

Spot Safety Project Evaluation

Project Log # 200505113

Spot Safety Project # 02-00-205

Spot Safety Project Evaluation of the Guardrail and “Road Subject to Flooding” Signs Installation on Bridge No. 65 Over Pinelog Branch on SR 1200 – Stantonsburg Rd in Pitt County.

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

Majed Bazzari

10/12/2005
Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 02-00-205 – The Guardrail Installation on Bridge No. 65 over Pinelog Branch on SR 1200 – Stantonsburg Rd in Pitt county.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naïve before and after analysis has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of guardrails on Bridge No. 65 over Pinelog Branch on SR 1200–Stantonsburg Rd and Installing “Road Subject to Flooding” signs on both directions of SR 1200. SR 1200–Stantonsburg Rd is a rural two-lane facility with a speed limit of 55 mph. Bridge No. 65 is scheduled to be replaced in the year 2006.

The initial crash analysis was completed from January 1, 1990 through January 1, 2000 with a total of twenty-three (23) reported crashes. Eleven Crashes were deemed to be correctable by the improvement. There were 3 class B injuries and 5 class C injuries resulting from these crashes. The statement of the problem was vehicles involved in Ran Off Road collisions resulting from standing water in the roadway and vehicles colliding with the bridge or the bridge rail end. The final completion date for the improvement at the subject Location was on May 1, 2001.

Naïve 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 was from April 1, 2001 through June 30, 2001. The before period consisted of reported crashes from July 1, 1997 through March 31, 2001 (3 Years, 9 Months) and the after period consisted of reported crashes from July 1, 2001 through March 31, 2005 (3 Years, 9 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes on SR 1200-Stantonsburg Rd from MP 5.12 to MP 5.42 which includes the treatment location (Bridge No. 65). A 0 feet Y-line was used in the analysis. Please see attached *Location Map* for further detail.

The following data Table 1 depicts the Naive Before and After Analysis for the Total Crashes and Target Crashes at the treatment location. Table 2 provides an in depth examination of the Naïve Before and After Analysis of the Total Crashes and Table 3 provides an in depth examination of the Naïve Before and After Analysis for the Guardrail Installation Target Crashes. Please note that the guardrail installation Target Crashes include the following crash types: Ran Off Road - Right, Ran Off Road - Left, Ran Off Road - Straight, Overturn/Rollover, Fixed Object, Head On, Sideswipe - Same Direction, and Sideswipe - Opposite Direction. Target Crashes are all potential Ran-Off Road crashes and include those crash types where at least one vehicle was involved in a lane departure.

| <u>Table 1. Treatment Information</u> | Before Period | After Period | Percent Reduction (-)/ Percent Increase (+) |
|---------------------------------------|---------------|--------------|--|
| Total Crashes | 14 | 6 | -57.1 |
| Total Severity Index | 3.11 | 2.23 | -28.3 |
| | | | |
| Total Target Crashes | 8 | 4 | -50.0 |
| Target Severity Index | 4.7 | 2.85 | -39.4 |
| | | | |
| Volume | 2100 | 2300 | 9.5 |

| <u>Table 2. Total Crash Information</u> | Before Period | After Period | Percent Reduction (-)/ Percent Increase (+) |
|---|---------------|--------------|--|
| <i>Total Crashes</i> | | | |
| Fatal Injuries | 0 | 0 | N/A |
| Non-Fatal Injuries | 4 | 1 | -75.0 |
| Total Injuries | 4 | 1 | -75.0 |
| <i>Total Crashes</i> | | | |
| Night Crashes | 6 | 5 | -16.7 |
| Wet Crashes | 7 | 3 | -57.1 |
| Alcohol/ Drug Crashes | 2 | 0 | -100.0 |
| | | | |

| <u>Table 3. Target Crash Information</u> | Before Period | After Period | Percent Reduction (-)/ Percent Increase (+) |
|--|---------------|--------------|--|
| <i>Target Crashes</i> | | | |
| Fatal Injuries | 0 | 0 | N/A |
| Non-Fatal Injuries | 4 | 1 | -75.0 |
| Total Injuries | 4 | 1 | -75.0 |
| <i>Target Crashes</i> | | | |
| Night Crashes | 2 | 3 | 50.0 |
| Wet Crashes | 4 | 3 | -25.0 |
| Alcohol/ Drug Crashes | 2 | 0 | -100.0 |
| | | | |
| Guardrail/ Bridge Rail Struck | 2 | 3 | 50.0 |

The naive before and after analysis at the treatment location resulted in a 57.1 percent decrease in Total Crashes, a 28.3 percent decrease in the Total Severity Index, and a 9.5 percent increase in Average Daily Traffic (ADT). There was also a 50.0 percent decrease in Target Crashes and a 39.4 percent decrease in the Severity Index for Target Crashes. The before period ADT year was 1999 and the after period ADT year was 2003.

Results and Discussion

The naive before and after analysis involving the comparison of the treatment actual before data versus the treatment actual after data resulted in a 57.1 percent decrease in Total Crashes and a 50.0 percent decrease in Target Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in both Total and Target Crashes from the before to the after period.

As previously stated, the guardrail was installed to reduce the number of vehicles colliding with the bridge that were Ran Off Road Crashes resulting from standing water in the roadway. From the crash statistics it can be seen that the guardrail installation had a positive effect on reducing the number and severity of both the Total and Target Crashes From the before to the after period. Additionally, there were a considerable number of crashes due to animals struck (36 % in the before period and 33 % in the after period).

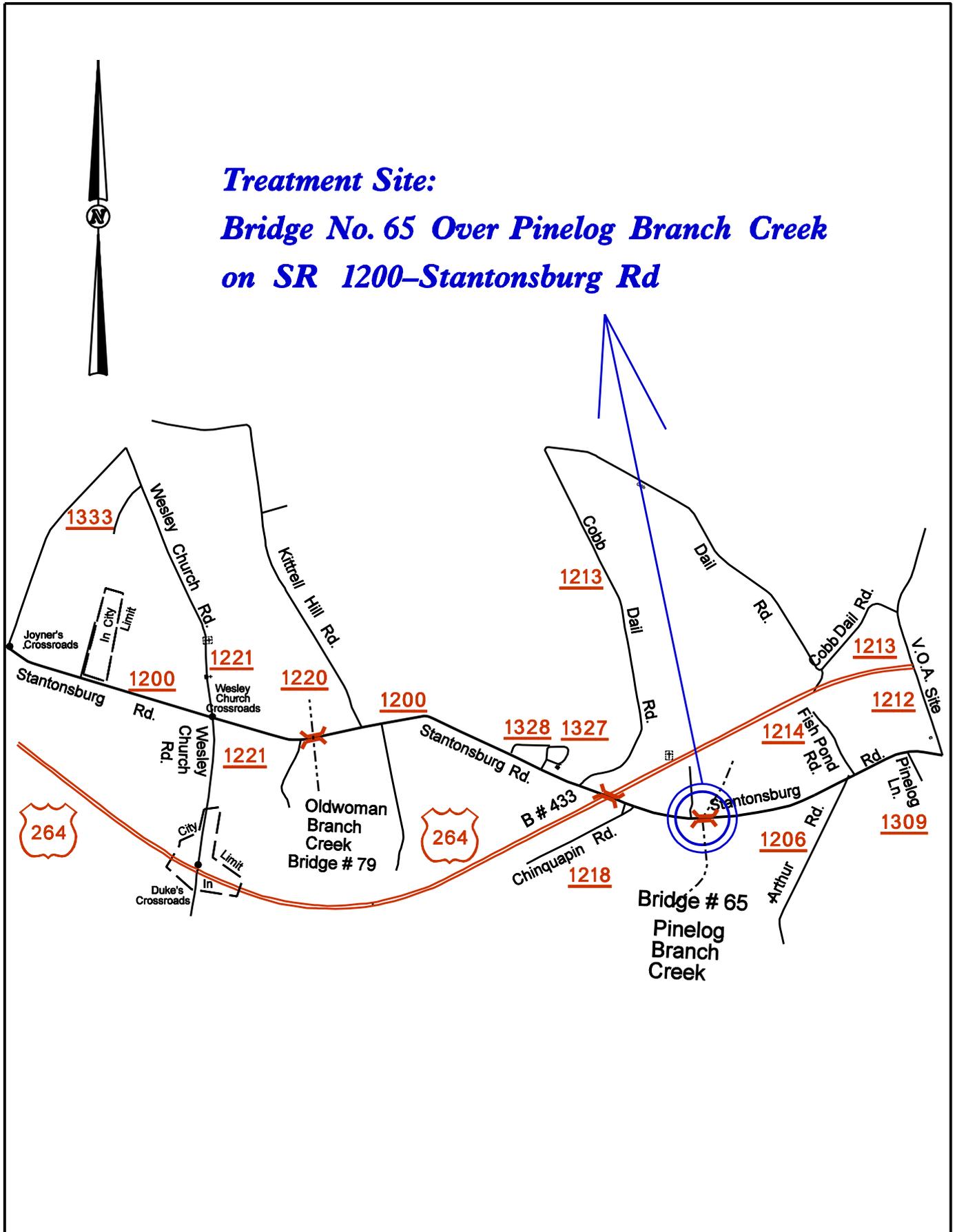
Hydroplaning due to flooding is a major issue west of bridge number 65 which resulted in several accidents. As a part of the project "Road Subject to Flooding" signs were requested to be installed on both directions of SR 1200 which appears to have had a positive impact in alerting the drivers of possible hydroplaning area. As shown in the study the number of crashes involving wet road conditions has been reduced by 57.1 percent for Total Crashes and 25 percent for Target Crashes.

Evaluation of Spot Safety Project Number 02-00-205

Location Map, Pitt County

Treatment Site:

*Bridge No. 65 Over Pinelog Branch Creek
on SR 1200-Stantonsburg Rd*



Treatment Site Photos Taken on (June 27, 2005)



Looking West on SR 1200 (Bridge # 65)



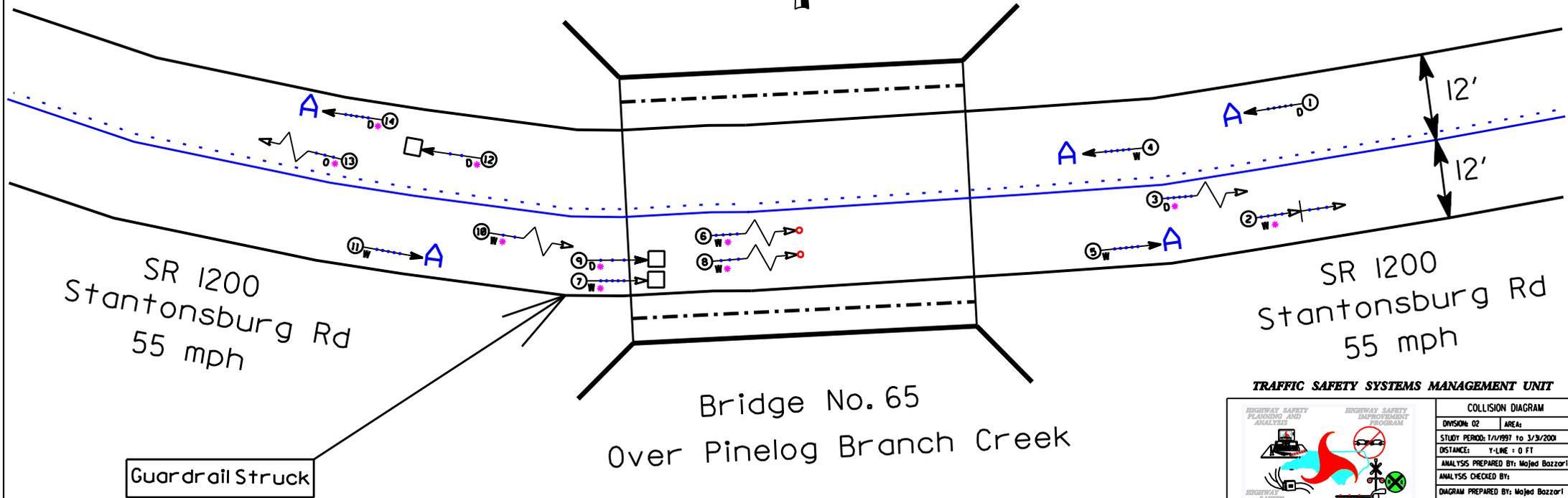
Looking West on SR 1200 (Bridge # 65)

Pitt County
 Bridge Number 65 Over Pinelog Branch on
 SR 1200-Stantonsburg Rd
 Treatment Site in The Before Period
 From 7/1/1997 To 3/31/2001



LEGEND

| | | | | | | | |
|--|-----------------|--|----------------|--|---------------|--|-------------------|
| | MOVING VEHICLE | | ANGLE | | 0 MPH OR LESS | | P PEDESTRIAN |
| | PEDESTRIAN | | TURNING | | 10 MPH TO 19 | | T TRAIN |
| | PARKED VEHICLE | | BACKING | | 20 MPH TO 29 | | • DRIVER AT FAULT |
| | PARKING VEHICLE | | SIDESWIPE | | 30 MPH TO 39 | | D DRY |
| | FIXED OBJECT | | OUT OF CONTROL | | 40 MPH TO 49 | | W WET |
| | HEAD ON | | OUT OF CONTROL | | 50 MPH TO 59 | | I ICY OR SNOWY |
| | REAR END | | INJURY | | 60 MPH TO 69 | | O OLY |
| | RAN OFF ROAD | | FATALITY | | 70 AND UP | | |



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT



| COLLISION DIAGRAM | |
|-------------------------------------|--------------|
| DIVISION: 02 | AREA: |
| STUDY PERIOD: 7/1/1997 to 3/31/2001 | |
| DISTANCE: Y-LINE : 0 FT | |
| ANALYSIS PREPARED BY: Mojed Bozzori | |
| ANALYSIS CHECKED BY: | |
| DIAGRAM PREPARED BY: Mojed Bozzori | |
| DIAGRAM REVIEWED BY: | |
| SCALE: | NOT TO SCALE |
| DATE: 9/28/2005 | |
| LOG NUMBER: 20050943 SS 02-00-205 | |

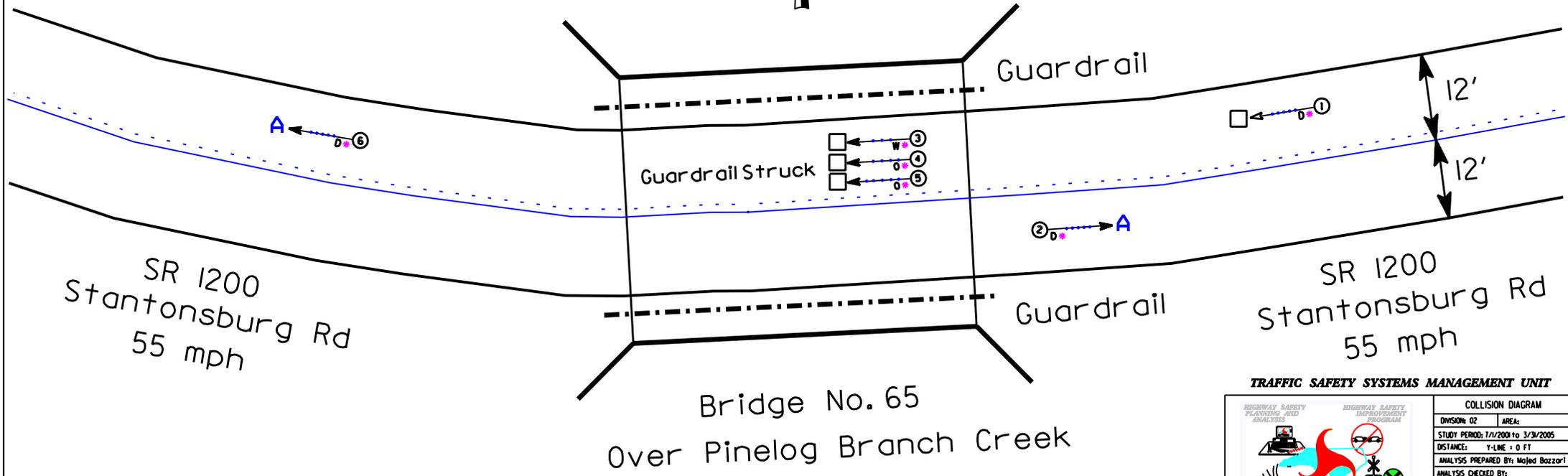
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH

Pitt County
 Bridge Number 65 Over Pinelog Branch on
 SR 1200-Stantonsburg Rd
 Treatment Site in The After Period
 From 7/1/2001 To 3/31/2005



LEGEND

| | | | | | | | |
|---|-----------------|---|----------------|---|---------------|---|----------------|
|  | MOVING VEHICLE |  | ANGLE |  | 0 MPH OR LESS |  | PEDESTRIAN |
|  | PEDESTRIAN |  | TURNING |  | 20 MPH TO 29 |  | TRAIN |
|  | PARKED VEHICLE |  | BACKING |  | 30 MPH TO 39 |  | OWNER AT FAULT |
|  | PARKING VEHICLE |  | SIDESLOPE |  | 40 MPH TO 49 |  | DRY |
|  | FIXED OBJECT |  | OUT OF CONTROL |  | 50 MPH TO 59 |  | WET |
|  | HEAD ON |  | INJURY |  | 60 MPH TO 69 |  | ICY OR SNOWY |
|  | REAR END |  | FATALITY |  | 70 AND UP |  | ONLY |
|  | RAN OFF ROAD | | | | | | |



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

| | | |
|--|--------------------------|-------------------------|
|  | COLLISION DIAGRAM | |
| | DIVISION: 02 | AREA: |
| STUDY PERIOD: 7/1/2001 to 3/31/2005 | | DISTANCE: Y-LINE = 0 FT |
| ANALYSIS PREPARED BY: Mojed Bozzori | | ANALYSIS CHECKED BY: |
| DIAGRAM PREPARED BY: Mojed Bozzori | | DIAGRAM REVIEWED BY: |
| SCALE: NOT TO SCALE | | DATE: 9/28/2005 |
| LOG NUMBER: 20050543 SS 02-00-205 | | |
| N.C. DEPARTMENT of TRANSPORTATION DIVISION of HIGHWAYS TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH | | |