

Spot Safety Project Evaluation

Project Log # 200812022

Spot Safety Project # 11-03-202

Spot Safety Project Evaluation of the Installation of a Traffic Signal At the Intersection of US 601 at NC 268 Surry County

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Transportation Mobility and Safety Division
North Carolina Department of Transportation

Principal Investigator


Brad Robinson, PE

4/29/2009
Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 11-03-202 – The Intersection of US 601 and NC 268 in Surry County.

The Signal ID is 11-1090 for the subject intersection.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of a traffic signal.

The subject location is a four-leg intersection which was controlled by stop signs on NC 268 in the before period. NC 268 had single lane approaches with median islands and dual stop signs in the before period. In the after period the islands were removed and left turn lanes were added. Both approaches of US 601 had a thru-right and a left turn lane in both the before and after period. The speed limits are 55 mph for NC 268 and 45 mph for US 601.

The original statement of problem was that vehicles were entering the roadway with poor sight distance, resulting in angle collisions.

The initial crash analysis was conducted from May 31, 1999 to June 1, 2002 with a total of 17 reported crashes, 14 of which were considered correctable by the chosen countermeasure. The final completion date for the improvements at the subject intersection was on December 22, 2003 with a total cost of \$56,000.00.

Naive 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 November 1, 2003 to January 31, 2004. The before period consisted of reported crashes from March 1, 1999 through October 31, 2003 (4 years and 8 months) and the after period consisted of reported crashes from February 1, 2004 through September 30, 2008 (4 years and 8 months). The ending date for this analysis was limited by the available crash data at the time the analysis was conducted.

The treatment data consisted of all reported crashes within 150 feet of the subject intersection. The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Frontal Impact crash types were the Target Crashes for the applied countermeasure. These crash types considered are as follows: Left Turn, same roadway; Left Turn, different roadway; Right Turn, same roadway; Right Turn, different roadway; Head On and Angle. The target crashes are clearly identified in the before and after period collision diagrams.

<u>Treatment Information</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	30	24	-20.0
Total Severity Index	9.51	5.01	-47.3
Target Crashes	22	17	-22.7
Target Crash Severity Index	11.25	5.79	-48.5
Volume	7,600	8,300	9.2
<u>Crash Severity Summary</u>			
Fatal Crashes	0	0	N/A
Class A Crashes	2	0	-100.0
Class B Crashes	3	4	33.3
Class C Crashes	11	9	-18.2
PDO Crashes	14	11	-21.4

The naive before and after analysis at the treatment location resulted in a 20 percent decrease in Total Crashes, a 23 percent decrease in Target Crashes, and an 9 percent increase in Average Daily Traffic (ADT). The before period ADT year was 2001 and the after period ADT year was 2006.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 20 percent decrease in Total Crashes and an 23 percent decrease in Target Crashes. The Total Severity Index decreased by 47 percent and the Target Crash Severity Index decreased by 49 percent. The summary results above demonstrate that both Total Crashes and Target Crashes appear to have decreased at the treatment location from the before to the after period.

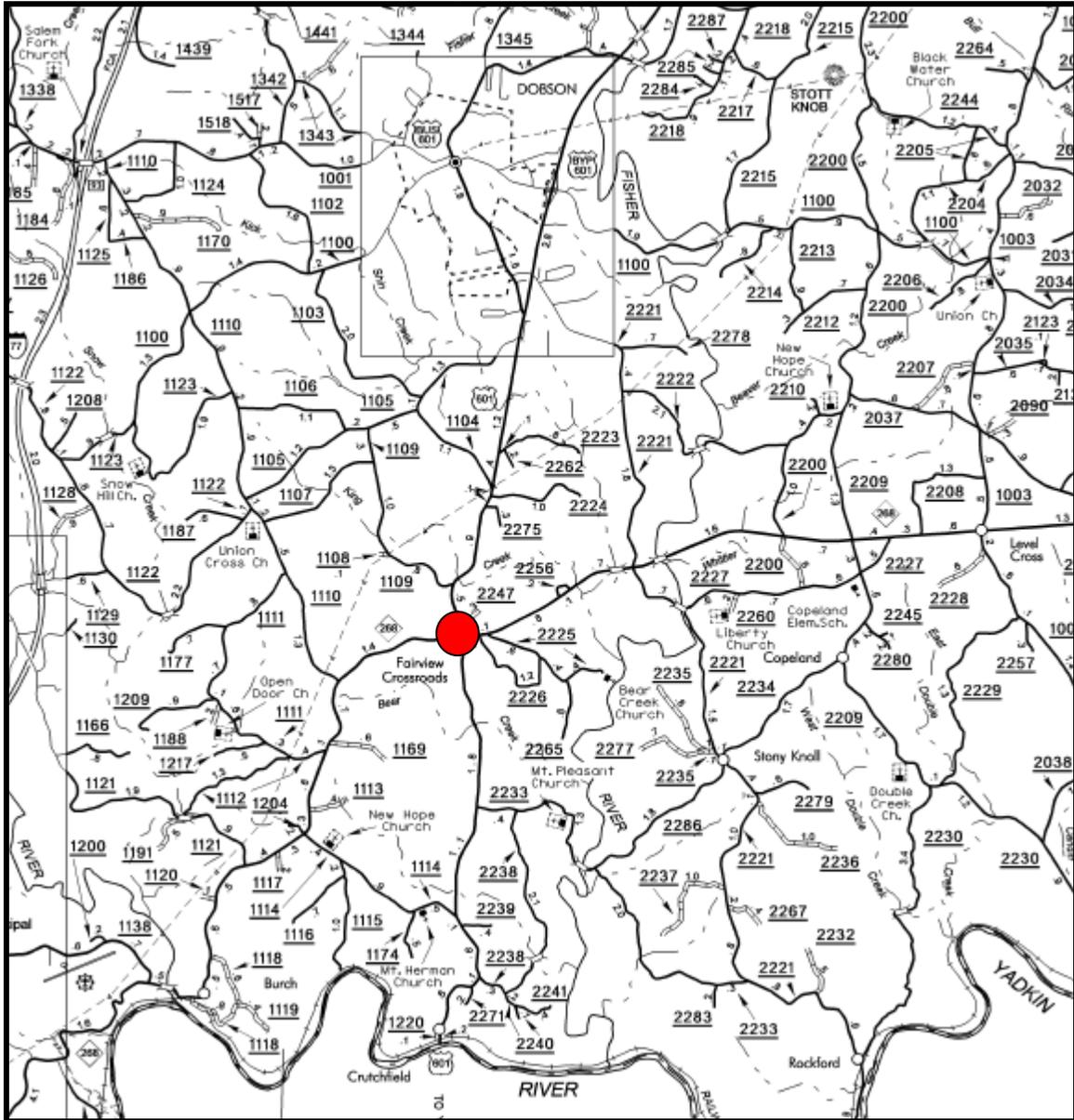
The calculated benefit to cost ratio for this project is 24.61 considering total crashes. The benefit to cost ratio considering only target crashes is 23.93. The benefits are calculated using the change in annual crash costs from the before to the after period. Operational and other benefits related to the project are not considered in this analysis. The costs of the project include the actual construction costs as well as the increase in annual maintenance and utility costs.

Referencing the above table and the *Collision Diagrams*, it is apparent that the installation of a traffic signal helped to reduce Frontal Impact Crashes at the subject intersection. A large pattern of crashes (10 crashes) between southbound US 601 vehicles and eastbound NC 268 vehicles was reduced by 70 percent from the before to the after period (from 10 to 3). A smaller pattern between northbound US 601 vehicles and eastbound NC 268 was reduced by 40 percent, from five in the before period to three in the after.

The one Target Crash pattern that increased from the before to the after period was between southbound US 601 vehicles and westbound NC 268 vehicles. This pattern increased by 50 percent, from four in the before period to six in the after. Four of the after period crashes in this pattern involved a vehicle on US 601 running the signal, one involved a vehicle on NC 268 running the signal, and the fault could not be determined for one.

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 for this type of intersection.

Location Map
Surry County
Evaluation of Spot Safety Project #11-03-202



Treatment Location: US 601 at NC 268



Looking West on NC 268



Looking East on NC 268



Looking North on US 601



Looking South on US 601

BENEFIT-COST ANALYSIS WORKSHEET

LOCATION: US 601 and NC 268
 COUNTY: Surry
 FILE NO.: SS 11-03-202

BY: BDR
 DATE: 4/9/2009

DETAILED COST: TYPE IMPROVEMENT - Signal

ITEMS	TOTAL	SERVICE	CRF	ANNUAL COST
Construction	\$0	0	0.000	\$0
	\$56,000	10	0.149	\$8,346
Right-of-Way	\$0	0	0.000	\$0
TOTALS	\$56,000	10	0.149	\$8,346

ESTIMATED INCREASE IN ANNUAL MAINT. COST = \$2,000
 ESTIMATED INCREASE IN ANNUAL UTILITY COST = \$900
 TOTAL ANNUAL COST= \$11,246
 TOTAL COST OF PROJECT= \$56,000

COMPREHENSIVE COST REDUCTION:

ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES

TIME PERIOD	YEARS	ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES				PDO		ANNUAL COSTS
		K & A CRASHES	K & A CRASHES PER YR	B & C CRASHES	B & C CRASHES PER YR	CRASHES	CRASHES PER YR	
BEFORE	4.67	2	0.43	14	3.00	14	3.00	\$342,355
AFTER	4.67	0	0.00	13	2.78	11	2.36	\$65,567

Annual Benefits from Crash Cost Savings \$276,788

NET AVG. ANNUAL BENEFITS = AVG. ANNUAL BENEFITS - TOTAL ANNUAL COST = \$265,542

BENEFIT-COST RATIO = AVG ANNUAL BENEFITS/TOTAL ANNUAL COST = 24.61

TOTAL COST OF PROJECT - \$56,000 COMPREHENSIVE B/C RATIO - 24.61

BENEFIT-COST ANALYSIS WORKSHEET

LOCATION: US 601 and NC 268
 COUNTY: Surry
 FILE NO.: SS 11-03-202 Target Crashes

BY: BDR
 DATE: 4/9/2009

DETAILED COST: TYPE IMPROVEMENT - Signal

ITEMS	TOTAL	SERVICE	CRF	ANNUAL COST
Construction	\$0	0	0.000	\$0
	\$56,000	10	0.149	\$8,346
Right-of-Way	\$0	0	0.000	\$0
TOTALS	\$56,000	10	0.149	\$8,346

ESTIMATED INCREASE IN ANNUAL MAINT. COST = \$2,000
 ESTIMATED INCREASE IN ANNUAL UTILITY COST = \$900
 TOTAL ANNUAL COST= \$11,246
 TOTAL COST OF PROJECT= \$56,000

COMPREHENSIVE COST REDUCTION:

ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES

TIME PERIOD	YEARS	ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES				PDO		ANNUAL COSTS
		K & A CRASHES	K & A CRASHES PER YR	B & C CRASHES	B & C CRASHES PER YR	CRASHES	CRASHES PER YR	
BEFORE	4.67	2	0.43	10	2.14	10	2.14	\$321,627
AFTER	4.67	0	0.00	11	2.36	6	1.28	\$52,505

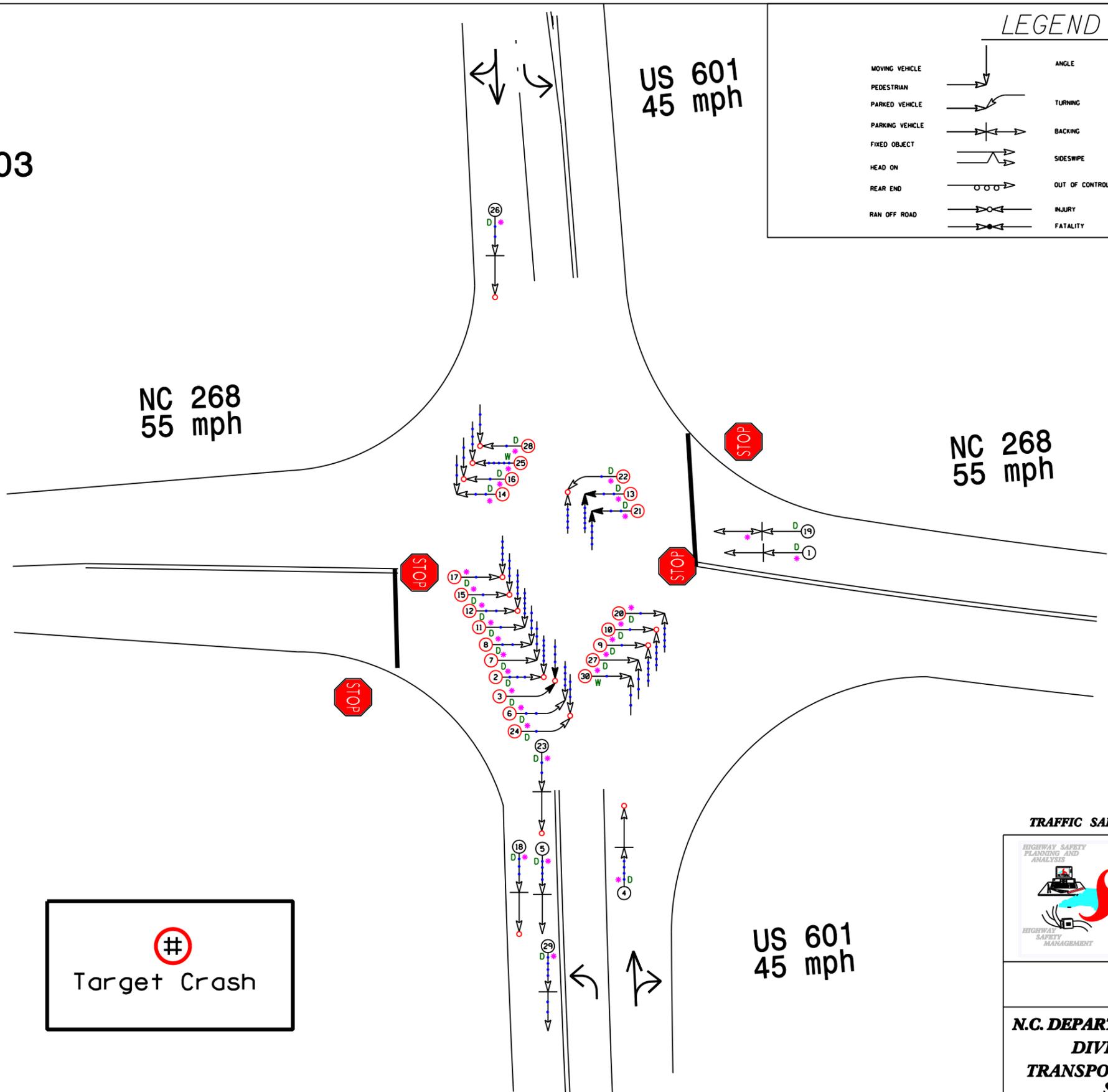
Annual Benefits from Crash Cost Savings \$269,122

NET AVG. ANNUAL BENEFITS = AVG. ANNUAL BENEFITS - TOTAL ANNUAL COST = \$257,876

BENEFIT-COST RATIO = AVG ANNUAL BENEFITS/TOTAL ANNUAL COST = 23.93

TOTAL COST OF PROJECT - \$56,000 COMPREHENSIVE B/C RATIO - 23.93

Surry County
 US 601 at NC 268
 BEFORE Period
 3/1/1999-10/31/2003



LEGEND

MOVING VEHICLE	ANGLE	9 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	INJURY	50 MPH TO 59	I ICY OR SNOWY
REAR END	FATALITY	60 MPH TO 69	O OILY
RAN OFF ROAD		70 AND UP	
		SPEED UNKNOWN	

Target Crash

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

	COLLISION DIAGRAM	
	DIVISION: II	AREA:
STUDY PERIOD: 3/1/1999-10/31/2003		
DISTANCE: Y-LINE = 150 FT		
ANALYSIS PREPARED BY: BDR		
ANALYSIS CHECKED BY:		
DIAGRAM PREPARED BY: BDR		
DIAGRAM REVIEWED BY:		
SCALE: NOT TO SCALE		
DATE: December 2008		
LOG NUMBER: 20082022		

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

Surry County
 US 601 at NC 268
 AFTER Period
 2/1/2004-9/30/2008

LEGEND

MOVING VEHICLE	ANGLE	9 MPH OR LESS	P PEDESTRIAN
PARKED VEHICLE	TURNING	10 MPH TO 19	T TRAIN
PARKING VEHICLE	BACKING	20 MPH TO 29	* DRIVER AT FAULT
FIXED OBJECT	SIDESWIPE	30 MPH TO 39	D DRY
	OUT OF CONTROL	40 MPH TO 49	W WET
RAN OFF ROAD	INJURY	50 MPH TO 59	I ICY OR SNOWY
	FATALITY	60 MPH TO 69	O OILY
		70 AND UP	
		SPEED UNKNOWN	

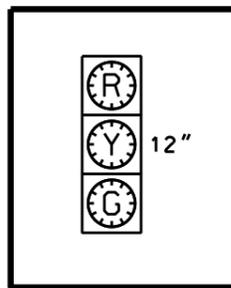


NC 268
55 mph

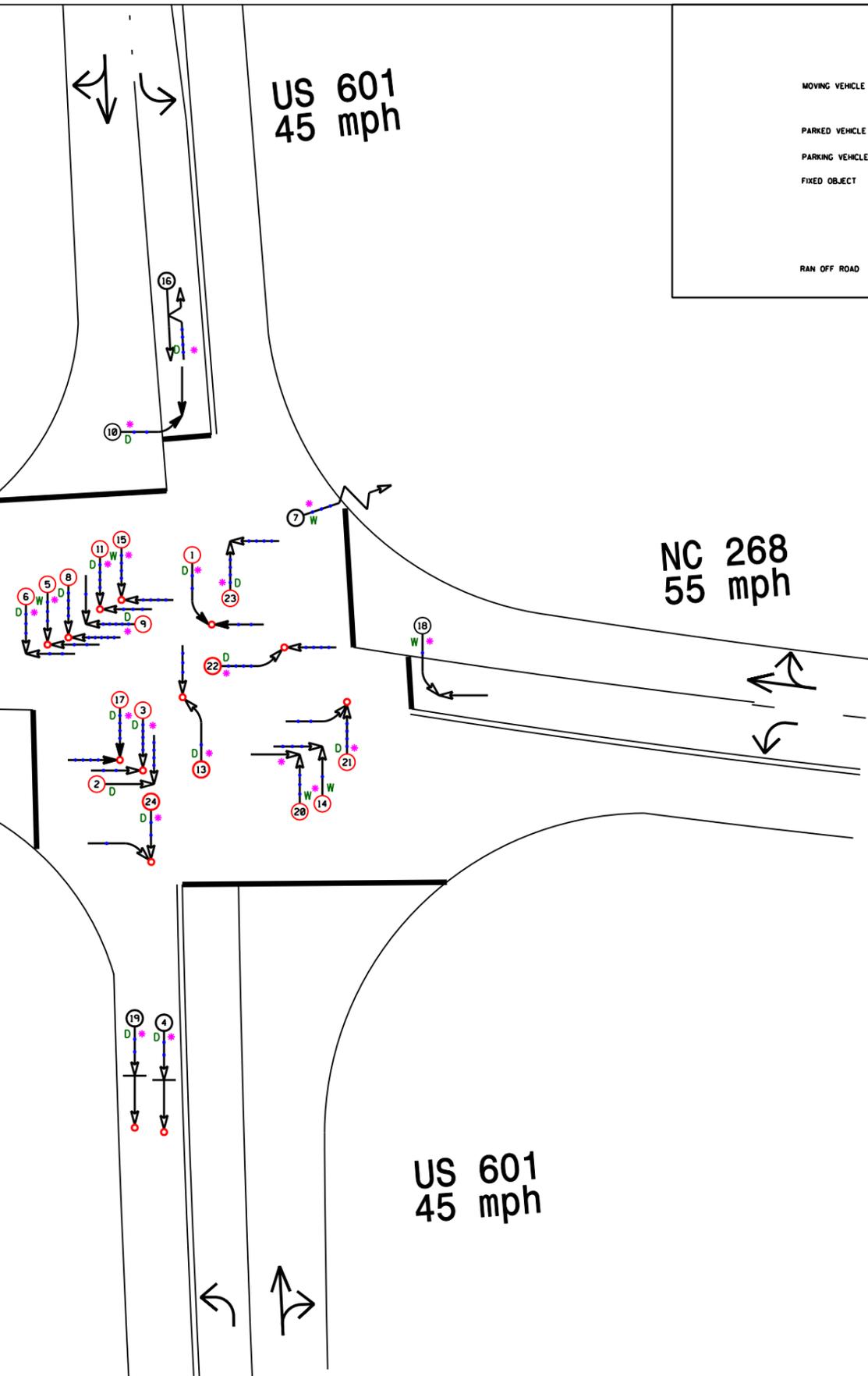
US 601
45 mph

NC 268
55 mph

US 601
45 mph



Target Crash



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT



COLLISION DIAGRAM	
DIVISION: II	AREA:
STUDY PERIOD: 2/1/2004-9/30/2008	
DISTANCE: Y-LINE = 150 FT	
ANALYSIS PREPARED BY: BDR	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: BDR	
DIAGRAM REVIEWED BY:	
SCALE: NOT TO SCALE	
DATE: December 2008	
LOG NUMBER: 20082022	

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

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Acc No	Crash ID	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
					F	A	B	C	R	L	W	Ch	Ci	Dv	Op
8	100279971	01/24/2001 10:20	ANGLE	\$ 4500	0	0	0	0	1	1	1	1	0	1	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 0 MPH	Dir: E	Veh Mnvr / Ped Actn:				12	Obj Strk:					
Unit	2 : 1	Alchl/Drgs: 0	Speed: 50 MPH	Dir: S	Veh Mnvr / Ped Actn:				4	Obj Strk:					
9	100281256	01/26/2001 11:33	ANGLE	\$ 7000	0	1	0	0	1	1	1	1	0	1	1
Unit	1 : 11	Alchl/Drgs: 0	Speed: 40 MPH	Dir: N	Veh Mnvr / Ped Actn:				4	Obj Strk:					
Unit	2 : 10	Alchl/Drgs: 0	Speed: 10 MPH	Dir: E	Veh Mnvr / Ped Actn:				4	Obj Strk:					
10	100360368	05/20/2001 13:55	ANGLE	\$ 12500	0	0	0	1	1	1	2	1	0	1	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 45 MPH	Dir: N	Veh Mnvr / Ped Actn:				4	Obj Strk:					
Unit	2 : 4	Alchl/Drgs: 0	Speed: 15 MPH	Dir: E	Veh Mnvr / Ped Actn:				4	Obj Strk:					
11	100370123	06/03/2001 17:30	ANGLE	\$ 1100	0	0	0	0	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 50 MPH	Dir: S	Veh Mnvr / Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs: 0	Speed: 20 MPH	Dir: E	Veh Mnvr / Ped Actn:				4	Obj Strk:					
12	100384612	06/24/2001 09:40	ANGLE	\$ 19300	0	0	0	1	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 0 MPH	Dir: E	Veh Mnvr / Ped Actn:				12	Obj Strk:					
Unit	2 : 2	Alchl/Drgs: 0	Speed: 55 MPH	Dir: S	Veh Mnvr / Ped Actn:				4	Obj Strk:					
13	100402153	07/22/2001 23:05	ANGLE	\$ 1500	0	0	0	0	1	5	1	1	0	1	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 45 MPH	Dir: N	Veh Mnvr / Ped Actn:				4	Obj Strk:					
Unit	2 : 32	Alchl/Drgs: 7	Speed: 45 MPH	Dir: W	Veh Mnvr / Ped Actn:				4	Obj Strk:					
14	100415926	08/11/2001 18:25	ANGLE	\$ 4500	0	0	0	0	1	1	2	1	0	4	1
Unit	1 : 3	Alchl/Drgs: 0	Speed: 55 MPH	Dir: S	Veh Mnvr / Ped Actn:				4	Obj Strk:					
Unit	2 : 2	Alchl/Drgs: 0	Speed: 55 MPH	Dir: W	Veh Mnvr / Ped Actn:				4	Obj Strk:					
15	100419693	08/17/2001 17:30	ANGLE	\$ 5000	0	0	0	2	1	1	1	1	0	1	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 0 MPH	Dir: E	Veh Mnvr / Ped Actn:				12	Obj Strk:					
Unit	2 : 1	Alchl/Drgs: 0	Speed: 55 MPH	Dir: S	Veh Mnvr / Ped Actn:				4	Obj Strk:					
16	100426354	08/26/2001 15:55	ANGLE	\$ 4000	0	0	1	0	1	1	1	1	0	1	1
Unit	1 : 20	Alchl/Drgs: 0	Speed: 45 MPH	Dir: S	Veh Mnvr / Ped Actn:				4	Obj Strk:					
Unit	2 : 1	Alchl/Drgs: 0	Speed: 10 MPH	Dir: W	Veh Mnvr / Ped Actn:				4	Obj Strk:					

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Acc No	Crash ID	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
					F	A	B	C	R	L	W	Ch	Ci	Dv	Op
17	100569735	03/02/2002 06:40	ANGLE	\$ 15500	0	0	1	0	1	1	2	1	0	4	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk:										
Unit	2 : 5	Alchl/Drugs: 1	Speed: 15 MPH Dir: E	Veh Mnvr / Ped Actn: 4	Obj Strk:										
18	100616940	05/08/2002 12:50	REAR END, TURN	\$ 8500	0	0	0	1	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 0 MPH Dir: S	Veh Mnvr / Ped Actn: 1	Obj Strk: 20										
Unit	2 : 3	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk:										
19	100630429	05/27/2002 14:30	BACKING UP	\$ 2200	0	0	0	0	1	1	2	1	0	13	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 0 MPH Dir: W	Veh Mnvr / Ped Actn: 1	Obj Strk:										
Unit	2 : 2	Alchl/Drugs: 1	Speed: 5 MPH Dir: W	Veh Mnvr / Ped Actn: 10	Obj Strk:										
20	100673572	07/27/2002 17:42	ANGLE	\$ 11800	0	0	0	0	1	1	1	1	0	1	1
Unit	1 : 4	Alchl/Drugs: 0	Speed: 10 MPH Dir: E	Veh Mnvr / Ped Actn: 4	Obj Strk:										
Unit	2 : 4	Alchl/Drugs: 0	Speed: 45 MPH Dir: N	Veh Mnvr / Ped Actn: 4	Obj Strk: 37										
21	100673928	07/28/2002 20:15	ANGLE	\$ 6000	0	0	0	0	1	5	1	1	0	4	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: N	Veh Mnvr / Ped Actn: 4	Obj Strk:										
Unit	2 : 1	Alchl/Drugs: 7	Speed: 20 MPH Dir: W	Veh Mnvr / Ped Actn: 12	Obj Strk:										
22	100763625	11/19/2002 11:30	LEFT TURN, DIFFERENT ROADWAYS	\$ 5000	0	0	0	1	1	1	1	1	0	4	1
Unit	1 : 2	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk:										
Unit	2 : 2	Alchl/Drugs: 0	Speed: 0 MPH Dir: E	Veh Mnvr / Ped Actn: 8	Obj Strk:										
23	101084230	03/21/2003 15:58	OTHER NON-COLLISION	\$ 3700	0	0	0	1	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 10 MPH Dir: N	Veh Mnvr / Ped Actn: 7	Obj Strk:										
Unit	2 : 4	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk:										
Unit	3 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk:										
24	100907167	05/27/2003 15:43	LEFT TURN, DIFFERENT ROADWAYS	\$ 2400	0	0	0	2	1	1	1	2	0	1	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk: 59										
Unit	2 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: E	Veh Mnvr / Ped Actn: 8	Obj Strk:										
25	100922967	06/16/2003 17:30	ANGLE	\$ 36000	0	2	0	0	2	1	2	1	0	4	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 60 MPH Dir: W	Veh Mnvr / Ped Actn: 4	Obj Strk:										
Unit	2 : 5	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4	Obj Strk:										

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Acc No	Crash ID	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
					F	A	B	C	R	L	W	Ch	Ci	Dv	Op
26	100933020	06/30/2003 20:00	REAR END, SLOW OR STOP	\$ 1500	0	0	0	1	1	1	2	1	0	4	1
Unit	1 : 2	Alchl/Drgs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drgs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 11		Obj Strk:									
27	100940872	07/10/2003 17:30	ANGLE	\$ 7000	0	0	0	0	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 5 MPH Dir: N	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drgs: 0	Speed: 5 MPH Dir: E	Veh Mnvr / Ped Actn: 4		Obj Strk:									
28	100959262	08/03/2003 12:45	ANGLE	\$ 1700	0	0	0	1	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 2	Alchl/Drgs: 0	Speed: 15 MPH Dir: W	Veh Mnvr / Ped Actn: 4		Obj Strk:									
29	100991108	09/13/2003 15:00	REAR END, SLOW OR STOP	\$ 2600	0	0	0	0	1	1	1	1	0	13	1
Unit	1 : 4	Alchl/Drgs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 11		Obj Strk:									
Unit	2 : 1	Alchl/Drgs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
30	101011989	10/09/2003 17:10	ANGLE	\$ 1900	0	0	0	0	2	1	3	1	0	1	1
Unit	1 : 1	Alchl/Drgs: 0	Speed: 10 MPH Dir: E	Veh Mnvr / Ped Actn: 12		Obj Strk: 38									
Unit	2 : 2	Alchl/Drgs: 0	Speed: 45 MPH Dir: N	Veh Mnvr / Ped Actn: 4		Obj Strk:									

Legend for Report Details:

Acc No - Accident Number
 Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
 Condition: R - Road Surface, L - Ambient Light, W - Weather
 Rd Ch - Road Character
 Rd Ci - Roadway Contributing Circumstances
 Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
 Alchl/Drgs - Alcohol Drugs Suspected
 Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
 Obj Strk - Object Struck

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	30	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	16	53.33
Total Injury Crashes	16	53.33
Property Damage Only Crashes	14	46.67
Night Crashes	3	10.00
Wet Crashes	2	6.67
Alcohol/Drugs Involvement Crashes	2	6.67

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	30	100.00
Fatal Crashes	0	0.00
Class A Crashes	2	6.67
Class B Crashes	3	10.00
Class C Crashes	11	36.67
Property Damage Only Crashes	14	46.67

Vehicle Exposure Statistics

Annual ADT = 7600

Total Vehicle Exposure = 12.97 (MEV)

Crash Rate	Crashes Per 100 Million Vehicles Entered
Total Crash Rate	231.38
Fatal Crash Rate	0.00
Non Fatal Crash Rate	123.40
Night Crash Rate	23.14
Wet Crash Rate	15.43
EPDO Rate	2199.67

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Miscellaneous Statistics

Severity Index =	9.51
EPDO Crash Index =	285.20
Estimated Property Damage Total = \$	203100.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	19	63.33
BACKING UP	1	3.33
LEFT TURN, DIFFERENT ROADWAYS	3	10.00
OTHER NON-COLLISION	1	3.33
REAR END, SLOW OR STOP	5	16.67
REAR END, TURN	1	3.33

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	3	15.79
Class B Injuries	3	15.79
Class C Injuries	13	68.42
Total Non-Fatal Injuries	19	100.00
Total Injuries	19	100.00

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	2	6.67
Feb	0	0.00
Mar	3	10.00
Apr	0	0.00
May	5	16.67
Jun	4	13.33
Jul	5	16.67
Aug	5	16.67
Sep	2	6.67
Oct	3	10.00
Nov	1	3.33
Dec	0	0.00

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	4	13.33
Tue	2	6.67
Wed	2	6.67
Thu	5	16.67
Fri	4	13.33
Sat	5	16.67
Sun	8	26.67

**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Intersection Analysis Report**

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	0	0.00
0200-0259	0	0.00
0300-0359	0	0.00
0400-0459	0	0.00
0500-0559	0	0.00
0600-0659	1	3.33
0700-0759	1	3.33
0800-0859	0	0.00
0900-0959	1	3.33
1000-1059	1	3.33
1100-1159	2	6.67
1200-1259	2	6.67
1300-1359	1	3.33
1400-1459	1	3.33
1500-1559	5	16.67
1600-1659	1	3.33
1700-1759	7	23.33
1800-1859	1	3.33
1900-1959	2	6.67
2000-2059	3	10.00
2100-2159	0	0.00
2200-2259	0	0.00
2300-2359	1	3.33

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Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	25	2	0	27
Dark	3	0	0	3
Other	0	0	0	0
Total	28	2	0	30

Object Struck Summary

Object Type	Times Struck	Percent of Total
EMBANKMENT	1	25.00
OFFICIAL HIGHWAY SIGN BREAKAWAY	1	25.00
OFFICIAL HIGHWAY SIGN NON-BREAKAWAY	1	25.00
PARKED MOTOR VEHICLE	1	25.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
LIGHT TRUCK (MINI-VAN, PANEL)	2	3.23
MOTORCYCLE	1	1.61
PASSENGER CAR	36	58.06
PICKUP	9	14.52
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	2	3.23
SINGLE UNIT TRUCK (3 OR MORE AXLES)	1	1.61
SPORT UTILITY	6	9.68
UNKNOWN	2	3.23
VAN	3	4.84

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
1999	2	0	1	1
2000	5	0	2	3
2001	9	0	5	4
2002	6	0	3	3
2003	8	0	5	3
Total	30	0	16	14

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
1999	0	1
2000	0	2
2001	0	6
2002	0	3
2003	0	7
Total	0	19

Miscellaneous Totals

Year	Property Damage	EPDO Index
1999	\$ 5200	9.40
2000	\$ 32700	19.80
2001	\$ 59400	114.40
2002	\$ 49000	28.20
2003	\$ 56800	113.40
Total	\$ 203100	285.20

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road &			
				Fixed Object	Angle	Side Swipe	Other
1999	0	0	1	0	1	0	0
2000	1	0	2	0	2	0	0
2001	0	0	0	0	9	0	0
2002	1	0	1	0	3	0	1
2003	1	0	2	0	4	0	1

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Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
Total	3	0	6	0	19	0	2

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Acc No	Crash ID	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
					F	A	B	C	R	L	W	Ch	Ci	Dv	Op
9	101542963	08/17/2005 09:12	ANGLE	\$ 5500	0	0	0	0	1	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 55 MPH Dir: W	Veh Mnvr / Ped Actn: 4		Obj Strk: 34									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
10	101545198	08/20/2005 21:31	LEFT TURN, DIFFERENT ROADWAYS	\$ 3500	0	0	0	0	1	4	1	3	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 0 MPH Dir: S	Veh Mnvr / Ped Actn: 1		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 25 MPH Dir: N	Veh Mnvr / Ped Actn: 8		Obj Strk:									
11	101584845	10/15/2005 10:43	ANGLE	\$ 10400	0	0	0	3	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 35 MPH Dir: W	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 4	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
12	101591634	10/25/2005 14:32	OTHER COLLISION WITH VEHICLE	\$ 1520	0	0	0	0	10	1	9	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 55 MPH Dir: E	Veh Mnvr / Ped Actn: 16		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 55 MPH Dir: E	Veh Mnvr / Ped Actn: 16		Obj Strk:									
13	101603262	11/07/2005 15:44	LEFT TURN, SAME ROADWAY	\$ 32000	0	0	0	1	1	1	1	2	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 10 MPH Dir: N	Veh Mnvr / Ped Actn: 8		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 50 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
14	101625639	12/05/2005 15:30	ANGLE	\$ 3000	0	0	0	0	2	1	6	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 25 MPH Dir: N	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: E	Veh Mnvr / Ped Actn: 4		Obj Strk:									
15	101792112	06/27/2006 16:00	ANGLE	\$ 11500	0	0	0	1	2	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 45 MPH Dir: W	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	3 : 2	Alchl/Drugs: 0	Speed: 0 MPH Dir: E	Veh Mnvr / Ped Actn: 4		Obj Strk:									
16	101778713	07/08/2006 18:05	LEFT TURN, DIFFERENT ROADWAYS	\$ 4500	0	0	0	0	1	1	1	1	0	3	1
Unit	1 : 2	Alchl/Drugs: 0	Speed: 0 MPH Dir: S	Veh Mnvr / Ped Actn: 1		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 40 MPH Dir: N	Veh Mnvr / Ped Actn: 8		Obj Strk:									
17	101887505	11/15/2006 06:00	ANGLE	\$ 9000	0	0	1	1	1	5	2	1	0	3	1
Unit	1 : 2	Alchl/Drugs: 0	Speed: 40 MPH Dir: E	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									

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Acc No	Crash ID	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
					F	A	B	C	R	L	W	Ch	Ci	Dv	Op
18	101925483	12/31/2006 10:55	LEFT TURN, DIFFERENT ROADWAYS	\$ 3000	0	0	0	0	2	1	3	1	0	3	1
Unit	1 : 2	Alchl/Drugs: 0	Speed: 15 MPH Dir: E	Veh Mnvr / Ped Actn: 8		Obj Strk:									
Unit	2 : 4	Alchl/Drugs: 0	Speed: 0 MPH Dir: W	Veh Mnvr / Ped Actn: 1		Obj Strk:									
19	102125228	08/30/2007 18:25	REAR END, SLOW OR STOP	\$ 8300	0	0	0	1	1	1	2	2	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 10 MPH Dir: S	Veh Mnvr / Ped Actn: 11		Obj Strk:									
20	102173168	10/25/2007 16:20	ANGLE	\$ 1000	0	0	0	0	2	1	2	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 5 MPH Dir: E	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 32	Alchl/Drugs: 7	Speed: 35 MPH Dir: N	Veh Mnvr / Ped Actn: 4		Obj Strk:									
21	102179391	10/31/2007 11:25	LEFT TURN, DIFFERENT ROADWAYS	\$ 2750	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: N	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 25 MPH Dir: E	Veh Mnvr / Ped Actn: 8		Obj Strk:									
22	102257576	02/07/2008 11:46	LEFT TURN, SAME ROADWAY	\$ 3500	0	0	0	1	1	1	1	1	0	3	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 55 MPH Dir: W	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: E	Veh Mnvr / Ped Actn: 8		Obj Strk:									
23	102223741	03/20/2008 08:47	ANGLE	\$ 4500	0	0	0	0	1	1	1	1	0	4	1
Unit	1 : 1	Alchl/Drugs: 0	Speed: 40 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									
Unit	2 : 2	Alchl/Drugs: 0	Speed: 45 MPH Dir: W	Veh Mnvr / Ped Actn: 4		Obj Strk:									
24	102304663	05/30/2008 17:12	RIGHT TURN, DIFFERENT ROADWAYS	\$ 1850	0	0	0	2	1	1	1	1	0	3	1
Unit	1 : 2	Alchl/Drugs: 0	Speed: 35 MPH Dir: E	Veh Mnvr / Ped Actn: 7		Obj Strk:									
Unit	2 : 1	Alchl/Drugs: 0	Speed: 45 MPH Dir: S	Veh Mnvr / Ped Actn: 4		Obj Strk:									

Legend for Report Details:

Acc No - Accident Number
 Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
 Condition: R - Road Surface, L - Ambient Light, W - Weather
 Rd Ch - Road Character
 Rd Ci - Roadway Contributing Circumstances
 Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
 Alchl/Drugs - Alcohol Drugs Suspected
 Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
 Obj Strk - Object Struck

**North Carolina Department of Transportation
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Intersection Analysis Report**

Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	24	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	13	54.17
Total Injury Crashes	13	54.17
Property Damage Only Crashes	11	45.83
Night Crashes	3	12.50
Wet Crashes	6	25.00
Alcohol/Drugs Involvement Crashes	0	0.00

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	24	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	4	16.67
Class C Crashes	9	37.50
Property Damage Only Crashes	11	45.83

Vehicle Exposure Statistics

Annual ADT = 8300

Total Vehicle Exposure = 14.14 (MEV)

Crash Rate	Crashes Per 100 Million Vehicles Entered
Total Crash Rate	169.69
Fatal Crash Rate	0.00
Non Fatal Crash Rate	91.92
Night Crash Rate	21.21
Wet Crash Rate	42.42
EPDO Rate	849.88

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Miscellaneous Statistics

Severity Index =	5.01
EPDO Crash Index =	120.20
Estimated Property Damage Total = \$	168395.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	12	50.00
LEFT TURN, DIFFERENT ROADWAYS	5	20.83
LEFT TURN, SAME ROADWAY	2	8.33
OTHER COLLISION WITH VEHICLE	1	4.17
RAN OFF ROAD - RIGHT	1	4.17
REAR END, SLOW OR STOP	2	8.33
RIGHT TURN, DIFFERENT ROADWAYS	1	4.17

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	0	0.00
Class B Injuries	6	26.09
Class C Injuries	17	73.91
Total Non-Fatal Injuries	23	100.00
Total Injuries	23	100.00

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Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	1	4.17
Feb	2	8.33
Mar	1	4.17
Apr	1	4.17
May	1	4.17
Jun	2	8.33
Jul	2	8.33
Aug	5	20.83
Sep	1	4.17
Oct	4	16.67
Nov	2	8.33
Dec	2	8.33

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	4	16.67
Tue	5	20.83
Wed	5	20.83
Thu	4	16.67
Fri	2	8.33
Sat	3	12.50
Sun	1	4.17

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Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	0	0.00
0200-0259	0	0.00
0300-0359	0	0.00
0400-0459	0	0.00
0500-0559	0	0.00
0600-0659	1	4.17
0700-0759	1	4.17
0800-0859	2	8.33
0900-0959	1	4.17
1000-1059	3	12.50
1100-1159	2	8.33
1200-1259	0	0.00
1300-1359	0	0.00
1400-1459	3	12.50
1500-1559	3	12.50
1600-1659	2	8.33
1700-1759	2	8.33
1800-1859	3	12.50
1900-1959	0	0.00
2000-2059	0	0.00
2100-2159	1	4.17
2200-2259	0	0.00
2300-2359	0	0.00

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Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	14	6	1	21
Dark	3	0	0	3
Other	0	0	0	0
Total	17	6	1	24

Object Struck Summary

Object Type	Times Struck	Percent of Total
COMMERCIAL SIGN	1	25.00
UTILITY POLE	3	75.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	25	52.08
PICKUP	18	37.50
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	1	2.08
SPORT UTILITY	2	4.17
UNKNOWN	1	2.08
VAN	1	2.08

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2004	5	0	4	1
2005	9	0	3	6
2006	4	0	2	2
2007	3	0	2	1
2008	3	0	2	1
Total	24	0	13	11

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2004	0	10
2005	0	5
2006	0	3
2007	0	2
2008	0	3
Total	0	23

Miscellaneous Totals

Year	Property Damage	EPDO Index
2004	\$ 36875	34.60
2005	\$ 81620	31.20
2006	\$ 28000	18.80
2007	\$ 12050	17.80
2008	\$ 9850	17.80
Total	\$ 168395	120.20

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road &			
				Fixed Object	Angle	Side Swipe	Other
2004	1	0	1	0	3	0	0
2005	2	0	0	1	5	0	1
2006	2	0	0	0	2	0	0
2007	1	0	1	0	1	0	0
2008	1	1	0	0	1	0	0

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Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
Total	7	1	2	1	12	0	1