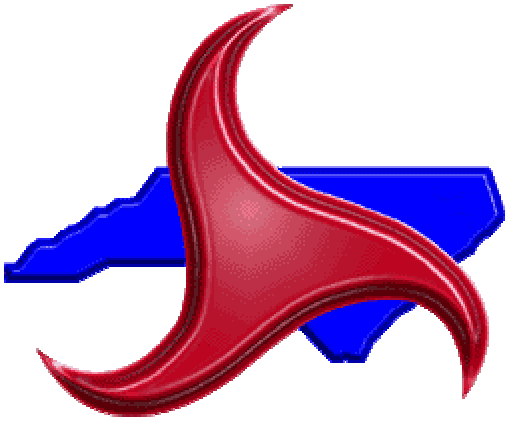
An Evaluation of the Speed Detection and Alert System Implemented in the B-3437 Work Zone on I-85 in Cleveland County



Documents Prepared By:

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

Principal Investigator

Brian G. Murphy, PE

Traffic Safety Project Engineer

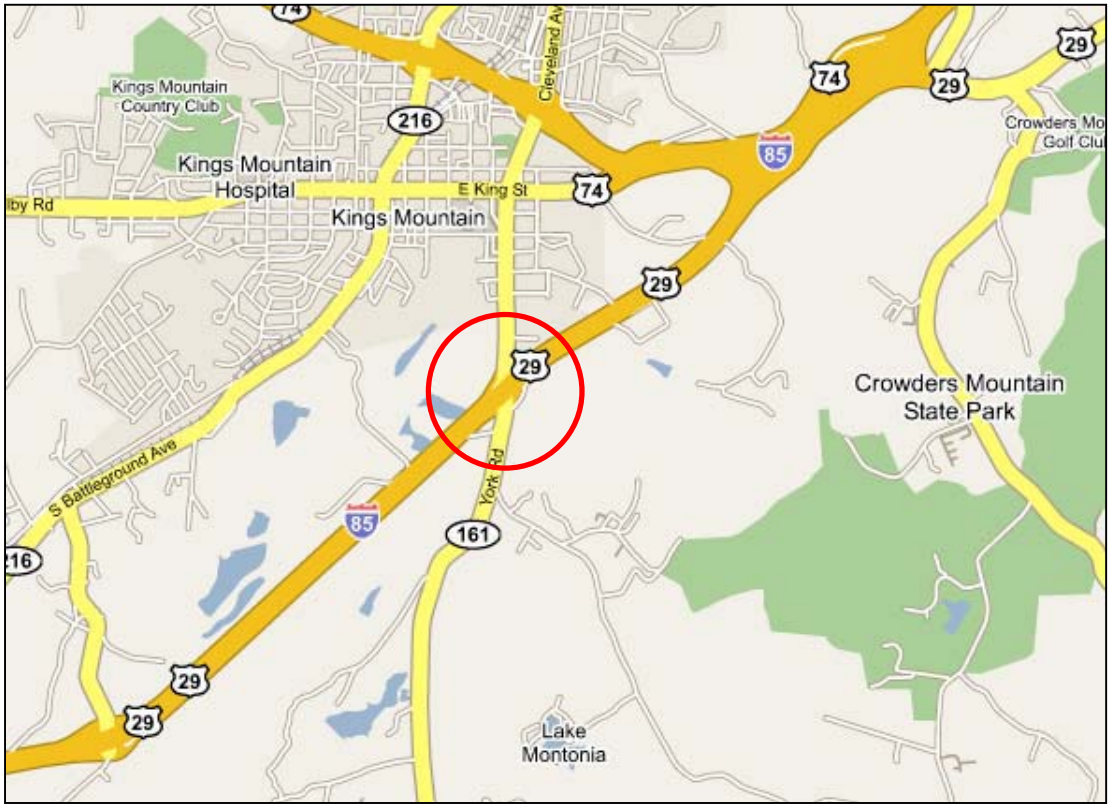
10/6/05
Date

INTRODUCTION

The purpose of this project is to investigate the effects of the speed detection and alert system implemented in the B-3437 work zone. The speed detection and alert system consisted of Doppler radar units to measure vehicle speeds and set off radar detection devices in vehicles travelling through the work zone. Also, two changeable message signs were installed on each approach to the work zone warning drivers of the upcoming construction and informing drivers that speed limits would be enforced. There were also State Highway Patrol drone vehicles parked within the work zone at various times throughout the project. See Appendix A for speed detection system specifications and traffic control plans that show device locations.

The speed detection and alert system was implemented in the B-3437 work zone on I-85 in Cleveland County. I-85 in this area is a four-lane divided freeway with an Average Daily Traffic (ADT) of 46,000 in 2003 and a speed limit of 65 miles per hour. The project consisted of replacing the NC 161 (York Road) bridge over I-85. In order to construct the new bridge, traffic on I-85 was shifted 11 feet towards the outside in each direction of travel to give more room for workers to maneuver in the median. In addition, lanes were narrowed to from 12 feet to 11 feet and concrete barrier was installed on left and right shoulders in both directions offset 2 feet from travel lanes. Appendix B contains various pictures showing the conditions of the work zone. Figure 1 shows a vicinity map of the project.

Figure 1. Project Vicinity Map



The speed detection and alert system became fully operational on November 22, 2004 and is still in place as of the date of this report. The system was installed as a response to concerns over vehicles speeding through the work zone and reports of several intense crashes in the work zone.

METHODOLOGY

The basic premise of this study was to perform a before and after type analysis to determine the effects of the speed detection and alert system on vehicle speeds. Crash data was also looked at but there was not enough data available at the time of this report to make conclusions as to whether the system helped to reduce crashes. The crash data was extracted from the Traffic Engineering Accident Analysis System (TEAAS) database.

Speed data was collected with a Lidar gun at the site on July 14th and 15th of 2004 before the speed detection system and alert system was installed. Data was collected on off-peak hours from 10:00 AM to 2:00 PM and from 8:00 PM to 12:00 AM on both days. Speed data was retrieved from the automated collection devices periodically once the system was installed. Lidar readings were also taken again and compared to the automated speed collection device so adjustments could be made to the automated data to account for the difference in data collection methods.

Appendix C contains a listing of all automated data collected by the system devices. Data is broken down by drone presence, direction, time period, and whether or not the speed data was used in the analysis. Speed data collected on weekends or during rain or fog were not used as these conditions will have an effect on the speed of drivers.

RESULTS

Crash Analysis

Crash analyses were done for ½ mile either side of NC 161 (York Road) on I-85. The 'before' period analyses consisted of reported crashes from January 1, 1999 to April 14, 2003 (4.3 years) and the 'during' period consisted of reported crashes from April 15, 2003 (let date for project) to March 31, 2005 (2 years). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

Complete crash data and analyses can be found in Appendix D of this report. Figures 2A and 2B below point out some of the more interesting statistics. Ideally, at least three years of crash data is used when preparing analyses such as this, but this could not be done since this is an ongoing project. The crash statistics will be updated when more data becomes available.

Figure 2A. Crash Statistics for I-85 from 0.50 Miles South of NC 161 to 0.50 Miles North of NC 161

High Level Crash Summary	Before WZ (1/1/1999 - 4/14/2003)		During WZ (4/15/2003 - 3/31/2005)	
Crash Type	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
Total Crashes	67	100.00	42	100.00
Fatal Crashes	0	0.00	0	0.00
Non-Fatal Injury Crashes	25	37.31	11	26.19
Total Injury Crashes	25	37.31	11	26.19
Property Damage Only Crashes	42	62.69	31	73.81
Vehicle Exposure Statistics				
Annual ADT	41,000		46,000	
Total Crash Rate (/100 MVMT)	104.42		127.34	
Non Fatal Crash Rate (/100 MVMT)	38.96		33.35	
Night Crash Rate (/100 MVMT)	31.17		51.54	
Wet Crash Rate (/100 MVMT)	12.47		21.22	
Miscellaneous Statistics				
Severity Index =	6.82		2.94	
EPDO Crash Index =	457.20		123.40	
Accident Type Summary				
Accident Type	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
Ran Off Road*	28	41.79	22	52.38
Rear End	15	22.39	3	7.14
Sideswipe, Same Direction	7	10.45	7	16.67

* Includes Fixed Object, Head-On, Ran Off Road Left, and Ran Off Road Right Crash Types

Figure 2B. Annualized Crash Frequencies for I-85 from 0.50 Miles South of NC 161 to 0.50 Miles North of NC 161

High Level Crash Summary			
Crash Type	**Before WZ**	**During WZ**	**Percent Change**
Total Crashes	16	21	31%
Fatal Crashes	0	0	N/A
Non-Fatal Injury Crashes	6	6	0%
Total Injury Crashes	6	6	0%
Property Damage Only Crashes	10	16	60%
Night Crashes	5	9	80%
Wet Crashes	2	4	100%
Alcohol/Drugs Involvement Crashes	1	0	-100%
Accident Type Summary			
Accident Type	**Before WZ**	**During WZ**	**Percent Change**
Ran Off Road*	7	11	57%
Rear End	4	2	-50%
Sideswipe, Same Direction	2	4	100%

* Includes Fixed Object, Head-On, Ran Off Road Left, and Ran Off Road Right Crash Types

Preliminary observations of the crash data shows that the severity index seems to have gone down significantly since the work zone has began. However, the total crash rate, night crash rate, and wet crash rate have all increased significantly. As seen in the accident type summary in Figure 2B, ran-off-road and sideswipe crashes have increased significantly also. These types of

crashes may be associated with the narrowed lanes and presence of concrete barriers offset 2 feet from each edge line.

Speed Data Analysis

Figure 3 below shows categorized speed data collected at the site.

Figure 3. Categorized Speed Data

		Lidar Readings			Automated Collection			Adjusted Automated Collection Values*		
Category	Dir	Observations	Average Speed	85th Percentile Speed	Observations	Average Speed	85th Percentile Speed	Observations	Average Speed	85th Percentile Speed
Before System Installed	NB	2,814	67.2	72.7	No Data	No Data	No Data	No Data	No Data	No Data
	SB	2,822	64.7	69.6	No Data	No Data	No Data	No Data	No Data	No Data
No Drones	NB	997	67.9	72.9	43,916	65.2	69.6	43,916	67.0	72.6
	SB	863	66.1	70.5	35,554	65.1	69.7	35,554	65.8	70.7
Drones NB & SB	NB	No Data	No Data	No Data	4,998	64.9	69.3	4,998	66.7	72.3
	SB	No Data	No Data	No Data	3,467	63.4	68.1	3,467	64.0	69.1
Drone NB Only	NB	No Data	No Data	No Data	3,422	65.1	69.6	3,422	66.9	72.6
	SB	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Drone SB Only	NB	978	67.1	72.4	20,323	64.4	68.7	20,323	66.2	71.7
	SB	890	63.8	68.3	29,180	64.6	69.1	29,180	65.3	70.1

* Adjustments made by taking the ratio of lidar readings to automated readings and weighting the ratios by the number of observations

** Do not have data on level of enforcement present at certain times, therefore could not account for this difference.

As discussed in the methodology section previously, the speed data collected by the automated devices had to be adjusted to account for the difference in data collection methods. The adjustment was made by calculating the ratio of the speeds collected by Lidar to the speeds collected by the automated devices for the exact same time period. The overall adjustment factor was derived by weighting the ratios for each individual time period by the number of observations in that time period. See Appendix E for detailed calculations of the adjustment factor.

Figure 4 Comparison of Speed Data for Different Drone Scenarios

	Before System Installed		Drones NB & SB		Drones NB Only		Drones SB Only		No Drones	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Observations	2,814	2,822	4,998	3,467	3,422	No Data	20,323	29,180	43,916	35,554
Average Speed	67.2	64.7	***66.7***	***64.0***	***66.9***	No Data	***66.2***	***65.3***	67.0	***65.8***
85th Percentile Speed	72.7	69.6	***72.3***	***69.1***	72.6	No Data	***71.7***	***70.1***	72.6	***70.7***
Variance	31.4	28.9	20.4	19.1	20.8	No Data	20.6	23.0	21.1	22.1

* Bold, Italicized Items are Statistically Significant at 90% Confidence Interval

Figure 4 above shows a comparison of the speed data during different drone placement scenarios. As shown in the chart, there was little change in the average and 85th percentile speeds between the different drone vehicle scenarios. The average speeds were very close to the speed limit in the before period, so one would really not expect to see drastic movements with the different countermeasures. The bold italicized numbers are statistically significant; however, the actual numerical difference between the numbers is actually quite small and perhaps not practically significant. The numbers can be deemed statistically significant because of the large sample size of observations in each category. The large sample sizes allow for very small

changes to be detected and declared significant in the statistical tests. More detailed information on the significance testing can be found in Appendix F.

One important factor that could not be accounted for is the different enforcement levels by local police and the State Highway Patrol. For the most part, enforcement on this project was routine, but according to the Resident Engineer there were times when the work zone was specifically targeted. The project team was unable to get dates for the targeted enforcement, but the effects of the targeted enforcement should be minimized because of the large number of sample sizes and wide range of dates for which speeds were collected.

FINAL COMMENTS

In future projects such as this, it would be desirable to pursue the possibility of installing the data collection devices before the drones or message boards are installed. This would allow the direct comparison of before and after speed data collected by the same devices. One of the challenges of this particular project was having to account for the different methods of speed data collection. This could be avoided if the devices could be installed before the countermeasures were implemented.

In this particular work zone, average speeds were relatively close to the speed limit before any countermeasures were installed. Because of this, drastic changes were not seen when comparing the average or 85th percentile speeds for different drone vehicle scenarios (nor were they expected). Local officers suggested that the average speed for vehicles traveling through the work zone was about 73-75 miles per hour. This claim is not supported by the speed data collected in the work zone. Reported speed related issues should be validated by a speed study before limited monies are used to procure resources to address the situation.

The main effectiveness of the speed compliance and alert system may be more evident when looking at the crash data in this work zone. There is not enough data yet to make conclusions, but the preliminary information looks promising as there has been only one minor injury crash since the implementation of the speed detection and alert system. The hope is that the message boards and drone State Highway Patrol vehicles have helped to make drivers more alert as they travel through the work zone.

--

Please direct questions or comments on this evaluation to Brian Murphy at (919) 733-3915 or via email at bgmurphy@dot.state.nc.us

APPENDIX A

1. SPEED DETECTION AND ALERT SYSTEMS

1.1. DESCRIPTION

Furnish, install, maintain, and remove Speed Detection and Alert Systems and all necessary hardware in accordance with the plans and specifications.

1.2. MATERIALS

(A) General:

Furnish Speed Detection and Alert Systems that will set off radar detection devices in vehicles travelling through the work zone by use of a Doppler Radar. The system must collect and log measured speed data in a roadside controller. The system architecture shall be modular, scalable, and fully compliant with the NTCIP (National Transportation Communications for ITS Protocol) standard and compatible with the National ITS architecture.

(B) Doppler Radar Sensors:

Furnish Doppler Radar Sensors (2 per system) housed in a weatherproof enclosure, which includes a computer board and a directional microwave transceiver. The device shall process raw Doppler signals generated by the microwave transceiver to measure vehicular speed with a range of 5-200 mph. The accuracy of the measured speed shall be +/- 2.5 mph. The interface to the sensor shall be NTCIP compliant.

(C) Roadside controllers:

Furnish roadside controllers (2 per system) that include a single board computer (SBC) with embedded software with sufficient memory to store up to 640,000 records of information. Each record shall be logged with date and time stamps. For this data log, the frequency of data recording shall be user-definable from once per second to once per hour.

After initial system configuration, the roadside controller shall be capable of autonomously collecting, processing, and storing speed data. The SBC shall be equipped with at least 4 serial ports and shall be compatible with the software provided with the speed detection and alert system. In addition, the SBC must be compatible with any Intel-based laptop computer using either the Windows NT or Windows 2000 Operating System, for purposes of speed data collection by the Department. If logged data is not retrieved before the available memory is full, the system shall automatically write over the oldest data records in memory, such that when the logged data is ultimately retrieved, the most recent data will be available.

The firmware for the SBC shall be fully NTCIP compliant. The roadside controller shall be housed in an aluminum NEMA 3R weatherproof enclosure. The roadside controller shall be a standard product that has been sold for at least one year; prototypes are not acceptable.

(D) Software:

Furnish and install a software application (1 per system) that runs on the roadside controller's SBC. Ensure that the software complies with the following:

- Includes a Graphical User Interface that is compliant with Windows standards
- Operates on Windows NT and Windows 2000 operating systems
- Provides the capability for the user to monitor the status of the sensor by simply clicking on its icon
- Provides the ability to receive and store data from the roadside controller for subsequent analysis
- Allows the user to specify the time between polling cycles when monitoring system status

The software shall be a standard product that has been sold for at least one year; prototypes are not acceptable. Ensure that software is licensed for use by the Department.

1.3. CONSTRUCTION METHODS

Install and place into operation the Speed Detection and Alert System equipment, including Doppler radar sensors and roadside controllers, on Changeable Message Signs in accordance with the plans and Manufacturer's recommendations.

Connect to the 12 VDC power source of the Changeable Message Signs, install the software on a Department representative's laptop computer, and verify proper operation.

Arrange for training to be conducted at the time of delivery by the manufacturer's representative at an approved site within the Division responsible for administration of the project. Training shall be for both the Contractor and for any Department personnel wishing to attend.

Allow a representative of the Department to download speed data from the roadside controller at any time. Provide the representative any necessary access to the equipment to facilitate data retrieval.

The Contractor shall remove and retain ownership of the Speed Detection and Alert System and all associated equipment upon project's completion, or earlier at the direction of the Engineer.

1.4. METHOD OF MEASUREMENT

Actual number of Speed Detection and Alert Systems furnished, installed, and accepted.

No separate payment will be made for connection of the system to the power supply, installation of software, or training. This work will be considered incidental to furnishing and installing Speed Detection and Alert Systems.

1.5. BASIS OF PAYMENT

The quantity of Speed Detection and Alert Systems, measured as provided above, will be paid for at the contract unit price each for "Speed Detection and Alert System."

Payment will be made under:

Speed Detection and Alert System……..Each

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.		SHEET NO.
B-3437		TCP-1
STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION
8.1801202	IMF-85-1(93)8	PE,UTIL
8.1801204	BRIMF-85-1(95)	CONST.

PLAN FOR PROPOSED
TRAFFIC CONTROL, MARKING & DELINEATION

PROJECT: 8.1801204 B-3437

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"-ROADWAY DESIGN UNIT-N.C. DEPARTMENT OF TRANSPORTATION-RALEIGH, N.C., DATED JANUARY 2002 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.07	ROLLING ROAD BLOCK OPERATION
1101.11	TRAFFIC CONTROL PLAN DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW PANELS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1160.01	TEMPORARY CRASH CUSHION
1165.01	TRUCK MOUNTED IMPACT ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - INTERCHANGES
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - THRU LANE DROPS
1205.08	PAVEMENT MARKINGS - SYMBOLS & WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS (TEMPORARY & PERMANENT)
1253.01	SNOWPLOWABLE RAISED PAVEMENT MARKERS
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS
1264.02	PLACEMENT OF OBJECT MARKERS
1267.01	FLEXIBLE DELINEATOR INSTALLATION
1267.02	FLEXIBLE DELINEATOR SPACING
1267.03	FLEXIBLE DELINEATORS - INTERCHANGES

INDEX OF SHEETS

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- NORTH ARROW
- PROPOSED PVMT. EXIST. PVMT.
- WORK AREA
- TEMPORARY PAVEMENT/ALIGNMENT
- WEDGING AND WIDENING

TRAFFIC CONTROL DEVICES

- TYPE I BARRICADE
- TYPE II BARRICADE
- TYPE III BARRICADE
- CONE
- DRUM
- FLASHING ARROW PANEL (TYPE C)
- TYPE 'B' WARNING LIGHT
- STATIONARY SIGN
- PORTABLE SIGN
- WARNING FLAGS
- CRASH CUSHION
- CHANGEABLE MESSAGE SIGN
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- POLICE
- FLAGGER
- PORTABLE CONCRETE BARRIER
- SHORING

PAVEMENT MARKINGS

- CRYSTAL PAVEMENT MARKER
- YELLOW/YELLOW PAVEMENT MARKER
- CRYSTAL/RED PAVEMENT MARKER
- PAVEMENT MARKING SYMBOLS

5/7/04 Added Sheet TCP-27

APPROVED: _____ DATE: _____

REVISION SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023380 ENGINEER JOSEPH ISHAK

PLAN REVIEWED BY: N.C.D.O.T. TRAFFIC CONTROL, MARKING & DELINEATION SECTION

J. STUART BOURNE, P.E. — TRAFFIC CONTROL ENGINEER

JOSEPH ISHAK, E.I. — TRAFFIC CONTROL PROJECT ENGINEER

SONYA SYKES — TRAFFIC CONTROL PROJ. DESIGN ENGINEER

ANITA ROPP — TRAFFIC CONTROL DESIGN ENGINEER

APPROVED: _____ DATE: _____

SEAL

PLAN PREPARED FOR N.C.D.O.T. BY:

DONNA C. KEENER, P.E. — PROJECT ENGINEER

P. MICHELLE WARD — DESIGN ENGINEER

P. MICHELLE WARD — DESIGN TECHNICIAN

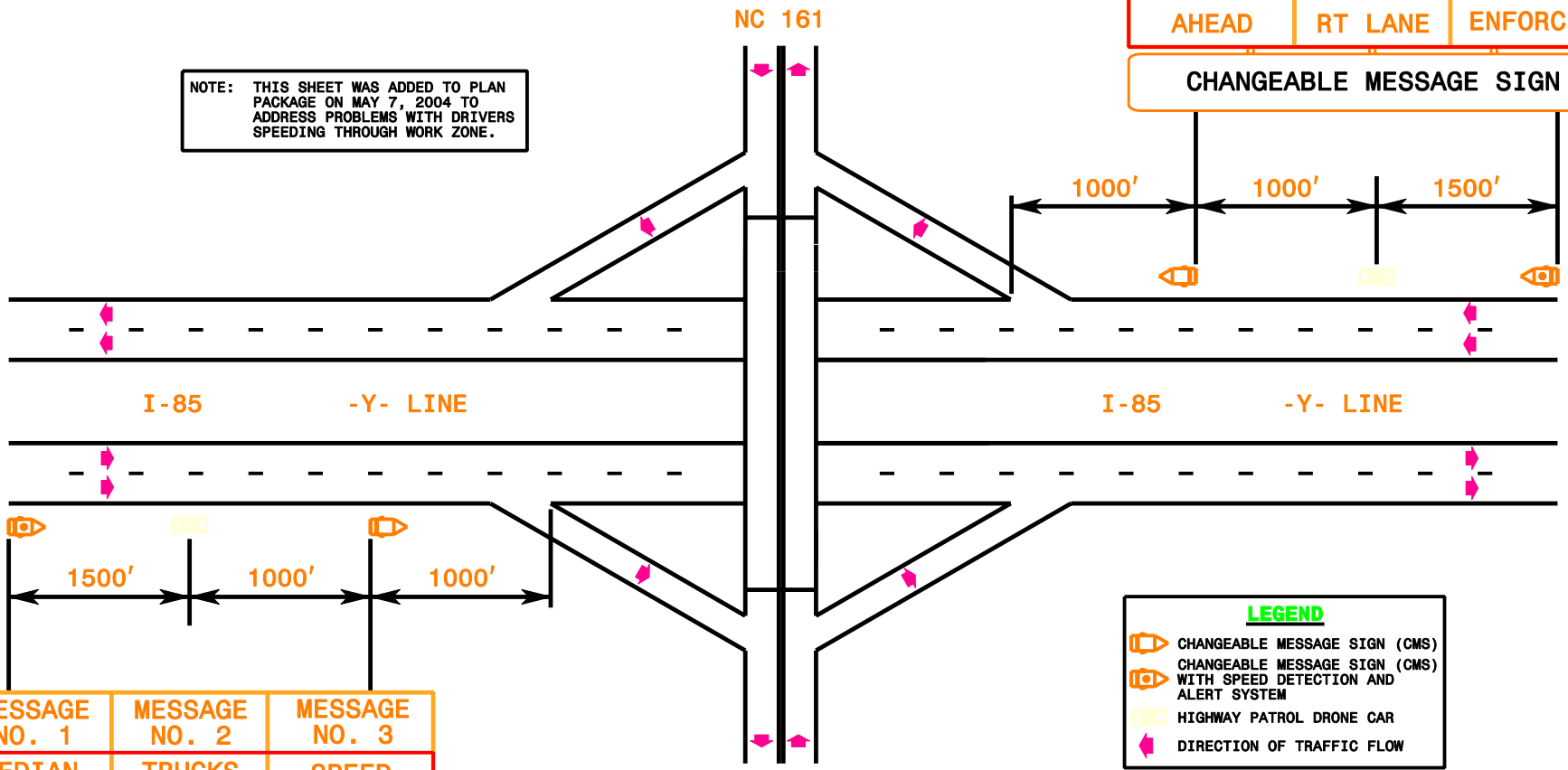
b3437tcptitle_revised.dgn 10/06/2005 11:10:22 AM

PROJ. REFERENCE NO.	SHEET NO.
B-3437	TCP-27

GENERAL NOTES

- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- HIGHWAY PATROL DRONE CAR WILL BE PROVIDED TO THE CONTRACTOR AND MAY ONLY BE OPERATED BY AUTHORIZED PERSONNEL.

NOTE: THIS SHEET WAS ADDED TO PLAN PACKAGE ON MAY 7, 2004 TO ADDRESS PROBLEMS WITH DRIVERS SPEEDING THROUGH WORK ZONE.



MESSAGE NO. 1	MESSAGE NO. 2	MESSAGE NO. 3
MEDIAN CONST AHEAD	TRUCKS USE RT LANE	SPEED LIMIT ENFORCED

CHANGEABLE MESSAGE SIGN

MESSAGE NO. 1	MESSAGE NO. 2	MESSAGE NO. 3
MEDIAN CONST AHEAD	TRUCKS USE RT LANE	SPEED LIMIT ENFORCED

CHANGEABLE MESSAGE SIGN

LEGEND

- CHANGEABLE MESSAGE SIGN (CMS)
- CHANGEABLE MESSAGE SIGN (CMS) WITH SPEED DETECTION AND ALERT SYSTEM
- HIGHWAY PATROL DRONE CAR
- DIRECTION OF TRAFFIC FLOW

SHEET 1 OF 1

APPROVED: DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028380 ENGINEER JOSEPH ISHAK

SPEED LIMIT COMPLIANCE SYSTEM

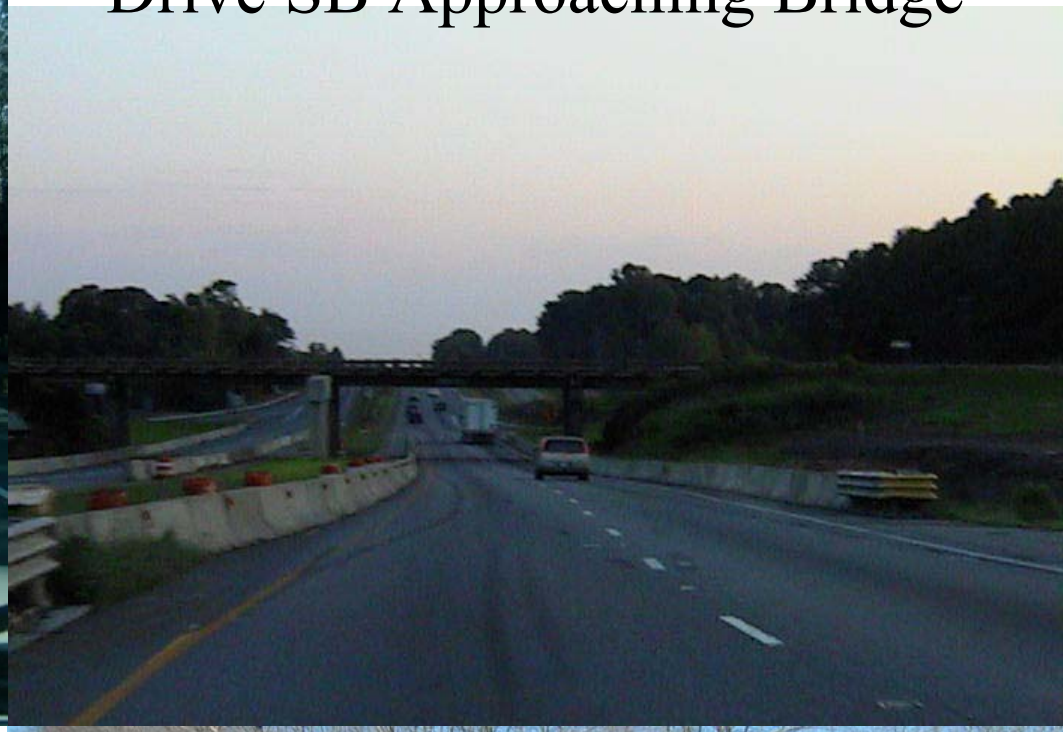
SCALE:	NONE
DATE:	05-07-04
DWG. BY:	CLL
DESIGN BY:	JI
REVIEWED BY:	JI
CADD FILE:	SLCS.DGN

REVISIONS

APPENDIX B

Drive NB Approaching Bridge

Drive SB Approaching Bridge



Highway Patrol Drone Vehicle

Highway Patrol Drone Vehicle

CMS - Message 1

CMS - Message 2

CMS - Message 3

Look South From Bridge

APPENDIX C

Date	Day	Direction	Time	Obs	Avg Speed	85th 'ile Speed	Category	Used?
11/22/2004	Monday	NB	10:00 PM - 12:00 AM	743	61.9	66.1	Drone-NB & SB	No - Rain
11/22/2004	Monday	NB	12:00 PM - 2:00 PM	931	64.6	68.9	Drone-NB & SB	Yes
11/22/2004	Monday	NB	8:00 PM - 10:00 PM	1148	63.7	67.9	Drone-NB & SB	No - Rain
12/7/2004	Tuesday	NB	10:00 AM - 12:00 PM	1249	63.6	67.9	Drone-NB & SB	No - Rain
12/7/2004	Tuesday	NB	10:00 PM - 12:00 AM	913	62.7	66.6	Drone-NB & SB	No - Rain
12/7/2004	Tuesday	NB	12:00 PM - 2:00 PM	1187	63.9	68.1	Drone-NB & SB	No - Rain
12/7/2004	Tuesday	NB	8:00 PM - 10:00 PM	1143	62.9	67.1	Drone-NB & SB	No - Rain
12/8/2004	Wednesday	NB	10:00 AM - 12:00 PM	609	59.4	69.5	Drone-NB & SB	Yes
12/8/2004	Wednesday	NB	10:00 AM - 12:00 PM	454	65.9	70.5	Drone-NB & SB	Yes
12/8/2004	Wednesday	NB	10:00 PM - 12:00 AM	1062	56.2	68.1	Drone-NB & SB	Yes
12/8/2004	Wednesday	SB	10:00 PM - 12:00 AM	1871	55.2	66.9	Drone-NB & SB	Yes
12/8/2004	Wednesday	NB	12:00 PM - 2:00 PM	1363	60.8	69.7	Drone-NB & SB	Yes
12/8/2004	Wednesday	NB	8:00 PM - 10:00 PM	986	56.4	67.8	Drone-NB & SB	Yes
12/8/2004	Wednesday	SB	8:00 PM - 10:00 PM	2031	57.3	68.1	Drone-NB & SB	Yes
12/9/2004	Thursday	NB	10:00 AM - 12:00 PM	1421	58.8	67.8	Drone-NB & SB	No - Rain
12/9/2004	Thursday	NB	10:00 PM - 12:00 AM	1251	54.1	66.1	Drone-NB & SB	No - Rain
12/9/2004	Thursday	NB	12:00 PM - 2:00 PM	1119	57.3	65.8	Drone-NB & SB	No - Rain
12/9/2004	Thursday	NB	8:00 PM - 10:00 PM	1162	54.0	67.6	Drone-NB & SB	No - Rain
12/10/2004	Friday	NB	10:00 AM - 12:00 PM	1130	60.1	69.1	Drone-NB & SB	No - Rain
12/11/2004	Saturday	NB	10:00 AM - 12:00 PM	1108	66.5	71.0	Drone-NB	No - Weekend
12/11/2004	Saturday	SB	10:00 AM - 2:00 PM	1874	67.6	72.5	Drone-NB	No - Weekend
12/11/2004	Saturday	NB	10:00 PM - 12:00 AM	846	63.3	67.6	Drone-NB	No - Weekend
12/11/2004	Saturday	SB	10:00 PM - 12:00 AM	1600	64.8	69.8	Drone-NB	No - Weekend
12/11/2004	Saturday	NB	12:00 PM - 2:00 PM	1142	66.4	70.9	Drone-NB	No - Weekend
12/11/2004	Saturday	SB	12:00 PM - 2:00 PM	1852	67.1	71.9	Drone-NB	No - Weekend
12/11/2004	Saturday	NB	8:00 PM - 10:00 PM	957	64.3	68.6	Drone-NB	No - Weekend
12/11/2004	Saturday	SB	8:00 PM - 10:00 PM	1787	64.9	70.0	Drone-NB	No - Weekend
12/12/2004	Sunday	NB	10:00 AM - 12:00 PM	1219	66.8	71.5	Drone-NB	No - Weekend
12/12/2004	Sunday	SB	10:00 AM - 2:00 PM	1882	67.7	72.7	Drone-NB	No - Weekend
12/12/2004	Sunday	NB	10:00 PM - 12:00 AM	819	63.8	68.6	Drone-NB	No - Weekend
12/12/2004	Sunday	SB	10:00 PM - 12:00 AM	391	65.6	70.9	Drone-NB	No - Weekend
12/12/2004	Sunday	NB	12:00 PM - 2:00 PM	1025	66.6	71.3	Drone-NB	No - Weekend
12/12/2004	Sunday	SB	12:00 PM - 2:00 PM	2079	69.1	74.1	Drone-NB	No - Weekend
12/12/2004	Sunday	NB	8:00 PM - 10:00 PM	1075	63.7	68.2	Drone-NB	No - Weekend
12/12/2004	Sunday	SB	8:00 PM - 10:00 PM	1735	66.5	71.2	Drone-NB	No - Weekend
12/13/2004	Monday	NB	10:00 AM - 12:00 PM	1278	65.3	69.3	Drone-NB	Yes
12/13/2004	Monday	NB	12:00 PM - 2:00 PM	1096	65.9	70.5	Drone-NB	Yes
12/13/2004	Monday	NB	8:00 PM - 10:00 PM	1048	63.9	68.1	Drone-NB	Yes
12/15/2004	Wednesday	NB	10:00 AM - 12:00 PM	1363	65.9	70.0	No Drones	Yes
12/15/2004	Wednesday	NB	10:00 PM - 12:00 AM	983	63.9	68.1	No Drones	Yes
12/15/2004	Wednesday	NB	12:00 PM - 2:00 PM	1060	66.3	70.2	No Drones	Yes
12/15/2004	Wednesday	NB	8:00 PM - 10:00 PM	1155	63.8	67.8	No Drones	Yes
12/16/2004	Thursday	NB	10:00 AM - 12:00 PM	1082	64.1	68.4	No Drones	Yes
12/16/2004	Thursday	NB	10:00 PM - 12:00 AM	847	64.1	68.1	No Drones	Yes
12/16/2004	Thursday	NB	12:00 PM - 2:00 PM	1059	65.6	69.8	No Drones	Yes
12/16/2004	Thursday	NB	8:00 PM - 10:00 PM	1237	64.2	68.6	No Drones	Yes
12/17/2004	Friday	NB	10:00 AM - 12:00 PM	1106	65.9	69.8	No Drones	Yes
12/17/2004	Friday	NB	10:00 PM - 12:00 AM	390	63.6	69.6	No Drones	Yes
12/17/2004	Friday	NB	12:00 PM - 2:00 PM	1397	66.4	70.8	No Drones	Yes
12/17/2004	Friday	NB	8:00 PM - 10:00 PM	1107	64.5	68.9	No Drones	Yes
1/5/2005	Wednesday	NB	10:00 AM - 12:00 PM	1349	64.4	68.1	No Drones	Yes
1/5/2005	Wednesday	NB	10:00 PM - 12:00 AM	975	64.0	68.2	No Drones	Yes
1/5/2005	Wednesday	NB	12:00 PM - 2:00 PM	1040	65.1	69.1	No Drones	Yes
1/5/2005	Wednesday	NB	8:00 PM - 10:00 PM	1112	63.5	68.0	No Drones	Yes
1/7/2005	Friday	NB	10:00 AM - 12:00 PM	1293	65.9	69.9	No Drones	Yes
1/7/2005	Friday	SB	10:00 PM - 12:00 AM	1128	65.0	69.7	No Drones	Yes
1/7/2005	Friday	NB	12:00 PM - 2:00 PM	1185	66.0	70.3	No Drones	Yes
1/7/2005	Friday	SB	12:00 PM - 2:00 PM	1805	66.1	70.7	No Drones	Yes
1/7/2005	Friday	SB	8:00 PM - 10:00 PM	1694	64.8	69.9	No Drones	Yes
1/11/2005	Tuesday	NB	10:00 AM - 12:00 PM	1134	65.5	69.2	No Drones	Yes
1/11/2005	Tuesday	SB	10:00 AM - 12:00 PM	2038	65.3	70.1	No Drones	Yes
1/11/2005	Tuesday	NB	10:00 PM - 12:00 AM	207	65.1	68.9	No Drones	Yes

Date	Day	Direction	Time	Obs	Avg Speed	85th 'ile Speed	Category	Used?
1/11/2005	Tuesday	SB	10:00 PM - 12:00 AM	1654	64.4	68.8	No Drones	Yes
1/11/2005	Tuesday	NB	12:00 PM - 2:00 PM	1261	65.4	69.6	No Drones	Yes
1/11/2005	Tuesday	SB	12:00 PM - 2:00 PM	1750	66.3	71.0	No Drones	Yes
1/11/2005	Tuesday	NB	8:00 PM - 10:00 PM	1090	64.5	68.9	No Drones	Yes
1/11/2005	Tuesday	SB	8:00 PM - 10:00 PM	1633	64.4	69.1	No Drones	Yes
1/14/2005	Friday	SB	10:00 AM - 12:00 PM	1989	65.5	70.0	No Drones	Yes
1/14/2005	Friday	SB	12:00 PM - 2:00 PM	1892	65.3	69.3	No Drones	Yes
1/14/2005	Friday	SB	8:00 PM - 10:00 PM	1781	65.4	70.3	No Drones	Yes
1/17/2005	Monday - (Holiday)	NB	10:00 AM - 12:00 PM	1415	65.1	69.6	Drone-SB	No - Holiday
1/17/2005	Monday - (Holiday)	NB	10:00 PM - 12:00 AM	445	64.1	68.6	Drone-SB	No - Holiday
1/17/2005	Monday - (Holiday)	NB	12:00 PM - 2:00 PM	1075	65.1	69.3	Drone-SB	No - Holiday
1/17/2005	Monday - (Holiday)	NB	8:00 PM - 10:00 PM	529	64.2	68.1	Drone-SB	No - Holiday
1/27/2005	Thursday	NB	10:00 AM - 12:00 PM	1379	65.1	69.6	Drone-SB	Yes
1/27/2005	Thursday	NB	10:00 PM - 12:00 AM	656	64.0	68.6	Drone-SB	Yes
1/27/2005	Thursday	NB	12:00 PM - 2:00 PM	995	64.1	68.6	Drone-SB	Yes
1/27/2005	Thursday	NB	8:00 PM - 10:00 PM	735	64.0	68.6	Drone-SB	Yes
1/30/2005	Sunday	NB	10:00 PM - 12:00 AM	1165	65.3	69.3	Drone-SB	No - Weekend
1/30/2005	Sunday	NB	8:00 PM - 10:00 PM	744	65.3	69.6	Drone-SB	No - Weekend
2/1/2005	Tuesday	NB	10:00 AM - 12:00 PM	886	63.6	67.6	Drone-SB	Yes
2/1/2005	Tuesday	SB	10:00 AM - 12:00 PM	1772	64.6	69.1	Drone-SB	Yes
2/1/2005	Tuesday	SB	10:00 PM - 12:00 AM	1291	62.9	66.9	Drone-SB	Yes
2/1/2005	Tuesday	NB	12:00 PM - 2:00 PM	578	62.8	66.6	Drone-SB	Yes
2/1/2005	Tuesday	SB	12:00 PM - 2:00 PM	1945	64.8	69.2	Drone-SB	Yes
2/1/2005	Tuesday	SB	8:00 PM - 10:00 PM	1765	63.6	68.1	Drone-SB	Yes
2/3/2005	Thursday	SB	10:00 AM - 12:00 PM	1895	63.7	67.8	Drone-SB	No - Rain
2/3/2005	Thursday	SB	10:00 PM - 12:00 AM	1446	63.7	68.6	Drone-SB	Yes
2/3/2005	Thursday	SB	12:00 PM - 2:00 PM	1892	64.8	68.9	Drone-SB	No - Rain
2/3/2005	Thursday	SB	8:00 PM - 10:00 PM	1632	64.4	68.6	Drone-SB	Yes
2/5/2005	Saturday	SB	10:00 AM - 12:00 PM	1924	67.0	72.0	Drone-SB	No - Weekend
2/5/2005	Saturday	SB	10:00 PM - 12:00 AM	1292	65.0	70.0	Drone-SB	No - Weekend
2/5/2005	Saturday	SB	12:00 PM - 2:00 PM	1988	66.9	71.7	Drone-SB	No - Weekend
2/5/2005	Saturday	SB	8:00 PM - 10:00 PM	1603	64.8	70.5	Drone-SB	No - Weekend
2/12/2005	Saturday	NB	10:00 AM - 12:00 PM	895	64.4	68.6	Drone-NB	No - Weekend
2/12/2005	Saturday	NB	10:00 PM - 12:00 AM	727	65.9	70.1	Drone-NB	No - Weekend
2/12/2005	Saturday	NB	12:00 PM - 2:00 PM	669	64.6	69.6	Drone-NB	No - Weekend
2/12/2005	Saturday	NB	8:00 PM - 10:00 PM	1254	65.1	69.6	Drone-NB	No - Weekend
2/13/2005	Sunday	NB	10:00 AM - 12:00 PM	837	64.1	68.1	Drone-NB	No - Weekend
2/13/2005	Sunday	NB	10:00 PM - 12:00 AM	1248	65.5	69.6	Drone-NB	No - Weekend
2/13/2005	Sunday	NB	12:00 PM - 2:00 PM	814	64.1	68.6	Drone-NB	No - Weekend
2/13/2005	Sunday	NB	8:00 PM - 10:00 PM	1117	65.3	69.6	Drone-NB	No - Weekend
2/14/2005	Monday	NB	10:00 AM - 12:00 PM	1032	63.1	67.1	Drone-SB	Yes
2/14/2005	Monday	NB	10:00 PM - 12:00 AM	1034	64.3	68.4	Drone-SB	Yes
2/14/2005	Monday	NB	12:00 PM - 2:00 PM	852	63.2	67.5	Drone-SB	Yes
2/14/2005	Monday	NB	8:00 PM - 10:00 PM	1305	64.2	68.6	Drone-SB	Yes
2/15/2005	Tuesday	NB	10:00 AM - 12:00 PM	2112	64.0	67.8	Drone-SB	Yes
2/15/2005	Tuesday	NB	12:00 PM - 2:00 PM	1017	63.7	67.6	Drone-SB	Yes
2/26/2005	Saturday	SB	10:00 AM - 12:00 PM	1805	67.3	72.2	Drone-SB	No - Weekend
2/26/2005	Saturday	SB	10:00 PM - 12:00 AM	1071	65.5	70.7	Drone-SB	No - Weekend
2/26/2005	Saturday	SB	12:00 PM - 2:00 PM	1957	67.9	73.3	Drone-SB	No - Weekend
2/26/2005	Saturday	SB	8:00 PM - 10:00 PM	1832	65.9	71.0	Drone-SB	No - Weekend
2/28/2005	Monday	SB	10:00 AM - 12:00 PM	1862	65.0	69.6	Drone-SB	Yes
2/28/2005	Monday	SB	10:00 PM - 12:00 AM	104	64.0	66.8	Drone-SB	Yes
2/28/2005	Monday	SB	12:00 PM - 2:00 PM	2011	65.5	69.6	Drone-SB	Yes
2/28/2005	Monday	SB	8:00 PM - 10:00 PM	1692	64.4	68.6	Drone-SB	Yes
3/4/2005	Friday	SB	10:00 AM - 12:00 PM	1920	66.8	71.3	Drone-SB	Yes
3/4/2005	Friday	SB	10:00 PM - 12:00 AM	1250	66.0	70.7	Drone-SB	Yes
3/4/2005	Friday	SB	12:00 PM - 2:00 PM	1807	66.7	71.2	Drone-SB	Yes
3/4/2005	Friday	SB	8:00 PM - 10:00 PM	1967	65.7	70.5	Drone-SB	Yes
3/10/2005	Thursday	NB	10:00 AM - 12:00 PM	1980	65.6	70.2	Drone-SB	Yes
3/10/2005	Thursday	NB	12:00 PM - 2:00 PM	2000	66.1	70.3	Drone-SB	Yes
3/21/2005	Monday	NB	10:00 AM - 12:00 PM	1335	64.7	69.1	Drone-SB	Yes
3/21/2005	Monday	NB	10:00 PM - 12:00 AM	116	63.9	67.8	Drone-SB	Yes

Date	Day	Direction	Time	Obs	Avg Speed	85th 'ile Speed	Category	Used?
3/21/2005	Monday	NB	12:00 PM - 2:00 PM	1155	65.0	69.1	Drone-SB	Yes
3/21/2005	Monday	NB	8:00 PM - 10:00 PM	1156	64.2	68.6	Drone-SB	Yes
3/25/2005	Friday (Holiday)	NB	10:00 AM - 12:00 PM	1269	63.7	68.6	Drone-SB	No - Holiday
3/25/2005	Friday (Holiday)	NB	10:00 PM - 12:00 AM	1068	64.8	69.6	Drone-SB	No - Holiday
3/25/2005	Friday (Holiday)	NB	12:00 PM - 2:00 PM	1427	65.3	69.6	Drone-SB	No - Holiday
3/25/2005	Friday (Holiday)	NB	8:00 PM - 10:00 PM	944	64.7	68.9	Drone-SB	No - Holiday
3/26/2005	Saturday	NB	10:00 AM - 12:00 PM	1197	66.7	71.5	Drone-SB	No - Weekend
3/26/2005	Saturday	NB	10:00 PM - 12:00 AM	403	64.8	70.0	Drone-SB	No - Weekend
3/26/2005	Saturday	NB	12:00 PM - 2:00 PM	1310	66.8	71.0	Drone-SB	No - Weekend
3/26/2005	Saturday	NB	8:00 PM - 10:00 PM	1132	64.1	68.6	Drone-SB	No - Weekend
3/27/2005	Sunday	NB	10:00 AM - 12:00 PM	1227	66.8	71.5	Drone-SB	No - Weekend
3/27/2005	Sunday	NB	10:00 PM - 12:00 AM	841	58.9	64.1	Drone-SB	No - Weekend
3/27/2005	Sunday	NB	12:00 PM - 2:00 PM	1153	66.4	71.0	Drone-SB	No - Weekend
3/27/2005	Sunday	NB	8:00 PM - 10:00 PM	1104	61.5	66.6	Drone-SB	No - Weekend
3/29/2005	Tuesday	SB	10:00 AM - 12:00 PM	2057	64.6	68.6	Drone-SB	Yes
3/29/2005	Tuesday	SB	10:00 PM - 12:00 AM	1160	62.0	66.1	Drone-SB	Yes
3/29/2005	Tuesday	SB	12:00 PM - 2:00 PM	1853	64.9	68.7	Drone-SB	Yes
3/29/2005	Tuesday	SB	8:00 PM - 10:00 PM	1646	61.3	65.3	Drone-SB	Yes
3/31/2005	Thursday	SB	10:00 AM - 12:00 PM	1963	63.3	67.2	Drone-SB	No - Rain
3/31/2005	Thursday	SB	10:00 PM - 12:00 AM	1665	62.8	66.9	Drone-SB	No - Fog
3/31/2005	Thursday	SB	12:00 PM - 2:00 PM	1789	62.2	66.4	Drone-SB	No - Rain
3/31/2005	Thursday	SB	8:00 PM - 10:00 PM	1748	63.2	67.6	Drone-SB	No - Fog
6/17/2005	Friday	NB	10:00 AM - 12:00 PM	1387	65.8	69.7	No Drones	Yes
6/17/2005	Friday	NB	10:00 PM - 12:00 AM	944	64.2	68.4	No Drones	Yes
6/17/2005	Friday	NB	12:00 PM - 2:00 PM	1100	66.3	70.1	No Drones	Yes
6/17/2005	Friday	NB	8:00 PM - 10:00 PM	1173	64.9	69.7	No Drones	Yes
6/18/2005	Saturday	NB	10:00 AM - 12:00 PM	1189	66.9	71.2	No Drones	No - Weekend
6/18/2005	Saturday	NB	10:00 PM - 12:00 AM	857	61.6	66.6	No Drones	No - Weekend
6/18/2005	Saturday	NB	12:00 PM - 2:00 PM	1354	67.2	71.2	No Drones	No - Weekend
6/18/2005	Saturday	NB	8:00 PM - 10:00 PM	1073	61.8	66.6	No Drones	No - Weekend
6/19/2005	Sunday	NB	10:00 AM - 12:00 PM	1274	67.0	71.0	No Drones	No - Weekend
6/19/2005	Sunday	NB	10:00 PM - 12:00 AM	831	65.4	70.9	No Drones	No - Weekend
6/19/2005	Sunday	NB	12:00 PM - 2:00 PM	1084	67.3	71.7	No Drones	No - Weekend
6/19/2005	Sunday	NB	8:00 PM - 10:00 PM	1346	66.4	71.0	No Drones	No - Weekend
6/23/2005	Thursday	NB	10:00 AM - 12:00 PM	1753	65.6	69.6	No Drones	Yes
6/23/2005	Thursday	NB	10:00 PM - 12:00 AM	853	63.7	67.9	No Drones	Yes
6/23/2005	Thursday	NB	12:00 PM - 2:00 PM	1231	65.9	70.0	No Drones	Yes
6/23/2005	Thursday	NB	8:00 PM - 10:00 PM	1102	65.6	70.0	No Drones	Yes
6/27/2005	Monday	SB	10:00 AM - 12:00 PM	2005	66.5	71.0	No Drones	Yes
6/27/2005	Monday	SB	10:00 PM - 12:00 AM	1171	62.4	67.1	No Drones	No - Rain
6/27/2005	Monday	SB	12:00 PM - 2:00 PM	1802	66.2	70.8	No Drones	Yes
6/27/2005	Monday	SB	8:00 PM - 10:00 PM	1823	61.5	66.1	No Drones	No - Rain
6/29/2005	Wednesday	SB	10:00 AM - 12:00 PM	1989	66.2	70.0	No Drones	Yes
6/29/2005	Wednesday	SB	10:00 PM - 12:00 AM	1870	63.4	67.8	No Drones	Yes
6/29/2005	Wednesday	SB	12:00 PM - 2:00 PM	1753	66.2	70.0	No Drones	Yes
6/29/2005	Wednesday	SB	8:00 PM - 10:00 PM	1923	64.6	69.6	No Drones	Yes
7/19/2005	Tuesday	NB	10:00 AM - 12:00 PM	1162	65.5	69.6	No Drones	Yes
7/19/2005	Tuesday	SB	10:00 AM - 12:00 PM	2048	65.9	70.4	No Drones	Yes
7/19/2005	Tuesday	NB	12:00 PM - 2:00 PM	1278	65.6	69.6	No Drones	Yes
7/19/2005	Tuesday	SB	12:00 PM - 2:00 PM	1806	65.4	69.6	No Drones	Yes

APPENDIX D

	Before WZ (1/1/1999 - 4/14/2003)		During WZ (4/15/2003 - 3/31/2005)	
High Level Crash Summary				
Crash Type	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
Total Crashes	67	100.00	42	100.00
Fatal Crashes	0	0.00	0	0.00
Non-Fatal Injury Crashes	25	37.31	11	26.19
Total Injury Crashes	25	37.31	11	26.19
Property Damage Only Crashes	42	62.69	31	73.81
Night Crashes	20	29.85	17	40.48
Wet Crashes	8	11.94	7	16.67
Alcohol/Drugs Involvement Crashes	5	7.46	0	0.00
Crash Severity Summary				
Crash Type	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
Total Crashes	67	100.00	42	100.00
Fatal Crashes	*0*	*0.00*	*0*	*0.00*
Class A Crashes	*3*	*4.48*	*0*	*0.00*
Class B Crashes	4	5.97	4	9.52
Class C Crashes	18	26.87	7	16.67
Property Damage Only Crashes	42	62.69	31	73.81
Vehicle Exposure Statistics				
Annual ADT =	41,000		46,000	
Total Length =	1 (Miles)		1 (Miles)	
Total Vehicle Exposure =	64.17 (MVMT)		32.94 (MVMT)	
Total Crash Rate	*104.42*		*127.34*	
Fatal Crash Rate	0		0	
Non Fatal Crash Rate	38.96		33.35	
Night Crash Rate	31.17		51.54	
Wet Crash Rate	12.47		21.22	
EPDO Rate	712.54		374.14	
Miscellaneous Statistics				
Severity Index =	*6.82*		*2.94*	
EPDO Crash Index =	457.20		123.40	
Estimated Property Damage Total =	$329,401		$292,550	
Accident Type Summary				
Accident Type	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
ANGLE	2	2.99	0	0.00
ANIMAL	1	1.49	3	7.14
FIXED OBJECT	9	13.43	5	11.90
HEAD ON	1	1.49	0	0.00
JACKKNIFE	1	1.49	0	0.00
LEFT TURN, SAME ROADWAY	2	2.99	0	0.00
MOVABLE OBJECT	2	2.99	1	2.38
OTHER COLLISION WITH VEHICLE	2	2.99	5	11.90
OTHER NON-COLLISION	4	5.97	0	0.00
OVERTURN/ROLLOVER	3	4.48	0	0.00
RAN OFF ROAD - LEFT	*12*	*17.91*	*11*	*26.19*
RAN OFF ROAD - RIGHT	6	8.96	6	14.29
REAR END, SLOW OR STOP	*15*	*22.39*	*3*	*7.14*
RIGHT TURN, SAME ROADWAY	0	0.00	1	2.38
SIDESWIPE, SAME DIRECTION	7	10.45	7	16.67

	Before WZ (1/1/1999 - 4/14/2003)		During WZ (4/15/2003 - 3/31/2005)	
Monthly Summary				
Month	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
Jan	7	10.45	5	11.90
Feb	7	10.45	4	9.52
Mar	1	1.49	2	4.76
Apr	9	13.43	4	9.52
May	5	7.46	2	4.76
Jun	3	4.48	2	4.76
Jul	5	7.46	2	4.76
Aug	6	8.96	0	0.00
Sep	1	1.49	8	19.05
Oct	5	7.46	1	2.38
Nov	9	13.43	9	21.43
Dec	9	13.43	3	7.14
Daily Summary				
Day	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
Mon	9	13.43	6	14.29
Tue	10	14.93	3	7.14
Wed	5	7.46	4	9.52
Thu	9	13.43	8	19.05
Fri	11	16.42	5	11.90
Sat	12	17.91	4	9.52
Sun	11	16.42	12	28.57
Hourly Summary				
Hour	**Number of Crashes**	**Percent Of Total**	**Number of Crashes**	**Percent Of Total**
0000-0059	3	4.48	2	4.76
0100-0159	2	2.99	2	4.76
0200-0259	1	1.49	2	4.76
0300-0359	1	1.49	1	2.38
0400-0459	2	2.99	0	0.00
0500-0559	2	2.99	0	0.00
0600-0659	2	2.99	2	4.76
0700-0759	1	1.49	1	2.38
0800-0859	3	4.48	2	4.76
0900-0959	0	0.00	0	0.00
1000-1059	3	4.48	0	0.00
1100-1159	5	7.46	3	7.14
1200-1259	4	5.97	2	4.76
1300-1359	8	11.94	2	4.76
1400-1459	6	8.96	1	2.38
1500-1559	5	7.46	3	7.14
1600-1659	5	7.46	3	7.14
1700-1759	6	8.96	3	7.14
1800-1859	2	2.99	2	5.00
1900-1959	0	0.00	3	7.14
2000-2059	1	1.49	5	11.90
2100-2159	2	2.99	2	4.76
2200-2259	1	1.49	0	0.00
2300-2359	2	2.99	1	2.38

Study Criteria Summary

County: CLEVELAND **City:** All and Rural
Date: 01/01/1999 **to** 4/14/2003 **Study:** B3437CLEVELANDNC161BEFOREWZ
Location: I-85 FROM 0.50 MILES SOUTH OF NC 161 TO 0.50 MILES NORTH OF NC 161

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
1	***100075143***	6.990	04/17/2000 04:30	OVERTURN/ROLLOVER	$ 5000	0	0	0	1	1	5	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 1		*Speed:* 65 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 59						
2	***100195192***	6.990	10/07/2000 07:38	OTHER COLLISION WITH VEHICLE	$ 8000	0	0	0	1	1	1	1	1	0		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 42						
Unit 2 : 15	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:*						
3	***100831171***	6.990	02/16/2003 17:55	FIXED OBJECT	$ 1000	0	0	0	1	4	5	6	1	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 40 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 42						
4	***100523482***	7.000	12/27/2001 14:42	RAN OFF ROAD - LEFT	$ 2100	0	0	0	0	1	1	1	3	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 44						
5	***100632177***	7.000	05/30/2002 01:11	OTHER COLLISION WITH VEHICLE	$ 17500	0	0	0	0	1	5	1	3	0	0	
Unit 1 : 4	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:*						
Unit 2 : 4	*Alchl/Drgs:* 7		*Speed:* 0 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 16				*Obj Strk:*						
6	***100356602***	7.090	04/15/2001 14:12	RAN OFF ROAD - RIGHT	$ 1000	0	0	0	0	2	1	2	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 37						
7	***99118355***	7.290	06/22/1999 10:00	RAN OFF ROAD - LEFT	$ 250	0	0	0	0	1	1	1	1	4	0	2
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* W		*Veh Mnvr/Ped Actn:* 6				*Obj Strk:* 38						
Unit 2 : 2	*Alchl/Drgs:* 0		*Speed:* 25 MPH	*Dir:* W		*Veh Mnvr/Ped Actn:* 8				*Obj Strk:*						
8	***99197482***	7.290	10/09/1999 00:05	ANIMAL	$ 1000	0	0	0	0	1	5	1	1	0	0	2
Unit 1 : 2	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 17						
9	***100774696***	7.320	12/04/2002 12:58	RAN OFF ROAD - LEFT	$ 3500	0	0	1	0	4	1	6	1	1		

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
Unit 1 : 4 *Alchl/Drgs:* 0 *Speed:* 45 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 5 *Obj Strk:* 44																
10	***100225094***	7.370	11/09/2000 11:12	REAR END, SLOW OR STOP	$ 3200	0	0	0	0	2	1	2	1	4	0	2
Unit 1 : 14 *Alchl/Drgs:* 0 *Speed:* 25 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
Unit 2 : 14 *Alchl/Drgs:* 0 *Speed:* 0 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 14 *Obj Strk:*																
11	***100256766***	7.370	12/19/2000 20:23	RAN OFF ROAD - LEFT	$ 20000	0	0	0	0	2	5	3	3	1	0	
Unit 1 : 4 *Alchl/Drgs:* 0 *Speed:* 50 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 5 *Obj Strk:* 44																
12	***100867202***	7.370	04/07/2003 05:55	FIXED OBJECT	$ 3000	0	0	0	0	3	5	3	4	1	0	2
Unit 1 : 1 *Alchl/Drgs:* 0 *Speed:* 50 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:* 44																
13	***99145533***	7.390	08/01/1999 08:20	RAN OFF ROAD - RIGHT	$ 7000	0	0	0	0	1	1	1	1	0	0	2
Unit 1 : 1 *Alchl/Drgs:* 0 *Speed:* 60 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
Unit 2 : 5 *Alchl/Drgs:* 0 *Speed:* 60 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
14	***99229074***	7.390	11/16/1999 05:15	SIDESWIPE, SAME DIRECTION	$ 400	0	0	0	1	1	5	1	1	0	0	2
Unit 1 : 1 *Alchl/Drgs:* 0 *Speed:* 55 MPH *Dir:* N *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
Unit 2 : 12 *Alchl/Drgs:* 0 *Speed:* 55 MPH *Dir:* N *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
15	***100095733***	7.390	05/16/2000 11:00	OVERTURN/ROLLOVER	$ 25000	0	2	0	0	1	1	1	3	0		
Unit 1 : 4 *Alchl/Drgs:* 0 *Speed:* 55 MPH *Dir:* N *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
16	***100140650***	7.390	07/18/2000 15:15	FIXED OBJECT	$ 7500	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1 *Alchl/Drgs:* 0 *Speed:* 65 MPH *Dir:* N *Veh Mnvr/Ped Actn:* 4 *Obj Strk:* 42																
17	***100341818***	7.415	04/24/2001 16:34	REAR END, SLOW OR STOP	$ 1600	0	0	0	0	2	1	3	1	0	0	3
Unit 1 : 14 *Alchl/Drgs:* 0 *Speed:* 35 MPH *Dir:* E *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
Unit 2 : 5 *Alchl/Drgs:* 0 *Speed:* 35 MPH *Dir:* E *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
18	***100196930***	7.440	07/15/2000 22:07	OTHER NON-COLLISION	$ 1500	0	1	1	0	1	2	1	1	0	0	
Unit 1 : 1 *Alchl/Drgs:* 0 *Speed:* 60 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:* 44																
19	***100772580***	7.440	12/02/2002 14:11	REAR END, SLOW OR STOP	$ 6000	0	0	0	2	1	1	2	1	0	0	
Unit 1 : 12 *Alchl/Drgs:* 0 *Speed:* 65 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																
Unit 2 : 12 *Alchl/Drgs:* 0 *Speed:* 65 MPH *Dir:* S *Veh Mnvr/Ped Actn:* 4 *Obj Strk:*																

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
20	***99067874***	7.452	04/12/1999 23:45	SIDESWIPE, SAME DIRECTION	$ 1050	0	0	0	0	1	5	1	3	0	0	2
	Unit 1 : 12	*Alchl/Drgs:* 0	*Speed:* 68 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 5			*Obj Strk:*								
	Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
21	***100367928***	7.453	05/13/2001 17:10	RAN OFF ROAD - LEFT	$ 6500	0	0	0	1	1	1	1	1	0	0	3
	Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* E	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
	Unit 2 : 20	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* E	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:* 18								
22	***99151476***	7.469	08/10/1999 21:20	ANGLE	$ 2050	0	0	0	0	1	5	1	3	4	0	2
	Unit 1 : 3	*Alchl/Drgs:* 0	*Speed:* 20 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
	Unit 2 : 3	*Alchl/Drgs:* 0	*Speed:* 45 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:* 64								
23	***100056192***	7.470	01/22/2000 16:45	REAR END, SLOW OR STOP	$ 7500	0	0	0	1	5	2	2	1	0	0	
	Unit 1 : 12	*Alchl/Drgs:* 0	*Speed:* 25 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 1			*Obj Strk:*								
	Unit 2 : 5	*Alchl/Drgs:* 0	*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
24	***100812608***	7.470	01/23/2003 15:16	RAN OFF ROAD - RIGHT	$ 3200	0	0	0	0	4	1	1	1	11		
	Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 60 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:* 38								
25	***99149616***	7.486	08/07/1999 21:19	SIDESWIPE, SAME DIRECTION	$ 6600	0	1	1	1	1	5	1	1	0	0	2
	Unit 1 : 5	*Alchl/Drgs:* 1	*Speed:* 80 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 5			*Obj Strk:* 42								
	Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
26	***99149610***	7.488	08/07/1999 11:00	RAN OFF ROAD - LEFT	$ 1000	0	0	0	0	1	1	1	1	0	0	2
	Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:* 58								
27	***100016022***	7.490	01/22/2000 17:15	FIXED OBJECT	$ 1750	0	0	0	0	5	2	2	1	0	0	
	Unit 1 : 5	*Alchl/Drgs:* 0	*Speed:* 25 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:* 44								
	Unit 2 : 32	*Alchl/Drgs:* 7	*Speed:* 25 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 15			*Obj Strk:* 44								
28	***100030158***	7.490	02/13/2000 04:00	REAR END, SLOW OR STOP	$ 7100	0	0	0	0	1	5	1	1	0		
	Unit 1 : 13	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
	Unit 2 : 4	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
29	***100203430***	7.490	10/12/2000 23:43	REAR END, SLOW OR STOP	$ 4000	0	0	0	2	1	5	1	2	0	0	
	Unit 1 : 32	*Alchl/Drgs:* 7	*Speed:* 75 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								
	Unit 2 : 2	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4			*Obj Strk:*								

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
30	***100232087***	7.490	11/15/2000 13:53	OTHER NON-COLLISION	$ 501	0	0	0	2	1	1	1	1	4	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:* 44									
31	***100232089***	7.490	11/15/2000 13:53	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	1	1	1	4		
Unit 1 : 14	*Alchl/Drgs:* 0		*Speed:* 5 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 11		*Obj Strk:*									
Unit 2 : 4	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 15		*Obj Strk:*									
32	***100232091***	7.490	11/17/2000 17:01	REAR END, SLOW OR STOP	$ 12000	0	0	0	0	1	1	2	1	4	0	
Unit 1 : 12	*Alchl/Drgs:* 0		*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 1		*Obj Strk:*									
Unit 2 : 1	*Alchl/Drgs:* 0		*Speed:* 50 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
33	***100247553***	7.490	12/07/2000 18:26	REAR END, SLOW OR STOP	$ 1200	0	0	0	0	1	5	1	1	0	0	
Unit 1 : 12	*Alchl/Drgs:* 0		*Speed:* 45 MPH	*Dir:* E	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
Unit 2 : 2	*Alchl/Drgs:* 0		*Speed:* 0 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 1		*Obj Strk:*									
34	***100364256***	7.490	05/08/2001 11:30	REAR END, SLOW OR STOP	$ 13800	0	0	2	1	1	1	1	3	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
Unit 2 : 6	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
Unit 3 : 1	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
35	***100403199***	7.490	07/24/2001 12:31	REAR END, SLOW OR STOP	$ 1500	0	0	0	2	1	1	2	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 30 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
Unit 2 : 4	*Alchl/Drgs:* 0		*Speed:* 30 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
36	***100413285***	7.490	08/05/2001 14:53	RAN OFF ROAD - RIGHT	$ 5000	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:* 42									
37	***100480296***	7.490	10/26/2001 17:31	FIXED OBJECT	$ 18500	0	0	0	0	1	1	1	3	6		
Unit 1 : 11	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:* 41									
38	***100590247***	7.490	04/01/2002 10:22	RAN OFF ROAD - LEFT	$ 4700	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:* 44									
39	***100603244***	7.490	04/19/2002 10:48	SIDESWIPE, SAME DIRECTION	$ 2000	0	0	0	0	1	1	1	1	0		
Unit 1 : 2	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									
Unit 2 : 5	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4		*Obj Strk:*									

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
40	***100604850***	7.490	04/21/2002 08:20	FIXED OBJECT	$ 6000	0	0	0	1	1	1	1	1	0	0	
Unit 1 : 5	*Alchl/Drgs:* 0	*Speed:* 70 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 64											
41	***100648205***	7.490	06/22/2002 17:25	FIXED OBJECT	$ 7000	0	0	0	0	1	1	2	3	0	0	
Unit 1 : 4	*Alchl/Drgs:* 0	*Speed:* 70 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 42											
42	***100666178***	7.490	07/18/2002 02:30	OVERTURN/ROLLOVER	$ 1750	0	0	0	3	1	5	1	1	0	0	
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 85 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
43	***100670239***	7.490	07/19/2002 16:28	LEFT TURN, SAME ROADWAY	$ 0	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
44	***100681414***	7.490	08/08/2002 06:52	RAN OFF ROAD - LEFT	$ 2000	0	0	0	5	1	1	1	1	0	0	
Unit 1 : 4	*Alchl/Drgs:* 0	*Speed:* 70 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
45	***100799374***	7.490	01/04/2003 15:59	LEFT TURN, SAME ROADWAY	$ 3500	0	0	0	0	1	1	1	3	0	0	
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
46	***100800311***	7.490	01/06/2003 01:07	OTHER NON-COLLISION	$ 4000	0	0	1	0	1	5	1	3	0	0	
Unit 1 : 1	*Alchl/Drgs:* 7	*Speed:* 75 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
47	***100812401***	7.490	01/23/2003 15:16	ANGLE	$ 11300	0	0	0	1	5	1	1	3	11	0	
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:* 50 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
48	***100831182***	7.490	02/16/2003 18:30	SIDESWIPE, SAME DIRECTION	$ 2550	0	0	0	0	4	5	6	3	0		
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:* 50 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
49	***100834082***	7.490	02/19/2003 11:55	JACKKNIFE	$ 13500	0	0	0	0	1	1	1	3	0	0	
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 70 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 42											

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
50	***100836058***	7.490	02/22/2003 06:30	RAN OFF ROAD - RIGHT	$ 200	0	0	0	0	2	5	3	1	1	0	2
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 61											
51	***100857460***	7.490	03/25/2003 14:41	MOVABLE OBJECT	$ 500	0	0	0	0	1	1	1	3	0	0	
Unit 1 : 10	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 18											
52	***100820456***	7.495	02/01/2003 03:28	HEAD ON	$ 9500	0	0	0	0	1	5	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 1	*Speed:* 90 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
53	***100016142***	7.500	01/23/2000 08:00	SIDESWIPE, SAME DIRECTION	$ 3000	0	0	0	0	5	1	5	1	0		
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:* 50 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 6	*Obj Strk:*											
54	***100729340***	7.510	10/11/2002 00:25	RAN OFF ROAD - LEFT	$ 3000	0	0	0	0	2	5	2	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* E	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
55	***100219355***	7.540	11/01/2000 00:25	REAR END, SLOW OR STOP	$ 3000	0	0	1	1	1	5	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 1	*Speed:* 75 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 59											
Unit 2 : 2	*Alchl/Drgs:* 0	*Speed:* 60 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
56	***100333952***	7.580	04/16/2001 16:09	SIDESWIPE, SAME DIRECTION	$ 1300	0	0	0	0	1	1	1	3	0	0	
Unit 1 : 10	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 5	*Obj Strk:*											
Unit 2 : 5	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
57	***99265045***	7.590	12/31/1999 13:20	REAR END, SLOW OR STOP	$ 2500	0	0	0	1	1	1	1	1	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 2	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 11	*Obj Strk:*											
58	***99265044***	7.590	12/31/1999 13:21	REAR END, SLOW OR STOP	$ 400	0	0	0	1	1	1	1	1	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 45 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 1	*Obj Strk:*											
59	***100175121***	7.590	09/04/2000 14:00	FIXED OBJECT	$ 5800	0	0	0	2	2	1	2	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 1	*Speed:* 45 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
Unit 2 : 4	*Alchl/Drgs:* 0	*Speed:* 45 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
60	***100233089***	7.650	11/18/2000 12:43	REAR END, SLOW OR STOP	$ 1600	0	0	0	0	1	1	2	1	4	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 15 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 10 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
61	***100753173***	7.650	11/08/2002 15:16	RAN OFF ROAD - LEFT	$ 2100	0	0	0	0	1	1	1	1	0		
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 10	*Alchl/Drgs:* 0	*Speed:* 60 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
62	***99265038***	7.790	12/31/1999 13:22	RAN OFF ROAD - LEFT	$ 2200	0	0	0	0	1	1	1	3	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
63	***99221656***	7.870	11/07/1999 13:00	OTHER NON-COLLISION	$ 2000	0	0	0	0	1	1	1	1	0	0	2
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 50 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 41											
64	***99265046***	7.890	12/31/1999 13:00	RAN OFF ROAD - LEFT	$ 3900	0	0	0	0	1	1	1	1	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
65	***100639894***	7.890	06/10/2002 16:07	RAN OFF ROAD - RIGHT	$ 17300	0	0	0	1	1	1	1	1	0		
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 67 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 37											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 10 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 11	*Obj Strk:*											
66	***99100935***	7.990	05/28/1999 12:00	MOVABLE OBJECT	$ 1000	0	0	0	0	1	1	1	1	0	0	0
Unit 1 : 5	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 64											
67	***100831183***	7.990	02/16/2003 13:41	FIXED OBJECT	$ 1000	0	0	0	0	6	1	6	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 42											

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

Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	67	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	25	37.31
Total Injury Crashes	25	37.31
Property Damage Only Crashes	42	62.69
Night Crashes	20	29.85
Wet Crashes	8	11.94
Alcohol/Drugs Involvement Crashes	5	7.46

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	67	100.00
Fatal Crashes	0	0.00
Class A Crashes	3	4.48
Class B Crashes	4	5.97
Class C Crashes	18	26.87
Property Damage Only Crashes	42	62.69

Vehicle Exposure Statistics

Annual ADT = 41000

Total Length = 1 (Miles) **1.609 (Kilometers)**

Total Vehicle Exposure = 64.17 (MVMT) **103.26 (MVKMT)**

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	104.42	64.88
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	38.96	24.21
Night Crash Rate	31.17	19.37
Wet Crash Rate	12.47	7.75
EPDO Rate	712.54	442.75

Miscellaneous Statistics

Severity Index =	6.82
EPDO Crash Index =	457.20
Estimated Property Damage Total = $	329401.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	2	2.99
ANIMAL	1	1.49
FIXED OBJECT	9	13.43
HEAD ON	1	1.49
JACKKNIFE	1	1.49
LEFT TURN, SAME ROADWAY	2	2.99
MOVABLE OBJECT	2	2.99
OTHER COLLISION WITH VEHICLE	2	2.99
OTHER NON-COLLISION	4	5.97
OVERTURN/ROLLOVER	3	4.48
RAN OFF ROAD - LEFT	12	17.91
RAN OFF ROAD - RIGHT	6	8.96
REAR END, SLOW OR STOP	15	22.39
SIDESWIPE, SAME DIRECTION	7	10.45

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	4	9.30
Class B Injuries	7	16.28
Class C Injuries	32	74.42
Total Non-Fatal Injuries	43	100.00
Total Injuries	43	100.00

Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	7	10.45
Feb	7	10.45
Mar	1	1.49
Apr	9	13.43
May	5	7.46
Jun	3	4.48
Jul	5	7.46
Aug	6	8.96
Sep	1	1.49
Oct	5	7.46
Nov	9	13.43
Dec	9	13.43

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	9	13.43
Tue	10	14.93
Wed	5	7.46
Thu	9	13.43
Fri	11	16.42
Sat	12	17.91
Sun	11	16.42

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	3	4.48
0100-0159	2	2.99
0200-0259	1	1.49
0300-0359	1	1.49
0400-0459	2	2.99
0500-0559	2	2.99
0600-0659	2	2.99
0700-0759	1	1.49
0800-0859	3	4.48
0900-0959	0	0.00
1000-1059	3	4.48
1100-1159	5	7.46
1200-1259	4	5.97
1300-1359	8	11.94
1400-1459	6	8.96
1500-1559	5	7.46
1600-1659	5	7.46
1700-1759	6	8.96
1800-1859	2	2.99
1900-1959	0	0.00
2000-2059	1	1.49
2100-2159	2	2.99
2200-2259	1	1.49
2300-2359	2	2.99

Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	35	4	5	44
Dark	14	4	2	20
Other	1	0	2	3
Total	50	8	9	67

Object Struck Summary

Object Type	Times Struck	Percent of Total
ANIMAL	1	2.56
DITCH	1	2.56
EMBANKMENT	2	5.13
FENCE OR FENCE POST	1	2.56
GUARDRAIL END ON SHOULDER	2	5.13
GUARDRAIL FACE IN MEDIAN	15	38.46
GUARDRAIL FACE ON SHOULDER	8	20.51
MOVABLE OBJECT	2	5.13
OFFICIAL HIGHWAY SIGN BREAKAWAY	2	5.13
OFFICIAL HIGHWAY SIGN NON-BREAKAWAY	2	5.13
OTHER FIXED OBJECT	3	7.69

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
COMMERCIAL BUS	1	0.94
LIGHT TRUCK (MINI-VAN, PANEL)	2	1.89
MOTORCYCLE	1	0.94
PASSENGER CAR	52	49.06
PICKUP	11	10.38
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	3	2.83
SINGLE UNIT TRUCK (3 OR MORE AXLES)	1	0.94
SPORT UTILITY	11	10.38
TRACTOR/DOULBES	1	0.94
TRACTOR/SEMI-TRAILER	4	3.77
TRUCK/TRACTOR	1	0.94
TRUCK/TRAILER	7	6.60
UNKNOWN	2	1.89
VAN	9	8.49

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total

Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
1999	14	0	4	10
2000	19	0	9	10
2001	9	0	3	6
2002	13	0	6	7
2003	12	0	3	9
Total	67	0	25	42

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
1999	0	6
2000	0	15
2001	0	6
2002	0	13
2003	0	3
Total	0	43

Miscellaneous Totals

Year	Property Damage	EPDO Index
1999	$ 31350	112.00
2000	$ 120651	222.40
2001	$ 51300	31.20
2002	$ 72850	57.40
2003	$ 53250	34.20
Total	$ 329401	457.20

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road	Angle	Side Swipe	Other
1999	0	0	2	5	1	3	3
2000	0	0	9	1	0	1	8
2001	0	0	3	4	0	1	1
2002	1	0	1	6	0	1	4
2003	1	0	0	2	1	1	7

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road	Angle	Side Swipe	Other
Total	2	0	15	18	2	7	23

Strip Diagram

Features	Milepost	Crash IDs
	6.990	100075143 | 100195192 | 100831171
Mile Marker: 7.0	7.000	100523482 | 100632177
	7.010	
	7.020	
	7.030	
	7.040	
	7.050	
	7.060	
	7.070	
	7.080	
	7.090	100356602
	7.100	
	7.110	
	7.120	
	7.130	
	7.140	
	7.150	
	7.160	
	7.170	
	7.180	
	7.190	
	7.200	
	7.210	
	7.220	
	7.230	
	7.240	
	7.250	
	7.260	
	7.270	
	7.280	
	7.290	99118355 | 99197482
	7.300	
	7.310	
	7.320	100774696
	7.330	
	7.340	
	7.350	
	7.360	
	7.370	100225094 | 100256766 | 100867202
	7.380	
	7.390	99145533 | 99229074 | 100095733 | 100140650
	7.400	

Features	Milepost	Crash IDs
	7.410	100341818
	7.420	
	7.430	
	7.440	100196930 | 100772580
	7.450	99067874 | 100367928
	7.460	
	7.470	99151476 | 100056192 | 100812608
	7.480	
Structure:220014 | NC 161	7.490	99149616 | 99149610 | 100016022 | 100030158 | 100203430 | 100232087 | 100232089 | 100232091 | 100247553 | 100364256 | 100403199 | 100413285 | 100480296 | 100590247 | 100603244 | 100604850 | 100648205 | 100666178 | 100670239 | 100681414 | 100799374 | 100800311 | 100812401 | 100831182 | 100834082 | 100836058 | 100857460 | 100820456
	7.500	100016142
	7.510	100729340
	7.520	
	7.530	
	7.540	100219355
	7.550	
	7.560	
	7.570	
	7.580	100333952
	7.590	99265045 | 99265044 | 100175121
	7.600	
	7.610	
	7.620	
	7.630	
	7.640	
	7.650	100233089 | 100753173
	7.660	
	7.670	
	7.680	
	7.690	
	7.700	
	7.710	
	7.720	
	7.730	
	7.740	
	7.750	
	7.760	
	7.770	

Features	Milepost	Crash IDs
	7.780	
	7.790	99265038
	7.800	
	7.810	
	7.820	
	7.830	
	7.840	
	7.850	
	7.860	
	7.870	99221656
	7.880	
	7.890	99265046 | 100639894
	7.900	
	7.910	
	7.920	
	7.930	
	7.940	
	7.950	
	7.960	
	7.970	
	7.980	
	7.990	99100935 | 100831183

Study Criteria Summary

County: CLEVELAND **City:** All and Rural
Date: 04/15/2003 **to** 3/31/2005 **Study:** B3437CLEVNC161DURINGWZ090105
Location: I-85 FROM 0.50 MILES SOUTH OF NC 161 TO 0.50 MILES NORTH OF NC 161

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
1	***101013952***	6.990	10/12/2003 20:54	ANIMAL	$ 400	0	0	0	0	1	5	1		0		
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 17											
2	***100995082***	7.000	09/19/2003 20:24	RAN OFF ROAD - LEFT	$ 21000	0	0	0	0	1	5	1	1	0		
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 67 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
3	***101100818***	7.000	01/25/2004 17:20	RAN OFF ROAD - LEFT	$ 3800	0	0	0	0	4	1	4	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 40 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 44											
4	***101133182***	7.000	03/04/2004 00:46	RAN OFF ROAD - LEFT	$ 3500	0	0	0	1	1	2	1	1	0	1	
Unit 1 : 15	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 6	*Obj Strk:*											
5	***101157502***	7.000	04/05/2004 12:21	OTHER COLLISION WITH VEHICLE	$ 500	0	0	0	0	1	1	1	2	0	0	2
Unit 1 : 10	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 2	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 15											
6	***101168739***	7.000	04/21/2004 15:27	SIDESWIPE, SAME DIRECTION	$ 1400	0	0	0	0	1	1	1	1	0		
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 68 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 32	*Alchl/Drgs:* 7	*Speed:* 0 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
7	***101329461***	7.000	11/07/2004 00:27	ANIMAL	$ 0	0	0	0	0	1	5	1	1	0	0	
Unit 1 : 10	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 17											
8	***101000084***	7.240	09/25/2003 17:38	OTHER COLLISION WITH VEHICLE	$ 2400	0	0	0	0	1	1	1	1	2	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* W	*Veh Mnvr/Ped Actn:* 15	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* W	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
9	***101091990***	7.370	01/11/2004 01:20	REAR END, SLOW OR STOP	$ 9000	0	0	0	1	1	5	1	3	0		2
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 70 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 2	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
10	***100888296***	7.390	05/04/2003 15:00	FIXED OBJECT	$ 3500	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 4	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 44						
11	***101328545***	7.390	11/06/2004 03:00	REAR END, SLOW OR STOP	$ 900	0	0	0	1	1	5	1	1	0	0	
Unit 1 : 12	*Alchl/Drgs:* 7		*Speed:* 70 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 5	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
12	***101320760***	7.390	12/15/2004 15:34	SIDESWIPE, SAME DIRECTION	$ 7000	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 14	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 20						
Unit 2 : 1	*Alchl/Drgs:* 7		*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 2					*Obj Strk:* 20						
13	***100878739***	7.490	04/22/2003 11:54	FIXED OBJECT	$ 3000	0	0	0	0	1	1	1	2	0		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 42						
14	***100880973***	7.490	04/25/2003 02:45	RAN OFF ROAD - LEFT	$ 95000	0	0	1	0	1	5	2	1	0		
Unit 1 : 14	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* E	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 44						
15	***101000092***	7.490	09/25/2003 01:46	ANIMAL	$ 1500	0	0	0	0	1	5	1	3	0	0	2
Unit 1 : 2	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 17						
16	***101034134***	7.490	11/04/2003 06:22	RIGHT TURN, SAME ROADWAY	$ 14000	0	0	0	2	1	1	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 75 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 7					*Obj Strk:*						
Unit 2 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 42						
17	***101038588***	7.490	11/09/2003 12:37	SIDESWIPE, SAME DIRECTION	$ 700	0	0	0	0	1	1	1	1	0		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 2	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
18	***101051715***	7.490	11/23/2003 21:27	OTHER COLLISION WITH VEHICLE	$ 200	0	0	0	0	1	5	1		0		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
19	***101102784***	7.490	01/26/2004 17:44	RAN OFF ROAD - RIGHT	$ 1000	0	0	0	0	4	2	4	3	0		
Unit 1 : 25	*Alchl/Drgs:* 0	*Speed:* 40 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 59											
20	***101103178***	7.490	01/26/2004 21:16	RAN OFF ROAD - LEFT	$ 1500	0	0	0	0	4	5	2	1	0		
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 40 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
21	***101103230***	7.490	01/26/2004 23:56	REAR END, SLOW OR STOP	$ 8000	0	0	1	0	4	5	6	2	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 50 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 16	*Obj Strk:*											
Unit 2 : 1	*Alchl/Drgs:* 0	*Speed:* 45 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
22	***101117123***	7.490	02/13/2004 20:46	SIDESWIPE, SAME DIRECTION	$ 150	0	0	0	0	1	5	1	1	4	10	1
Unit 1 : 12	*Alchl/Drgs:* 0	*Speed:* 15 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
Unit 2 : 32	*Alchl/Drgs:* 7	*Speed:* 0 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
23	***101122727***	7.490	02/20/2004 19:08	SIDESWIPE, SAME DIRECTION	$ 1000	0	0	0	0	1	5	1	3	0	0	2
Unit 1 : 32	*Alchl/Drgs:* 7	*Speed:* 0 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 5	*Obj Strk:*											
Unit 2 : 14	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
24	***101143893***	7.490	03/18/2004 16:07	FIXED OBJECT	$ 1000	0	0	0	0	2	1	3	1	0		
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 60 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
25	***101193447***	7.490	05/22/2004 13:37	RAN OFF ROAD - LEFT	$ 10000	0	0	1	0	1	1	1	1	0	14	
Unit 1 : 2	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 62											
26	***101213160***	7.490	06/16/2004 07:10	MOVABLE OBJECT	$ 21500	0	0	0	0	1	3	1	1	4	10	1
Unit 1 : 4	*Alchl/Drgs:* 0	*Speed:* 80 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 48											
Unit 2 : 10	*Alchl/Drgs:* 0	*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:*											
27	***101237861***	7.490	07/19/2004 16:40	RAN OFF ROAD - LEFT	$ 700	0	0	0	0	1	1	2	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0	*Speed:* 55 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4	*Obj Strk:* 18											
28	***101279333***	7.490	09/09/2004 18:46	OTHER COLLISION WITH VEHICLE	$ 11500	0	0	0	1	1	1	1	1	0	0	
Unit 1 : 5	*Alchl/Drgs:* 0	*Speed:* 65 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:* 4	*Obj Strk:*											

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
29	***101281399***	7.490	09/12/2004 18:39	RAN OFF ROAD - LEFT	$ 2700	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 70 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 62						
30	***101285689***	7.490	09/17/2004 08:04	RAN OFF ROAD - RIGHT	$ 1500	0	0	0	0	2	1	2	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 18						
31	***101287374***	7.490	09/19/2004 14:01	RAN OFF ROAD - RIGHT	$ 900	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 62						
32	***101287373***	7.490	09/19/2004 16:37	FIXED OBJECT	$ 5500	0	0	0	0	1	1	1	1	4		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 46						
33	***101323734***	7.490	11/01/2004 13:42	FIXED OBJECT	$ 6500	0	0	0	0	1	1	1		0		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
34	***101325565***	7.490	11/03/2004 19:21	RAN OFF ROAD - LEFT	$ 1300	0	0	0	0	2	5	3	3	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 70 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 42						
35	***101347792***	7.490	11/13/2004 11:37	RAN OFF ROAD - RIGHT	$ 13000	0	0	0	0	1	1	1	1	0	0	2
Unit 1 : 32	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 32	*Alchl/Drgs:* 7		*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 42						
36	***101353594***	7.490	12/05/2004 20:30	RAN OFF ROAD - LEFT	$ 3300	0	0	0	1	1	4	1	3	0		
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:* 62						
37	***101369350***	7.490	12/23/2004 08:29	RAN OFF ROAD - RIGHT	$ 2000	0	0	0	0	2	1	3	1	4	0	
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 55 MPH	*Dir:* S	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
38	***101401911***	7.490	02/03/2005 06:22	SIDESWIPE, SAME DIRECTION	$ 5200	0	0	0	0	2	4	2	9	4	0	
Unit 1 : 14	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
39	***101420908***	7.490	02/27/2005 20:42	SIDESWIPE, SAME DIRECTION	$ 2600	0	0	0	0	2	5	3	5	0		
Unit 1 : 10	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						
Unit 2 : 2	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N	*Veh Mnvr/Ped Actn:* 4					*Obj Strk:*						

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
40	***101206640***	7.491	06/08/2004 02:03	RAN OFF ROAD - RIGHT	$ 13000	0	0	1	2	1	5	1	1	0	0	2
Unit 1 : 4	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:*						
41	***100947611***	7.585	07/05/2003 19:52	RAN OFF ROAD - LEFT	$ 3400	0	0	0	0	1	1	1	1	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 65 MPH	*Dir:* S		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:* 42						
42	***101287612***	7.650	11/04/2004 11:14	OTHER COLLISION WITH VEHICLE	$ 7500	0	0	0	1	3	1	2	1	0	0	2
Unit 1 : 1	*Alchl/Drgs:* 0		*Speed:* 60 MPH	*Dir:* N		*Veh Mnvr/Ped Actn:* 4				*Obj Strk:*						
Unit 2 : 12	*Alchl/Drgs:* 0		*Speed:* 60 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

Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	42	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	11	26.19
Total Injury Crashes	11	26.19
Property Damage Only Crashes	31	73.81
Night Crashes	17	40.48
Wet Crashes	7	16.67
Alcohol/Drugs Involvement Crashes	0	0.00

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	42	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	4	9.52
Class C Crashes	7	16.67
Property Damage Only Crashes	31	73.81

Vehicle Exposure Statistics

Annual ADT = 46000

Total Length = 1 (Miles) **1.609 (Kilometers)**

Total Vehicle Exposure = 32.98 (MVMT) **53.08 (MVKMT)**

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	127.34	79.13
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	33.35	20.72
Night Crash Rate	51.54	32.03
Wet Crash Rate	21.22	13.19
EPDO Rate	374.14	232.48

Miscellaneous Statistics

Severity Index =	2.94
EPDO Crash Index =	123.40
Estimated Property Damage Total = $	292550.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANIMAL	3	7.14
FIXED OBJECT	5	11.90
MOVABLE OBJECT	1	2.38
OTHER COLLISION WITH VEHICLE	5	11.90
RAN OFF ROAD - LEFT	11	26.19
RAN OFF ROAD - RIGHT	6	14.29
REAR END, SLOW OR STOP	3	7.14
RIGHT TURN, SAME ROADWAY	1	2.38
SIDESWIPE, SAME DIRECTION	7	16.67

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	0	0.00
Class B Injuries	4	28.57
Class C Injuries	10	71.43
Total Non-Fatal Injuries	14	100.00
Total Injuries	14	100.00

Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	5	11.90
Feb	4	9.52
Mar	2	4.76
Apr	4	9.52
May	2	4.76
Jun	2	4.76
Jul	2	4.76
Aug	0	0.00
Sep	8	19.05
Oct	1	2.38
Nov	9	21.43
Dec	3	7.14

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	6	14.29
Tue	3	7.14
Wed	4	9.52
Thu	8	19.05
Fri	5	11.90
Sat	4	9.52
Sun	12	28.57

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	2	4.76
0100-0159	2	4.76
0200-0259	2	4.76
0300-0359	1	2.38
0400-0459	0	0.00
0500-0559	0	0.00
0600-0659	2	4.76
0700-0759	1	2.38
0800-0859	2	4.76
0900-0959	0	0.00
1000-1059	0	0.00
1100-1159	3	7.14
1200-1259	2	4.76
1300-1359	2	4.76
1400-1459	1	2.38
1500-1559	3	7.14
1600-1659	3	7.14
1700-1759	3	7.14
1800-1859	2	4.76
1900-1959	3	7.14
2000-2059	5	11.90
2100-2159	2	4.76
2200-2259	0	0.00
2300-2359	1	2.38

Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	17	4	1	22
Dark	12	3	2	17
Other	2	0	1	3
Total	31	7	4	42

Object Struck Summary

Object Type	Times Struck	Percent of Total
ANIMAL	3	12.50
CONTRUCTION BARRIER	4	16.67
EMBANKMENT	1	4.17
GUARDRAIL FACE IN MEDIAN	4	16.67
GUARDRAIL FACE ON SHOULDER	5	20.83
MEDIAN BARRIER FACE	1	4.17
MOVABLE OBJECT	2	8.33
PARKED MOTOR VEHICLE	2	8.33
PEDALCYCLIST	1	4.17
SHOULDER BARRIER FACE	1	4.17

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
MOTOR HOME/RECREATIONAL VEHICLE	1	1.61
PASSENGER CAR	31	50.00
PICKUP	8	12.90
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	4	6.45
SPORT UTILITY	3	4.84
TRACTOR/DOULBES	1	1.61
TRACTOR/SEMI-TRAILER	4	6.45
TRUCK/TRAILER	3	4.84
UNKNOWN	5	8.06
VAN	2	3.23

Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2003	11	0	2	9
2004	29	0	9	20
2005	2	0	0	2
Total	42	0	11	31

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2003	0	3
2004	0	11
2005	0	0
Total	0	14

Miscellaneous Totals

Year	Property Damage	EPDO Index
2003	$ 145100	25.80
2004	$ 139650	95.60
2005	$ 7800	2.00
Total	$ 292550	123.40

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road	Angle	Side Swipe	Other
2003	0	1	0	3	0	1	6
2004	0	0	3	14	0	4	8
2005	0	0	0	0	0	2	0
Total	0	1	3	17	0	7	14

Strip Diagram

Features	Milepost	Crash IDs
	6.990	101013952
Mile Marker: 7.0	7.000	100995082 | 101100818 | 101133182 | 101157502 | 101168739 | 101329461
	7.010	
	7.020	
	7.030	
	7.040	
	7.050	
	7.060	
	7.070	
	7.080	
	7.090	
	7.100	
	7.110	
	7.120	
	7.130	
	7.140	
	7.150	
	7.160	
	7.170	
	7.180	
	7.190	
	7.200	
	7.210	
	7.220	
	7.230	
	7.240	101000084
	7.250	
	7.260	
	7.270	
	7.280	
	7.290	
	7.300	
	7.310	
	7.320	
	7.330	
	7.340	
	7.350	
	7.360	
	7.370	101091990
	7.380	
	7.390	100888296 | 101328545 | 101320760

Features	Milepost	Crash IDs
	7.400	
	7.410	
	7.420	
	7.430	
	7.440	
	7.450	
	7.460	
	7.470	
	7.480	
Structure:220014 | NC 161 | YORK	7.490	100878739 | 100880973 | 101000092 | 101034134 | 101038588 | 101051715 | 101102784 | 101103178 | 101103230 | 101117123 | 101122727 | 101143893 | 101193447 | 101213160 | 101237861 | 101279333 | 101281399 | 101285689 | 101287374 | 101287373 | 101323734 | 101325565 | 101347792 | 101353594 | 101369350 | 101401911 | 101420908 | 101206640
	7.500	
	7.510	
	7.520	
	7.530	
	7.540	
	7.550	
	7.560	
	7.570	
	7.580	
	7.590	100947611
	7.600	
	7.610	
	7.620	
	7.630	
	7.640	
	7.650	101287612
	7.660	
	7.670	
	7.680	
	7.690	
	7.700	
	7.710	
	7.720	
	7.730	
	7.740	
	7.750	
	7.760	
	7.770	

Features	Milepost	Crash IDs
	7.780	
	7.790	
	7.800	
	7.810	
	7.820	
	7.830	
	7.840	
	7.850	
	7.860	
	7.870	
	7.880	
	7.890	
	7.900	
	7.910	
	7.920	
	7.930	
	7.940	
	7.950	
	7.960	
	7.970	
	7.980	
	7.990	

APPENDIX E

Adjustment Factor Calculation for Speed Data Collected by Automated Devices

				Automated Device Data			Lidar Data			Ratios		
Date	Begin Time	End Time	Direction	Obs	Average Speed	85th Percentile Speed	Obs	Average Speed	85th Percentile Speed	Ratio of Obs	Ratio of Average Speed	Ratio of 85th Percentile Speed
3/10/2005	12:05 PM	1:05 PM	NB	959	66.1	70.2	482	66.9	72.5	0.50	1.01	1.03
3/10/2005	1:05 PM	2:05 PM	NB	894	66.0	70.3	496	67.2	72.4	0.55	1.02	1.03
7/19/2005	9:56 AM	10:56 AM	NB	671	65.5	69.2	507	67.9	72.7	0.76	1.04	1.05
7/19/2005	10:56 AM	11:56 AM	NB	544	65.5	69.6	490	67.9	73.2	0.90	1.04	1.05
7/19/2005	12:17 PM	1:17 PM	SB	988	65.9	69.6	423	66.1	70.7	0.43	1.00	1.02
7/19/2005	1:17 PM	2:17 PM	SB	1060	65.0	69.4	439	66.2	70.3	0.41	1.02	1.01
										Final adjustment factor (SB) -->	1.01	1.01
										Final adjustment factor (NB) -->	1.03	1.04

APPENDIX F

	Before System Installed		Drones NB & SB		Drones NB Only		Drones SB Only		No Drones	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Observations	2,814	2,822	4,998	3,467	3,422	No Data	20,323	29,180	43,916	35,554
Average Speed	67.2	64.7	***66.7***	***64.0***	***66.9***	No Data	***66.2***	***65.3***	67.0	***65.8***
85th Percentile Speed	72.7	69.6	***72.3***	***69.1***	72.6	No Data	***71.7***	***70.1***	72.6	***70.7***
Variance	31.4	28.9	20.4	19.1	20.8	No Data	20.6	23.0	21.1	22.1

Statistical Information - 90% Confidence

	Drone NB & SB (NB Lanes)			Drone NB & SB (SB Lanes)			Drone NB Only (NB Lanes)			Drone SB Only (NB Lanes)			Drone SB Only (SB Lanes)			No Drones (NB Lanes)			No Drones (SB Lanes)		
	t-calc	t-crit	sig?	t-calc	t-crit	sig?	t-calc	t-crit	sig?	t-calc	t-crit	sig?	t-calc	t-crit	sig?	t-calc	t-crit	sig?	t-calc	t-crit	sig?
Average Speed	3.803	1.645	YES	5.234	1.645	YES	2.298	1.645	YES	8.685	1.645	YES	5.957	1.645	YES	1.593	1.645	NO	13.020	1.645	YES
85th Percentile Speed	2.630	1.645	YES	4.368	1.645	YES	0.087	1.645	NO	8.624	1.645	YES	4.432	1.645	YES	0.106	1.645	NO	18.262	1.645	YES