



Naive Before and After Analysis

Before Period: March 1, 2007 through October 31, 2010 (3 years, 8 months)

Const. Period: November 1, 2010 through April 30, 2012

After Period: May 1, 2012 through December 31, 2015 (3 years, 8 months)

Analysis Criteria: Treatment data consisted of all crashes within 150 feet of the subject intersection for all approaches. Additionally, the u-turn locations were analyzed with a 150-foot y-line.

Target Crashes: Crossover (movement prevented by the installation of the concrete) Crashes were the selected target crashes, which include the following: Angle and Left Turn Different Roadway. Frontal Impact crashes are highlighted as target crashes for the median u-turn locations.

| Treatment Info – NC-24 @ Linden | Before | After | Percent Reduction (-) Percent Increase (+) |
|--|---------------|--------------|---|
| Total Crashes | 31 | 36 | 16.1 % |
| Total Severity Index | 8.52 | 1.62 | - 81.0 % |
| Target Crashes - Crossover | 5 | 0 | - 100.0 % |
| Target Crash Severity Index | 19.12 | 0.00 | - 100.0 % |
| Volume (2008, 2014) | 24,500 | 26,500 | 8.2 % |

| <u>Injury Crash Summary</u> | Before | After | Percent Reduction (-) Percent Increase (+) |
|------------------------------------|---------------|--------------|---|
| Fatal injury Crashes | 2 | 0 | - 100.0 % |
| Class A injury Crashes | 0 | 0 | N/A |
| Class B injury Crashes | 2 | 0 | - 100.0 % |
| Class C Injury Crashes | 9 | 3 | - 66.7 % |
| Property Damage Only | 18 | 33 | 83.3 % |

| <u>Additional Information</u> | Before | After | Percent Reduction (-) Percent Increase (+) |
|--------------------------------------|---------------|--------------|---|
| Night Crashes | 8 | 8 | 0.0 % |
| Wet Roadway Crashes | 6 | 7 | 16.7 % |
| Alcohol / Drugs Involvement Crashes | 1 | 0 | - 100.0 % |
| Left Turn Same Roadway Crashes | 6 | 3 | - 50.0 % |
| Right Turn Diff Rd (from Sidestreet) | 1 | 12 | 100+ % |

| <u>U-Turn North – Mittie Haddock – MP 9.449 700' North/West of Linden</u> | Before | After |
|--|---------------|--------------|
| Total Crashes | 2 | 9 |
| Total Severity Index | 1.00 | 4.29 |
| | | |
| Frontal Impact Crashes (U-Turn) | N/A | 3 |
| Rear-End Crashes Approaching Signal | N/A | 1 |

| <u>U-Turn South – MP 9.743 850' South/East of Linden</u> | Before | After |
|---|---------------|--------------|
| Total Crashes | 0 | 12 |
| Total Severity Index | 0.00 | 2.23 |
| | | |
| Frontal Impact Crashes (U-Turn) | N/A | 7 |
| Rear-End Crashes Approaching Signal | N/A | 4 |

Overall Summary Results

| | | |
|------------------------|---------|-------------|
| Total Crashes: | 16 % | (increase) |
| Total Crash Severity: | - 81 % | (reduction) |
| Target Crashes: | - 100 % | (reduction) |
| Target Crash Severity: | - 100 % | (reduction) |
| Volume: | 8 % | (increase) |

Additional Summary Results

| | | |
|---------------------------------------|---------|-------------|
| Fatal Injury Crashes: | - 100 % | (reduction) |
| Right Turn Diff Rd (from Sidestreet): | 100+ % | (increase) |

Items for Discussion/Concerns

The location was part of a larger effort to create a superstreet along the NC-24 corridor in the Town of Spout Springs due to significant residential and commercial growth, in part due to Fort Bragg nearby.

The before-after analysis indicates a benefit with the elimination of severe injury crashes. The after period shows an increase in right turn different roadway crashes from the subdivision and commercial side-streets as motorists are forced to use the median u-turn locations.

Collision diagrams are provided for all three locations including the treatment intersection and both median u-turn sites.

U-Turn North experienced three (3) frontal impact crashes from vehicles on NC-24 running the red indication signal. U-Turn South experienced seven (7) frontal impact collisions including four (4) at-fault drivers making the u-turn and three (3) failing to stop travelling northbound.

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: March 7, 2016

Hazard W-5206B
 Order# 41000039583
 Harnett County
 BEFORE Period
 3/1/07-10/31/10

H.M. CAGLE

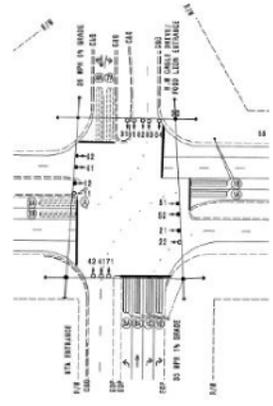
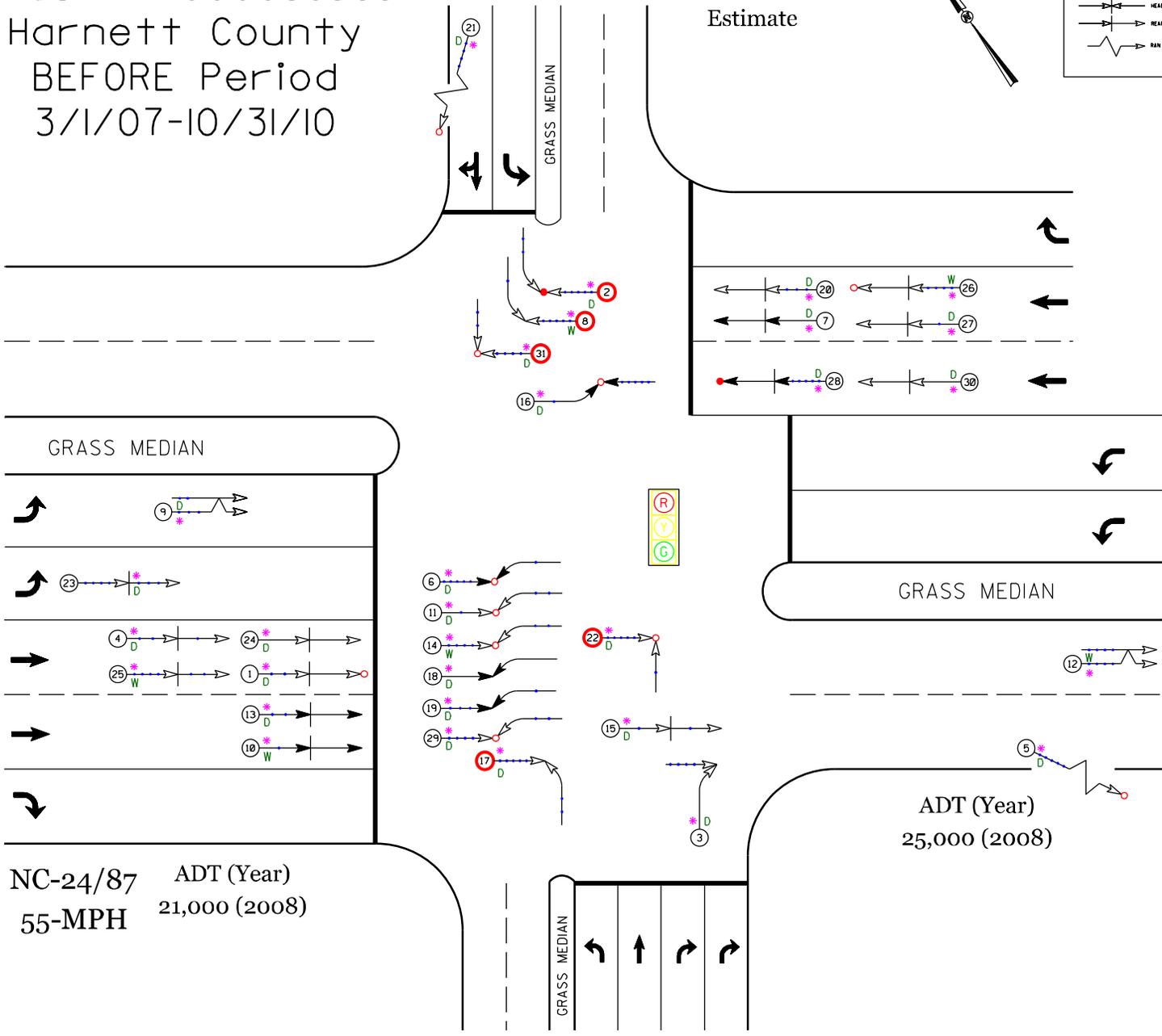
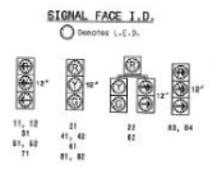
ADT (Year)
 500 (2008)
 Estimate

LEGEND

| | | | | | | | |
|--|-------------------------------|--|------------|--|---------------|--|-----------------|
| | MOVING VEHICLE | | ANGLE | | 9 MPH OR LESS | | PEDESTRIAN |
| | PAKED VEHICLE | | TURNING | | 10 MPH TO 19 | | TRAIN |
| | PAKED VEHICLE FIXED OBJECT | | BACKING | | 20 MPH TO 29 | | DRIVER AT FAULT |
| | HEAD ON | | SIDE SWIPE | | 30 MPH TO 39 | | DRY |
| | REAR END | | REAR END | | 40 MPH TO 49 | | WET |
| | RAN OFF ROAD | | REAR END | | 50 MPH TO 59 | | ICY OR SNOWY |
| | | | REAR END | | 60 MPH TO 69 | | OTHER |
| | | | REAR END | | 70 AND UP | | |
| | | | REAR END | | SPEED UNKNOWN | | |



Original
 Sig-ID 06-1209
 8-Phase



GRASS MEDIAN

GRASS MEDIAN

NC-24/87 ADT (Year)
 55-MPH 21,000 (2008)

ADT (Year)
 25,000 (2008)

LINDEN OAKS ADT (Year)
 2,500 (2008)
 Estimate

Crossover
 Target Crashes

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

TRAFFIC SAFETY UNIT

Date: 3-7-2016 Prepared By: J. Schronce

Hazard W-5206B
 Order# 41000039583
 Harnett County
 AFTER Period
 5/1/12-12/31/15

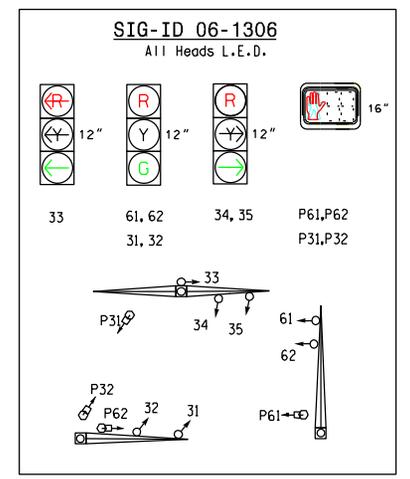
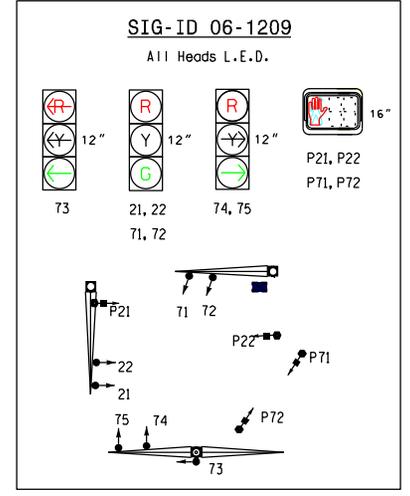
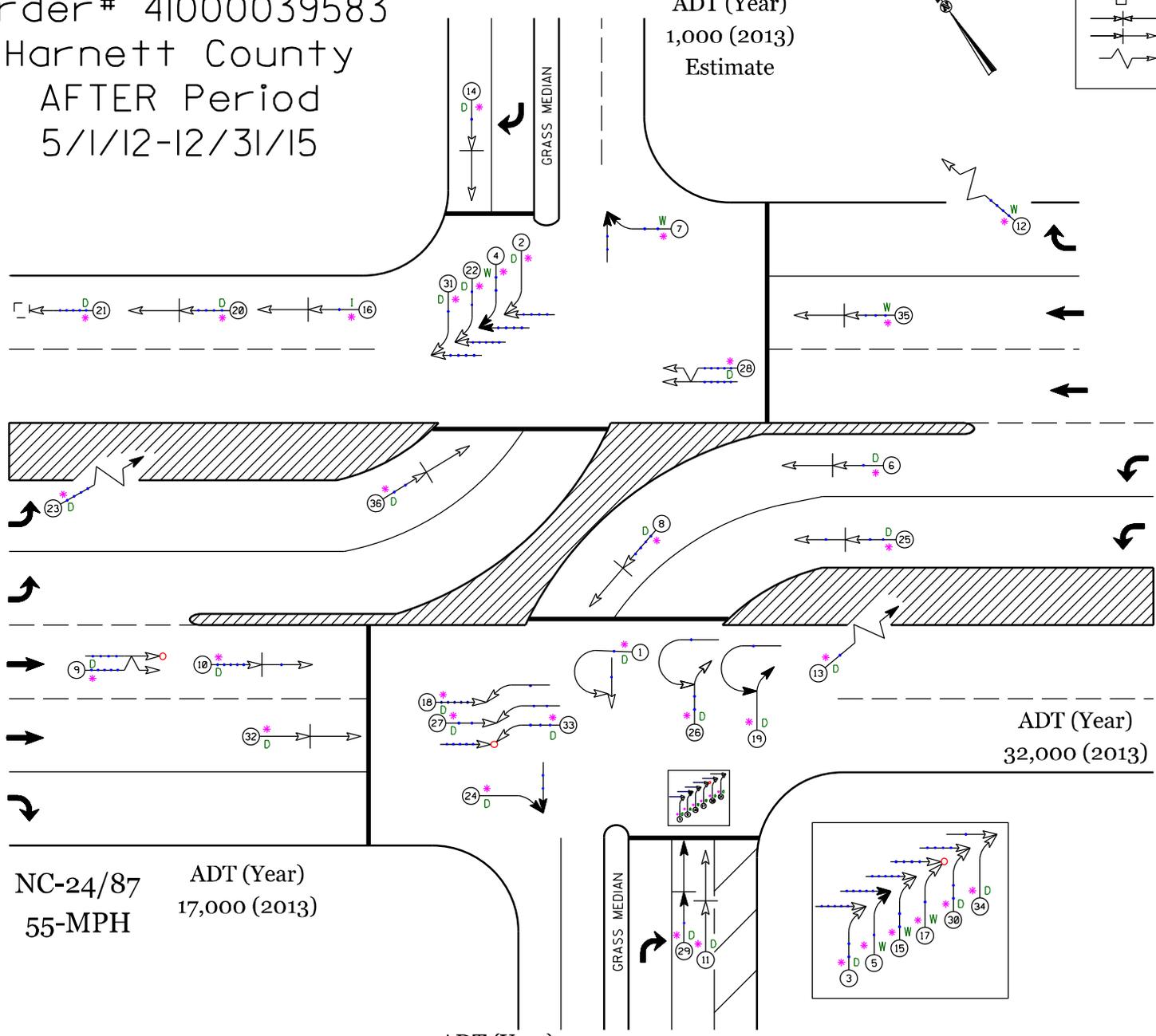
H.M. CAGLE

ADT (Year)
 1,000 (2013)
 Estimate



LEGEND

| | | | | | | | |
|--|-----------------|--|--------------|--|---------------|--|-----------------|
| | MOVING VEHICLE | | ANGLE | | 9 MPH OR LESS | | PEDESTRIAN |
| | PAKED VEHICLE | | TURNING | | 10 MPH TO 19 | | TRAIN |
| | PARKING VEHICLE | | BACKING | | 20 MPH TO 29 | | DRIVER AT FAULT |
| | FIXED OBJECT | | SIDESWIPE | | 30 MPH TO 39 | | DRY |
| | HEAD ON | | RAN OFF ROAD | | 40 MPH TO 49 | | WET |
| | REAR END | | FATALITY | | 50 MPH TO 59 | | ICY OR SNOWY |
| | SPEED UNKNOWN | | OTHER | | 60 MPH TO 69 | | |



NC-24/87
 55-MPH

ADT (Year)
 17,000 (2013)

ADT (Year)
 32,000 (2013)

ADT (Year)
 3,000 (2013)
 Estimate

LINDEN OAKS

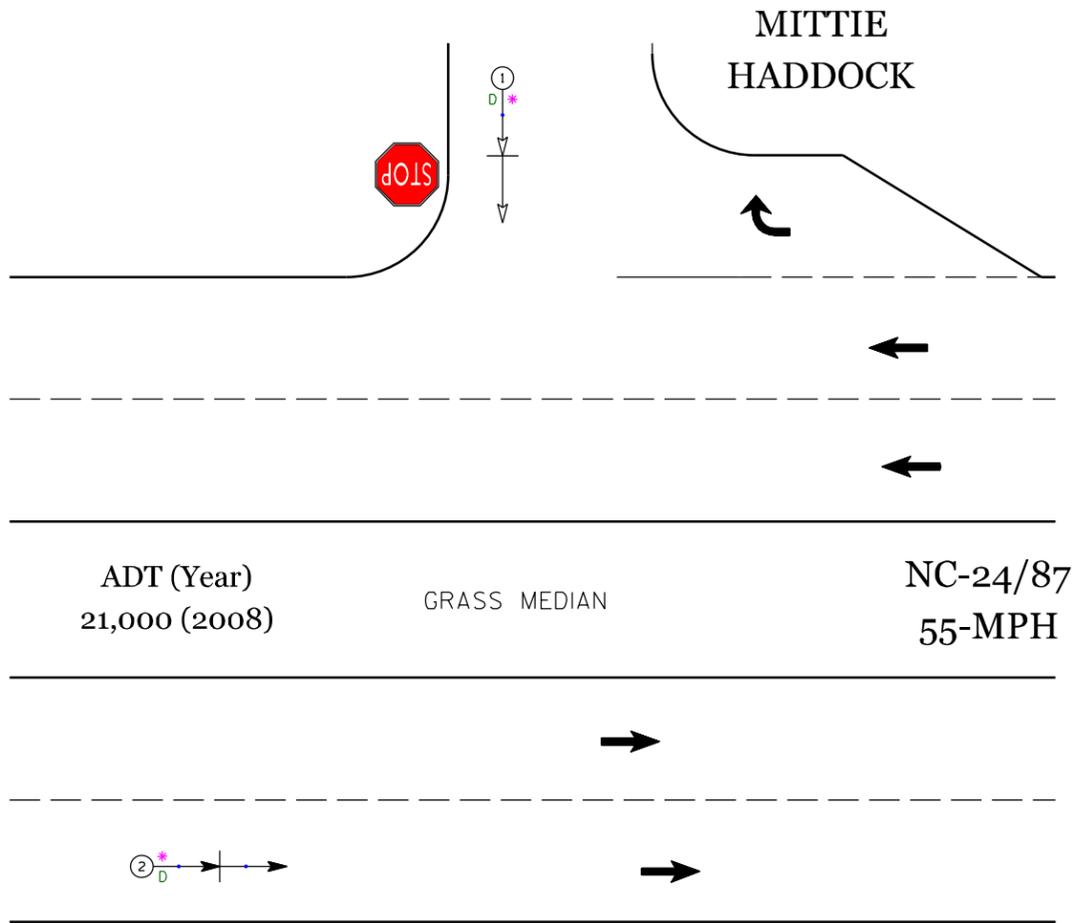
Crossover
 Target Crashes

Hazard W-5206B
 Order# 41000039583
 Harnett County
 U-Turn North (West)



| LEGEND | | | | | | | |
|--------|-----------------|--|---------------|--|---------------|--|-----------------|
| | MOVING VEHICLE | | ANGLE | | 9 MPH OR LESS | | PEDESTRIAN |
| | PARKED VEHICLE | | TURNING | | 10 MPH TO 19 | | TRAN |
| | PARKING 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 | | SPEED UNKNOWN | | 60 MPH TO 69 | | OTHER |

Before Period
 3/1/07 - 10/31/10
 3.67 Yrs



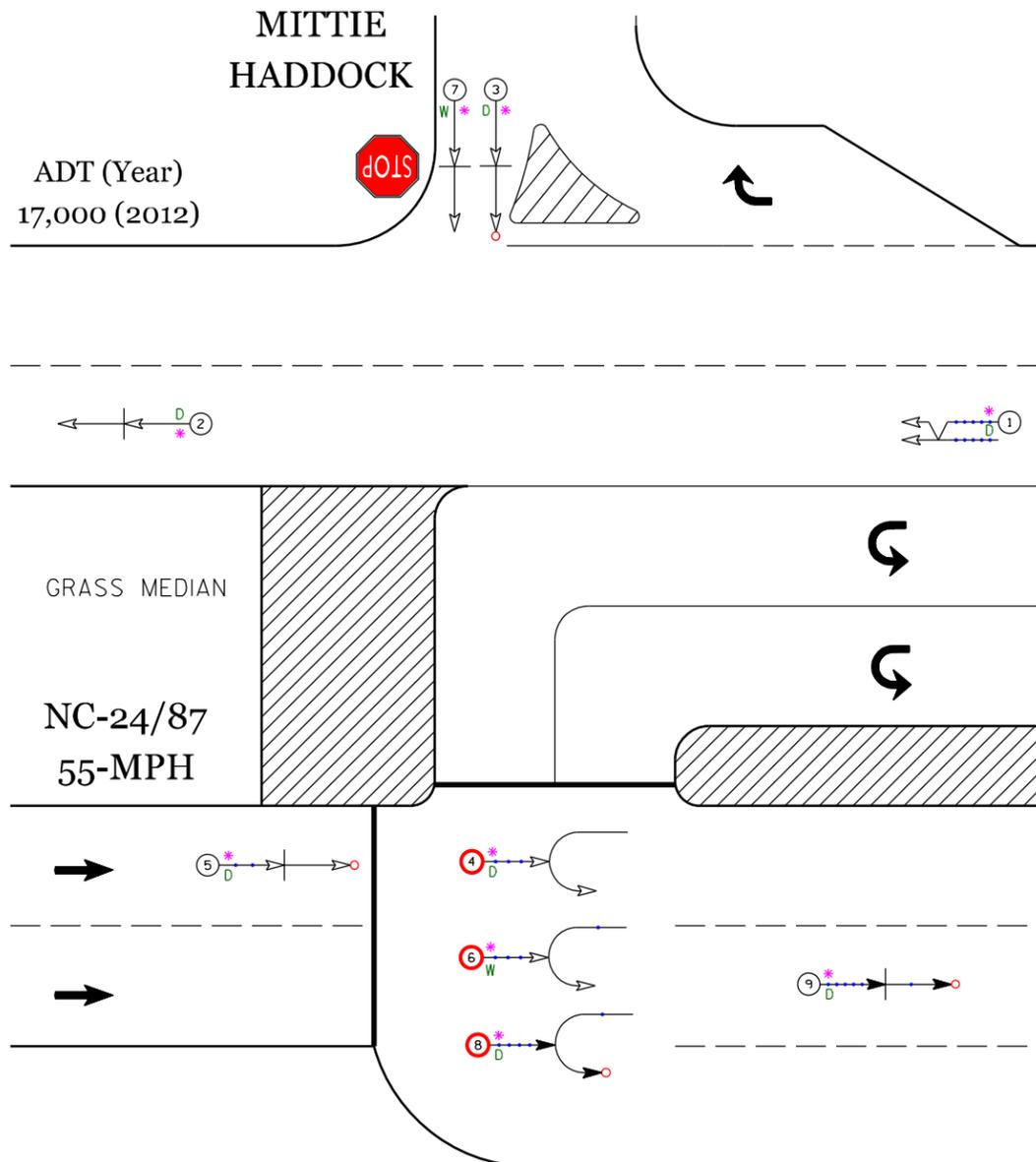
ADT (Year)
 21,000 (2008)

GRASS MEDIAN

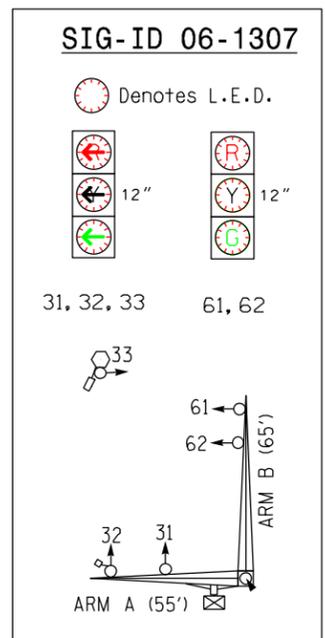
NC-24/87
 55-MPH

MITTIE
 HADDOCK

ADT (Year)
 17,000 (2012)

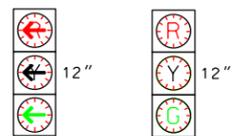


After Period
 5/1/12 - 12/31/15
 3.67 Yrs

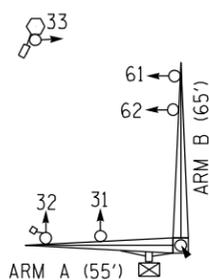


SIG-ID 06-1307

Denotes L.E.D.



31, 32, 33 61, 62



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

TRAFFIC SAFETY UNIT

Date: 3-7-2016

Prepared By: J. Schronce

Frontal Impact
 Target Crashes

Hazard W-5206B
 Order# 41000039583
 Harnett County
 U-Turn South (East)

LEGEND

| | | | | | | | |
|--|-----------------|--|-----------|--|---------------|--|-----------------|
| | MOVING VEHICLE | | ANGLE | | 9 MPH OR LESS | | PEDESTRIAN |
| | PARKED VEHICLE | | TURNING | | 10 MPH TO 19 | | TRAIN |
| | PARKING 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 | | OTHER |
| | | | | | 70 AND UP | | |
| | | | | | SPEED UNKNOWN | | |



No Before
 Period Crashes

NC-24/87
 55-MPH
 GRASS MEDIAN
 ADT (Year)
 25,000 (2008)

Before Period
 3/1/07 - 10/31/10
 3.67 Yrs

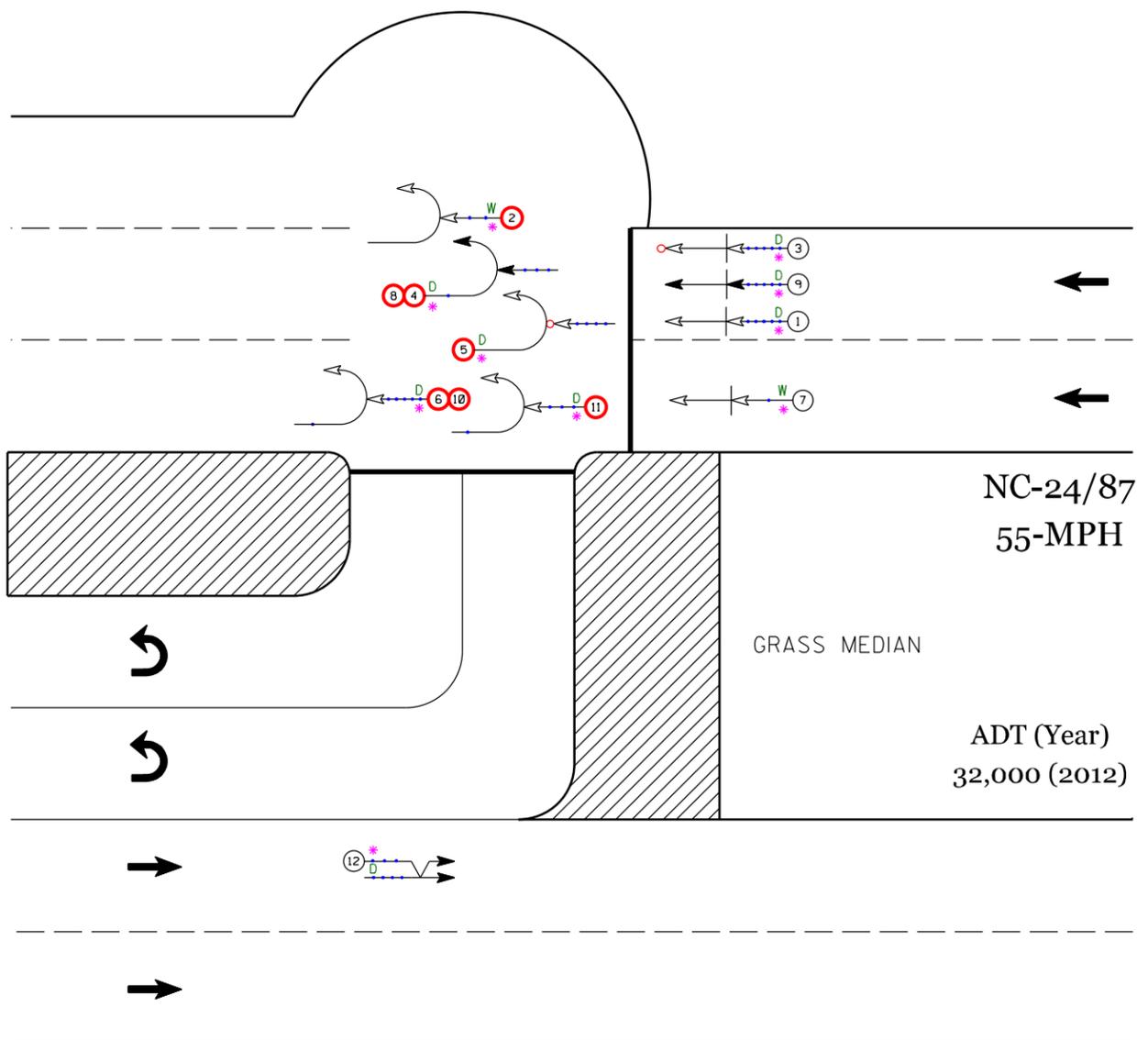
SIG-ID 06-1308

Denotes L.E.D.

| | |
|-----|-----|
| | |
| | |
| 12" | 12" |

71, 72
 73

21, 22



After Period
 5/1/12 - 12/31/15
 3.67 Yrs

Frontal Impact
 Target Crashes

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

TRAFFIC SAFETY UNIT

Date: 3-7-2016

Prepared By: J. Schronce