# FINAL
# ACCIDENT ANALYSIS TECHNICAL MEMORANDUM

**S.R. 39**
**(From North of I-4 to U.S. 301)**
**Hillsborough and Pasco Counties, Florida**

**Work Program Item Segment Numbers: 255099 1 and 256289 1**
**State Project Numbers: 10200-1508 and 14110-1503**
**FAP No.: F-321-1(4)**

Prepared for:

**Florida Department of Transportation**
**District Seven**
**11201 N. McKinley Drive**
**Tampa, Florida 33612-6403**

**January 1999**

# FINAL
# ACCIDENT ANALYSIS TECHNICAL MEMORANDUM

S.R. 39
(From North of I-4 to U.S. 301)
Hillsborough and Pasco Counties, Florida

Work Program Item Segment Numbers: 255099 1 and 256289 1
State Project Numbers: 10200-1508 and 14110-1503
FAP No.: F-321-1(4)

Prepared for:

Florida Department of Transportation
District Seven
11201 N. McKinley Drive
Tampa, Florida 33612-6403

Prepared by:

PBS&J
5300 West Cypress Street, Suite 300
Tampa, Florida 33607-1066

January 1999

# FINAL
# CRASH ANALYSIS TECHNICAL MEMORANDUM

# S.R. 39, FROM NORTH OF I-4 TO U.S. 301

## CRASH DATA

To evaluate the safety of traffic operations on S.R. 39, from north of I-4 to U.S. 301, the traffic crash records for the years 1993, 1994, 1995, 1996 and 1997 were obtained from Florida Department of Transportation's (FDOT) computerized safety database. Tables 1 and 2 summarize the crashes in the study area. Specifically Table 1 depicts crashes at spot (intersection) locations and Table 2 contains information about crashes along roadway segments. The crash summary tables identify the type of crash, cause of crash, pavement condition, light condition, time of day, severity of crash and economic loss involved in the crashes.

### Spot Locations

The spot locations reflect the number of crashes that occurred within 300 ft of the intersection. The following six major intersections along S.R. 39 were analyzed as spot locations:

- I-4
- Sam Allen Road
- Knights Griffin Road
- Zephyrhills Bypass
- Michigan Avenue
- U.S. 301

There were a total of 152 crashes reported at the above six intersections. Fifty-five (55) of those crashes were angle collisions followed by forty (40) left-turn crashes and thirty-one

(31) rear-end crashes. Most of the crashes at the intersections were caused by failure to yield right-of-way (ROW), followed by careless driving. There were three fatalities during the five year period. Two of these fatalities occurred at S.R. 39/Sam Allen Road intersection in the year 1993. The other fatality occurred at S.R. 39/Zephyrhills Bypass intersection in the year 1994. At all the six intersections there were two hundred and five (205) injuries related to the 152 crashes. The total economic damage due to the 152 crashes was reported to be nearly 18.33 million dollars.

## Segment Locations

Crash analyses were also conducted for the segments between the major intersections mentioned above. The following is a list of the segments that were evaluated:

- From North of I-4 to Sam Allen Road
- From Sam Allen Road to Knights Griffin Road
- From Knights Griffin Road to Zephyrhills Bypass
- From Zephyrhills Bypass to Michigan Avenue
- From Michigan Avenue to U.S. 301

There were a total of 100 crashes reported on S.R. 39 segments during the five year period. Twenty-six (26) rear-end and sixteen (16) angle collisions account for the majority of the known type of crashes. Careless driving followed by failure to yield ROW were the major causes of crashes. There were three fatalities, all occurring on the segment from Knights Griffin Road to Zephyrhills Bypass. Two of the fatalities occurred in 1994 and one occurred in 1995. The total economic loss on the segments due to the five-year crashes is almost 17.74 million dollars. More than half (approximately 9.63 million dollars) of the economic loss was reported on the segment from Knights Griffin Road to Zephyrhills Bypass. Between 1993 and 1997 there were no crashes reported for the S.R. 39 segment between Michigan Avenue and US 301.

## Safety Ratios

To evaluate the performance of the intersections and segments with regard to traffic safety, actual and critical crash rates and safety ratios were calculated for the intersections and segments summarized in the Tables. The crash rates and safety ratios were calculated based on the methodology outlined in the *Highway Safety Improvement Program Guideline*[1] prepared by the FDOT. This methodology uses crash data, the traffic volume data obtained from FDOT computerized database, and the standardized crash information assumptions provided in the Guideline. The rates and safety ratios are defined as follows:

- The actual crash rate is a function of the number of crashes per year that occurred along a specific segment or at an intersection. The actual crash rate is determined from the length of the segment and the number in millions of vehicles that either travel along the specific segment or enter the specific intersection during the same year.

- The critical crash rate represents the average crash rate for the segments and signalized intersections for a roadway with the same characteristics as the one being studied. The critical crash rate is determined by using the typical section characteristics (number of lanes, divided versus undivided), the setting of the roadway (rural versus urban), and the traffic volumes.

- The safety ratio is the ratio between the actual crash rate and the critical crash rate. Safety ratios above 1.000 indicate that the specific segment or intersection experiences vehicle collisions above the average and, therefore, traffic safety at these locations may need to be improved.

The safety ratios calculated for years 1993 through 1997 for the S.R. 39 intersections and segments are provided in Table 1 and Table 2 respectively. Table 3 highlights the years

---

[1] *Highway Safety Improvement Program Guideline, Topic No. 500-000-100-c*; Florida Department of Transportation, Safety Office; Tallahassee, FL; Effective Date November 4, 1991.

intersections and segments experienced above average crash rates (safety ratio greater than one). The detailed safety ratio calculations are provided in Appendix A. The following intersections and segments are traditionally experiencing above average crash rates:

- I-4/S.R. 39
- Sam Allen Road/S.R. 39
- Zephyrhills Bypass/S.R. 39
- S.R. 39, From North of I-4 to Sam Allen Road.

**Table 1**
**Crash Summary for S.R. 39 Spot Locations**
**(Defined as 0.1 mile or less)**

| Crash Characteristics | S.R. 39 at I-4 (Hillsborough County MP 1.202 to 1.439) | | | | | | S.R. 39 at Sam Allen Road (Hillsborough County MP 2.139 to 2.253) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1993 | 1994 | 1995 | 1996 | 1997 | Total | 1993 | 1994 | 1995 | 1996 | 1997 | Total |
| **Type of Crash** | | | | | | | | | | | | |
| Rear end | 0 | 2 | 0 | 3 | 1 | 6 | 2 | 2 | 1 | 3 | 7 | 15 |
| Left-turn | 4 | 5 | 2 | 2 | 5 | 18 | 2 | 0 | 2 | 0 | 4 | 8 |
| Right-turn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Angle | 5 | 5 | 3 | 4 | 2 | 19 | 2 | 3 | 2 | 0 | 2 | 9 |
| Sideswipe | 1 | 0 | 2 | 0 | 1 | 4 | 0 | 1 | 0 | 2 | 1 | 4 |
| Head-On | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Overturned | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hit Pedestrian/Bicyclist | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Other | 2 | 0 | 1 | 0 | 3 | 6 | 0 | 0 | 2 | 0 | 0 | 2 |
| **Cause of Crash** | | | | | | | | | | | | |
| Careless Driving | 0 | 2 | 0 | 3 | 3 | 8 | 3 | 2 | 2 | 4 | 7 | 18 |
| Disregard Traffic Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Failed to Yield ROW | 9 | 10 | 4 | 6 | 9 | 38 | 3 | 3 | 3 | 1 | 2 | 12 |
| Exceeded Safe Speed | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| Following Too Close | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alcohol and/or Drugs | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| Improper Maneuver | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 |
| Other | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 2 | 0 | 2 | 5 |
| **Pavement Condition** | | | | | | | | | | | | |
| Dry | 9 | 11 | 8 | 8 | 10 | 46 | 5 | 5 | 4 | 4 | 13 | 31 |
| Wet | 1 | 1 | 0 | 1 | 2 | 5 | 2 | 1 | 3 | 1 | 3 | 10 |
| Other | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| **Light Condition** | | | | | | | | | | | | |
| Daylight | 7 | 11 | 7 | 8 | 9 | 42 | 7 | 4 | 3 | 5 | 10 | 29 |
| Night | 4 | 1 | 1 | 1 | 3 | 10 | 1 | 2 | 4 | 0 | 5 | 12 |
| Dawn/Dusk | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| **Time of Day** | | | | | | | | | | | | |
| 7:00 - 8:59 a.m. | 1 | 2 | 1 | 0 | 1 | 5 | 3 | 0 | 0 | 2 | 4 | 9 |
| 4:00 - 5:59 p.m. | 3 | 2 | 2 | 3 | 3 | 13 | 1 | 2 | 1 | 1 | 1 | 6 |
| Other | 8 | 8 | 5 | 6 | 8 | 35 | 4 | 4 | 6 | 2 | 11 | 27 |
| **Severity of Crash** | | | | | | | | | | | | |
| Injury* | 8 | 16 | 5 | 4 | 12 | 45 | 8 | 9 | 6 | 6 | 22 | 51 |
| Fatality | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| Property Damage Only | 6 | 4 | 6 | 5 | 4 | 25 | 1 | 2 | 5 | 0 | 3 | 11 |
| Safety Ratio | 1.443 | 1.443 | 0.937 | 1.112 | 1.453 | -- | 0.867 | 0.610 | 0.717 | 0.540 | 1.701 | -- |
| Economic Loss** | 9.115 | 8.940 | 6.030 | 6.740 | 8.940 | 39.765 | 12.176 | 9.132 | 10.654 | 7.610 | 24.352 | 63.924 |
| Total | 12 | 12 | 8 | 9 | 12 | 53 | 8 | 6 | 7 | 5 | 16 | 42 |

Notes:
* More than one injury per crash might be reported.
** Figures are in 100,000 dollars.

| Crash Characteristics | S.R. 39 at Knights-Griffin Road (Hillsborough County MP 4.203 to 4.317) | | | | | | S.R. 39 at Zephyrhills Bypass (Pasco County MP 2.687 to 2.801) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1993 | 1994 | 1995 | 1996 | 1997 | Total | 1993 | 1994 | 1995 | 1996 | 1997 | Total |
| **Type of Crash** | | | | | | | | | | | | |
| Rear end | 1 | 0 | 1 | 0 | 3 | 5 | 1 | 0 | 1 | 1 | 0 | 3 |
| Left-turn | 1 | 1 | 1 | 2 | 0 | 5 | 1 | 1 | 0 | 4 | 2 | 8 |
| Right-turn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Angle | 0 | 3 | 1 | 3 | 0 | 7 | 10 | 5 | 1 | 3 | 1 | 20 |
| Sideswipe | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head-On | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| Overturned | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 |
| Hit Pedestrian/Bicyclist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Cause of Crash** | | | | | | | | | | | | |
| Careless Driving | 0 | 0 | 1 | 0 | 3 | 4 | 4 | 0 | 1 | 1 | 0 | 6 |
| Disregard Traffic Control | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| Failed to Yield ROW | 1 | 1 | 1 | 4 | 1 | 8 | 8 | 2 | 1 | 5 | 2 | 18 |
| Exceeded Safe Speed | 0 | 3 | 1 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 2 |
| Following Too Close | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alcohol and/or Drugs | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 5 |
| Improper Maneuver | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 3 |
| **Pavement Condition** | | | | | | | | | | | | |
| Dry | 2 | 3 | 3 | 5 | 4 | 17 | 13 | 7 | 1 | 9 | 4 | 34 |
| Wet | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Light Condition** | | | | | | | | | | | | |
| Daylight | 3 | 2 | 1 | 4 | 1 | 11 | 13 | 2 | 2 | 7 | 2 | 26 |
| Night | 0 | 2 | 2 | 1 | 2 | 7 | 0 | 4 | 0 | 1 | 2 | 7 |
| Dawn/Dusk | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 2 |
| **Time of Day** | | | | | | | | | | | | |
| 7:00 - 8:59 a.m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 4:00 - 5:59 p.m. | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 4 |
| Other | 2 | 4 | 3 | 4 | 4 | 17 | 11 | 5 | 2 | 9 | 3 | 30 |
| **Severity of Crash** | | | | | | | | | | | | |
| Injury* | 8 | 5 | 2 | 20 | 5 | 40 | 34 | 10 | 5 | 11 | 5 | 65 |
| Fatality | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Property Damage Only | 1 | 1 | 1 | 0 | 2 | 5 | 1 | 1 | 0 | 1 | 1 | 4 |
| Safety Ratio | 0.422 | 0.542 | 0.417 | 0.696 | 0.529 | -- | 2.049 | 1.117 | 0.311 | 1.279 | 0.551 | -- |
| Economic Loss** | 4.566 | 6.088 | 4.566 | 7.610 | 6.088 | 28.918 | 28.457 | 5.460 | 1.560 | 7.020 | 6.088 | 48.585 |
| Total | 3 | 4 | 3 | 5 | 4 | 19 | 13 | 7 | 2 | 9 | 4 | 35 |

Notes:
* More than one injury per crash might be reported.
** Figures are in 100,000 dollars.

| Crash Characteristics | S.R. 39 at Michigan Avenue (Pasco County MP 3.328 to 3.442) | | | | | | S.R. 39 at US 301 (Pasco County MP 3.504 to 3.618) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1993 | 1994 | 1995 | 1996 | 1997 | Total | 1993 | 1994 | 1995 | 1996 | 1997 | Total |
| **Type of Crash** | | | | | | | | | | | | |
| Rear end | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Left-turn | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-turn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Angle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sideswipe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head-On | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Overturned | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hit Pedestrian/Bicyclist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Cause of Crash** | | | | | | | | | | | | |
| Careless Driving | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Disregard Traffic Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Failed to Yield ROW | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exceeded Safe Speed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Following Too Close | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alcohol and/or Drugs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Improper Maneuver | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Pavement Condition** | | | | | | | | | | | | |
| Dry | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| Wet | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Light Condition** | | | | | | | | | | | | |
| Daylight | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| Night | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dawn/Dusk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Time of Day** | | | | | | | | | | | | |
| 7:00 - 8:59 a.m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:00 - 5:59 p.m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| **Severity of Crash** | | | | | | | | | | | | |
| Injury* | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 2 |
| Fatality | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Property Damage Only | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Safety Ratio | 0.000 | 0.160 | 0.000 | 0.000 | 0.138 | -- | 0.000 | 0.000 | 0.156 | 0.000 | 0.000 | -- |
| Economic Loss** | 0 | 0.688 | 0 | 0 | 0.688 | 1.376 | 0 | 0 | 0.688 | 0 | 0 | 0.688 |
| Total | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |

Notes:
* More than one injury per crash might be reported.
** Figures are in 100,000 dollars.

Table 2
Crash Summary for S.R. 39 Segment Locations

| Crash Characteristics | From I-4 to Sam Allen Road (Hillsborough County MP 1.439 to 2.139) | | | | | | From Sam Allen Road to Knights Griffin Road (Hillsborough County MP 2.253 to 4.203) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1993 | 1994 | 1995 | 1996 | 1997 | Total | 1993 | 1994 | 1995 | 1996 | 1997 | Total |
| **Type of Crash** | | | | | | | | | | | | |
| Rear end | 1 | 2 | 0 | 5 | 0 | 8 | 1 | 1 | 2 | 3 | 0 | 7 |
| Left-turn | 4 | 3 | 0 | 2 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-turn | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Angle | 3 | 2 | 0 | 0 | 0 | 5 | 2 | 3 | 1 | 0 | 0 | 6 |
| Sideswipe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head-On | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 2 |
| Overturned | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hit Pedestrian/Bicyclist | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Other | 1 | 0 | 2 | 0 | 0 | 3 | 2 | 2 | 2 | 3 | 0 | 9 |
| **Cause of Crash** | | | | | | | | | | | | |
| Careless Driving | 1 | 3 | 0 | 4 | 0 | 8 | 3 | 4 | 4 | 3 | 0 | 14 |
| Disregard Traffic Control | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 3 |
| Failed to Yield RQW | 7 | 3 | 0 | 2 | 0 | 12 | 1 | 2 | 1 | 0 | 0 | 4 |
| Exceeded Safe Speed | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| Following Too Close | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alcohol and/or Drugs | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| Improper Maneuver | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| Other | 2 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 |
| **Pavement Condition** | | | | | | | | | | | | |
| Dry | 11 | 8 | 3 | 6 | 0 | 28 | 4 | 4 | 7 | 3 | 0 | 18 |
| Wet | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 3 | 0 | 7 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Light Condition** | | | | | | | | | | | | |
| Daylight | 9 | 3 | 3 | 5 | 0 | 20 | 3 | 2 | 4 | 4 | 0 | 13 |
| Night | 3 | 3 | 0 | 2 | 0 | 8 | 2 | 2 | 3 | 1 | 0 | 8 |
| Dawn/Dusk | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 4 |
| **Time of Day** | | | | | | | | | | | | |
| 7:00 - 8:59 a.m. | 1 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 1 |
| 4:00 - 5:59 p.m. | 2 | 1 | 1 | 3 | 0 | 7 | 0 | 2 | 0 | 0 | 0 | 2 |
| Other | 9 | 7 | 1 | 3 | 0 | 20 | 6 | 4 | 6 | 6 | 0 | 22 |
| **Severity of Crash** | | | | | | | | | | | | |
| Injury* | 9 | 19 | 0 | 3 | 0 | 31 | 15 | 8 | 6 | 3 | 0 | 32 |
| Fatality | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Property Damage Only | 5 | 1 | 3 | 4 | 0 | 13 | 2 | 3 | 3 | 3 | 0 | 11 |
| **Safety Ratio** | 2.801 | 1.867 | 0.682 | 1.678 | 0.000 | -- | 0.802 | 0.692 | 0.848 | 0.765 | 0.000 | -- |
| **Economic Loss** | 12.178 | 6.240 | 2.340 | 5.460 | 0 | 26.218 | 13.134 | 13.134 | 15.323 | 12.467 | 0 | 54.058 |
| **Total** | 12 | 8 | 3 | 7 | 0 | 30 | 6 | 6 | 7 | 6 | 0 | 25 |

Notes:
* More than one injury per crash might be reported.
** Figures are in 100,000 dollars.

Table 2 (Continued)
Crash Summary for S.R. 39 Segment Locations

| Crash Characteristics | From Knights Griffin Road to Zephyrhills Bypass (MP 4.317 - 10.910[1] (MP 0.000 - 2.687)[2] | | | | | | From Zephyrhills Bypass to Michigan Avenue (Pasco County MP 2.801 to 3.328) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1993 | 1994 | 1995 | 1996 | 1997 | Total | 1993 | 1994 | 1995 | 1996 | 1997 | Total |
| **Type of Crash** | | | | | | | | | | | | |
| Rear end | 0 | 3 | 4 | 4 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Left-turn | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 1 |
| Right-turn | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Angle | 0 | 1 | 2 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sideswipe | 0 | 0 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head-On | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Overturned | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hit Pedestrian/Bicyclist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 4 | 10 | 5 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Cause of Crash** | | | | | | | | | | | | |
| Careless Driving | 0 | 4 | 7 | 11 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 |
| Disregard Traffic Control | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Failed to Yield ROW | 0 | 1 | 2 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exceeded Safe Speed | 0 | 0 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Following Too Close | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alcohol and/or Drugs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Improper Maneuver | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 2 | 6 | 1 | 0 | 9 | 0 | 0 | 0 | 0 | 1 | 1 |
| **Pavement Condition** | | | | | | | | | | | | |
| Dry | 0 | 5 | 13 | 13 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wet | 0 | 5 | 5 | 3 | 0 | 13 | 0 | 0 | 0 | 0 | 1 | 1 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Light Condition** | | | | | | | | | | | | |
| Daylight | 0 | 6 | 11 | 11 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 |
| Night | 0 | 4 | 6 | 5 | 0 | 15 | 0 | 0 | 0 | 0 | 1 | 1 |
| Dawn/Dusk | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Time of Day** | | | | | | | | | | | | |
| 7:00 - 8:59 a.m. | 0 | 0 | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:00 - 5:59 p.m. | 0 | 2 | 2 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 8 | 14 | 13 | 0 | 35 | 0 | 0 | 0 | 0 | 1 | 1 |
| **Severity of Crash** | | | | | | | | | | | | |
| Injury* | 0 | 11 | 22 | 17 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fatality | 0 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Property Damage Only | 0 | 1 | 7 | 6 | 0 | 14 | 0 | 0 | 0 | 0 | 1 | 1 |
| Safety Ratio | 0.000 | 0.474 | 0.835 | 0.678 | 0.000 | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.426 | -- |
| Economic Loss** | 0 | 21.89 | 39.40 | 35.02 | 0 | 96.31 | 0 | 0 | 0 | 0 | 0.78 | 0.78 |
| **Total** | 0 | 10 | 18 | 16 | 0 | 44 | 0 | 0 | 0 | 0 | 1 | 1 |

Notes:
* More than one injury per crash might be reported.
** Figures are in 100,000 dollars.
1. Hillsborough County
2. Pasco County

**Table 3**
**Summary of High Crash History by Location and Year**
**(Safety Ratio Greater than One)**

| Location | Years |
|---|---|
| *Intersections* | |
| I-4 | 1993,1994,1996 and 1997 |
| Sam Allen Road | 1997 |
| Knights Griffin Road | None |
| Zephyrhills Bypass | 1993, 1994 and 1996 |
| Michigan Avenue | None |
| U.S. 301 | None |
| *Segments* | |
| From North of I-4 to Sam Allen Road | 1993, 1994 and 1996 |
| From Sam Allen Road to Knights Griffin Road | None |
| From Knights Griffin Road to Zephyrhills Bypass | None |
| From Zephyrhills Bypass to Michigan Avenue | None |
| From Michigan Avenue to U.S. 301 | None |

# APPENDIX A

## Safety Ratio Calculations

# SAFETY RATIO CALCULATIONS

## SR 39 / I-4 Eastbound

### 1993 (4.563 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 12 /4.563 = | 2.630 |
| Critical Crash Rate | = | 1.118 +1.645sqrt(1.118/4.563)-1/(2*4.563) | |
| | = | 1.118+1.645*0.4950-0.110 | |
| | = | 1.823 | |
| Safety Ratio | = | 2.630/1.823 | = 1.443 |

### 1994 (4.563 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 12 /4.563 = | 2.630 |
| Critical Crash Rate | = | 1.118 +1.645sqrt(1.118/4.563)-1/(2*4.563) | |
| | = | 1.118+1.645*0.4950-0.110 | |
| | = | 1.823 | |
| Safety Ratio | = | 2.630/1.823 | = 1.443 |

### 1995 (4.709 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 8 /4.709 = | 1.699 |
| Critical Crash Rate | = | 1.118 +1.645sqrt(1.118/4.709)-1/(2*4.709) | |
| | = | 1.118+1.645*0.4873-0.106 | |
| | = | 1.813 | |
| Safety Ratio | = | 1.699/1.813 | = 0.937 |

### 1996 (4.417 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 9 /4.417 = | 2.038 |
| Critical Crash Rate | = | 1.118 +1.645sqrt(1.118/4.417) - 1/(2*4.417) | |
| | = | 1.118+1.645*0.5031-0.113 | |
| | = | 1.832 | |
| Safety Ratio | = | 2.038/1.832 | = 1.112 |

### 1997 (4.526 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 12 /4.526 = | 2.651 |
| Critical Crash Rate | = | 1.118 +1.645sqrt(1.118/4.526) - 1/(2*4.526) | |
| | = | 1.118+1.645*0.4970-0.110 | |
| | = | 1.825 | |
| Safety Ratio | = | 2.651/1.825 | = 1.453 |

# SAFETY RATIO CALCULATIONS

## SR 39 / Sam Allen Road

### 1993 (3.887 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 8 /3.887 =        2.058 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/3.887)-1/(2*3.887) |
| | = | 1.485+1.645*0.6181-0.129 |
| | = | 2.373 |
| Safety Ratio | = | 2.058/2.373    = 0.867 |

### 1994 (4.198 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 6 /4.198 =        1.429 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/4.198)-1/(2*4.198) |
| | = | 1.485+1.645*0.5948-0.119 |
| | = | 2.344 |
| Safety Ratio | = | 1.429/2.344    = 0.610 |

### 1995 (4.161 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 7 /4.161 =        1.682 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/4.161)-1/(2*4.161) |
| | = | 1.485+1.645*0.5974-0.120 |
| | = | 2.348 |
| Safety Ratio | = | 1.682/2.348    = 0.717 |

### 1996 (3.906 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 5 /3.906 =        1.280 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/3.906) - 1/(2*3.906) |
| | = | 1.485+1.645*0.6166-0.128 |
| | = | 2.371 |
| Safety Ratio | = | 1.280/2.371    = 0.540 |

### 1997 (3.979 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 16 /3.979 =       4.022 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/3.979) - 1/(2*3.979) |
| | = | 1.485+1.645*0.6109-0.126 |
| | = | 2.364 |
| Safety Ratio | = | 4.022/2.364    = 1.701 |

# SAFETY RATIO CALCULATIONS

<u>SR 39 / Knights-Griffin Road</u>

<u>1993</u>  (2.847 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 3 /2.847 =         1.054 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.847)-1/(2*2.847) |
| | = | 1.485+1.645*0.7222-0.176 |
| | = | 2.497 |
| Safety Ratio | = | 1.054/2.497   = 0.422 |

<u>1994</u>  (2.975 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 4 /2.975 =         1.345 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.975)-1/(2*2.975) |
| | = | 1.485+1.645*0.7065-0.168 |
| | = | 2.479 |
| Safety Ratio | = | 1.345/2.479   = 0.542 |

<u>1995</u>  (2.884 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 3 /2.884 =         1.040 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.884)-1/(2*2.884) |
| | = | 1.485+1.645*0.7176-0.173 |
| | = | 2.492 |
| Safety Ratio | = | 1.040/2.492   = 0.417 |

<u>1996</u>  (2.884 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 5 /2.884 =         1.734 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.884) - 1/(2*2.884) |
| | = | 1.485+1.645*0.7176-0.173 |
| | = | 2.492 |
| Safety Ratio | = | 1.734/2.492   = 0.696 |

<u>1997</u>  (3.066 mv/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 4 /3.066 =         1.305 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/3.066) - 1/(2*3.066) |
| | = | 1.485+1.645*0.6959-0.163 |
| | = | 2.467 |
| Safety Ratio | = | 1.305/2.467   = 0.529 |

# SAFETY RATIO CALCULATIONS

## SR 39 / Zephyrhills Bypass

### 1993  (2.482 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 13 /2.482 = | 5.238 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.482)-1/(2*2.482) | |
| | = | 1.485+1.645*0.7735-0.201 | |
| | = | 2.556 | |
| Safety Ratio | = | 5.238/2.556 | = 2.049 |

### 1994  (2.446 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 7 /2.446 = | 2.862 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.446)-1/(2*2.446) | |
| | = | 1.485+1.645*0.7793-0.204 | |
| | = | 2.562 | |
| Safety Ratio | = | 2.862/2.562 | = 1.117 |

### 1995  (2.519 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 2 /2.519 = | 0.794 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.519)-1/(2*2.519) | |
| | = | 1.485+1.645*0.7679-0.199 | |
| | = | 2.550 | |
| Safety Ratio | = | 0.794/2.550 | = 0.311 |

### 1996  (2.811 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 9 /2.811 = | 3.202 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.811) - 1/(2*2.811) | |
| | = | 1.485+1.645*0.7269-0.178 | |
| | = | 2.503 | |
| Safety Ratio | = | 3.202/2.503 | = 1.279 |

### 1997  (2.920 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 4 /2.920 = | 1.370 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.920) - 1/(2*2.920) | |
| | = | 1.485+1.645*0.7131-0.171 | |
| | = | 2.487 | |
| Safety Ratio | = | 1.370/2.487 | = 0.551 |

# SAFETY RATIO CALCULATIONS

## SR 39 / Michigan Avenue

### 1993 (2.482 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.482 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.482)-1/(2*2.482) | |
| | = | 1.485+1.645*0.7735-0.201 | |
| | = | 2.556 | |
| Safety Ratio | = | 0.000/2.556 | = 0.000 |

### 1994 (2.446 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 1 /2.446 = | 0.409 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.446)-1/(2*2.446) | |
| | = | 1.485+1.645*0.7793-0.204 | |
| | = | 2.562 | |
| Safety Ratio | = | 0.409/2.562 | = 0.160 |

### 1995 (2.519 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.519 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.519)-1/(2*2.519) | |
| | = | 1.485+1.645*0.7679-0.199 | |
| | = | 2.550 | |
| Safety Ratio | = | 0.000/2.550 | = 0.000 |

### 1996 (2.811 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.811 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.811) - 1/(2*2.811) | |
| | = | 1.485+1.645*0.7269-0.178 | |
| | = | 2.503 | |
| Safety Ratio | = | 0.000/2.503 | = 0.000 |

### 1997 (2.920 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 1 /2.920 = | 0.342 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.920) - 1/(2*2.920) | |
| | = | 1.485+1.645*0.7131-0.171 | |
| | = | 2.487 | |
| Safety Ratio | = | 0.342/2.487 | = 0.138 |

# SAFETY RATIO CALCULATIONS

<u>SR 39 / US 301</u>

<u>1993</u> (2.482 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.482 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.482)-1/(2*2.482) | |
| | = | 1.485+1.645*0.7735-0.201 | |
| | = | 2.556 | |
| Safety Ratio | = | 0.000/2.556  = 0.000 | |

<u>1994</u> (2.446 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.446 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.446)-1/(2*2.446) | |
| | = | 1.485+1.645*0.7793-0.204 | |
| | = | 2.562 | |
| Safety Ratio | = | 0.000/2.562  = 0.000 | |

<u>1995</u> (2.519 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 1 /2.519 = | 0.397 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.519)-1/(2*2.519) | |
| | = | 1.485+1.645*0.7679-0.199 | |
| | = | 2.550 | |
| Safety Ratio | = | 0.397/2.550  = 0.156 | |

<u>1996</u> (2.811 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.811 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.811) -  1/(2*2.811) | |
| | = | 1.485+1.645*0.7269-0.178 | |
| | = | 2.503 | |
| Safety Ratio | = | 0.000/2.503  = 0.000 | |

<u>1997</u> (2.920 mv/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /2.920 = | 0.000 |
| Critical Crash Rate | = | 1.485 +1.645sqrt(1.485/2.920) -  1/(2*2.920) | |
| | = | 1.485+1.645*0.7131-0.171 | |
| | = | 2.487 | |
| Safety Ratio | = | 0.000/2.487  = 0.000 | |

## SAFETY RATIO CALCULATIONS

<u>SR 39, From I-4 EB to Sam Allen Road</u>

<u>1993</u>  (3.194 mvm/y)

| Actual Crash Rate | = | 12 /3.194 = | 3.757 |
|---|---|---|---|

Critical Crash Rate     =     0.718 +1.645sqrt(0.718/3.194)-1/(2*3.194)

            =   0.718+1.645*0.4741-0.157

            =   1.341

Safety Ratio     =     3.757/1.341     = 2.801

<u>1994</u>   (3.194 mvm/y)

Actual Crash Rate     =     8 /3.194 =     2.505

Critical Crash Rate     =     0.718 +1.645sqrt(0.718/3.194)-1/(2*3.194)

            =   0.718+1.645*0.4741-0.157

            =   1.341

Safety Ratio     =     2.505/1.341     = 1.867

<u>1995</u>   (3.296 mvm/y)

Actual Crash Rate     =     3 /3.296 =     0.910

Critical Crash Rate     =     0.718 +1.645sqrt(0.718/3.296)-1/(2*3.296)

            =   0.718+1.645*0.4667-0.152

            =   1.334

Safety Ratio     =     0.910/1.334     = 0.682

<u>1996</u>   (3.092 mvm/y)

Actual Crash Rate     =     7 /3.092 =     2.264

Critical Crash Rate     =     0.718 +1.645sqrt(0.718/3.092) -  1/(2*3.092)

            =   0.718+1.645*0.4819-0.162

            =   1.349

Safety Ratio     =     2.264/1.349     = 1.678

<u>1997</u>   (3.168 mvm/y)

Actual Crash Rate     =     0 /3.168 =     0.000

Critical Crash Rate     =     0.718 +1.645sqrt(0.718/3.168) -  1/(2*3.168)

            =   0.718+1.645*0.4761-0.158

            =   1.343

Safety Ratio     =     0.000/1.343     = 0.000

# SAFETY RATIO CALCULATIONS

## SR 39, From Sam Allen Road to Knights Griffin Road

__1993__ (6.263 mvm/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 6 /6.263 = | 0.958 |

Critical Crash Rate    =    0.718 +1.645sqrt(0.718/6.263)-1/(2*6.263)

                               =    0.718+1.645*0.3386-0.080

                               =    1.195

Safety Ratio         =    0.958/1.195    = 0.802

__1994__ (7.473 mvm/y)

Actual Crash Rate    =    6 /7.473 =      0.803

Critical Crash Rate    =    0.718 +1.645sqrt(0.718/7.473)-1/(2*7.473)

                               =    0.718+1.645*0.3100-0.067

                               =    1.161

Safety Ratio         =    0.803/1.161    = 0.692

__1995__ (7.046 mvm/y)

Actual Crash Rate    =    7 /7.046 =      0.993

Critical Crash Rate    =    0.718 +1.645sqrt(0.718/7.046)-1/(2*7.046)

                               =    0.718+1.645*0.3192-0.071

                               =    1.172

Safety Ratio         =    0.993/1.172    = 0.848

__1996__ (6.619 mvm/y)

Actual Crash Rate    =    6 /6.619 =      0.906

Critical Crash Rate    =    0.718 +1.645sqrt(0.718/6.619) - 1/(2*6.619)

                               =    0.718+1.645*0.3293-0.076

                               =    1.184

Safety Ratio         =    0.906/1.184    = 0.765

__1997__ (6.690 mvm/y)

Actual Crash Rate    =    0 /6.690 =      0.000

Critical Crash Rate    =    0.718 +1.645sqrt(0.718/6.690) - 1/(2*6.690)

                               =    0.718+1.645*0.3276-0.075

                               =    1.182

Safety Ratio         =    0.000/1.182    = 0.000

# SAFETY RATIO CALCULATIONS

## SR 39, From Knights Griffin Rd to Zephyrhills Bypass

### 1993 (23.033 mvm/y)

Actual Crash Rate $=$ 0 /23.033 = 0.000

Critical Crash Rate $=$ 0.718 +1.645sqrt(0.718/23.033)-1/(2*23.033)

$=$ 0.718+1.645*0.1766-0.022

$=$ 0.987

Safety Ratio $=$ 0.000/0.987 = 0.000

### 1994 (21.170 mvm/y)

Actual Crash Rate $=$ 10 /21.170 = 0.472

Critical Crash Rate $=$ 0.718 +1.645sqrt(0.718/21.170)-1/(2*21.170)

$=$ 0.718+1.645*0.1842-0.024

$=$ 0.997

Safety Ratio $=$ 0.472/0.997 = 0.474

### 1995 (21.678 mvm/y)

Actual Crash Rate $=$ 18 /21.678 = 0.830

Critical Crash Rate $=$ 0.718 +1.645sqrt(0.718/21.678)-1/(2*21.678)

$=$ 0.718+1.645*0.1820-0.023

$=$ 0.994

Safety Ratio $=$ 0.830/0.994 = 0.835

### 1996 (24.049 mvm/y)

Actual Crash Rate $=$ 16 /24.049 = 0.665

Critical Crash Rate $=$ 0.718 +1.645sqrt(0.718/24.049) - 1/(2*24.049)

$=$ 0.718+1.645*0.1728-0.021

$=$ 0.981

Safety Ratio $=$ 0.665/0.981 = 0.678

### 1997 (26.081 mvm/y)

Actual Crash Rate $=$ 0 /26.081 = 0.000

Critical Crash Rate $=$ 0.718 +1.645sqrt(0.718/26.081) - 1/(2*26.081)

$=$ 0.718+1.645*0.1659-0.019

$=$ 0.972

Safety Ratio $=$ 0.000/0.972 = 0.000

# SAFETY RATIO CALCULATIONS

<u>SR 39. From Zephyrhills Bypass to Michigan</u>

<u>1993</u>  (1.308 mvm/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 0 /1.308 =        0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/1.308)-1/(2*1.308) |
| | = | 0.718+1.645*0.7409-0.382 |
| | = | 1.555 |
| Safety Ratio | = | 0.000/1.555  = 0.000 |

<u>1994</u>  (1.289 mvm/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 0 /1.289 =        0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/1.289)-1/(2*1.289) |
| | = | 0.718+1.645*0.7464-0.388 |
| | = | 1.558 |
| Safety Ratio | = | 0.000/1.558  = 0.000 |

<u>1995</u>  (1.327 mvm/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 0 /1.327 =        0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/1.327)-1/(2*1.327) |
| | = | 0.718+1.645*0.7355-0.377 |
| | = | 1.551 |
| Safety Ratio | = | 0.000/1.551  = 0.000 |

<u>1996</u>  (1.481 mvm/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 0 /1.481 =        0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/1.481) -  1/(2*1.481) |
| | = | 0.718+1.645*0.6962-0.338 |
| | = | 1.526 |
| Safety Ratio | = | 0.000/1.526  = 0.000 |

<u>1997</u>  (1.539 mvm/y)

| | | |
|---|---|---|
| Actual Crash Rate | = | 1 /1.539 =        0.650 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/1.539) -  1/(2*1.539) |
| | = | 0.718+1.645*0.6831-0.325 |
| | = | 1.517 |
| Safety Ratio | = | 0.650/1.517  = 0.428 |

# SAFETY RATIO CALCULATIONS

### SR 39, From Michigan Avenue to US 301

#### 1993 (0.154 mvm/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /0.154 = | 0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/0.154)-1/(2*0.154) | |
| | = | 0.718+1.645*2.1601-3.249 | |
| | = | 1.022 | |
| Safety Ratio | = | 0.000/1.022 | = 0.000 |

#### 1994 (0.152 mvm/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /0.152 = | 0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/0.152)-1/(2*0.152) | |
| | = | 0.718+1.645*2.1761-3.298 | |
| | = | 1.000 | |
| Safety Ratio | = | 0.000/1.000 | = 0.000 |

#### 1995 (0.156 mvm/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /0.156 = | 0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/0.156)-1/(2*0.156) | |
| | = | 0.718+1.645*2.1443-3.202 | |
| | = | 1.043 | |
| Safety Ratio | = | 0.000/1.043 | = 0.000 |

#### 1996 (0.174 mvm/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /0.174 = | 0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/0.174) - 1/(2*0.174) | |
| | = | 0.718+1.645*2.0299-2.869 | |
| | = | 1.188 | |
| Safety Ratio | = | 0.000/1.188 | = 0.000 |

#### 1997 (0.181 mvm/y)

| | | | |
|---|---|---|---|
| Actual Crash Rate | = | 0 /0.181 = | 0.000 |
| Critical Crash Rate | = | 0.718 +1.645sqrt(0.718/0.181) - 1/(2*0.181) | |
| | = | 0.718+1.645*1.9915-2.762 | |
| | = | 1.232 | |
| Safety Ratio | = | 0.000/1.232 | = 0.000 |