

Spot Safety Project Evaluation

Project Information

Order ID: 41000035165

Project ID: 06-08-209

Location: SR 1102 (Gillis Hill Road), entire two mile section from the Hoke County line to SR 3569 (Old Raeford Rd).

County: Cumberland

City: Fayetteville

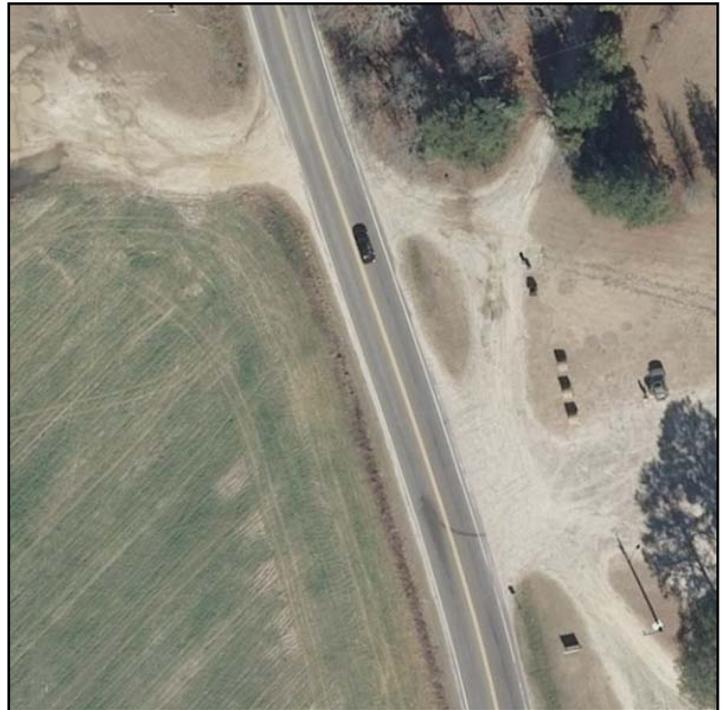
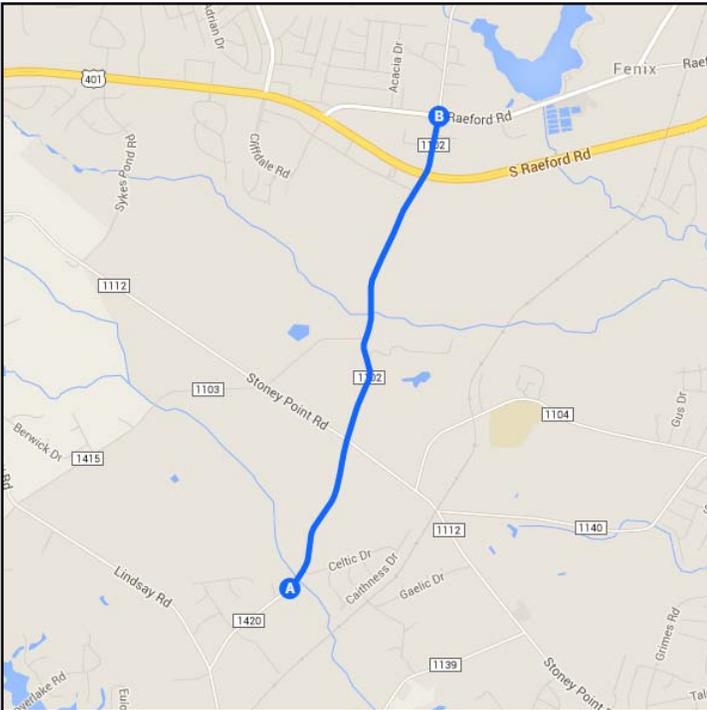
Division: 6

Signal ID: N/A

Countermeasure: Upgrade and replace all warning signs to current standards

Project Completion: January 29, 2010 Project Cost: \$4,000

Map and Aerial (from Google Maps – Coordinates are 35.013382, -79.055010)



Naive Before and After Analysis

Before Period: December 1, 2004 through November 30, 2009 (5.00 years)

Construction Period: December 1, 2009 through March 31, 2010

After Period: April 1, 2010 through March 31, 2015 (5.00 years)

Analysis Criteria: Treatment data consisted of all crashes along the mainline of SR 1102 (Gillis Hill Rd) from the Hoke County line to SR 3569 (Old Raeford Rd), excluding crashes within 150 ft of major intersections – SR 3791 (Celtic Dr), SR 1100/SR 1112 (Stoney Point Dr), SR 1103 (Galatia Church Rd), entrance to Wal-Mart, US 401 (Raeford Rd), and SR 1402/SR 3569 (Old Raeford Rd).

Target Crashes: The target crashes for this project are Lane Departure crashes: Ran Off Road Right, Ran Off Road – Left, Ran Off Road – Straight, Head On, Sideswipe – Opposite Direction, Parked Vehicle, Fixed Object, Overturn/Rollover, and Jackknife.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	116	102	- 12.1 %
Total Severity Index	5.69	3.76	- 33.9 %
Target Crashes	80	52	- 35.0 %
Target Crash Severity Index	7.15	4.27	- 40.2 %
Volume (2007, 2012)	10,000	14,000	40.0 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	2	0	- 100.0 %
Class A injury Crashes	1	0	- 100.0 %
Class B injury Crashes	18	5	- 72.2 %
Class C Injury Crashes	25	33	32.0 %
Property Damage Only	70	64	- 8.6 %

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Night Crashes	42	41	- 2.4 %
Wet Crashes	45	35	- 22.2 %
Alcohol/Drug Related Crashes	6	6	0.0 %
Animal Crashes	0	4	N/A

Overall Summary Results

Total Crashes:	- 12 %	(reduction)
Total Crash Severity:	- 34 %	(reduction)
Target Crashes:	- 35 %	(reduction)
Target Crash Severity Index:	- 40 %	(reduction)
Volume:	+ 40 %	(increase)

Items for Discussion/Concerns

After plotting the Lane Departure crashes with GIS, a smaller strip presented itself as needing more detailed analysis. The strip is from approximately MP 0.87 – 1.042 and 1.098 – 1.35, excluding crashes within 150 ft of the Galatia Church Road intersection. There is a pattern of Lane Departure crashes in two major curves, one south and one north of Galatia Church Road, in the Before period. This pattern decreases in both curves in the After period, though the northern curve still has a large number of crashes.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	67	41	- 38.8 %
Total Severity Index	6.67	4.07	- 39.0 %
Target Crashes	61	33	- 45.9 %
Target Crash Severity Index	6.98	4.59	- 34.3 %

A majority of the crashes in these curves occurred under wet or icy road conditions, 58% in the Before period and 56% in the After period. In the Before period, all of the wet/icy road condition crashes were Lane Departure crashes.

<u>Wet/Icy Road Conditions</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	39	23	- 41.0 %
Total Severity Index	4.79	3.90	- 18.8 %
Target Crashes	39	20	- 48.7 %
Target Crash Severity Index	4.79	4.33	- 9.7 %

In addition to examining crashes at the subject location, weather data was evaluated to compare rainfall totals in each time period. The weather data was collected from a station located in downtown Fayetteville and was provided to us by the State Climate Office of North Carolina. The following table describes the results:

<u>Weather Data (Greater than 0.01 in)</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Calendar Days	1,826	1,826	0.0 %
Total Precipitation (inches)	216.8	224.4	3.5 %
Total Wet Days	498	542	8.8 %
Average Rain Total Per Event (inches)	.44	.41	-6.8 %
Percentage of Rain Days	27%	30%	11.1 %

It should also be noted that two other safety projects were constructed on this section of SR 1102 during the analysis periods, although they were not taken into account for this evaluation.

The first project, Spot Safety Project #06-11-11596, involved the installation of a 4-section flashing yellow arrow signal head with time-of-day programming at the intersection of SR 1102 and SR 1112 (Stoney Point Rd). This project was completed on January 12, 2009.

The second project, Spot Safety Project #06-08-217, involved the construction of a left turn lane on SR 1102 at its intersection with SR 3791. In addition, linear delineation system panels and guardrail delineators were installed in the vicinity of Little Rockfish Creek. This project was completed on September 12, 2011.

Data Prepared For

The Traffic Safety Unit *of the*
 Transportation Mobility and Safety Division *of the*
 Division of Highways *of the*
 North Carolina Department of Transportation

Data Prepared By

Principal Investigator: Ian Pike, Engineering Assistant
 Checked by: Brad Robinson, PE

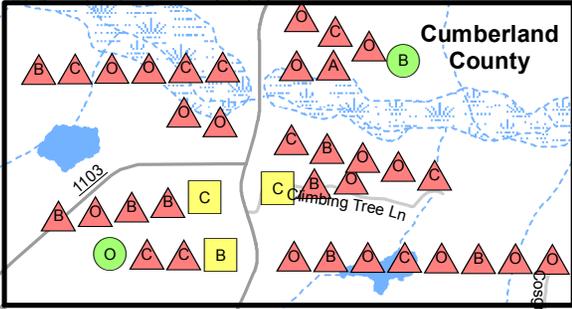
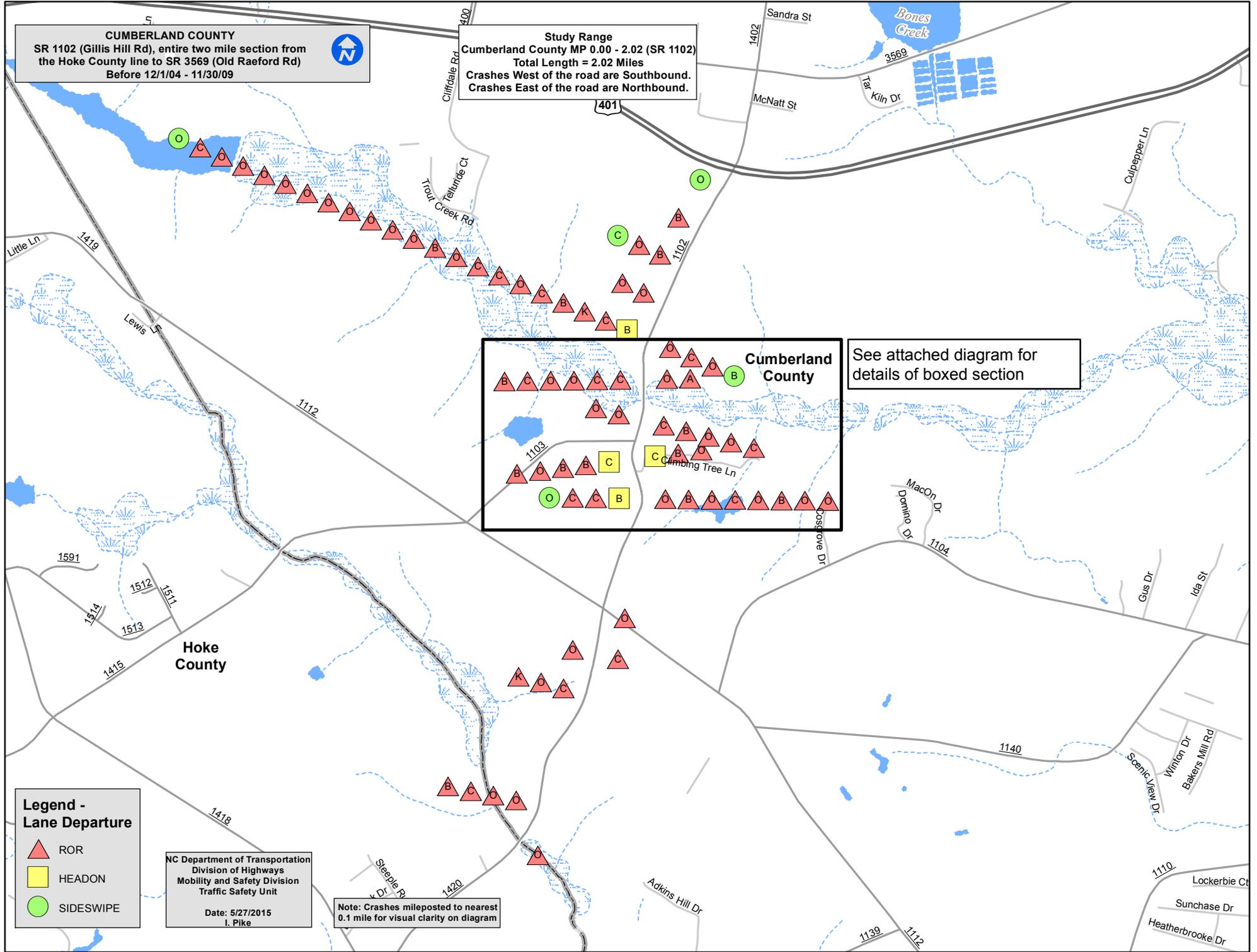
Work Group/Consultant: NCDOT - Safety Evaluation Group

Date: August 3, 2015

CUMBERLAND COUNTY
 SR 1102 (Gillis Hill Rd), entire two mile section from
 the Hoke County line to SR 3569 (Old Raeford Rd)
 Before 12/1/04 - 11/30/09



Study Range
 Cumberland County MP 0.00 - 2.02 (SR 1102)
 Total Length = 2.02 Miles
 Crashes West of the road are Southbound.
 Crashes East of the road are Northbound.



Legend - Lane Departure

- ROR
- HEADON
- SIDESWIPE

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

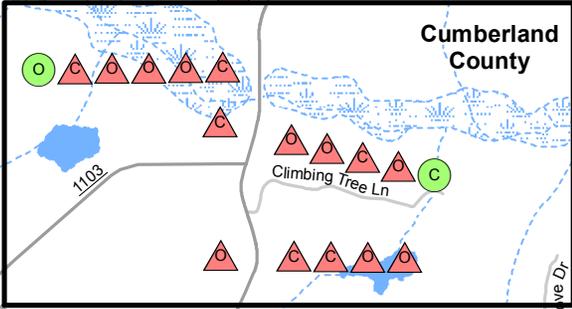
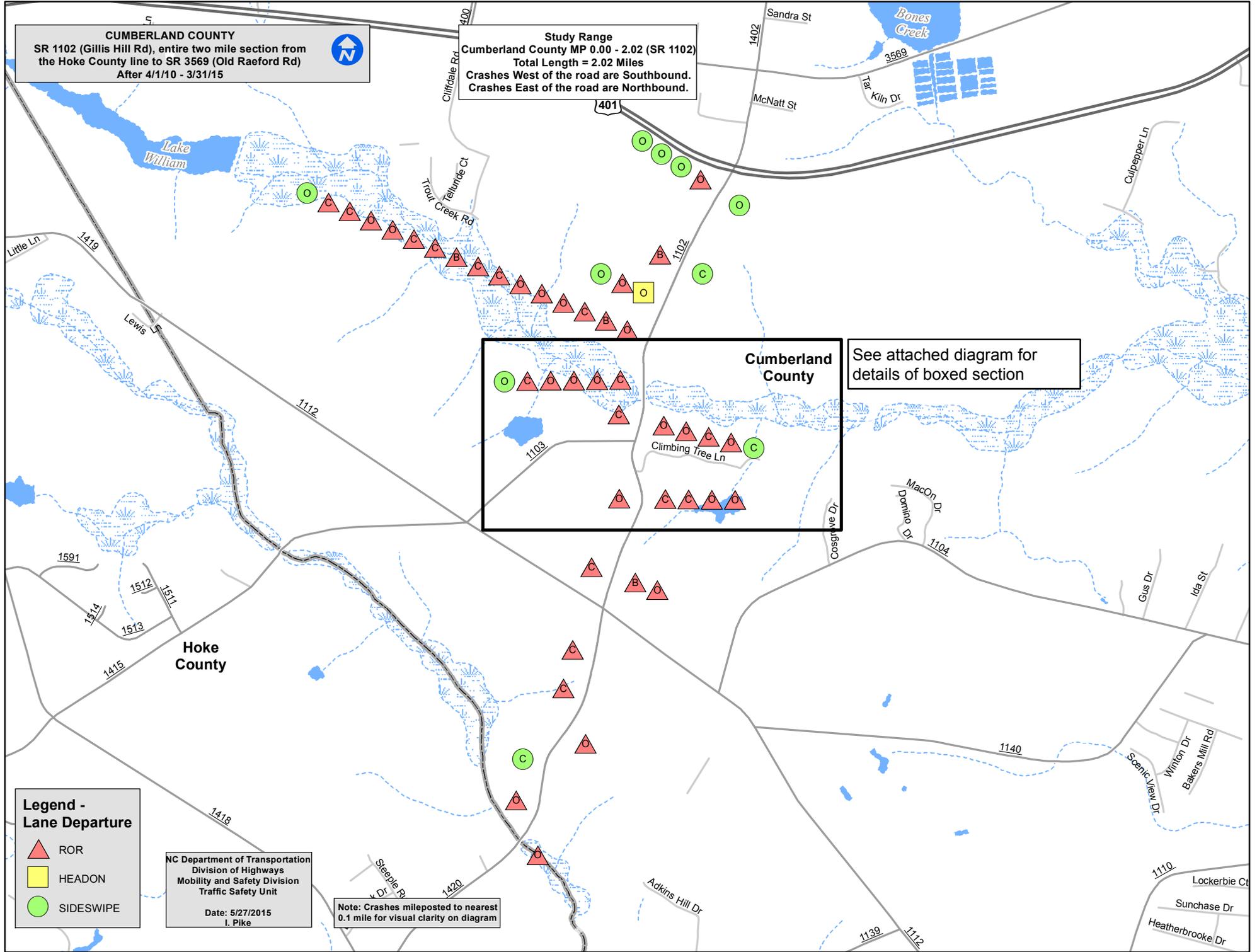
Date: 5/27/2015
 I. Pike

Note: Crashes mileposted to nearest 0.1 mile for visual clarity on diagram

CUMBERLAND COUNTY
 SR 1102 (Gillis Hill Rd), entire two mile section from
 the Hoke County line to SR 3569 (Old Raeford Rd)
 After 4/1/10 - 3/31/15



Study Range
 Cumberland County MP 0.00 - 2.02 (SR 1102)
 Total Length = 2.02 Miles
 Crashes West of the road are Southbound.
 Crashes East of the road are Northbound.



Legend - Lane Departure

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 Division of Highways
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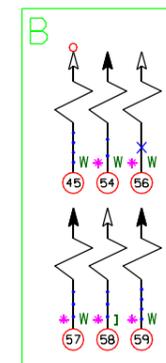
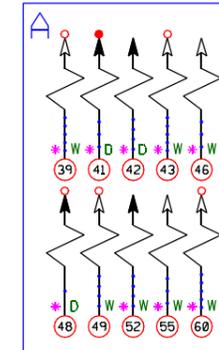
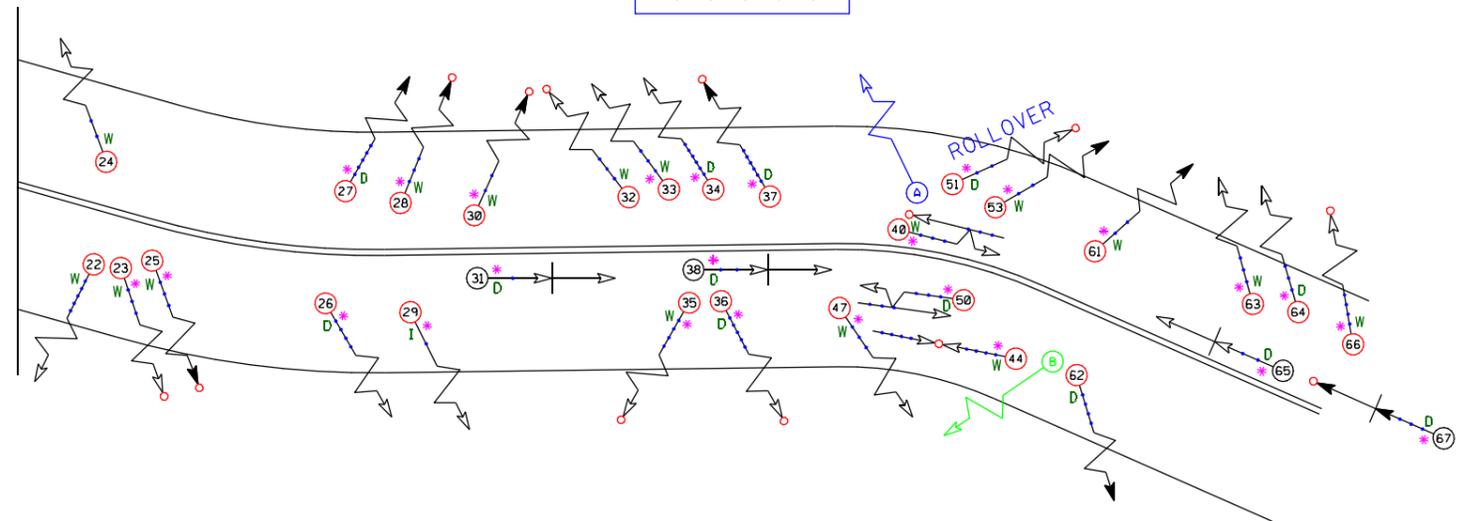
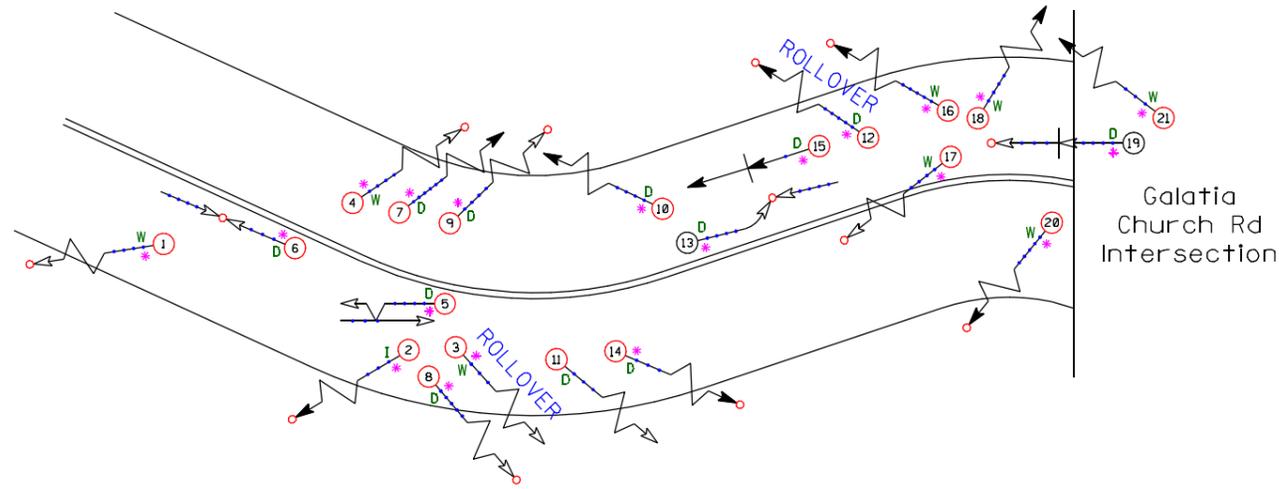
Cumberland County

BEFORE Period

12/1/04-11/30/09

MP 0.87-1.042; 1.098-1.35

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		70 AND UP		W WET
	DAYLIGHT CRASH		SPEED UNKNOWN				I ICY OR SNOWY
	NIGHT CRASH						O Other



Target Crashes



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

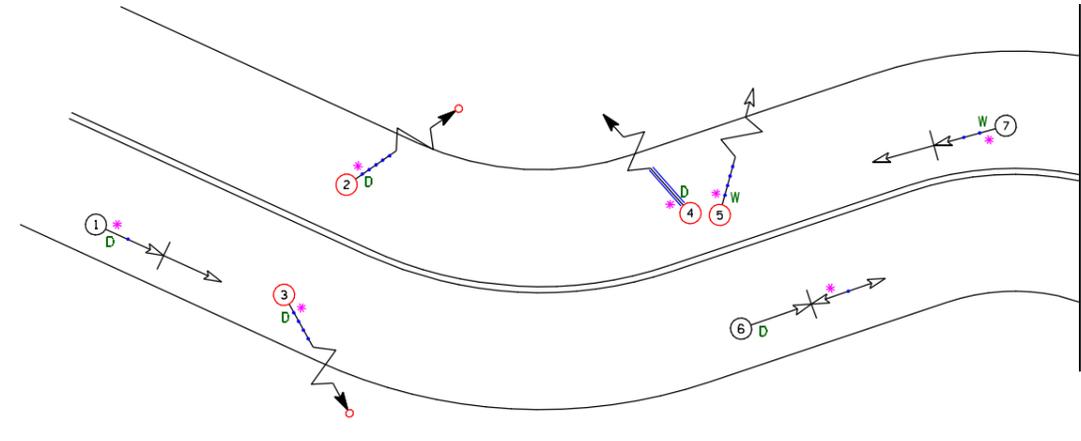
TRAFFIC SAFETY UNIT

Date: June 2015

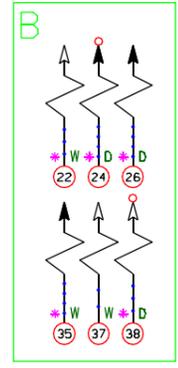
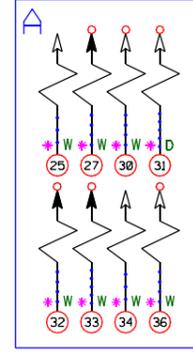
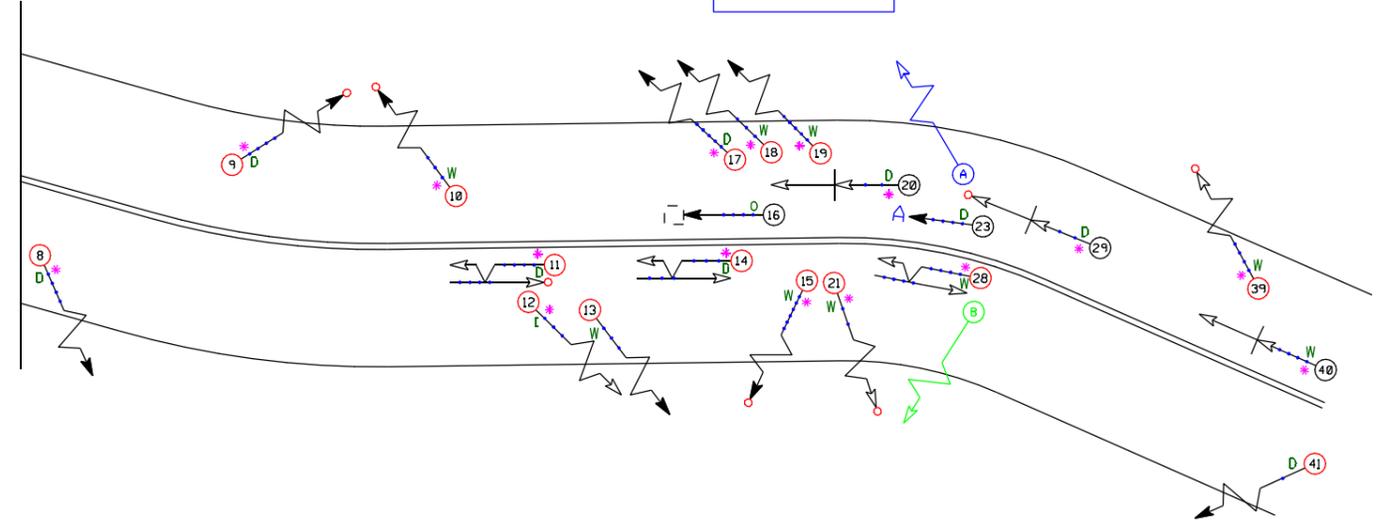
Prepared By: Ian Pike

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 Order# 41000035165
 Cumberland County
 AFTER Period
 4/1/10-3/31/15
 MP 0.87-1.042; 1.098-1.35

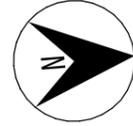
LEGEND							
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		ANIMAL
	PARKED VEHICLE		TURNING		10 MPH TO 19		PEDESTRIAN
	PARKING VEHICLE		BACKING		20 MPH TO 29		BICYCLE
	MOVABLE OBJECT		SIDESWIPE		30 MPH TO 39		TRAIN
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	REAR END		FATALITY		50 MPH TO 59		DRY
	RAN OFF ROAD				60 MPH TO 69		WET
	DAYLIGHT CRASH				70 AND UP		ICY OR SNOWY
	NIGHT CRASH				SPEED UNKNOWN		Other



Galatia Church Rd Intersection



Target Crashes



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

TRAFFIC SAFETY UNIT

Date: June 2015

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