

Hazard Elimination Project Evaluation

Project Information

Order ID: 41000036717

Project ID: W-5205A

Location: I-540 from 0.89 mile west of US-1 (Capital Blvd) eastward to 0.58 mile east of US-64 Business (Knightdale Blvd) – MP 14.847 to 23.761 (8.9 miles)

County: Wake

City: Raleigh

Division: 5

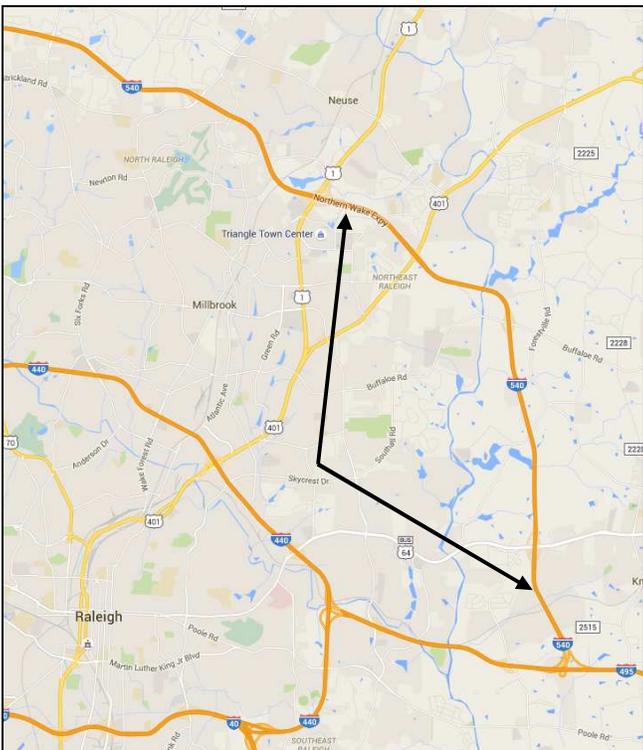
Signal ID: N/A

Countermeasure: Median and Shoulder Milled Rumble Strips in both directions

Project Completion: September 30, 2010

Project Cost: \$180,000

Map and Aerial (from Google Maps) – Coordinates 35.827074, -78.518257



Naive Before and After Analysis

Before Period:	February 1, 2007 through June 30, 2010 (3 years, 5 months)
Const. Period:	July 1, 2010 through September 30, 2010
After Period:	October 1, 2010 through February 28, 2014 (3 years, 5 months) <i>(I-540 from Triangle Town Blvd to US-64 Bypass opened on 1/16/2007)</i>
Analysis Criteria:	Treatment data consisted of all crashes along on I-540 (Northern Wake Expressway) from 0.89 mile west of US-1 (Capital Blvd) eastward to 0.58 mile east of US-64 Business (Knightdale Blvd) – Milepost 14.847-23.761.
Target Crashes:	Lane Departure crashes were the target crashes for the applied countermeasure. Lane Departure crashes include: Ran-Off Road (Left, Right, Straight); Fixed Object; Head-on; Parked Motor Vehicle; Sideswipe – Opposite Direction; and Overturn/Rollover.
Correctable Crashes:	Correctable crashes are Lane Departure crashes that are potentially correctable by rumble strips. Crashes are considered correctable if: the first event involved at least one vehicle crossing the centerline of the roadway; it was not caused by a vehicle swerving to avoid a vehicle, person, animal, or other object in the roadway; it was not caused by mechanical problems, blown tires, or a medical problem with the driver; it was not caused by the weather, such as hydroplaning or sliding on ice; and it was not clear from the crash diagram/narrative that the driver lost control prior to crossing the edge line.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	301	347	15.3 %
Total Severity Index	3.01	3.38	12.3 %
Target Crashes – Lane Departure	133	134	0.8 %
LD Target Crash Severity Index	3.24	4.40	35.8 %
Correctable Crashes	43	26	- 39.5 %
Correctable Severity Index	4.48	2.71	- 39.5 %
Volume (2008, 2012)	49,100	53,800	9.6 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	1	0	- 100.0 %
Class A injury Crashes	2	3	50.0 %
Class B injury Crashes	11	25	100+ %
Class C Injury Crashes	40	56	- 35.0 %
Property Damage Only	247	263	6.5 %

<u>Additional Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Animal Crashes	57	34	- 40.4 %
Night Crashes	98	100	2.0 %
Wet Roadway Crashes	94	69	- 26.6 %
Alcohol/Drugs Involvement Crashes	8	11	37.5 %

<u>Eastbound Only MP 14.847-23.761</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	156	169	8.3 %
Total Severity Index	3.30	3.29	- 0.3 %
Target Crashes – Lane Departure	75	72	- 4.0 %
LD Target Crash Severity Index	2.97	3.57	20.2 %
Correctable Crashes	27	15	- 44.4 %
Correctable Severity Index	3.19	2.97	- 6.9 %

<u>Westbound Only MP 14.847-23.761</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	145	178	22.8 %
Total Severity Index	2.70	3.47	28.5 %
Target Crashes – Lane Departure	58	62	6.9 %
LD Target Crash Severity Index	3.58	5.35	49.4 %
Correctable Crashes	16	11	- 31.3 %
Correctable Severity Index	6.66	2.35	- 64.7 %

Overall Summary Results

Total Crashes:	15 %	(increase)
Total Crash Severity:	12 %	(increase)
Target Crashes:	1 %	(increase)
Target Crash Severity:	36 %	(increase)
Volume:	10 %	(increase)

Additional Summary Results

Correctable Lane Departure:	- 40 %	(reduction)
Wet Roadway Crashes:	- 27 %	(reduction)

Items for Discussion/Concerns

None – the after period rumble strip correctable crashes reduced in both frequency and severity.

GIS Collision Diagrams are available showing Lane Departure and Correctable Crashes by direction.

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

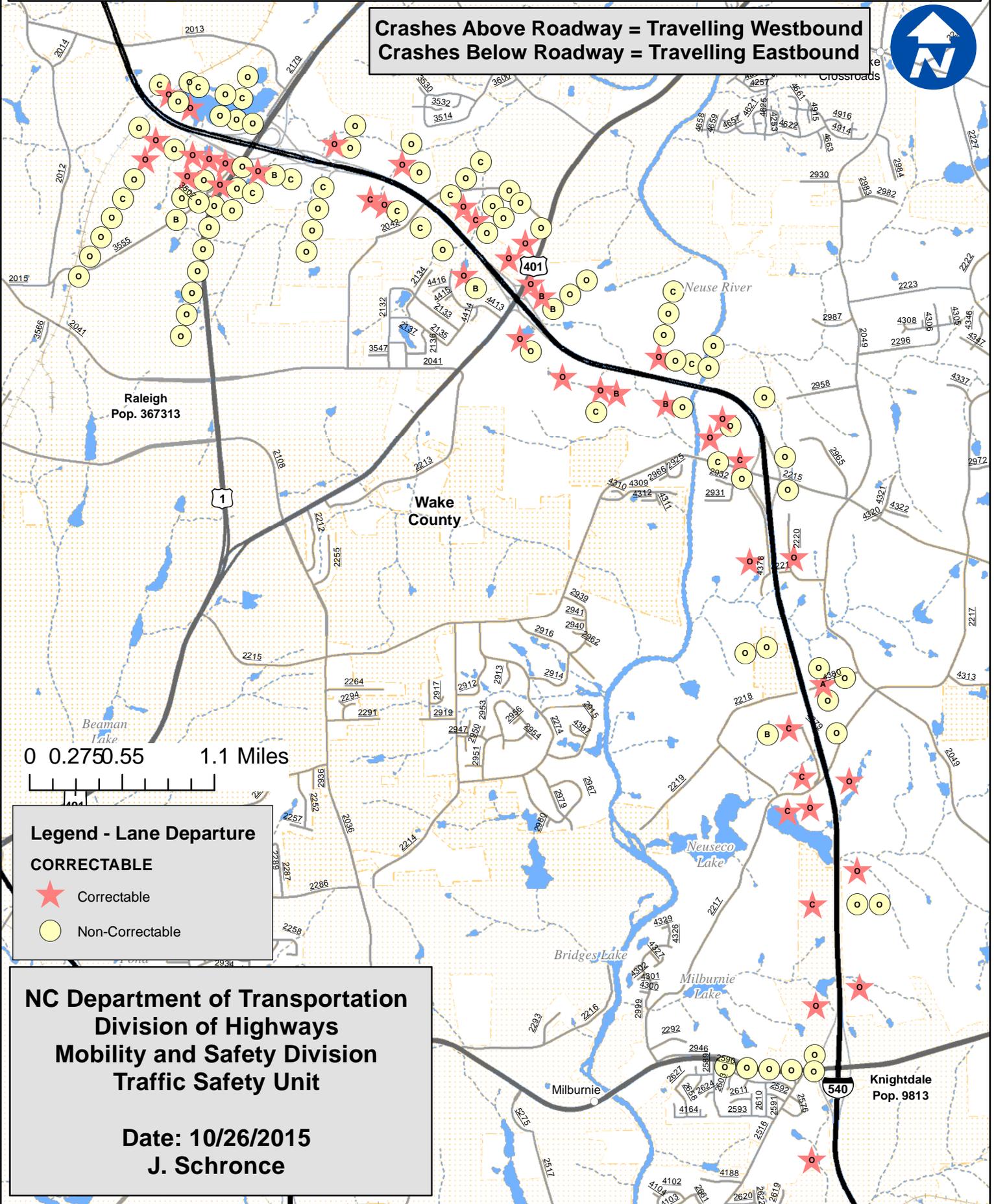
Principal Investigator: Jason B. Schronce, PE
Work Group/Consultant: NCDOT - Safety Evaluation Group
Date: November 9, 2015

W-5205A - WAKE County

I-540 from 0.89 mile west of US-1 to 0.58 mile east of US-64B (MP 14.847 to 23.761)

BEFORE PERIOD - 2/1/2007 to 6/30/2010 (3.41 Yrs)

Crashes Above Roadway = Travelling Westbound
Crashes Below Roadway = Travelling Eastbound



Legend - Lane Departure

CORRECTABLE

★ Correctable

○ Non-Correctable

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

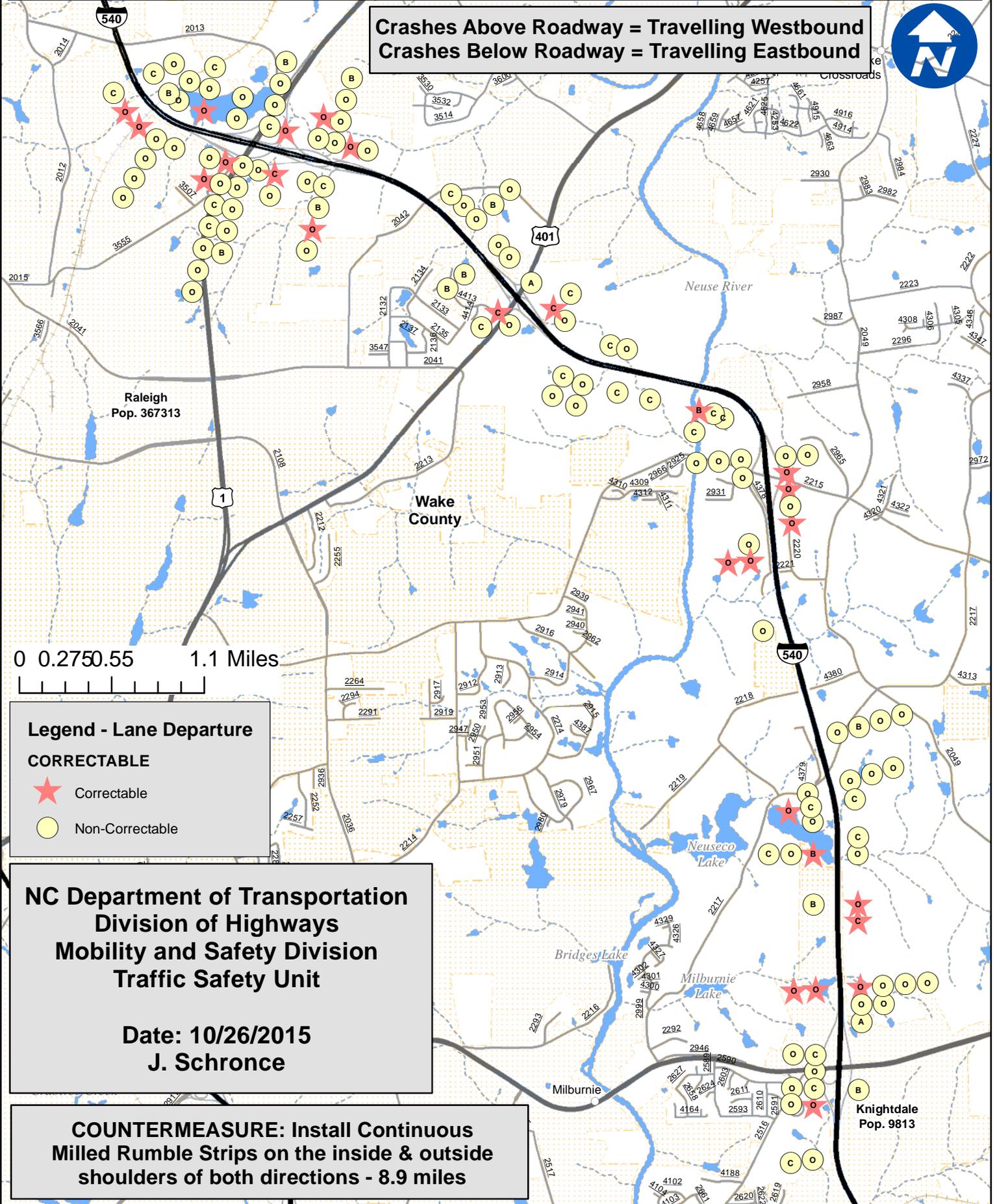
Date: 10/26/2015
J. Schronce

W-5205A - WAKE County

I-540 from 0.89 mile west of US-1 to 0.58 mile east of US-64B (MP 14.847 to 23.761)

AFTER PERIOD - 10/1/2010 to 2/28/2014 (3.41 Yrs)

Crashes Above Roadway = Travelling Westbound
Crashes Below Roadway = Travelling Eastbound



Legend - Lane Departure
CORRECTABLE

- ★ Correctable
- Non-Correctable

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

Date: 10/26/2015
J. Schronce

COUNTERMEASURE: Install Continuous Milled Rumble Strips on the inside & outside shoulders of both directions - 8.9 miles