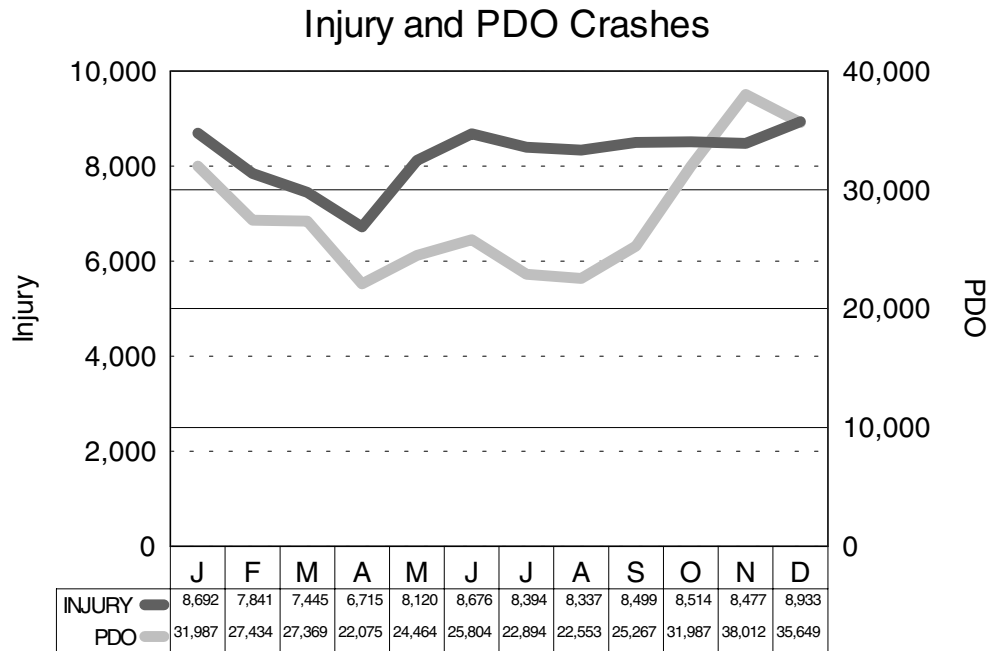
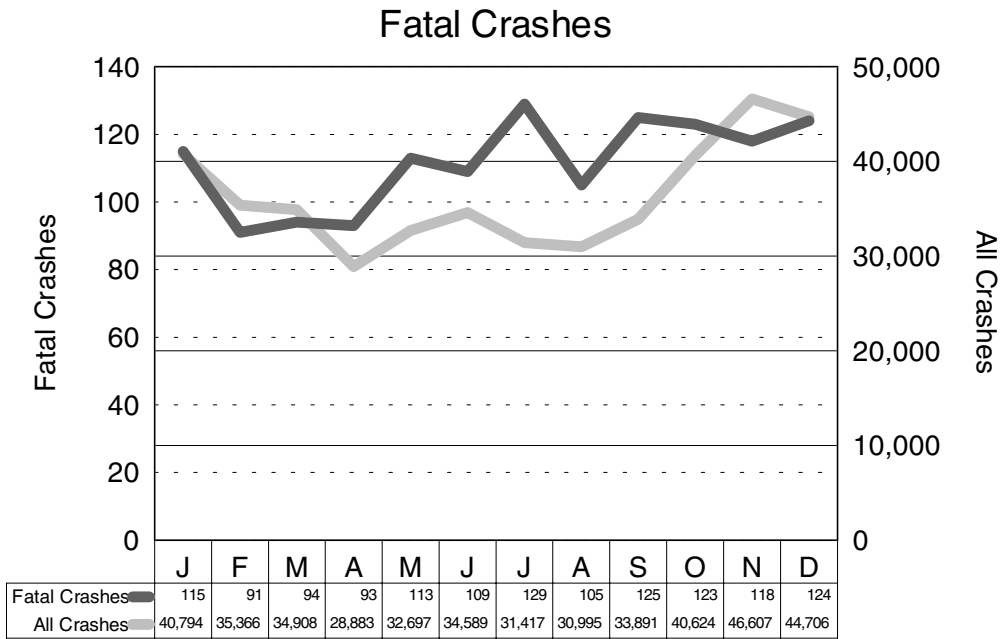


## ALL CRASHES INJURY SEVERITY BY MONTH



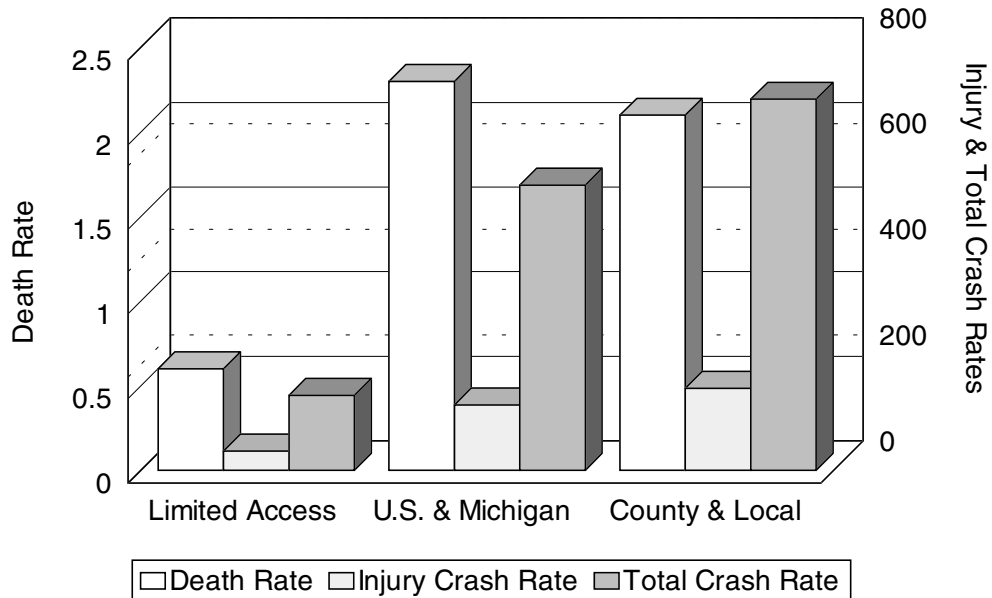
The charts on this page show that the months of June through September are peak months in terms of the ratio of the number of crashes involving death or injury to the number of noninjury crashes. That is, if a person was in a motor vehicle crash during one of these months there was a higher chance of that crash resulting in death or injury to one of the involved persons than if that crash happened during one of the other months.

## CRASH EXPERIENCE BY ROADWAY TYPE

The table below provides a detailed breakdown of estimated vehicle mileage, crashes, death rates (deaths per 100 million vehicle miles), and crash rates (crashes per 100 million vehicle miles) for the major roadway types in Michigan. All rates are lowest on limited access highways. 1996 estimated mileage figures were provided by the Michigan Department of Transportation [9].

| STATEWIDE               | Estimated Mileage (Billions) | All Crashes | Injury Crashes | Deaths | Total Crash Rate | Injury Crash Rate | Death Rate |
|-------------------------|------------------------------|-------------|----------------|--------|------------------|-------------------|------------|
| Limited Access Roadways | 26.2                         | 37,125      | 9,512          | 147    | 141.7            | 36.3              | 0.6        |
| U.S. & Michigan Roads   | 20.6                         | 111,146     | 25,525         | 479    | 539.5            | 123.9             | 2.3        |
| County & City Roads     | 40.9                         | 287,206     | 63,606         | 879    | 702.2            | 155.5             | 2.1        |
| Totals                  | 87.7                         | 435,477     | 98,643         | 1,505  | 496.6            | 112.5             | 1.7        |

Rates per 100 Million Vehicle Miles



## CRASH TYPE

| CRASH TYPE                  | All Crashes    |              | Fatal Crashes |              | Injury Crashes |               |               | PDO Crashes    |
|-----------------------------|----------------|--------------|---------------|--------------|----------------|---------------|---------------|----------------|
|                             | Number         | % of Total   | Number        | % of Fatal   | A              | B             | C             |                |
| Single Vehicle              | 133,997        | 30.8         | 595           | 44.4         | 4,182          | 8,461         | 10,877        | 109,882        |
| Head On                     | 9,722          | 2.2          | 179           | 13.4         | 893            | 1,191         | 1,393         | 6,066          |
| Head On - Left Turn         | 13,767         | 3.2          | 46            | 3.4          | 865            | 1,725         | 3,027         | 8,104          |
| Angle                       | 88,266         | 20.3         | 335           | 25.0         | 3,467          | 6,846         | 15,572        | 62,046         |
| Rear End                    | 101,474        | 23.3         | 70            | 5.2          | 1,603          | 4,149         | 22,200        | 73,452         |
| Rear End - Left Turn        | 4,900          | 1.1          | 6             | 0.4          | 120            | 289           | 1,002         | 3,483          |
| Rear End - Right Turn       | 3,374          | 0.8          | 2             | 0.1          | 32             | 83            | 554           | 2,703          |
| Sideswipe - Same Direction  | 35,888         | 8.2          | 20            | 1.5          | 329            | 757           | 2,401         | 32,381         |
| Sideswipe - Opposite Direct | 12,902         | 3.0          | 19            | 1.4          | 189            | 425           | 1,099         | 11,170         |
| Other                       | 24,353         | 5.6          | 57            | 4.3          | 637            | 1,102         | 1,966         | 20,591         |
| Unknown                     | 6,834          | 1.6          | 10            | 0.7          | 164            | 301           | 742           | 5,617          |
| <b>Totals</b>               | <b>435,477</b> | <b>100.0</b> | <b>1,339</b>  | <b>100.0</b> | <b>12,481</b>  | <b>25,329</b> | <b>60,833</b> | <b>335,495</b> |

Single Vehicle, Head On, and Angle crash types produce the highest number of fatal crashes (82.8%). Single Vehicle crashes include rollovers, which are particularly deadly crash types. Rear End - Turning and Sideswipe crashes produce the lowest number of fatal crashes (3.4%).

## RELATION TO ROADWAY

| LOCATION OF FIRST IMPACT | All Crashes    |              | Fatal Crashes |              | Injury Crashes |               |               | PDO Crashes    |
|--------------------------|----------------|--------------|---------------|--------------|----------------|---------------|---------------|----------------|
|                          | Number         | % of Total   | Number        | % of Fatal   | A              | B             | C             |                |
| On Road                  | 370,652        | 85.1         | 931           | 69.5         | 9,255          | 18,797        | 52,315        | 289,354        |
| Median                   | 2,599          | 0.6          | 12            | 0.9          | 155            | 273           | 402           | 1,757          |
| Shoulder                 | 18,198         | 4.2          | 89            | 6.6          | 781            | 1,571         | 2,200         | 13,557         |
| Outside of Shoulder/Curb | 34,738         | 8.0          | 264           | 19.7         | 1,942          | 4,011         | 4,817         | 23,704         |
| Gore                     | 745            | 0.2          | 2             | 0.1          | 42             | 90            | 91            | 520            |
| Other/Unknown            | 8,545          | 2.0          | 41            | 3.1          | 306            | 587           | 1,008         | 6,603          |
| <b>Totals</b>            | <b>435,477</b> | <b>100.0</b> | <b>1,339</b>  | <b>100.0</b> | <b>12,481</b>  | <b>25,329</b> | <b>60,833</b> | <b>335,495</b> |

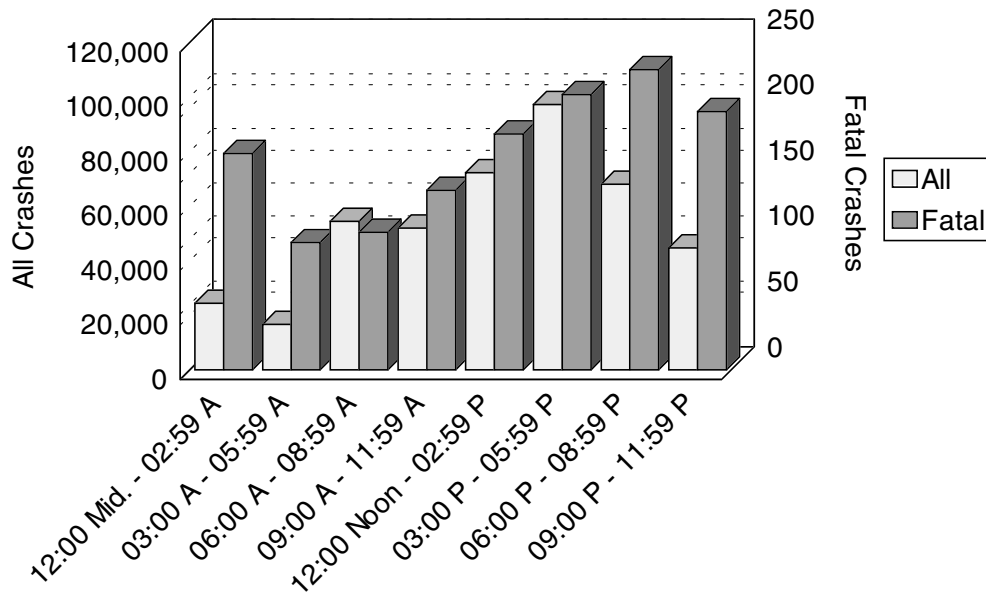
Crashes that happen outside of the normal driving lanes are overrepresented in the fatal count. Only 8.0 percent of crashes occur outside the shoulder of the road, but these crashes account for 19.7 percent of the fatal crashes.



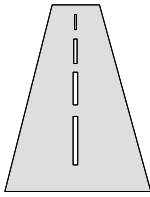
## TIME AND SEVERITY

| TIME OF DAY             | All Crashes    |              | Fatal Crashes |              | Injury Crashes |               |               | PDO Crashes    |
|-------------------------|----------------|--------------|---------------|--------------|----------------|---------------|---------------|----------------|
|                         | Number         | % of Total   | Number        | % of Fatal   | A              | B             | C             |                |
| 12:00 mid. - 02:59 a.m. | 24,321         | 5.6          | 165           | 12.3         | 1,091          | 2,111         | 2,566         | 18,388         |
| 03:00 a.m. - 05:59 a.m. | 16,656         | 3.8          | 97            | 7.2          | 556            | 1,006         | 1,410         | 13,587         |
| 06:00 a.m. - 08:59 a.m. | 54,316         | 12.5         | 105           | 7.8          | 1,181          | 2,445         | 7,076         | 43,509         |
| 09:00 a.m. - 11:59 a.m. | 51,902         | 11.9         | 137           | 10.2         | 1,428          | 2,822         | 7,895         | 39,620         |
| 12:00 noon - 02:59 p.m. | 72,165         | 16.6         | 180           | 13.4         | 2,037          | 4,248         | 12,191        | 53,509         |
| 03:00 p.m. - 05:59 p.m. | 97,161         | 22.3         | 210           | 15.7         | 2,704          | 5,879         | 15,831        | 72,537         |
| 06:00 p.m. - 08:59 p.m. | 67,971         | 15.6         | 229           | 17.1         | 1,909          | 3,882         | 8,433         | 53,518         |
| 09:00 p.m. - 11:59 p.m. | 44,577         | 10.2         | 197           | 14.7         | 1,442          | 2,653         | 4,735         | 35,550         |
| Unknown                 | 6,408          | 1.5          | 19            | 1.4          | 133            | 283           | 696           | 5,277          |
| <b>Total</b>            | <b>435,477</b> | <b>100.0</b> | <b>1,339</b>  | <b>100.0</b> | <b>12,481</b>  | <b>25,329</b> | <b>60,833</b> | <b>335,495</b> |

Time and Severity



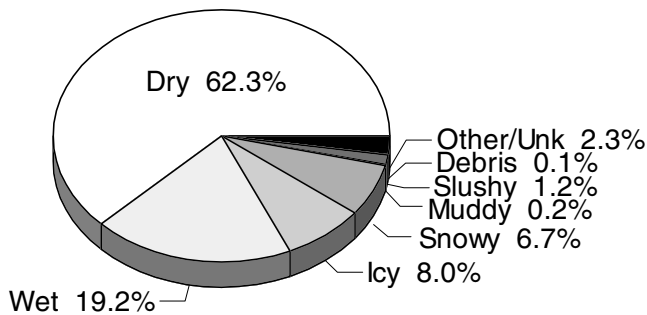
Crash frequencies peak in the late afternoon, then drop off steadily until 6:00 AM (the morning rush hour). Fatal crash frequencies rise with the frequency of other crashes, but continue at a high rate well into the early morning hours. There are proportionally more fatal crashes during the midnight to 2:59 AM time period.



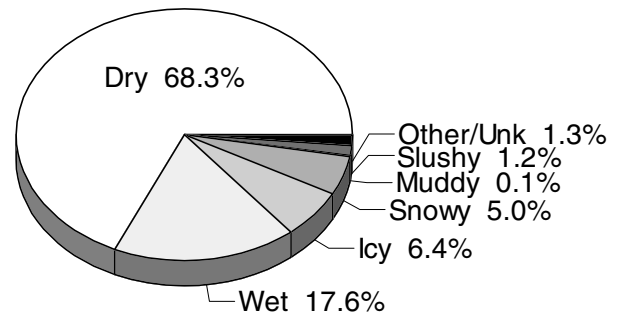
## ROAD CONDITION

| ROAD SURFACE<br>CONDITION | All Crashes |               | Fatal Crashes |               | Injury Crashes |        |        | PDO<br>Crashes |
|---------------------------|-------------|---------------|---------------|---------------|----------------|--------|--------|----------------|
|                           | Number      | % of<br>Total | Number        | % of<br>Fatal | A              | B      | C      |                |
| Dry                       | 271,356     | 62.3          | 915           | 68.3          | 8,367          | 16,681 | 37,641 | 207,752        |
| Wet                       | 83,826      | 19.2          | 235           | 17.6          | 2,231          | 4,717  | 13,609 | 63,034         |
| Icy                       | 34,994      | 8.0           | 86            | 6.4           | 895            | 1,797  | 4,518  | 27,698         |
| Snowy                     | 29,356      | 6.7           | 67            | 5.0           | 599            | 1,311  | 3,182  | 24,197         |
| Muddy                     | 741         | 0.2           | 2             | 0.1           | 23             | 49     | 97     | 570            |
| Slushy                    | 5,059       | 1.2           | 16            | 1.2           | 177            | 318    | 770    | 3,778          |
| Debris                    | 261         | 0.1           | 0             | 0.0           | 11             | 29     | 35     | 186            |
| Other/Unknown             | 9,884       | 2.3           | 18            | 1.3           | 178            | 427    | 981    | 8,280          |
| Totals                    | 435,477     | 100.0         | 1,339         | 100.0         | 12,481         | 25,329 | 60,833 | 335,495        |

ALL CRASHES



FATAL CRASHES



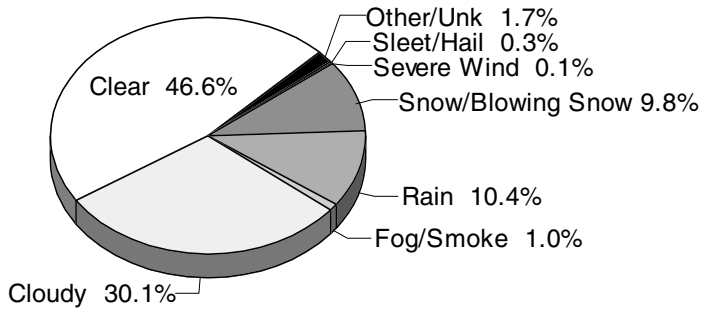
Most crashes (62.3%) and most fatal crashes (68.3%) occur on dry roads. This indicates that Michigan drivers do a good job of adjusting their driving behavior for bad road conditions.



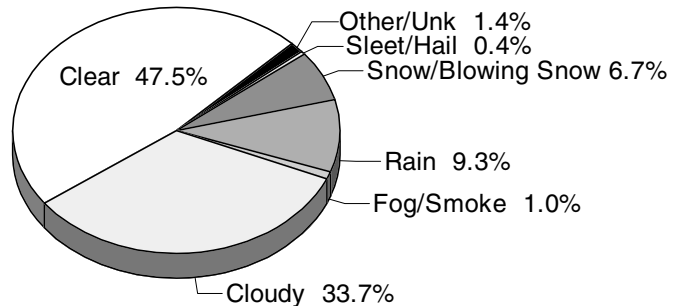
## WEATHER CONDITION

| WEATHER<br>CONDITION | All Crashes    |               | Fatal Crashes |               | Injury Crashes |               |               | PDO<br>Crashes |
|----------------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|----------------|
|                      | Number         | % of<br>Total | Number        | % of<br>Fatal | A              | B             | C             |                |
| Clear                | 203,138        | 46.6          | 636           | 47.5          | 6,363          | 12,487        | 27,875        | 155,777        |
| Cloudy               | 131,169        | 30.1          | 451           | 33.7          | 3,621          | 7,566         | 18,442        | 101,089        |
| Fog/Smoke            | 4,180          | 1.0           | 13            | 1.0           | 117            | 226           | 456           | 3,368          |
| Rain                 | 45,336         | 10.4          | 124           | 9.3           | 1,252          | 2,669         | 7,727         | 33,564         |
| Snow/Blowing Snow    | 42,600         | 9.8           | 90            | 6.7           | 973            | 2,030         | 5,437         | 34,070         |
| Severe Wind          | 466            | 0.1           | 0             | 0.0           | 12             | 16            | 70            | 368            |
| Sleet/Hail           | 1,149          | 0.3           | 6             | 0.4           | 30             | 80            | 160           | 873            |
| Other/Unknown        | 7,439          | 1.7           | 19            | 1.4           | 113            | 255           | 666           | 6,386          |
| <b>Totals</b>        | <b>435,477</b> | <b>100.0</b>  | <b>1,339</b>  | <b>100.0</b>  | <b>12,481</b>  | <b>25,329</b> | <b>60,833</b> | <b>335,495</b> |

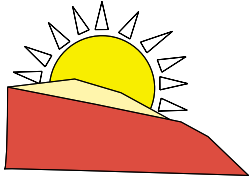
### ALL CRASHES



### FATAL CRASHES



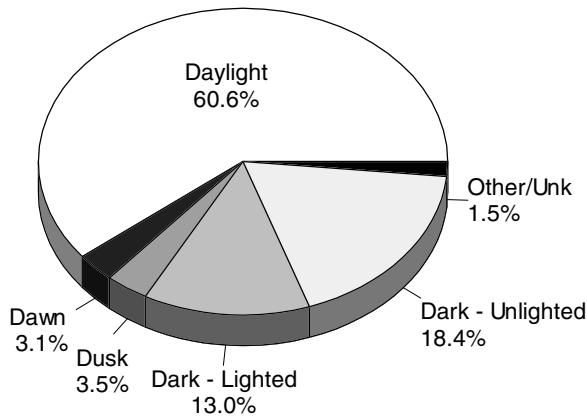
The majority of all crashes occur in good weather (46.6%) as do the majority of fatal crashes (47.5%).



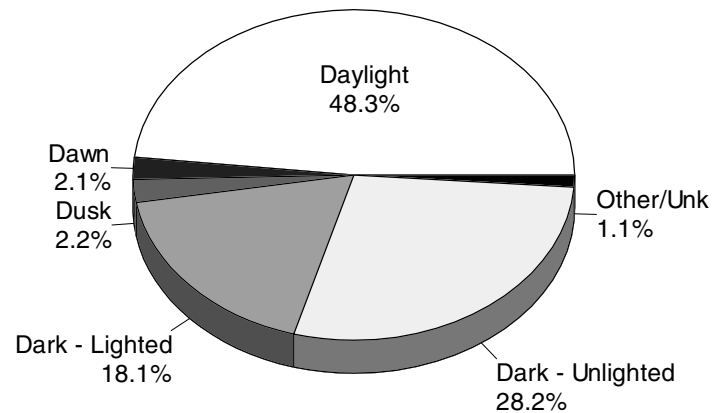
## LIGHT CONDITION

| LIGHT CONDITION  | All Crashes |            | Fatal Crashes |            | Injury Crashes |        |        | PDO Crashes |
|------------------|-------------|------------|---------------|------------|----------------|--------|--------|-------------|
|                  | Number      | % of Total | Number        | % of Fatal | A              | B      | C      |             |
| Daylight         | 263,767     | 60.6       | 647           | 48.3       | 7,582          | 15,976 | 42,775 | 196,787     |
| Dawn             | 13,666      | 3.1        | 28            | 2.1        | 256            | 529    | 1,345  | 11,508      |
| Dusk             | 15,024      | 3.5        | 29            | 2.2        | 402            | 787    | 1,793  | 12,013      |
| Dark - Lighted   | 56,506      | 13.0       | 243           | 18.1       | 2,089          | 4,025  | 8,684  | 41,465      |
| Dark - Unlighted | 79,947      | 18.4       | 377           | 28.2       | 2,043          | 3,805  | 5,633  | 68,089      |
| Other/Unknown    | 6,567       | 1.5        | 15            | 1.1        | 109            | 207    | 603    | 5,633       |
| Totals           | 435,477     | 100.0      | 1,339         | 100.0      | 12,481         | 25,329 | 60,833 | 335,495     |

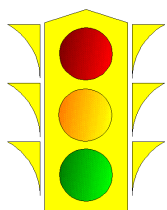
### ALL CRASHES



### FATAL CRASHES



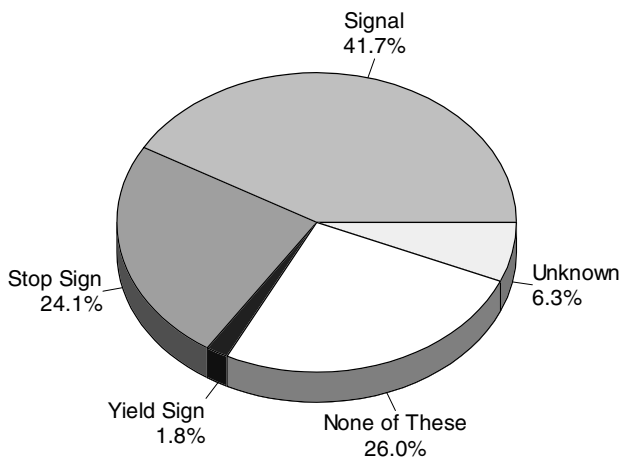
The majority (60.6%) of all crashes happen during daylight hours. Dark conditions create the greatest hazard, as they are overrepresented in fatal crashes. Areas without street lights have the highest fatality rate.



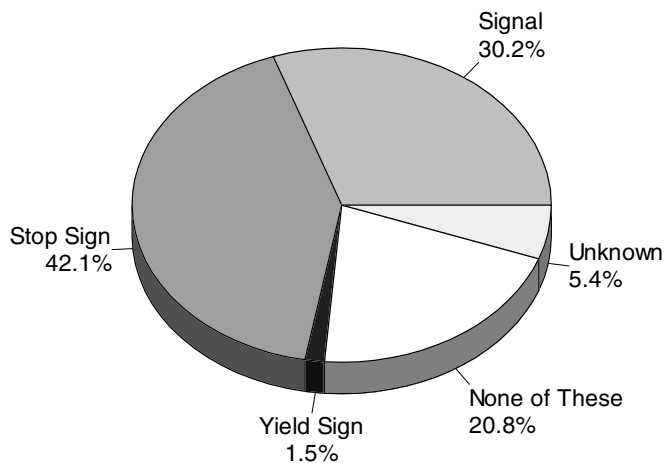
## INTERSECTION CRASHES BY TRAFFIC CONTROL TYPE

| TRAFFIC CONTROL TYPE | All Crashes |            | Fatal Crashes |            | Injury Crashes |        |        | PDO Crashes |
|----------------------|-------------|------------|---------------|------------|----------------|--------|--------|-------------|
|                      | Number      | % of Total | Number        | % of Fatal | A              | B      | C      |             |
| Signal               | 65,460      | 41.7       | 122           | 30.2       | 2,049          | 4,379  | 13,744 | 45,166      |
| Stop Sign            | 37,873      | 24.1       | 170           | 42.1       | 1,453          | 3,030  | 6,546  | 26,674      |
| Yield Sign           | 2,898       | 1.8        | 6             | 1.5        | 87             | 211    | 560    | 2,034       |
| None of These        | 40,781      | 26.0       | 84            | 20.8       | 1,073          | 2,600  | 6,470  | 30,554      |
| Unknown              | 9,904       | 6.3        | 22            | 5.4        | 299            | 545    | 1,544  | 7,494       |
| Totals               | 156,916     | 100.0      | 404           | 100.0      | 4,961          | 10,765 | 28,864 | 111,922     |

**ALL CRASHES**



**FATAL CRASHES**



Intersections with stop signs are overrepresented in fatal crashes. Driver perception, awareness, and adherence to traffic control signing are all key factors in crashes at intersections.



## CONSTRUCTION ZONE CRASHES

| CONSTRUCTION<br>ZONE TYPE       | All Crashes  |               | Fatal Crashes |               | Injury Crashes |            |            | PDO<br>Crashes |
|---------------------------------|--------------|---------------|---------------|---------------|----------------|------------|------------|----------------|
|                                 | Number       | % of<br>Total | Number        | % of<br>Fatal | A              | B          | C          |                |
| <b>Construction/Maintenance</b> |              |               |               |               |                |            |            |                |
| <b>Activity - On Road</b>       |              |               |               |               |                |            |            |                |
| Lane Closed                     | 2,285        | 42.9          | 6             | 42.9          | 41             | 105        | 376        | 1,757          |
| Lane Open                       | 725          | 13.6          | 1             | 7.1           | 25             | 34         | 106        | 559            |
| Unk Lane Closure                | 144          | 2.7           | 1             | 7.1           | 4              | 7          | 24         | 108            |
| <b>Activity - Off Road</b>      |              |               |               |               |                |            |            |                |
| Lane Closed                     | 254          | 4.8           | 0             | 0.0           | 2              | 11         | 47         | 194            |
| Lane Open                       | 557          | 10.5          | 0             | 0.0           | 13             | 28         | 100        | 416            |
| Unk Lane Closure                | 43           | 0.8           | 0             | 0.0           | 0              | 3          | 5          | 35             |
| <b>Activity - None</b>          |              |               |               |               |                |            |            |                |
| Lane Closed                     | 585          | 11.0          | 1             | 7.1           | 21             | 42         | 97         | 424            |
| Lane Open                       | 439          | 8.2           | 2             | 14.3          | 14             | 26         | 71         | 326            |
| Unk Lane Closure                | 29           | 0.5           | 0             | 0.0           | 0              | 1          | 3          | 25             |
| <b>Activity - Unknown</b>       |              |               |               |               |                |            |            |                |
| Lane Closed                     | 103          | 1.9           | 2             | 14.3          | 0              | 5          | 16         | 80             |
| Lane Open                       | 37           | 0.7           | 1             | 7.1           | 0              | 2          | 4          | 30             |
| Unk Lane Closure                | 126          | 2.4           | 0             | 0.0           | 1              | 4          | 20         | 101            |
| <b>Sub-Total</b>                | <b>5,327</b> | <b>100.0</b>  | <b>14</b>     | <b>100.0</b>  | <b>121</b>     | <b>268</b> | <b>869</b> | <b>4,055</b>   |
| <b>Utility</b>                  |              |               |               |               |                |            |            |                |
| <b>Activity - On Road</b>       |              |               |               |               |                |            |            |                |
| Lane Closed                     | 153          | 31.6          | 0             | 0.0           | 5              | 5          | 29         | 114            |
| Lane Open                       | 78           | 16.1          | 0             | 0.0           | 3              | 5          | 17         | 53             |
| Unk Lane Closure                | 6            | 1.2           | 0             | 0.0           | 0              | 0          | 2          | 4              |
| <b>Activity - Off Road</b>      |              |               |               |               |                |            |            |                |
| Lane Closed                     | 33           | 6.8           | 0             | 0.0           | 2              | 3          | 9          | 19             |
| Lane Open                       | 60           | 12.4          | 0             | 0.0           | 3              | 4          | 10         | 43             |
| Unk Lane Closure                | 4            | 0.8           | 0             | 0.0           | 0              | 0          | 2          | 2              |
| <b>Activity - None</b>          |              |               |               |               |                |            |            |                |
| Lane Closed                     | 16           | 3.3           | 0             | 0.0           | 1              | 1          | 3          | 11             |
| Lane Open                       | 43           | 8.9           | 0             | 0.0           | 1              | 1          | 5          | 36             |
| Unk Lane Closure                | 0            | 0.0           | 0             | 0.0           | 0              | 0          | 0          | 0              |
| <b>Activity - Unknown</b>       |              |               |               |               |                |            |            |                |
| Lane Closed                     | 4            | 0.8           | 0             | 0.0           | 0              | 1          | 0          | 3              |
| Lane Open                       | 7            | 1.4           | 0             | 0.0           | 0              | 1          | 1          | 5              |
| Unk Lane Closure                | 80           | 16.5          | 2             | 100.0         | 2              | 3          | 11         | 62             |
| <b>Sub-Total</b>                | <b>484</b>   | <b>100.0</b>  | <b>2</b>      | <b>100.0</b>  | <b>17</b>      | <b>24</b>  | <b>89</b>  | <b>352</b>     |
| <b>Total</b>                    | <b>5,811</b> |               | <b>16</b>     |               | <b>138</b>     | <b>292</b> | <b>958</b> | <b>4,407</b>   |

