FY2005 Problem Identification

COLORADO DEPARTMENT OF TRANSPORTATION

OFFICE OF TRANSPORTATION SAFETY

FY2005 Problem Identification Report

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Prepared for:

Colorado Department of Transportation
Safety and Engineering Branch
4201 East Arkansas Avenue
Empire Park, Suite 770
Denver, Colorado 80222

Prepared By:

Dr. Jeffrey Zax, Professor of Economics,
University of Colorado at Boulder

Dr. Naci Mocan, Professor of Economics,
University of Colorado at Denver

University of Colorado at Boulder
Department of Economics
256 UCB
Boulder, Colorado 80309-0256

Jennifer Garner, Garner Insight

Glissen Rhode, Glissen, LLC

Table of Contents | FY2005 Problem Identification Report

Abstract | FY2005 Problem Identification Report

Abstract | FY2005 Problem Identification Report

Study Team

The Colorado Department of Transportation (CDOT) retained University of Colorado Professors, Dr. Jeffery Zax and Dr. Naci Mocan, to complete the FY2005 Problem Identification Report. Dr. Zax and Dr. Mocan were assisted in this effort by Jennifer Garner of Garner Insight, and Glissen Rhode of Glissen, LLC. The study team gratefully acknowledges the leadership of Henry Sandoval and the invaluable assistance of Rahim Marandi and Tim Foote.

Purpose

The annual Problem Identification report characterizes 2002 traffic crashes and examines the behavioral side of traffic crashes in Colorado. It also presents 25-year trends in fatal crashes. This report utilizes data from the 2002 CDOT Crash Database and from the 1977-2002 Fatal Accident Reporting System (FARS).

Research Highlights

The study team applied a fresh perspective to the analysis of traffic crashes. Sections I-VI of the report focus on different aspects of 2002 crashes. Some of the key findings are discussed below.

Section I: Profile of 2002 Crashes in Colorado – Selected Findings

- Of the 137,216 reported traffic crashes in Colorado, 25% resulted in an injury or fatality.
- Crashes at intersections and interchanges and in rural areas tend to be more severe. Crashes during rain, snow, sleet and hail tend to be no more severe than crashes with "no weather" conditions.
- Among the eleven largest counties, Denver County had the highest rate of injury and fatal crashes per capita and Douglas County had the lowest.

Section II: Profile of 2002 Crash Drivers – Selected Findings

- Only 1,333 drivers, or less than one-half of one percent, were involved in fatal crashes.
- Nearly one-third of all crashes involved at least one driver with no recorded license.
- Large vehicles, such as trucks, motor homes and buses, are relatively unlikely to be involved in injury and fatality crashes.
- More than 70% of crashes involving motorcycles, bicycles, motorized bicycles cause injuries.
- Among the 38,504 drivers who become involved in crashes with reported contributing factors, drivers who are sleeping, fatigued, sick or disabled are more likely to cause injuries than drivers in crashes with other contributing factors.

- Although newer vehicles are slightly less likely to be involved in severe crashes than are older vehicles, the difference is less than might be expected based on improvements in safety technology.

Section III: Effect of Driver Age in Colorado Crashes – Selected Findings

- The youngest drivers have the highest reported crash rate per capita, compared to all other drivers.
- Regardless of their age, women account for approximately 40% of the drivers involved in crashes.
- Per capita, 17 year old men have the highest rate of crash involvement.

Section IV: Effect of Impairment in Colorado Crashes – Selected Findings

- Impairment is more common in more severe crashes, among male crash drivers and among drivers in their early to mid-20s.
- Rates of impairment among crash drivers aged between 22 and 29 are much higher than at any other ages. More than 10% of all drivers aged 21, 22 and 23 involved in injury and fatal crashes are impaired.

Section V: Repeat Offenders in Colorado Crashes – Selected Findings

- According to recorded drivers' license numbers, at least 11,675 drivers were involved in multiple crashes in Colorado during 2002. Of them, 6,503 drivers, or 55.7%, were involved in only non-injury, nonfatal crashes.
- Of all drivers in fatal crashes, 6.7% were involved in at least one other crash in the same year.
- Repeat offenders were slightly more likely to be impaired than drivers involved in only a single crash.
- 56,740 drivers in all crashes did not have recorded drivers' licenses. It is likely that an unknown number of additional repeat offenders are present among this group.
- Among repeat offenders with Colorado licenses, 7,342, or 64.1%, were men. More than three-quarters of the repeat offenders with licenses from other states were men.

Section VI: Crash Driver Residence – Selected Findings

- Among the largest counties, residents of Mesa, Pueblo and Weld Counties were most likely to be involved in crashes that resulted in injuries or fatalities..
- Among residents of Adams and Denver Counties, approximately 27% of injury and fatality crash drivers were age 17 or younger.

- Residents aged 65 and over constituted slightly more than 5% of all drivers in injury and fatality accidents in Weld County, but nearly 12% in Mesa County.

- The propensities of drivers resident in each county to become involved in injury or fatal crashes outside their county of residence varies substantially. For example, more than 70% of Adams County residents who became involved in injury or fatality crashes did so outside of Adams County. In contrast, only about 16% of Pueblo County residents who became so involved did so outside of Pueblo County.

Section VII: Fatal Accident Reporting System (FARS) – Selected Findings

- In 2002 there were 676 fatal crashes in the State of Colorado. The annual number of fatal crashes has increased slowly since approximately 1987.

- In 2002, 742 people died in Colorado crashes involving a motor vehicle.

- In 2002, 53 fatal crashes involved a motorcycle, or 8% of all fatal crashes.

- In 2002 71% of fatal crashes occurred on roads with posted speed limits below 65 MPH.

- In 2002 the national average of alcohol-related crashes as a proportion of fatal crashes is 35%. The median among state averages is 36.2%. In Colorado, it is 43.3%. Colorado ranks as the 8th worst state behind Montana (51.7%), Rhode Island (49.4%), North Carolina (48.8%), New Mexico (48.7%), South Dakota (48.4), South Carolina (47.2), and Washington (45.4%). Washington DC and Utah have the lowest and the second-lowest rates of alcohol-related fatal crashes with 9.3%, and 19.7%, respectively.

Section I | Profile of 2002 Crashes in Colorado

Section I | Profile of 2002 Crashes in Colorado

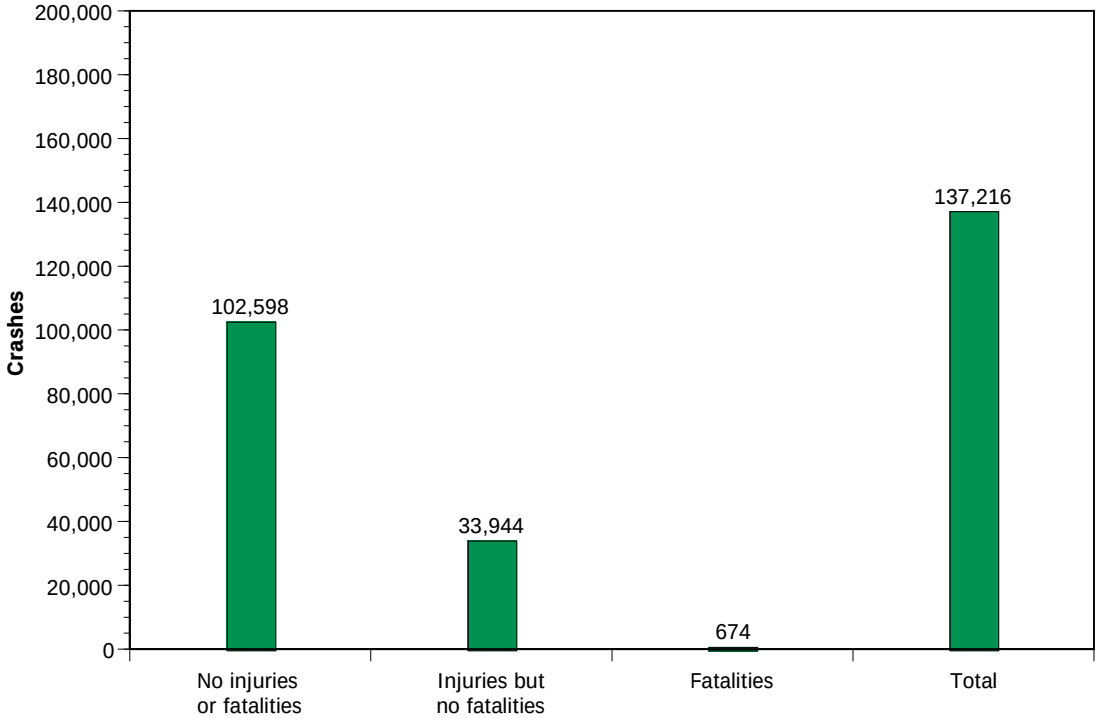
Introduction

In 2002, there were 137,216 traffic crashes in Colorado. This section profiles 2002 Colorado traffic crashes.

Crash Severity

In 2002, 25% of all reported crashes resulted in an injury or fatality.

Exhibit I-1.
Traffic Crashes in Colorado by Severity, 2002



Source: 2002 CDOT Crash Database.

As shown in Exhibit I-2 on the following page, the majority of non-fatal injury crashes resulted in a single injury. However, many crashes involved multiple injuries. On the extreme end of the spectrum, the crash database indicates that several crashes resulted in 20 or more people being injured, with an extreme case of 90 injuries. The accuracy of these large reported injury counts may be open to question.

Exhibit I-2.
Number of Crashes with Injuries but No Fatalities by Number of Injuries

Source: 2002 CDOT Crash Database.

Number of Non-fatal Injury Crashes	Number Injured
23,993	1
6,900	2
2,028	3
693	4
295	5
95	6
43	7
12	8
7	9
151	10
2	11
2	12
1	14
30	20
1	26
16	30
9	40
3	50
1	60
1	70
1	91

As shown in Exhibit I-3, the majority of fatal crashes resulted in one death per crash. Based on the crash data, three fatal crashes resulted in reports of 10 deaths each.

Exhibit I-3.
Number of Crashes with Fatalities by Number of Fatalities

Source: 2002 CDOT Crash Database.

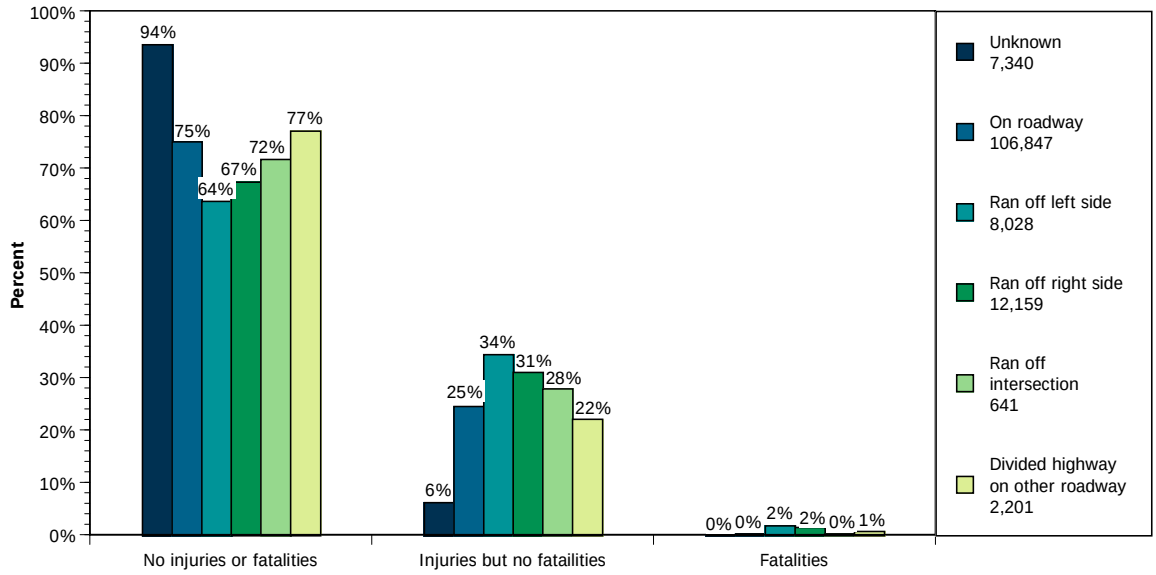
Number of Fatal Crashes	Number Killed
615	1
50	2
3	3
2	4
1	5
3	10

Location and Roadway Effects on Crash Severity

The severity of 2002 crashes varied based on the location of the crash and roadway characteristics.

Exhibit I-4 on the following page presents the distribution of crash severity by the location of the crash with respect to the road. The majority of all crashes occurred on the roadway. The fewest crashes occurred when a vehicle ran off a T intersection. One-third of all injury crashes occurred when a vehicle "ran off the left side" of the roadway. Crashes in which vehicles leave the roadway tend to be more severe.

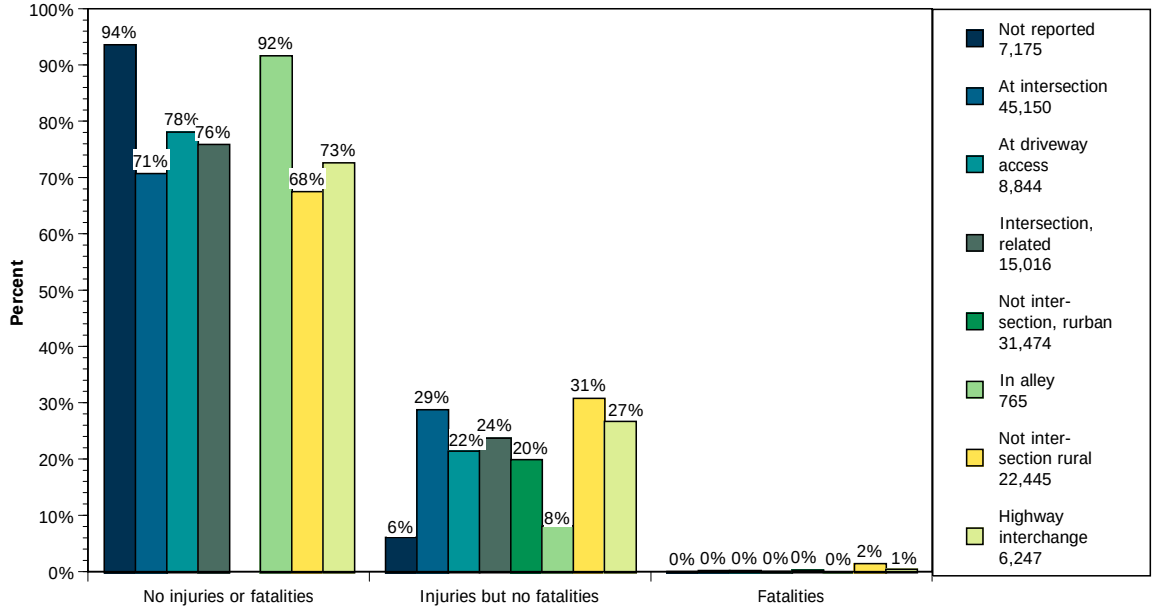
Exhibit I-4.
Effects of Crash Location on Crash Severity



Source: 2002 CDOT Crash Database.

As shown in Exhibit I-5, crashes at intersections and interchanges and in rural areas tend to be more severe. Slightly more than 45,000 crashes occurred at intersections in 2002. More than 22,000 crashes occurred on non-intersection rural roadways.

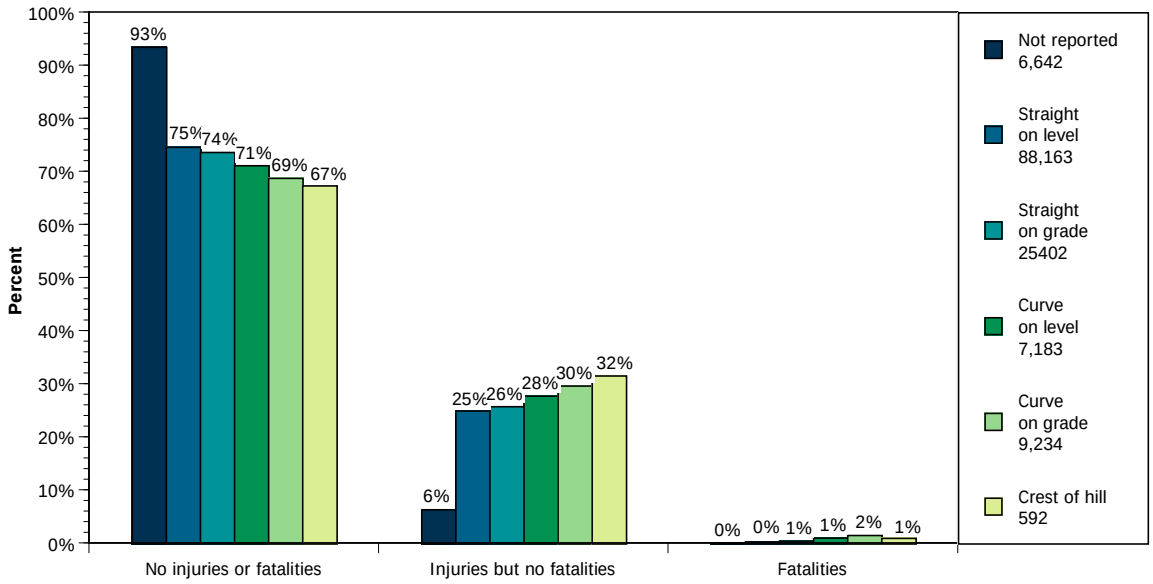
Exhibit I-5.
Effects of Road Description on Crash Severity



Source: 2002 CDOT Crash Database.

As shown in Exhibit I-6, crashes where vision is obstructed, at curves and hill crests, tend to be more severe. The majority of all crashes (88,163) occurred straight on, on level roadways.

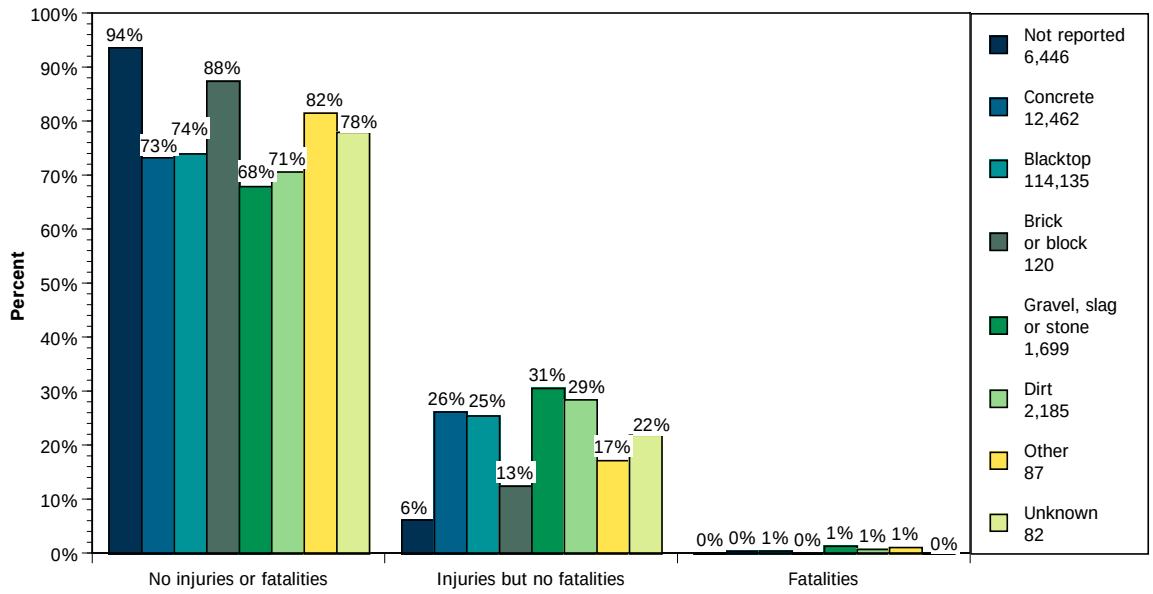
Exhibit I-6.
Effects of Road Contour on Crash Severity



Source: 2002 CDOT Crash Database.

As shown in Exhibit I-7 on the following page, crashes on gravel, slag or stone tend to be more severe. Crashes on brick or block tend to be less severe. Most crashes (114,135) occurred on blacktop, but 1,699 occurred on gravel, slag or stone.

Exhibit I-7.
Effects of Road Surface on Crash Severity



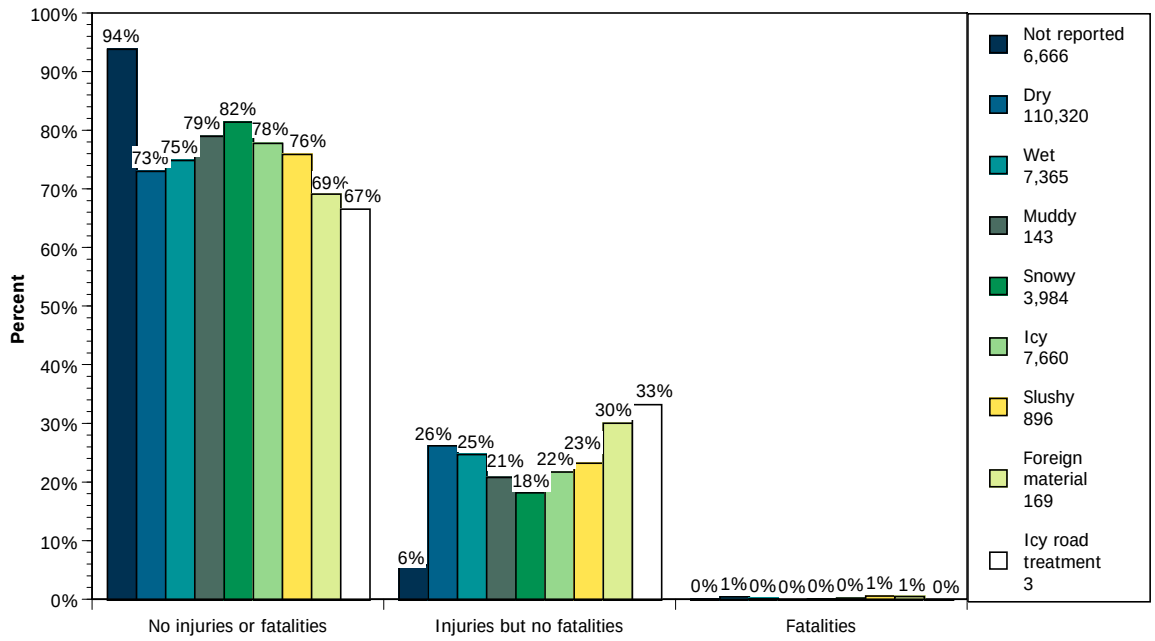
Source: 2002 CDOT Crash Database.

Effects of Road Condition and Weather on Crash Severity

The following exhibits examine the effect of road conditions, lighting and weather on the severity of crashes.

As shown in Exhibit I-8 on the following page, crashes are more severe in the very rare instances when foreign material (169 crashes) or visible icy road treatments (3 crashes) are present. Among the common circumstances, crashes are somewhat more likely to be severe under dry conditions, perhaps because drivers are less cautious.

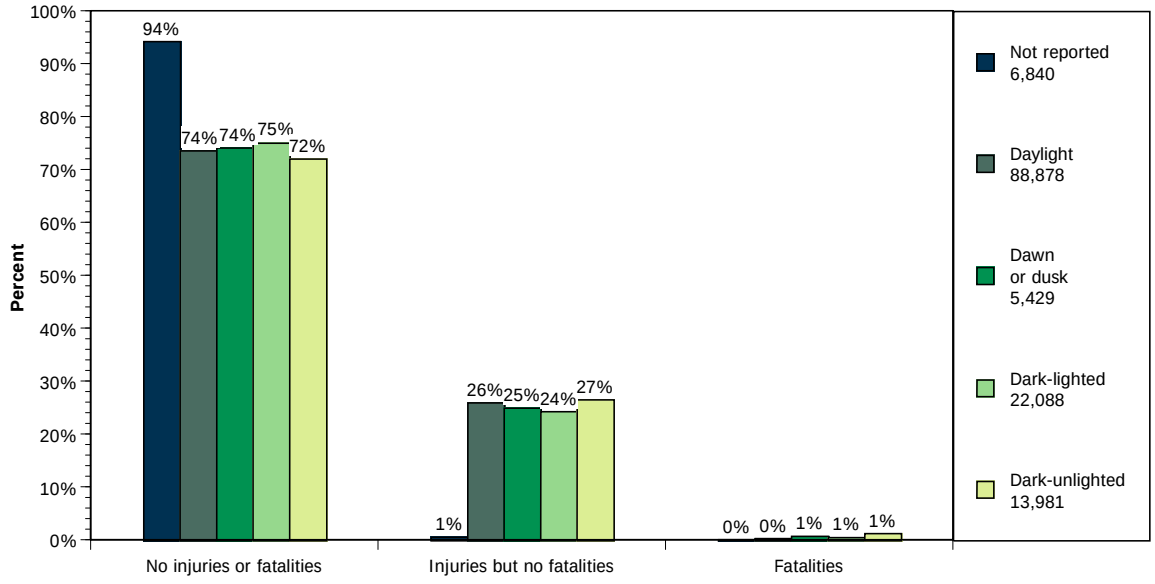
Exhibit I-8.
Effects of Road Condition at Crash Site on Crash Severity



Source: 2002 CDOT Crash Database.

Light conditions have little effect on the severity of crashes (Exhibit I-9). Regardless of light conditions, most reported crashes are property damage-only.

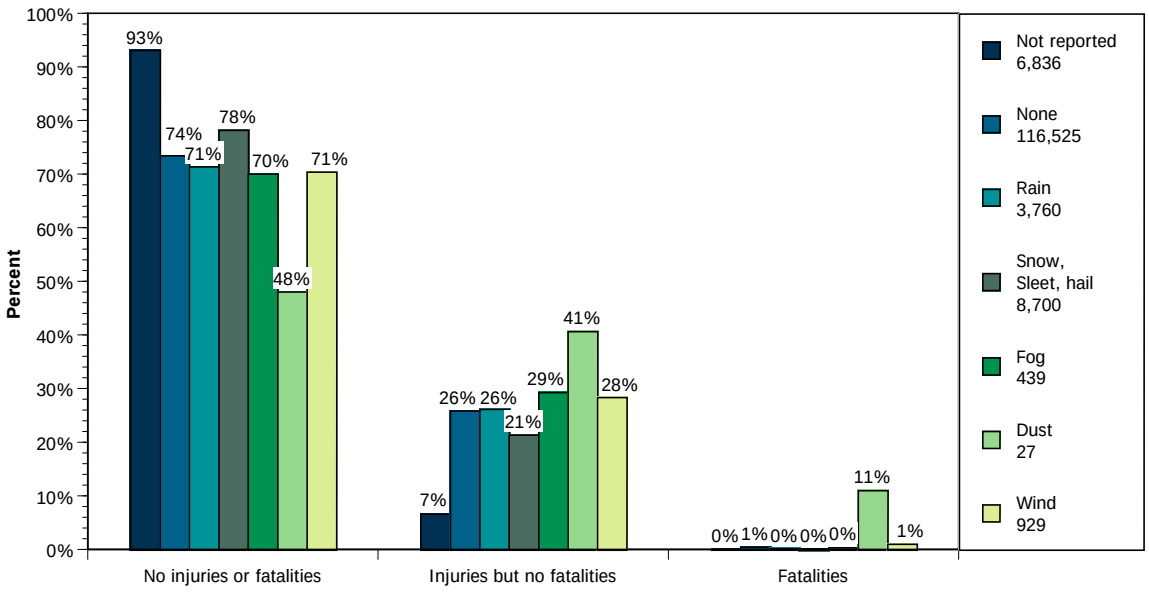
Exhibit I-9.
Effects of Light Conditions on Crash Severity



Source: 2002 CDOT Crash Database.

Crashes involving dust, although rare (27 crashes), tend to be unusually severe. Fog (439 crashes) and wind (929 crashes) also produce crashes of greater than average severity. Crashes during rain, snow, sleet and hail tend to be no more severe than crashes with "no weather" conditions.

Exhibit I-10.
Effects of Weather Conditions on Crash Severity



Source: 2002 CDOT Crash Database.

Crash Severity by Colorado Counties

Exhibit I-11 on the following page details the severity of crashes that occurred in Colorado's counties. As previously discussed, 25% of the 2002 crashes in Colorado resulted in an injury or a fatality. As shown in Exhibit I-11, injury crashes accounted for more than 30% of all crashes in ten rural counties.

Exhibit I-11.
Number of Crashes and Severity for All Counties

	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Total
Adams	74.4%	25.2%	0.4%	11,365
Alamosa	79.3%	19.9%	0.8%	614
Arapahoe	72.2%	27.5%	0.3%	13,406
Archuleta	70.3%	28.4%	1.3%	401
Baca	74.0%	20.8%	5.2%	77
Bent	66.4%	32.7%	0.9%	110
Boulder	71.9%	27.7%	0.4%	7,405
Broomfield	79.0%	20.3%	0.6%	1,274
Chaffee	69.9%	28.4%	1.8%	388
Cheyenne	61.5%	34.6%	3.9%	52
Clear Creek	73.7%	25.7%	0.6%	779
Conejos	69.4%	28.3%	2.3%	173
Costilla	71.0%	27.8%	1.2%	162
Crowley	64.4%	35.6%	0.0%	59
Custer	58.6%	38.4%	3.0%	99
Delta	69.1%	29.4%	1.6%	517
Denver	78.1%	21.7%	0.2%	28,782
Dolores	70.0%	26.7%	3.3%	60
Douglas	75.9%	23.6%	0.5%	4,325
Eagle	79.0%	20.1%	1.0%	1,611
El Paso	73.6%	26.1%	0.3%	15,459
Elbert	66.0%	31.2%	2.8%	353
Fremont	72.1%	27.2%	0.7%	978
Garfield	80.3%	19.3%	0.4%	1,962
Gilpin	74.6%	23.8%	1.6%	185
Grand	79.8%	19.3%	0.9%	559
Gunnison	71.4%	27.2%	1.4%	427
Hinsdale	38.5%	53.9%	7.7%	13
Huerfano	67.9%	29.9%	2.3%	221
Jackson	74.8%	22.2%	3.0%	99
Jefferson	76.4%	23.3%	0.3%	13,253
Kiowa	61.8%	38.2%	0.0%	55
Kit Carson	64.6%	32.7%	2.8%	254
La Plata	72.8%	26.5%	0.7%	1,384
Lake	63.6%	34.1%	2.3%	132
Larimer	73.2%	26.4%	0.5%	6,817
Las Animas	68.1%	30.6%	1.3%	536
Lincoln	72.5%	26.6%	0.9%	222
Logan	67.9%	31.3%	0.9%	464

Exhibit I-11.
Number of Crashes and Severity for All Counties, Continued

	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Total
Mesa	70.1%	29.1%	0.8%	3,087
Mineral	72.7%	23.4%	3.9%	77
Moffat	83.4%	16.3%	0.3%	661
Montezuma	74.6%	23.5%	1.9%	669
Montrose	77.5%	22.1%	0.4%	956
Morgan	69.2%	29.4%	1.4%	765
Otero	70.7%	28.2%	1.1%	440
Ouray	77.3%	22.7%	0.0%	176
Park	77.9%	16.6%	5.5%	235
Phillips	69.0%	29.3%	1.7%	58
Pitkin	86.5%	13.1%	0.4%	927
Prowers	75.0%	23.6%	1.4%	356
Pueblo	70.8%	28.4%	0.8%	4,212
Rio Blanco	82.6%	15.9%	1.5%	397
Rio Grande	74.7%	24.5%	0.8%	257
Routt	87.1%	12.4%	0.5%	879
Saguache	64.4%	34.9%	0.7%	149
San Juan	72.3%	27.7%	0.0%	47
San Miguel	82.4%	16.8%	0.8%	244
Sedgwick	64.0%	34.7%	1.3%	75
Summit	79.0%	20.6%	0.4%	1,174
Teller	70.9%	28.0%	1.2%	604
Washington	65.1%	34.0%	0.9%	106
Weld	70.7%	28.4%	0.9%	5,435
Yuma	72.5%	24.5%	3.1%	196
Total	102,598	33,944	674	137,216

Source: 2002 CDOT Crash Database.

Exhibit I-12 presents crashes per capita for the State's eleven largest counties. To create these rates, 2000 Census data were used. Using population figures to create these rates is imperfect at best. A far better measure would be to calculate crash rates using accurate county-level Vehicle Miles Traveled (VMT). To the study team's knowledge, accurate VMT information is available only at the State level.

Even using the imperfect measure of per capita crashes, it is apparent that both total crashes and the severity of crashes vary by county. Denver County had the highest rate of injury and fatal crashes per capita and Douglas County had the lowest.

Exhibit I-12.
Crashes per Capita for Colorado's Eleven Largest Counties

	Population	Total Crashes	Total Crashes per 1,000 Capita	Total Injury and Fatality Crashes	Total Injury and Fatality Crashes per 1,000 Capita
Colorado	4,501,051	137,216	30.5	34,618	7.7
Adams	372,609	11,365	30.5	2,905	7.8
Arapahoe	510,163	13,406	26.3	3,723	7.3
Boulder	278,712	7,405	26.6	2,079	7.5
Denver	558,379	28,782	51.6	6,308	11.3
Douglas	211,577	4,325	20.4	1,043	4.9
El Paso	543,625	15,459	28.4	4,079	7.5
Jefferson	530,496	13,253	25.0	3,131	5.9
Larimer	264,036	6,817	25.8	1,830	6.9
Mesa	122,080	3,087	25.3	922	7.6
Pueblo	147,293	4,212	28.6	1,230	8.4
Weld	204,132	5,435	26.6	1,592	7.8

Source: 2002 CDOT Crash Database.

The severity of crashes occurring in Colorado's cities varied widely. In Aurora, 31% of all crashes resulted in an injury but no fatality, compared to 22% of Denver's crashes. In Elizabeth, 12% of all crashes were severe, compared to 40% in Erie. Statistics for Centennial in Exhibits I-13 and I-14 appear to be suspect, perhaps because it had only been incorporated in 2001.

Exhibit I-13.
Number of Crashes and Severity for Cities with Ten or More Crashes

City	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Total
Alamosa	84.8%	15.2%	0.0%	361
Arvada	80.3%	19.4%	0.3%	2,057
Aspen	91.3%	8.7%	0.0%	426
Aurora	69.4%	30.3%	0.3%	7,391
Avon	85.0%	15.0%	0.0%	147
Basalt	83.8%	14.7%	1.5%	68
Berthoud	89.1%	10.1%	0.8%	119
Black Hawk	83.7%	16.3%	0.0%	49
Boulder	70.2%	29.6%	0.2%	2,822
Breckenridge	86.3%	13.7%	0.0%	175
Brighton	82.5%	16.8%	0.7%	743
Broomfield	79.0%	20.4%	0.6%	1,269
Brush	75.8%	24.2%	0.0%	33
Burlington	77.3%	22.7%	0.0%	44
Calhan	90.9%	9.1%	0.0%	11
Canon City	79.0%	20.8%	0.2%	423
Carbondale	90.9%	9.1%	0.0%	66
Castle Rock	79.1%	20.9%	0.0%	436
Centennial	75.4%	24.6%	0.0%	334
Center	92.3%	7.7%	0.0%	26
Central City	93.3%	6.7%	0.0%	15
Cherry Hills Village	80.6%	19.4%	0.0%	304
Colorado Springs	75.2%	24.6%	0.2%	12,411
Columbine Valley	81.8%	18.2%	0.0%	11
Commerce City	75.4%	24.2%	0.4%	952
Cortez	71.3%	28.2%	0.6%	174
Craig	83.2%	16.9%	0.0%	184
Cripple Creek	88.6%	11.4%	0.0%	35
Dacono	88.1%	11.9%	0.0%	42
Delta	76.9%	22.0%	1.1%	91
Denver	78.1%	21.7%	0.2%	28,770
Dillon	75.0%	25.0%	0.0%	48
Durango	80.3%	19.3%	0.4%	539
Eagle	83.6%	16.4%	0.0%	61
Eaton	82.9%	17.1%	0.0%	35
Edgewater	75.0%	25.0%	0.0%	84
Elizabeth	88.5%	11.5%	0.0%	52
Englewood	74.4%	25.0%	0.5%	919
Erie	59.6%	40.4%	0.0%	52
Estes Park	83.3%	16.7%	0.0%	198

Exhibit I-13.
Number of Crashes and Severity for Cities with Ten or More Crashes, Continued

City	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Total
Evans	78.1%	20.9%	1.0%	398
Federal Heights	77.4%	22.6%	0.0%	221
Firestone	78.4%	18.9%	2.7%	37
Florence	82.5%	17.5%	0.0%	57
Fountain	65.3%	34.7%	0.0%	72
Frederick	84.8%	15.2%	0.0%	92
Frisco	84.2%	15.8%	0.0%	38
Ft. Collins	79.4%	20.4%	0.2%	3,672
Ft. Lupton	85.5%	13.9%	0.6%	165
Ft. Morgan	80.9%	19.1%	0.0%	304
Glendale	71.0%	28.6%	0.4%	276
Glenwood Springs	85.0%	15.0%	0.0%	467
Golden	81.0%	18.6%	0.5%	646
Grand Junction	74.1%	25.6%	0.3%	1,879
Greeley	72.6%	27.2%	0.2%	1,852
Greenwood Village	72.7%	27.3%	0.0%	1,238
Gunnison	84.3%	15.7%	0.0%	51
Holyoke	79.2%	20.8%	0.0%	24
Idaho Springs	80.0%	20.0%	0.0%	40
Ignacio	56.4%	41.0%	2.6%	39
Johnstown	83.9%	16.1%	0.0%	62
Kersey	81.8%	18.2%	0.0%	11
La Junta	80.8%	19.3%	0.0%	161
Lafayette	79.7%	19.4%	0.9%	464
Lakeside	80.7%	19.4%	0.0%	31
Lakewood	80.8%	18.9%	0.3%	4,266
Lamar	80.6%	19.4%	0.0%	160
Las Animas	75.0%	25.0%	0.0%	36
Limon	85.4%	14.6%	0.0%	48
Littleton	82.2%	17.6%	0.2%	1,108
Lochbuie	72.7%	27.3%	0.0%	11
Lone Tree	88.5%	11.5%	0.0%	78
Longmont	77.3%	22.6%	0.1%	1,951
Louisville	79.4%	20.6%	0.0%	345
Loveland	62.8%	36.9%	0.3%	656
Manitou Springs	86.6%	13.4%	0.0%	134
Meeker	73.5%	26.5%	0.0%	34
Milliken	81.8%	18.2%	0.0%	44
Montrose	81.2%	18.7%	0.2%	552
Monument	84.1%	15.9%	0.0%	44
Morrison	76.9%	23.1%	0.0%	13
Mountain View	81.0%	19.1%	0.0%	21
Mt. Crested Butte	88.9%	11.1%	0.0%	18

Exhibit I-13.
Number of Crashes and Severity for Cities with More than Ten Crashes, Continued

City	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Total
New Castle	80.4%	19.6%	0.0%	46
Northglenn	84.3%	15.5%	0.2%	931
Pagosa Springs	80.5%	18.3%	1.2%	82
Palisade	92.3%	7.7%	0.0%	13
Palmer Lake	80.8%	19.2%	0.0%	26
Paonia	89.5%	10.5%	0.0%	19
Parachute	88.9%	11.1%	0.0%	27
Parker	85.2%	14.4%	0.3%	637
Platteville	50.0%	50.0%	0.0%	18
Pueblo	72.8%	26.6%	0.6%	3,399
Rangely	96.9%	3.1%	0.0%	32
Rifle	92.4%	7.7%	0.0%	196
Rocky Ford	75.4%	24.6%	0.0%	61
Salida	78.7%	20.2%	1.1%	94
Sheridan	82.1%	17.9%	0.0%	513
Silt	92.0%	8.0%	0.0%	50
Silverthorn	80.0%	20.0%	0.0%	155
Snowmass Village	91.2%	8.8%	0.0%	68
Steamboat Springs	92.5%	7.3%	0.3%	371
Sterling	74.2%	25.8%	0.0%	128
Superior	83.3%	16.7%	0.0%	12
Telluride	94.9%	5.1%	0.0%	79
Thornton	79.9%	19.8%	0.3%	2,036
Trinidad	79.3%	20.3%	0.4%	246
Vail	79.7%	18.9%	1.4%	212
Walsenburg	73.9%	26.1%	0.0%	23
Westminster	76.9%	22.9%	0.3%	1,986
Wheat Ridge	76.2%	23.8%	0.0%	1,374
Windsor	75.7%	23.5%	0.7%	136
Winter Park	80.0%	20.0%	0.0%	10
Woodland Park	81.5%	18.5%	0.0%	184
Wray	90.9%	9.1%	0.0%	33
Yuma	92.5%	5.0%	2.5%	40
Total	102,598	33,944	674	137,216

Source: 2002 CDOT Crash Database.

As with the county-level analysis, per capita crash rates varied widely among Colorado's largest cities. (Again, population is an imperfect proxy for accurate city-level VMT.) Westminster had the lowest per capita severe crash rate, apart from the suspect values reported for Centennial. Denver had the highest per capita rate.

Exhibit I-14.
Crashes per Capita for Cities with More than 50,000 Population

	Population	Total Crashes	Total Crashes per 1,000 Capita	Total Injury and Fatality Crashes	Total Inury and Fatality Crashes per 1,000 Capita
Denver	560,882	28,770	51.29	6,306	11.24
Colorado Springs	373,328	12,411	33.24	3,076	8.24
Aurora	287,216	7,391	25.73	2,263	7.88
Lakewood	144,150	4,266	29.59	821	5.7
Ft. Collins	124,428	3,672	29.51	757	6.08
Westminster	104,011	1,986	19.09	459	4.41
Pueblo	103,846	3,399	32.73	925	8.91
Arvada	102,322	2,057	20.1	405	3.96
Centennial	101,374	334	3.29	82	0.8
Boulder	93,752	2,822	30.1	841	8.97
Thornton	93,655	2,036	21.74	409	4.37
Greeley	82,091	1,852	22.56	507	6.18
Longmont	77,725	1,951	25.1	442	5.69
Loveland	54,862	656	11.96	244	4.45

Source: 2002 CDOT Crash Database.

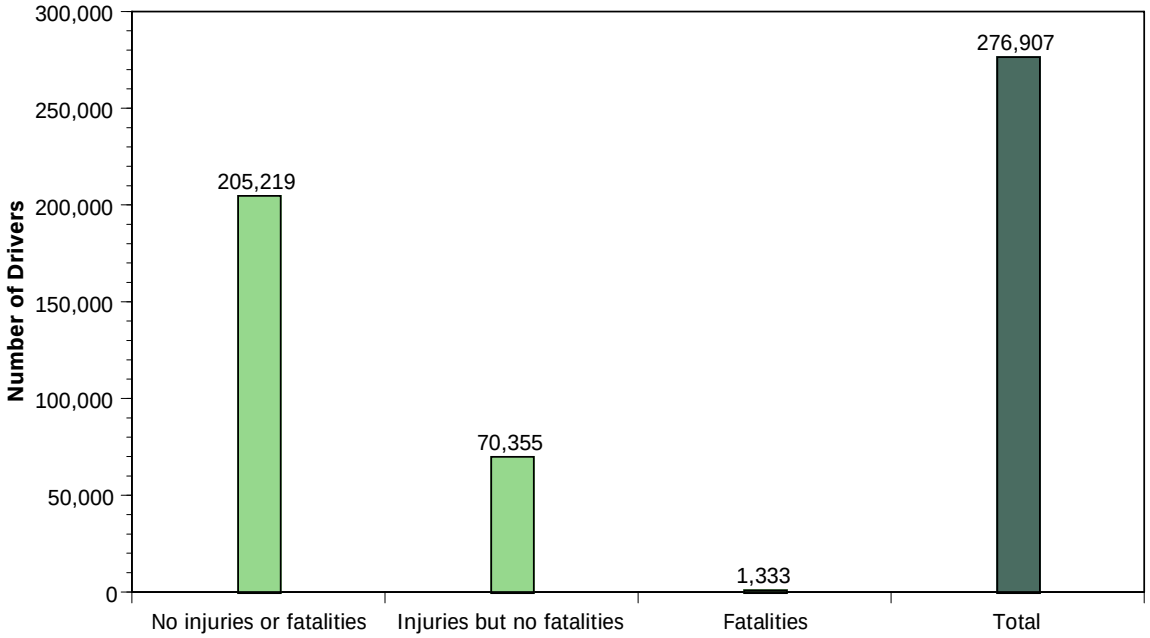
Section II | Drivers in Colorado Crashes

Section II | Drivers in Colorado Crashes

Introduction

This section investigates the characteristics of drivers and vehicles involved in accidents. Nearly one-third of all crashes involved at least one driver with no recorded license. Nearly half of all fatal crashes involved at least one driver with no recorded license. Although newer vehicles are slightly less likely to be involved in severe crashes than are older vehicles, the difference is less than might be expected based on improvements in safety technology.

Exhibit II-1.
Number of Drivers Involved in Crashes of Differing Severity



Source: 2002 CDOT Crash Database.

Exhibit II-1 reports that 276,907 drivers were associated with the 137,216 crashes in 2002. Nearly three-quarters were involved in non-injury, nonfatal crashes. Only 1,333 drivers, or less than one-half of one percent, were involved in fatal crashes.

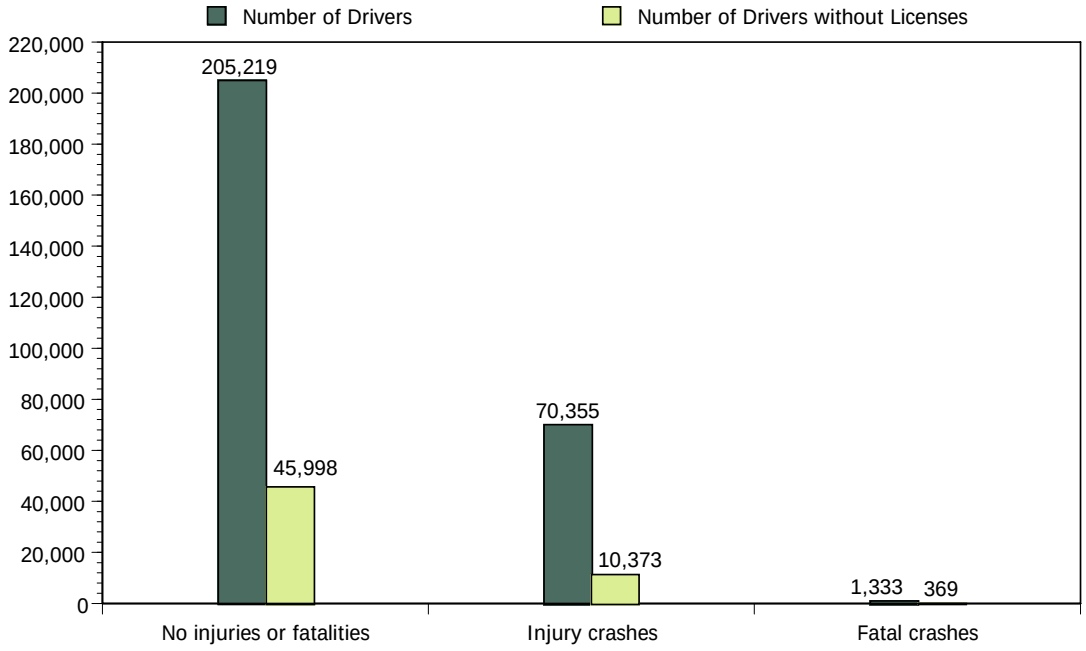
Exhibit II-2.
Vehicles and Licensed Drivers in All Crashes

	Crashes with no Injuries or Fatalities		Injury Crashes		Fatal Crashes	
	Number	Percent	Number	Percent	Number	Percent
Number of crashes	102,598		33,944		674	
Average number of vehicles per crash	2.02		2.08		1.98	
Number of crashes in which at least one driver has no license	35,741	34.8%	9,120	26.9%	331	49.1%
Number of crashes in which no driver has a license	9,082	8.9%	573	1.7%	8	1.2%
Number of crashes with more than one driver in which no driver has a license	8,281	8.1%	464	1.4%	5	0.7%

Source: 2002 CDOT Crash Database.

According to Exhibit II-2, the typical crash involved two vehicles, regardless of severity. Nearly one-third of all crashes involved at least one driver with no recorded license. Nearly half of all fatal crashes involved at least one driver with no recorded license. No driver had a recorded license in almost nine thousand accidents involving at least two drivers.

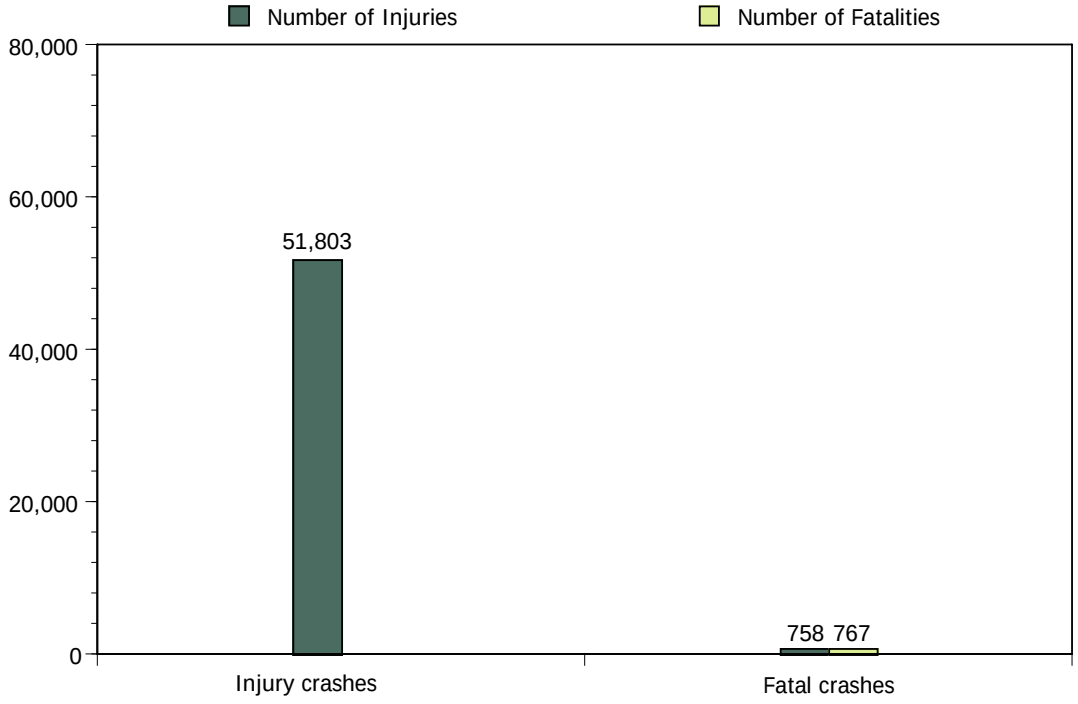
Exhibit II-3.
Licensed and Unlicensed Drivers in Injury and Fatality Crashes



Source: 2002 CDOT Crash Database.

Exhibit II-3 reports that 45,998 of the 205,219 drivers involved in non-injury, non-fatal crashes, or 22.4%, had no recorded license. This ratio was lower among drivers in injury crashes, at 14.7%. However, 27.7%, or more than one-quarter, of all drivers in fatal crashes had no recorded license.

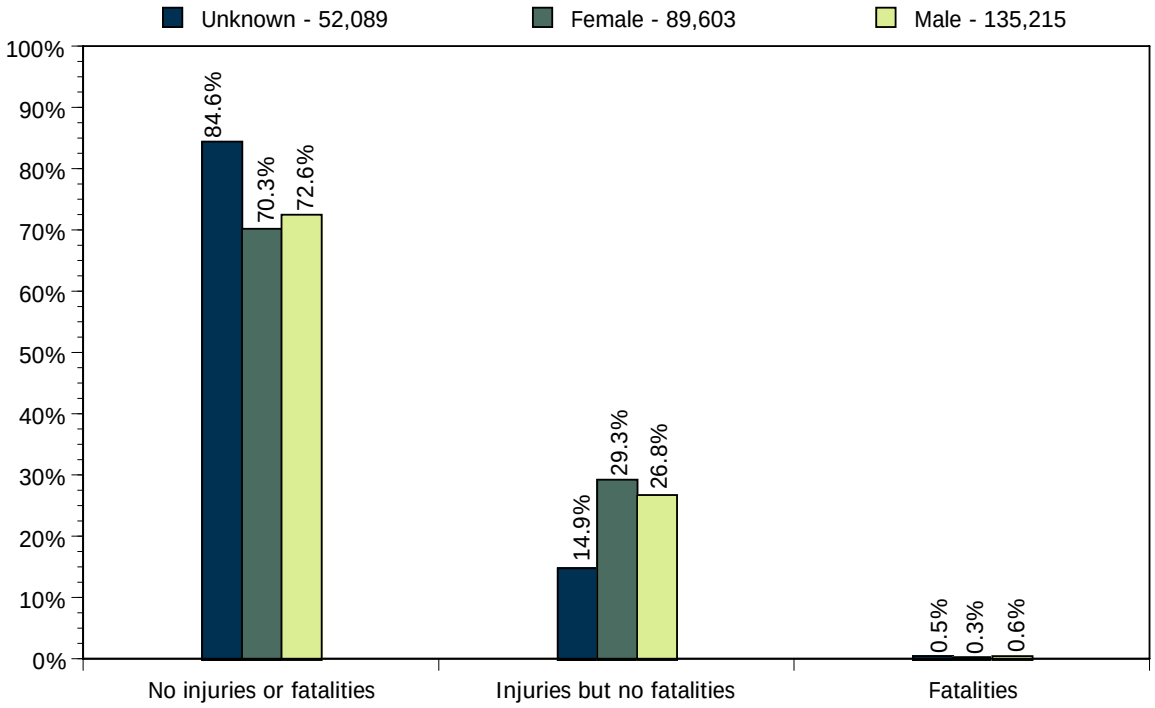
Exhibit II-4.
Number of Injuries and Fatalities in 2002 Crashes



Source: 2002 CDOT Crash Database.

Exhibit II-4 indicates that injury crashes caused 51,803 injuries in 2002, or 1.53 injuries per accident. Fatal crashes caused 758 injuries and 767 fatalities, or 1.12 injuries and 1.14 fatalities per crash.

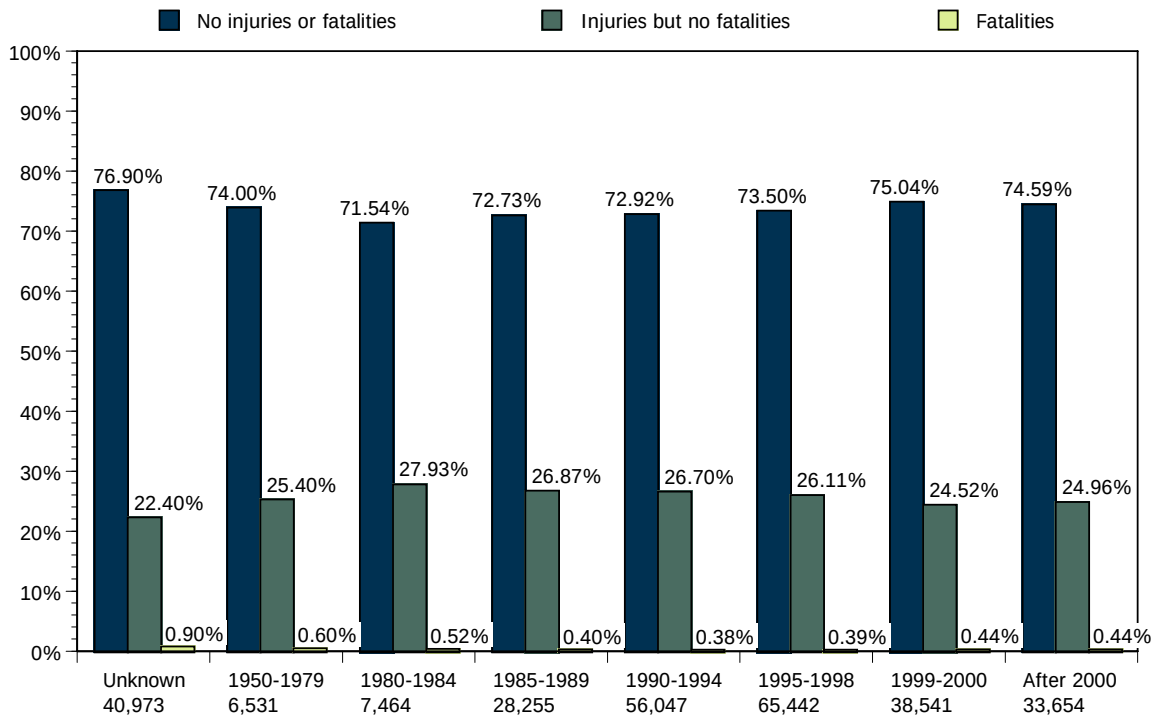
Exhibit II-5.
Sex of Driver by Severity of Accident



Source: 2002 CDOT Crash Database.

Exhibit II-5 portrays the proportions of drivers of given sex by severity of accident. The proportions of men and women involved in accidents of differing severity are fairly similar. However, drivers whose sex is not known were much more likely to be involved in non-injury, non-fatal accidents. This suggests that records are kept less diligently for accidents of lesser severity.

Exhibit II-6.
Year of Vehicle

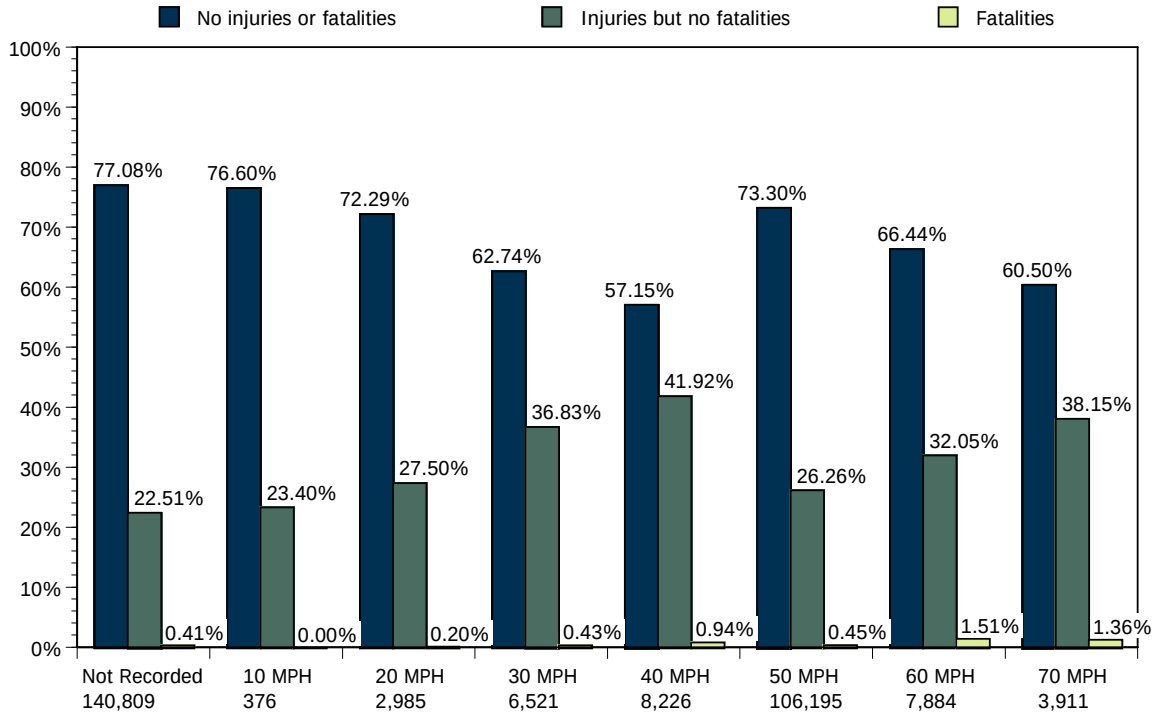


Source: 2002 CDOT Crash Database.

Exhibit II-6 reports the vintages of vehicles involved in crashes and the frequency with which vehicles of different vintages are involved in accidents of differing severity. The vehicle vintage contributing the largest proportion to the vehicles involved in all accidents was 1995-1998, with 65,442 vehicles, or 23.6% of all vehicles in crashes. About one-tenth as many vehicles date from before 1980.

The rates of involvement in injury and fatal crashes are very similar across vehicle vintages. To the extent that variation exists, there appears to be a slight tendency for crashes involving newer vehicles to be less severe. This tendency is less marked than might be anticipated, however. Given the same crash circumstances, injuries and fatalities should be more frequent in older cars than in newer cars because of improved safety technology. The similarity of severe crash rates across vehicle vintages therefore suggests that newer vehicles may be driven in more dangerous circumstances.

Exhibit II-7.
Legal Speed Limit



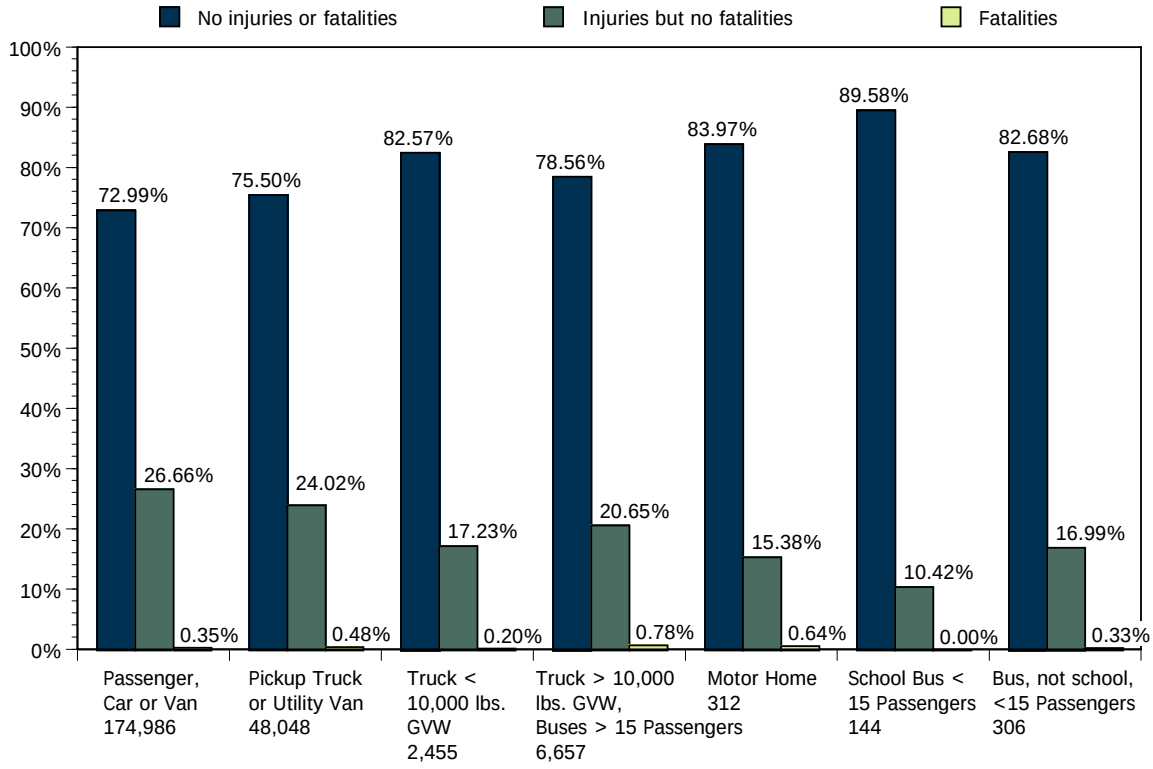
Source: 2002 CDOT Crash Database.

Exhibit II-7 describes the severity of crashes on roads with different legal speed limits. No record regarding legal speed limits is available for more than half of all vehicles in crashes. Among the 136,098 vehicles involved in crashes with recorded legal speed limits for the roads on which they were traveling, 106,195, or 78.0%, were traveling on roads with legal speed limits of 50 miles per hour when they became involved in a crash.

According to this Exhibit, the probability that a crash will cause injury is greatest when the vehicle is traveling on roads with moderate speed limits of 30 and 40 miles per hour. However, recorded crashes on these roads are relatively infrequent.

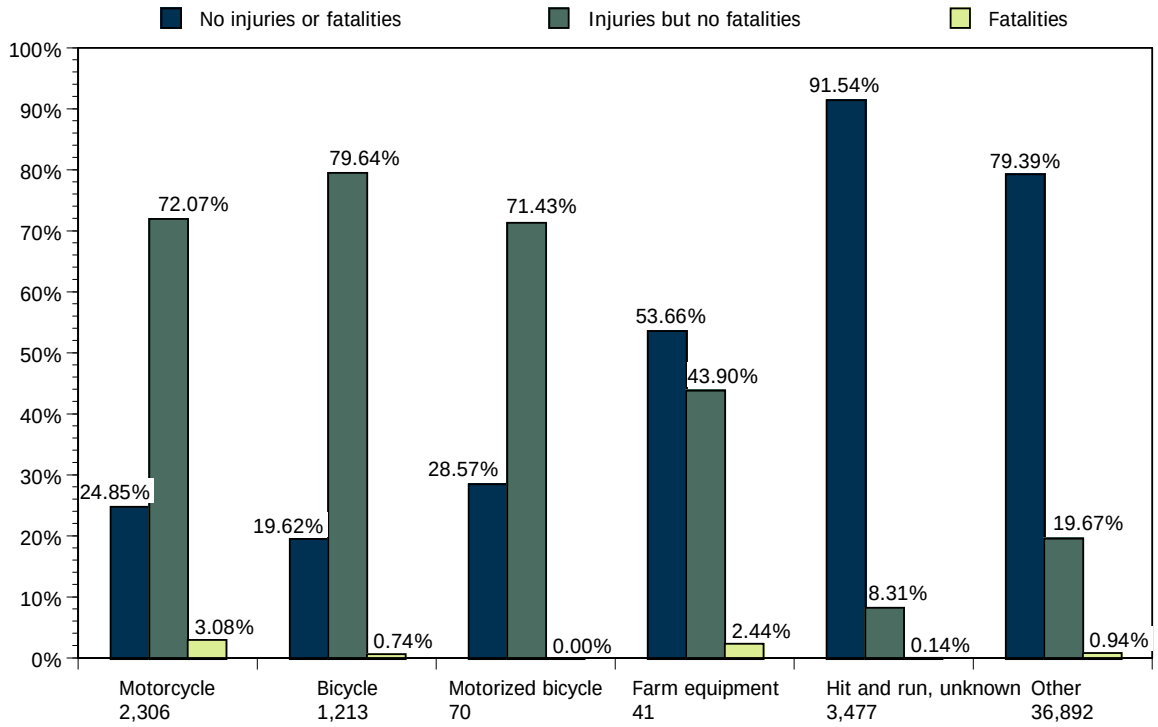
The probability that a crash will cause deaths is greatest when the vehicle is traveling on roads with the highest speed limits of 60 and 70 miles per hour. Again, recorded crashes on these roads are relatively infrequent.

Exhibit II-8a.
Type of Vehicle



Source: 2002 CDOT Crash Database.

Exhibit II-8b.
Type of Vehicle, Continued



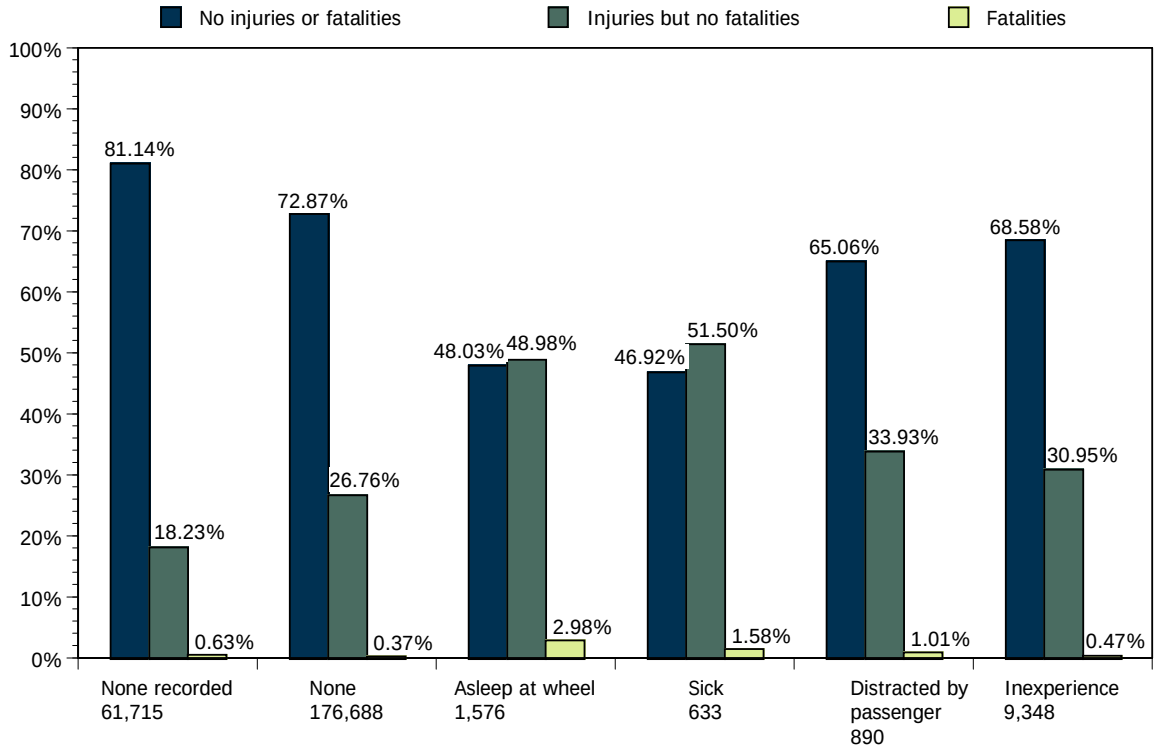
Source: 2002 CDOT Crash Database.

Exhibits II-8a and II-8b portray the severity of crashes involving vehicles of different types. Of the vehicles involved in crashes, 174,986, or 63.1%, were passenger cars or vans. The vehicle type contributing the second highest number of involved vehicles is "other", with 36,892, or 13.3% of all vehicles.

Perhaps surprisingly, large vehicles, such as trucks, motor homes and buses, are relatively unlikely to be involved in injury and fatality crashes. More than 80% of crashes involving these vehicles are non-injury and non-fatal.

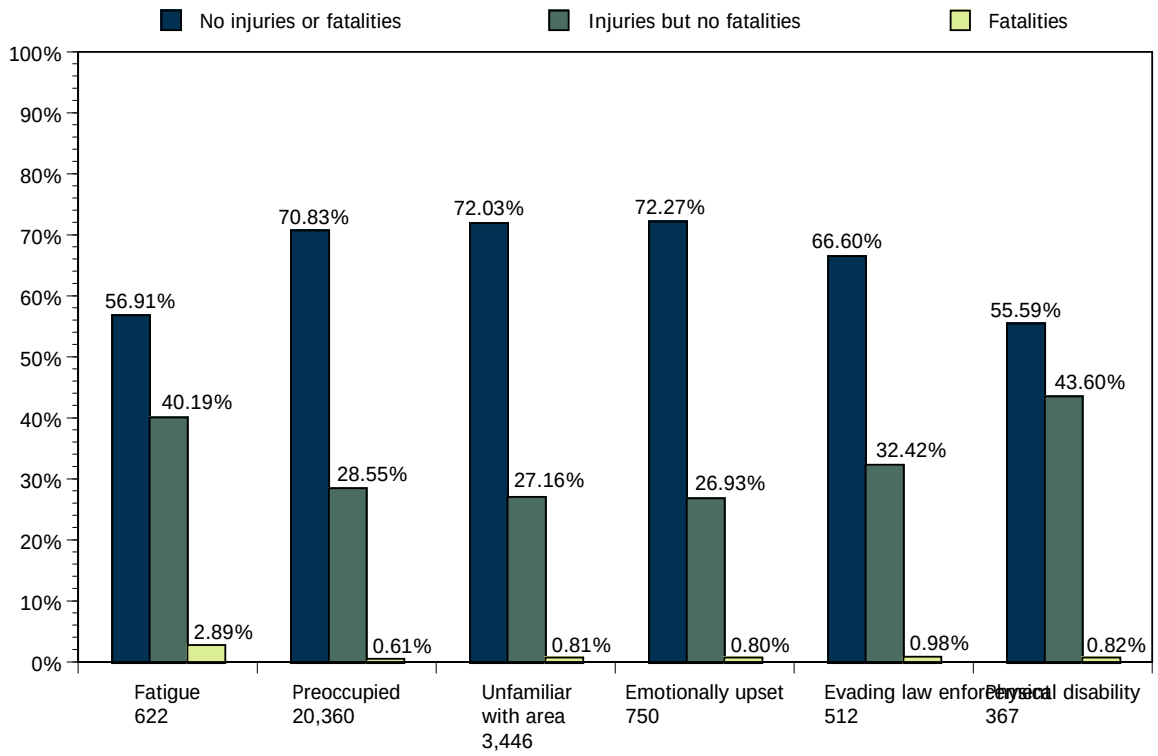
In contrast, more than 70% of crashes involving motorcycles, bicycles, motorized bicycles cause injuries. Injuries occur in more than half of crashes involving farm equipment. Of crashes involving motorcycles, slightly more than three percent cause fatalities. Nearly 2.5% of crashes involving farm equipment also cause fatalities. For all other vehicle types, fatalities occur in less than 1 percent of all crashes.

Exhibit II-9a.
Contributing Factors



Source: 2002 CDOT Crash Database.

Exhibit II-9b.
Contributing Factors, Continued



Source: 2002 CDOT Crash Database.

Exhibits II-9a and II-9b present the distributions of crash severity for crashes with different contributing factors. Most drivers, 176,688, or 63.8%, become involved without contributing factors. Another 61,715, or 22.3%, become involved with no contributing factor recorded.

Among the 38,504 drivers who become involved in crashes with contributing factors, drivers who are sleeping, fatigued, sick or disabled are more likely to cause injuries than crashes with other contributing factors. Crashes involving drivers who are sleeping, fatigued or sick are more likely to cause fatalities than accidents with other contributing factors.

Exhibit II-10.
Drivers in Crashes within a County as a Proportion of All County Residents Aged 15 Years and Older

County	Drivers Involved in Crashes	Population Aged 15 Years and Older	Drivers Involved in Crashes as Percent of Resident Population
Adams	23,541	275,783	8.54%
Alamosa	1,201	11,594	10.36%
Arapahoe	28,337	379,960	7.46%
Archuleta	725	7,906	9.17%
Baca	139	3,651	3.81%
Bent	201	4,856	4.14%
Boulder	14,894	235,512	6.32%
Chaffee	703	13,701	5.13%
Cheyenne	87	1,722	5.05%
Clear Creek	1,472	7,623	19.31%
Conejos	291	6,213	4.68%
Costilla	277	2,917	9.50%
Crowley	104	4,685	2.22%
Custer	143	2,866	4.99%
Delta	950	22,417	4.24%
Denver	60,817	451,079	13.48%
Dolores	90	1,518	5.93%
Douglas	8,663	127,657	6.79%
Eagle	2,938	33,312	8.82%
El Paso	31,291	397,489	7.87%
Elbert	621	14,989	4.14%
Fremont	1,818	38,366	4.74%
Garfield	3,662	33,976	10.78%
Gilpin	317	3,932	8.06%
Grand	959	10,235	9.37%
Gunnison	701	11,896	5.89%
Hinsdale	18	659	2.73%
Huerfano	374	6,566	5.70%
Jackson	168	1,262	13.31%
Jefferson	26,866	417,201	6.44%
Kiowa	98	1,298	7.55%
Kit Carson	412	6,286	6.55%
La Plata	2,645	35,980	7.35%
Lake	208	6,049	3.44%
Larimer	13,615	202,011	6.74%
Las Animas	993	12,185	8.15%
Lincoln	396	4,921	8.05%

Exhibit II-10.
Drivers in Crashes within a County as a Proportion of All County Residents Aged 15 Years and Older, Continued

County	Drivers Involved in Crashes	Population Aged 15 Years and Older	Drivers Involved in Crashes as Percent of Resident Population
Logan	829	16,377	5.06%
Mesa	6,248	92,546	6.75%
Mineral	115	686	16.76%
Moffat	1,260	10,146	12.42%
Montezuma	1,262	18,468	6.83%
Montrose	1,858	26,170	7.10%
Morgan	1,399	20,312	6.89%
Otero	851	15,923	5.34%
Ouray	295	3,048	9.68%
Park	409	11,720	3.49%
Phillips	102	3,487	2.93%
Pitkin	1,776	12,812	13.86%
Prowers	684	10,916	6.27%
Pueblo	8,387	111,465	7.52%
Rio Blanco	735	4,743	15.50%
Rio Grande	486	9,584	5.07%
Routt	1,600	16,074	9.95%
Saguache	261	4,559	5.73%
San Juan	70	475	14.74%
San Miguel	410	5,645	7.26%
Sedgwick	123	2,245	5.48%
Summit	2,153	20,100	10.71%
Teller	1,053	16,262	6.48%
Washington	160	3,886	4.12%
Weld	10,694	138,313	7.73%
Yuma	339	7,596	4.46%

Source: 2002 CDOT Crash Database.

Exhibit II-10 presents the number of drivers involved in all crashes occurring in each Colorado county, the 2000 population of that county aged 15 years and above, and the percentage formed by the former of the latter. The population aged 15 years and older is from the 2000 Census of Population and Housing, Bureau of the Census. This source does not separately identify the population of individuals aged 15 years old. It also does not report values for Broomfield County, which did not exist at that time. The population of this county is allocated to other counties in this Exhibit. This allocation understates the proportion of drivers in crashes to the 2002 populations in these counties.

Denver County had the most accidents within its boundaries, nearly twice as many as in El Paso County. However, drivers in crashes formed a larger proportion of the resident driving-age population in Clear Creek, Mineral, Pitkin, Rio Blanco and San Juan Counties. In at least some of these counties, crash rates are inflated by non-residents traveling to tourist destinations.

Exhibit II-11.
Drivers in Injury and Fatal Crashes within a County as a Proportion of All County Residents Aged 15 Years and Older

County	Drivers Involved in Injury and Fatality Crashes	Population Aged 15 Years and Older	Drivers Involved in Injury and Fatality Crashes as Percent of Resident Population
Adams	6,266	275,783	2.27%
Alamosa	246	11,594	2.12%
Arapahoe	8,183	379,960	2.15%
Archuleta	205	7,906	2.59%
Baca	36	3,651	0.99%
Bent	63	4,856	1.30%
Boulder	4,286	235,512	1.82%
Chaffee	199	13,701	1.45%
Cheyenne	37	1,722	2.15%
Clear Creek	410	7,623	5.38%
Conejos	90	6,213	1.45%
Costilla	70	2,917	2.40%
Crowley	39	4,685	0.83%
Custer	58	2,866	2.02%
Delta	292	22,417	1.30%
Denver	13,901	451,079	3.08%
Dolores	28	1,518	1.84%
Douglas	2,152	127,657	1.66%
Eagle	610	33,312	1.83%
El Paso	8,597	397,489	2.16%
Elbert	220	14,989	1.47%
Fremont	499	38,366	1.30%
Garfield	711	33,976	2.09%
Gilpin	83	3,932	2.11%
Grand	187	10,235	1.83%
Gunnison	189	11,896	1.59%
Hinsdale	10	659	1.52%
Huerfano	121	6,566	1.84%
Jackson	36	1,262	2.85%
Jefferson	6,565	417,201	1.57%
Kiowa	36	1,298	2.77%
Kit Carson	149	6,286	2.37%
La Plata	711	35,980	1.98%
Lake	72	6,049	1.19%
Larimer	3,695	202,011	1.83%
Las Animas	305	12,185	2.50%
Lincoln	110	4,921	2.24%
Logan	260	16,377	1.59%
Mesa	1,909	92,546	2.06%
Mineral	32	686	4.66%
Moffat	190	10,146	1.87%
Montezuma	318	18,468	1.72%
Montrose	417	26,170	1.59%
Morgan	400	20,312	1.97%
Otero	248	15,923	1.56%
Ouray	65	3,048	2.13%

Exhibit II-11.
Drivers in Injury and Fatal Crashes within a County as a Proportion of All County Residents Aged 15 Years and Older, Continued

County	Drivers Involved in Injury and Fatality Crashes	Population Aged 15 Years and Older	Drivers Involved in Injury and Fatality Crashes as Percent of Resident Population
Park	96	11,720	0.82%
Phillips	33	3,487	0.95%
Pitkin	246	12,812	1.92%
Prowers	178	10,916	1.63%
Pueblo	2,508	111,465	2.25%
Rio Blanco	118	4,743	2.49%
Rio Grande	121	9,584	1.26%
Routt	186	16,074	1.16%
Saguache	91	4,559	2.00%
San	22	475	4.63%
San Miguel	62	5,645	1.10%
Sedgwick	38	2,245	1.69%
Summit	451	20,100	2.24%
Teller	297	16,262	1.83%
Washington	55	3,886	1.42%
Weld	3,214	138,313	2.32%
Yuma	87	7,596	1.15%

Source: 2002 CDOT Crash Database.

Exhibit II-11 presents the number of drivers involved in injury and fatal crashes occurring in each Colorado county, the 2000 population of that county aged 15 years and above, and the percentage formed by the former of the latter. Once again, the largest number of involved drivers occurs in crashes within Denver County. However, the ratio of involved drivers to the resident driving-age population was much higher in Clear Creek, Mineral and San Juan Counties.

Although Pitkin County had a disproportionate rate of involvement in all crashes compared to its resident driving-age population, most of that involvement was in non-injury, non-fatal crashes. Its rate of involvement in injury and fatal crashes is not especially elevated.

Section III | Ages of Drivers in Colorado Crashes

Section III | Ages of Drivers in Colorado Crashes

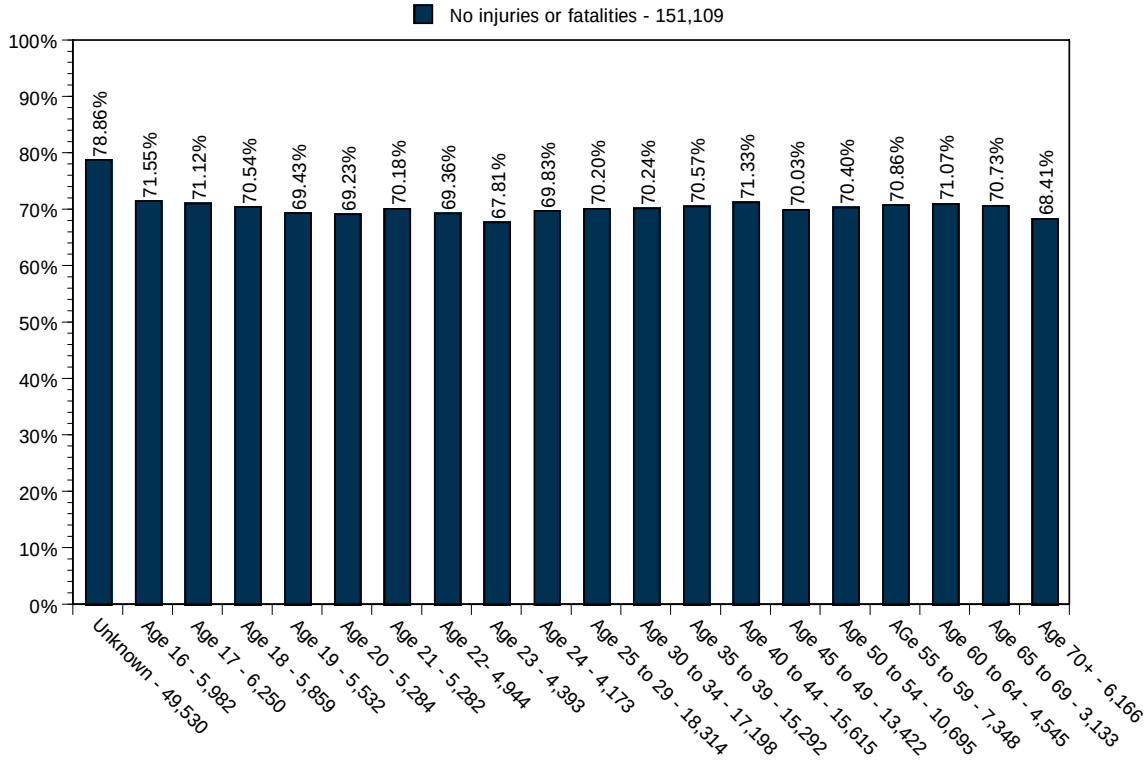
Introduction

This section explores the effect of driver age on the severity of crashes in Colorado.

Age and Crash Severity

In 2002, age did not impact the likelihood that a driver was involved in a property damage-only crash (Exhibit III-1a).

Exhibit III-1a.
Non-injury, Non-fatal Crash Drivers as Proportion of All Crash Drivers By Age



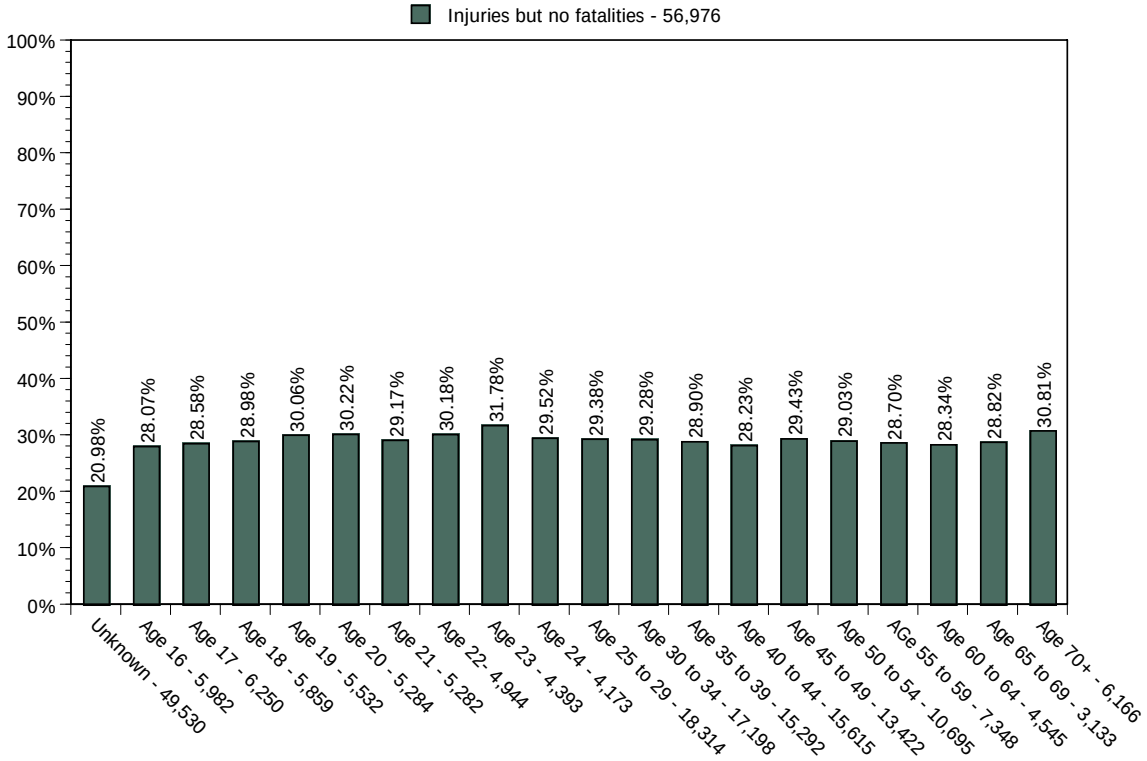
Note: Percentages of "non-injury, non-fatal" crash drivers are derived from total number of persons included within each age category. Exhibit III-1a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Section III | Ages of Drivers in Colorado Crashes

About 30% of drivers in a given age group are involved in an injury crash (Exhibit III-1b). No particular age group appears to be more or less likely to be involved in an injury crash.

Exhibit III-1b.
Injury Crash Drivers as Proportion of All Crash Drivers By Age



Note: Percentages of "injury" crash drivers are derived from total number of persons included within each age category.

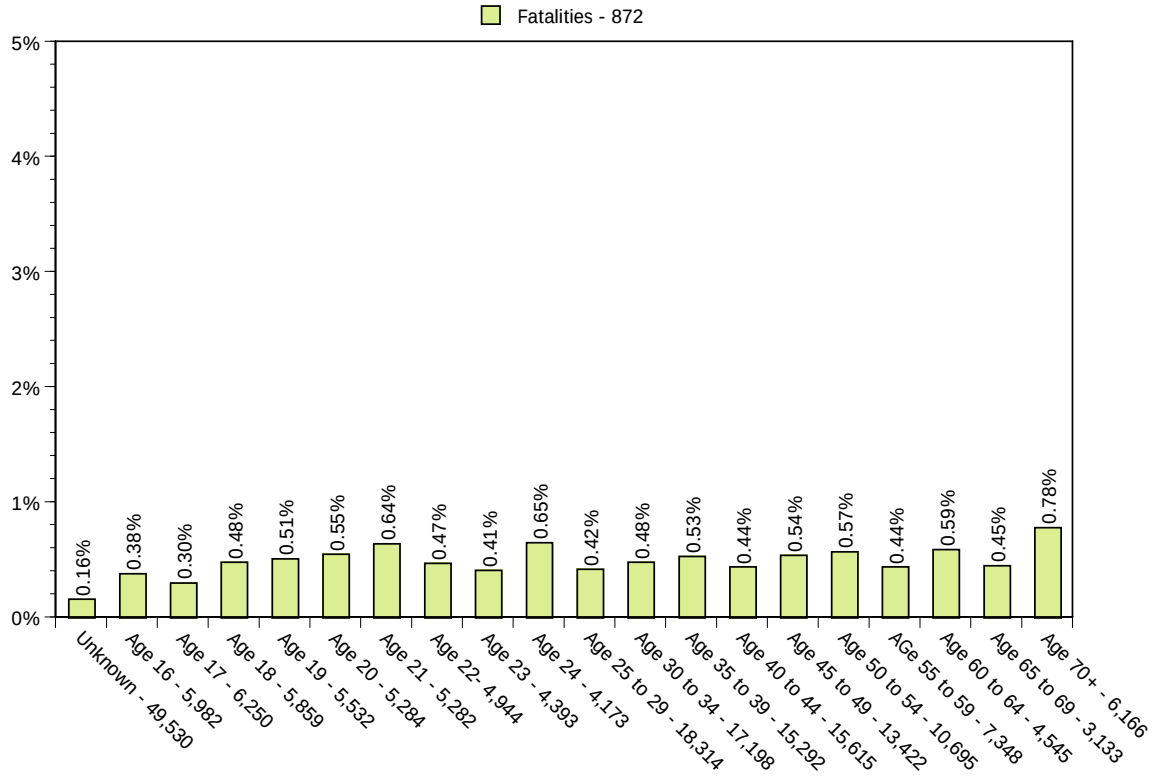
Exhibit III-1a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Section III | Ages of Drivers in Colorado Crashes

With respect to involvement in fatal crashes, some age cohorts are *slightly* more likely to be involved in a fatal crash. Compared to other age cohorts, the oldest drivers had the highest rate of fatal crash involvement. However, these differences are barely perceptible.

Exhibit III-1c.
Fatal Crash Drivers as Proportion of All Crash Drivers By Age



Note: Percentages of "fatal" crash drivers are derived from total number of persons included within each age category.

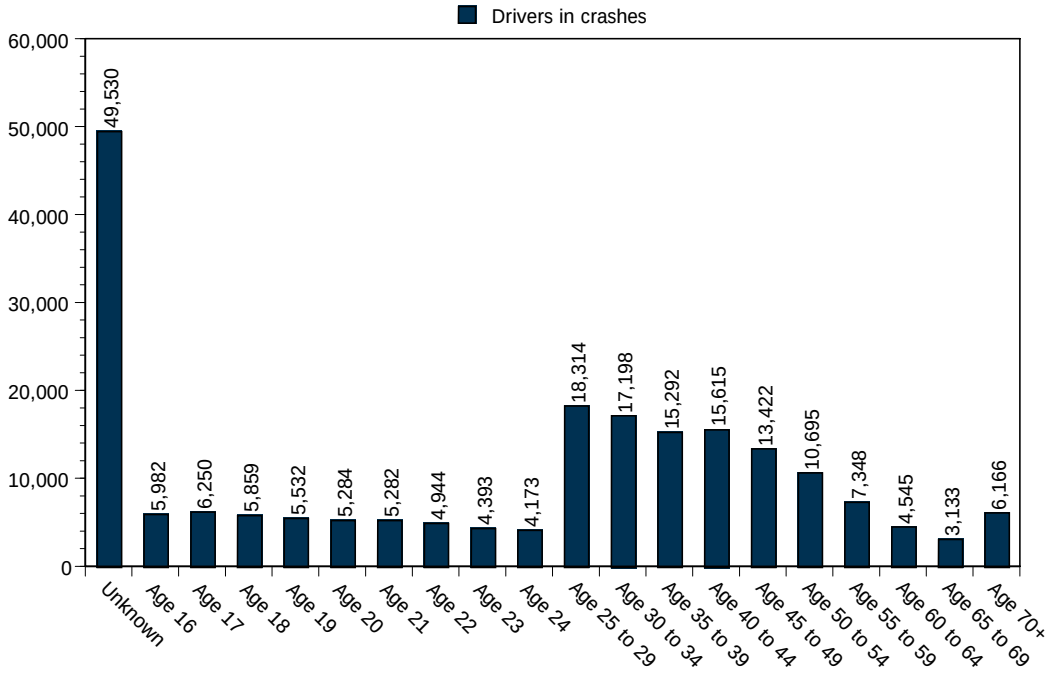
Exhibit III-1a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Section III | Ages of Drivers in Colorado Crashes

Exhibit III-2a presents the total number of drivers involved in reported crashes, by age. Driver age was not reported for more than 49,000 crashes.

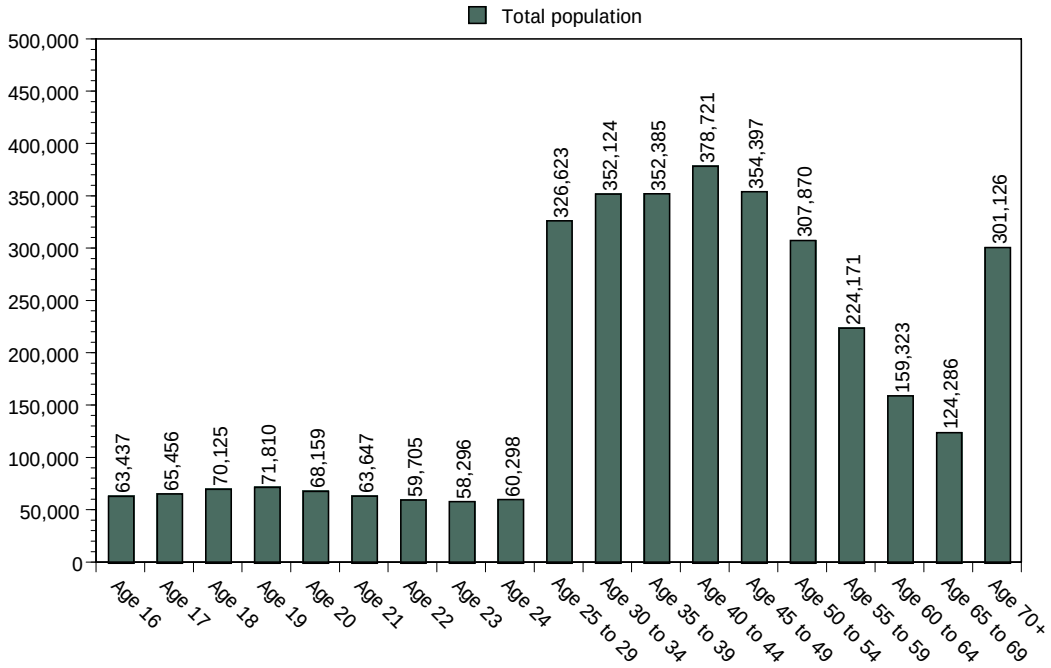
Exhibit III-2a.
Number of Drivers in All Crashes by Age



Source: 2002 CDOT Crash Database.

Exhibit III-2b is Colorado's 2002 population, broken out by age.

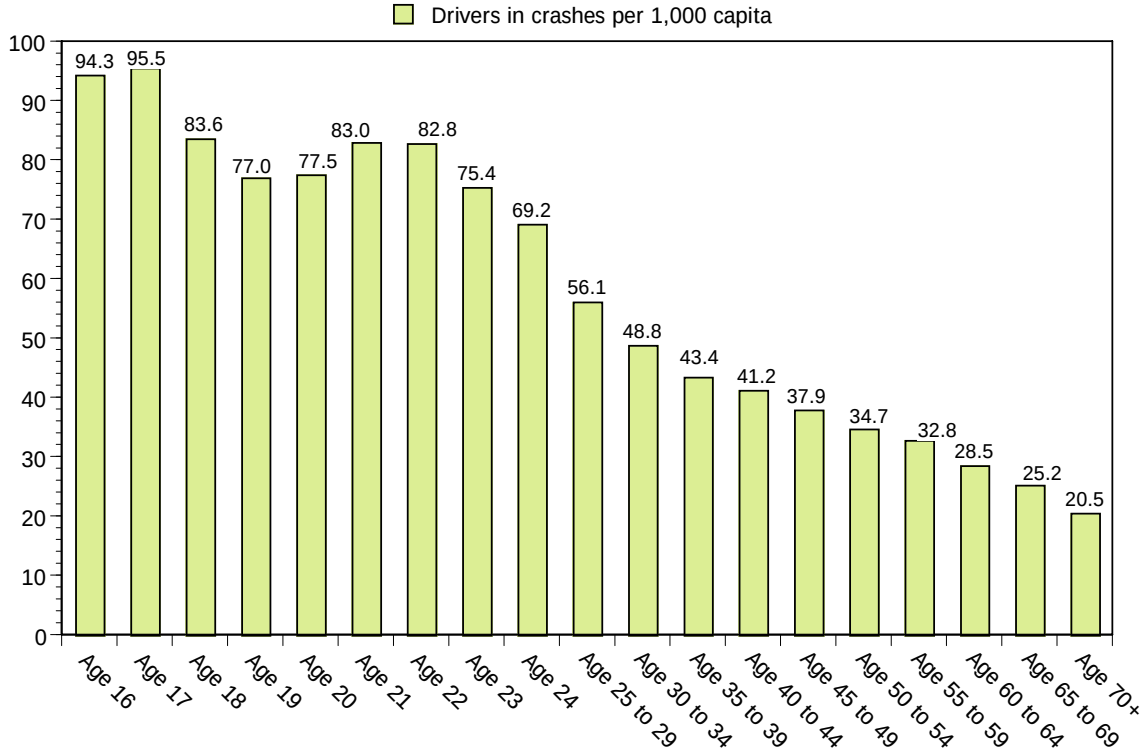
Exhibit III-2b.
Estimated 2002 State Population by Age



Source: 2002 CDOT Crash Database.

As shown in Exhibit III-2c, the youngest drivers have the highest reported crash rate per capita, compared to all other drivers. This is likely due to inexperience. Similarly, the oldest drivers have the lowest per capita crash rates. This may result from reduced exposure, in that people age 70 and older may drive less frequently than in their youth.

Exhibit III-2c.
Drivers in All Crashes per 1,000 Capita by Age

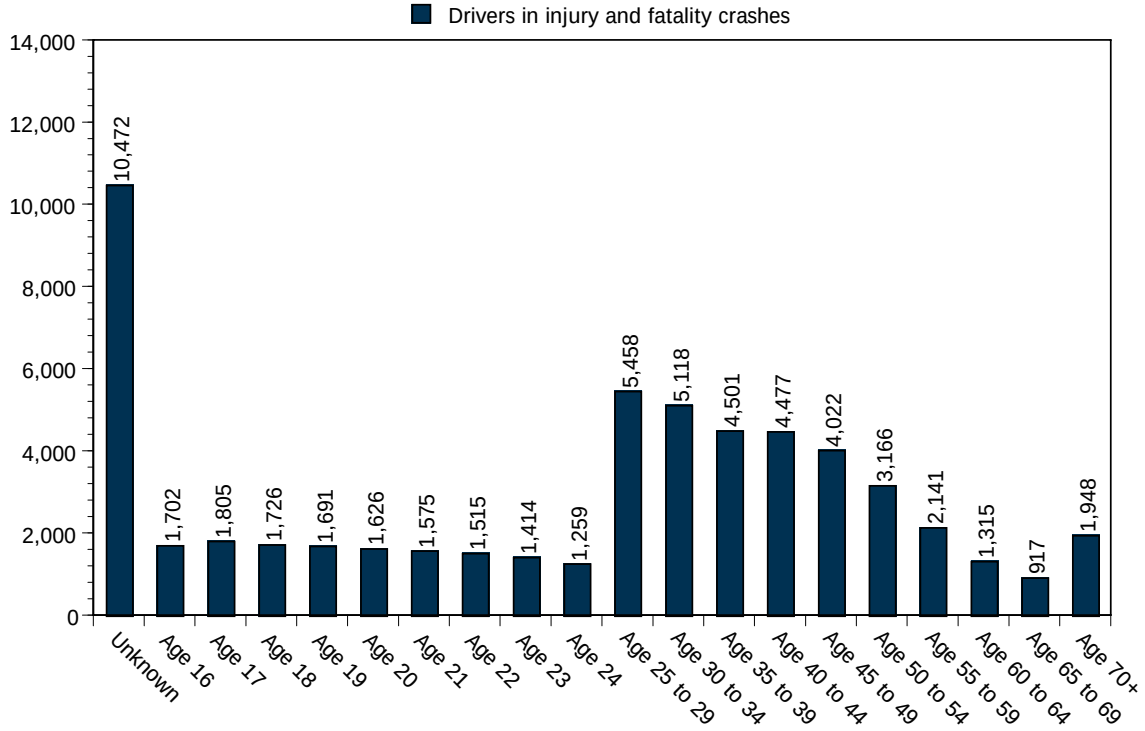


Source: 2002 CDOT Crash Database.

Section III | Ages of Drivers in Colorado Crashes

Exhibit III-3a shows the number of drivers, by age cohort, who were involved in injury or fatal crashes in 2002.

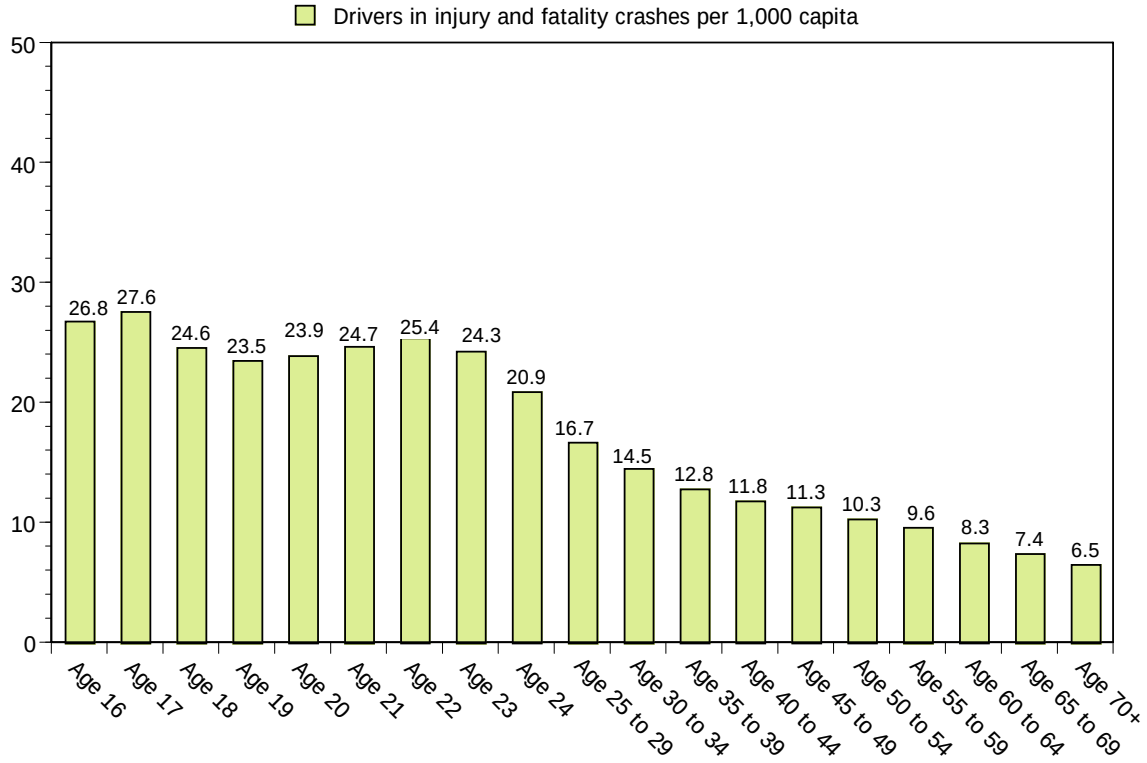
Exhibit III-3a.
Number of Drivers in Injury and Fatality Crashes by Age



Source: 2002 CDOT Crash Database.

Exhibit III-3b presents the per capita rate of involvement in injury and fatal crashes, by age. The likelihood of being a driver in an injury or fatal crash decreases with age. The youngest drivers have the highest per capita injury and fatal crash rates.

Exhibit III-3b.
Drivers in Injury and Fatality Crashes per1,000 Capita by Age



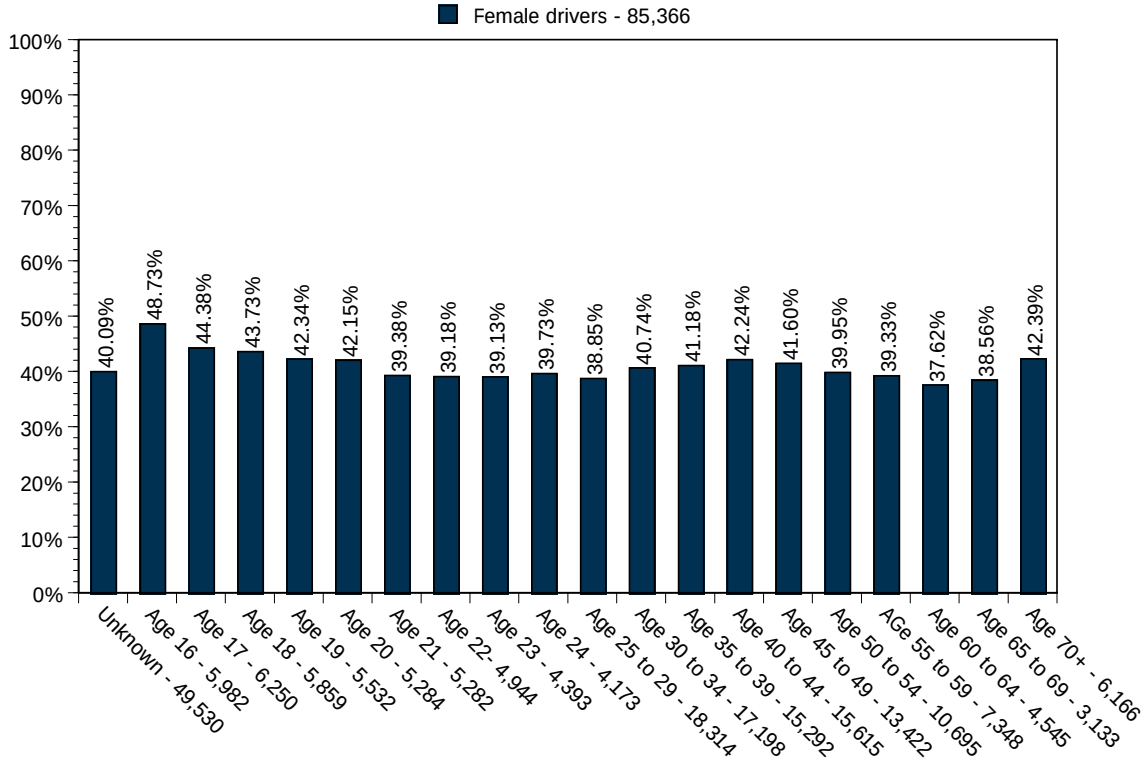
Source: 2002 CDOT Crash Database.

Gender and Driver Age

The following series of graphics examines the differential roles of age and gender on crash involvement.

Regardless of their age, women account for approximately 40% of the drivers involved in crashes. The youngest women drivers are almost as likely as male 16 year olds to be involved in a reported crash. Across all other age cohorts, women are less likely than men to be drivers in a crash. Gender was not reported for more than 49,000 drivers.

Exhibit III-4a.
Proportion of Drivers in All Crashes Identified as Female by Age



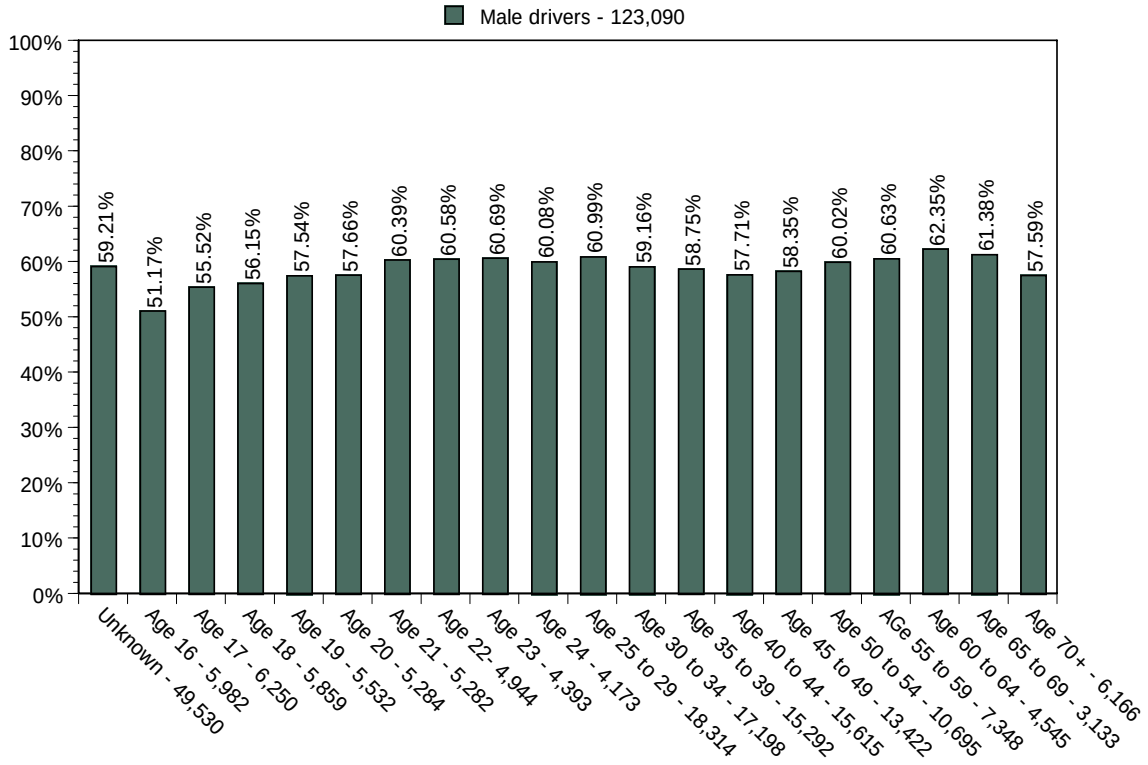
Note: Percentages of "female" crash drivers are derived from total number of persons included within each age category.

Exhibit III-4a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

With the exception of 16 year old drivers, men of any age cohort are more likely than women to be a driver in a crash. Across most age cohorts, men comprise 60% of crash drivers. Gender was not reported for more than 49,000 drivers.

Exhibit III-4b.
Proportion of Drivers in All Crashes Identified as Male by Age



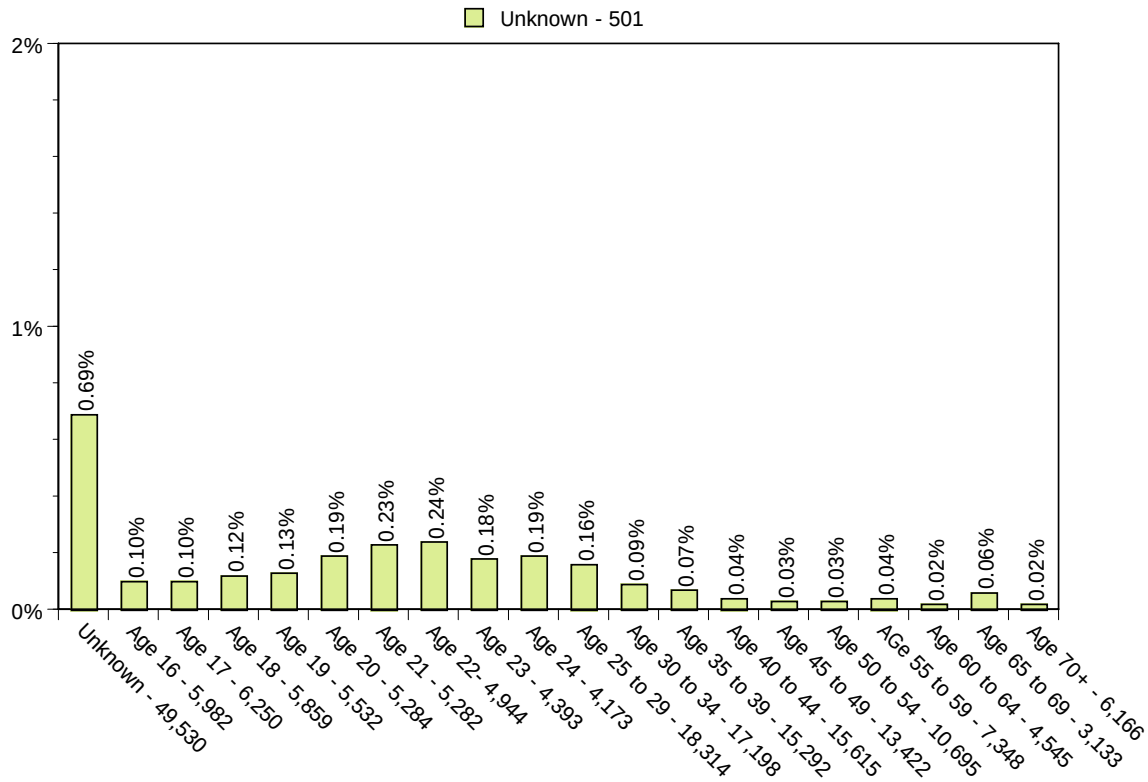
Note: Percentages of "male" crash drivers are derived from total number of persons included within each age category.

Exhibit III-4a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Cases where the gender of the driver was unknown represent a small fraction of all drivers when examined by age cohort. It appears that gender is more likely to be reported in crashes involving older drivers.

Exhibit III-4c.
Proportion of Drivers in All Crashes Identified as Sex Unknown by Age

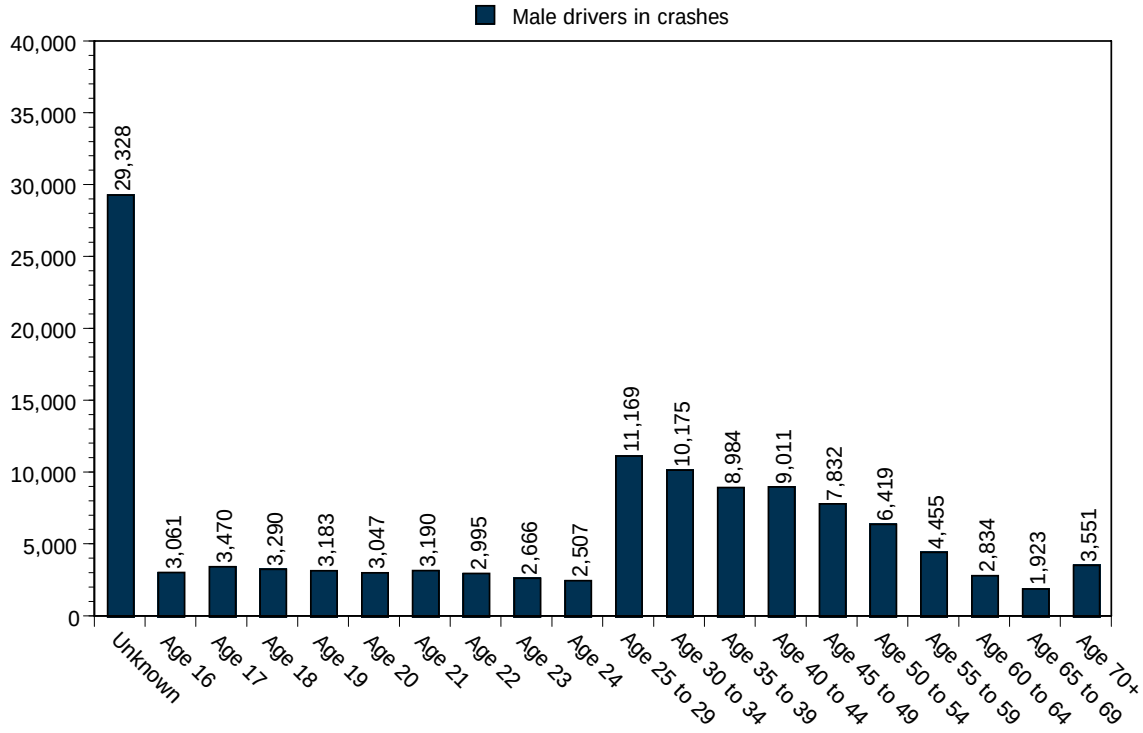


Note: Percentages of "unknown sex" crash drivers are derived from total number of persons included within each age category. Exhibit III-4a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Exhibit III-5a presents the distribution of male crash drivers by age. The age of more than 29,000 male drivers was unreported.

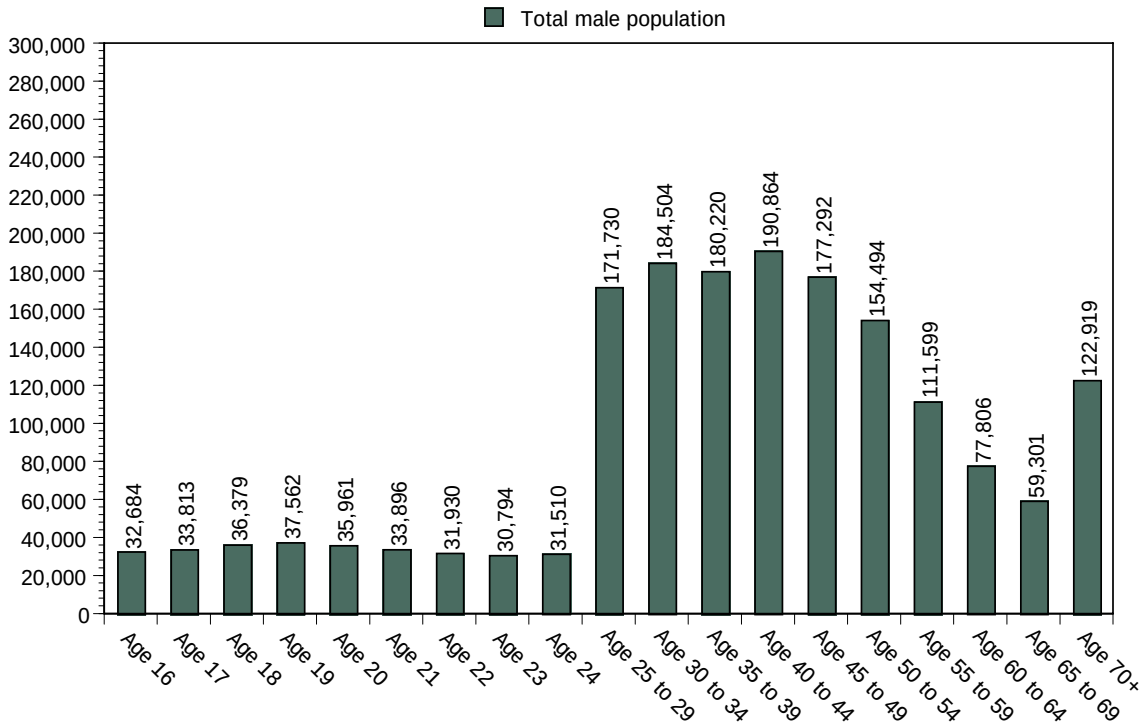
Exhibit III-5a.
Number of Male Drivers in All Crashes by Age



Source: 2002 CDOT Crash Database.

Exhibit III-5b presents the distribution of males by age in Colorado.

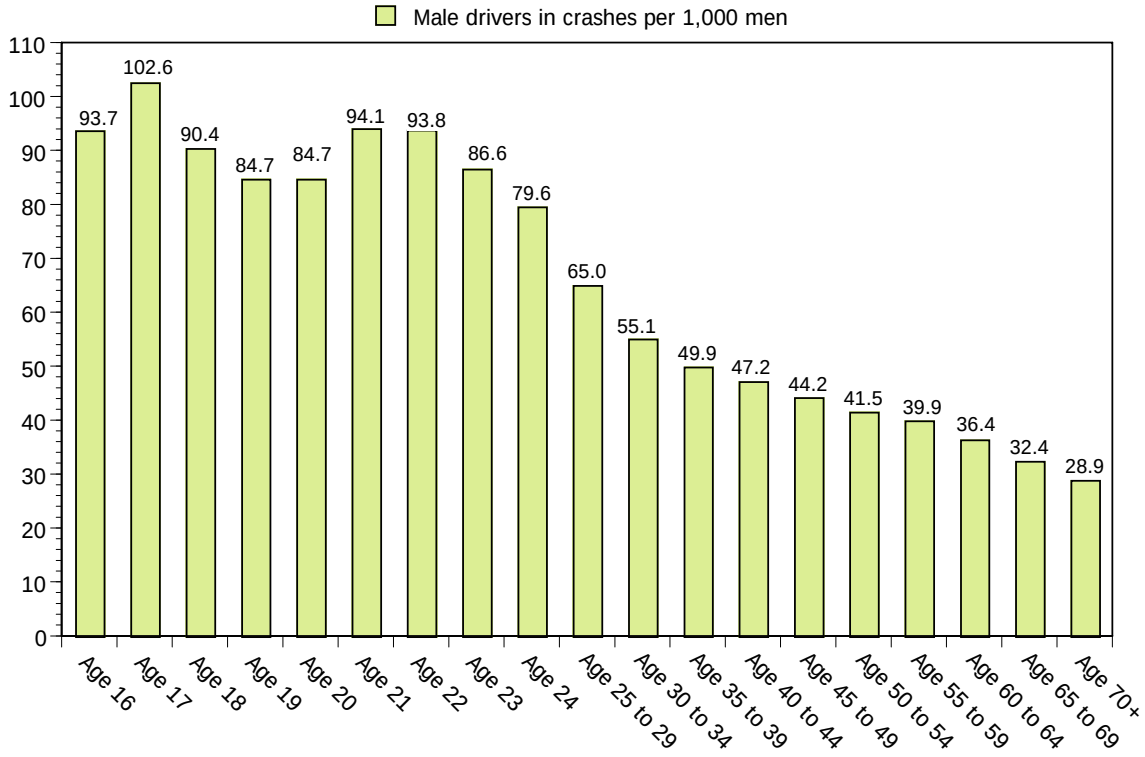
Exhibit III-5b.
Estimated 2002 State Male Population by Age



Source: 2002 CDOT Crash Database.

The per capita rate of involvement by men in crashes declines with age. Per capita, 17 year old men have the highest rate of crash involvement.

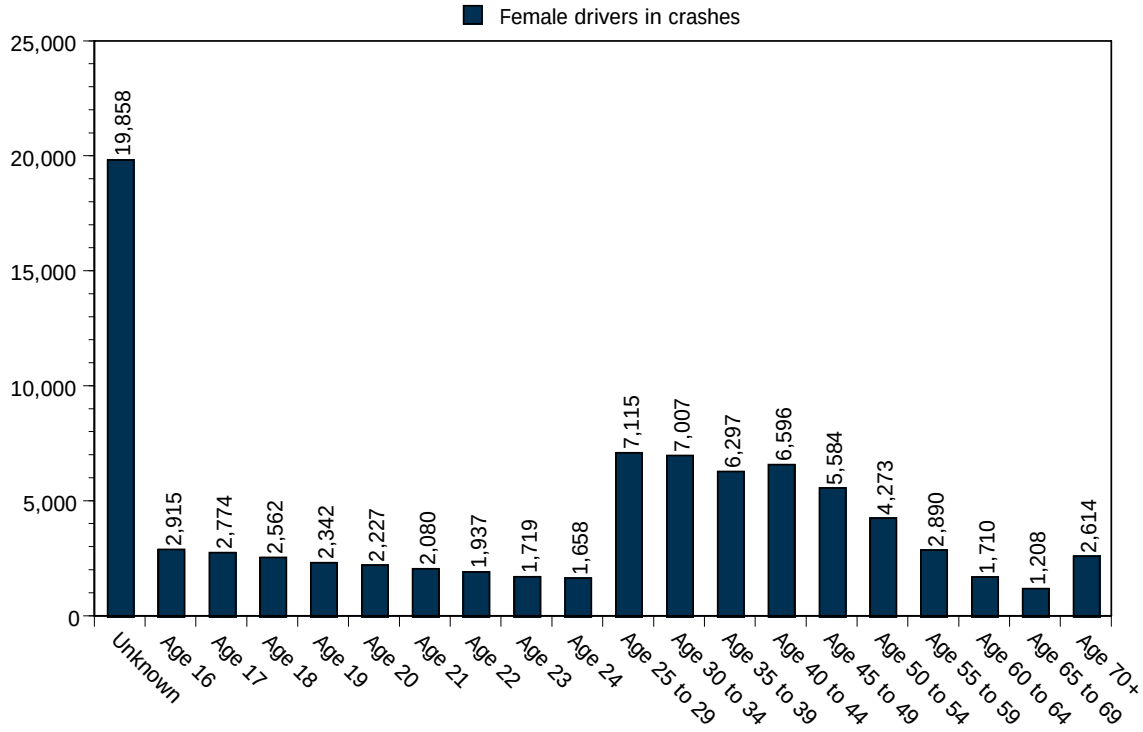
Exhibit III-5c.
Male Drivers in All Crashes per 1,000 Men by Age



Source: 2002 CDOT Crash Database.

Exhibit III-6a shows the count of female crash drivers by age. Age was not reported for more than 19,000 women drivers.

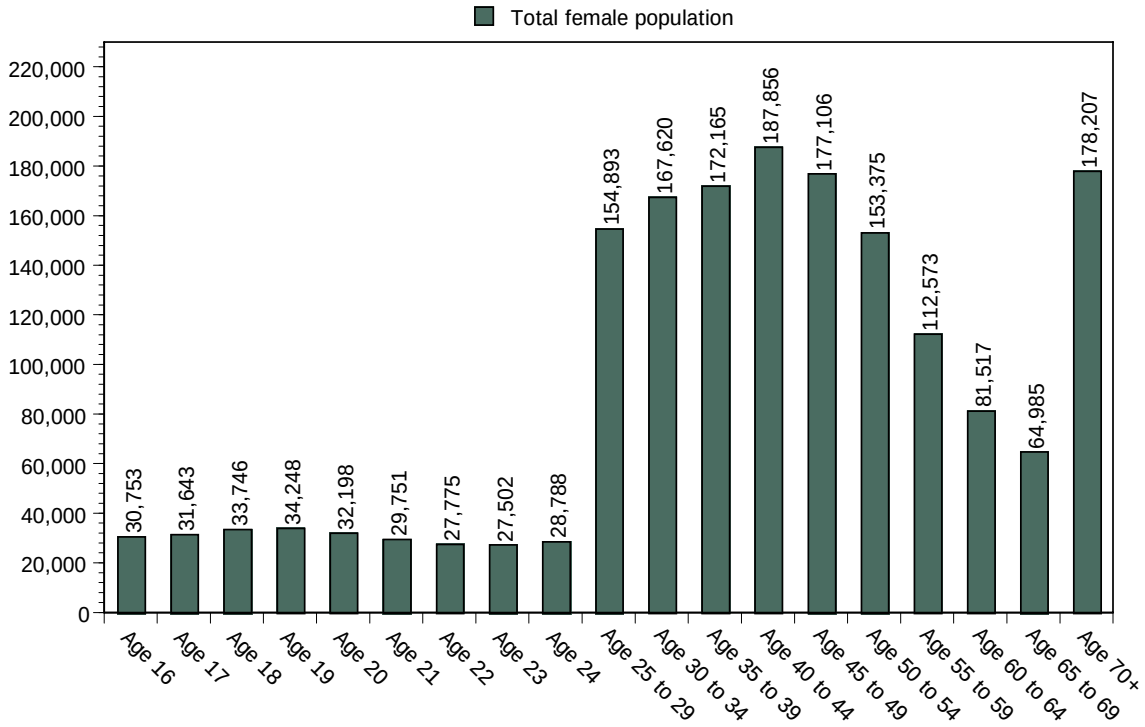
Exhibit III-6a.
Number of Female Drivers in All Crashes by Age



Source: 2002 CDOT Crash Database.

Colorado's female population by age is presented below.

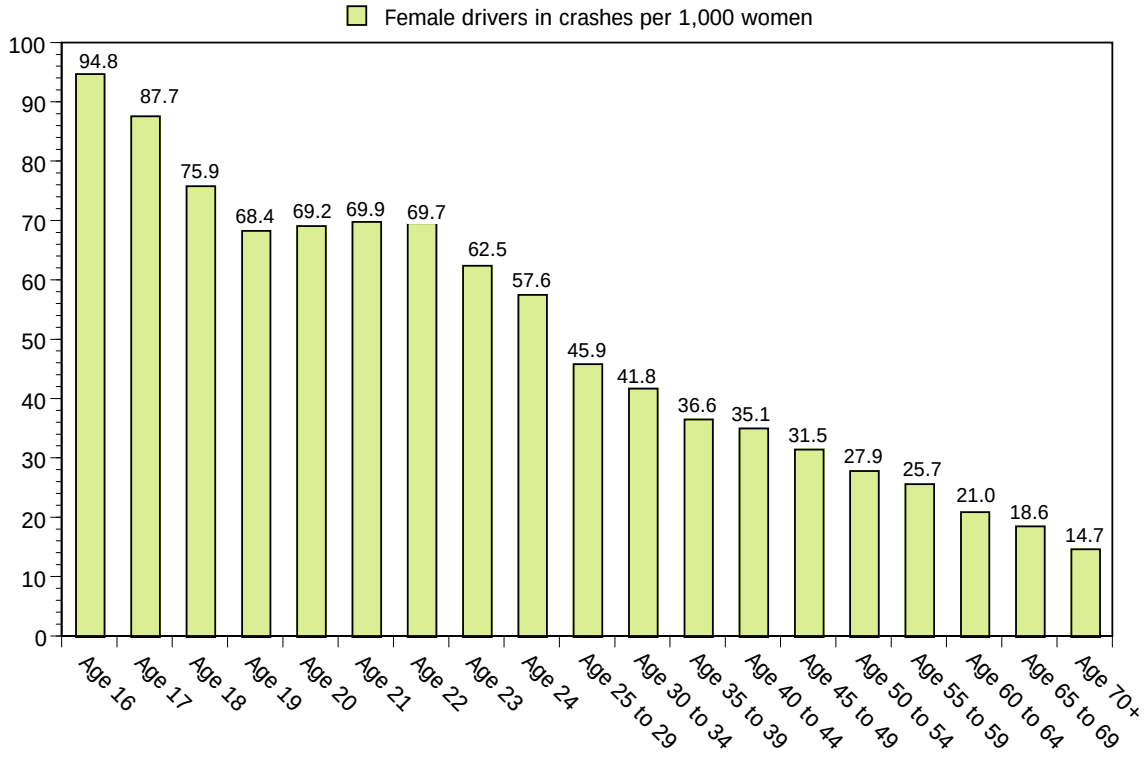
Exhibit III-6b.
Estimated 2002 State Female Population by Age



Source: 2002 CDOT Crash Database.

The per capita crash rate for Colorado women is shown in Exhibit III-6c. Sixteen year old women have the highest per capita crash rate. The rate of crash involvement declines with increased age.

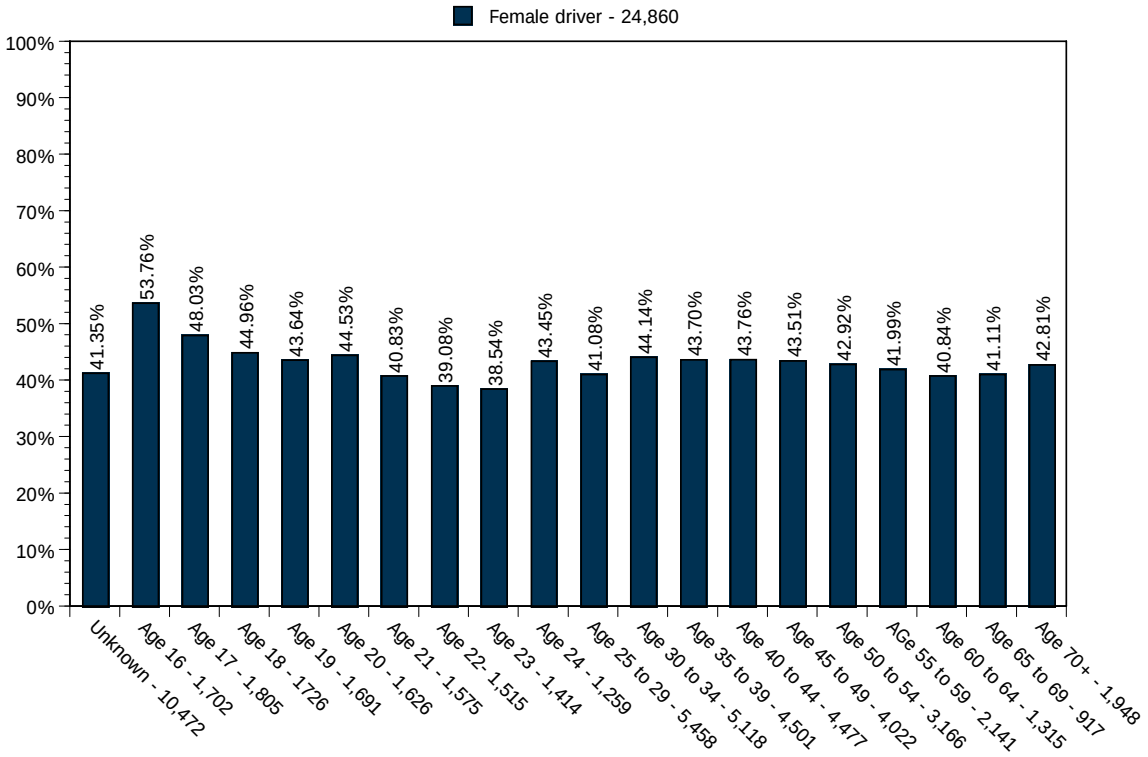
Exhibit III-6c.
Female Drivers in All Crashes per 1,000 Women by Age



Source: 2002 CDOT Crash Database.

In general, slightly more than 40% of female crash drivers are involved in injury or fatal crashes. When they are in a crash, sixteen year old female crash drivers are more likely than older women to be involved in more severe crashes.

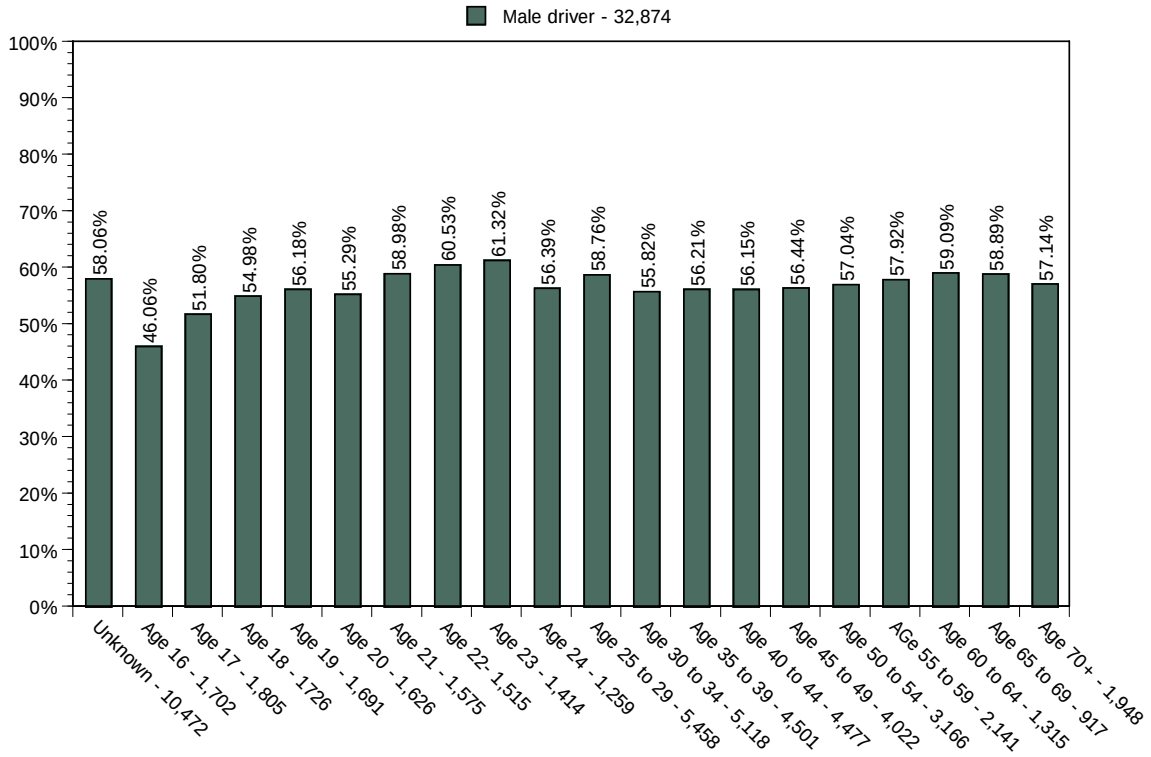
Exhibit III-7a.
Proportion of Drivers in Injury and Fatality Crashes Identified as Female by Age



Source: 2002 CDOT Crash Database.

When they are the driver in a crash, about 60% of men ages 22 or 23 are involved in an injury or fatal crash, compared to 46% of sixteen year olds. Overall, about 56% of male crash drivers are involved in an injury or fatal crash, regardless of age.

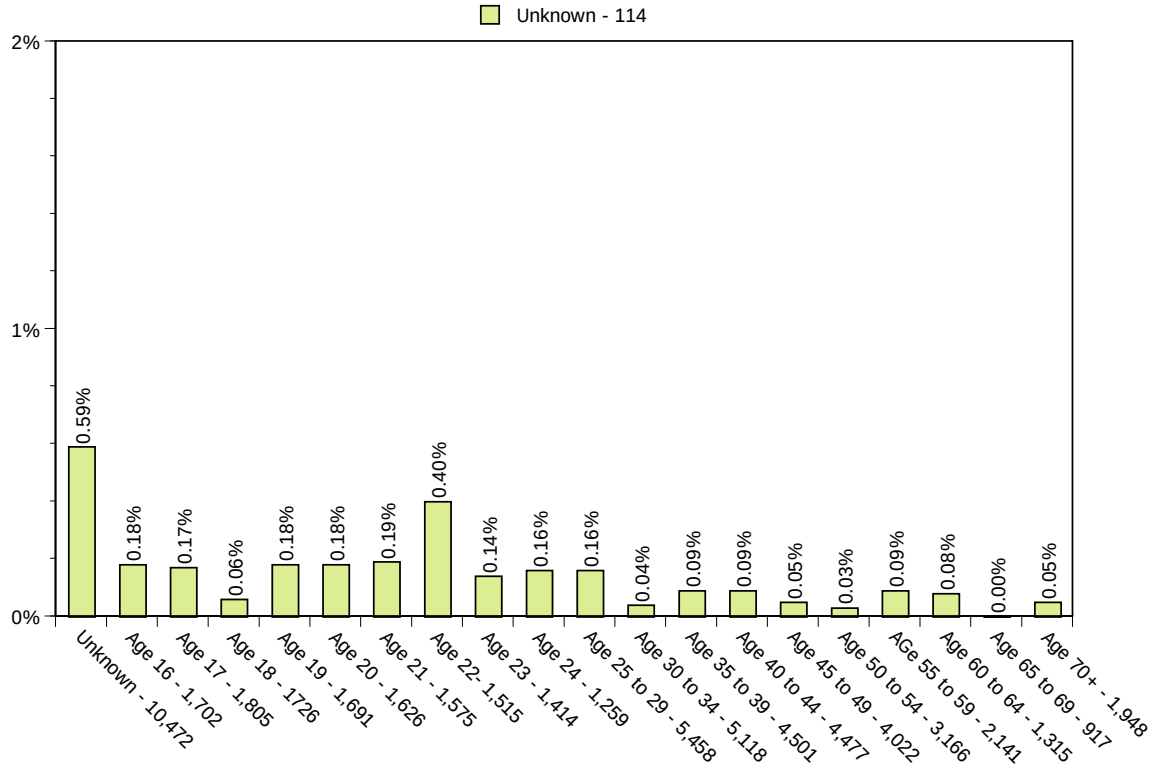
Exhibit III-7b.
Proportion of Drivers in Injury and Fatality Crashes Identified as Male by Age



Source: 2002 CDOT Crash Database.

In 114 crashes the gender of the driver was unreported. In 10,472 crashes neither gender nor age was reported.

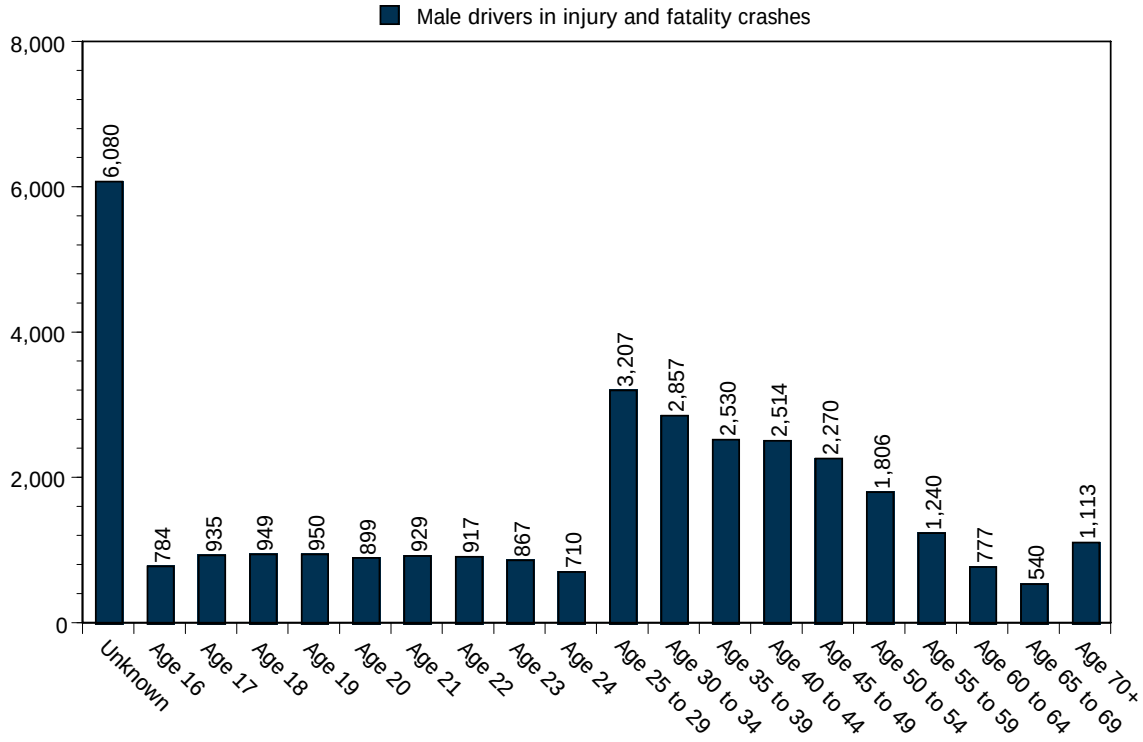
Exhibit III-7c.
Proportion of Drivers in Injury and Fatality Crashes Identified as Sex Unknown by Age



Source: 2002 CDOT Crash Database.

Exhibit III-8a presents the number of male drivers involved in injury or fatal crashes, by age. Age was unreported for more than 6,000 male crash drivers.

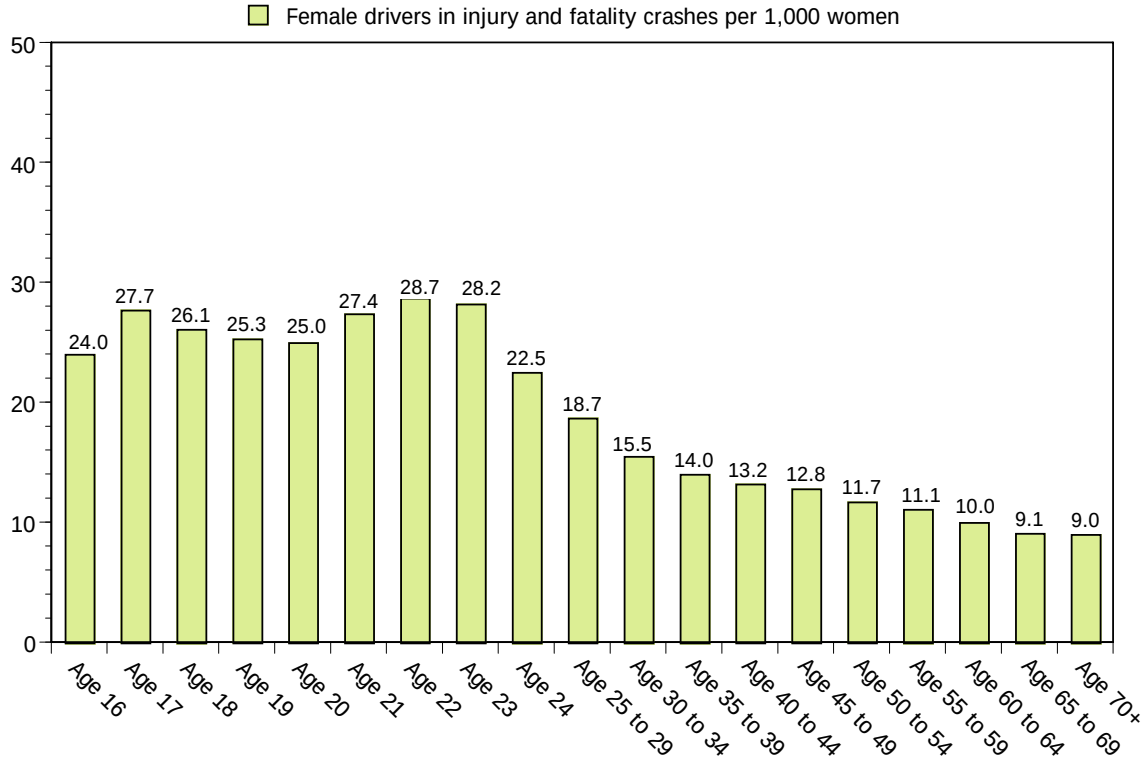
Exhibit III-8a.
Number of Male Drivers in Injury and Fatality Crashes by Age



Source: 2002 CDOT Crash Database.

Exhibit III-8b shows the per capita rate of male involvement in injury or fatal crashes by age. Older male drivers have lower per capita rates of injury or fatal crashes than younger men. The rate begins to decline at age 24.

Exhibit III-8b.
Male Drivers in Injury or Fatal Crashes per 1,000 Men by Age

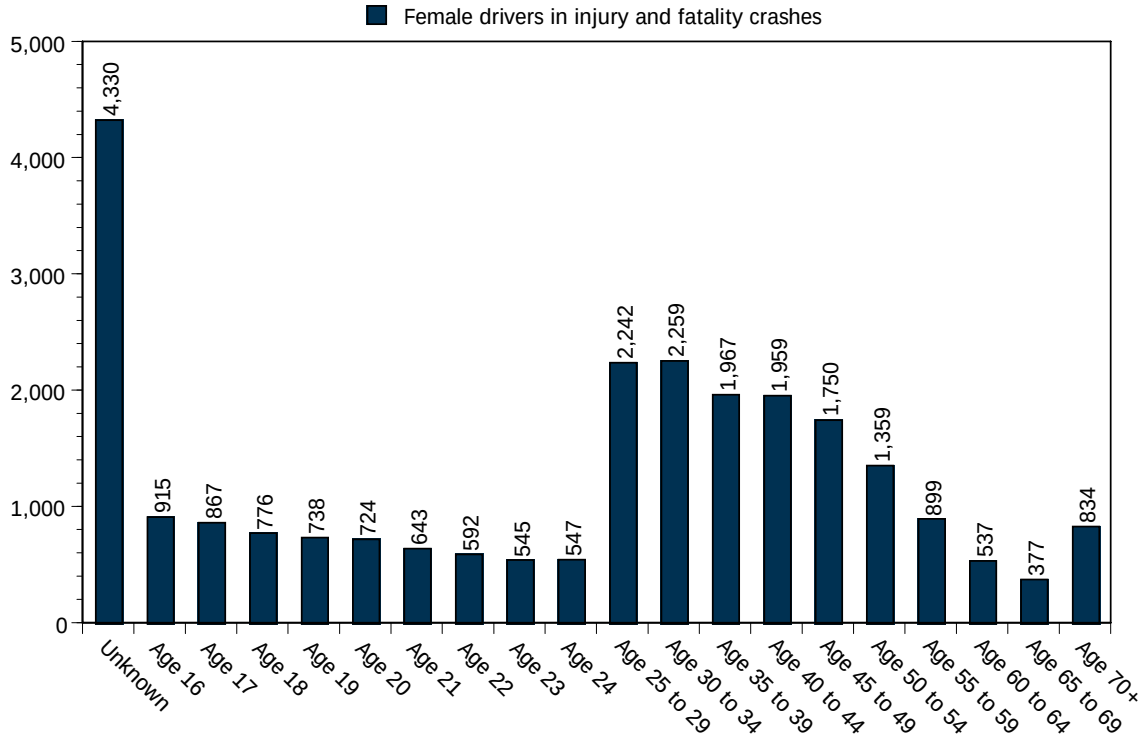


Source: 2002 CDOT Crash Database.

Section III | Ages of Drivers in Colorado Crashes

Exhibit III-9a presents the number of women involved in injury or fatal crashes, by age. Age was unreported for more than 4,000 female drivers.

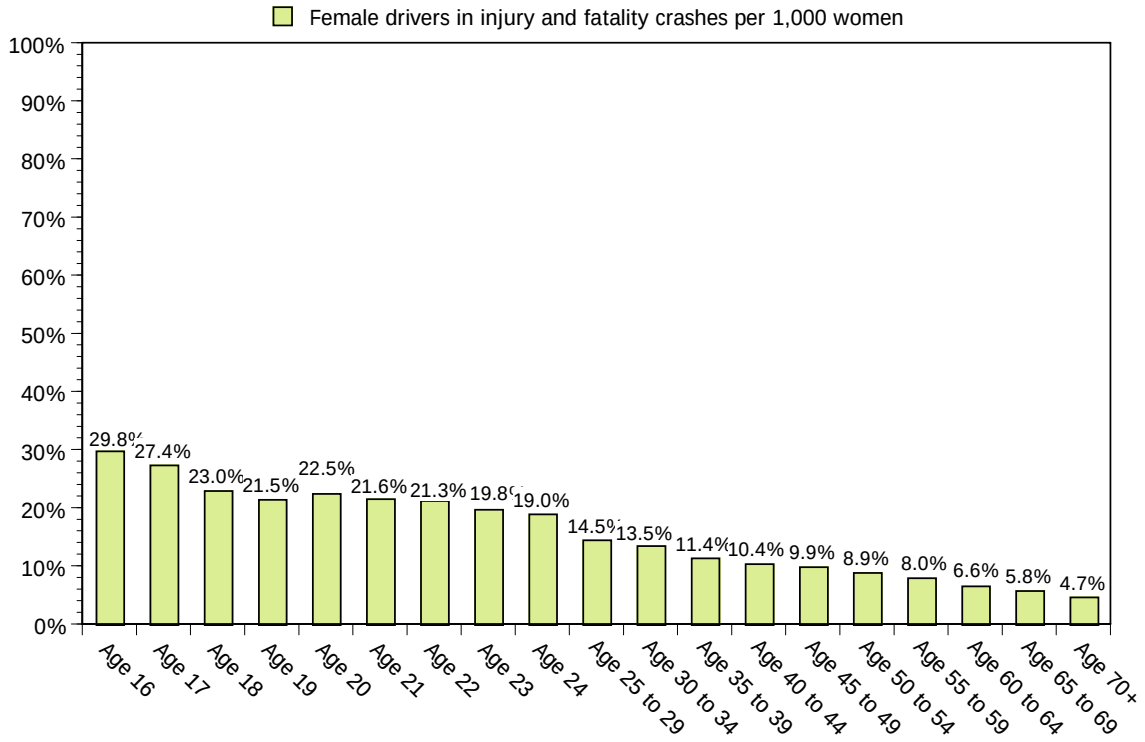
Exhibit III-9a.
Number of Female Drivers in Injury and Fatality Crashes by Age



Source: 2002 CDOT Crash Database.

The per capita rate of injury or fatal crash involvement by women declines with age. Sixteen year old women have the highest per capita rate of injury or fatal crash involvement, compared to all other age cohorts.

Exhibit III-9b.
Female Drivers in Injury and Fatality Crashes per 1,000 Women by Age



Source: 2002 CDOT Crash Database.

Section IV | Effect of Impairment in Colorado Crashes

Section IV | Effect of Impairment in Colorado Crashes

Introduction

This section summarizes the information available in crash records regarding driver impairment. "Impairment", for this purpose, is defined as occurring whenever a driver is reported to demonstrate evidence of the consumption of alcohol, prescription drugs or medication, or illegal drugs. The Exhibits in this section demonstrate that most crash drivers are not impaired. However, impairment is more common in more severe crashes, among male crash drivers and among drivers in their early to mid-20s.

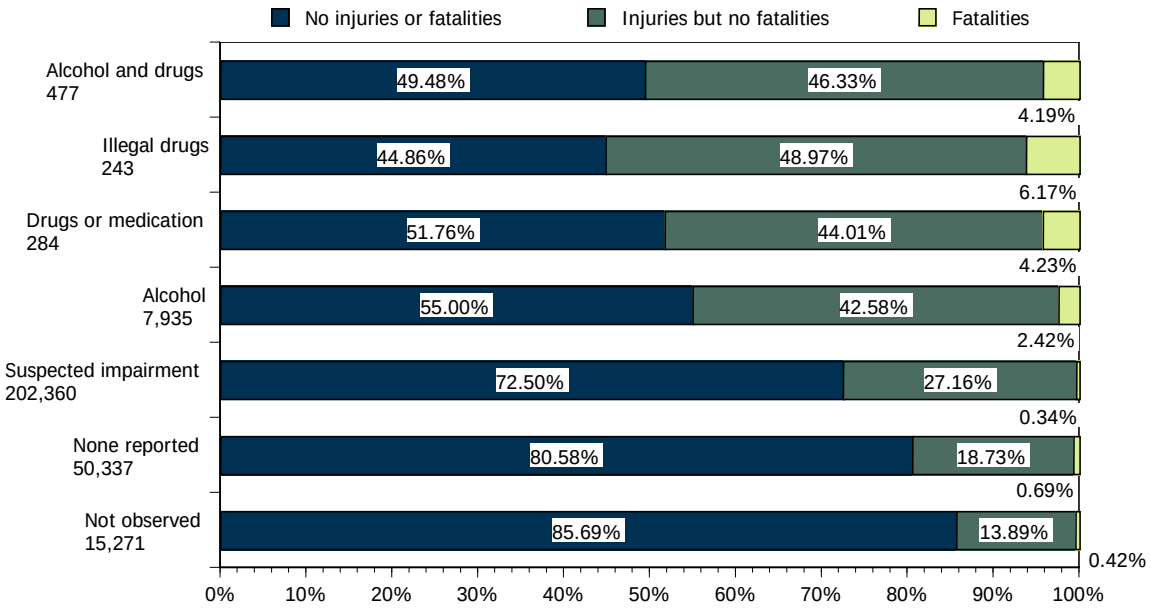
Exhibit IV-1.
Condition of Drivers in All Crashes

Condition of Driver	Number of Drivers	Percent of Drivers in All Crashes
Not observed	15,271	5.5%
None reported	50,337	18.2%
No suspected impairment	202,360	73.1%
Impaired, of which	8,939	3.2%
Alcohol	7,935	2.9%
Rx drugs or medication	284	0.1%
Illegal drugs	243	0.1%
Alcohol and drugs	477	0.2%
Total	276,907	100%

Source: 2002 CDOT Crash Database.

Exhibit IV-1 demonstrates that impairment of any sort is relatively rare among drivers involved in all crashes. Among all drivers, 91.3% were classified as either "none reported" or "no suspected impairment". The proportion positively identified as impaired was only slightly more than 3%. Almost all reported impairment was associated with alcohol.

Exhibit IV-2.
Condition of Driver by Severity of Crash



Source: 2002 CDOT Crash Database.

Exhibit IV-2 demonstrates that crashes involving drivers who appear to be under the influence of alcohol, drugs or medications are much more likely to cause injury and death than crashes involving drivers who do not appear to be impaired. It also demonstrates that drivers for whom the state of impairment is not observed are rarely involved in injury or fatal crashes. This suggests that reporting agencies tend to ignore the possibility of impairment when the crash is not severe.

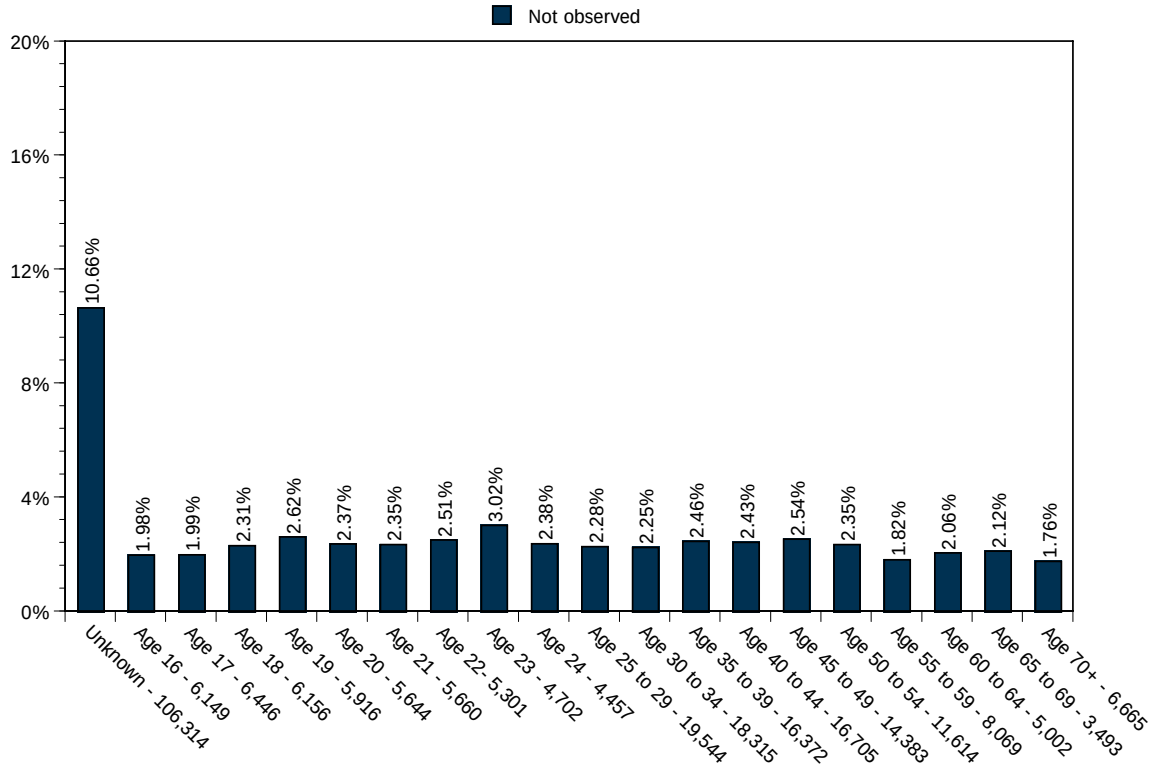
Exhibit IV-3.
Condition of Drivers in All Crashes

Condition of Driver	Number of Male Drivers	Percent of Male Drivers in All Crashes	Number of Female Drivers	Percent of Female Drivers in All Crashes
Not observed	4,281	3.2%	1,767	2.0%
None reported	8,367	6.2%	5,416	6.0%
No suspected impairment	115,857	85.7%	80,581	89.9%
Impaired	6,710	5.0%	1,839	2.1%
Alcohol	6,065	4.5%	1,525	1.7%
Rx drugs or medication	146	0.1%	134	0.2%
Illegal drugs	168	0.1%	59	0.1%
Alcohol and drugs	331	0.2%	121	0.1%
Total	135,215	100%	89,603	100.0%

Source: 2002 CDOT Crash Database.

Exhibit IV-3 demonstrates that the rate of impairment among men involved in all crashes is more than twice as high, at 5.0%, as the rate of impairment among women, 2.1%. Alcohol is the principal form of impairment for both. However, women are less likely than men to be impaired by alcohol or illegal drugs, and more likely to be impaired by prescription drugs or medication. Crash records do not identify sex for 52,089 drivers, of whom 36,554 have no reported impairment and impairment was not observed for 9,223.

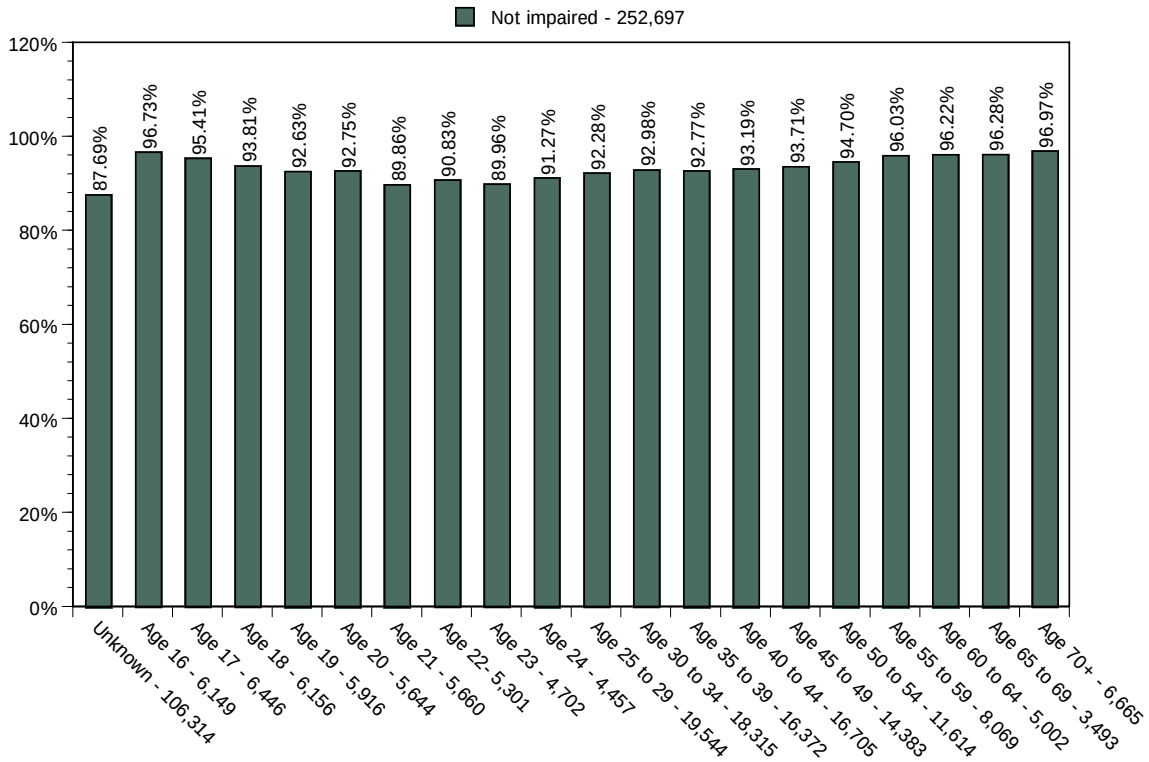
Exhibit IV-4a.
Rate of Impairment Among Drivers in All Crashes by Age



Note: Percentages of "not observed" crash drivers are derived from total number of persons included within each age category. Exhibit IV-4a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

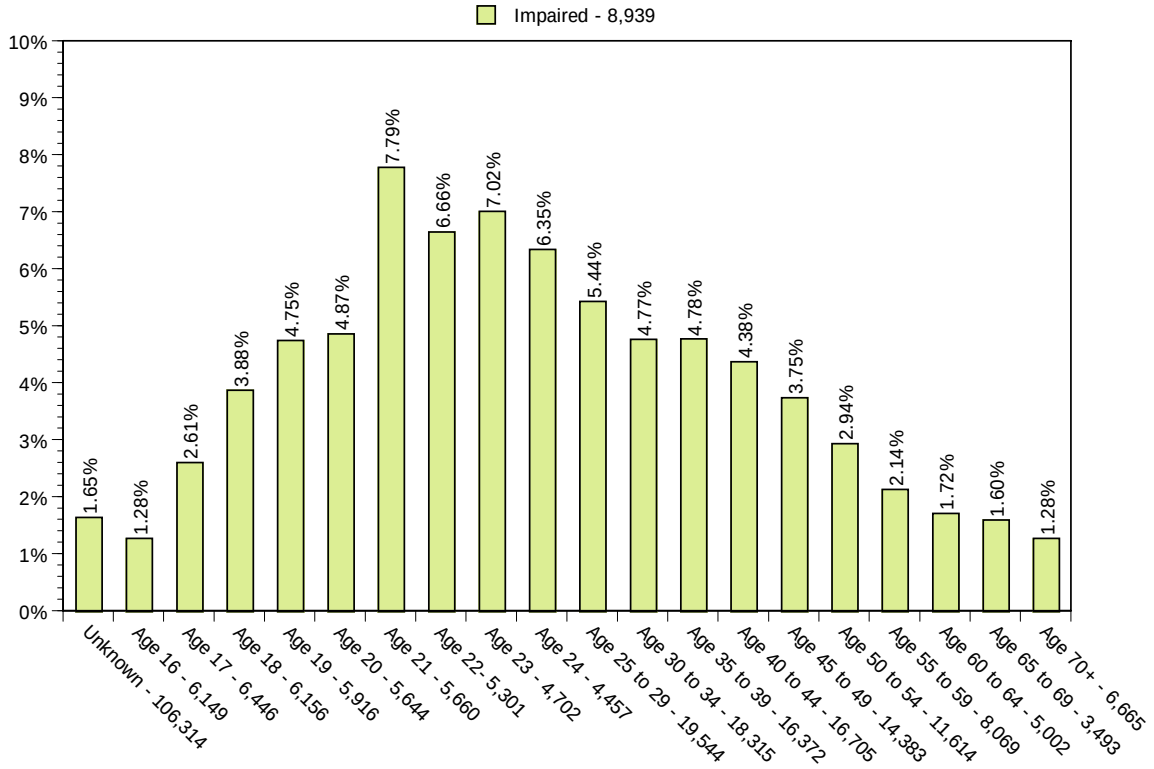
Exhibit IV-4b.
Rate of Impairment Among Drivers in All Crashes by Age



Note: Percentages of "not impaired" crash drivers are derived from total number of persons included within each age category. Exhibit IV-4a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Exhibit IV-4c.
Rate of Impairment Among Drivers in All Crashes by Age



Note: Percentages of "impaired" crash drivers are derived from total number of persons included within each age category.

Exhibit IV-4a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Exhibits IV-4a, IV-4b and IV-4c compare the rates of impairment among drivers of different ages in all crashes. Exhibit IV-4a demonstrates that drivers whose ages are unknown are most likely to have unobserved states of impairment. Exhibit IV-4b demonstrates that most crash drivers at any age are unimpaired. However, Exhibit IV-4c demonstrates that rates of impairment among crash drivers aged between 21 and 29 are much higher than at any other ages. Rates of impairment are lowest among the youngest and oldest crash drivers.

Exhibit IV-5.
Condition of Drivers in Injury and Fatal Crashes

Source: 2002 CDOT Crash Database.

Condition of Driver	Number of Drivers	Percent of Drivers in All Crashes
Not observed	2,185	3.1%
None reported	9,774	13.6%
No suspected impairment	55,646	77.6%
Impaired	8,939	5.7%
Alcohol	4,083	5.0%
Rx drugs or medication	137	0.2%
Illegal drugs	134	0.2%
Alcohol and drugs	241	0.3%

Exhibit IV-5 demonstrates that drivers in injury and fatal crashes are more likely to be impaired than drivers in all crashes. Exhibit IV-1 gives the rate of impairment in all crashes as 3.2%. The rate in injury and fatal crashes is nearly twice as large, at 5.7%. Alcohol is the principle form of impairment in injury and fatal crashes, as in all crashes. However, impairment due to prescription drugs or medication and illegal drugs is more common in injury and fatal crashes than in other crashes. The comparison between this Exhibit and Exhibit IV-1 also demonstrates that impairment is more likely to be observed in more severe crashes.

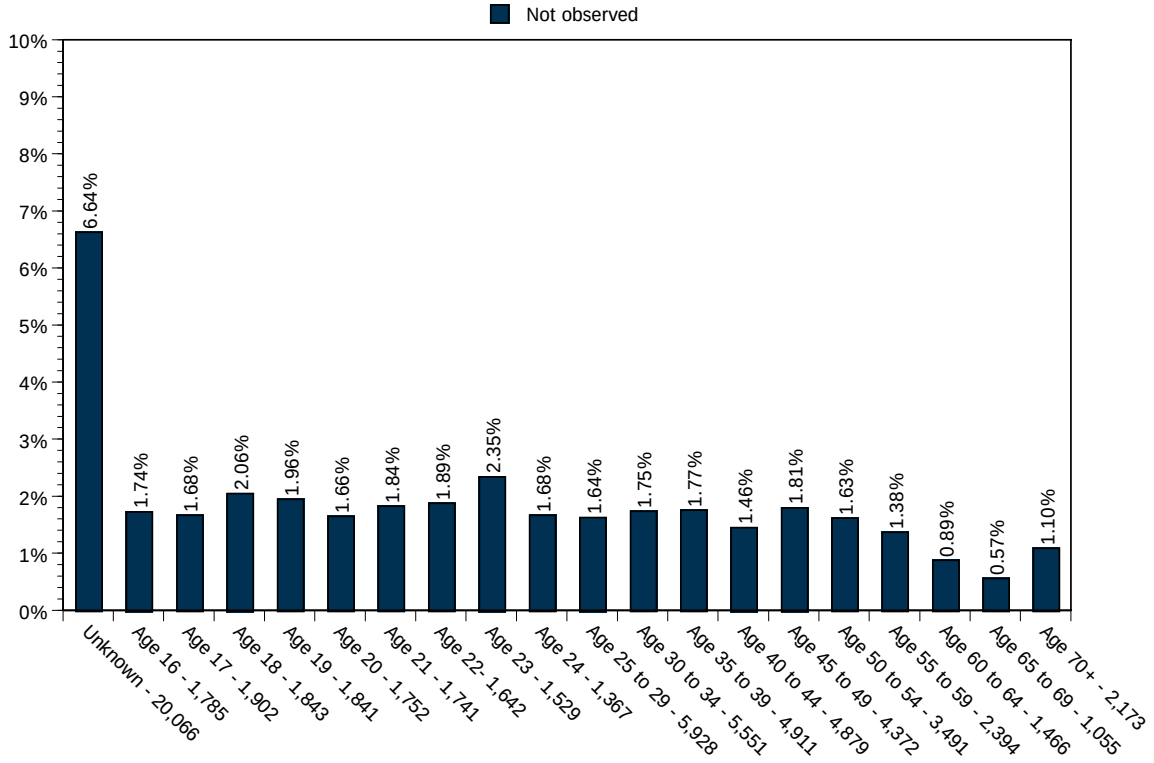
Exhibit IV-6.
Condition of Drivers in Injury and Fatal Crashes by Sex

Condition of Driver	Number of Male Drivers	Percent of Male Drivers in All Crashes	Number of Female Drivers	Percent of Female Drivers in All Crashes
Not observed	832	2.3%	401	1.5%
None reported	1,978	5.3%	1,410	5.3%
No suspected impairment	31,075	83.9%	23,936	90.0%
Impaired	3,157	8.5%	854	3.2%
Alcohol	2,810	7.6%	699	2.6%
Rx drugs or medication	71	0.2%	65	0.2%
Illegal drugs	95	0.3%	36	0.1%
Alcohol and drugs	181	0.5%	54	0.2%
Total	37,042	100%	26,601	100%

Source: 2002 CDOT Crash Database.

Exhibit IV-6 demonstrates that impairment rates for both men and women are higher in injury and fatality crashes than in all crashes. Moreover, the disparity in impairment rates between men and women is greater in injury and fatality crashes than in all crashes, as depicted in Exhibit IV-3. While alcohol remains the predominant form of impairment, men involved in injury and fatality crashes exhibit an increased probability of impairment through illegal drugs.

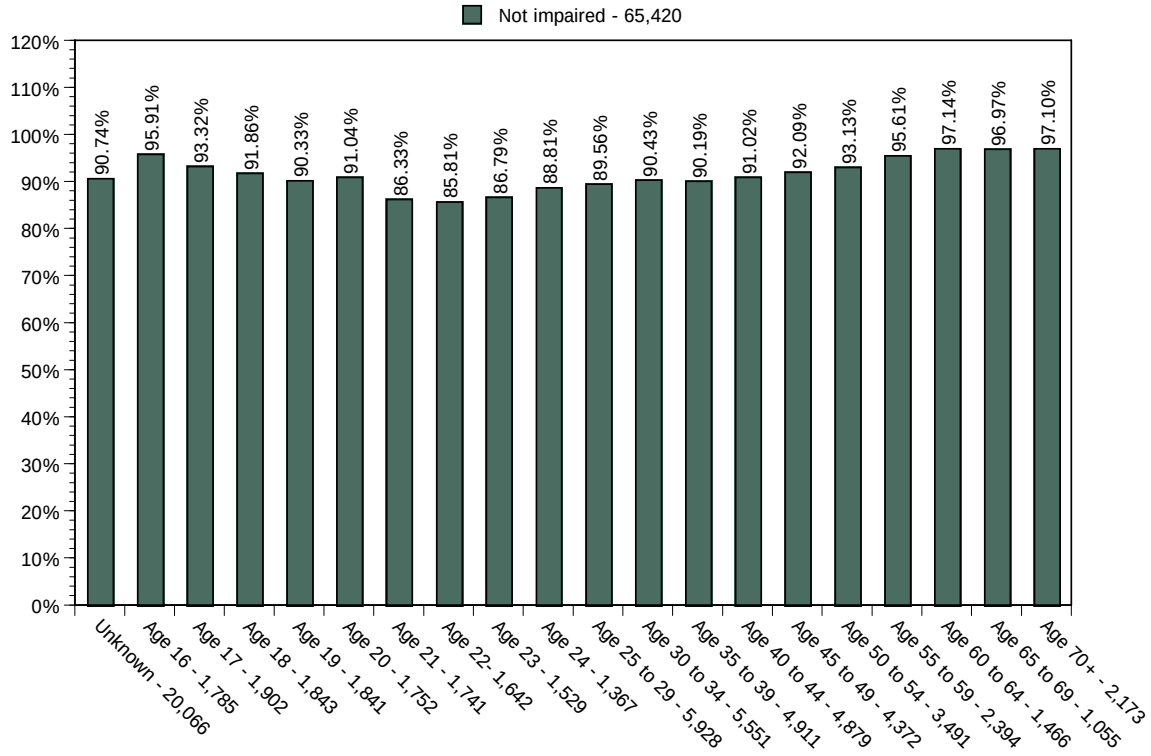
Exhibit IV-7a.
Rate of Impairment Among Drivers in Injury and Fatal Crashes by Age



Note: Percentages of "not observed" crash drivers are derived from total number of persons included within each age category. Exhibit IV-7a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

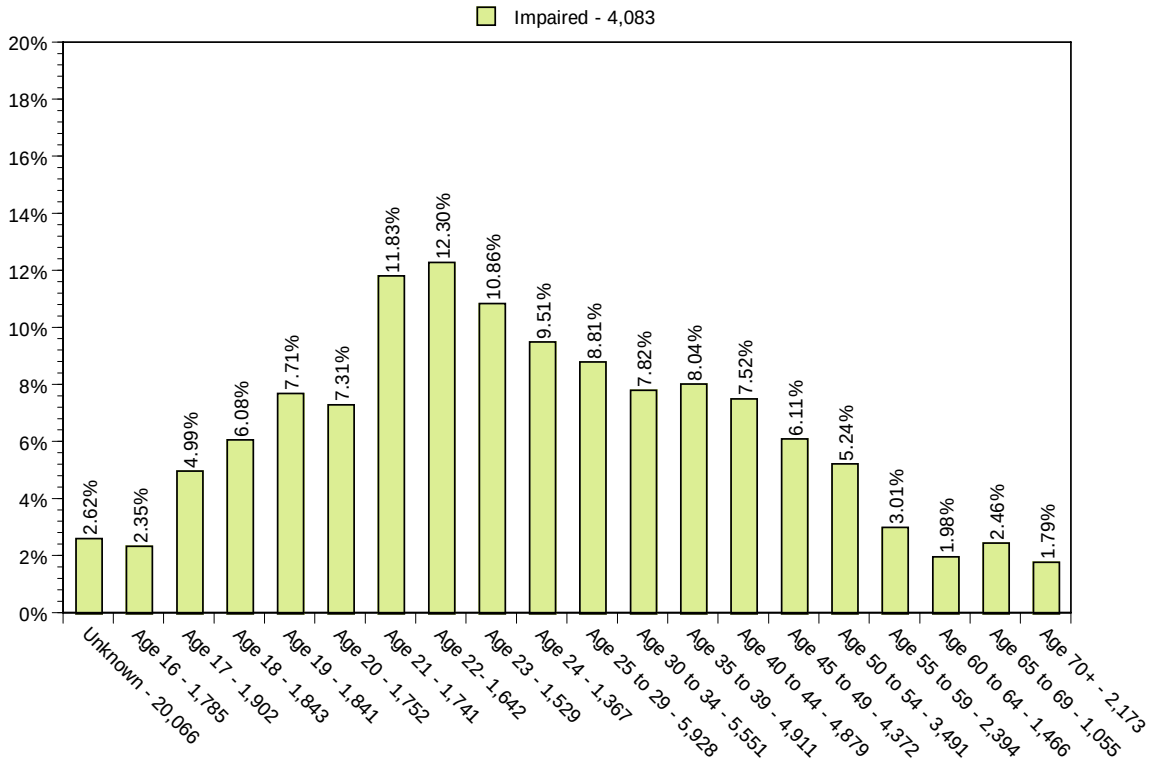
Exhibit IV-7b.
Rate of Impairment Among Drivers in Injury and Fatal Crashes by Age



Note: Percentages of "not impaired" crash drivers are derived from total number of persons included within each age category. Exhibit IV-7a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Exhibit IV-7c.
Rate of Impairment Among Drivers in Injury and Fatal Crashes by Age



Note: Percentages of "impaired" crash drivers are derived from total number of persons included within each age category.

Exhibit IV-7a-c percentages for each age category equal 100%.

Source: 2002 CDOT Crash Database.

Exhibits IV-7a, IV-7b and IV-7c compare the rates of impairment in injury and fatal crashes for drivers of different ages. Exhibit IV-7b demonstrates that, as in all crashes, most drivers in injury and fatal crashes at any age are unimpaired. Moreover, Exhibit IV-7c indicates that rates of impairment in injury and fatal crashes among the youngest and oldest drivers are quite low.

Exhibit IV-7c demonstrates that impairment rates are much higher for drivers aged 21 to 24 in injury and fatal crashes. More than 10% of all drivers aged 21, 22 and 23 involved in injury and fatal crashes are impaired.

Impairment rates among 21-year-old drivers in all crashes, as given in Exhibit IV-4c, are moderate. However, impairment rates among 21-year-old drivers in injury and fatal accidents, as given in Exhibit IV-7c, are very high. This implies that 21-year-old drivers who are impaired are much more likely to become involved in injury and fatal crashes than are impaired drivers of other ages. This suggests that drivers who are in their first year of legal eligibility for the purchase of alcohol may be more dangerous drivers because of inexperience with impaired driving.

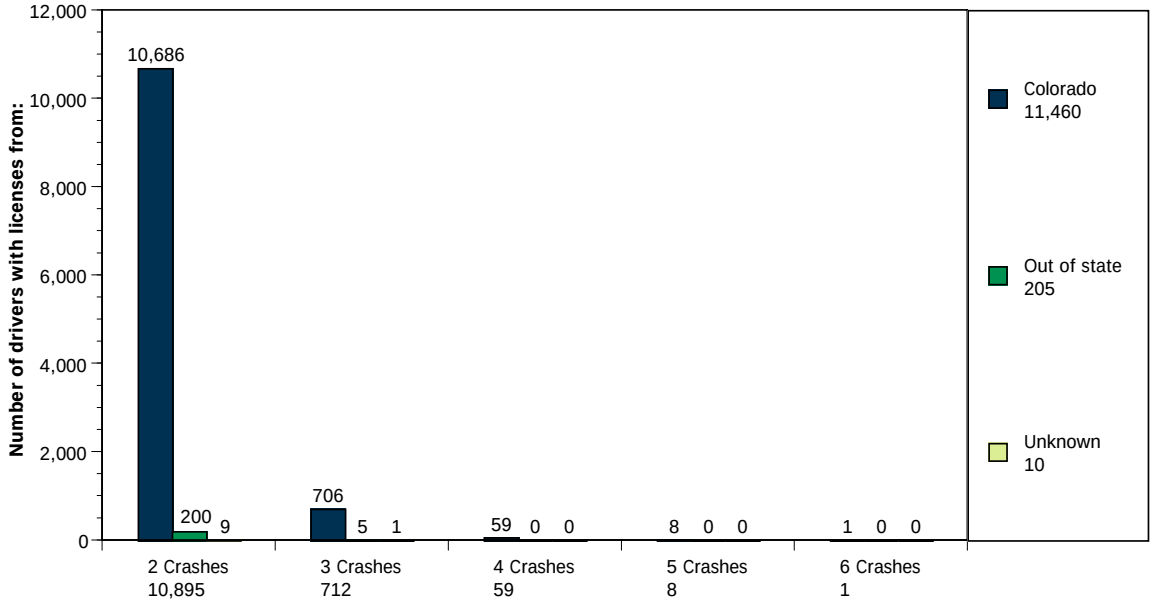
Section V | Repeat Offenders in Colorado Crashes

Section V | Repeat Offenders in Colorado Crashes

Introduction

According to recorded drivers' license numbers, at least 11,675 drivers were involved in multiple crashes in Colorado during 2002. Of them, 6,503 drivers, or 55.7%, were involved in only non-injury, non-fatal crashes. Repeat offenders were somewhat older, on average, than the typical impaired driver. Of all drivers in fatal crashes, 6.7% were involved in at least one other crash in the same year. Repeat offenders were slightly more likely to be impaired than drivers involved in only a single crash.

Exhibit V-1.
Number of Drivers in Multiple Crashes by State of License and Number of Crashes

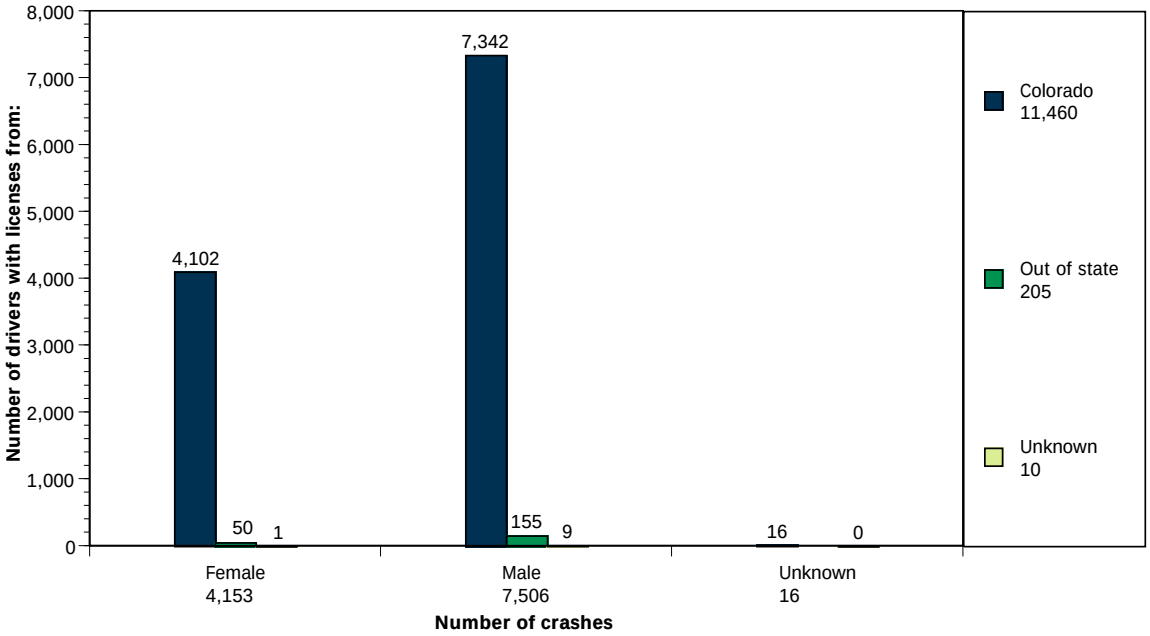


Source: 2002 CDOT Crash Database.

Exhibit V-1 demonstrates that the vast majority of identifiable repeat offenders held Colorado drivers' licenses and were involved in only two crashes. All drivers involved in more than three crashes held Colorado drivers' licenses.

As previously presented in Exhibit II-3, 56,740 drivers in all crashes did not have recorded drivers' licenses. It is likely that an unknown number of additional repeat offenders are present among this group.

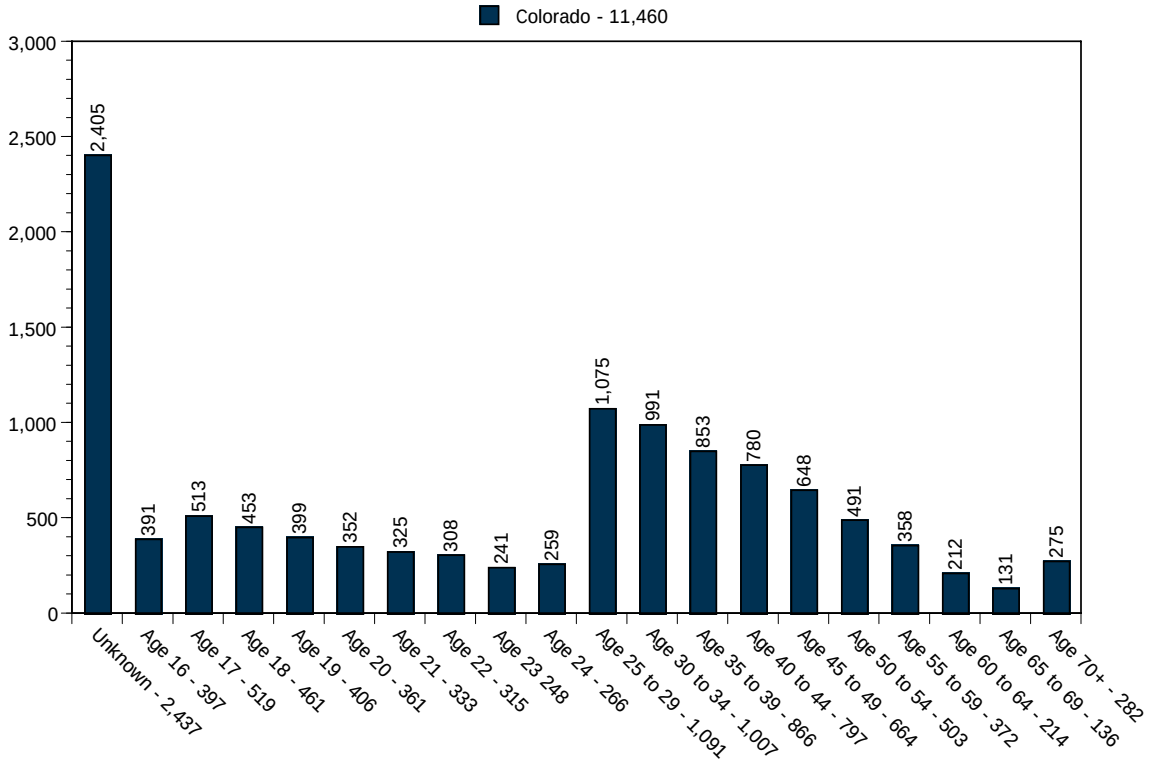
Exhibit V-2.
Number of Drivers in Multiple Crashes by State of License and Sex



Source: 2002 CDOT Crash Database.

Exhibit V-2 demonstrates that repeat offenders were disproportionately male. Among repeat offenders with Colorado licenses, 7,342, or 64.1%, were men. More than three-quarters of the repeat offenders with licenses from other states were men.

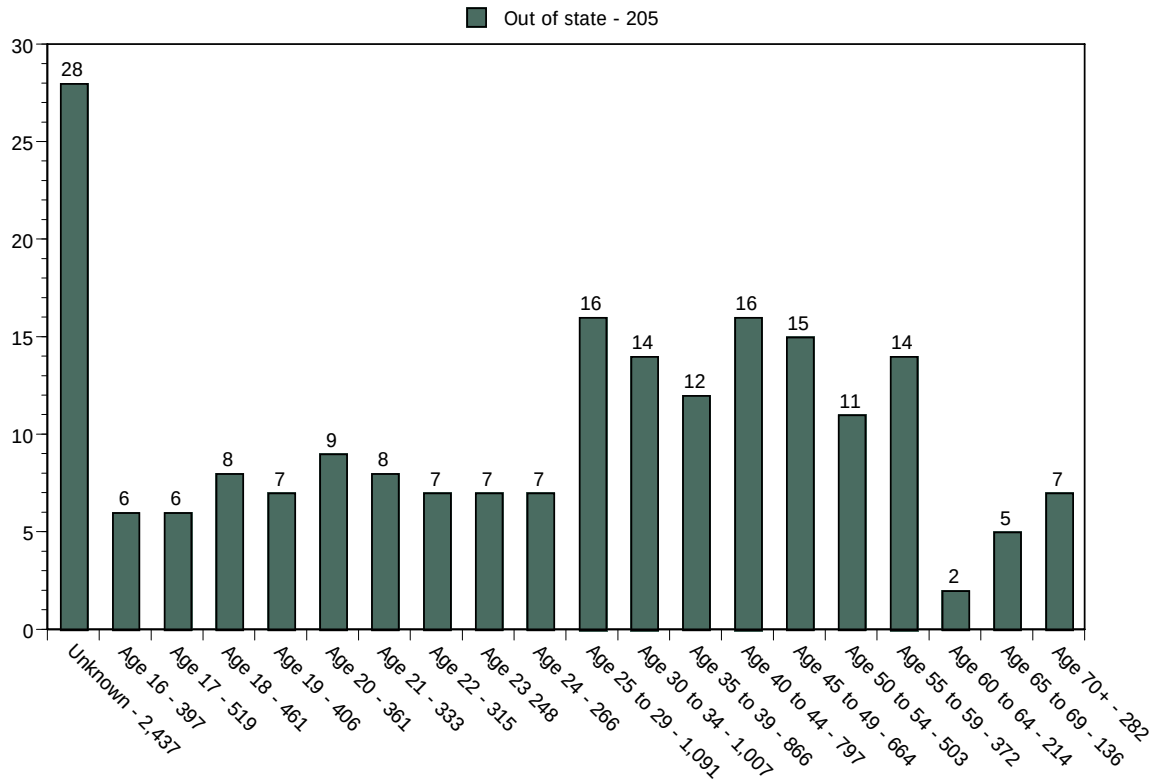
Exhibit V-3a.
Number of Drivers in Multiple Crashes by State of License and Age



Source: 2002 CDOT Crash Database.

Exhibit V-3a demonstrates that drivers with Colorado licenses and repeat offenses are much more likely to be young than old. For example, the 513 repeat offenders aged 17 alone outnumber all repeat offenders aged between 50 and 54, and all repeat offenders in each of the five-year age categories at ages above 54. Repeat offenders aged within the four years from 21 to 24 outnumber repeat offenders in the five-year age category from 25 to 29.

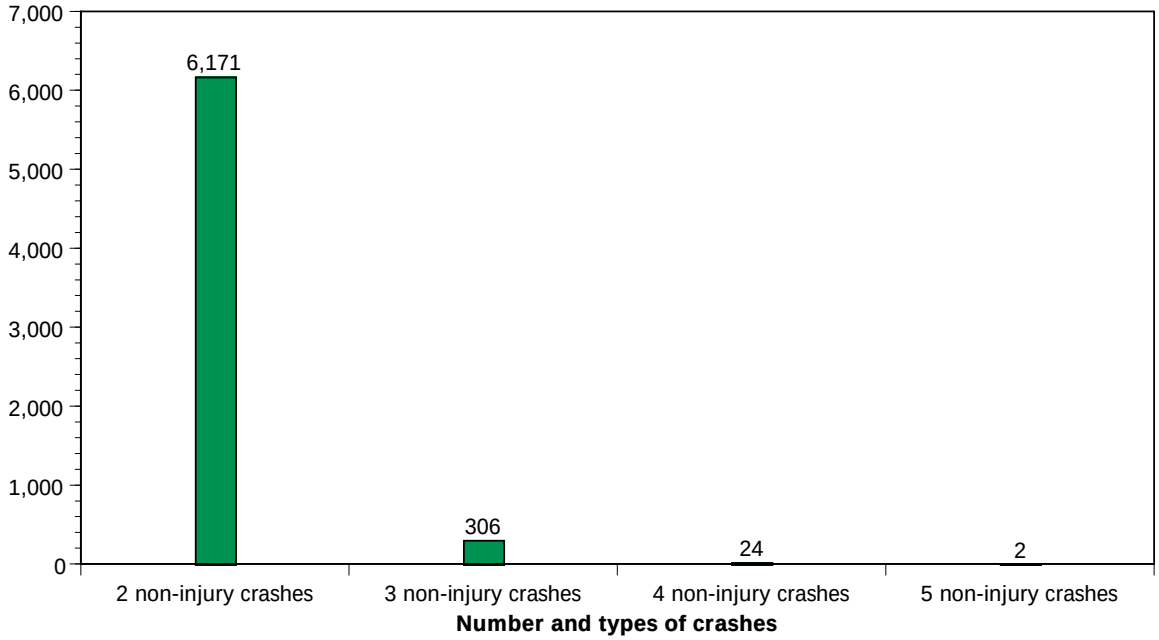
Exhibit V-3b.
Number of Drivers in Multiple Crashes by State of License and Age



Source: 2002 CDOT Crash Database.

Exhibit V-3b demonstrates the same point for the relatively few drivers with licenses from other states involved in multiple crashes within Colorado. The number of these drivers at each of the ages between 16 and 24 varies between six and eight. The average number at any higher age is approximately three or less.

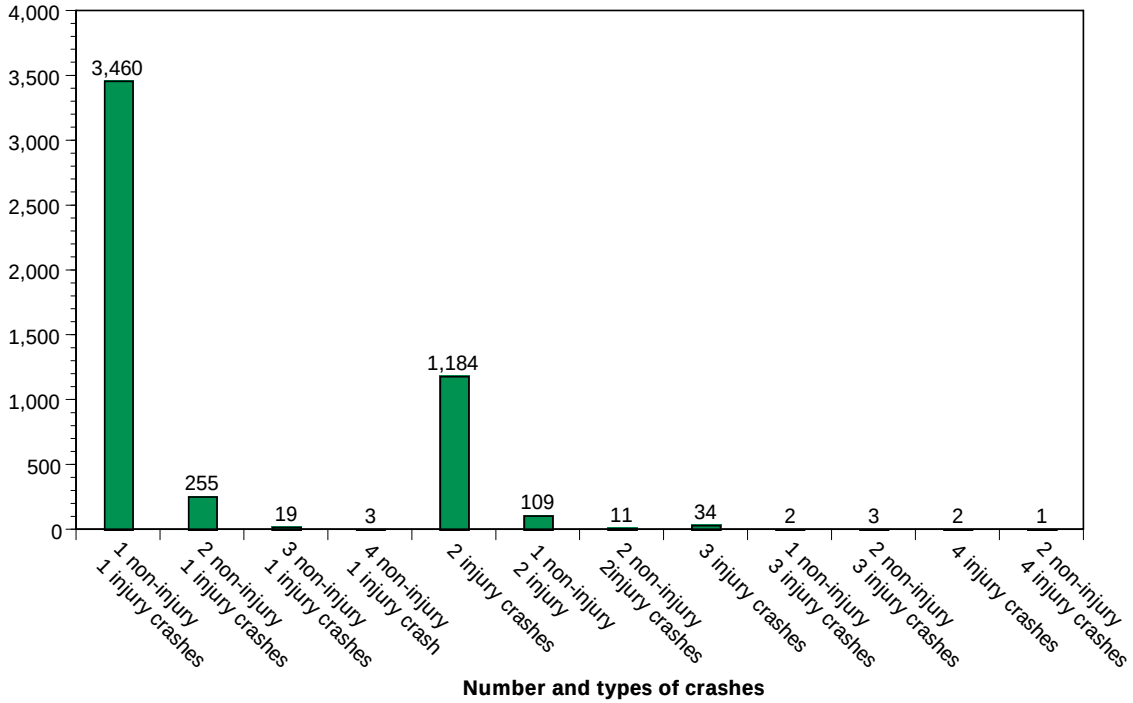
Exhibit V-4.
Number of Drivers Involved in Multiple Crashes, Non-Injury Only



Source: 2002 CDOT Crash Database.

Exhibit V-4 reports that 6,503 of the 11,765 repeat offenders were involved in only non-injury, non-fatal crashes. Of them, 94.9% were involved in two crashes only. However, two drivers were involved in five separate crashes.

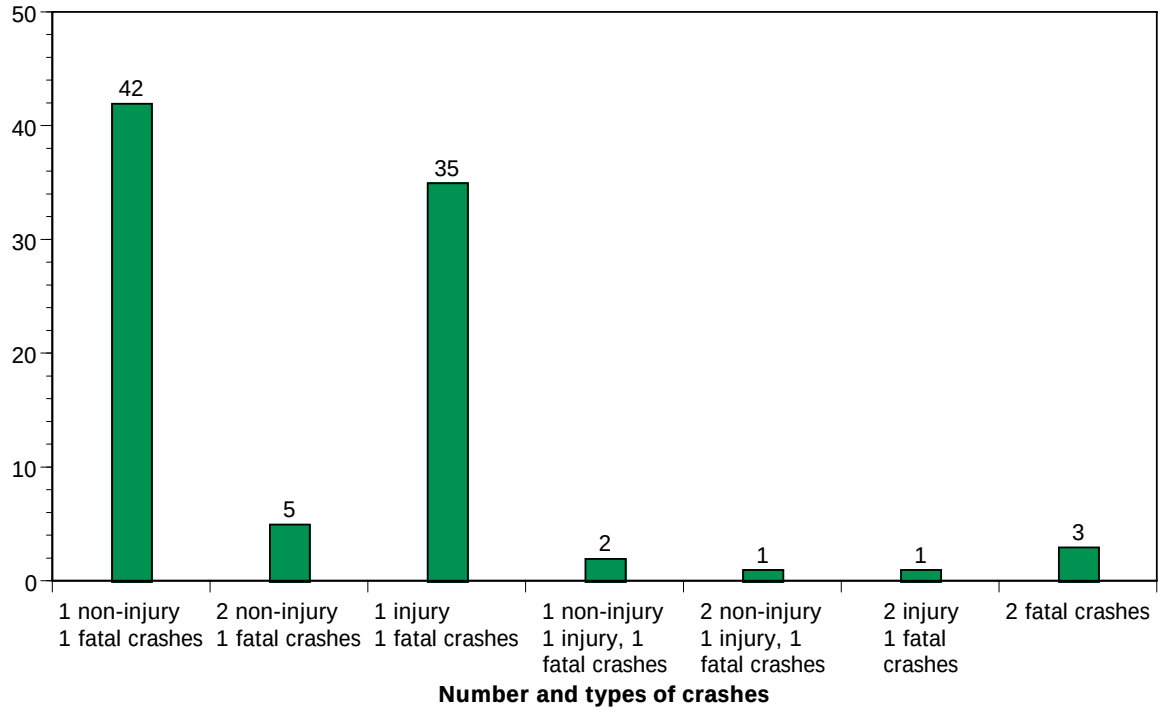
Exhibit V-5
Number of Drivers Involved in Multiple Crashes, Non-Injury and Injury Only



Source: 2002 CDOT Crash Database.

According to Exhibit V-5, 5,083 drivers were involved in multiple crashes, none of which involved fatalities but at least one of which involved injury. Of these, 3,737 were involved in only one injury crash. However, three drivers were involved in four different crashes resulting in injuries.

Exhibit V-6.
Number of Drivers Involved in Multiple Crashes, Including at Least One Fatal Crash



Source: 2002 CDOT Crash Database.

Only 89 drivers were involved in multiple crashes, at least one of which resulted in fatalities. Of them, 86 were involved in only one fatal crash. Three drivers were involved in two fatal crashes. These latter drivers are each counted twice in the total of 1,333 driver records associated with fatal accidents in Exhibit II-1. Consequently, there were 1,330 unique drivers involved in fatal crashes in Colorado in 2002. The 89 drivers involved in at least one fatal crash and at least two crashes overall represent 6.7% of all drivers involved in fatal crashes.

Exhibit V-7.
Alcohol, Medication and Drug Use Among Drivers Involved in Multiple Crashes

	Number of Drivers	Percent of Drivers
No alcohol, medication or drug use noted in any crash	10,907	93.4%
Alcohol, medication or drug use noted in some but not all crashes	533	4.6%
Alcohol, medication or drug use noted in all crashes	235	2.0%

Source: 2002 CDOT Crash Database.

Exhibit V-7 demonstrates that 6.6% of all repeat offenders were impaired in at least one of their crashes. This rate is slightly more than twice the rate of impairment among drivers in all crashes, as given in Exhibit IV-1. It is slightly more than the rate of impairment among all drivers in injury and fatal accidents as given in Exhibit IV-5. Two percent of repeat offenders were impaired in all of their crashes.

Section VI | Crash Driver Residence

Section VI | Crash Driver Residence

Introduction

Previous sections analyze the 2002 crash data based on the location of the crash. This section reexamines these data based on the county of residence on record for each of the drivers in these crashes. The county of residence is derived from license information. This is presumably current as of the date on which the license was issued, but may not be accurate at the time of a crash if the driver has changed residence. Such inaccuracies will not bias the analyses here if all counties experience roughly similar rates of residential relocations.

Exhibit VI-1.
Percent of all Resident Drivers Involved in Crashes, by Type of Crash

County	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Number of Resident Drivers involved in Crashes
Adams	72.22%	27.45%	0.33%	33,007
Alamosa	78.06%	21.50%	0.44%	679
Arapahoe	73.27%	26.53%	0.20%	15,406
Archuleta	69.66%	29.37%	0.97%	412
Baca	68.18%	30.30%	1.52%	66
Bent	69.17%	30.00%	0.83%	120
Boulder	70.84%	28.80%	0.35%	11,644
Broomfield	72.33%	27.38%	0.29%	2,400
Chaffee	70.02%	28.64%	1.34%	447
Cheyenne	73.81%	21.43%	4.76%	42
Clear Creek	73.36%	25.91%	0.73%	274
Conejos	70.55%	29.11%	0.34%	292
Costilla	68.38%	31.62%	0.00%	117
Crowley	65.96%	32.98%	1.06%	94
Custer	66.94%	32.26%	0.81%	124
Delta	72.21%	26.65%	1.14%	878
Denver	72.62%	27.10%	0.29%	35,443
Dolores	68.42%	22.81%	8.77%	57
Douglas	75.32%	24.45%	0.23%	7,925
Eagle	79.01%	20.28%	0.72%	1,672
El Paso	73.51%	26.14%	0.35%	26,902
Elbert	71.88%	27.79%	0.33%	896
Fremont	69.10%	30.38%	0.52%	1,537
Garfield	78.67%	20.88%	0.45%	2,452
Gilpin	70.37%	28.89%	0.74%	135
Grand	75.69%	23.12%	1.19%	506
Gunnison	69.29%	29.70%	1.02%	394
Hillside	100.00%	0.00%	0.00%	2
Hindsdale	65.00%	35.00%	0.00%	20
Huerfano	72.08%	27.92%	0.00%	154
Jackson	82.98%	12.77%	4.26%	47
Jefferson	73.21%	26.45%	0.34%	20,185

Exhibit VI-1.
Percent of all Resident Drivers Involved in Crashes, by Type of Crash, Continued

County	No Injuries or Fatalities	Injuries but no Fatalities	Fatalities	Number of Resident Drivers involved in Crashes
Kiowa	75.76%	24.24%	0.00%	33
Kit Carson	68.63%	29.90%	1.47%	204
La Plata	70.62%	28.28%	1.10%	1,637
Lake	71.94%	25.18%	2.88%	278
Larimer	66.46%	33.03%	0.51%	9,185
Las Animas	67.86%	31.20%	0.94%	532
Lincoln	68.18%	29.55%	2.27%	132
Logan	68.46%	31.15%	0.38%	520
Mesa	69.29%	30.28%	0.44%	5,255
Mineral	68.97%	27.59%	3.45%	29
Moffat	82.97%	16.90%	0.14%	728
Montezuma	72.12%	26.09%	1.79%	782
Montrose	73.99%	25.52%	0.49%	1,434
Morgan	71.50%	27.66%	0.85%	1,063
Otero	69.42%	28.86%	1.72%	641
Ouray	75.73%	23.30%	0.97%	103
Park	73.15%	25.21%	1.65%	607
Phillips	72.28%	25.74%	1.98%	101
Pitkin	81.28%	18.41%	0.31%	641
Prowers	69.29%	28.93%	1.78%	394
Pueblo	69.32%	30.00%	0.68%	6,773
Rio Blanco	82.78%	16.56%	0.66%	302
Rio Grande	74.72%	24.44%	0.84%	356
Routt	86.32%	13.36%	0.33%	921
Saguache	70.00%	28.82%	1.18%	170
San Juan	90.48%	9.52%	0.00%	21
San Miguel	76.21%	23.30%	0.49%	206
Sedgwick	79.63%	20.37%	0.00%	54
Summit	75.55%	23.95%	0.50%	998
Teller	71.90%	27.44%	0.66%	1,064
Washington	62.26%	36.79%	0.94%	106
Weld	68.88%	30.41%	0.70%	8,986
Yuma	72.10%	25.36%	2.54%	276

Source: 2002 CDOT Crash Database.

Exhibit VI-1 presents the number of drivers living in each Colorado county that were involved in crashes in 2002, and the distribution of these drivers across crashes of differing severity. In the smaller counties, few drivers were involved. However, more than 30,000 residents of Adams County and Denver County were involved in crashes in this year. More than 20,000 in El Paso and Jefferson Counties were also involved. Among the largest counties, residents of Mesa, Pueblo and Weld Counties were most likely to be involved in crashes that resulted in injuries or fatalities.

Exhibit VI-2.
Resident Drivers in Injury and Fatality Crashes Per 100 Residents 15 Years of Age and Older, by County

County	Number of Drivers in Injury and Fatality Crashes	Number of Drivers in Injury and Fatality Crashes as Percent of Population >15 Years of Age	Number of Male Drivers in Injury and Fatality Crashes	Number of Male Drivers in Injury and Fatality Crashes as Percent of Population >15 Years of Age	Number of Female Drivers in Injury and Fatality Crashes	Number of Female Drivers in Injury and Fatality Crashes as Percent of Population >15 Years of Age
Adams	9,170	3.33%	5,278	3.78%	3,862	2.83%
Alamosa	149	1.29%	84	1.48%	65	1.10%
Arapahoe	4,118	1.08%	2,301	1.24%	1,817	0.93%
Archuleta	125	1.58%	72	1.81%	53	1.35%
Baca	21	0.58%	12	0.67%	9	0.48%
Bent	37	0.76%	26	0.93%	11	0.54%
Boulder	3,395	1.44%	1,884	1.58%	1,507	1.29%
Chaffee	134	0.98%	77	1.05%	57	0.90%
Cheyenne	11	0.64%	7	0.82%	4	0.46%
Clear Creek	73	0.96%	44	1.10%	29	0.80%
Conejos	86	1.38%	49	1.60%	36	1.15%
Costilla	37	1.27%	26	1.80%	11	0.75%
Crowley	32	0.68%	13	0.40%	19	1.34%
Custer	417	1.43%	23	1.57%	18	1.28%
Delta	244	1.09%	136	1.22%	108	0.96%
Denver	9,706	2.15%	5,738	2.53%	3,924	1.75%
Dolores	181	1.19%	15	1.91%	3	0.41%
Douglas	1,956	1.53%	1,069	1.69%	885	1.37%
Eagle	351	1.05%	208	1.12%	140	0.95%
El Paso	7,125	1.79%	3,901	1.97%	3,218	1.61%
Elbert	252	1.68%	139	1.85%	113	1.51%
Fremont	475	1.24%	285	1.27%	190	1.19%
Garfield	523	1.54%	314	1.80%	208	1.26%
Gilpin	402	1.02%	26	1.23%	14	0.77%
Grand	1,231	1.20%	79	1.44%	44	0.93%
Gunnison	121	1.02%	69	1.06%	52	0.96%
Hinsdale	75	1.06%	4	1.16%	3	0.96%
Huerfano	43	0.65%	28	0.77%	15	0.51%
Jackson	80	0.63%	5	0.78%	3	0.49%
Jefferson	5,408	1.30%	2,983	1.45%	2,421	1.14%
Kiowa	8	0.62%	5	0.78%	3	0.46%
Kit Carson	64	1.02%	46	1.38%	18	0.61%
La Plata	481	1.34%	268	1.47%	212	1.20%
Lake	78	1.29%	63	1.93%	15	0.54%
Larimer	3,081	1.53%	1,704	1.70%	1,376	1.35%
Las Animas	171	1.40%	96	1.63%	75	1.19%
Lincoln	42	0.85%	24	0.84%	18	0.87%
Logan	164	1.00%	95	1.09%	69	0.90%
Mesa	1,614	1.74%	916	2.04%	698	1.46%
Mineral	95	1.31%	6	1.75%	3	0.87%
Moffat	124	1.22%	74	1.41%	50	1.02%
Montezuma	218	1.18%	126	1.41%	92	0.96%
Montrose	373	1.43%	221	1.73%	152	1.13%
Morgan	303	1.49%	173	1.71%	129	1.26%

Exhibit VI-2.
Resident Drivers in Injury and Fatality Crashes Per 100 Residents 15 Years of Age and Older, by County, Continued

County	Number of Drivers in Injury and Fatality Crashes	Number of Drivers in Injury and Fatality Crashes as Percent of Population >15 Years of Age	Number of Male Drivers in Injury and Fatality Crashes	Number of Male Drivers in Injury and Fatality Crashes as Percent of Population >15 Years of Age	Number of Female Drivers in Injury and Fatality Crashes	Number of Female Drivers in Injury and Fatality Crashes as Percent of Population >15 Years of Age
Otero	196	1.23%	105	1.37%	91	1.10%
Ouray	256	0.82%	12	0.78%	13	0.86%
Park	1,633	1.39%	94	1.55%	69	1.22%
Phillips	28	0.80%	18	1.08%	10	0.55%
Pitkin	1,206	0.94%	61	0.89%	59	0.99%
Prowers	121	1.11%	72	1.33%	49	0.89%
Pueblo	2,078	1.86%	1,083	2.01%	990	1.72%
Rio Blanco	52	1.10%	34	1.42%	18	0.77%
Rio Grande	90	0.94%	53	1.13%	37	0.76%
Routt	126	0.78%	74	0.85%	51	0.69%
Saguache	51	1.12%	30	1.31%	21	0.92%
Mesa	1,614	1.74%	916	2.04%	698	1.46%
Mineral	95	1.31%	6	1.75%	3	0.87%
Moffat	124	1.22%	74	1.41%	50	1.02%
Montezuma	218	1.18%	126	1.41%	92	0.96%
Montrose	373	1.43%	221	1.73%	152	1.13%
Morgan	303	1.49%	173	1.71%	129	1.26%
Otero	196	1.23%	105	1.37%	91	1.10%
Ouray	256	0.82%	12	0.78%	13	0.86%
Park	1,633	1.39%	94	1.55%	69	1.22%
Phillips	28	0.80%	18	1.08%	10	0.55%
Pitkin	1,206	0.94%	61	0.89%	59	0.99%
Prowers	121	1.11%	72	1.33%	49	0.89%
Pueblo	2,078	1.86%	1,083	2.01%	990	1.72%
Rio Blanco	52	1.10%	34	1.42%	18	0.77%
Rio Grande	90	0.94%	53	1.13%	37	0.76%
Routt	126	0.78%	74	0.85%	51	0.69%
Saguache	51	1.12%	30	1.31%	21	0.92%
San Juan	20	0.42%	1	0.40%	1	0.45%
San Miguel	49	0.87%	26	0.83%	23	0.92%
Sedgwick	11	0.49%	7	0.63%	4	0.35%
Summit	2,442	1.21%	165	1.39%	79	0.96%
Teller	299	1.84%	183	2.23%	116	1.44%
Washington	40	1.03%	22	1.13%	18	0.93%
Weld	2,796	2.02%	1,655	2.41%	1,131	1.63%
Yuma	77	1.01%	49	1.31%	28	0.73%

Source: 2002 CDOT Crash Database.

Exhibit VI-2 presents the numbers of residents in each county who were involved as drivers in injury or fatality accidents as a proportion of the county population aged 15 or older. More then three percent of the driving-age population in Adams County was involved in these accidents in 2002. More than two percent of the populations in Denver and Weld Counties were similarly involved.

Section VI | Crash Driver Residence

Men were more likely to be involved in injury and fatality crashes than women. More than three percent of men in Adams County were involved in these crashes. More than two percent of men in Denver, Mesa, Pueblo, Teller and Weld County were also involved. In contrast, the only county in which more than two percent of women were involved was Adams County.

Exhibit VI-3.
Resident Drivers Involved in Injury and Fatality Crashes, by Sex

County	Female	Male	Sex Unknown	Number of Resident Drivers Involved in Injury and Fatality Crashes
Adams	42.12%	57.56%	0.33%	9,170
Alamosa	43.62%	56.38%	0.00%	149
Arapahoe	44.12%	55.88%	0.00%	4,118
Archuleta	42.40%	57.60%	0.00%	125
Baca	42.86%	57.14%	0.00%	21
Bent	29.73%	70.27%	0.00%	37
Boulder	44.39%	55.49%	0.12%	3,395
Broomfield	42.77%	57.23%	0.00%	663
Chaffee	42.54%	57.46%	0.00%	134
Cheyenne	36.36%	63.64%	0.00%	11
Clear Creek	39.73%	60.27%	0.00%	73
Conejos	41.86%	56.98%	1.16%	86
Costilla	29.73%	70.27%	0.00%	37
Crowley	59.38%	40.63%	0.00%	32
Custer	43.90%	56.10%	0.00%	41
Delta	44.26%	55.74%	0.00%	244
Denver	40.43%	59.12%	0.45%	9,706
Dolores	16.67%	83.33%	0.00%	18
Douglas	45.25%	54.65%	0.10%	1,956
Eagle	39.89%	59.26%	0.85%	351
El Paso	45.16%	54.75%	0.08%	7,125
Elbert	44.84%	55.16%	0.00%	252
Fremont	40.00%	60.00%	0.00%	475
Garfield	39.77%	60.04%	0.19%	523
Gilpin	35.00%	65.00%	0.00%	40
Grand	35.77%	64.23%	0.00%	123
Gunnison	42.98%	57.02%	0.00%	121
Hindsdale	42.86%	57.14%	0.00%	7
Huerfano	34.88%	65.12%	0.00%	43
Jackson	37.50%	62.50%	0.00%	8
Jefferson	44.77%	55.16%	0.07%	5,408
Kiowa	37.50%	62.50%	0.00%	8
Kit Carson	28.13%	71.88%	0.00%	64
La Plata	44.07%	55.72%	0.21%	481
Lake	19.23%	80.77%	0.00%	78
Larimer	44.66%	55.31%	0.03%	3,081
Las Animas	43.86%	56.14%	0.00%	171
Lincoln	42.86%	57.14%	0.00%	42
Logan	42.07%	57.93%	0.00%	164
Mesa	43.25%	56.75%	0.00%	1,614
Mineral	33.33%	66.67%	0.00%	9
Moffat	40.32%	59.68%	0.00%	124

Exhibit VI-3.
Resident Drivers Involved in Injury and Fatality Crashes, by Sex, Continued

County	Female	Male	Sex Unknown	Number of Resident Drivers Involved in Injury and Fatality Crashes
Montezuma	42.20%	57.80%	0.00%	218
Montrose	40.75%	59.25%	0.00%	373
Morgan	42.57%	57.10%	0.33%	303
Otero	46.43%	53.57%	0.00%	196
Ouray	52.00%	48.00%	0.00%	25
Park	42.33%	57.67%	0.00%	163
Phillips	35.71%	64.29%	0.00%	28
Pitkin	49.17%	50.83%	0.00%	120
Prowers	40.50%	59.50%	0.00%	121
Pueblo	47.64%	52.12%	0.24%	2,078
Rio Blanco	34.62%	65.38%	0.00%	52
Rio Grande	41.11%	58.89%	0.00%	90
Routt	40.48%	58.73%	0.79%	126
Saguache	41.18%	58.82%	0.00%	51
San Juan	50.00%	50.00%	0.00%	2
San Miguel	46.94%	53.06%	0.00%	49
Sedgwick	36.36%	63.64%	0.00%	11
Summit	32.38%	67.62%	0.00%	244
Teller	38.80%	61.20%	0.00%	299
Washington	45.00%	55.00%	0.00%	40
Weld	40.45%	59.19%	0.36%	2,796
Yuma	36.36%	63.64%	0.00%	77

Source: 2002 CDOT Crash Database.

Exhibit VI-3 reiterates this point. Across counties, men typically constituted between 55% and 60% of the residents involved in injury and fatality crashes.

Exhibit VI-4.
Resident Drivers Involved in Injury and Fatality Crashes, by Age

	Age <17	Age 17-21	Age 22-25	Age 25-54	Age 55-64	Age >65	Number of Resident Drivers
Adams	26.99%	12.72%	6.84%	45.16%	3.12%	5.18%	9,170
Alamosa	16.78%	24.83%	7.38%	38.93%	3.36%	8.72%	149
Arapahoe	22.54%	14.47%	5.93%	45.87%	4.27%	6.92%	4,118
Archuleta	13.60%	14.40%	6.40%	45.60%	5.60%	14.40%	125
Baca	28.57%	9.52%	4.76%	47.62%	0.00%	9.52%	21
Bent	18.92%	16.22%	8.11%	56.76%	0.00%	0.00%	37
Boulder	17.64%	15.49%	8.10%	47.81%	4.12%	6.83%	3,395
Broomfield	14.01%	15.81%	8.28%	52.86%	3.92%	5.12%	663
Chaffee	22.39%	12.69%	6.72%	41.04%	2.24%	14.93%	134
Cheyenne	9.09%	18.18%	0.00%	63.64%	0.00%	9.09%	11
Clear Creek	13.70%	9.59%	4.11%	54.79%	5.48%	12.33%	73
Conejos	11.63%	19.77%	10.47%	44.19%	6.98%	6.98%	86
Costilla	5.41%	21.62%	8.11%	40.54%	8.11%	16.22%	37
Crowley	3.13%	12.50%	12.50%	43.75%	3.13%	25.00%	32
Custer	9.76%	14.63%	0.00%	41.46%	21.95%	12.20%	41
Delta	14.34%	15.16%	5.74%	47.13%	4.10%	13.52%	244
Denver	27.10%	10.38%	8.15%	44.58%	3.03%	6.77%	9,706
Dolores	11.11%	5.56%	5.56%	38.89%	16.67%	22.22%	18
Douglas	20.35%	13.80%	5.16%	52.56%	3.53%	4.60%	1,956
Eagle	14.53%	11.11%	9.97%	58.69%	2.85%	2.85%	351
El Paso	12.93%	17.35%	8.10%	50.20%	3.76%	7.66%	7,125
Elbert	21.43%	18.65%	4.37%	42.86%	6.35%	6.35%	252
Fremont	23.58%	15.37%	6.53%	38.11%	5.68%	10.74%	475
Garfield	21.61%	15.30%	5.54%	46.46%	5.16%	5.93%	523
Gilpin	5.00%	5.00%	10.00%	60.00%	7.50%	12.50%	40
Grand	8.94%	18.70%	11.38%	47.97%	5.69%	7.32%	123
Gunnison	14.88%	20.66%	13.22%	38.84%	3.31%	9.09%	121
Hindsdale	14.29%	0.00%	28.57%	42.86%	0.00%	14.29%	7
Huerfano	16.28%	9.30%	6.98%	39.53%	6.98%	20.93%	43
Jackson	25.00%	37.50%	0.00%	37.50%	0.00%	0.00%	8
Jefferson	19.18%	13.72%	6.71%	47.45%	4.46%	8.49%	5,408
Kiowa	0.00%	37.50%	0.00%	37.50%	0.00%	25.00%	8
Kit Carson	26.56%	18.75%	4.69%	40.63%	4.69%	4.69%	64
La Plata	9.15%	18.30%	10.81%	50.94%	2.08%	8.73%	481
Lake	12.82%	14.10%	5.13%	60.26%	2.56%	5.13%	78
Larimer	24.15%	18.57%	7.53%	40.02%	2.92%	6.82%	3,081
Las Animas	28.07%	15.79%	5.26%	36.84%	2.92%	11.11%	171
Lincoln	19.05%	21.43%	2.38%	45.24%	2.38%	9.52%	42
Logan	17.07%	19.51%	9.15%	36.59%	5.49%	12.20%	164

Exhibit VI-4.
Resident Drivers Involved in Injury and Fatality Crashes by Age, Continued

	Age <17	Age 17-21	Age 22-25	Age 25-54	Age 55-64	Age >65	Number of Resident Drivers
Mesa	14.87%	17.91%	6.88%	43.49%	5.08%	11.77%	1,614
Mineral	0.00%	0.00%	22.22%	77.78%	0.00%	0.00%	9
Moffat	22.58%	12.10%	2.42%	47.58%	4.84%	10.48%	124
Montezuma	16.06%	17.43%	5.05%	44.50%	5.50%	11.47%	218
Montrose	17.16%	21.98%	5.63%	37.53%	4.29%	13.40%	373
Morgan	14.85%	18.81%	5.94%	46.86%	1.98%	11.55%	303
Otero	19.39%	16.84%	8.16%	38.27%	2.55%	14.80%	196
Ouray	12.00%	20.00%	8.00%	40.00%	8.00%	12.00%	25
Park	11.66%	12.27%	4.29%	58.90%	4.91%	7.98%	163
Phillips	10.71%	17.86%	0.00%	39.29%	10.71%	21.43%	28
Pitkin	40.00%	7.50%	7.50%	37.50%	4.17%	3.33%	120
Prowers	17.36%	24.79%	6.61%	38.84%	2.48%	9.92%	121
Pueblo	16.22%	16.75%	6.26%	46.49%	3.90%	10.39%	2,078
Rio Blanco	15.38%	9.62%	0.00%	63.46%	1.92%	9.62%	52
Rio Grande	15.56%	21.11%	3.33%	36.67%	7.78%	15.56%	90
Routt	25.40%	11.90%	5.56%	49.21%	3.17%	4.76%	126
Saguache	11.76%	25.49%	7.84%	37.25%	3.92%	13.73%	51
San Juan	0.00%	0.00%	0.00%	100%	0.00%	0.00%	2
San Miguel	22.45%	10.20%	6.12%	55.10%	4.08%	2.04%	49
Sedgwick	18.18%	9.09%	9.09%	36.36%	9.09%	18.18%	11
Summit	10.25%	14.34%	10.25%	58.61%	2.87%	3.69%	244
Teller	9.36%	16.39%	5.69%	53.51%	7.69%	7.36%	299
Washington	32.50%	17.50%	2.50%	27.50%	10.00%	10.00%	40
Weld	22.42%	16.49%	7.69%	44.74%	3.15%	5.51%	2,796
Yuma	24.68%	20.78%	10.39%	31.17%	2.60%	10.39%	77

Source: 2002 CDOT Crash Database.

Exhibit VI-4 presents the distributions by age of residents in each county who were involved as drivers in injury and fatality crashes. These distributions differ, sometimes dramatically. For example, of drivers in these crashes who were resident in El Paso County, less than 13% were less than 17 years of age. However, in Adams and Denver Counties, the share of these drivers was more than twice as high, at approximately 27%, Similarly, residents aged 65 and over constituted slightly more than 5% of all drivers in injury and fatality accidents in Weld County, but nearly 12% in Mesa County.

Exhibit VI-5.
Resident Drivers Involved in Injury and Fatality Crashes, by Contributing Factors

County	No Contributing Factor	Asleep at Wheel	Sick	Distracted by Passenger	Inexperience	Fatigue	Preocupied	Unfamiliar with Area	Emotionally Upset	Evading Law Enforcement	Physical Disability	Number of Resident Drivers with Reported Contributing Factors
Adams	83.33%	0.74%	0.43%	0.44%	3.95%	0.25%	8.94%	1.19%	0.31%	0.23%	0.20%	8,405
Alamosa	62.50%	2.08%	0.69%	0.00%	9.72%	0.69%	19.44%	2.78%	1.39%	0.00%	0.69%	144
Arapahoe	80.51%	0.59%	0.46%	0.67%	4.96%	0.21%	10.58%	1.23%	0.31%	0.23%	0.26%	3,895
Archuleta	71.79%	0.85%	0.00%	0.85%	8.55%	0.85%	11.97%	2.56%	1.71%	0.00%	0.85%	117
Baca	66.67%	0.00%	0.00%	0.00%	23.81%	0.00%	4.76%	0.00%	0.00%	4.76%	0.00%	21
Bent	62.16%	5.41%	0.00%	2.70%	5.41%	0.00%	8.11%	5.41%	8.11%	2.70%	0.00%	37
Boulder	83.78%	1.20%	0.52%	0.58%	4.46%	0.37%	6.86%	1.66%	0.31%	0.06%	0.18%	3,249
Broomfield	81.77%	1.11%	0.48%	0.16%	4.75%	0.63%	9.51%	0.95%	0.00%	0.32%	0.32%	631
Chaffee	64.62%	3.85%	3.08%	0.00%	6.92%	1.54%	16.92%	2.31%	0.00%	0.00%	0.77%	130
Cheyenne	70.00%	10.00%	0.00%	0.00%	0.00%	0.00%	10.00%	10.00%	0.00%	0.00%	0.00%	10
Clear Creek	78.87%	2.82%	0.00%	0.00%	7.04%	0.00%	9.86%	1.41%	0.00%	0.00%	0.00%	71
Conejos	58.02%	2.47%	1.23%	1.23%	3.70%	2.47%	30.86%	0.00%	0.00%	0.00%	0.00%	81
Costilla	48.57%	2.86%	2.86%	5.71%	2.86%	0.00%	34.29%	0.00%	2.86%	0.00%	0.00%	35
Crowley	54.84%	12.90%	3.23%	0.00%	3.23%	0.00%	19.35%	6.45%	0.00%	0.00%	0.00%	31
Custer	63.16%	5.26%	0.00%	0.00%	7.89%	0.00%	21.05%	2.63%	0.00%	0.00%	0.00%	38
Delta	70.00%	2.92%	0.00%	0.00%	6.25%	1.67%	17.50%	0.42%	0.42%	0.83%	0.00%	240
Denver	82.37%	1.04%	0.69%	0.31%	3.56%	0.35%	9.68%	1.19%	0.28%	0.29%	0.25%	9,022
Dolores	72.22%	5.56%	0.00%	0.00%	5.56%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	18
Douglas	79.32%	1.38%	0.58%	0.32%	6.17%	0.27%	10.21%	1.44%	0.21%	0.00%	0.11%	1,881
Eagle	70.97%	3.52%	0.88%	1.47%	9.97%	0.59%	9.68%	1.76%	0.29%	0.29%	0.59%	341
El Paso	83.83%	0.92%	0.53%	0.53%	4.39%	0.26%	7.62%	1.08%	0.41%	0.23%	0.21%	7,036
Elbert	78.60%	1.65%	1.23%	0.82%	7.82%	0.41%	8.23%	1.23%	0.00%	0.00%	0.00%	243
Fremont	75.45%	2.95%	0.91%	0.23%	3.18%	0.00%	14.09%	1.14%	0.68%	0.68%	0.68%	440
Garfield	69.17%	4.74%	1.19%	0.79%	7.91%	1.38%	12.25%	1.98%	0.40%	0.00%	0.20%	506
Gilpin	70.00%	0.00%	0.00%	2.50%	10.00%	0.00%	15.00%	2.50%	0.00%	0.00%	0.00%	40
Grand	74.36%	3.42%	0.00%	1.71%	3.42%	0.00%	11.97%	3.42%	0.85%	0.00%	0.85%	117
Gunnison	61.61%	1.79%	3.57%	0.00%	8.93%	0.00%	18.75%	4.46%	0.00%	0.89%	0.00%	112
Hindsdale	57.14%	14.29%	0.00%	0.00%	0.00%	0.00%	14.29%	14.29%	0.00%	0.00%	0.00%	7
Huerfano	65.00%	5.00%	0.00%	0.00%	2.50%	12.50%	12.50%	0.00%	0.00%	2.50%	0.00%	40
Jackson	42.86%	28.57%	0.00%	0.00%	0.00%	0.00%	28.57%	0.00%	0.00%	0.00%	0.00%	7
Jefferson	82.48%	1.02%	0.62%	0.50%	4.21%	0.42%	8.48%	1.22%	0.48%	0.24%	0.32%	4,990
Kiowa	75.00%	0.00%	0.00%	0.00%	12.50%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	8
Kit Carson	60.32%	3.17%	0.00%	3.17%	14.29%	0.00%	11.11%	6.35%	0.00%	0.00%	1.59%	63
La Plata	72.79%	3.40%	0.23%	0.45%	5.44%	0.45%	14.74%	1.36%	0.45%	0.45%	0.23%	441
Lake	62.34%	5.19%	2.60%	2.60%	10.39%	1.30%	11.69%	2.60%	1.30%	0.00%	0.00%	77
Larimer	73.28%	1.16%	0.58%	0.65%	5.91%	0.40%	15.92%	1.20%	0.22%	0.29%	0.40%	2,758

Exhibit VI-5.
Resident Drivers Involved in Injury and Fatality Crashes, by Contributing Factors, Continued

County	No Contributing Factor	Asleep at Wheel	Sick	Distracted by Passenger	Inexperience	Fatigue	Preocupied	Unfamiliar with Area	Emotionally Upset	Evading Law Enforcement	Physical Disability	Number of Resident Drivers with Reported Contributing Factors
Las Animas	58.18%	2.42%	1.21%	0.61%	9.70%	1.21%	23.03%	1.82%	1.82%	0.00%	0.00%	165
Lincoln	74.36%	5.13%	0.00%	2.56%	2.56%	5.13%	5.13%	2.56%	2.56%	0.00%	0.00%	39
Logan	64.15%	3.14%	0.63%	1.89%	12.58%	0.63%	13.21%	3.14%	0.63%	0.00%	0.00%	159
Mesa	74.68%	1.53%	0.38%	0.45%	5.85%	0.00%	15.20%	1.15%	0.13%	0.13%	0.51%	1,572
Mineral	22.22%	22.22%	22.22%	0.00%	0.00%	0.00%	11.11%	11.11%	0.00%	0.00%	11.11%	9
Moffat	67.52%	0.85%	2.56%	0.85%	14.53%	1.71%	10.26%	1.71%	0.00%	0.00%	0.00%	117
Montezuma	67.61%	1.88%	0.94%	2.35%	12.68%	0.94%	11.74%	0.94%	0.00%	0.47%	0.47%	213
Montrose	75.42%	2.23%	0.56%	1.12%	7.82%	0.56%	10.61%	0.56%	0.28%	0.00%	0.84%	358
Morgan	65.66%	3.70%	0.34%	0.34%	11.45%	3.03%	12.79%	2.02%	0.34%	0.00%	0.34%	297
Otero	74.47%	2.13%	1.60%	0.53%	6.91%	1.06%	9.57%	3.19%	0.00%	0.00%	0.53%	188
Ouray	83.33%	0.00%	0.00%	0.00%	12.50%	0.00%	4.17%	0.00%	0.00%	0.00%	0.00%	24
Park	77.64%	2.48%	0.62%	0.00%	1.86%	0.62%	16.15%	0.62%	0.00%	0.00%	0.00%	161
Phillips	75.00%	0.00%	0.00%	0.00%	10.71%	3.57%	3.57%	7.14%	0.00%	0.00%	0.00%	28
Pitkin	68.42%	3.51%	0.88%	0.00%	7.02%	1.75%	13.16%	4.39%	0.88%	0.00%	0.00%	114
Prowers	71.67%	2.50%	2.50%	1.67%	7.50%	0.83%	11.67%	1.67%	0.00%	0.00%	0.00%	120
Pueblo	82.21%	0.96%	0.27%	0.64%	4.70%	0.75%	8.07%	1.34%	0.43%	0.37%	0.27%	1,872
Rio Blanco	74.47%	6.38%	0.00%	2.13%	4.26%	2.13%	6.38%	4.26%	0.00%	0.00%	0.00%	47
Rio Grande	58.14%	1.16%	3.49%	1.16%	11.63%	2.33%	17.44%	2.33%	1.16%	1.16%	0.00%	86
Routt	75.41%	4.10%	0.00%	0.82%	8.20%	1.64%	6.56%	1.64%	1.64%	0.00%	0.00%	122
Saguache	67.35%	4.08%	0.00%	2.04%	8.16%	2.04%	14.29%	2.04%	0.00%	0.00%	0.00%	49
San Juan	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2
San Miguel	75.56%	8.89%	0.00%	2.22%	4.44%	0.00%	8.89%	0.00%	0.00%	0.00%	0.00%	45
Sedgwick	50.00%	20.00%	0.00%	10.00%	10.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10
Summit	86.38%	2.13%	0.00%	0.43%	3.83%	0.85%	6.38%	0.00%	0.00%	0.00%	0.00%	235
Teller	74.74%	3.07%	1.71%	0.34%	7.51%	0.34%	10.92%	1.37%	0.00%	0.00%	0.00%	293
Washington	61.54%	2.56%	2.56%	0.00%	25.64%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	39
Weld	78.33%	1.40%	0.47%	0.58%	5.71%	0.70%	9.67%	1.32%	0.39%	1.09%	0.35%	2,575
Yuma	53.33%	8.00%	0.00%	2.67%	20.00%	4.00%	6.67%	1.33%	1.33%	0.00%	2.67%	75

Source: 2002 CDOT Crash Database.

Section VI | Crash Driver Residence

Exhibit VI-5 reports the incidence of various contributing factors to injury and fatality crashes among the residents of each county. The most common factors were inexperience and preoccupation. Again, counties vary widely. More than 83% of drivers resident in Adams, Boulder and El Paso Counties exhibited no observed contributing factors. However, this was true of only 75% of drivers resident in Mesa County.

Exhibit VI-6.
Resident Drivers Involved in Injury and Fatality Crashes, by Condition of Driver

County	No Suspected Impairment	Alcohol	RX Drugs or Medication	Illegal Drugs	Alcohol and Drugs	Not Observed	Number of Resident Drivers with Reported Condition of Driver
Adams	92.59%	5.25%	0.21%	0.09%	0.40%	1.47%	8,579
Alamosa	92.62%	4.70%	1.34%	0.00%	0.67%	0.67%	149
Arapahoe	92.43%	5.04%	0.20%	0.30%	0.38%	1.65%	3,950
Archuleta	84.30%	12.40%	0.00%	0.00%	0.00%	3.31%	121
Baca	90.48%	9.52%	0.00%	0.00%	0.00%	0.00%	21
Bent	89.19%	8.11%	0.00%	0.00%	0.00%	2.70%	37
Boulder	93.05%	4.77%	0.15%	0.06%	0.34%	1.63%	3,251
Broomfield	92.66%	5.94%	0.00%	0.31%	0.00%	1.09%	640
Chaffee	90.24%	6.50%	0.00%	1.63%	0.00%	1.63%	123
Cheyenne	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10
Clear Creek	87.50%	4.17%	0.00%	1.39%	1.39%	5.56%	72
Conejos	81.25%	12.50%	0.00%	1.25%	2.50%	2.50%	80
Costilla	86.49%	10.81%	0.00%	0.00%	0.00%	2.70%	37
Crowley	80.00%	20.00%	0.00%	0.00%	0.00%	0.00%	30
Custer	92.50%	7.50%	0.00%	0.00%	0.00%	0.00%	40
Delta	84.32%	10.17%	0.42%	0.00%	0.00%	5.08%	236
Denver	91.77%	5.98%	0.18%	0.26%	0.47%	1.34%	9,195
Dolores	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17
Douglas	94.52%	3.83%	0.27%	0.05%	0.21%	1.12%	1,878
Eagle	84.06%	10.14%	0.29%	0.58%	0.58%	4.35%	345
El Paso	92.21%	5.36%	0.30%	0.30%	0.33%	1.50%	7,048
Elbert	93.83%	1.65%	0.00%	0.41%	0.00%	4.12%	243
Fremont	90.63%	7.14%	0.45%	0.00%	0.00%	1.79%	448
Garfield	88.84%	6.37%	0.40%	0.20%	0.60%	3.59%	502
Gilpin	82.50%	12.50%	0.00%	0.00%	2.50%	2.50%	40
Grand	88.43%	4.96%	0.00%	0.83%	0.83%	4.96%	121
Gunnison	81.65%	11.93%	0.92%	0.00%	0.00%	5.50%	109
Hindsdale	71.43%	14.29%	0.00%	0.00%	14.29%	0.00%	7
Huerfano	76.92%	12.82%	2.56%	2.56%	2.56%	2.56%	39
Jackson	83.33%	0.00%	0.00%	0.00%	0.00%	16.67%	6
Jefferson	92.02%	5.86%	0.20%	0.22%	0.29%	1.41%	5,089
Kiowa	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8
Kit Carson	93.55%	1.61%	0.00%	0.00%	3.23%	1.61%	62
La Plata	86.10%	7.85%	0.45%	0.22%	0.22%	5.16%	446
Lake	84.62%	8.97%	0.00%	0.00%	1.28%	5.13%	78
Larimer	91.89%	5.74%	0.14%	0.35%	0.17%	1.70%	2,874
Las Animas	87.18%	8.97%	1.28%	0.64%	0.00%	1.92%	156
Lincoln	87.50%	2.50%	5.00%	0.00%	0.00%	5.00%	40
Logan	90.00%	7.50%	0.00%	0.00%	0.00%	2.50%	160

Exhibit VI-6.
Resident Drivers Involved in Injury and Fatality Crashes, by Condition of Driver, Continued

County	No Suspected Impairment	Alcohol	RX Drugs or Medication	Illegal Drugs	Alcohol and Drugs	Not Observed	Number of Resident Drivers with Reported Condition of Driver
Mesa	92.84%	4.88%	0.32%	0.32%	0.44%	1.20%	1,578
Mineral	66.67%	22.22%	11.11%	0.00%	0.00%	0.00%	9
Moffat	97.56%	0.81%	0.00%	0.00%	0.00%	1.63%	123
Montezuma	83.72%	9.30%	0.93%	0.93%	0.00%	5.12%	215
Montrose	89.84%	6.32%	0.00%	0.27%	0.82%	2.75%	364
Morgan	89.23%	8.75%	0.00%	0.67%	0.34%	1.01%	297
Otero	89.69%	5.67%	0.00%	0.00%	0.52%	4.12%	194
Ouray	82.61%	17.39%	0.00%	0.00%	0.00%	0.00%	23
Park	87.34%	5.06%	0.63%	0.63%	1.27%	5.06%	158
Phillips	85.71%	10.71%	0.00%	0.00%	0.00%	3.57%	28
Pitkin	90.35%	5.26%	0.00%	0.00%	0.00%	4.39%	114
Prowers	92.44%	5.04%	0.84%	0.00%	0.84%	0.84%	119
Pueblo	92.13%	6.09%	0.20%	0.10%	0.40%	1.09%	2,020
Rio Blanco	84.62%	11.54%	0.00%	0.00%	1.92%	1.92%	52
Rio Grande	86.67%	12.22%	0.00%	0.00%	0.00%	1.11%	90
Routt	90.32%	4.84%	0.00%	0.00%	0.81%	4.03%	124
Saguache	92.00%	6.00%	2.00%	0.00%	0.00%	0.00%	50
San Juan	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2
San Miguel	65.91%	20.45%	0.00%	0.00%	0.00%	13.64%	44
Sedgwick	80.00%	10.00%	0.00%	0.00%	10.00%	0.00%	10
Summit	86.67%	9.33%	0.00%	0.00%	0.44%	3.56%	225
Teller	89.35%	6.19%	0.34%	0.00%	0.34%	3.78%	291
Washington	92.31%	5.13%	0.00%	0.00%	2.56%	0.00%	39
Weld	90.72%	6.90%	0.27%	0.15%	0.31%	1.65%	2,608
Yuma	86.49%	5.41%	1.35%	0.00%	0.00%	6.76%	74

Source: 2002 CDOT Crash Database.

Exhibit VI-6 presents rates of impairment among drivers resident in each county who were involved in injury or fatality crashes. Reported rates of impairment vary widely. However, some of this variation is attributable to small counties, in which one or two impaired drivers can constitute a large proportion of all involved drivers. Among the larger counties, typically 90% or more of resident drivers in injury and fatality crashes were not suspected of impairment. In virtually all counties, alcohol was the most frequent form of impairment.

Exhibit VI-7
Resident Drivers Involved in Injury and Fatal Crashes Outside County of Residence as Percent of all Resident Drivers Involved in Crashes

County	Number of Resident Drivers Involved in Injury and Fatal Crashes	Number of Resident Drivers Involved in Injury and Fatal Crashes Outside County of Residence as Percent of all Resident Drivers Involved in Injury and Fatal Crashes
Adams	9,170	72.04%
Alamosa	149	30.87%
Arapahoe	4,118	63.72%
Archuleta	125	21.60%
Baca	21	52.38%
Bent	37	43.24%
Boulder	3,395	25.95%
Chaffee	134	40.30%
Cheyenne	11	63.64%
Clear Creek	73	68.49%
Conejos	86	46.51%
Costilla	37	59.46%
Crowley	32	62.50%
Custer	41	48.78%
Delta	244	39.75%
Denver	9,706	40.97%
Dolores	18	61.11%
Douglas	1,956	60.63%
Eagle	351	41.88%
El Paso	7,125	11.65%
Elbert	252	73.02%
Fremont	475	40.84%
Garfield	523	36.52%
Gilpin	40	82.50%
Grand	123	52.85%
Gunnison	121	46.28%
Hindsdale	7	71.43%
Huerfano	43	55.81%
Jackson	8	75.00%
Jefferson	5,408	47.30%
Kiowa	8	62.50%
Kit Carson	64	42.19%
La Plata	481	14.55%
Lake	78	64.10%
Larimer	3,081	24.63%
Las Animas	171	21.05%
Lincoln	42	59.52%
Logan	164	34.15%
Mesa	1,614	14.25%
Mineral	9	88.89%
Moffat	124	35.48%
Montezuma	218	22.94%
Montrose	373	32.17%
Morgan	303	33.33%
Otero	196	32.65%
Ouray	25	56.00%
Park	163	87.73%
Phillips	28	60.71%
Pitkin	120	40.00%
Prowers	121	27.27%

Exhibit VI-7
Resident Drivers Involved in Injury and Fatal Crashes Outside County of Residence as Percent of all Resident Drivers Involved in Crashes, Continued

County	Number of Resident Drivers Involved in Injury and Fatal Crashes	Number of Resident Drivers Involved in Injury and Fatal Crashes Outside County of Residence as Percent of all Resident Drivers Involved in Injury and Fatal Crashes
Pueblo	2,078	15.98%
Rio Blanco	52	34.62%
Rio Grande	90	56.67%
Routt	126	38.10%
Saguache	51	62.75%
San Juan	2	50.00%
San Miguel	49	55.10%
Sedgwick	11	72.73%
Summit	244	42.21%
Teller	299	53.85%
Washington	40	62.50%
Weld	2,796	38.52%
Yuma	77	42.86%

Source: 2002 CDOT Crash Database.

Exhibit VI-7 describes the propensities of drivers resident in each county to become involved in injury or fatal crashes outside their county of residence. This propensity varies substantially. For example, more than 70% of Adams County residents who became involved in injury or fatality crashes did so outside of Adams County. In contrast, only about 16% of Pueblo County residents who became so involved did so outside of Pueblo County.

Exhibit VI-8.
Drivers Involved in Crashes Outside County of Residence as Percent of all Resident Drivers Involved in Crashes

County	Number of Drivers Involved in Injury and Fatal Crashes within County	Number of Drivers Involved in Injury and Fatal Crashes within County with Residence in a Different County as Percent of all Drivers Involved in Injury and Fatal Crashes within County
Adams	4,994	48.66%
Alamosa	183	43.72%
Arapahoe	7,008	78.68%
Archuleta	130	24.62%
Baca	15	33.33%
Bent	41	48.78%
Boulder	3,488	27.92%
Chaffee	149	46.31%
Cheyenne	14	71.43%
Clear Creek	281	91.81%
Conejos	62	25.81%
Costilla	44	65.91%
Crowley	27	55.56%
Custer	42	50.00%
Delta	213	30.99%
Denver	11,052	48.16%
Dolores	16	56.25%
Douglas	1,798	57.17%
Eagle	367	44.41%
El Paso	7,231	12.94%
Elbert	147	53.74%
Fremont	380	26.05%
Garfield	488	31.97%
Gilpin	64	89.06%
Grand	127	54.33%
Gunnison	125	48.00%
Hinsdale	7	71.43%
Huerfano	57	66.67%
Jackson	20	90.00%
Jefferson	5,480	47.99%
Kiowa	14	78.57%
Kit Carson	71	47.89%
La Plata	472	12.92%
Lake	48	41.67%
Larimer	2,982	22.13%
Las Animas	173	21.97%
Lincoln	47	63.83%
Logan	170	36.47%
Mesa	1,606	13.82%
Mineral	20	95.00%
Moffat	107	25.23%

Exhibit VI-8.
Drivers Involved in Crashes Outside County of Residence as Percent of all Resident Drivers Involved in Crashes, Continued

County	Number of Drivers Involved in Injury and Fatal Crashes within County	Number of Drivers Involved in Injury and Fatal Crashes within County with Residence in a Different County as Percent of all Drivers Involved in Injury and Fatal Crashes within County
Montezuma	197	14.72%
Montrose	322	21.43%
Morgan	279	27.60%
Otero	180	26.67%
Ouray	44	75.00%
Park	56	64.29%
Phillips	19	42.11%
Pitkin	163	55.83%
Prowers	120	26.67%
Pueblo	2,036	14.24%
Rio Blanco	67	49.25%
Rio Grande	79	50.63%
Routt	127	38.58%
Saguache	47	59.57%
San Juan	9	88.89%
San Miguel	39	43.59%
Sedgwick	15	80.00%
Summit	311	54.66%
Teller	247	44.13%
Washington	37	59.46%
Weld	2,546	32.48%
Yuma	65	32.31%

Source: 2002 CDOT Crash Database.

Exhibit VI-8 reports the extent to which injury and fatality crashes in each county involved drivers resident in that county. Again, counties varied widely in their experience. Barely 14% of drivers involved in injury and fatality crashes that took place in Pueblo County had residences in other counties. In contrast, almost 79% of drivers involved in crashes of these types in Arapahoe County resided elsewhere.

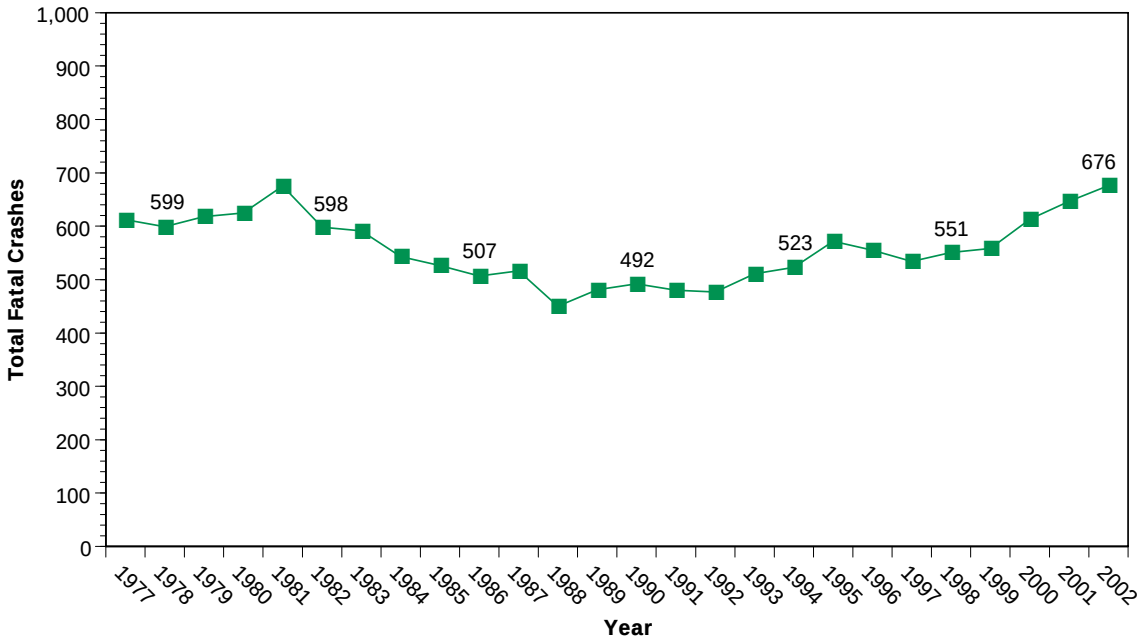
Section VII | Fatal Accident Reporting System Data

Section VII | Fatal Accident Reporting System Data

Introduction

In 2002 there were 676 fatal crashes in the State of Colorado. The annual number of fatal crashes has increased slowly since approximately 1987.

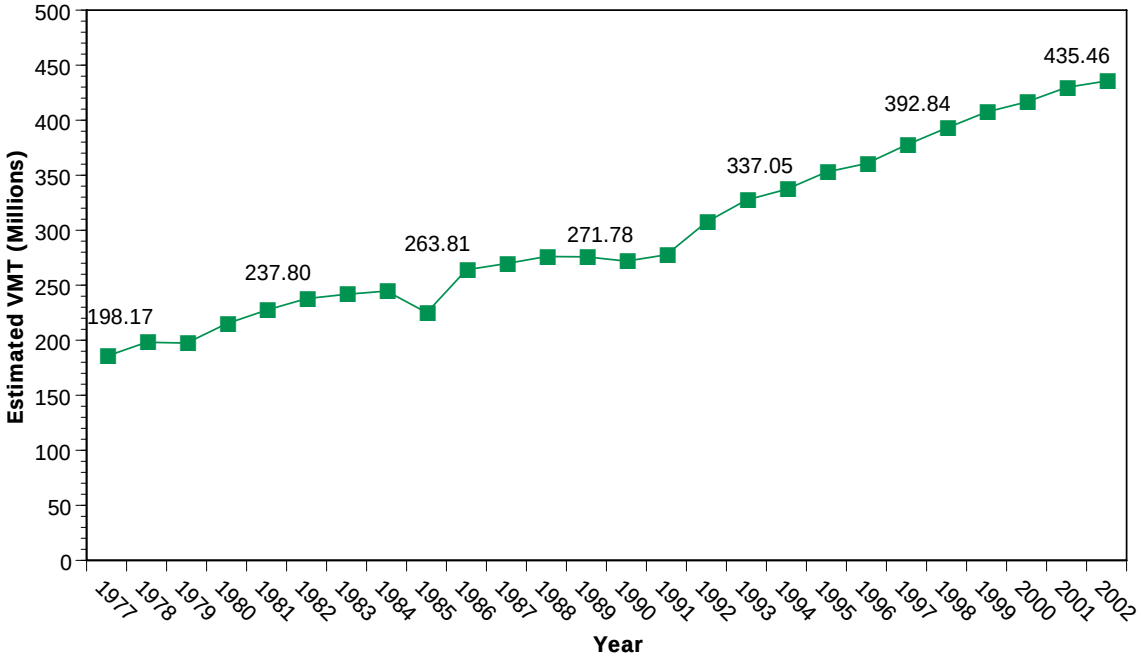
Exhibit VII-1a.
Number of Fatal Crashes, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Vehicle Miles Traveled (VMT) in Colorado have been steadily increasing over time.

Exhibit VII-1b.
Estimated Vehicle Miles Traveled (VMT) in Millions, 1977-2002

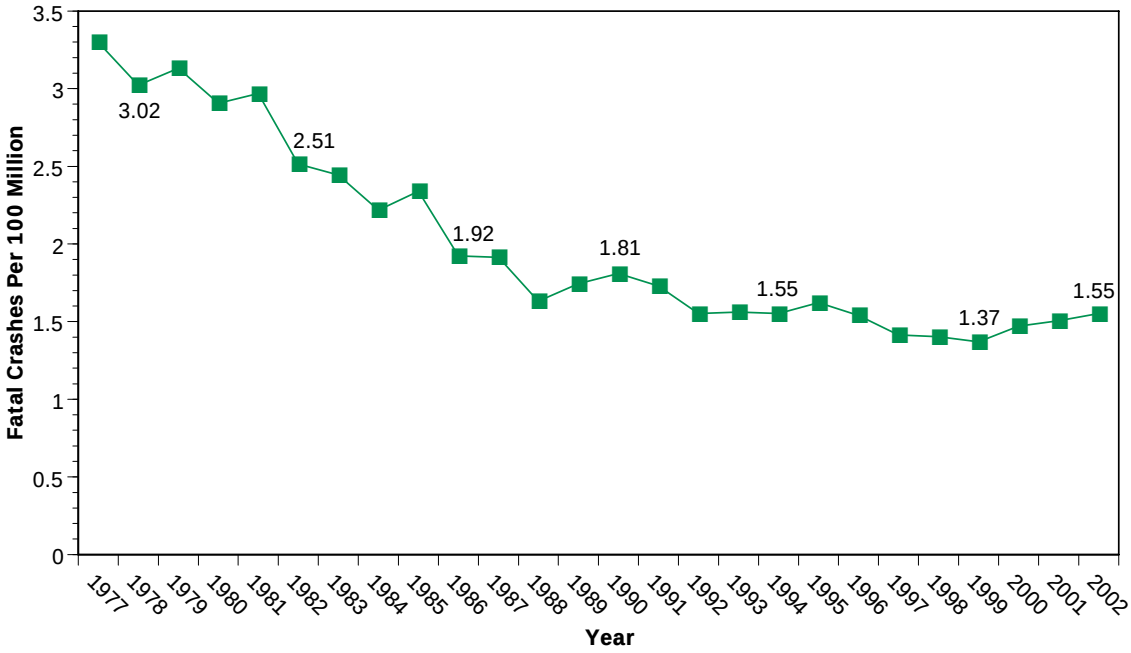


Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Annual estimated vehicle miles traveled (VMT) have increased consistently over the past 25 years, with the exception of an unexplained decline in 1985.

In general, fatal crashes per 100 million VMT declined steadily from the late 1970s through the mid-1990s. In subsequent years the fatal crash rate has varied within a relatively narrow range. In 2002 it climbed to 1.55 fatal crashes per 100 million VMT, up from the historic low of 1.37 in 1999.

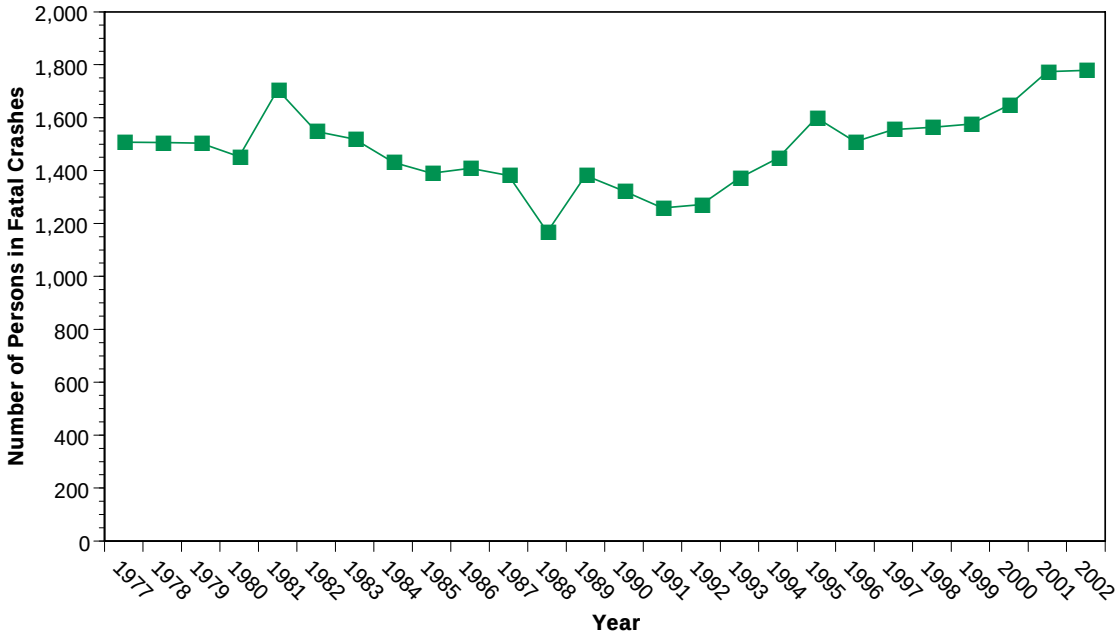
Exhibit VII-1c.
Fatal Crashes per 100 Million VMT, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

The number of persons involved in fatal crashes, including all passengers, drivers, pedestrians and bicyclists has risen in recent years to historic highs. However, this increase largely mirrors the increase in fatal Crashes. The number of involved persons per crash had not changed noticeably.

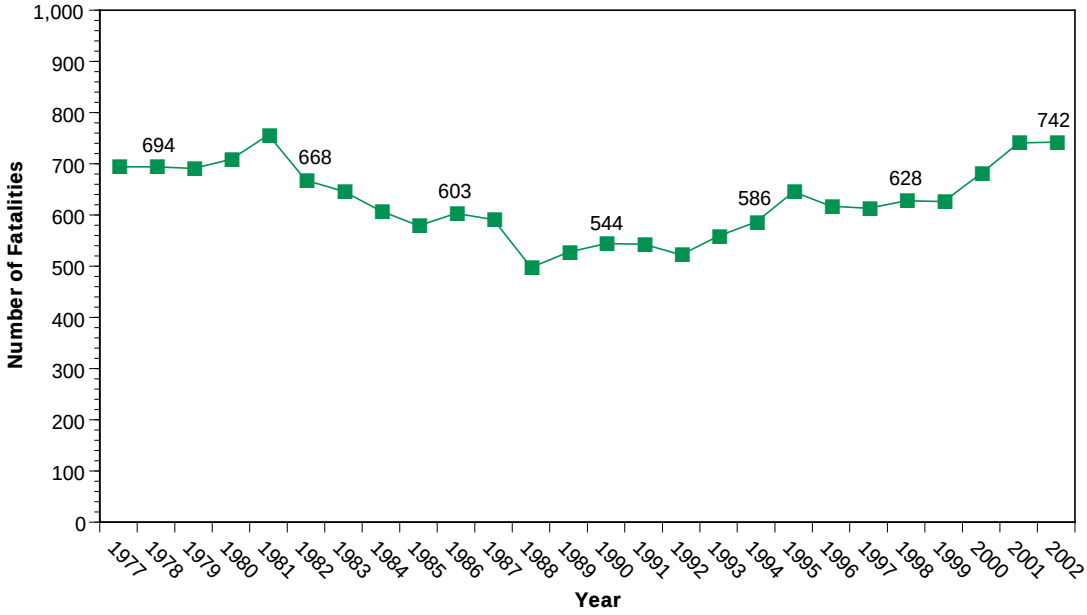
Exhibit VII-2a.
Number of Persons Involved in Fatal Crashes, 1997-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, 742 people died in Colorado crashes involving a motor vehicle. The number of annual fatalities rose throughout the 1990s and into the most recent years. Again, the historical pattern mirrors that in the numbers of fatal Crashes.

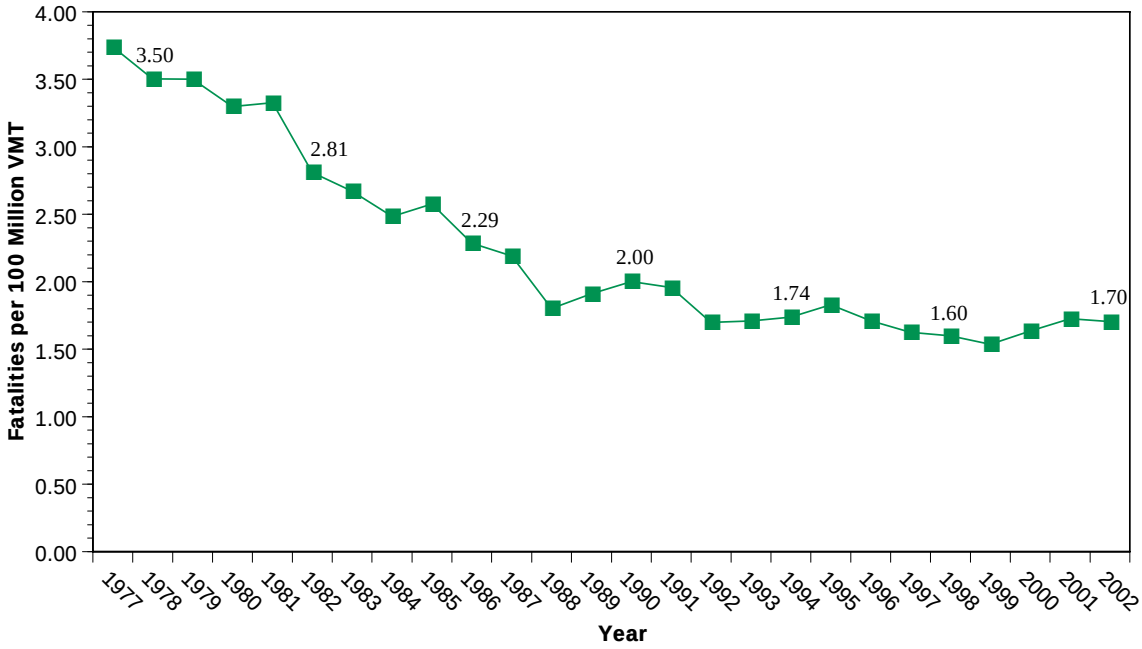
Exhibit VII-2b.
Fatalities, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, there were 1.7 fatalities per 100 million VMT. As with the number of fatal crashes per 100 million VMT, the fatality rate has declined regularly from 1977 through the early 1990s, reflecting changes in vehicle safety, roadway engineering improvements and an increased focus on promoting safe driving behavior. In subsequent years, the fatality rate has oscillated within a fairly narrow range

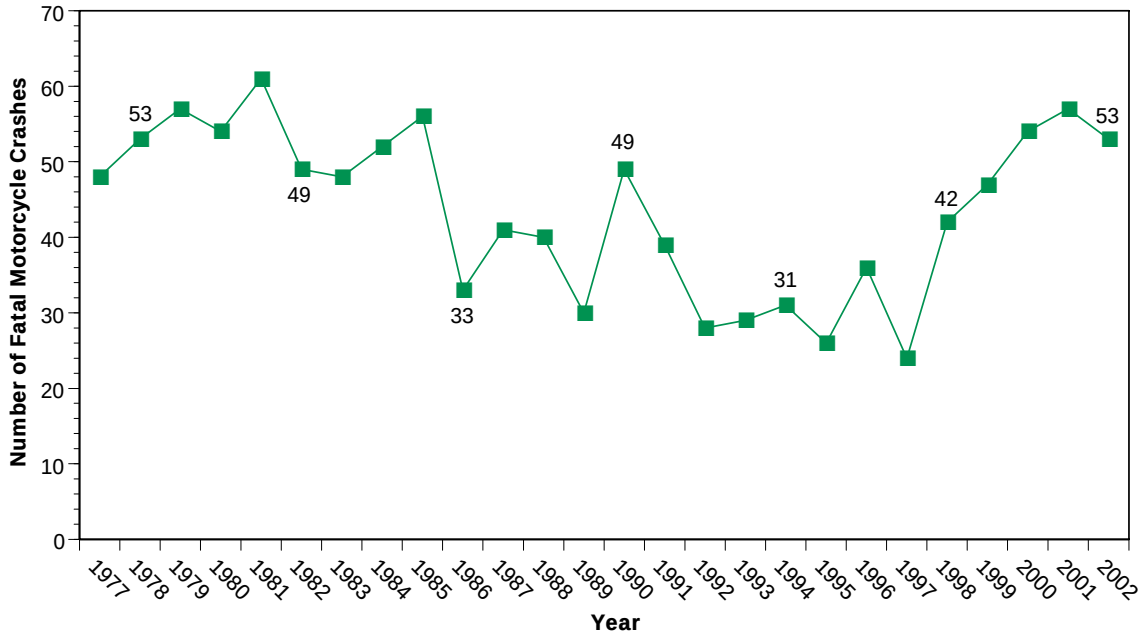
Exhibit VII-2c.
Fatalities Per 100 Million VMT, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

The number of fatal crashes that involve a motorcycle has been up and down since the late 1970s. As motorcycles increase in popularity (or decrease), it follows that fatal crashes will increase (or decrease). In 2002, 53 fatal crashes involved a motorcycle, or 8% of all fatal crashes.

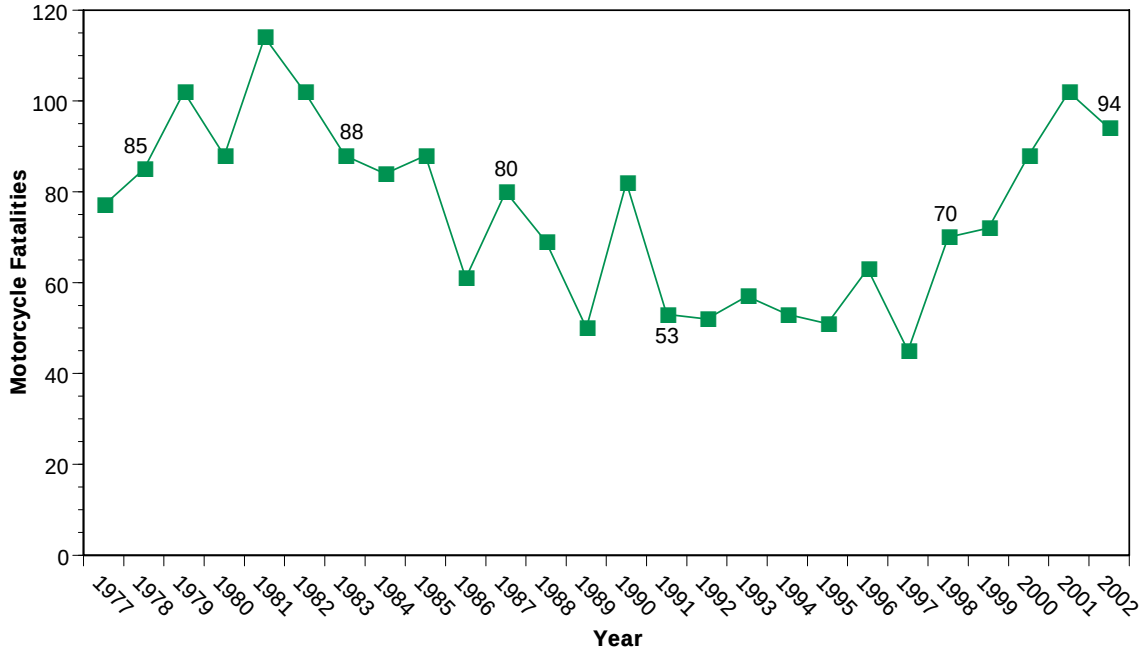
Exhibit VII-3a.
Number of Fatal Motorcycle Crashes, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, 94 people died in crashes that included a motorcycle.

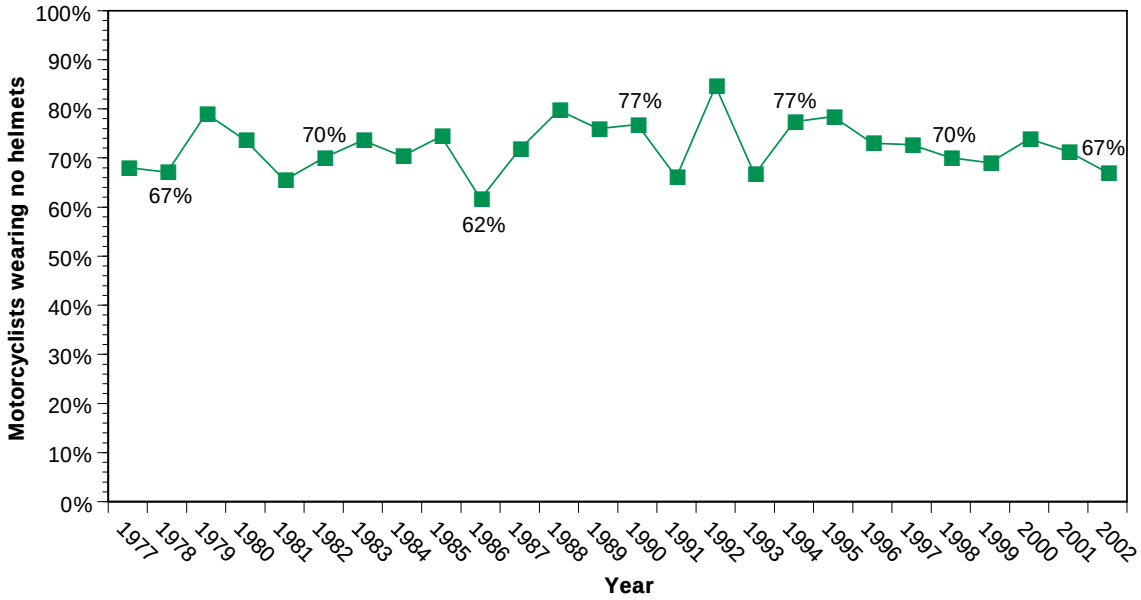
Exhibit VII-3b.
Fatalities in Motorcycle Crashes, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Overall, a large majority of motorcyclists involved in fatal crashes were not wearing helmets at the time of the crash.

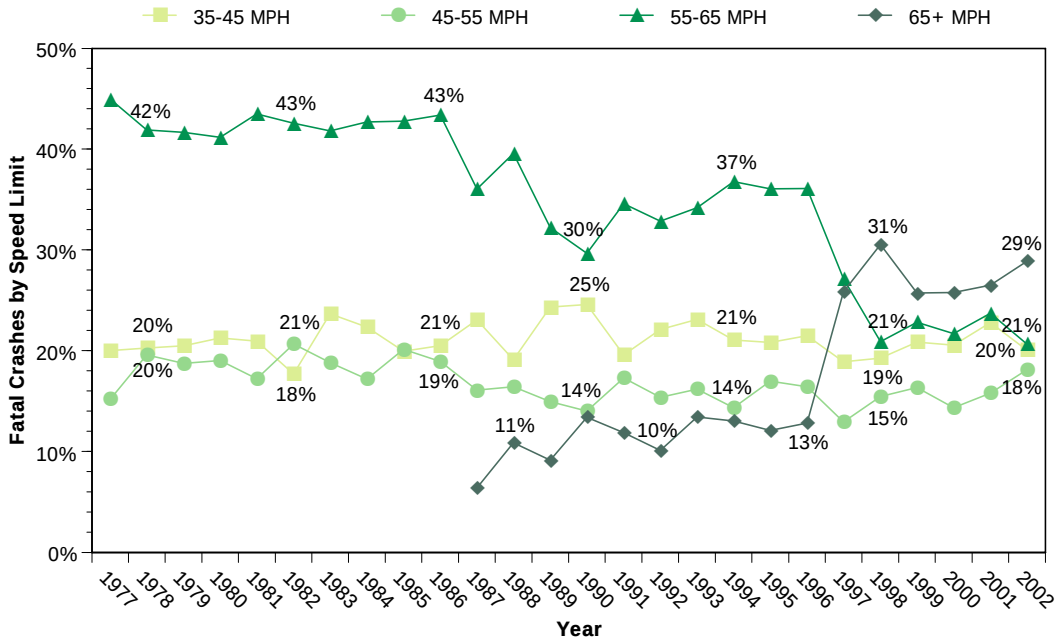
Exhibit VII-3c.
Riders and Occupants of Motorcycles Wearing No Helmet as a Percentage of Riders and Occupants of all Fatal Motorcycle Crashes, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Exhibit VII-4 shows the distribution of fatal crashes by the posted speed limit at the location of the crash. In 2002 71% of fatal crashes occurred on roads with posted speed limits below 65 MPH.

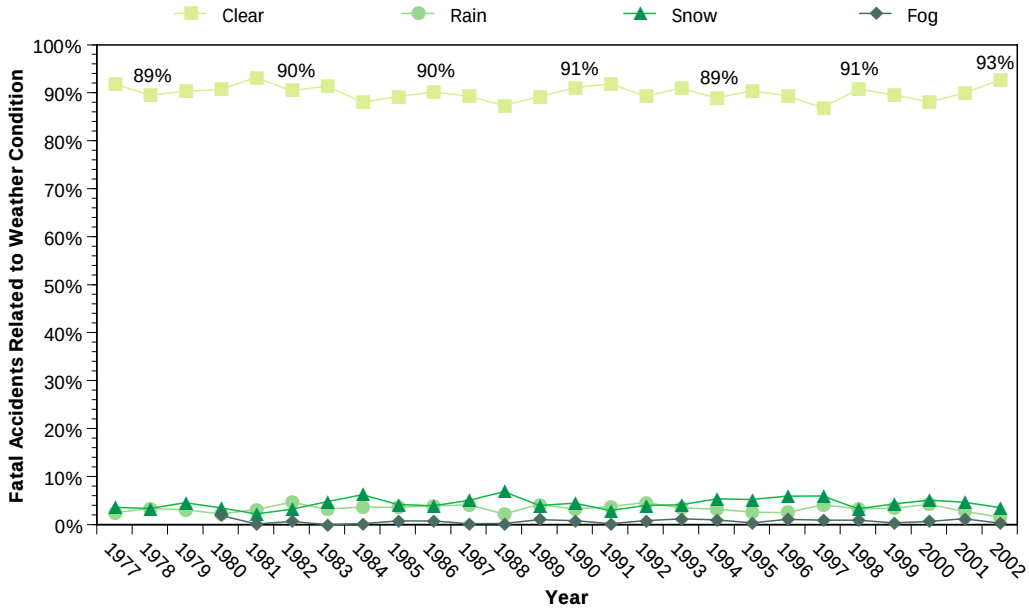
Exhibit VII-4.
Distribution of Fatal Crashes by Posted Speed Limit, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

As shown in Exhibit VII-5, the vast majority of fatal crashes in Colorado occur in clear weather conditions. Drivers may be more cautious in inclement weather.

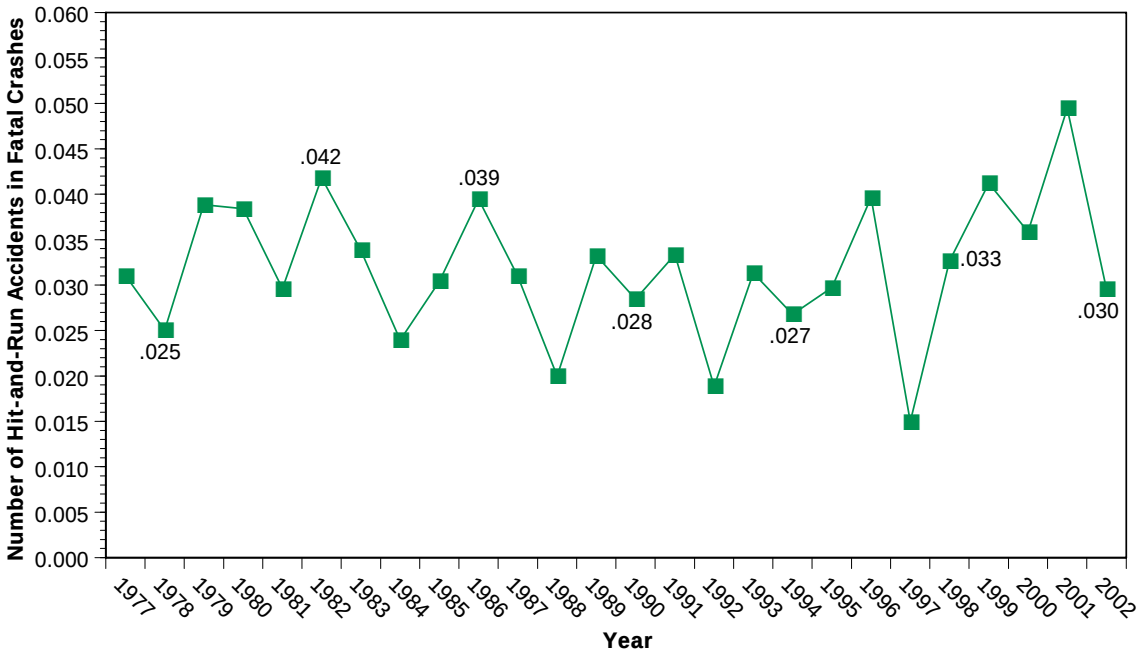
Exhibit VII-5.
Distribution of Fatal Crashes by Weather Condition, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Historically, fewer than 5% of all fatal crashes involved a driver who fled the crash scene. In 2002, 3% of all fatal crashes involved a hit-and-run driver.

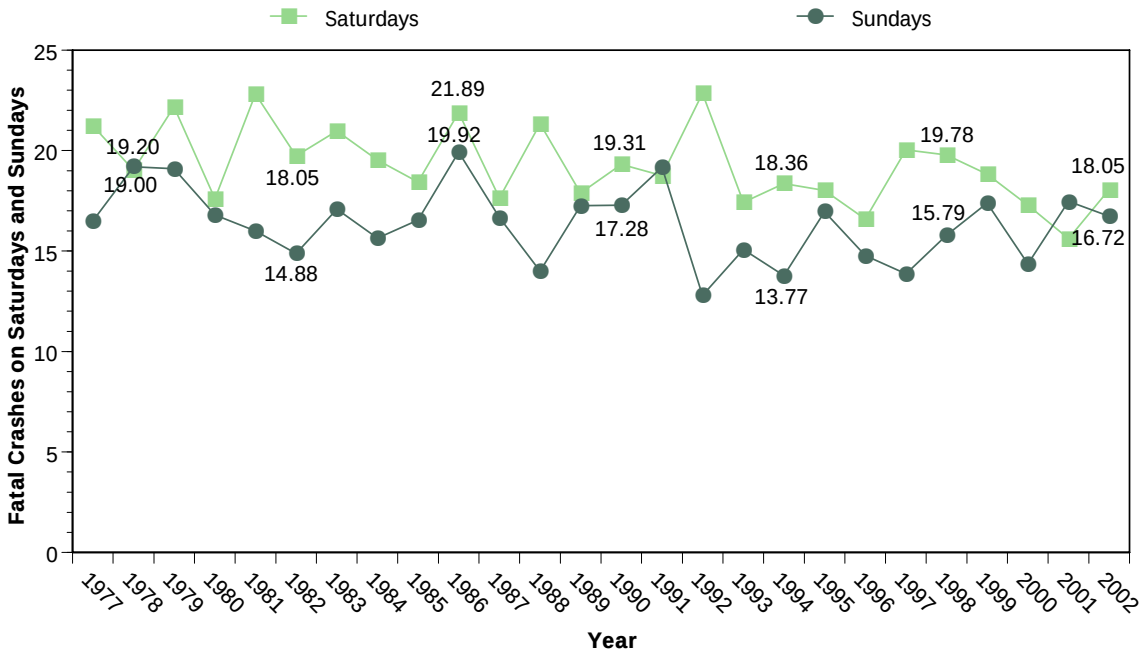
Exhibit VII-6.
Proportion of Hit-and-run Crashes in Fatal Crashes, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In general, fewer than 40% of all fatal crashes occur on a Saturday or Sunday. In 2002, 35% of fatal crashes occurred on a Saturday or Sunday.

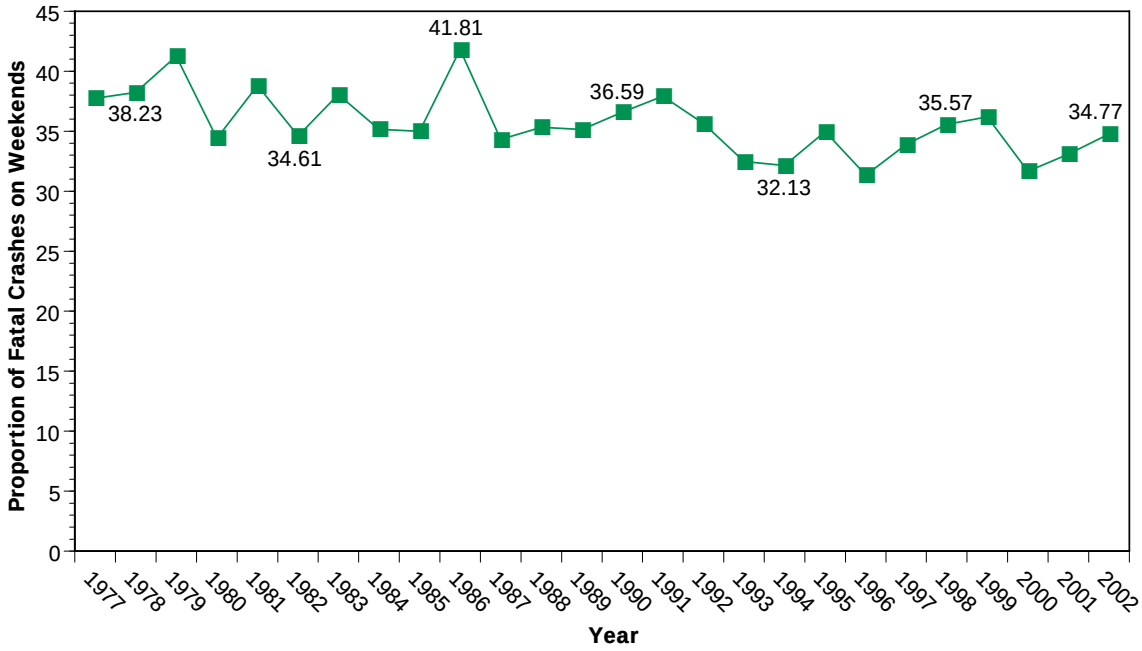
Exhibit VII-7a.
Proportion of Fatal Crashes on Saturdays and Sundays, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Combining data for fatal crashes on Saturdays and Sundays, the proportion of fatal crashes on weekends has fluctuated between 33% and 38% of all fatal crashes. Even at the lower end of this range, a disproportionate number of fatal crashes occur on weekends.

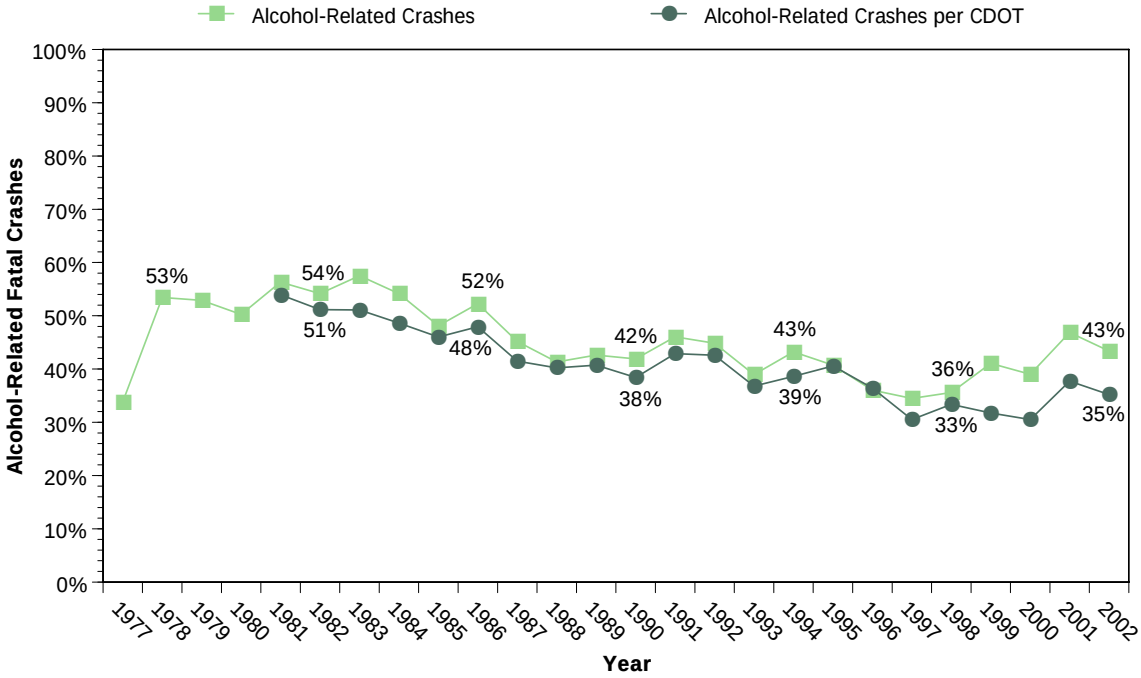
Exhibit VII-7b.
The Proportion of Fatal Crashes on Weekends, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002 the national average of alcohol-related crashes as a proportion of fatal crashes is 35%. The median among state averages is 36.2%. In Colorado, it is 43.3%. Colorado ranks as the 8th worst state behind Montana (51.7%), Rhode Island (49.4%), North Carolina (48.8%), New Mexico (48.7%), South Dakota (48.4), South Carolina (47.2), and Washington (45.4%). Washington DC, and Utah have the lowest and the second-lowest rates of alcohol-related fatal crashes with 9.3%, and 19.7%, respectively.

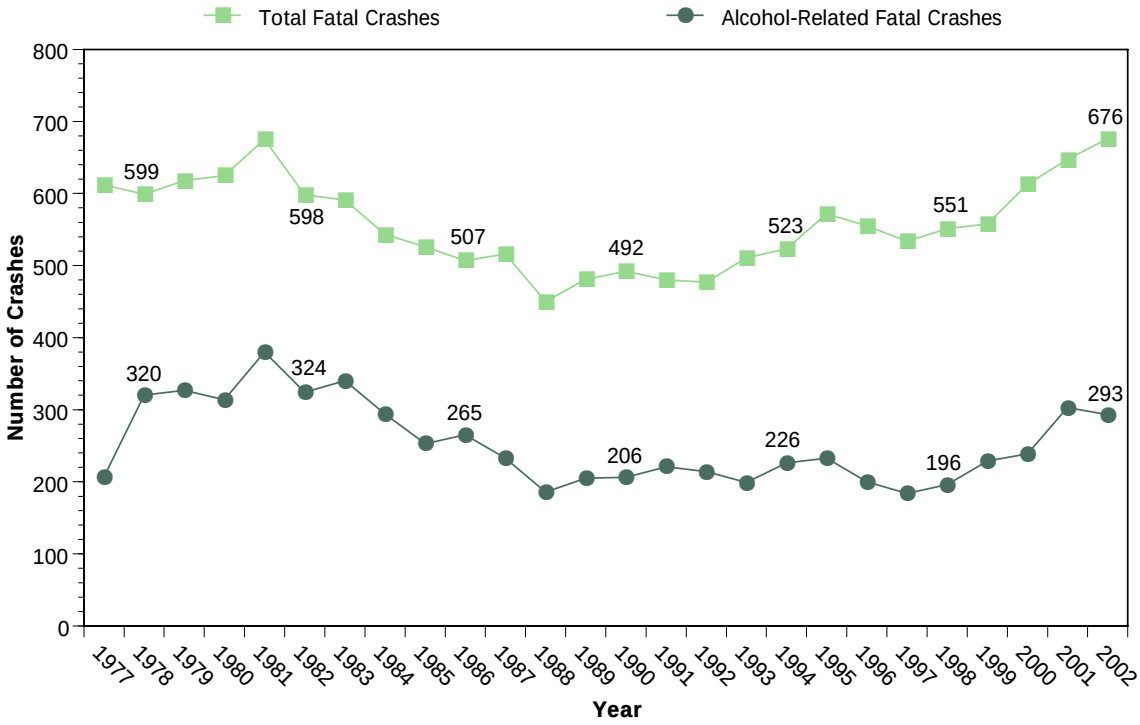
Exhibit VII-8a.
Alcohol-related Fatal Crashes as a Percentage of all Fatal Crashes, 1977-2002 (Includes the Classification of Original FARS Data (NHTSA), and the Classification of CDOT)



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

The role of alcohol in fatal crashes declined in the 1980s, but began to rise again in 1998. According to the FARS data, 43.3% of Colorado's 2002 fatal crashes involved alcohol.

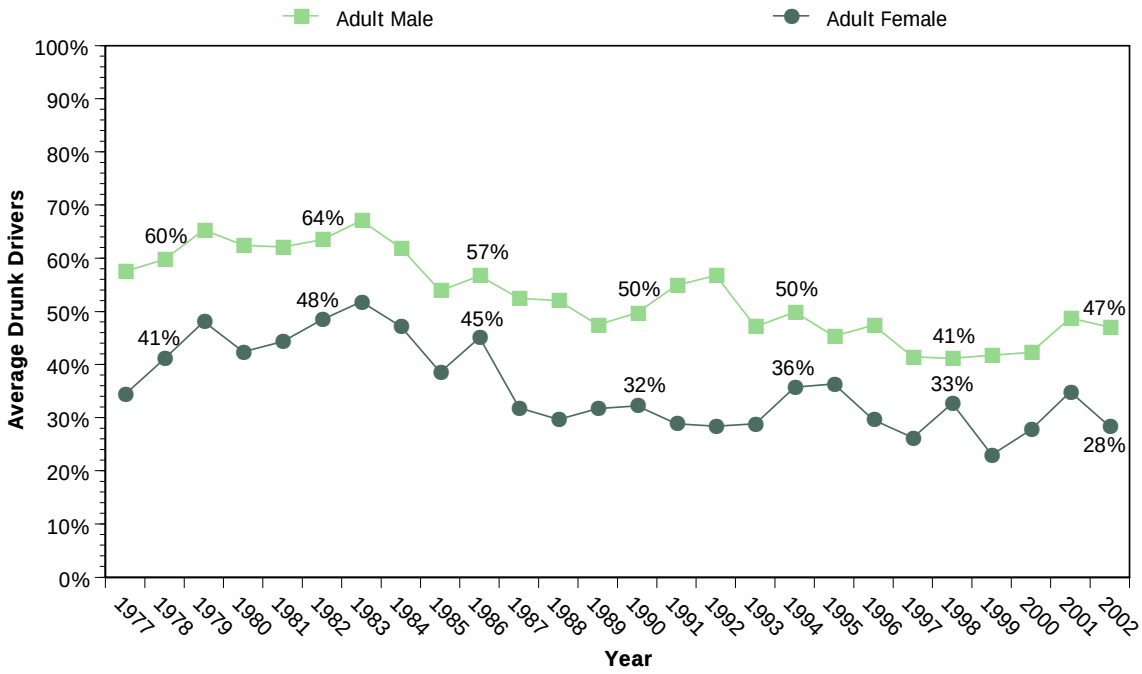
Exhibit VII-8b.
Total Fatal Crashes and Alcohol-related Crashes, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Men are more likely to have been drinking than women when involved in a fatal crash. In 2002, 47% of the male drivers in fatal crashes had been drinking, compared to 28% of female fatal crash drivers.

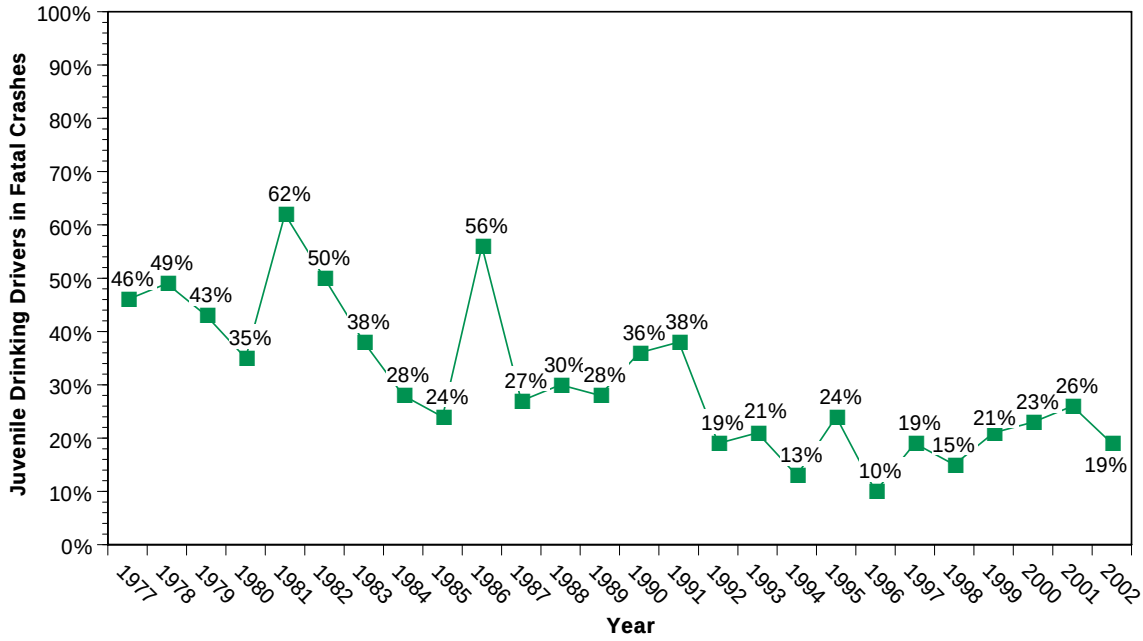
Exhibit VII-9.
Adult Male *Drinking Drivers* as a Percentage of all Male *Drivers* Involved in a Fatal Crash, Adult Female *Drinking Drivers* as a Percentage of all Female *Drivers* Involved in a Fatal Crash 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Compared to previous decades, juvenile fatal crash drivers in 2002 were much less likely to have been drinking. In 1981, 61% of juvenile fatal crash drivers had been drinking, compared to 19% in 2002. (Juvenile drivers are those under the age of 18.)

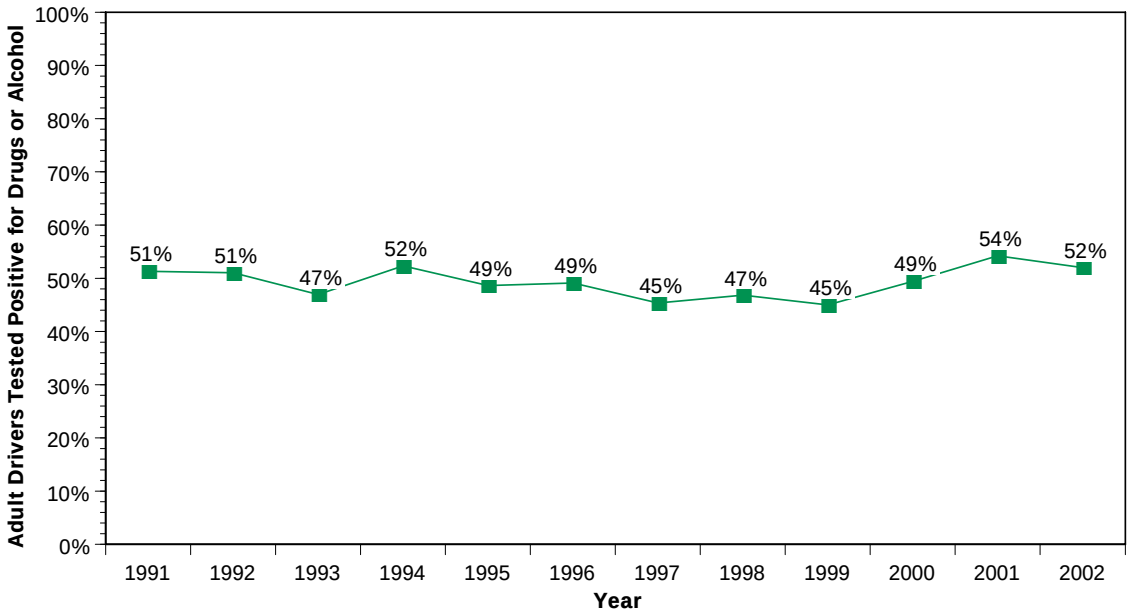
Exhibit VII-10.
Juvenile *Drinking Drivers* as Percentage of all Juvenile Drivers Involved in a Fatal Crash, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Among those tested, slightly more than half of the adult fatal crash drivers tested positive for alcohol or drugs. This proportion has varied only between 45% and 54% since 1991.

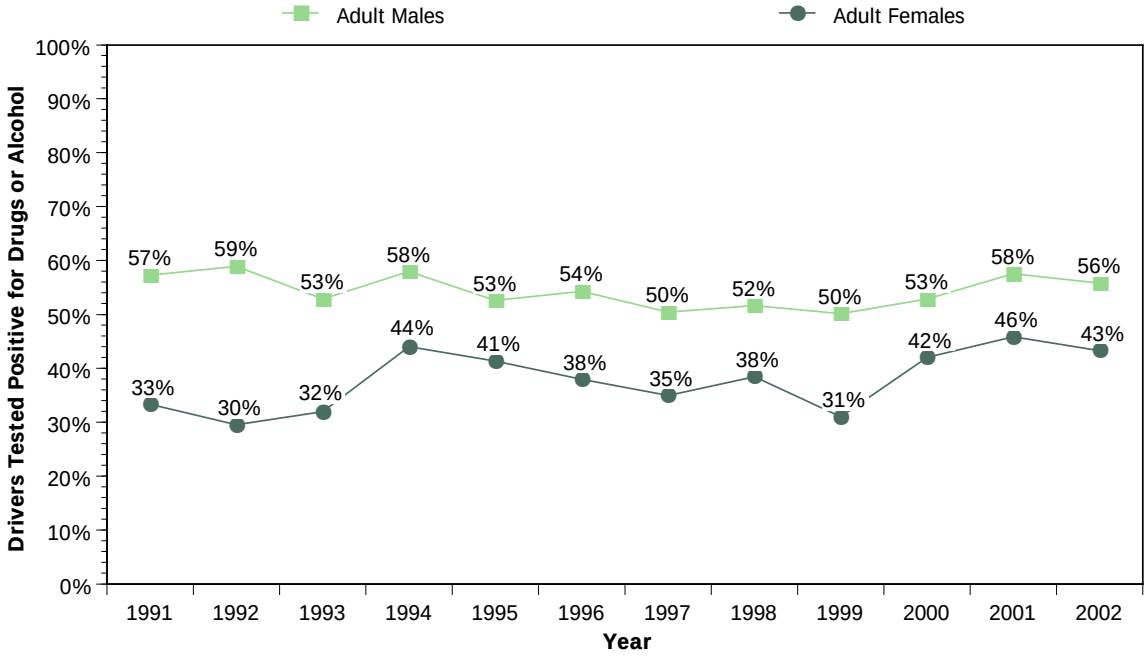
Exhibit VII-11.
Adult *Drivers* Who Tested Positive for *Alcohol or Drugs* as a Percentage of all Adult *Drivers* Involved in a Fatal Crash, 1991-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Among those tested in 2002, 56% of adult male drivers involved in a fatal crash tested positive for alcohol or drugs. Only 43% of adult female drivers tested positive.

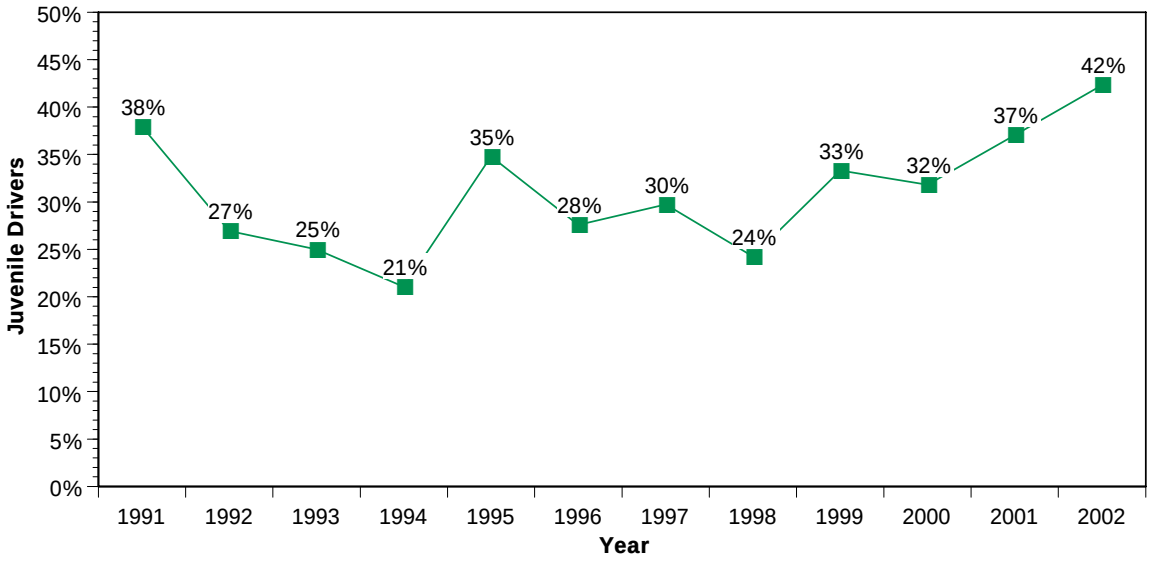
Exhibit VII-12.
Adult Male and Female *Drivers* who Tested Positive for Alcohol or Drugs as a Percentage of all Adult *Drivers* Involved in a Fatal Crash, 1991-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Among those tested, 42% of juvenile fatal crash drivers tested positive for alcohol or drugs in 2002. This represents a substantial increase from the previous year, and a more marked increase from the low value of 24% observed in 1998. Given the decline in juvenile alcohol involvement documented in Exhibit VII-10, this increase is apparently attributable to increased drug involvement.

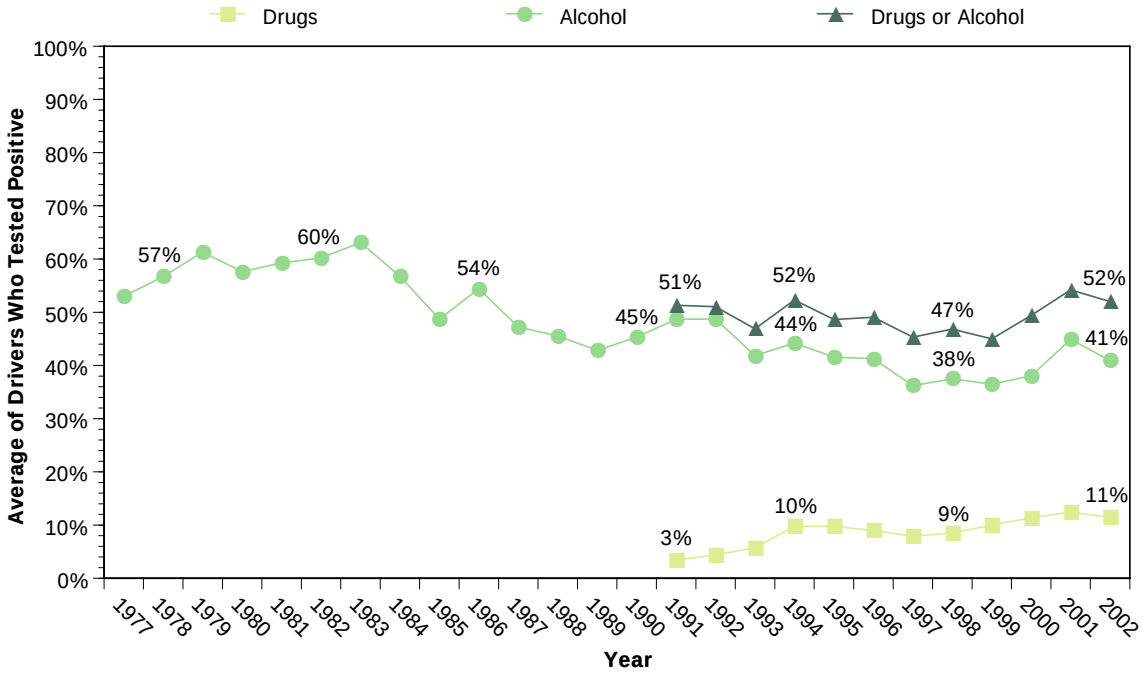
Exhibit VII-13.
Juvenile *Drivers* Who Tested Positive for Alcohol or Drugs as a Percentage of all Juvenile *Drivers* Involved in a Fatal Crash, 1991-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Among those tested, drivers are more likely to test positive for alcohol than drugs. In 2002, 11% of those tested were positive for drugs. However, the rate of positive drug tests has increased steadily since they were first instituted in 1991.

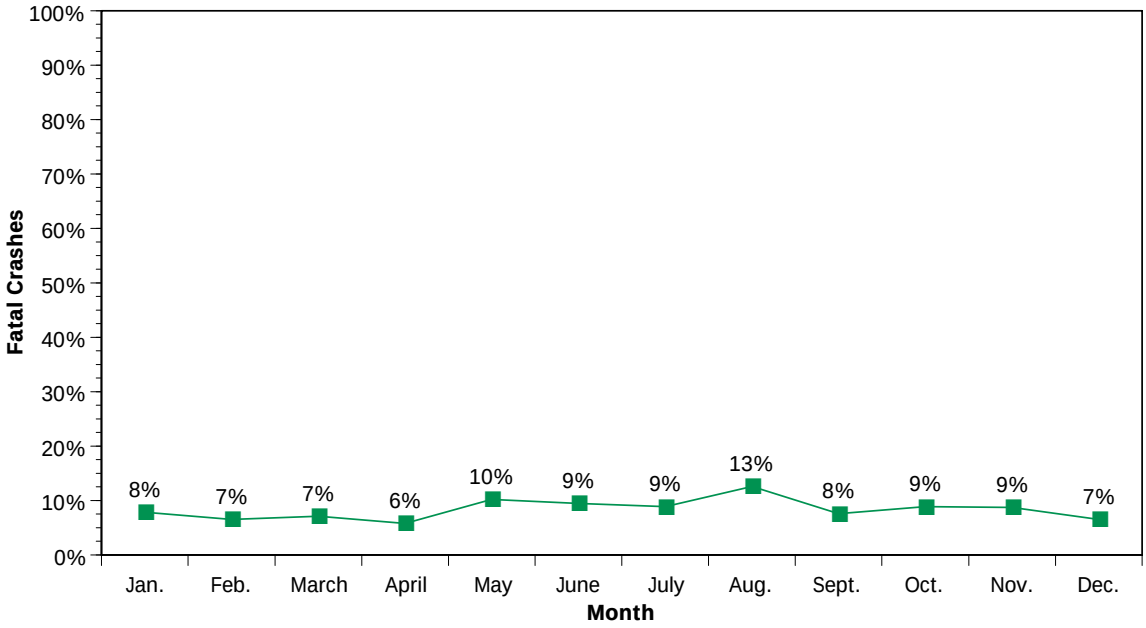
Exhibit VII-14.
Adult *Drivers* Who Tested Positive for (i) Drugs, (ii) Alcohol, and (iii) Drugs or Alcohol as a Percentage of all Adult *Drivers* Involved in a Fatal Crash, 1991-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, the monthly rate of fatal crashes was fairly constant. August had the highest proportion of fatal crashes (13%) and April had the lowest at 6%.

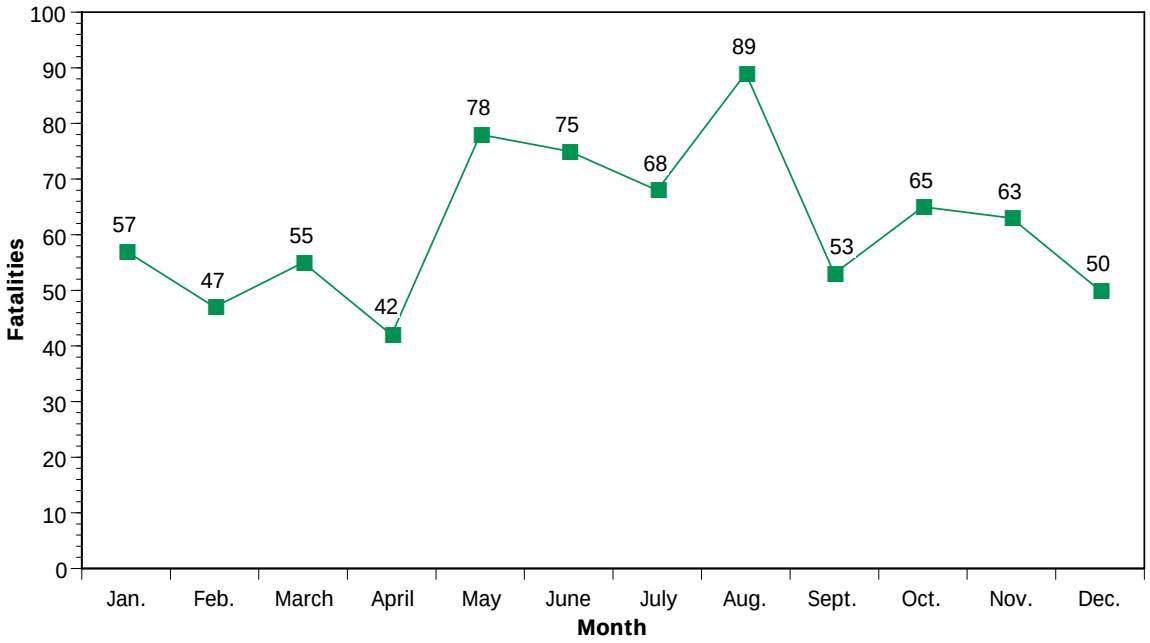
Exhibit VII-15.
Distribution of the Number of Fatal Crashes by Month, 2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

August was also the deadliest month in 2002, when 89 people died in car crashes.

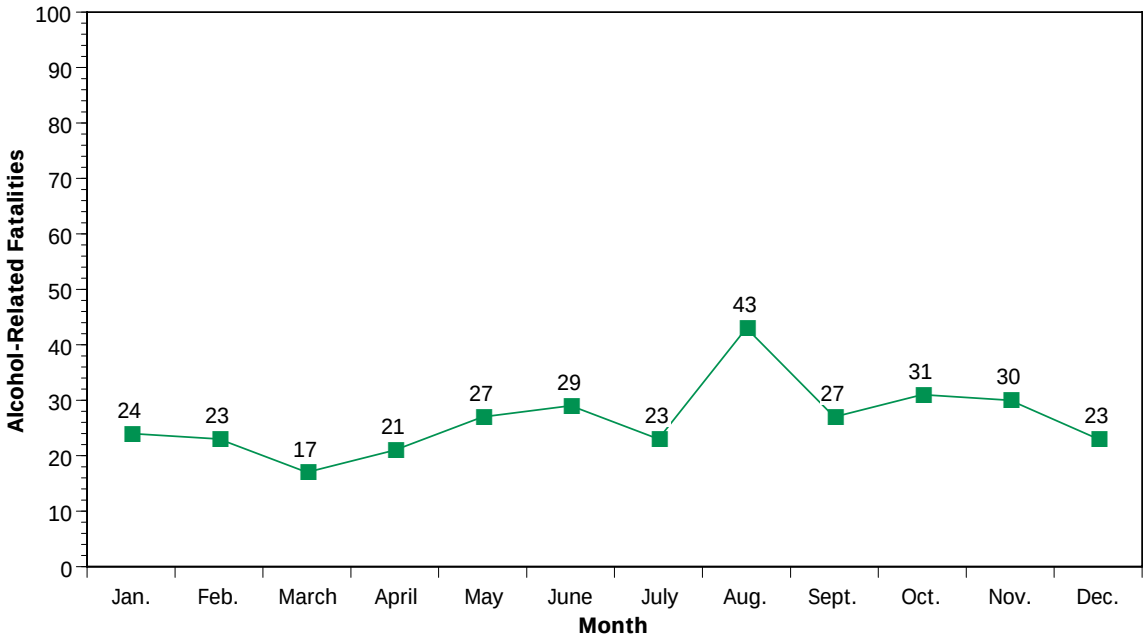
Exhibit VII-16.
Distribution of Fatalities by Month, 2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In August, 43 people died in alcohol-related fatal crashes, the highest number of alcohol-related fatalities in a single month in 2002.

Exhibit VII-17.
Distribution of Alcohol-Related Fatalities by Month, 2002

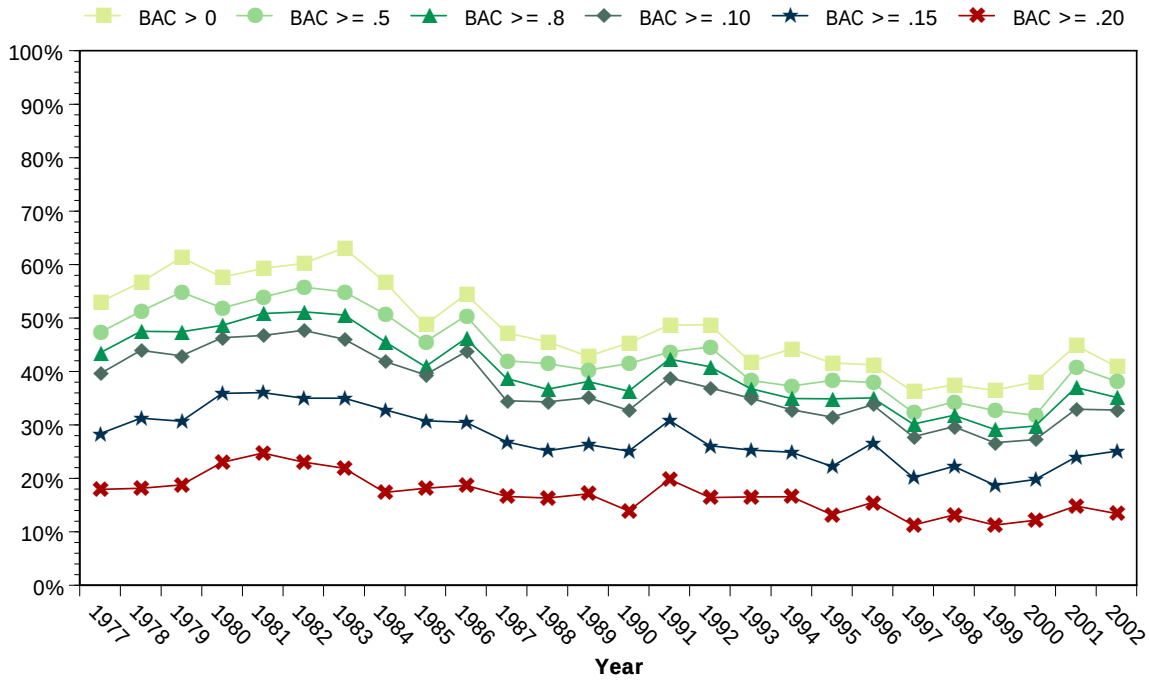


Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Exhibit VII-18 compares the relative BAC of drivers involved in fatal crashes from 1977 through 2002. This graph is to be read from top to bottom. The top line measures the proportion of all fatal crash drivers who had a BAC greater than 0.0. The second line from the top removes drivers with BACs less than 0.5, to give the proportion of all fatal crash drivers with BAC greater than or equal to 0.5.. Each successive line deletes drivers with the lowest remaining levels of BAC to indicate the proportion of all fatal crash drivers with at least the BAC level associated with that line. The bottom, red line, shows the proportion of fatal crash drivers who had a BAC of 0.2 or greater.

Over time, the proportions of fatal crash drivers with BAC at any level have gradually declined. For example, in 1981, approximately 24.7% of fatal crash drivers had a BAC of 0.20 or greater. This declined to approximately 13.4% in 2002. Similarly, nearly 65% of drivers had a positive BAC in 1983, but only 40% had a positive BAC in 2002. Consequently, the average BAC has almost surely declined as well.

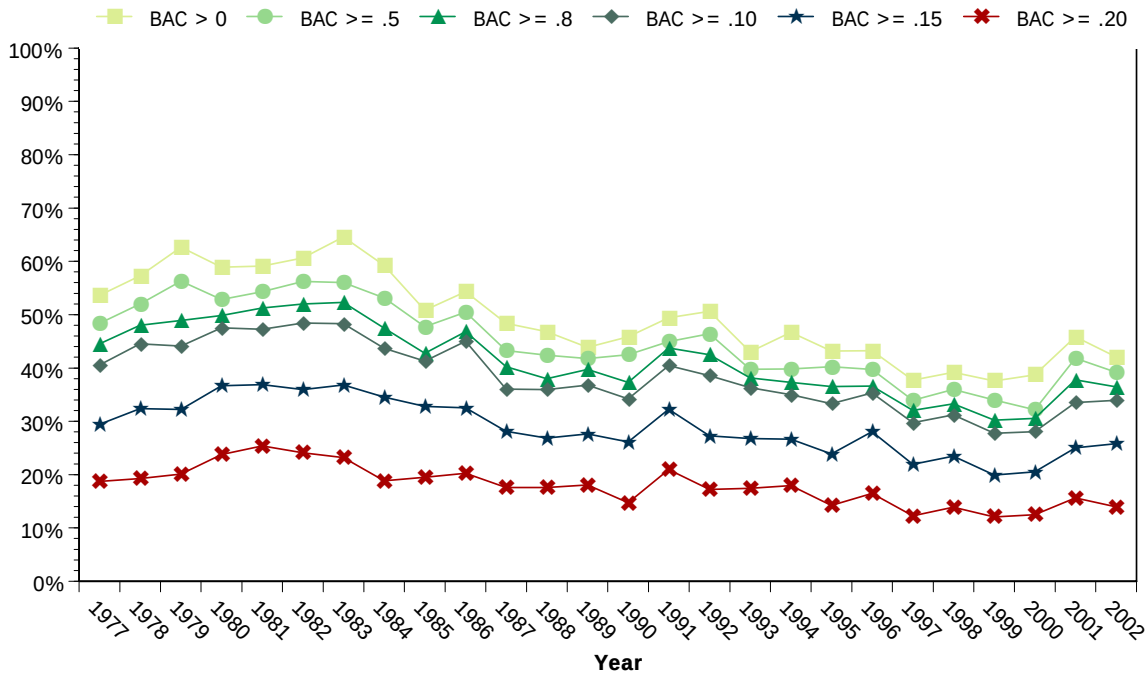
Exhibit VII-18.
Rate of Drinking Drivers Among Fatal Drivers by BAC Over Time, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Exhibit VII-19 is constructed in the same manner as Exhibit VII-18. This graphic excludes juvenile fatal crash drivers. Once again, the proportions of adult fatal crash drivers with any level of BAC have declined slowly since the early 1980s. In 2002, approximately 33.9% of adult drivers in fatal crashes had BACs that exceeded the legal limit of 0.10.

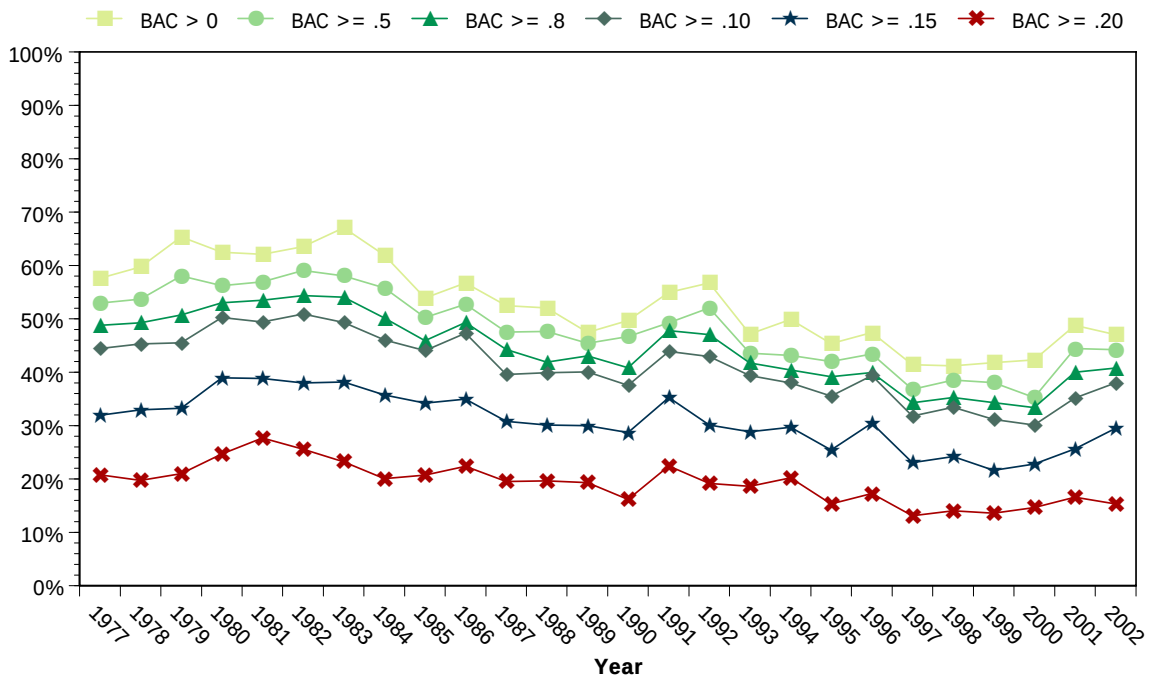
Exhibit VII-19.
Rate of Drinking Adult Drivers Among Adult Fatal Drivers by BAC Over Time, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In recent years, the proportion of men with the highest BACs (0.10 or greater) grew while the proportion of male fatal crash drivers with very low BACs declined slightly.

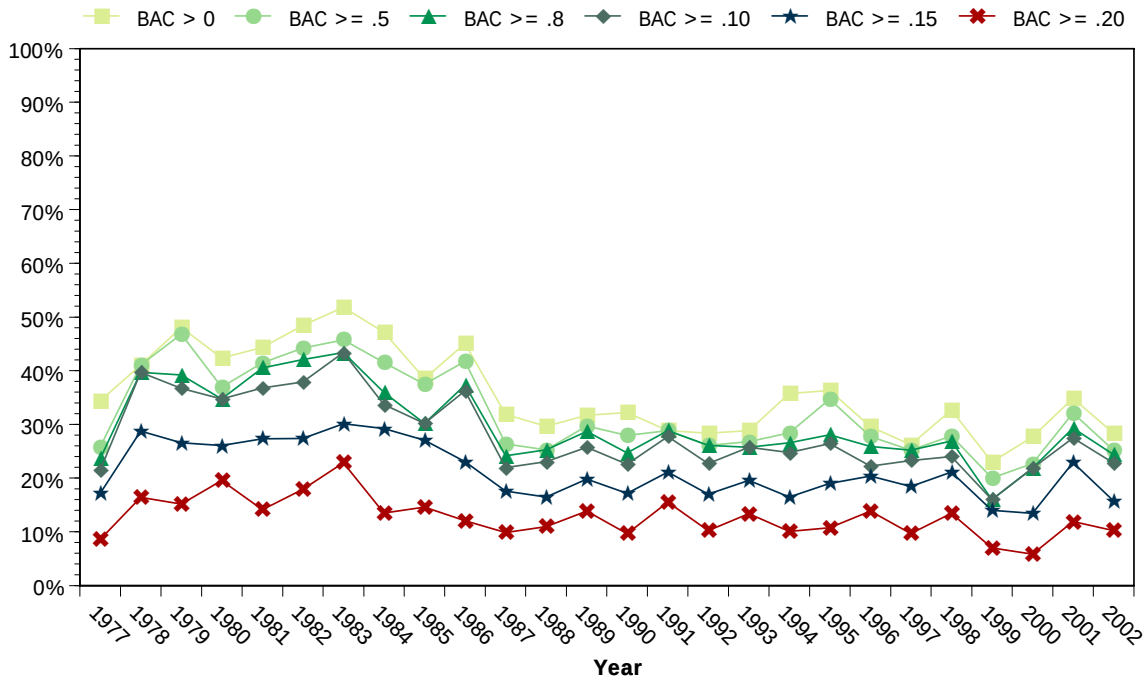
Exhibit VII-20.
Rate of Drinking Male Drivers Among Male Fatal Drivers by BAC Over Time, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In general, female drinking fatal crash drivers tend to have BACs that exceed the legal limit of 0.10.

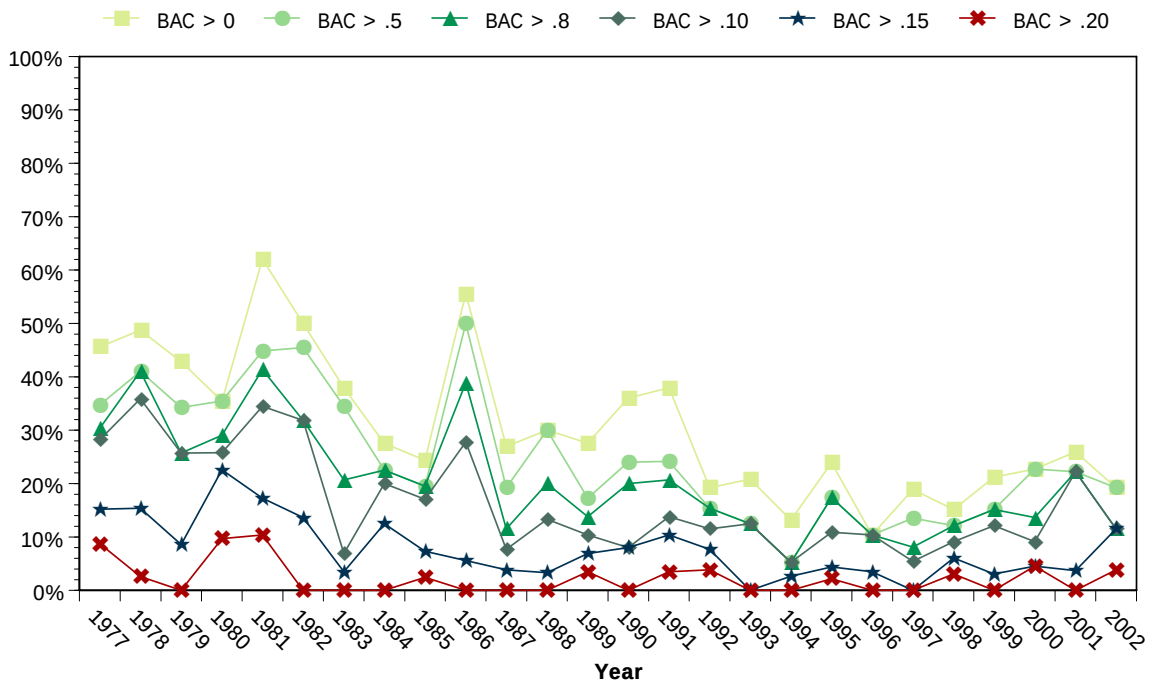
Exhibit VII-21.
Rate of Drinking Female Drivers Among Female Fatal Drivers by BAC Over time, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Among juvenile drinking drivers involved in fatal crashes, most have BACs below 0.15.

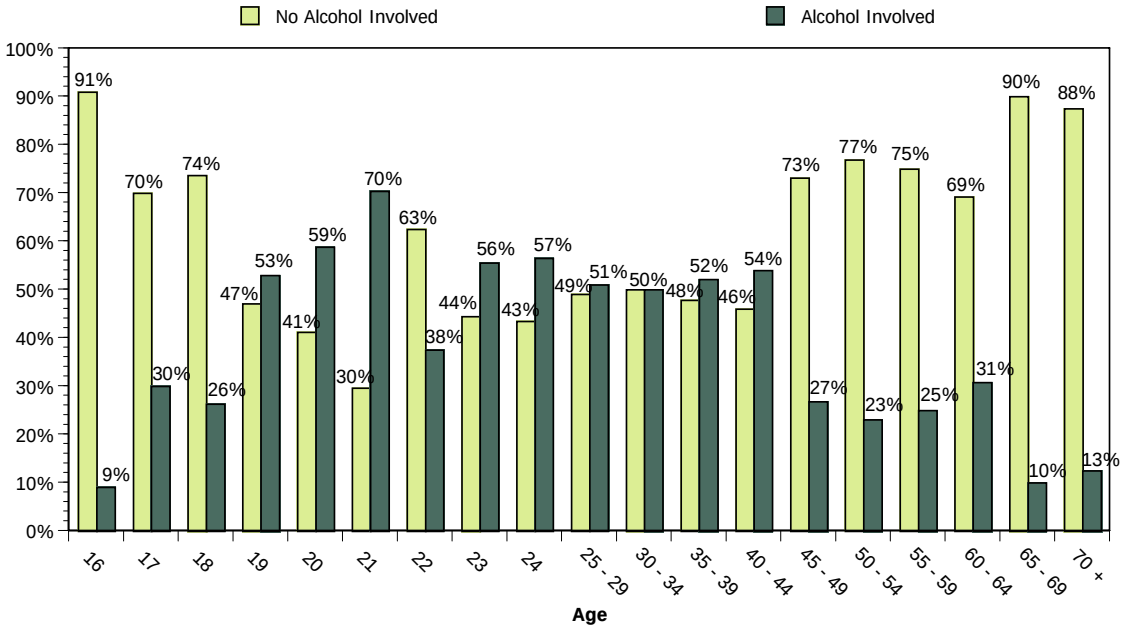
Exhibit VII-22.
Rate of Drinking Juvenile Drivers Among Juvenile Fatal Drivers by BAC Over Time, 1977-2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

The youngest drivers and the oldest drivers tend to be the least likely drinking drivers in fatal crashes. In the first year of "legal" drinking, the majority of 21 year-old fatal crash drivers had been drinking. About half of the drivers between the ages of 25 and 44 had been drinking prior to their involvement in a fatal crash.

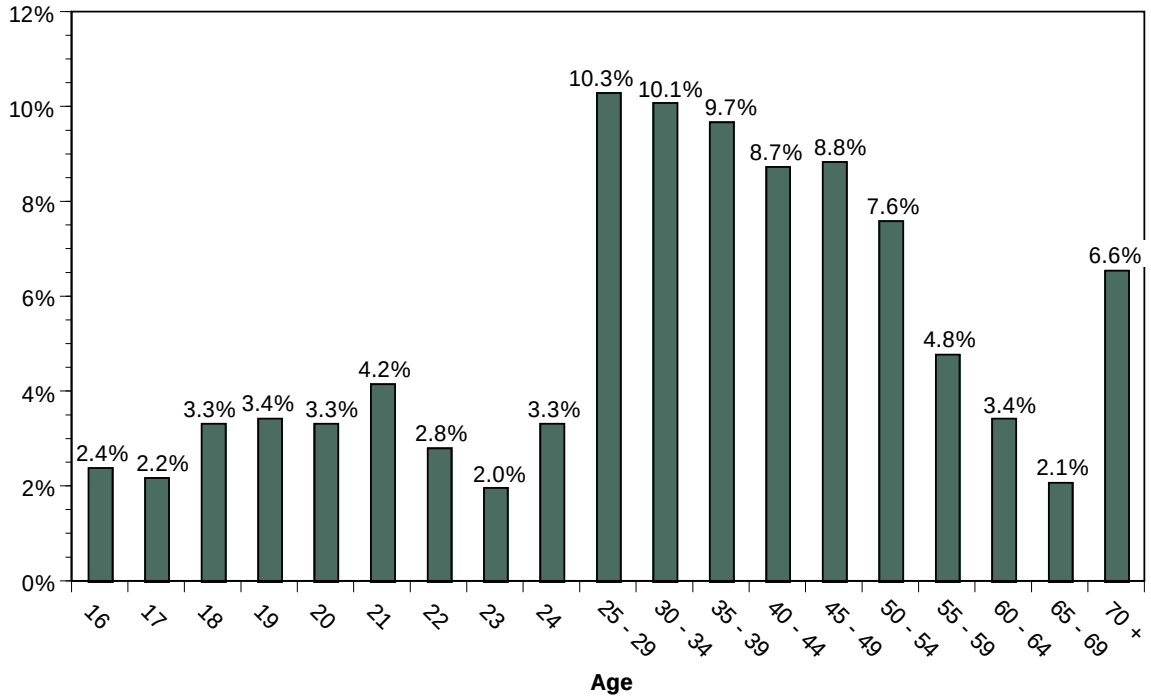
Exhibit VII-23.
Distribution of Alcohol Consuming and Non-Consuming Fatal Drivers in Each Age Group



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Exhibit 24 shows the age distribution of drivers involved in fatal crashes in 2002.

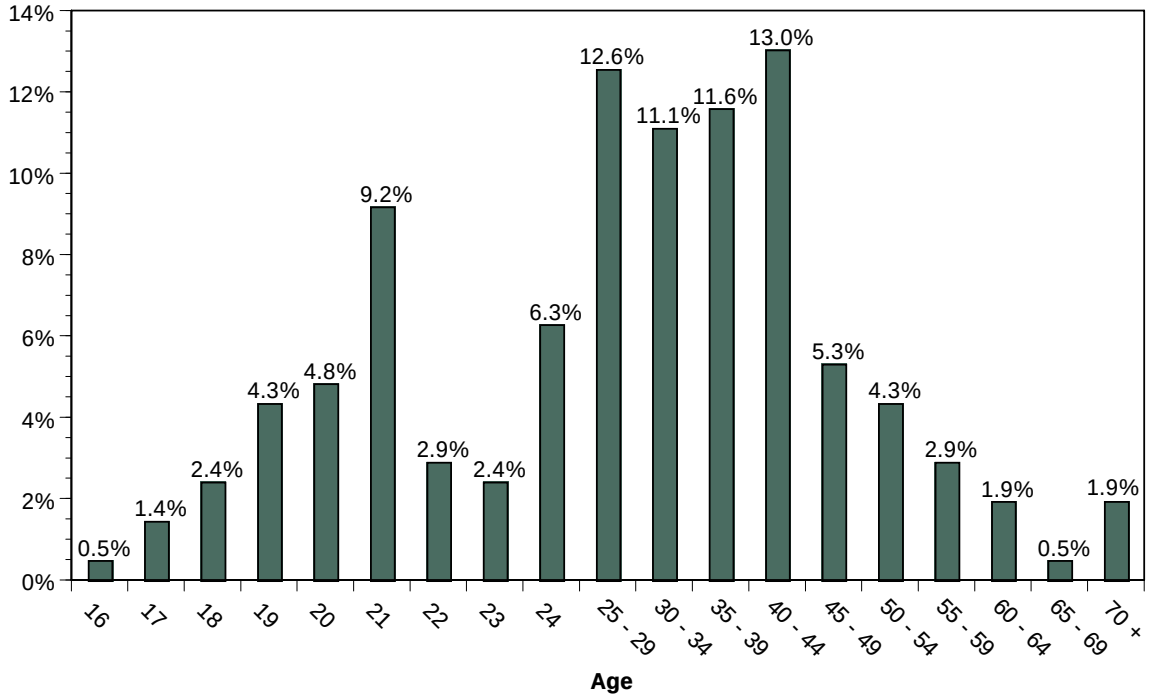
Exhibit VII-24.
Age Distribution of Drivers in Fatal Crashes by Age, 2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, 48% of the drinking drivers involved in fatal crashes were between the ages of 24 and 44.

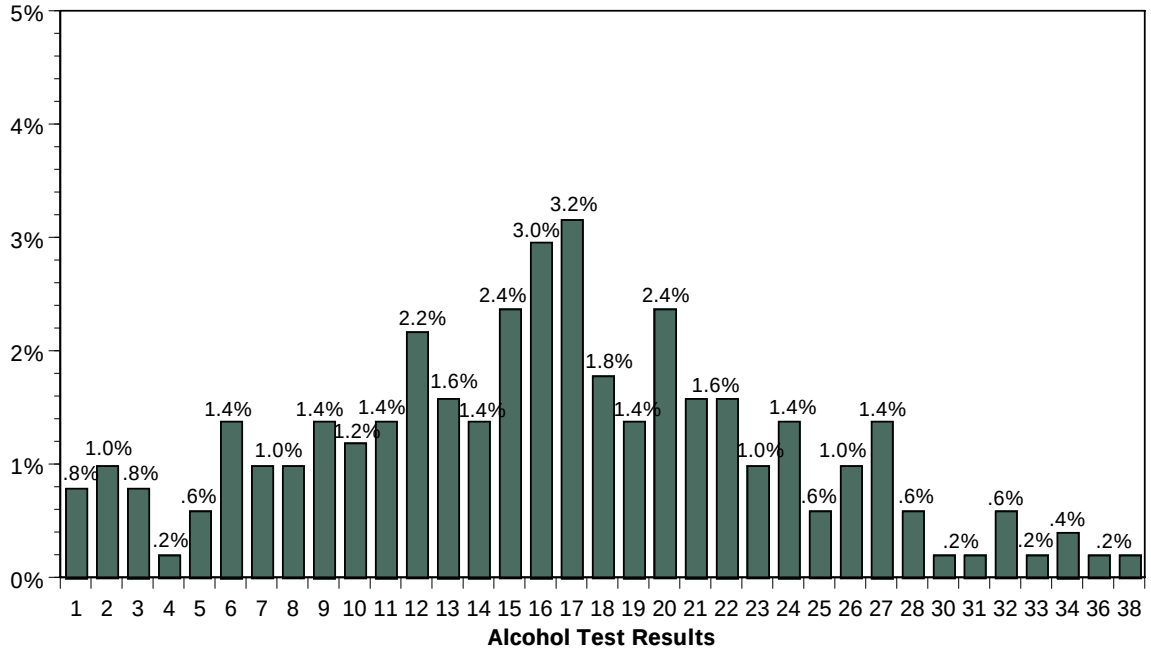
Exhibit VII-25.
Age Distribution of Drinking Drivers in Fatal Crashes by Age, 2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, 8% of fatal crash drivers had a BAC that was less than 0.10. The majority of drivers – 60% - had BAC test results equal to 0.0.

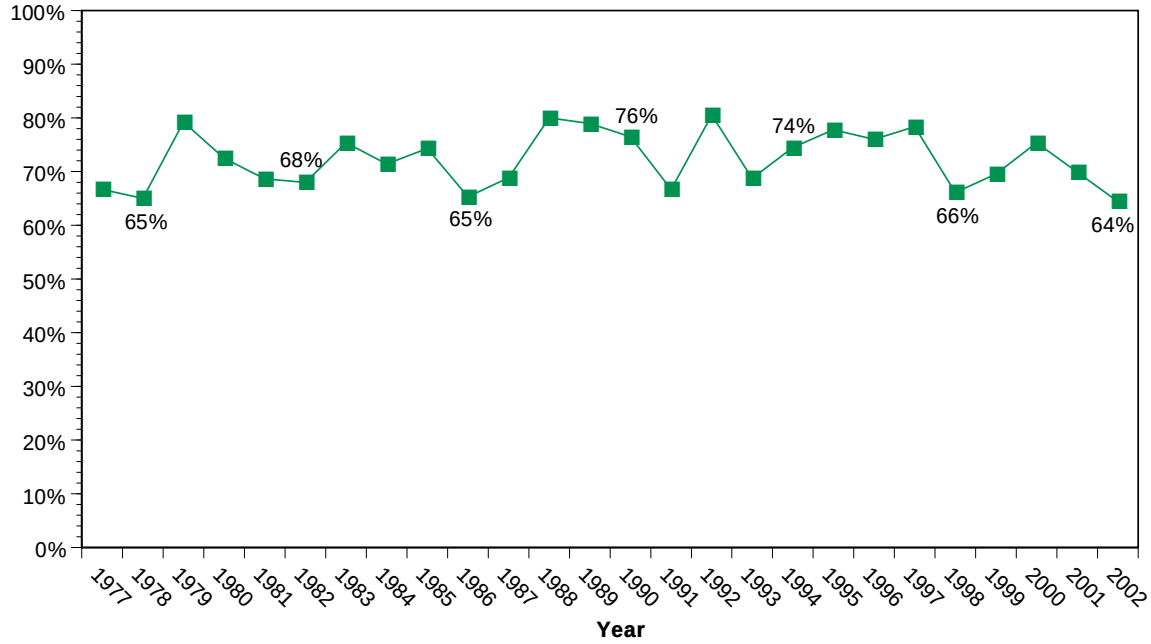
Exhibit VII-26.
Distribution of BAC within Drivers of Fatal Crashes, 2002



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, 64% of the motorcycle riders or their passengers who died were not wearing a helmet.

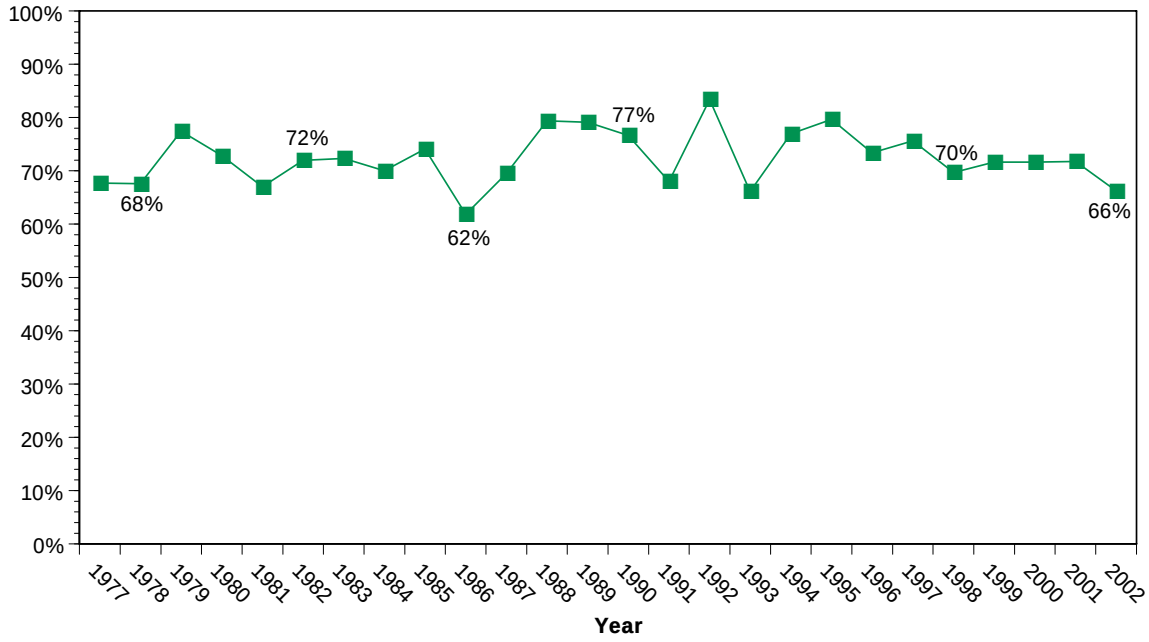
Exhibit VII-27.
Proportion of No Helmet (Motorcycle Riders and Occupants) of those Who Died



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

Similarly, 66% of injured or fatally injured motorcycle riders or passengers were not wearing a helmet.

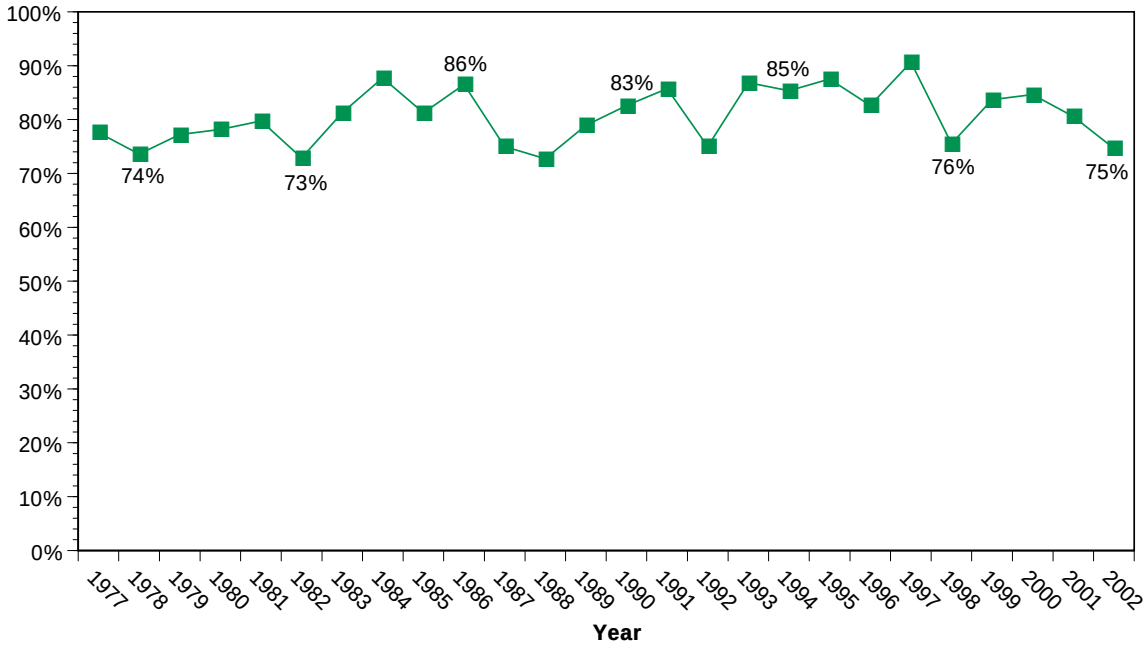
Exhibit VII-28.
Proportion of No Helmet (Motorcycle Riders and Passengers) of those who Died or Suffered an Incapacitating Injury



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, 75% of the motorcycle riders or passengers who were not wearing a helmet died.

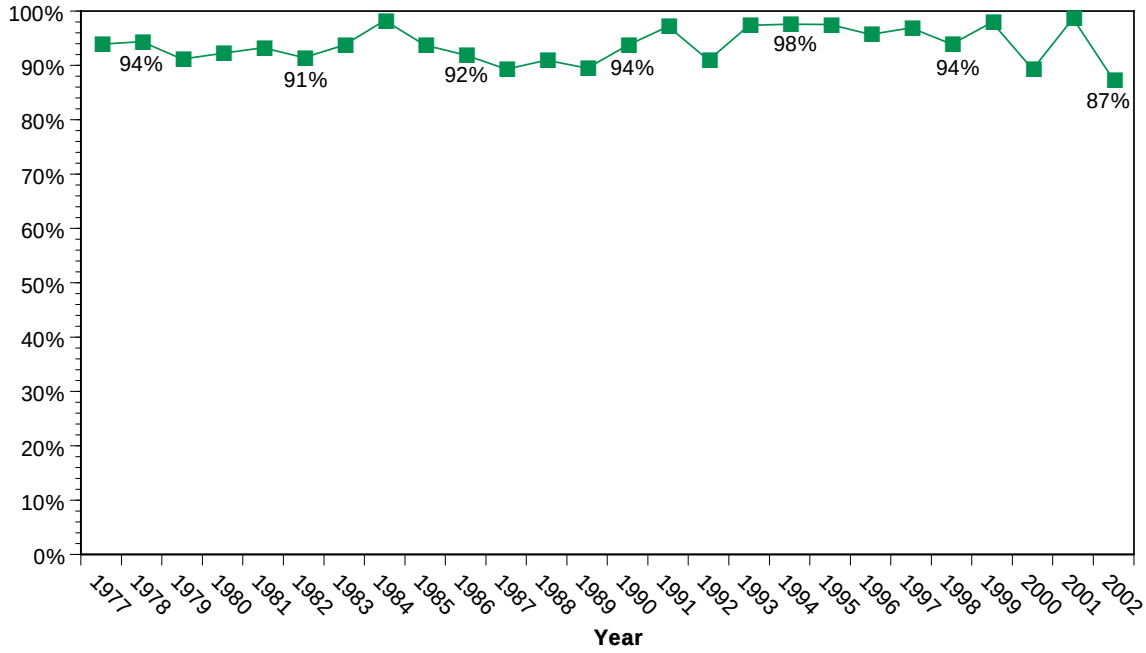
Exhibit VII-29.
Proportion who Died in a Fatal Crash of Those (Drivers and Occupants) who were Not Wearing a Helmet



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.

In 2002, only 13% of the motorcycle riders or passengers who were not wearing a helmet were uninjured in the crash.

Exhibit VII-30.
Proportion who Died or Suffered Incapacitating Injury (Drivers and Occupants) of those who were Not Wearing a Helmet



Source: National Highway Transportation Safety Administration, FARS data, 1977-2002.