Spot Safety Project Evaluation

Project Log # 200712067

Spot Safety Project # 04-99-205

Spot Safety Project Evaluation of the Curb Radius Improvements
At the Intersection of SR 1192 (Hines Street) and Nash Street
Wilson County, City of Wilson

Documents Prepared By:

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

Principal Investigator

_____ 3-10-2008
Jason B. Schronce Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 04-99-205 – The Intersection of SR 1192 (Hines Street) and Nash Street in Wilson County, within the city limits of Wilson.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of curb edge radius improvements. SR 1192 (Hines Street / Nash Street) is a five lane, curb and gutter facility running east and west in the City of Wilson. SR 1192 presents a dedicated left turn lane at the intersection with a speed limit of 45 mph. Nash Street is a three lane, curb and gutter facility that tee intersects SR 1192 at this location with a posted speed limit of 35 mph. The studied intersection maintained signal control through the entire before and after analysis.

The original statement of problem was the safety concern contributed by the inadequate turning radius for westbound traffic on SR 1192 making a right turn onto Nash Street. The improvements are being made to the northeast quadrant of the intersection and include increasing the radius from approximately 30 to 50 feet while backing the westbound SR 1192 stop bar approximately 10 feet. The radius revision should help to accommodate truck traffic, school buses, and other large commercial vehicles that use this intersection frequently.

The initial crash analysis was completed from September 1, 1991 to August 31, 1997 with twenty-six (26) reported crashes. The final completion date for the improvement at the subject intersection was on May 14, 2002 with a total cost of $5,000.00.

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 April 1, 2002 to June 30, 2002. The before period consisted of reported crashes from February 1, 1997 through March 31, 2002 (5 years and 2 months) and the after period consisted of reported crashes from July 1, 2002 through August 31, 2007 (5 years and 2 months). The ending date for this analysis was determined by the date of available crash data at the time of analysis.

The treatment data consisted of all crashes within 150 feet of the subject intersection. *Please see attached location map and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Right turn, same roadway crashes involving SR 1192 and Nash Street vehicles were considered Target Crashes for this particular countermeasure.

Treatment Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	31	8	- 74.19 %
Total Severity Index	4.10	4.70	14.63 %
Target Crashes	1	0	- 100.00 %
Target Crash Severity Index	8.40	0.00	- 100.00 %
Volume	17,700	14,300	- 19.21 %
Injury Crash Summary - Total			
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	2	1	- 50.00 %
Class C Injury Crashes	11	3	- 72.73 %
Total Injury Crashes	13	4	- 69.23 %

The naive before and after analysis at the treatment location resulted in a 74 percent decrease in Total Crashes, complete elimination of Target Crashes, and a 15 percent increase in the Total Severity Index. The before period ADT year was 1999 and the after period ADT year was 2005.

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 74 percent decrease in Total Crashes and elimination of all Target Crashes. 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.

Referencing the *Collision Diagrams*, the one Right Turn-Different Roadway target crash from the before period was eliminated in the after period. The overall intersection experienced major crash reduction from the before to the after periods especially in the areas of rear-ends and sideswipe type collisions on SR 1192. The reduction in these particular patterns can not be attributed directly to the countermeasure installed but may have been impacted more by the volume reduction seen through the study. We are also unaware of other possible signal phasing changes or countermeasures installed that may not have been funded by the Spot Safety program.

The calculated benefit to cost ratio for this project is 82.27 considering total crashes. 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.

Please see the attached *Treatment Site Photos*. Photos are provided for all approaches to the treatment intersection. 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
Wilson County, City of Wilson
Evaluation of Spot Safety Project # 04-99-205

Treatment Location: SR 1192 (Hines Street) at Nash Street

TREATMENT SITE PHOTOS TAKEN 1/16/2008

Traveling Northeast on Hines Street

Traveling Northeast on Hines Street

Traveling West on Nash Street

Traveling West on Nash

Traveling Southeast on Nash

Traveling Southeast on Nash

Traveling Southeast on Nash

BENEFIT-COST ANALYSIS WORKSHEET

LOCATION: SR 1192 at Nash
COUNTY: Wilson
FILE NO.: SS 04-99-205
BY: JBS
DATE: 3/5/2008
NOTES: Total Crashes

DETAILED COST: TYPE IMPROVEMENT - Curb radius extension

ITEMS	TOTAL	SERVICE	CRF	ANNUAL COST
Construction	$5,000	20	0.102	$509
	$0	0	0.000	$0
Right-of-Way	$0	0	0.000	$0
TOTALS	$5,000	20	0.102	$509

ESTIMATED INCREASE IN ANNUAL MAINT. COST = $0
ESTIMATED INCREASE IN ANNUAL UTILITY COST = $0

TOTAL ANNUAL COST= $509
TOTAL COST OF PROJECT= $5,000

COMPREHENSIVE COST REDUCTION:

ESTIMATED NUMBER OF ANNUAL ACCIDENT DECREASES

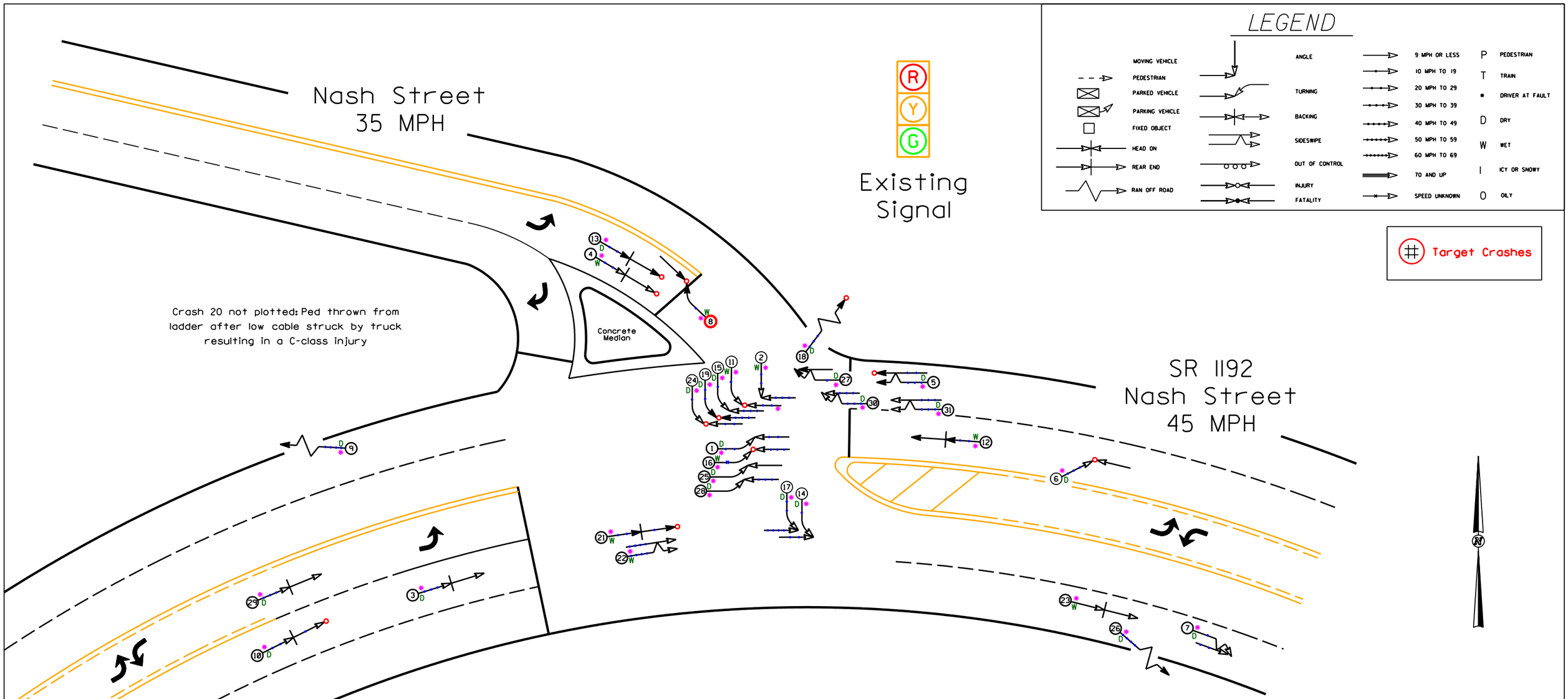
TIME PERIOD	YEARS	K & A CRASHES	K & A CRASHES PER YR	B & C CRASHES	B & C CRASHES PER YR	PDO CRASHES	PDO CRASHES PER YR	ANNUAL COSTS
BEFORE	5.17	0	0.00	13	2.51	18	3.48	$58,839
AFTER	5.17	0	0.00	4	0.77	4	0.77	$16,944

Annual Benefits from Crash Cost Savings $41,896

NET AVG. ANNUAL BENEFITS = AVG. ANNUAL BENEFITS - TOTAL ANNUAL COST = $41,386

BENEFIT-COST RATIO = AVG ANNUAL BENEFITS/TOTAL ANNUAL COST = 82.27

TOTAL COST OF PROJECT - $5,000 COMPREHENSIVE B/C RATIO - 82.27

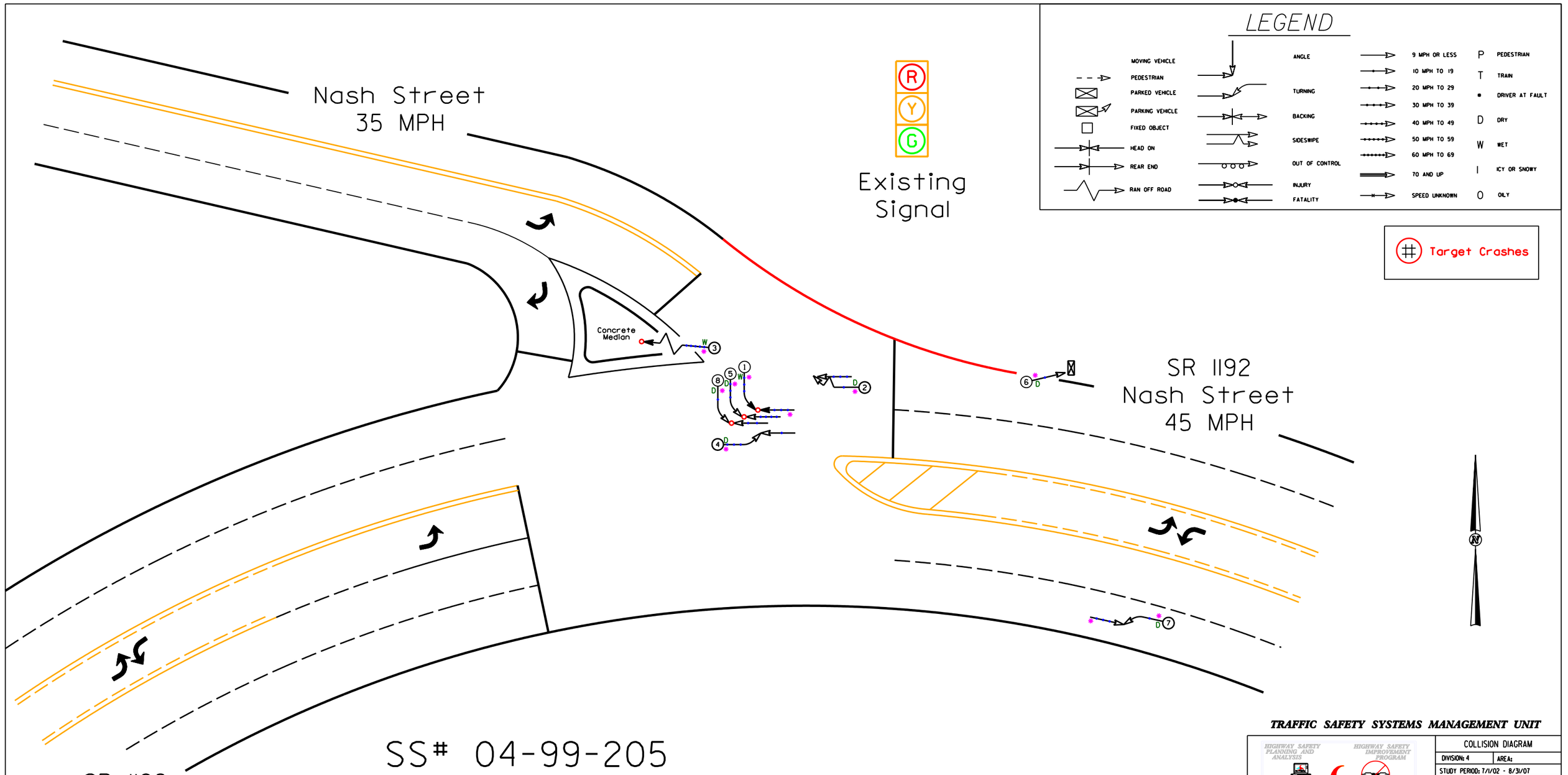


SS# 04-99-205
Wilson County
City of Wilson
BEFORE Period
2/1/97 - 3/31/02

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

COLLISION DIAGRAM	
DIVISION: 4	AREA:
STUDY PERIOD: 2/1/1997 - 3/31/2002	
DISTANCE: Y-LINE = 150FT	
ANALYSIS PREPARED BY: JBS	
ANALYSIS CHECKED BY: BR	
DIAGRAM PREPARED BY: JBS	
DIAGRAM REVIEWED BY: ST	
SCALE: NOT TO SCALE	
DATE: 2-28-2008	
LOG NUMBER: SS# 04-99-205	

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



LEGEND

MOVING VEHICLE
PEDESTRIAN
PARKED VEHICLE
PARKING VEHICLE
FIXED OBJECT
HEAD ON
REAR END
RAN OFF ROAD

ANGLE
TURNING
BACKING
SIDESWIPE
OUT OF CONTROL
INJURY
FATALITY

9 MPH OR LESS
10 MPH TO 19
20 MPH TO 29
30 MPH TO 39
40 MPH TO 49
50 MPH TO 59
60 MPH TO 69
70 AND UP
SPEED UNKNOWN

P PEDESTRIAN
T TRAIN
* DRIVER AT FAULT
D DRY
W WET
I ICY OR SNOWY
O OILY

Target Crashes

SS# 04-99-205
Wilson County
City of Wilson
AFTER Period
7/1/02 - 8/31/07

After Period Changes:
1. Increase Radius (30' to 50')
2. Back WB Stop Bar 10'

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

HIGHWAY SAFETY PLANNING AND ANALYSIS
HIGHWAY SAFETY IMPROVEMENT PROGRAM
HIGHWAY SAFETY MANAGEMENT
RAILROAD-HIGHWAY SAFETY MANAGEMENT

COLLISION DIAGRAM

DIVISION: 4	AREA:
STUDY PERIOD: 7/1/02 - 8/31/07	
DISTANCE:	Y-LINE = 150FT
ANALYSIS PREPARED BY: JBS	
ANALYSIS CHECKED BY: BR	
DIAGRAM PREPARED BY: JBS	
DIAGRAM REVIEWED BY: ST	
SCALE: NOT TO SCALE	
DATE: 2-28-2008	
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