienced six (6) lane departure target crashes.

Overall, the entire treatment route experienced a 48 percent reduction in lane departure crashes and a 79 percent reduction in lane departure wet collisions. The analysis also showed the elimination of severe injury crashes in the after period from four (4) A-injury collisions in the before period.

The *GIS Collision Diagrams* did indicate one small segment that experienced an increase in after period lane departure crashes. This segment on SR 1003 (Buffalo Road) from SR 2230 (Pond Ave) to SR 1941 (Byrd Road) jumped from two (2) lane departure crashes to five (5) lane departure collisions through the analysis. The following picture shows an aerial of this 0.18 mile segment (MP 9.333 to 9.513). Additionally, the Safety Evaluation Group plotted this 0.18 mile strip into a separate attached collision diagram for your reference.



Aerial Map of SR 1003 Segment – BING Maps

Please see the attached *Treatment Site Photos*. Photos are provided from Google Street View for an example of the treated roadway segment of SR 1003. 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 countermeasure.

Treatment Site Photos



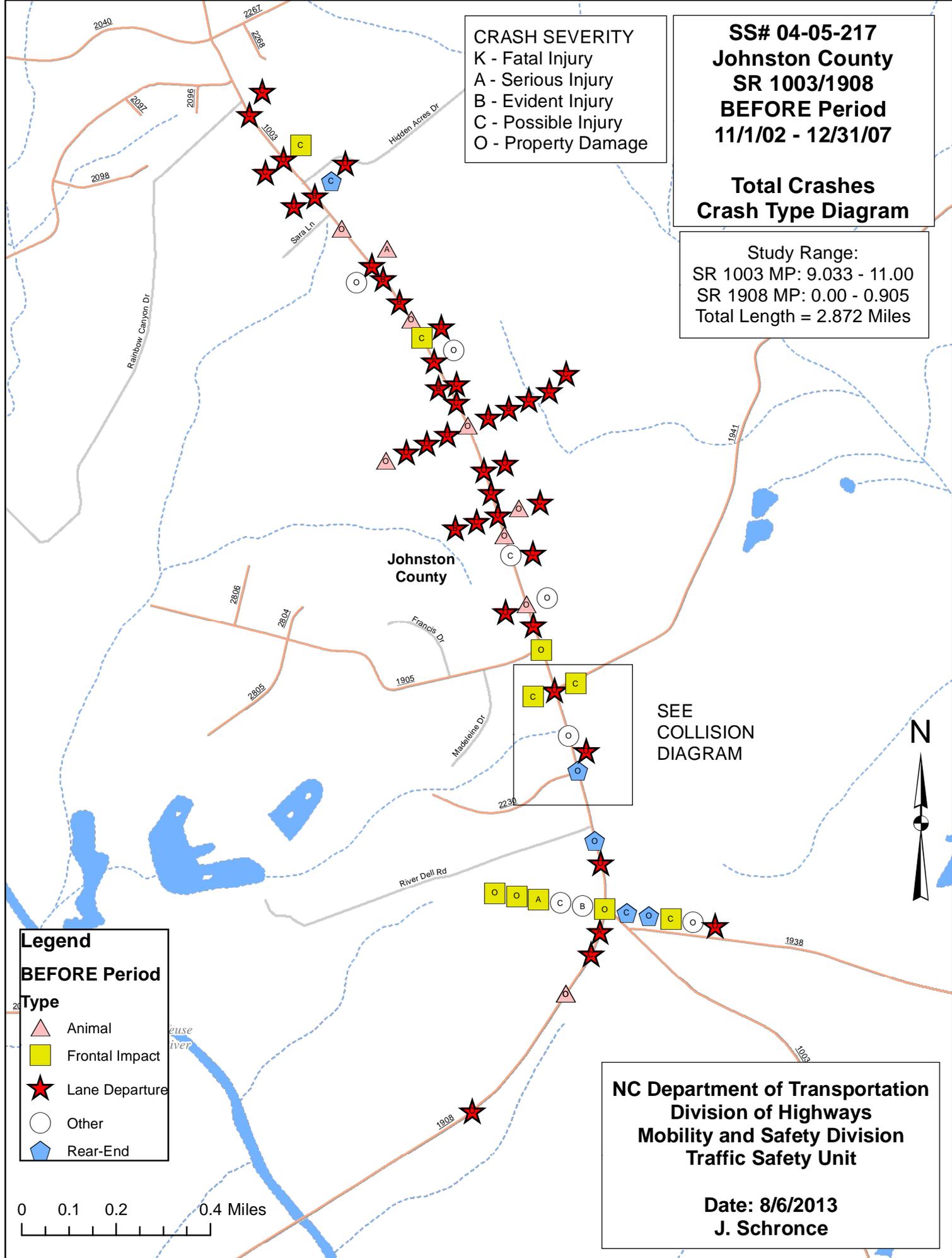
**SR 1003 (Buffalo Rd) – Near MP 9.4 (north of SR 2230) looking North
Google Street View – March 2009 Photo**

CRASH SEVERITY
 K - Fatal Injury
 A - Serious Injury
 B - Evident Injury
 C - Possible Injury
 O - Property Damage

SS# 04-05-217
Johnston County
SR 1003/1908
BEFORE Period
11/1/02 - 12/31/07

Total Crashes
Crash Type Diagram

Study Range:
 SR 1003 MP: 9.033 - 11.00
 SR 1908 MP: 0.00 - 0.905
 Total Length = 2.872 Miles

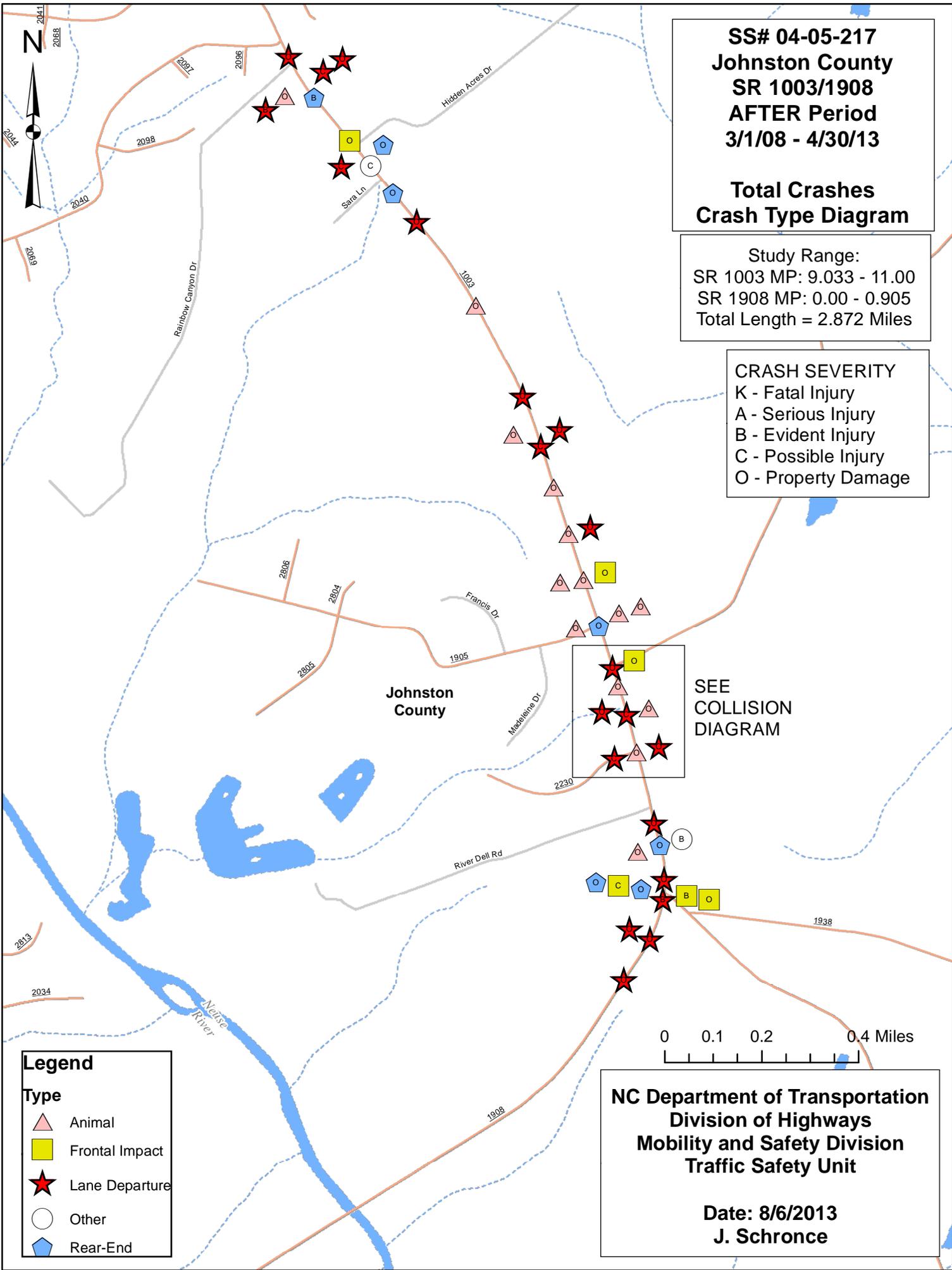


Legend
BEFORE Period
Type

- Animal
- Frontal Impact
- Lane Departure
- Other
- Rear-End

NC Department of Transportation
Division of Highways
Mobility and Safety Division
Traffic Safety Unit

Date: 8/6/2013
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SS# 04-05-217
Johnston County
SR 1003/1908
AFTER Period
3/1/08 - 4/30/13

Total Crashes
Crash Type Diagram

Study Range:
 SR 1003 MP: 9.033 - 11.00
 SR 1908 MP: 0.00 - 0.905
 Total Length = 2.872 Miles

CRASH SEVERITY
 K - Fatal Injury
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SEE
 COLLISION
 DIAGRAM

- Legend**
- Type
- Animal
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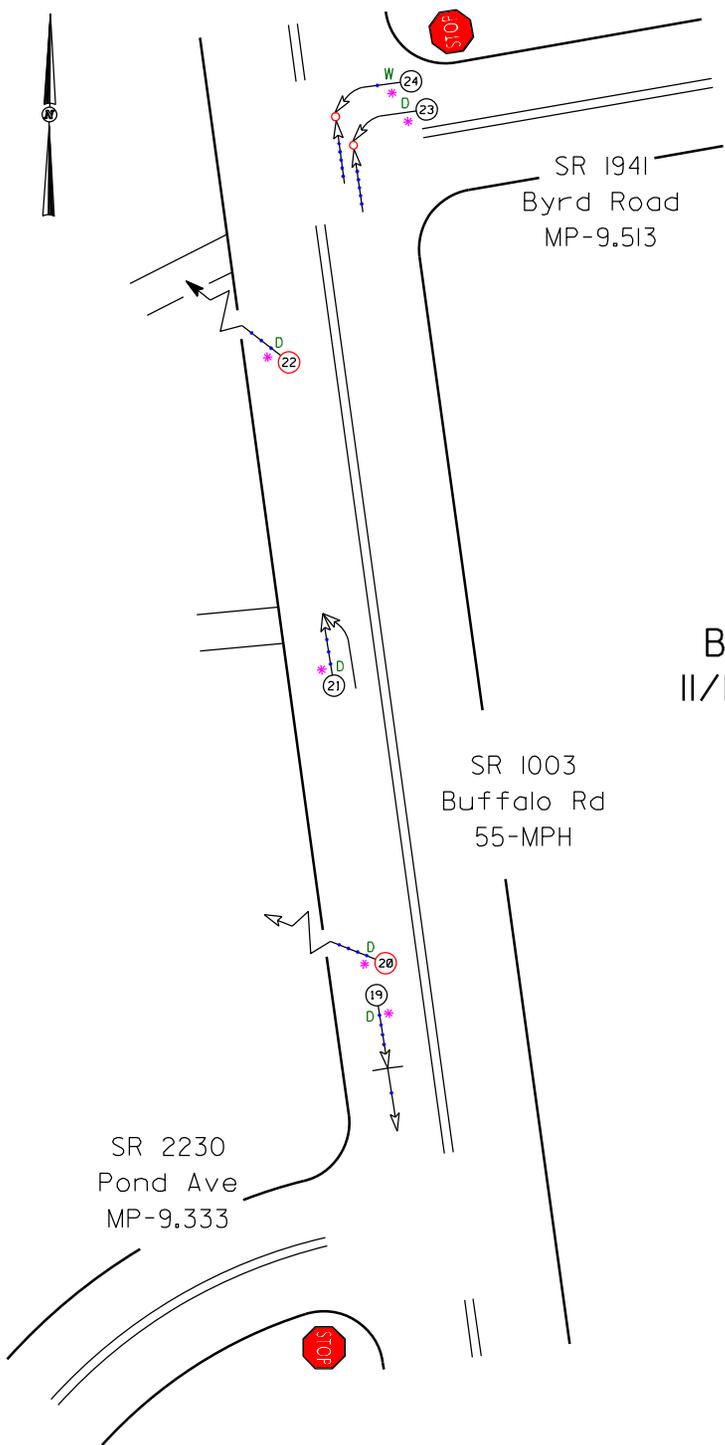
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LEGEND

MOVING VEHICLE	ANGLE	5 MPH OR LESS	PEDESTRIAN
PARKED VEHICLE	TURNING	10 MPH TO 19	TRUCK
PARKED VEHICLE	BACKING	20 MPH TO 29	DRIVER AT FAULT
FIXED OBJECT	SIDESWIPE	30 MPH TO 39	DRY
HEAD ON	INJURY	40 MPH TO 49	WET
REAR END	FATALITY	50 MPH TO 59	ICY OR SNOWY
RAN OFF ROAD		60 MPH TO 69	LIGHT RAIN
		70 AND UP	OTHER
		SPEED UNKNOWN	



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BEFORE Period
11/1/02 - 12/31/07

AFTER Period
3/1/08 - 4/30/13

Countermeasure:
1.5-Foot Paved Shoulders

Lane Departure
Target Crashes

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

TRAFFIC SAFETY UNIT

Date: 8-6-2013

Prepared By: J. Schronce

