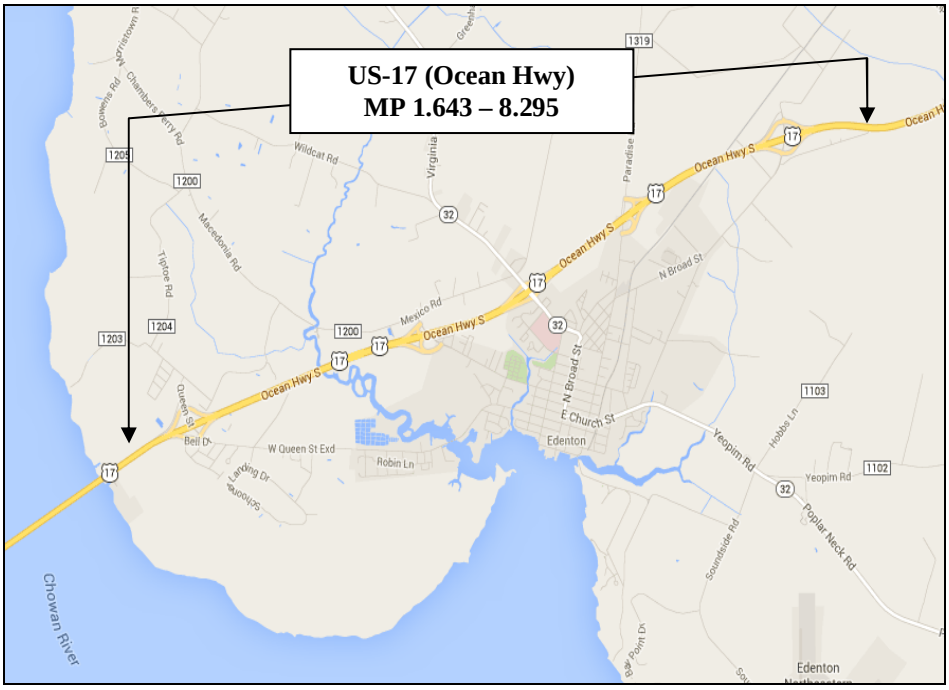
# Hazard Elimination / Spot Safety Project Evaluation

## Project Information

| | |
|---|---|
| Order ID: | 41000030129 |
| Project ID: | W-5211 / SS# 01-04-201 |
| Location: | US-17 (Ocean Hwy) from 0.11 mile west of SR 1204 (Queen Street) Interchange to 500-feet west of SR 1330 (Shannonhouse Rd) Intersection |
| County: | Chowan |
| City: | Edenton |
| Division: | 1 |
| Signal ID: | N/A |
| Countermeasure: | Median Cable Barrier Guardrail (W-5211)<br>Milled-In Rumblestrips (SS01-04-201) |
| Project Completion: | July 8, 2010 (W-5211)<br>September 2, 2010 (SS01-04-201) |
| Project Cost: | $446,250 (W-5211)<br>$90,500 (SS01-04-201) |

## Map and Aerial (from Google Maps) – Coordinates: 36.059542,-76.669014




## Naive Before and After Analysis

Before Period: September 1, 2006 through March 31, 2010 (3 years, 7 months)

Const. Period: April 1, 2010 through October 31, 2010 (Both Projects)

After Period: November 1, 2010 through May 30, 2014 (3 years, 7 months)

Analysis Criteria: Treatment data consisted of all crashes along US-17 (Ocean Highway) with a 0-foot y-line and no ramps. The segment is from 0.11 mile west of the SR 1204 (Queen Street) Interchange to 500-feet west of SR 1330 (Shannonhouse Rd) intersection (Milepost Range 1.643 to 8.295).

Target Crashes: Cross Median Crashes are the Target Crashes for the Cable Median installation (W-5211). Additionally, Lane Departure Crashes and After Period Median Guardrail Hit Crashes are highlighted in the following tables and on the GIS Collision Diagrams.

Correctable Crashes: Correctable crashes are Lane Departure crashes that are potentially correctable by Rumblestrips (SS01-04-201). Crashes are considered correctable if: the first event involved at least one vehicle crossing a roadway edge line; 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.

| Treatment Information | Before | After | Percent Reduction (-) Percent Increase (+) |
|---|---|---|---|
| Total Crashes | 58 | 84 | 44.8 % |
| Total Severity Index | 5.40 | 2.87 | - 46.9 % |
| | | | |
| Lane Departure Crashes | 18 | 42 | 100+ % |
| Lane Departure Crash Severity Index | 8.91 | 3.86 | - 56.7 % |
| | | | |
| Cross Median Crashes | 2 | 0 | - 100.0 % |
| Cross Median Crash Severity Index | 8.40 | 0.00 | - 100.0 % |
| | | | |
| Median Guardrail Hit Crashes | 0 | 25 | 100+ % |
| Median Guardrail Crash Severity Index | 0.00 | 4.03 | 100+ % |
| | | | |
| Correctable Crashes | 8 | 13 | 62.5 % |
| Correctable Severity Index | 4.70 | 2.71 | - 42.3 % |
| | | | |
| Volume (2008, 2012) | 9,000 | 8,100 | - 10.0 % |
| Total Crash Rate (100 Million Veh Miles) | 74.07 | 119.28 | 61.0 % |

| **Injury Crash Summary** | **Before** | **After** | **Percent Reduction (-) Percent Increase (+)** |
|---|---|---|---|
| Fatal injury Crashes | 0 | 1 | 100.0 % |
| Class A injury Crashes | 2 | 0 | - 100.0 % |
| Class B injury Crashes | 3 | 4 | 33.3 % |
| Class C Injury Crashes | 11 | 7 | - 36.4 % |
| Property Damage Only | 42 | 72 | 71.4 % |

| **Additional Information** | **Before** | **After** | **Percent Reduction (-) Percent Increase (+)** |
|---|---|---|---|
| Animal Crashes | 35 | 36 | 2.9 % |
| Night Crashes | 42 | 47 | 11.9 % |
| Alcohol/Drugs Involvement Crashes | 3 | 1 | - 66.7 % |

| **Treatment Information – Wet Roadway** | **Before** | **After** | **Percent Reduction (-) Percent Increase (+)** |
|---|---|---|---|
| Total Wet Crashes (Rain/Standing Water) | 5 | 16 | 100+ % |
| Total Wet Crashes (Snow/Ice/Slush) | 6 | 10 | 66.7 % |
| | | | |
| Lane Departure Wet (Rain/Standing Water) | 2 | 14 | 100+ % |
| Lane Departure Wet (Snow/Ice/Slush) | 6 | 10 | 66.7 % |
| | | | |
| Median Guardrail Wet Hit (Rain/Standing Water) | 0 | 8 | 100+ % |
| Median Guardrail Wet Hit (Snow/Ice/Slush) | 0 | 7 | 100+ % |

Due to increase in the after period wet roadway crashes, weather data was also examined to compare natural rainfall/winter weather events during the analysis that affect roadway conditions. Historical weather data was obtained from the State Climate Office of North Carolina at the closest collection point (Edenton: 312635). The date ranges match the study periods and days of precipitation equal to or greater than 0.01 inches were recorded.

| **Weather Data Information** | **Before** | **After** | **Percent Reduction (-) Percent Increase (+)** |
|---|---|---|---|
| Total Recorded Rain Precipitation (inches) | 163.9 | 162.1 | - 1.1 % |
| Total Days of Rain Precipitation / WET Road | 365 | 312 | - 14.5 % |
| | | | |
| Total Recorded Snow Precipitation (inches) | 8.0 | 17.0 | 100+ % |
| Total Days of Snow Precipitation | 5 | 6 | 20.0 % |

**Overall Summary Results**

| | | |
|---|---|---|
| Total Crashes: | 45 % | (increase) |
| Total Crash Severity: | - 47 % | (reduction) |
| Cross Median: | - 100 % | (reduction) |
| Cross Median Severity: | -100 % | (reduction) |
| Volume: | - 10 % | (reduction) |

**Additional Summary Results**

| | | |
|---|---|---|
| Lane Departure Crashes: | 100+ % | (increase) |
| Lane Departure Severity: | - 57 % | (reduction) |

**Items for Discussion/Concerns**

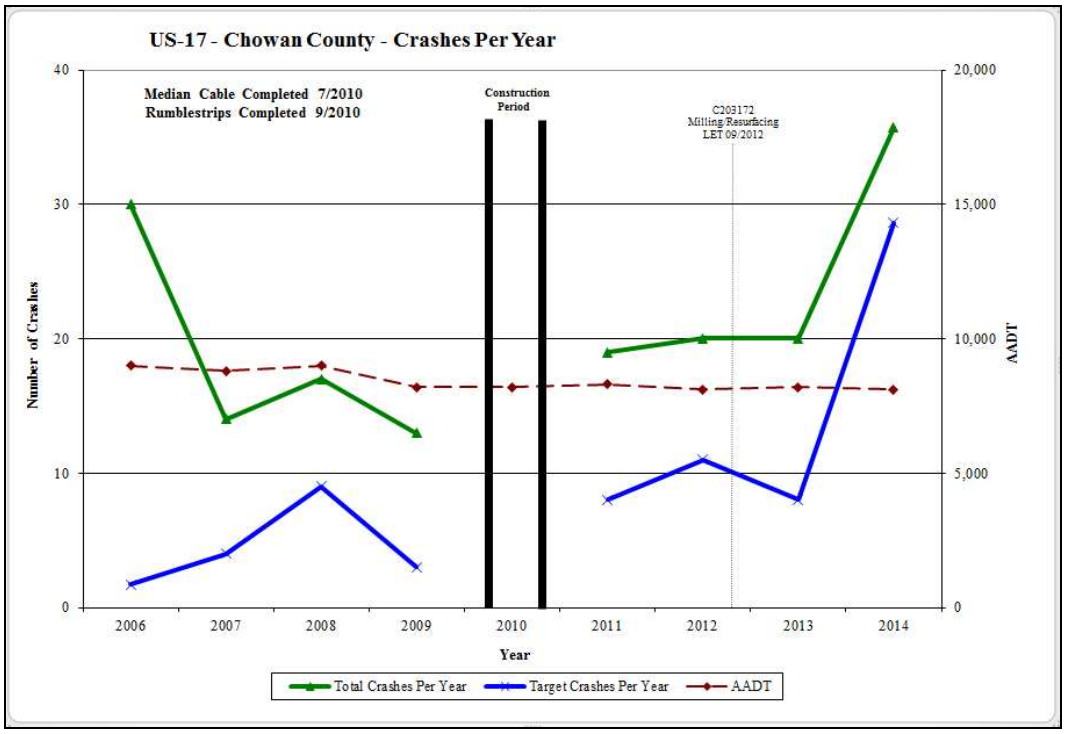
Typically, one would expect guardrail installation projects to result in an increase in the frequency and a decrease in the severity of Ran-Off Road crashes. The increase in Ran-Off Road Crashes is expected due to the placement of a fixed object (guardrail) near the travel way. The decrease in the severity of Ran-Off Road Crashes is expected due to the guardrail being more forgiving than the object it is protecting. The results from this project seem to be in concurrence with the above mentioned expectations.

There was an after period fatal collision along this segment. A fatal investigation was not completed since the fatality resulted from a medical condition and not injuries sustained in the collision.

The Safety Evaluation did discover, through a search of the Archived Letting List, that this roadway was resurfaced in the 4$^{th}$ Quarter of 2012. Project C203172 was Let on September 18, 2012 and included milling, resurfacing, and milled rumble strips on US-17 through Chowan County. The effects of this resurfacing project were not accounted for in this evaluation.

The data tables above show an increase in after period wet roadway crashes. Weather data provided indicates that the intensity of each rainfall event was higher in the after period with nearly the same amount of total inches of rainfall over fewer total days. Also, there was double the amount of snow/ice in the after period.

The trend in total crashes has been displayed below (in crashes per year) to attempt to account for the effects of various other projects along the study corridor. The 2014 data point is represented by 5 months of crash data with the majority of the lane departure crashes during this year occurring during ice/snow events.




## 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, P.E.

Work Group/Consultant: NCDOT - Safety Evaluation Group


Date: July 1, 2015

# W-5122 / SS# 01-04-201 - CHOWAN County
# US-17 (Ocean Hwy) From 0.11 mile west of SR 1204 to 150' west of SR 1330 (MP 1.643 - 8.295)
# BEFORE PERIOD - 9/1/2006 to 3/31/2010 (3.58 Yrs)

## Legend

**TYPE**

- Animal
- Cross Median
- LD-Right
- Other
- Rear-End

Hancock
Chowan County
Edenton
Pop. 5099
Pembroke Creek
Queen Anne Creek
Chowan River

0 0.3 0.6 1.2 Miles

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

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

**Date: 7/1/2015**
**J. Schronce**

# W-5122 / SS# 01-04-201 - CHOWAN County
# US-17 (Ocean Hwy) From 0.11 mile west of SR 1204 to 150' west of SR 1330 (MP 1.643 - 8.295)
# AFTER PERIOD - 11/1/2010 to 5/30/2014 (3.58 Yrs)

## Legend

**TYPE**

- Animal
- Cross Median
- LD-Right
- Other
- Rear-End
- Struck Med GR

**AFTER Period Countermeasures:**
**Install Median Cable Guardrail (W-5122)**
**Install Milled-In Rumblestrips (SS01-04-201)**

Chowan County

Edenton Pop. 5099

Pembroke Creek

Queen Anne Creek

Chowan River

0 0.3 0.6 1.2 Miles

**Crashes Below Roadway = Travelling Eastbound**
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**Date: 7/1/2015**
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