Spot Safety Project Evaluation

Project Log # 200512213

Spot Safety Project # 09-00-204

Spot Safety Project Evaluation of the Center Left Turn Lane on SR 2649 (Hopkins Rd), the Right Turn Slip Ramp at the Intersection of SR 2649 and SR 2648 (Old Winston Rd), and conversion of the Intersection to an All-Way Stop
Forsyth 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

_____ 3-20-2006
Brad Robinson, EI Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 09-00-204 – The center turn lane installation on SR 2649 (Hopkins Rd), the construction of a right turn slip ramp at the intersection of SR 2649 and SR 2648 (Old Winston Rd), and the conversion of the intersection to an all-way stop in Forsyth 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 naive 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 to convert the intersection of SR 2649 (Hopkins Rd) and SR 2648 (Old Winston Rd) to an all-way stop condition and to construct a right turn slip ramp on Old Winston Rd. In addition, a center left turn lane was constructed on Hopkins Rd from the intersection to 0.23 miles north. Hopkins Rd and Old Winston Rd were both 2-lane roads with no turn lanes in the subject location. The speed limits are 35 mph for Old Winston Rd and 45 mph for Hopkins Rd.

The project was initially requested by the Kernersville Assistant Public Works Director. Approximately 90 percent of traffic entering the intersection of Old Winston Rd and Hopkins Rd travel between the east approach of Old Winston Rd and Hopkins Rd. Motorists entering Old Winston Rd from Hopkins Rd assumed most westbound Old Winston Rd traffic would turn right and were being struck by those that traveled straight through the intersection.

The initial crash analysis was conducted from January 1, 1997 through January 1, 2000 with a total of 14 reported crashes. There were 9 crashes (6 Left Turn Different Roadways and 3 Rear End) which were deemed correctable by the improvement. The final completion date for the improvement at the subject location was on January 25, 2001 at a cost of $368,600. $98,500 from Spot Safety funds was used, with the additional balance of $270,100 being provided by the Town of Kernersville.

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

October 1, 2000 through April 31, 2001. The before period consisted of reported crashes from April 1, 1996 through September 30, 2000 (4 Years, 6 Months) and the after period consisted of reported crashes from May 1, 2001 through October 31, 2005 (4 Years, 6 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed. Because Spot Safety funds seemed to be primarily for the installation of the right turn slip ramp, the treatment data consisted of all crashes within 150' from the intersection of Hopkins Rd and Old Winston Rd. The center left turn lane installation analysis was investigated separately. It includes all crashes on Hopkins Rd from 150' north of the intersection to Mile Post 0.23.

The following data Table 1 depicts the Naive Before and After Analysis for the Total Crashes and Target Crashes at the treatment intersection. The Target Crashes for the right turn slip ramp include Left Turn Different Roadway crashes which involved a left turning vehicle from Hopkins Rd and a westbound vehicle on Old Winston Rd. Table 2 depicts the Naïve Before and After Analysis for the Total Crashes and Target Crashes along Hopkins Rd. The Target Crashes for the center left turn lane include Rear End, Slow or Stop crashes.

Table 1. Treatment Information for Intersection	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	13	4	-69.2
Total Severity Index	13.8	1	-92.8
Total Target Crashes	10	1	-90.0
Target Severity Index	17.64	1	-94.3
Volume	10,600	11,500	8.5

Table 2. Treatment Information for Strip on Hopkins Rd	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	2	2	0
Total Severity Index	4.7	1	-78.7
Total Target Crashes	1	1	0
Target Severity Index	1	1	0
Volume	10200	10600	3.9

The naive before and after analysis at the treatment intersection resulted in a 69.2 percent decrease in Total Crashes, a 92.8 percent decrease in the Total Severity Index, and a 8.5 percent increase in Average Daily Traffic (ADT). There was also a 90 percent decrease in Target Crashes and a 94.3 percent decrease in the Severity Index for Target Crashes. The before period ADT year was 1998 and the after period ADT year was 2003.

The naive before and after analysis at the treatment strip resulted in no change for both Total Crashes and Target Crashes and a 3.9 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1998 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 for the intersection resulted in a 69.2 percent decrease in Total Crashes and a 92.8 percent decrease in Target Crashes. The summary results above demonstrate that the treatment intersection appears to have had a significant decrease in both Total and Target crashes from the before to the after period. There was no change in the before and after period for Total Crashes or Target Crashes for the strip on Hopkins Rd.

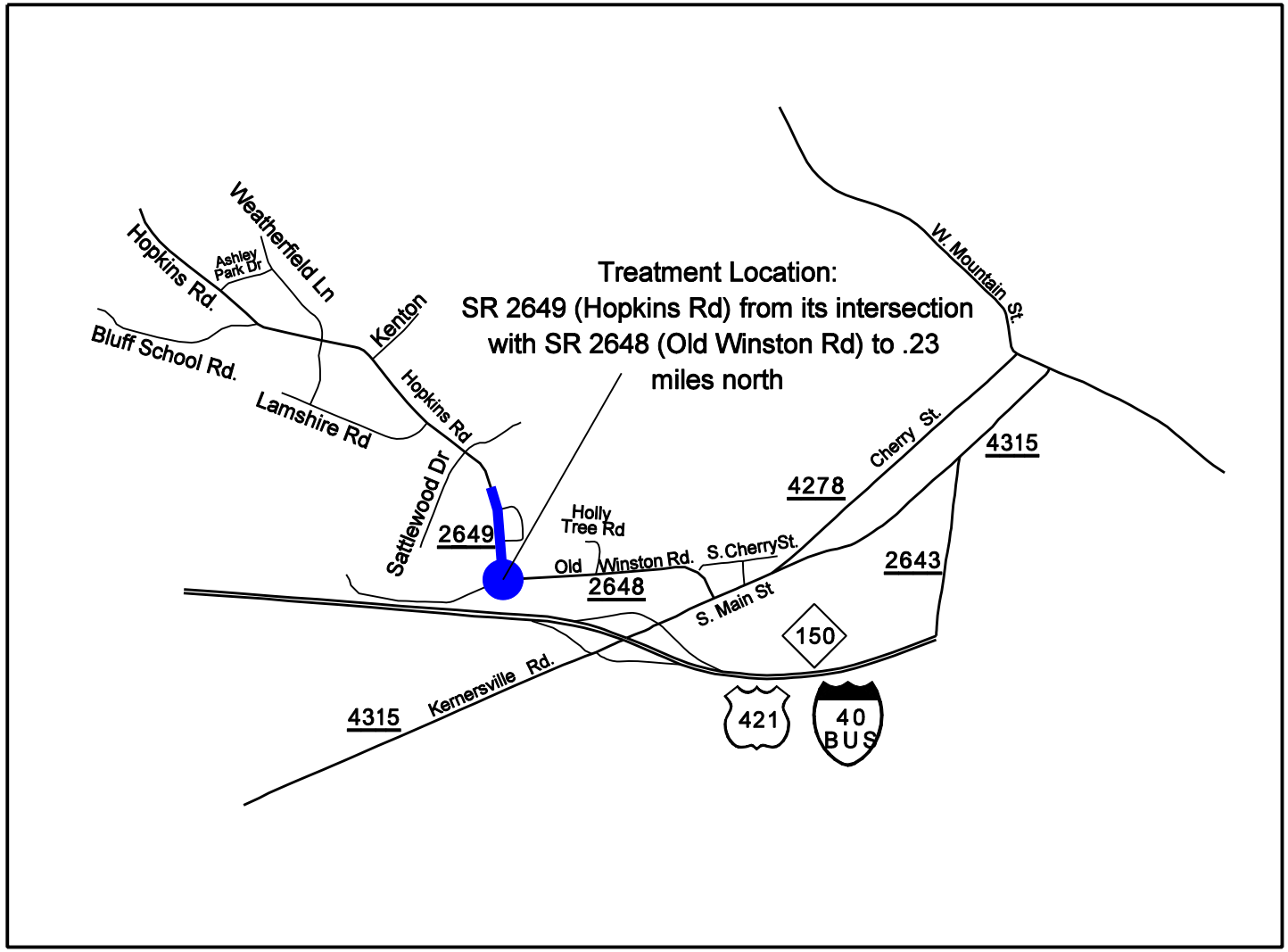
Although there was no improvement from the before to the after period on Hopkins Rd, this is a result of the strip not appearing to have a problem in the before period. As previously stated, Spot Safety funds seemed to primarily be for the right turn slip ramp from Old Winston Rd. The Town of Kernersville funded the rest of the project. The center left turn lane seems to be primarily to reduce congestion along Hopkins Rd. The large decrease in the Total Severity Index along the strip (78.7%) is misleading. In the before period there were only 2 crashes along the strip, with one being a class "C" injury crash. In the after period there were also only 2 crashes along the strip, this time resulting in no injuries. With such a small number of crashes, and the only injury being a "C" injury, the Total Severity Index for the strip is not significant.

As previously stated the main reason for the improvement was that left-turning vehicles from Hopkins Rd were assuming most westbound Old Winston Rd traffic would turn right and were therefore being struck by those that went straight through the intersection. The installation of the right turn slip ramp in combination with the conversion of the intersection to an all-way stop appears to have corrected this problem. There does not appear to be any crash patterns created by the improvement.

Please see the attached *Treatment Site Photos*. Photos are provided for each leg of the intersection and along the section of Hopkins Rd with the center left turn lane.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors.

Location Map
Forsyth County
Evaluation of Spot Safety Project # 09-00-204



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TREATMENT SITE PHOTOS TAKEN 3/9/2006

Traveling West On SR 2648 (Old Winston Rd)

Looking Right at Stop Sign on Westbound SR 2648

Traveling East on SR 2648 (Old Winston Rd)

Traveling South on SR 2649 (Hopkins Rd)

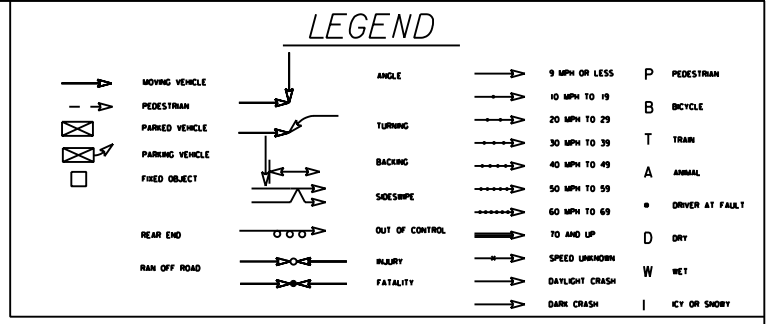
Looking Right From SR 2649 (Hopkins Rd)

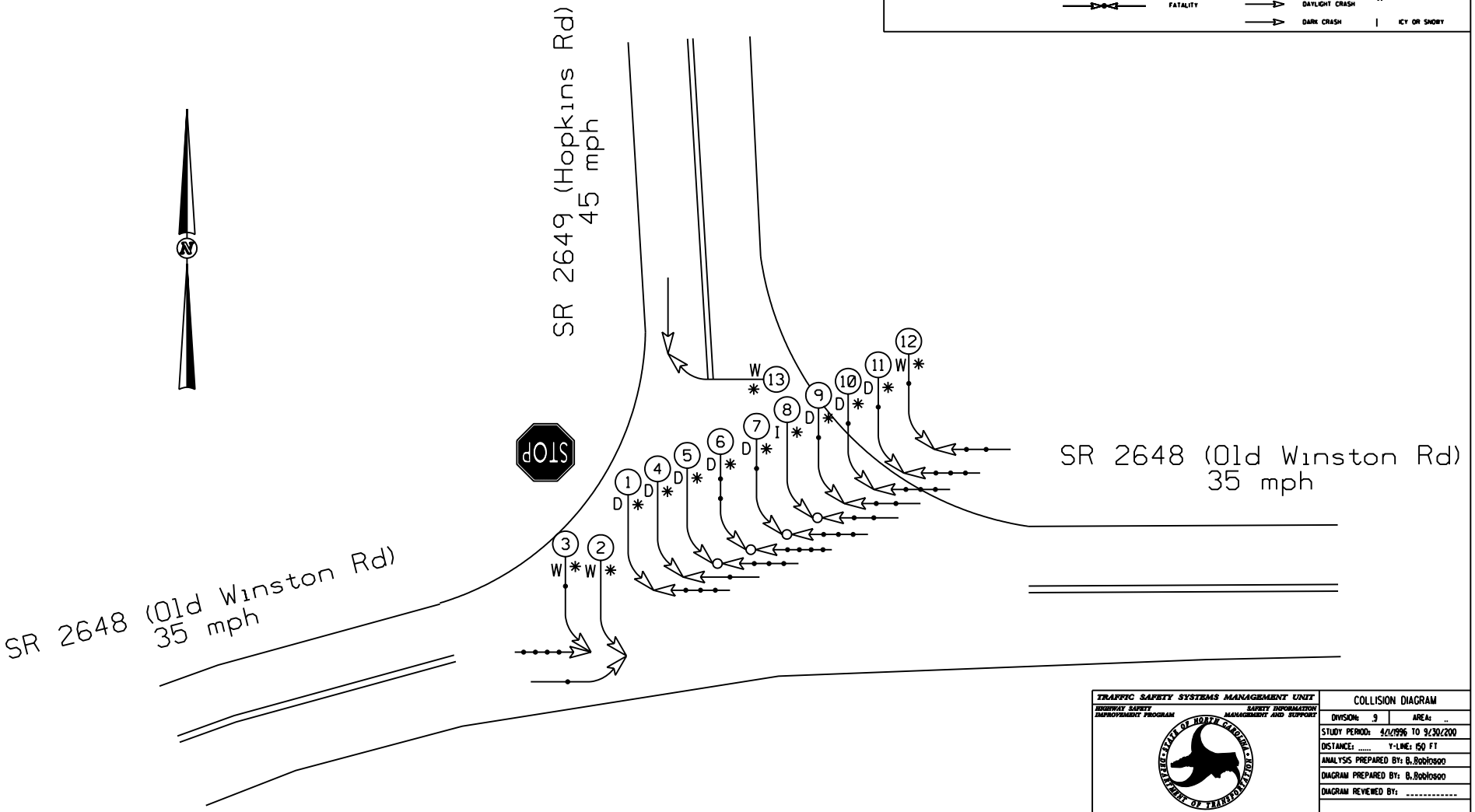

Looking Left From SR 2649

Traveling South on SR 2649 (Hopkins Rd) – Start of Turn Lane

Traveling South on SR 2649 – Turn Lane

Forsyth County
SR 2649 (Hopkins Rd) at
SR 2468 (Old Winston Rd)
Treatment Site in the Before Period
From 4/1/1996-9/30/2000





TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

HIGHWAY SAFETY IMPROVEMENT PROGRAM — SAFETY INFORMATION MANAGEMENT AND SUPPORT

SAFETY EVALUATION — TRAFFIC SAFETY

COLLISION DIAGRAM

DIVISION: 9	AREA: ..
STUDY PERIOD:	4/1/1996 TO 9/30/200
DISTANCE:	Y-LINE: 150 FT
ANALYSIS PREPARED BY:	B.Robinson
DIAGRAM PREPARED BY:	B.Robinson
DIAGRAM REVIEWED BY:	----------
SCALE:	NOT TO SCALE
DATE:	March 2006
LOG NUMBER:	20050203

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

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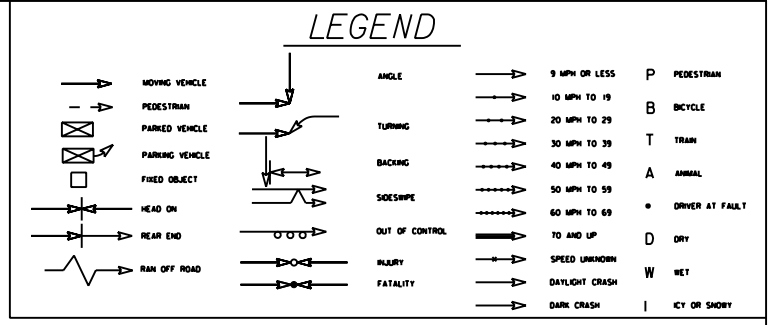
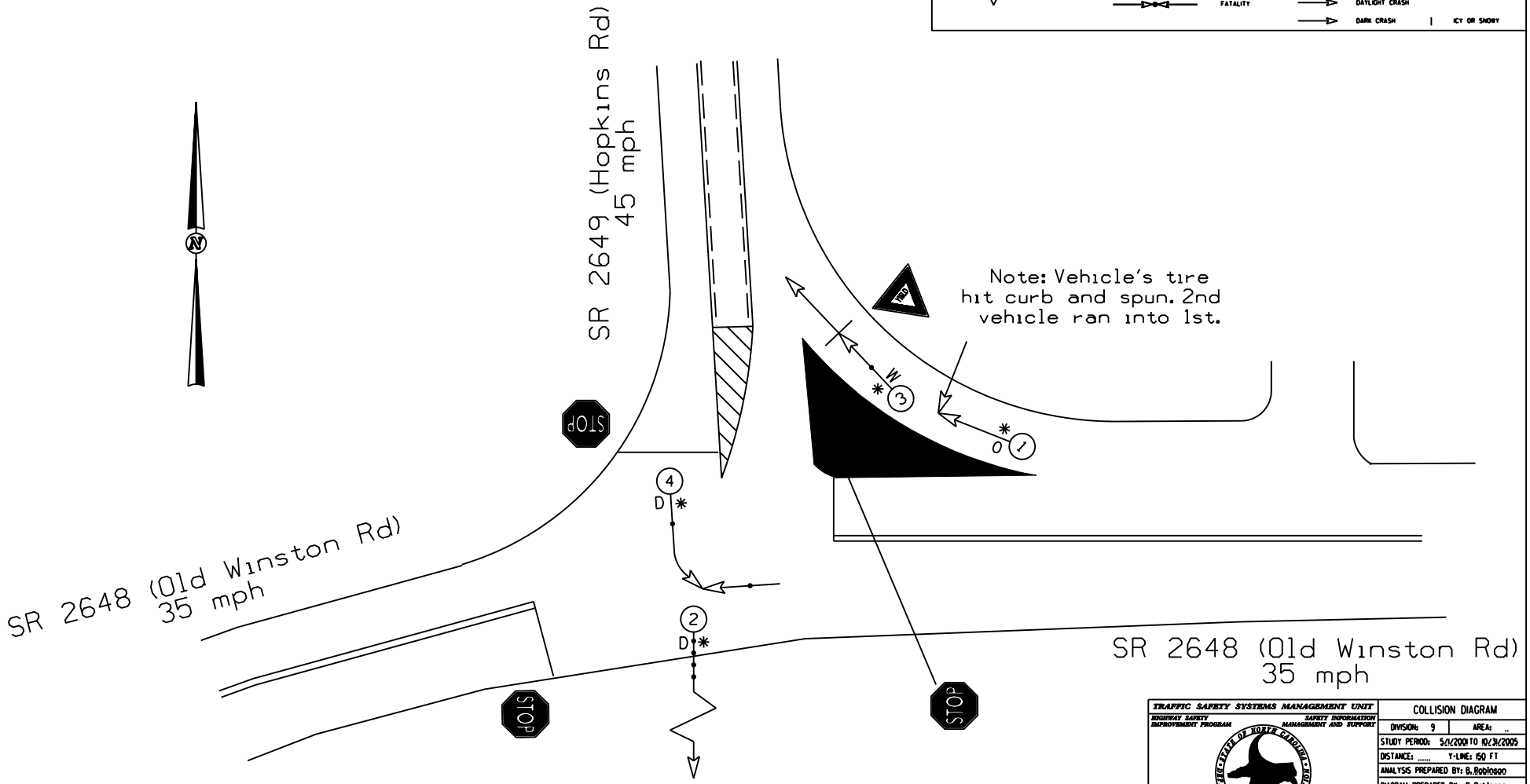
Forsyth County
SR 2649 (Hopkins Rd) at
SR 2468 (Old Winston Rd)
Treatment Site in the After Period
From 5/1/2001-10/31/2005





TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT	COLLISION DIAGRAM
HIGHWAY SAFETY IMPROVEMENT PROGRAM / SAFETY INFORMATION MANAGEMENT AND SUPPORT	DIVISION: 9 AREA: ..
	STUDY PERIOD: 5/1/2001 TO 10/31/2005
	DISTANCE: ..... Y-LINE: 150 FT
	ANALYSIS PREPARED BY: B.Robinson
	DIAGRAM PREPARED BY: B.Robinson
	DIAGRAM REVIEWED BY: ----------
SAFETY EVALUATION / TRAFFIC SAFETY	
	SCALE: NOT TO SCALE
	DATE: March 2006
	LOG NUMBER: 20052120

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