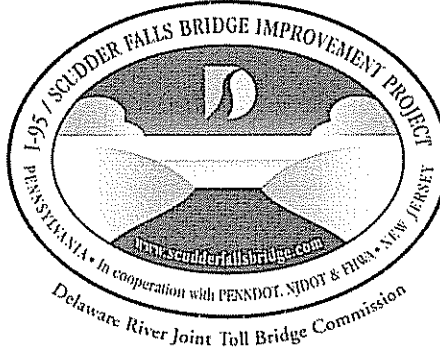


Prepared for:



Delaware River Joint Toll Bridge Commission



# I-95/Scudder Falls Bridge Improvement Project

## Technical Memorandum No. 7 Traffic: Crash Analysis

Contract C-393A,  
Capital Project No. CP0301A,  
Account No. 7161-06-012

Prepared by:

**DMJM HARRIS**

Philadelphia, PA

In association with:

**HNTB Corporation  
STV Inc.**

**Gannett Fleming, Inc.  
A.D. Marble & Company  
Kise Straw & Kolodner, Inc.  
Riverfront Associates, Inc.**

### **Confidential – Traffic Accident Analysis**

*This document is the property of the Delaware River Joint Toll Bridge Commission. The data and information contained herein are part of an existing traffic engineering and safety study. This safety study is only provided to those official agencies or persons who have responsibility in the highway transportation system and may only be used by such agencies or persons for traffic safety-related planning or research. The document and information are confidential pursuant to 23 U.S.C. §409 and may not be published, reproduced, released or discussed without the written permission of the River Joint Toll Bridge Commission.*

**March 8, 2004**

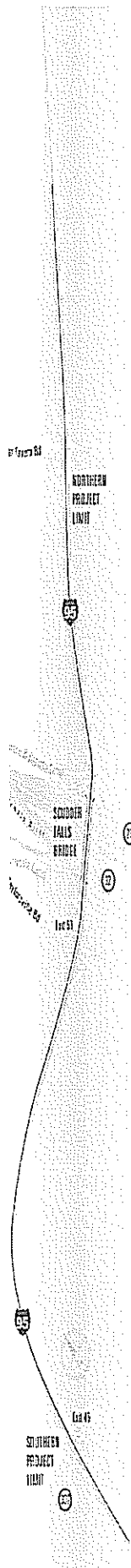
## Technical Memorandum No. 7 – Traffic: Crash Analysis

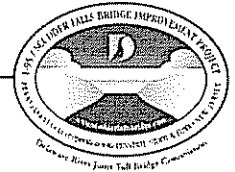
Contract C-393A, Capital Project No. CP0301A, Account No. 7161-06-012  
I-95/Scudder Falls Bridge Improvement Project



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## OVERVIEW AND SUMMARY

### Background

The Delaware River Joint Toll Bridge Commission (DRJTBC), in cooperation with the New Jersey Department of Transportation (NJDOT), the Pennsylvania Department of Transportation (PENNDOT) and the Federal Highway Administration (FHWA), recently initiated the environmental documentation and preliminary engineering effort for the I-95/Scudder Falls Bridge Improvement Project. The project will address congestion and safety at the Scudder Falls Bridge and along I-95 from PA Route 332 in Bucks County, Pennsylvania to Bear Tavern Road in Mercer County, New Jersey.

As part of the overall Project, DMJM+HARRIS have prepared this crash analysis report to document the location, type and severity of crashes within the project area. Crashes were classified as to the roadway condition and time of crash to give a relative complete review of the crash history and potential causes for the crashes. Given the over 5-mile length of the corridor, and overall intent of the study, this crash analysis is developed to an appropriate depth and detail. The intent of the crash analysis is to support the corridor needs development process in conjunction with parallel tasks such as traffic analysis and the roadway deficiency survey. The observations derived through the crash data review, and summarized in this report, will be incorporated within the study's forthcoming existing conditions and needs report.

### Study Area and Period

The crash analysis was performed for the entire study area and included mainline I-95 and the four (4) interchanges of PA-332, PA-32, NJ-29 and CR-579. The I-95 study area traverses through Bucks County in Pennsylvania and Mercer County in New Jersey and for the purposes of this study is divided into four (4) segments (see page 4), as defined below:

- Segment 1 – PA 332 (Newtown-Yardley Road) to Dolington Road – 1.5 miles
- Segment 2 – Dolington Road to the PA abutment of the Scudder Falls Bridge – 1.2 miles
- Segment 3 – Scudder Falls Bridge – 0.28 miles
- Segment 4 – Scudder Falls Bridge NJ Abutment to Bear Tavern Road (NJ-579) – 3.0 Miles

Crash information was provided by three (3) sources, which have roadway jurisdiction limits within the project study area:

- Delaware River Joint Toll Bridge Commission (DRJTBC)
- Pennsylvania Department of Transportation (PennDOT)
- New Jersey Department of Transportation (NJDOT)

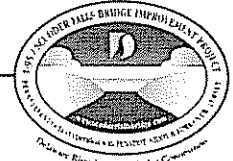
DMJM+HARRIS compiled and sorted all the data, taking into account the possibility of dual records for the same incident, and determined that there were a total of 314 reported crashes from year 1999 to 2001.

### Methodology

Crash records provided by the three (3) agencies were collected and reviewed by engineering staff for importance, clarity, relevance, and consistency. Upon conclusion that the data collected could provide effective data, the corridor was broken into logical segments that could

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be used for comparison purposes. These segments took into account the jurisdictional limits of the three (3) agencies, as well as comparison data from each state. Next, each crash was categorized into types such as, but not limited to, rear-end collisions, multi-car collisions, and side-swipes, and were plotted on collision diagrams to depict the corresponding segment location map, at the specific point of the incident. A collision diagram is a sketch showing the nature of crashes, and by means of arrows, the approximate path of vehicles and pedestrians involved in crashes. Collision diagrams are used to study crash patterns, to determine what type of remedial measures are required (in conjunction with traffic flow models and diagrams), and the results from their applications. A tabular summary of all the crashes, per segment was created to show the type of incident, frequency of occurrence by weather, roadway conditions, light conditions and time of day. These tabulations were then used to create pie-charts that graphically represent the data collected.

Next, a qualitative and statistical analysis of each segment was completed. Crashes, injuries and fatality rates are used to compare crash experiences across state jurisdictions. For this analysis, crash rates were calculated in units of *crashes per million vehicle mile* and are expressed by the following equations:

*Million Vehicle Miles Traveled Per Year =*

Average Daily Traffic (ADT) x Segment Distance (in Feet) x 1 mile/5280 feet x 365 days/year

and

*Crashes per Time Period =*

# of Crashes/Time Period (years)

Therefore,

Crash Rate = Crashes per Time Period / Million Vehicle Miles Traveled per Year

The crash rates for the four (4) segments within the study period were calculated and identified within the study.

Finally, after review of all of the above information, observations to the frequency and locations of crashes were identified for each segment.

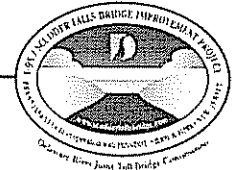
### Observations

The following observations for *the entire study area*, between 1999-2001 were made after completion of the crash analysis:

- A total of 314 crashes were reported
- Only 1 fatality was reported, within segment 4, outside of the Commission's jurisdiction.
- Approximately 48% of all the crashes occurred at the interchanges.
- Approximately 15% of all the crashes involved trucks.
- 39% of the crashes were rear-end collisions.
- 30% of the crashes were classified as other types of crashes. Since each jurisdiction utilizes this designation in different ways, these crashes may include the following;

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debris on the roadway, animal encounter (deer), driving into a ditch, or hitting a pothole.

- 11% of the crashes were angled collisions
- 10% of the crashes were sideswipe collisions
- 7% of the crashes were fixed object collisions
- 2% of the crashes were non collision crashes.
- <1% of the crashes involved pedestrians
- 0% of the crashes were head on collisions
- Over 85% of crashes that reported injuries yielded either minor or no injuries. This maybe due to many of the crashes occurring during high volume and low speed time frames.
- Almost 75% of all crashes occur during clear weather, so weather does not play a major factor in crashes along the study area.
- Over 67% of all the crashes occur on dry surfaces, so precipitation does not play a major factor in crashes along the corridor.
- Almost 60% of all crashes occurred during the daylight hours.
- 45% of all crashes occurred within the AM and PM peak travel times (6 AM – 9 AM, and 3 PM – 6 PM), or during 6 of the 24 hour day.

The following are observations for the area *within the Commission's jurisdiction*, between 1999-2001 which were made after completion of the crash analysis:

- A total of 137 crashes were reported in an area the length equivalent of 0.75 miles or approximately 4,000 feet. This equates to 44% of the total study crashes occurring within only 15% of the analyzed roadway length.
- Approximately 78% of all these crashes occurred at the interchanges.
- Approximately 15% of all these crashes involved trucks.
- 46% of these crashes were rear-end collisions.

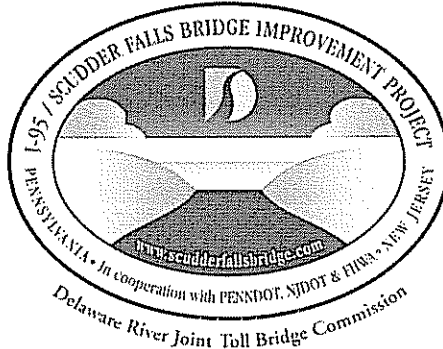
From this information, it is shown that a majority of the crashes within the corridor as well as within the Commission's jurisdiction occur at the interchanges. Most of the crashes at the interchanges can be categorized as rear-end collisions. From this information, careful design of the interchange geometry, including radii, stopping sight distance, acceleration and deceleration lane lengths, and proper signing must be taken into consideration. For instance, a majority of crashes at the I-95 / Taylorsville Road interchange occur on the movement onto I-95 NB from westbound Taylorsville Road. Due to inadequate acceleration lane length, vehicles had a tendency to accelerate prematurely while other vehicles were in front of them. This was also seen at the Route NJ-29 interchange for the movement onto I-95 SB.

The corridor also experienced a number of crashes involving trucks. A consistent 15% of all crashes involved trucks and design considerations for trucks should be a part of the overall analysis and design of the corridor. Stopping sight distances should be especially reviewed since many of the crashes involving trucks were rear-end crashes. The grade of the two interchanges nearest the bridge play a major role in a trucks ability to accelerate and decelerate. Since the bridge sits at or near the sag of a vertical curve, trucks exiting I-95 NB at Taylorsville Road, and I-95 SB exiting at Route NJ-29 experience a stronger gravitational effect, which will increase the need of deceleration lane lengths. Gravity acts against a vehicles breaking on a negative grade, therefore requiring additional deceleration lane length. The opposite affects the I-95 SB traffic entering from Taylorsville Road, as well as traffic from Route NJ-29 entering on to I-95 NB, the positive grade will increase the time and length of acceleration lanes.





Delaware River Joint Toll Bridge Commission



# **I-95/Scudder Falls Bridge Improvement Project**

## **Technical Memorandum No. 7 Traffic: Crash Analysis**

### **Chapter 1 OVERALL CORRIDOR CRASH SUMMARY**

# I-95 Corridor Crash Analysis 1999-2001 Crash Summary

Frequency of Occurrence by Collision Type												
Segment Name	Angle	Rear End	Hit Fixed Obi.	Sideswipe	Non-Collision	Hit Pedestrian	Head-on	All Others	Totals			
Segment 1	10	20.4%	22	44.9%	11	22.4%	1	2.0%	1	2.0%	49	100%
Segment 2	6	13.3%	25	55.6%	8	17.8%	0	0.0%	2	4.4%	45	100%
Segment 3	2	6.7%	11	36.7%	3	10.0%	0	0.0%	6	20.0%	30	100%
Segment 4	17	8.9%	65	34.2%	1	0.5%	0	0.0%	86	45.3%	190	100%
Total	35	11.1%	123	39.2%	23	7.3%	31	9.9%	95	30.3%	314	100%

Frequency of Occurrence by Severity												
Segment Name	No Injury	Minor Injury	Moderate Injury	Major Injury	Fatality	Unknown	Total					
Segment 1	25	51.0%	16	32.7%	6	12.2%	0	0.0%	2	4.1%	49	100%
Segment 2	24	53.3%	13	28.9%	3	6.7%	1	2.2%	4	8.9%	45	100%
Segment 3	21	70.0%	4	13.3%	0	0.0%	0	0.0%	5	16.7%	30	100%
Segment 4	50	26.3%	14	7.4%	15	7.9%	0	0.0%	110	57.9%	190	100%
Total	120	38.2%	47	15.0%	24	7.6%	1	0.3%	121	38.5%	314	100%

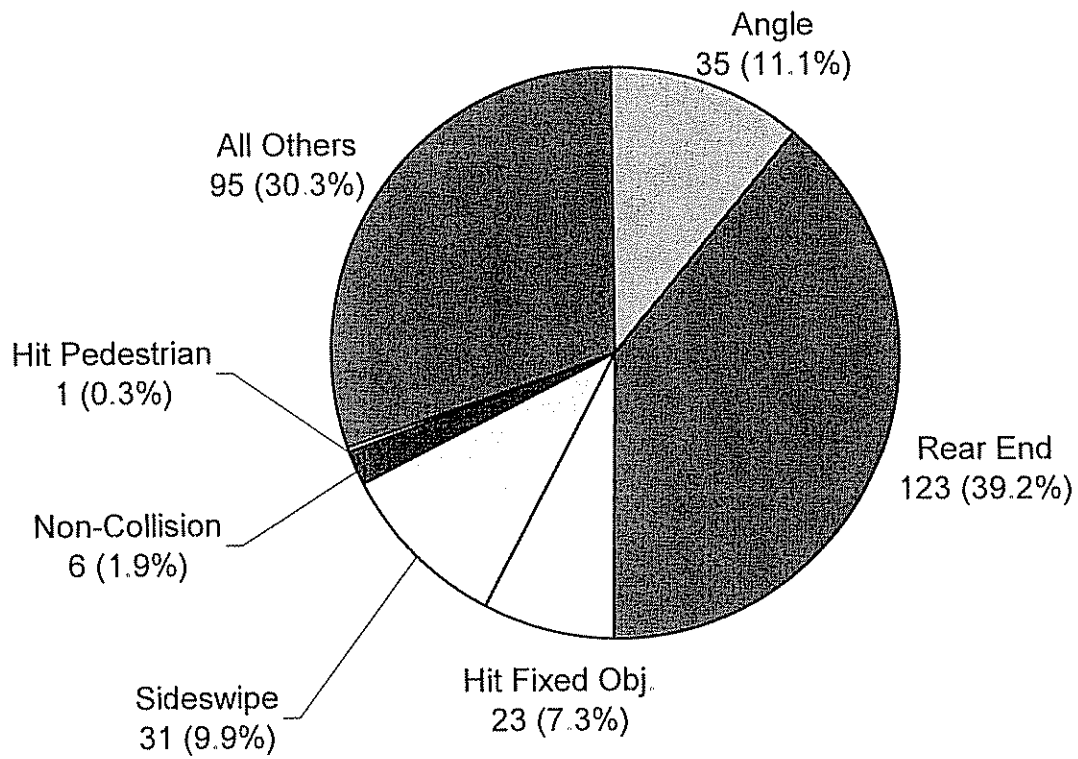
Frequency of Occurrence by Weather Conditions												
Segment Name	Clear	Rain	Snow	Sleet/Freeze	Fog/Smoke	Unknown	Total					
Segment 1	48	98.0%	1	2.0%	0	0.0%	0	0.0%	0	0.0%	49	100%
Segment 2	38	84.4%	4	8.9%	1	2.2%	1	2.2%	1	2.2%	45	100%
Segment 3	21	70.0%	7	23.3%	1	3.3%	0	0.0%	1	3.3%	30	100%
Segment 4	124	65.3%	55	28.9%	6	3.2%	0	0.0%	2	1.1%	190	100%
Total	231	73.6%	67	21.3%	8	2.5%	0	0.0%	3	1.0%	314	100%

Frequency of Occurrence by Road Conditions												
Segment Name	Dry	Wet	Snowy	Icy	Unknown	Others	Total					
Segment 1	48	93.9%	2	4.1%	0	0.0%	0	0.0%	1	2.0%	49	100%
Segment 2	35	77.8%	4	8.9%	3	6.7%	0	0.0%	2	4.4%	45	100%
Segment 3	20	66.7%	8	26.7%	0	0.0%	0	0.0%	2	6.7%	30	100%
Segment 4	112	58.9%	65	34.2%	8	4.2%	1	0.5%	3	1.6%	190	100%
Total	213	67.8%	79	25.2%	9	2.9%	4	1.3%	8	2.5%	314	100%

Frequency of Occurrence by Light Conditions												
Segment Name	Daylight	Dark(St. Light)	Dark(No St. Light)	Dawn	Dusk	Unknown	Total					
Segment 1	31	63.3%	3	6.1%	12	24.5%	1	2.0%	2	4.1%	49	100%
Segment 2	25	55.6%	8	17.8%	4	8.9%	3	6.7%	1	2.2%	45	100%
Segment 3	17	56.7%	5	16.7%	0	0.0%	5	16.7%	0	0.0%	30	100%
Segment 4	110	57.9%	50	26.3%	17	8.9%	2	1.1%	7	3.7%	190	100%
Total	183	58.3%	66	21.0%	33	10.5%	11	3.5%	10	3.2%	314	100%

Frequency of Occurrence by Hour of Day												
Segment Name	00-06	06-09	09-15	15-18	18-24	Unknown	Total					
Segment 1	7	14.3%	8	16.3%	13	26.5%	11	22.4%	9	18.4%	49	100%
Segment 2	5	11.1%	16	35.6%	10	22.2%	6	13.3%	7	15.6%	45	100%
Segment 3	1	3.3%	8	26.7%	8	26.7%	8	26.7%	4	13.3%	30	100%
Segment 4	11	5.8%	20	10.5%	47	24.7%	64	33.7%	48	25.3%	190	100%
Total	24	7.6%	52	16.6%	78	24.8%	89	28.3%	68	21.6%	314	100%

**SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY COLLISION TYPES  
(ALL SEGMENTS)**

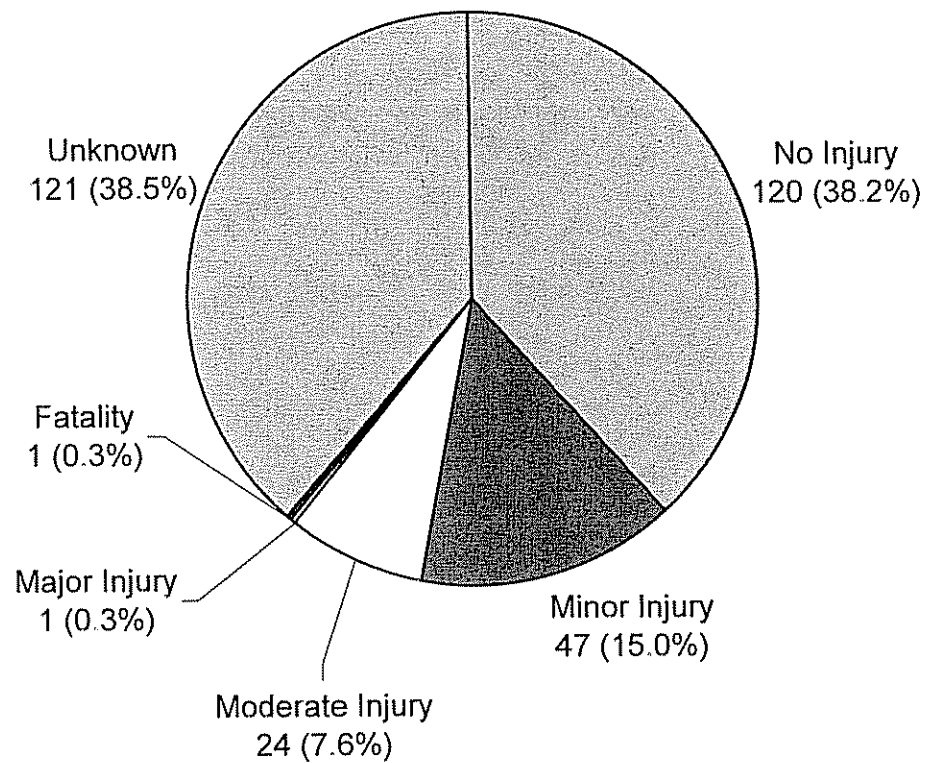


**Legend:**

314 Total Crashes between 1999-2001  
# (% of Total)



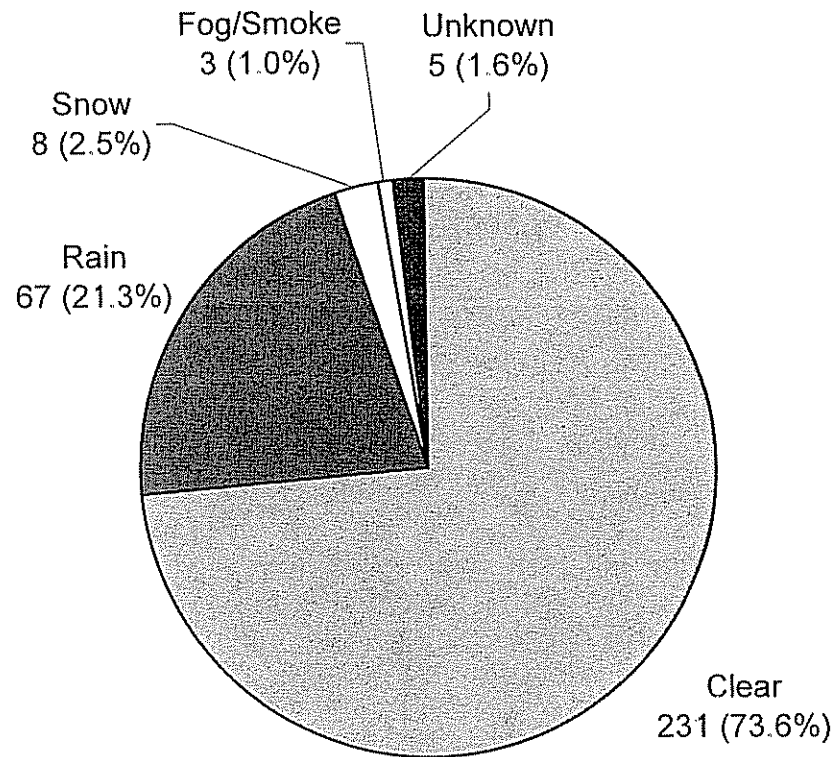
**SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY INJURY SEVERITY  
(ALL SEGMENTS)**



**Legend:**

314 Total Crashes from 1999 - 2001  
# (% of Total)

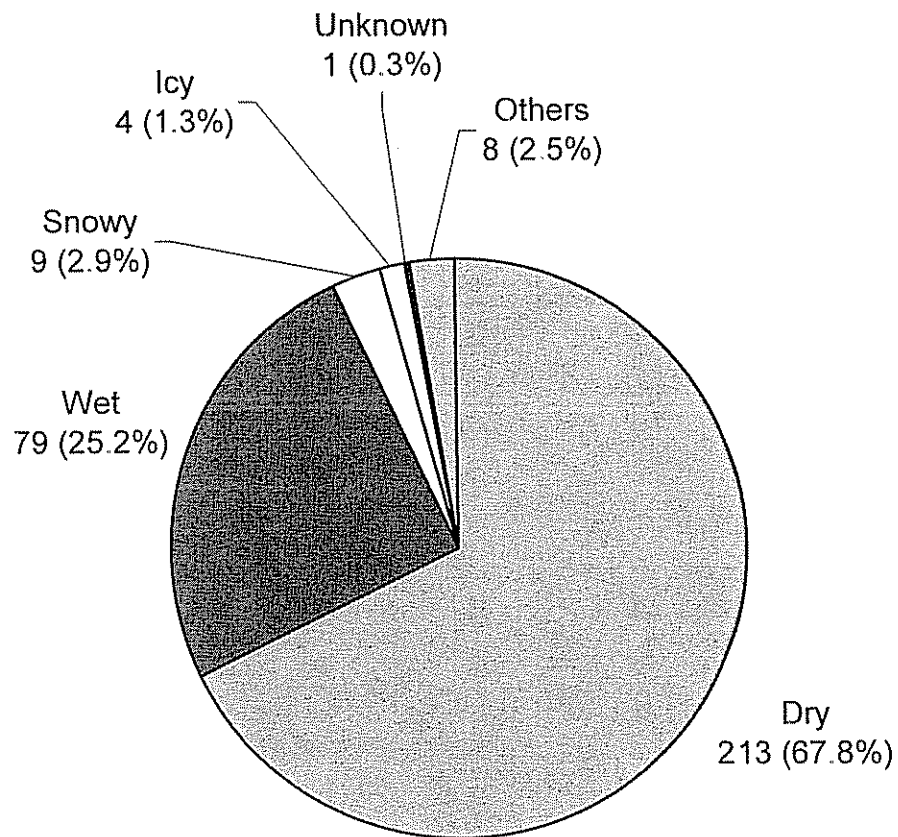
**SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY WEATHER CONDITION  
(ALL SEGMENTS)**



**Legend:**

314 Total Crashes from 1999 - 2001  
# (% of Total)

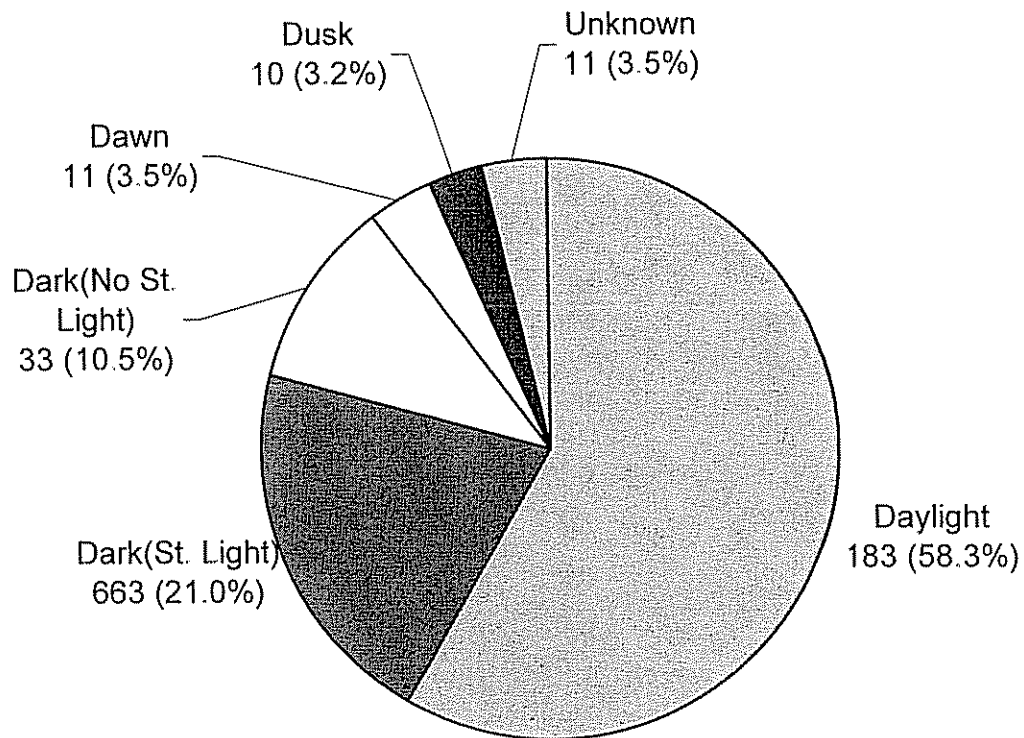
**SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY ROAD CONDITION  
(ALL SEGMENTS)**



**Legend:**

314 Total Crashes from 1999 - 2001  
# (% of Total)

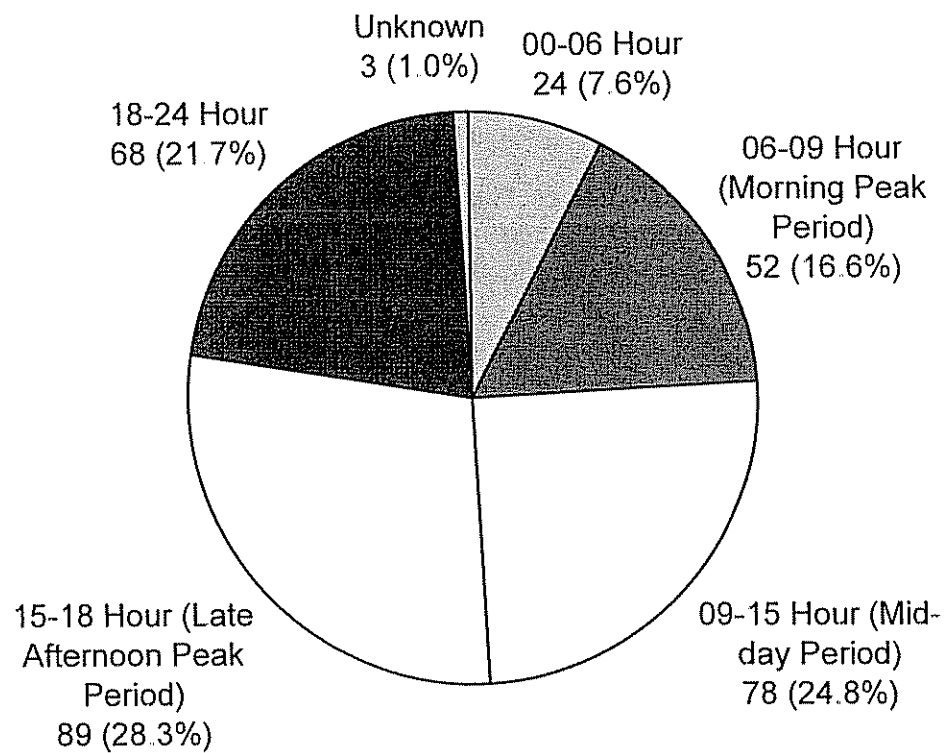
**SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY LIGHT CONDITION  
(ALL SEGMENTS)**



**Legend:**

314 Total Crashes from 1999 - 2001  
# (% of Total)

**SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY TIME OF DAY  
(ALL SEGMENTS)**



**Legend:**

314 Total Crashes from 1999 - 2001  
# (% of Total)

### SCUDDER FALLS BRIDGE CRASH ANALYSIS

Comparison Of Reported Crashes On All Segments							
Segment	ADT	Distance (Miles)	Million Vehicle Miles Traveled/Year	Crashes Per Year	Crashes/Million Veh. Miles Traveled	Average State Rate	Above/Below State Rate
Segment 1	47,000	1.5	25.73	16.33	0.63	0.47	Above
Segment 2	47,000	1.12	19.21	15.00	0.78	0.47	Above
Segment 3	55,100	0.227	4.57	10.00	2.19	3.76*	Below
Segment 4	50,690	3.03	56.06	63.33	1.13	1.66**	Below

Notes:

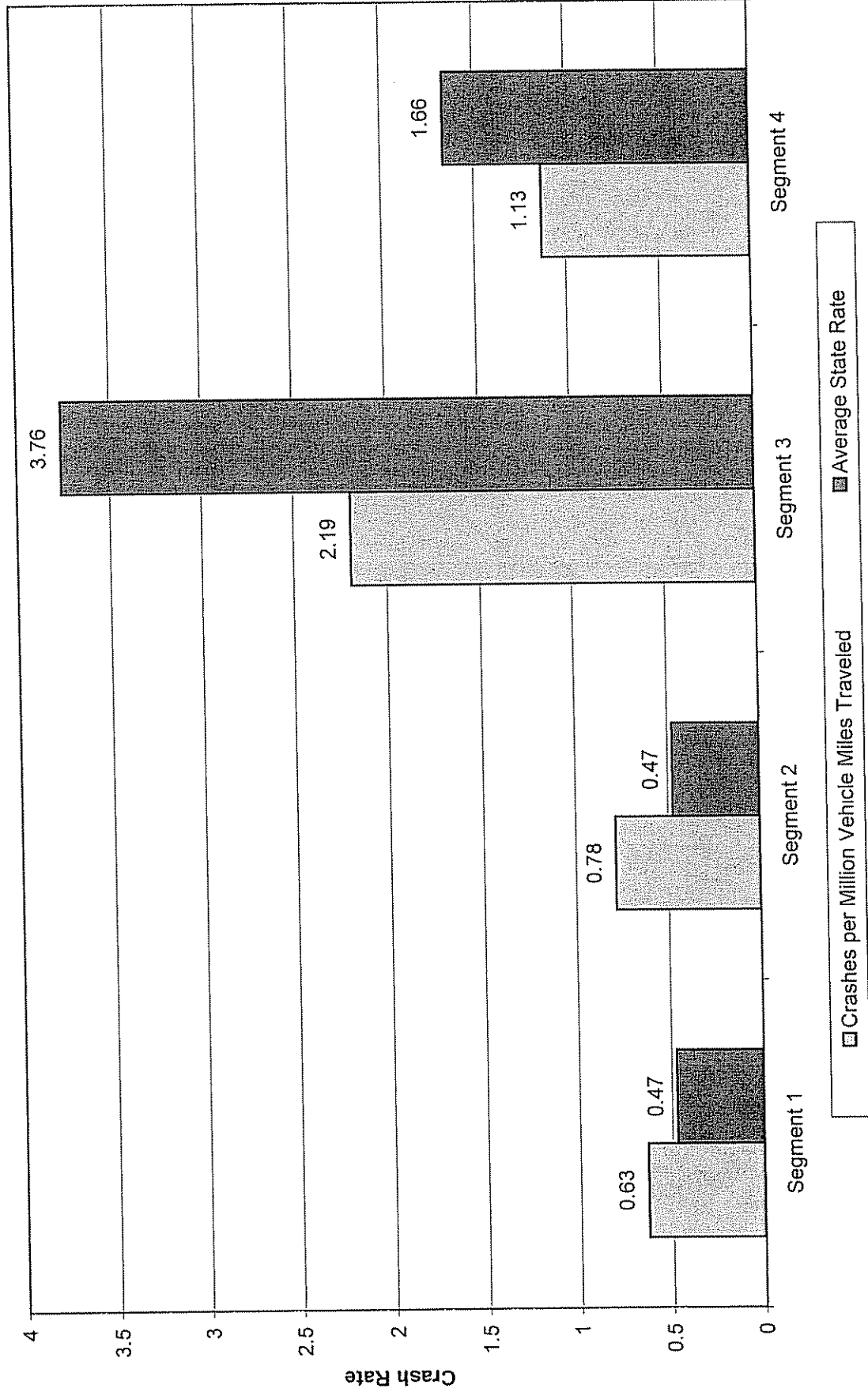
1. ADTs for segment 1 and 2 are collected from PENNDOT Statewide Traffic Volume Map provided on PennDOT's official website.
2. The avg. state rate for segments 1 and 2 is collected from PENNDOT corrected 1997-2001 Homogeneous Report published by Crash Information Systems and Analysis Division (printed on 08/21/03)
3. ADTs for segments 3 and 4 are collected from NJDOT 2000 Straight Line Diagrams.
4. The avg. state rates for segments 3 and 4 are collected from NJDOT Crash Records (Statewide average crash rates by cross-section geometry).

\* 3.76 is the avg. rate between 1999 and 2001  $\{[3.44 (1999) + 4.35 (2000) + 3.50 (2001)] / 3\}$  for a roadway facility with 4 or more lanes, barrier median and no shoulder.

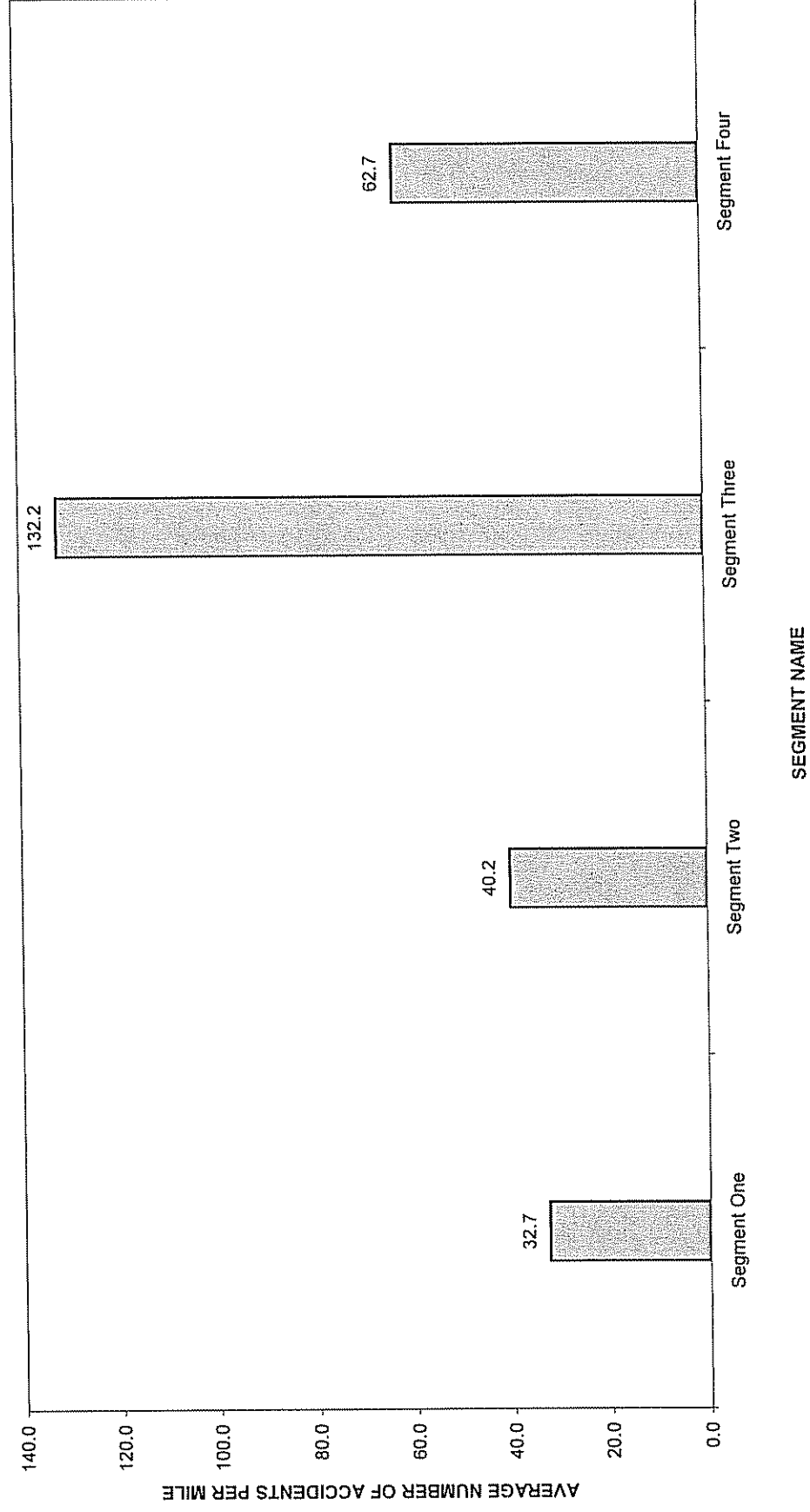
\*\* 1.66 is the avg. rate between 1999 and 2001  $\{[1.48 (1999) + 1.73 (2000) + 1.77 (2001)] / 3\}$  for a roadway facility with 4 or more lanes, grass median and with shoulder.



Comparison of Study Area Crash Rates with Average State Crash Rates

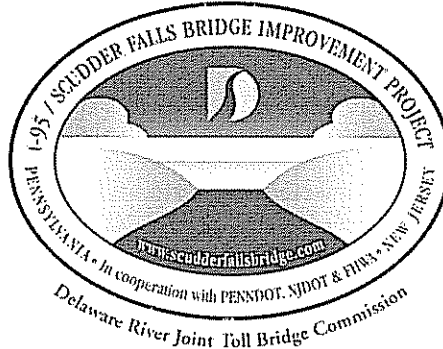


# NUMBER OF REPORTED ACCIDENTS PER MILE BASED ON SEGMENT FROM 1999 TO 2001





Delaware River Joint Toll Bridge Commission

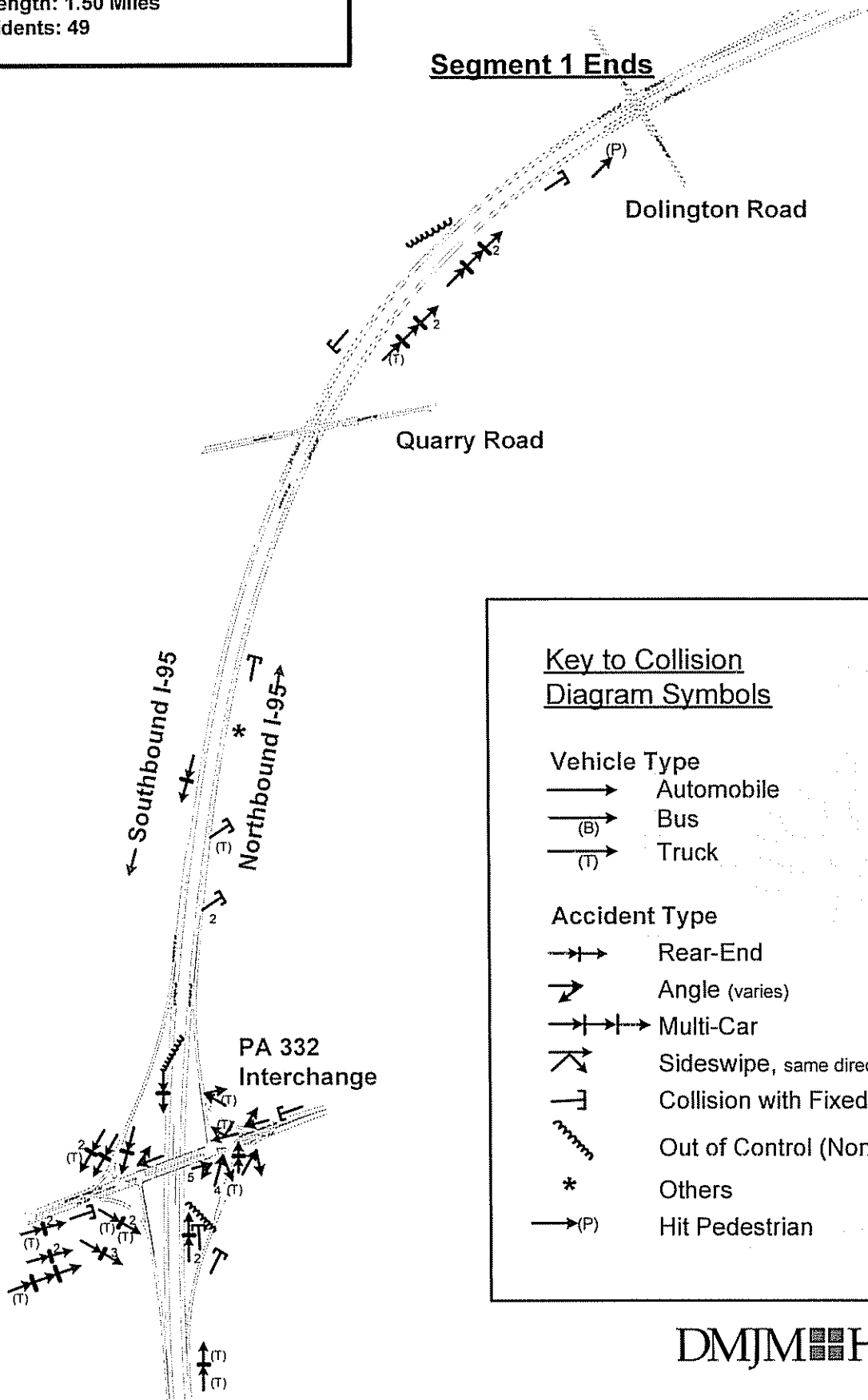


# **I-95/Scudder Falls Bridge Improvement Project**

## **Technical Memorandum No. 7 Traffic: Crash Analysis**

### **Chapter 2 SEGMENT 1 CRASH SUMMARY**

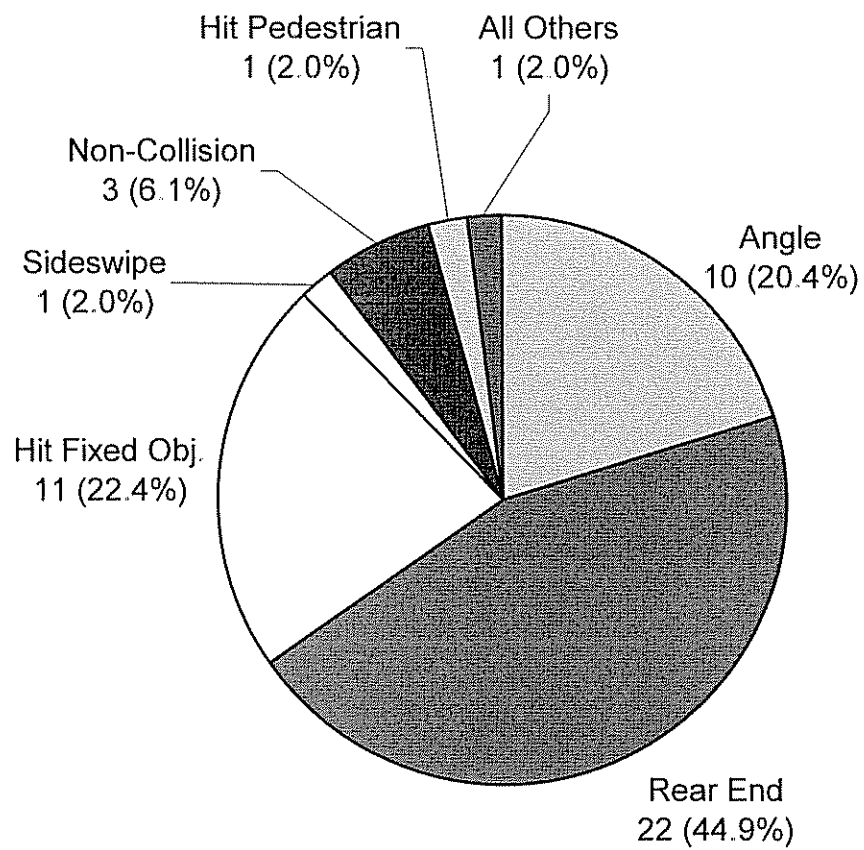
Subject: I-95 Collision Diagrams (Segment 1)  
 Segment Length: 1.50 Miles  
 No. Of Accidents: 49



**Segment 1 Begins**

PRINT ALL C, S and W CHARTS FOR THE REPORT  
DO NOT PRINT CRASH SUMMARIES OR CHART LINKS

**SEGMENT ONE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY COLLISION TYPES**

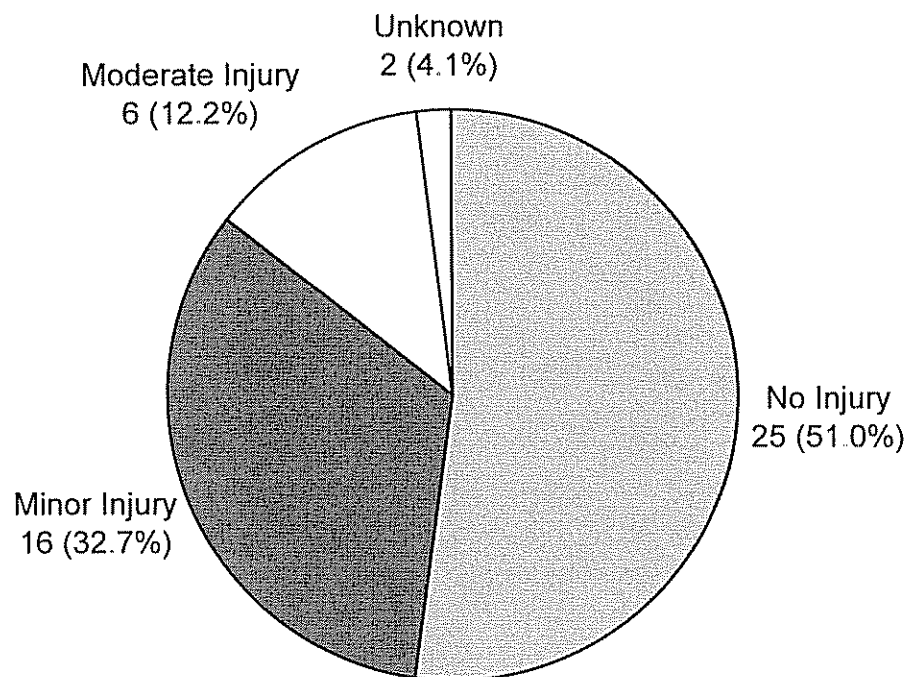


**Legend:**

49 Total Crashes between 1999-2001  
# (% of Total)



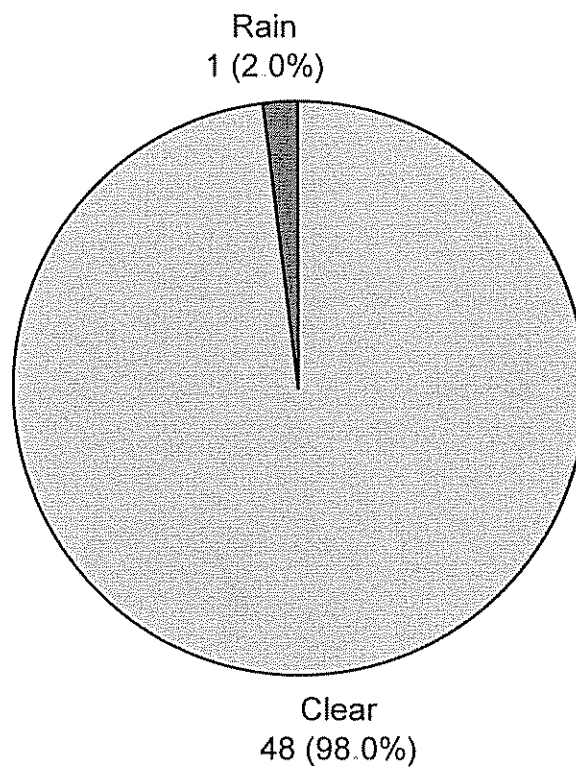
**SEGMENT ONE**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY INJURY SEVERITY**



**Legend:**

49 Total Crashes from 1999 - 2001  
# (% of Total)

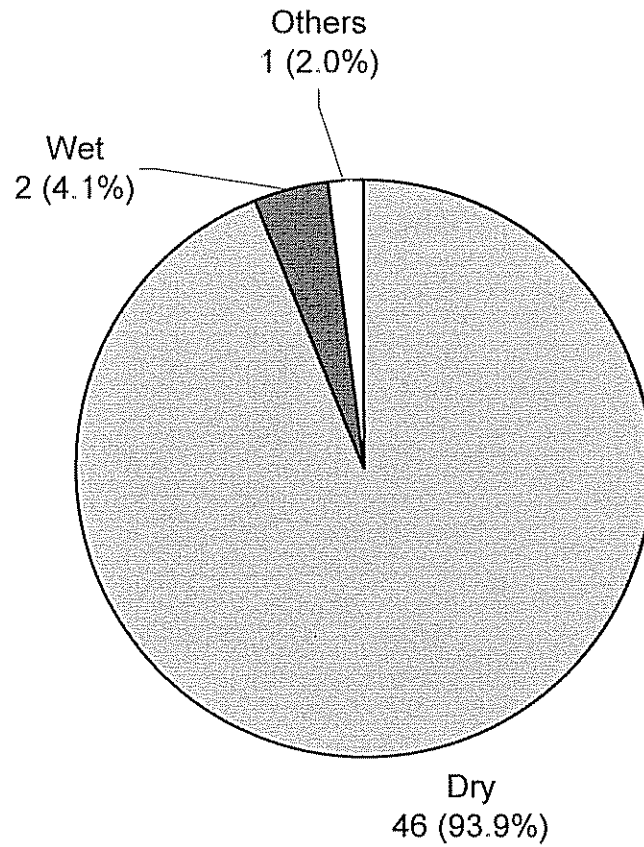
**SEGMENT ONE**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY WEATHER CONDITION**



**Legend:**

49 Total Crashes from 1999 - 2001  
# (% of Total)

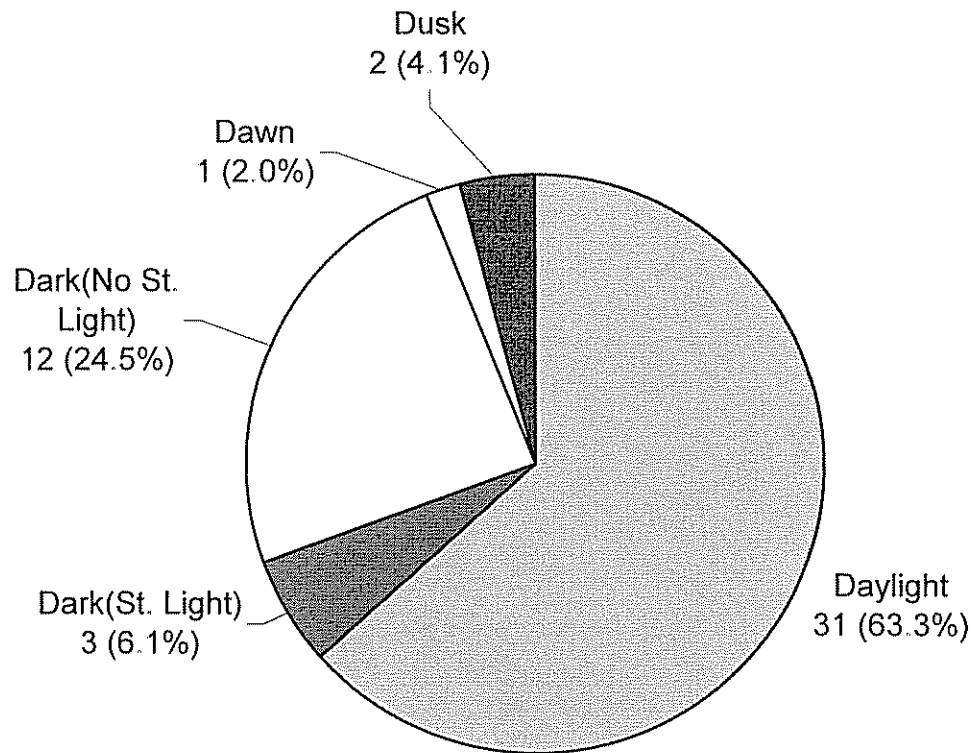
**SEGMENT ONE**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY ROAD CONDITION**



**Legend:**

49 Total Crashes from 1999 - 2001  
# (% of Total)

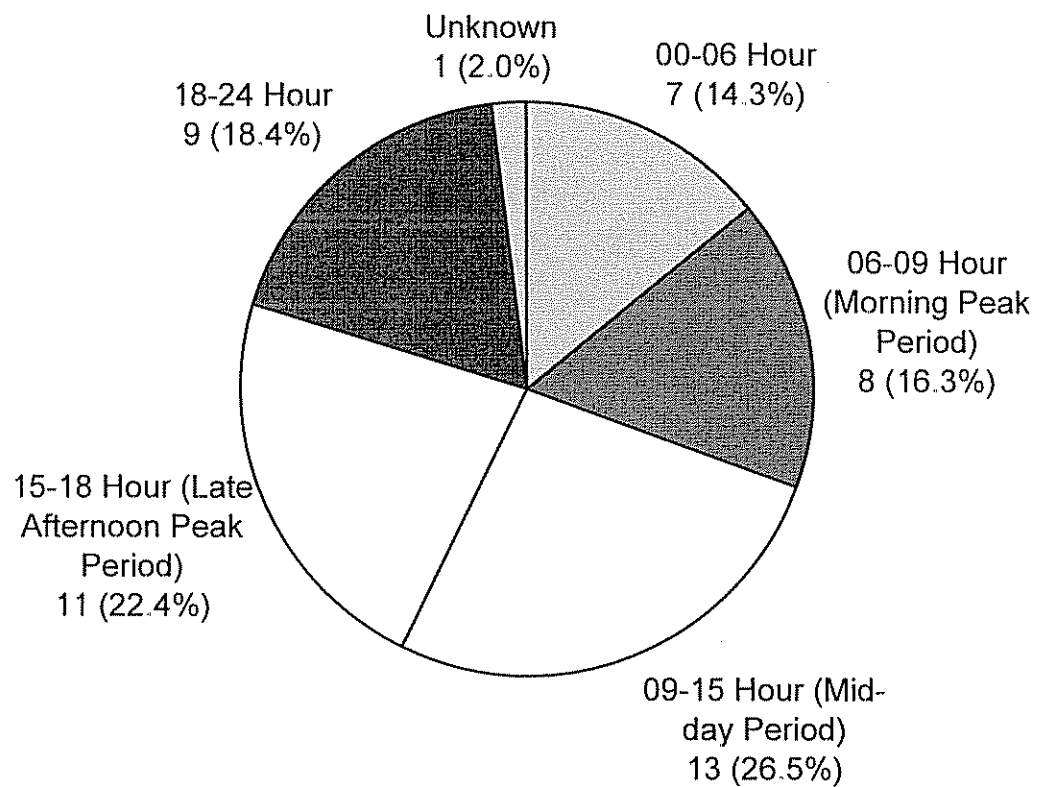
**SEGMENT ONE**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY LIGHT CONDITION**



**Legend:**

49 Total Crashes from 1999 - 2001  
# (% of Total)

**SEGMENT ONE**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY TIME OF DAY**

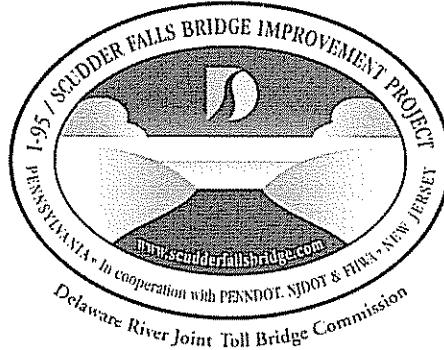


**Legend:**

49 Total Crashes from 1999 - 2001  
# (% of Total)



Delaware River Joint Toll Bridge Commission



# **I-95/Scudder Falls Bridge Improvement Project**

## **Technical Memorandum No. 7 Traffic: Crash Analysis**

### **Chapter 3 SEGMENT 2 CRASH SUMMARY**



# Key to Collision Diagram Symbols

**Vehicle Type**  
 Automobile  
 Bus  
 Truck

**Accident Type**  
 Rear-End  
 Angle (varies)  
 Multi-Car  
 Sideswipe, same direction  
 Collision with Fixed Object  
 Out of Control (Non-Collision)  
 Others  
 Hit Pedestrian

## Segment 2 Begins

Dollington Road

Southbound I-95  
 Northbound I-95

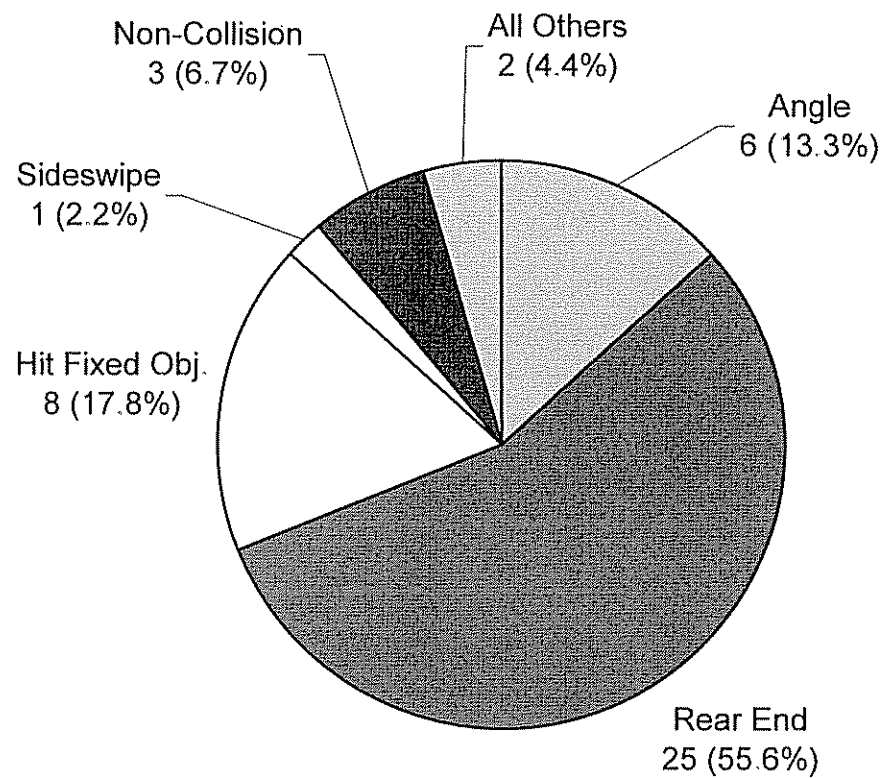
Taylorsville Road  
 Interchange

## Segment 2 Ends

Subject: I-95 Collision Diagrams (Segment 2)  
 Segment Length: 1.12 Miles  
 No. Of Accidents: 45

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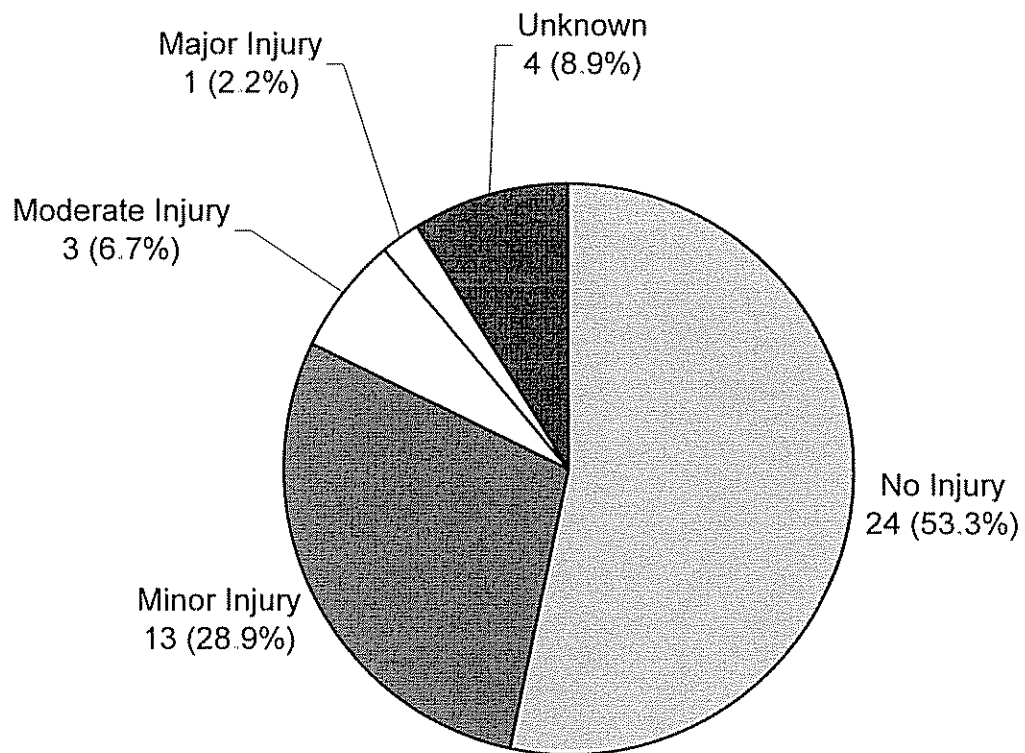
**SEGMENT TWO  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY COLLISION TYPES**



**Legend:**

45 Total Crashes between 1999-2001  
# (% of Total)

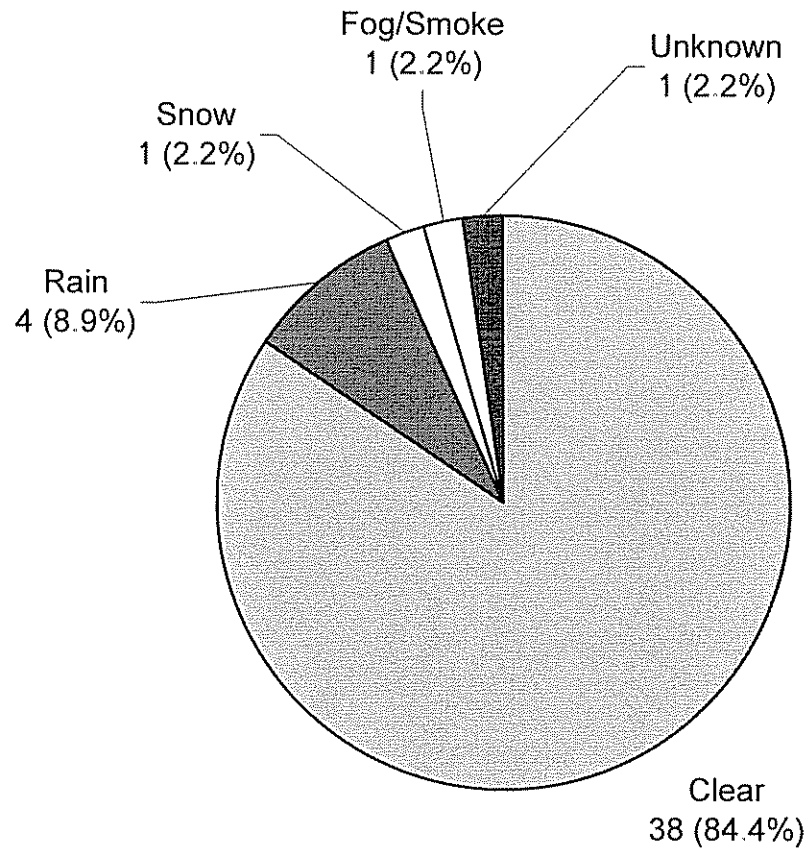
**SEGMENT TWO  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY INJURY SEVERITY**



**Legend:**

45 Total Crashes from 1999 - 2001  
# (% of Total)

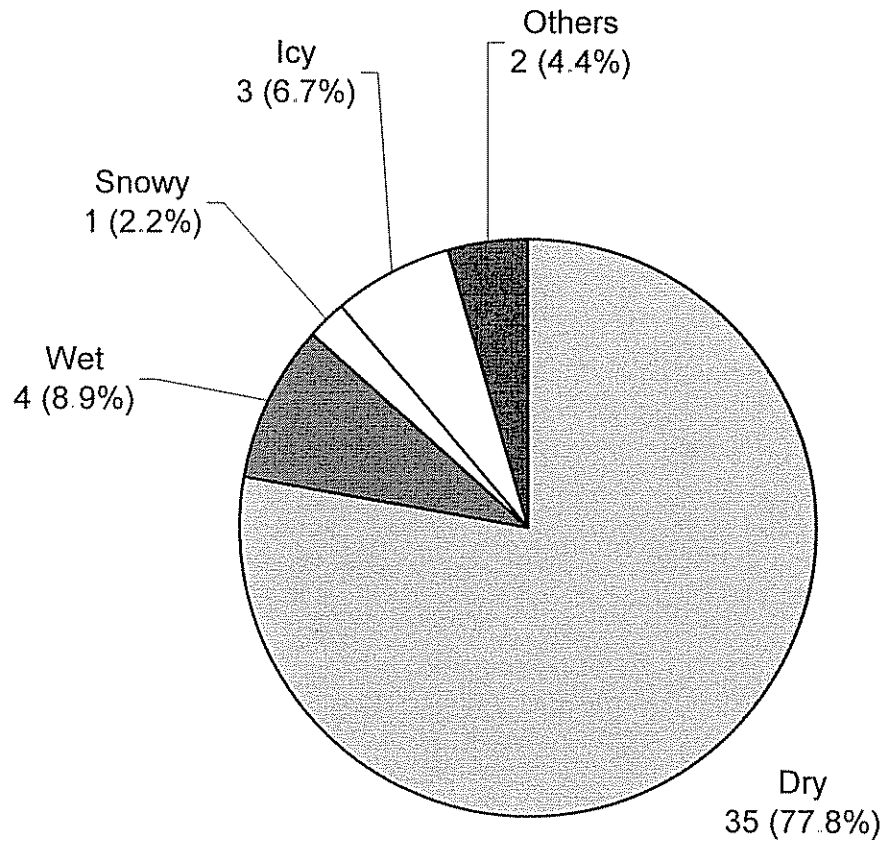
**SEGMENT TWO**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY WEATHER CONDITION**



**Legend:**

45 Total Crashes from 1999 - 2001  
# (% of Total)

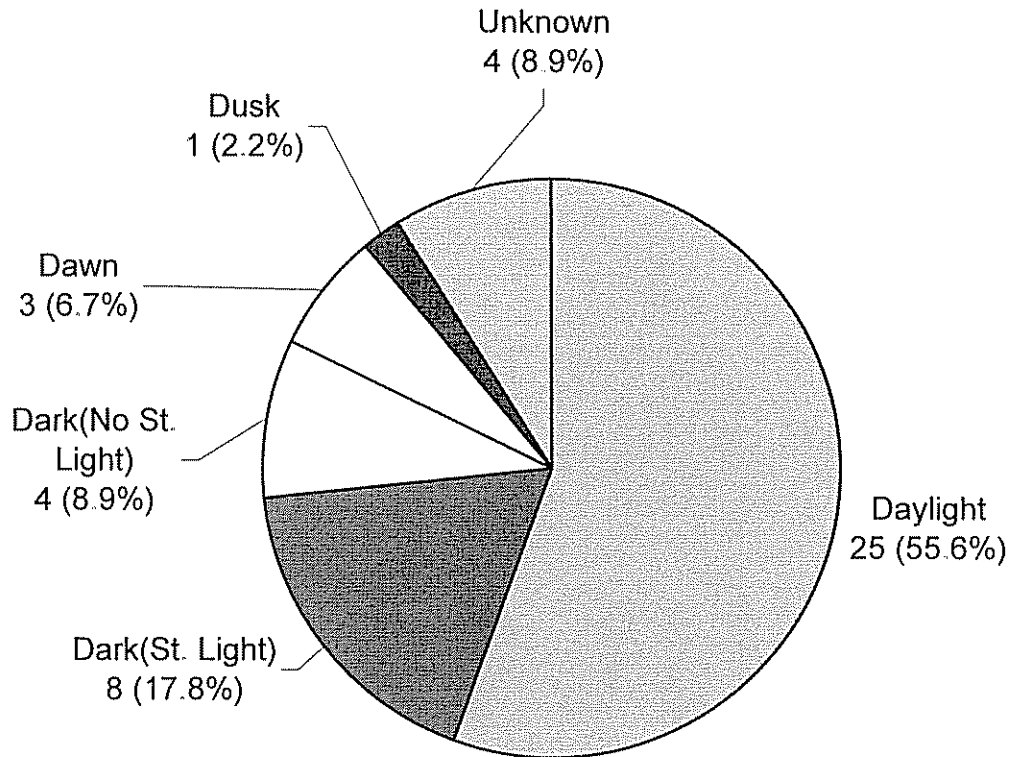
**SEGMENT TWO  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY ROAD CONDITION**



**Legend:**

45 Total Crashes from 1999 - 2001  
# (% of Total)

**SEGMENT TWO  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY LIGHT CONDITION**

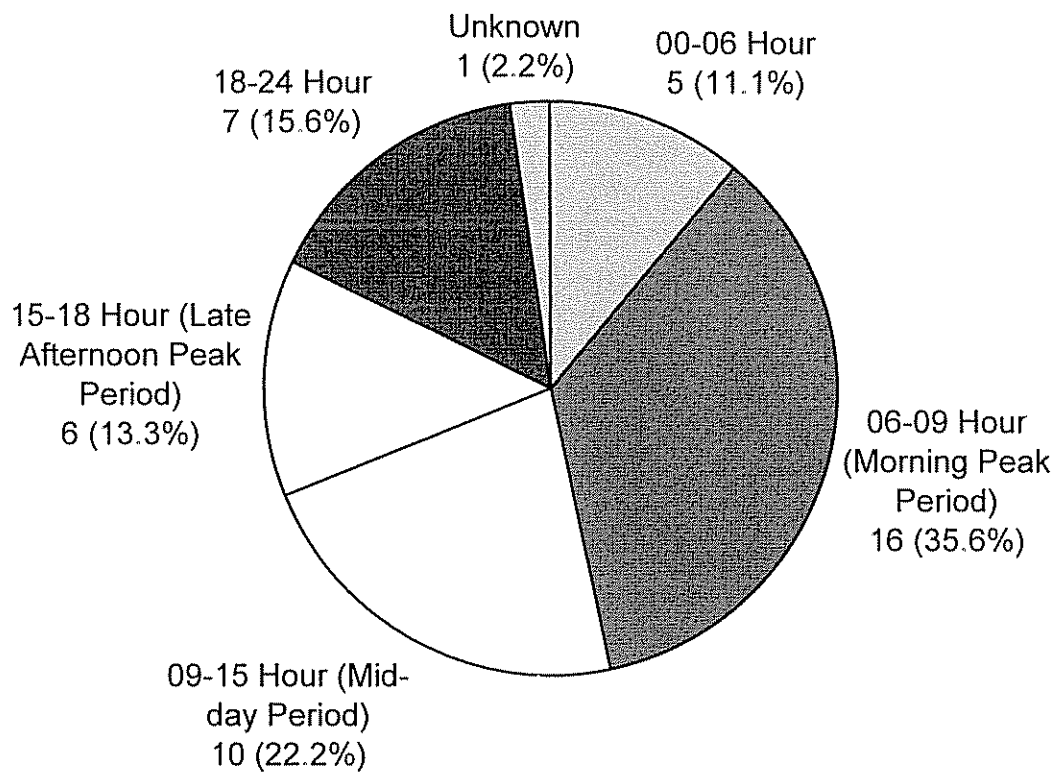


**Legend:**

45 Total Crashes from 1999 - 2001  
# (% of Total)



**SEGMENT TWO**  
**SCUDDER FALLS BRIDGE CRASH ANALYSIS**  
**BROKEN DOWN BY TIME OF DAY**

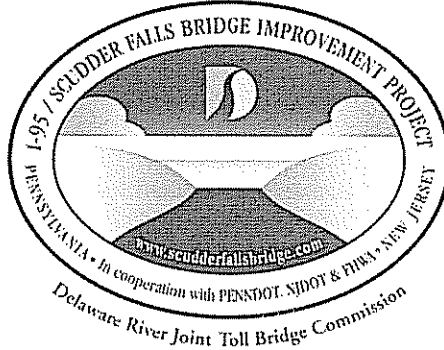


**Legend:**

45 Total Crashes from 1999 - 2001  
# (% of Total)



Delaware River Joint Toll Bridge Commission



# **I-95/Scudder Falls Bridge Improvement Project**

## **Technical Memorandum No. 7 Traffic: Crash Analysis**

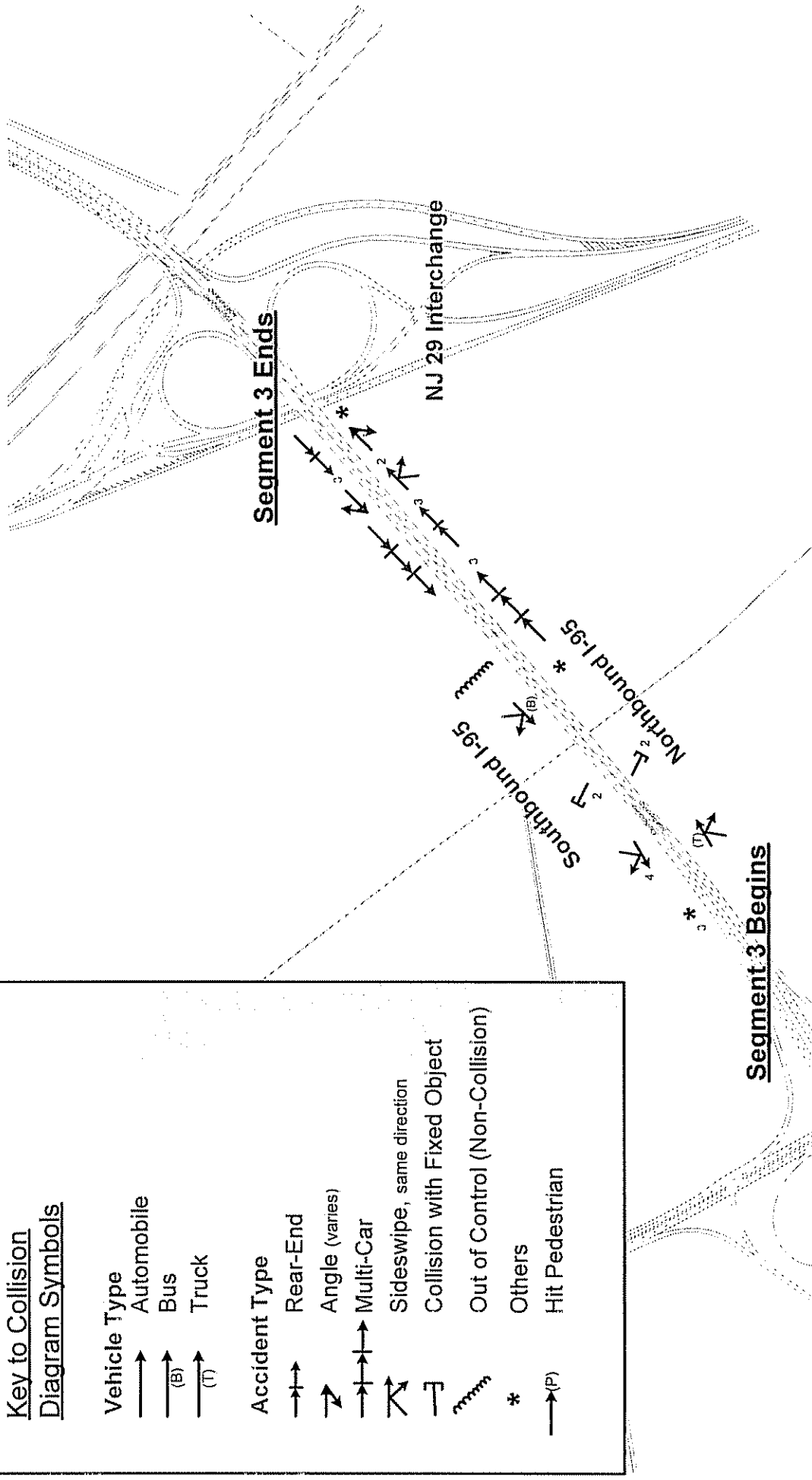
### **Chapter 4 SEGMENT 3 CRASH SUMMARY**

DMJM  HARRIS

# Key to Collision Diagram Symbols

**Vehicle Type**  
 Automobile  
 Bus  
 Truck

**Accident Type**  
 Rear-End  
 Angle (varies)  
 Multi-Car  
 Sideswipe, same direction  
 Collision with Fixed Object  
 Out of Control (Non-Collision)  
 Others  
 Hit Pedestrian

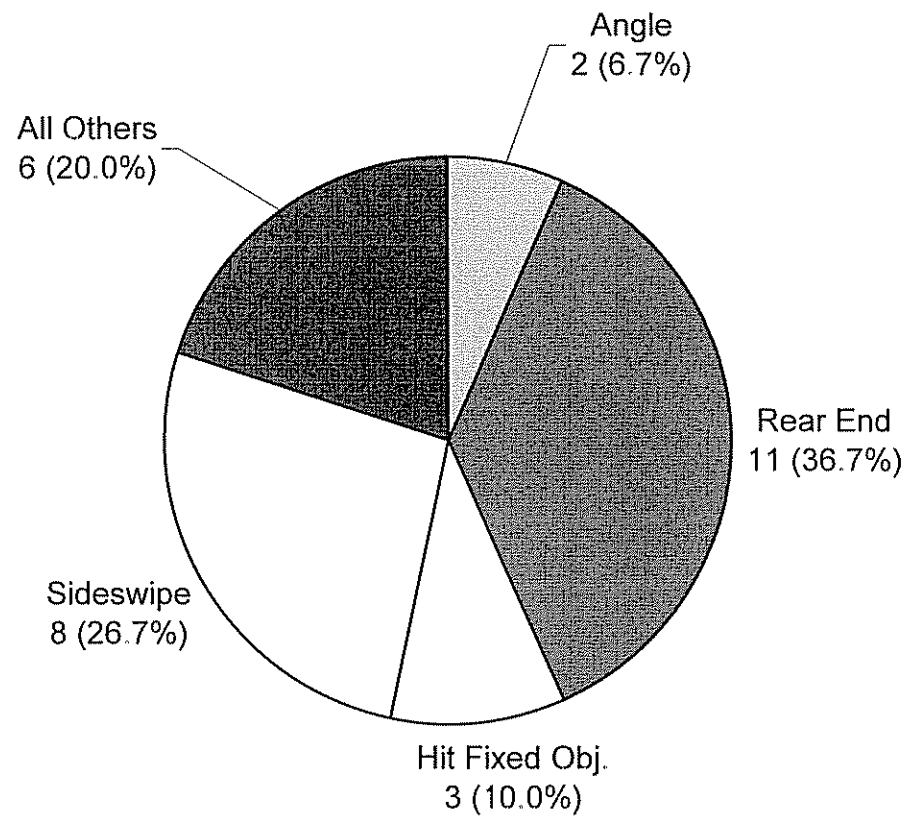


Subject: I-95 Collision Diagrams (Segment 3)  
 Segment Length: 0.227 Miles  
 No. Of Accidents: 30

DMJM HARRIS

Taylorsville Road  
 Interchange

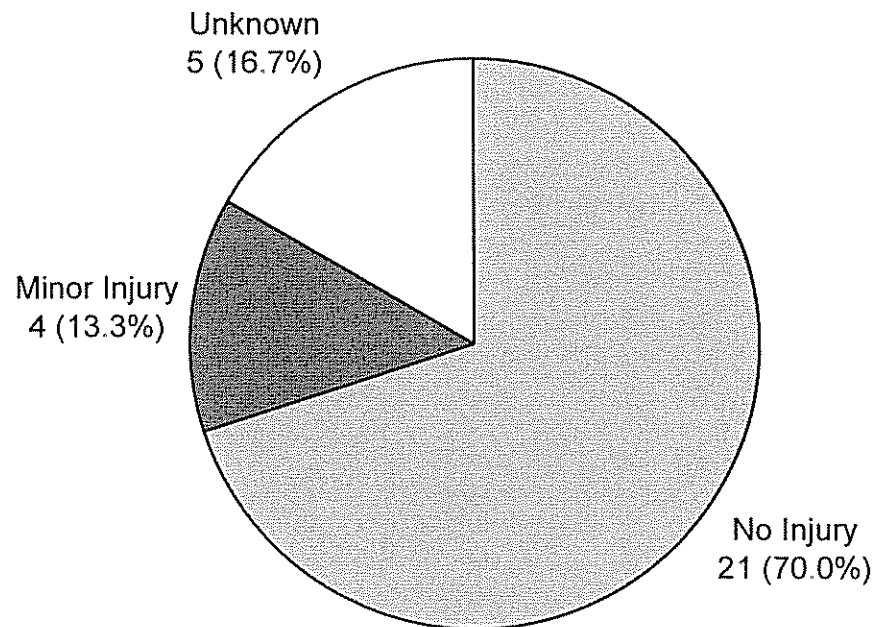
**SEGMENT THREE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY COLLISION TYPES**



**Legend:**

30 Total Crashes between 1999-2001  
# (% of Total)

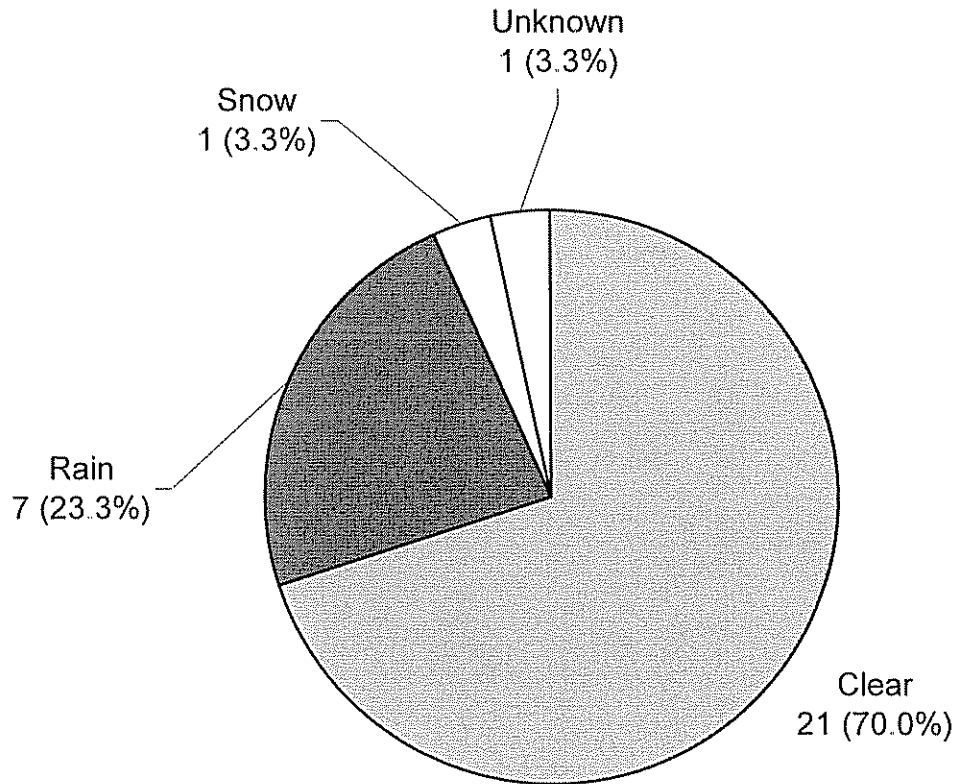
**SEGMENT THREE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY INJURY SEVERITY**



**Legend:**

30 Total Crashes from 1999 - 2001  
# (% of Total)

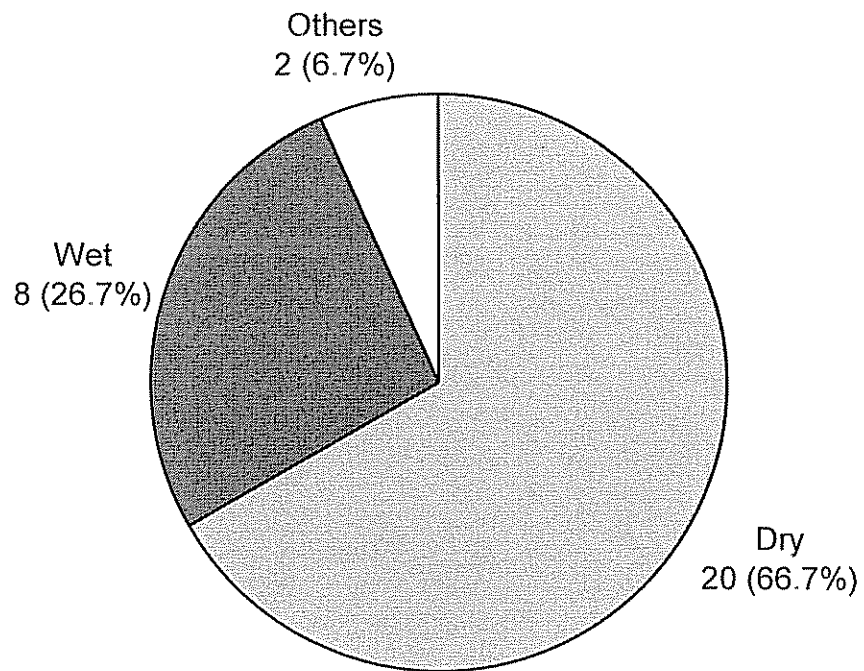
**SEGMENT THREE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY WEATHER CONDITION**



**Legend:**

30 Total Crashes from 1999 - 2001  
# (% of Total)

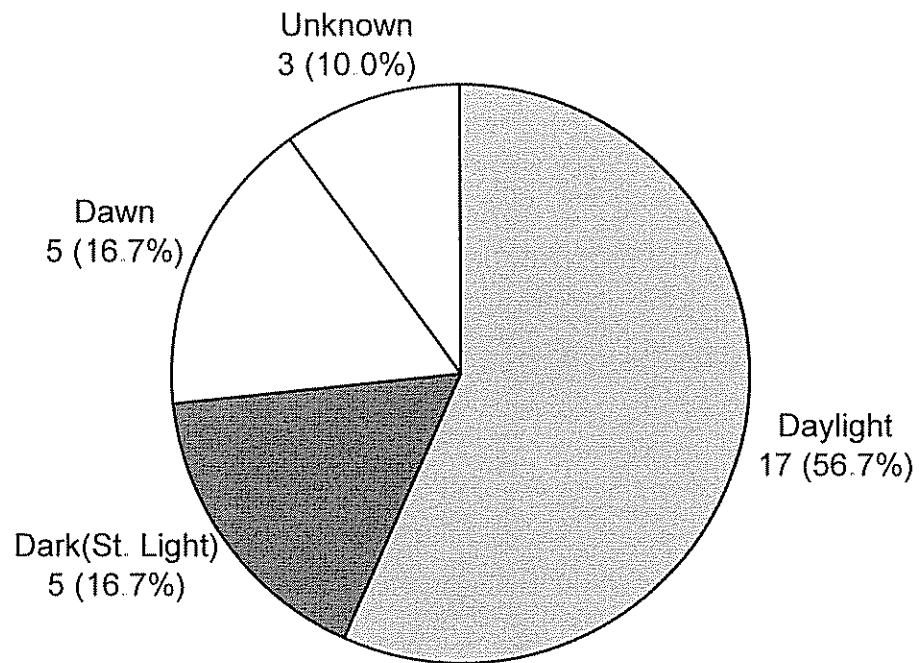
**SEGMENT THREE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY ROAD CONDITION**



**Legend:**

30 Total Crashes from 1999 - 2001  
# (% of Total)

**SEGMENT THREE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY LIGHT CONDITION**

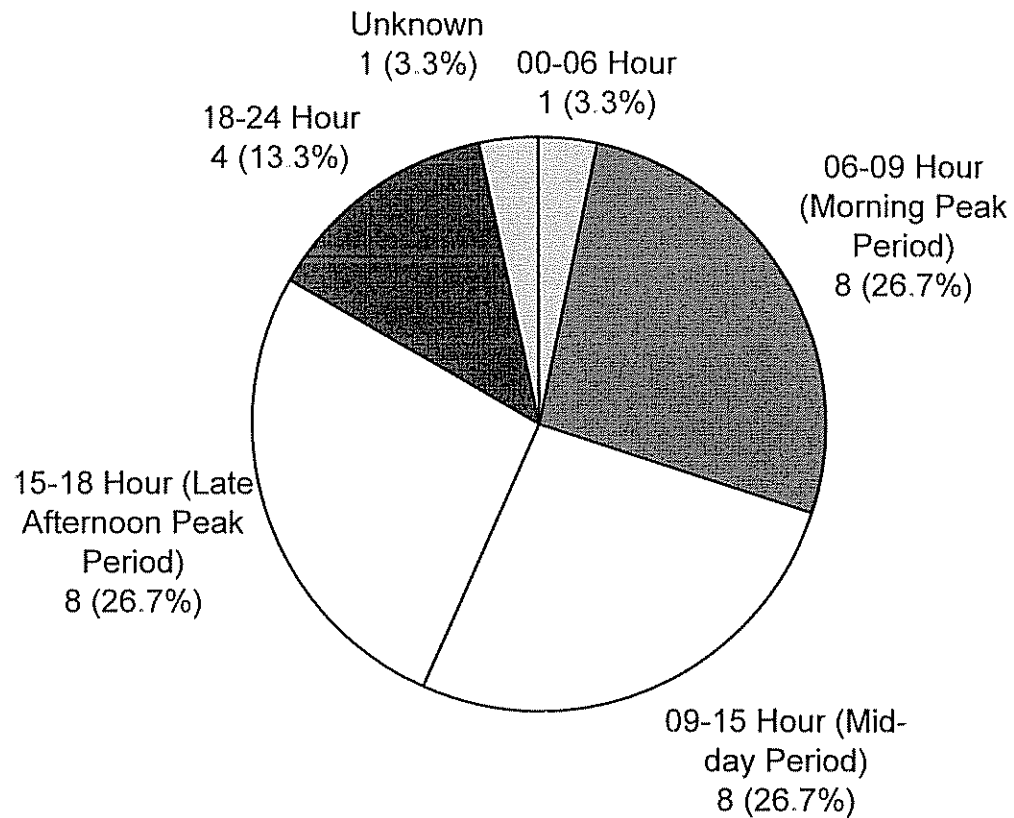


**Legend:**

30 Total Crashes from 1999 - 2001  
# (% of Total)



**SEGMENT THREE  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY TIME OF DAY**



**Legend:**

30 Total Crashes from 1999 - 2001  
# (% of Total)



Delaware River Joint Toll Bridge Commission



# **I-95/Scudder Falls Bridge Improvement Project**

## **Technical Memorandum No. 7 Traffic: Crash Analysis**

### **Chapter 5 SEGMENT 4 CRASH SUMMARY**

Key to Collision  
Diagram Symbols

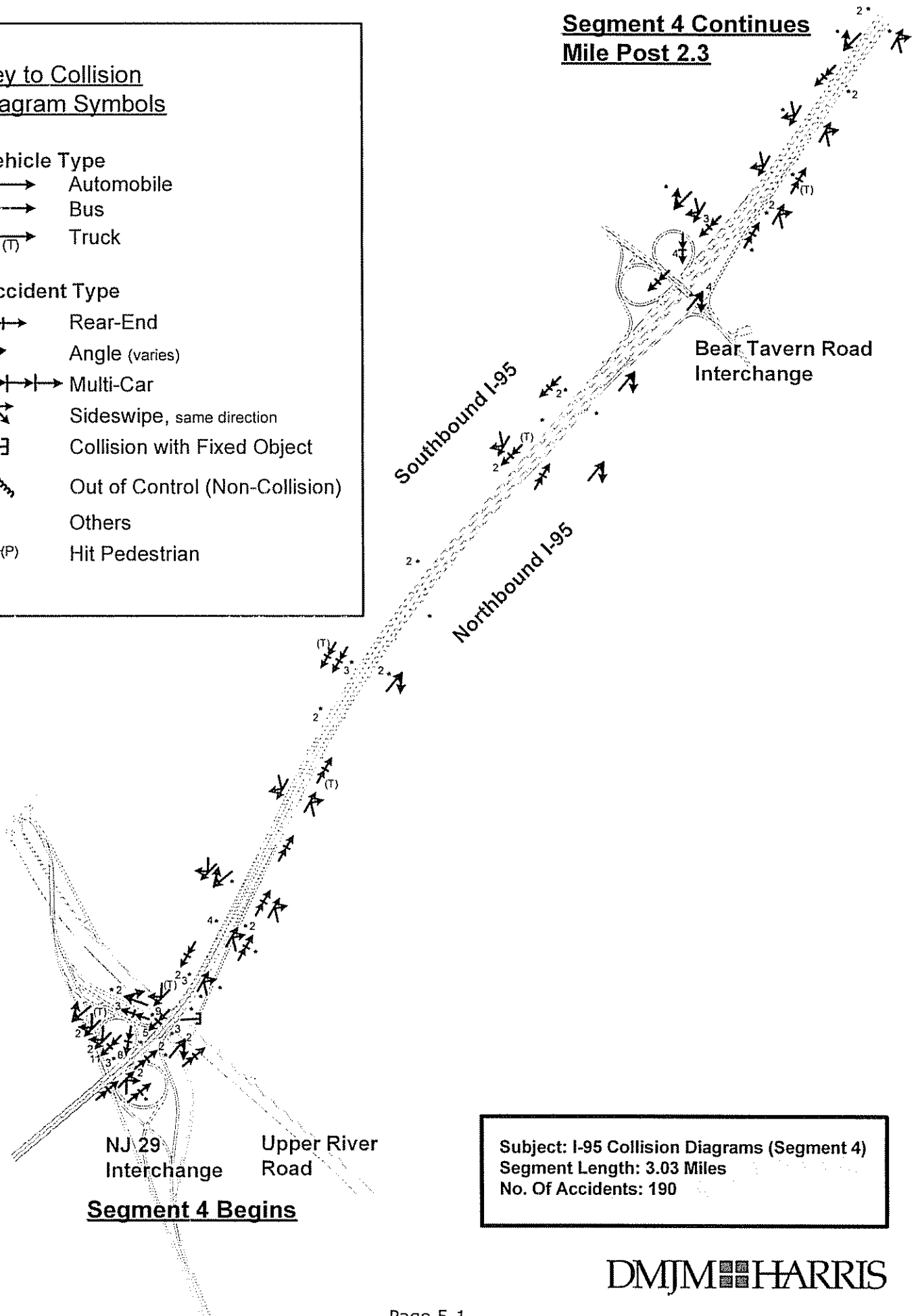
**Vehicle Type**

- Automobile
- Bus
- (T) Truck

**Accident Type**

- Rear-End
- ↗ Angle (varies)
- Multi-Car
- ↔ Sideswipe, same direction
- | Collision with Fixed Object
- ~~~~~ Out of Control (Non-Collision)
- \* Others
- (P) Hit Pedestrian

**Segment 4 Continues  
Mile Post 2.3**



**Segment 4 Begins**

Subject: I-95 Collision Diagrams (Segment 4)  
Segment Length: 3.03 Miles  
No. Of Accidents: 190

DMJM HARRIS

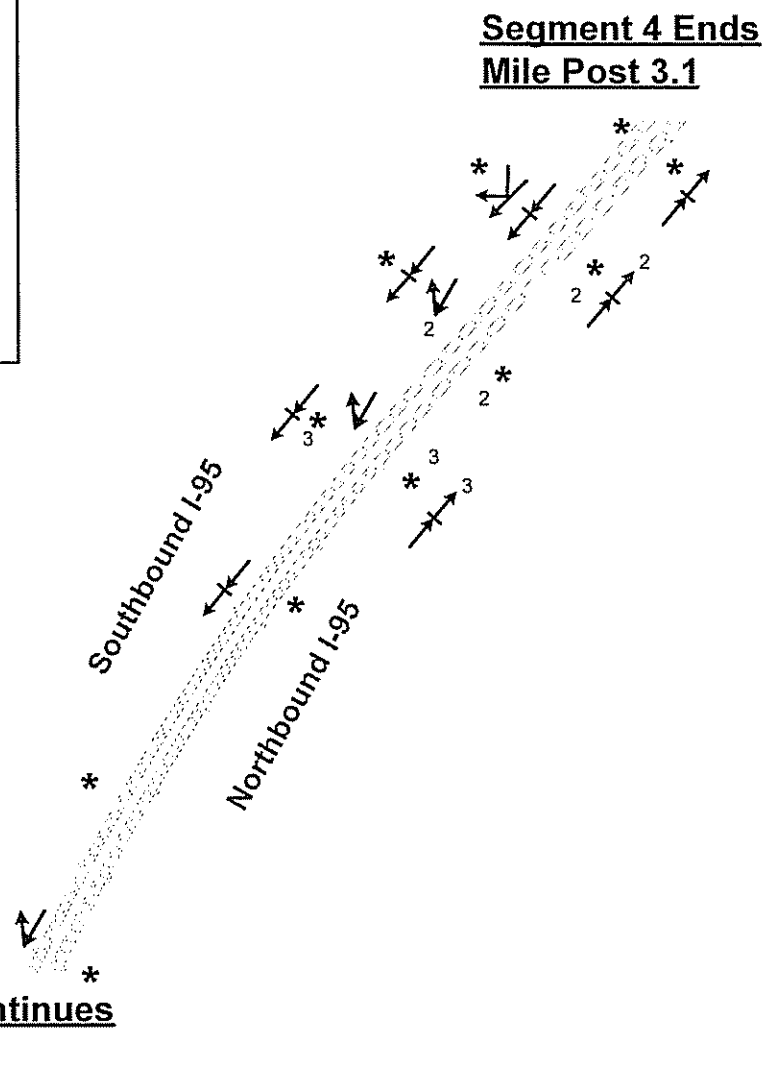
## Key to Collision Diagram Symbols

### Vehicle Type

- Automobile
- Bus
- (T) Truck

### Accident Type

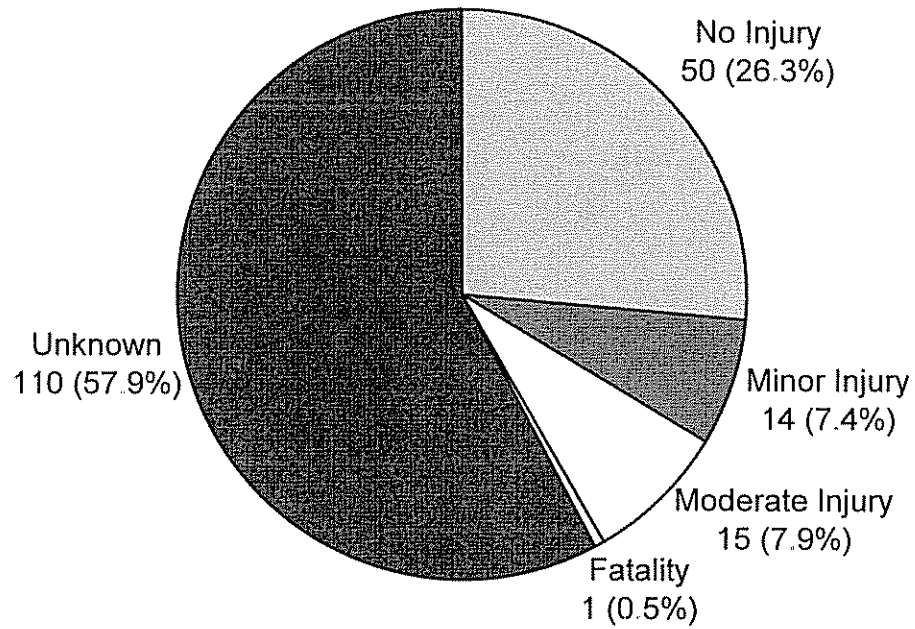
- +→ Rear-End
- ↗ Angle (varies)
- +→+→ Multi-Car
- ↗ Sideswipe, same direction
- Collision with Fixed Object
- ~~~~~ Out of Control (Non-Collision)
- \* Others
- (P) Hit Pedestrian



Subject: I-95 Collision Diagrams (Segment 4)  
Segment Length: 3.03 Miles  
No. Of Accidents: 190

DMJM  HARRIS

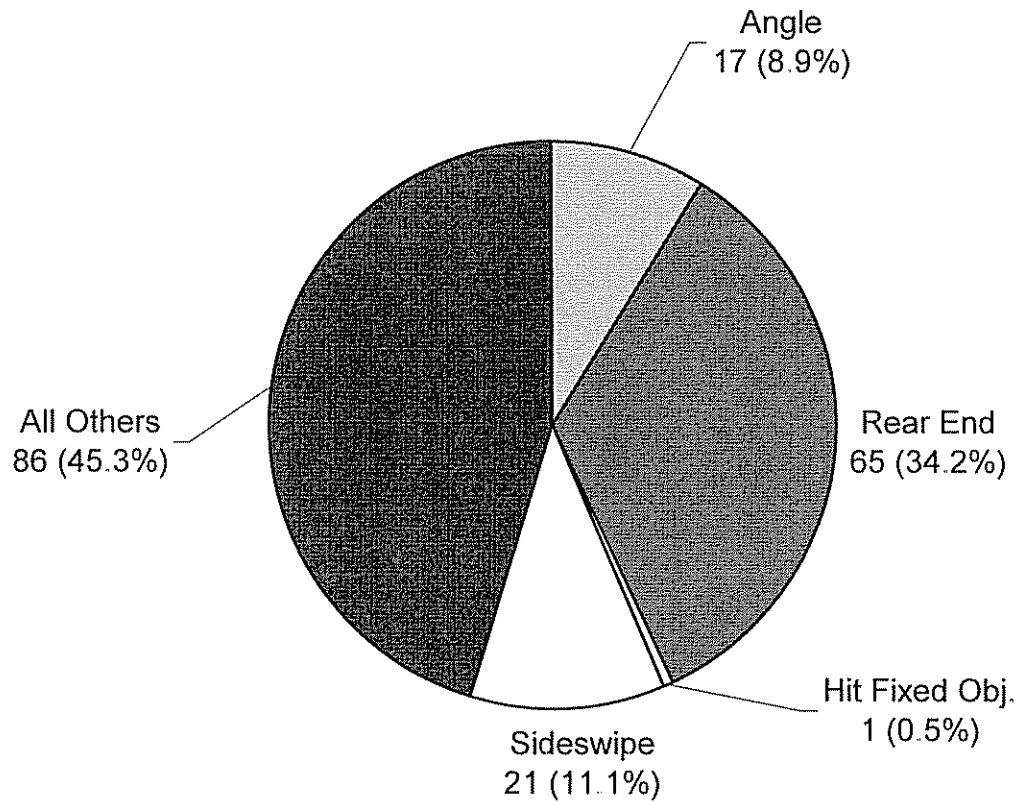
**SEGMENT FOUR  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY INJURY SEVERITY**



**Legend:**

190 Total Crashes from 1999 - 2001  
# (% of Total)

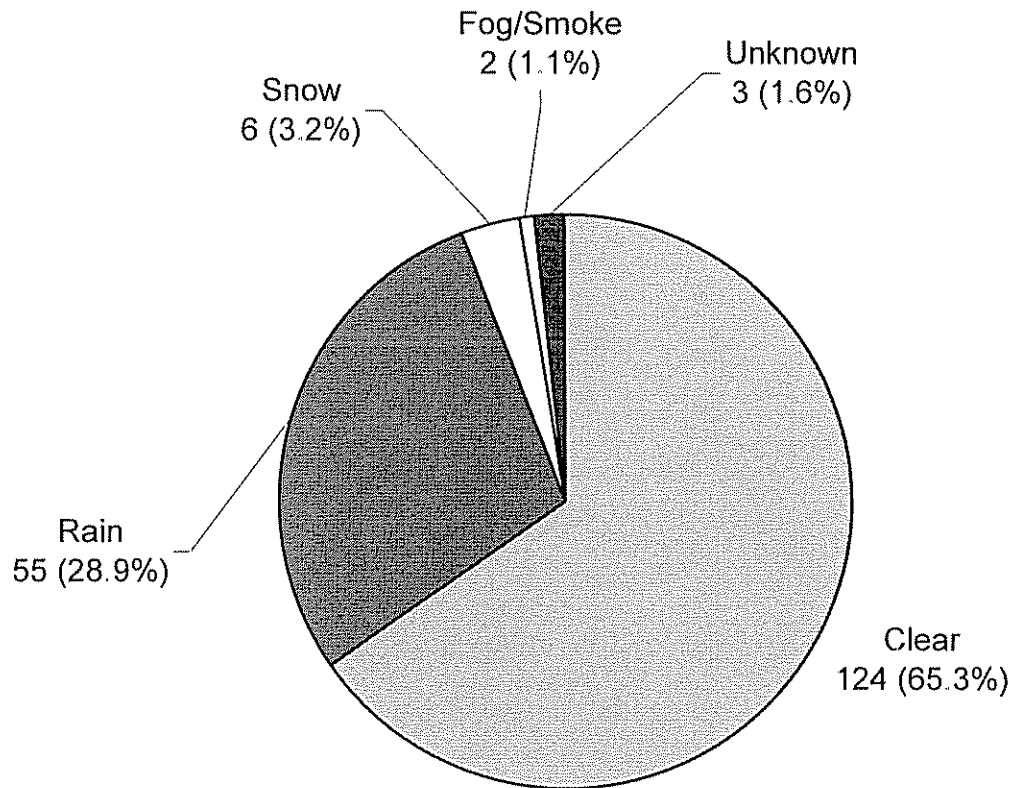
**SEGMENT FOUR  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY COLLISION TYPES**



**Legend:**

190 Total Crashes between 1999-2001  
# (% of Total)

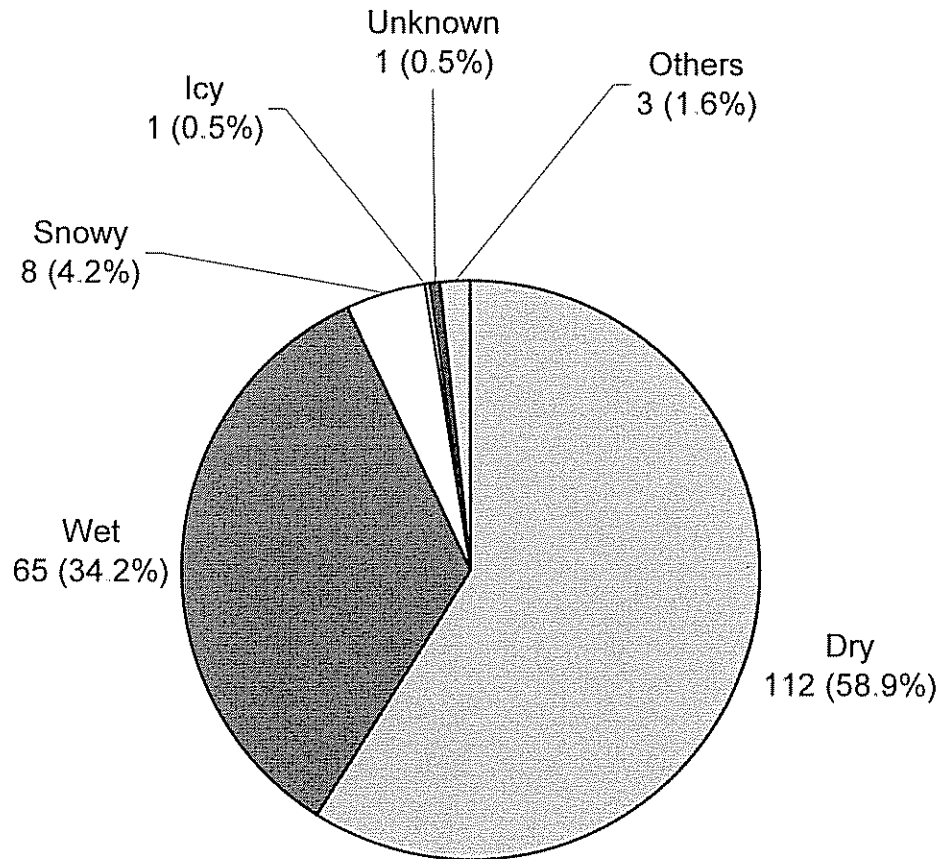
**SEGMENT FOUR  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY WEATHER CONDITION**



**Legend:**

190 Total Crashes from 1999 - 2001  
# (% of Total)

**SEGMENT FOUR  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY ROAD CONDITION**

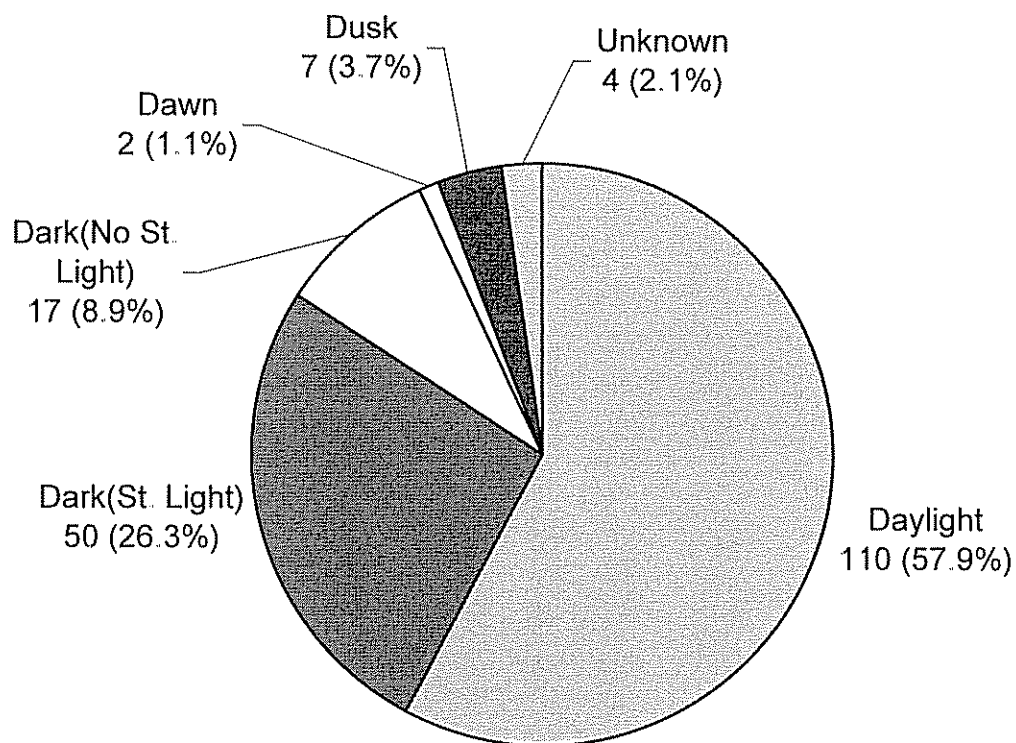


**Legend:**

190 Total Crashes from 1999 - 2001  
# (% of Total)



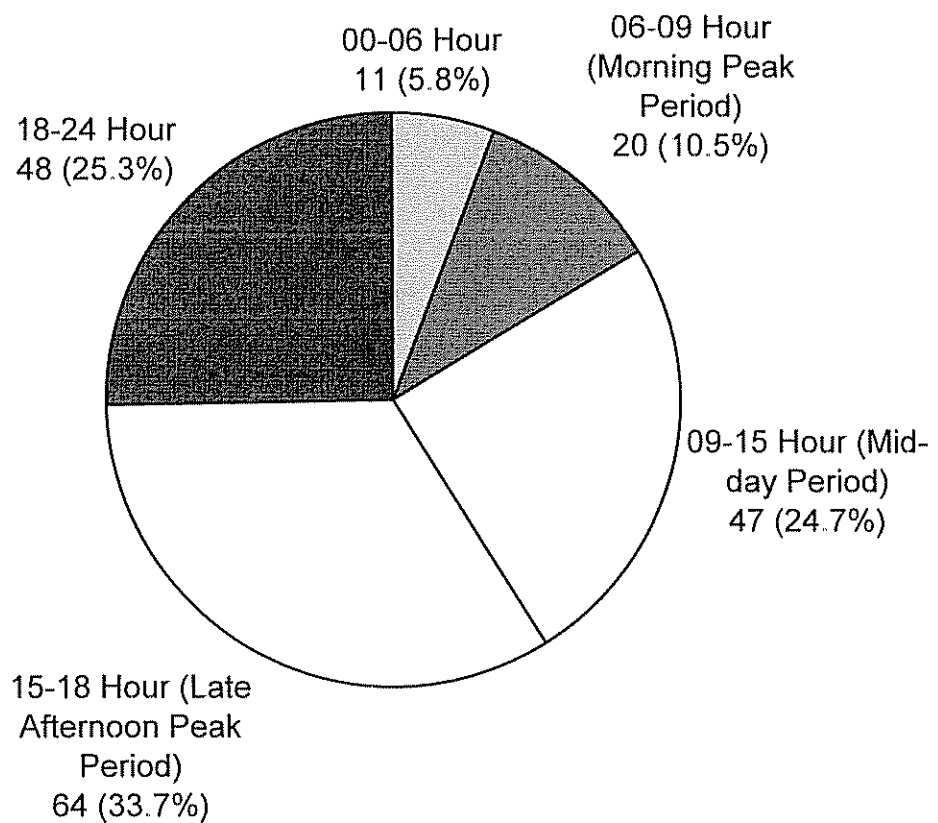
**SEGMENT FOUR  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY LIGHT CONDITION**



**Legend:**

190 Total Crashes from 1999 - 2001  
# (% of Total)

**SEGMENT FOUR  
SCUDDER FALLS BRIDGE CRASH ANALYSIS  
BROKEN DOWN BY TIME OF DAY**



**Legend:**

190 Total Crashes from 1999 - 2001  
# (% of Total)