
South Jersey Transportation Planning Organization

2005 Road Safety Audit

**Delilah Road (CR 646)
Egg Harbor Township, City Of Pleasantville, Atlantic County**



Prepared By:



Orth-Rodgers & Associates, Inc.
810 Bear Tavern Road, Suite 307
West Trenton, NJ 08628

In Association with:



June 14, 2005

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Prepared By:

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810 Bear Tavern Road, Suite 307
West Trenton, NJ 08628

In Association with:

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June 14, 2005

Introduction

The South Jersey Transportation Planning Organization (SJTPO) has retained Orth-Rodgers & Associates, Inc. (ORA) to conduct their 2005 Road Safety Audit (RSA) of five sections of roadways in southern New Jersey. The sections of roadways to be studied were selected by SJTPO based on a number of factors considered important to the safety and future development of the roadways. Among the factors considered were crash data, traffic volume growth, local cooperation and control, and recent and future development along the roadway. State highways were excluded from the process. County and local officials cooperated with SJTPO in identifying roads that met these parameters. The selection process is detailed in a report prepared by SJTPO dated November 29, 2004.

Two of the roadways are located in Atlantic County, one is in Cumberland County and two are in Salem County. The five roadway sections are:

1. English Creek Road (CR 575) between Ocean Heights Avenue (CR 559A) and Delilah Road (CR 646), in the Township of Egg Harbor, Atlantic County.
2. Delilah Road (CR 646) between the Airport Circle (at Tilton Road, CR 563) and US RT 9 in the Township of Egg Harbor and the City of Pleasantville, Atlantic County.
3. Third Street, Wheaton Avenue, and South Main Road (CR 555) between Main Street (Millville) and Sherman Avenue, in the Cities of Millville and Vineland, Cumberland County.
4. Hook Road (CR 551) between RT 49 and US RT 40 in the Townships of Pennsville and Carneys Point.
5. Richwood Road (CR 609), Swedesboro Road (CR 666), and Monroeville Road (CR 604) in the Township of Upper Pittsgrove, Salem County.

Each road will have a separate report but will share the same introduction, background format and some text.

Safety audits serve to address safe operation of roadways and to ensure a high level of safety for all road users. The process of a safety audit is two-fold: 1) to conduct a formal examination of highway features and the surrounding environment that increase the potential for crashes; and, 2) identify countermeasures that will reduce or (eliminate) the probability of such crashes. According to the Federal Highway Administration (FHWA), the formal definition of a road safety audit is as follows:

“A Road Safety Audit is the formal examination of an existing or future roadway or traffic project by an independent team of trained specialists.”¹

To accomplish these goals, the audit team assesses the crash potential and safety performance of a roadway and prepares a report that documents the safety deficiencies and appropriate countermeasures. Safety audits are especially important during the design phase of a project as they can identify deficiencies before they are built into the project and propose cost-effective safety improvements that can be adopted from the onset. Project managers can then evaluate, select, and justify appropriate project changes within the constraints of budget, time and policy issues.

The purpose of this audit is to identify potential safety deficiencies along the selected section of five roads. There are three primary parts of the audit: the data collection and evaluation phase, the field view (conducted by the team), and the preparation of the report and findings.

The data collection phase is performed prior to the audit team conducting a field view of the entire roadway. The data is intended to assist the team in identifying potential safety problems, as well as to provide a factual and historic component of the study. Traffic count and crash data

¹ Federal Highway Administration, Road Safety Audits and Road Safety Audit Reviews , EDL #12345 FHWA XX-03-999

are collected, an inventory of the traffic control devices is taken, and when deemed necessary a capacity analysis of major intersections is performed. The traffic counts were used to analyze solutions for the intersections, as well as aid in identifying the most congested sections of the roads. The crash data assists the team in identifying specific areas and/or conditions that warrant close scrutiny that might have otherwise been overlooked. The inventory of traffic control devices, in addition to documenting what traffic control devices were present before the audit began, often provides clues to safety issues that have been identified or experienced in the past. The capacity analysis of intersections identify how well the intersections are operating and when and where improvements may be needed. Based on an analysis of all data, the audit team can conduct a productive and comprehensive evaluation of the roads being studied.

Background Information

A kick-off meeting was held on January 12, 2005, at the Atlantic County Engineer's Office. This meeting featured a presentation by ORA to provide a forum to educate attendees on core elements of RSA process, such as:

1. Definition – What is involved in the typical safety audit and how it differs from other safety review measures currently in use.
2. Process – The required steps involved in a successful audit and the reasons the steps are required.
3. Lessons learned from previous audits.
4. The Draft & Final Report – What to expect.

After the formal presentation a discussion of the roadway began with the project leader asking questions of the local officials in order to obtain background information and insight into the problems on the road from the local officials. The local officials were asked what changes have occurred along the road within the last three years. What changes are planned along the road? Are there any developments planned in the area that will affect the traffic on the road? What safety problems have you had? What intersections should be counted? The attendees displayed a genuine interest in roadway safety and in participating in this audit. A typical audit team is comprised of three to five members. ORA chose to have a larger than usual audit team for this project for the following reasons:

- ♦ There was a wealth of experience that could be tapped into.
- ♦ The team did not want to discourage any effort towards achieving a safer roadway environment.

- ♦ It is hoped that greater participation will increase the likelihood that the findings of the team would be implemented.

At the end of the kick-off meeting, the RSA was scheduled for February 15, 2005 commencing at 9:00 AM. Coordinating the efforts of this relatively large group was encouraged and facilitated by Jim Mason, John Peterson, and Tim Chelius. The attendees at the kick-off meeting are listed below.

KICK-OFF MEETING ATTENDEES

Name	Agency
Jim Mason	Atlantic County - Engineering
John Pope	Egg Harbor Township Police Department
John Peterson	Atlantic County Planning
Ray Reeve	NJ Division of Highway Traffic Safety
Everest John	Atlantic County
John J. Petersack	NJDOT - Planning
Michael Gaines	Pleasantville Police Department
William Kafer	NJDOT - Traffic Engineering & Investigations
Edward Newman	Atlantic County Engineering
John Townsend	Egg Harbor Police Department
Timothy Chelius	SJTPO - Executive Director
Norman Deitch	Orth-Rodgers & Associates, Inc.
George Strathern	Orth-Rodgers & Associates, Inc.

Delilah Road

Delilah Road (CR 646) is an existing roadway that falls under the jurisdictional control of Atlantic County. Over its entire length, it is designated as a west-east road. Even though it's orientation in this study section is more north-south, the narrative will use the west-east designation. The section being audited is a major connector roadway between Tilton Road (CR 563) and RT US 9. From the traffic circle at Tilton Road to Doughty Road, it is basically a two-lane roadway with shoulders. At several locations, left-turn lanes are added and the shoulder deleted to accommodate the left-turn lane. From west of Doughty Road to east of Fire Road, it has a five-lane cross-section with a center lane for left turns. From east of Fire Road to RT US 9, it is again a basic two-lane roadway flared to three lanes at RT US 9. There are four signalized intersections along the study section. The signalized intersections are Doughty Road, Fire Road, Mill Road and RT US 9. The signal designs and operations are discussed in the findings of this report. The Garden State Parkway goes over the road, but there is not an interchange with it. Development along the road is mixed residential-commercial. The section west of Doughty Road is mostly sparsely residential and the section east of Doughty more commercial and more densely developed. Parking is not practiced along the roadway.

Local officials stated that the roadway is not just used on a daily basis by local and county residents, but also by motorists going to and from Atlantic City. Two of the major employers in the area are the Atlantic City International Airport and the adjacent Federal Aviation facility. It was noted that they have cooperated in implementing flex-time hours for their employees.

The section of Delilah Road from the circle to Westcoat Road is scheduled to be improvements next year. These improvements consist of eliminating the traffic circle, installing a traffic signal at that location, and constructing a four-lane cross-section. SJTPO is pursuing with the NJDOT the feasibility of extending this improvement to east of Westcoat Road to include that

intersection in the project as well. Therefore, the audit team addressed only short-term improvements for this section. Also, it was ascertained that an 800-unit housing development was planned along Westcoat Road and that the developer was to make a financial contribution to improving Delilah Road.

The following sections describe the various tasks undertaken by ORA in partnership with the Safety Audit Team and summarize the findings from the audit process in a manner that will allow the responsible agencies and personnel to prioritize implementation of safety enhancements.

Pre-Audit Data Collection and Analysis

Prior to the audit activities on site, ORA collected and reviewed traffic data and other related materials in order to assist the team in conducting the audit. A description of the materials that were reviewed is provided below.

1. Aerial Photos

Aerial photographs of the study section, scaled at approximately 1"=300', were printed and used as reference at kick-off and audit meetings.

2. Straight Line Plan

The straight line diagram was used as a base for 1"=400' straight line plans of the study section of the road. The crash data, traffic count and inventory of traffic control devices were shown on these plans for use at the audit and for the final report.

3. Traffic Volume Data

At the kick-off meeting, the team agreed that AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak hour manual counts would be taken at the Westcoat Road, Fire Road, and RT US 9 intersections. The count at Westcoat Road counted school buses separately. The counts were conducted by A-TECH Engineering on February 3, 2005. ORA reviewed the turning movement counts at these intersections and used the volumes to perform capacity analyses of the intersections to identify operational issues.

Intersection capacity analyses (level of service analyses) were performed using the count data. The Delilah Road and Fire Road intersection was found to be operating at an overall Level of Service 'D' during both the AM and PM peak hours, as was the intersection of RT

US 9 and Delilah Road. The intersection of Delilah Road and Westcoat Road was found to be operating an overall Level of Service 'A' during both the AM and PM peak hours.

4. Crash Data

SJTPO received and forwarded to ORA the crash reports from the Egg Harbor Township Police Department. Crash reports were not received from the Pleasantville Police Department until after the actual field audit was conducted. Summary sheets were prepared for each of the three years, as well as a combined summary sheet for the three-year period. For the three-year period, a total of 155 crashes were plotted for the study section of road. Eighty (80) of the crashes occurred in Egg Harbor Township and 75 in Pleasantville. Sixty (60) crashes occurred in 2001, 51 in 2002 and 44 in 2003, showing an overall downward trend. Eighteen (18) of the crashes occurred in the section scheduled for improvement between the circle and Westcoat Road. Another nine (9) occurred at Westcoat Road. Fourteen (14) of the crashes (12 right-angle, 1 fixed-object and 1 left-turn) occurred at the WAWA driveway located just east of Rt US 9 and are technically outside the study area.

The type of crashes are characterized as follows:

1-Fatal crash -involving a pedestrian crossing 300 feet west of Westcoat Road and a eastbound vehicle.

34 injury crashes

121 Non-Injury crashes

34 right-angle crashes – As stated above, 12 of these occurred at the WAWA driveway located east of Rt US 9. Three (3) occurred at another WAWA driveway located just east of the Tilton Road circle, four (4) at the Fire Road intersection, two (2) at the Mill Road intersection and the remaining throughout the study section of roadway.

75 same-direction type crashes were basically concentrated at the signalized intersections and at the approach to the Tilton Road circle. The New Road (RT US 9) intersection alone experienced 36 crashes, Fire Road 14, Doughty Road eight (8), and Mill Road three (3). The

statewide average for same-directional crashes on county roads is approximately 29%. This section of road had a same direction crash experience of 48%; almost double the statewide average.

16 fixed-object crashes – No concentration.

1 head-on type crash.

5 sideswipe type crashes – Three (3) eastbound approaching Fire Road.

15 left-turn crashes – Three (3) at Westcoat Road, three (3) at Mill Road, and two (2) at New Road (Rt US 9). No other concentrations.

1 pedestrian-fatal – Three hundred feet (300') west of Westcoat Road.

10 other type crashes.

An extensive review of the crashes established the following:

- ♦ The critical months for crash occurrence are February and December.
- ♦ Weekdays had a higher frequency of daily crash occurrences than did Saturday or Sunday.
- ♦ The highest frequency of crashes occurred during the evening peak (4:00-6:00 PM).
- ♦ The percentage of crashes during daylight hours is consistent with the statewide average for county roads (approximately 70%).
- ♦ The percentage of crashes for wet road conditions (20 %) is lower than the statewide average for county roads (approximately 29%).
- ♦ The percentage of crashes with injuries (22%) is lower than the statewide average for county roads (approximately 30%).
- ♦ The percentage of same directional accidents (48%) far exceeds the statewide average for county roads (approximately 29%).

- ♦ The percentage of left-turn accidents (9%) slightly exceeds the statewide average for county roads (approximately 6%).
- ♦ The percentage of fixed-object type accidents is consistent (10%) with the statewide average for county roads (approximately 12%).

5. **Other Information**

Additional materials reviewed by ORA prior to the formal audit process included video tapes from pre-audit field views and traffic signal plans and timings for each of the signalized intersections.

All the materials listed above are included in the Appendix.

Audit

On February 15, 2005, the Safety Audit Team met in the Atlantic County Engineering Offices in Northfield to formally conduct the roadway inspection. The meeting commenced at 9:00 AM with brief statements by ORA representatives who reiterated the importance of RSAs and outlined the objectives of the safety audit. There were brief introductions by team members followed by an extensive review and discussion of materials described in the previous section. The team then boarded a bus provided by Atlantic County to conduct the audit. Team members are listed below:

SAFETY AUDIT TEAM FOR DELILAH ROAD

Name	Agency
John Peterson	Atlantic County Planning
Ray Reeve	NJ Division of Highway Traffic Safety
Emory Silipigni	Pleasantville Police Department
Nancy Allen	NJDOT - Traffic Engineering & Investigations
Edward Newman	Atlantic County Engineering
John Townsend	Egg Harbor Police Department
Kourdes Castaneda	FHWA
Norman Deitch	Orth-Rodgers & Associates, Inc.
Karen Yunk	FHWA
Timothy Chelius	SJTPO - Executive Director
Bill Schiavi	SJTPO
George Strathern	Orth-Rodgers & Associates, Inc.
Peter Szwandrak	Orth-Rodgers & Associates, Inc.

The team walked the road from east to west, beginning at New Road (RT US 9) and finishing near the Tilton Road circle.

During the walk, team members identified features on the roadway and its surrounding environment that could contribute to the occurrence or relative severity of roadway crashes. At each intersection and mid-block location, the audit team identified safety deficiencies and inappropriate traffic signs and other items that are not consistent with effective road function and use. The inspection focused not only on motorists' safety issues, but also highlighted the safety needs of other user groups, such as pedestrians, bicyclists, truck drivers, and disabled pedestrians. A variety of safety improvement measures were discussed with field notes and digital photographs being taken by team members.

The audit team returned to the Atlantic County Engineering Offices to review information gathered during the roadway inspection. The Safety Audit Checklist was completed in correlation with findings from the inspection. The team leader informed other team members on the next step in the audit process; ORA will prepare a draft report summarizing the findings from the audit process and forward the report to all team members for their review and comments.

A nighttime safety audit was conducted on April 20, 2005, by Mr. Deitch, Mr. Peterson, and Mr. Strathern. The goal was to check the retroreflectivity of the street signs, pavement markings, and condition of the raised pavement markers (RPMs). In addition, the need for street lighting was checked and lights adjacent to the roadway on private property were checked to ensure that they did not create bright areas which could distract drivers. The team also looked for issues that would only be apparent during hours of darkness, such as clearly defined roadway alignment, signal indication visibility conflicts, ineffective street lighting, etc.

The next section of the report summarizes the findings from the roadway inspection, and recommended actions to correct the specific situation. The level of effort required and degree of potential safety benefit to be gained is also noted for each item.

Findings

The findings from the Delilah Road safety audit are presented in the tables on the following pages.

	SAFETY ISSUE	REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
1	Parkway sign located on the west side of RT US 9 just north of Delilah Road intersection, leaning into roadway & One Way/ Do Not Enter signs positioned improperly.	Re-install signs.	X			X		
2	Sign installation. Many if not most of the signs along the road are installed on “bendaway” rather than “breakaway” supports. Many installed as “breakaway” are installed incorrectly with the snub too far out of the ground or on the wrong side of the post.	Consideration be give to inventorying the method of sign installation for each sign along entire the road and taking steps to properly install all signs as “breakaway” in accordance with the most current NJDOT standard			X		X	
3	Twelve right-angle type crashes occurred at the driveway to the WAWA located along the north side of the road east of RT US 9. Ten of the 12 right-angle type crashes involved a westbound motorist. It appears that motorists stopped in the westbound shared through/ right-turn lane are letting motorists on the WAWA driveway enter the road who are being struck by a westbound motorist in the left-turn lane or riding in the crosshatching area to get to the left-turn lane.	Consideration be give to prohibiting left turns from the WAWA driveways onto Delilah Road. Motorists could be re-directed to turn left from the WAWA northern most driveway onto RT US 9 and then turn left at the intersection to travel east on Delilah Road. Increased enforcement of motorists riding the crosshatched area should also be considered. As an alternative, flexible delineator posts installed along the perimeter of the crosshatching should significantly reduce these crashes, but they will increase the length of back-ups.	X					X
4	Junction Rte. 9 sign assembly located along the south side of road approximately 175’ west of RT US 9 is weathered.	Replace sign.	X			X		

SAFETY ISSUE		REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
5	Chain link fence w/ stiffening pipe located on the south side of road approximately 300' to the west of the intersection of Rt US 9.	Consideration be given to contacting the property owner regarding the removal of the stiffening pipe.	X				X	
6	Sign on north side of road in front of Atlantic Welding mounted on 4 x 4 appears to be within ROW.	Notify owner of sign to remove it from ROW.	X			X		
7	Iron pipe on north side of road in front of Ziko's 2' behind curb.	Contact property owner regarding removal of pipe.	X				X	
8	Fire hydrant with concrete bollards in front of Ziko's 4 feet behind curb.	Notify property owner to remove bollards.	X				X	
9	Empty U-post in front of Harrah's Transportation Department.	Remove post.	X			X		
10	"Signal Ahead" sign with "NEW SIGNAL" plate, "Road May Be Flooded" sign and "PLEASANTVILLE HS & MS NEXT LEFT" placed too close together.	Remove "Signal Ahead" sign and "NEW SIGNAL" plate.	X			X		
		Remove "Road May Be Flooded" sign as flooding problem has been addressed.	X			X		
		Retain Pleasantville HS & MS NEXT LEFT".	X			X		
11	Harrah's/NJ Transit sign located on the south side of road east of Mill Road installed too low.	Re-install sign in accordance with MUTCD guidelines.	X			X		
12	"Reduced Speed Ahead" sign located on the south side of road between Mill Road and Rt US 9 is weathered and installed too low.	Install new sign in accordance with current MUTCD guidelines.	X			X		
13	Concrete lump adjacent to roadway located on south side of Delilah Road across from Ryder Logistics.	Remove concrete.	X				X	

SAFETY ISSUE		REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
14	Intersection of Delilah Road and Mill Road. Pavement markings worn.	Replace all pavement markings throughout intersection.	X			X		
15	Mill Road intersection is established school crossing. Signing for school crossing not up to current standards.	Install S1-1 (School Crossing) and W16-7 (Diagonal Arrow) signs on all four corners of the intersection and S1-1 (School Crossing) and W 16-9p (Ahead) signs along all four approaches to the intersection a minimum of 150' from the intersection.	X			X		
16	Mill Road mast-arm signs appear small.	Confirm lettering size is 8 inch C.	X			X		
17	Mill Road intersection. The pedestrian signal on the northwest corner of the intersection serving the crosswalk across Mill Road is not visible to pedestrians using the crosswalk.	Re-aim pedestrian signal.	X			X		
18	Worn "Welcome to Pleasantville" sign & "Crime Watch" sign located along the south side of road west of Mill Road.	Remove sign.	X			X		
19	In front of Shore Supply store (745 Delilah Road): Area landscaped with large stone, which is difficult to walk on.	Consideration be given to constructing sidewalk through this area.		X		X		
20	"New Signal" plate installed below "Signal Ahead" sign facing eastbound traffic approaching Mill Road is outdated.	Remove sign.	X			X		
21	"Road May be Flooded" sign located on south side of road across from 750 Delilah Road. Drainage problem no longer exists in this area.	Remove sign.	X			X		

	SAFETY ISSUE	REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
22	"STOP" sign and "DO NOT ENTER" sign on the westerly driveway to the Hertz Equipment Rental property are worn and the posts damaged so that the 'STOP" sign is visible to Delilah Road traffic.	Notify property owner to remove or replace signs and posts.	X			X		
23	"Entrance Only" sign and post on the Hertz Equipment Rental property easterly driveway is damaged.	Notify property owner to remove or repair sign and post.	X			X		
24	Concrete filled bollards installed at both driveways to the Harrison Beverage property appears to be within ROW.	Notify property owner to remove bollards.	X				X	
25	Non-bicycle safe inlet casting located west of 750 Delilah Road on south side of roadway.	Inlet casting to be changed to bicycle safe type.	X				X	
26	School buses are stored behind 750 Delilah Road. Driveway is narrow and radii minimal.	Consideration should be given to reconstructing driveway to accommodate turning buses.		X			X	
27	It appears that unnecessary guide rail is installed along the south side of road in front of City Supply Co located west of Margaret Avenue. Nighttime delineation of guide rail is very good.	Consideration should be given to removing guide rail and adding chevron signage for lane taper.		X			X	
28	Worn "No Parking When Road is Snow Covered" sign. Located east of Wawa driveway and west of Margaret Avenue on the south side of roadway.	Replace sign.	X			X		
29	Worn route marker sign. (Directional sign is in satisfactory condition). Located east of Wawa driveway and west of Margaret Avenue on the south side of roadway.	Replace sign.	X			X		
30	Worn STOP sign on Wawa driveway located on the south side of road east of Fire Road.	Replace sign.	X			X		

SAFETY ISSUE		REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
31	Triangular shaped vertical curbed island located on Wawa driveway referenced in item #30 does not accommodate larger type vehicles. The vertical curbing has been struck many times.	Consideration should be given to redesigning the driveway to accommodate larger vehicles. (A mountable curb design could provide a solution.)		X			X	
32	Area in front of Wawa referenced in item #30 landscaped with stone, which is difficult to walk on.	Consideration be give to constructing sidewalk through this area.		X		X		
33	Additional sign needed prohibiting left turns from the Wawa driveway referenced in item #30.	Install R3-2 (NO LEFT TURN) sign on the north side of the road facing the driveway.	X			X		
34	Eastbound lane lines worn in area east of Fire Road.	Re-install necessary lane lines up to lane taper.	X			X		
35	Fire Road traffic signal has no provisions for pedestrians, only has one over-the-roadway signal for through traffic on Delilah Road, and has no mast-arm mounted street name signs.	Install pedestrian signals, crosswalks, and PPBs at the intersection. Reposition signal heads #4 and #9 on the mast arm and install an additional signal indication for each direction of traffic on Delilah Road. Install street name signs on mast-arms.			X			X
36	Fire Road intersection signs and pavement markings in need of improvements.	Re-stripe pavement markings throughout intersection. Add handicap curb ramps to necessary locations throughout intersection. Intersection signage to be changed from "Left On Arrow Only" to" Left Turn Yield On Green Ball". Curb face on southwest corner of intersection is exposed and in need of repair.			X			X

	SAFETY ISSUE	REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
37	"Truck Route" sign on the north side of road west of Fire Road obstructing visibility of lane use sign.	Relocate "Truck Route" sign farther to the west.	X			X		
38	During the field view, members of the team were asked by two separate motorists for directions to the Social Security office which is located on Fire Road south of the intersection.	Install signs along both of the Delilah Road approaches to the intersection directing motorists to the Social Security office.	X			X		
39	Worn route marker sign assembly located just west of Fire Road on south side of roadway.	Replace sign.	X			X		
40	Missing milepost marker on north side of road just west of Fire Road.	Add necessary signage.	X			X		
41	Along north side of road, west of Fire Road- R3-9b (two-way left turn only) installed on same posts as AC International Airport, FAA technical Center and several other non-regulatory signs. The installation of regulatory signs on the same sign post as motorist advisory signs is discouraged, and in this case, simply the number of signs are too many for the motorist to read.	Remove all but R3-9b (two-way left turn only) sign. Re-install R3-9b at appropriate height and install "BEGIN" plate below it. Alternative location for non-regulatory sign could be considered.	X			X		
42	The R3-9b sign along the north side of road west of the R3-9b, referenced in item #41, should have "END" plate below it.	Install "END" plate below R3-9b sign.	X			X		
43	Missing milepost marker sign just east of Doughty Road on south side of road.	Replace sign.	X			X		
44	There are three lane use control signs facing westbound traffic approaching Doughty Road.	Remove center lane use sign.	X			X		
45	Center lane crosshatching missing east of Doughty Road at beginning and end of center left-turn lane.	Install missing pavement marking.	X			X		

SAFETY ISSUE		REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
46	Large boulders located at driveway to United Rentals along south side of road.	Contact property owner regarding moving boulders out of clear zone.	X				X	
47	Along south side of road non-bicycle safe inlet casting is located at driveway for township emergency access route.	Inlet casting to be changed to bicycle safe type.	X				X	
48	Doughty Road traffic signal has no provisions for pedestrians, only has one over-the-roadway signal for through traffic on Delilah Road.	Install pedestrian signals, crosswalks, and PPBs at the intersection. Re-position signal heads #2 and #5 on the mast arm and install an additional signal indication for each direction of traffic on Delilah Road.			X			X
49	Doughty Road traffic signal has numerous signing discrepancies.	Remove all "LEFT LANE MUST TURN LEFT" signs installed on the signal poles. Install R10-5 (LEFT ON GREEN ARROW ONLY) signs below signals #13 and #14. Replace R10-10 (LEFT TURN SIGNAL) signs installed on mast-arms next to signals #1 & #4 with R10-5 (LEFT ON GREEN ARROW ONLY) signs.		X				X

	SAFETY ISSUE	REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
50	The traffic signals at both Fire Road and Doughty Road operate as fully-actuated signals with variable cycle lengths. Operating these as semi-actuated signals on a background cycle and establishing a coordinated signal system along Delilah Road including Mill Road may reduce the frequency of vehicles having to stop along the Delilah Road approaches, which in turn should reduce the frequency of crashes at the intersections.	Consideration should be given to operating the signals on background cycles and establishing a coordinated signal system including the Fire Road intersection, the Doughty Road intersection and the Mill Road intersection.		X				X
51	Westbound traffic experiences a right lane drop west of Doughty Road. Vertical curb along the northerly side of the road tapers in narrowing the roadway before the Old (North) Doughty Road intersection. This narrowing gives the illusion that the lane drop occurs along the narrowing section of the roadway when in reality the lane drop does not occur until west of the Old (North) Doughty Road intersection. This narrowing together with the signing is confusing and counter-intuitive.	Accomplish the lane drop east of Old (North) Doughty Road. Revise the signing and pavement marking to reflect the new location of the lane drop. Remove all conflicting signs and pavement markings.		X				X
52	No guide rail protection provided adjacent to Garden State Parkway abutments.	Consideration should be given to providing guide rail protection.			X			X
53	Large "Welcome"/ Advertising sign on south side of road located just west of the Garden State Parkway is constructed with 4"x12" sign posts.	Large posts should be replaced w/ 4"x4" breakaway type signposts or existing posts drilled to breakaway standard.		X				X
54	A "Keep Right" Sign is needed on Canale Road approaching Delilah Road.	Install necessary sign.	X			X		

	SAFETY ISSUE	REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
55	Pipe outfall and associated swale exists just west Delilah Road intersection with Canale Road on the north side of roadway.	Consideration should be given to re-grading area to eliminate swale or installing guide rail .		X				X
56	A headwall exists adjacent to the eastbound lane in between Eagon Avenue & Canale Drive.	The headwall appears to be a warranted obstruction and consideration should be given to installing guide rail protection.		X				X
57	Major transmission structures (poles) exist adjacent to both the eastbound and westbound lanes in between Eagon Avenue & Canale Drive.	The two structures appear to be warranted obstructions and consideration should be given to installing guide rail protection.		X				X
58	Deteriorating roadway condition exists in front of driveway to the old flea market located between Fork Road and Eagon Avenue.	Roadway repair should be considered.		X			X	
59	A lane use control sign (R3-7) is missing from the eastbound lane of Delilah Road just to the east of the Fork Road intersection.	Install missing sign.	X			X		
60	“VEHICLES ENTERING ROADWAY” sign along the north side of the road east of Westcoat Road. Non-standard sign that does not serve a specific need.	Remove “VEHICLES ENTERING ROADWAY” sign.	X			X		
61	Curbing & re-grading is needed at the northeast corner of the Delilah Road intersection with Westcoat Road.	Repair as necessary.		X		X		
62	The incorrect guide rail end treatment is being used at the northwest corner of Westcoat Road.	Update guide rail end treatment.		X			X	
63	Airport sign (I-5) is improperly displayed at Delilah Road intersection with Westcoat Road.	Sign should be re-oriented 90 degrees – Plane should point to same direction as arrow.	X			X		

	SAFETY ISSUE	REMEDIAL ACTION	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
			LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
64	Redundant lane use control signing facing eastbound traffic approaching Westcoat Drive.	Remove existing lane use signs and install one "LEFT LANE MUST TURN LEFT" sign at intersection and another at the beginning of left turn lane.	X			X		
65	General Comment: All crossroad and side road warning signs should have supplemental street name plates below them on same post.		X			X		
66	Night safety audit found the following;	1. Contact property owner to re-align fixture, re-inspect after corrected.	X			X		
	1. Luminare in front of 6634 Delilah Road is bothersome to eastbound motorists.	2. Contact property owner to re-align fixtures, re-inspect after corrected.	X			X		
	2. Luminare in front and on the sides of 6587 is bothersome to eastbound motorists.	3. Consider installing luminare at Doughty Road intersection.		X			X	
	3. No luminare at the Doughty Road intersection.	4. Consideration should be given to requesting that the bus company find another location to store the buses overnight.	X				X	
	4. Two school buses park overnight along the westbound side of the road opposite Third Street. Westbound traffic experiences a non-critical horizontal left hand curve along that section of road. The buses appear to be parked off of the county ROW on private property.							

Recommendation Summary

As stated earlier, the intent of the road safety audit process is to conduct a formal examination of highway features and surrounding environment that increase the potential for crashes and identify countermeasures that will reduce (or eliminate) the probability of such crashes. The safety issues identified during the conduct of this audit and included in this report have been organized to provide the convenience and flexibility necessary to allow the implementation of the safety improvements as time and budget limitations allow. To the extent possible, the findings have been separated into line items so that the improvements can be implemented independently or grouped as appropriate. Clearly, consolidating a number of the safety recommendations will reduce the overall cost of improvements. We recommend that the appropriate management staff review the findings and decide what items can be completed in the immediate (within 1 year) future. This Road Safety Audit project revealed a number of problematic issues in the study area. Many of the deficiencies can be corrected in the short term if the roadway owners dedicate both the time and financial resources to the task. Other findings, such as the redesign of the traffic signals, require a greater expenditure of both time and resources. The Level of Effort indicated on the finding sheets of the report represent the team's best effort at categorizing each item.

As with all traffic studies, some of the crash experience on the roadway has no obvious solution. The most significant is the number of same-directional type crashes at the Rt US 9 intersection. Traffic signals generally eliminate right-angle type crashes and cause same-directional type crashes. The number (36) of same-directional accidents at this intersection was unexpected. The signal design meets current MUTCD standards, with 12" signal indications and two over-the-roadway indications over all approaches to the intersection. Visibility of traffic signal heads is unrestricted. Intersections operating at or over capacity generally experience long queues and operate at low speeds during the hours of congestion. While long queues can contribute to the

number of same directional crashes at an intersection, the number at this intersection still exceeds expectations.

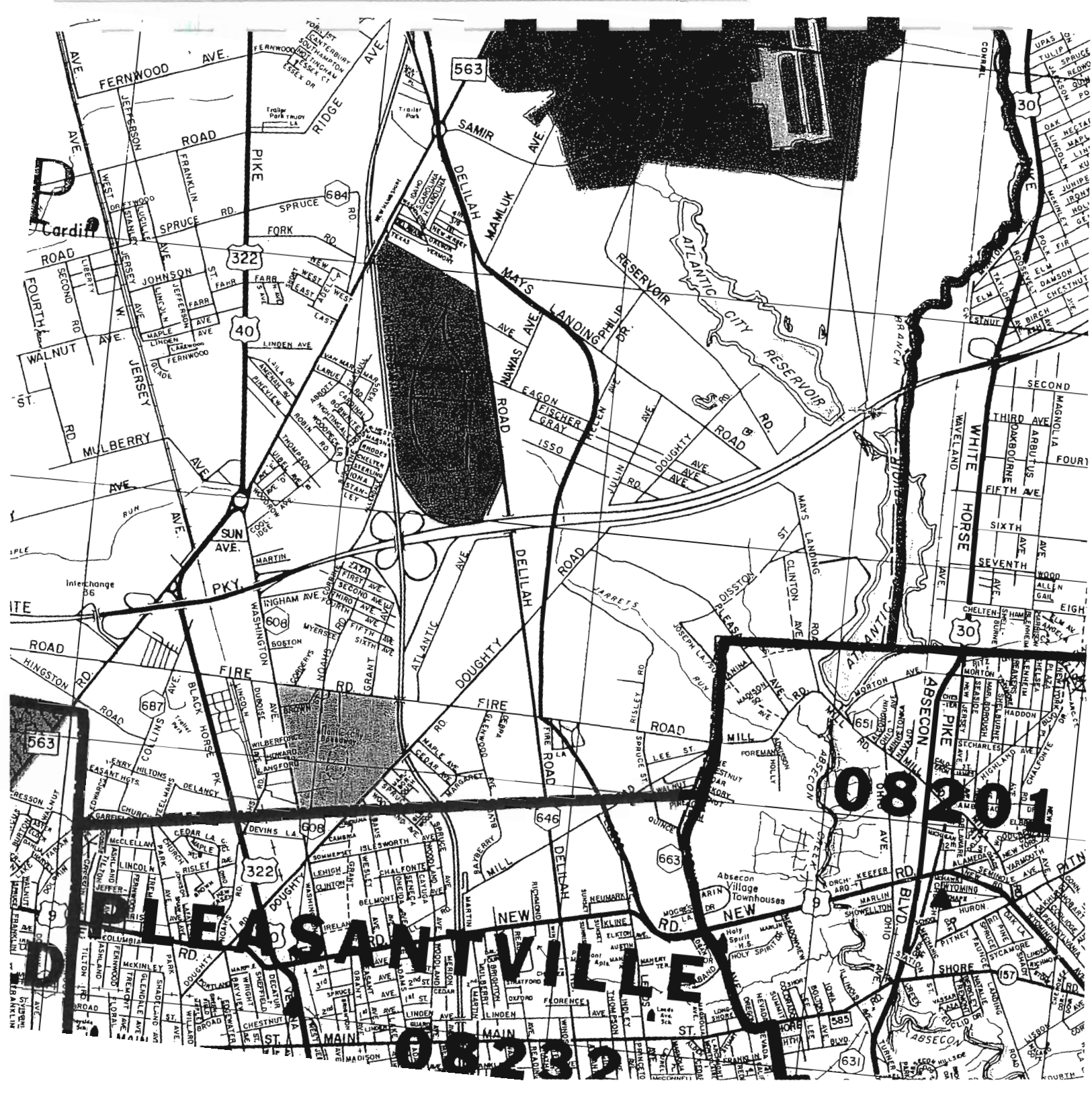
The safety audit focused on roadway features on this road. However, as with any road, enforcement is a crucial component of safety. Without proper enforcement, motorists may become lax in obeying and observing the traffic regulations along the road. This disobedience contributes to the crash experience. Unfortunately, since 9-11, police departments throughout the country have been stretched to their limits by additional demands for their services. Local officials are reminded that no number of safety audits or improvements is a substitute for enforcement. Just as resources must be allocated to the physical improvements of the road, so must they be allocated to enforcement.

Overall, most of the crashes along this roadway are concentrated at the signalized intersections. It is felt that motorists will benefit the most from implementing the recommendations for the WAWA driveway (Item #3) and upgrading the traffic signal installations and establishing a coordinated signal system, as recommended in the findings of this report.

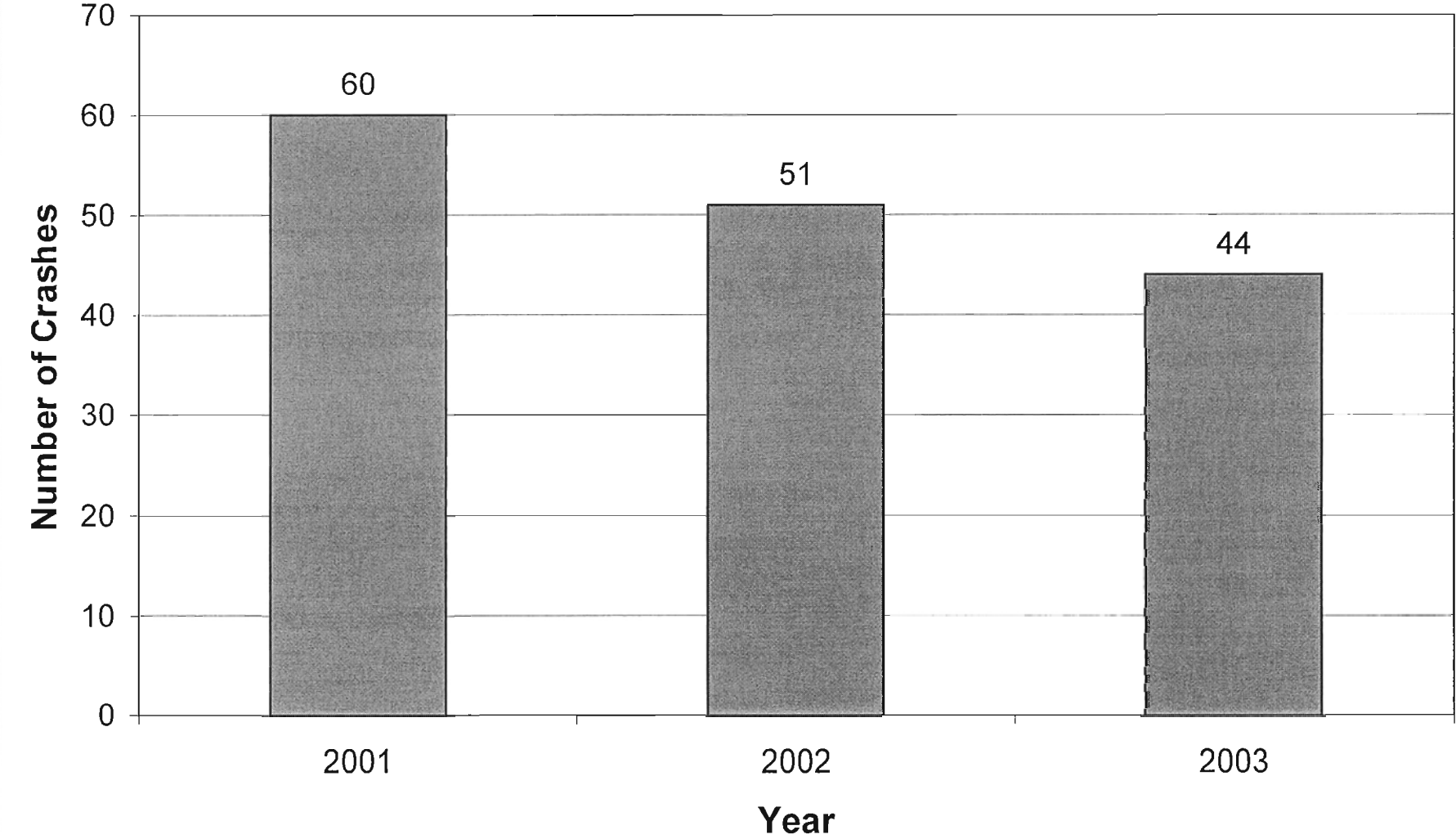
The opinions found in the findings of this Safety Audit report are those of the Safety Audit Team, as a whole, and not necessarily the opinions of the SJTPO or the individual team members.

Appendix

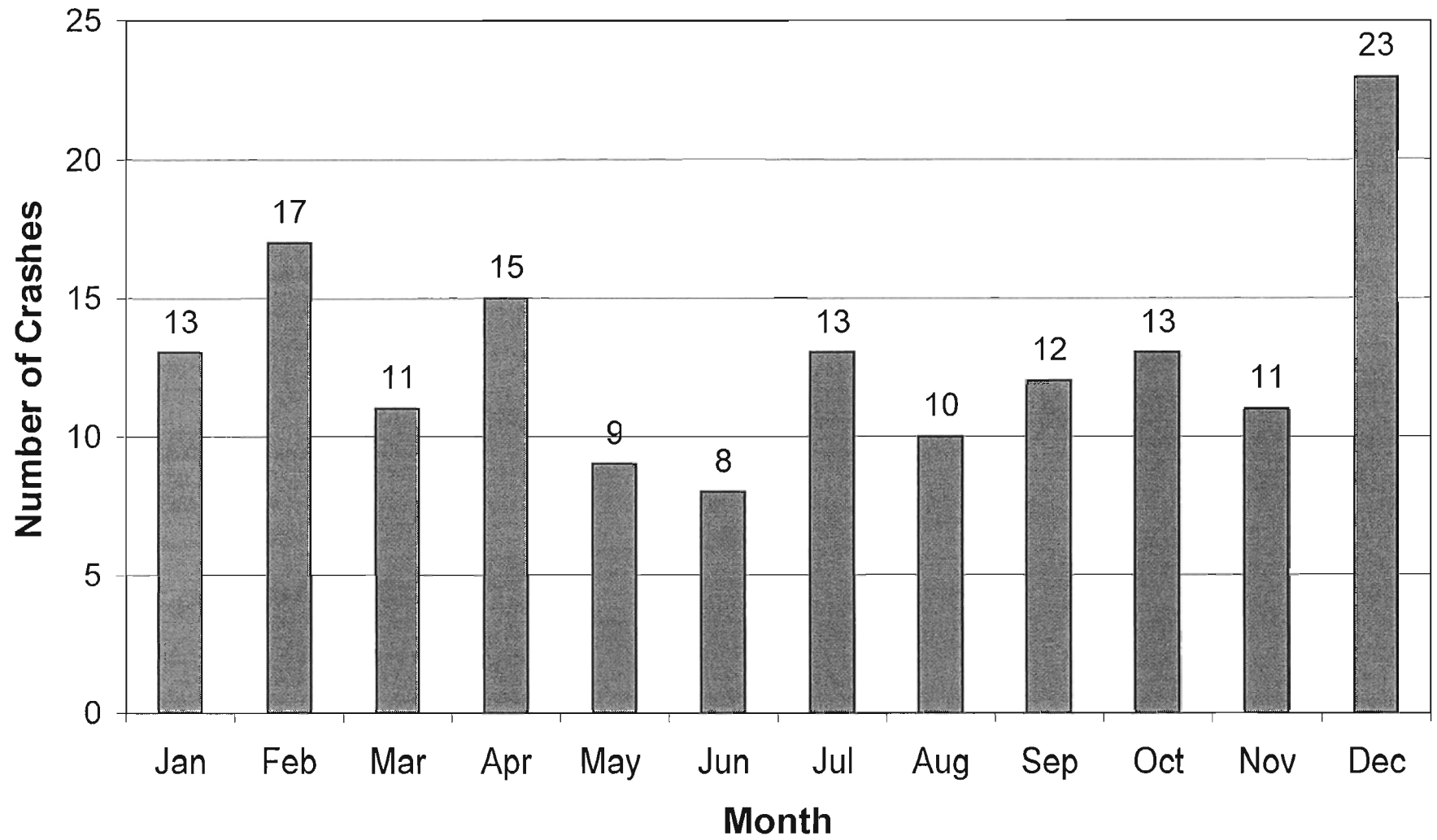
- Street Map of audited section of road.
- Straight-line plan on which are plotted crashes, existing traffic control devices, traffic volumes, level of service.
- Crash Data Summary Sheets
- Crash Data Charts
- Photographs
- Checklists



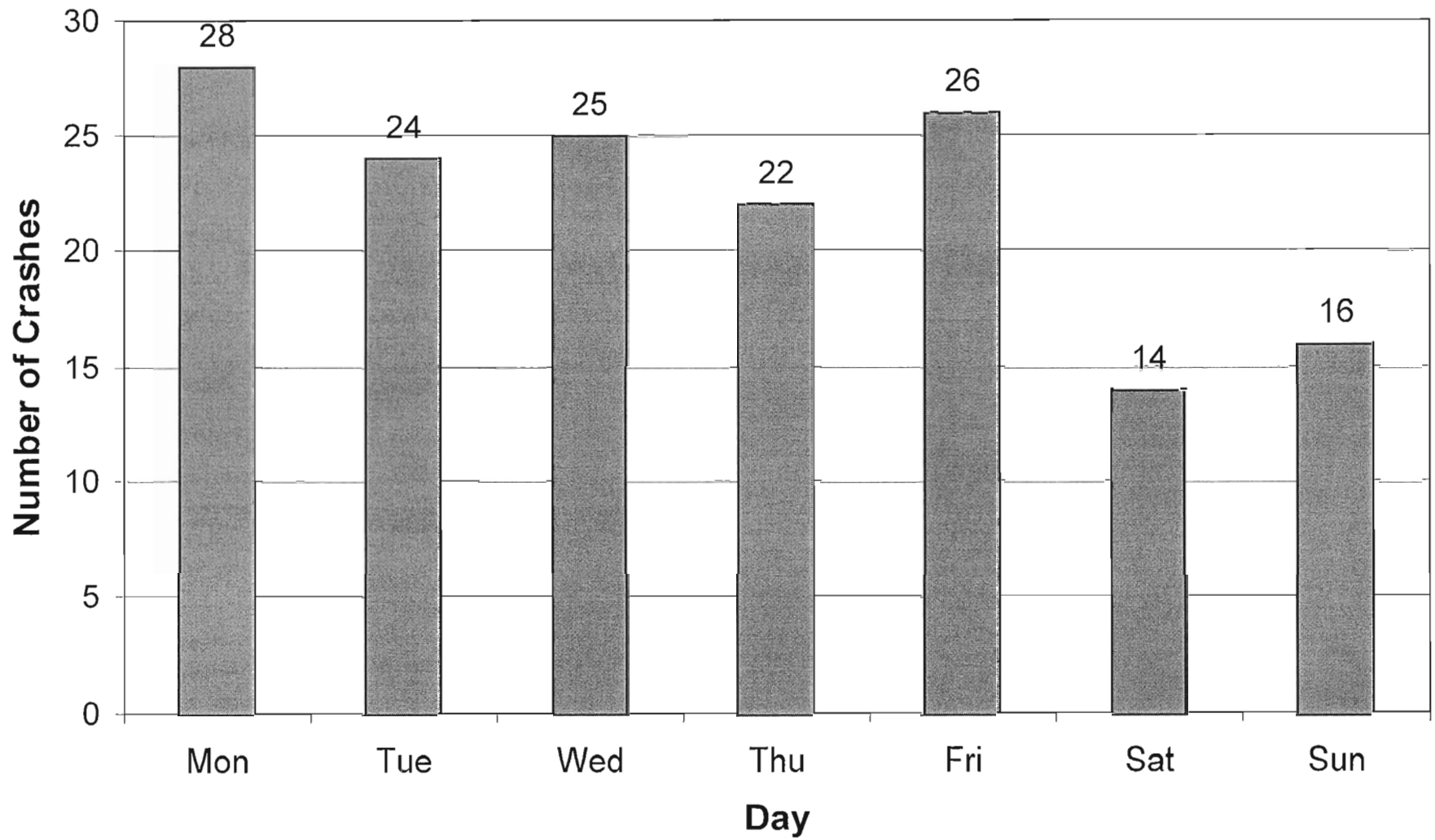
Delilah Road - 3 Year Trend



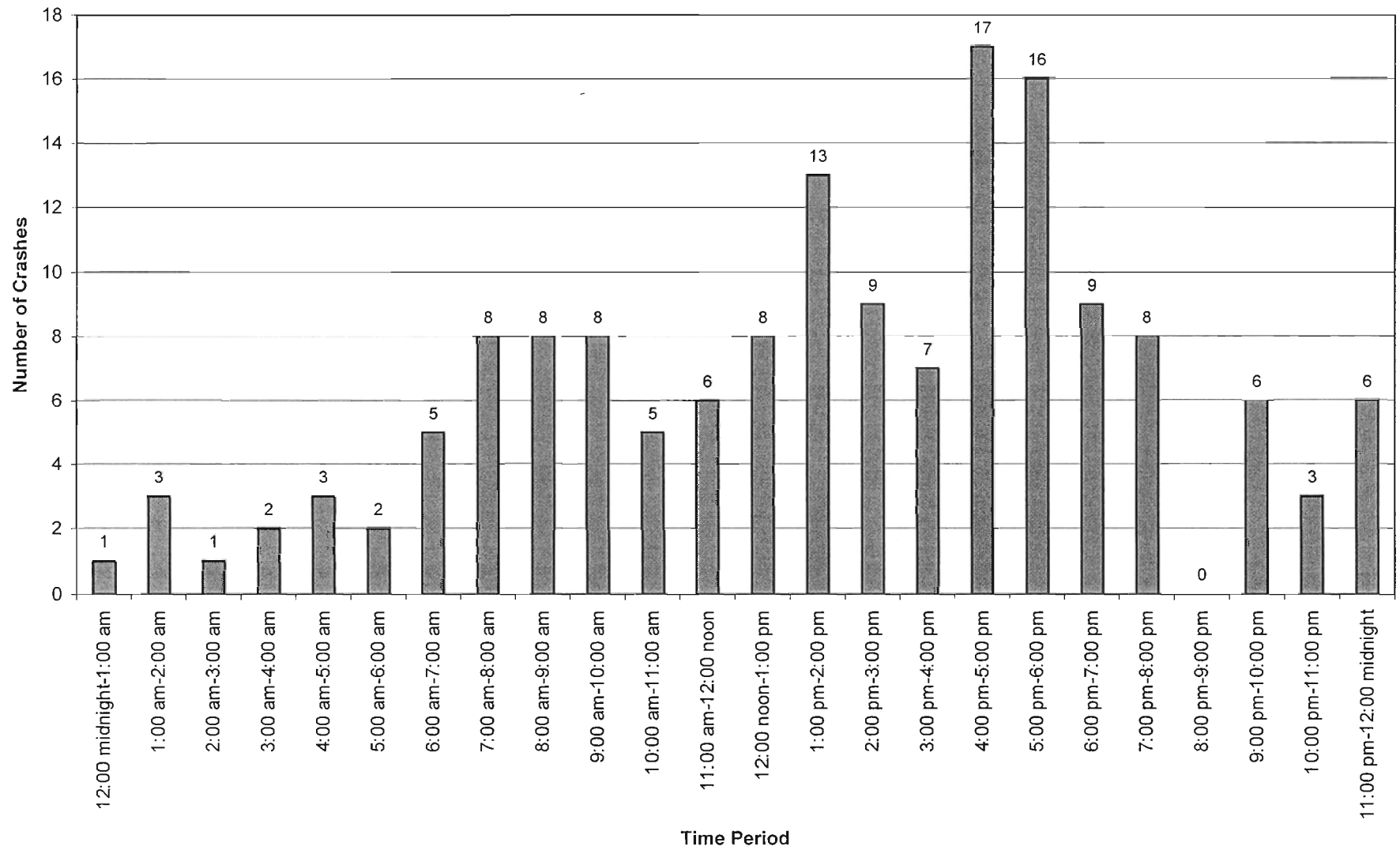
Delilah Road - Crash Occurrence by Month



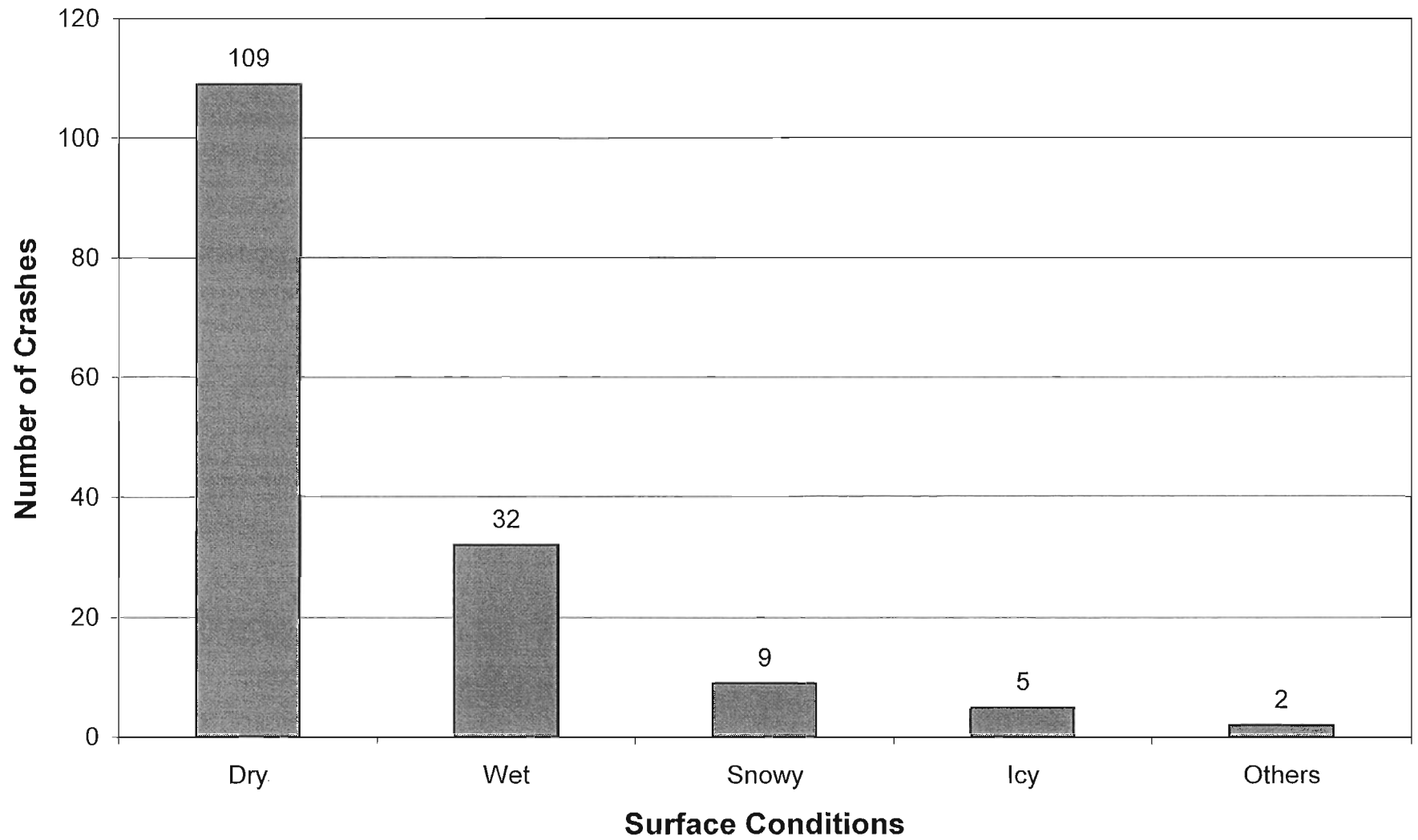
Delilah Road - Crash Occurrence by Day of Week



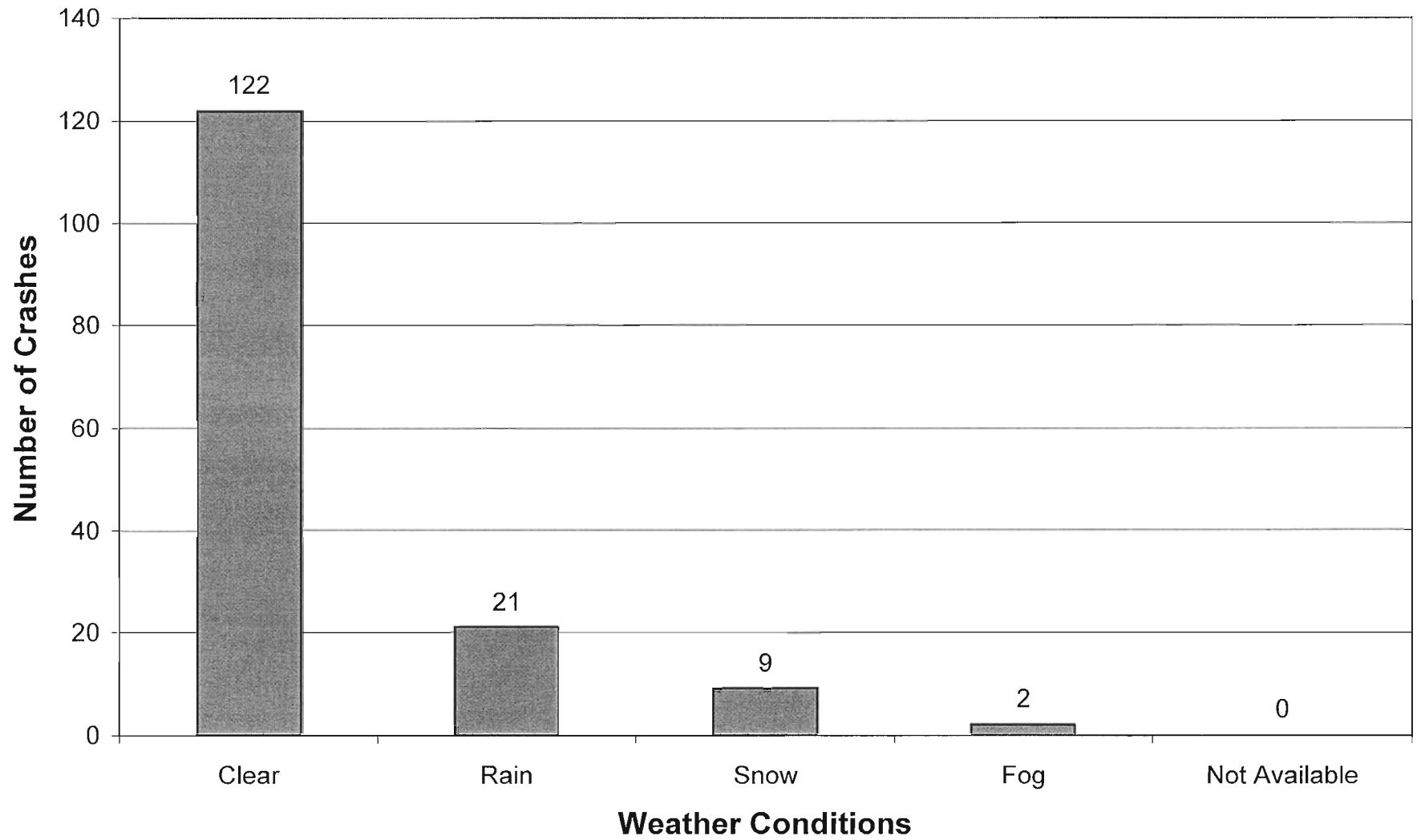
Delilah Road - Crash Occurrence by Time of Day



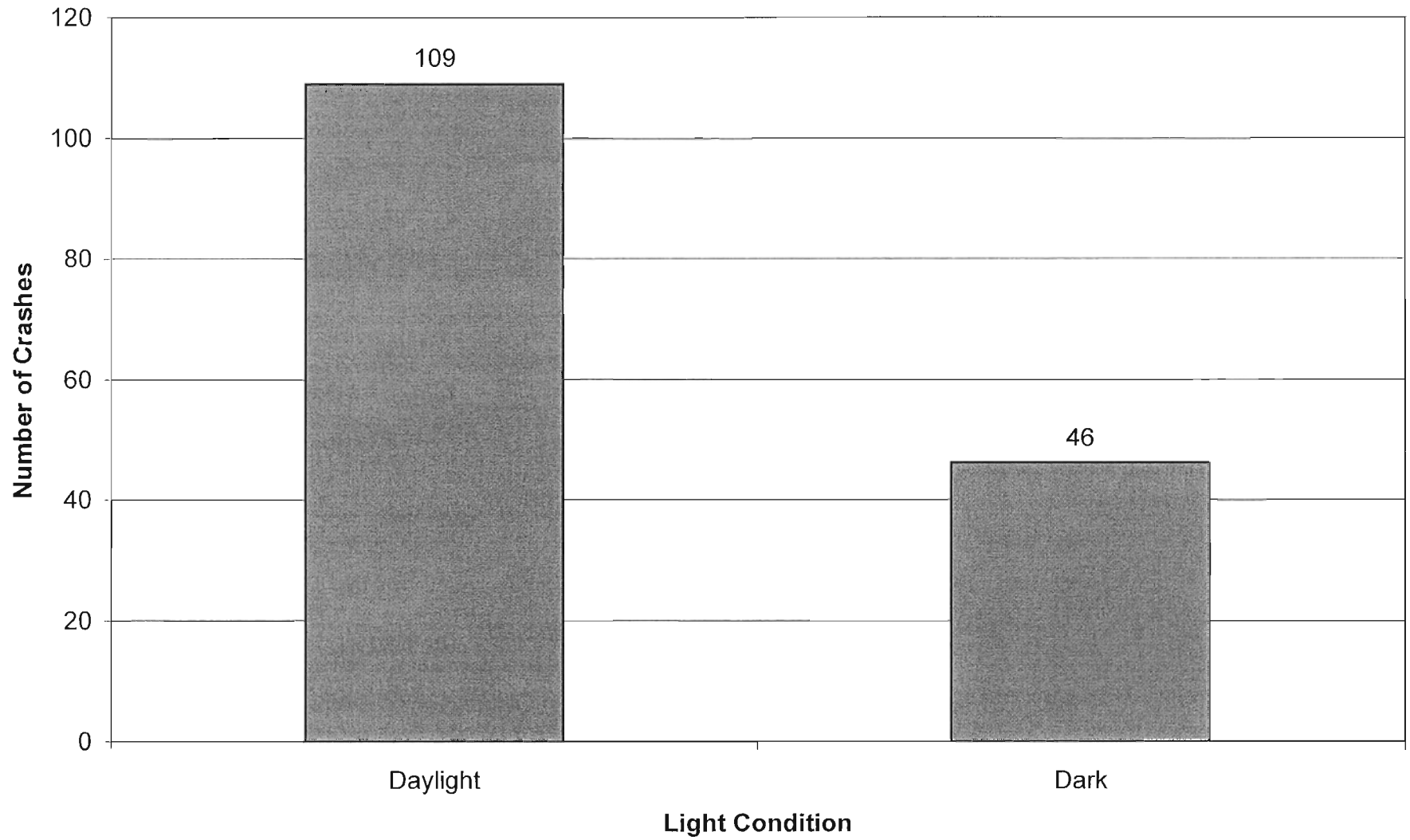
Delilah Road - Crash Occurrence by Surface Conditions



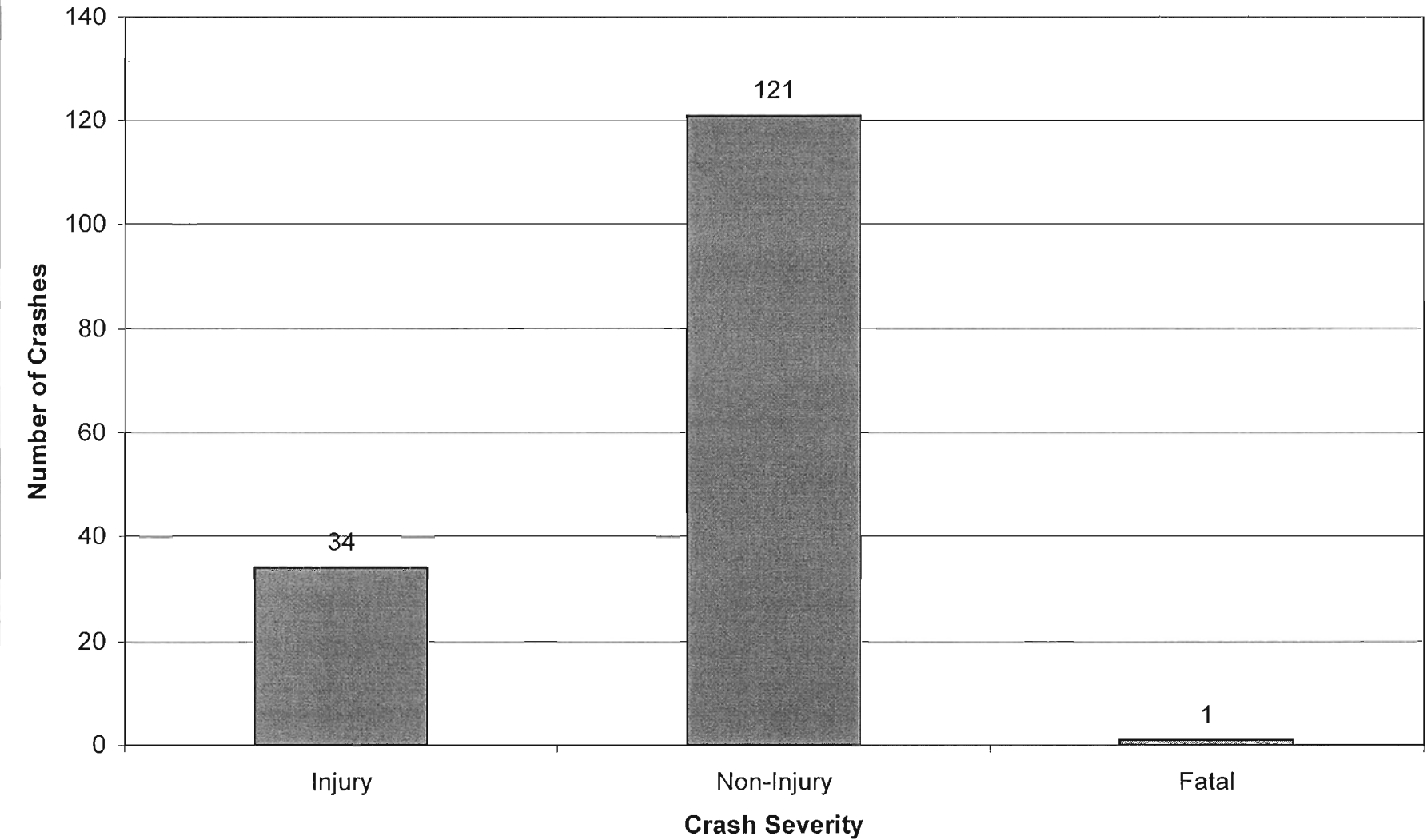
Delilah Road - Crash Occurrence by Weather Conditions



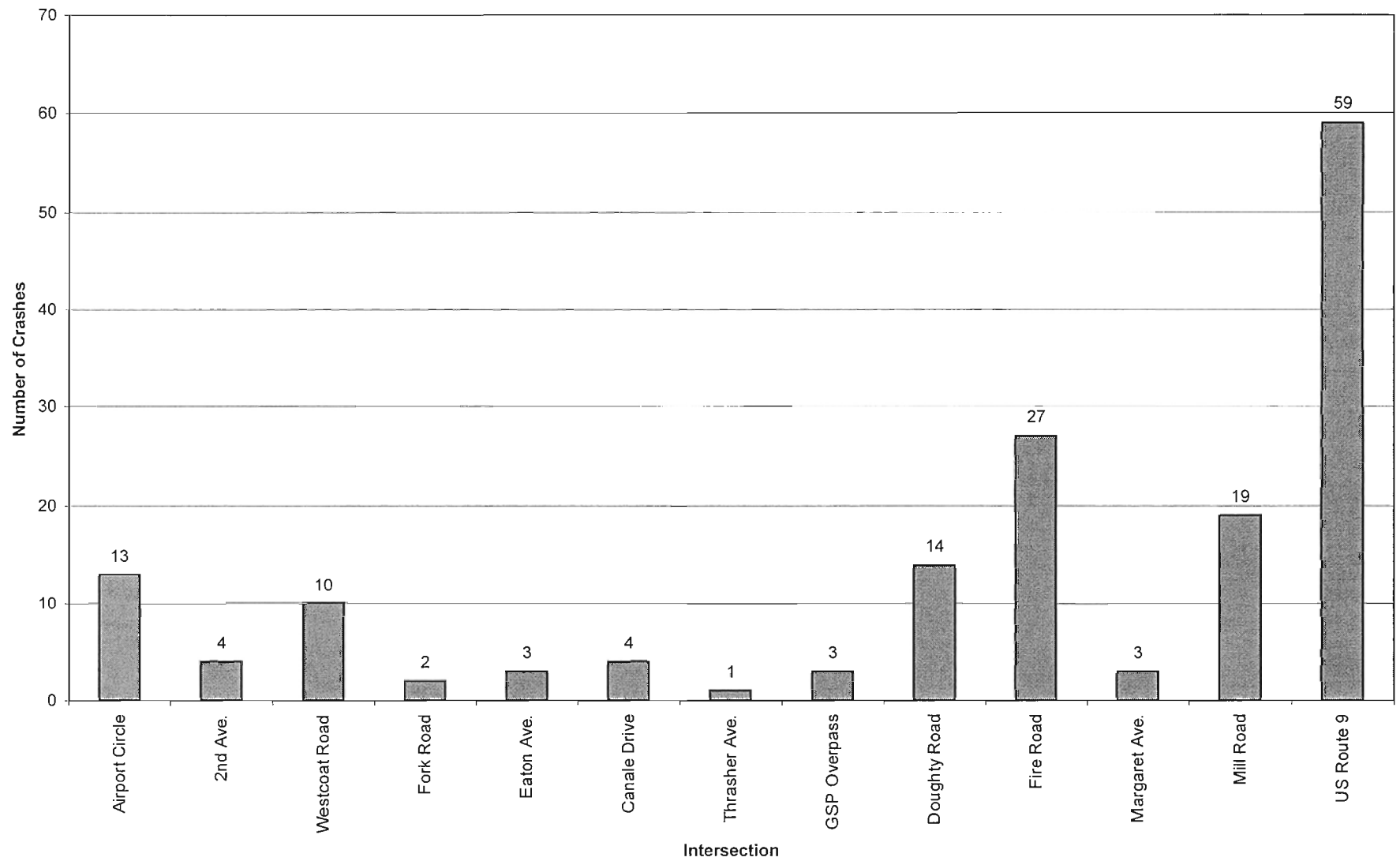
Delilah Road - Crash Occurrence by Light Condition



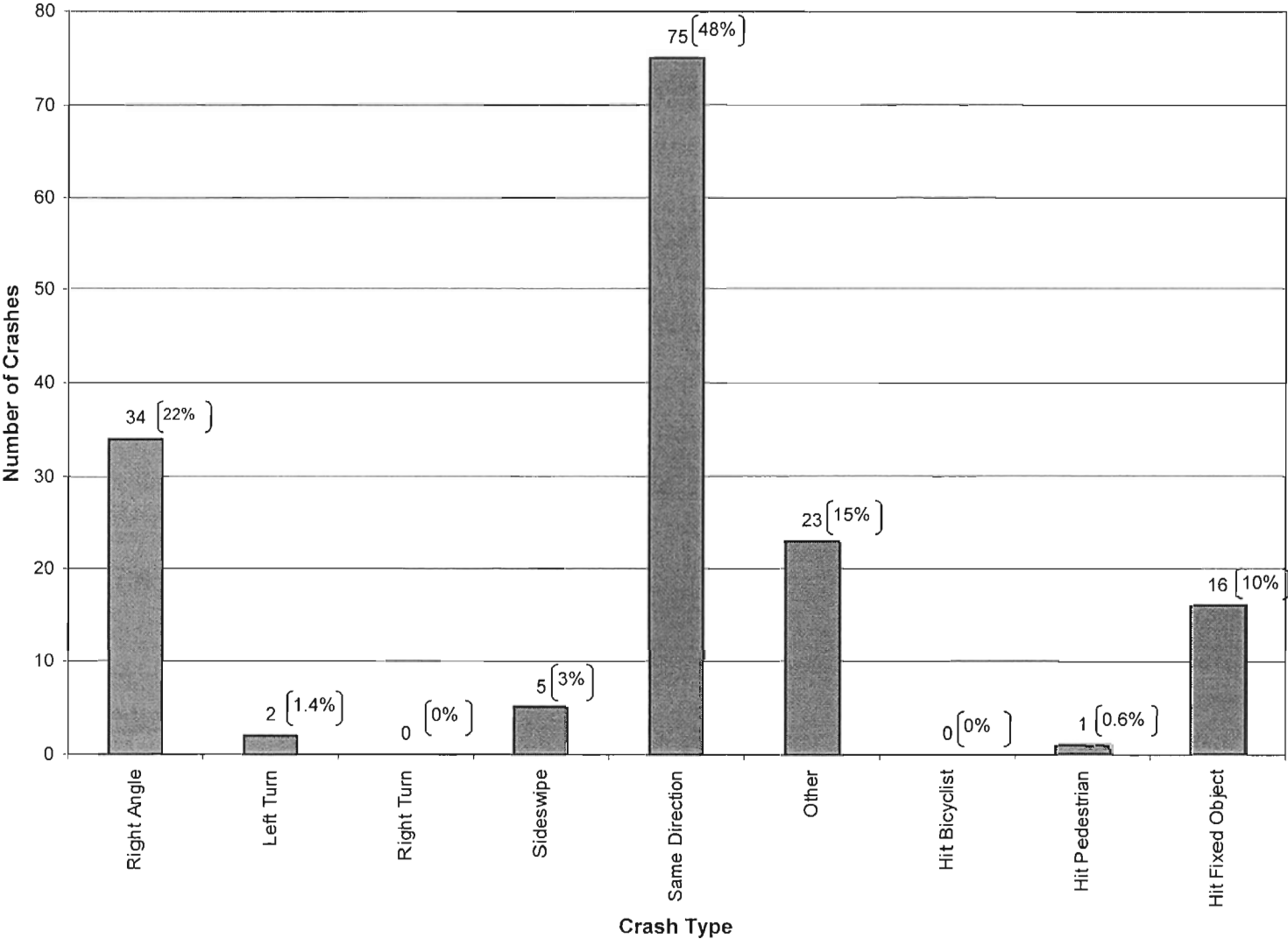
Delilah Road - Crash Severity



Delilah Road - Spot Location of Crashes (Proximity to Nearest Intersection)



Delilah Road - Crash Type



DELILAH ROAD
ACCIDENT SUMMARY 2001-2003
TOTAL-155 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>13</u>	<u>17</u>	<u>11</u>	<u>15</u>	<u>9</u>	<u>8</u>	<u>13</u>	<u>10</u>	<u>12</u>	<u>13</u>	<u>11</u>	<u>23</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	1	12:00-1300	8	Monday	28
1:00 – 2:00	3	1300-1400	13	Tuesday	24
2:00 – 3:00	1	1400-1500	9	Wednesday	25
3:00 – 4:00	2	1500-1600	7	Thursday	22
4:00 – 5:00	3	1600-1700	17	Friday	26
5:00 – 6:00	2	1700-1800	16	Saturday	14
6:00 – 7:00	5	1800-1900	9	Sunday	16
7:00 – 8:00	8	1900-2000	8		
8:00 – 9:00	8	2000-2100	0		
9:00 – 10:00	8	2100-2200	6		
10:00 – 11:00	5	2200-2300	3		
11:00 – 12 Noon	6	2300-2400	6		

Accident Caused By

Local Resident 43 County Resident 80 State Resident 17 Out-of-State Resident 10 Unknown 6

DAY 109
NIGHT 46

DRY 109 WET 32 SNOWY 7 ICY 5 OTHERS 2

CLEAR 122 RAIN 21 SNOW 9 FOG 2

INJURY 34 NON-INJURY 121 FATAL 1

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
34	75	2	0	5

Fixed Object	Head On	Other	Pedestrian	Bike
16	1	23	1 (FATAL)	0

Parking Related 0

DELILAH ROAD
ACCIDENT SUMMARY 2001-2003
EGG HARBOR TOWNSHIP
TOTAL-80 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>8</u>	<u>12</u>	<u>4</u>	<u>7</u>	<u>6</u>	<u>3</u>	<u>5</u>	<u>5</u>	<u>7</u>	<u>7</u>	<u>6</u>	<u>10</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	1	12:00-1300	7	Monday	13
1:00 – 2:00	0	1300-1400	8	Tuesday	17
2:00 – 3:00	1	1400-1500	6	Wednesday	12
3:00 – 4:00	1	1500-1600	3	Thursday	12
4:00 – 5:00	1	1600-1700	9	Friday	12
5:00 – 6:00	1	1700-1800	12	Saturday	9
6:00 – 7:00	3	1800-1900	5	Sunday	5
7:00 – 8:00	4	1900-2000	3		
8:00 – 9:00	4	2000-2100	0		
9:00 – 10:00	3	2100-2200	2		
10:00 – 11:00	1	2200-2300	1		
11:00 – 12 Noon	2	2300-2400	2		

Accident Caused By

Local Resident 12 County Resident 54 State Resident 10 Out-of-State Resident 2 Unknown 2

DAY 61

NIGHT 19

DRY 51 WET 17 SNOWY 7 ICY 3 OTHERS 2

CLEAR 59 RAIN 12 SNOW 8 FOG 0

INJURY 21 NON-INJURY 58 FATAL 1

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
17	33	0	0	2

Fixed Object	Head On	Other	Pedestrian	Bike
12	1	15	1 (FATAL)	0

Parking Related 0

DELILAH ROAD
(Pleasantville Township)
ACCIDENT SUMMARY 2001-2003
TOTAL-75 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>5</u>	<u>5</u>	<u>7</u>	<u>8</u>	<u>3</u>	<u>5</u>	<u>8</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>5</u>	<u>13</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	0	12:00-1300	1	Monday	15
1:00 – 2:00	3	1300-1400	5	Tuesday	7
2:00 – 3:00	0	1400-1500	3	Wednesday	13
3:00 – 4:00	1	1500-1600	4	Thursday	10
4:00 – 5:00	2	1600-1700	8	Friday	14
5:00 – 6:00	1	1700-1800	4	Saturday	5
6:00 – 7:00	2	1800-1900	4	Sunday	11
7:00 – 8:00	4	1900-2000	5		
8:00 – 9:00	4	2000-2100	0		
9:00 – 10:00	5	2100-2200	4		
10:00 – 11:00	4	2200-2300	2		
11:00 – 12 Noon	4	2300-2400	4		

Accident Caused By

Local Resident 31 County Resident 26 State Resident 7 Out-of-State Resident 8 Unknown 4

DAY 48

NIGHT 27

DRY 58 WET 15 SNOWY 0 ICY 2 OTHERS 0

CLEAR 63 RAIN 9 SNOW 1 FOG 2

INJURY 13 NON-INJURY 63 FATAL 0

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
17	42	2	0	3

Fixed Object	Head On	Other	Pedestrian	Bike
4	0	7	0	0

Parking Related 0

DELILAH ROAD
(Egg Harbor Township)
ACCIDENT SUMMARY 2003
TOTAL-21 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>2</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>3</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	0	12:00-1300	1	Monday	2
1:00 – 2:00	0	1300-1400	2	Tuesday	4
2:00 – 3:00	0	1400-1500	4	Wednesday	3
3:00 – 4:00	1	1500-1600	1	Thursday	3
4:00 – 5:00	1	1600-1700	3	Friday	4
5:00 – 6:00	0	1700-1800	2	Saturday	2
6:00 – 7:00	0	1800-1900	1	Sunday	3
7:00 – 8:00	1	1900-2000	1		
8:00 – 9:00	0	2000-2100	0		
9:00 – 10:00	1	2100-2200	1		
10:00 – 11:00	0	2200-2300	0		
11:00 – 12 Noon	0	2300-2400	1		

Accident Caused By

Local Resident 3 County Resident 15 State Resident 2 Out-of-State Resident 0 Unknown 1

DAY 14

NIGHT 7

DRY 12 WET 6 SNOWY 0 ICY 3 OTHERS _____

CLEAR 14 RAIN 7 SNOW 0 FOG 0 _____

INJURY 5 NON-INJURY 16

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
6	8	0	0	0

Fixed Object	Head On	Other	Pedestrian	Bike
3	1	4	0	0

Parking Related 0

DELILAH ROAD
(Pleasantville Township)
ACCIDENT SUMMARY 2003
TOTAL-23 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>2</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>8</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	0	12:00-1300	1	Monday	3
1:00 – 2:00	0	1300-1400	0	Tuesday	2
2:00 – 3:00	0	1400-1500	1	Wednesday	4
3:00 – 4:00	1	1500-1600	3	Thursday	6
4:00 – 5:00	1	1600-1700	1	Friday	4
5:00 – 6:00	0	1700-1800	3	Saturday	0
6:00 – 7:00	0	1800-1900	1	Sunday	4
7:00 – 8:00	1	1900-2000	2		
8:00 – 9:00	2	2000-2100	0		
9:00 – 10:00	2	2100-2200	0		
10:00 – 11:00	1	2200-2300	1		
11:00 – 12 Noon	1	2300-2400	1		

Accident Caused By

Local Resident 9 **County Resident** 9 **State Resident** 2 **Out-of-State Resident** 1 **Unknown** 2

DAY 15

NIGHT 8

DRY 18 **WET** 4 **SNOWY** 0 **ICY** 1 **OTHERS** 0

CLEAR 20 **RAIN** 3 **SNOW** 0 **FOG** 0

INJURY 6 **NON-INJURY** 17 **FATAL** 0

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
9	11	0	0	1

Fixed Object	Head On	Other	Pedestrian	Bike
1	0	1	0	0

Parking Related 0

DELILAH ROAD
(Egg Harbor Township)
ACCIDENT SUMMARY 2002
TOTAL-33 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>4</u>	<u>7</u>	<u>1</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>2</u>	<u>5</u>

Time of Day				Day of Week	
AM Midnight - Noon	Number of Accidents	PM Noon - Midnight	Number of Accidents		Number of Accidents
Midnight – 1:00	1	12:00-1300	4	Monday	7
1:00 – 2:00	0	1300-1400	1	Tuesday	6
2:00 – 3:00	1	1400-1500	0	Wednesday	7
3:00 – 4:00	0	1500-1600	1	Thursday	4
4:00 – 5:00	0	1600-1700	4	Friday	2
5:00 – 6:00	1	1700-1800	6	Saturday	5
6:00 – 7:00	0	1800-1900	3	Sunday	2
7:00 – 8:00	1	1900-2000	1		
8:00 – 9:00	3	2000-2100	0		
9:00 – 10:00	1	2100-2200	1		
10:00 – 11:00	1	2200-2300	1		
11:00 – 12 Noon	1	2300-2400	1		

Accident Caused By

Local Resident 5 **County Resident** 21 **State Resident** 6 **Out-of-State Resident** 0 **Unknown** 1

DAY 24

NIGHT 9

DRY 18 **WET** 8 **SNOWY** 5 **ICY** 0 **OTHERS** 2

CLEAR 24 **RAIN** 4 **SNOW** 5 **FOG** 0

INJURY 13 **NON-INJURY** 20

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
5	17	0	0	0

Fixed Object	Head On	Other	Pedestrian	Bike
4	0	7	0	0

Parking Related 0

DELILAH ROAD
(Pleasantville Township)
ACCIDENT SUMMARY 2002
TOTAL-18 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>2</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>4</u>	<u>4</u>	<u>0</u>	<u>0</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	0	12:00-1300	0	Monday	4
1:00 – 2:00	2	1300-1400	2	Tuesday	1
2:00 – 3:00	0	1400-1500	0	Wednesday	5
3:00 – 4:00	0	1500-1600	0	Thursday	1
4:00 – 5:00	0	1600-1700	5	Friday	0
5:00 – 6:00	0	1700-1800	1	Saturday	3
6:00 – 7:00	0	1800-1900	0	Sunday	4
7:00 – 8:00	0	1900-2000	1		
8:00 – 9:00	2	2000-2100	0		
9:00 – 10:00	0	2100-2200	1		
10:00 – 11:00	1	2200-2300	1		
11:00 – 12 Noon	1	2300-2400	1		

Accident Caused By

Local Resident 12 County Resident 4 State Resident 1 Out-of-State Resident 1 Unknown 0

DAY 11

NIGHT 7

DRY 12 WET 5 SNOWY 0 ICY 1 OTHERS 0

CLEAR 14 RAIN 3 SNOW 1 FOG 0

INJURY 1 NON-INJURY 17 FATAL 0

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
<u>4</u>	<u>9</u>	<u>2</u>	<u>0</u>	<u>0</u>

Fixed Object	Head On	Other	Pedestrian	Bike
<u>1</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>

DELILAH ROAD
(Egg Harbor Township)
ACCIDENT SUMMARY 2001
TOTAL-26 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>2</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>3</u>	<u>2</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	0	12:00-1300	2	Monday	4
1:00 – 2:00	0	1300-1400	5	Tuesday	7
2:00 – 3:00	0	1400-1500	2	Wednesday	2
3:00 – 4:00	0	1500-1600	1	Thursday	5
4:00 – 5:00	0	1600-1700	2	Friday	6
5:00 – 6:00	0	1700-1800	4	Saturday	2
6:00 – 7:00	3	1800-1900	1	Sunday	0
7:00 – 8:00	2	1900-2000	1		
8:00 – 9:00	1	2000-2100	0		
9:00 – 10:00	1	2100-2200	0		
10:00 – 11:00	0	2200-2300	0		
11:00 – 12 Noon	1	2300-2400	0		

Accident Caused By

Local Resident 4 County Resident 18 State Resident 2 Out-of-State Resident 2 Unknown 0

DAY 23

NIGHT 3

DRY 21 WET 3 SNOWY 2 ICY 0 OTHERS 0

CLEAR 21 RAIN 1 SNOW 3 FOG 0

INJURY 3 NON-INJURY 22 FATAL 1

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
6	8	0	0	2

Fixed Object	Head On	Other	Pedestrian	Bike
5	0	5	1(FATAL)	0

Parking Related 0

DELILAH ROAD
(Pleasantville Township)
ACCIDENT SUMMARY 2001
TOTAL-34 ACCIDENTS
Month

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<u>1</u>	<u>3</u>	<u>6</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>5</u>	<u>5</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>5</u>

Time of Day				Day of Week	
AM	Number of	PM	Number of		Number of
Midnight - Noon	Accidents	Noon - Midnight	Accidents		Accidents
Midnight – 1:00	0	12:00-1300	0	Monday	8
1:00 – 2:00	1	1300-1400	3	Tuesday	4
2:00 – 3:00	0	1400-1500	2	Wednesday	4
3:00 – 4:00	0	1500-1600	1	Thursday	3
4:00 – 5:00	1	1600-1700	3	Friday	10
5:00 – 6:00	1	1700-1800	0	Saturday	2
6:00 – 7:00	2	1800-1900	3	Sunday	3
7:00 – 8:00	3	1900-2000	2		
8:00 – 9:00	0	2000-2100	0		
9:00 – 10:00	3	2100-2200	3		
10:00 – 11:00	2	2200-2300	0		
11:00 – 12 Noon	2	2300-2400	2		

Accident Caused By

Local Resident 11 County Resident 11 State Resident 4 Out-of-State Resident 6 Unknown 2

DAY 22
NIGHT 12

DRY 28 WET 6 SNOWY 0 ICY 0 OTHERS 0

CLEAR 29 RAIN 3 SNOW 0 FOG 2

INJURY 6 NON-INJURY 28 FATAL 0

Right Angle	Same Direction	Left Turn	Right Turn	Side Swipe
4	22	0	0	2

Fixed Object	Head On	Other	Pedestrian	Bike
2	0	4	0	0

Parking Related 0

SJTPO Safety Audits



P1010051.JPG



P1010052.JPG



P1010053.JPG



P1010054.JPG

Delilah Road

SJTPO Safety Audits



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Delilah Road

SJTPO Safety Audits



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pv1.JPG

Delilah Road

SJTPO Safety Audits



pv10.JPG



pv11.JPG



pv12.JPG



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Delilah Road

SJTPO Safety Audits



pv2 .JPG



pv3 .JPG



pv4 .JPG



pv5 .JPG

Delilah Road

SJTPO Safety Audits



pv6.JPG



pv7.JPG



pv8.JPG



pv9.JPG

Delilah Road

Route _____

Date _____

Safety Audit Stage 5**Operation/Existing Roads****Checklist 5-1****General Topics**

Item	Issues to be Considered	Check	Comments
1 Landscaping	Is landscaping in accordance with guidelines (e.g., clearances, sight distance)?		
	Are required clearances and sight distances not likely to be restricted following future plant growth (landscaping and natural)?		
2 Parking	Are provisions for parking satisfactory in relation to traffic operations and safety?		
3 Temporary works	Are all locations free of construction or maintenance equipment, and any signing or temporary traffic control devices that are no longer required?		
4 Headlight glare	Have any problems due to headlight glare (e.g., two-way service road close to main traffic lanes) been addressed?		

Checklist 5-2

Alignment and Cross Section

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Visibility, sight distances	Is sight distance adequate for the speed of traffic using the route?		
	Is adequate sight distance provided for intersections, crossings (e.g., pedestrian, cyclist, cattle, railway) etc.?		
2 Design speed	Is the horizontal and vertical alignment suitable for the (85th percentile) traffic speed? If not:		
	(a) Are warning signs installed?		
	(b) Are advisory speed signs installed?		
	Are the posted advisory speeds for curves appropriate?		

Checklist 5-2

Alignment and Cross Section

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
3 Overtaking	Are adequate passing opportunities provided?		
4 Readability by drivers	Are there any sections of roadway which may cause confusion e.g.:		
	(a) Is alignment of roadway clearly defined?		
	(b) Has disused pavement (if any) been removed or treated?		
	(c) Have old pavement markings been removed properly?		
	(d) Do streetlight and tree lines conform with the road alignment?		

Checklist 5-2
Alignment and Cross Section
Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
5 Widths	Are all traffic lanes and roadway widths, including bridges, adequate?		
6 Shoulders	Are shoulder widths appropriate (e.g. for broken down or emergency vehicles)?		
	Are shoulders traversable for all vehicles and road users?		
	Is the shoulder cross slope sufficient to provide proper drainage?		
7 Side slopes	Are the side slopes and table drains safe for run off vehicles to traverse?		

Checklist 5-3

Intersections

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Location	Are intersections located safely with respect to horizontal and vertical alignment?		
2 Warning	Where intersections occur at the end of high speed environments (e.g., at approaches to towns), are there traffic control devices to alert drivers?		
3 Controls	Are pavement markings and intersection control signing satisfactory?		
4 Layout	Is the alignment of curbs, traffic islands and medians satisfactory?		
	Is the intersection layout obvious to all users?		
	Are turning radii and tapers appropriate?		

Checklist 5-3

Intersections

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
5 Visibility, sight distances	Is sight distance adequate for all movements and all users?		

Checklist 5-4

Auxiliary Lanes and Turn Lanes

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Tapers	Are starting and finishing tapers located and aligned correctly?		
2 Shoulders	Are appropriate shoulder widths provided at merges in accordance with design guidelines?		
3 Signs	Is signing and marking installed in accordance with standards?		
4 Turning traffic	Is there advance warning of the approaching auxiliary lane?		

Checklist 5-4

Auxiliary Lanes and Turn Lanes

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
5 Visibility, sight distances	Have right turn movements within the length of the auxiliary lane been avoided?		
	Has stopping sight distance been provided to the rear of turning vehicles?		
	Has stopping sight distance been provided for entering and leaving vehicles?		

Checklist 5-5

Non-Motorized Traffic

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Paths	Are there appropriate travel paths and crossing points for pedestrians and cyclists?		
2 Barriers and fencing	Where necessary, is fencing installed to guide pedestrians and cyclists to crossings or overpasses?		
	Is fencing of your design (e.g., avoid solid horizontal rails)?		
	Where necessary, is crash barrier installed to separate vehicle, pedestrian and cyclist flows?		
3 Bus stops	Are bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility?		
4 Elderly and disabled	Are there adequate provisions for the elderly, the disabled, children, wheelchairs and baby carriages (e.g., holding rails, curb and median crossings, ramps)?		
	Where necessary, are hand rails provided (e.g., on bridges, ramps), and are they adequate?		

Checklist 5-5
Non-Motorized Traffic
Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
Elderly and disabled (cont.)	Distance between stop line and pedestrian crossing at signalized intersections (for visibility of pedestrians from truck driver's seat).		
	Signal timing - cycle length - pedestrian clearance time - are pedestrian buttons operable?		
5 Cyclists	Is the pavement width adequate for the number of cyclists using the route?		
	Is the bicycle route continuous, i.e., free of squeeze points or gaps?		
	Are bicycle safe grates provided at drainage pits where necessary?		

*Checklist 5-6**Signs and Lighting*

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Lighting	Is appropriate lighting installed at intersections, roundabouts, pedestrian and bicycle crossings, pedestrian refuges, etc?		
	Is all lighting operating satisfactorily?		
	Are the appropriate types of poles used for all locations and correctly installed (e.g. slip base at correct height, rigid poles protected if within clear zone)?		
	Are all locations free of any lighting which may conflict visually with traffic signals or signs?		
	Has lighting for signs, particularly overhead signs, been provided where necessary?		
2 Signs	Are all necessary regulatory, warning and direction signs (including detours) in place? Are they conspicuous?		
	Are there any redundant signs?		

Checklist 5-6

Signs and Lighting

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
Signs (cont.)	Are traffic signs in their correct locations, and properly positioned with respect to lateral clearance and height?		
	Are the correct signs used for each situation, and is each sign necessary?		
	Are signs placed so as not to restrict sight distance, particularly for vehicles?		
	Are all signs effective for all likely conditions (e.g. day, night, rain, fog, rising or setting sun, oncoming headlights, poor lighting)?		
	Do sign supports conform to guidelines?		
3 Marking and delineation	Have retroreflective markers been installed? Where colored markers are used, have they been installed correctly?		
	Is all necessary pavement marking installed?		
	Are pavement markings (center lines, edge lines, transverse lines) clearly visible and effective for all likely conditions (e.g. day, night, rain, fog, rising or setting sun, oncoming headlights, light colored pavement surface, poor lighting)?		

Checklist 5-6
Signs and Lighting
Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
Marking and delineation (cont.)	On light colored pavement surfaces (e.g. concrete) are RRPMS used to simulate traffic lanes?		
	Has raised profile edge marking been provided where necessary (e.g. fatigue zones)?		
	Is delineation adequate and in accordance with guidelines (e.g. post-mounted delineators, RRPMS, chevron alignment markers)?		
	Is delineation effective for all likely conditions (e.g. day, night, rain, fog, rising or setting sun, oncoming headlights)?		
	If chevron alignment markers are installed, have the correct types of markers been used?		
	Are vehicle paths through intersections delineated where required?		
	On truck routes, are reflective devices appropriate to driver's eye height?		

Checklist 5-7
Traffic Signals
Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Operation	Are traffic signals operating correctly? Is the number and location of signal displays appropriate?		
2 Visibility	Are traffic signals clearly visible to approaching motorists?		
	Is the end of likely vehicle queues visible to motorists so that they may stop safely?		
	Have any visibility problems caused by the rising or setting sun been addressed?		
	Are signal displays shielded so that they can be seen only by the motorists for whom they are intended?		
	Where signal displays are not visible from an adequate distance, are signal warning signs and/or flashing lights installed?		
3 Other provisions	Where necessary, are there provisions for visually impaired pedestrians (e.g., audio-tactile push buttons, tactile markings)? Are they working?		
	Where necessary, are there provisions for elderly or disabled pedestrians (e.g., extended green phase, phase displacement)?		

Checklist 5-8

Physical Objects

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Clear zone	Is a clear zone provided in accordance with the guidelines?		
	Is the appropriate treatment or protection provided for any objects within the clear zone (e.g., slip-base or frangible poles, crash barrier, crash cushions, sloping culvert, headwalls)?		

Checklist 5-8

Physical Objects

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
2 Crash barriers	Are safety barriers installed at all necessary locations, including on bridges, in accordance with guidelines?		
	Are the crash barrier systems suitable for the purpose?		
	Is the length of crash barrier at each installation adequate? Are the crash barriers correctly installed?		
	Are Guard Rail Energy Absorbing Terminals (GREAT) or crash cushions installed where necessary (e.g., off ramp, bridge piers)?		

Checklist 5-8**Physical Objects**

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
Crash barriers (cont.)	Where works are subject to stage construction, are temporary barriers installed in accordance to guidelines?		
	Is there a safe run off area behind breakaway terminals?		
3 Fencing	Is pedestrian fencing where needed?		
	Is fencing in the clear zone free of separate horizontal rails?		
	Is there adequate delineation/visibility of barriers and fences at night?		

Checklist 5-9

Delineation

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Line markings	Are all line markings (center line, edge line, transverse lines) in good condition?		
2 Guide posts	Are guide posts correctly placed, clean, and visible?		
3 Raised and Recessed Pavement Markings	Are RPM's in good condition?		
4 Chevron Alignment Markers	Are Chevron Alignment Markers placed correctly, and used only according to standards?		

Checklist 5-10

Pavement

Project _____

Audit Team Members _____

Date _____

Item	Issues to be Considered	Check	Comments
1 Pavement defects	Is the pavement free of defects (e.g., excessive roughness or rutting, potholes, etc.) which could result in safety problems (e.g., loss of steering control)?		
2 Skid resistance	Does the pavement appear to have adequate skid resistance, particularly on curves, steep grades and approaches to intersection? Has skid resistance testing been carried out where necessary?		
3 Ponding	Is the pavement free of areas where ponding or sheet flow of water may occur with resultant safety problems?		
4 Loose screenings	Is the pavement free of loose screenings?		