

MAG REGIONAL FREEWAY BOTTLENECK STUDY

TASK 11 SAFETY REVIEW WORKING PAPER

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Submitted to:
THE MARICOPA ASSOCIATION OF GOVERNMENTS

Prepared by:



OLSSON ASSOCIATES

SAFETY REVIEW WORKING PAPER

Safety on the roadway network is a primary concern of the traffic engineering profession. As part of the Regional Freeway Bottleneck Study, crash data for the years 1998, 1999, and 2000 were obtained from the ADOT Accident Records System. The data was collected to meet two objectives:

- To determine those freeway segments with a greater crash experience than the typical freeway segments.
- To aid in the evaluation of the bottleneck locations.

FREEWAY SYSTEM CRASH DATA

A summary of the crash data on the entire freeway system for the years 1998, 1999, and 2000 is shown in Table 1. The majority of the crashes, 62 percent, are rear-end collisions with another 15 percent being sideswipes. Almost one in every five freeway crashes involves only one vehicle.

Table 1. Freeway Crash Data – Collision Type

Year	Total Crashes	Rear End	Sideswipe	Single Vehicle	Other
1998	8,439	5,416	1,125	1,566	332
1999	8,631	5,348	1,272	1,587	424
2000	10,290	6,316	1,593	1,920	461
Total	27,360	17,080	3,990	5,073	1,217
Percent	100.0%	62.4%	14.6%	18.6%	4.4%

Tables 2 and 3 provide information on the severity of crashes and the number involving trucks. Ninety-six of the freeway crashes (0.3 percent) during these three years resulted in a fatality and 28 percent resulted in injuries. The majority of the crashes resulted in property damage only. Six percent of freeway crashes involved a heavy truck.

Table 2. Freeway Crash Data – Severity

Year	Total Crashes	Property Damage Only	Injury	Fatal
1998	8,439	6,127	2,285	27
1999	8,631	6,139	2,463	29
2000	10,290	7,201	3,049	40
Total	27,360	19,467	7,797	96
Percent	100.0%	71.1%	28.5%	0.4%

Table 3. Freeway Crash Data - Trucks

Year	Total Crashes	Heavy Truck Involved
1998	8,439	486
1999	8,631	560
2000	10,290	664
Total	27,360	1,710
Percent	100.0%	6.2%

LOCATION ANALYSIS

Crash rates, measured by the number of accidents by vehicle-mile of travel, were calculated for each mile segment of the freeway network. The crash rates for the years 1998, 1999, and 2000 are plotted on Figures 1, 2, and 3, respectively.

The vehicle crash data were further analyzed with a technique termed “Box and Whisker Diagram”. This technique was described in an ITE Journal article in the May 1993 edition. This technique is graphical and based upon the median crash rate. Its primary use is to discern roadway segments that have crash rates substantially different from the typical locations within a data set. An important secondary use is to compare changes from year to year.

The 25th percentile, 50th percentile, and 75th percentile values of each data set are determined. Additionally, an “inner fence” and an “outer fence” are determined. The inner fence is calculated as the difference between the 75th percentile value and the 25th percentile value multiplied by 1.5 then added to the 50th percentile value. The outer fence is calculated in the same manner except that a factor of 2.5 is utilized instead of 1.5.

A diagram is then plotted consisting of a “box” bounded by the 75th and 25th percentile values, and a “whisker” extending from the box to the highest data point. The median value – or 50th percentile value – is indicated within the box. The inner and outer fences are also plotted. Those locations with crash rates above the box are in the highest 25% of collision locations. Those locations with crash rates above the inner fence are considered to have unusual crash rates. Those locations with rates above the outer fence are considered to have very unusual crash rates.

Box and Whisker Analysis

Box and whisker diagrams for the regional freeway system for calendar years 1998, 1999, and 2000 were prepared. The 25th, 50th (median) and 75th percentiles were then plotted (Figure 4).

Comparing the values between the years 1998 and 2000, the 25th, 50th, and 75th percentile values have increased slightly, while the inner fence value has remained unchanged, and the outer fence value has decreased. The highest collision rate in 2000 (5.72 accidents per million

vehicle-miles of travel) is substantially less than the highest collision rate in 1998 (7.00). The median rate was 0.60 in 1998 and 0.78 in 2000. The 1999 statistics are generally in the same range as the 1998 and 2000 data.

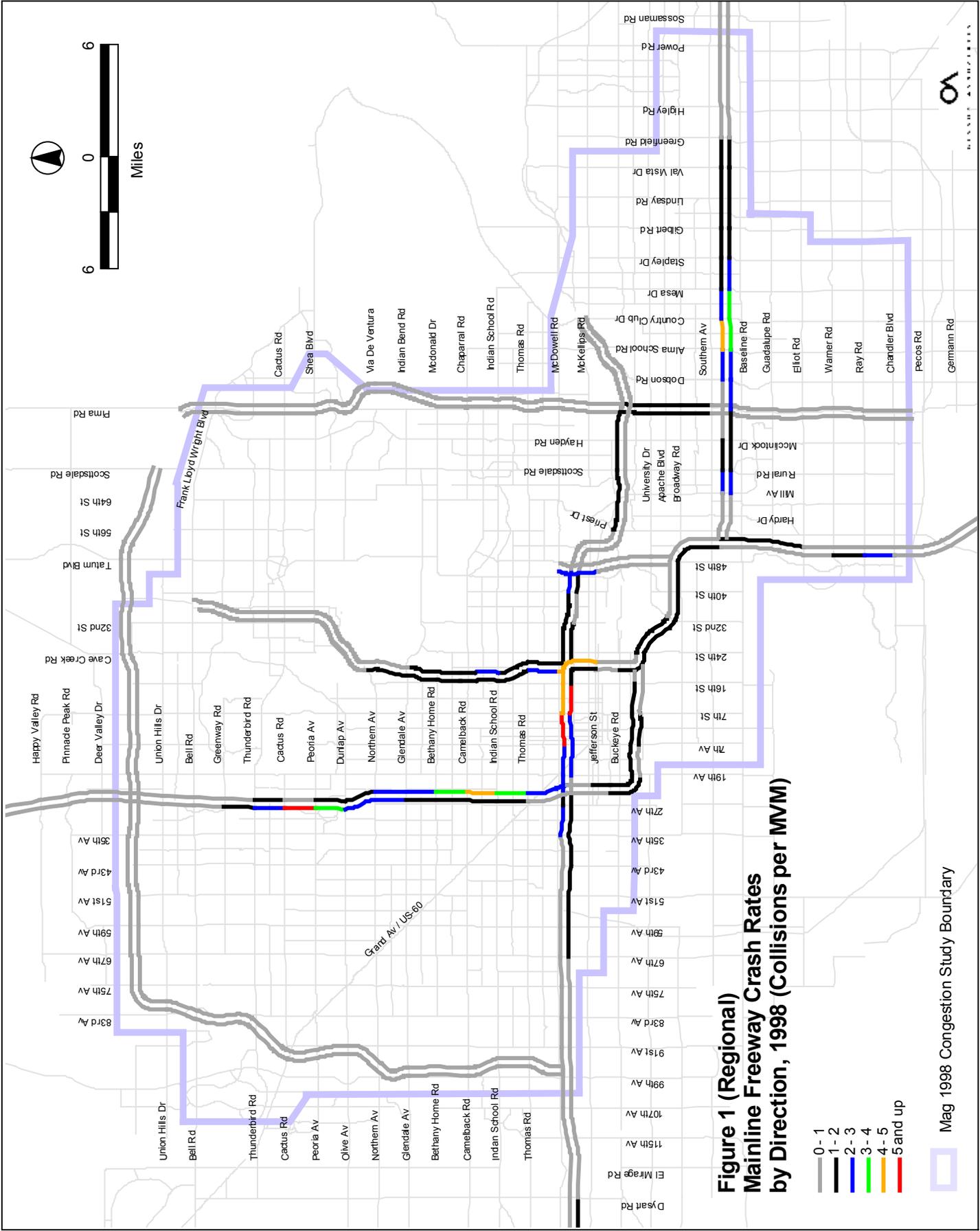
The eighteen one-mile segments that were above the outer fence at least once during this three-year period are listed in Table 4. Crash rates at four locations were above the outer fence for all three years, and another four were above the outer fence for two years. The other ten locations were above the outer fence in just one year.

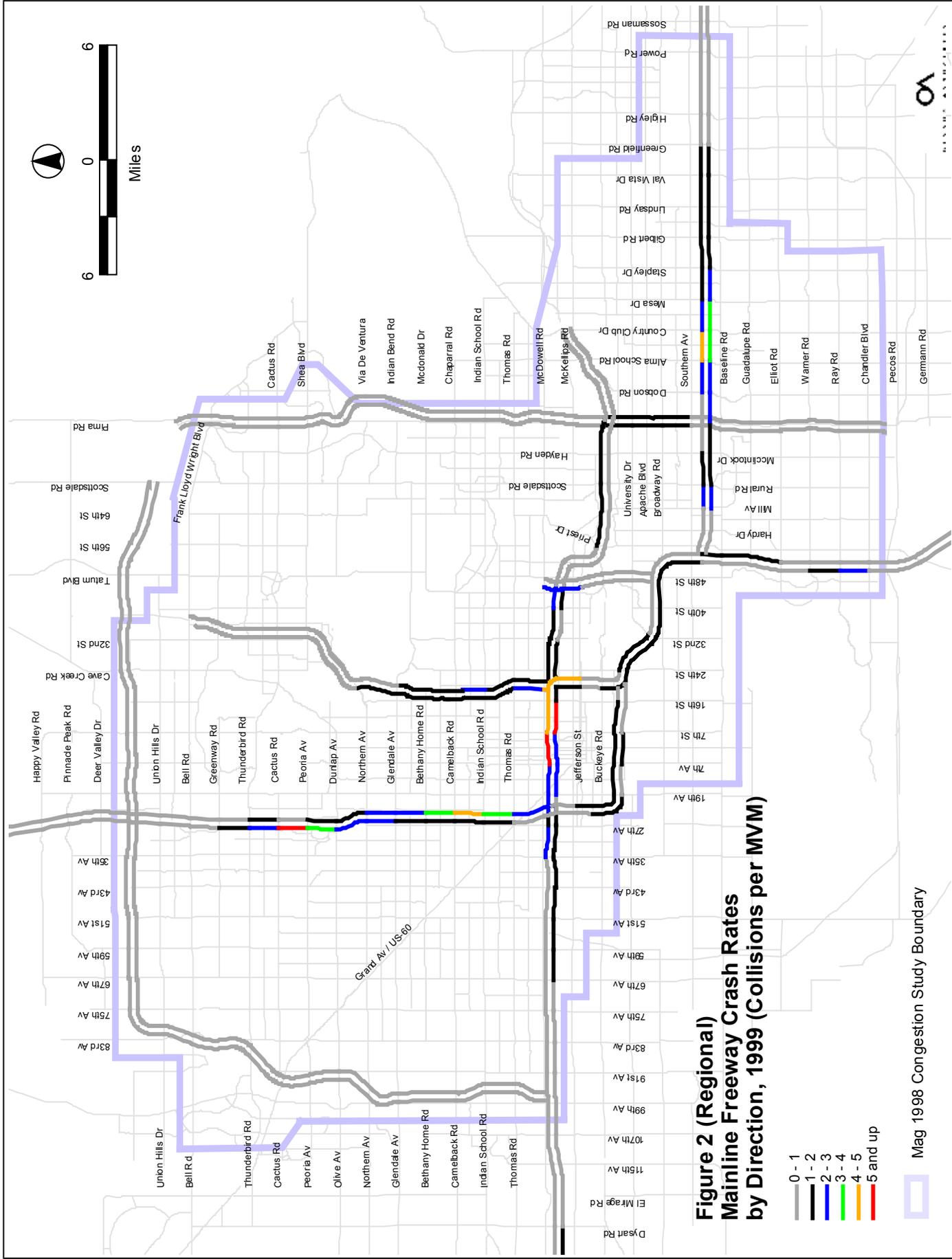
Table 4. All Locations Above Outer Fence In 1998, 1999, Or 2000

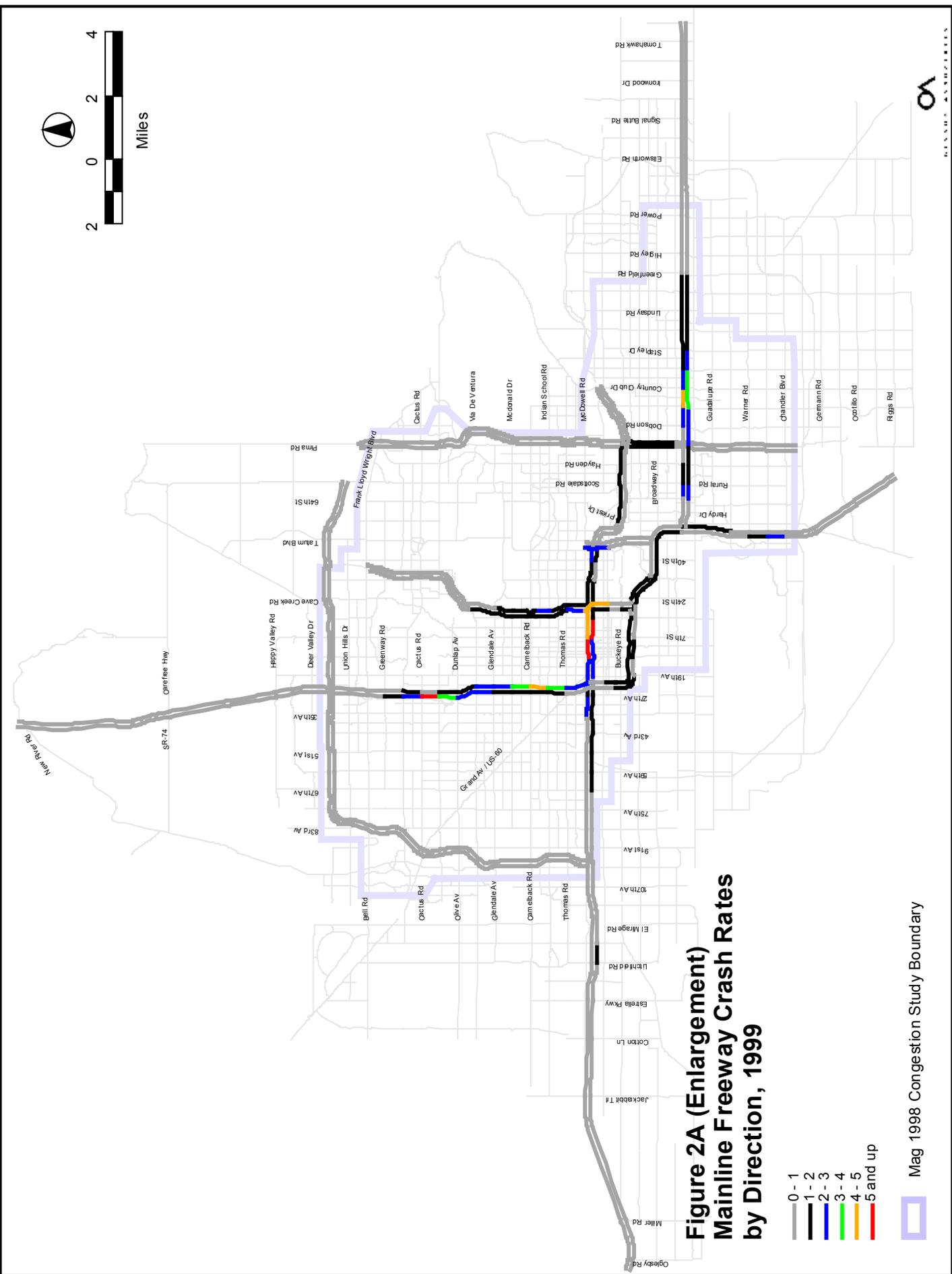
Location	Years Above Outer Fence		
	1998	1999	2000
I-10 Eastbound: 19 th Avenue to 7 th Avenue			X
I-10 Eastbound: 7 th Street to 16 th Street	X	X	
I-10 Westbound: 16 th Street to 7 th Street	X	X	
I-10 Westbound: 7 th Street to 7 th Avenue	X	X	X
I-17 Southbound: Cactus Road to Peoria Avenue	X		X
I-17 Southbound: Peoria Avenue to Dunlap Avenue	X		
I-17 Southbound Thomas Road to I-10			X
I-17 Northbound: I-10 to Thomas Road			X
I-17 Northbound: Thomas Road to Indian School Road	X	X	
I-17 Northbound: Indian School Road to Camelback Road	X		
SR-51 Southbound: McDowell Road to Loop 202	X	X	X
US-60 Eastbound: Dobson Road to Alma School Road			X
US-60 Eastbound: Alma School Road to Country Club Drive	X	X	X
US-60 Eastbound: Country Club Drive to Mesa Drive		X	
US-60 Westbound: Country Club Drive to Alma School Road	X		
US-60 Westbound: Rural Road to Mill Avenue		X	
US-60 Westbound: Mill Avenue to Priest Drive			X
SR-202 Westbound: 32 nd Street to 24 th Street	X	X	X

ADOT Actions at High Crash Locations

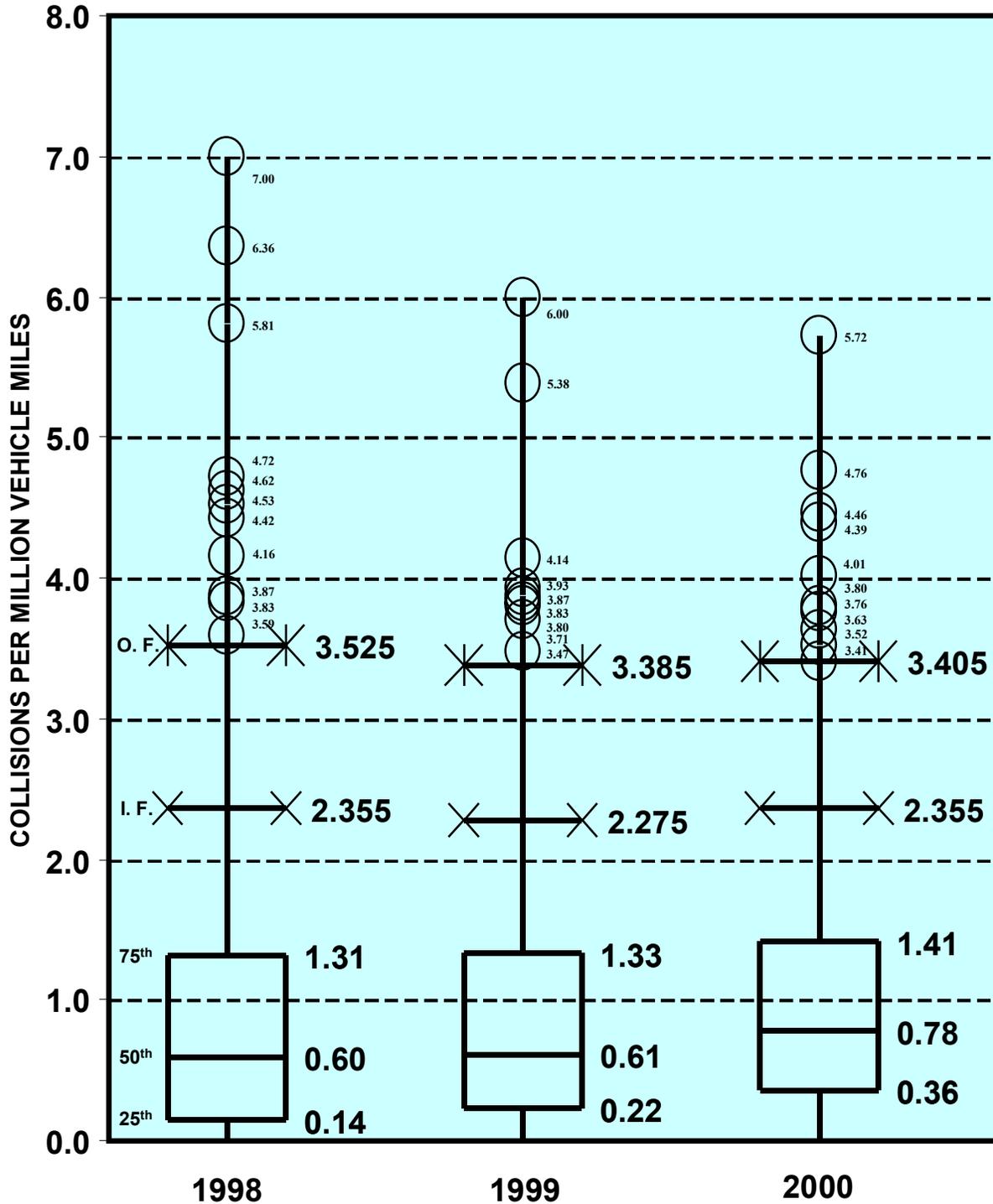
The eighteen one-mile segments are mapped in Figure 5. By reviewing the map, it can be seen that the eighteen segments are clustered into eleven identifiable locations, many of which are under study or re-construction by the Arizona Department of Transportation at this time. The locations and ADOT initiated remedial actions for each of these ten segments are shown in Table 5.







MAG BOTTLENECK STUDY BOX AND WHISKER DIAGRAMS



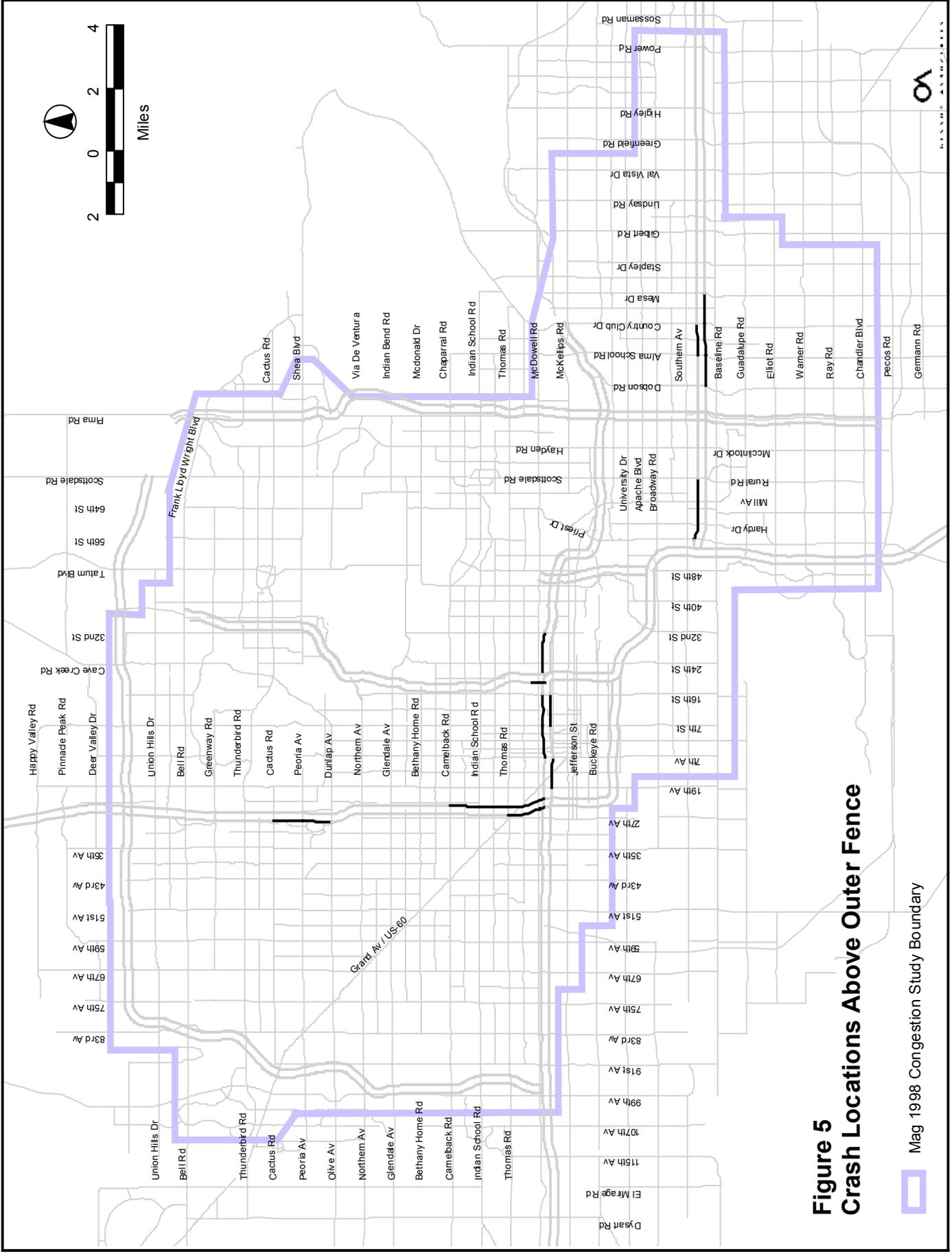


Figure 5
Crash Locations Above Outer Fence

Mag 1998 Congestion Study Boundary

Table 5. High Crash Locations and Remedial Action

Location	ADOT Remedial Actions Underway
EB I-10: 19 th Avenue to 7 th Avenue	Re-striping to add a new lane; Tunnel lighting study
EB I-10: 7 th Street to 16 th Street	Re-striping to add a new lane
WB Loop 202: 32 nd Street to 24 th Street	Constructing auxiliary lane
WB I-10: 16 th Street to 7 th Avenue	Re-striping to add a new lane; Tunnel lighting study
I-17 SB: Cactus Road to Dunlap Avenue	HOV lane added; Auxiliary lanes in 2005
I-17 SB: Thomas Road to I-10	HOV lane added; Auxiliary lanes under contract
I-17 NB: I-10 to Camelback Road	HOV lane added; Auxiliary lanes in 2005
SB SR-51: McDowell Road to Loop 202	Re-striping on I-10; Adding HOV lane
US-60 EB: Dobson Road to Mesa Drive	Adding general purpose and HOV lanes
US-60 WB: Country Club Drive to Alma School Road	Adding general purpose and HOV lanes
US-60 WB: Rural Road to Priest Drive	Adding HOV lanes

In addition to the current actions underway by ADOT, each of these eleven locations has been identified as part of a congested bottleneck location and is being evaluated as part of the bottleneck analysis.

Crash Analysis

The identification of the eighteen locations that were above the outer fence as related to crash incidence provides an opportunity to evaluate crashes, which occur in high frequency locations relative to the entire freeway system. This comparison is shown in Table 6. Not surprisingly, four of five crashes in high crash locations are rear-end collisions compared to three of five on the entire freeway system. Single vehicle crashes are a less frequent occurrence in high crash locations: 6.7 percent compared to 18.6 percent on the entire freeway system.

Table 6. High Crash-Total Freeway Comparison

	All Freeways	High Crash Locations
Collision Type		
Percent of rear end crashes	62.4%	80.5%
Percent of side swipe crashes	14.6%	11.0%
Percent of single vehicle crashes	18.6%	6.7%
Other	4.4%	1.8%
Severity		
Percent of property damage only crashes	71.1%	72.0%
Percent of injury crashes	28.5%	28.0%
Percent of fatal crashes	0.4%	0.0%
Trucks		
Percent of heavy truck crashes	6.2%	3.9%

The percentage of property damage only, injury, and fatal crashes is the same in high crash locations as it is on the entire freeway system. Truck crashes account for six percent of all freeway crashes and four percent of high crash area crashes.

A more detailed look at the data can be made through the evaluation of data from each of the three years at the eighteen sites. As indicated earlier, four of the identified sites exceed the outer fence in all three years, four more exceed the outer fence in two of the three years, and ten exceed the outer fence in just one of the three years. Thus of the 54 observations (18 sites in each of three years), 30 were “over the outer fence”.

Crash data for the 54 observations are shown in a series of ten tables, Table 6 through Table 15. In each of these tables, the locations and years that exceeded the outer fence are highlighted. For example, in Table 6, in the three years for the I-10 EB segment between 19th Avenue and 7th Avenue, only the year 2000 data is highlighted because that was the only year it exceeded the outer fence.

Table 7 shows all of the crash data for each location for each of the three years. In Tables 8 through 16, the data is sorted as follows:

- Table 8. Total crashes
- Table 9. The number of rear-end crashes
- Table 10. The percentage of the crashes that are rear-end
- Table 11. The number of sideswipe crashes
- Table 12. The percentage of the crashes that are sideswipe
- Table 13. The number of single vehicle crashes
- Table 14. The percentage of the crashes that are single vehicle
- Table 15. The number of crashes involving heavy trucks
- Table 16. The percentage of the crashes involving heavy trucks
- Table 17. The percentage of the crashes involving heavy trucks sorted by year

General observations from the tables are:

- Rear-end crashes are the most prevalent type of crash, both in number and percentage, in locations that exceed the outer fence (Tables 9 and 10).
- The number and percentage of sideswipe crashes do not seem to be an indication of locations that exceed the outer fence (Tables 11 and 12).
- When single vehicle crashes are a high percentage of the crashes that occur in a particular location, the location is not be above the outer fence (Tables 13 and 14).
- The number and percentage of heavy truck involvement in crashes is not an indication of locations that exceed the outer fence. However, the percentage of crashes involving heavy trucks exceeds the percentage of heavy trucks on the road (Tables 15, 16 and 17).

Looking at the site specific data at the four locations which exceeded the outer fence in each of the three years (Table 7):

- I-10 WB from 7th Street to 7th Avenue is through the deck-park tunnel. Over 85 percent of the crashes over the three-year period were rear-end crashes, typically indicating that slowing or stopped vehicles are involved. As stated earlier, ADOT is currently doing a study of the lighting in the tunnel, which, if changes in the lighting are recommended and made, may help reduce the number of crashes. ADOT is also re-stripping the roadway to add another lane through the tunnel.
- Loop 202 WB from 32nd Street to 24th Street is approaching the I-10/SR-51/Loop 202 traffic interchange (the “short stack”), an area that has been identified as a bottleneck. Again, about 85 percent of the crashes during the three-year study period were rear-end crashes. The short stack is the point at which three freeways: SR-51 from the north, Loop 202 from the east, and I-10 from the south meet with most of the traffic wanting to continue west on I-10 into the downtown area. Again with the large percentage of rear-end crashes, slowing or stopped vehicles are usually involved. ADOT is adding an auxiliary lane between 32nd and 24th Streets and also the additional lane through the tunnel should help traffic flow and thus reduce the number of rear-end crashes.
- SR-51 SB from McDowell Road to Loop 202 is the north leg of the short stack, again in a bottleneck area with over 85 percent of the crashes being rear-end crashes. Traffic is slowing and merging in the area to position itself for exiting to either I-10 WB or Loop 202 EB.
- US-60 EB from Alma School Road to Country Club Drive is in an area where the SB to EB Loop 101 ramp is entering US-60 and lane drops are occurring downstream from the entrance ramp. Thus, there is considerable slowing and merging. Rear-end crashes, while still the predominate type, are only 76 percent of the crashes in this area with sideswipe crashes making up 13 percent of the total. The area is currently under re-construction as part of the US-60 design-build project. The new lane configuration along with the completion of the Santan and Red Mountain freeways should help reduce the number of crashes on this segment of US-60.

CONCLUSIONS

There were 27,360 crashes on the regional freeway over the past three years - about 25 per day. Of these, 6,552 – 24 percent – occurred on segments of the freeway that statistically were above the outer fence, that is, experienced very unusual crash rates. The freeway segments that experienced these highly unusual crash rates are congested segments of the freeway. Thus most of the crashes, 80 percent, were rear-end crashes – the result of a driver following too closely or being inattentive and thus not able to stop in time to prevent the crash. A program to alert drivers of congestion ahead by using the dynamic message signs in place on the freeway system might be a useful tool in reducing rear-end crashes.

ADOT has identified and is implementing a number of projects to help relieve congestion and, thus, hopefully reduce the number of crashes at particular sites. Likewise the evaluation being done in the bottleneck areas as part of this MAG Regional Bottleneck Study will identify other projects to help alleviate congestion and improve safety. However, until technology produces a system where vehicles are separated automatically, crashes will continue to occur.

Table 7. Segment Crash Data

Year	Freeway	Location	Total	Rear-End		Sideswipe		Single Vehicle		Other		Trucks	
				Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1998	I-10 EB	19th Avenue to 7th Avenue	119	87	73%	12	10%	11	9%	9	8%	5	4%
1999	I-10 EB	19th Avenue to 7th Avenue	125	95	76%	16	13%	11	9%	3	2%	7	6%
2000	I-10 EB	19st Avenue to 7th Avenue	187	133	71%	37	20%	14	7%	3	2%	17	9%
1998	I-10 EB	7th Street to 16th Street	267	214	80%	12	4%	15	6%	5	2%	9	3%
1999	I-10 EB	7th Street to 16th Street	176	137	78%	24	14%	9	5%	6	3%	5	3%
2000	I-10 EB	7th Street to 16th Street	126	92	73%	22	17%	8	6%	4	3%	5	4%
1998	I-10 WB	16th Street to 7th Street	226	191	85%	21	9%	9	4%	5	2%	7	3%
1999	I-10 WB	16th Street to 7th Street	191	156	82%	24	13%	9	5%	2	1%	11	6%
2000	I-10 WB	16th Street to 7th Street	160	125	78%	25	16%	10	6%	0	0%	6	4%
1998	I-10 WB	7th Street to 7th Avenue	323	272	84%	31	10%	14	4%	6	2%	12	4%
1999	I-10 WB	7th Street to 7th Avenue	277	246	89%	22	8%	4	1%	5	2%	5	2%
2000	I-10 WB	7th Street to 7th Avenue	266	223	84%	24	9%	16	6%	3	1%	8	3%
1998	I-17 NB	I-10 to Thomas Road	67	43	64%	11	16%	12	18%	1	1%	3	4%
1999	I-17 NB	I-10 to Thomas Road	91	45	49%	27	30%	16	18%	3	3%	9	10%
2000	I-17 NB	I-10 to Thomas Road	148	101	68%	25	17%	18	12%	4	3%	15	10%
1998	I-17 NB	Indian School Road to Camelback Road	158	122	77%	13	8%	20	13%	3	2%	1	1%
1999	I-17 NB	Indian School Road to Camelback Road	84	65	77%	8	10%	7	8%	4	5%	5	6%
2000	I-17 NB	Indian School Road to Camelback Road	148	101	68%	25	17%	18	12%	4	3%	15	10%
1998	I-17 NB	Thomas Road to Indian School Road	127	95	75%	16	13%	13	10%	3	2%	6	5%
1999	I-17 NB	Thomas Road to Indian School Road	114	79	69%	20	18%	14	12%	1	1%	7	6%
2000	I-17 NB	Thomas Road to Indian School Road	96	66	69%	18	19%	11	11%	1	1%	7	7%
1998	I-17 SB	Cactus Road to Peoria Avenue	220	199	90%	11	5%	7	3%	3	1%	8	4%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	99	83%	10	8%	10	8%	1	1%	1	1%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	109	85%	10	8%	8	6%	1	1%	4	3%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	101	81%	13	10%	9	7%	2	2%	8	6%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	57	84%	5	7%	6	9%	0	0%	3	4%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	75	81%	12	13%	6	6%	0	0%	8	9%
1998	I-17 SB	Thomas Road to I-10	35	19	54%	5	14%	8	23%	3	9%	1	3%
1999	I-17 SB	Thomas Road to I-10	44	24	55%	5	11%	13	30%	2	5%	3	7%
2000	I-17 SB	Thomas Road to I-10	154	114	74%	20	13%	16	10%	4	3%	17	11%
1998	Loop 202 WB	32nd Street to 24th Street	149	122	82%	14	9%	9	6%	4	3%	3	2%
1999	Loop 202 WB	32nd Street to 24th Street	143	119	83%	13	9%	8	6%	3	2%	4	3%
2000	Loop 202 WB	32nd Street to 24th Street	190	168	88%	13	7%	7	4%	2	1%	1	1%
1998	SR-51 SB	McDowell Road to Loop 202	36	31	86%	2	6%	3	8%	0	0%	0	0%
1999	SR-51 SB	McDowell Road to Loop 202	31	26	84%	5	16%	0	0%	0	0%	0	0%
2000	SR-51 SB	McDowell Road to Loop 202	30	26	87%	1	3%	2	7%	1	3%	0	0%
1998	US-60 EB	Alma School Road to Country Club Drive	109	76	70%	16	15%	13	12%	4	4%	5	5%
1999	US-60 EB	Alma School Road to Country Club Drive	113	85	75%	15	13%	11	10%	2	2%	3	3%
2000	US-60 EB	Alma School Road to Country Club Drive	132	108	82%	15	11%	9	7%	0	0%	6	5%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	72	77%	8	9%	12	13%	1	1%	2	2%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	100	78%	20	16%	8	6%	1	1%	5	4%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	28	54%	14	27%	8	15%	2	4%	2	4%
1998	US-60 EB	Dobson Road to Alma School Road	75	53	71%	7	9%	13	17%	2	3%	2	3%
1999	US-60 EB	Dobson Road to Alma School Road	71	41	58%	15	21%	12	17%	3	4%	3	4%
2000	US-60 EB	Dobson Road to Alma School Road	93	73	78%	13	14%	3	3%	4	4%	3	3%
1998	US-60 WB	Country Club Drive to Alma School Road	132	109	83%	13	10%	9	7%	1	1%	7	5%
1999	US-60 WB	Country Club Drive to Alma School Road	40	27	68%	5	13%	5	13%	3	8%	0	0%
2000	US-60 WB	Country Club Drive to Alma School Road	33	20	61%	6	18%	7	21%	0	0%	1	3%
1998	US-60 WB	Mill Avenue to Priest Drive	27	15	56%	3	11%	9	33%	0	0%	0	0%
1999	US-60 WB	Mill Avenue to Priest Drive	50	22	44%	5	10%	19	38%	4	8%	2	4%
2000	US-60 WB	Mill Avenue to Priest Drive	157	132	84%	11	7%	10	6%	4	3%	5	3%
1998	US-60 WB	Rural Road to Mill Avenue	38	33	87%	3	8%	1	3%	1	3%	1	3%
1999	US-60 WB	Rural Road to Mill Avenue	103	84	82%	8	8%	8	8%	3	3%	5	5%
2000	US-60 WB	Rural Road to Mill Avenue	63	48	76%	4	6%	10	16%	1	2%	2	3%

**Table 8. Segment Crash Data
Sorted by Total Number of Crashes**

Year	Freeway	Location	Total
1998	I-10 WB	7th Street to 7th Avenue	323
1999	I-10 WB	7th Street to 7th Avenue	277
1998	I-10 EB	7th Street to 16th Street	267
2000	I-10 WB	7th Street to 7th Avenue	266
1998	I-10 WB	16th Street to 7th Street	226
1998	I-17 SB	Cactus Road to Peoria Avenue	220
1999	I-10 WB	16th Street to 7th Street	191
2000	Loop 202 WB	32nd Street to 24th Street	190
2000	I-10 EB	19th Avenue to 7th Avenue	187
1999	I-10 EB	7th Street to 16th Street	176
2000	I-10 WB	16th Street to 7th Street	160
1998	I-17 NB	Indian School Road to Camelback Road	158
2000	US-60 WB	Mill Avenue to Priest Drive	157
2000	I-17 SB	Thomas Road to I-10	154
1998	Loop 202 WB	32nd Street to 24th Street	149
2000	I-17 NB	I-10 to Thomas Road	148
2000	I-17 NB	Indian School Road to Camelback Road	148
1999	Loop 202 WB	32nd Street to 24th Street	143
2000	US-60 EB	Alma School Road to Country Club Drive	132
1998	US-60 WB	Country Club Drive to Alma School Road	132
1999	US-60 EB	Country Club Drive to Mesa Drive	129
2000	I-17 SB	Cactus Road to Peoria Avenue	128
1998	I-17 NB	Thomas Road to Indian School Road	127
2000	I-10 EB	7th Street to 16th Street	126
1999	I-10 EB	19th Avenue to 7th Avenue	125
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125
1999	I-17 SB	Cactus Road to Peoria Avenue	120
1998	I-10 EB	19th Avenue to 7th Avenue	119
1999	I-17 NB	Thomas Road to Indian School Road	114
1999	US-60 EB	Alma School Road to Country Club Drive	113
1998	US-60 EB	Alma School Road to Country Club Drive	109
1999	US-60 WB	Rural Road to Mill Avenue	103
2000	I-17 NB	Thomas Road to Indian School Road	96
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93
1998	US-60 EB	Country Club Drive to Mesa Drive	93
2000	US-60 EB	Dobson Road to Alma School Road	93
1999	I-17 NB	I-10 to Thomas Road	91
1999	I-17 NB	Indian School Road to Camelback Road	84
1998	US-60 EB	Dobson Road to Alma School Road	75
1999	US-60 EB	Dobson Road to Alma School Road	71
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68
1998	I-17 NB	I-10 to Thomas Road	67
2000	US-60 WB	Rural Road to Mill Avenue	63
2000	US-60 EB	Country Club Drive to Mesa Drive	52
1999	US-60 WB	Mill Avenue to Priest Drive	50
1999	I-17 SB	Thomas Road to I-10	44
1999	US-60 WB	Country Club Drive to Alma School Road	40
1998	US-60 WB	Rural Road to Mill Avenue	38
1998	SR-51 SB	McDowell Road to Loop 202	36
1998	I-17 SB	Thomas Road to I-10	35
2000	US-60 WB	Country Club Drive to Alma School Road	33
1999	SR-51 SB	McDowell Road to Loop 202	31
2000	SR-51 SB	McDowell Road to Loop 202	30
1998	US-60 WB	Mill Avenue to Priest Drive	27

**Table 9. Segment Crash Data
Sorted by Number of Rear-End Crashes**

Year	Freeway	Location	Total	Number	Percent
1998	I-10 WB	7th Street to 7th Avenue	323	272	84%
1999	I-10 WB	7th Street to 7th Avenue	277	246	89%
2000	I-10 WB	7th Street to 7th Avenue	266	223	84%
1998	I-10 EB	7th Street to 16th Street	267	214	80%
1998	I-17 SB	Cactus Road to Peoria Avenue	220	199	90%
1998	I-10 WB	16th Street to 7th Street	226	191	85%
2000	Loop 202 WB	32nd Street to 24th Street	190	168	88%
1999	I-10 WB	16th Street to 7th Street	191	156	82%
1999	I-10 EB	7th Street to 16th Street	176	137	78%
2000	I-10 EB	19th Avenue to 7th Avenue	187	133	71%
2000	US-60 WB	Mill Avenue to Priest Drive	157	132	84%
2000	I-10 WB	16th Street to 7th Street	160	125	78%
1998	I-17 NB	Indian School Road to Camelback Road	158	122	77%
1998	Loop 202 WB	32nd Street to 24th Street	149	122	82%
1999	Loop 202 WB	32nd Street to 24th Street	143	119	83%
2000	I-17 SB	Thomas Road to I-10	154	114	74%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	109	85%
1998	US-60 WB	Country Club Drive to Alma School Road	132	109	83%
2000	US-60 EB	Alma School Road to Country Club Drive	132	108	82%
2000	I-17 NB	I-10 to Thomas Road	148	101	68%
2000	I-17 NB	Indian School Road to Camelback Road	148	101	68%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	101	81%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	100	78%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	99	83%
1999	I-10 EB	19th Avenue to 7th Avenue	125	95	76%
1998	I-17 NB	Thomas Road to Indian School Road	127	95	75%
2000	I-10 EB	7th Street to 16th Street	126	92	73%
1998	I-10 EB	19th Avenue to 7th Avenue	119	87	73%
1999	US-60 EB	Alma School Road to Country Club Drive	113	85	75%
1999	US-60 WB	Rural Road to Mill Avenue	103	84	82%
1999	I-17 NB	Thomas Road to Indian School Road	114	79	69%
1998	US-60 EB	Alma School Road to Country Club Drive	109	76	70%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	75	81%
2000	US-60 EB	Dobson Road to Alma School Road	93	73	78%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	72	77%
2000	I-17 NB	Thomas Road to Indian School Road	96	66	69%
1999	I-17 NB	Indian School Road to Camelback Road	84	65	77%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	57	84%
1998	US-60 EB	Dobson Road to Alma School Road	75	53	71%
2000	US-60 WB	Rural Road to Mill Avenue	63	48	76%
1999	I-17 NB	I-10 to Thomas Road	91	45	49%
1998	I-17 NB	I-10 to Thomas Road	67	43	64%
1999	US-60 EB	Dobson Road to Alma School Road	71	41	58%
1998	US-60 WB	Rural Road to Mill Avenue	38	33	87%
1998	SR-51 SB	McDowell Road to Loop 202	36	31	86%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	28	54%
1999	US-60 WB	Country Club Drive to Alma School Road	40	27	68%
1999	SR-51 SB	McDowell Road to Loop 202	31	26	84%
2000	SR-51 SB	McDowell Road to Loop 202	30	26	87%
1999	I-17 SB	Thomas Road to I-10	44	24	55%
1999	US-60 WB	Mill Avenue to Priest Drive	50	22	44%
2000	US-60 WB	Country Club Drive to Alma School Road	33	20	61%
1998	I-17 SB	Thomas Road to I-10	35	19	54%
1998	US-60 WB	Mill Avenue to Priest Drive	27	15	56%

**Table 10. Segment Crash Data
Sorted by Percent of Rear-End Crashes**

Year	Freeway	Location	Total	Number	Percent
1998	I-17 SB	Cactus Road to Peoria Avenue	220	199	90%
1999	I-10 WB	7th Street to 7th Avenue	277	246	89%
2000	Loop 202 WB	32nd Street to 24th Street	190	168	88%
1998	US-60 WB	Rural Road to Mill Avenue	38	33	87%
2000	SR-51 SB	McDowell Road to Loop 202	30	26	87%
1998	SR-51 SB	McDowell Road to Loop 202	36	31	86%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	109	85%
1998	I-10 WB	16th Street to 7th Street	226	191	85%
1998	I-10 WB	7th Street to 7th Avenue	323	272	84%
2000	US-60 WB	Mill Avenue to Priest Drive	157	132	84%
1999	SR-51 SB	McDowell Road to Loop 202	31	26	84%
2000	I-10 WB	7th Street to 7th Avenue	266	223	84%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	57	84%
1999	Loop 202 WB	32nd Street to 24th Street	143	119	83%
1998	US-60 WB	Country Club Drive to Alma School Road	132	109	83%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	99	83%
1998	Loop 202 WB	32nd Street to 24th Street	149	122	82%
2000	US-60 EB	Alma School Road to Country Club Drive	132	108	82%
1999	I-10 WB	16th Street to 7th Street	191	156	82%
1999	US-60 WB	Rural Road to Mill Avenue	103	84	82%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	101	81%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	75	81%
1998	I-10 EB	7th Street to 16th Street	267	214	80%
2000	US-60 EB	Dobson Road to Alma School Road	93	73	78%
2000	I-10 WB	16th Street to 7th Street	160	125	78%
1999	I-10 EB	7th Street to 16th Street	176	137	78%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	100	78%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	72	77%
1999	I-17 NB	Indian School Road to Camelback Road	84	65	77%
1998	I-17 NB	Indian School Road to Camelback Road	158	122	77%
2000	US-60 WB	Rural Road to Mill Avenue	63	48	76%
1999	I-10 EB	19th Avenue to 7th Avenue	125	95	76%
1999	US-60 EB	Alma School Road to Country Club Drive	113	85	75%
1998	I-17 NB	Thomas Road to Indian School Road	127	95	75%
2000	I-17 SB	Thomas Road to I-10	154	114	74%
1998	I-10 EB	19th Avenue to 7th Avenue	119	87	73%
2000	I-10 EB	7th Street to 16th Street	126	92	73%
2000	I-10 EB	19st Avenue to 7th Avenue	187	133	71%
1998	US-60 EB	Dobson Road to Alma School Road	75	53	71%
1998	US-60 EB	Alma School Road to Country Club Drive	109	76	70%
1999	I-17 NB	Thomas Road to Indian School Road	114	79	69%
2000	I-17 NB	Thomas Road to Indian School Road	96	66	69%
2000	I-17 NB	I-10 to Thomas Road	148	101	68%
2000	I-17 NB	Indian School Road to Camelback Road	148	101	68%
1999	US-60 WB	Country Club Drive to Alma School Road	40	27	68%
1998	I-17 NB	I-10 to Thomas Road	67	43	64%
2000	US-60 WB	Country Club Drive to Alma School Road	33	20	61%
1999	US-60 EB	Dobson Road to Alma School Road	71	41	58%
1998	US-60 WB	Mill Avenue to Priest Drive	27	15	56%
1999	I-17 SB	Thomas Road to I-10	44	24	55%
1998	I-17 SB	Thomas Road to I-10	35	19	54%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	28	54%
1999	I-17 NB	I-10 to Thomas Road	91	45	49%
1999	US-60 WB	Mill Avenue to Priest Drive	50	22	44%

**Table 11. Segment Crash Data
Sorted by Number of Sideswipes**

Year	Freeway	Location	Total	Number	Percent
2000	I-10 EB	19th Avenue to 7th Avenue	187	37	20%
1998	I-10 WB	7th Street to 7th Avenue	323	31	10%
1999	I-17 NB	I-10 to Thomas Road	91	27	30%
2000	I-10 WB	16th Street to 7th Street	160	25	16%
2000	I-17 NB	I-10 to Thomas Road	148	25	17%
2000	I-17 NB	Indian School Road to Camelback Road	148	25	17%
1999	I-10 EB	7th Street to 16th Street	176	24	14%
1999	I-10 WB	16th Street to 7th Street	191	24	13%
2000	I-10 WB	7th Street to 7th Avenue	266	24	9%
2000	I-10 EB	7th Street to 16th Street	126	22	17%
1999	I-10 WB	7th Street to 7th Avenue	277	22	8%
1998	I-10 WB	16th Street to 7th Street	226	21	9%
1999	I-17 NB	Thomas Road to Indian School Road	114	20	18%
2000	I-17 SB	Thomas Road to I-10	154	20	13%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	20	16%
2000	I-17 NB	Thomas Road to Indian School Road	96	18	19%
1999	I-10 EB	19th Avenue to 7th Avenue	125	16	13%
1998	I-17 NB	Thomas Road to Indian School Road	127	16	13%
1998	US-60 EB	Alma School Road to Country Club Drive	109	16	15%
1999	US-60 EB	Alma School Road to Country Club Drive	113	15	13%
2000	US-60 EB	Alma School Road to Country Club Drive	132	15	11%
1999	US-60 EB	Dobson Road to Alma School Road	71	15	21%
1998	Loop 202 WB	32nd Street to 24th Street	149	14	9%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	14	27%
1998	I-17 NB	Indian School Road to Camelback Road	158	13	8%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	13	10%
1999	Loop 202 WB	32nd Street to 24th Street	143	13	9%
2000	Loop 202 WB	32nd Street to 24th Street	190	13	7%
2000	US-60 EB	Dobson Road to Alma School Road	93	13	14%
1998	US-60 WB	Country Club Drive to Alma School Road	132	13	10%
1998	I-10 EB	19th Avenue to 7th Avenue	119	12	10%
1998	I-10 EB	7th Street to 16th Street	267	12	4%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	12	13%
1998	I-17 NB	I-10 to Thomas Road	67	11	16%
1998	I-17 SB	Cactus Road to Peoria Avenue	220	11	5%
2000	US-60 WB	Mill Avenue to Priest Drive	157	11	7%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	10	8%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	10	8%
1999	I-17 NB	Indian School Road to Camelback Road	84	8	10%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	8	9%
1999	US-60 WB	Rural Road to Mill Avenue	103	8	8%
1998	US-60 EB	Dobson Road to Alma School Road	75	7	9%
2000	US-60 WB	Country Club Drive to Alma School Road	33	6	18%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	5	7%
1998	I-17 SB	Thomas Road to I-10	35	5	14%
1999	I-17 SB	Thomas Road to I-10	44	5	11%
1999	SR-51 SB	McDowell Road to Loop 202	31	5	16%
1999	US-60 WB	Country Club Drive to Alma School Road	40	5	13%
1999	US-60 WB	Mill Avenue to Priest Drive	50	5	10%
2000	US-60 WB	Rural Road to Mill Avenue	63	4	6%
1998	US-60 WB	Mill Avenue to Priest Drive	27	3	11%
1998	US-60 WB	Rural Road to Mill Avenue	38	3	8%
1998	SR-51 SB	McDowell Road to Loop 202	36	2	6%
2000	SR-51 SB	McDowell Road to Loop 202	30	1	3%

**Table 12. Segment Crash Data
Sorted by Percent of Sideswipe Crashes**

Year	Freeway	Location	Total	Number	Percent
1999	I-17 NB	I-10 to Thomas Road	91	27	30%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	14	27%
1999	US-60 EB	Dobson Road to Alma School Road	71	15	21%
2000	I-10 EB	19st Avenue to 7th Avenue	187	37	20%
2000	I-17 NB	Thomas Road to Indian School Road	96	18	19%
2000	US-60 WB	Country Club Drive to Alma School Road	33	6	18%
1999	I-17 NB	Thomas Road to Indian School Road	114	20	18%
2000	I-10 EB	7th Street to 16th Street	126	22	17%
2000	I-17 NB	I-10 to Thomas Road	148	25	17%
2000	I-17 NB	Indian School Road to Camelback Road	148	25	17%
1998	I-17 NB	I-10 to Thomas Road	67	11	16%
1999	SR-51 SB	McDowell Road to Loop 202	31	5	16%
2000	I-10 WB	16th Street to 7th Street	160	25	16%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	20	16%
1998	US-60 EB	Alma School Road to Country Club Drive	109	16	15%
1998	I-17 SB	Thomas Road to I-10	35	5	14%
2000	US-60 EB	Dobson Road to Alma School Road	93	13	14%
1999	I-10 EB	7th Street to 16th Street	176	24	14%
1999	US-60 EB	Alma School Road to Country Club Drive	113	15	13%
2000	I-17 SB	Thomas Road to I-10	154	20	13%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	12	13%
1999	I-10 EB	19th Avenue to 7th Avenue	125	16	13%
1998	I-17 NB	Thomas Road to Indian School Road	127	16	13%
1999	I-10 WB	16th Street to 7th Street	191	24	13%
1999	US-60 WB	Country Club Drive to Alma School Road	40	5	13%
1999	I-17 SB	Thomas Road to I-10	44	5	11%
2000	US-60 EB	Alma School Road to Country Club Drive	132	15	11%
1998	US-60 WB	Mill Avenue to Priest Drive	27	3	11%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	13	10%
1998	I-10 EB	19th Avenue to 7th Avenue	119	12	10%
1999	US-60 WB	Mill Avenue to Priest Drive	50	5	10%
1998	US-60 WB	Country Club Drive to Alma School Road	132	13	10%
1998	I-10 WB	7th Street to 7th Avenue	323	31	10%
1999	I-17 NB	Indian School Road to Camelback Road	84	8	10%
1998	Loop 202 WB	32nd Street to 24th Street	149	14	9%
1998	US-60 EB	Dobson Road to Alma School Road	75	7	9%
1998	I-10 WB	16th Street to 7th Street	226	21	9%
1999	Loop 202 WB	32nd Street to 24th Street	143	13	9%
2000	I-10 WB	7th Street to 7th Avenue	266	24	9%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	8	9%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	10	8%
1998	I-17 NB	Indian School Road to Camelback Road	158	13	8%
1999	I-10 WB	7th Street to 7th Avenue	277	22	8%
1998	US-60 WB	Rural Road to Mill Avenue	38	3	8%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	10	8%
1999	US-60 WB	Rural Road to Mill Avenue	103	8	8%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	5	7%
2000	US-60 WB	Mill Avenue to Priest Drive	157	11	7%
2000	Loop 202 WB	32nd Street to 24th Street	190	13	7%
2000	US-60 WB	Rural Road to Mill Avenue	63	4	6%
1998	SR-51 SB	McDowell Road to Loop 202	36	2	6%
1998	I-17 SB	Cactus Road to Peoria Avenue	220	11	5%
1998	I-10 EB	7th Street to 16th Street	267	12	4%
2000	SR-51 SB	McDowell Road to Loop 202	30	1	3%

**Table 13. Segment Crash Data
Sorted by Number of Single Vehicle Crashes**

Year	Freeway	Location	Total	Number	Percent
1998	I-17 NB	Indian School Road to Camelback Road	158	20	13%
1999	US-60 WB	Mill Avenue to Priest Drive	50	19	38%
2000	I-17 NB	I-10 to Thomas Road	148	18	12%
2000	I-17 NB	Indian School Road to Camelback Road	148	18	12%
2000	I-10 WB	7th Street to 7th Avenue	266	16	6%
1999	I-17 NB	I-10 to Thomas Road	91	16	18%
2000	I-17 SB	Thomas Road to I-10	154	16	10%
1998	I-10 EB	7th Street to 16th Street	267	15	6%
2000	I-10 EB	19th Avenue to 7th Avenue	187	14	7%
1998	I-10 WB	7th Street to 7th Avenue	323	14	4%
1999	I-17 NB	Thomas Road to Indian School Road	114	14	12%
1998	I-17 NB	Thomas Road to Indian School Road	127	13	10%
1999	I-17 SB	Thomas Road to I-10	44	13	30%
1998	US-60 EB	Alma School Road to Country Club Drive	109	13	12%
1998	US-60 EB	Dobson Road to Alma School Road	75	13	17%
1998	I-17 NB	I-10 to Thomas Road	67	12	18%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	12	13%
1999	US-60 EB	Dobson Road to Alma School Road	71	12	17%
1998	I-10 EB	19th Avenue to 7th Avenue	119	11	9%
1999	I-10 EB	19th Avenue to 7th Avenue	125	11	9%
2000	I-17 NB	Thomas Road to Indian School Road	96	11	11%
1999	US-60 EB	Alma School Road to Country Club Drive	113	11	10%
2000	I-10 WB	16th Street to 7th Street	160	10	6%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	10	8%
2000	US-60 WB	Mill Avenue to Priest Drive	157	10	6%
2000	US-60 WB	Rural Road to Mill Avenue	63	10	16%
1999	I-10 EB	7th Street to 16th Street	176	9	5%
1998	I-10 WB	16th Street to 7th Street	226	9	4%
1999	I-10 WB	16th Street to 7th Street	191	9	5%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	9	7%
1998	Loop 202 WB	32nd Street to 24th Street	149	9	6%
2000	US-60 EB	Alma School Road to Country Club Drive	132	9	7%
1998	US-60 WB	Country Club Drive to Alma School Road	132	9	7%
1998	US-60 WB	Mill Avenue to Priest Drive	27	9	33%
2000	I-10 EB	7th Street to 16th Street	126	8	6%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	8	6%
1998	I-17 SB	Thomas Road to I-10	35	8	23%
1999	Loop 202 WB	32nd Street to 24th Street	143	8	6%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	8	6%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	8	15%
1999	US-60 WB	Rural Road to Mill Avenue	103	8	8%
1999	I-17 NB	Indian School Road to Camelback Road	84	7	8%
1998	I-17 SB	Cactus Road to Peoria Avenue	220	7	3%
2000	Loop 202 WB	32nd Street to 24th Street	190	7	4%
2000	US-60 WB	Country Club Drive to Alma School Road	33	7	21%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	6	9%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	6	6%
1999	US-60 WB	Country Club Drive to Alma School Road	40	5	13%
1999	I-10 WB	7th Street to 7th Avenue	277	4	1%
1998	SR-51 SB	McDowell Road to Loop 202	36	3	8%
2000	US-60 EB	Dobson Road to Alma School Road	93	3	3%
2000	SR-51 SB	McDowell Road to Loop 202	30	2	7%
1998	US-60 WB	Rural Road to Mill Avenue	38	1	3%
1999	SR-51 SB	McDowell Road to Loop 202	31	0	0%

**Table 14. Segment Crash Data
Sorted by Percent of Single Vehicle Crashes**

Year	Freeway	Location	Total	Number	Percent
1999	US-60 WB	Mill Avenue to Priest Drive	50	19	38%
1998	US-60 WB	Mill Avenue to Priest Drive	27	9	33%
1999	I-17 SB	Thomas Road to I-10	44	13	30%
1998	I-17 SB	Thomas Road to I-10	35	8	23%
2000	US-60 WB	Country Club Drive to Alma School Road	33	7	21%
1998	I-17 NB	I-10 to Thomas Road	67	12	18%
1999	I-17 NB	I-10 to Thomas Road	91	16	18%
1998	US-60 EB	Dobson Road to Alma School Road	75	13	17%
1999	US-60 EB	Dobson Road to Alma School Road	71	12	17%
2000	US-60 WB	Rural Road to Mill Avenue	63	10	16%
2000	US-60 EB	Country Club Drive to Mesa Drive	52	8	15%
1998	US-60 EB	Country Club Drive to Mesa Drive	93	12	13%
1998	I-17 NB	Indian School Road to Camelback Road	158	20	13%
1999	US-60 WB	Country Club Drive to Alma School Road	40	5	13%
1999	I-17 NB	Thomas Road to Indian School Road	114	14	12%
2000	I-17 NB	I-10 to Thomas Road	148	18	12%
2000	I-17 NB	Indian School Road to Camelback Road	148	18	12%
1998	US-60 EB	Alma School Road to Country Club Drive	109	13	12%
2000	I-17 NB	Thomas Road to Indian School Road	96	11	11%
2000	I-17 SB	Thomas Road to I-10	154	16	10%
1998	I-17 NB	Thomas Road to Indian School Road	127	13	10%
1999	US-60 EB	Alma School Road to Country Club Drive	113	11	10%
1998	I-10 EB	19th Avenue to 7th Avenue	119	11	9%
1999	I-17 SB	Peoria Avenue to Dunlap Avenue	68	6	9%
1999	I-10 EB	19th Avenue to 7th Avenue	125	11	9%
1999	I-17 NB	Indian School Road to Camelback Road	84	7	8%
1999	I-17 SB	Cactus Road to Peoria Avenue	120	10	8%
1998	SR-51 SB	McDowell Road to Loop 202	36	3	8%
1999	US-60 WB	Rural Road to Mill Avenue	103	8	8%
2000	I-10 EB	19st Avenue to 7th Avenue	187	14	7%
1998	I-17 SB	Peoria Avenue to Dunlap Avenue	125	9	7%
2000	US-60 EB	Alma School Road to Country Club Drive	132	9	7%
1998	US-60 WB	Country Club Drive to Alma School Road	132	9	7%
2000	SR-51 SB	McDowell Road to Loop 202	30	2	7%
2000	I-17 SB	Peoria Avenue to Dunlap Avenue	93	6	6%
2000	US-60 WB	Mill Avenue to Priest Drive	157	10	6%
2000	I-10 EB	7th Street to 16th Street	126	8	6%
2000	I-10 WB	16th Street to 7th Street	160	10	6%
2000	I-17 SB	Cactus Road to Peoria Avenue	128	8	6%
1999	US-60 EB	Country Club Drive to Mesa Drive	129	8	6%
1998	Loop 202 WB	32nd Street to 24th Street	149	9	6%
2000	I-10 WB	7th Street to 7th Avenue	266	16	6%
1998	I-10 EB	7th Street to 16th Street	267	15	6%
1999	Loop 202 WB	32nd Street to 24th Street	143	8	6%
1999	I-10 EB	7th Street to 16th Street	176	9	5%
1999	I-10 WB	16th Street to 7th Street	191	9	5%
1998	I-10 WB	7th Street to 7th Avenue	323	14	4%
1998	I-10 WB	16th Street to 7th Street	226	9	4%
2000	Loop 202 WB	32nd Street to 24th Street	190	7	4%
2000	US-60 EB	Dobson Road to Alma School Road	93	3	3%
1998	I-17 SB	Cactus Road to Peoria Avenue	220	7	3%
1998	US-60 WB	Rural Road to Mill Avenue	38	1	3%
1999	I-10 WB	7th Street to 7th Avenue	277	4	1%
1999	SR-51 SB	McDowell Road to Loop 202	31	0	0%

**Table 15. Segment Crash Data
Sorted by Number of Heavy Truck Crashes**

YEAR	FREEWAY	LOCATION	TOTAL	TRUCKS NUMBER	PORTION	PERCENT TRUCKS
2000	I-17 SB	Thomas to I-10	154	17	11%	2%
2000	I-10 EB	19th Avenue to 7th Avenue	187	17	9%	3%
2000	I-17 NB	I-10 to Thomas	148	15	10%	2%
2000	I-17 NB	Indian School to Camelback	148	15	10%	2%
1998	I-10 WB	7th Street to 7th Avenue	323	12	4%	3%
1999	I-10 WB	16th Street to 7th Street	191	11	6%	3%
1999	I-17 NB	I-10 to Thomas	91	9	10%	2%
1998	I-10 EB	7th Street to 16th Street	267	9	3%	3%
2000	I-17 SB	Peoria to Dunlap	93	8	9%	2%
1998	I-17 SB	Peoria to Dunlap	125	8	6%	2%
1998	I-17 SB	Cactus to Peoria	220	8	4%	2%
2000	I-10 WB	7th Street to 7th Avenue	266	8	3%	3%
2000	I-17 NB	Thomas to Indian School	96	7	7%	2%
1999	I-17 NB	Thomas to Indian School	114	7	6%	2%
1999	I-10 EB	19th Avenue to 7th Avenue	125	7	6%	3%
1998	US-60 WB	Country Club to Alma School	132	7	5%	2%
1998	I-10 WB	16th Street to 7th Street	226	7	3%	3%
1998	I-17 NB	Thomas to Indian School	127	6	5%	2%
2000	US-60 EB	Alma School to Country Club	132	6	5%	2%
2000	I-10 WB	16th Street to 7th Street	160	6	4%	3%
1999	I-17 NB	Indian School to Camelback	84	5	6%	2%
1999	US-60 WB	Rural to Mill	103	5	5%	2%
1998	US-60 EB	Alma School to Country Club	109	5	5%	2%
1998	I-10 EB	19th Avenue to 7th Avenue	119	5	4%	3%
2000	I-10 EB	7th Street to 16th Street	126	5	4%	3%
1999	US-60 EB	Country Club to Mesa	129	5	4%	3%
2000	US-60 WB	Mill to Priest	157	5	3%	2%
1999	I-10 EB	7th Street to 16th Street	176	5	3%	3%
1999	I-10 WB	7th Street to 7th Avenue	277	5	2%	3%
2000	I-17 SB	Cactus to Peoria	128	4	3%	2%
1999	Loop 202 WB	32nd Street to 24th Street	143	4	3%	1%
1999	I-17 SB	Thomas to I-10	44	3	7%	2%
1998	I-17 NB	I-10 to Thomas	67	3	4%	2%
1999	I-17 SB	Peoria to Dunlap	68	3	4%	2%
1999	US-60 EB	Dobson to Alma School	71	3	4%	2%
2000	US-60 EB	Dobson to Alma School	93	3	3%	2%
1999	US-60 EB	Alma School to Country Club	113	3	3%	2%
1998	Loop 202 WB	32nd Street to 24th Street	149	3	2%	1%
1999	US-60 WB	Mill to Priest	50	2	4%	2%
2000	US-60 EB	Country Club to Mesa	52	2	4%	3%
2000	US-60 WB	Rural to Mill	63	2	3%	2%
1998	US-60 EB	Dobson to Alma School	75	2	3%	2%
1998	US-60 EB	Country Club to Mesa	93	2	2%	3%
2000	US-60 WB	Country Club to Alma School	33	1	3%	2%
1998	I-17 SB	Thomas to I-10	35	1	3%	2%
1998	US-60 WB	Rural to Mill	38	1	3%	2%
1999	I-17 SB	Cactus to Peoria	120	1	1%	2%
1998	I-17 NB	Indian School to Camelback	158	1	1%	2%
2000	Loop 202 WB	32nd Street to 24th Street	190	1	1%	1%
1998	SR-51 SB	McDowell to SR-202	36	0	0%	1%
1999	SR-51 SB	McDowell to SR-202	31	0	0%	1%
2000	SR-51 SB	McDowell to SR-202	30	0	0%	1%
1999	US-60 WB	Country Club to Alma School	40	0	0%	2%
1998	US-60 WB	Mill to Priest	27	0	0%	2%

**Table 16. Segment Crash Data
Heavy Truck Crashes Sorted by Percent of Heavy Truck Crashes**

YEAR	FREEWAY	LOCATION	TOTAL	TRUCKS NUMBER	PORTION	PERCENT TRUCKS
2000	I-17 SB	Thomas to I-10	154	17	11%	2%
2000	I-17 NB	I-10 to Thomas	148	15	10%	2%
2000	I-17 NB	Indian School to Camelback	148	15	10%	2%
1999	I-17 NB	I-10 to Thomas	91	9	10%	2%
2000	I-10 EB	19th Avenue to 7th Avenue	187	17	9%	3%
2000	I-17 SB	Peoria to Dunlap	93	8	9%	2%
2000	I-17 NB	Thomas to Indian School	96	7	7%	2%
1999	I-17 SB	Thomas to I-10	44	3	7%	2%
1998	I-17 SB	Peoria to Dunlap	125	8	6%	2%
1999	I-17 NB	Thomas to Indian School	114	7	6%	2%
1999	I-17 NB	Indian School to Camelback	84	5	6%	2%
1999	I-10 WB	16th Street to 7th Street	191	11	6%	3%
1999	I-10 EB	19th Avenue to 7th Avenue	125	7	6%	3%
1998	US-60 WB	Country Club to Alma School	132	7	5%	2%
1999	US-60 WB	Rural to Mill	103	5	5%	2%
1998	I-17 NB	Thomas to Indian School	127	6	5%	2%
1998	US-60 EB	Alma School to Country Club	109	5	5%	2%
2000	US-60 EB	Alma School to Country Club	132	6	5%	2%
1998	I-17 NB	I-10 to Thomas	67	3	4%	2%
1999	I-17 SB	Peoria to Dunlap	68	3	4%	2%
1999	US-60 EB	Dobson to Alma School	71	3	4%	2%
1998	I-10 EB	19th Avenue to 7th Avenue	119	5	4%	3%
1999	US-60 WB	Mill to Priest	50	2	4%	2%
2000	I-10 EB	7th Street to 16th Street	126	5	4%	3%
1999	US-60 EB	Country Club to Mesa	129	5	4%	3%
2000	US-60 EB	Country Club to Mesa	52	2	4%	3%
2000	I-10 WB	16th Street to 7th Street	160	6	4%	3%
1998	I-10 WB	7th Street to 7th Avenue	323	12	4%	3%
1998	I-17 SB	Cactus to Peoria	220	8	4%	2%
1998	I-10 EB	7th Street to 16th Street	267	9	3%	3%
2000	US-60 EB	Dobson to Alma School	93	3	3%	2%
2000	US-60 WB	Mill to Priest	157	5	3%	2%
2000	US-60 WB	Rural to Mill	63	2	3%	2%
2000	I-17 SB	Cactus to Peoria	128	4	3%	2%
1998	I-10 WB	16th Street to 7th Street	226	7	3%	3%
2000	US-60 WB	Country Club to Alma School	33	1	3%	2%
2000	I-10 WB	7th Street to 7th Avenue	266	8	3%	3%
1998	I-17 SB	Thomas to I-10	35	1	3%	2%
1999	I-10 EB	7th Street to 16th Street	176	5	3%	3%
1999	Loop 202 WB	32nd Street to 24th Street	143	4	3%	1%
1998	US-60 EB	Dobson to Alma School	75	2	3%	2%
1999	US-60 EB	Alma School to Country Club	113	3	3%	2%
1998	US-60 WB	Rural to Mill	38	1	3%	2%
1998	US-60 EB	Country Club to Mesa	93	2	2%	3%
1998	Loop 202 WB	32nd Street to 24th Street	149	3	2%	1%
1999	I-10 WB	7th Street to 7th Avenue	277	5	2%	3%
1999	I-17 SB	Cactus to Peoria	120	1	1%	2%
1998	I-17 NB	Indian School to Camelback	158	1	1%	2%
2000	Loop 202 WB	32nd Street to 24th Street	190	1	1%	1%
1998	SR-51 SB	McDowell to SR-202	36	0	0%	1%
1999	SR-51 SB	McDowell to SR-202	31	0	0%	1%
2000	SR-51 SB	McDowell to SR-202	30	0	0%	1%
1999	US-60 WB	Country Club to Alma School	40	0	0%	2%
1998	US-60 WB	Mill to Priest	27	0	0%	2%

**Table 17. Segment Crash Data
Heavy Truck Crashes Sorted by Year**

YEAR	FREEWAY	LOCATION	TOTAL	TRUCKS NUMBER PORTION		PERCENT TRUCKS
2000	I-10 EB	19th Avenue to 7th Avenue	187	17	9%	3%
2000	I-10 EB	7th Street to 16th Street	126	5	4%	3%
2000	I-10 WB	16th Street to 7th Street	160	6	4%	3%
2000	I-10 WB	7th Street to 7th Avenue	266	8	3%	3%
2000	I-17 NB	I-10 to Thomas	148	15	10%	2%
2000	I-17 NB	Indian School to Camelback	148	15	10%	2%
2000	I-17 NB	Thomas to Indian School	96	7	7%	2%
2000	I-17 SB	Cactus to Peoria	128	4	3%	2%
2000	I-17 SB	Peoria to Dunlap	93	8	9%	2%
2000	I-17 SB	Thomas to I-10	154	17	11%	2%
2000	Loop 202 WB	32nd Street to 24th Street	190	1	1%	1%
2000	SR-51 SB	McDowell to SR-202	30	0	0%	1%
2000	US-60 EB	Alma School to Country Club	132	6	5%	2%
2000	US-60 EB	Country Club to Mesa	52	2	4%	3%
2000	US-60 EB	Dobson to Alma School	93	3	3%	2%
2000	US-60 WB	Country Club to Alma School	33	1	3%	2%
2000	US-60 WB	Mill to Priest	157	5	3%	2%
2000	US-60 WB	Rural to Mill	63	2	3%	2%
1999	I-10 EB	19th Avenue to 7th Avenue	125	7	6%	3%
1999	I-10 EB	7th Street to 16th Street	176	5	3%	3%
1999	I-10 WB	16th Street to 7th Street	191	11	6%	3%
1999	I-10 WB	7th Street to 7th Avenue	277	5	2%	3%
1999	I-17 NB	I-10 to Thomas	91	9	10%	2%
1999	I-17 NB	Indian School to Camelback	84	5	6%	2%
1999	I-17 NB	Thomas to Indian School	114	7	6%	2%
1999	I-17 SB	Cactus to Peoria	120	1	1%	2%
1999	I-17 SB	Peoria to Dunlap	68	3	4%	2%
1999	I-17 SB	Thomas to I-10	44	3	7%	2%
1999	Loop 202 WB	32nd Street to 24th Street	143	4	3%	1%
1999	SR-51 SB	McDowell to SR-202	31	0	0%	1%
1999	US-60 EB	Alma School to Country Club	113	3	3%	2%
1999	US-60 EB	Country Club to Mesa	129	5	4%	3%
1999	US-60 EB	Dobson to Alma School	71	3	4%	2%
1999	US-60 WB	Country Club to Alma School	40	0	0%	2%
1999	US-60 WB	Mill to Priest	50	2	4%	2%
1999	US-60 WB	Rural to Mill	103	5	5%	2%
1998	I-10 EB	19th Avenue to 7th Avenue	119	5	4%	3%
1998	I-10 EB	7th Street to 16th Street	267	9	3%	3%
1998	I-10 WB	16th Street to 7th Street	226	7	3%	3%
1998	I-10 WB	7th Street to 7th Avenue	323	12	4%	3%
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1998	I-17 NB	Thomas to Indian School	127	6	5%	2%
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1998	I-17 SB	Peoria to Dunlap	125	8	6%	2%
1998	I-17 SB	Thomas to I-10	35	1	3%	2%
1998	Loop 202 WB	32nd Street to 24th Street	149	3	2%	1%
1998	SR-51 SB	McDowell to SR-202	36	0	0%	1%
1998	US-60 EB	Alma School to Country Club	109	5	5%	2%
1998	US-60 EB	Country Club to Mesa	93	2	2%	3%
1998	US-60 EB	Dobson to Alma School	75	2	3%	2%
1998	US-60 WB	Country Club to Alma School	132	7	5%	2%
1998	US-60 WB	Mill to Priest	27	0	0%	2%
1998	US-60 WB	Rural to Mill	38	1	3%	2%