STATE

OF

COLORADO

Highway Safety Program
2006 Problem Identification Report

Final Report

FY 2006 Problem Identification

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FY 2006 Problem Identification

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Executive Summary

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This Executive Summary presents highlights of the FY 2006 Problem Identification report prepared for CDOT's Safety & Traffic Engineering Branch by the University of Colorado's Dr. Jeffrey Zax and Dr. Naci Mocan, Garner Insight's Jennifer Garner and Glissen LLC's Glissen Rhode. This report was prepared using CDOT's 2003 crash database and time series data from the Fatality Analysis Reporting System (FARS). The Motor Vehicle Division of the Department of Revenue provided the study team with a database of 2003 drivers. The study team gratefully acknowledges the leadership and assistance of Henry Sandoval, Roberta Lopez, Matt Clayton, Rahim Marandi and Tim Foote.

Selected Key Findings

The following are selected key findings from the analysis of CDOT's 2003 crash database and FARS data. Supporting information for selected findings are included in this Executive Summary.

Colorado Crash Trends

Colorado experienced marked improvement in several key crash statistics from 2002 to 2003. Over this period, fatal crashes fell by 16% and alcohol-related fatal crashes fell by 20% (Exhibit I.1).

Among the state's largest cities, Wheat Ridge, Denver, Pueblo, Boulder and Colorado Springs have the highest per capita injury and fatal crash rates (Exhibit I.2). Statewide in 2003, 25% of all reported crashes resulted in an injury or fatality. The proportion of crashes resulting in an injury varied widely. In the City of Loveland, 40% of all crashes resulted in an injury, compared to 19% in Englewood (see Exhibit III.12). The cities of Castle Rock, Parker, Brighton, Arvada and Thornton had the lowest per capita rates of injury and fatal crashes, among large cities.

The Eastern Plains region has had a higher number of on-system fatal crashes than other rural regions each year since 1999 (see Exhibit III.15). Among the largest counties, El Paso and Weld had the greatest numbers of fatal crashes. With respect to injury crashes, Denver and El Paso counties had the greatest number of crashes.

Residents of El Paso County are involved in 75% of El Paso County fatal crashes, as shown in Exhibit I.3, and County residents are also involved in 84% of the County's injury crashes (Exhibit III.17). Since County residents are involved in such a significant number of the County's most severe crashes, implementing a traffic safety program in El Paso County targeting residents may be recommended. In 2003, Weld County residents were involved in only two in five Weld County fatal crashes and slightly more than half of the County's injury crashes. The knowledge that non-county residents are often involved in Weld County's most serious crashes may impact how traffic safety programs are delivered.

Age and Gender

In 2003, drivers age 29 and younger had higher overall crash rates per capita than older age cohorts (Exhibit IV.1). After controlling for each age cohort's population size, drivers age 24 and younger all were over-represented in PDO, injury and fatal crashes. For example, 23 year-olds drivers were involved in twice as many injury crashes as would be expected given their population (Exhibit I.4).

Among fatal crash drivers, nearly three out of four were men (Exhibit IV.5). Regardless of the severity of crash, men are involved in more crashes than would be expected given their share of the driving age population. The over-involvement of men in more sever crashes is consistent across all age cohorts (see Exhibits IV.5 through IV.7).

Occupant Protection

Colorado's seat belt use rate continues to climb (Exhibit I.5). Drivers on the Front Range are most likely to use seat belts (81%). The Eastern Plains region of the state annually lags other parts of the state with respect to seat belt use (70%), followed closely by the Western Region (74%). Children's seat belt use and car seat use rates have risen steadily in recent years. Nearly 90% of the youngest children were properly restrained (see Exhibit V.6).

Nearly 30% (or more) of the drivers involved in serious injury crashes that occurred in Lakewood, Brighton, Broomfield, Commerce City and Thornton were unbelted (Exhibit I.6). Littleton, Longmont, Wheat Ridge and Grand Junction had the highest proportion of injury crash drivers who were using seat belts. Among the largest counties, Arapahoe County had the highest proportion of reported seat belt use by drivers in the most severe injury crashes (81%) compared to the lowest rate, 71% in Weld County (Exhibit V.8).

Nearly 80% of the unbelted drivers in the most serious injury crashes were male (Exhibit V.9). Injury crash drivers of all ages do not use seat belts. The greatest proportion of unbelted drivers were those between the ages of 25 and 29 (Exhibit V.10). Impaired injury crash drivers were five times more likely to be unbelted than sober injury crash drivers (Exhibit V.11).

Impaired Driving

In 2003, the national average of alcohol-related crashes as a proportion of fatal crashes is 35%. In Colorado, it is 41% (Exhibit I.7) and Colorado ranks as the 8th worst state.

Brighton, Thornton, Northglenn, Lakewood and Pueblo had the highest proportion of impaired injury crash drivers among Colorado's largest cities (Exhibit I.8). In contrast, Parker, Longmont, Grand Junction, Boulder and Denver had the lowest proportion of injury crash drivers suspected of impairment.

Drivers between the ages of 18 and 29 had the highest rates of involvement in impaired driving crashes (Exhibit I.8).

If adult men are involved in a fatal crash, it is likely they are impaired by alcohol. Among fatal crash drivers, men are much more likely to be impaired than women (see Exhibit VI.16). Drivers between the ages of 21 and 24 have much higher incidences of impaired driving crashes than would be expected given their relative share of Colorado's driving age population (Exhibit VI.19). Since 2000, the proportion of juvenile fatal crash drivers (age 18 or younger) suspected of impairment by drugs has been rising, while the proportion of alcohol-impaired juveniles has fallen (Exhibit VI.22). Underage, juvenile fatal crash drivers are much less likely to be impaired than fatal crash drivers between the ages of 21 and 24. For example, 18% of 19 year-old fatal crash drivers were impaired, compared to 71% of 21 year-old fatal crash drivers (Exhibit VI.16).

Bicycle and Pedestrian Crashes

In 2003, nearly 2,300 crashes involved a bicycle or pedestrian. The majority of these (80%) were injury crashes. However, bicycle and pedestrian injury crashes comprise a small proportion of injury crashes statewide (7%).

Intervention Analysis

The time-series behavior of fatal crashes, fatalities and alcohol-related fatalities were analyzed using Structural Time Series models to examine the effect of Colorado's 1987 seat belt law and 1987 speed limit reduction. The models allowed forecasting of these key variables as well.

Report Organization

Section II Introduction follows this summary. A detailed examination of 2003 crashes is found in Section III, followed by an analysis of Age and Sex of Driver in Section IV. Section V presents analyses related to occupant protection and Section VI examines impaired driving. A brief discussion of bicycle and pedestrian crashes comprises Section VII. A crash intervention analysis concludes the body of the report in Section VIII. Appendix A includes maps of all on-system fatal and injury crashes for each Colorado county in 2003.

Exhibit I.1
Colorado Crash and Population Trends, 1993-2003

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	% Change 2002-2003	% Change 1999-2003
Total Crashes	90,430	94,610	95,778	101,886	107,844	110,866	115,145	121,995	131,020	137,216	126,878	-7.5%	40.3%
Fatal Crashes	511	523	572	555	534	551	558	613	647	677	570	-15.8%	11.5%
Injury Crashes	28,153	30,134	30,455	30,263	28,252	31,080	31,406	31,940	34,160	33,944	31,731	-6.5%	12.7%
PDO Crashes	61,757	63,821	67,366	71,069	79,078	79,263	83,175	89,456	92,213	102,598	94,578	-7.8%	53.1%
Fatalities	559	586	645	617	613	628	626	681	741	743	642	-13.6%	14.8%
Injuries	43,007	45,862	46,099	45,448	42878	45,488	46,804	47,387	48,649	51,803	45,167	-12.8%	5.0%
Fatalities Per 100 Million VMT	1.72	1.73	1.83	1.71	1.62	1.6	1.54	1.63	1.73	1.71	1.48	-13.5%	-14.0%
Injuries Per 100 Million VMT	132.2	135.6	130.7	126.1	113.6	118.1	115.4	114	113.3	119	104.1	-12.5%	-21.3%
Alcohol-Related Fatal Crashes	188	243	255	226	208	223	218	234	295	292	233	-20.2%	23.9%
Alcohol-Related Fatalities	204	277	295	240	240	244	239	264	337	317	258	-18.6%	26.5%
Population (Thousands)	3,605	3,712	3,811	3,903	3,996	4,103	4,216	4,301	4,437	4,501	4,551	1.1%	26.2%
VMT (Billions)	32.52	33.83	35.27	36.04	37.74	38.52	40.55	41.56	43	43.55	43.4	-0.3%	33.5%
Licensed Drivers (Thousands)	2,592	2,733	2,815	2,849	2,996	3,014	3,040	3,113	3,288				
Registered Vehicles (Thousands)	3,450	3,619	3,556	3,841	3,961	4,053	4,130		4,006				

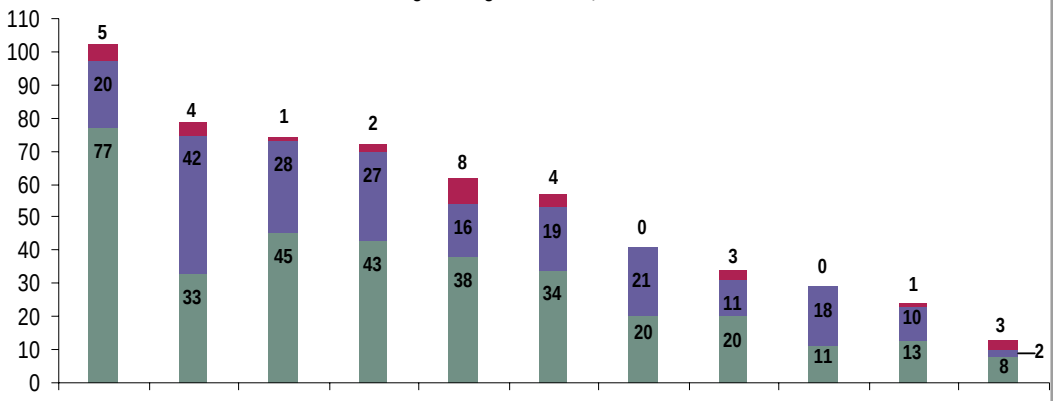
Source: Colorado Department of Revenue — Motor Vehicle Division, CDOT, Colorado Division of Local Governments — Colorado Economic and Demographic Information System, U.S. Department of Transportation, National Highway Safety Administration, Fatality Analysis Reporting System (FARS).

Exhibit I.2
Crashes Per Capita for Cities with More than 25,000 Population

	Population	Total Crashes	Total Crashes per 1,000 Capita	Total Injury and Fatal Crashes	Total Injury and Fatal Crashes Per 1,000 Capita
Denver	566,173	24,883	43.95	5,456	9.64
Colorado Springs	377,006	11,119	29.49	2,925	7.76
Aurora	290,782	7,083	24.36	2,110	7.26
Lakewood	143,454	4,175	29.1	713	4.97
Fort Collins	125,461	3,601	28.7	819	6.53
Westminster	104,522	1,807	17.29	457	4.37
Pueblo	104,291	3,359	32.21	923	8.85
Arvada	102,513	2,101	20.49	424	4.14
Centennial	100,692	47	0.47	13	0.13
Thornton	97,855	1,881	19.22	408	4.17
Boulder	97,763	2,633	26.93	823	8.42
Greeley	84,519	1,810	21.42	456	5.4
Longmont	79,145	1,849	23.36	451	5.7
Loveland	55,905	730	13.06	295	5.28
Broomfield	43,484	1,297	29.83	258	5.93
Littleton	40,422	1,031	25.51	180	4.45
Northglenn	35,937	919	25.57	176	4.9
Parker	33,267	676	20.32	95	2.86
Englewood	32,410	955	29.47	180	5.55
Castle Rock	32,261	433	13.42	89	2.76
Wheat Ridge	31,902	1,412	44.26	380	11.91
Commerce City	26,805	853	31.82	192	7.16
Brighton	26,113	667	25.54	94	3.6

Source: 2003 CDOT Crash Database.

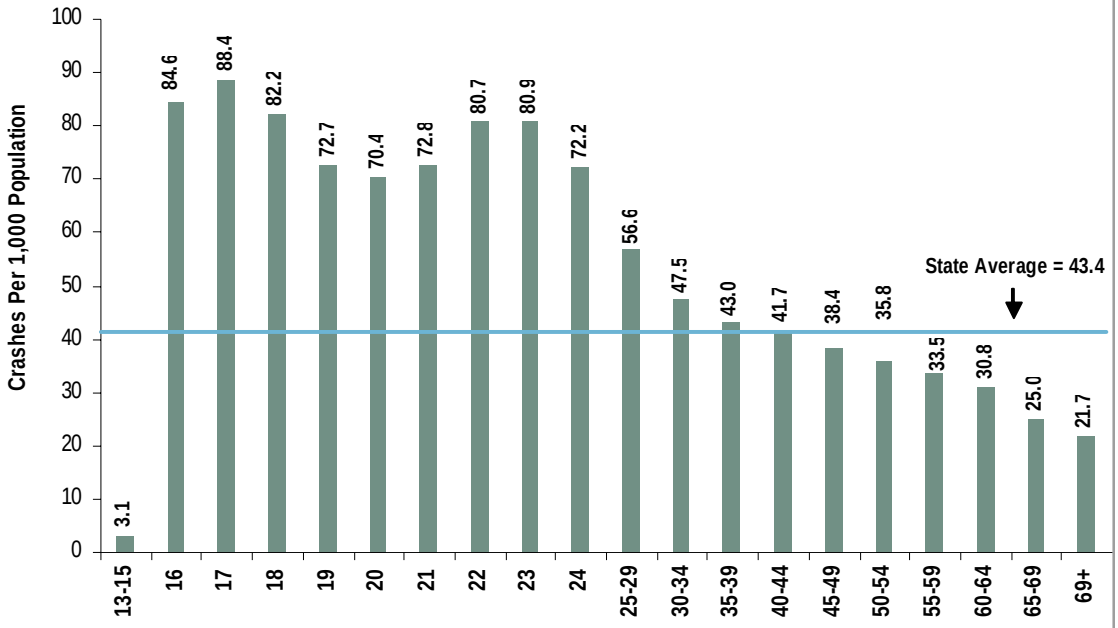
Exhibit I.3
Place of Residence of Drivers in Fatal Crashes Occurring in Large Counties, 2003



	El Paso	Weld	Jefferson	Denver	Larimer	Adams	Arapahoe	Pueblo	Douglas	Boulder	Mesa
Same as County	75.49%	41.77%	60.81%	59.72%	61.29%	59.65%	48.78%	58.82%	37.93%	54.17%	61.54%
Other County	19.61%	53.16%	37.84%	37.50%	25.81%	33.33%	51.22%	32.35%	62.07%	41.67%	15.38%
Out-of-State	4.90%	5.06%	1.35%	2.78%	12.90%	7.02%	0.00%	8.82%	0.00%	4.17%	23.08%
Total Number	101	86	76	77	61	63	41	35	30	28	13

Source: 2003 CDOT Crash Database.

Exhibit I.4
Drivers in All Crashes Per 1,000 Capita by Age



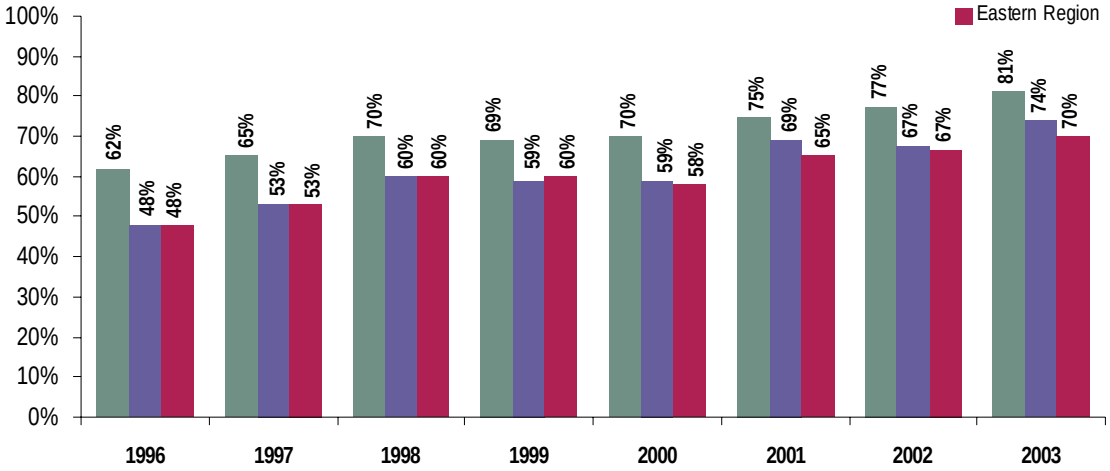
Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Total Crashes	599	5,453	5,921	5,877	5,432	5,160	4,906	4,967	4,696	4,185
Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001

Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	69+
Total Crashes	18,287	16,917	15,075	15,972	14,002	11,419	8,173	5,248	3,286	6,858
Population	322,809	355,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

Note: 44,152 crash drivers were unknown.

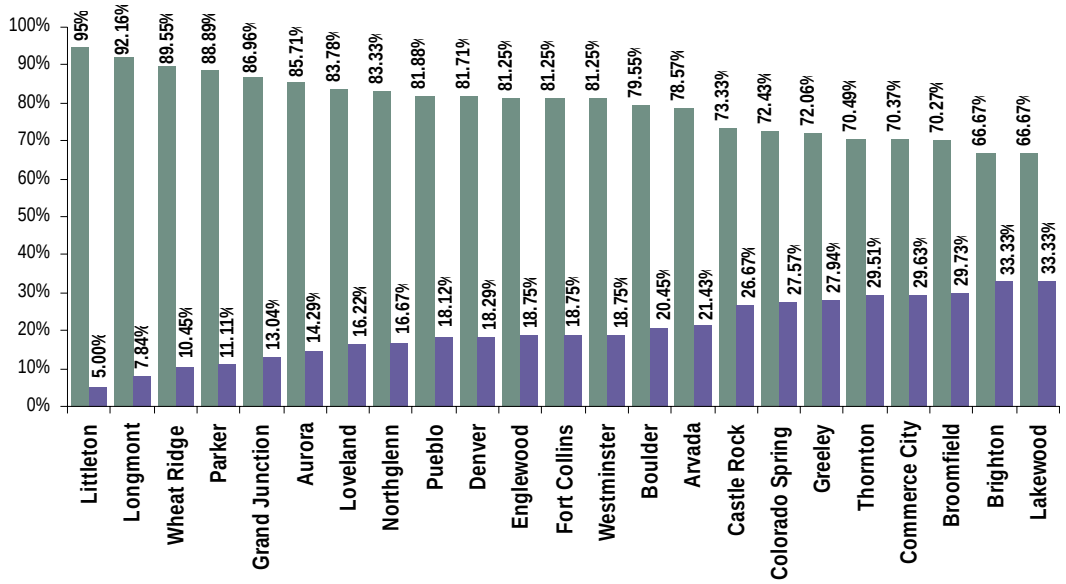
Source: 2003 CDOT Crash Database.

Exhibit I.5
Colorado Regional Seat Belt Use, 1997-2003



Source: Annual Seat Belt Surveys conducted by the CSU Institute of Transportation Management on behalf of CDOT.

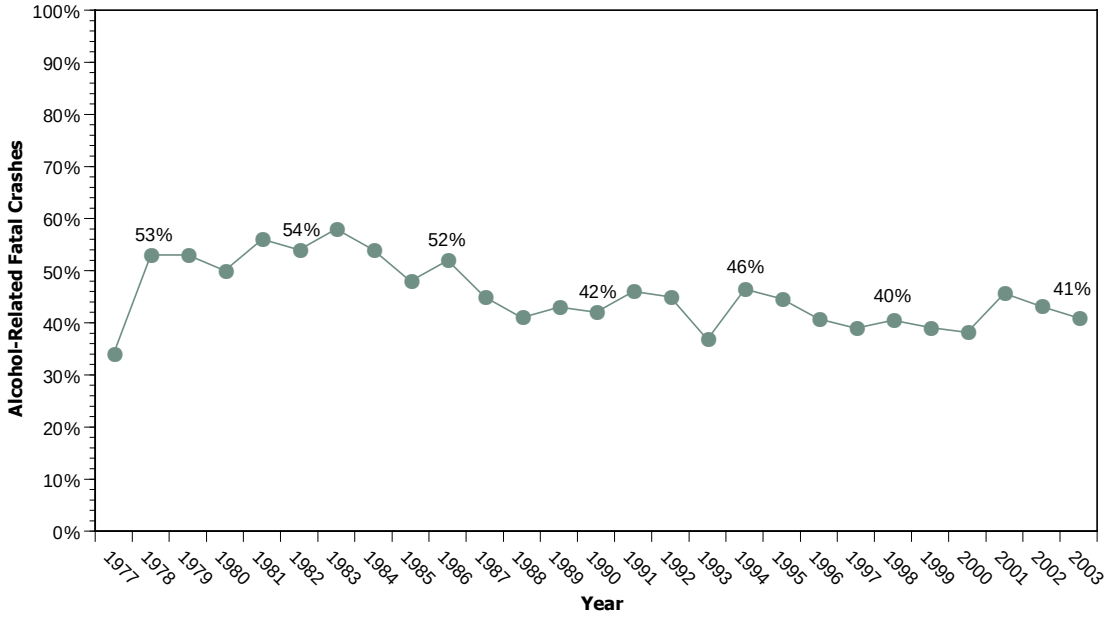
Exhibit I.6
Driver Protection of All Drivers in Incapacitating Injury Crashes, by Large City of Crash



	Littleton	Longmont	Wheat Ridge	Parker	Grand Junction	Aurora	Loveland	Northglenn	Pueblo	Denver	Englewood	Fort Collins	Westminster	Boulder	Arvada	Castle Rock	Colorado Spring	Greeley	Thornton	Commerce City	Broomfield	Brighton	Lakewood
Restraint Used	38	94	60	8	60	348	31	30	122	688	26	65	39	35	55	11	155	49	43	38	26	14	64
Restraint Not Used	2	8	7	1	9	58	6	6	27	154	6	15	9	9	15	4	59	19	18	16	11	7	32
Total Drivers	**40**	**102**	**67**	**9**	**69**	**406**	**37**	**36**	**149**	**842**	**32**	**80**	**48**	**44**	**70**	**15**	**214**	**68**	**61**	**54**	**37**	**21**	**96**

Source: 2003 CDOT Crash Database.

Exhibit I.6
Alcohol Related Fatal Crashes as a Percentage of All Fatal Crashes in Colorado, 1977-2003



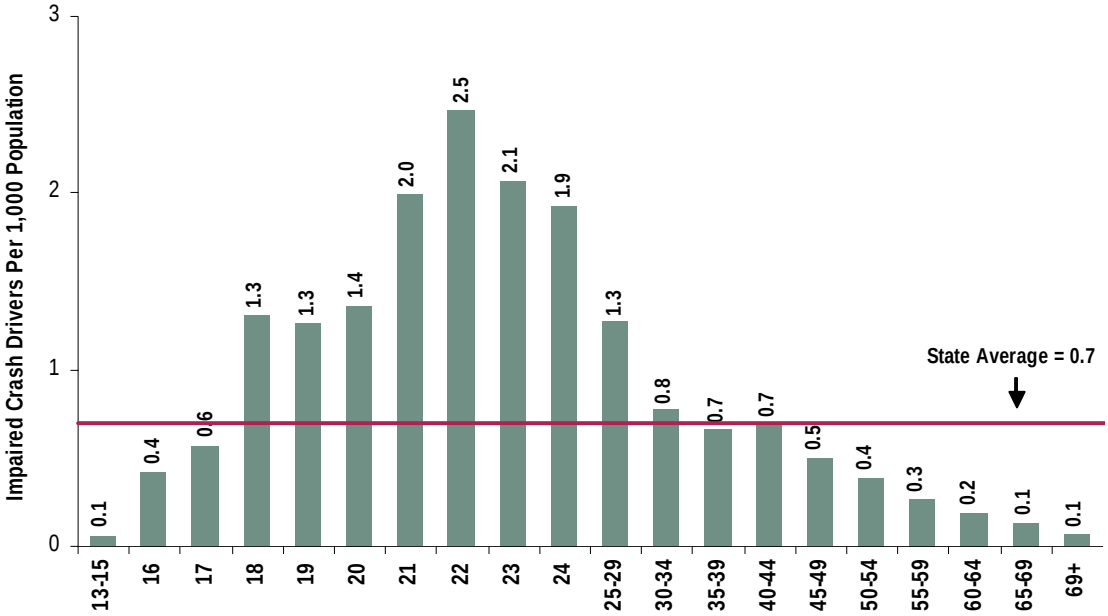
Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit I.7
Percent of All Injury Crash Drivers Who Were Impaired by Large City of Crash, 2003

City	Impairment Suspected		No Impairment Suspected		Total	City	Impairment Suspected		No Impairment Suspected		Total
Arvada	40	5.92%	636	94.08%	676	Grand Junction	26	3.19%	788	96.81%	814
Aurora	221	6.10%	3,401	93.90%	3,622	Greeley	40	5.22%	727	94.78%	767
Boulder	47	3.28%	1,386	96.72%	1,433	Lakewood	82	7.06%	1,079	92.94%	1,161
Brighton	13	8.44%	141	91.56%	154	Littleton	19	5.79%	309	94.21%	328
Broomfield	23	4.94%	443	95.06%	466	Longmont	23	2.86%	782	97.14%	805
Castle Rock	10	6.71%	139	93.29%	149	Loveland	17	3.89%	420	96.11%	437
Centennial	2	9.52%	19	90.48%	21	Northglenn	26	7.81%	307	92.19%	333
Colorado Springs	300	5.58%	5,079	94.42%	5,379	Parker	3	1.59%	186	98.41%	189
Commerce City	21	5.82%	340	94.18%	361	Pueblo	105	6.67%	1,470	93.33%	1,575
Denver	441	4.69%	8,965	95.31%	9,406	Thornton	61	8.28%	676	91.72%	737
Englewood	16	5.13%	296	94.87%	312	Westminster	53	6.05%	823	93.95%	876
Fort Collins	70	4.82%	1,381	95.18%	1,451	Wheat Ridge	36	4.74%	724	95.26%	760
Grand Junction	26	3.19%	788	96.81%	814	Total	169		30,517		322

Source: 2003 CDOT Crash Database.

Exhibit I.8
Impaired Drivers Involved in Injury Crashes, Crash Involvement Index by Age, 2003



Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Impairment	10	27	38	93	94	100	134	152	120	112
Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001

Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	69+
Impairment	412	277	233	262	183	122	64	32	17	22
Population	322,809	355,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

Source: 2003 CDOT Crash Database.

Introduction

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The Colorado Department of Transportation (CDOT) retained the University of Colorado to prepare the FY 2006 Problem Identification Report. University of Colorado Professors Dr. Jeffery Zax and Dr. Naci Mocan were assisted in this effort by Jennifer Garner of Garner Insight LLC and Glissen Rhode of Glissen, LLC.

Purpose

Each year CDOT examines crash records to identify traffic safety problems and opportunities for improving traffic safety in Colorado. CDOT managers in the Safety and Traffic Engineering Branch use the research results to develop traffic safety programs and projects. The resulting document, the FY 2006 Problem Identification Report, is available online at www.dot.state.co.us/Traffic_Manuals_Guidelins/Accident_and_Rates_Books.asp.

Objective

Examining crash trends and the factors associated with crashes, both behavioral and environmental, aids CDOT program managers in their task to support the Department's safety mission and to achieve the Department's goals and objectives. Findings from the Problem Identification Report are used to support the Safety and Traffic Engineering Branch's strategies to increase traffic safety including prevention, collaboration/partnerships, education and enforcement.

Data Sources

To prepare the FY 2006 Problem Identification Report, the study team relied primarily on four sources of data: CDOT's 2003 crash database, the Motor Vehicle Department's database of 2003 licensed drivers, the 2003 Fatality Analysis Reporting System (FARS) and the Motor Vehicle Department's 2004 citation file. County-level on-system Vehicle Miles Traveled (VMT) data were obtained from CDOT. Population data were obtained from the Colorado Division of Local Governments and the US Census Bureau.

Analyses

Analyses in this report include examinations of crash trends, crash locations, the factors contributing to crashes and an examination of high-risk drivers. High-risk drivers include young drivers, impaired drivers and drivers who do not use occupant protection devices. Crashes involving bicycles and pedestrians were also included. Preliminary analyses of the 2004 citation file are also included, a new addition to the Problem Identification process. In a separate effort, a market segmentation system, Cohorts, is being applied to drivers with 2004 citations. This effort, conducted by Looking Glass, will provide CDOT with additional insights into the attitudes and motivations of higher risk drivers.

The Crash Data

Accident reports compiled by law enforcement at the time of a crash are the foundation for the Problem Identification report. These accident reports include information about the crash location, the factors that contributed to the crash, the severity of the crash, and whether or not a driver was impaired at the time of the incident. Driver's license records are linked to the crashes. From the driver's license file come demographic data, including the driver's gender, age and place of residence.

There are some limitations to these data. For property-damage only crashes, it may be the case that the driver's seat belt use (or non-use) is unrecorded. Similarly, the address reported in a driver's license file may be out of date. This report's analyses are designed to minimize these limitations, where possible.

Acknowledgments

The study team would like to gratefully acknowledge the leadership of Henry Sandoval, Roberta Lopez and Matt Clayton and the invaluable assistance of Rahim Marandi and Tim Foote.

PDO, Injury and Fatal Crashes Involving all Vehicles

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Overview, Crash Baselines and Trends

Selected Key Findings

Colorado experienced marked improvement in several key crash statistics from 2002 to 2003. Over this period, fatal crashes fell by 16% and alcohol-related fatal crashes fell by 20%.

Among the state's largest cities, Wheat Ridge, Denver, Pueblo, Boulder and Colorado Springs have the highest per capita injury and fatal crash rates. Statewide in 2003, 25% of all reported crashes resulted in an injury or fatality. The proportion of crashes resulting in an injury varied widely. In the City of Loveland, 40% of all crashes resulted in an injury, compared to 19% in Englewood. The cities of Castle Rock, Parker, Brighton, Arvada and Thornton had the lowest per capita rates of injury and fatal crashes, among large cities.

The Eastern Plains region has had a higher number of on-system fatal crashes than other rural regions each year since 1999. Among the largest counties, El Paso and Weld had the greatest numbers of fatal crashes. With respect to injury crashes, Denver and El Paso counties had the greatest number of crashes.

Residents of El Paso County are involved in 75% of El Paso County fatal crashes, and County residents are also involved in 84% of the County's injury crashes. Since County residents are involved in such a significant number of the County's most severe crashes, implementing a traffic safety program in El Paso County targeting residents may be recommended.

In 2003, Weld County residents were involved in only two in five Weld County fatal crashes and slightly more than half of the County's injury crashes. The knowledge that non-county residents are often involved in Weld County's most serious crashes may impact how traffic safety programs are delivered

Colorado Crash Trends

Reducing the number of fatalities in traffic crashes, and the associated social and economic losses from these crashes, is at the core of the Colorado Department of Transportation's traffic safety program. In addition to statewide and local enforcement and public information and education projects, CDOT has also supported key traffic safety legislation over the past twenty years. Examples of traffic safety legislative milestones include:

- Child safety seat and seat belt laws (1985 and 1987);
- Efforts focusing on drinking and driving (e.g., creation of the Law Enforcement Assistance Fund in 1982 and passage of the 0.08 law in 2004); and
- The Graduated Licensing Law for new drivers (1999, 2005).

As shown in Exhibit III.1 on the following page, Colorado experienced tremendous growth in both population and Vehicle Miles Traveled (VMT). Since 1999, the state's population grew by 25% and VMT grew by 33%. Despite these pressures, fatalities increased by only 15% and injuries grew by only 5%. More importantly, the rate of fatalities per 100 million VMT fell by 14% from 1999 to 2003 and the rate of injuries per 100 million VMT decreased by 21% over the same period. Another key benchmark, the proportion of fatal crashes that are alcohol-related increased overall from 1999 to 2003. However, the number of alcohol-related fatal crashes fell from its high of 293 in 2002 to 233 in 2003, a 20% decrease.

Exhibit III.1
Colorado Crash and Population Trends, 1993-2003

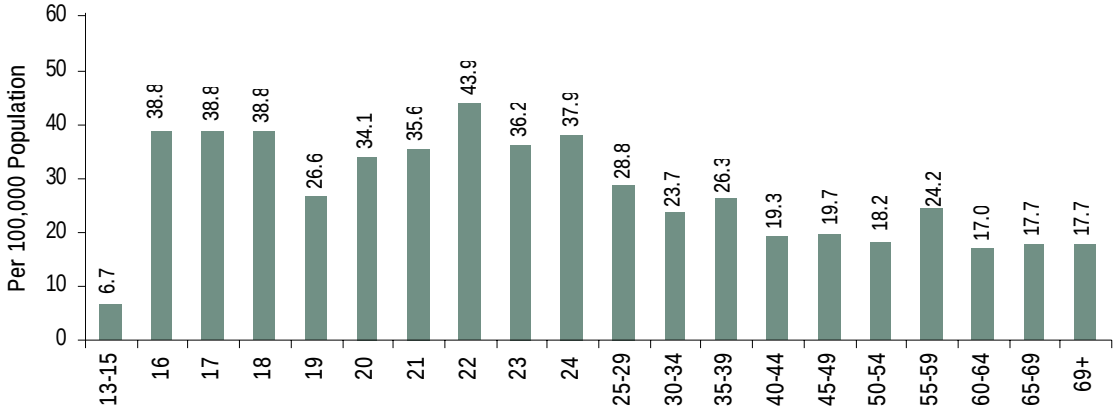
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	% Change 2002-2003	% Change 1999-2003
Total Crashes	90,430	94,610	95,778	101,886	107,844	110,866	115,145	121,995	131,020	137,216	126,878	-7.5%	40.3%
Fatal Crashes	511	523	572	555	534	551	558	613	647	677	570	-15.8%	11.5%
Injury Crashes	28,153	30,134	30,455	30,263	28,252	31,080	31,406	31,940	34,160	33,944	31,731	-6.5%	12.7%
PDO Crashes	61,757	63,821	67,366	71,069	79,078	79,263	83,175	89,456	92,213	102,598	94,578	-7.8%	53.1%
Fatalities	559	586	645	617	613	628	626	681	741	743	642	-13.6%	14.8%
Injuries	43,007	45,862	46,099	45,448	42878	45,488	46,804	47,387	48,649	51,803	45,167	-12.8%	5.0%
Fatalities Per 100 Million VMT	1.72	1.73	1.83	1.71	1.62	1.6	1.54	1.63	1.73	1.71	1.48	-13.5%	-14.0%
Injuries Per 100 Million VMT	132.2	135.6	130.7	126.1	113.6	118.1	115.4	114	113.3	119	104.1	-12.5%	-21.3%
Alcohol-Related Fatal Crashes	188	243	255	226	208	223	218	234	295	292	233	-20.2%	23.9%
Alcohol-Related Fatalities	204	277	295	240	240	244	239	264	337	317	258	-18.6%	26.5%
Population (Thousands)	3,605	3,712	3,811	3,903	3,996	4,103	4,216	4,301	4,437	4,501	4,551	1.1%	26.2%
VMT (Billions)	32.52	33.83	35.27	36.04	37.74	38.52	40.55	41.56	43	43.55	43.4	-0.3%	33.5%
Licensed Drivers (Thousands)	2,592	2,733	2,815	2,849	2,996	3,014	3,040	3,113	3,288				
Registered Vehicles (Thousands)	3,450	3,619	3,556	3,841	3,961	4,053	4,130		4,006				

Source: Colorado Department of Revenue—Motor Vehicle Division, CDOT, Colorado Division of Local Governments—Colorado Economic and Demographic Information System, U.S. Department of Transportation, National Highway Safety Administration, Fatality Analysis Reporting System (FARS).

Fatalities

Exhibit III.2 presents the rate of driver involvement in fatal crashes by age. Two high-risk cohorts emerge: drivers between the ages of 16 and 18 and drivers ages 20 through 24.

Exhibit III.2
Drivers Involved in Fatal Crashes per 100,000 Population, 2003



Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Drivers	13	25	26	31	19	25	24	27	21	22
Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001

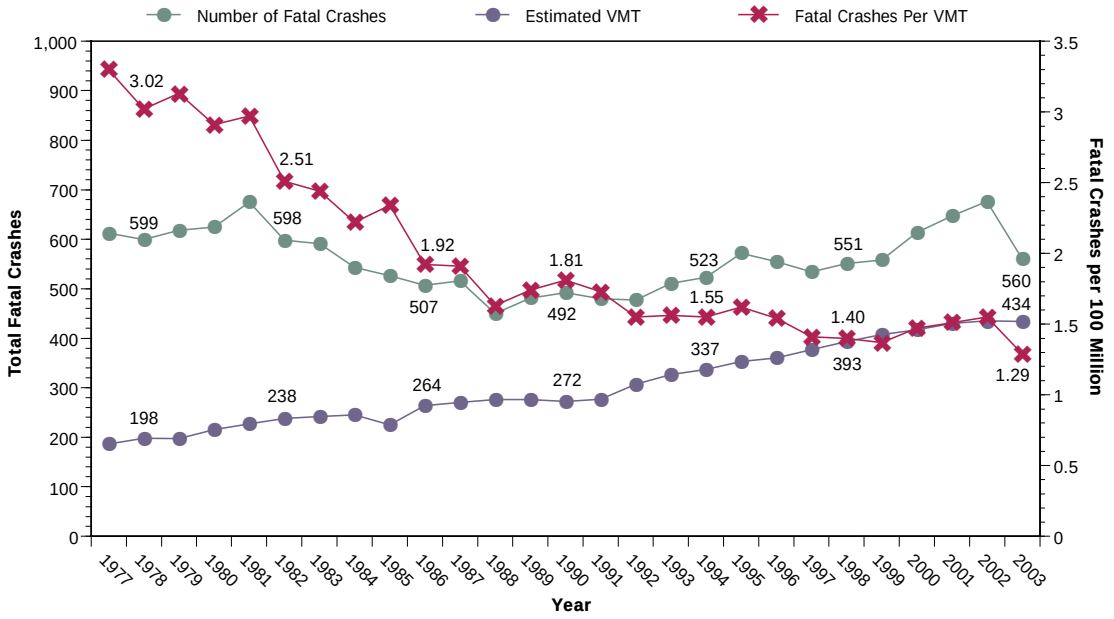
Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	69+
Drivers	93	85	92	74	72	58	59	29	14	56
Population	322,809	358,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

Source: 2003 CDOT Crash Database.

Fatal Crashes Per 100 Million VMT

Exhibit III.3 presents the number of fatal crashes and the number of fatal crashes per 100 million VMT annually from 1977 through 2003. From 1997 to 2002, both the number and rate of fatal crashes were increasing. This trend appeared to reverse in 2003.

Exhibit III.3
Fatal Crashes Per 100 Million VMT and Actual Fatalities, 1977-2003

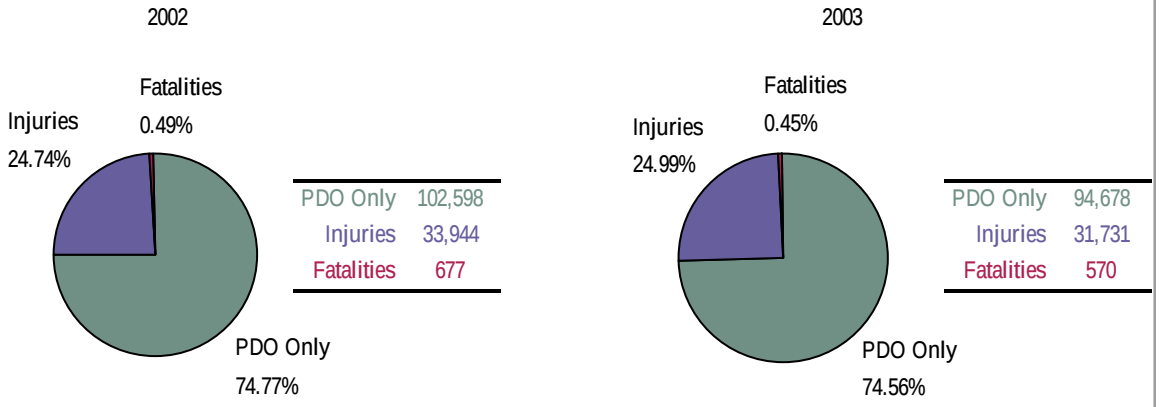


Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Profile of Crashes in Colorado

The vast majority of reported crashes are property-damage only (PDO). As shown in Exhibit III.4, PDO crashes accounted for 75% of all reported crashes in 2003.

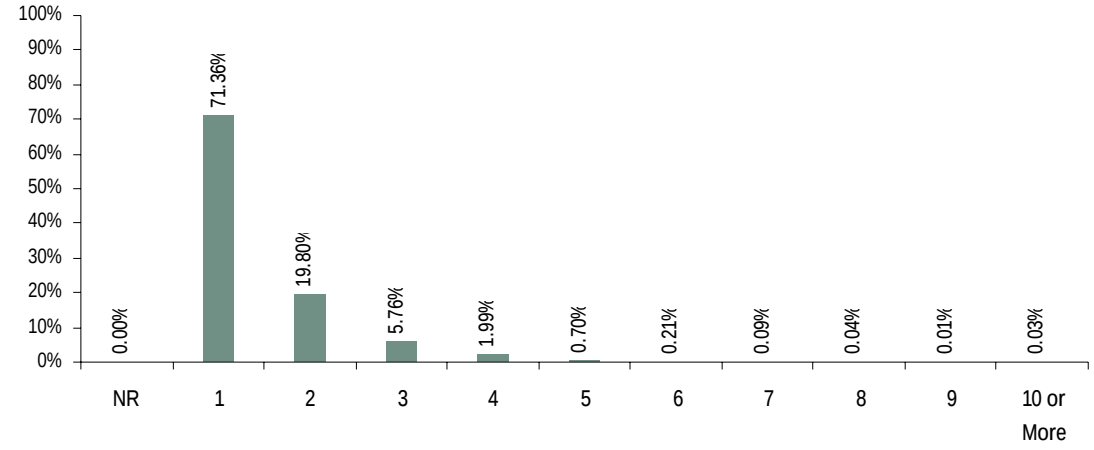
Exhibit III.4
Crashes in Colorado by Severity, 2002 and 2003



Source: 2002 and 2003 CDOT Crash Database.

Most injury crashes (71%) involve single injuries. Exhibit III.5 presents the number of injuries per crash.

Exhibit III.5
Number of Injuries Per Crashes, 2003

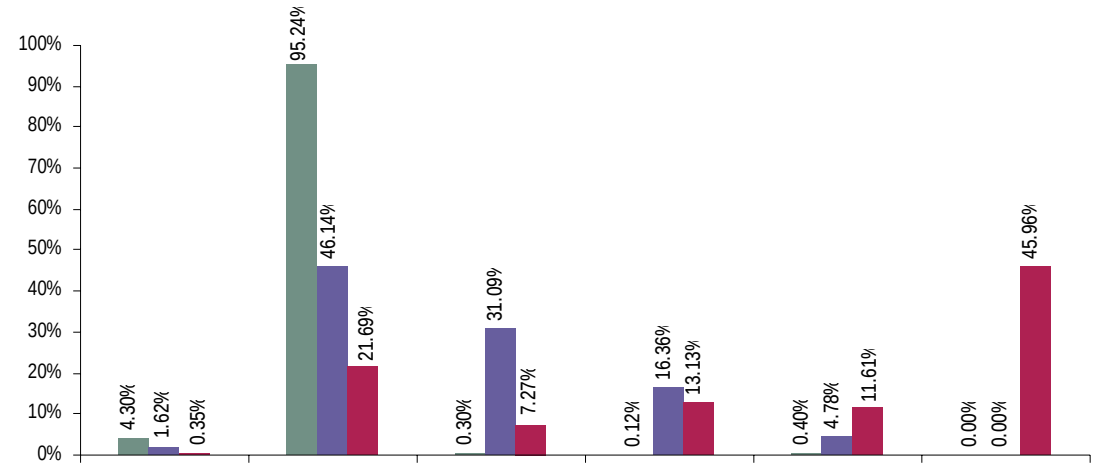


	NR	1	2	3	4	5	6	7	8	9	10 or More
Injury Crashes	0	16,263	1,257	107	13	2	0	0	0	0	0
Total Crashes	94,836	22,790	6,349	1,861	653	235	73	31	14	6	6

Source: 2003 CDOT Crash Database.

Exhibit III.6 shows the severity of injuries in 2003 crashes.

Exhibit III.6
Severity of Injury, 2003



	Not Reported	No Injury	Possible Injury	Injury, Not Incapacitating	Injury, Capacitating	Fatal
PDO Only	64	1,425	4	2	1	0
Injury Crashes	9	259	175	92	27	0
Fatal Crashes	0	2	1	1	1	4
Total Crashes	7,343	168,552	17,971	9,485	2,840	394

Source: 2003 CDOT Crash Database.

Exhibit III.7
Number of Injury Crashes by Injuries, 2003

Number of Injury Crashes	Number Injured	Percent Injured
22,644	1	71.36%
6,282	2	19.80%
1,829	3	5.76%
633	4	1.99%
223	5	0.70%
66	6	0.21%
29	7	0.09%
13	8	0.04%
4	9	0.01%
5	10	0.02%
3	12	0.01%

Souce: 2003 CDOT Crash Database.

As shown in Exhibit III.7, 20% of 2003 injury crashes resulted in two injuries per crash.

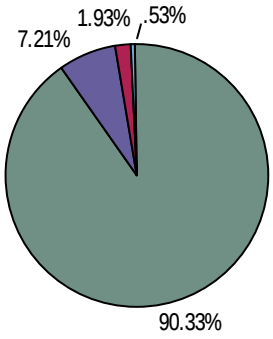
Exhibits III.8 and III.9 demonstrate that nine out of ten fatal crashes in 2003 resulted in a single fatality.

Exhibit III.8
Number of Fatal Crashes by Fatalities, 2003

Number of Fatal Crashes	Number of Fatalities	Percent of Fatal Crashes
515	1	90.33%
41	2	7.21%
11	3	1.93%
3	4	0.53%

Source: 2003 CDOT Crash Database.

Exhibit III.9
Fatalities Per Fatal Crash, 2003

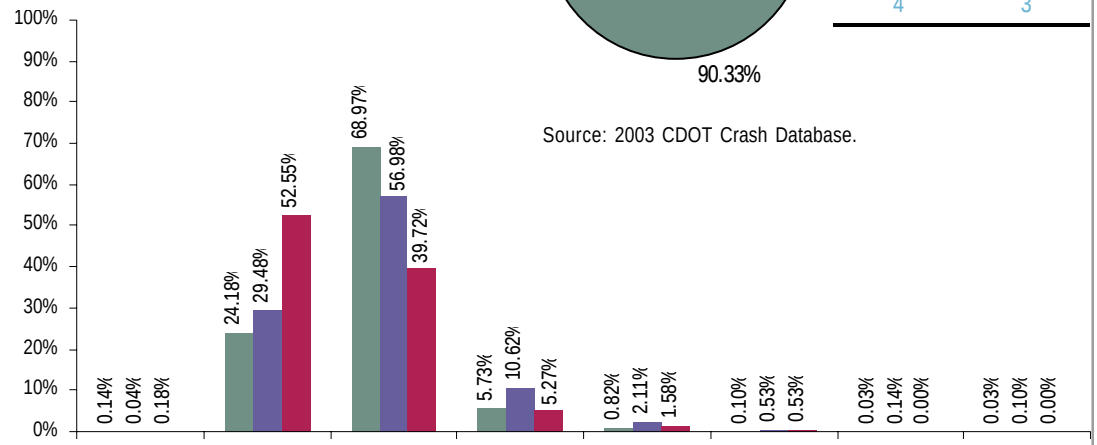


Fatalities	Fatal Crashes
1	515
2	41
3	11
4	3

Source: 2003 CDOT Crash Database.

Exhibit III.10 presents the number of vehicles involved in 2003 crashes, by the severity of the crash. The greatest proportion of two-vehicle crashes are property damage-only, while the greatest proportion of single-vehicle crashes are fatal crashes.

Exhibit III.10
Number of Vehicles Involved in Crashes, 2003



	Not Recorded	1	2	3	4	5	6	7 or More
PDO Only	132	22,869	65,230	5,419	776	95	28	28
Injury Crashes	13	9,354	18,080	3,370	670	168	44	32
Fatal Crashes	1	299	226	30	9	3	0	0
Total Crashes	147	32,519	83,535	8,817	1,459	269	69	63

Source: 2003 CDOT Crash Database.

Crash Location

This section explores the 2003 crash data based on the location where each crash occurred.

City, Region, County and Road

Wheat Ridge, Denver and Pueblo had the highest number of total crashes per capita in 2003 (Exhibit III.11). These same three cities had the highest fatal and injury crash rates (per capita) in 2003. Among cities with populations greater than 25,000, Centennial, Parker, Castle Rock and Brighton had the lowest injury and fatal crash rates per capita.

Exhibit III.11
Crashes Per Capita for Cities with More than 25,000 Population

	Population	Total Crashes	Total Crashes per 1,000 Capita	Total Injury and Fatal Crashes	Total Injury and Fatal Crashes Per 1,000 Capita
Denver	566,173	24,883	43.95	5,456	9.64
Colorado Springs	377,006	11,119	29.49	2,925	7.76
Aurora	290,782	7,083	24.36	2,110	7.26
Lakewood	143,454	4,175	29.1	713	4.97
Fort Collins	125,461	3,601	28.7	819	6.53
Westminster	104,522	1,807	17.29	457	4.37
Pueblo	104,291	3,359	32.21	923	8.85
Arvada	102,513	2,101	20.49	424	4.14
Centennial	100,692	47	0.47	13	0.13
Thornton	97,855	1,881	19.22	408	4.17
Boulder	97,763	2,633	26.93	823	8.42
Greeley	84,519	1,810	21.42	456	5.4
Longmont	79,145	1,849	23.36	451	5.7
Loveland	55,905	730	13.06	295	5.28
Broomfield	43,484	1,297	29.83	258	5.93
Littleton	40,422	1,031	25.51	180	4.45
Northglenn	35,937	919	25.57	176	4.9
Parker	33,267	676	20.32	95	2.86
Englewood	32,410	955	29.47	180	5.55
Castle Rock	32,261	433	13.42	89	2.76
Wheat Ridge	31,902	1,412	44.26	380	11.91
Commerce City	26,805	853	31.82	192	7.16
Brighton	26,113	667	25.54	94	3.6

Source: 2003 CDOT Crash Database.

Exhibit III.12, on the following pages, displays the 2003 severity of crashes in each Colorado city that experienced ten or more crashes. In 2003, 75% of all crashes were PDO crashes and the remaining 25% of crashes were injury and fatal crashes. The incidence of injury and fatal crashes varies widely by city. In Lakewood, fewer than one in five crashes involved an injury or fatality. Almost one-third of Boulder crashes involved an injury or fatality.

Exhibit III.12
Number of Crashes and Severity for Cities with Ten or More Crashes

City	PDO Crashes	Injury Crashes	Fatal Crashes	Total Crashes
Alamosa	81.20%	18.50%	0.30%	335
Arvada	79.80%	20.00%	0.10%	2,101
Aspen	90.40%	9.60%	0.00%	376
Aurora	70.20%	29.60%	0.20%	7,083
Avon	83.80%	16.20%	0.00%	185
Basalt	91.50%	8.50%	0.00%	82
Bayfield	84.60%	15.40%	0.00%	13
Berthoud	83.00%	16.00%	0.90%	106
Black Hawk	73.80%	23.80%	2.40%	42
Boulder	68.70%	31.10%	0.20%	2,633
Breckenridge	90.30%	9.70%	0.00%	175
Brighton	85.90%	14.10%	0.00%	667
Broomfield	80.10%	19.40%	0.50%	1,297
Brush	82.50%	17.50%	0.00%	57
Burlington	85.50%	14.50%	0.00%	55
Calhan	92.90%	7.10%	0.00%	14
Canon City	79.90%	19.50%	0.60%	353
Carbondale	81.00%	19.00%	0.00%	58
Castle Rock	79.40%	20.60%	0.00%	433
Centennial	72.30%	23.40%	4.30%	47
Center	77.30%	22.70%	0.00%	22
Central City	100.00%	0.00%	0.00%	10
Cherry Hills Village	81.60%	18.40%	0.00%	245
Colorado Springs	73.70%	26.10%	0.20%	11,119
Columbine Valley	60.60%	39.40%	0.00%	33
Commerce City	77.50%	22.20%	0.40%	853
Cortez	71.10%	28.40%	0.50%	190
Craig	82.60%	17.40%	0.00%	195
Cripple Creek	93.50%	6.50%	0.00%	31
Dacono	73.10%	26.90%	0.00%	26
Del Norte	80.00%	20.00%	0.00%	10
Delta	75.40%	24.60%	0.00%	171
Denver	78.10%	21.70%	0.20%	24,883
Dillon	69.60%	28.30%	2.20%	46
Durango	80.30%	19.40%	0.30%	625
Eagle	91.30%	8.70%	0.00%	69
Eaton	83.90%	16.10%	0.00%	31
Edgewater	80.50%	19.50%	0.00%	77
Elizabeth	90.50%	9.50%	0.00%	21
Englewood	81.20%	18.80%	0.00%	955
Erie	71.40%	28.60%	0.00%	56
Estes Park	85.10%	14.90%	0.00%	161
Evans	78.90%	20.70%	0.40%	275

Exhibit III.12
Number of Crashes and Severity for Cities with Ten or More Crashes, Continued

City	PDO Crashes	Injury Crashes	Fatal Crashes	Total Crashes
Federal Heights	78.90%	21.10%	0.00%	261
Firestone	75.70%	24.30%	0.00%	37
Florence	73.20%	26.80%	0.00%	41
Ft. Collins	77.30%	22.60%	0.20%	3,601
Ft. Lupton	83.90%	16.10%	0.00%	143
Ft. Morgan	83.50%	16.50%	0.00%	260
Fountain	57.10%	42.90%	0.00%	35
Frederick	78.20%	21.80%	0.00%	119
Frisco	77.80%	22.20%	0.00%	45
Garden City	72.70%	27.30%	0.00%	11
Glendale	70.20%	29.80%	0.00%	235
Glenwood Springs	82.70%	17.00%	0.30%	342
Golden	78.60%	20.80%	0.50%	571
Grand Junction	70.50%	29.30%	0.20%	1,500
Greeley	74.80%	24.90%	0.30%	1,810
Greenwood Village	72.10%	27.80%	0.10%	1,120
Gunnison	84.70%	15.30%	0.00%	72
Holyoke	92.90%	7.10%	0.00%	42
Idaho Springs	85.90%	14.10%	0.00%	71
Ignacio	74.10%	25.90%	0.00%	27
Johnstown	71.40%	28.60%	0.00%	63
Lafayette	74.90%	25.10%	0.00%	426
La Junta	76.10%	23.20%	0.70%	138
Lakeside	68.80%	31.30%	0.00%	32
Lakewood	82.90%	16.90%	0.20%	4,175
Lamar	74.60%	24.60%	0.80%	126
Las Animas	84.40%	15.60%	0.00%	32
Leadville	79.30%	20.70%	0.00%	29
Limon	94.10%	5.90%	0.00%	34
Littleton	82.50%	17.10%	0.40%	1,031
Lochbuie	81.80%	18.20%	0.00%	11
Lone Tree	90.90%	9.10%	0.00%	11
Longmont	75.60%	24.30%	0.10%	1,849
Louisville	82.50%	17.20%	0.30%	338
Loveland	59.60%	40.00%	0.40%	730
Manitou Springs	88.50%	11.50%	0.00%	130
Meeker	88.60%	11.40%	0.00%	35
Milliken	87.90%	12.10%	0.00%	33
Monte Vista	66.70%	33.30%	0.00%	12
Montrose	81.60%	18.40%	0.00%	539
Monument	90.90%	9.10%	0.00%	33
Morrison	71.70%	28.30%	0.00%	46
Mount Crested Butte	90.50%	9.50%	0.00%	21

Exhibit III.12
Number of Crashes and Severity for Cities with Ten or More Crashes, Continued

City	PDO Crashes	Injury Crashes	Fatal Crashes	Total Crashes
New Castle	81.00%	19.00%	0.00%	42
Northglenn	80.80%	18.80%	0.30%	919
Pagosa Springs	80.00%	20.00%	0.00%	75
Palisade	80.00%	20.00%	0.00%	10
Palmer Lake	87.50%	12.50%	0.00%	16
Parachute	90.90%	9.10%	0.00%	33
Parker	85.90%	13.90%	0.10%	676
Platteville	80.00%	20.00%	0.00%	35
Pueblo	72.50%	27.20%	0.20%	3,359
Rangely	100.00%	0.00%	0.00%	28
Ridgeway	92.30%	7.70%	0.00%	13
Rifle	92.50%	7.50%	0.00%	200
Rocky Ford	51.40%	48.60%	0.00%	35
Salida	80.80%	19.20%	0.00%	73
Sheridan	77.60%	22.20%	0.20%	517
Silt	87.30%	12.70%	0.00%	63
Silverthorn	87.20%	12.80%	0.00%	141
Snowmass	91.70%	8.30%	0.00%	12
Snowmass Village	88.10%	11.90%	0.00%	42
Steamboat Springs	91.00%	9.00%	0.00%	365
Sterling	65.40%	33.60%	0.90%	107
Superior	74.20%	25.80%	0.00%	66
Telluride	93.60%	6.40%	0.00%	78
Thornton	78.30%	21.50%	0.20%	1,881
Trinidad	84.30%	15.70%	0.00%	229
Vail	82.70%	16.90%	0.40%	225
Walsenburg	73.70%	26.30%	0.00%	38
Westminster	74.70%	24.90%	0.40%	1,807
Wheat Ridge	73.10%	26.80%	0.10%	1,412
Windsor	79.30%	20.00%	0.70%	135
Woodland Park	88.30%	11.70%	0.00%	180
Wray	100.00%	0.00%	0.00%	21
Yuma	85.70%	14.30%	0.00%	42

Source: 2003 CDOT Crash Database.

On the county level, the number of drivers involved in an injury or fatal crash is a very small proportion of a county's driving age population (Exhibit III.13 on the following page). Adams, Pueblo and Weld counties had the highest overall proportion of injury crash drivers, compared to the county's population.

Exhibit III.13
Drivers in Injury and Fatal Crashes From a County as a Proportion of all County Residents Aged 14 Years and Older

		Injuries		Fatalities	
County of Crash Location	Population Aged > 14	Number of Drivers in Injury Crashes	All Drivers in Injury Crashes as Percent of All Driving Age Residents	Number of Drivers in Fatal Crashes	All Drivers in Fatal Crashes as Percent of All Driving Age Residents
Adams	275,783	5,221	1.89%	76	0.03%
Alamosa	11,594	148	1.28%	8	0.07%
Arapahoe	379,960	6,428	1.69%	51	0.01%
Archuleta	7,906	119	1.51%	5	0.06%
Baca	3,651	31	0.85%	3	0.08%
Bent	4,856	27	0.56%	3	0.06%
Boulder	235,512	3,358	1.43%	33	0.01%
Broomfield	32,930	495	1.50%	5	0.02%
Chaffee	13,701	112	0.82%	7	0.05%
Cheyenne	1,722	8	0.46%	4	0.23%
Clear Creek	7,623	131	1.72%	3	0.04%
Conejos	6,213	69	1.11%	8	0.13%
Costilla	2,917	34	1.17%	3	0.10%
Crowley	4,685	32	0.68%	1	0.02%
Custer	2,866	26	0.91%	0	0.00%
Delta	22,417	260	1.16%	4	0.02%
Denver	451,079	7,313	1.62%	73	0.02%
Dolores	1,518	14	0.92%	0	0.00%
Douglas	127,657	2,104	1.65%	20	0.02%
Eagle	33,312	369	1.11%	8	0.02%
El Paso	397,489	6,506	1.64%	96	0.02%
Elbert	14,989	223	1.49%	5	0.03%
Fremont	38,366	390	1.02%	9	0.02%
Garfield	33,976	412	1.21%	9	0.03%
Gilpin	3,932	64	1.63%	0	0.00%
Grand	10,235	122	1.19%	1	0.01%
Gunnison	11,896	82	0.69%	3	0.03%
Hinsdale	659	4	0.61%	1	0.15%
Huerfano	6,566	44	0.67%	2	0.03%
Jackson	1,262	12	0.95%	0	0.00%
Jefferson	417,201	6,467	1.55%	82	0.02%
Kiowa	1,298	11	0.85%	1	0.08%
Kit Carson	6,286	45	0.72%	1	0.02%
La Plata	35,980	481	1.34%	14	0.04%
Lake	6,049	68	1.12%	3	0.05%
Larimer	202,011	3,159	1.56%	57	0.03%
Las Animas	12,185	132	1.08%	1	0.01%
Lincoln	4,921	36	0.73%	2	0.04%
Logan	16,377	144	0.88%	9	0.06%
Mesa	92,546	1,451	1.57%	15	0.02%
Mineral	686	6	0.87%	0	0.00%
Moffat	10,146	157	1.55%	5	0.05%
Montezuma	18,468	236	1.28%	7	0.04%
Montrose	26,170	340	1.30%	7	0.03%

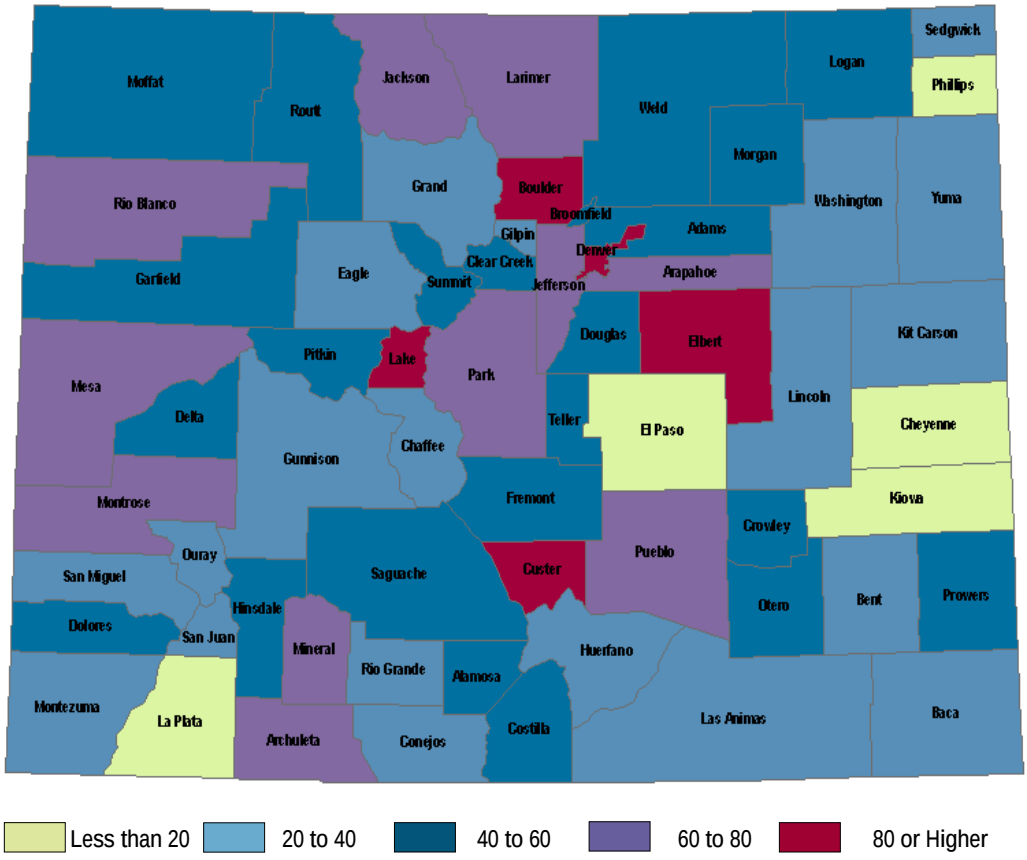
Exhibit III.13
Drivers in Injury and Fatal Crashes From a County as a Proportion of all County Residents Aged 14 Years and Older, Continued

		Injuries		Fatalities	
County of Crash Location	Population Aged > 14	Number of Drivers in Injury Crashes	All Drivers in Injury Crashes as Percent of All Driving Age Residents	Number of Drivers in Fatal Crashes	All Drivers in Fatal Crashes as Percent of All Driving Age Residents
Morgan	20,312	239	1.18%	11	0.05%
Otero	15,923	186	1.17%	3	0.02%
Ouray	3,048	23	0.75%	0	0.00%
Park	11,720	181	1.54%	4	0.03%
Phillips	3,487	37	1.06%	1	0.03%
Pitkin	12,812	113	0.88%	1	0.01%
Prowers	10,916	119	1.09%	6	0.06%
Pueblo	111,465	2,077	1.86%	28	0.03%
Rio Blanco	4,743	44	0.93%	1	0.02%
Rio Grande	9,584	109	1.14%	7	0.07%
Routt	16,074	147	0.91%	2	0.01%
Saguache	4,559	61	1.34%	3	0.07%
San Juan	475	8	1.68%	0	0.00%
San Miguel	5,645	43	0.76%	1	0.02%
Sedgwick	2,245	15	0.67%	0	0.00%
Summit	20,100	182	0.91%	2	0.01%
Teller	16,262	240	1.48%	2	0.01%
Washington	3,886	34	0.87%	6	0.15%
Weld	138,313	2,527	1.83%	45	0.03%
Yuma	7,596	57	0.75%	2	0.03%

Source: 2002 and 2003 CDOT Crash Database.

For those injury crashes occurring on the state highway system, five counties - Denver, Boulder, Elbert, Lake and Custer, had 80 or more injury crashes per 100 million VMT (Exhibit III.14 on the following page).

Exhibit III.14
2003 County and Region On-System Injury Crashes Per 100 Million County and Region VMT

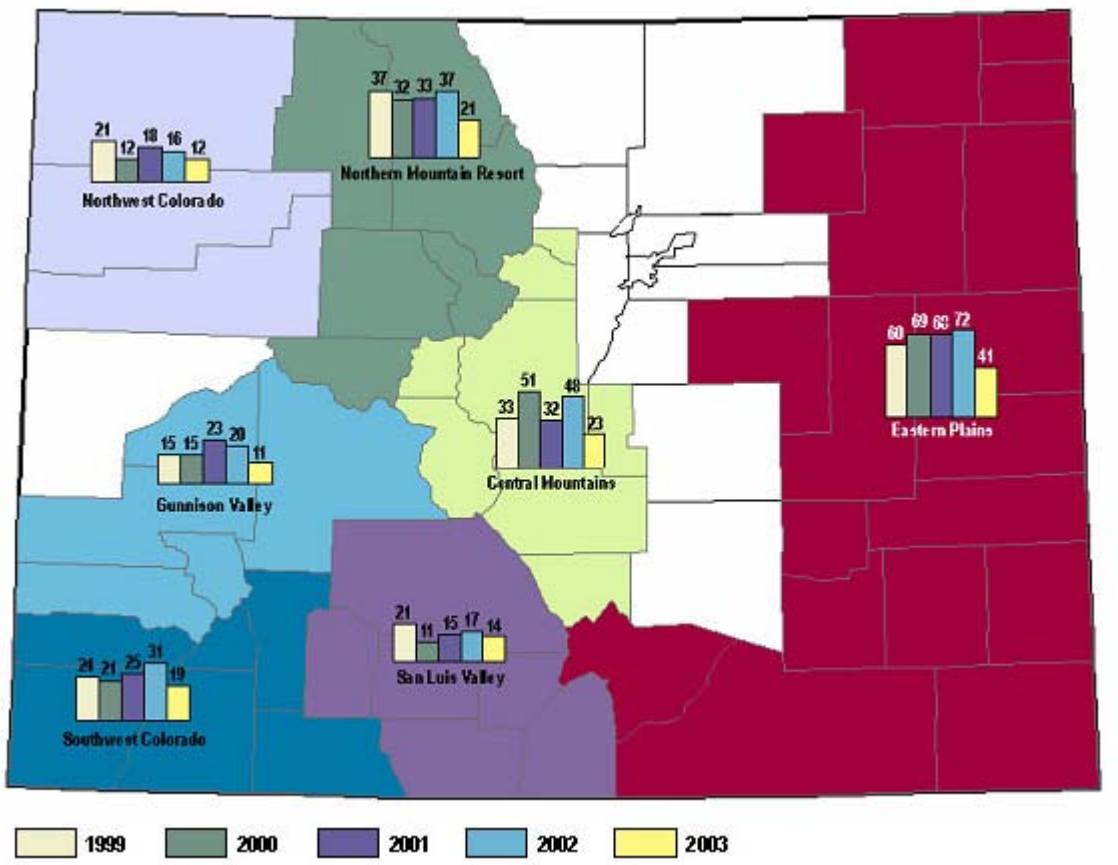


Source: 2003 CDOT Crash Database.

Location of Fatal Crashes

Exhibit III.15 presents the number of fatal crashes that occurred on the state highway system roadways in rural counties from 1999 through 2003. In the Eastern Plains region, on-system fatal crashes fell by 43% from 2002 to 2003.

Exhibit III.15
Fatal On-System Crashes by Rural Region, 1999-2003



Source: CDOT Crash Database, years 1999, 2000, 2002 and 2003. 2001 FARS data from CDOT.

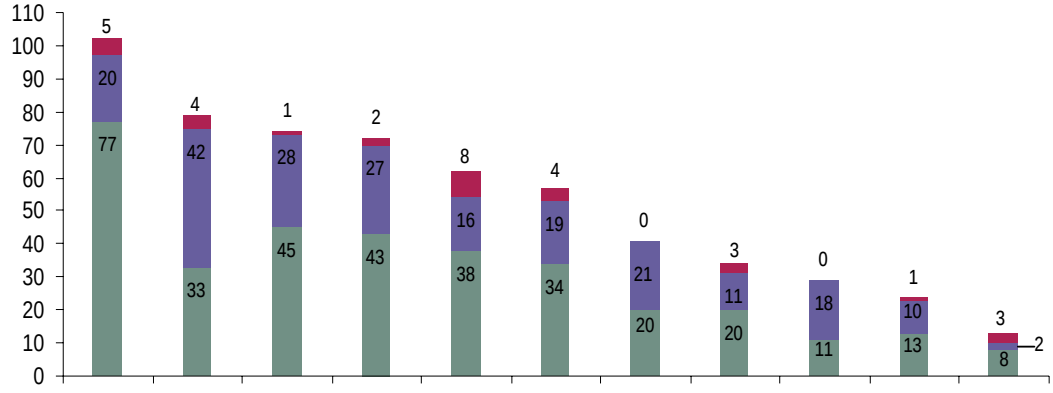
Crash Driver Residence

This section explores the 2003 crash data based on the residence of the drivers involved in each crash.

County, Region and Road

In the largest Colorado counties, typically more than half of the drivers involved in fatal crashes live in the county where the crash occurred. The exceptions are in Weld and Douglas counties. As shown in Exhibit III.16 on the following page, three out of four El Paso County fatal crash drivers live in El Paso County.

Exhibit III.16
Place of Residence of Drivers in Fatal Crashes Occurring in Large Counties, 2003

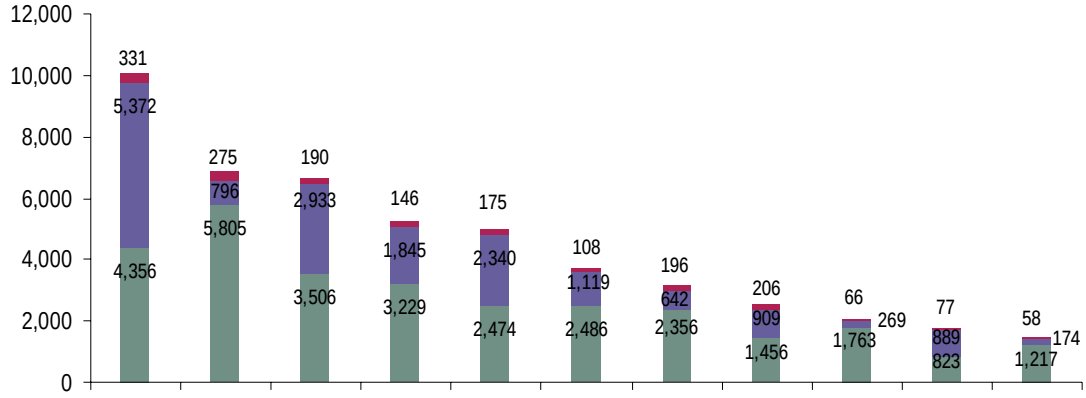


	El Paso	Weld	Jefferson	Denver	Larimer	Adams	Arapahoe	Pueblo	Douglas	Boulder	Mesa
Same as County	75.49%	41.77%	60.81%	59.72%	61.29%	59.65%	48.78%	58.82%	37.93%	54.17%	61.54%
Other County	19.61%	53.16%	37.84%	37.50%	25.81%	33.33%	51.22%	32.35%	62.07%	41.67%	15.38%
Out-of-State	4.90%	5.06%	1.35%	2.78%	12.90%	7.02%	0.00%	8.82%	0.00%	4.17%	23.08%
Total Number	101	86	76	77	61	63	41	35	30	28	13

Source: 2003 CDOT Crash Database.

In Weld County, a slight majority of fatal crash drivers (53%) live outside Weld County. Among the largest counties, the role of resident drivers in injury crashes ranges widely (Exhibit III.17). For example, 84% of El Paso County injury crash drivers live in El Paso County. On the other end of the spectrum, less than half (46%) of Douglas County's injury crash drivers live in Douglas County.

Exhibit III.17
Place of Residence of Drivers in Injury Crashes Occuring in Large Counties, 2003



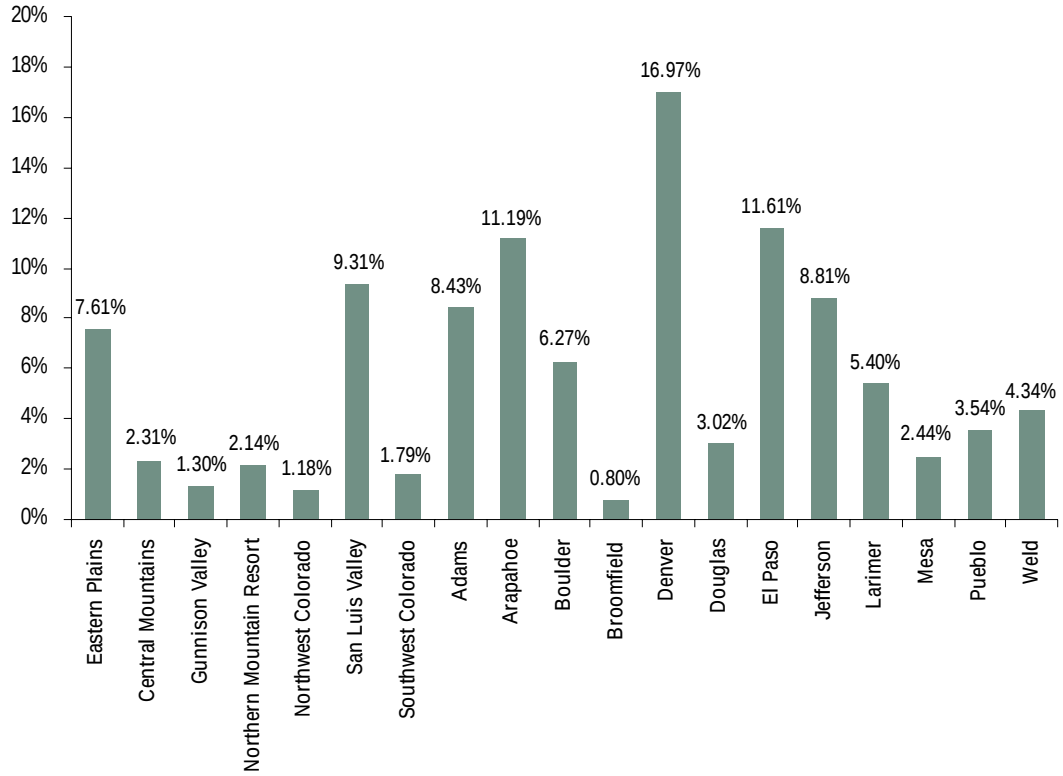
	Denver	El Paso	Arapahoe	Jefferson	Adams	Boulder	Larimer	Weld	Pueblo	Douglas	Mesa
Same as County	43.30%	84.42%	52.89%	61.86%	49.59%	66.95%	73.76%	56.63%	84.03%	46.00%	83.99%
Other County	53.40%	11.58%	44.24%	35.34%	46.90%	30.14%	20.10%	35.36%	12.82%	49.69%	12.01%
Out-of-State	3.29%	4.00%	2.87%	2.80%	3.51%	2.91%	6.14%	8.01%	3.15%	4.30%	4.00%
Total Number	10,059	6,876	6,629	5,220	4,989	3,713	3,194	2,571	2,098	1,789	1,449

Source: 2003 CDOT Crash Database.

Exhibit III.18 shows the distribution of 2003 injury crashes by the county or region in which a crash occurred. Nearly one in ten injury crashes occurred in the San Luis Valley.

Exhibit III.18

Distribution of Drivers Involved in Injury Crashes by County and Region of Crash, 2003



Region/County	Eastern Plains	Central Mtns.	Gunnison Valley	Northern Mtn.	NW Colorado	San Luis Valley	SW Colorado	Adams	Arapahoe	Boulder
Drivers	4,500	1,366	768	1,268	696	510	1,059	4,985	6,623	3,712
Region/County	**Broomfield**	**Denver**	**Douglas**	**El Paso**	**Jefferson**	**Larimer**	**Mesa**	**Pueblo**	**Weld**	
Drivers	474	10,041	1,789	6,868	5,212	3,193	1,444	2,092	2,567	

Source: 2003 CDOT Crash Database.

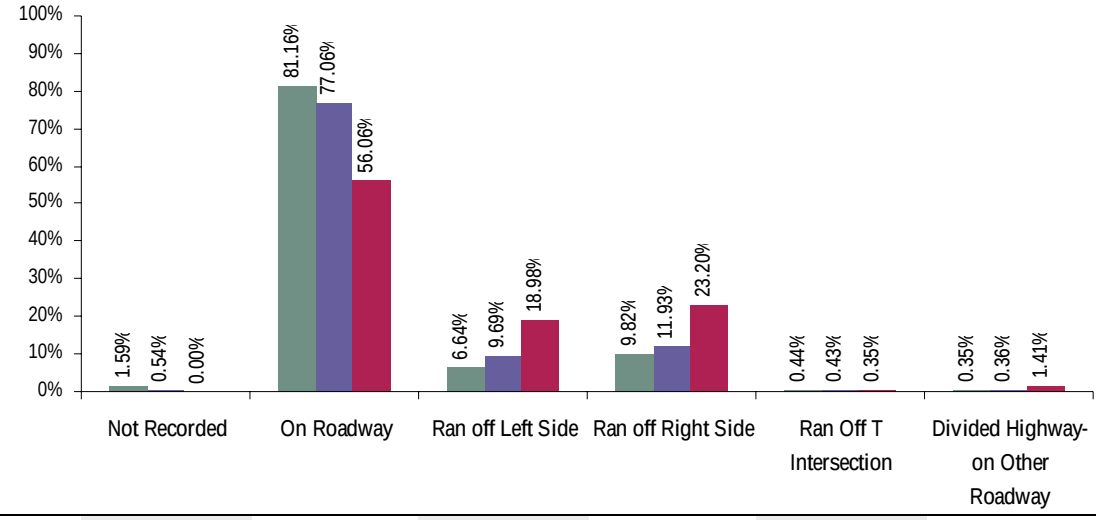
Roadway Characteristics of Crashes

This section explores the roadway characteristics and conditions reported for 2003 crashes.

Location Relative to the Roadway

As shown in Exhibit III.19 on the following page, most PDO and injury crashes occurred on roadways. In contrast, only slightly more than half of all fatal crashes occurred on roadways. Fatal crashes were much more likely to occur after running off of the roadway.

Exhibit III.19
Crash Severity by Location Relative to Roadway



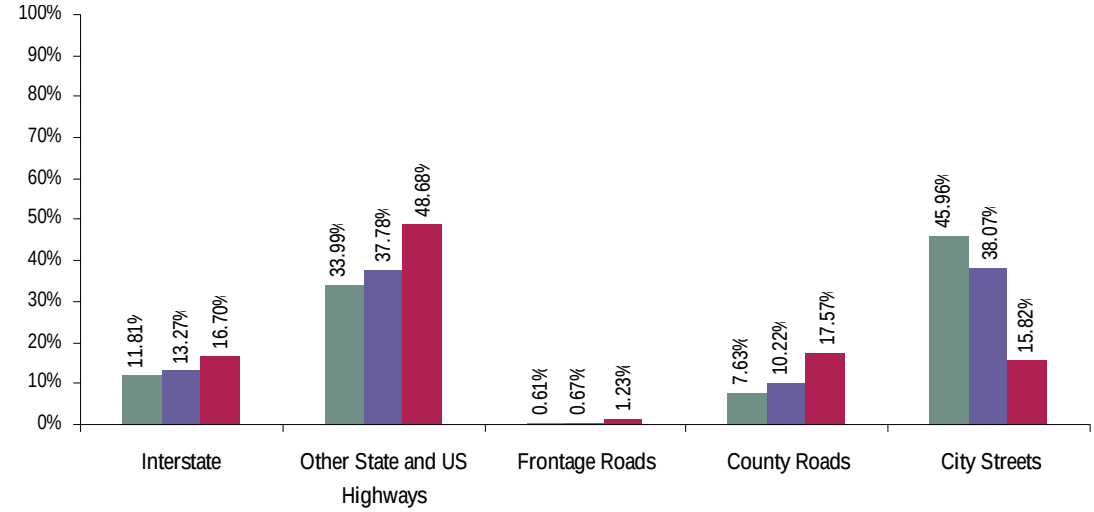
	Not Recorded	On Roadway	Ran off Left Side	Ran off Right Side	Ran Off T Intersection	Divided Highway-on Other Roadway
PDO Only	1,504	76,762	6,276	9,291	415	330
Injury Crashes	171	24,452	3,074	3,784	137	113
Fatal Crashes	0	319	108	132	2	8
Total Crashes	1,675	101,533	9,458	13,207	554	451

Source: 2003 CDOT Crash Database.

Road Type

Nearly half of the 2003 fatal crashes occurred on a non-interstate State or US Highway (Exhibit III.20). About 16% of fatal crashes occur on city streets, compared to 46% of PDO crashes.

Exhibit III.20
Crash Road Type, by Crash Severity, 2003



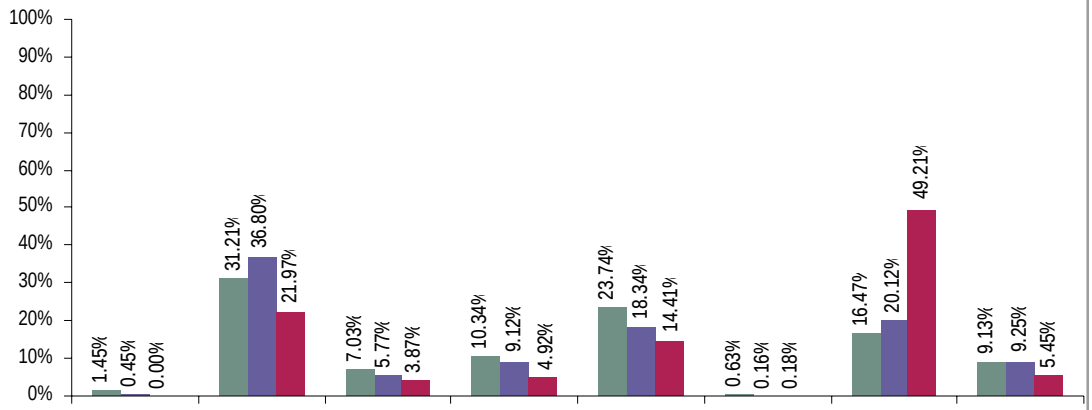
	Interstate	Other State and US Highways	Frontage Roads	County Roads	City Streets
PDO Only	11,171	32,146	578	7,219	43,464
Injury Crashes	4,210	11,987	213	3,242	12,079
Fatal Crashes	95	277	7	100	90
Total Crashes	15,476	44,410	798	10,561	55,633

Source: 2003 CDOT Crash Database

Road Description

Exhibit III.21 presents the description of crash roadways. Nearly 50% of 2003 fatal crashes occurred on a non-intersection rural road. Slightly more than one in three injury crashes happened at intersections.

Exhibit III.21
Crash Severity by Road Description, 2003



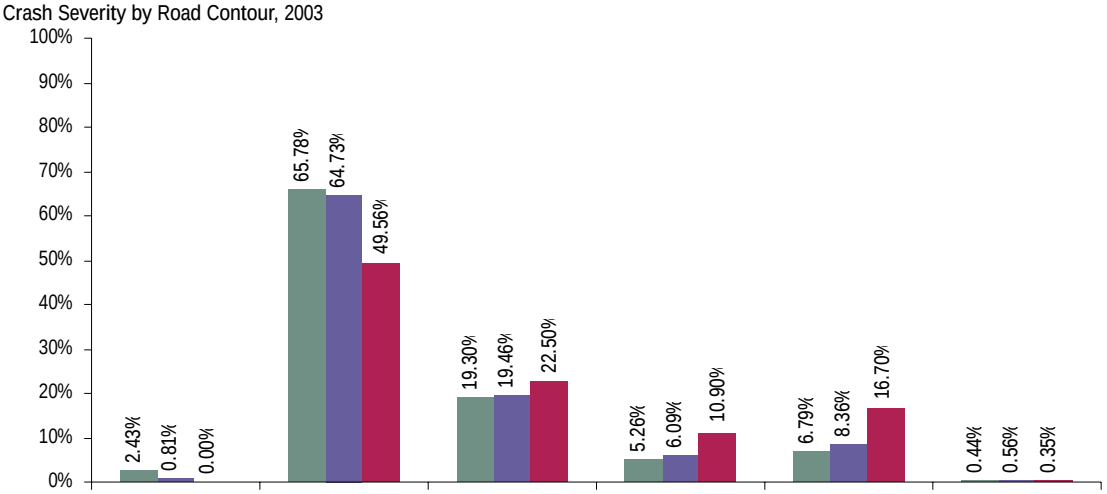
	Not Reported	At Intersection	At Driveway Access	Intersection Related	Non-Intersection Urban	In Alley	Non-Intersection Rural	Highway Interchange
PDO Only	1,370	29,522	6,648	9,779	22,451	599	15,573	8,636
Injury Crashes	142	11,678	1,830	2,893	5,821	50	6,383	2,934
Fatal Crashes	0	125	22	28	82	1	280	31
Total Crashes	1,512	41,325	8,500	12,700	28,354	650	22,236	11,601

Source: 2003 CDOT Crash Database.

Road Contour

As shown in Exhibit III.22 on the following page, fatal crashes were much less likely to occur on straight, level road segments, and much more likely to occur on graded or curved road segments, than were PDO and injury crashes. The distributions of PDO and injury crashes across road contours were very similar.

Exhibit III.22
Crash Severity by Road Contour, 2003



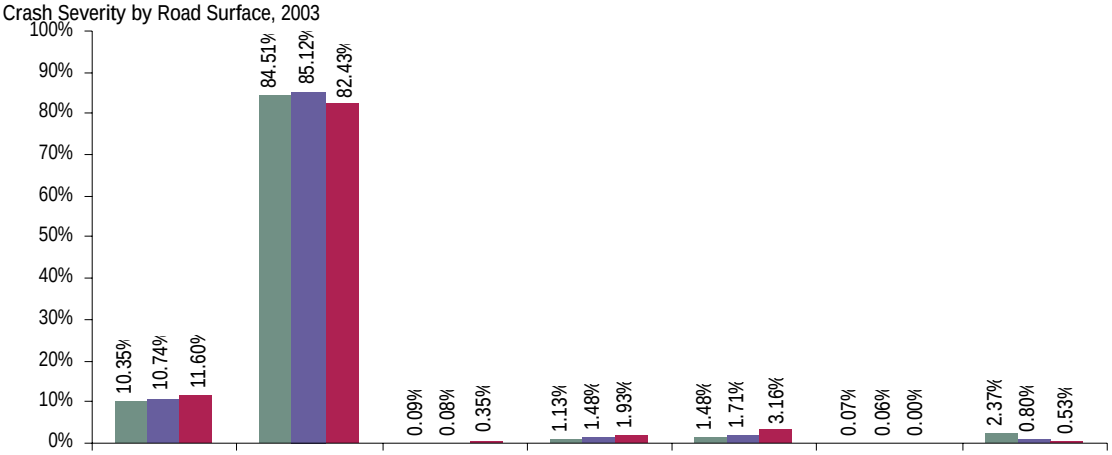
	Not Recorded	Straight On-level	Straight On-grade	Curve On-level	Curve On-grade	Hillcrest
PDO Only	2,301	62,209	18,255	4,975	6,425	413
Injury Crashes	256	20,539	6,174	1,931	2,653	178
Fatal Crashes	0	282	128	62	95	2
Total Crashes	2,557	8,330	24,557	6,968	9,173	593

Source: 2003 CDOT Crash Database.

Road Surface

PDO, injury and fatal crashes were equally likely to occur on either blacktop or concrete road surfaces (Exhibit III.23). More specifically, no single road surface type was associated with more (or less) severe crashes.

Exhibit III.23
Crash Severity by Road Surface, 2003



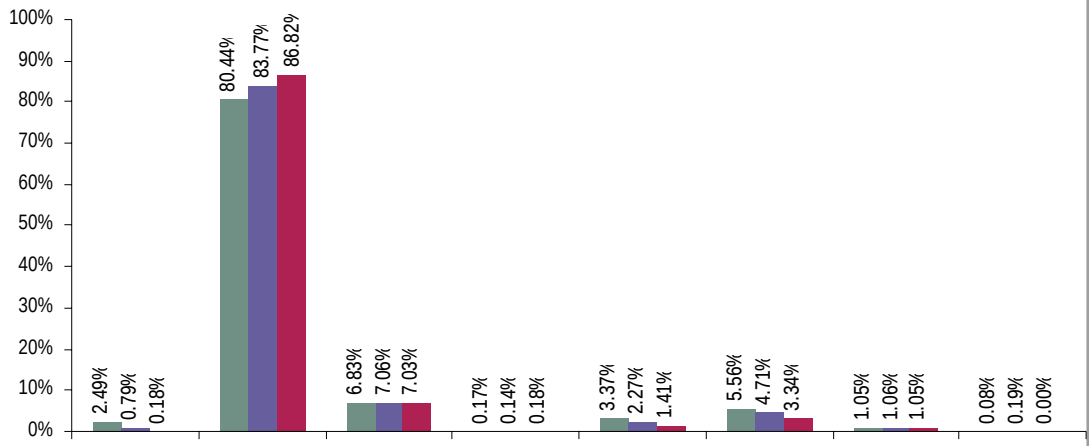
	Concrete	Blacktop (Bituminous)	Brick of Block	Gravel, Slag or Stone	Dirt	Other	Unknown
PDO Only	9,789	79,925	86	1,067	1,404	70	2,237
Injury Crashes	3,409	27,011	25	469	544	19	254
Fatal Crashes	66	469	2	11	18	0	3
Total Crashes	13,264	107,405	113	1,547	1,966	89	2,494

Source: 2003 CDOT Crash Database.

Road Condition

As shown in Exhibit III.24, the vast majority of all crashes, regardless of severity, occur on dry roads. In 2003, 86% of fatal crashes occurred on dry roads.

Exhibit III.24
Crash Severity by Road Condition, 2003



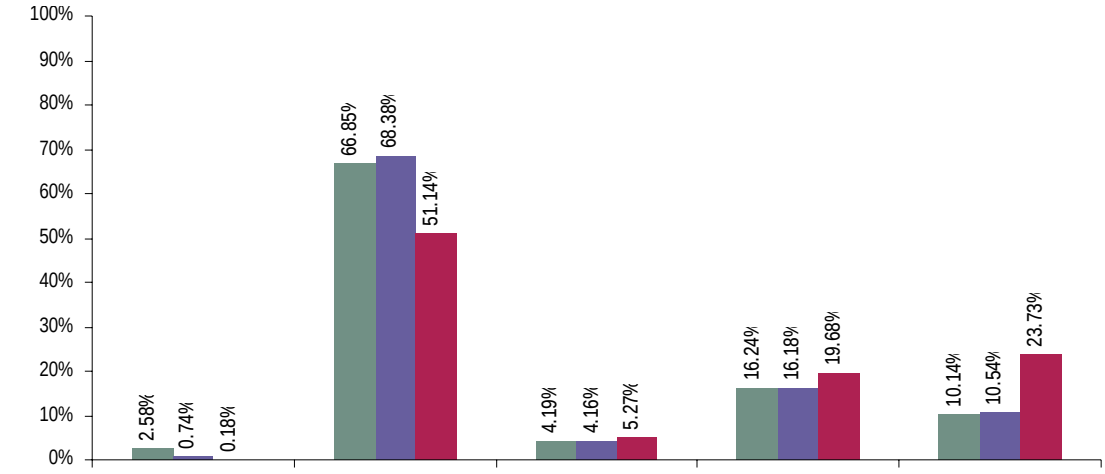
	Not Recorded	Dry	Wet	Muddy	Snowy	Icy	Slushy	Foreign Material
PDO Only	2,358	76,080	6,460	165	3,184	5,255	996	78
Injury Crashes	251	26,581	2,240	461	721	1,496	336	60
Fatal Crashes	1	494	40	1	8	19	6	0
Total Crashes	2,610	103,155	8,740	212	3,913	6,770	1,338	138

Source: 2003 CDOT Crash Database.

Lighting Condition

Fatal crashes were much more likely than less severe crashes to occur under conditions of restricted lighting, especially in dark, unlighted conditions (Exhibit III.25 on the following page). Lighting conditions for PDO and injury crashes were similar to each other, with the majority of PDO and injury crashes occurring in daylight.

Exhibit III.25
Crash Severity by Light Conditions, 2003



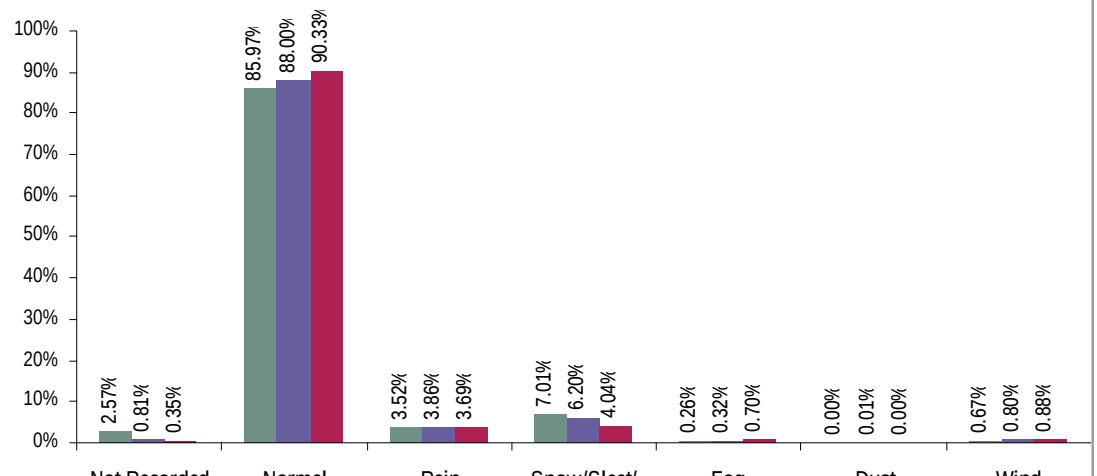
	Not Recorded	Daylight	Dawn or Dusk	Dark, Lighted	Dark, Unlighted
PDO Only	2,441	63,225	3,959	15,631	9,592
Injury Crashes	234	21,698	1,320	5,134	3,345
Fatal Crashes	1	291	30	112	135
Total Crashes	2,676	85,214	539	2,067	13,072

Source: 2003 CDOT Crash Database.

Weather Condition

In 2003, the majority of crashes, regardless of severity, occurred under normal weather conditions (Exhibit III.26 on the following page). Nine out of ten fatal crashes occurred under normal weather conditions, a slightly greater proportion than PDO and injury crashes. Just under 15% of PDO crashes occur in adverse weather conditions.

Exhibit III.26
Crash Severity by Adverse Weather Conditions, 2003

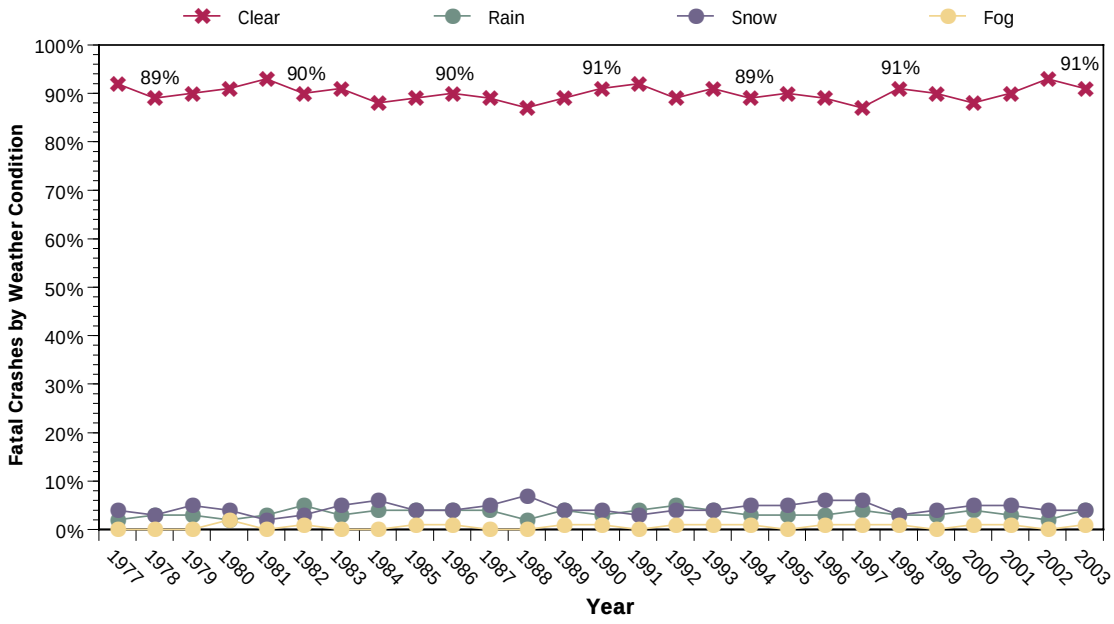


	Not Recorded	Normal Conditions	Rain	Snow/Sleet/ Hail	Fog	Dust	Wind
PDO Only	2,433	81,304	3,332	6,630	243	4	632
Injury Crashes	257	27,922	1,226	1,968	102	3	253
Fatal Crashes	2	515	21	23	4	0	5
Total Crashes	2692	109,740	4579	8621	349	7	890

Source: 2003 CDOT Crash Database.

Exhibit III.27 demonstrates the weather conditions associated with Colorado's fatal crashes since 1977. Each year approximately 90% of fatal crashes occur on clear days.

Exhibit III.27
Distribution of Fatal Crashes by Weather Condition, 1977-2003

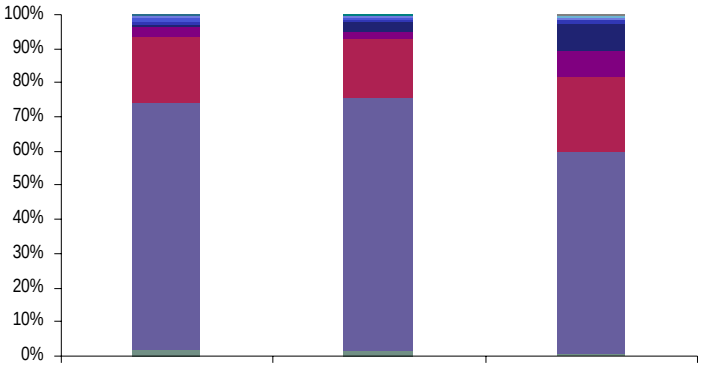


Source: National Highway Transportation Safely Administration, FARS Data, 1977-2003.

Vehicle Type

Exhibit III.28 presents the types of vehicles involved in crashes. Passenger cars are involved in about three-quarters of PDO and injury crashes, but only 60% of fatal crashes. Compared to their role in injury and PDO crashes, heavy trucks and motorcycles comprise a greater proportion of fatal crashes.

Exhibit III.28
Vehicles Involved in in PDO, Injury and Fatal Crashes, 2003

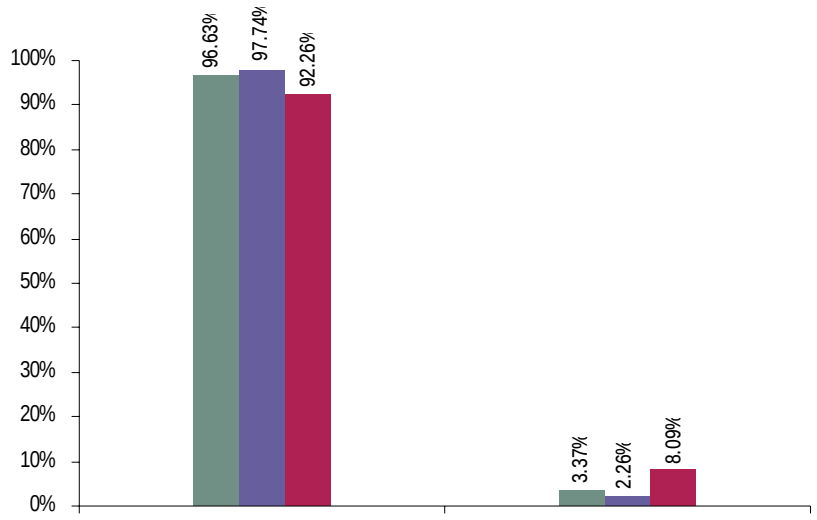


	PDO Crashes		Injury Crashes		Fatal Crashes		Total
Not Reported	2.25%	3,366	1.30%	731	0.35%	3	4,100
Passenger Car or Van	72.06%	107,779	74.34%	41,755	59.79%	510	150,044
Pickup Truck, Utility Van	19.09%	28,557	17.28%	9,707	21.45%	183	950
Truck, Gross Weight >10,000 or Bus >15 People	3.22%	4,819	2.17%	1,219	7.85%	67	38,447
Motorcycle	0.30%	452	2.89%	1,622	7.97%	68	1,823
Pickup Truck, Utility Van w/ Trailer	0.97%	1,448	0.66%	368	0.82%	7	1,710
Truck, Gross Weight <10,001	0.96%	1,438	0.48%	270	0.23%	2	6,105
Passenger Vehicle with Trailer	0.49%	728	0.39%	219	0.35%	3	231
Non-school Bus, <15 People	0.13%	198	0.07%	42	0.23%	2	132
Motor Home	0.12%	186	0.08%	43	0.23%	2	242
Hit & Run - Unknown	0.08%	120	0.04%	22	0.00%	0	2,142
Small School Bus, <15 People	0.07%	109	0.04%	22	0.12%	1	38
Farm Equipment	0.02%	35	0.01%	5	0.00%	0	43
Bicycle	0.01%	15	0.04%	22	0.12%	1	40
Motorized Bicycle	0.01%	11	0.06%	31	0.12%	1	142
Other	0.20%	304	0.16%	89	0.35%	3	396

Source: 2003 CDOT Crash Database.

Commercial vehicles comprise a small proportion of 2003 PDO and injury crashes (Exhibit III.29 on the following page), 3% and 2% respectively. However, commercial vehicles are involved in nearly 8% of all fatal crashes.

Exhibit III.29
Commercial Vehicle Involvement by Severity, 2003

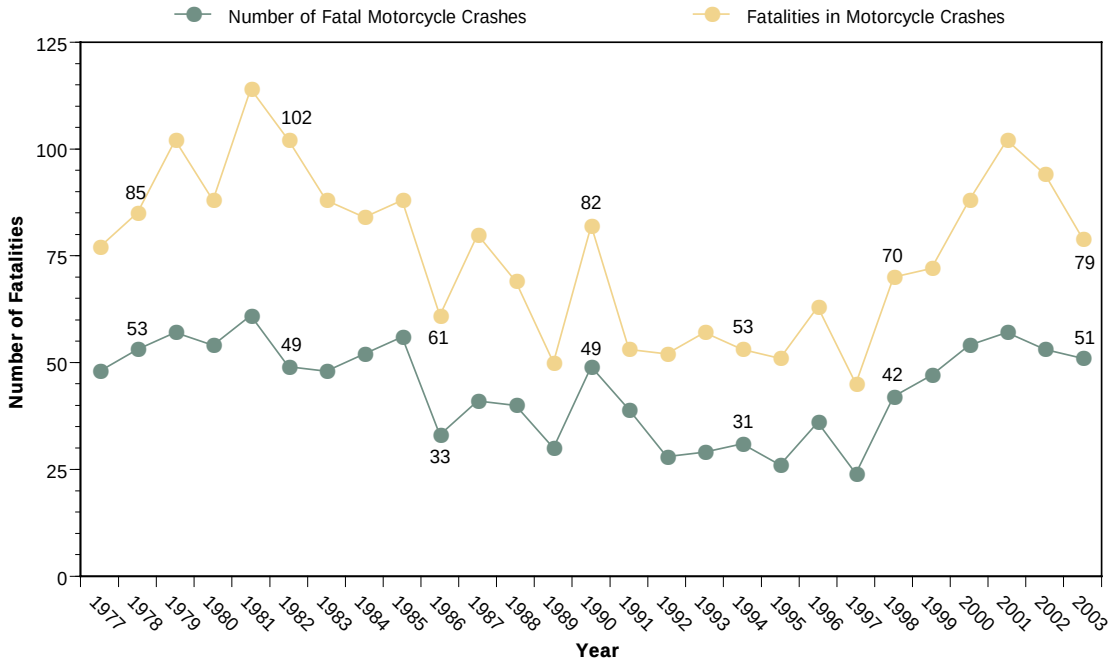


	No	Yes	Total
PDO Only	144,529	5,036	149,565
Injury Crashes	54,899	1,268	56,167
Fatal Crashes	787	69	853
Total Crashes	200,215	6,370	206,585

Source: 2003 CDOT Crash Database.

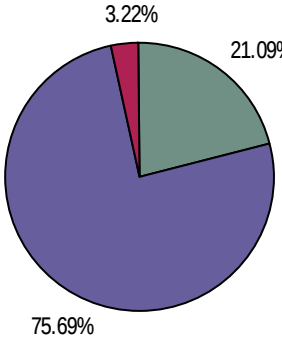
In 2003, 51 fatal crashes involved a motorcycle (Exhibit III.30).

Exhibit III.30
Number of Fatal Motorcycle Crashes, 1977-2003



Source: National Highway Transportation Safety Administration, FARS Data, 1977-2003.

Exhibit III.31
Motorcyclists Involved in Crashes in the Largest Counties and Regions, 2003



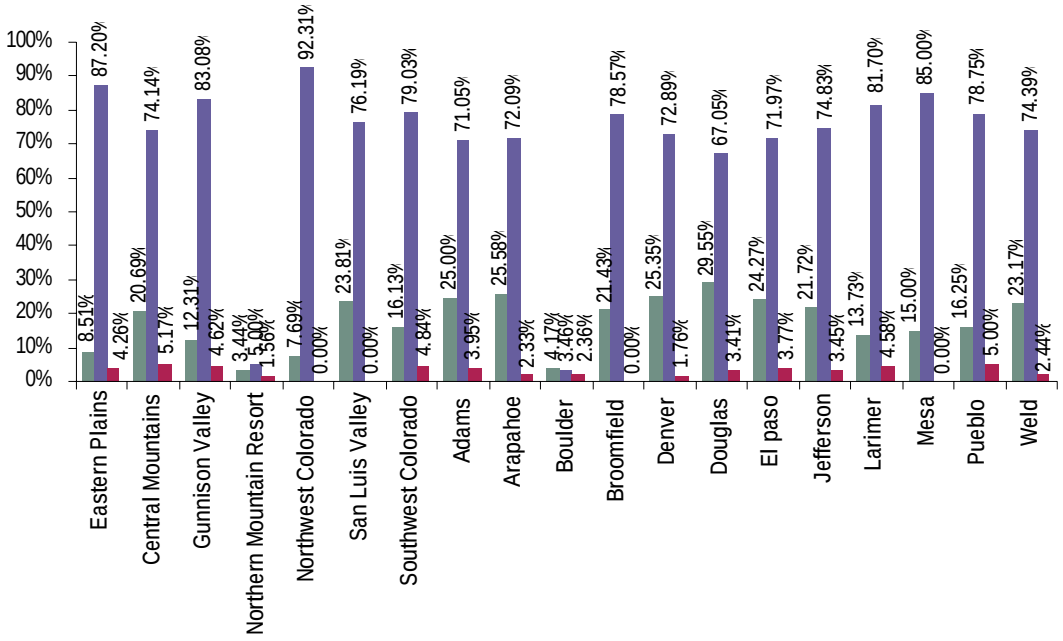
Severity	Number
PDO Crashes	452
Injury Crashes	1,622
Fatal Crashes	69

Source: 2003 CDOT Crash Database.

As shown in Exhibit III.31, if a motorcyclist is involved in a crash, it is very likely that the crash involved an injury. Out of all 2003 crashes that involved a motorcyclist, 75% of the crashes resulted in at least one injury.

In the majority of cases, crashes involving motorcycles result in injuries. Exhibit III.32 shows the distribution of motorcycle crash severity in the 11 largest counties and the balance of the state. An injury resulted in nine out of ten motorcycle crashes that occurred in Northwest Colorado.

Exhibit III.32
Motorcyclists Involved in Crashes in the Largest Counties and Regions, 2003



Region/County	Eastern Plains	Central Mtns.	Gunnison Valley	Northern Mtn.	Northwest Colorado	San Luis Valley	Southwest Colorado	Adams	Arapahoe	Boulder
PDO Crashes	4	24	8	15	2	5	10	38	44	18
Injury Crashes	41	86	54	48	24	16	49	108	124	106
Fatal Crashes	2	6	3	1	0	0	3	6	4	3
Total Crashes	47	116	65	64	26	21	62	152	172	127

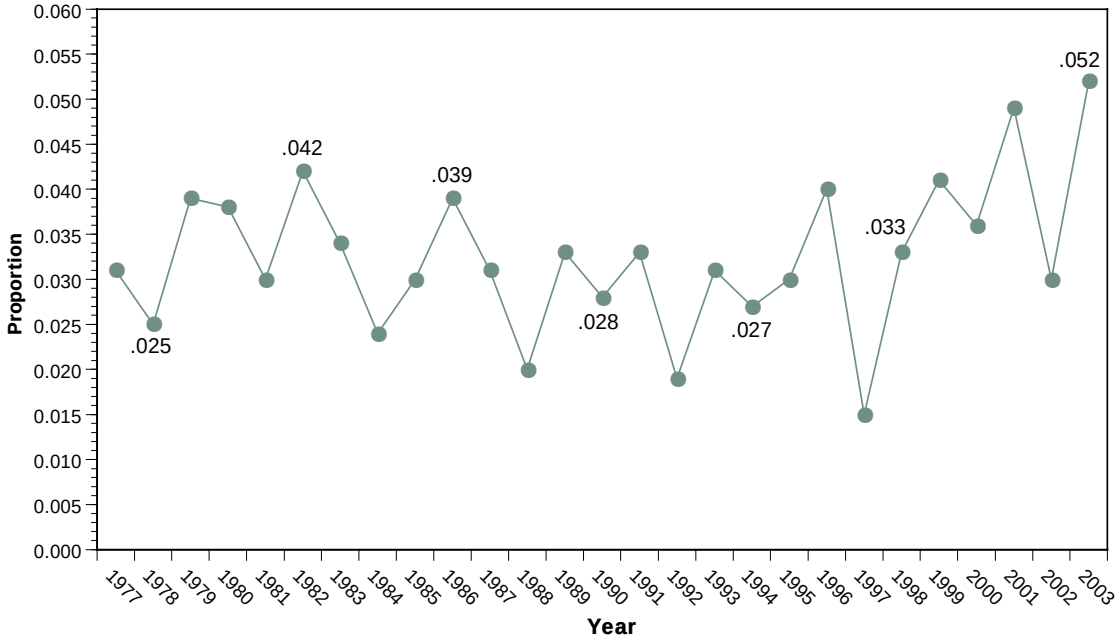
Age Cohort	Broomfield	Denver	Douglas	El paso	Jefferson	Larimer	Mesa	Pueblo	Weld
PDO Crashes	3	72	26	58	63	21	9	13	19
Injury Crashes	11	207	59	172	217	125	51	63	61
Fatal Crashes	0	5	3	9	10	7	0	4	2
Total Crashes	14	284	88	239	290	153	60	80	82

Source: 2003 CDOT Crash Database.

Hit-and-Run Fatal Crashes

In 2003, 5% of fatal crashes involved a hit-and-run driver, the greatest proportion of hit-and-run fatal crash involvement reported since 1977 (Exhibit III.33).

Exhibit III.33
Proportion of Hit-and-Run Crashes in Fatal Crashes, 1977-2003

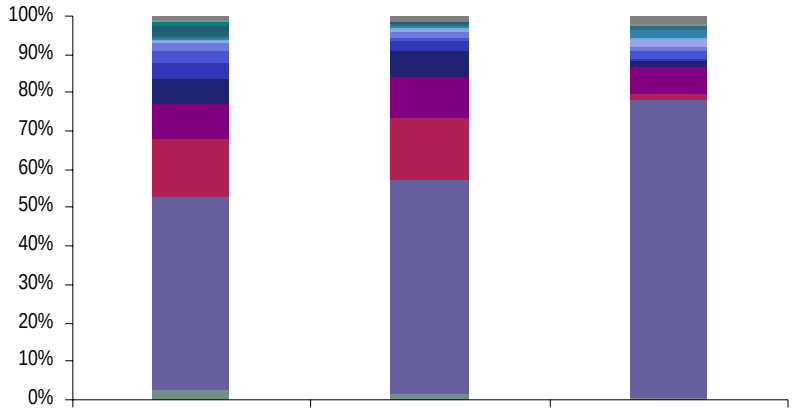


Source: National Highway Transportation Safety Adminstration, FARS data, 1977-2003.

Vehicle Movement

Exhibit III.34 details the vehicle movement for PDO, injury and fatal crashes. In nearly four out of five fatal crashes a vehicle was going straight.

Exhibit III.34
Crash Severity by Vehicle Movement, 2003



	PDO		Injury Crashes		Fatal Crashes		Total
Not Reported	2.69%	4,021	1.60%	896	0.35%	3	4,920
Going Straight	50.11%	74,954	55.93%	31,415	78.08%	666	107,035
Stopped in Traffic	15.14%	22,643	15.97%	8,971	1.06%	9	31,623
Making Left Turn	9.23%	13,798	10.94%	6,147	7.27%	62	20,007
Slowing	6.62%	9,897	6.27%	3,519	1.41%	12	13,428
Making Right Turn	4.28%	6,399	2.45%	1,377	0.59%	5	7,781
Changing Lanes	2.99%	4,473	1.47%	828	2.34%	20	5,321
Starting in Traffic	1.75%	2,622	1.46%	820	0.82%	7	3,449
Passing	0.71%	1,056	0.61%	340	2.23%	19	1,415
Avoiding Object in Roadway	0.46%	693	0.48%	271	0.47%	4	968
Weaving	0.30%	450	0.44%	249	1.99%	17	716
Making U-turn	0.59%	886	0.40%	223	0.70%	6	1,115
Backing	2.79%	4,167	0.34%	193	0.23%	2	4,362
Entering/Leaving Parked Position	0.82%	1,228	0.21%	119	0.12%	1	1,348
Parked	0.29%	431	0.13%	71	0.12%	1	503
Other	1.23%	1,847	1.30%	728	2.23%	19	2,594

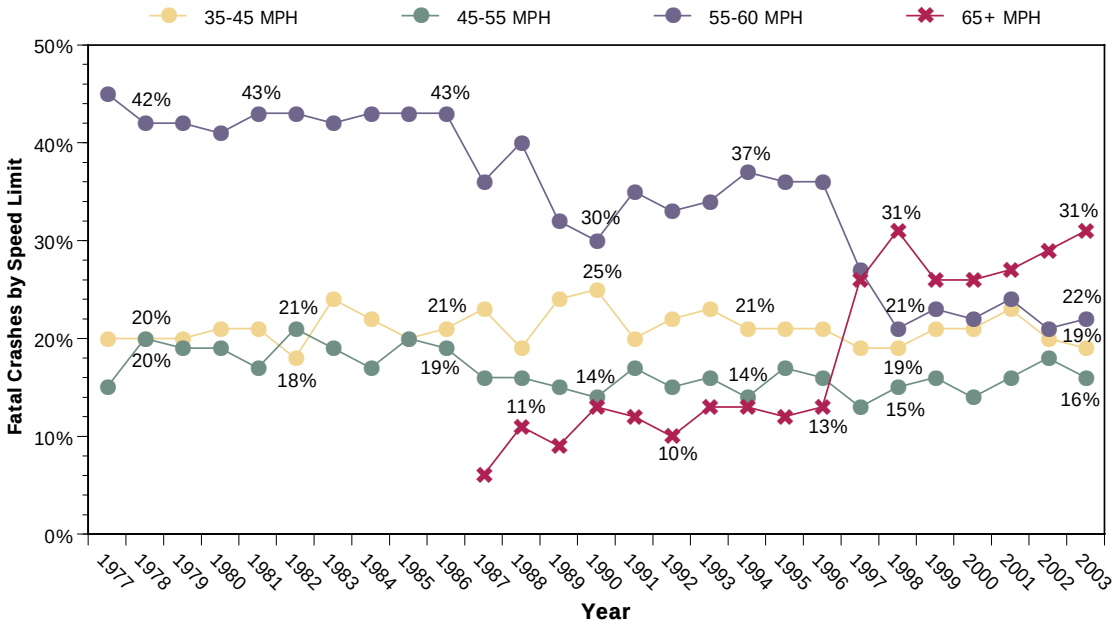
Source: National Highway Transportation Safety Administration, FARS data, 1977-2003

Vehicle Speed

Exhibit III.35 on the following page presents the distribution of fatal crashes by the posted speed limit. In 2003, nearly one-third of fatal crashes occurred in areas where the speed limit was 65 MPH or higher.

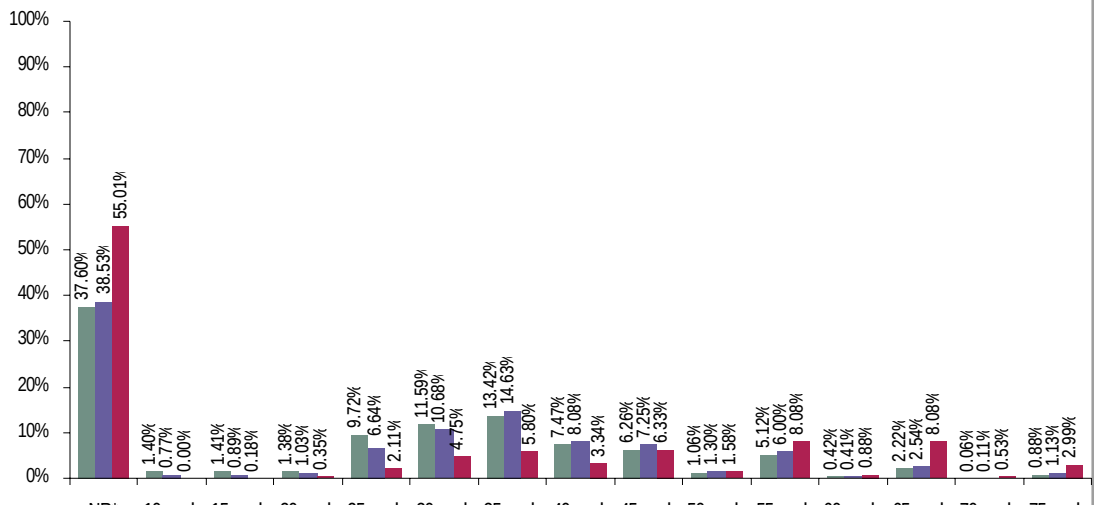
As shown in Exhibit III.36 on the following page, valid speed limits were not recorded for more than one-third of all crashes, and for more than one-half of all fatal crashes. Of those crashes with plausible recorded speed limits, fatal crashes were much more likely to occur a high legal speed limits than were PDO and injury crashes.

Exhibit III.35
Distribution of Fatal Crashes by Posted Speed Limit, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003

Exhibit III.36
Crash Severity by Legal Speed Limit, 1977-2003



	NR*	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph	75 mph
PDO Only	35,559	1,323	1,338	1,305	9,195	10,966	12,688	7,062	5,918	1,002	4,841	394	2,103	56	828
Injury Crashes	12,225	243	282	328	2,107	3,390	4,642	2,565	2,302	414	1,903	130	806	36	358
Fatal Crashes	313	0	1	2	12	27	33	19	36	9	46	5	46	3	17
Total Crashes	48,097	1,566	1,621	1,635	11,314	14,383	17,363	9,646	8,256	1,425	6,790	529	2,955	95	1,203

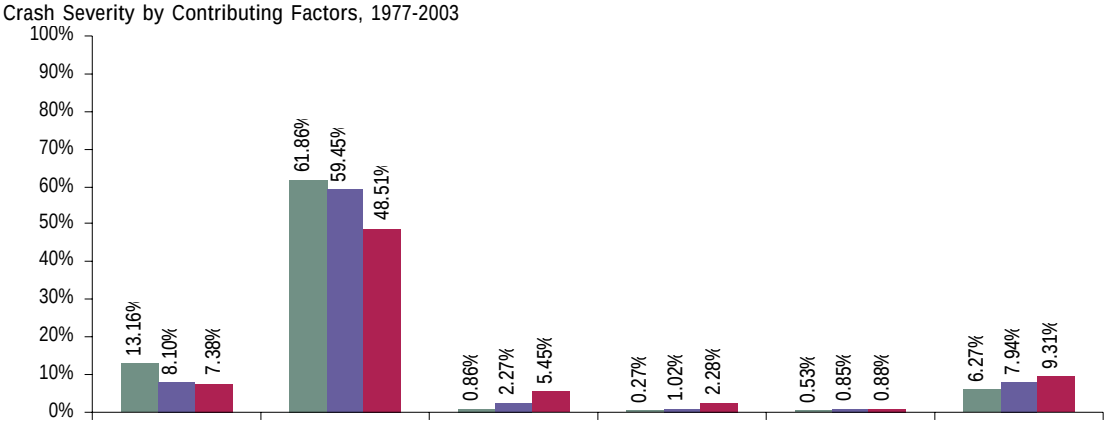
Note: *NR = Not Recorded.

Source: 2003 CDOT Database.

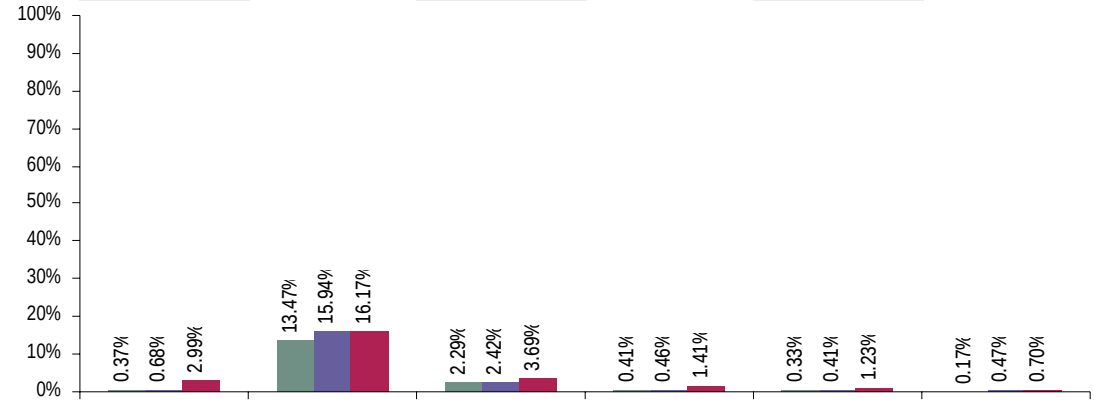
Most Apparent Human Contributing Factor

In approximately 60% of PDO and injury crashes, no contributing factor was identified (Exhibit III.37). In the remainder, the most frequent contributing factor was driver preoccupation, followed by driver inexperience. These were also the most frequent contributing factors to fatal crashes, but noteworthy proportions of these crashes were also caused by drivers who were sleeping, unfamiliar with the area in which they were driving, fatigued and sick. Slightly more than half of all fatal accidents had identifiable contributing factors.

Exhibit III.37
Crash Severity by Contributing Factors, 1977-2003



	Not Recorded	No Apparent Contributing Factor	Asleep at the Wheel	Illness	Distracted by Passenger	Driver Inexperience
PDO Only	12,448	58,504	817	252	504	5,927
Injury Crashes	2,569	18,864	719	323	269	2,521
Fatal Crashes	42	276	31	13	5	53
Total Crashes	1,559	77,644	1,567	588	778	8,501



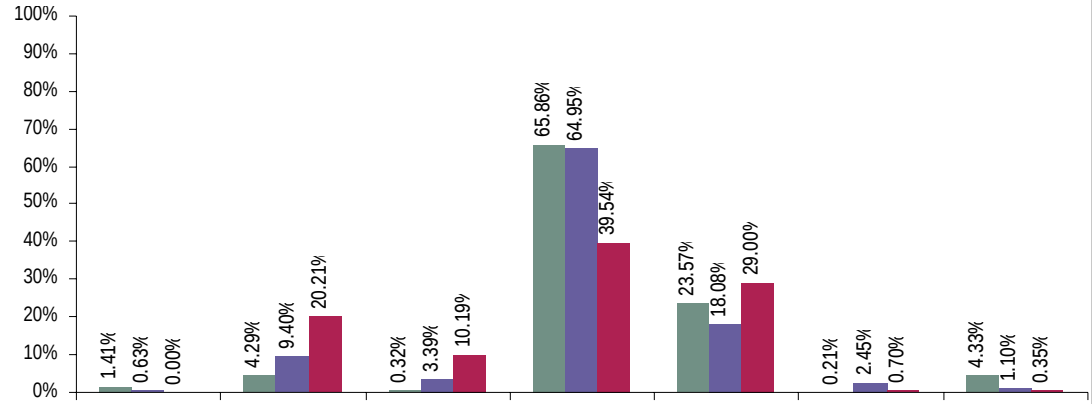
	Driver Fatigue	Driver Preoccupied	Driver Unfamiliar with Area	Driver Emotionally Upset	Evading Law Enforcement Officer	Physical Disability
PDO Only	354	12,741	2,168	387	315	161
Injury Crashes	215	5,058	769	146	130	148
Fatal Crashes	17	92	21	8	7	4
Total Crashes	586	17,891	2,958	541	452	313

Source: 2003 CDOT Database.

First Harmful Event

Nearly two-thirds of all PDO and injury crashes began with a collision with a moving motor vehicle (Exhibit III.38). Approximately 20% of these crashes began with a collision with an immobile object. Less than 10% of these crashes began with a non-collision accident, and very few involved collision with a pedestrian. In contrast, 10% of fatal crashes began with collisions with a pedestrian, 20% began with non-collision accidents, 29% involved a collision with an immobile object and only 40% involved a collision with a moving motor vehicle. This last number, though low relative to crashes of other severities, is inconsistent with the record of the number of vehicles involved in a crash. According to that tabulation, reported in Exhibit III.10, relatively few fatal crashes involved multiple vehicles.

Exhibit III.38
"First Harmful Event" for Fatal Crashes, 2003



	Not Recorded	Non-Collision Accident	Collision with Pedestrian	Collision with Moving Motor Vehicle	Collision with Immobile Object	Collision with Bicycle	Collision with Animal
PDO Only	1,338	4,061	300	62,291	22,296	200	4,092
Injury Crashes	201	2,982	1,077	20,610	5,736	777	348
Fatal Crashes	0	115	58	225	165	4	2
Total Crashes	1,539	7,158	1,435	83,126	28,197	981	4,442

Source: 2003 CDOT Crash Database.

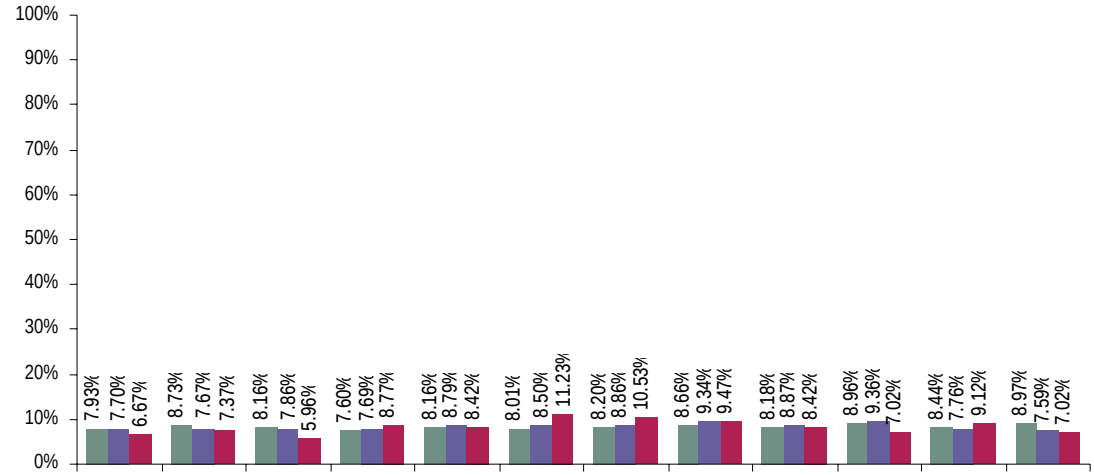
Crashes by Time of Year and Day

This section explores the timing of crashes by month, day and time of day.

Month of Year

As shown in Exhibit III.39, PDO crashes were distributed almost evenly across months of the year. Injury crashes showed a modest tendency to occur more frequently in the summer and early fall, and were noticeably lower in November through April. Fatal crashes showed the most marked seasonality. They were especially frequent in June and July, and especially rare in December through March.

Exhibit III.39
PDO, Injury and Fatal Crashes in Colorado by Month, 2003



	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
PDO Only	7,502	8,257	7,722	7,186	7,721	7,576	7,751	8,191	7,735	8,471	7,982	8,484
Injury Crashes	2,443	2,433	2,495	2,440	2,788	2,698	2,812	2,965	2,815	2,971	2,462	2,409
Fatal Crashes	38	42	34	50	48	64	60	54	48	40	52	40
Total Crashes	9,983	10,732	10,251	9,676	10,556	10,338	10,623	11,211	10,598	11,482	10,496	10,932

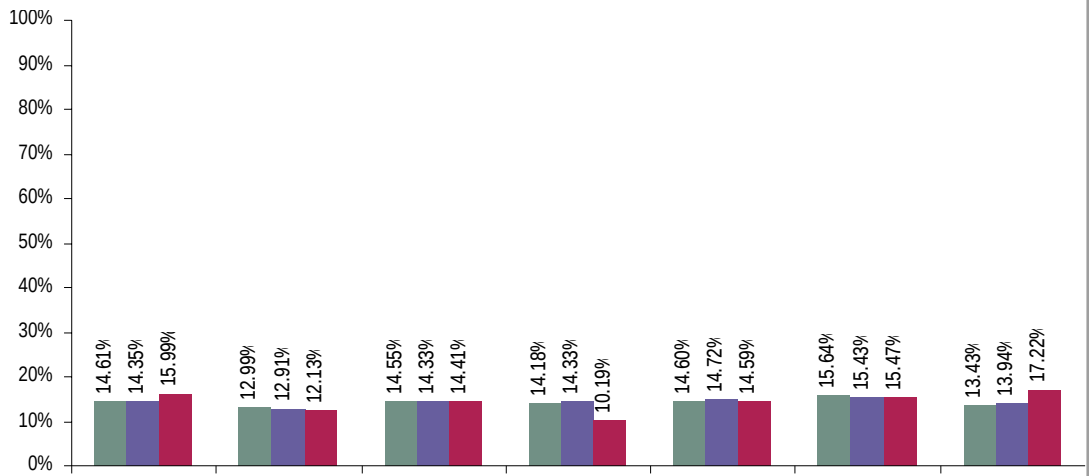
Source: 2003 CDOT Crash Database.

Day of Week

PDO and injury crashes were spread out fairly evenly over the days of the week, with modest troughs on Mondays and modest peaks on Friday (Exhibit III.40 on the following page). In contrast, fatal accidents exhibited a fairly strong peak on Saturday with distinct sub-peaks on Friday and Sunday. The trough for fatal accidents was again on Monday.

Exhibit III.41, on the following page, demonstrates the proportion of fatal crashes that occurred on weekends each year from 1977 through 2003. In 2003, slightly more than one in three fatal crashes occurred on a weekend.

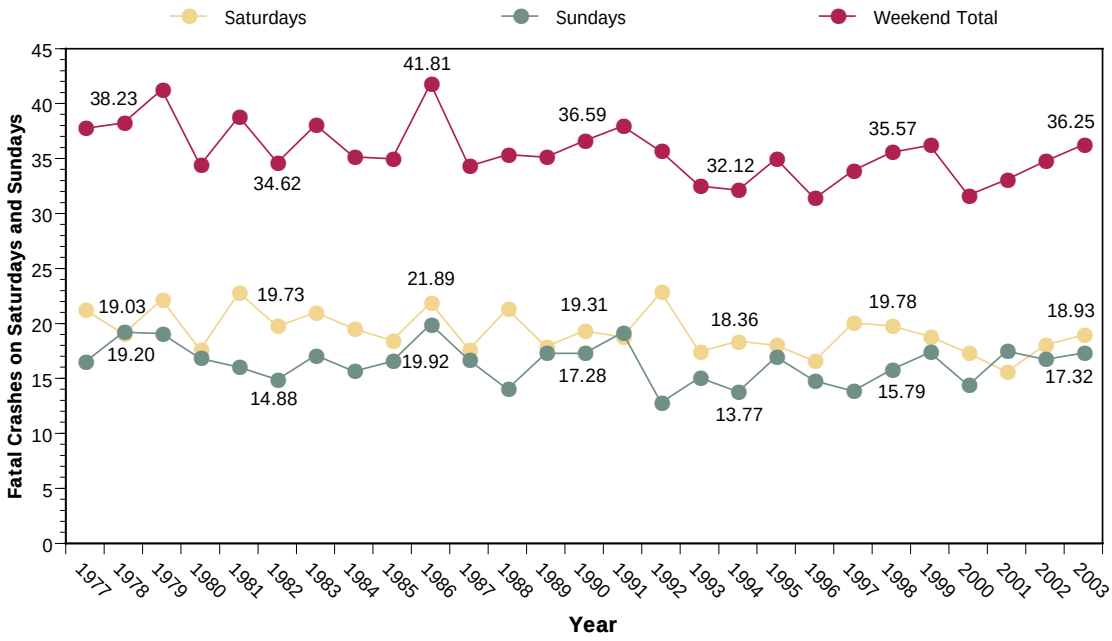
Exhibit III.40
Drivers Involved in PDO, Injury and Fatal Crashes by Day of Week, 2003



	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
PDO Only	13,818	12,284	13,761	13,410	13,813	14,794	12,698
Injury Crashes	4,553	4,096	4,547	4,546	4,671	4,895	4,423
Fatal Crashes	91	69	82	58	83	88	98
Total Crashes	18,462	16,449	18,390	18,014	18,567	19,777	17,219

Source: 2003 CDOT Crash Database.

Exhibit III.41
Proportion of Fatal Crashes on Saturdays and Sundays, 1977-2003

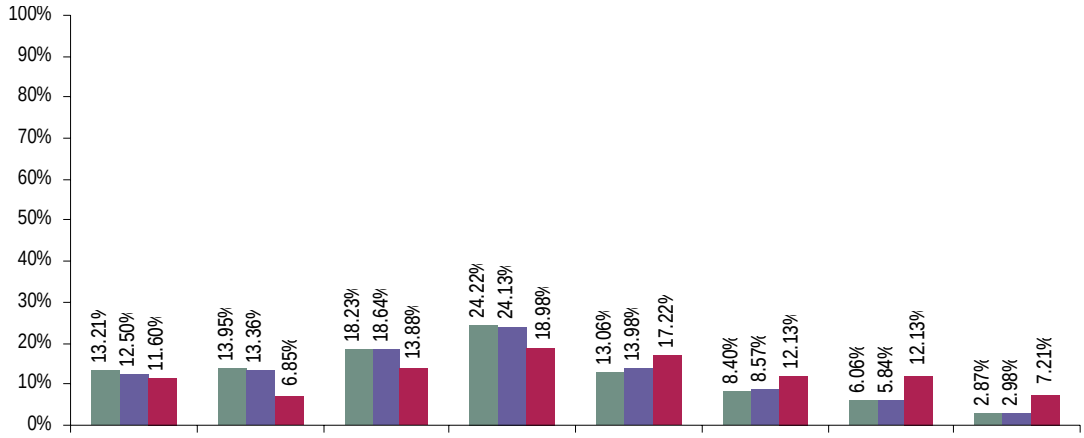


Source: National Highway Transportation Safety Administration, FARS Data, 1977-2003.

Time of Day

Exhibit III.42 presents the distribution of 2003 crashes by severity and time of day. Nearly one in five fatal crashes occur during the afternoon rush hour, from 3:00 p.m. to 5:59 p.m. Crashes occurring between the hours of 12:00 a.m. and 2:59 a.m. are more likely to be fatal than PDO or injury crashes.

Exhibit III.42
Drivers Involved in PDO, Injury and Fatal Crashes by Time of Day, 2003



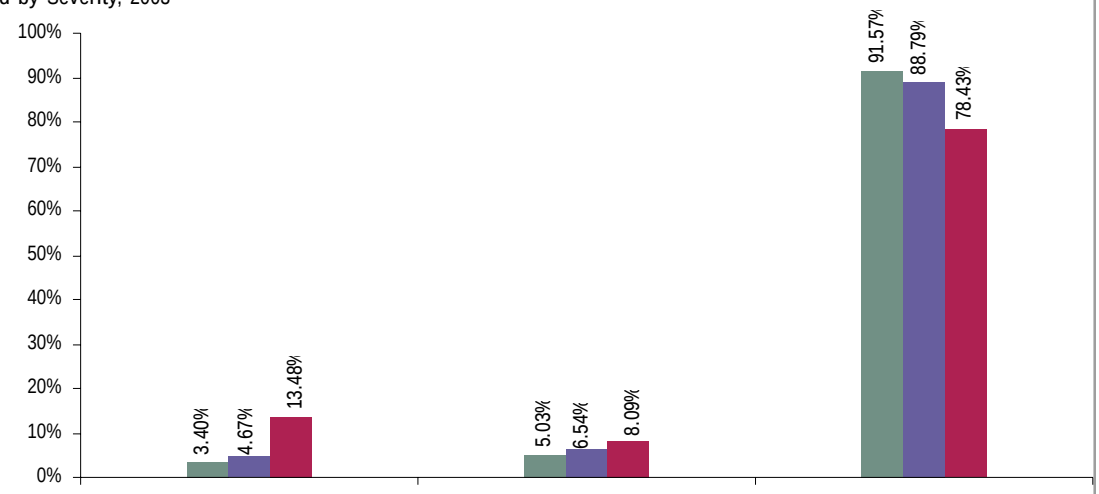
	6:00 a.m. - 8:59 a.m.	9:00 a.m. - 11:59 a.m.	12:00 p.m. - 2:59 p.m.	3:00 p.m. - 5:59 p.m.	6:00 p.m. - 8:59 p.m.	9:00 p.m. - 11:59 p.m.	12:00 a.m. - 2:59 a.m.	3:00 a.m. - 5:59 a.m.
PDO Only	12,495	13,193	17,241	22,911	12,352	7,946	5,727	2,713
Injury Crashes	3,967	4,239	5,915	7,656	4,435	2,720	1,853	946
Fatal Crashes	66	39	79	108	98	69	69	41
Total Crashes	16,528	17,471	23,235	30,675	16,885	10,735	7,649	3,700

Source: 2003 CDOT Crash Database.

Insurance

As shown in Exhibit III.43, most drivers were insured, and the greatest insurance compliance rates occurred for PDO crashes. In 14% of fatal crashes, insurance was not reported and in 8% of fatal crashes a driver was not insured.

Exhibit III.43
Insured by Severity, 2003



	Not Reported	Not Insured	Insured
PDO Only	5,082	7,527	136,956
Injury Crashes	2,622	3,673	49,872
Fatal Crashes	115	69	669
Total Crashes	7,819	11,269	187,497

Source: 2003 CDOT Crash Database.

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Age and Sex of Colorado Drivers

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Colorado Driver Overview, Baselines and Trends

This section explores the relative roles of age and gender in 2003 Colorado crashes.

Selected Key Findings

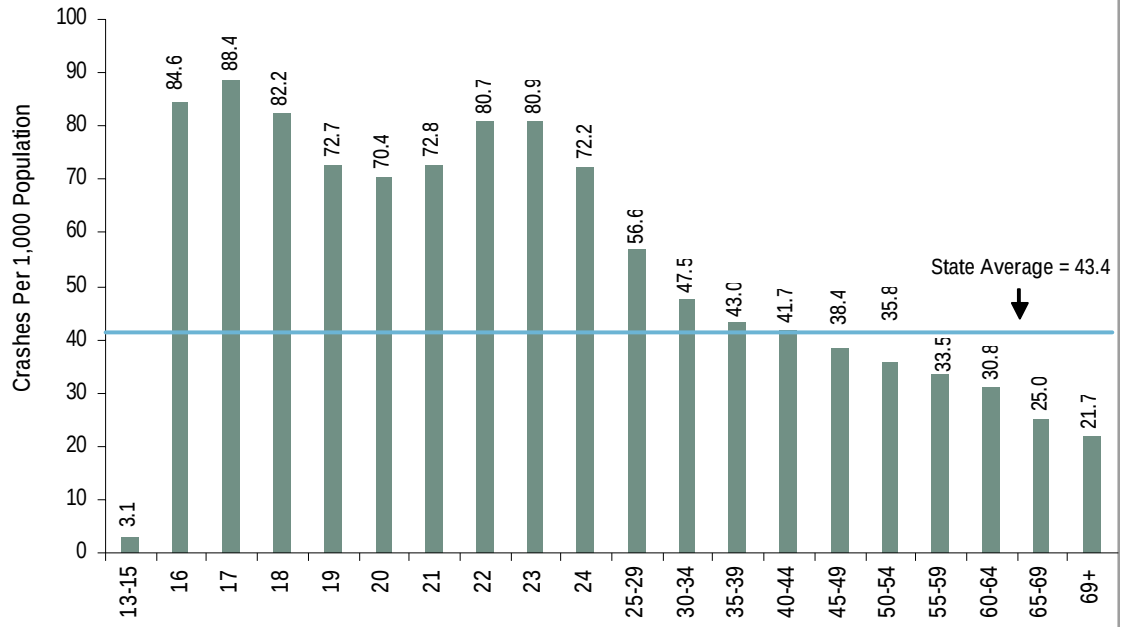
In 2003, drivers age 29 and younger had higher overall crash rates per capita than older age cohorts. After controlling for each age cohort's population size, drivers age 24 and younger all were over-represented in PDO, injury and fatal crashes. For example, 23 year-olds drivers were involved in twice as many injury crashes as would be expected given their population.

Among fatal crash drivers, nearly three out of four were men. Regardless of the severity of crash, men are involved in more crashes than would be expected given their share of the driving age population. The over-involvement of men in more sever crashes is consistent across all age cohorts.

Crash Involvement by Age

In 2003, there were 43.4 crashes per 1,000 population statewide, regardless of crash severity (Exhibit IV.1). Drivers under age 40 all experienced crash rates per 1,000 population that exceeded the state average. Younger drivers, particularly those ages 16 to 18 and 22 and 23 had crash rates that exceeded 80 crashes per 1,000 population, almost double the state rate.

Exhibit IV.1
Drivers in All Crashes Per 1,000 Capita by Age



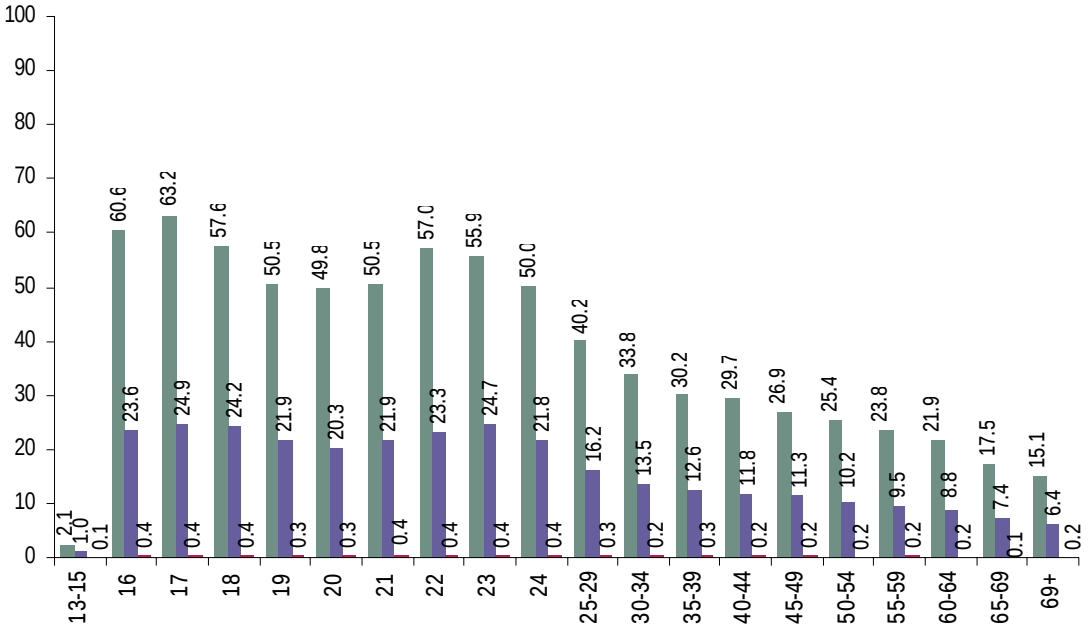
Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Total Crashes	599	5,453	5,921	5,877	5,432	5,160	4,906	4,967	4,696	4,185
Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001
Age Cohort	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**69+**
Total Crashes	18,287	16,917	15,075	15,972	14,002	11,419	8,173	5,248	3,286	6,858
Population	322,809	355,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

Note: 44,152 crash drivers were unknown.

Source: 2003 CDOT Crash Database.

Exhibit IV.2 presents crash involvement rates by severity for each age cohort. The youngest drivers (ages 16 and 17) have the highest per capita PDO crash rates. Per capita injury crash rates are very similar for drivers between the ages of 16 and 24. Beginning with age 25, the injury crash rate begins to fall. Involvement in fatal crashes per capita is consistent amongst all age groups.

Exhibit IV.2
Crash Severity Per 1,000 population, by Age Cohort



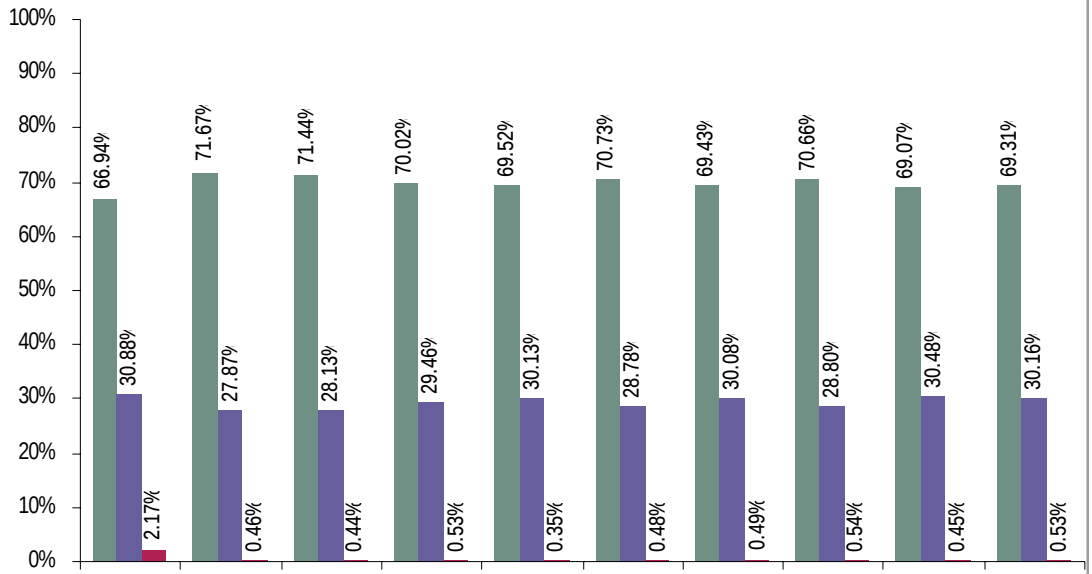
Age Cohort	13-15	16	17	18	19	20	21	22	23	24
PDO Crashes	401	3,909	4,229	4,117	3,777	3,649	3,407	3,511	3,243	2,902
Injury Crashes	185	1,520	1,665	1,732	1,637	1,485	1,476	1,431	1,431	1,263
Fatal Crashes	13	25	26	31	19	25	24	27	21	22
Total Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001
Age Cohort	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**69+**
PDO Crashes	12,979	12,019	10,574	11,367	9,816	8,104	5,799	3,724	2,302	4,771
Injury Crashes	5,218	4,814	4,414	4,533	4,120	3,257	2,316	1,495	970	2,035
Fatal Crashes	93	85	92	74	72	58	59	29	14	56
Total Population	322,809	355,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

Note: 34,965 PDO crash drivers, 9,170 injury crash drivers, and 17 fatal crash drivers were unknown.

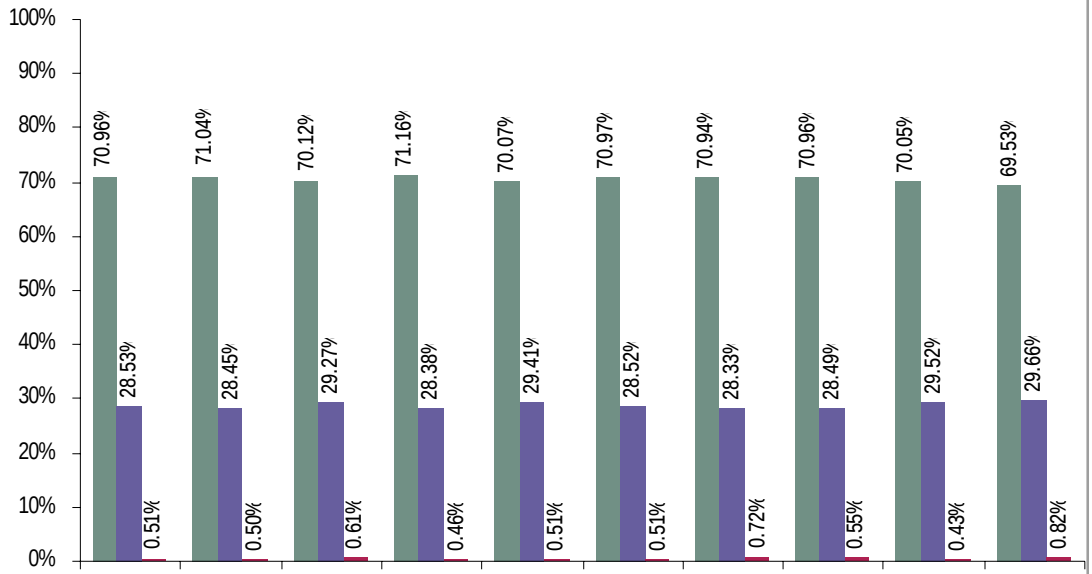
Source: 2003 CDOT Crash Database.

Exhibit IV.3 on the following page demonstrates that for any given age cohort, about 30% of all crashes involve an injury.

Exhibit IV.3
Distribution of Crash Severity by Driver Age



	13-15	16	17	18	19	20	21	22	23	24
PDO Crashes	401	3,909	4,229	4,117	3,777	3,649	3,407	3,511	3,243	2,902
Injury Crashes	185	1,520	1,665	1,732	1,637	1,485	1,476	1,431	1,431	1,263
Fatal Crashes	13	25	26	31	19	25	24	27	21	22
Total Crashes	599	5,453	5,921	5,877	5,432	5,160	4,906	4,967	4,696	4,185



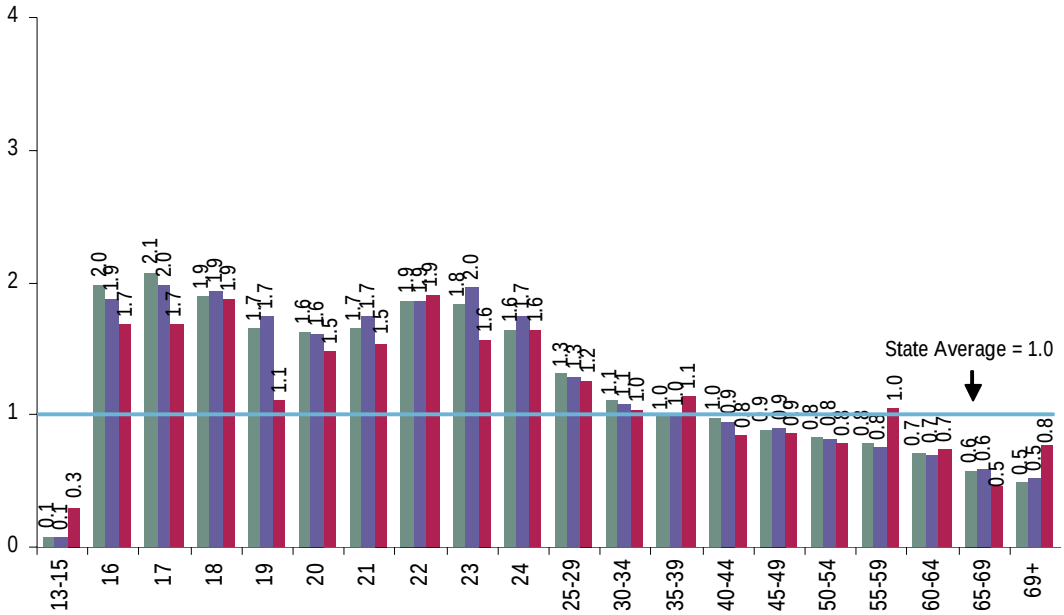
	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	>69
PDO Crashes	12,979	12,019	10,574	11,367	9,816	8,104	5,799	3,724	2,302	4,771
Injury Crashes	5,218	4,814	4,414	4,533	4,120	3,257	2,316	1,495	970	2,035
Fatal Crashes	93	85	92	74	72	58	59	29	14	56
Total Crashes	18,287	16,917	15,075	15,972	14,002	11,419	8,173	5,248	3,286	6,858

Note: 79.20% of PDO crashes and 20.80% injury crashes were not recorded.

Source: 2003 CDOT Crash Database.

Exhibit IV.4 calculates a crash involvement index, by severity of crash, for each age cohort. As shown, 23 year-old drivers are involved in two times more injury crashes than would be expected given the incidence of 23 year-olds in Colorado. The crash involvement index demonstrates that drivers age 24 and younger are involved in more crashes than expected, making them the state's highest risk drivers.

Exhibit IV.4
Colorado Crash Involvement Index by Crash Severity and Age



Age Cohort	13-15	16	17	18	19	20	21	22	23	24
PDO Crashes	401	3,909	4,229	4,117	3,777	3,649	3,407	3,511	3,243	2,902
Injury Crashes	185	1,520	1,665	1,732	1,637	1,485	1,476	1,431	1,431	1,263
Fatal Crashes	13	25	26	31	19	25	24	27	21	22
Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001
Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	69+
PDO Crashes	12,979	12,019	10,574	11,367	9,816	8,104	5,799	3,724	2,302	4,771
Injury Crashes	5,218	4,814	4,414	4,533	4,120	3,257	2,316	1,495	970	2,035
Fatal Crashes	93	85	92	74	72	58	59	29	14	56
Population	322,809	355,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

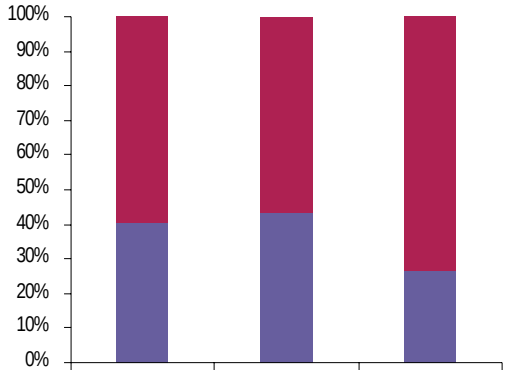
Source: 2003 CDOT Crash Database.

Crash Involvement by Age and Sex

Exhibit IV.5 on the following page demonstrates the rate of crash involvement by men and women by crash severity. Regardless of the type of crash, men have a higher rate of involvement. As crashes get more severe, the incidence of male involvement increases. More specifically, men are involved in 40% of PDO crashes and 73% of fatal crashes.

Exhibit IV.6, below, examines the role of sex in PDO crashes across age cohorts. Among younger drivers, there is only a slight disparity among men and women's involvement in PDO crashes. For example, 46% of 16 year-old PDO crash drivers are women, compared to only 35% of drivers ages 65 to 69. However, the PDO involvement rate of women is fairly consistent across age cohorts at about 40%.

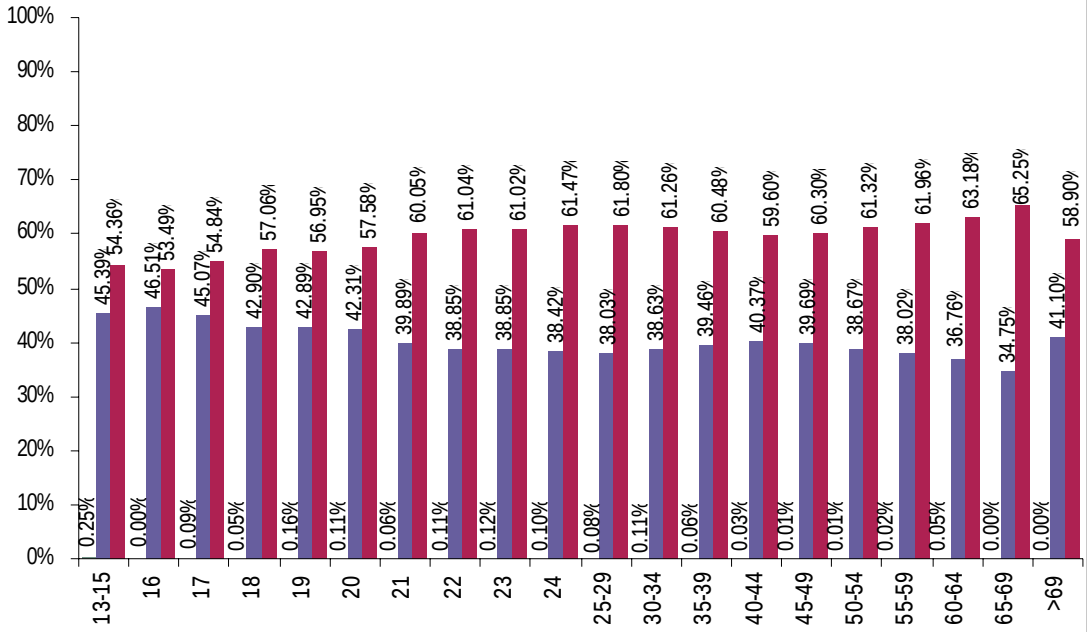
Exhibit IV.5
Sex of Driver by Severity of Crash



	PDO		Injuries		Fatalities		Total
Not Reported	0.18%	264	0.17%	94	0.00%	0	358
Female	39.92%	59,712	43.22%	24,277	26.47%	229	84,218
Male	59.90%	89,589	56.61%	31,796	73.53%	636	122,021

Source: 2003 CDOT Crash Database.

Exhibit IV.6
Drivers Involved in PDO Crashes by Age and Sex



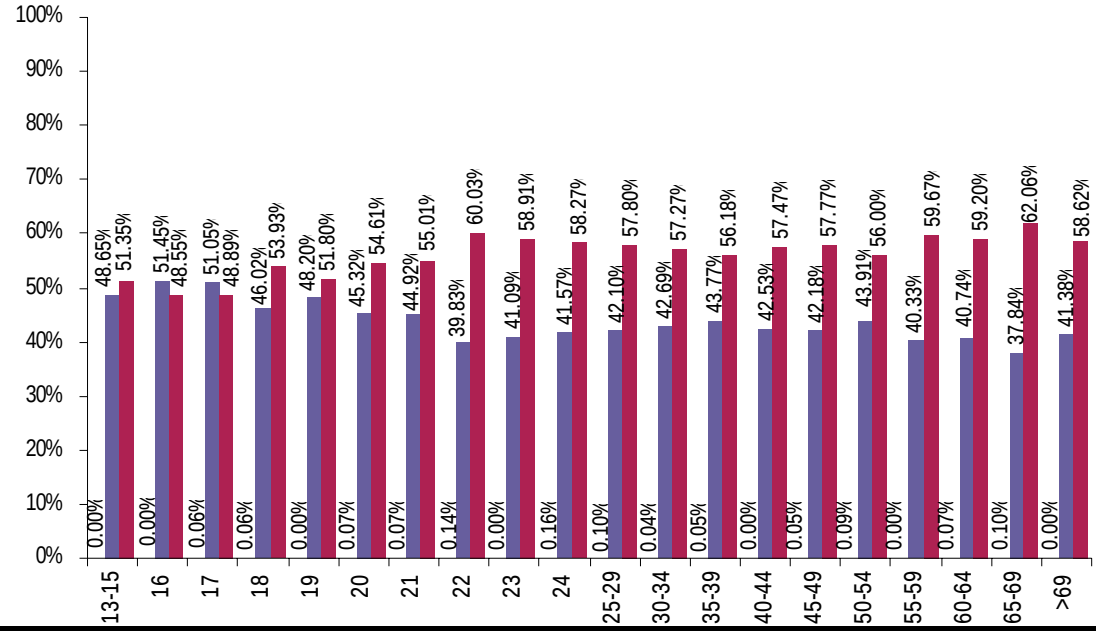
Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Not Reported	1	0	4	2	6	4	2	4	4	3
Female Drivers	182	1,818	1,906	1,766	1,620	1,544	1,359	1,364	1,260	1,115
Male Drivers	218	2,091	2,319	2,349	2,151	2,101	2,046	2,143	1,979	1,784
Total Drivers	401	3,909	4,229	4,117	3,777	3,649	3,407	3,511	3,243	2,902
Age Cohort	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**>69**
Not Reported	10	13	6	3	1	1	1	2	0	0
Female Drivers	4,936	4,643	4,173	4,589	3,896	3,134	2,205	1,369	800	1,961
Male Drivers	8,033	7,363	6,395	6,775	5,919	4,969	3,593	2,353	1,502	2,810
Total Drivers	12,979	12,019	10,574	11,367	9,816	8,104	5,799	3,724	2,302	4,771

Note: Of the 114,600 total drivers, 67 were not reported, 45,640 were female and 68,893 were male.

Source: 2003 CDOT Crash Database.

For injury crashes, male/female involvement rates are fairly equal for drivers ages 17 or younger (Exhibit IV.7) As drivers age, this gap widens and women's share of injury crashes by age is about 40%.

Exhibit IV.7
Drivers Involved in Injury Crashes by Age and Sex



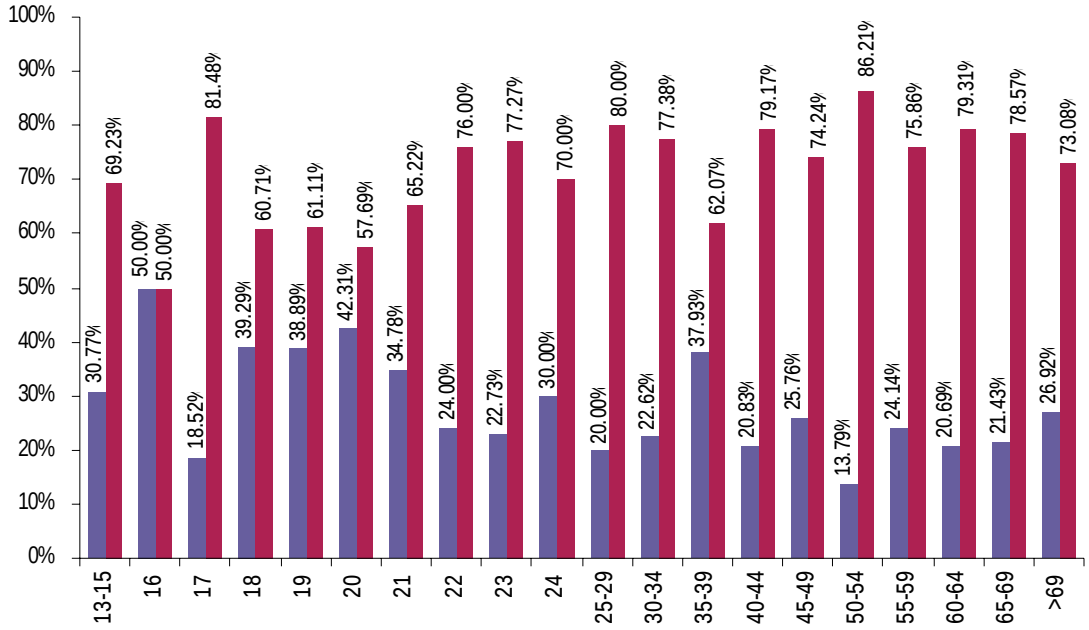
Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Not Reported	0	0	1	1	0	1	1	2	0	2
Female Drivers	90	782	850	797	789	673	663	570	588	525
Male Drivers	95	738	814	934	848	811	812	859	843	736
Total Drivers	185	1,520	1,665	1,732	1,637	1,485	1,476	1,431	1,431	1,263
Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	>69
Not Reported	5	2	2	0	2	3	0	1	1	0
Female Drivers	2,197	2,055	1,932	1,928	1,738	1,430	934	609	367	842
Male Drivers	3,016	2,757	2,480	2,605	2,380	1,824	1,382	885	602	1,193
Total Drivers	5,218	4,814	4,414	4,533	4,120	3,257	2,316	1,495	970	2,035

Note: Of the 46,997 injury drivers, 24 drivers were not reported, 20,359 were female and 26,614 were male.

Source: 2003 CDOT Crash Database.

The disparity of gender involvement in crashes is particularly pronounced for fatal crashes, especially for drivers age 21 and older (Exhibit IV.8). Even though there is a relatively small number of fatal crashes for many age cohorts, the predominant role of men is clear. Four out of five fatal crashes involving drivers ages 25 to 29 involved a male driver.

Exhibit IV.8
Drivers Involved in Fatal Crashes by Age and Sex



Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Female Drivers	4	12	5	11	7	11	8	6	5	6
Male Drivers	9	12	22	17	11	15	15	19	17	14
Total Drivers	13	25	26	31	19	25	24	27	21	22
Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	>69
Female Drivers	18	19	33	15	17	8	14	6	3	14
Male Drivers	72	65	54	57	49	50	44	23	11	38
Total Drivers	93	85	92	74	72	58	59	29	14	56

Note: Of the total 836 fatal drivers, 222 were female and 614 were male.

Source: 2003 CDOT Crash Database.

Residence of Crash Driver by Age and Sex

Exhibit IV.9 on the following page presents the injury and fatal crash involvement of male and female county residents for all Colorado counties. In Weld County, 60% of injury and fatal crash drivers were men, compared to 52% of Pueblo County injury and fatal crashes.

Exhibit IV.9
Resident Drivers Involved in Injury and Fatal Crashes by Gender

	Female		Male		Not Reported		Total
	Number	Percent	Number	Percent	Number	Percent	Number
Adams	2,212	41.76%	3,076	58.07%	9	0.17%	5,297
Alamosa	63	40.38%	93	59.62%	0	0.00%	156
Arapahoe	2,919	45.05%	3,551	54.81%	9	0.14%	6,479
Archuleta	56	45.16%	68	54.84%	0	0.00%	124
Baca	13	38.24%	21	61.76%	0	0.00%	34
Bent	9	30.00%	20	66.67%	1	3.33%	30
Boulder	1,509	44.50%	1,880	55.44%	2	0.06%	3,391
Broomfield	217	43.40%	282	56.40%	1	0.20%	500
Chaffee	53	44.54%	66	55.46%	0	0.00%	119
Cheyenne	3	25.00%	9	75.00%	0	0.00%	12
Clear Creek	53	39.55%	81	60.45%	0	0.00%	134
Conejos	26	34.21%	50	65.79%	0	0.00%	76
Cook	0	0.00%	1	100.00%	0	0.00%	1
Costilla	22	59.46%	15	40.54%	0	0.00%	37
Crowley	10	30.30%	23	69.70%	0	0.00%	33
Custer	12	46.15%	14	53.85%	0	0.00%	26
Delta	94	35.61%	169	64.02%	1	0.38%	264
Denver	3,069	41.55%	4,305	58.29%	12	0.16%	7,386
Dolores	9	64.29%	5	35.71%	0	0.00%	14
Douglas	964	45.39%	1,160	54.61%	0	0.00%	2,124
Eagle	163	43.24%	214	56.76%	0	0.00%	377
El Paso	3,087	46.76%	3,506	53.11%	9	0.14%	6,602
Elbert	96	42.11%	132	57.89%	0	0.00%	228
Fremont	159	39.85%	239	59.90%	1	0.25%	399
Garfield	173	41.09%	248	58.91%	0	0.00%	421
Gilpin	34	53.13%	30	46.88%	0	0.00%	64
Grand	60	48.78%	63	51.22%	0	0.00%	123
Gunnison	27	31.76%	57	67.06%	1	1.18%	85
Hinsdale	2	40.00%	3	60.00%	0	0.00%	5
Huerfano	17	36.96%	29	63.04%	0	0.00%	46
Jackson	5	41.67%	7	58.33%	0	0.00%	12
Jefferson	2,899	44.27%	3,643	55.63%	7	0.11%	6,549
Kiowa	2	16.67%	10	83.33%	0	0.00%	12
Kit Carson	15	32.61%	31	67.39%	0	0.00%	46
La Plata	217	43.84%	276	55.76%	2	0.40%	495
Lake	25	35.21%	45	63.38%	1	1.41%	71
Larimer	1,449	45.06%	1,764	54.85%	3	0.09%	3,216
Las Animas	53	39.85%	80	60.15%	0	0.00%	133
Lincoln	14	36.84%	24	63.16%	0	0.00%	38
Logan	60	39.22%	93	60.78%	0	0.00%	153
Mesa	653	44.54%	811	55.32%	2	0.14%	1,466

Source: 2003 CDOT Crash Database.

Exhibit IV.9
Resident Drivers Involved in Injury and Fatal Crashes by Gender, Continued

	Female		Male		Not Reported		Total
	Number	Percent	Number	Percent	Number	Percent	Number
Mineral	3	50.00%	3	50.00%	0	0.00%	6
Moffat	70	43.21%	92	56.79%	0	0.00%	162
Montezuma	95	39.09%	148	60.91%	0	0.00%	243
Montrose	146	42.07%	201	57.93%	0	0.00%	347
Morgan	112	44.80%	138	55.20%	0	0.00%	250
Otero	86	45.50%	103	54.50%	0	0.00%	189
Ouray	9	39.13%	14	60.87%	0	0.00%	23
Park	80	43.24%	104	56.22%	1	0.54%	185
Phillips	23	60.53%	15	39.47%	0	0.00%	38
Pitkin	57	50.00%	57	50.00%	0	0.00%	114
Prowers	49	39.20%	76	60.80%	0	0.00%	125
Pueblo	998	47.41%	1,107	52.59%	0	0.00%	2,105
Rio Blanco	17	37.78%	28	62.22%	0	0.00%	45
Rio Grande	50	43.10%	66	56.90%	0	0.00%	116
Routt	62	41.61%	87	58.39%	0	0.00%	149
Saguache	25	39.06%	39	60.94%	0	0.00%	64
San Juan	3	37.50%	5	62.50%	0	0.00%	8
San Miguel	27	61.36%	17	38.64%	0	0.00%	44
Sedgwick	7	46.67%	8	53.33%	0	0.00%	15
Summit	61	33.15%	123	66.85%	0	0.00%	184
Teller	97	40.08%	145	59.92%	0	0.00%	242
Washington	14	35.00%	26	65.00%	0	0.00%	40
Weld	1,025	39.85%	1,546	60.11%	1	0.04%	2,572
Yuma	19	32.20%	40	67.80%	0	0.00%	59
Total	23,658		30,382		63		54,103

Source: 2003 CDOT Crash Database.

Exhibit IV.10 on the following page presents the age distribution of fatal and injury crash drivers by their county of residence. Among Larimer County's resident injury or fatal crash drivers, more than one in three were age 21 or younger. Denver residents age 21 and younger represent nearly 40% of the County's severe crash drivers. Drivers age 65 or older seem to be involved in a greater proportion of injury or fatal crashes when they live in more rural communities. For example, drivers in this age cohort represent 5% of Denver's injury or fatal crash drivers, compared to 10% in Mesa County.

Exhibit IV.10
Resident Drivers Involved in Injury and Fatal Crashes by Age

	<17 Years		17-21Years		22-24 Years		25-54 Years		55-64 Years		> 65 Years		Total
County	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Adams	128	2.42%	1,676	31.64%	429	8.10%	2,587	48.84%	287	5.42%	190	3.59%	5,297
Alamosa	9	5.77%	36	23.08%	22	14.10%	67	42.95%	12	7.69%	10	6.41%	156
Arapahoe	154	2.38%	2,514	38.80%	424	6.54%	2,788	43.03%	362	5.59%	237	3.66%	6,479
Archuleta	2	1.61%	26	20.97%	7	5.65%	67	54.03%	11	8.87%	11	8.87%	124
Baca	2	5.88%	8	23.53%	0	0.00%	11	32.35%	6	17.65%	7	20.59%	34
Bent	3	10.00%	7	23.33%	0	0.00%	9	30.00%	3	10.00%	8	26.67%	30
Boulder	109	3.21%	1,074	31.67%	251	7.40%	1,586	46.77%	213	6.28%	158	4.66%	3,391
Broomfield	22	4.40%	131	26.20%	36	7.20%	269	53.80%	28	5.60%	14	2.80%	500
Chaffee	3	2.52%	21	17.65%	11	9.24%	50	42.02%	15	12.61%	19	15.97%	119
Cheyenne	2	16.67%	5	41.67%	1	8.33%	3	25.00%	1	8.33%	0	0.00%	12
Clear Creek	4	2.99%	18	13.43%	8	5.97%	90	67.16%	12	8.96%	2	1.49%	134
Conejos	3	3.95%	18	23.68%	4	5.26%	36	47.37%	4	5.26%	11	14.47%	76
Cook	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	100%	1
Costilla	2	5.41%	7	18.92%	3	8.11%	18	48.65%	6	16.22%	1	2.70%	37
Crowley	1	3.03%	9	27.27%	1	3.03%	15	45.45%	2	6.06%	5	15.15%	33
Custer	2	7.69%	5	19.23%	2	7.69%	11	42.31%	3	11.54%	3	11.54%	26
Delta	13	4.92%	74	28.03%	10	3.79%	113	42.80%	23	8.71%	31	11.74%	264
Denver	94	1.27%	2,830	38.32%	581	7.87%	3,106	42.05%	414	5.61%	361	4.89%	7,386
Dolores	2	14.29%	3	21.43%	0	0.00%	8	57.14%	1	7.14%	0	0.00%	14
Douglas	98	4.61%	586	27.59%	107	5.04%	1,113	52.40%	147	6.92%	73	3.44%	2,124
Eagle	17	4.51%	74	19.63%	35	9.28%	212	56.23%	22	5.84%	17	4.51%	377
El Paso	200	3.03%	1,579	23.92%	561	8.50%	3,390	51.35%	478	7.24%	394	5.97%	6,602
Elbert	11	4.82%	72	31.58%	9	3.95%	106	46.49%	22	9.65%	8	3.51%	228
Fremont	15	3.76%	138	34.59%	29	7.27%	151	37.84%	34	8.52%	32	8.02%	399
Garfield	16	3.80%	92	21.85%	34	8.08%	227	53.92%	34	8.08%	18	4.28%	421
Gilpin	0	0.00%	13	20.31%	4	6.25%	42	65.63%	4	6.25%	1	1.56%	64
Grand	2	1.63%	23	18.70%	8	6.50%	68	55.28%	10	8.13%	12	9.76%	123
Gunnison	3	3.53%	31	36.47%	8	9.41%	28	32.94%	9	10.59%	6	7.06%	85
Hinsdale	0	0.00%	0	0.00%	1	20.00%	3	60.00%	1	20.00%	0	0.00%	5
Huerfano	0	0.00%	8	17.39%	5	10.87%	25	54.35%	3	6.52%	5	10.87%	46
Jackson	2	16.67%	4	33.33%	1	8.33%	4	33.33%	1	8.33%	0	0.00%	12
Jefferson	224	3.42%	1,968	30.05%	436	6.66%	3,081	47.05%	475	7.25%	365	5.57%	6,549
Kiowa	0	0.00%	4	33.33%	0	0.00%	7	58.33%	1	8.33%	0	0.00%	12
Kit Carson	1	2.17%	18	39.13%	3	6.52%	15	32.61%	5	10.87%	4	8.70%	46
La Plata	21	4.24%	122	24.65%	38	7.68%	252	50.91%	33	6.67%	29	5.86%	495
Lake	4	5.63%	16	22.54%	4	5.63%	41	57.75%	6	8.45%	0	0.00%	71
Larimer	140	4.35%	978	30.41%	271	8.43%	1,441	44.81%	215	6.69%	171	5.32%	3,216
Las Animas	13	9.77%	34	25.56%	7	5.26%	60	45.11%	11	8.27%	8	6.02%	133
Lincoln	2	5.26%	8	21.05%	6	15.79%	18	47.37%	1	2.63%	3	7.89%	38
Logan	13	8.50%	35	22.88%	10	6.54%	64	41.83%	14	9.15%	17	11.11%	153
Mesa	71	4.84%	364	24.83%	93	6.34%	665	45.36%	122	8.32%	151	10.30%	1,466

Source: 2003 CDOT Crash Database.

Exhibit IV.10
Resident Drivers Involved in Injury and Fatal Crashes by Age, Continued

	<17 Years		17-21Years		22-24 Years		25-54 Years		55-64 Years		> 65 Years		Total
County	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Mineral	1	16.67%	0	0.00%	1	16.67%	2	33.33%	1	16.67%	1	16.67%	6
Moffat	5	3.09%	52	32.10%	9	5.56%	78	48.15%	10	6.17%	8	4.94%	162
Montezuma	21	8.64%	47	19.34%	19	7.82%	110	45.27%	20	8.23%	26	10.70%	243
Montrose	12	3.46%	72	20.75%	21	6.05%	172	49.57%	33	9.51%	37	10.66%	347
Morgan	22	8.80%	65	26.00%	14	5.60%	120	48.00%	11	4.40%	18	7.20%	250
Otero	14	7.41%	57	30.16%	14	7.41%	74	39.15%	13	6.88%	17	8.99%	189
Ouray	3	13.04%	6	26.09%	1	4.35%	8	34.78%	1	4.35%	4	17.39%	23
Park	9	4.86%	39	21.08%	7	3.78%	101	54.59%	18	9.73%	11	5.95%	185
Phillips	2	5.26%	7	18.42%	4	10.53%	19	50.00%	2	5.26%	4	10.53%	38
Pitkin	3	2.63%	38	33.33%	4	3.51%	53	46.49%	14	12.28%	2	1.75%	114
Prowers	13	10.40%	29	23.20%	4	3.20%	62	49.60%	8	6.40%	9	7.20%	125
Pueblo	73	3.47%	549	26.08%	176	8.36%	964	45.80%	170	8.08%	173	8.22%	2,105
Rio Blanco	1	2.22%	7	15.56%	5	11.11%	23	51.11%	5	11.11%	4	8.89%	45
Rio Grande	8	6.90%	23	19.83%	10	8.62%	53	45.69%	12	10.34%	10	8.62%	116
Routt	3	2.01%	52	34.90%	15	10.07%	66	44.30%	9	6.04%	4	2.68%	149
Saguache	4	6.25%	11	17.19%	9	14.06%	26	40.63%	7	10.94%	7	10.94%	64
San Juan	0	0.00%	1	12.50%	4	50.00%	2	25.00%	1	12.50%	0	0.00%	8
San Miguel	1	2.27%	12	27.27%	4	9.09%	24	54.55%	3	6.82%	0	0.00%	44
Sedgwick	1	6.67%	1	6.67%	3	20.00%	5	33.33%	2	13.33%	3	20.00%	15
Summit	3	1.63%	35	19.02%	21	11.41%	106	57.61%	13	7.07%	6	3.26%	184
Teller	9	3.72%	53	21.90%	8	3.31%	139	57.44%	16	6.61%	17	7.02%	242
Washington	2	5.00%	7	17.50%	2	5.00%	23	57.50%	3	7.50%	3	7.50%	40
Weld	91	3.54%	801	31.14%	169	6.57%	1,244	48.37%	170	6.61%	97	3.77%	2,572
Yuma	4	6.78%	18	30.51%	4	6.78%	23	38.98%	5	8.47%	5	8.47%	59
Total	1,713		16,611		3,988		25,344		3,598		2,849		54,103

Source: 2003 CDOT Crash Database.

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Occupant Protection and Colorado Crashes

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Occupant Protection Overview, Baselines and Trends

This section presents data related to Colorado drivers' use of occupant protection. In many cases, analyses of occupant protection use focus on the most severe crashes, those with an apparent, incapacitating or fatal injury, because it is the study team's belief that these more severe crashes have the most accurate occupant protection data.

Selected Key Findings

Colorado's seat belt use rate continues to climb. Drivers on the Front Range are most likely to use seat belts (81%). The Eastern Plains region of the state annually lags other parts of the state with respect to seat belt use (70%), followed closely by the Western Region (74%). Children's seat belt use and car seat use rates have risen steadily in recent years. Nearly 90% of the youngest children were properly restrained.

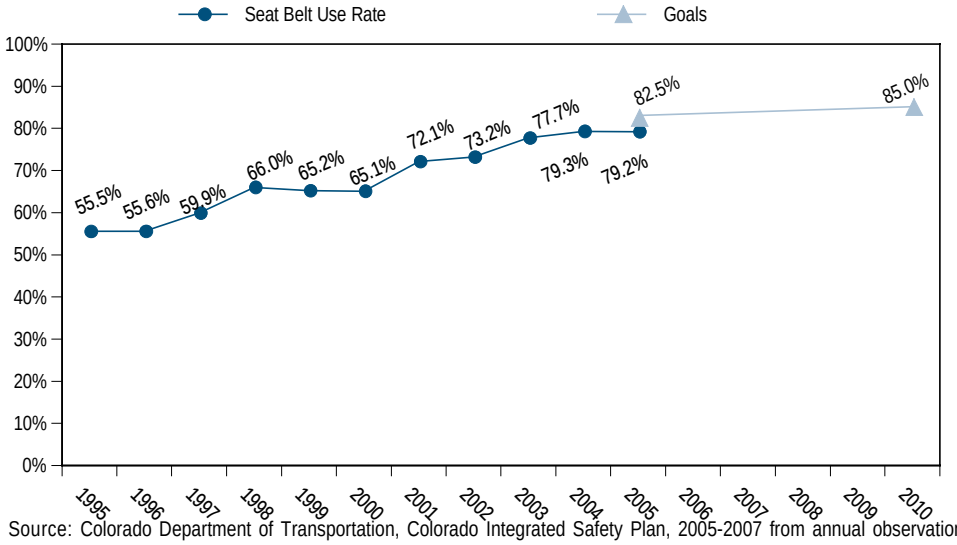
Nearly 30% (or more) of the drivers involved in serious injury crashes that occurred in Lakewood, Brighton, Broomfield, Commerce City and Thornton were unbelted. Littleton, Longmont, Wheat Ridge and Grand Junction had the highest proportion of injury crash drivers who were using seat belts. Among the largest counties, Arapahoe County had the highest proportion of reported seat belt use by drivers in the most severe injury crashes (81%) compared to the lowest rate, 71% in Weld County.

Injury crash drivers of all ages do not use seat belts. The greatest proportion of unbelted drivers were those between the ages of 25 and 29. Nearly 80% of the unbelted drivers in the most serious injury crashes were male. Impaired injury crash drivers were five times more likely to be unbelted than sober injury crash drivers.

Adult Occupant Protection

Each year, CDOT's contractor, the Institute of Transportation Management at Colorado State University conducts a NHTSA-compliant statistically valid observational survey of seat belt use statewide. The most recent figures are shown in Exhibit V.1. In 2003, statewide seat belt use reached a new high of 77.7%.

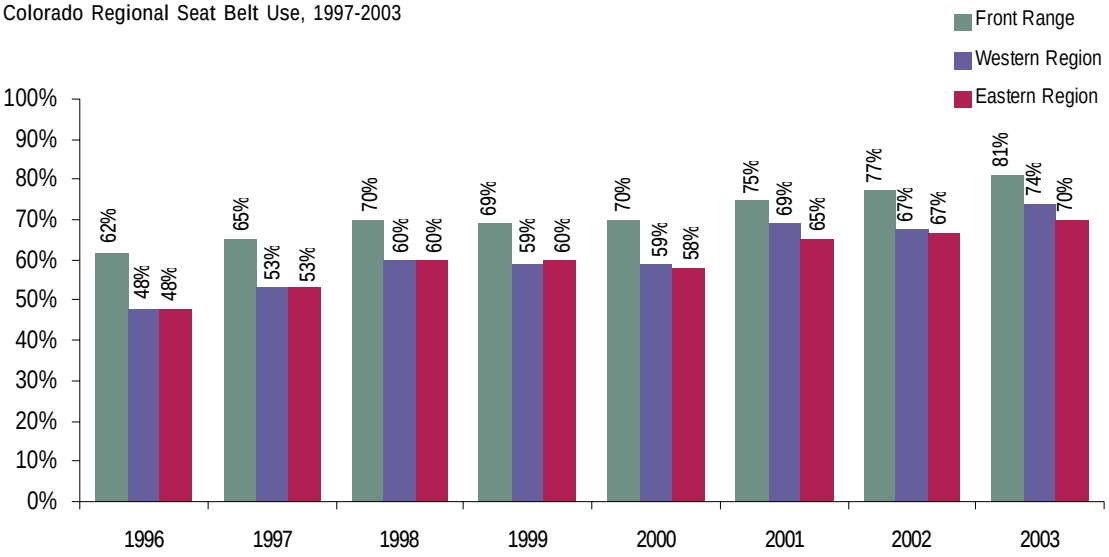
Exhibit V.1
Overall Seat Belt Use Rate, 1995-2003



Source: Colorado Department of Transportation, Colorado Integrated Safety Plan, 2005-2007 from annual observational seat belt surveys.

Exhibit V.2 demonstrates that seat belt use on Colorado's more densely populated Front Range continues to outpace seat belt use rates in both the Western and Eastern regions of the state.

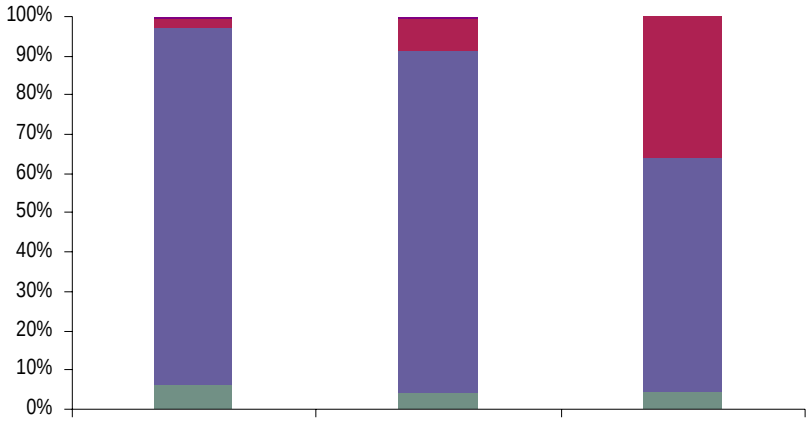
Exhibit V.2
Colorado Regional Seat Belt Use, 1997-2003



Source: Annual Seat Belt Surveys conducted by the CSU Institute of Transportation Management on behalf of CDOT.

In more than one in three fatal crashes, a driver was not using a seat belt (Exhibit V.3). It is important to note that the occupant protection rates reported for PDO crashes are likely exaggerated. In many of these cases, the reporting officer does not witness whether or not the PDO drivers were using seat belts.

Exhibit V.3
Occupant Protection Use by Drivers in Crashes, 2003



	PDO Crashes		Injury Crashes		Fatal Crashes		Total
Not Reported	6.09%	91	4.08%	23	4.81%	0	11,441
Restraint Used	91.23%	1,364	87.52%	492	59.32%	5	186,109
No Restraint Used	2.64%	39	8.37%	47	35.87%	3	8,948
Child Safety Device Used	0.40%	1	0.40%	0	0.00%	0	87

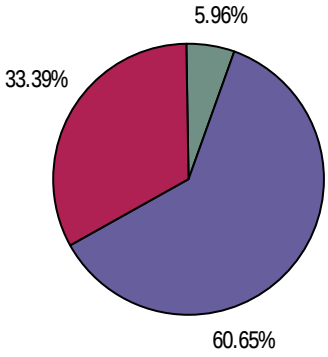
Source: 2003 CDOT Crash Database.

As shown in Exhibit V.4, 61% of fatal crash drivers were using seat belts. In 6% of cases, a driver's use of occupant protection was not reported.

Child Occupant Protection

Seat belt use by children between the ages of 5 and 15 has doubled since the baseline survey was conducted (Exhibit V.5 below). In 2003, nearly three in four children in this age group were observed using seat belts.

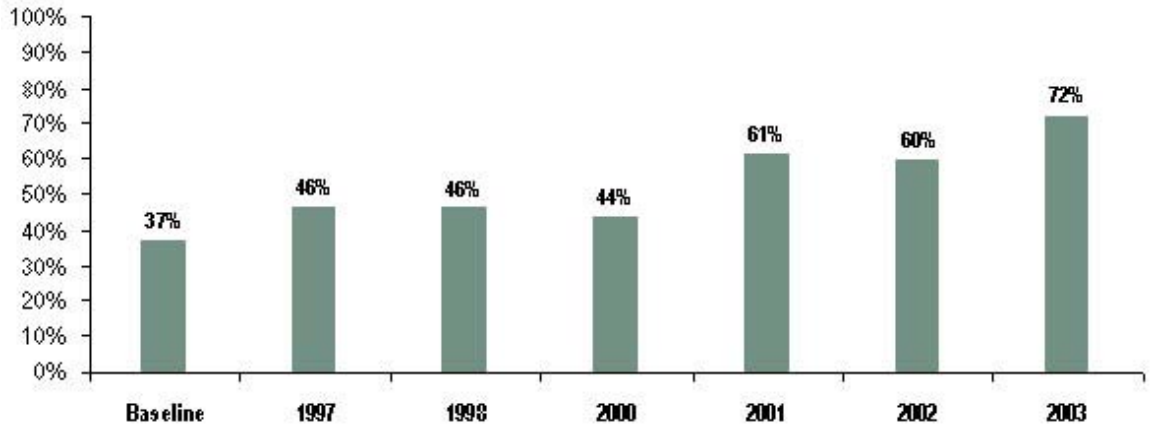
Exhibit VI.4
Driver Protection Seat Belt Use in Fatal Crashes



Restraint	Number
Not Reported	35
Restraint Used	356
Restraint Not Used	196

Source: 2003 CDOT Crash Database.

Exhibit VI.5
Colorado Seat Belt Use by Children Ages 5 to 15, 1997-2003

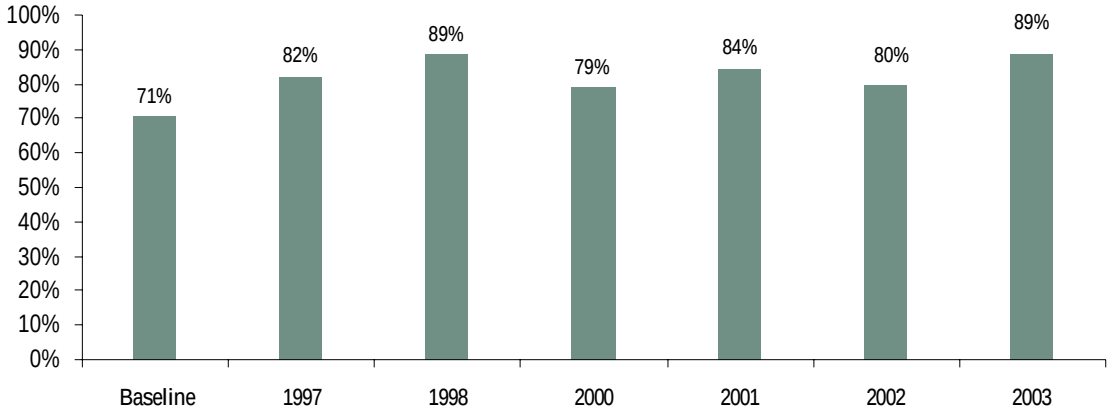


Note: A child/juvenile seat belt study was not conducted in 1999. Juveniles are between the ages of 5 and 15 years of age.

Source: 2003 CDOT Crash Database.

In 2003, nearly nine in ten children age 4 or younger were observed using a booster or car seat (Exhibit V.6 on the following page).

Exhibit V.6
Colorado Car Seat Use of Children Age 0 to 4, 1997 - 2003



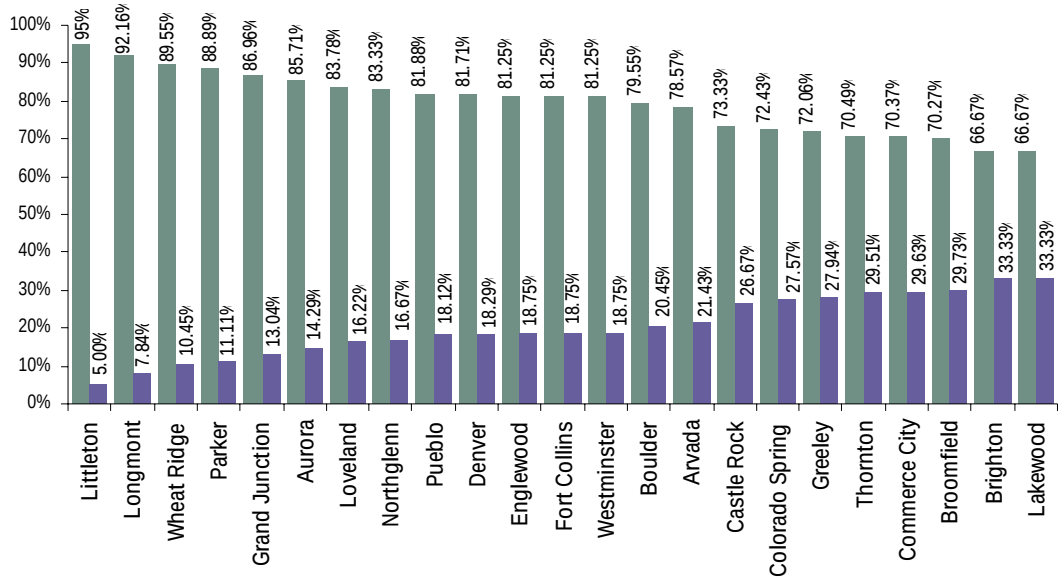
Note: A Child/Juvenile selt belt study was not conducted in 1999. Children are between the ages of 0 and 4 years of age.

Source: 2003 CDOT Crash Database.

Occupant Protection by Location of Crash

Exhibit V.7 shows the seat belt use rates for drivers in severe injury crashes by the large city of crash. Severe injury crash drivers in Lakewood and Brighton were the least likely to be using a seat belt.

Exhibit V.7
Driver Protection of All Drivers in Incapacitating Injury Crashes, by Large City of Crash

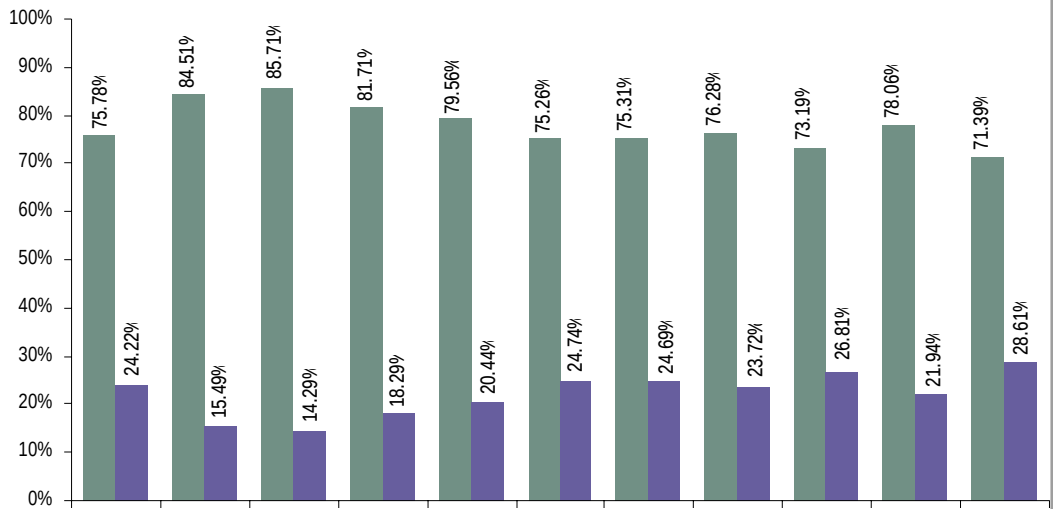


	Littleton	Longmont	Wheat Ridge	Parker	Grand Junction	Aurora	Loveland	Northglenn	Pueblo	Denver	Englewood	Fort Collins	Westminster	Boulder	Arvada	Castle Rock	Colorado Spring	Greeley	Thornton	Commerce City	Broomfield	Brighton	Lakewood
Restraint Used	38	94	60	8	60	348	31	30	122	688	26	65	39	35	55	11	155	49	43	38	26	14	64
Restraint Not Used	2	8	7	1	9	58	6	6	27	154	6	15	9	9	15	4	59	19	18	16	11	7	32
Total Drivers	40	102	67	9	69	406	37	36	149	842	32	80	48	44	70	15	214	68	61	54	37	21	96

Source: 2003 CDOT Crash Database.

Among the largest counties, incapacitating crash drivers were most likely to be using a seat belt if the crash occurred in Arapahoe or Boulder County (Exhibit V.8). They were least likely to use a seat belt if the crash occurred in Weld or Mesa County, followed closely by El Paso, Jefferson and Adams counties.

Exhibit V.8
Driver Protection in Incapacitating Injury Crashes, by Large County of Crash



	Adams	Arapahoe	Boulder	Denver	Douglas	El Paso	Jefferson	Larimer	Mesa	Pueblo	Weld
Restraint Used	341	491	282	688	179	368	369	254	101	185	292
Restraint Not Used	109	90	47	154	46	121	121	79	37	52	117
Total Drivers	450	581	329	842	225	489	490	333	138	237	409

Source: 2003 CDOT Crash Database.

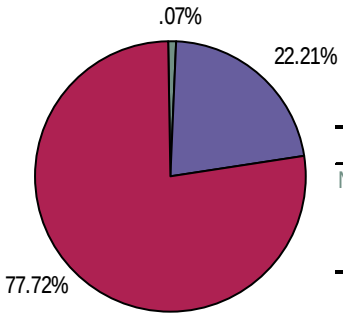
Seatbelt Non-Use by Gender

Nearly four out of five unbelted incapacitating injury crash drivers were male (Exhibit V.9).

Seatbelt Non-Use by Age

The age distribution of incapacitating injury crash drivers who were not using a seat belt is shown in Exhibit V.10 on the following page. The majority of these unbelted drivers are age 25 or older.

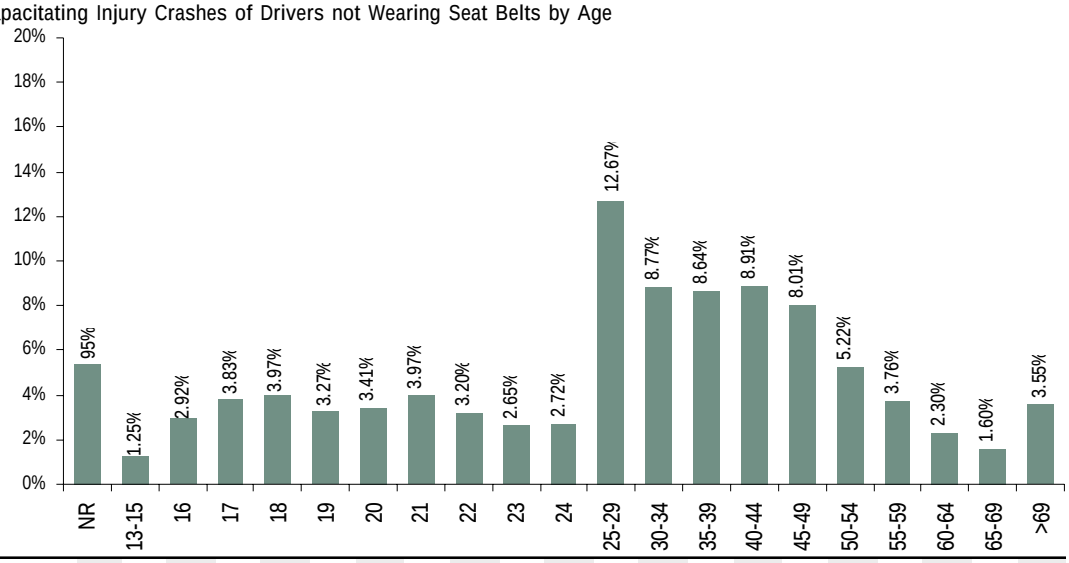
Exhibit V.9
Incapacitating Injury Crashes of Drivers not Wearing Seat Belts by Gender



Restraint	Number
Not Reported	1
Female	319
Male	1,116

Source: 2003 CDOT Crash Database.

Exhibit V.10
Incapacitating Injury Crashes of Drivers not Wearing Seat Belts by Age



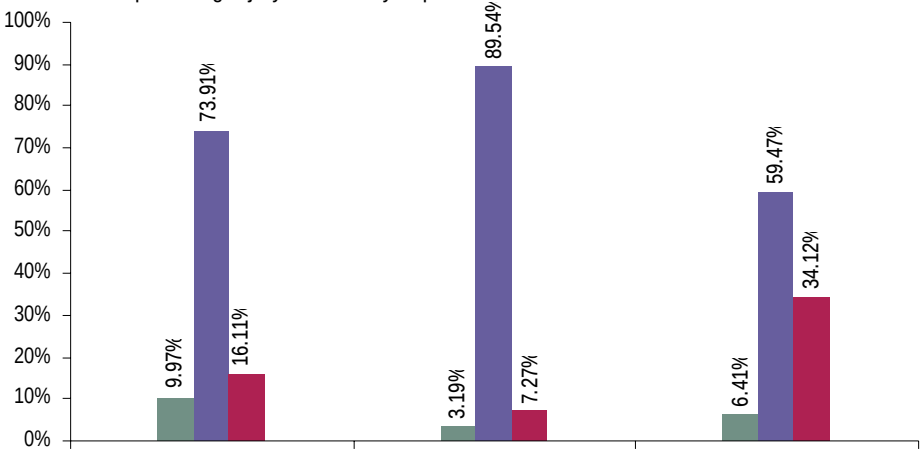
	NR	13-15	16	17	18	19	20	21	22	23	24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	>69
Restraint Not Used	77	18	42	55	57	47	49	57	46	38	39	182	126	124	128	115	75	54	33	23	51

Source: 2003 CDOT Crash Database.

Seatbelt Non-Use and Driver Impairment

Exhibit V.11 presents the reported seat belt use of incapacitating injury crash drivers by impairment status. More than one-third of the incapacitating injury crash drivers who were suspected of impairment were also not using seat belts.

Exhibit V.11
Restraint Status of Incapacitating Injury Crashes by Impairment



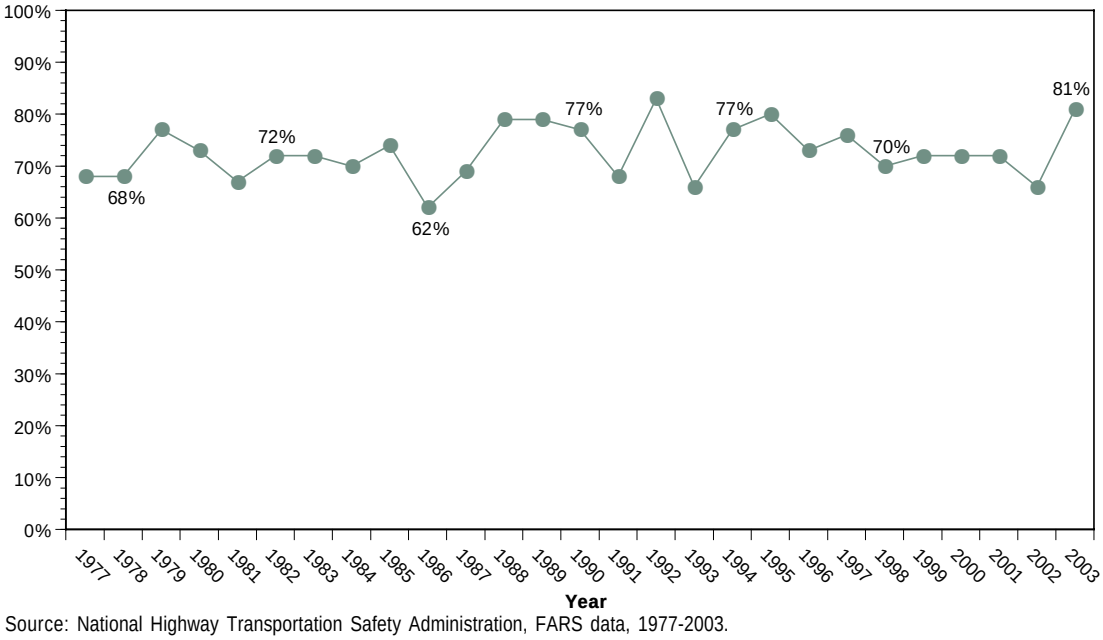
	Unknown	No Impairment Suspected	Impairment Suspected	Total
Impairment Unknown	39	289	63	391
Restraint Used	141	3,956	321	4,418
No Restraint Used	92	854	490	1,436
Total Drivers	272	5,099	874	6,245

Source: 2003 CDOT Crash Database.

Use of Helmets in Motorcycle Crashes

Exhibit V.12 demonstrates that 81% of all motorcycle riders and occupants involved in fatal motorcycle crashes were not wearing helmets.

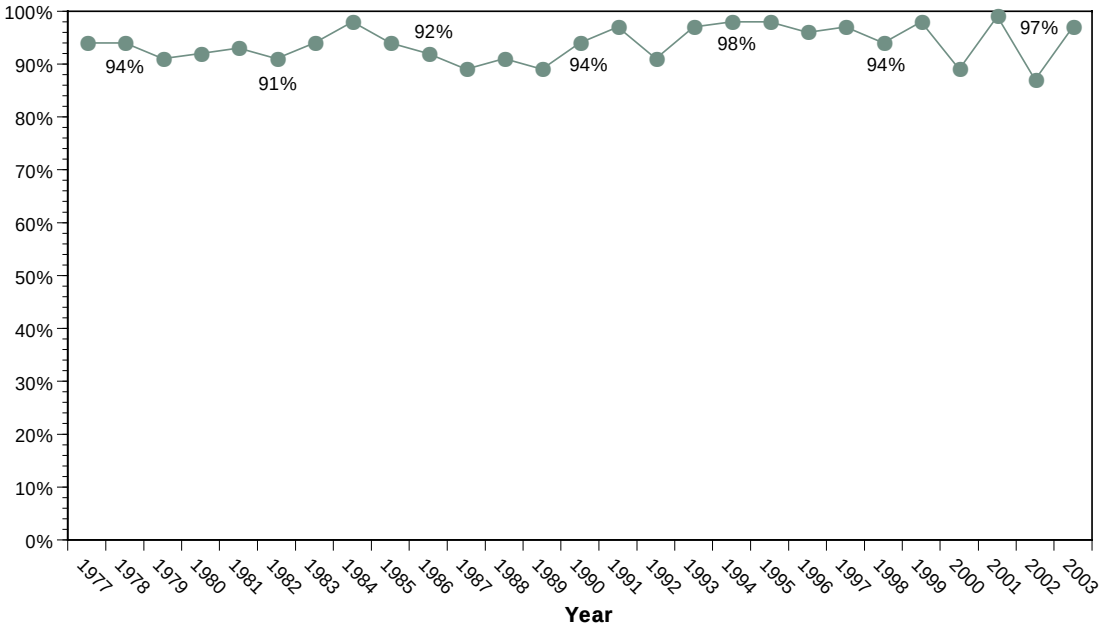
Exhibit V.12
Proportion of Motorcyclists and Occupants Not Wearing a Helmet of Fatal and Injury Motorcycle Crashes



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Those riders that did not use a helmet had an extremely high probability of being injured or killed. As shown in Exhibit V.13, 97% of the motorcycle riders that did not use helmets and were involved in a fatal crash were themselves injured or killed.

Exhibit V.13
Proportion of Motorcyclists and Occupants Not Wearing a Helmet that Were Injured or Killed



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

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Impairment Effects in Colorado PDO, Injury and Fatal Crashes

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Impaired Driver Overview, Baselines and Trends

This section examines the role of driver impairment in Colorado crashes using both the Fatality Analysis Reporting System (FARS) and CDOT crash data.

Selected Key Findings

In 2003, 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 41%. 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.

Brighton, Thornton, Northglenn, Lakewood and Pueblo had the highest proportion of impaired injury crash drivers among Colorado's largest cities. In contrast, Parker, Longmont, Grand Junction, Boulder and Denver had the lowest proportion of injury crash drivers suspected of impairment.

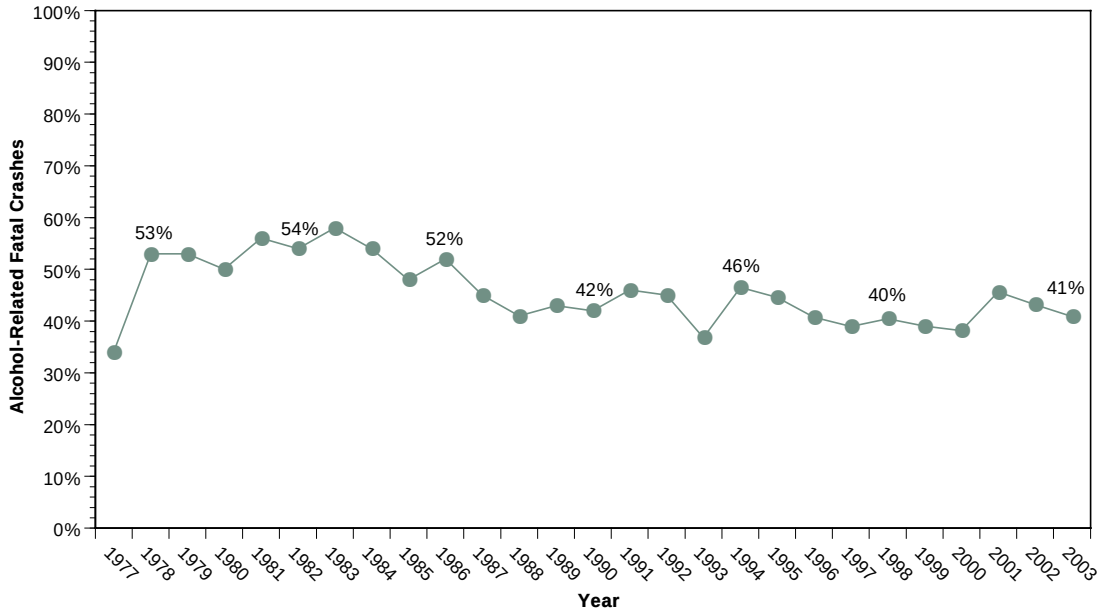
Drivers between the ages of 18 and 29 had the highest rates of involvement in impaired driving crashes.

If adult men are involved in a fatal crash, it is likely they are impaired by alcohol. Among fatal crash drivers, men are much more likely to be impaired than women. Drivers between the ages of 21 and 24 have much higher incidences of impaired driving crashes than would be expected given their relative share of Colorado's driving age population. Since 2000, the proportion of juvenile fatal crash drivers (age 18 or younger) suspected of impairment by drugs has been rising, while the proportion of alcohol-impaired juveniles has fallen. Underage, juvenile fatal crash drivers are much less likely to be impaired than fatal crash drivers between the ages of 21 and 24. For example, 18% of 19 year-old fatal crash drivers were impaired, compared to 71% of 21 year-old fatal crash drivers.

Alcohol-Related Fatal Crash Trends

From 1978 through 1986, half of fatal crashes were alcohol-related. This trend declined by 10 percentage points, to 42% by 1990. After additional decreases in the mid-1990s, the proportion of alcohol-involved fatal crashes began to rise again in 1998. In 2003, two in five fatal crashes included an impaired driver (Exhibit VI.1 on the following page).

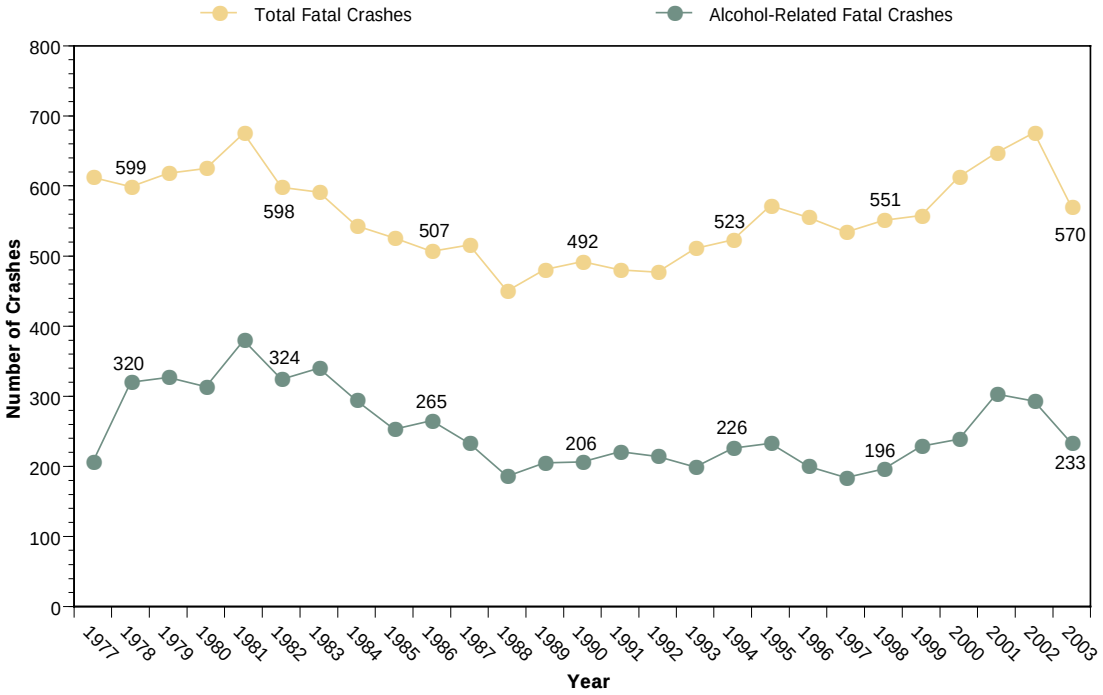
Exhibit VI.1
Alcohol-Related Fatal Crashes as a Percentage of All Fatal Crashes in Colorado, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.2 presents the total number of fatal crashes and the number of alcohol-related fatal crashes from 1977 through 2003.

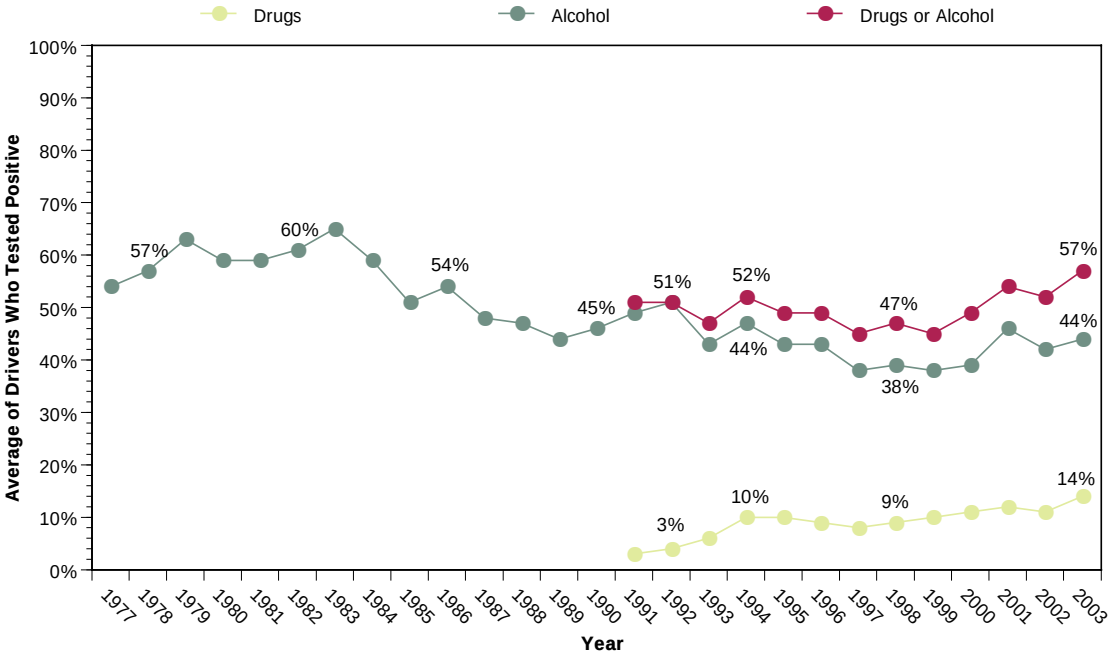
Exhibit VI.2
Total Fatal Crashes and Alcohol-Related Crashes, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.3 details the proportion of fatal crash drivers who tested positive for alcohol or drug use. The proportion of drug-impaired drivers in fatal crashes reached a high of 14% in 2003.

Exhibit VI.3
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, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Residence of Impaired Crash Drivers

The impairment status of injury and fatal crash drivers is reported in Exhibit VI.4, below and continued on the following page, based on the driver's county of residence. About 8% of Denver County's injury and fatal crash drivers were suspected of alcohol-impairment at the time of the crash, compared to 6% of Weld and Pueblo County drivers.

Exhibit VI.4
Resident Drivers Involved in Injury and Fatality Crashes, by Condition of Driver

	No Impairment Suspected		Alcohol		RX Drugs or Medication		Illegal Drugs		Alcohol and Drugs		Impairment Not Known/Assessed		Total
Adams	4,676	88.28%	294	5.55%	4	0.08%	12	0.23%	14	0.26%	297	5.61%	5,297
Alamosa	136	87.18%	15	9.62%	0	0.00%	0	0.00%	0	0.00%	5	3.21%	156
Arapahoe	5,695	87.90%	270	4.17%	12	0.19%	4	0.06%	11	0.17%	487	7.52%	6,479
Archuleta	93	75.00%	16	12.90%	0	0.00%	2	1.61%	0	0.00%	13	10.48%	124
Baca	30	88.24%	4	11.76%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	34
Bent	27	90.00%	3	10.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	30
Boulder	3,023	89.15%	140	4.13%	7	0.21%	5	0.15%	7	0.21%	209	6.16%	3,391
Broomfield	461	92.20%	20	4.00%	0	0.00%	2	0.40%	2	0.40%	15	3.00%	500
Chaffee	101	84.87%	10	8.40%	0	0.00%	1	0.84%	0	0.00%	7	5.88%	119

Exhibit VI.4
Resident Drivers Involved in Injury and Fatality Crashes, by Condition of Driver, Continued

	No Impairment Suspected		Alcohol		RX Drugs or Medication		Illegal Drugs		Alcohol and Drugs		Impairment Not Known/Assessed		Total
Cheyenne	6	50.00%	3	25.00%	0	0.00%	2	16.67%	0	0.00%	1	8.33%	12
Clear Creek	110	82.09%	10	7.46%	0	0.00%	1	0.75%	1	0.75%	12	8.96%	134
Conejos	65	85.53%	8	10.53%	0	0.00%	0	0.00%	0	0.00%	3	3.95%	76
Cook	1	100%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1
Costilla	31	83.78%	5	13.51%	0	0.00%	0	0.00%	0	0.00%	1	2.70%	37
Crowley	30	90.91%	3	9.09%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	33
Custer	18	69.23%	5	19.23%	0	0.00%	0	0.00%	0	0.00%	3	11.54%	26
Delta	230	87.12%	21	7.95%	0	0.00%	0	0.00%	1	0.38%	12	4.55%	264
Denver	6,401	86.66%	429	5.81%	13	0.18%	13	0.18%	30	0.41%	500	6.77%	7,386
Dolores	10	71.43%	2	14.29%	0	0.00%	0	0.00%	0	0.00%	2	14.29%	14
Douglas	1,937	91.20%	80	3.77%	4	0.19%	7	0.33%	3	0.14%	93	4.38%	2,124
Eagle	326	86.47%	30	7.96%	3	0.80%	1	0.27%	2	0.53%	15	3.98%	377
El Paso	6,058	91.76%	334	5.06%	11	0.17%	10	0.15%	25	0.38%	164	2.48%	6,602
Elbert	202	88.60%	8	3.51%	2	0.88%	1	0.44%	0	0.00%	15	6.58%	228
Fremont	330	82.71%	23	5.76%	1	0.25%	2	0.50%	2	0.50%	41	10.28%	399
Garfield	340	80.76%	33	7.84%	0	0.00%	2	0.48%	2	0.48%	44	10.45%	421
Gilpin	52	81.25%	8	12.50%	0	0.00%	0	0.00%	0	0.00%	4	6.25%	64
Grand	101	82.11%	12	9.76%	0	0.00%	0	0.00%	0	0.00%	10	8.13%	123
Gunnison	64	75.29%	7	8.24%	0	0.00%	1	1.18%	1	1.18%	12	14.12%	85
Hinsdale	3	60.00%	1	20.00%	0	0.00%	0	0.00%	0	0.00%	1	20.00%	5
Huerfano	37	80.43%	6	13.04%	0	0.00%	0	0.00%	1	2.17%	2	4.35%	46
Jackson	11	91.67%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	8.33%	12
Jefferson	5,749	87.78%	327	4.99%	11	0.17%	13	0.20%	22	0.34%	427	6.52%	6,549
Kiowa	11	91.67%	1	8.33%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	12
Kit Carson	35	76.09%	7	15.22%	0	0.00%	0	0.00%	0	0.00%	4	8.70%	46
La Plata	388	78.38%	41	8.28%	0	0.00%	1	0.20%	4	0.81%	61	12.32%	495
Lake	52	73.24%	7	9.86%	1	1.41%	1	1.41%	2	2.82%	8	11.27%	71
Larimer	2,769	86.10%	159	4.94%	7	0.22%	6	0.19%	10	0.31%	265	8.24%	3,216
Las Animas	114	85.71%	10	7.52%	0	0.00%	0	0.00%	1	0.75%	8	6.02%	133
Lincoln	31	81.58%	3	7.89%	0	0.00%	0	0.00%	1	2.63%	3	7.89%	38
Logan	137	89.54%	11	7.19%	1	0.65%	0	0.00%	0	0.00%	4	2.61%	153
Mesa	1,329	90.65%	68	4.64%	4	0.27%	3	0.20%	3	0.20%	59	4.02%	1,466
Mineral	3	50.00%	2	33.33%	0	0.00%	0	0.00%	0	0.00%	1	16.67%	6
Moffat	137	84.57%	9	5.56%	2	1.23%	1	0.62%	3	1.85%	10	6.17%	162
Montezuma	206	84.77%	24	9.88%	1	0.41%	1	0.41%	0	0.00%	11	4.53%	243
Montrose	279	80.40%	29	8.36%	1	0.29%	2	0.58%	1	0.29%	35	10.09%	347
Morgan	228	91.20%	16	6.40%	0	0.00%	0	0.00%	1	0.40%	5	2.00%	250
Otero	169	89.42%	10	5.29%	0	0.00%	1	0.53%	1	0.53%	8	4.23%	189
Ouray	17	73.91%	3	13.04%	0	0.00%	0	0.00%	0	0.00%	3	13.04%	23
Park	166	89.73%	7	3.78%	1	0.54%	0	0.00%	0	0.00%	11	5.95%	185
Phillips	33	86.84%	2	5.26%	0	0.00%	0	0.00%	0	0.00%	3	7.89%	38
Pitkin	93	81.58%	8	7.02%	0	0.00%	0	0.00%	2	1.75%	11	9.65%	114
Prowers	111	88.80%	11	8.80%	0	0.00%	0	0.00%	0	0.00%	3	2.40%	125

Exhibit VI.4
Resident Drivers Involved in Injury and Fatality Crashes, by Condition of Driver, Continued

	No Impairment Suspected		Alcohol		RX Drugs or Medication		Illegal Drugs		Alcohol and Drugs		Impairment Not Known/Assessed		Total
Pueblo	1,879	89.26%	129	6.13%	3	0.14%	6	0.29%	9	0.43%	79	3.75%	2,105
Rio Blanco	41	91.11%	2	4.44%	0	0.00%	0	0.00%	1	2.22%	1	2.22%	45
Rio Grande	100	86.21%	10	8.62%	0	0.00%	1	0.86%	0	0.00%	5	4.31%	116
Routt	130	87.25%	9	6.04%	2	1.34%	0	0.00%	3	2.01%	5	3.36%	149
Saguache	49	76.56%	9	14.06%	0	0.00%	0	0.00%	0	0.00%	6	9.38%	64
San Juan	5	62.50%	2	25.00%	0	0.00%	0	0.00%	1	12.50%	0	0.00%	8
San Miguel	34	77.27%	7	15.91%	0	0.00%	0	0.00%	0	0.00%	3	6.82%	44
Sedgwick	13	86.67%	1	6.67%	0	0.00%	0	0.00%	0	0.00%	1	6.67%	15
Summit	155	84.24%	14	7.61%	2	1.09%	3	1.63%	1	0.54%	9	4.89%	184
Teller	222	91.74%	11	4.55%	0	0.00%	0	0.00%	4	1.65%	5	2.07%	242
Washington	34	85.00%	3	7.50%	0	0.00%	0	0.00%	0	0.00%	3	7.50%	40
Weld	2,232	86.78%	145	5.64%	7	0.27%	4	0.16%	7	0.27%	177	6.88%	2,572
Yuma	50	84.75%	1	1.69%	0	0.00%	1	1.69%	0	0.00%	7	11.86%	59
Total	47,606		2,898		100		110		179		3,210		54,103

Source: 2003 CDOT Crash Database.

Location of Impaired Crash

Exhibit VI.5 presents the impairment rates of injury crashes that occurred in Colorado's largest cities. Brighton, Thornton, Northglenn, Lakewood, Castle Rock and Pueblo were the cities with the six greatest injury crash driver impairment rates in 2003 (excluding Centennial; this community had only 21 reported injury crashes). Parker, Longmont, Grand Junction, Boulder and Denver had the lowest rate of suspected impaired driving among injury crash drivers.

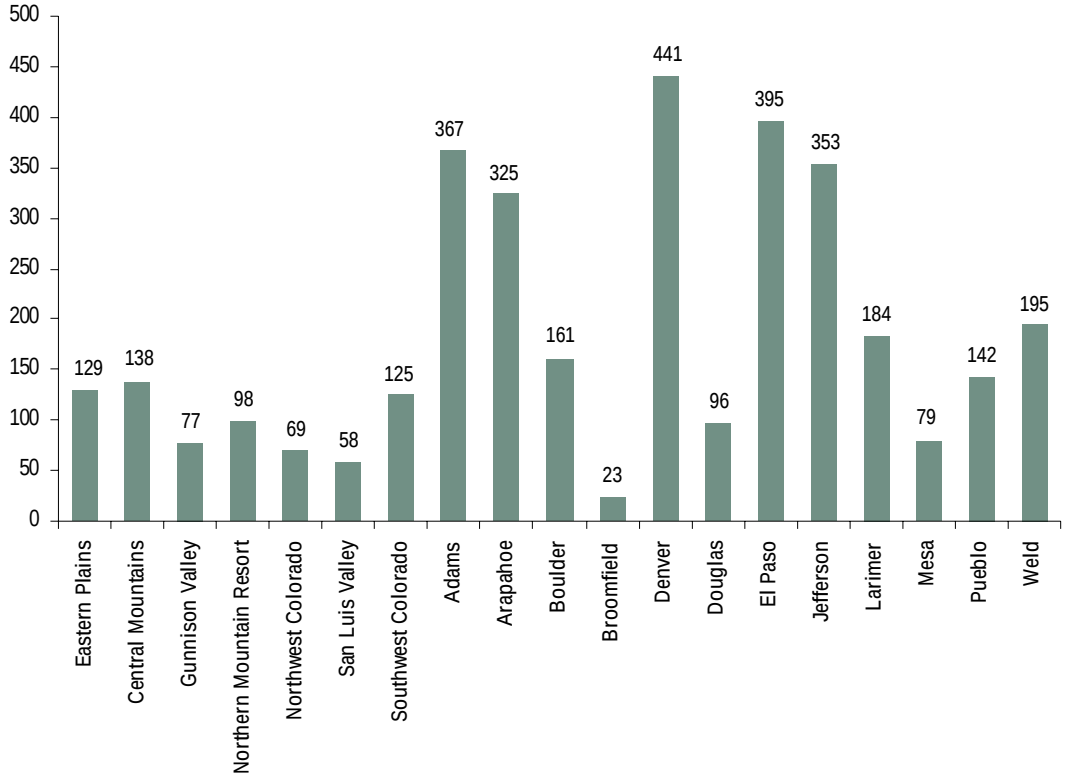
Exhibit VI.5
Percent of All Injury Crash Drivers Who Were Impaired by Large City of Crash, 2003

City	Impairment Suspected		No Impairment Suspected		Total	City	Impairment Suspected		No Impairment Suspected		Total
Arvada	40	5.92%	636	94.08%	676	Grand Junction	26	3.19%	788	96.81%	814
Aurora	221	6.10%	3,401	93.90%	3,622	Greeley	40	5.22%	727	94.78%	767
Boulder	47	3.28%	1,386	96.72%	1,433	Lakewood	82	7.06%	1,079	92.94%	1,161
Brighton	13	8.44%	141	91.56%	154	Littleton	19	5.79%	309	94.21%	328
Broomfield	23	4.94%	443	95.06%	466	Longmont	23	2.86%	782	97.14%	805
Castle Rock	10	6.71%	139	93.29%	149	Loveland	17	3.89%	420	96.11%	437
Centennial	2	9.52%	19	90.48%	21	Northglenn	26	7.81%	307	92.19%	333
Colorado Springs	300	5.58%	5,079	94.42%	5,379	Parker	3	1.59%	186	98.41%	189
Commerce City	21	5.82%	340	94.18%	361	Pueblo	105	6.67%	1,470	93.33%	1,575
Denver	441	4.69%	8,965	95.31%	9,406	Thornton	61	8.28%	676	91.72%	737
Englewood	16	5.13%	296	94.87%	312	Westminster	53	6.05%	823	93.95%	876
Fort Collins	70	4.82%	1,381	95.18%	1,451	Wheat Ridge	36	4.74%	724	95.26%	760
Grand Junction	26	3.19%	788	96.81%	814	Total	169		30,517		33,026

Source: 2003 CDOT Crash Database.

Exhibit VI.6 presents the number of injury crash drivers who were impaired based on the county or region of crash.

Exhibit VI.6
Number of All Injury Crash Drivers Who Were Impaired by County and Region of Crash, 2003



Region/County	Eastern Plains	Central Mtns.	Gunnison Valley	Northern Mtn.	NW Colorado	San Luis Valley	SW Colorado	Adams	Arapahoe	Boulder
Total	1,506	1,294	704	1,223	657	517	997	4,812	6,098	3,517

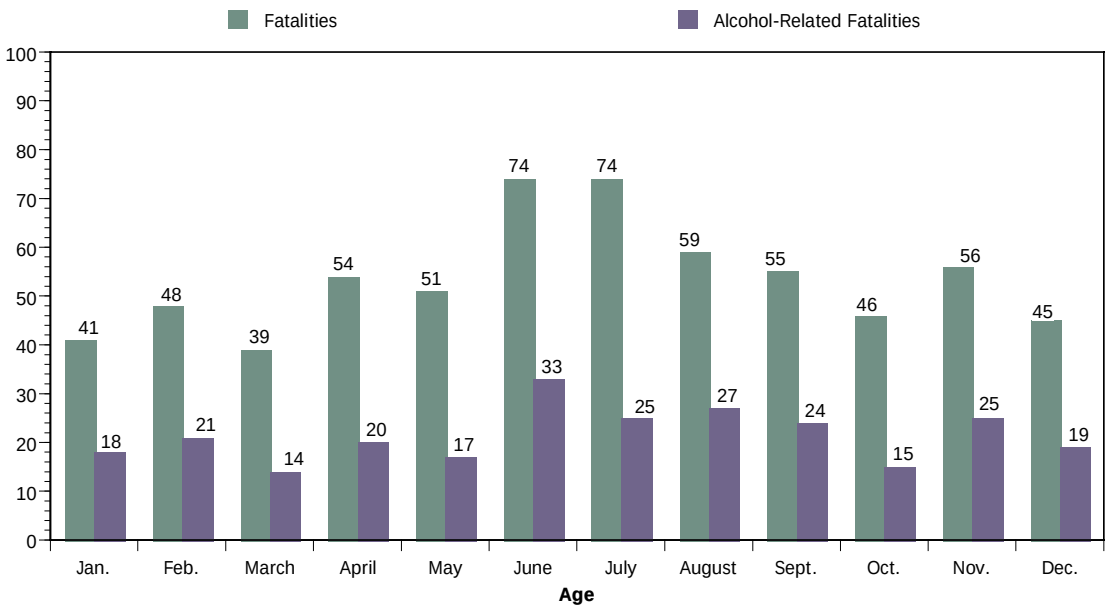
Region/County	Broomfield	Denver	Douglas	El Paso	Jefferson	Larimer	Mesa	Pueblo	Weld
Total	467	9,406	1,778	6,825	4,912	2,986	1,401	2,046	2,476

Source: 2003 CDOT Crash Database.

Month of Year

Exhibit VI.7 on the following page shows the total number of fatalities and the number of alcohol-related fatalities by month for 2003. In June 2003 there were 33 alcohol-related fatalities.

Exhibit VI.7
Distribution of Fatalities by Month Compared to Alcohol-Related Fatalities by Month, 2003



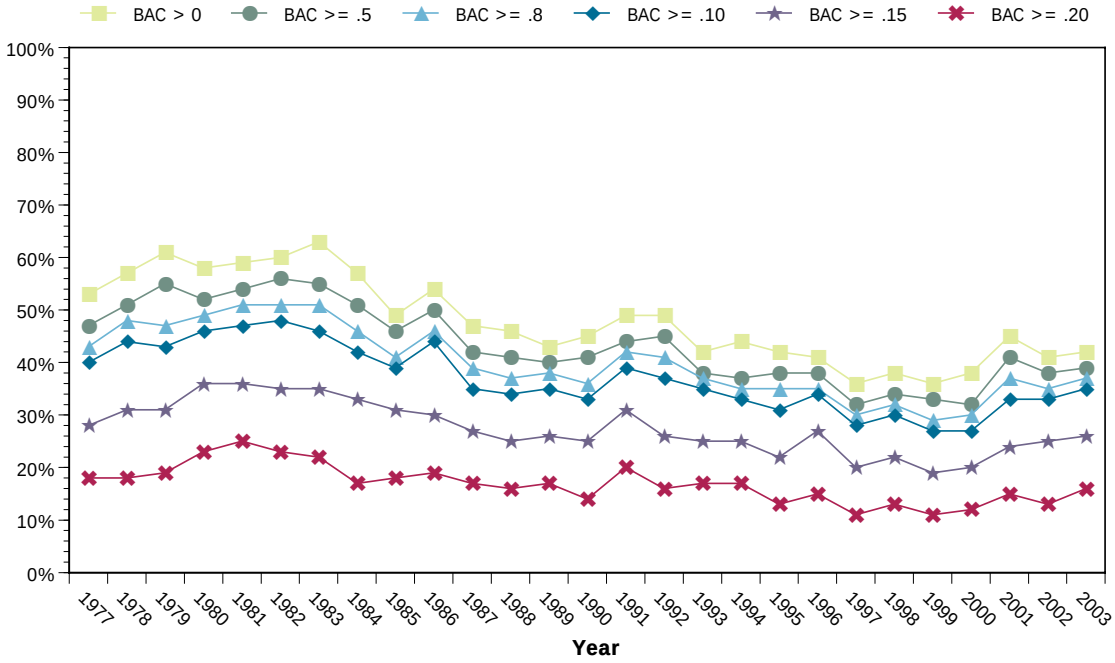
Source: National Highway Transportation Safety Administration, FARS data, 2003.

Average BAC Trends

Exhibits VI.8 through Exhibit VI.14 explore the average annual BAC for fatal crash drivers. Each graph should be read from top to bottom. The top line measure 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 a 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 with a BAC of 0.20 or greater.

Over time, the proportions of fatal crash drivers with a recorded BAC at any level have gradually declined (Exhibit VI.8 on the following page). For example, in 1981, approximately 25% of fatal crash drivers had a BAC of 0.20 or greater. This declined to approximately 13% in 2004. Similarly, nearly 65% of fatal crash drivers had a positive BAC in 1983, but only 40% had a positive BAC in 2003. Consequently, the average BAC has declined over time.

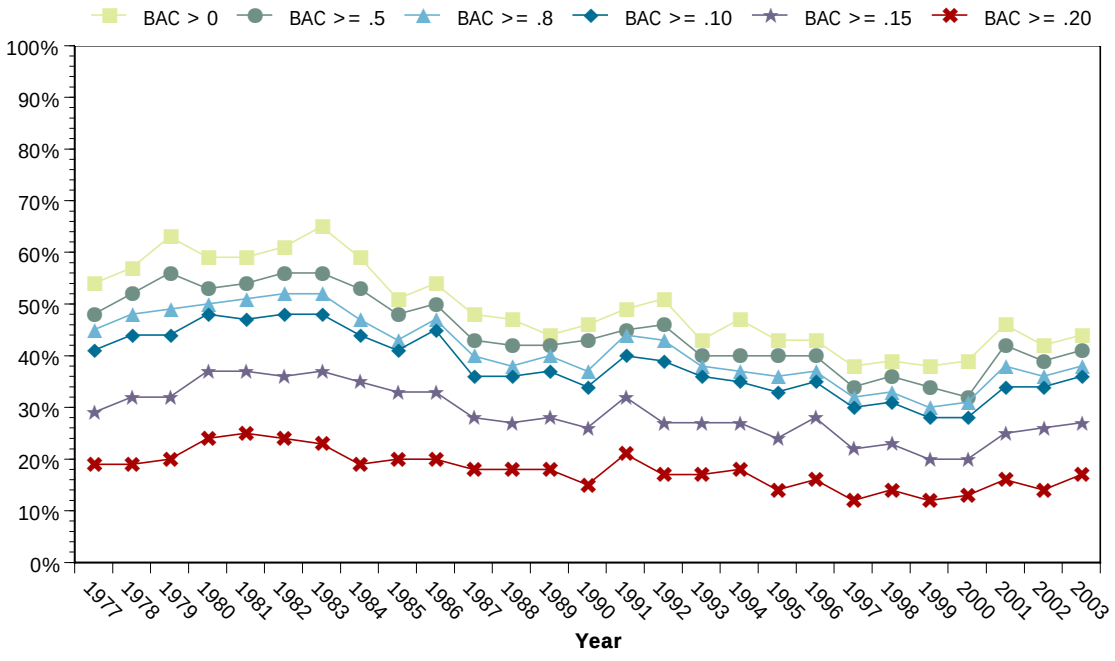
Exhibit VI.8
Rate of Drinking Drivers Among Fatal Drivers by BAC Over Time, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.9 presents the rate of drinking adult drivers (age 21 or older) by BAC. About 39% of adult fatal crash drivers had a BAC of .08 or greater in 2003.

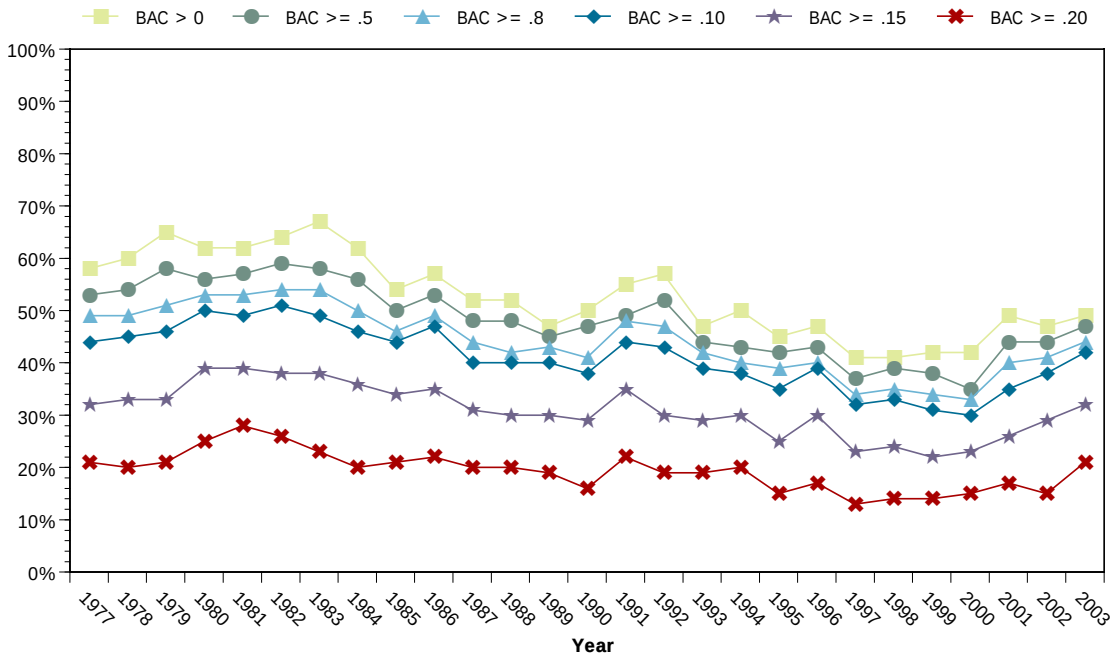
Exhibit VI.9
Rate of Drinking Adult Drivers Among Adult Fatal Drivers by BAC Over Time, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

The rate of male fatal crash drinking drivers by average BAC is presented in Exhibit VI.10. In 1983, almost 70% of male fatal crash drivers had a positive BAC. This has fallen to about 50% of all male fatal crash drivers in 2003. About 22% of the 2003 male fatal crash drivers had an average BAC of 0.20 or greater.

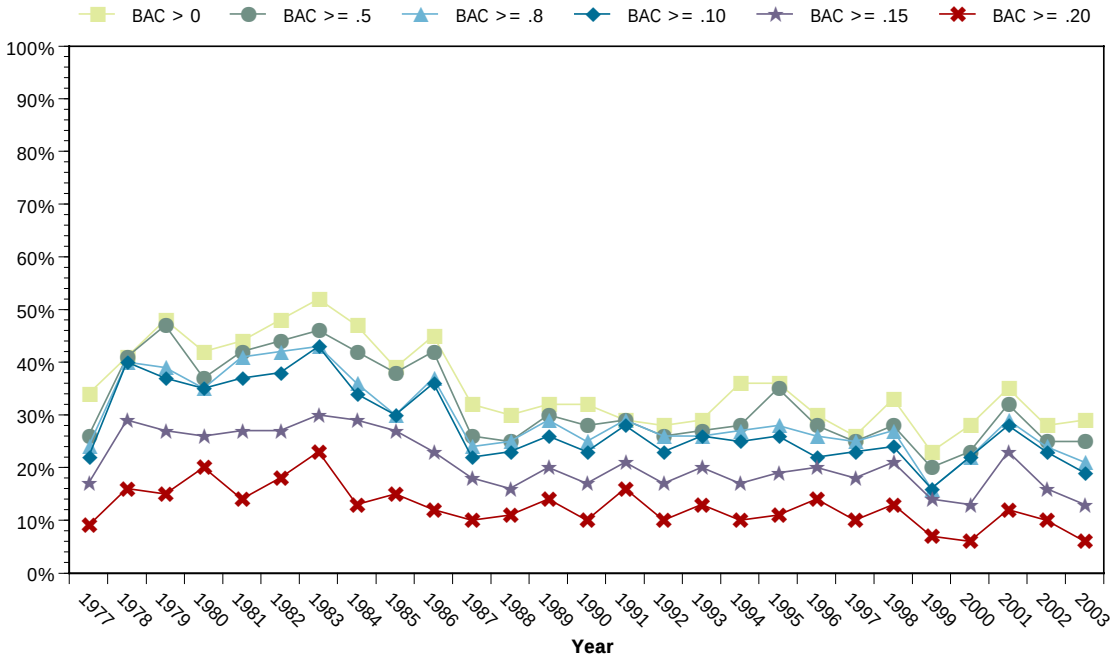
Exhibit VI.10
Rate of Drinking Male Drivers Among Male Fatal Drivers by BAC Over Time, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.11 on the following page demonstrates that female fatal crash drivers are much less likely to be impaired than men (Exhibit VI.10 above). In 1983, slightly more than 50% of female fatal crash drivers had a positive BAC, compared to approximately 30% in 2003. Female fatal crash drivers had lower average BACs than their male counterparts. For example, about 5% of female fatal crash drivers had a BAC of 0.20 or more, compared to 22% of men.

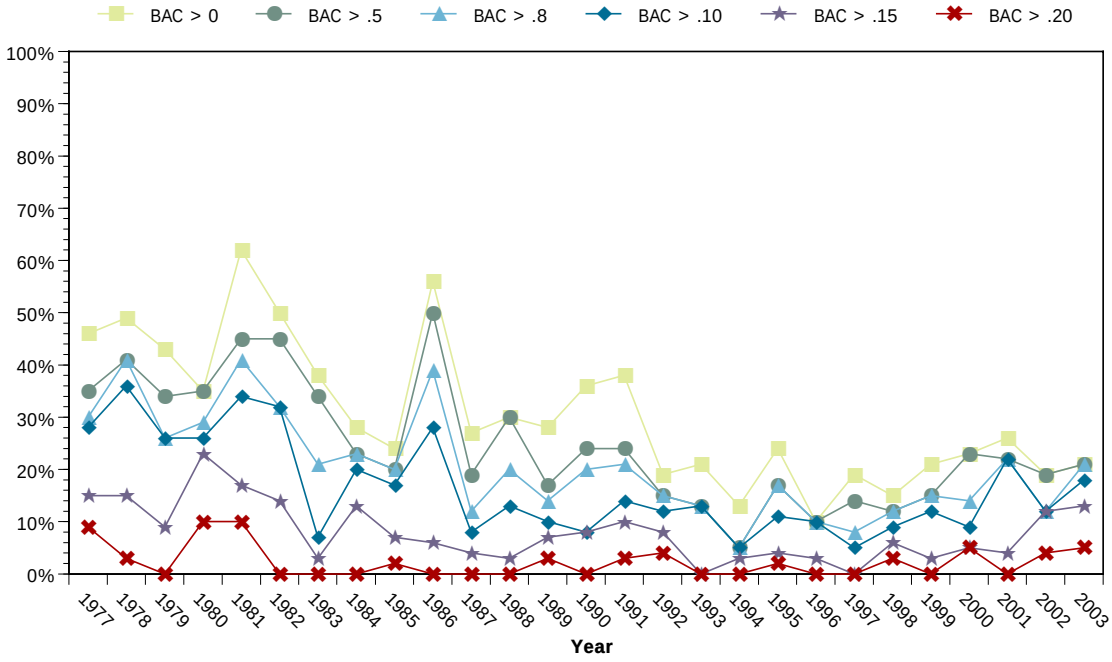
Exhibit VI.11
Rate of Drinking Female Drivers Among Female Fatal Drivers by BAC Over Time, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.12 presents the average BAC of juvenile (age 18 or younger) fatal crash drivers over time. Juveniles involved in fatal crashes are less likely to be impaired, compared to their adult counterparts. However, about one in five juvenile fatal crash drivers had a BAC greater than 0.0.

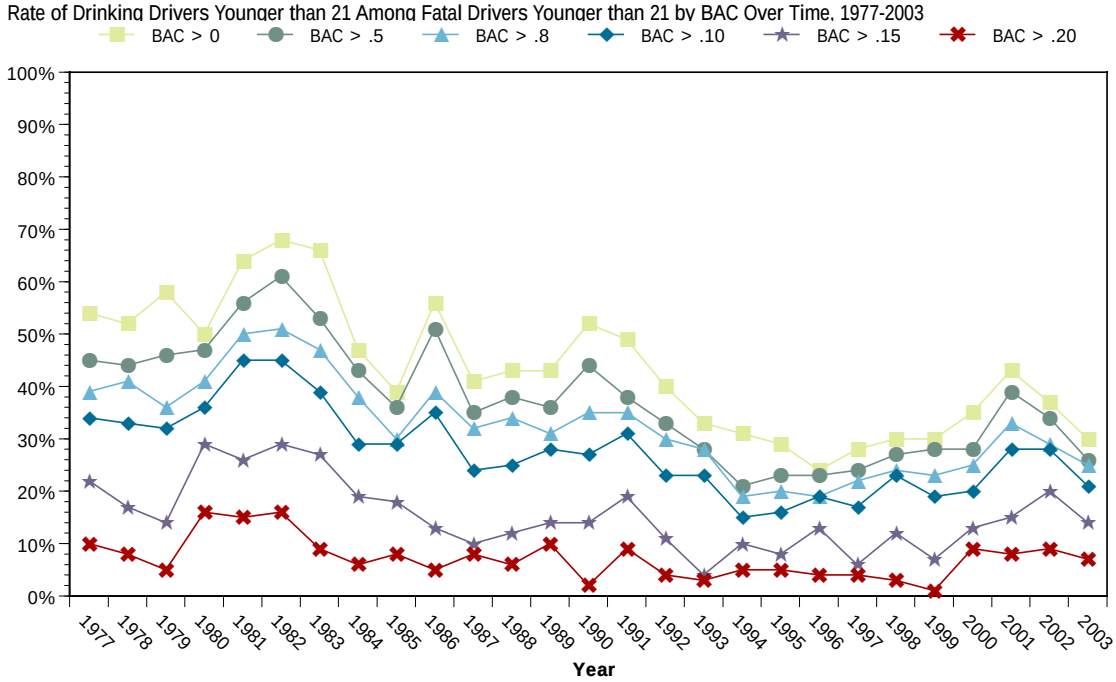
Exhibit VI.12
Rate of Drinking Juvenile Drivers Among Juvenile Fatal Drivers by BAC Over Time, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.13 presents the average BAC for all underage drinking drivers (age 21 or younger) involved in fatal crashes over time. While the proportion of underage fatal crash drivers has declined, in 2003 about 30% of all underage fatal crash drivers had a positive BAC.

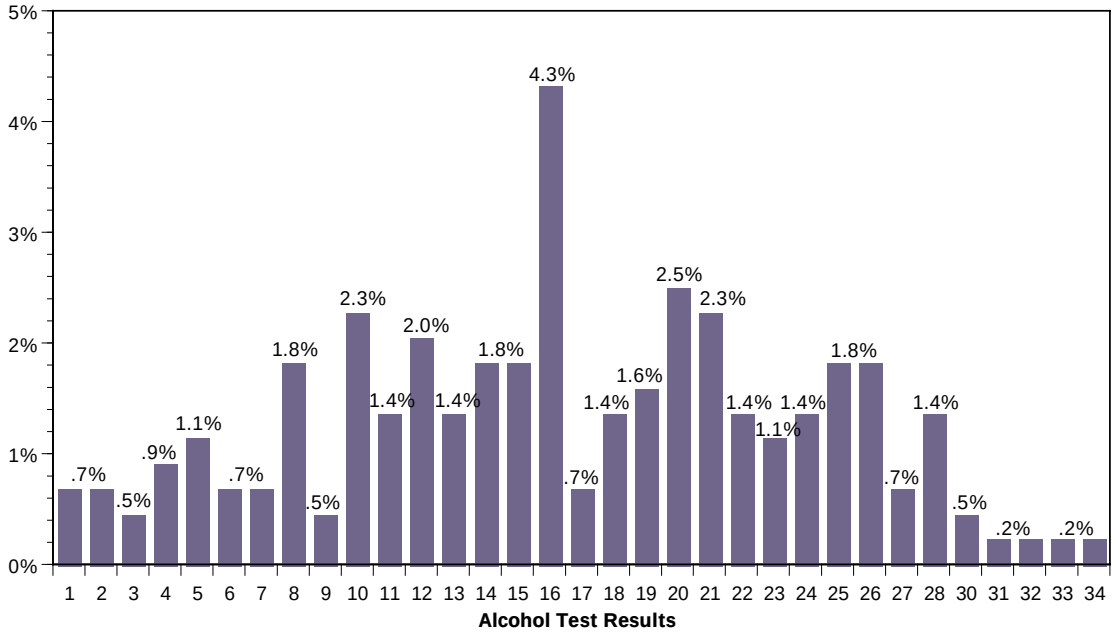
Exhibit VI.13
Rate of Drinking Drivers Younger than 21 Among Fatal Drivers Younger than 21 by BAC Over Time, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.14 presents the distribution of fatal crash driver by BAC. (Not pictured are the 60% of drivers who were not impaired.) As Exhibit VII.14 demonstrates, 4.3% of impaired fatal crash drivers had a BAC of .16.

Exhibit VI.14
Distribution of BAC within Drivers of Fatal Crashes, 2003

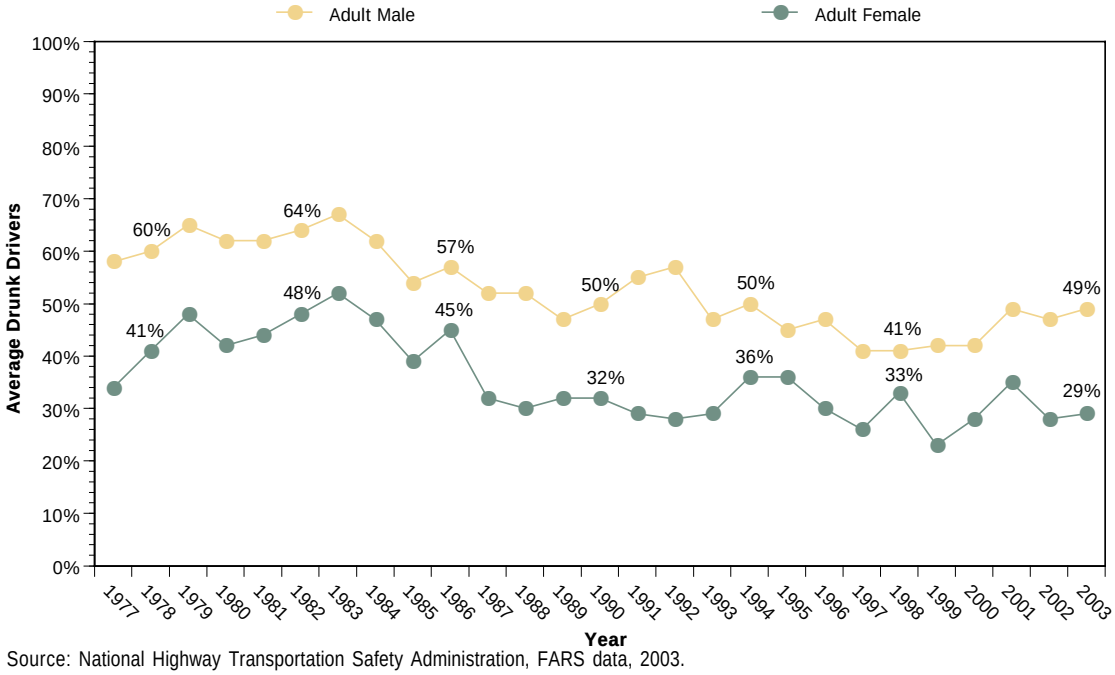


Source: National Highway Transportation Safety Administration, FARS data, 2003.

Sex of Impaired Drivers

Exhibit VI.15 depicts the proportion of male and female fatal crash drivers that were impaired by alcohol, over time. For example, 49% of male fatal crash drivers were impaired by alcohol in 2003, compared to 29% of female fatal crash drivers.

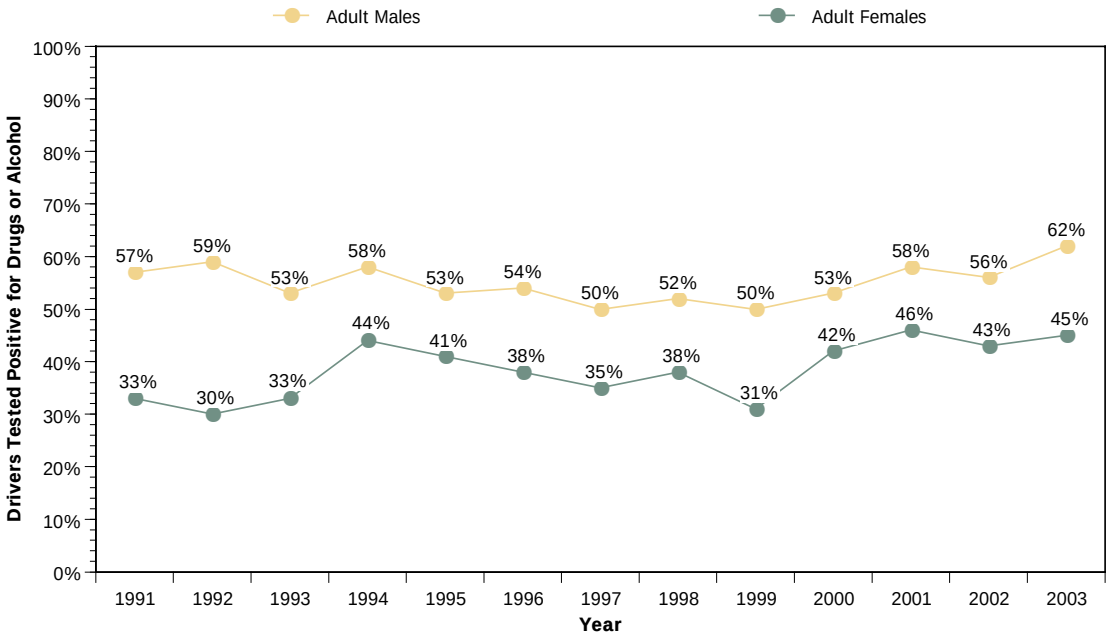
Exhibit VI.15
Adult Male and Female Drinking Drivers as a Percentage of all Male Drivers and Female Drivers Involved in a Fatal Crash, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 2003.

Exhibit VI.16 on the following page examines the proportion of all fatal crash drivers who were impaired by either alcohol or drugs, by gender. For example, 62% of all male fatal crash drivers were impaired by alcohol or drugs.

Exhibit VI.16
Adult Male Drivers Testing Positive for Alcohol or Drugs as a Percentage of All Male Drivers and Female Drivers Testing Positive for Alcohol or Drugs as a Percentage of All Female Drivers, by Fatal Crash, 1991-2003

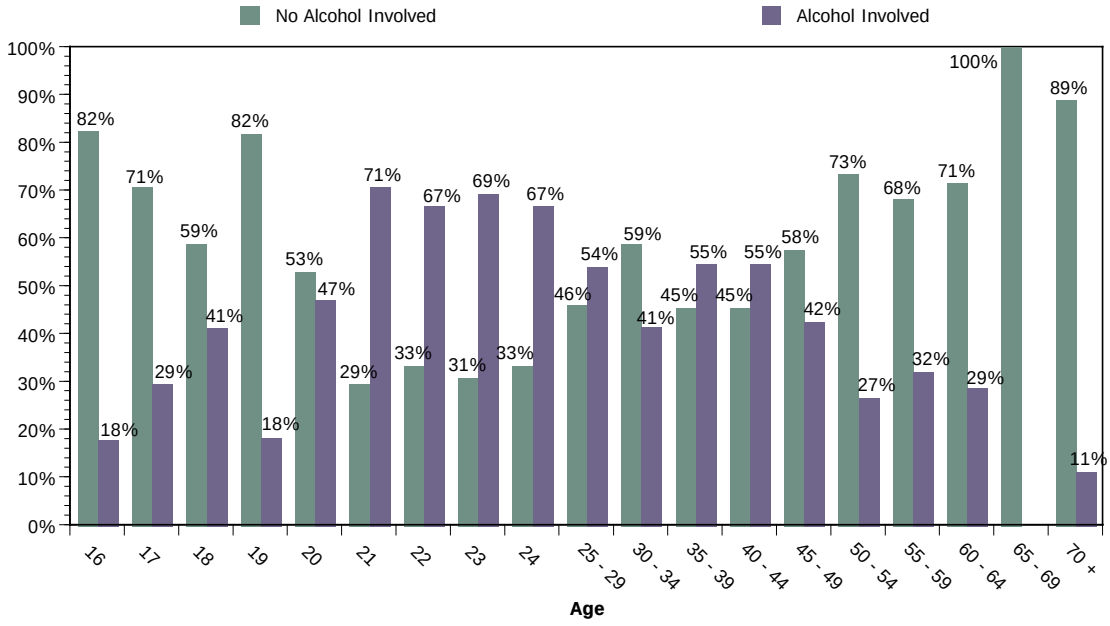


Source: National Highway Transportation Safety Administration, FARS data, 2003.

Age and Driver Impairment

Exhibit VI.17 presents the impairment status of fatal crash drivers by age for 2003. For example, 18% of 16 year-old fatal crash drivers were impaired, compared to 69% of 23 year-old fatal crash drivers.

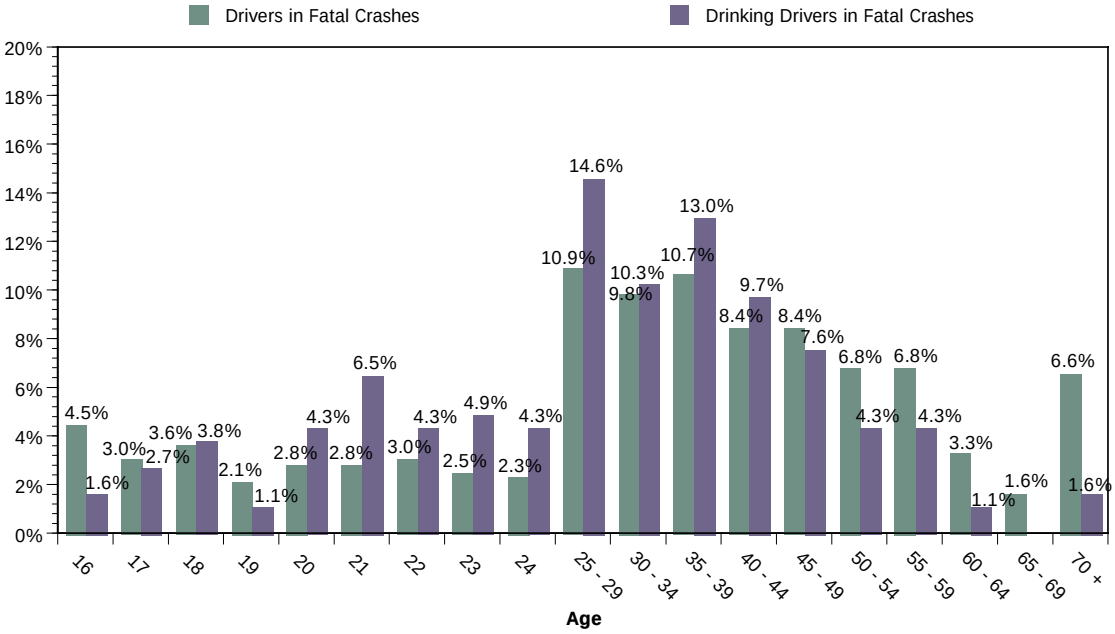
Exhibit VI.17
Distribution of Alcohol Consuming and Non-consuming Fatal Drivers in Each Age Group, 2003



Source: National Highway Transportation Safety Administration, FARS data, 2003.

Exhibit VI.18 compares the relative distribution of all fatal crash drivers by age with impaired fatal crash drivers by age for 2003. As shown, 4.5% of fatal crash drivers were age 16, but 16 year-olds account for 1.6% of the impaired fatal crash drivers. Drivers age 25 to 29 were involved in 11% of fatal crashes overall, and were 15% of all the impaired fatal crash drivers.

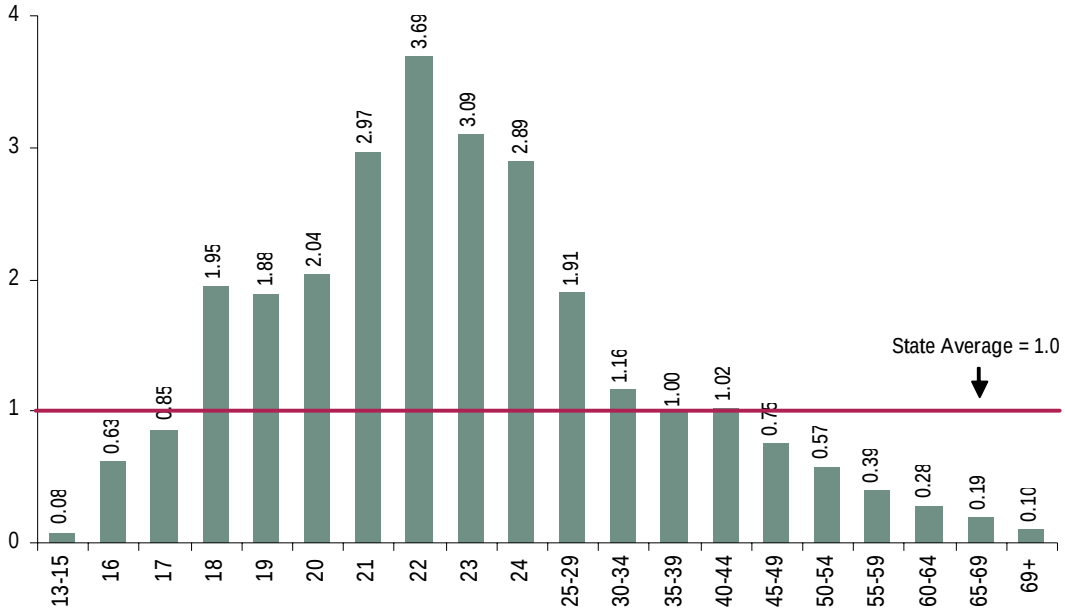
Exhibit VI.18
Age Distribution of Drivers and Drinking Drivers in Fatal Crashes by Age, 2003



Source: National Highway Transportation Safety Administration, FARS data, 2003.

Exhibit VI.19 presents the impaired injury crash involvement rates per capita by age. Compared to their population, 22 year-old drivers are almost three times more likely to be an impaired injury crash driver than would be expected.

Exhibit VI.19
Impaired Driver Injury Crash Rate Index by Age, 2003

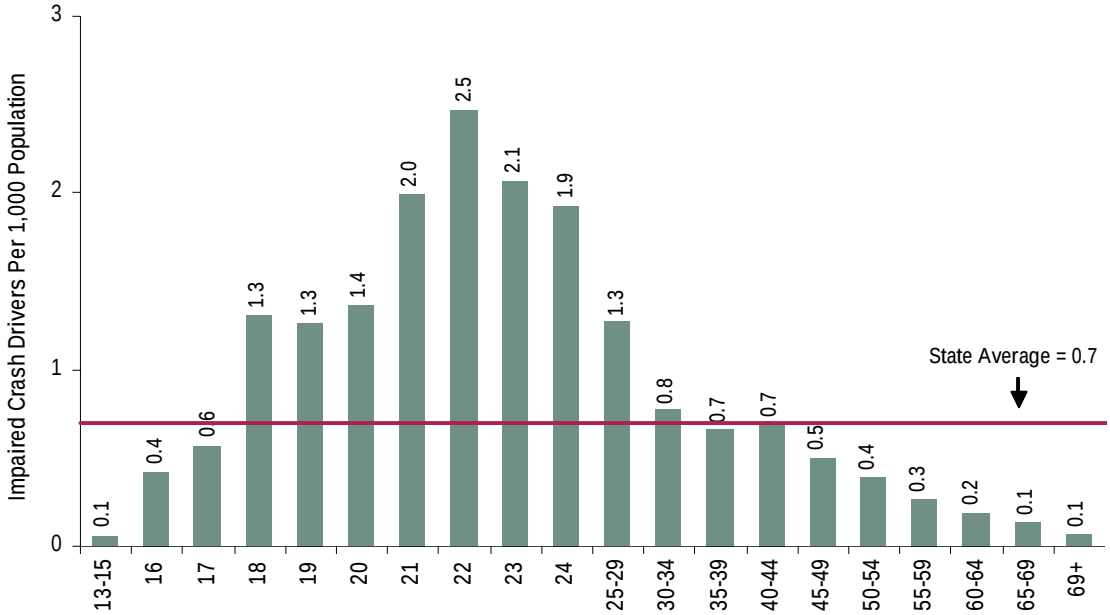


Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Impairment	10	27	38	93	94	100	134	152	120	112
Total	132	1,184	1,323	1,378	1,331	1,220	1,219	1,179	1,214	1,055
Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	69+
Impairment	412	277	233	262	183	122	64	32	17	22
Total	4,268	4,035	3,695	3,668	3,331	2,663	1,866	1,192	752	1,653

Source: 2003 CDOT Crash Database.

In 2003, there were 0.7 alcohol-related injury crashes per 1,000 capita (Exhibit VI.20). Drivers between the ages of 18 and 29 had the highest impaired driver injury crash rates.

Exhibit VI.20
Impaired Drivers Injury Crash Involvement per 1,000 Capita by Age, 2003

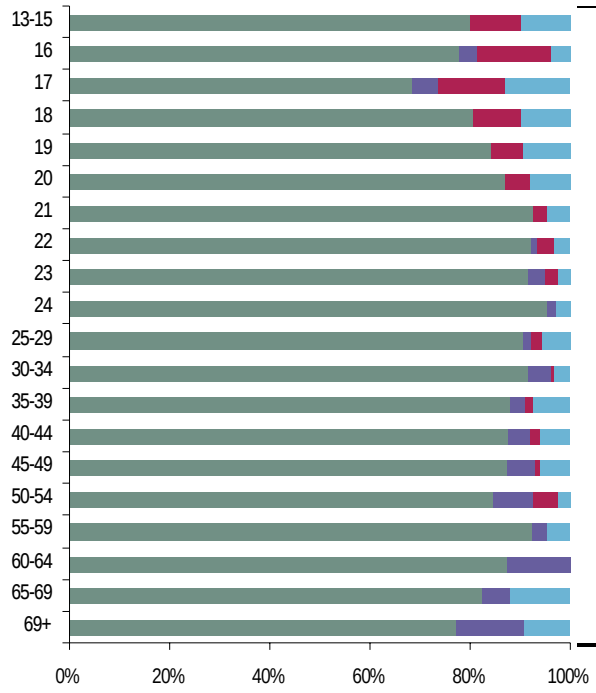


Age Cohort	13-15	16	17	18	19	20	21	22	23	24
Impairment	10	27	38	93	94	100	134	152	120	112
Population	193,053	64,456	66,944	71,469	74,719	73,273	67,434	61,545	58,041	58,001
Age Cohort	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	69+
Impairment	412	277	233	262	183	122	64	32	17	22
Population	322,809	355,887	350,218	382,691	364,741	318,692	244,027	170,257	131,479	316,226

Source: 2003 CDOT Crash Database.

For those suspected of being impaired, Exhibit VI.21 explores the source of impairment, by the driver age. Although several age cohorts have small sample sizes, it is clear that alcohol is the predominant recorded source of driver impairment for all age cohorts. However, illegal drugs contribute to driver impairment, particularly for drivers age 21 or younger. Prescription drugs are a source of impairment for almost one in ten impaired drivers age 50 or older.

Exhibit VI.21
Source of Known or Suspected Driver Impairment by Driver Age, 2003



	Alcohol		RX Drugs or Medication		Illegal Drugs		Alcohol and Drugs	
13-15	8	80.00%	0	0.00%	1	10.00%	1	10.00%
16	21	77.78%	1	3.70%	4	14.81%	1	3.70%
17	26	68.42%	2	5.26%	5	13.16%	5	13.16%
18	75	80.65%	0	0.00%	9	9.68%	9	9.68%
19	79	84.04%	0	0.00%	6	6.38%	9	9.57%
20	87	87.00%	0	0.00%	5	5.00%	8	8.00%
21	124	92.54%	0	0.00%	4	2.99%	6	4.48%
22	140	92.11%	2	1.32%	5	3.29%	5	3.29%
23	110	91.67%	4	3.33%	3	2.50%	3	2.50%
24	107	95.54%	2	1.79%	0	0.00%	3	2.68%
25-29	373	90.53%	7	1.70%	9	2.18%	23	5.58%
30-34	254	91.70%	12	4.33%	2	0.72%	9	3.25%
35-39	205	87.98%	7	3.00%	4	1.72%	17	7.30%
40-44	230	87.79%	11	4.20%	5	1.91%	16	6.11%
45-49	160	87.43%	10	5.46%	2	1.09%	11	6.01%
50-54	103	84.43%	10	8.20%	6	4.92%	3	2.46%
55-59	59	92.19%	2	3.13%	0	0.00%	3	4.69%
60-64	28	87.50%	4	12.50%	0	0.00%	0	0.00%
65-69	14	82.35%	1	5.88%	0	0.00%	2	11.76%
69+	17	77.27%	3	13.64%	0	0.00%	2	9.09%

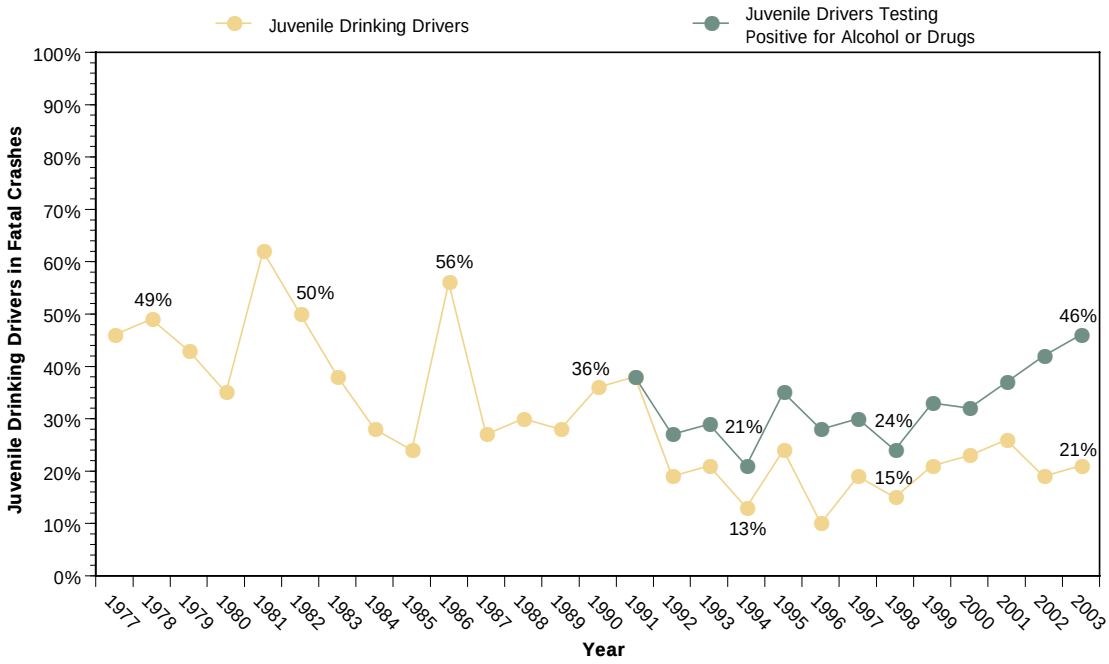
Source: 2003 CDOT Crash Database.

Exhibit VI.22, on the following page, examines the impairment rate of juvenile (age 18 or younger) impaired drivers involved in fatal crashes. In 1968, 56% of juveniles involved in fatal crashes were alcohol-impaired. Since drug testing began in 1991, the proportion of recorded drug-impaired juveniles has tended to rise, particularly since 1998. Whether more juveniles are driving while drug-impaired or if the reported increase is a result of more widespread drug testing is unclear. In 2003, 46% of all juvenile fatal crash drivers tested positive for alcohol or drugs, and 21% of all juvenile fatal crash drivers were alcohol-impaired.

Vehicle Type and Impaired Driving

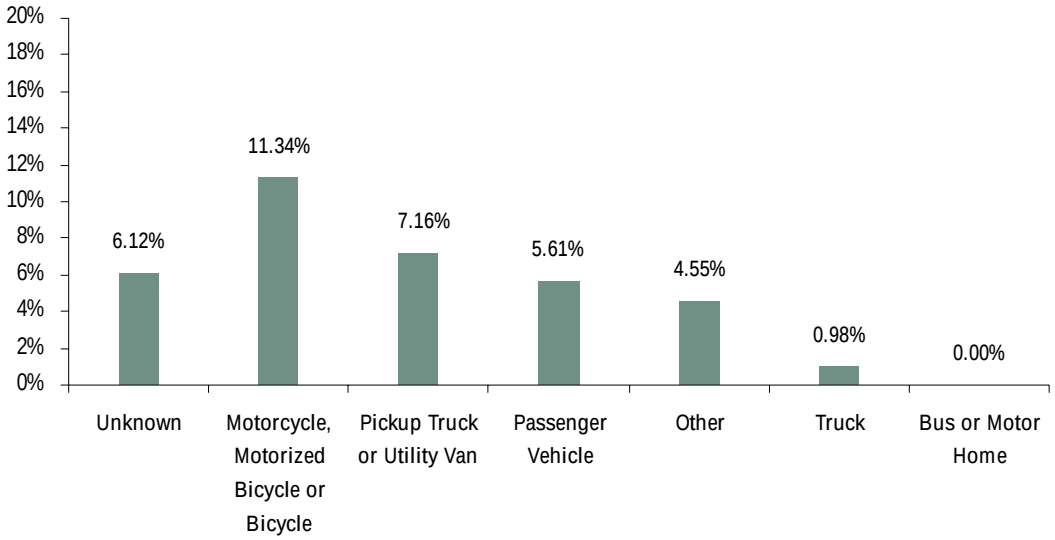
Exhibit VI.23, on the following page, examines the proportion of injury and fatal crash drivers who were impaired based on their vehicle type. For example, 11% of motorcycle riders involved in injury or fatal crashes were impaired, compared to 6% of passenger vehicle drivers and 7% of pick-up truck drivers.

Exhibit VI.22
Juvenile Drinking Drivers and Juvenile Drivers Who Tested Positive for Alcohol and Drugs as a Percentage of All Juvenile Drivers Involved in a Fatal Crash, 1977-2003



Source: National Highway Transportation Safety Administration, FARS data, 1977-2003.

Exhibit VI.23
Impaired Injury/Fatal Crash Drivers by Vehicle Type, Compared to the Vehicle Type of Non-impaired Injury Crash Drivers, 2003



	Unknown	Motorcycle, Motorized Bicycle or Bicycle	Pickup Truck or Utility Van	Passenger Vehicle	Other	Truck	Bus or Motor Home
Impaired Drivers	3	151	568	2,002	3	11	0
Total	49	1,331	7,936	35,665	66	1,126	84

Source: 2003 CDOT Crash Database.

PDO, Injury and Fatal Crashes Involving Bicycles and Pedestrians

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Crashes Involving Bicyclists and Pedestrians

This section explores the characteristics of crashes that involved bicyclists or pedestrians.

Selected Key Findings

In 2003, there were 2,904 reported crashes that involved a bicycle or pedestrian. The majority of these resulted in an injury. In 2003, there were a total of 31,731 injury crashes. Of these, 7% involved a bicycle or pedestrian. Bicycle and pedestrian crashes occur throughout the year, at fairly consistent rates across months and days of the week. The majority of bicycle and pedestrian crashes occur at intersections under normal weather conditions in daylight hours.

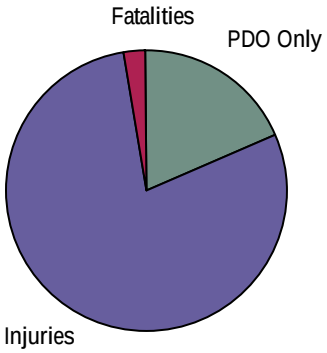
Crash Severity

Exhibit VII.1 demonstrates that nearly 80% of reported bicycle or pedestrian crashes involved an injury.

Location

Nearly all pedestrian and bicycle crashes occur on a roadway (Exhibit VII.2 below).

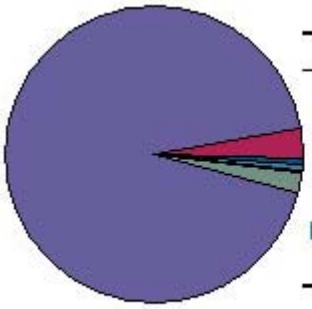
Exhibit VII.1
Severity of Crashes Involving Bicyclists and Pedestrians, 2003



	Number	Percent
PDO Only	539	18.56%
Injury Crashes	2,293	78.96%
Fatal Crashes	72	2.48%

Source: 2003 CDOT Crash Database.

Exhibit VII.2
Severity of Bicycle and Pedestrian Crashes by Location of Crash, 2003



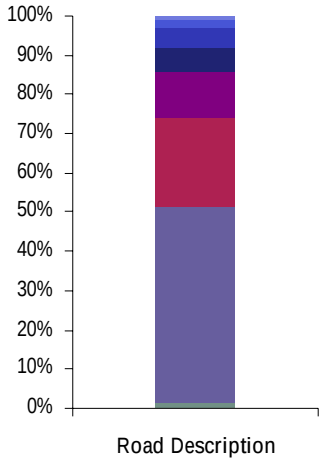
	Percent	Number	Total
Not Recorded	2.17%	63	63
On Roadway	93.15%	2,705	2,768
Ran Off Right Side	3.06%	89	2,793
Ran Off Left Side	0.86%	25	2,882
Divided Highway-On Other Roadway	0.62%	18	2,886
Ran Off T Intersection	0.14%	4	2,904

Source: 2003 CDOT Crash Database.

Road Description

Almost half of bicycle and pedestrian crashes occur at intersections (Exhibit VII.3).

Exhibit VII.3
Bicycle and Pedestrian Crashes by Road Description, 2003



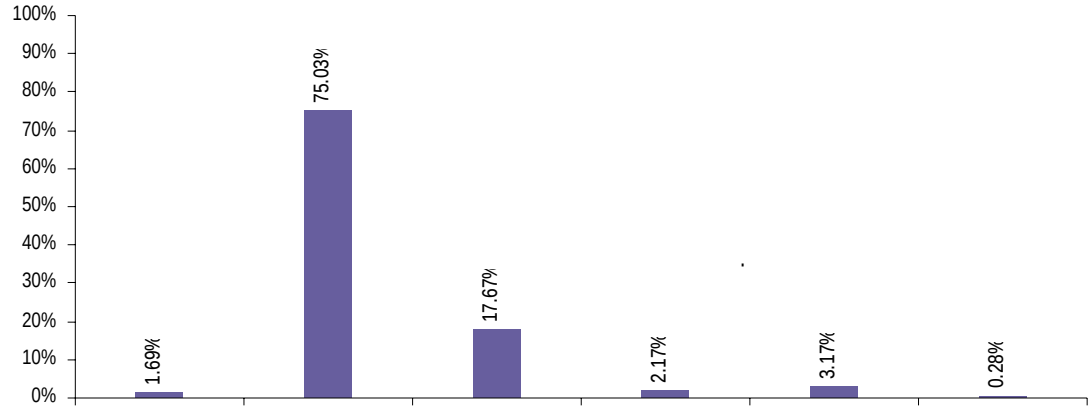
	Percent	Number	Total
Not Recorded	1.45%	42	42
At Intersection	49.83%	1,447	1,489
Non-Intersection, Urban	23.07%	670	2,665
At Driveway Access	11.29%	328	1,817
Intersection Related	6.13%	178	1,995
Non-Intersection, Rural	5.37%	156	2,854
Highway Interchange	1.72%	50	2,904
In Alley	1.14%	33	2,698

Source: 2003 CDOT Crash Database.

Road Contour

Exhibit VII.4 demonstrates that 75% of bicycle and pedestrian crashes occur on road contours characterized as "straight, on-level."

Exhibit VII.4
Bicycle and Pedestrian Crashes by Road Contour, 2003



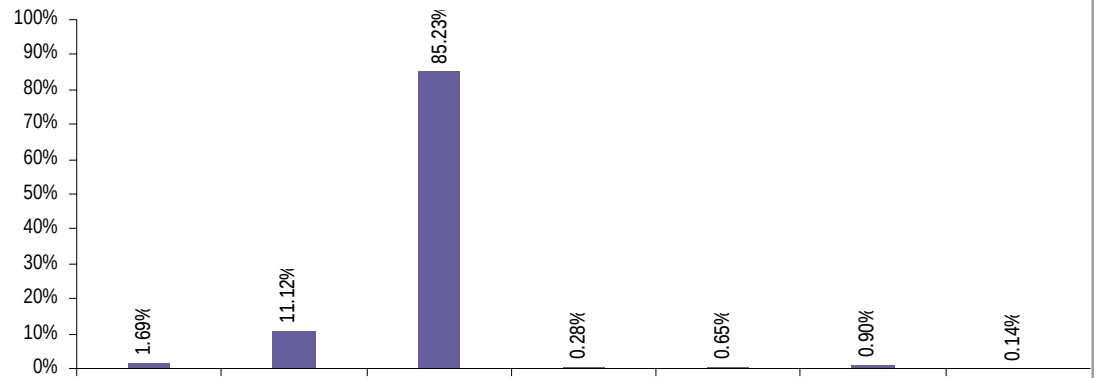
	Not Recorded	Straight On-level	Straight On-grade	Curve On-level	Curve On-grade	Hillcrest
	49	2,179	513	63	92	8
Total Crashes	2,557	8,330	24,557	6,968	9,173	593

Source: 2003 CDOT Crash Database.

Road Surface

The majority of bicycle and pedestrian crashes occur on brick or block road surfaces (Exhibit VII.5).

Exhibit VII.5
Bicycle and Pedestrian Crashes by Road Surface, 2003



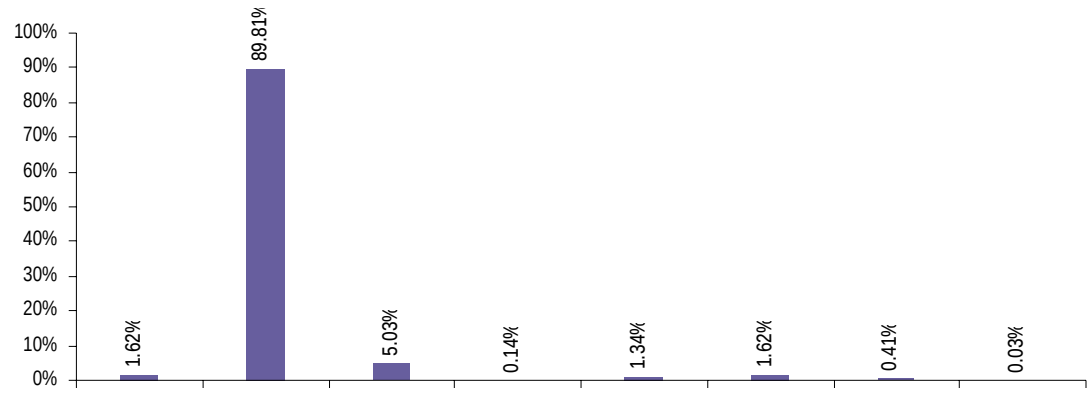
	49	323	2475	8	19	26	4
Total Crashes	49	372	2,847	2,855	2,874	2,900	2,904

Source: 2003 CDOT Crash Database.

Road Condition

Exhibit VII.6 shows the road condition for bicycle and pedestrian crashes. Nearly nine in ten occurred on dry roads.

Exhibit VII.6
Bicycle and Pedestrian Crashes by Road Condition, 2003



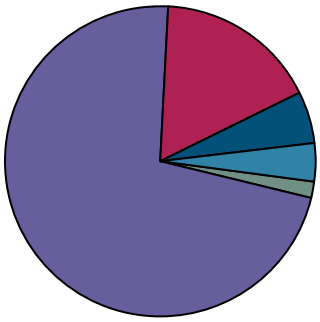
	47	2,608	146	4	39	47	12	1
Total Crashes	47	2,655	2,801	2,805	2,844	2,891	2,903	2,904

Source: 2003 CDOT Crash Database.

Lighting Condition

Nearly three out of four bicycle and pedestrian crashes occur in daylight (Exhibit VII.7).

Exhibit VII.7
Bicycle and Pedestrian Crashes by Lighting Condition, 2003



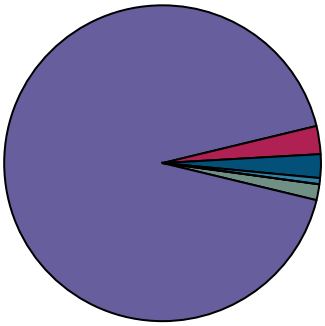
	Number	Percent	Total
Not Recorded	45	1.55%	45
Daylight	2,097	72.21%	2,142
Dark, Lighted	498	17.15%	2,754
Dark, Unlighted	150	5.17%	2,904
Dawn or Dusk	114	3.93%	2,256

Source: 2003 CDOT Crash Database.

Adverse Weather Condition

Not surprisingly, nearly all bicycle and pedestrian crashes occur during normal weather conditions (Exhibit VII.8).

Exhibit VII.8
Bicycle and Pedestrian Crashes by Weather Condition, 2003



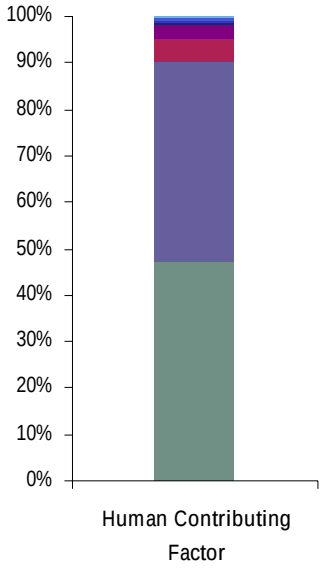
	Number	Percent	Total
Not Recorded	49	1.69%	49
Normal Conditions	2,682	92.36%	2,731
Snow/Sleet/Hail	84	2.89%	2,891
Rain	76	2.62%	2,807
Wind	10	0.34%	2,904
Fog	3	0.10%	2,894

Source: 2003 CDOT Crash Database.

Driver — Most Apparent Human Contributing Factor

In almost half of bicycle and pedestrian crashes, the most apparent human contributing factor was not reported. As shown in Exhibit VII.9 on the following page, less than 10 percent of bicycle and pedestrian crashes were assigned a human contributing factor.

Exhibit VII.9
Driver in Bicycle and Pedestrian Crashes—Most Apparant Human Contributing Factor, 2003



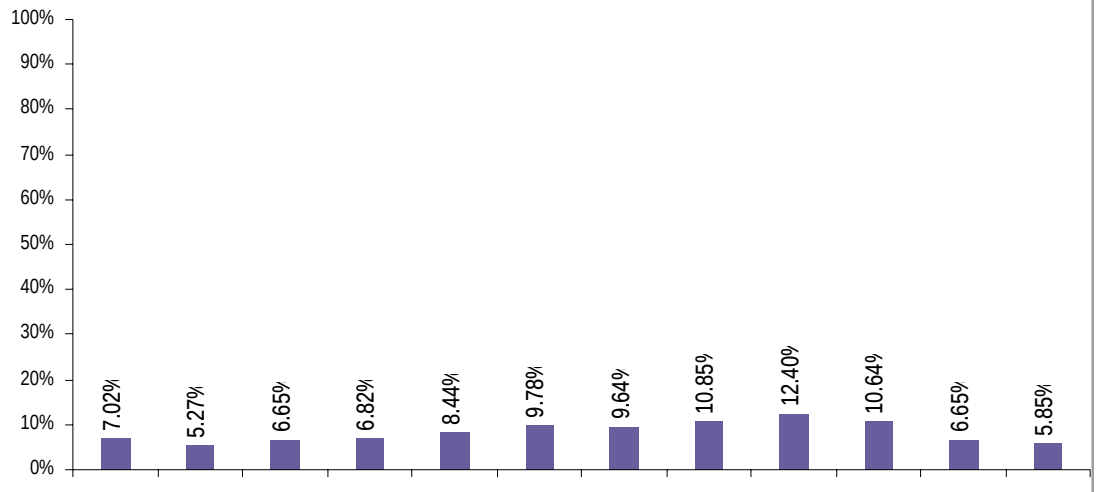
	Percent	Number	Total
Not Reported	47.21%	1,371	1,371
No Apparent Contributing Factor	43.01%	1,249	2,620
Driver Inexperience	4.99%	145	2,778
Driver Preoccupied	3.24%	94	2,873
Driver Unfamiliar with Area	0.38%	11	2,884
Driver Emotionally Upset	0.31%	9	2,893
Illness	0.24%	7	2,630
Physical Disability	0.24%	7	2,904
Evading Law Enforcement Officer	0.14%	4	2,897
Asleep at the Wheel	0.10%	3	2,623
Distracted by Passenger	0.10%	3	2,633
Driver Fatigue	0.03%	1	2,779

Source: 2003 CDOT Crash Database.

Month of Year

As shown in Exhibit VII.10, bicycle and pedestrian crashes occur year-round, with the greatest proportion (12%) occurring in September and the fewest in February (5%).

Exhibit VII.10
Bicycle and Pedestrian Crashes by Month of Year, 2003



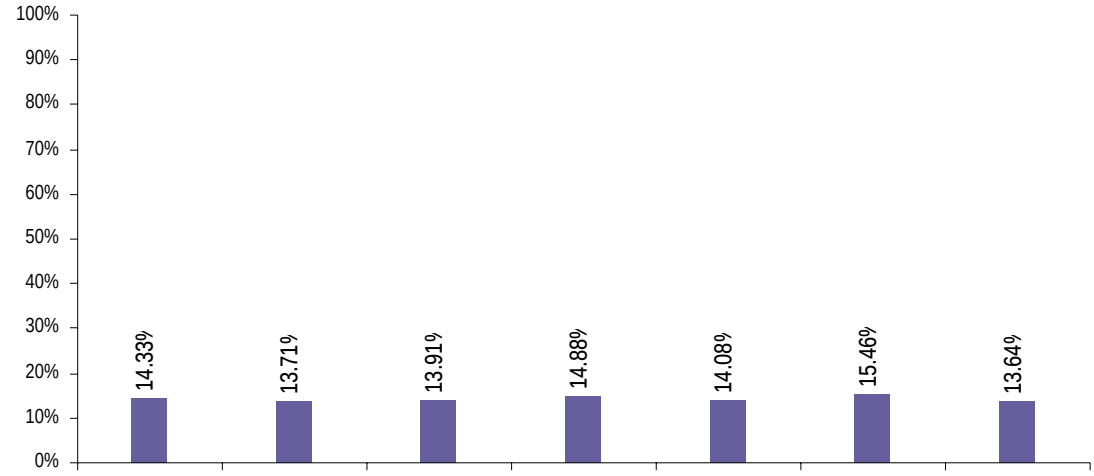
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	204	153	193	198	245	284	280	315	360	309	193	170
Total Crashes	204	357	550	748	993	1,277	1,557	1,872	2,232	2,541	2,734	2,904

Source: 2003 CDOT Crash Database.

Day of Week

Exhibit VII.11 presents the distribution of 2003 bicycle and pedestrian crashes across the days of the week. As shown, the highest proportion of crashes occurs on Fridays (15.5%) and the lowest on Mondays, 13.7%.

Exhibit VII.11
Bicycle and Pedestrian Crashes by Day of Week, 2003



	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	416	398	404	432	409	449	396
Total Crashes	416	814	1,218	1,650	2,059	2,508	2,904

Source: 2003 CDOT Crash Database.

Intervention Analysis of Fatal Crashes, Fatalities and Alcohol-Related Fatalities in Colorado

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Intervention Analysis

This section presents Structural Time Series models developed for fatal crashes, fatalities and alcohol-related fatalities.

FARS data allow for the portrayal of the time-series behavior of fatal crashes, fatalities, and alcohol-related fatalities. The behavior of these variables are analyzed using Structural Time Series models (Mocan and Topyan, 1993, *Oxford Bulletin of Economics and Statistics*; Mocan, 1994, *Economics Letters*; and Harvey and Durbin, *Royal Statistical Society, Series A,* 1986). Let ACC_t stand for fatal accidents in time period *t*. The dynamics of ACC_t over time can be expressed by Equation (1) below where μ_t represents slowly-evolving trend component in fatal accidents, and Ψ_t stands for the cycle-component inherent in accidents. ε_t is regular random component.

$$(1)\quad ACC_t = \mu_t + \Omega_t + \psi_t + \varepsilon_t$$

The trend in fatal accidents, μ_t is determined by its level and the slope in each time period, which can be written in general as random walks as in Equation (2).

$$(2)\quad \begin{aligned} \mu_t &= \mu_{t-1} + \beta_{t-1} + \eta_t \\ \beta_t &= \beta_{t-1} + \xi_t \end{aligned}$$

One flexible method to model the cyclical behavior of fatal accidents, represented by Ψ in Equation (1), is to assume a stochastic trigonometric process, which is depicted by Equation (3).

$$(3)\quad \begin{aligned} \Omega_t &= \rho\cos\lambda_c\Omega_{t-1} + \rho\sin\lambda_c\Omega^*_{t-1} + \tau_t \\ \Omega^*_t &= -\rho\sin\lambda_c\Omega_{t-1} + \rho\cos\lambda_c\Omega^*_{t-1} + \tau^*_t \end{aligned}$$

where ρ is a damping factor with $0 \le \rho \le 1$, λ_c is the frequency of the cycle in radians, and τ_t and τ^*_t are independently, identically distributed disturbances with mean zero and variance σ^2_t.

The component ψ represents seasonality, which does not exist in annual data. In case of monthly data, seasonality is assumed to be generated by the following trigonometric process, which is allowed to evolve over time.

$$\psi_t = \sum_{j=1}^{s/2} \psi_{jt}$$

$$(4)\quad \begin{aligned} \psi_t &= \psi_{j,t-1}\cos\lambda_j + \psi^*_{j,t-1}\sin\lambda_j + \omega_{jt} \\ \psi^*_{jt} &= -\psi_{j,t}\sin\lambda_j + \psi^*_{j,t-1}\cos\lambda_j + \omega^*_{jt} \end{aligned}$$

The model can be extended by adding an intervention variable to investigate the impact of an event that took place in period *k*. In this case, the model can be extended as

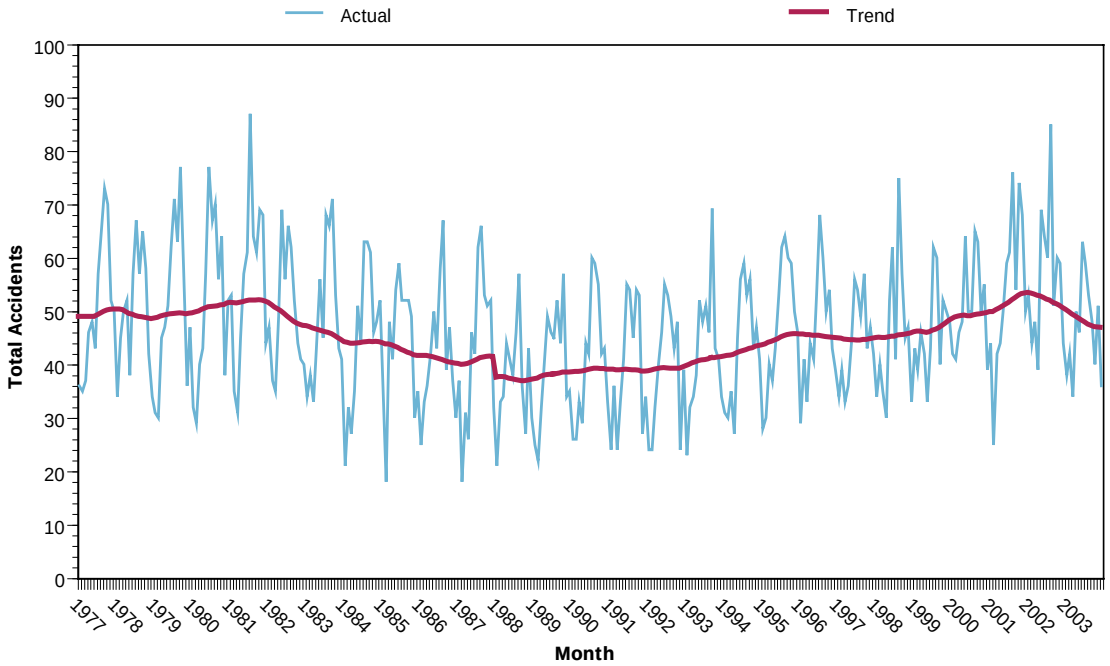
(5) $ACC_t = \mu_t + \Omega_t + \psi_t + \alpha I_t + \varepsilon_t$

where I_t is the intervention variable, such that $I_t=0$ if $t<k$, and $I_t=1$ if $t\geq k$; and á is the impact of the intervention on the level of the fatal accidents.

In 1987 Colorado passed the seat belt law, which became effective on July 1, 1987 and also the speed limit has been reduced from 70 mph to 65 mph (adopted, April 10, 1987). To investigate the extent to which both of these changes influenced fatal crashes, fatalities and alcohol-related fatalities the model is estimated with annual data with an intervention variable that takes the value of 1 after 1988.

The model described above is estimated with annual data on fatal crashes, fatalities and alcohol-related fatalities. In each case the impact of a change in trend in 1988 is analyzed. The data are used in logarithms. Exhibit VIII.1 displays the actual number of fatal crashes and the estimated trend component. The coefficient of the intervention variable (á) is estimated -0.188 (t=3.43), indicating that the impact of the two law changes had been a reduction in the level of the number of fatal accidents by 17%. This impact is also demonstrated by the estimated trend component of fatal accidents in graph, where the sharp drop is visible.

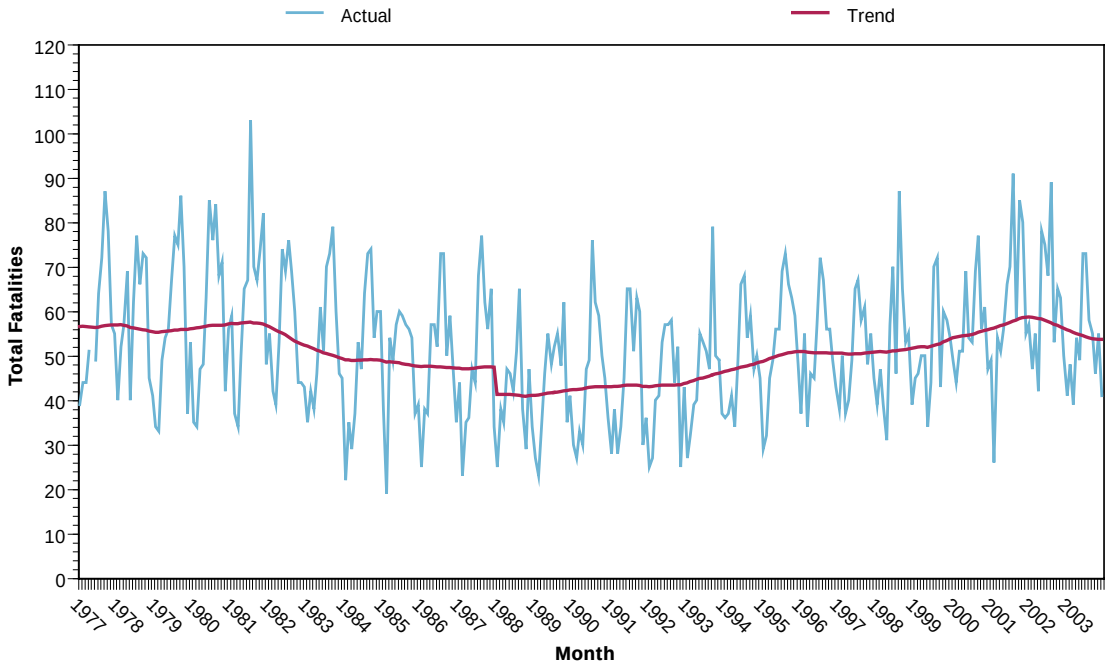
Exhibit VIII.1
Fatal Crashes, Actual and Trend, 1977 - 2003



Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

The analysis of Fatalities revealed that the intervention generated a drop in the level of fatalities by 18% (the estimated á was -0.20 with a t-value of 3.35). Fatalities and the estimated trend are displayed in Exhibit VIII.2 on the following page.

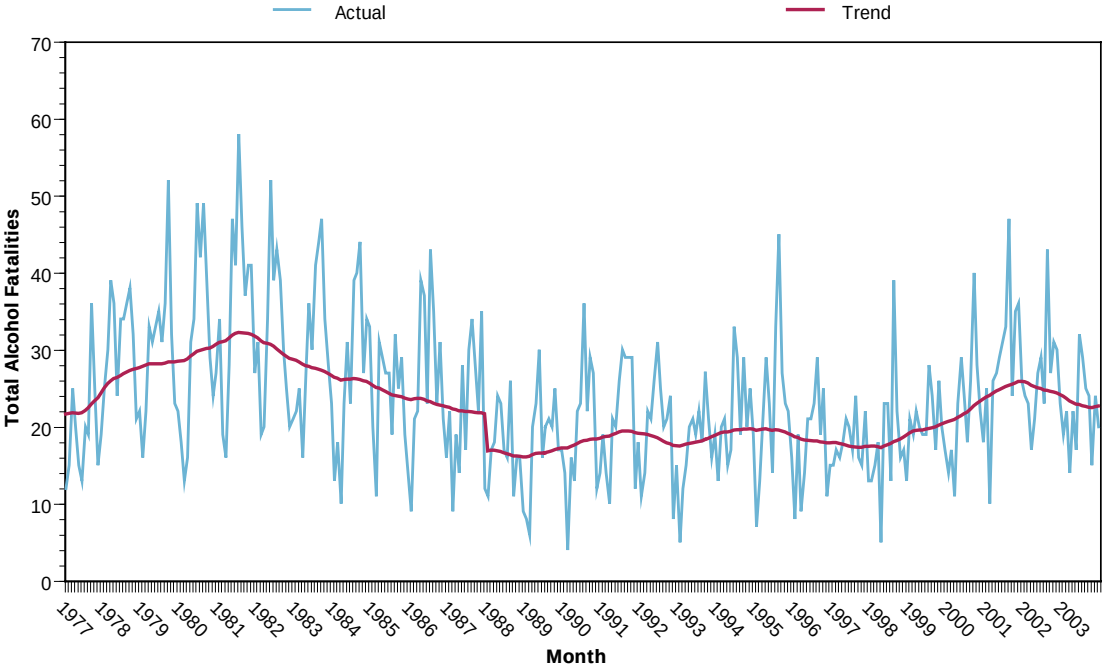
Exhibit VIII.2
Fatalities, Actual and Trend, 1977 - 2003



Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

Estimation of the model for alcohol-related fatalities showed that the decline in the level after 1987 was 38% (á=-0.48, t=4.57), which is demonstrated in Exhibit VIII.3.

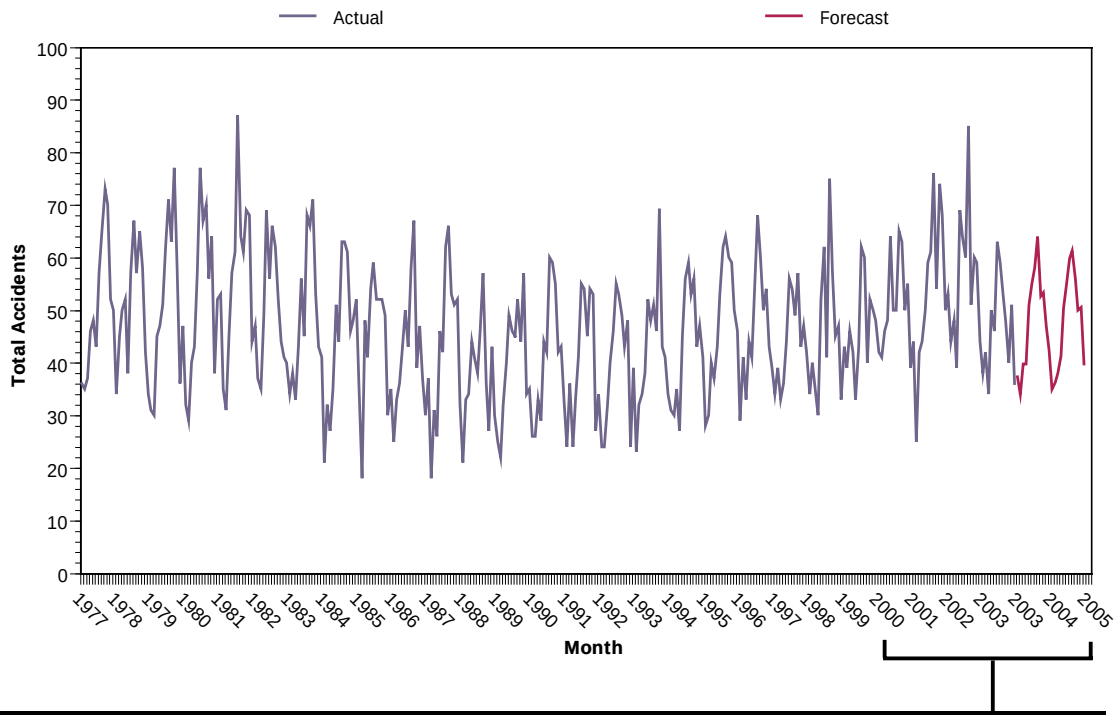
Exhibit VIII.3
Alcohol-Related Fatalities, Actual and Trend, 1977 - 2003



Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

Alternatively, the models are estimated with monthly data. The monthly number of fatal accidents and the estimated trend with the intervention component are displayed in Exhibit VIII.4. Although the impact of the intervention is estimated to be negative, it is not statistically significant at conventional levels. (á=-0.10, t=1.24). (Exhibits IX.4 through IX.6 include monthly forecasts for 2004 and 2005, based on the model.)

Exhibit VIII.4
Monthly Fatal Crashes, Actual and Forecast, 1977 - 2003

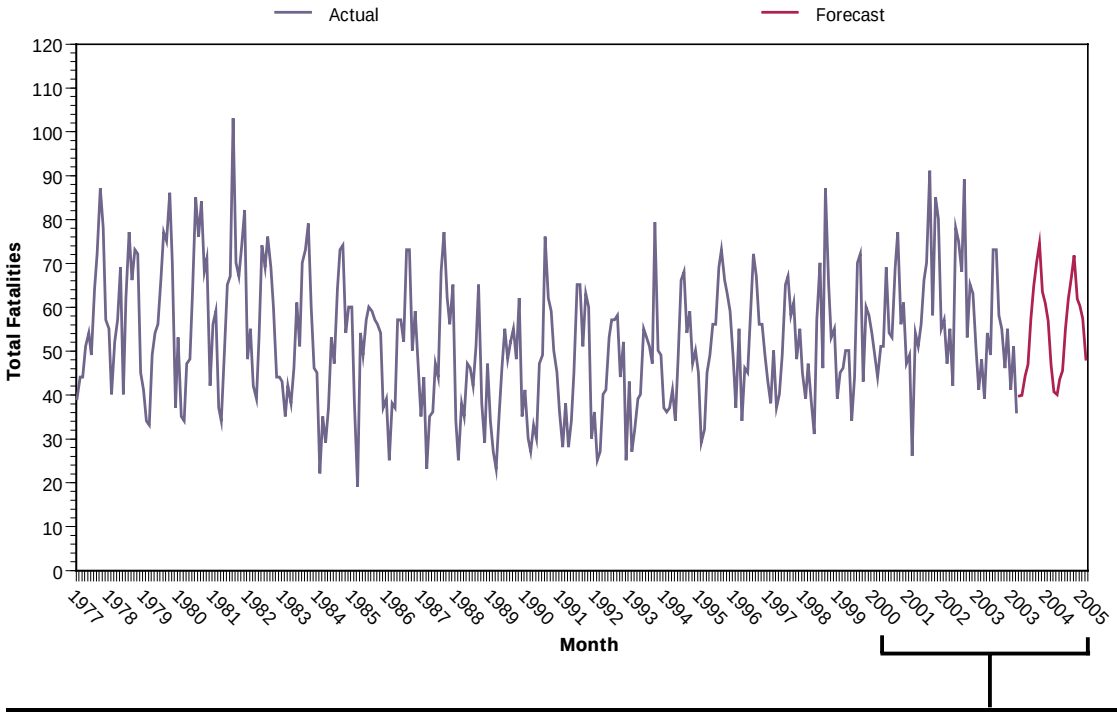


	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Actual												
2000	42	41	46	48	64	50	50	65	63	50	55	39
2001	44	25	42	44	50	59	61	76	54	74	68	50
2002	53	44	48	39	69	65	60	85	51	60	59	44
2003	38	42	34	50	48	64	60	54	48	40	52	40
Forecast												
2004	37.35	33.97	39.78	39.75	50.98	54.97	58.09	63.97	52.68	53.32	47.04	42.32
2005	34.97	36.23	37.90	41.22	50.35	54.73	59.80	61.31	55.97	49.99	50.48	39.78

Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

Exhibit VIII.5 demonstrates that monthly fatalities dropped by 13% (the intervention coefficient is estimated as -0.14, with a t-value of 1.78, which is statistically significant at the % level.

Exhibit VIII.5
Monthly Fatalities, Actual and Forecast, 1977 - 2003

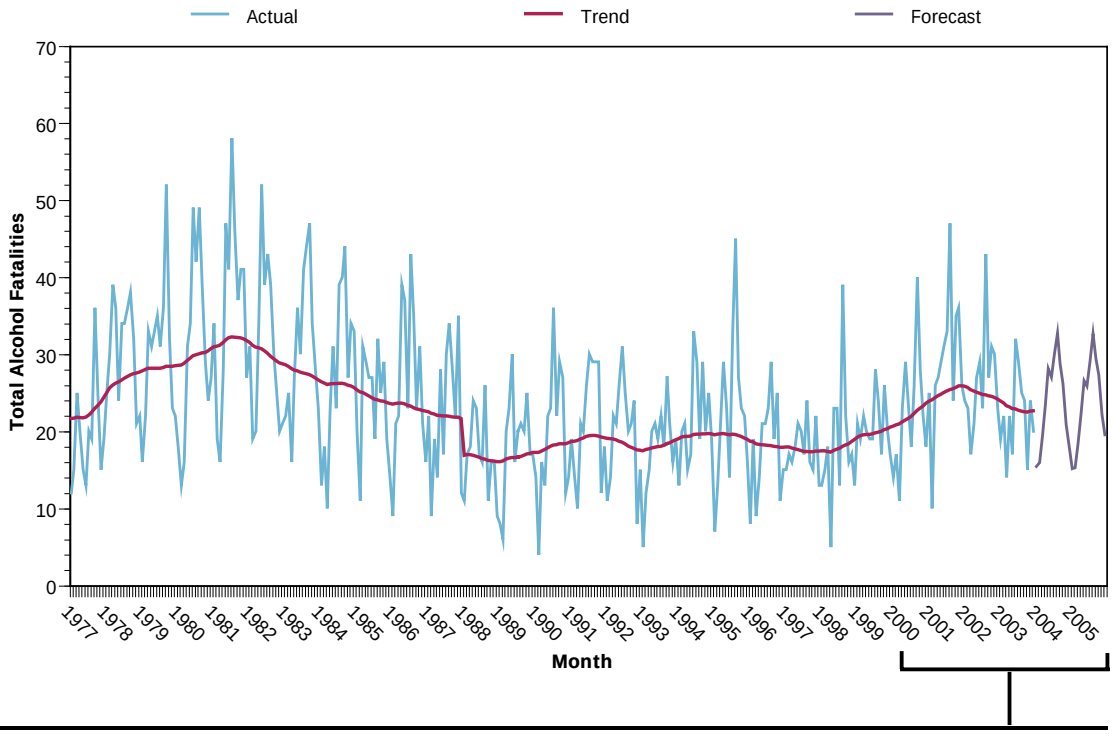


	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Actual												
2000	49	44	51	51	69	54	53	69	77	56	61	47
2001	49	26	54	51	56	66	70	91	58	85	80	55
2002	57	47	55	42	78	76	68	89	53	65	63	50
2003	41	48	39	54	51	74	74	59	55	46	56	45
Forecast												
2004	39.69	39.79	44.17	46.85	57.25	64.76	70.13	74.43	63.41	60.77	56.84	46.86
2005	40.60	39.94	43.51	45.43	54.89	61.77	66.98	71.63	61.81	60.20	57.30	48.02

Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

Monthly number of alcohol-related fatalities and the estimated trend component are displayed in Exhibit VIII.6. The estimated impact of the intervention is a drop by 22%. (á=-0.25, t=1.7).

Exhibit VIII.6
Total Monthly Alcohol-Related Fatalities, Actual and Forecast, 1977 - 2003



	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Actual												
2000	14	17	11	22	29	24	16	25	40	26	22	18
2001	24	10	26	21	27	30	33	46	24	35	35	26
2002	23	22	17	21	27	28	23	43	25	32	30	26
2003	18	21	14	20	17	33	25	27	24	15	25	19
Forecast												
2004	15.45	15.92	19.39	23.42	28.13	27.04	29.93	32.74	28.77	26.16	20.86	18.20
2005	15.15	15.28	18.34	22.04	26.57	25.86	29.18	32.67	29.40	27.33	22.17	19.53

Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

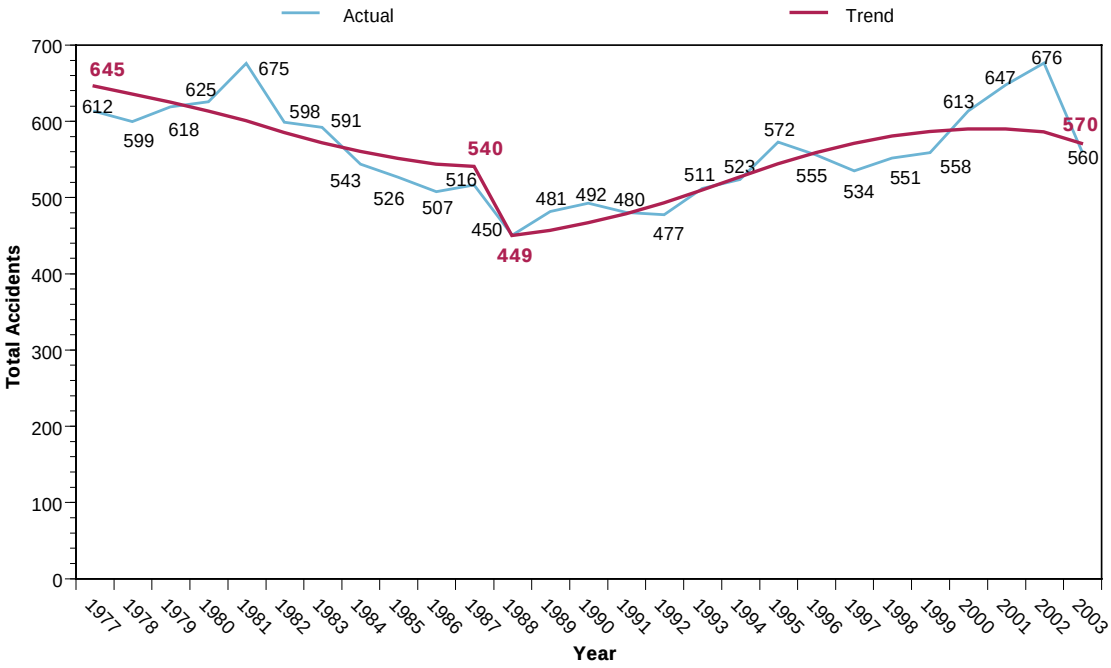
Taken together, these results suggest that the seal belt and the decrease in speed limit adopted in 1987 had an impact on the number of fatal crashes, fatalities as well as alcohol-related fatalities. Although the estimates obtained from monthly data are less precise regarding the impact of the law changes on fatal accidents, analysis of annual data reveals a drop in fatal accidents by 17%. The drop in the number of fatalities is 13-to-18 percent, and the drop in alcohol-related fatalities attributable to the intervention is 22-to-38%.

Note that the behavior of the trend and cycles of each outcome is critical in determining the long-run movement. Specifically, each outcome has been trending up since 1988, but the analysis indicates that their level would have been higher than those observed today had there been no intervention in 1987. Another intervention was the increase in the speed limit to 75 mph in 1996. This particular event did not register a statistically significant change in the level of the variables analyzed.

Exhibits VIII.7, VIII.8 and VIII.9 display the trends of fatal accidents, fatalities and alcohol-related fatalities along with the actual values for 1977 to 2003. The trends are shown in red.

The total fatal crash trend estimated from the model appears to indicate continued decreases in the number of fatal crashes (Exhibit VIII.7).

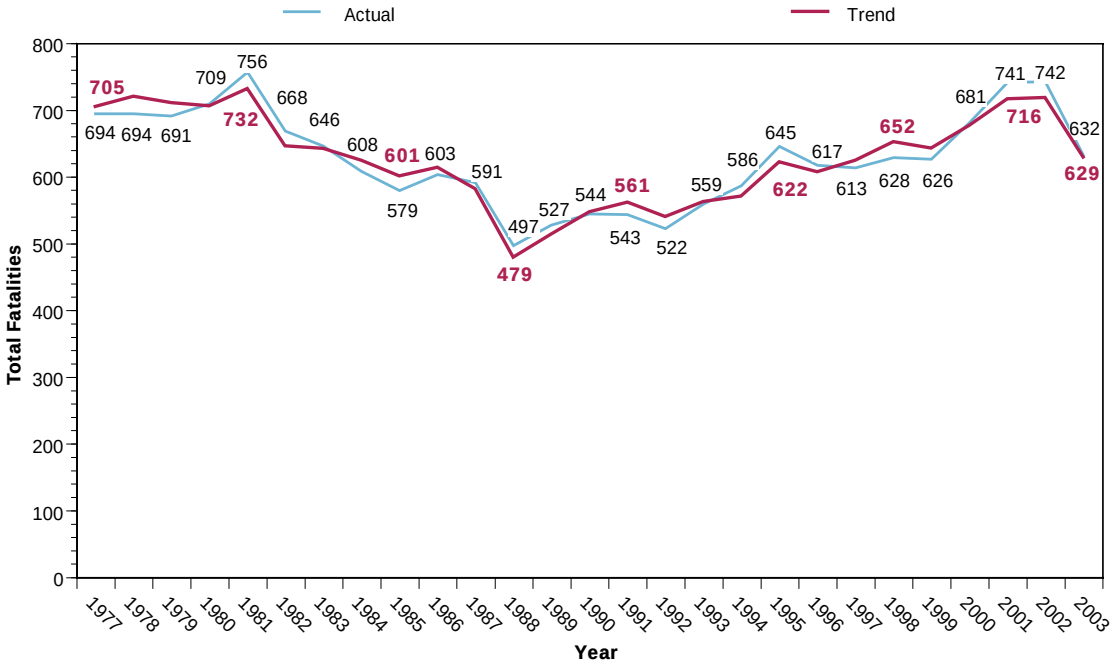
Exhibit VIII.7
Number of Fatal Crashes, Actual and Trend, 1977 - 2003



Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

Exhibit VIII.8 estimates a sharp drop in the number of fatalities.

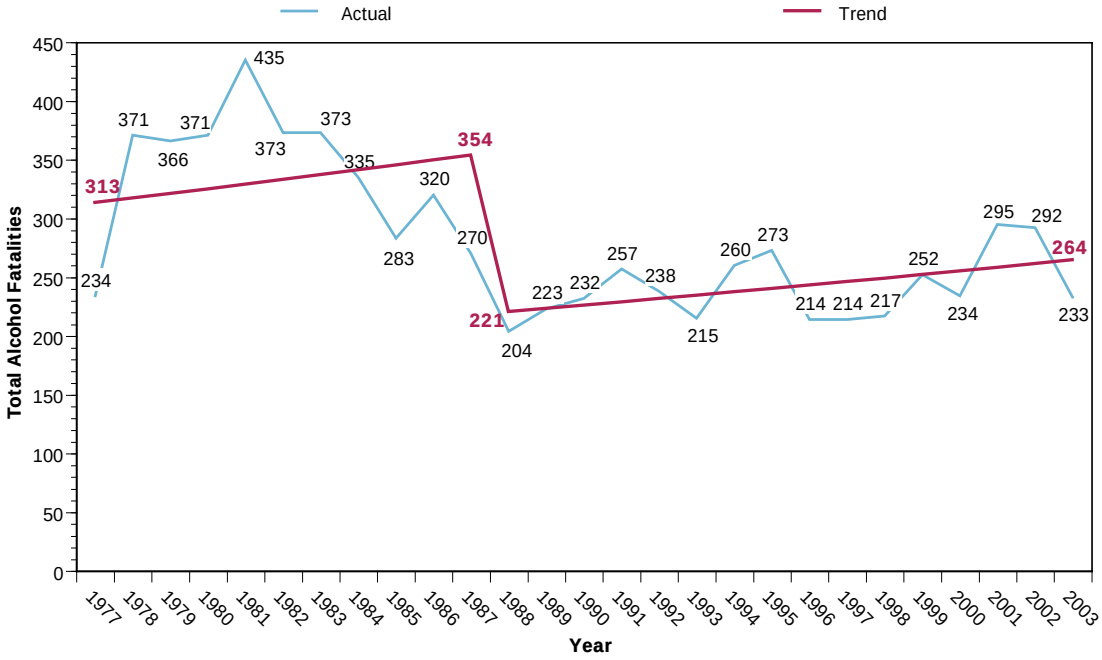
Exhibit VIII.8
Total Fatalities, Actual and Trend, 1977 - 2003



Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

The slope of the trend line for alcohol-related fatalities indicates the potential for annual increases (Exhibit VIII.9).

Exhibit VIII.9
Number of Alcohol-related Fatalities, Actual and Trend, 1977 - 2003



Source: National Highway Transportation and Safety Administration, FARS data, 1977-2003.

On-System Crash Locations by County

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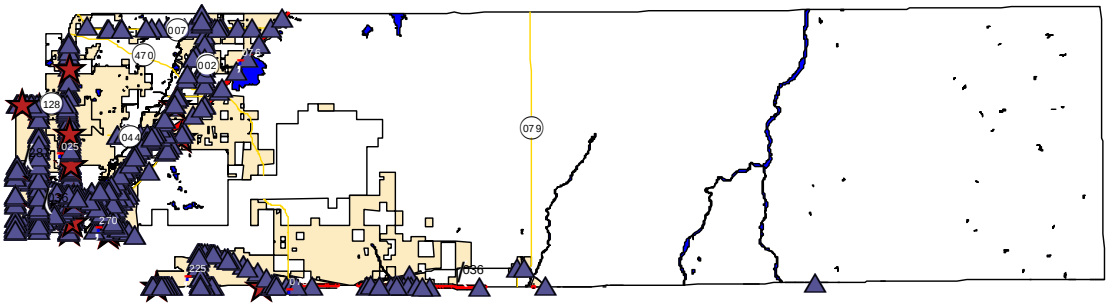
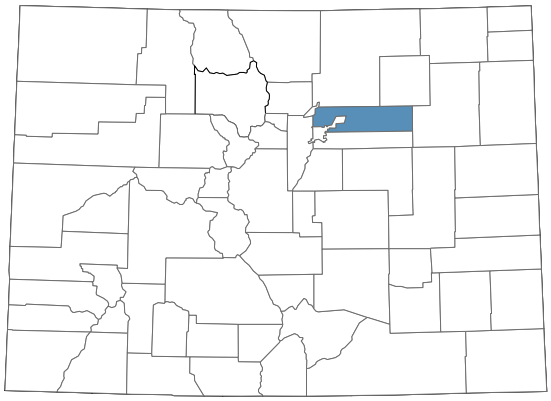
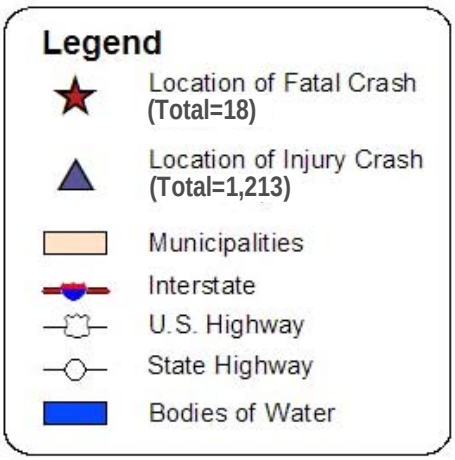
Adams County
Location of Fatal and Injury Crashes, State and U.S. Highways

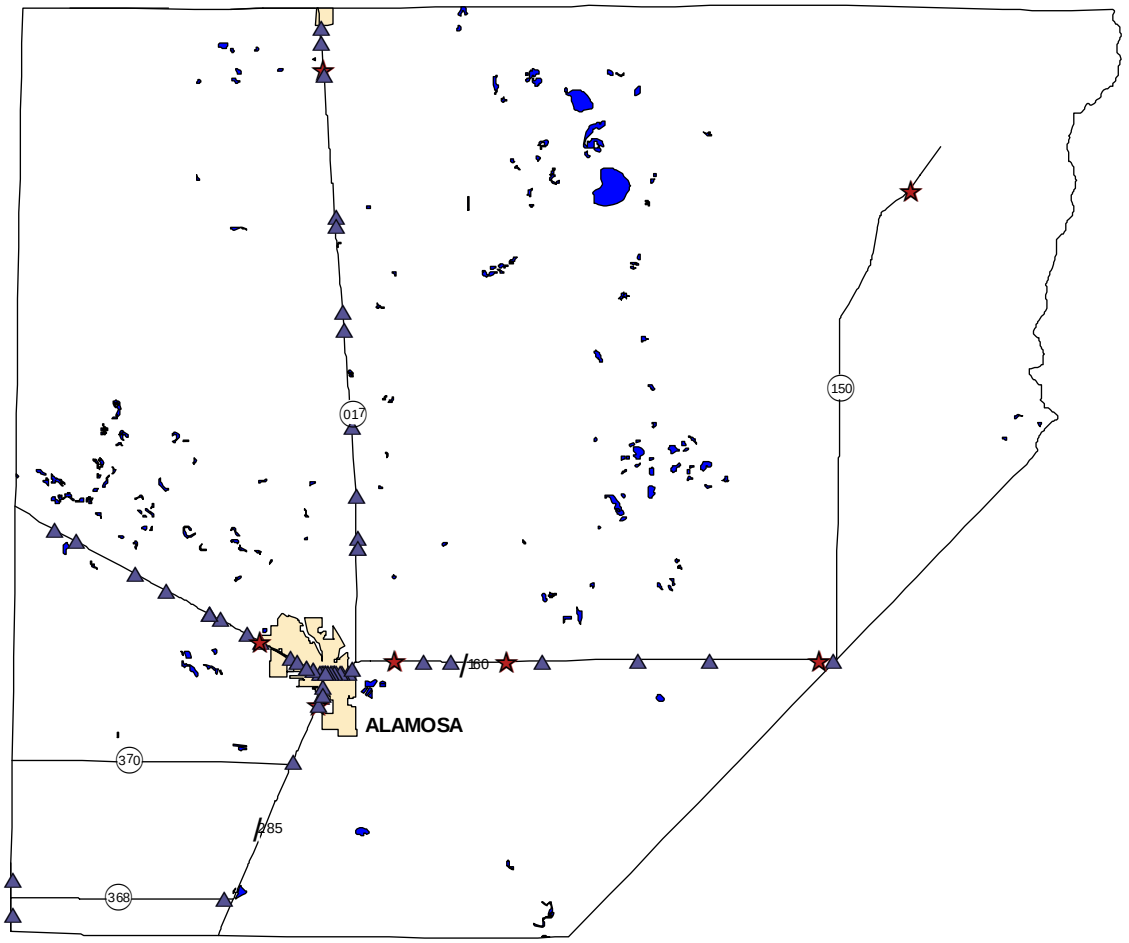


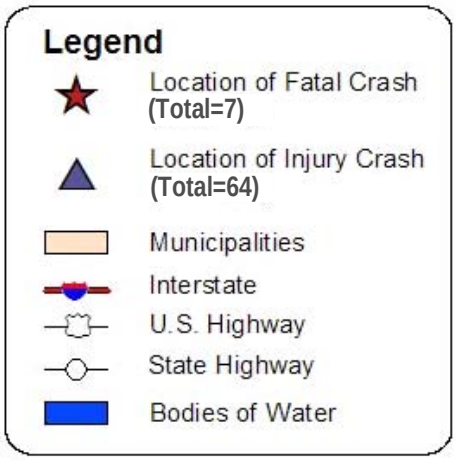
State of Colorado



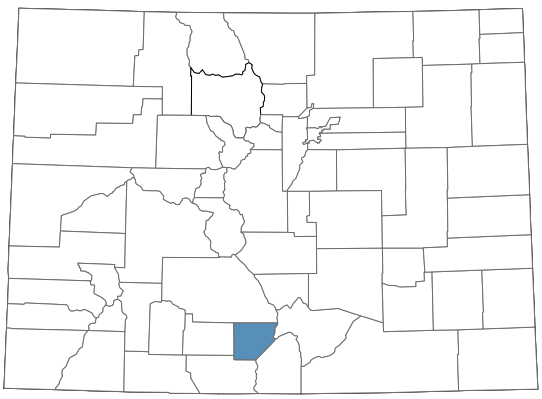


Alamosa County
Location of Fatal and Injury Crashes, State and U.S. Highways

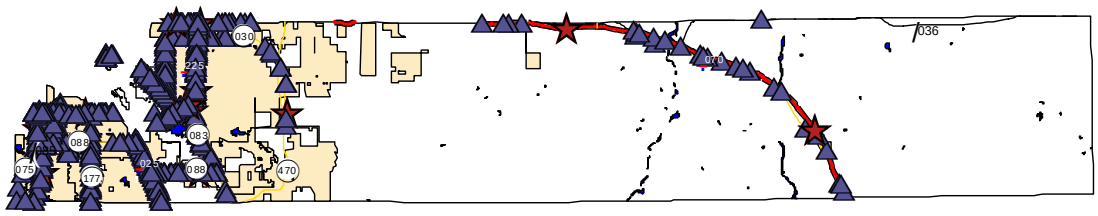




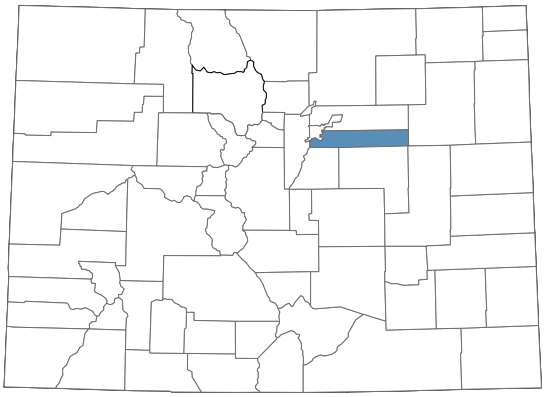
State of Colorado

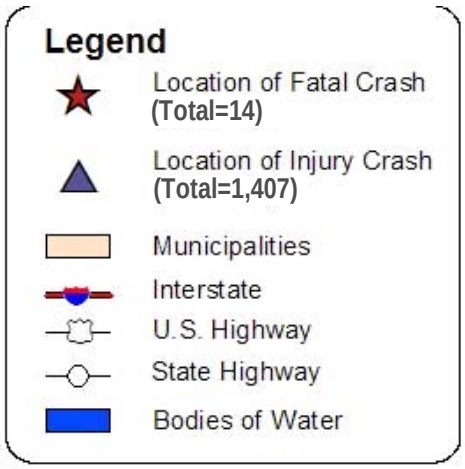


Arapahoe County
Location of Fatal and Injury Crashes, State and U.S. Highways

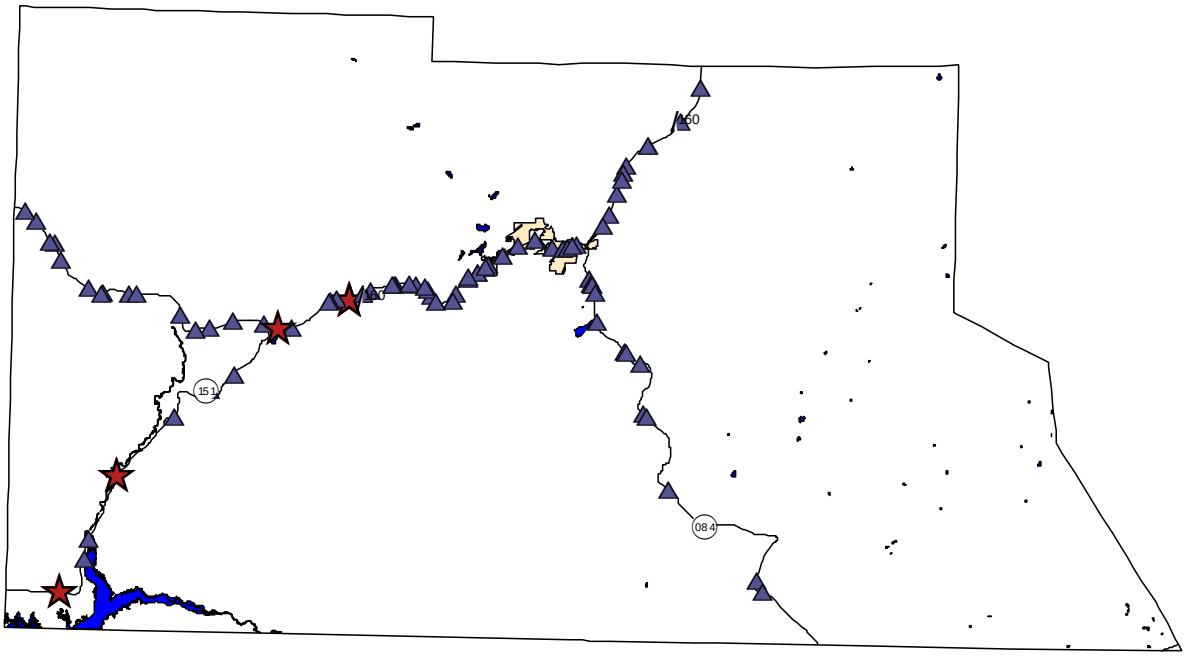


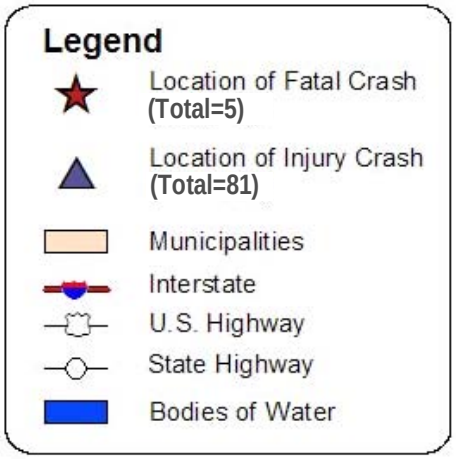
State of Colorado



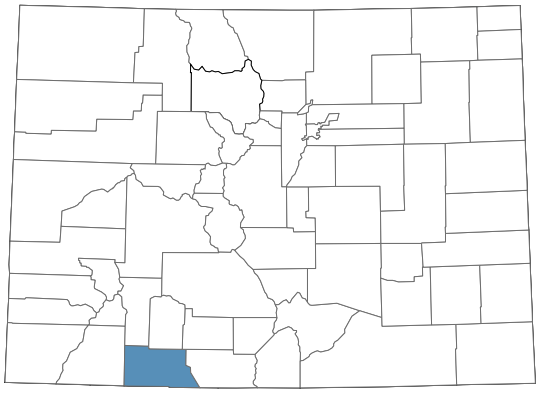


Archuleta County
Location of Fatal and Injury Crashes, State and U.S. Highways

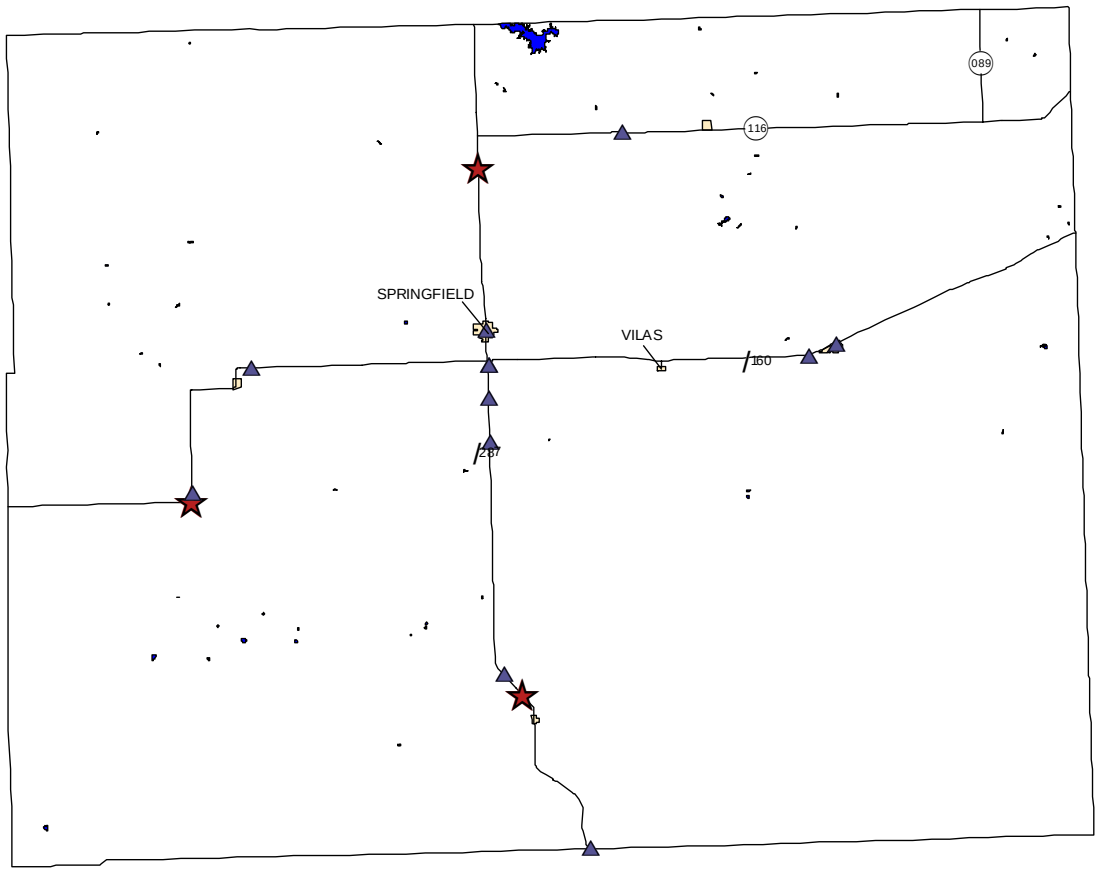




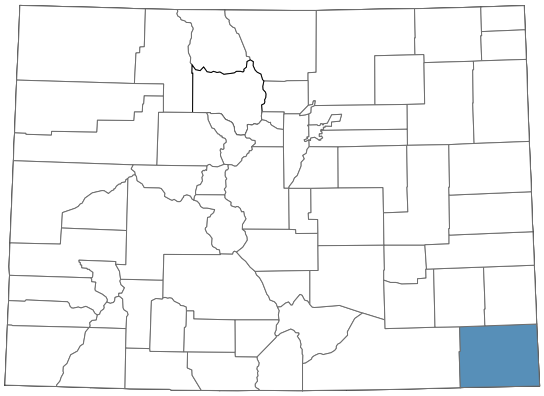
State of Colorado

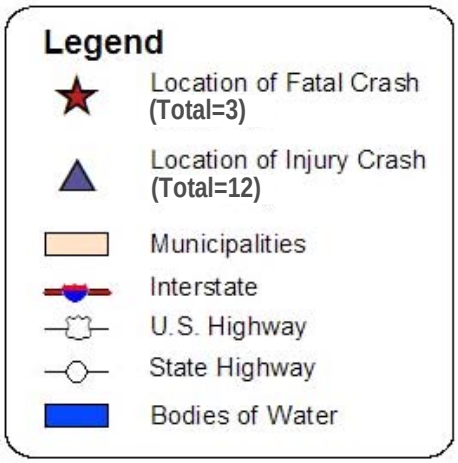


Baca County
Location of Fatal and Injury Crashes, State and U.S. Highways

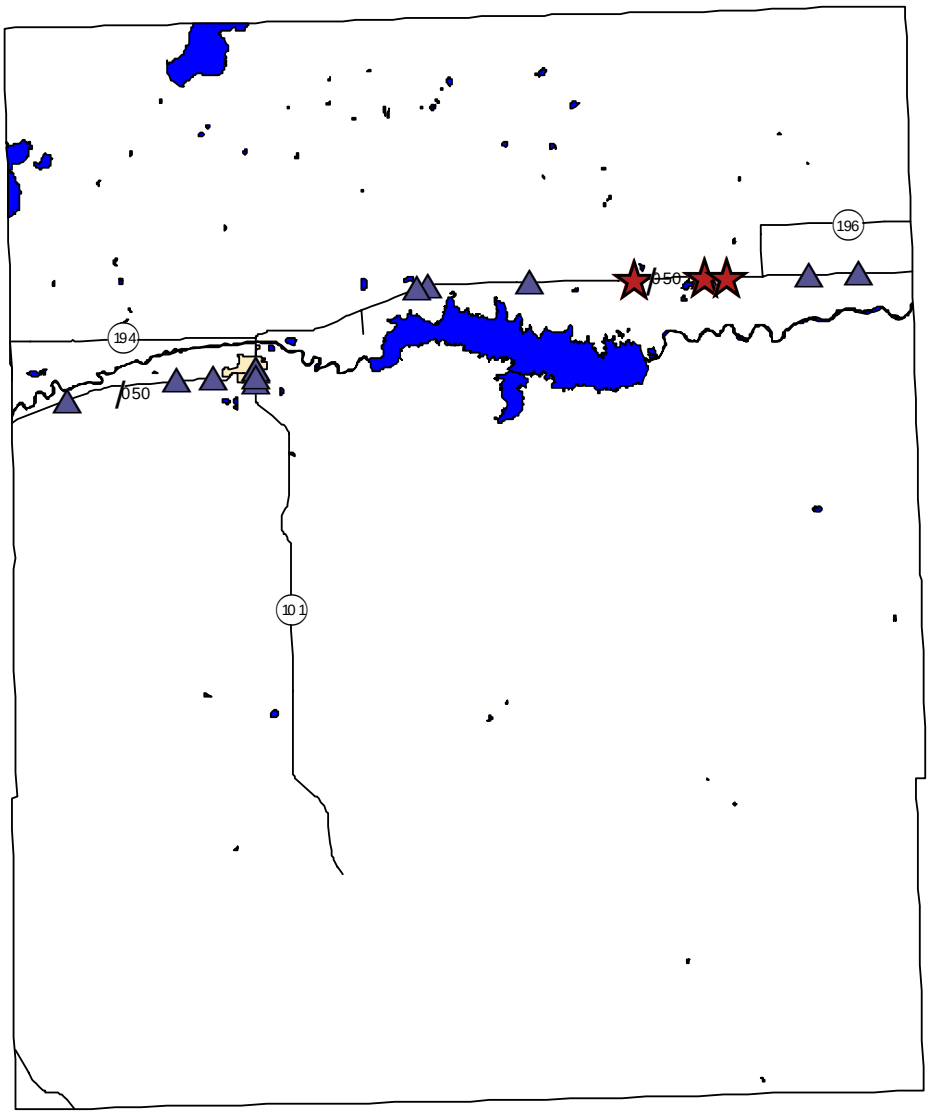


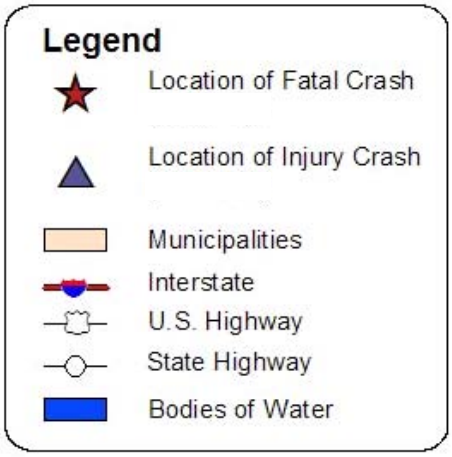
State of Colorado



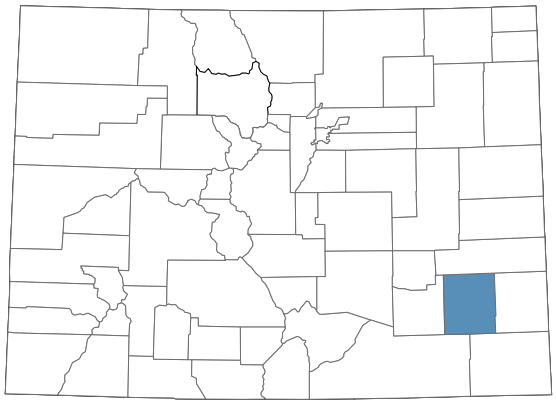


Bent County
Location of Fatal and Injury Crashes, State and U.S. Highways

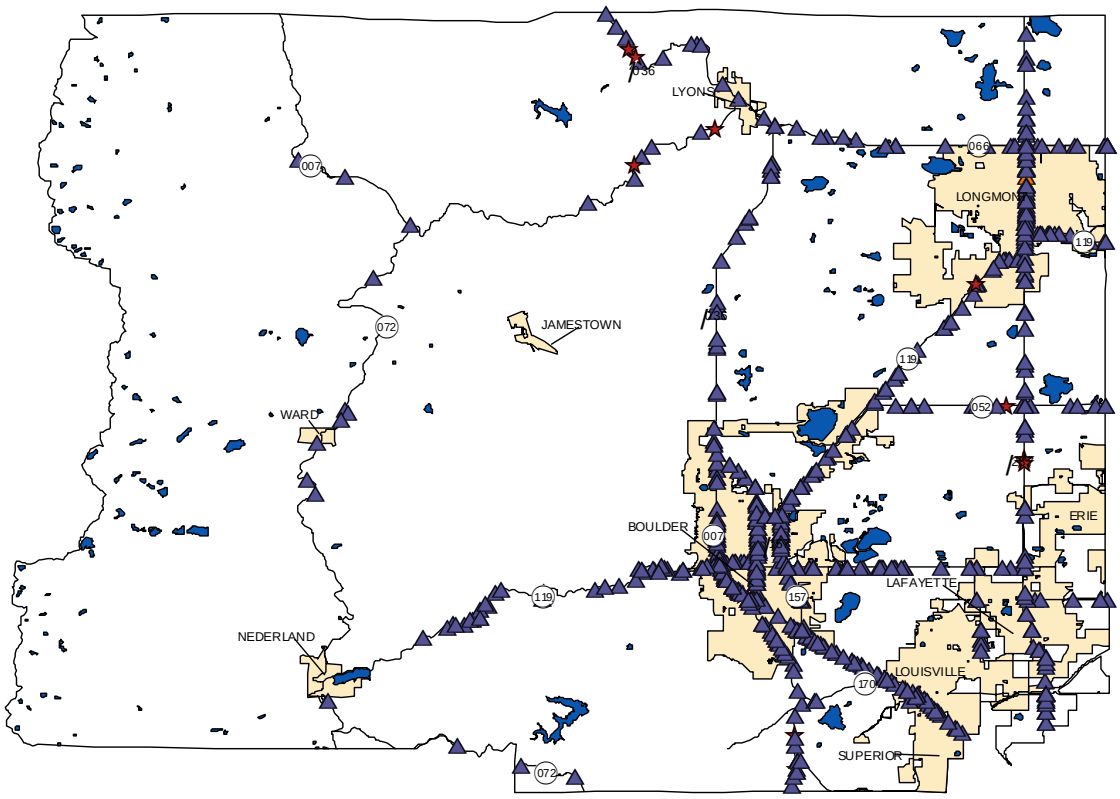




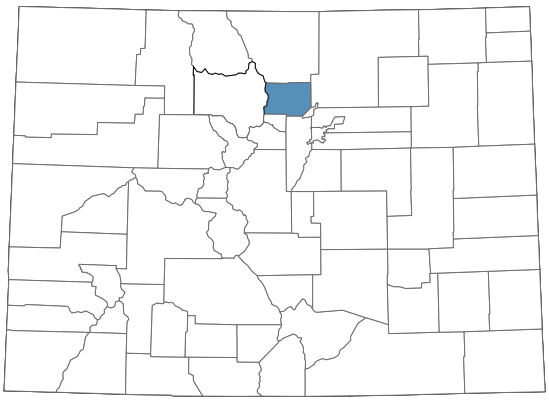
State of Colorado

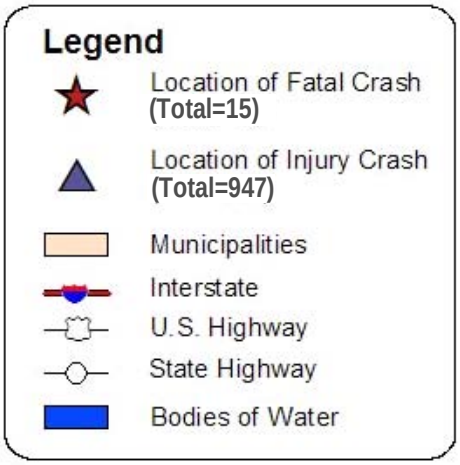


Boulder County
Location of Fatal and Injury Crashes, State and U.S. Highways

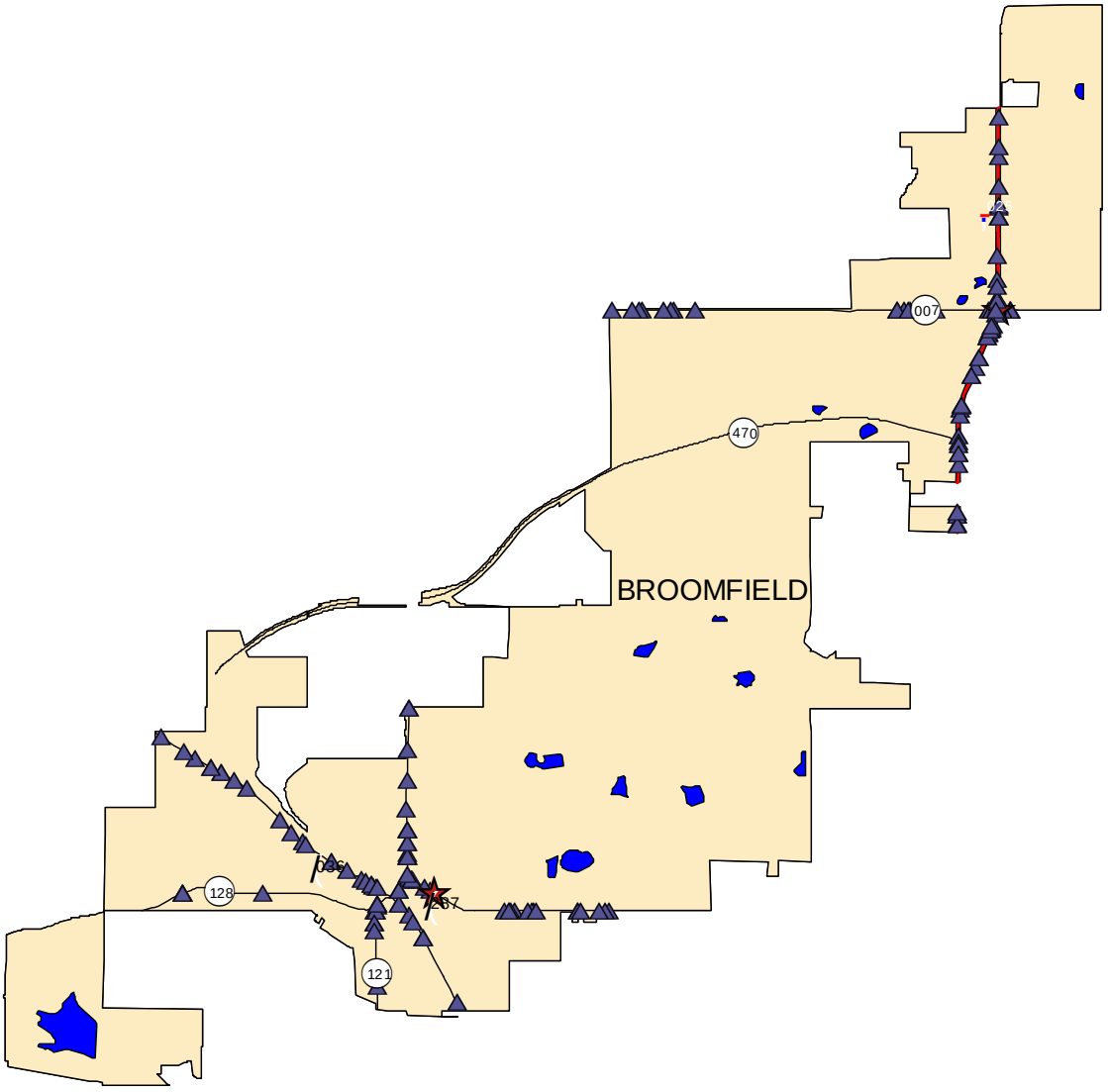


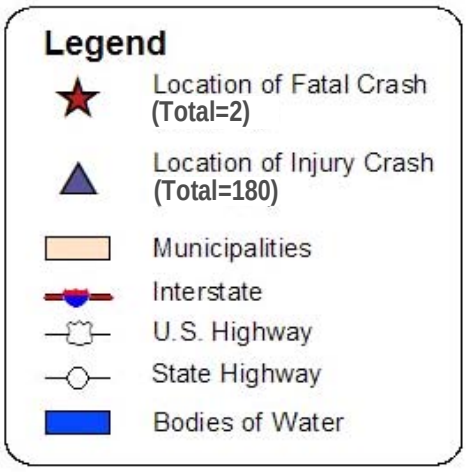
State of Colorado



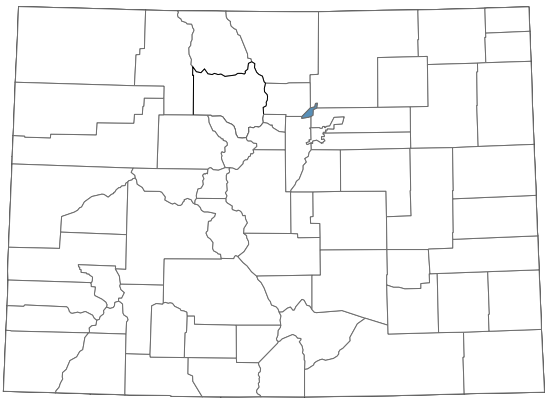


Broomfield County
Location of Fatal and Injury Crashes, State and U.S. Highways

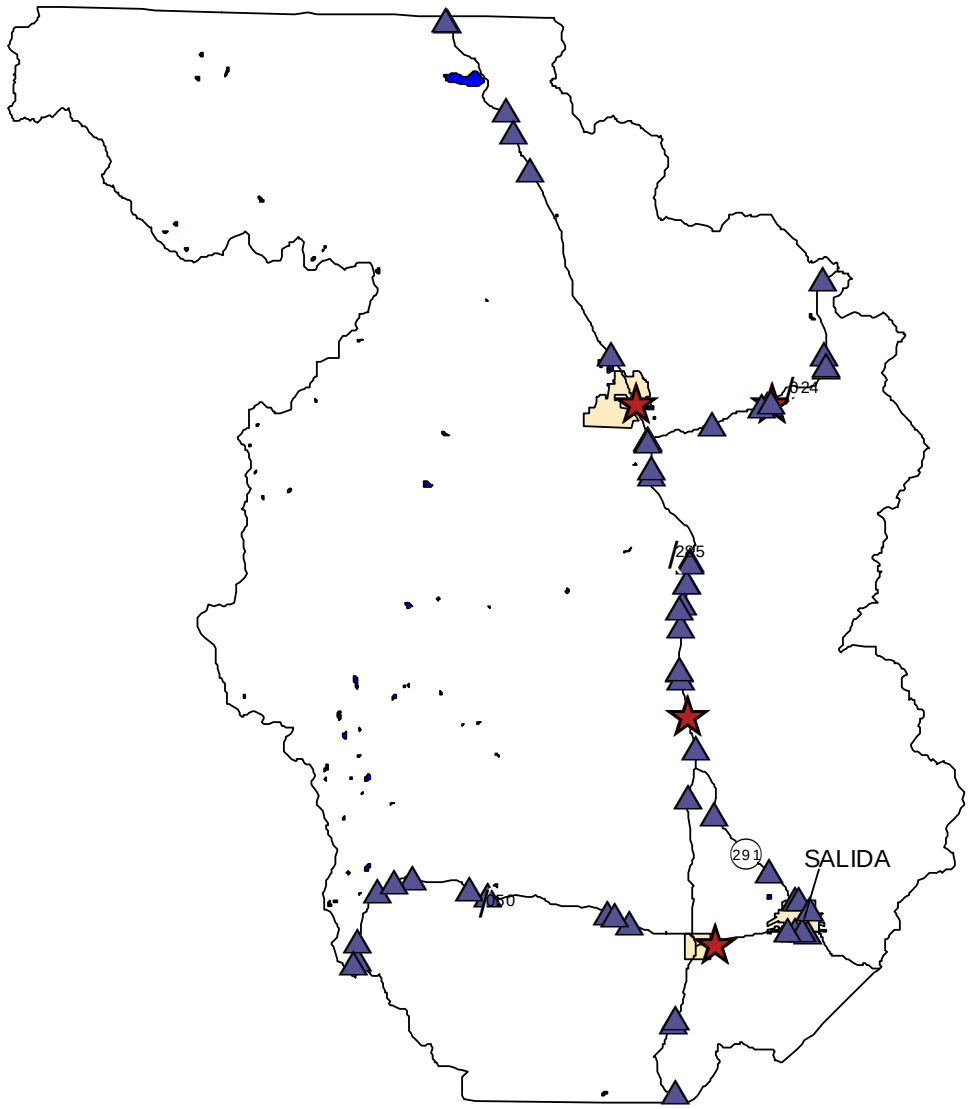




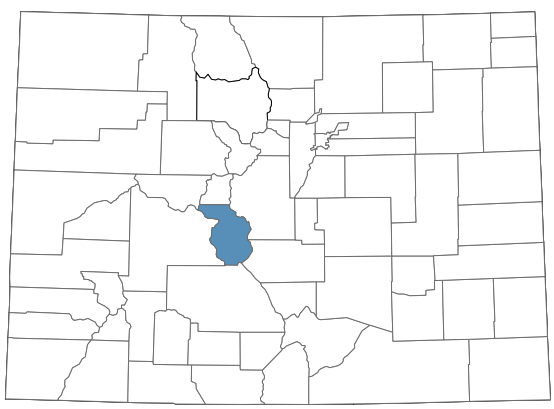
State of Colorado

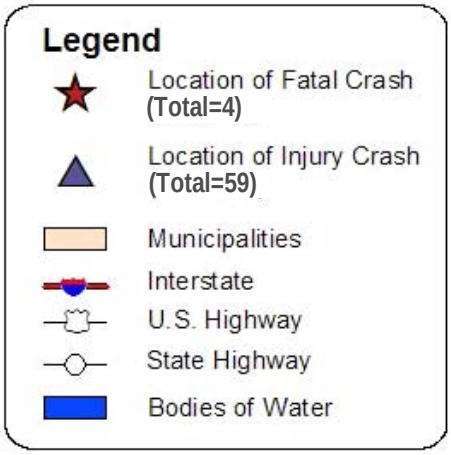


Chaffee County
Location of Fatal and Injury Crashes, State and U.S. Highways

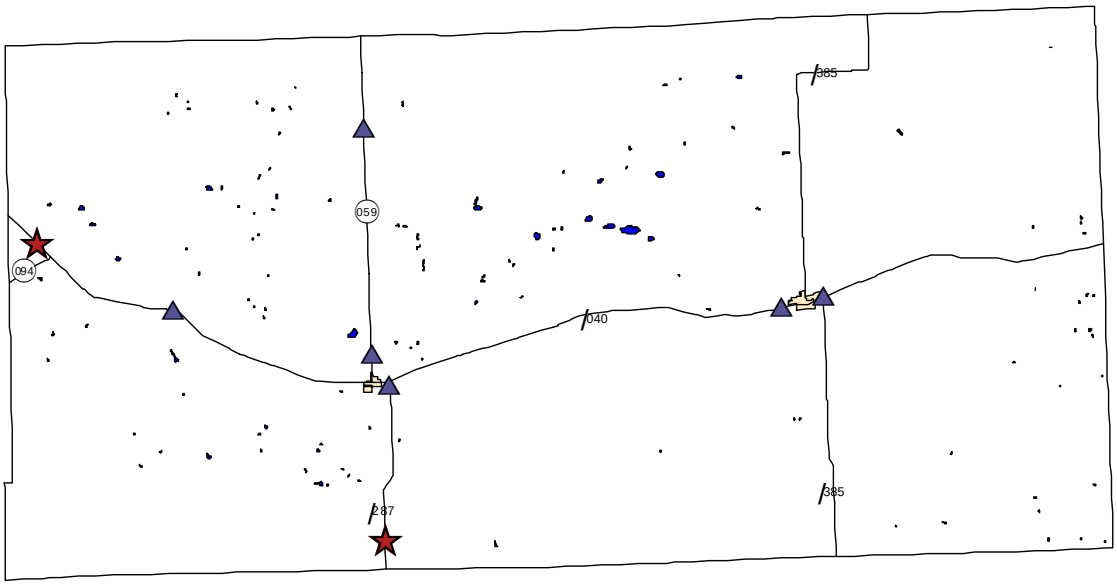


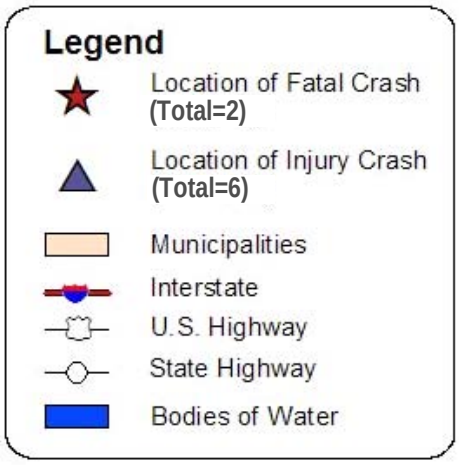
State of Colorado



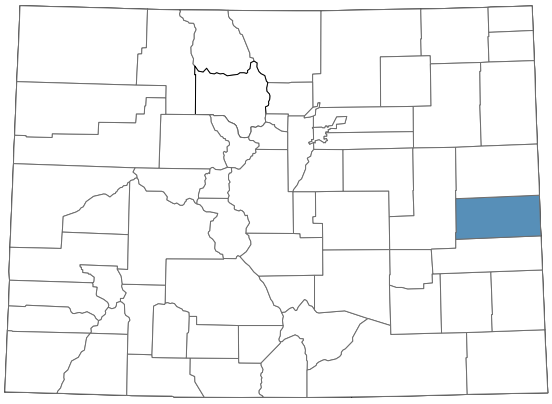


Cheyenne County
Location of Fatal and Injury Crashes, State and U.S. Highways

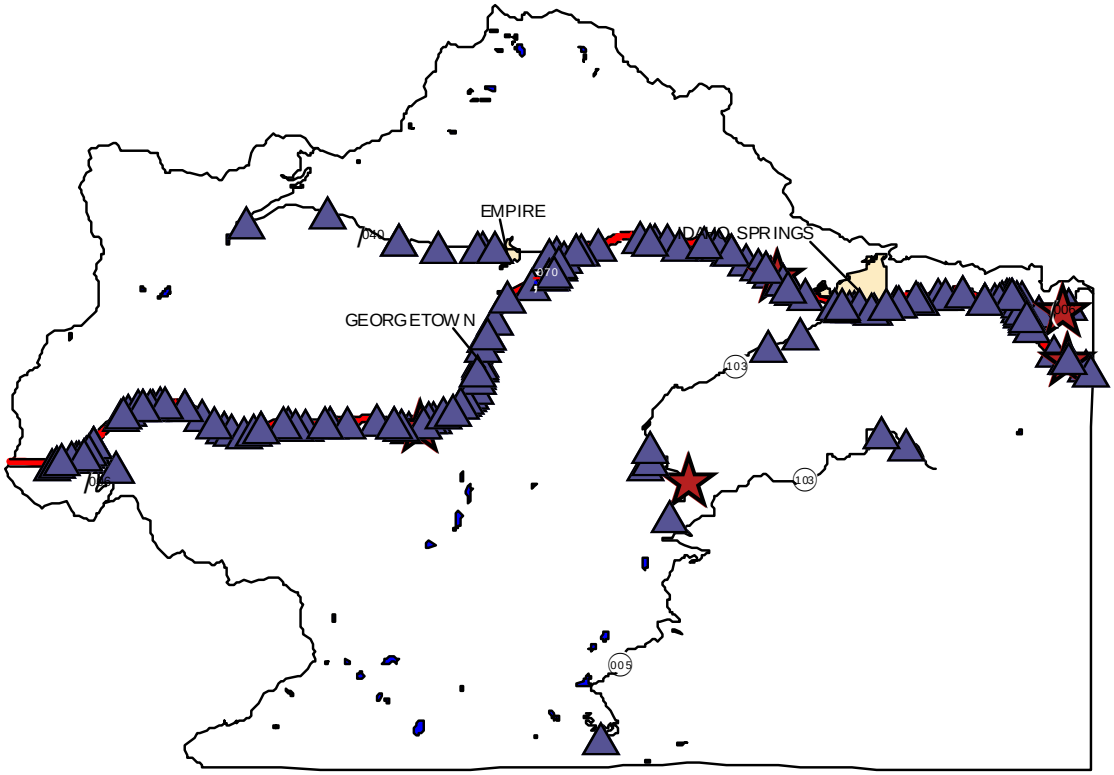




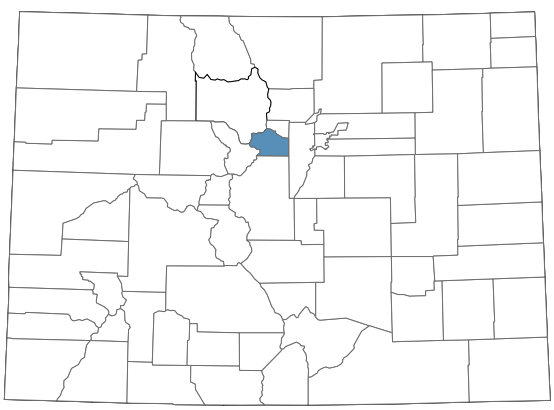
State of Colorado

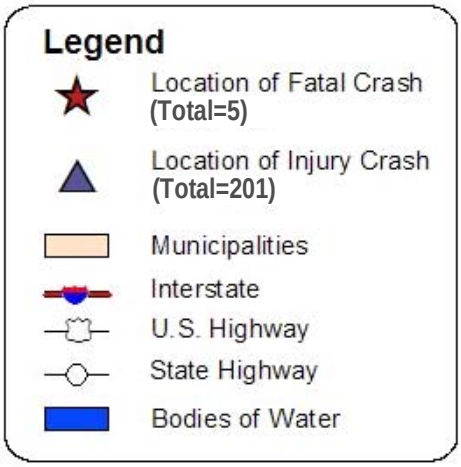


Clear Creek County
Location of Fatal and Injury Crashes, State and U.S. Highways

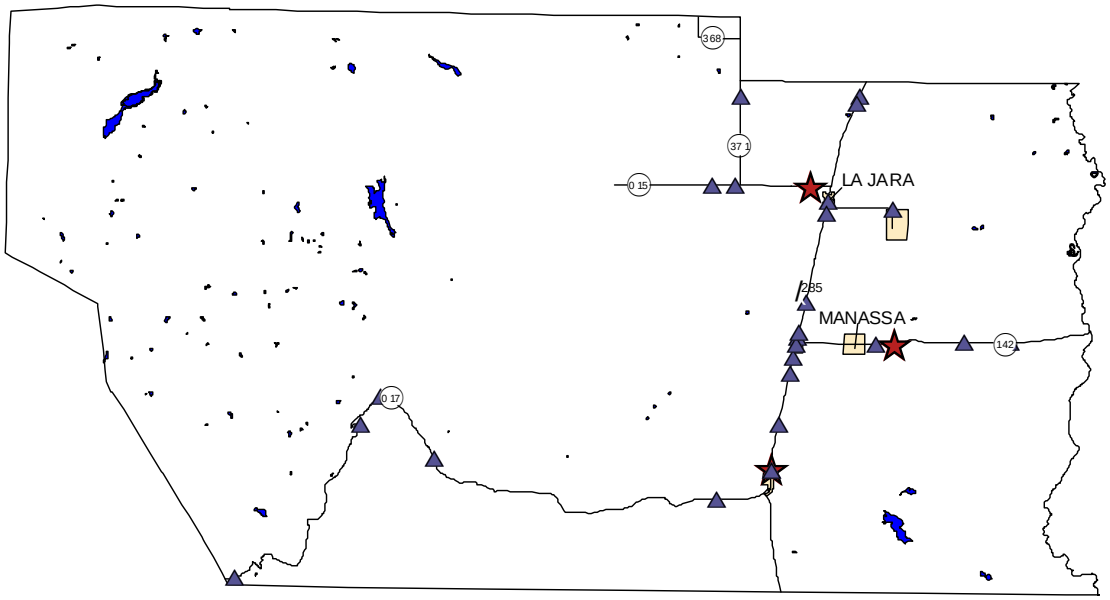


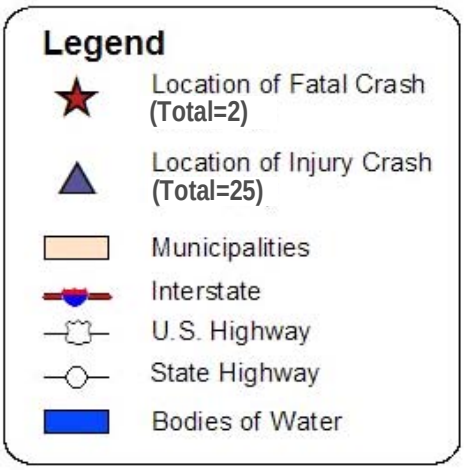
State of Colorado



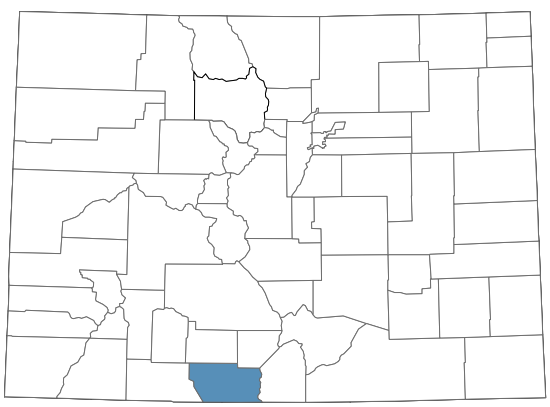


Conejos County
Location of Fatal and Injury Crashes, State and U.S. Highways

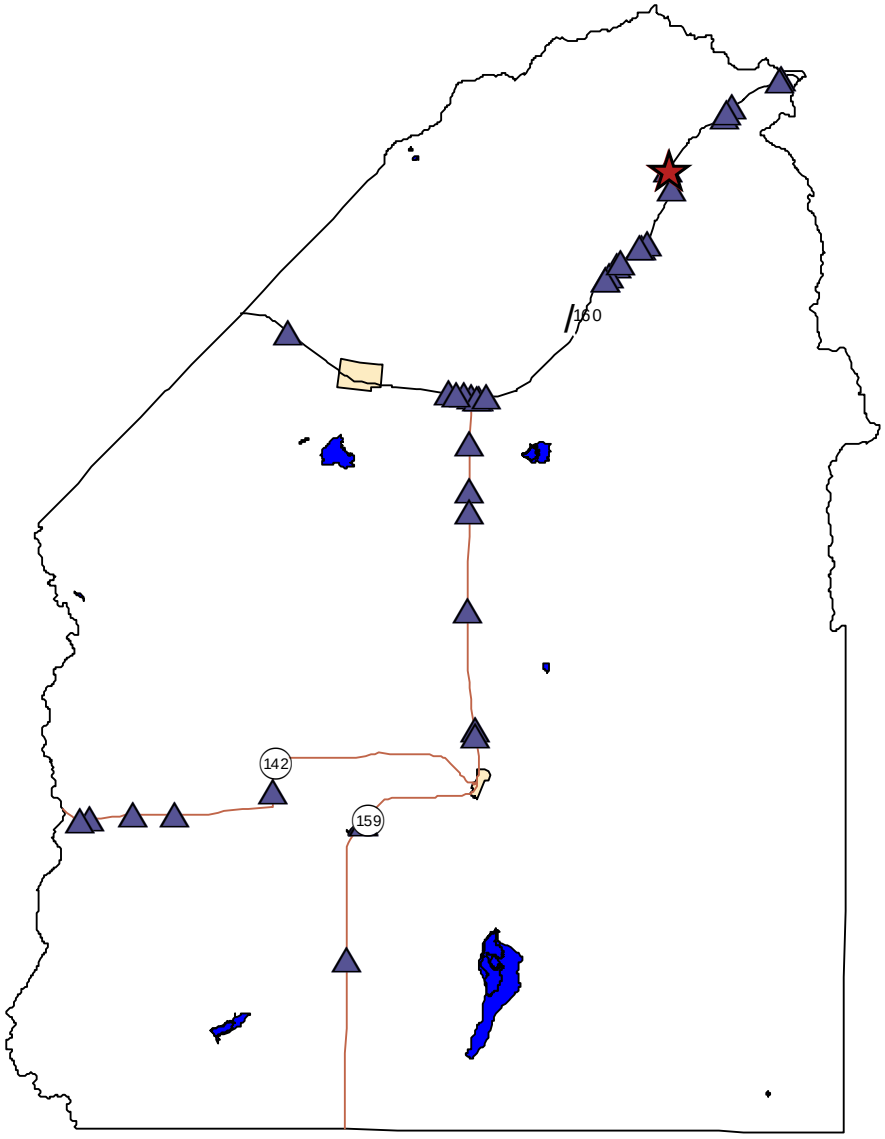




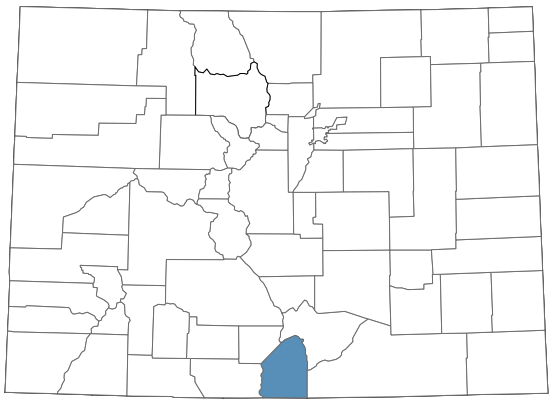
State of Colorado



Costilla County
Location of Fatal and Injury Crashes, State and U.S. Highways



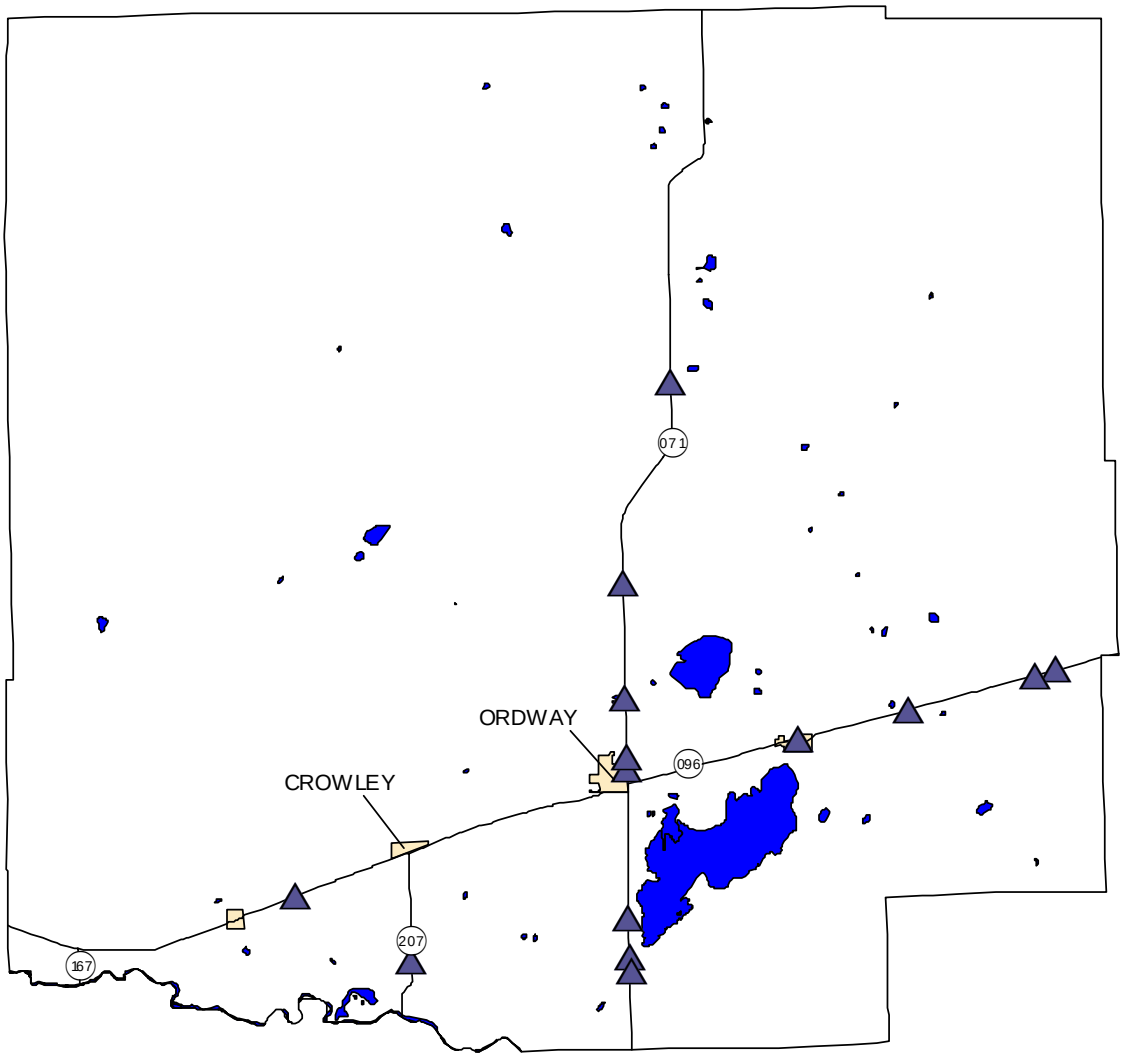
State of Colorado



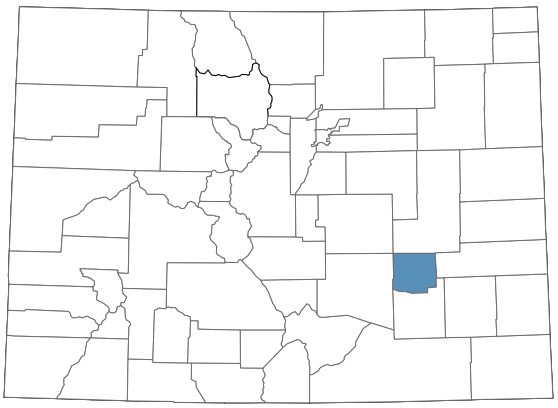
Legend

- Location of Fatal Crash (Total=1)
- Location of Injury Crash (Total=37)
- Municipalities
- Interstate
- U.S. Highway
- State Highway
- Bodies of Water

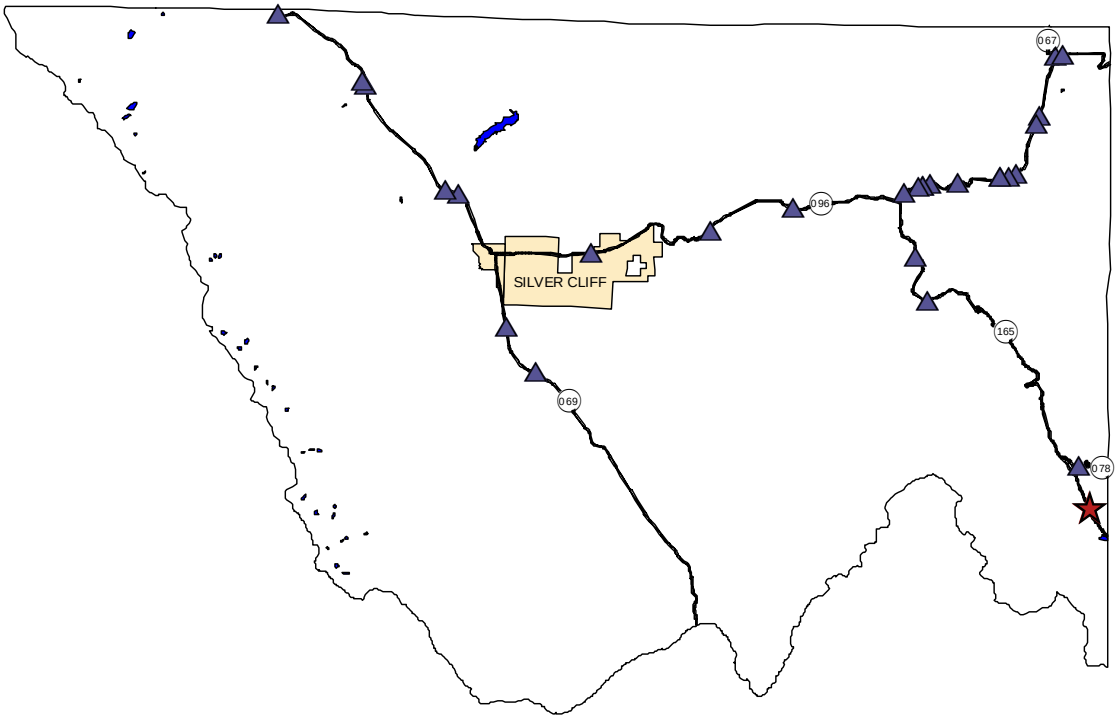
Crowley County
Location of Fatal and Injury Crashes, State and U.S. Highways



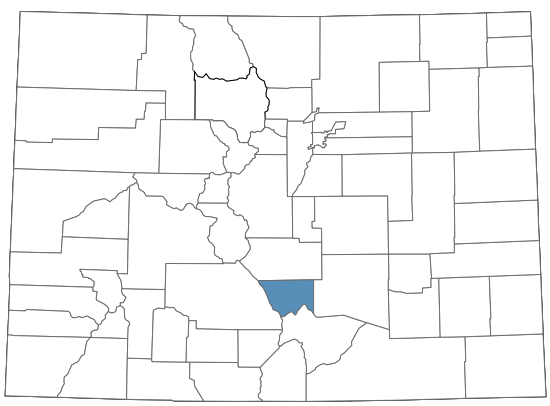
State of Colorado

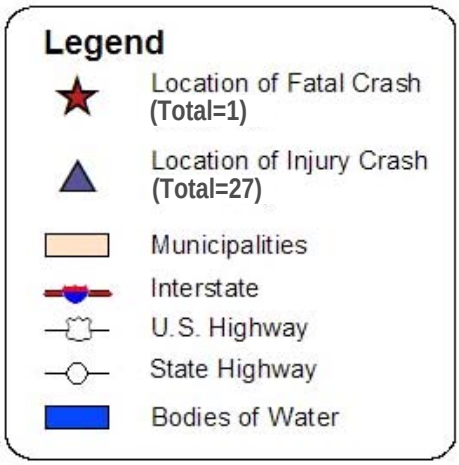


Custer County
Location of Fatal and Injury Crashes, State and U.S. Highways

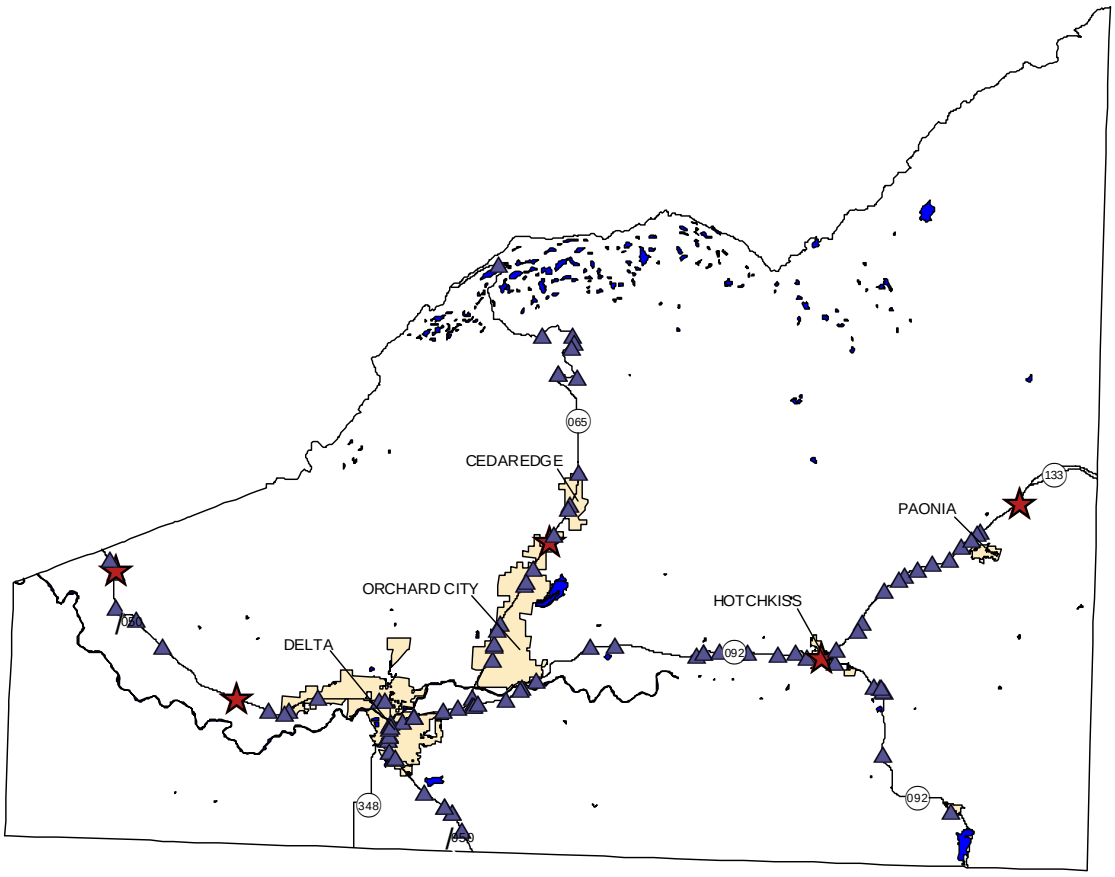


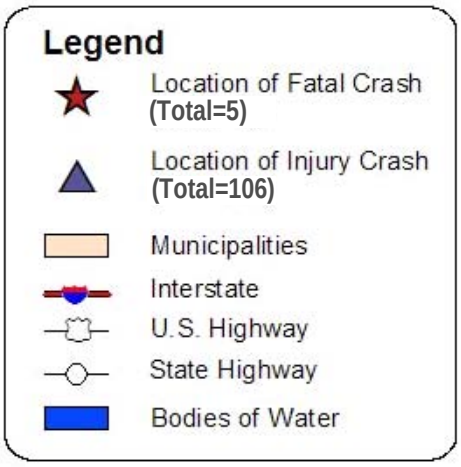
State of Colorado



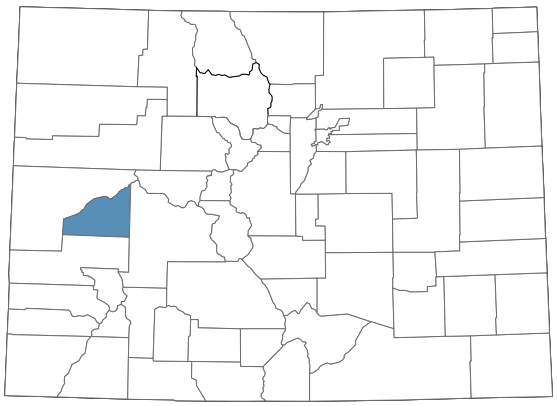


Delta County
Location of Fatal and Injury Crashes, State and U.S. Highways

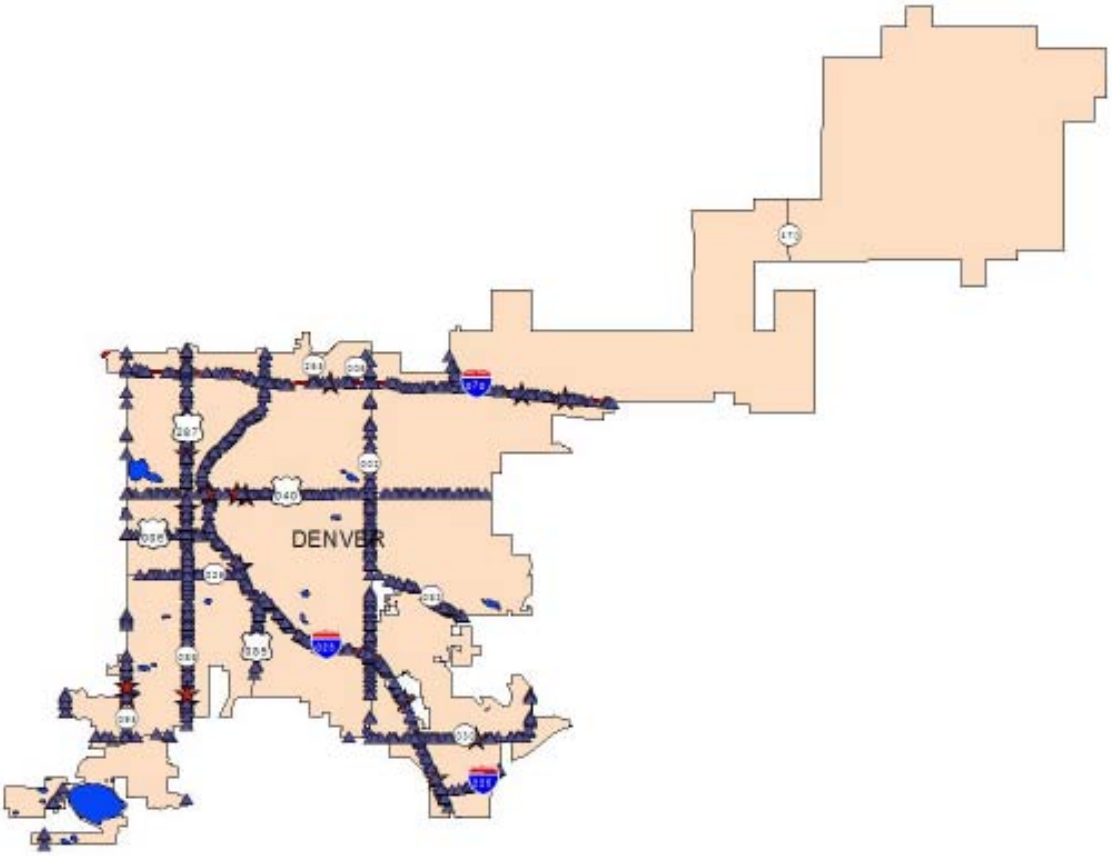




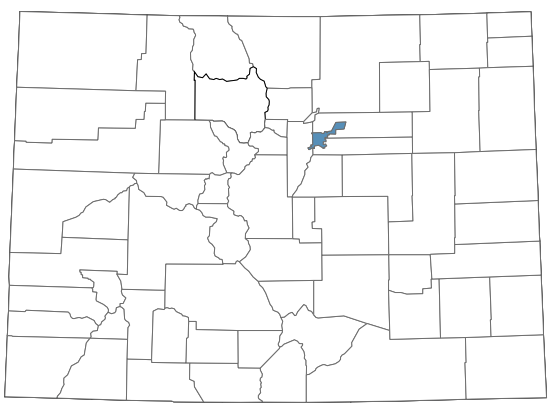
State of Colorado

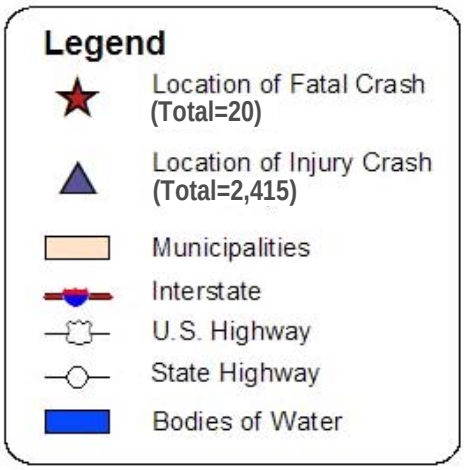


Denver County
Location of Fatal and Injury Crashes, State and U.S. Highways

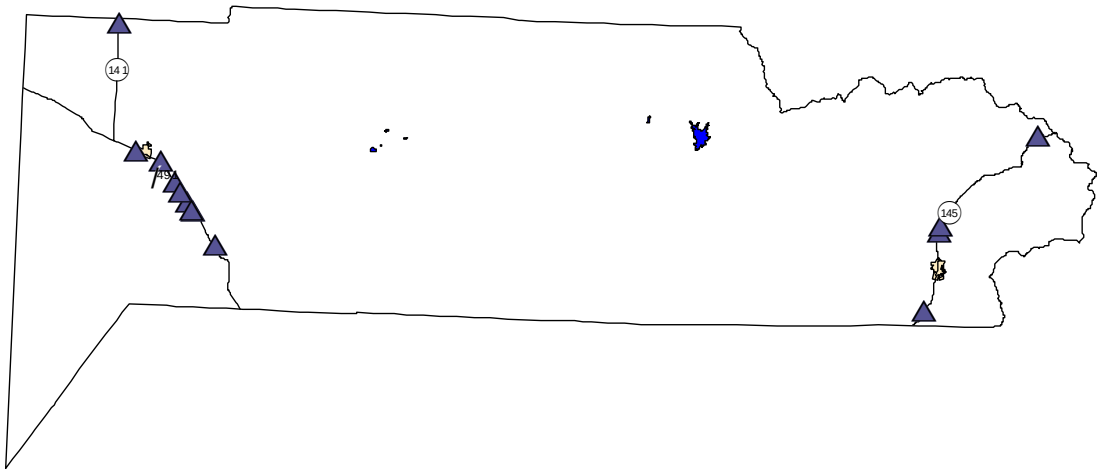


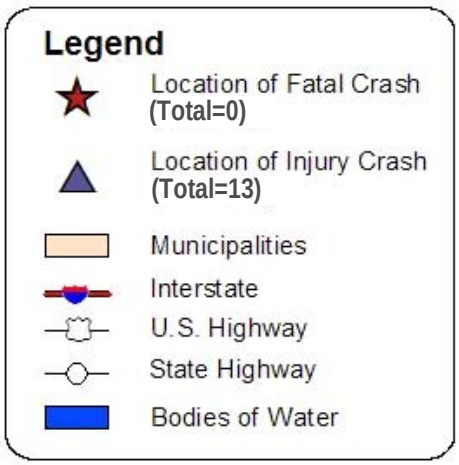
State of Colorado



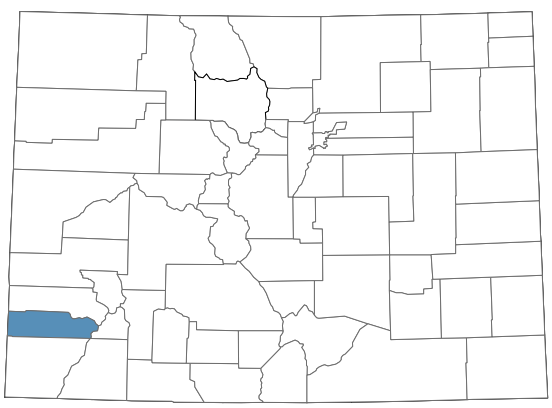


Dolores County
Location of Fatal and Injury Crashes, State and U.S. Highways

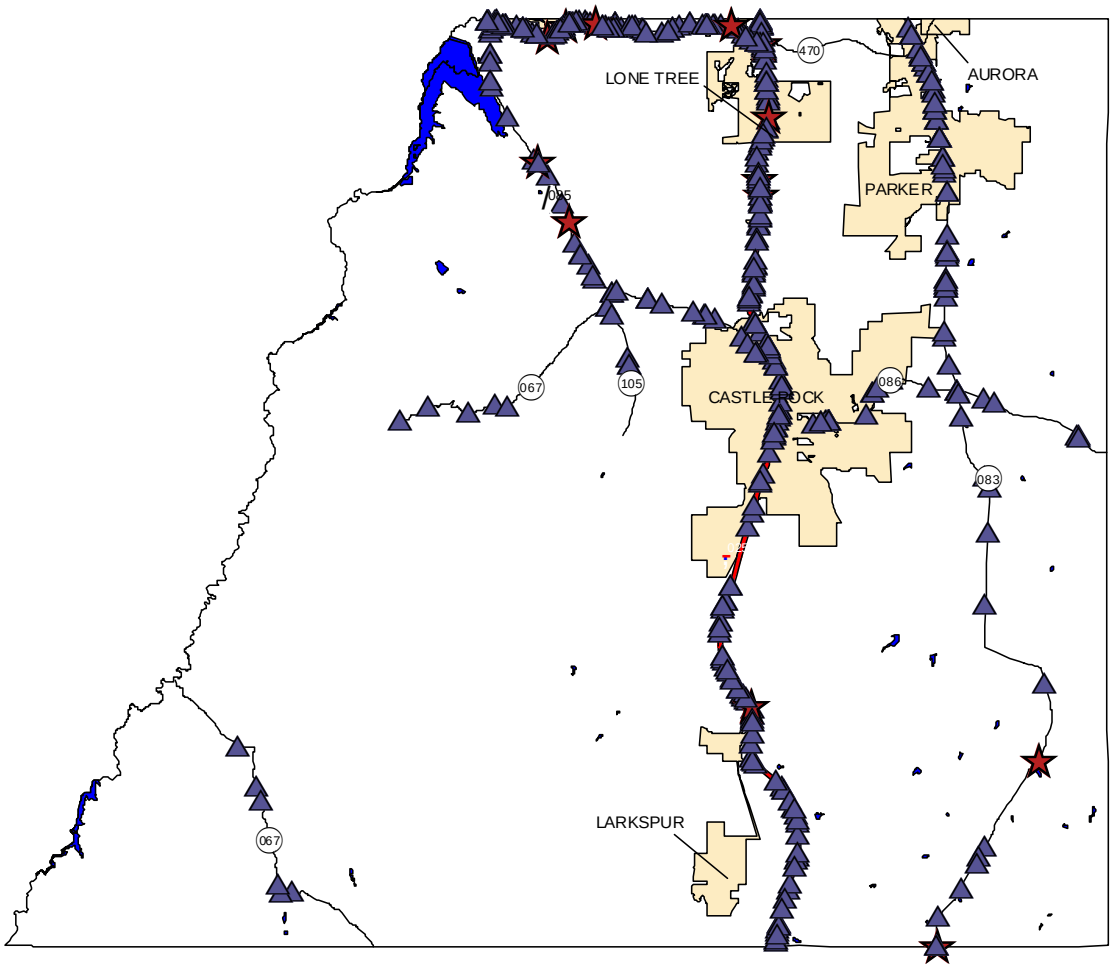




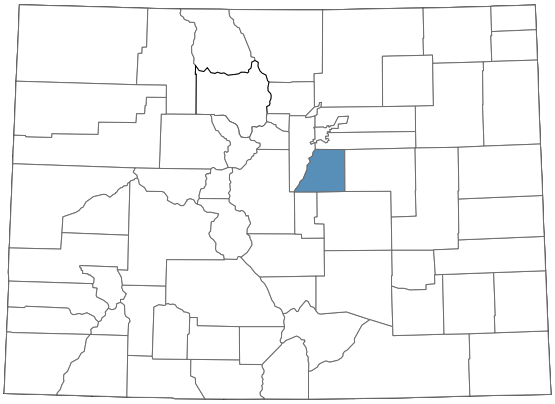
State of Colorado



Douglas County
Location of Fatal and Injury Crashes, State and U.S. Highways



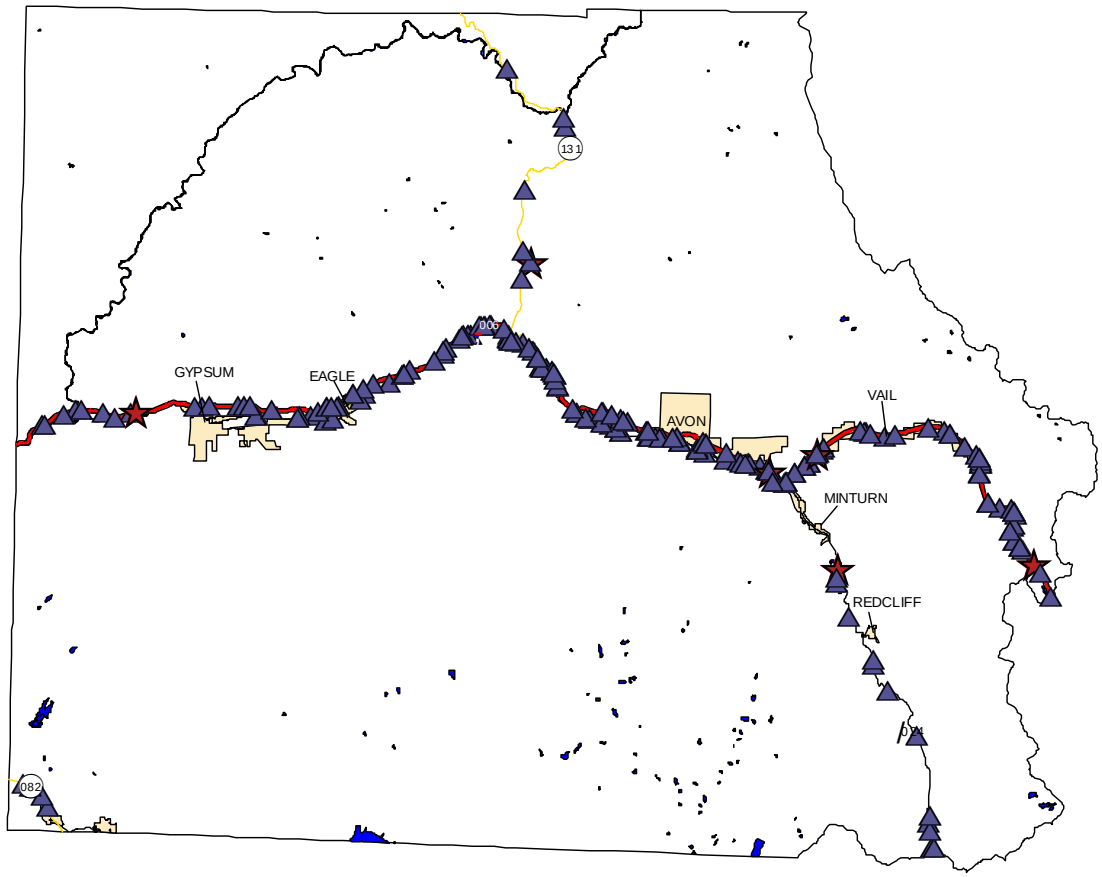
State of Colorado

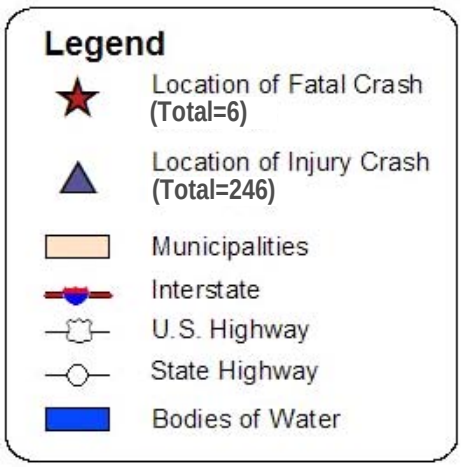


Legend

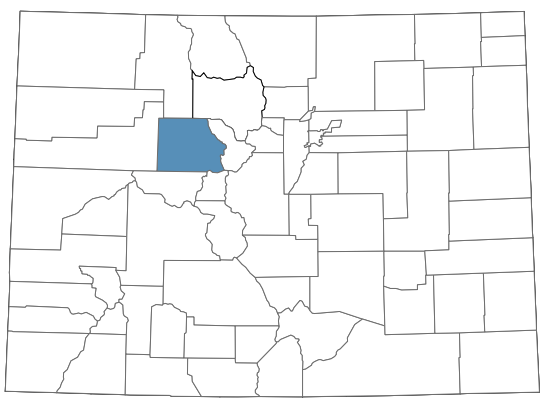
- Location of Fatal Crash (Total=13)
- Location of Injury Crash (Total=546)
- Municipalities
- Interstate
- U.S. Highway
- State Highway
- Bodies of Water

Eagle County
Location of Fatal and Injury Crashes, State and U.S. Highways

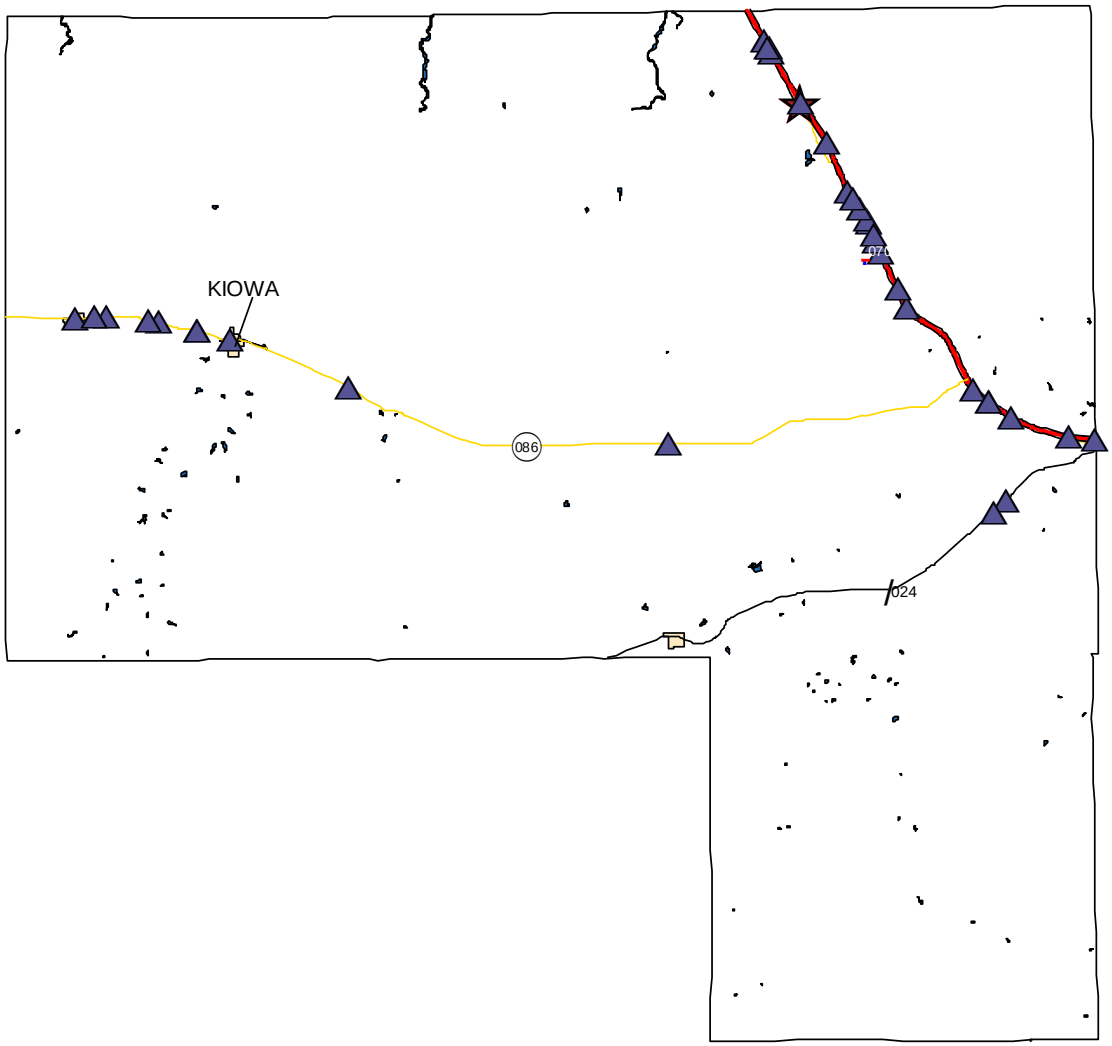




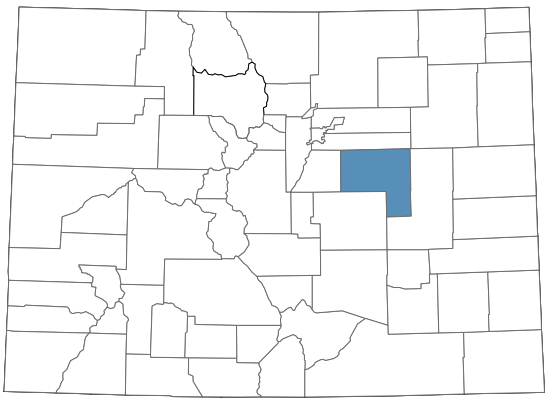
State of Colorado

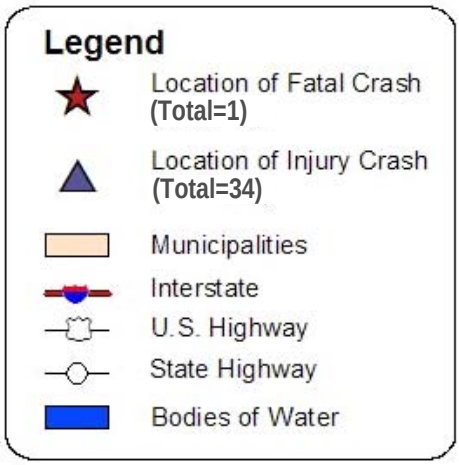


Elbert County
Location of Fatal and Injury Crashes, State and U.S. Highways

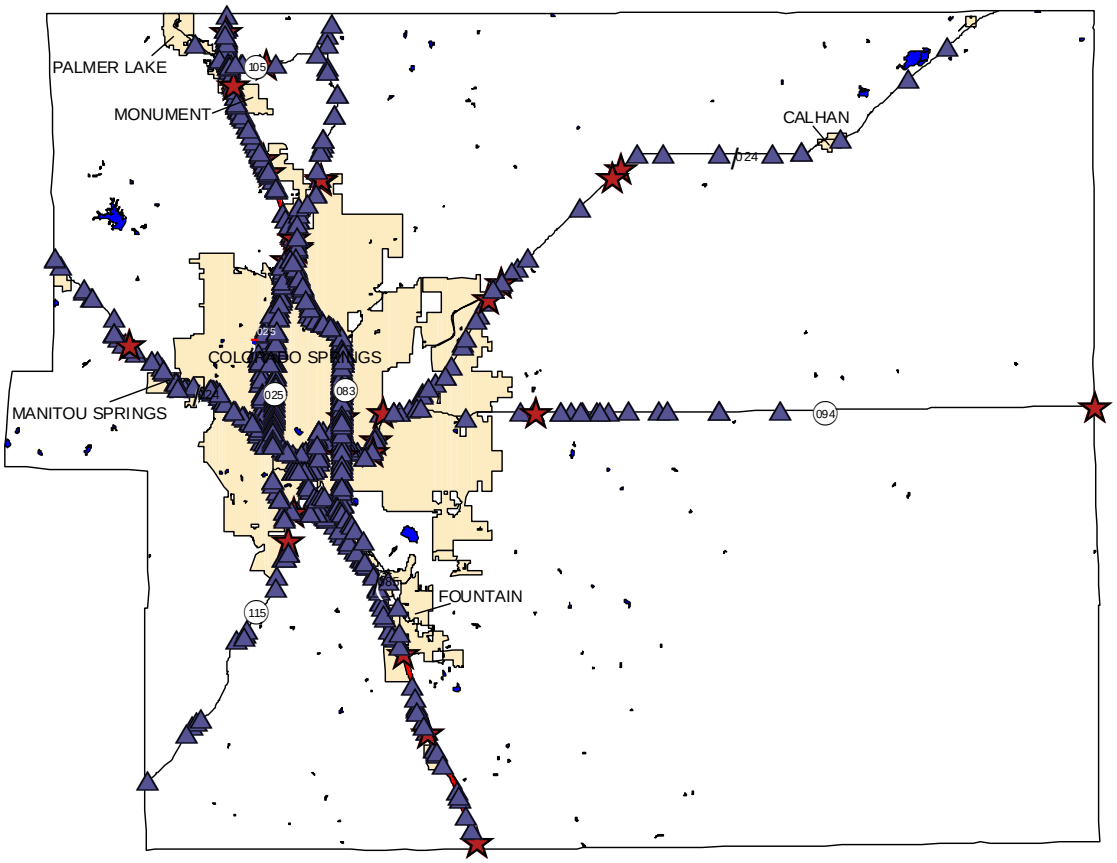


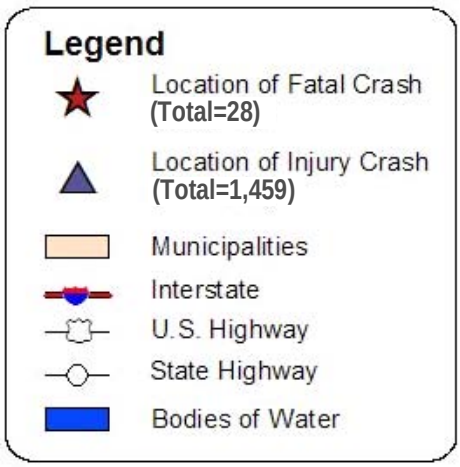
State of Colorado



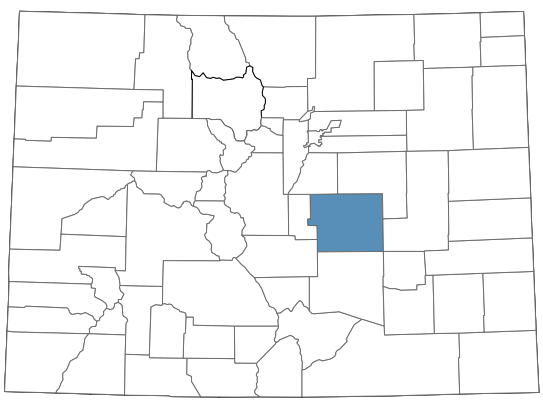


El Paso County
Location of Fatal and Injury Crashes, State and U.S. Highways

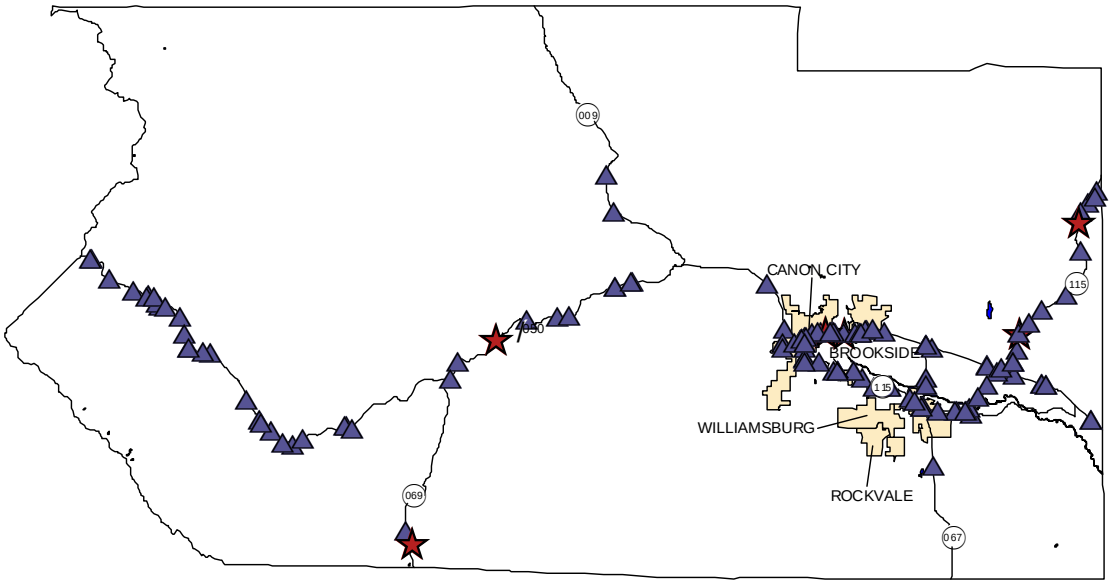




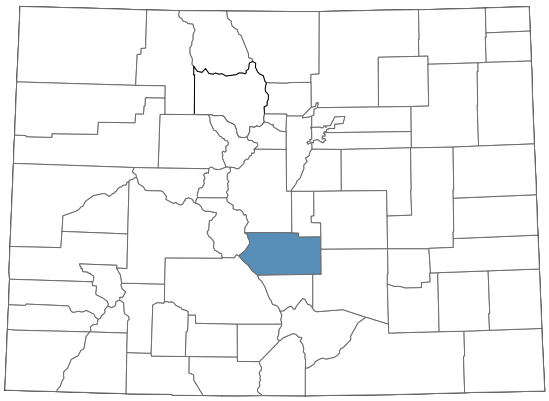
State of Colorado

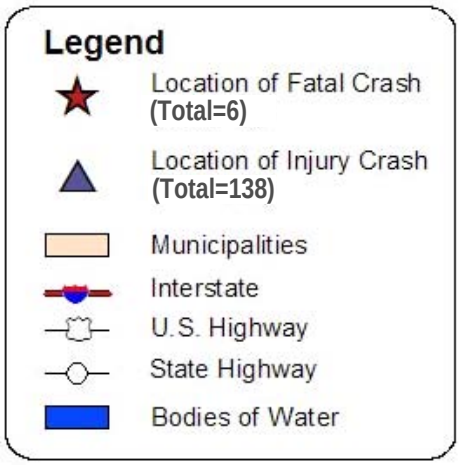


Fremont County
Location of Fatal and Injury Crashes, State and U.S. Highways

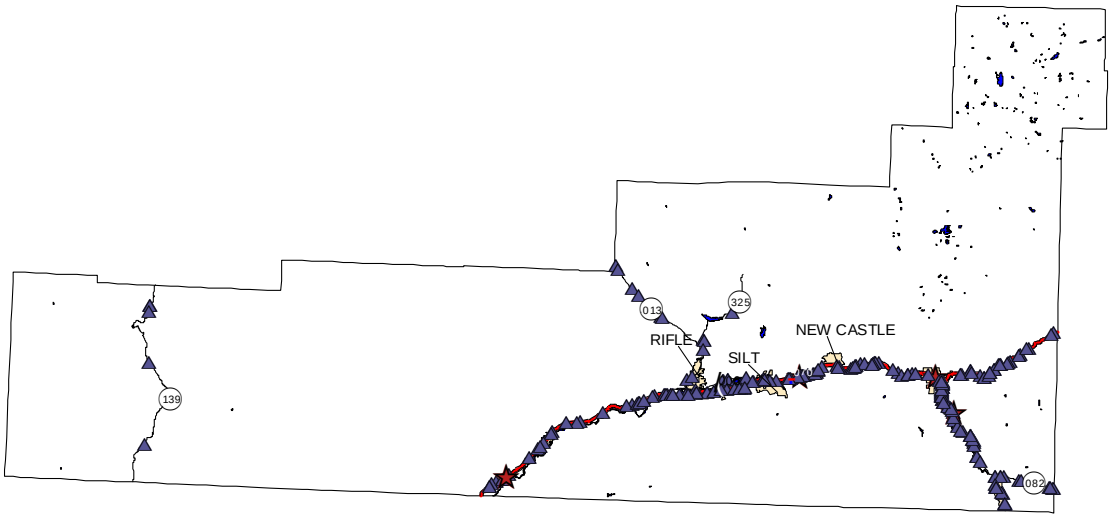


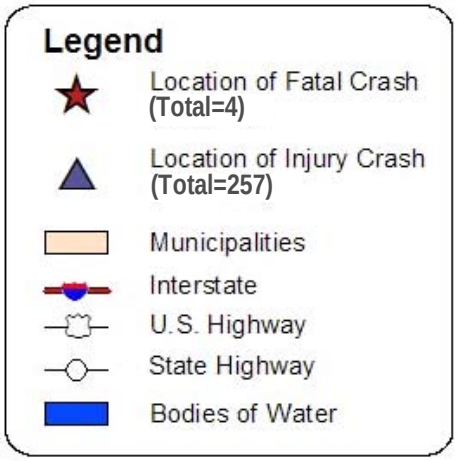
State of Colorado



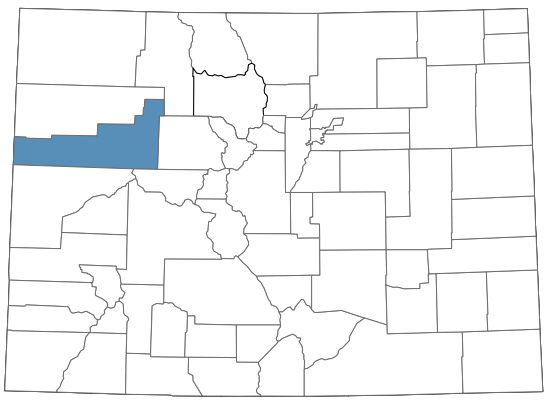


Garfield County
Location of Fatal and Injury Crashes, State and U.S. Highways

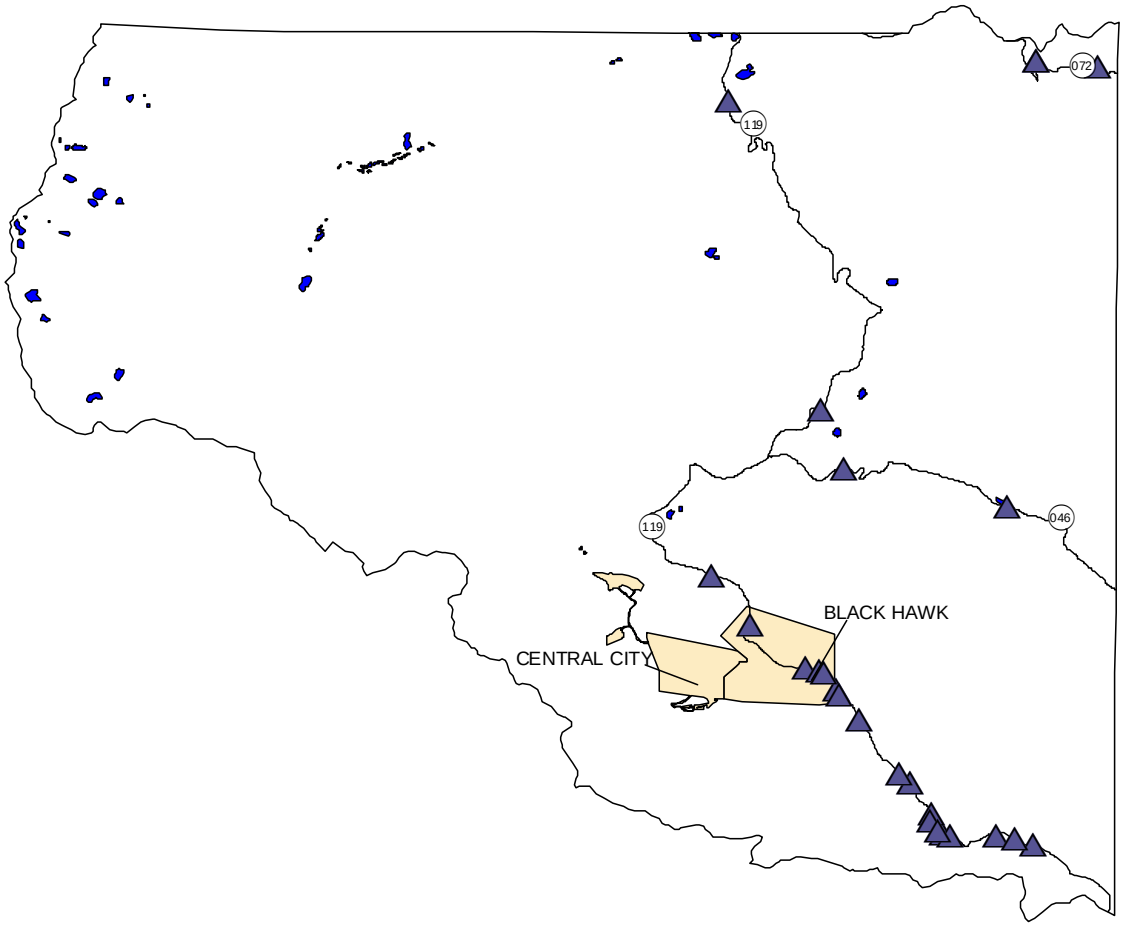




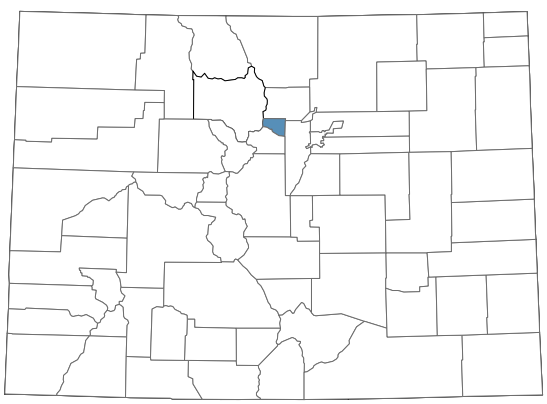
State of Colorado

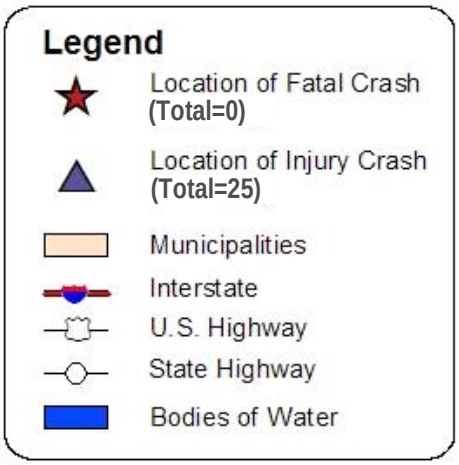


Gilpin County
Location of Fatal and Injury Crashes, State and U.S. Highways

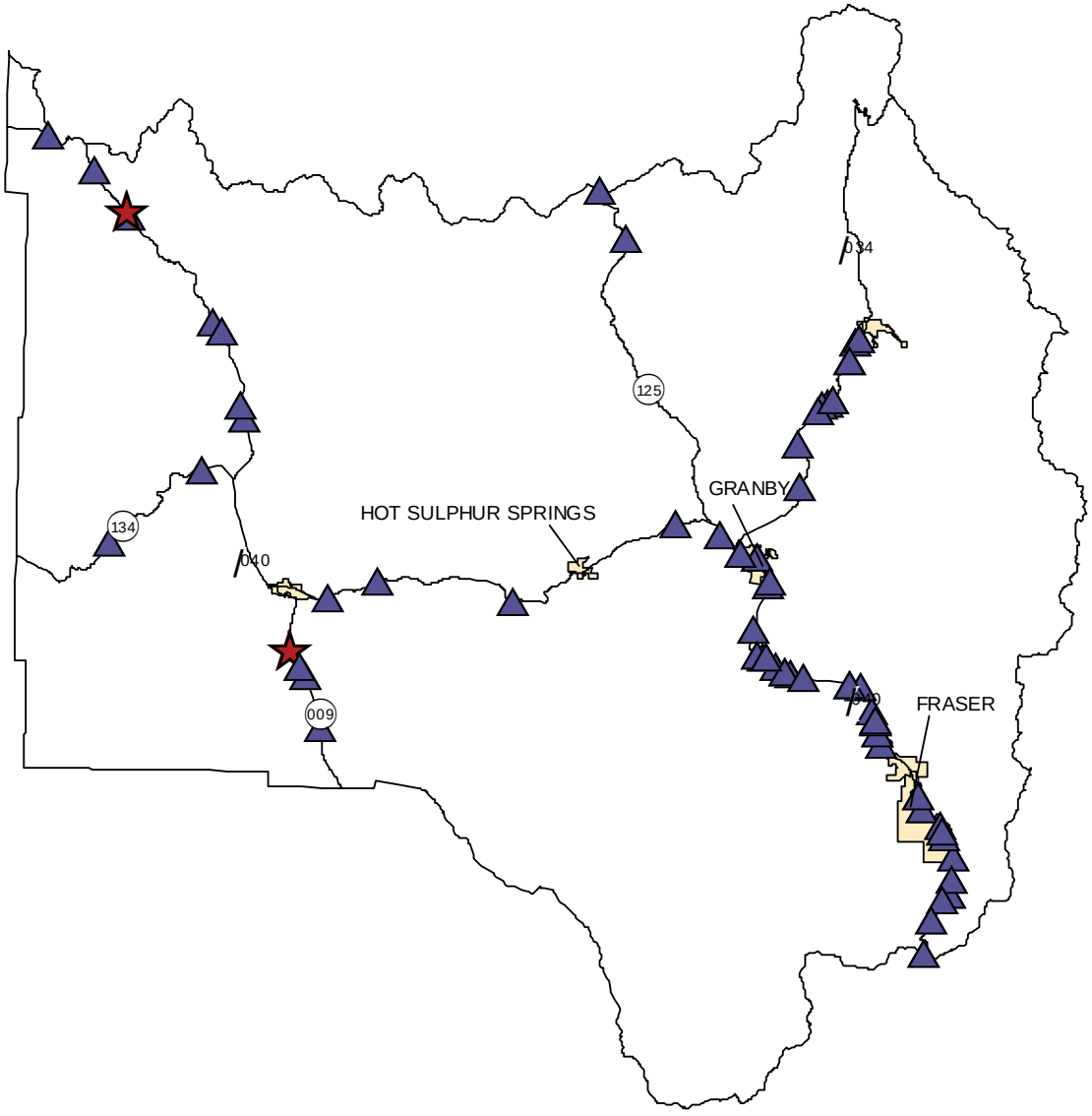


State of Colorado

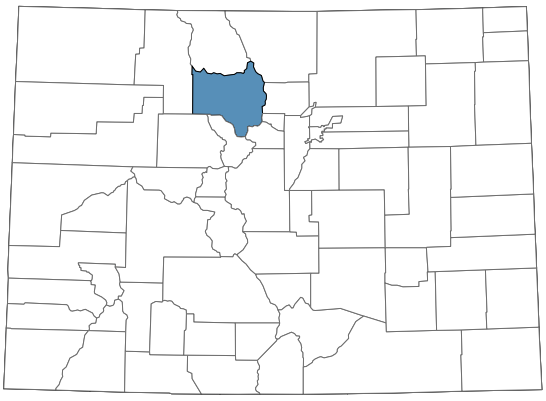




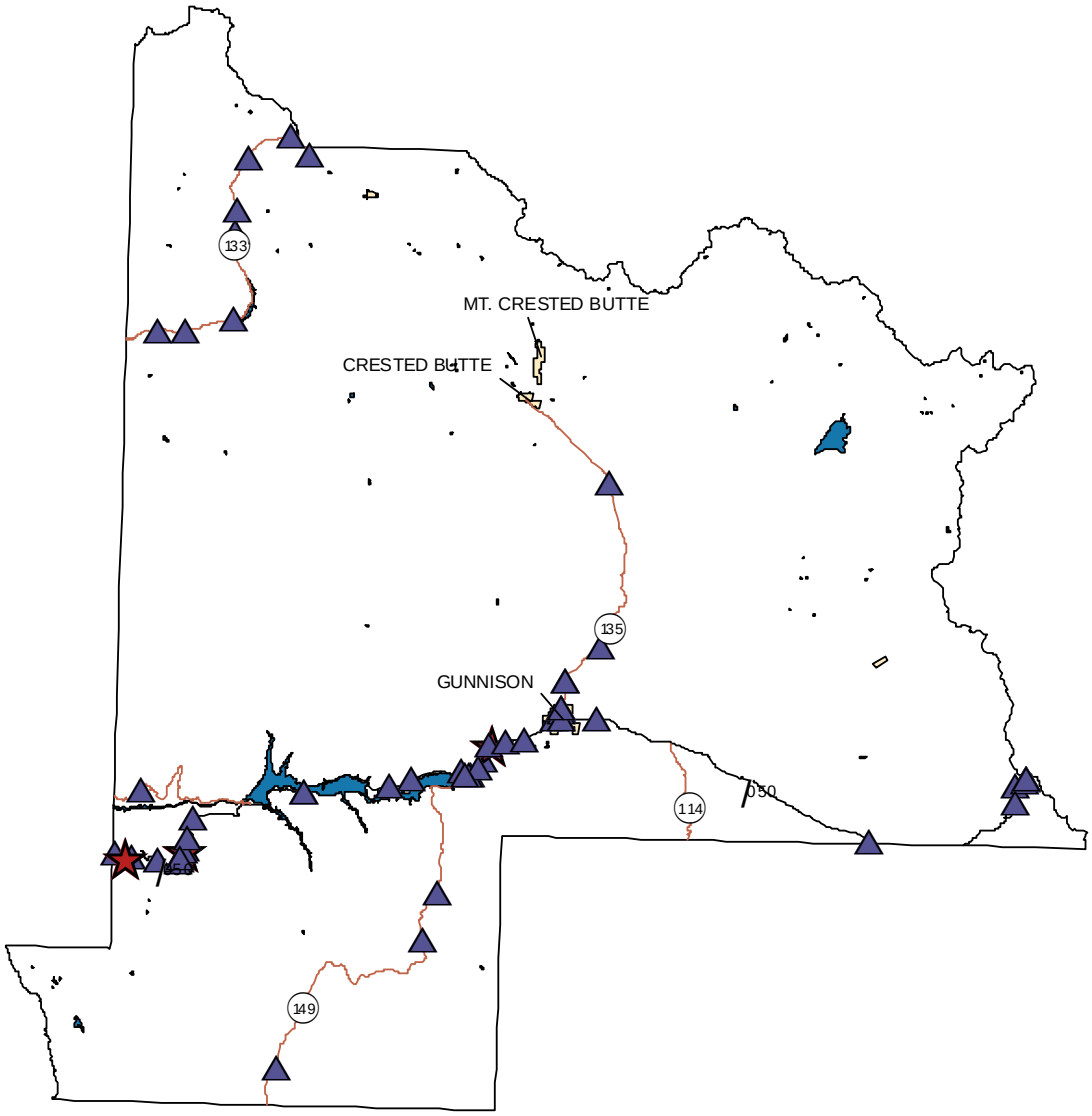
Grand County
Location of Fatal and Injury Crashes, State and U.S. Highways



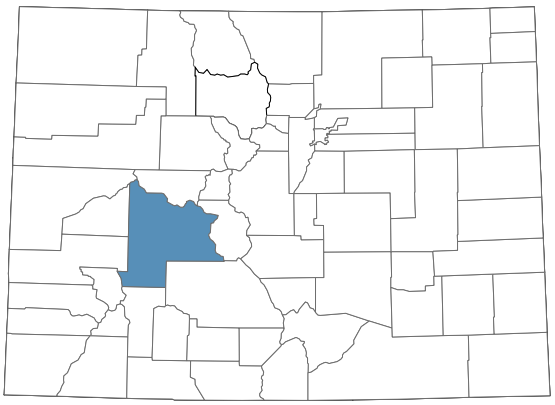
State of Colorado

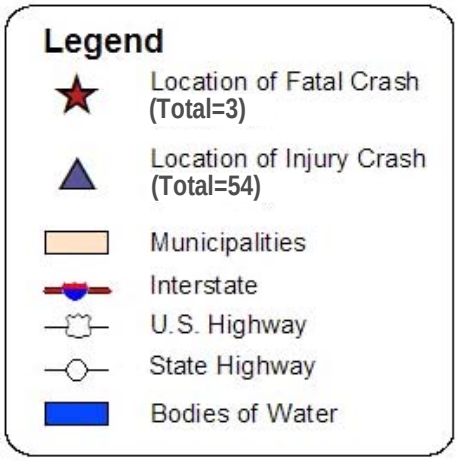


Gunnison County
Location of Fatal and Injury Crashes, State and U.S. Highways

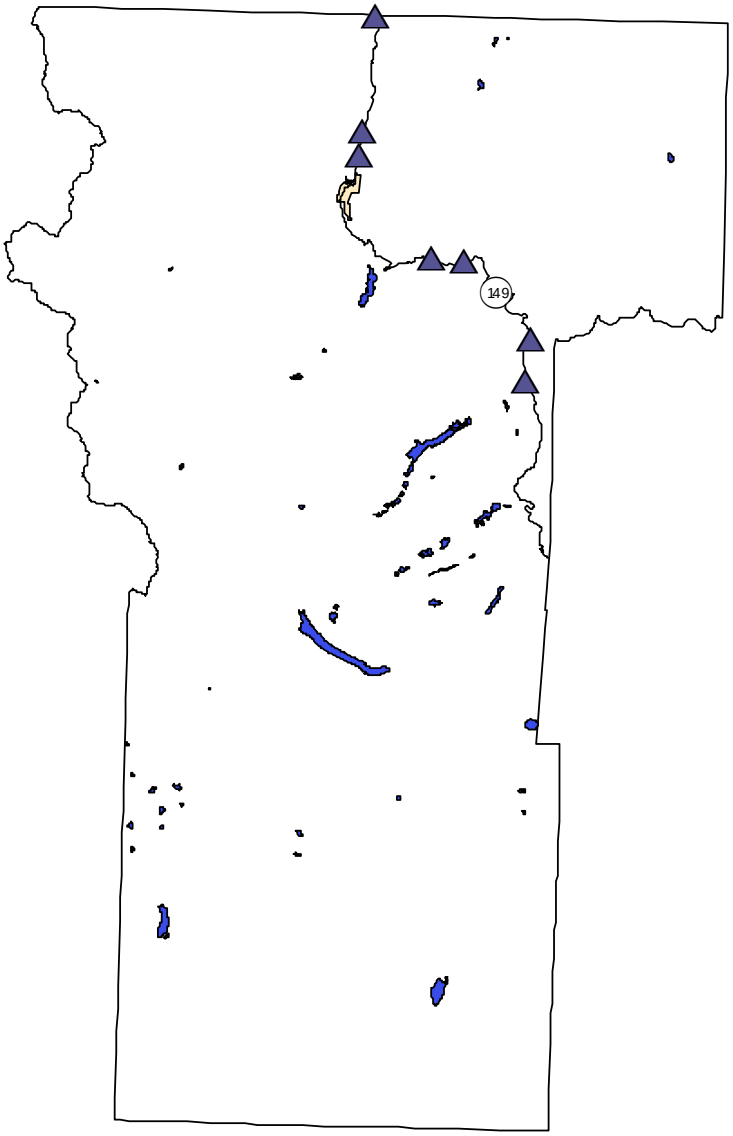


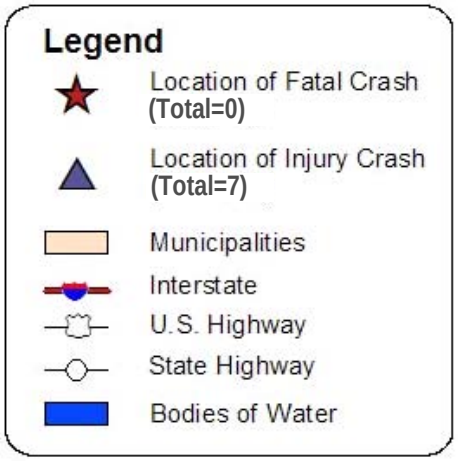
State of Colorado



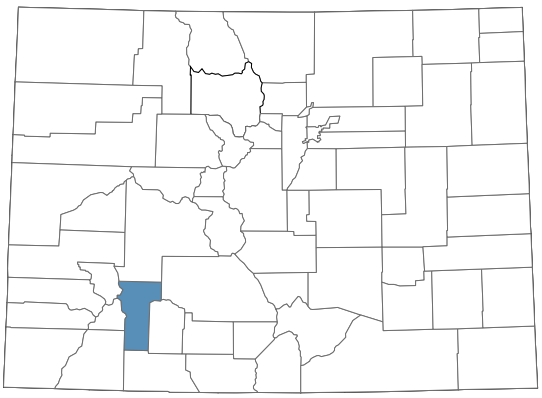


Hinsdale County
Location of Fatal and Injury Crashes, State and U.S. Highways

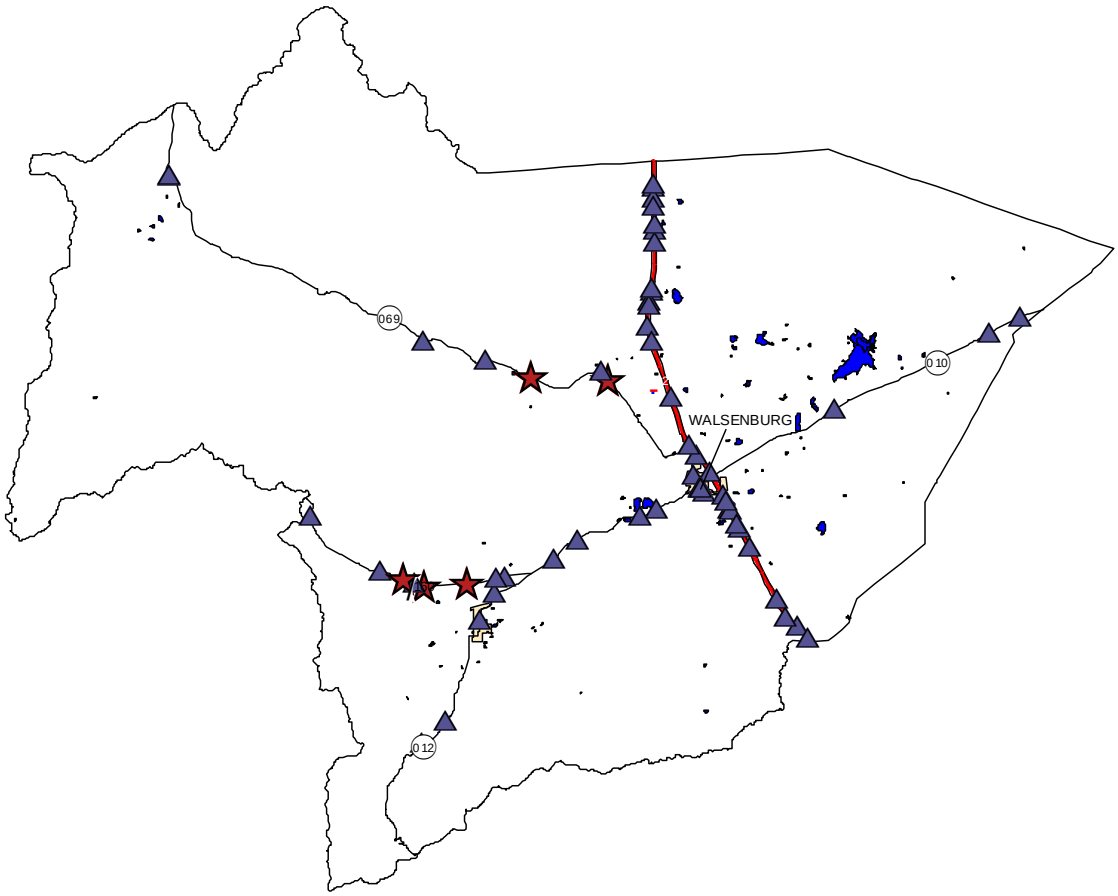




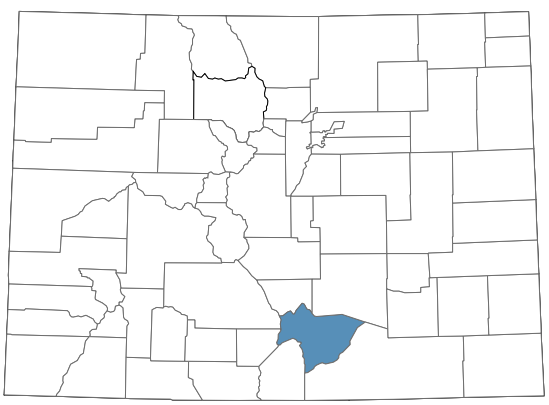
State of Colorado

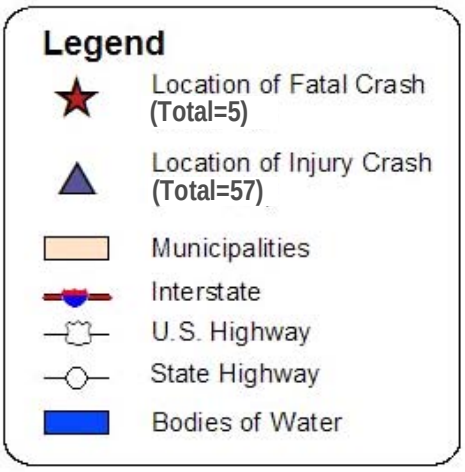


Huerfano County
Location of Fatal and Injury Crashes, State and U.S. Highways

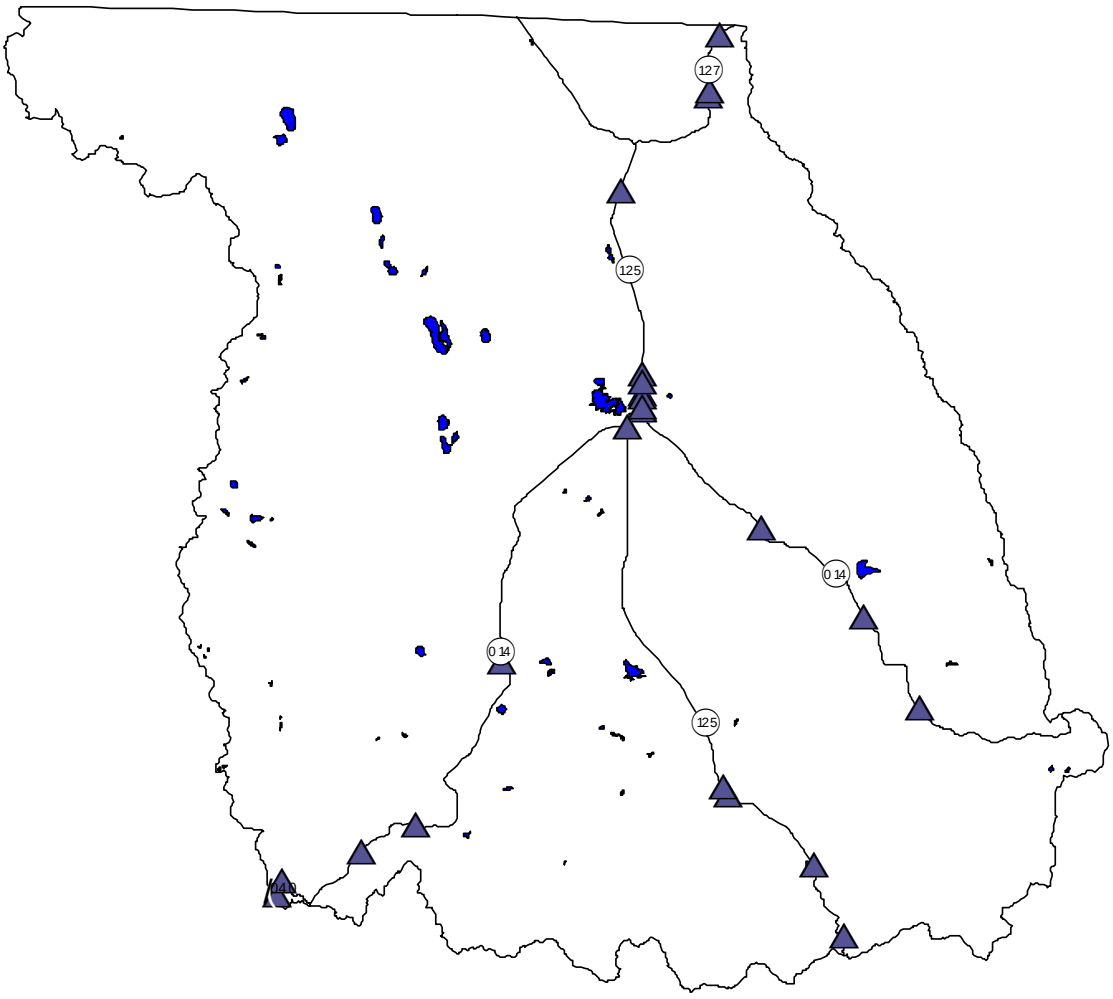


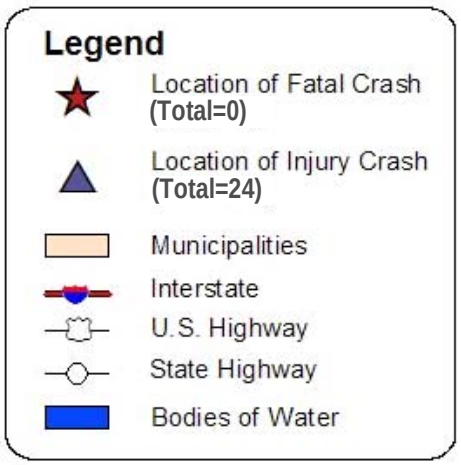
State of Colorado



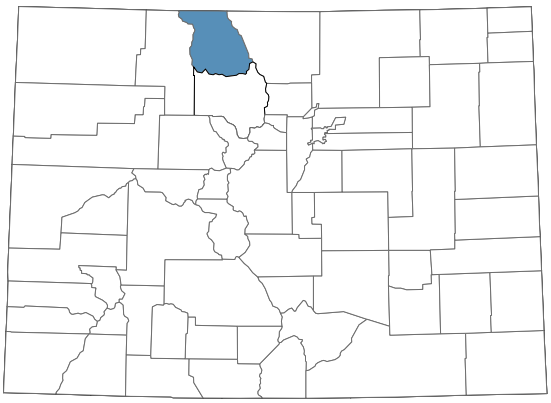


Jackson County
Location of Fatal and Injury Crashes, State and U.S. Highways

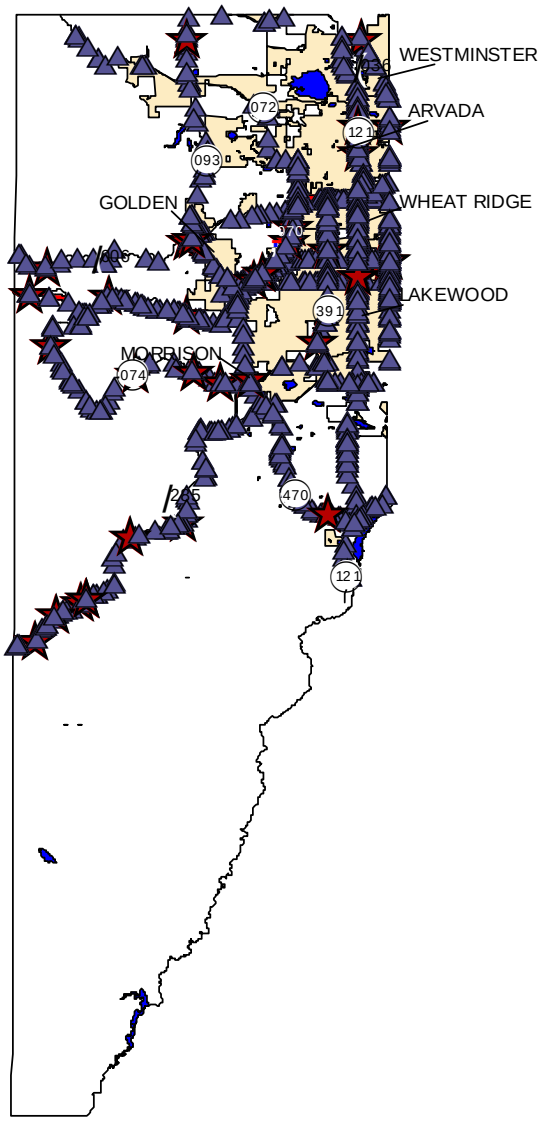




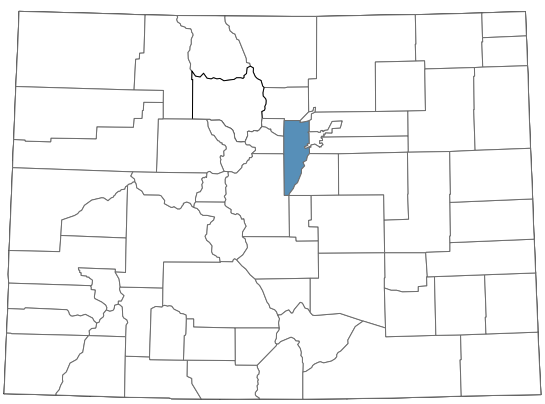
State of Colorado

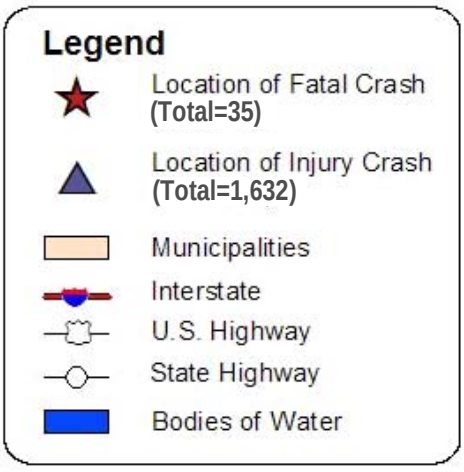


Jefferson County
Location of Fatal and Injury Crashes, State and U.S. Highways

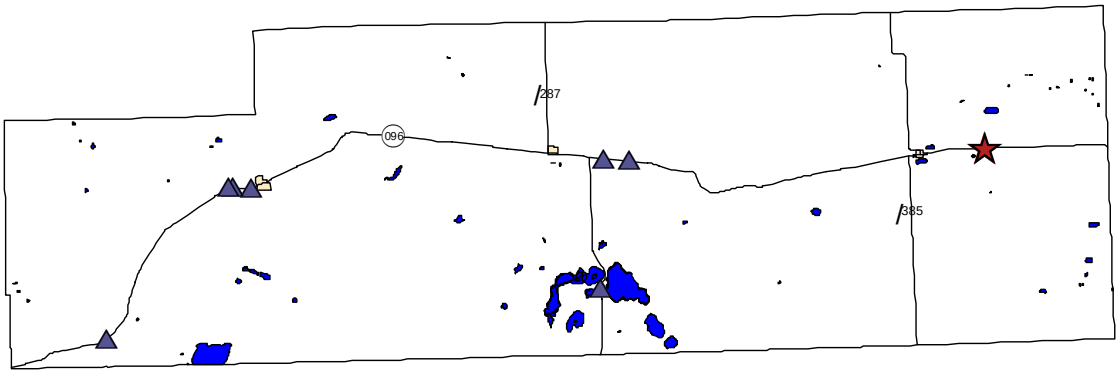


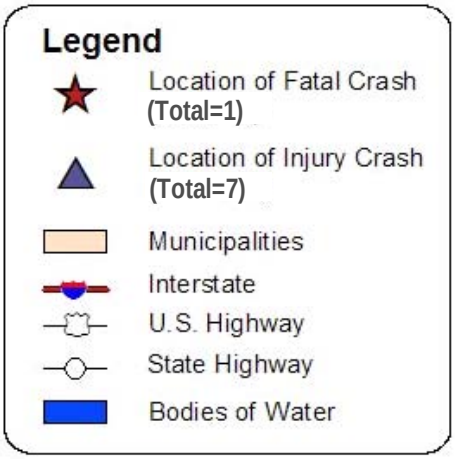
State of Colorado



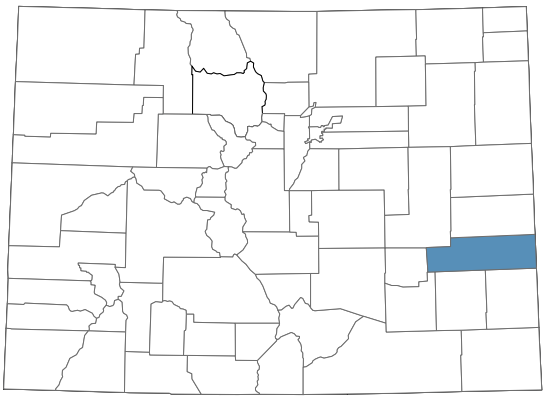


Kiowa County
Location of Fatal and Injury Crashes, State and U.S. Highways

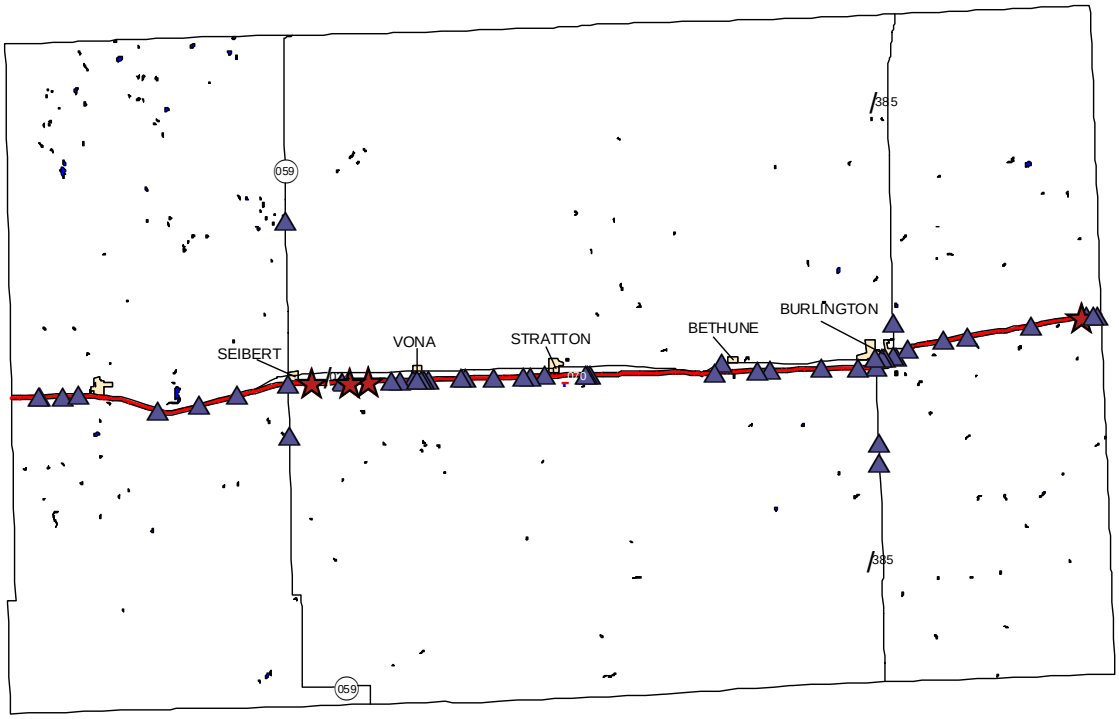




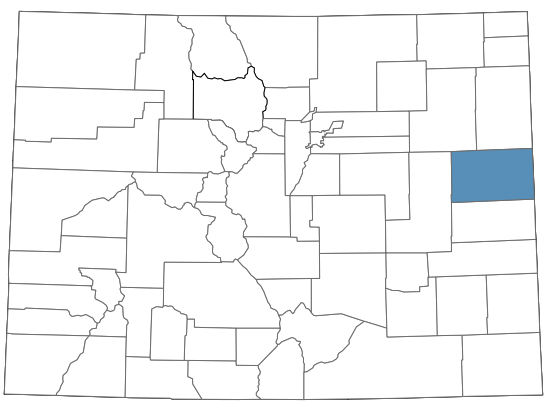
State of Colorado

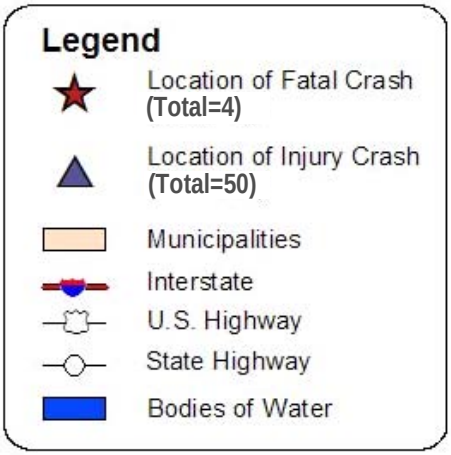


Kit Carson County
Location of Fatal and Injury Crashes, State and U.S. Highways

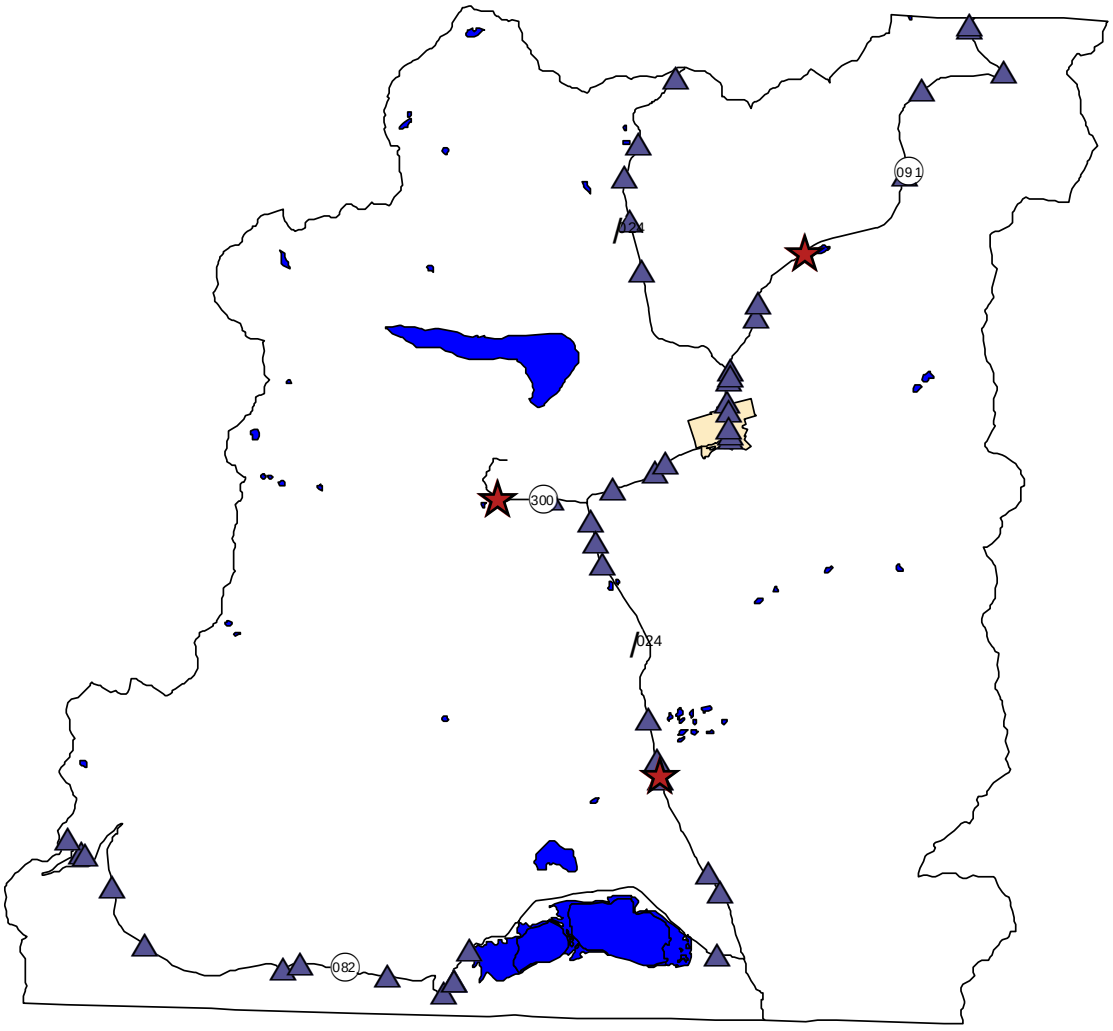


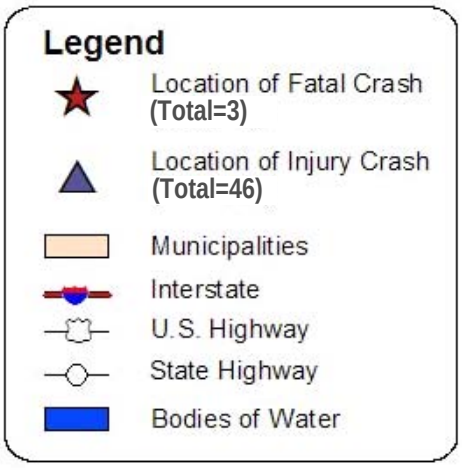
State of Colorado



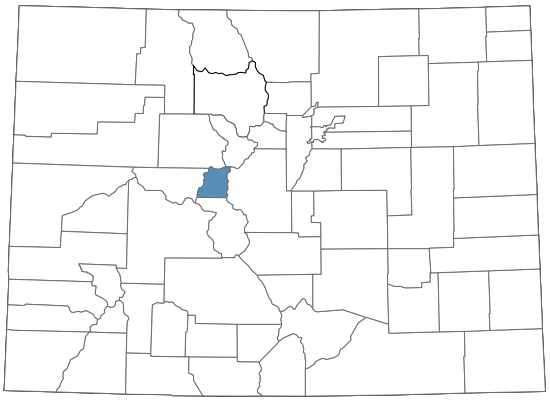


Lake County
Location of Fatal and Injury Crashes, State and U.S. Highways

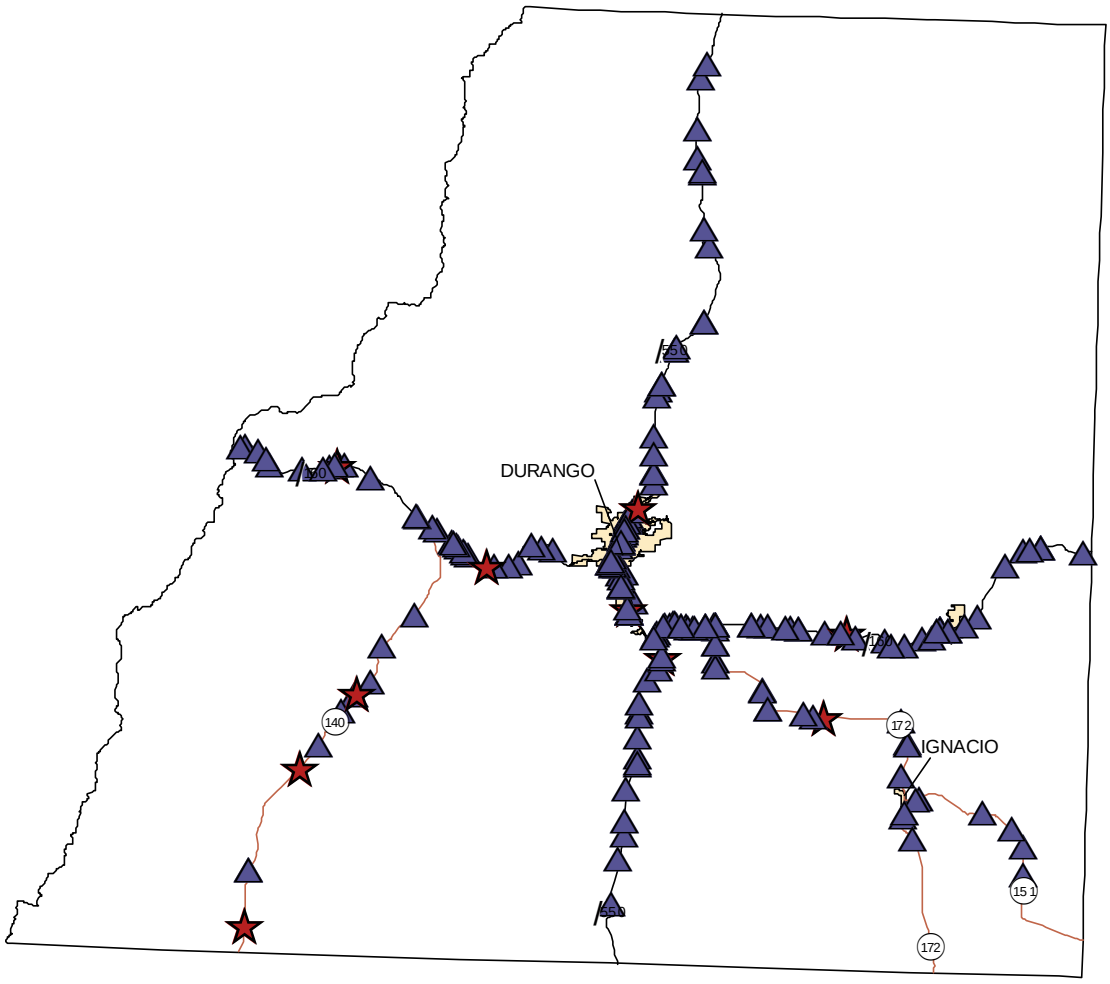




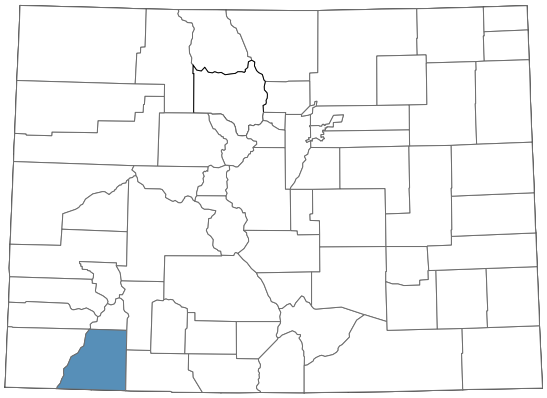
State of Colorado

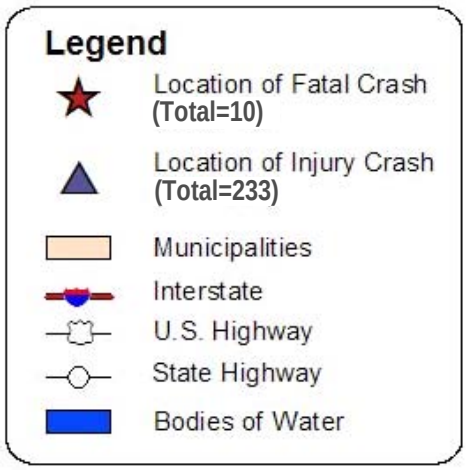


LaPlata County
Location of Fatal and Injury Crashes, State and U.S. Highways

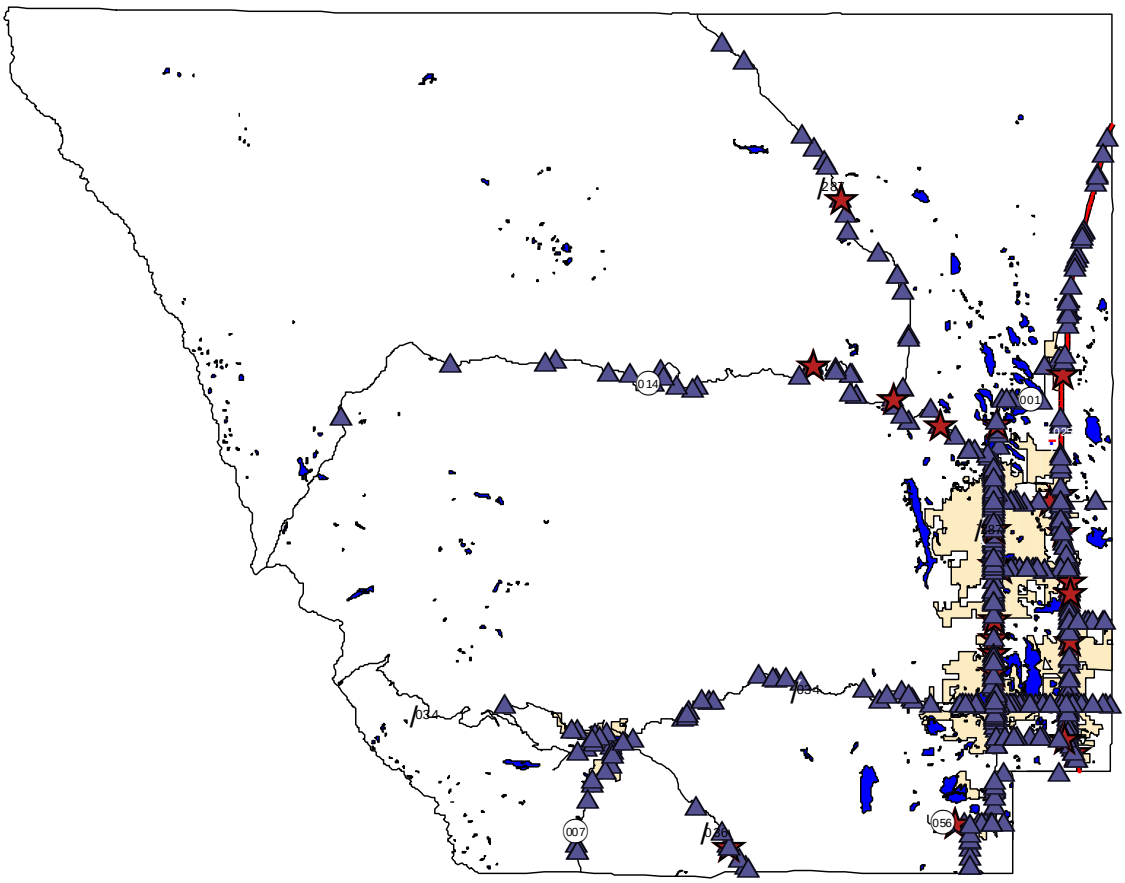


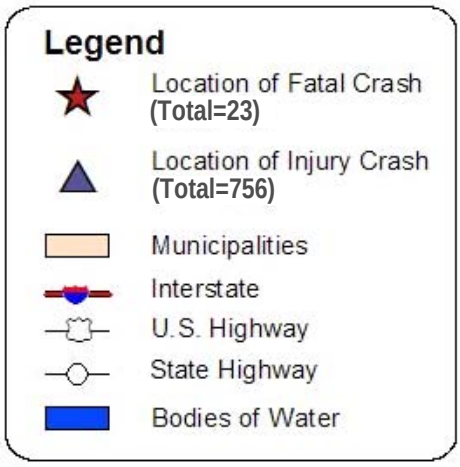
State of Colorado



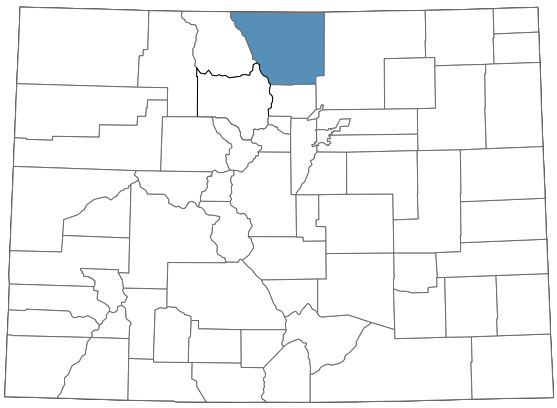


Larimer County
Location of Fatal and Injury Crashes, State and U.S. Highways

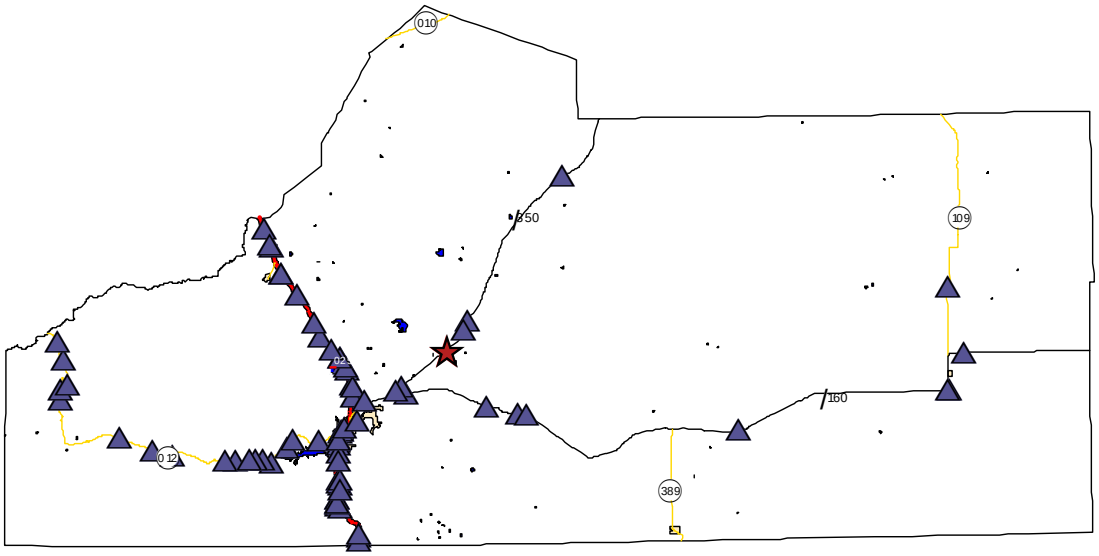




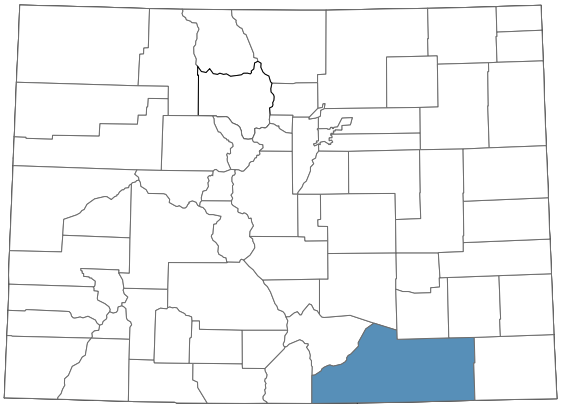
State of Colorado

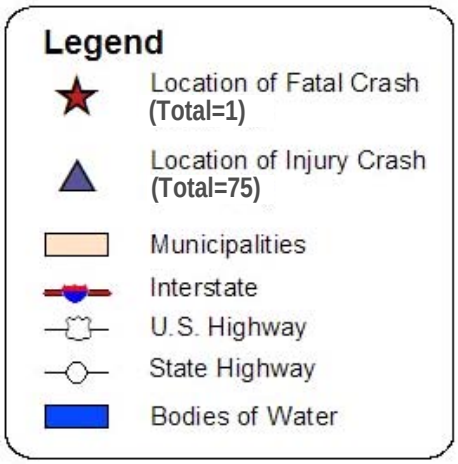


Las Animas County
Location of Fatal and Injury Crashes, State and U.S. Highways

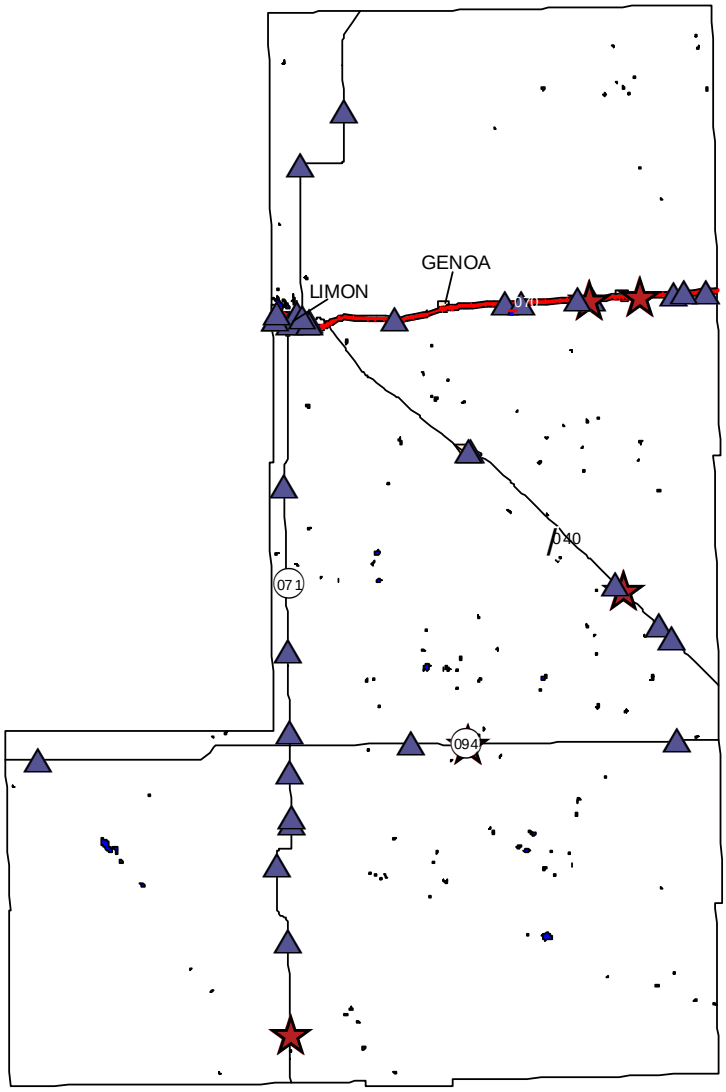


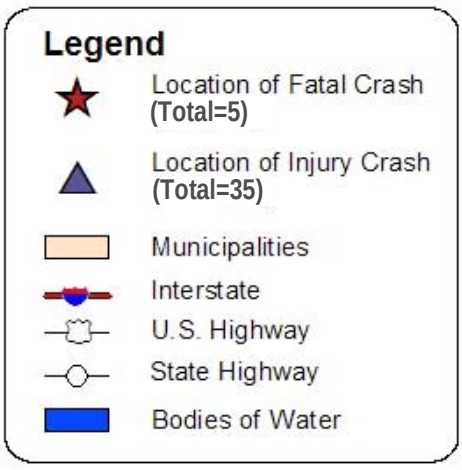
State of Colorado



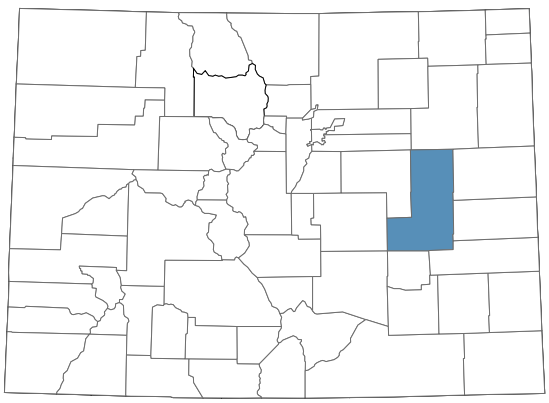


Lincoln County
Location of Fatal and Injury Crashes, State and U.S. Highways

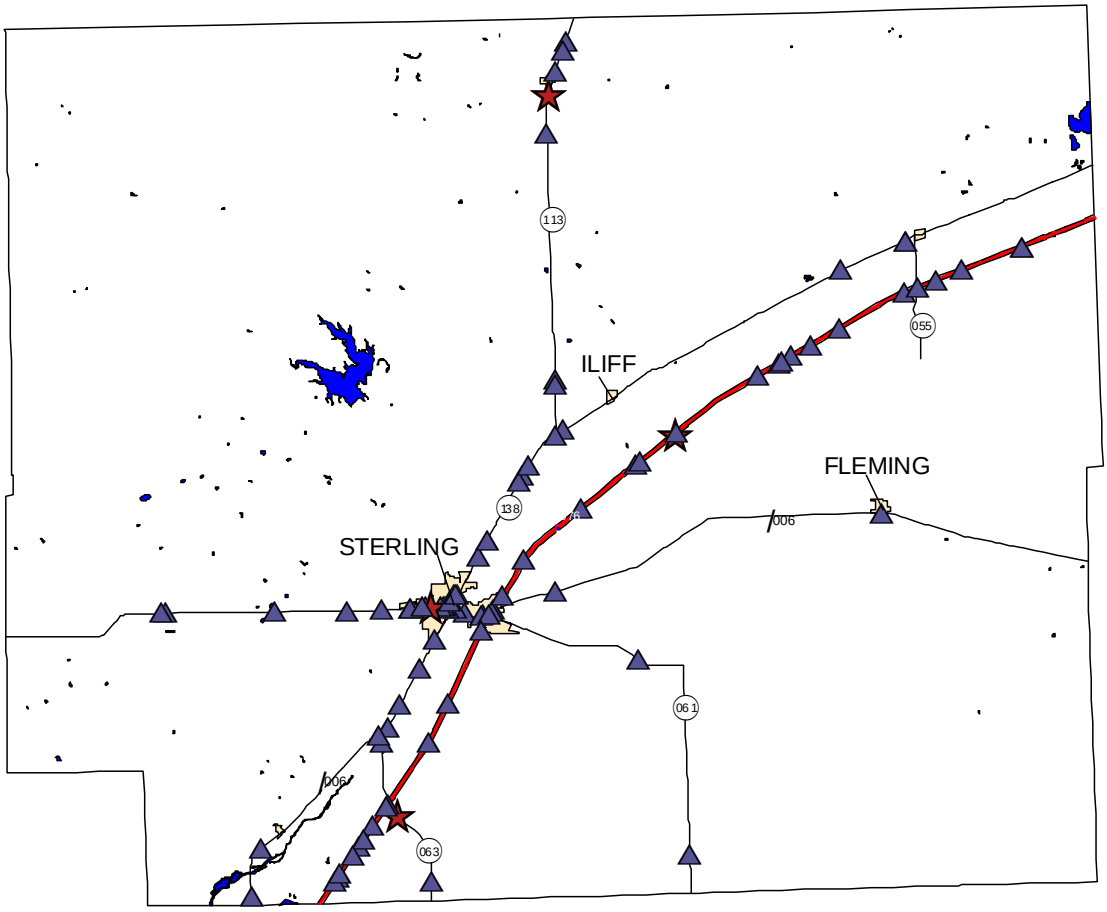




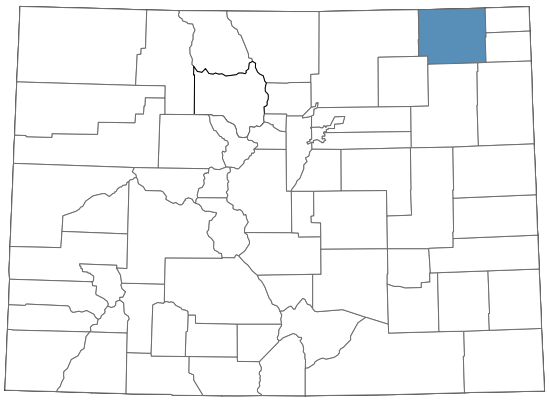
State of Colorado

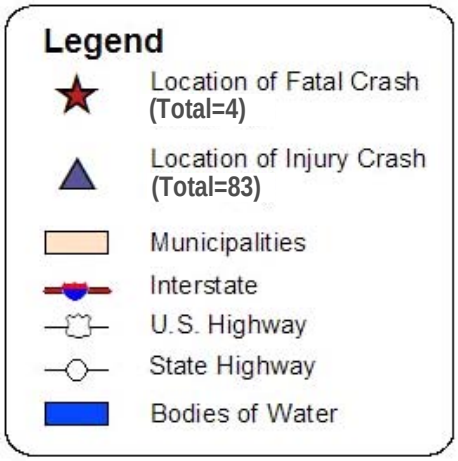


Logan County
Location of Fatal and Injury Crashes, State and U.S. Highways

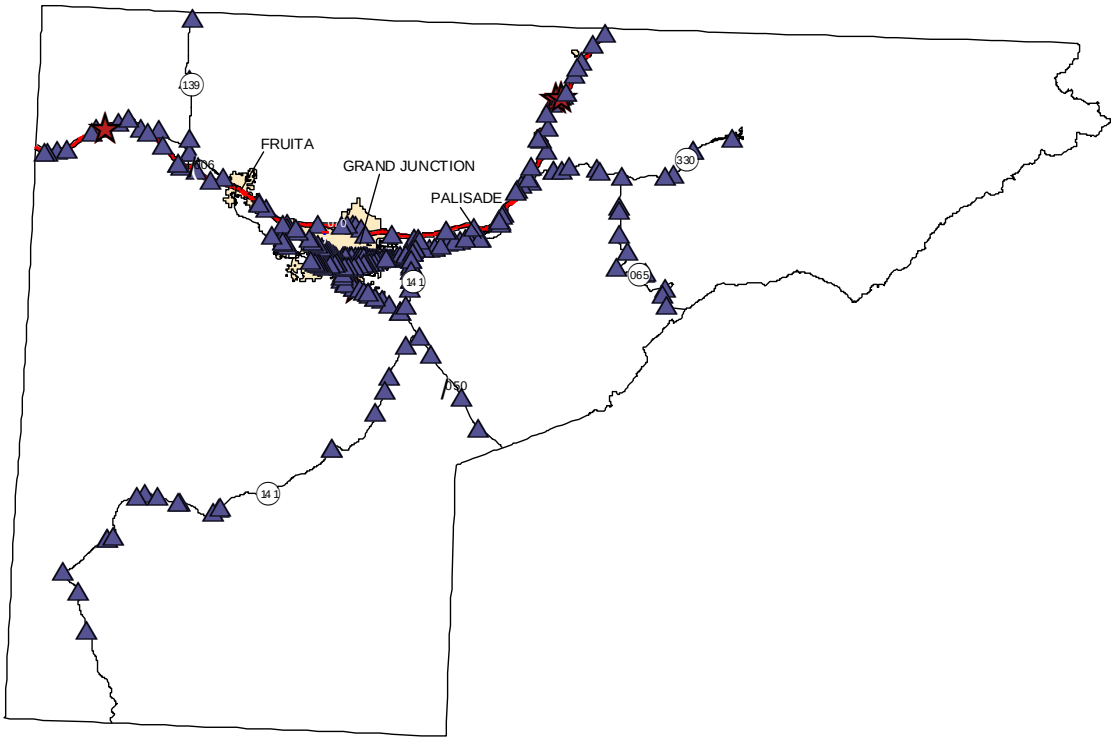


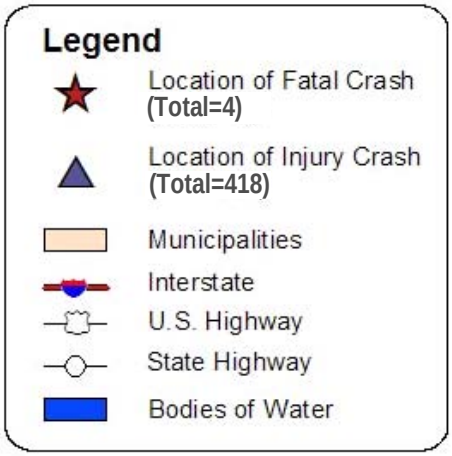
State of Colorado



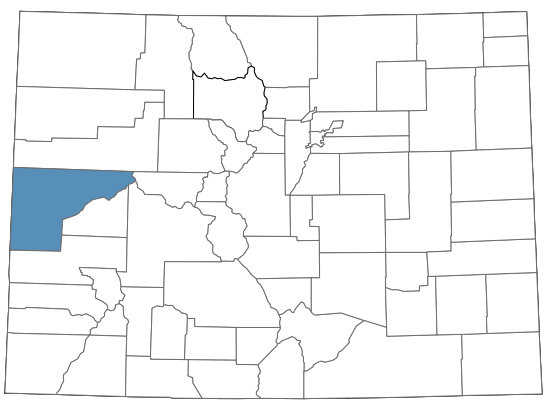


Mesa County
Location of Fatal and Injury Crashes, State and U.S. Highways

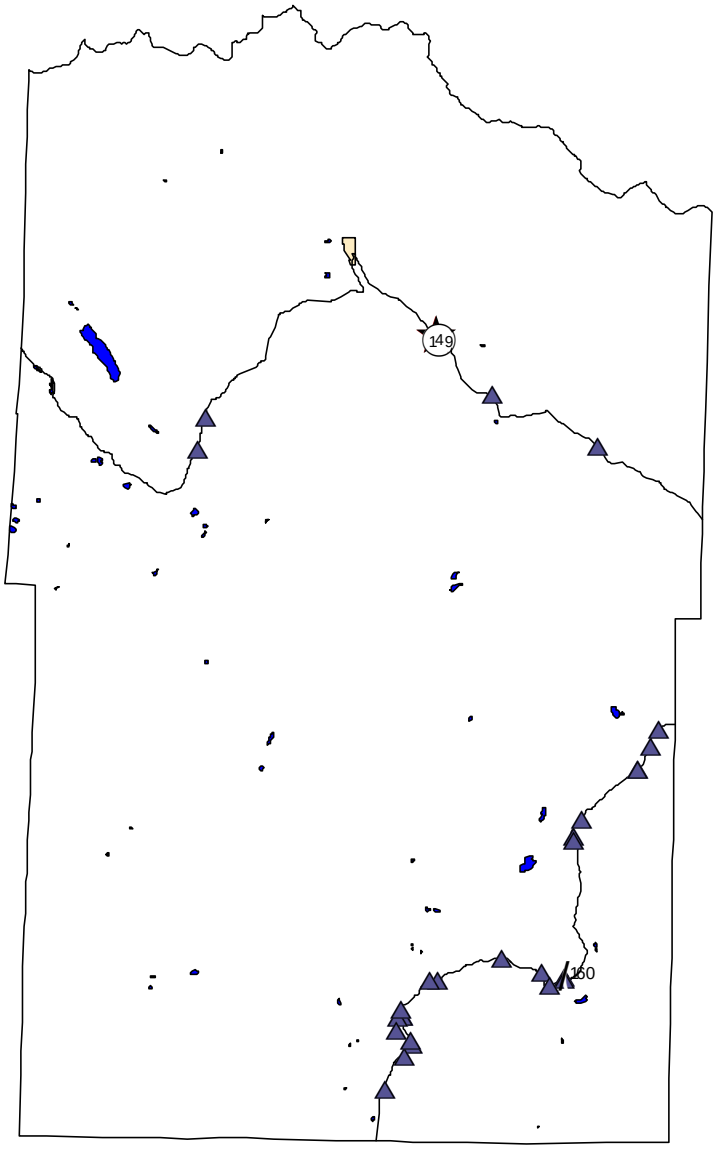




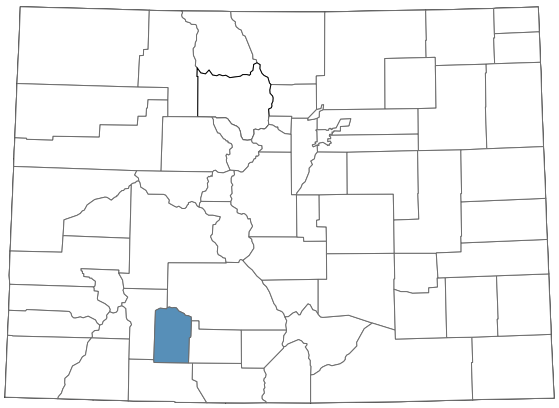
State of Colorado

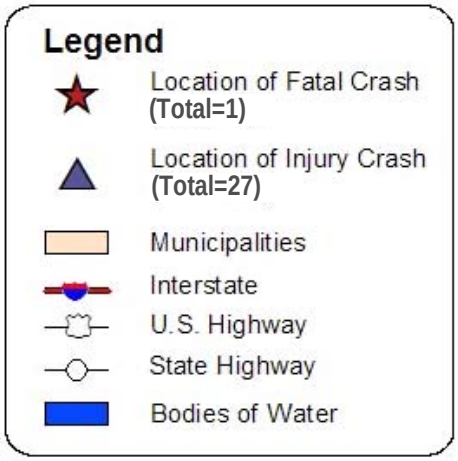


Mineral County
Location of Fatal and Injury Crashes, State and U.S. Highways

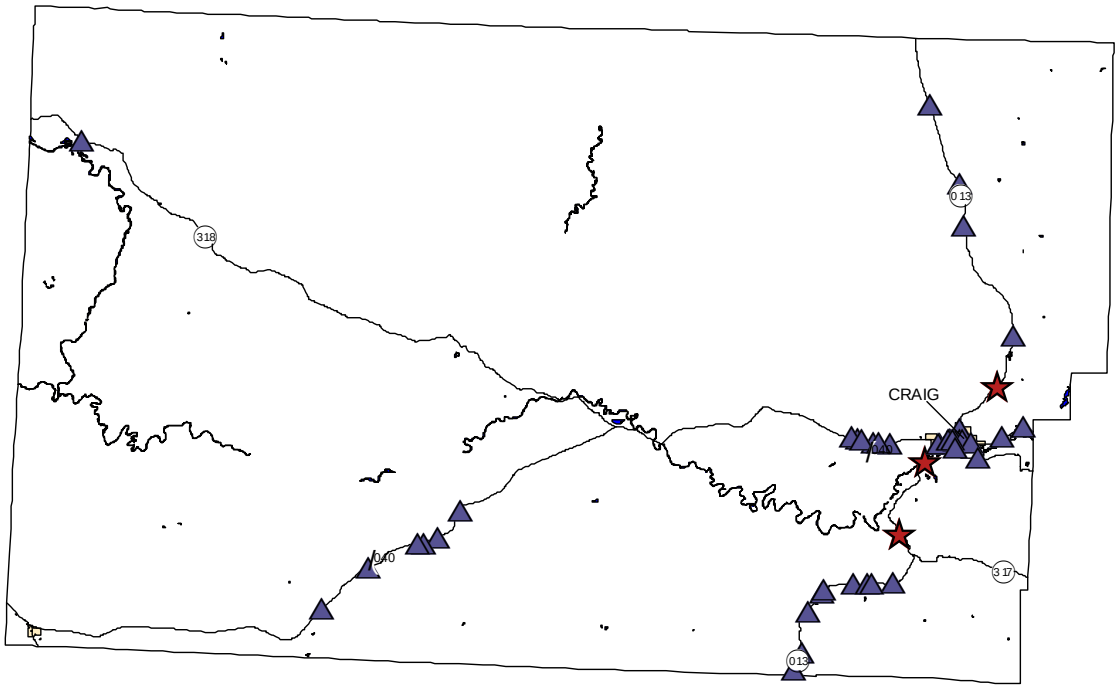


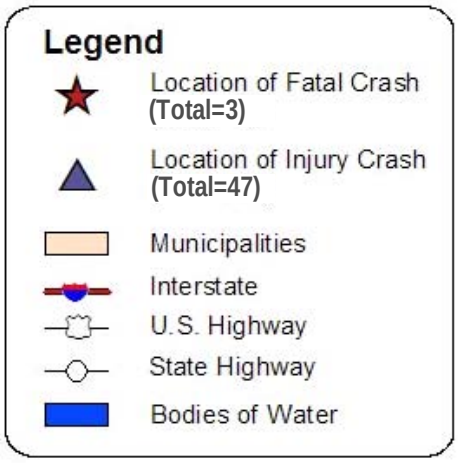
State of Colorado



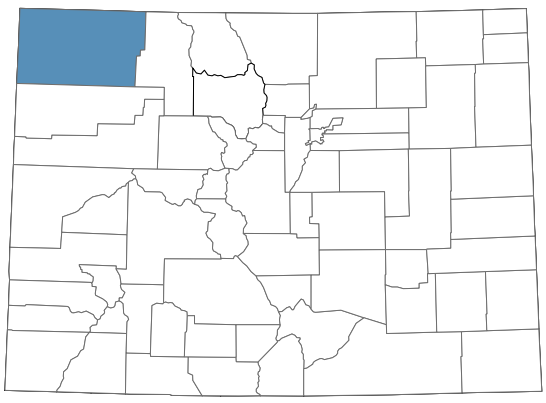


Moffat County
Location of Fatal and Injury Crashes, State and U.S. Highways

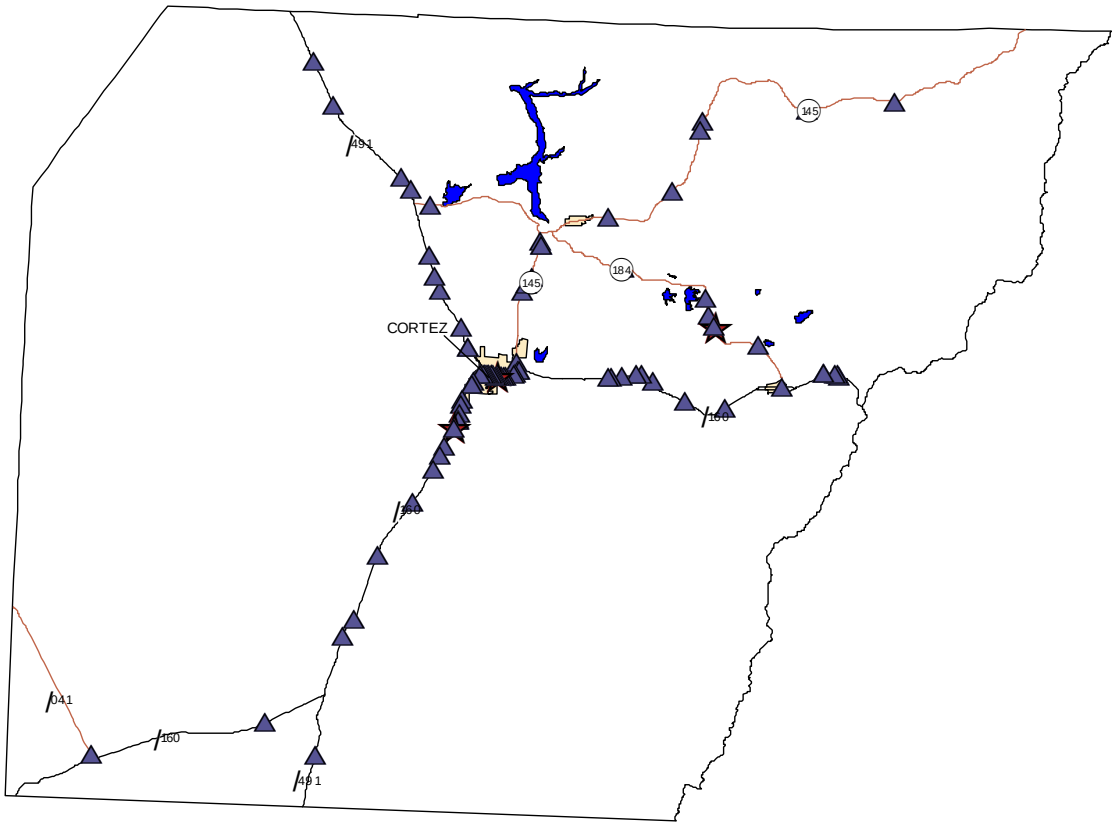




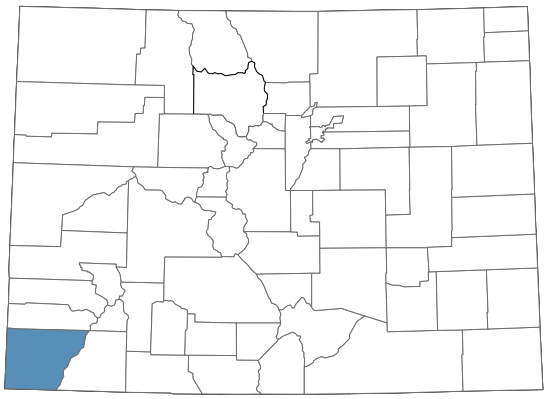
State of Colorado

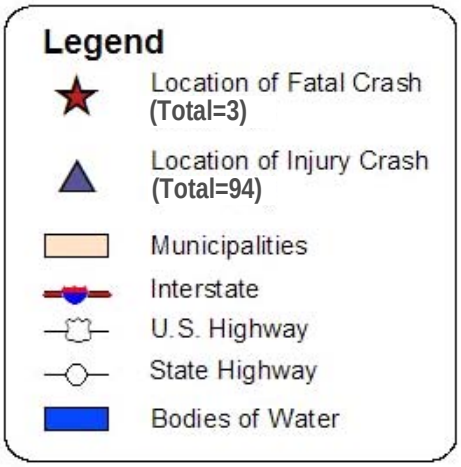


Montezuma County
Location of Fatal and Injury Crashes, State and U.S. Highways

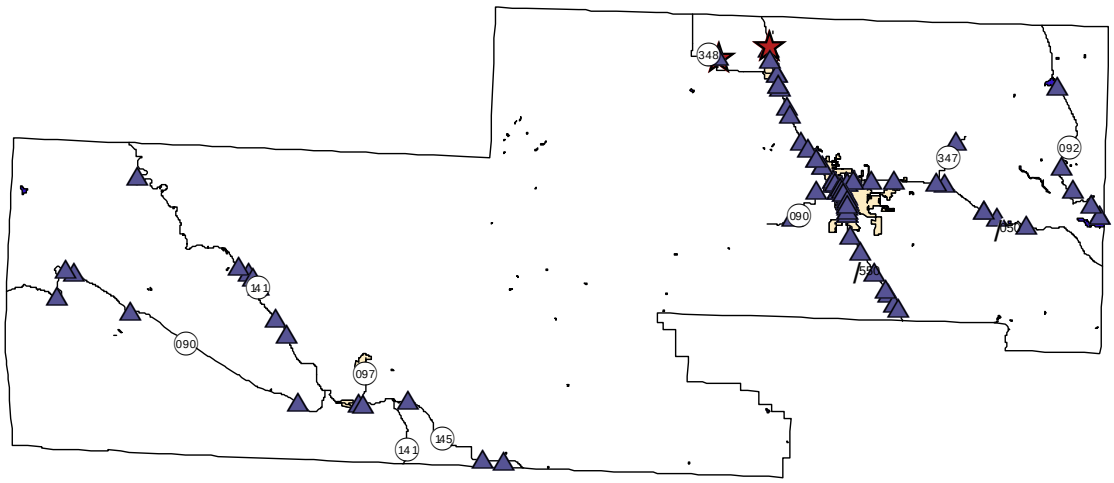


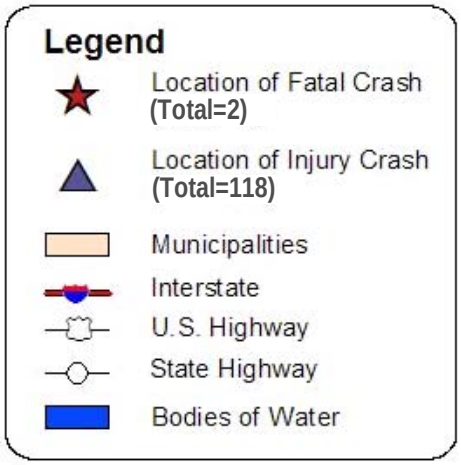
State of Colorado



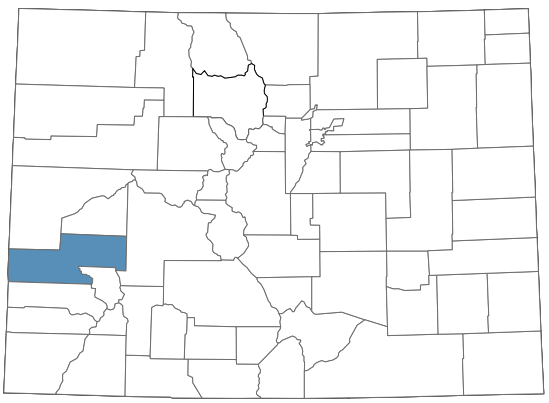


Montrose County
Location of Fatal and Injury Crashes, State and U.S. Highways

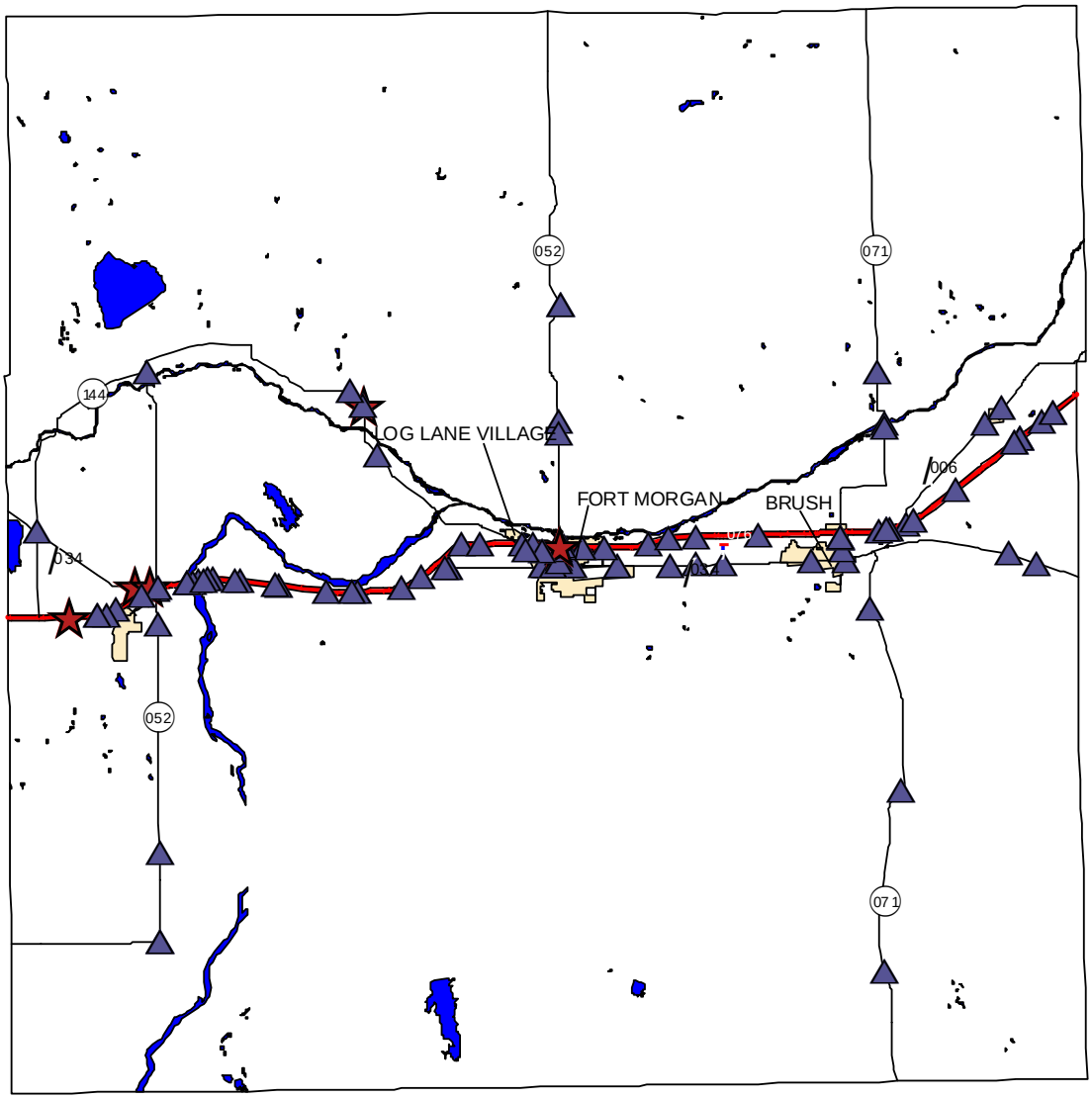




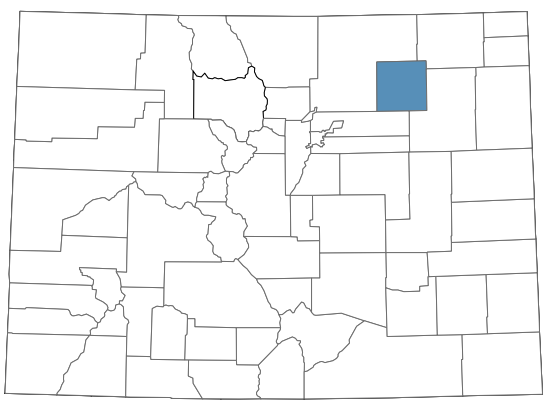
State of Colorado

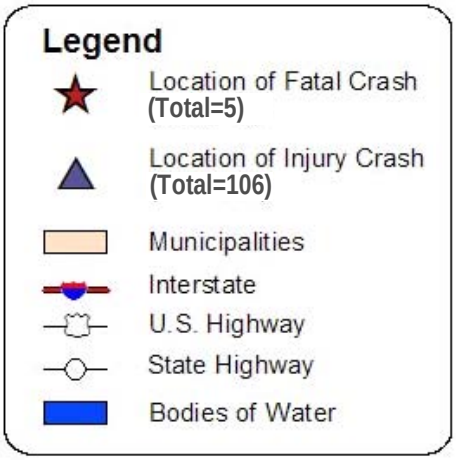


Morgan County
Location of Fatal and Injury Crashes, State and U.S. Highways



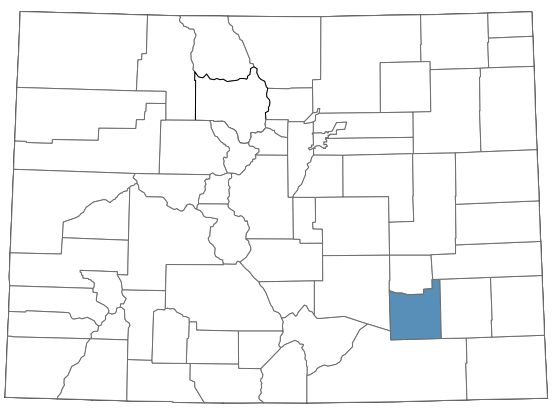
State of Colorado



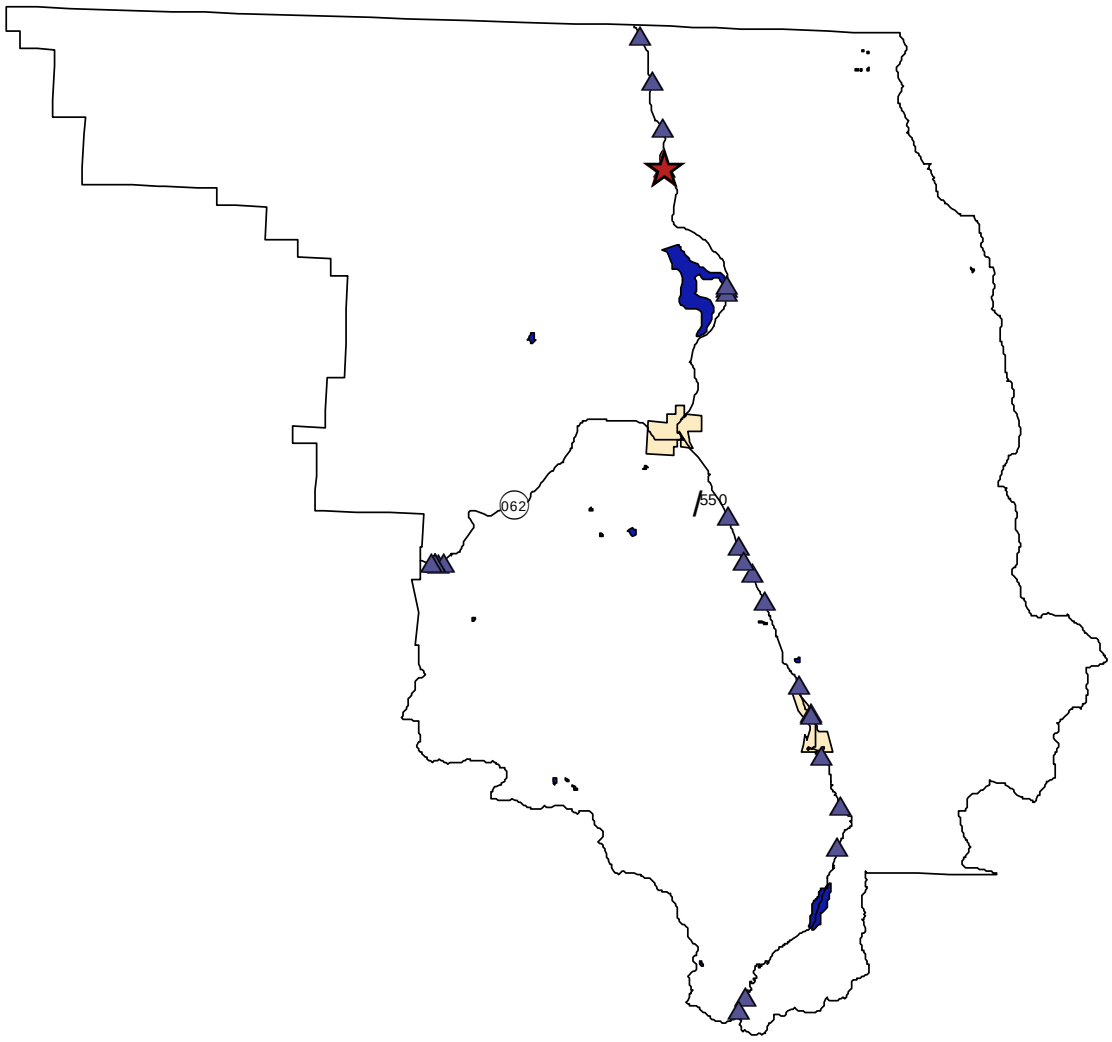


Otero County
Location of Fatal and Injury Crashes, State and U.S. Highways

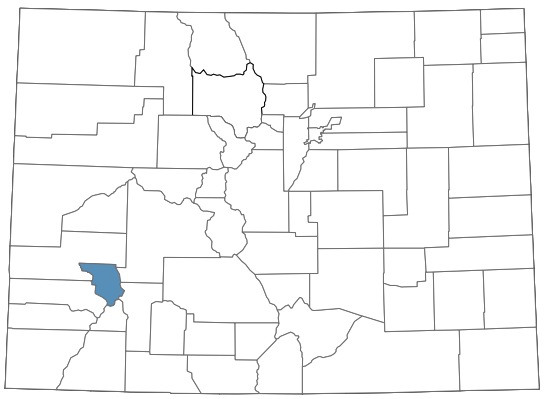
State of Colorado

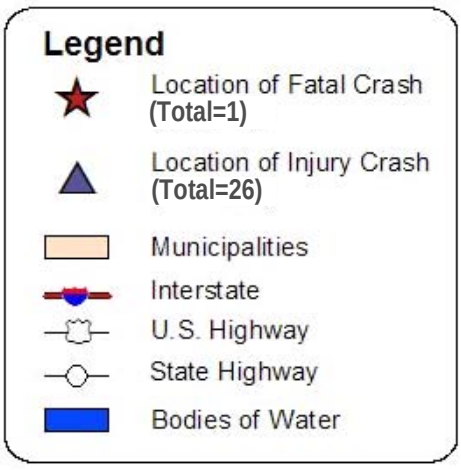


Ouray County
Location of Fatal and Injury Crashes, State and U.S. Highways

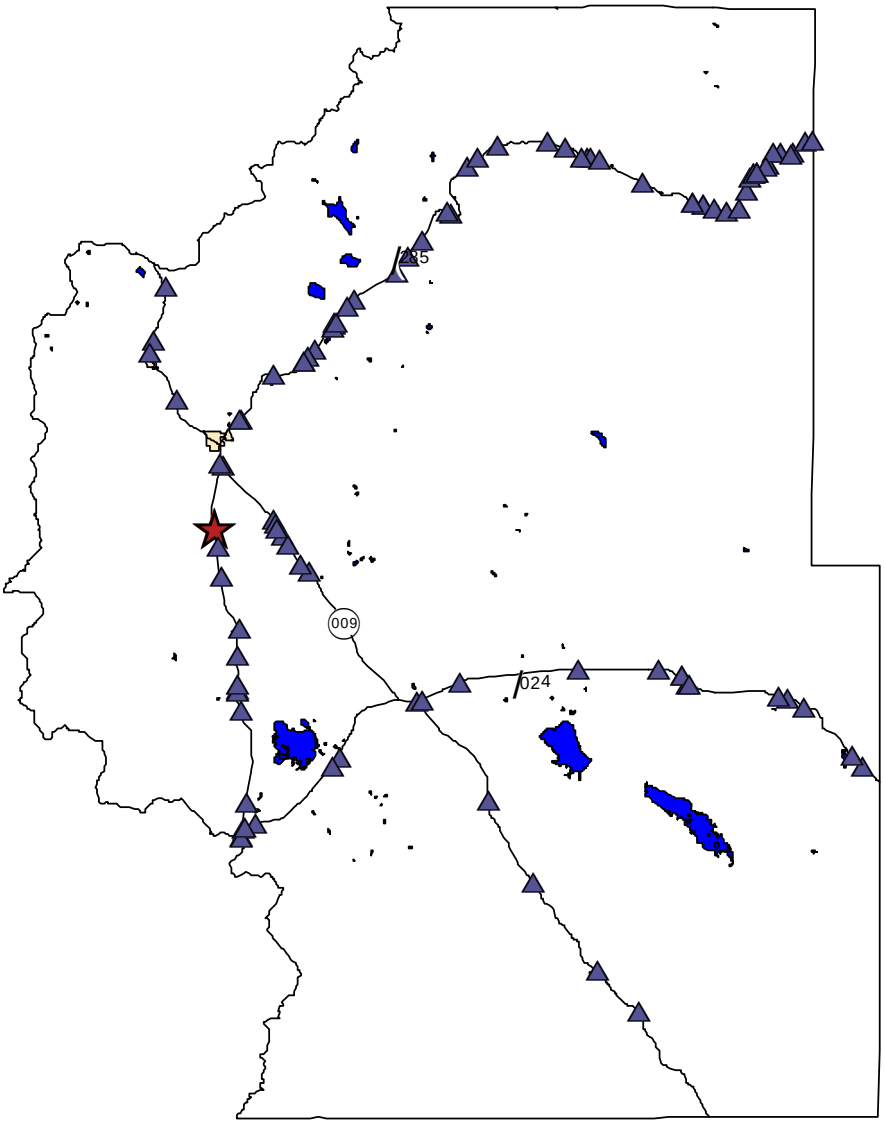


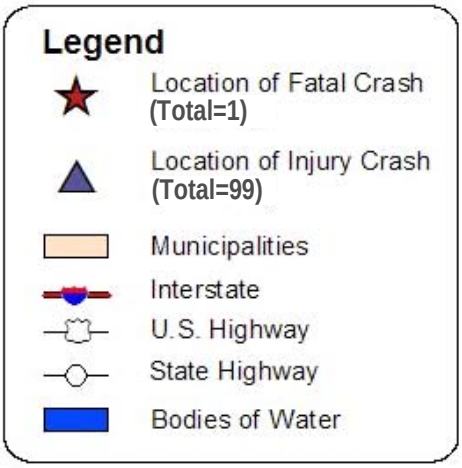
State of Colorado





Park County
Location of Fatal and Injury Crashes, State and U.S. Highways





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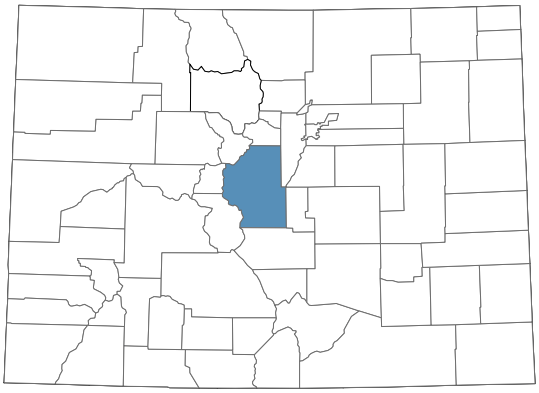

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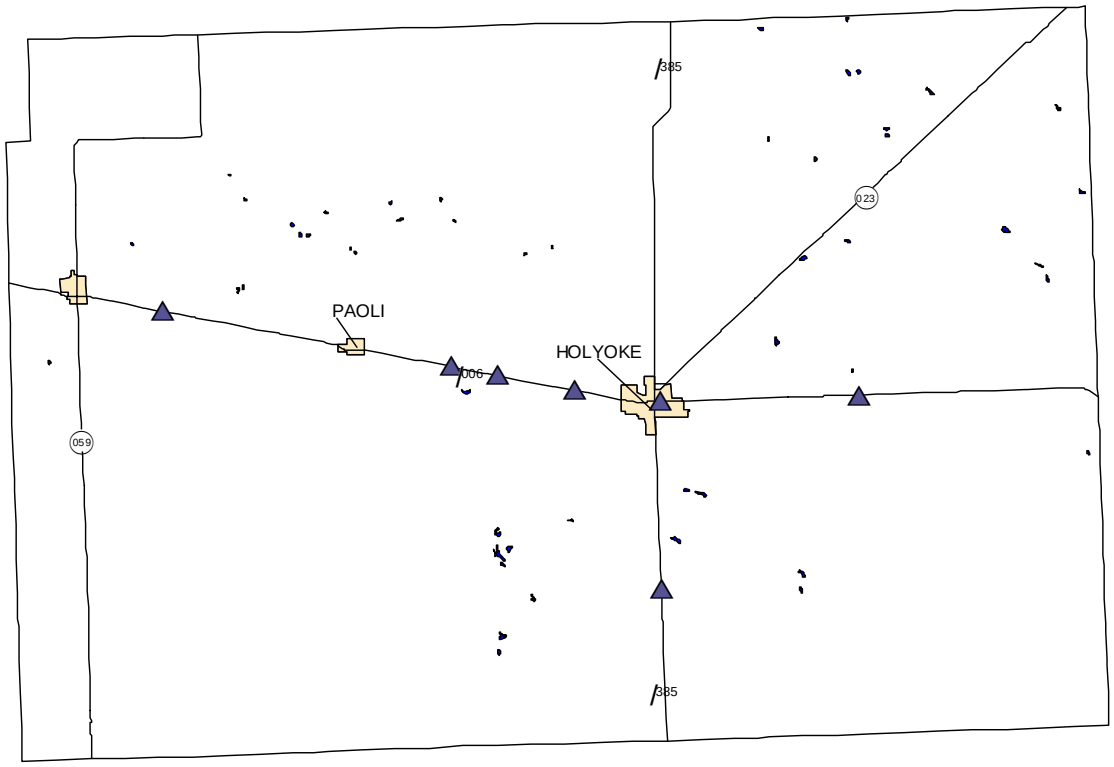

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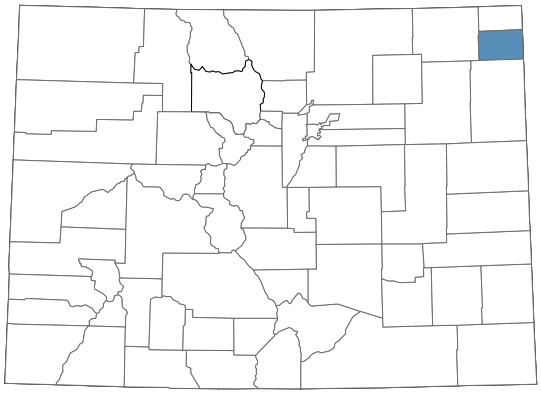

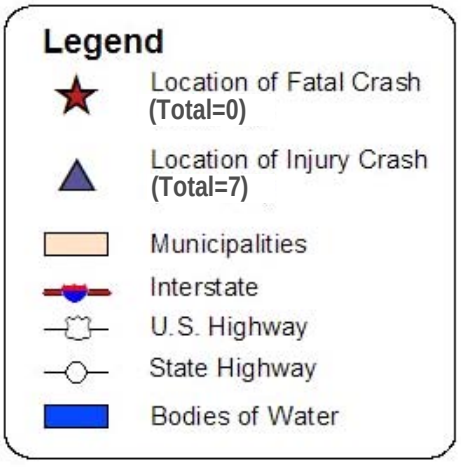

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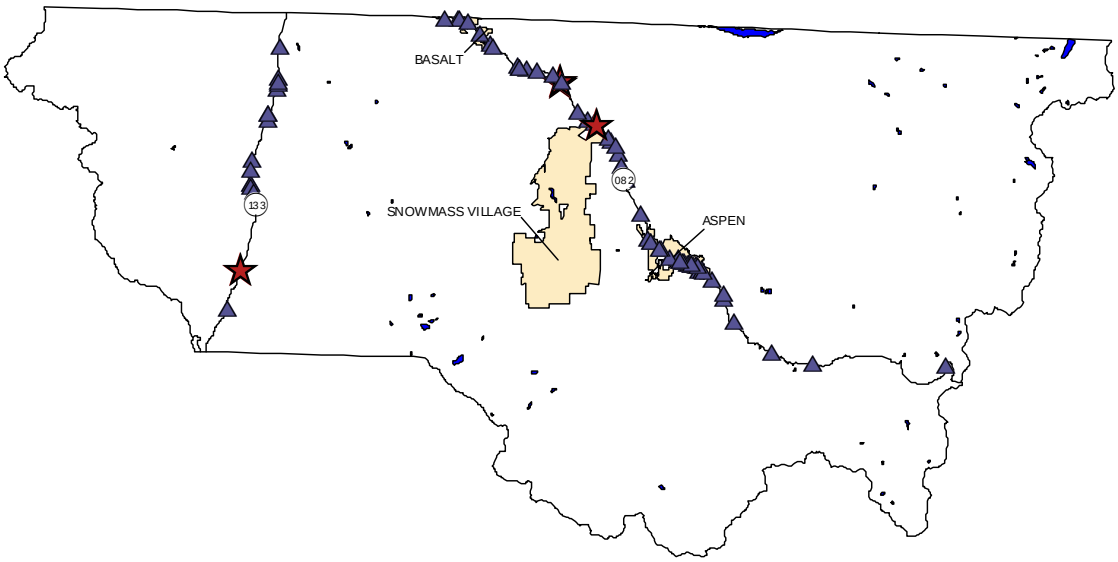

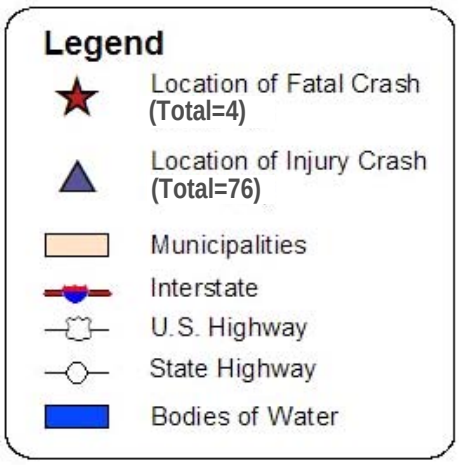

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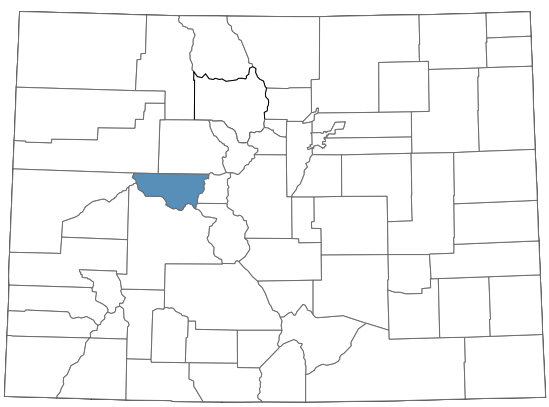

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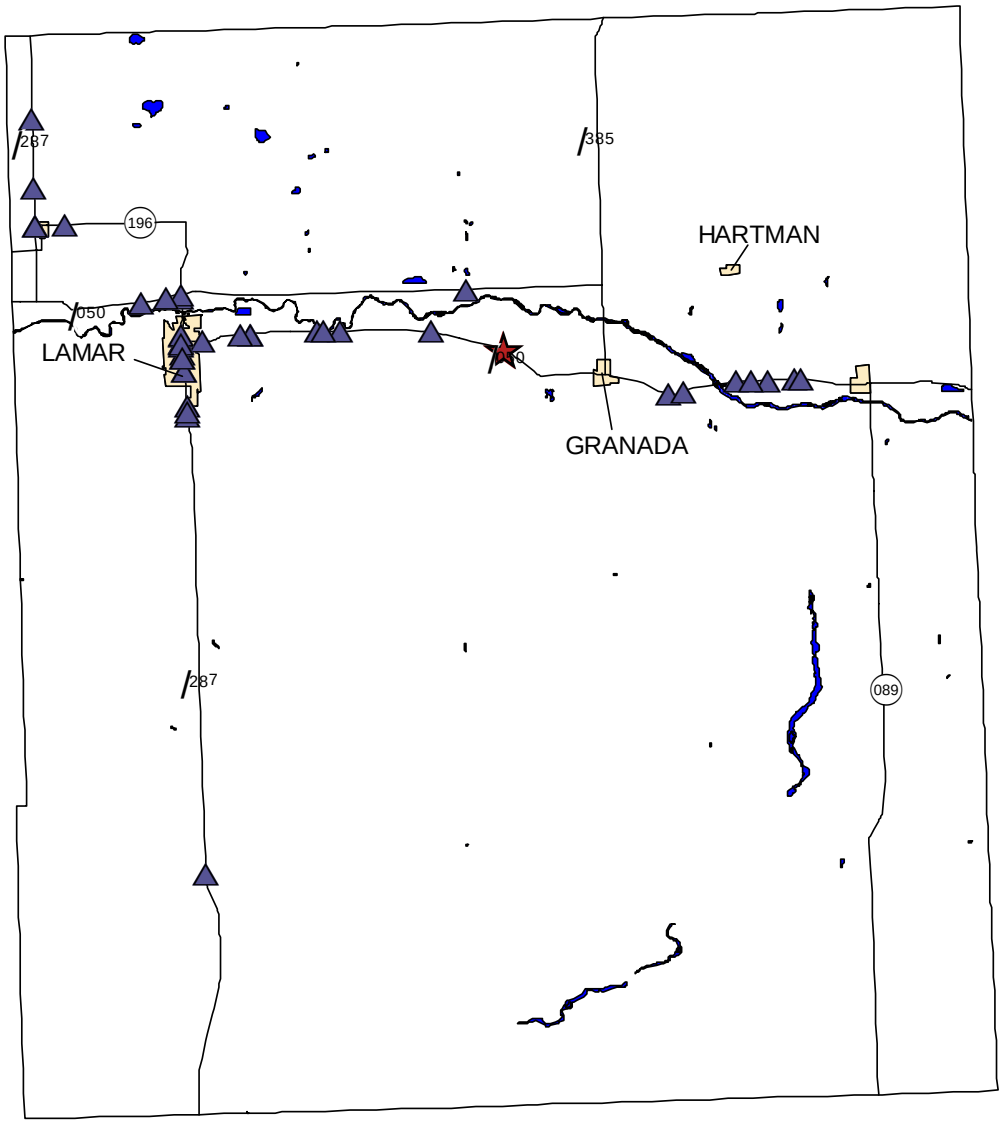

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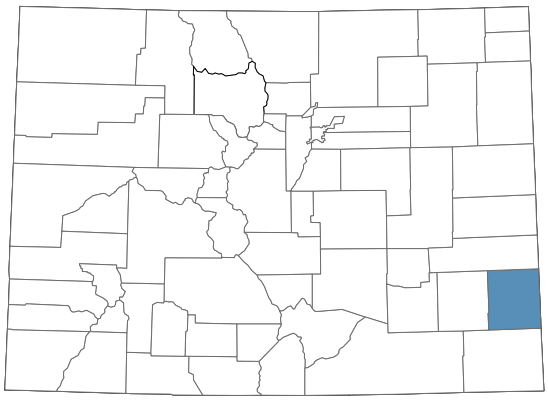

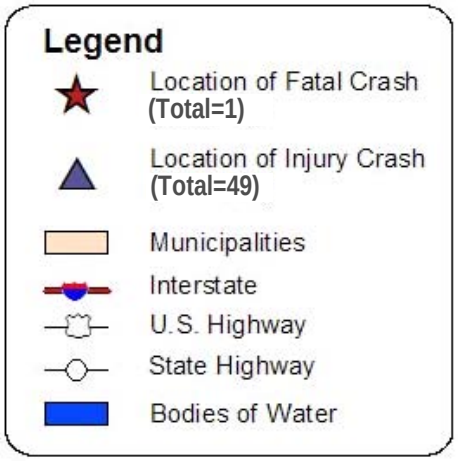

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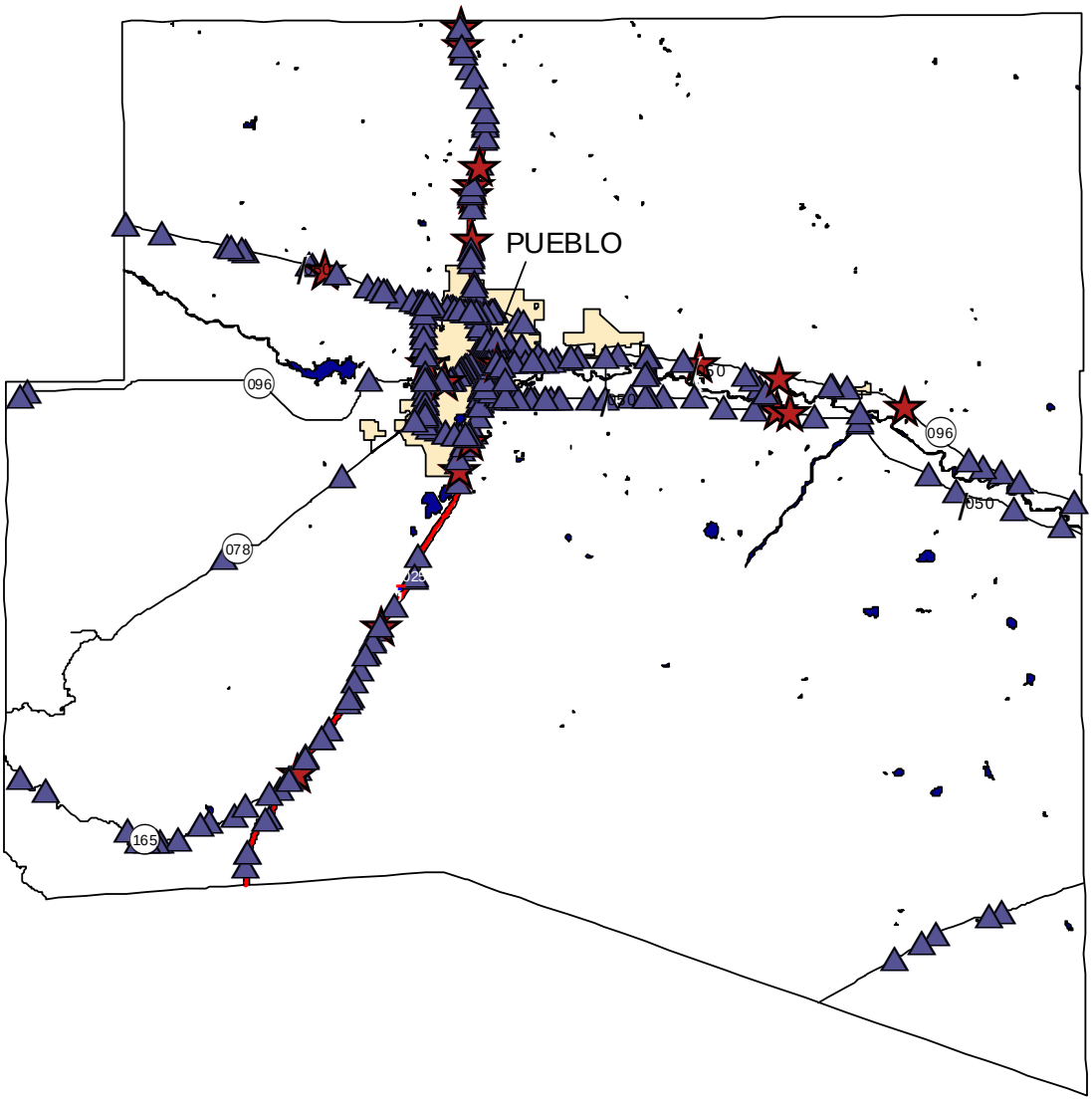

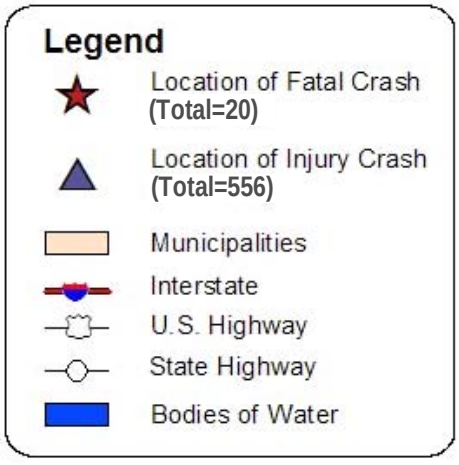

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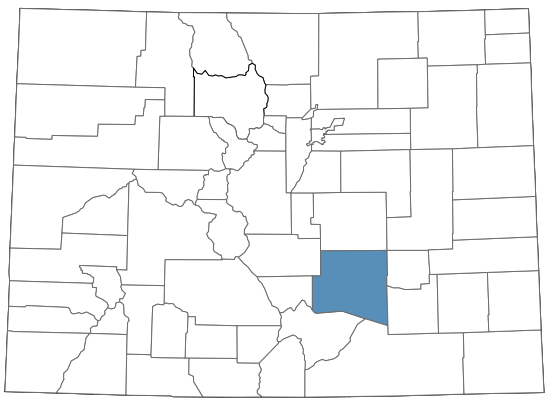

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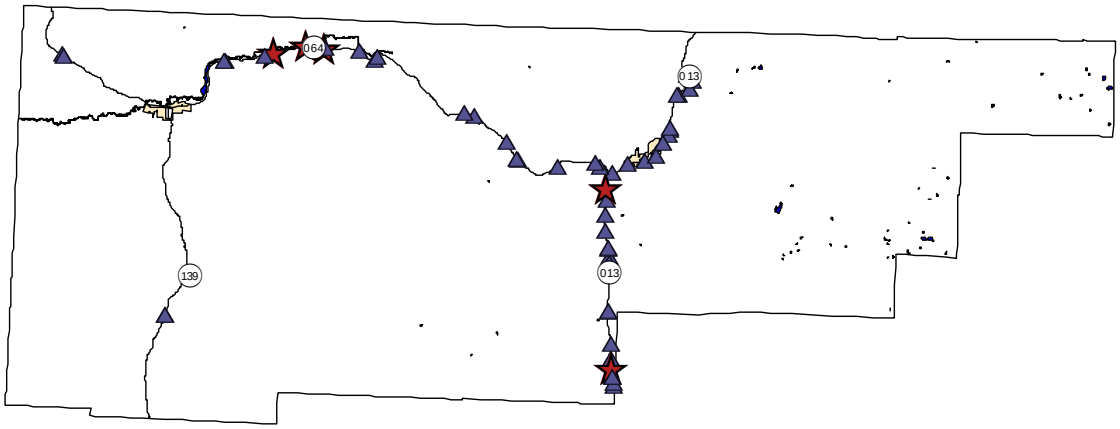
Location of Fatal and Injury Crashes, State and U.S. Highways



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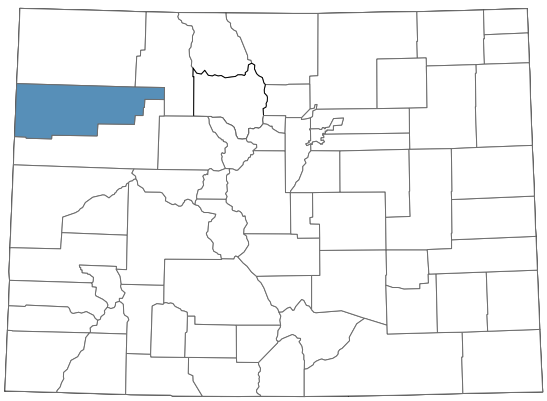

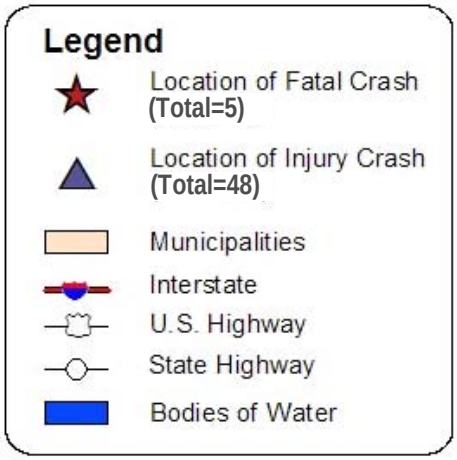

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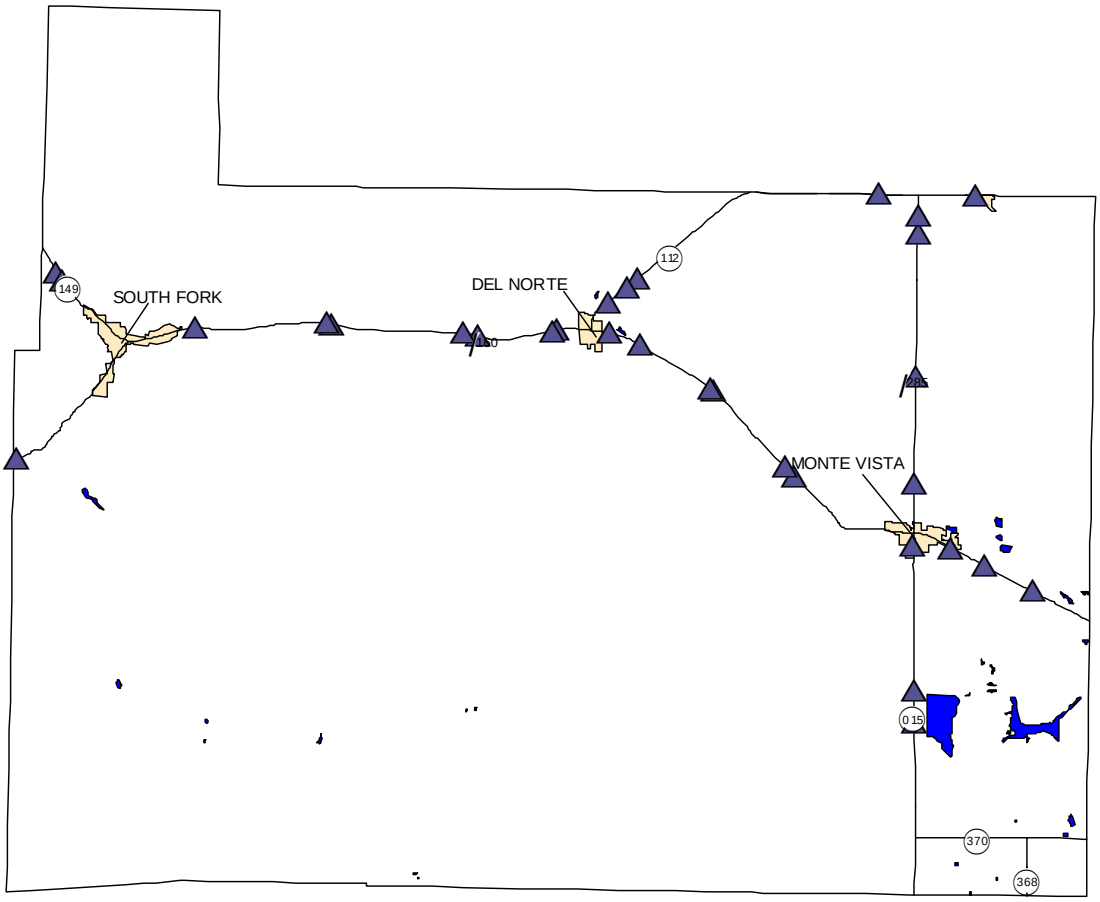

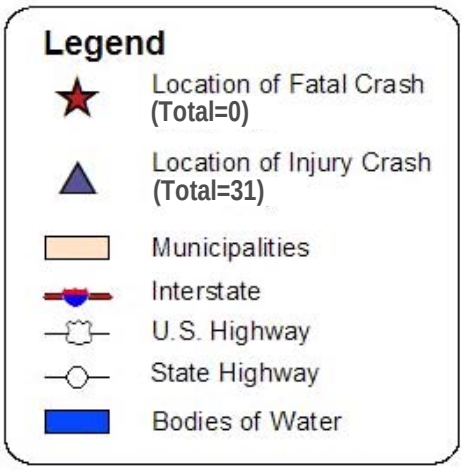

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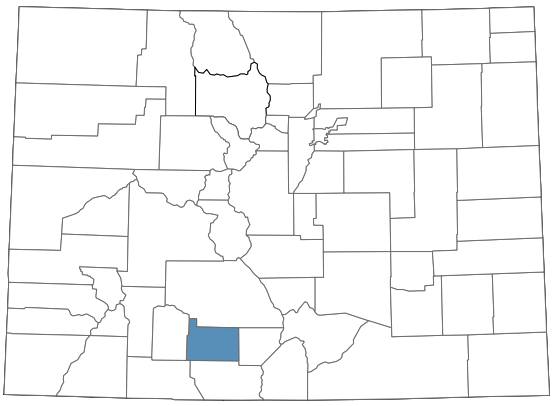

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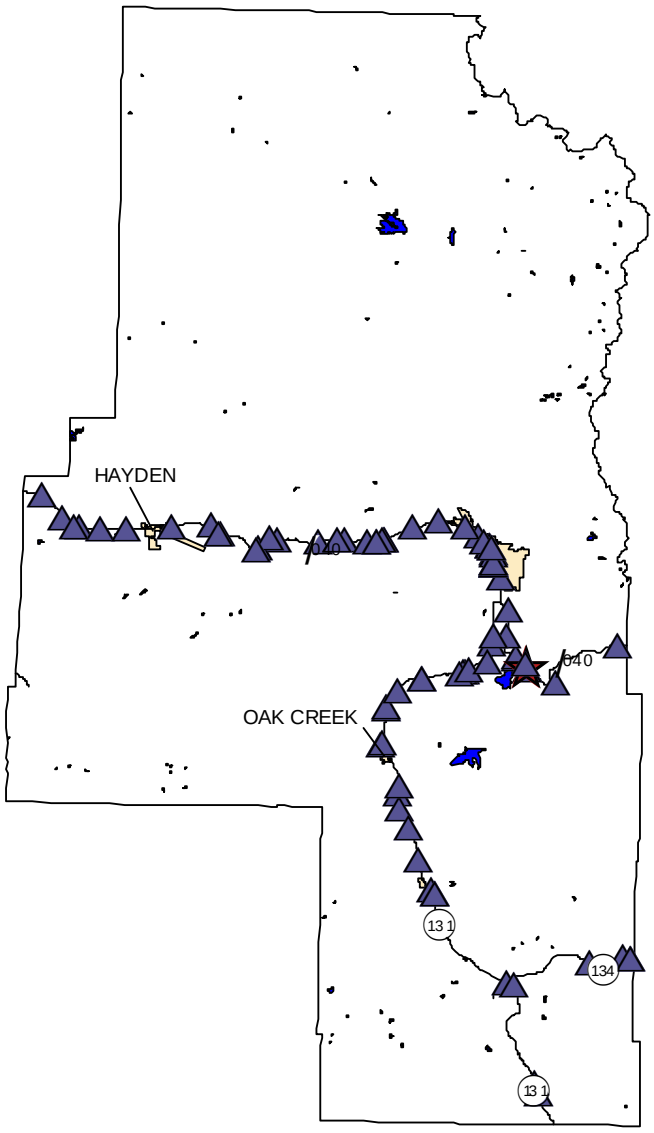
Location of Fatal and Injury Crashes, State and U.S. Highways



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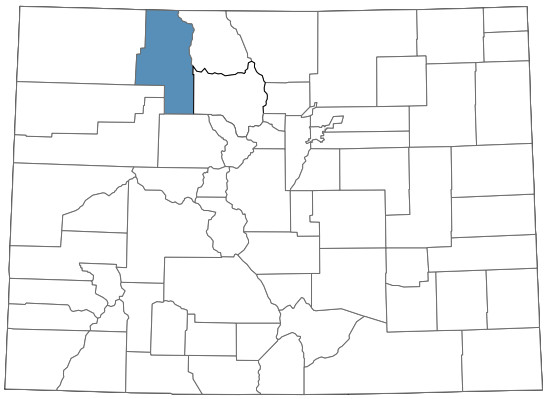

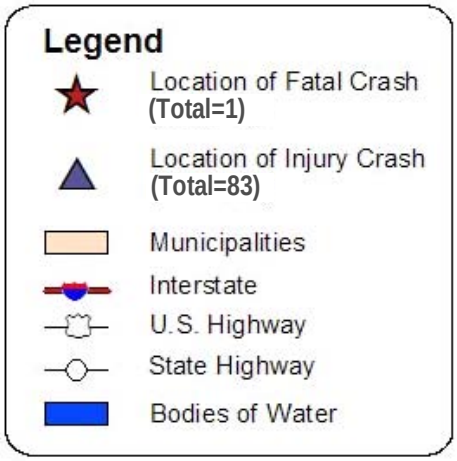

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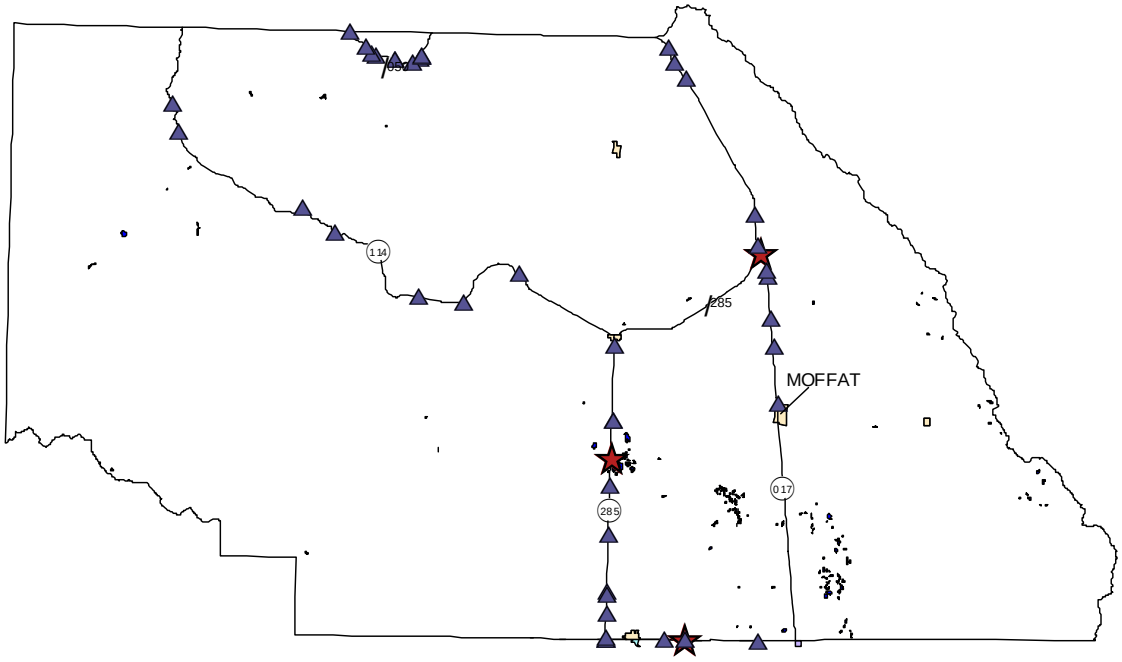
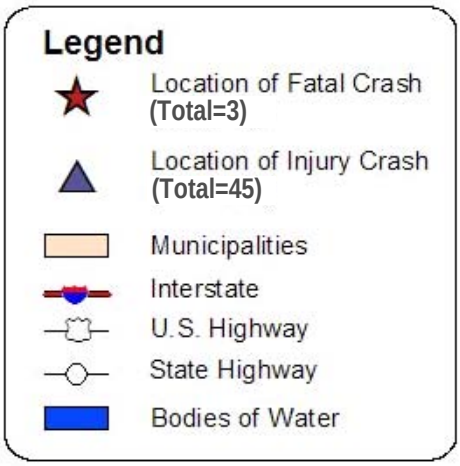
Location of Fatal and Injury Crashes, State and U.S. Highways





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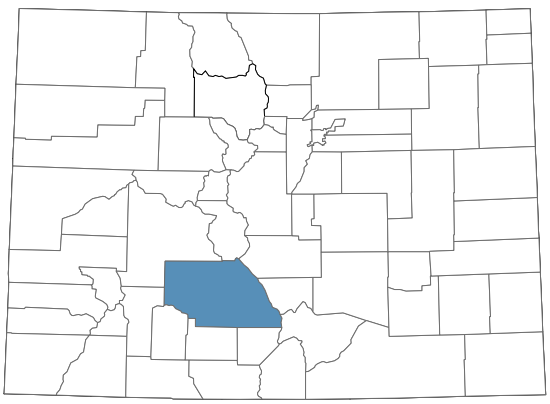

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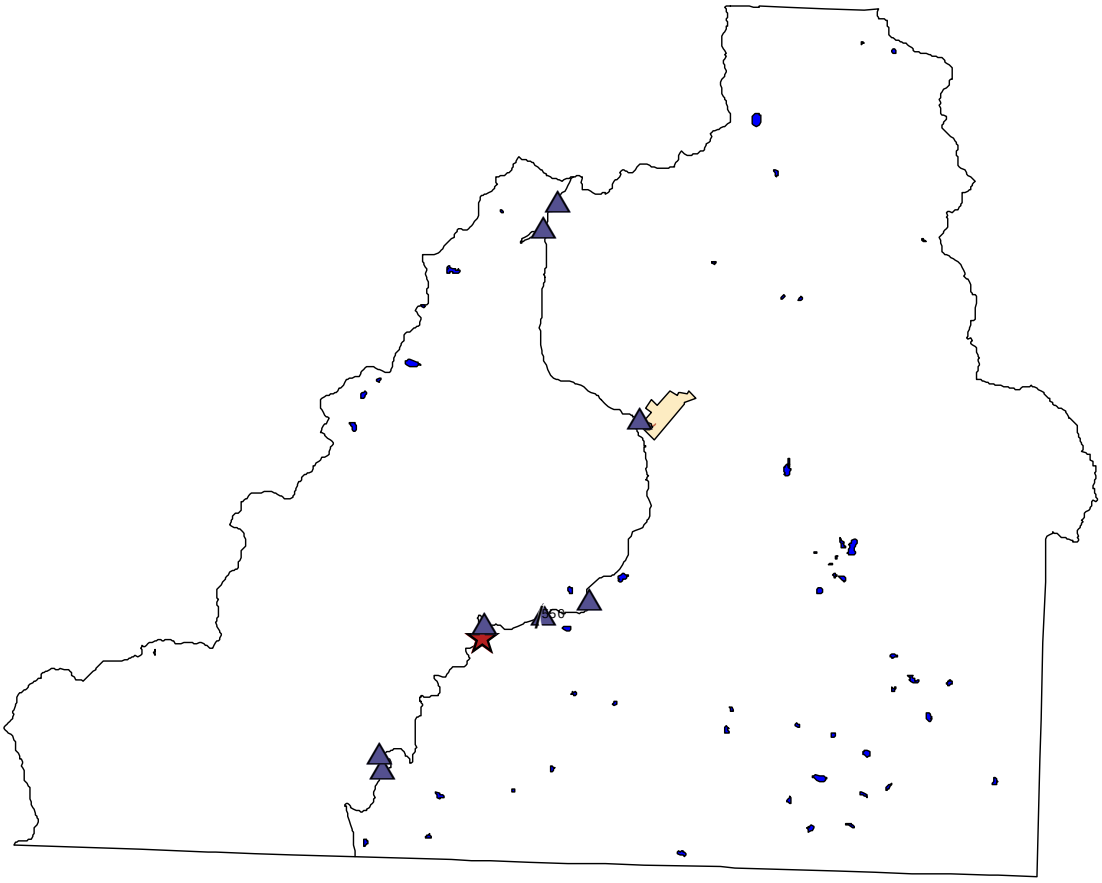
Location of Fatal and Injury Crashes, State and U.S. Highways



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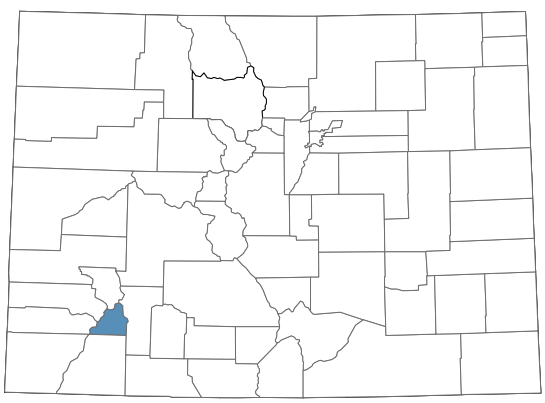

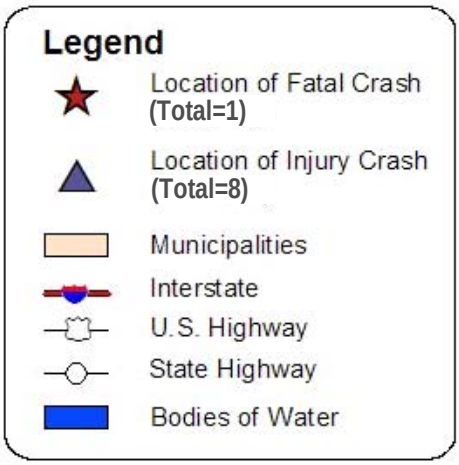

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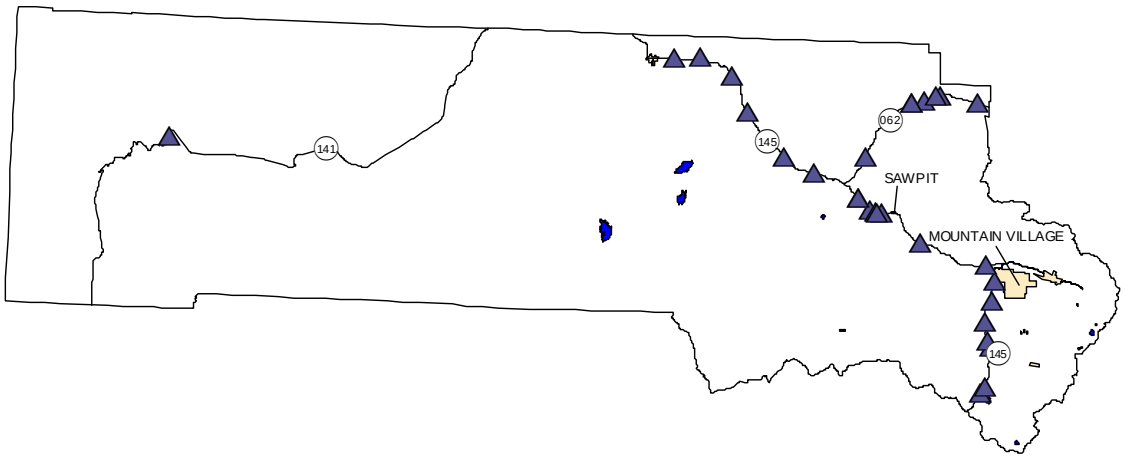
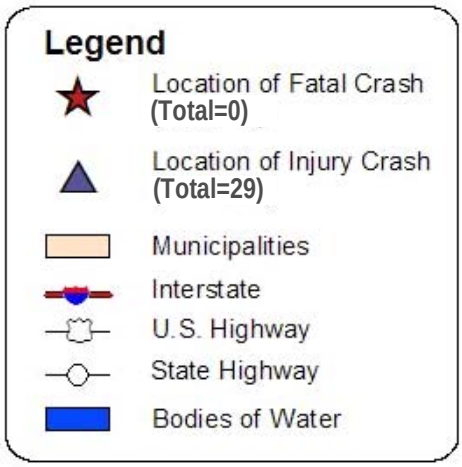
Location of Fatal and Injury Crashes, State and U.S. Highways





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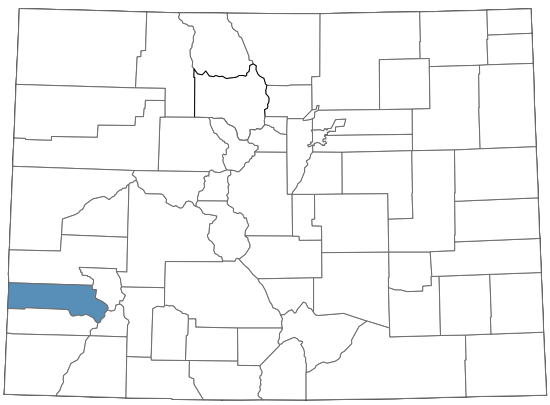

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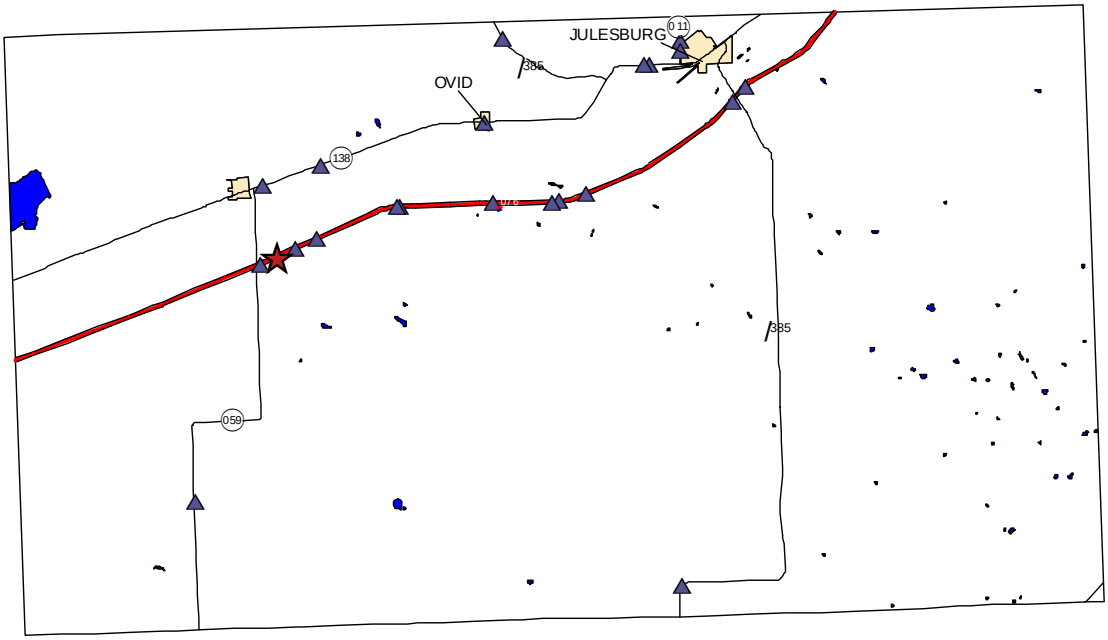
Location of Fatal and Injury Crashes, State and U.S. Highways



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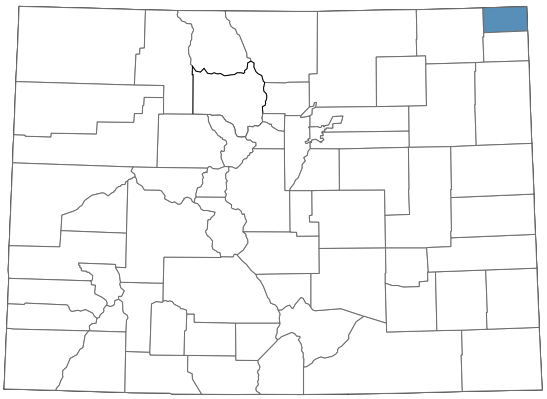

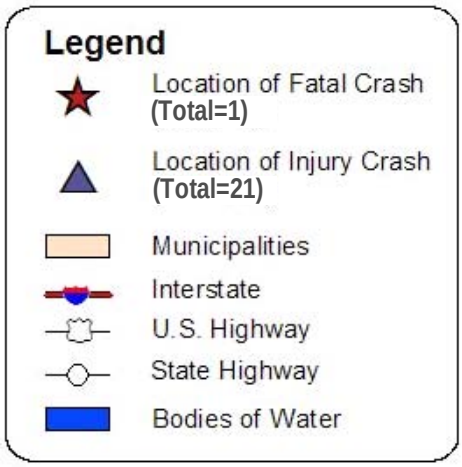

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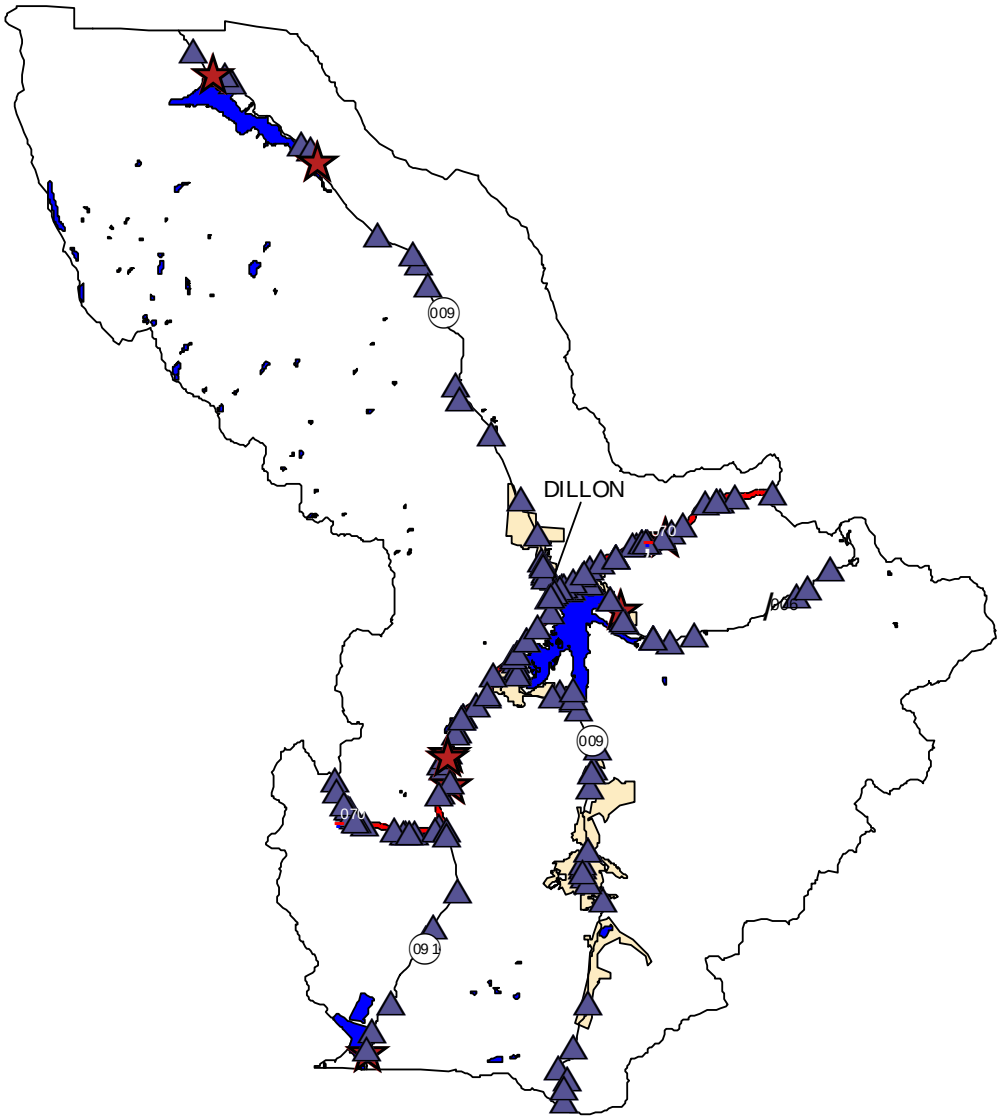

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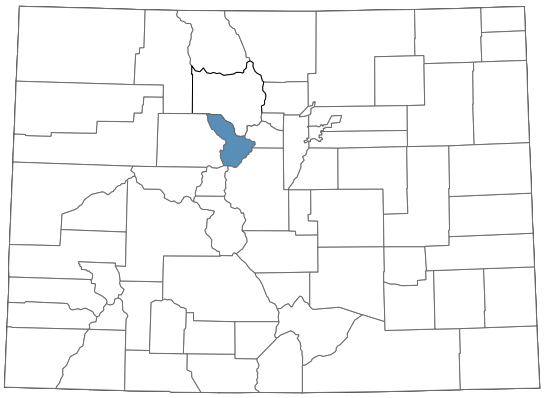

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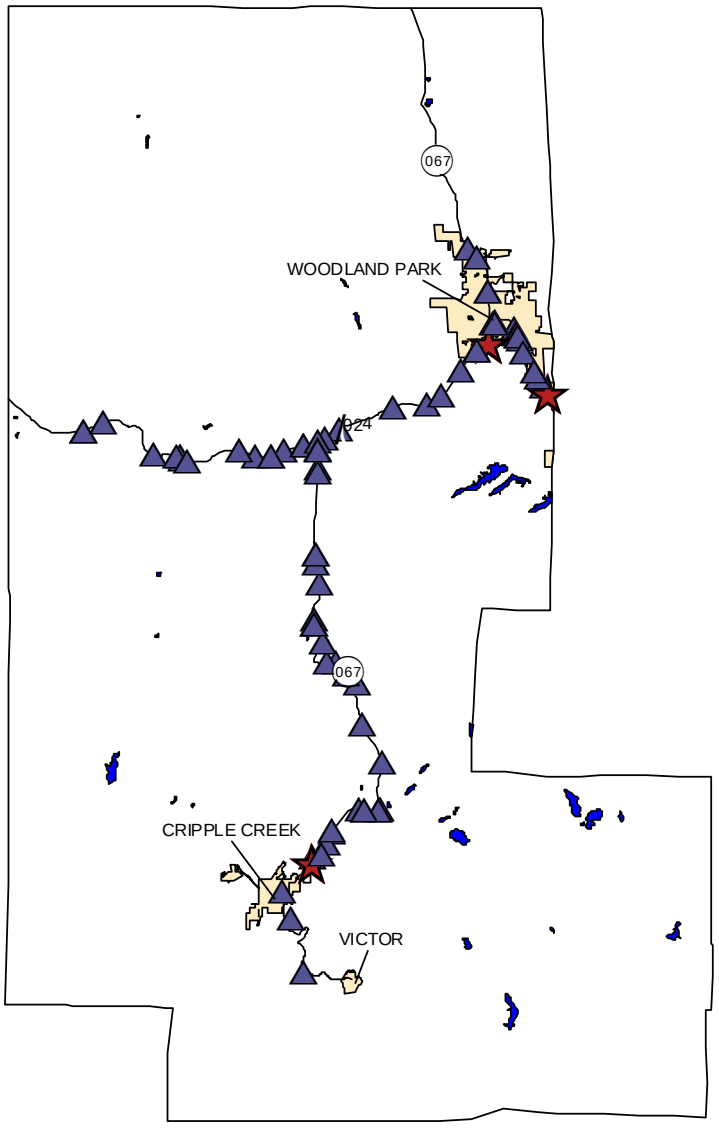

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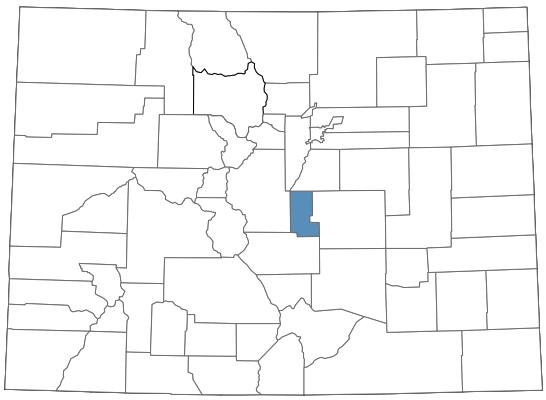

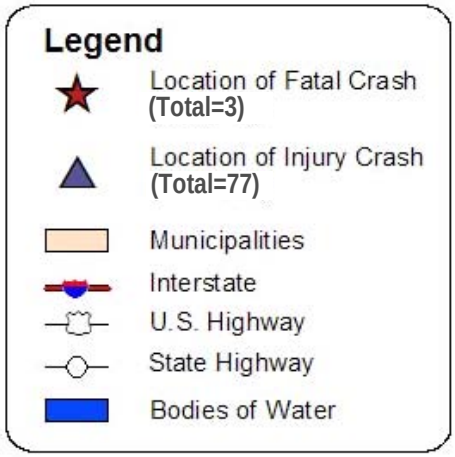

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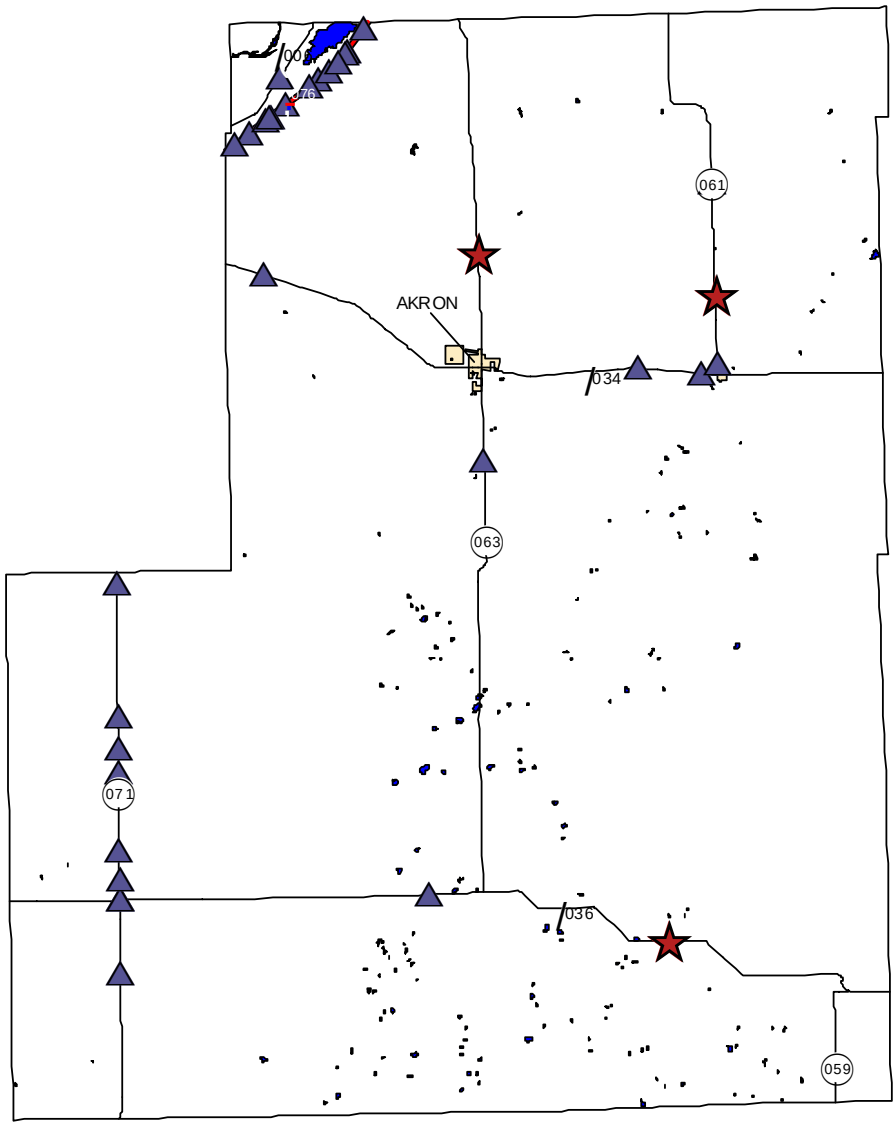
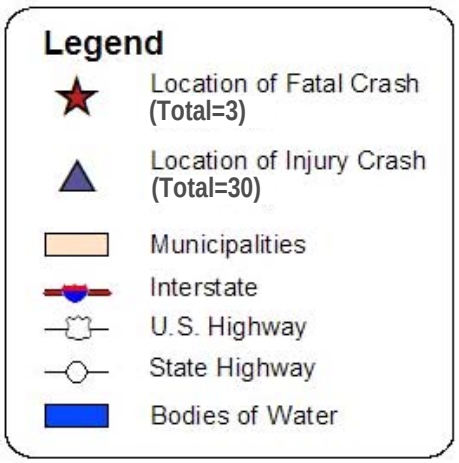
Location of Fatal and Injury Crashes, State and U.S. Highways





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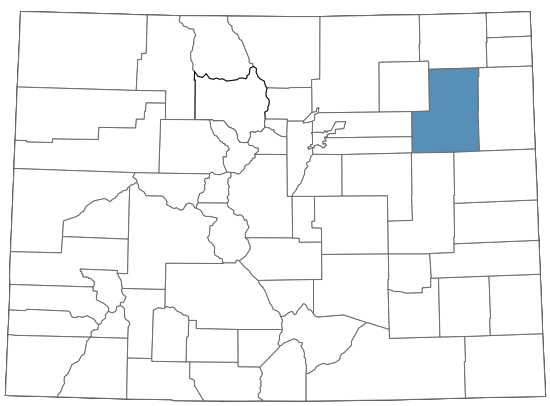

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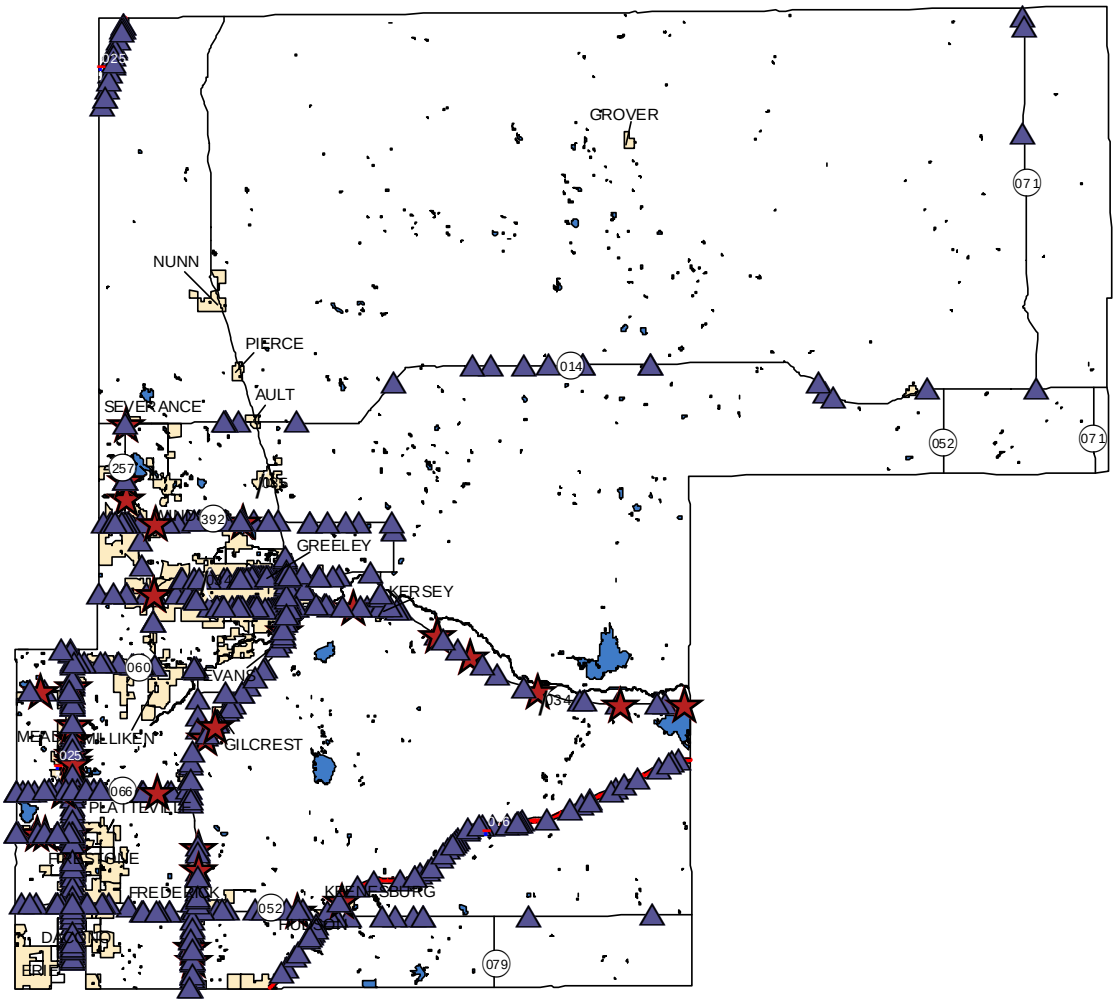
Location of Fatal and Injury Crashes, State and U.S. Highways



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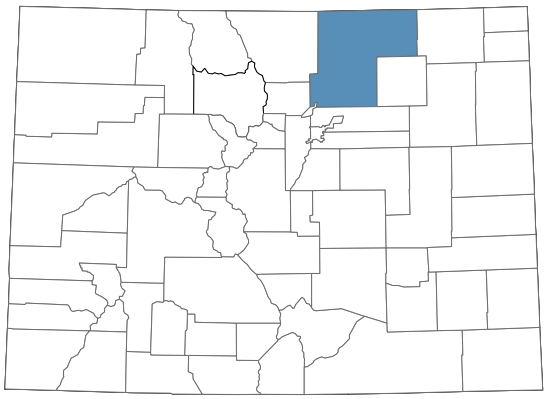

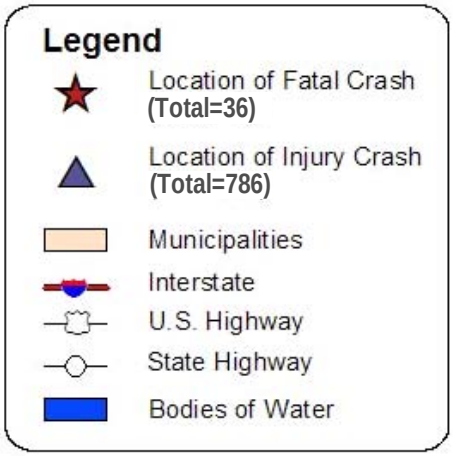

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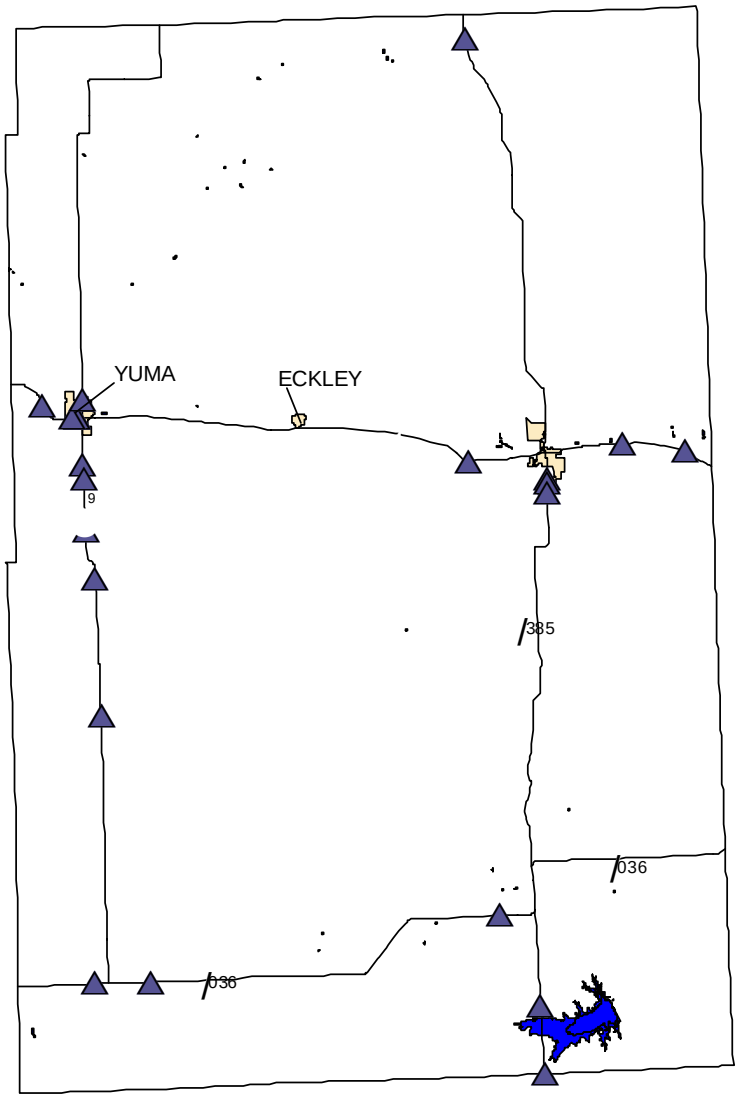
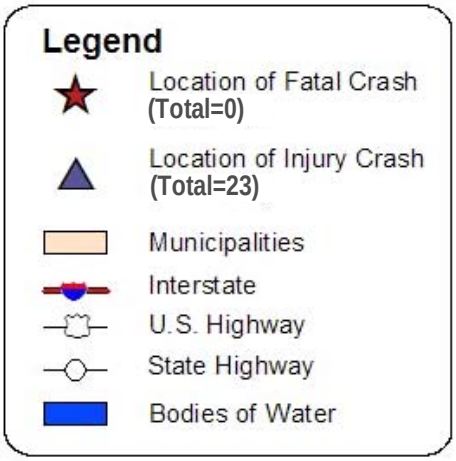
Location of Fatal and Injury Crashes, State and U.S. Highways





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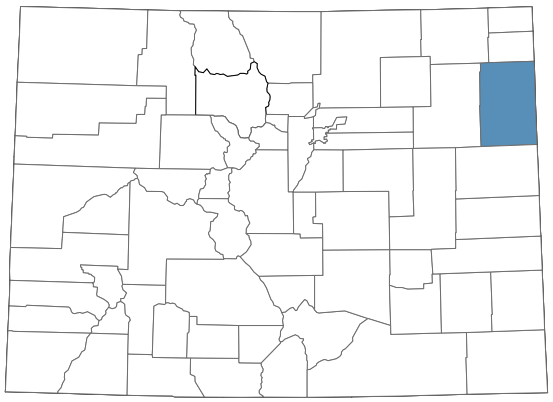

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Appendix A. On-System Crash Locations in Colorado 1

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COLORADO DEPARTMENT OF TRANSPORTATION
SAFETY AND TRAFFIC ENGINEERING BRANCH

SAFETY DOESN'T HAPPEN BY ACCIDENT