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FATAL TRAFFIC ACCIDENTS

ON COLORADO'S STREETS AND HIGHWAYS

CALENDAR YEAR 1962



COMPILED BY
COLORADO DEPARTMENT OF HIGHWAYS
PLANNING AND RESEARCH DIVISION
TRAFFIC OPERATIONS SECTION

CALENDAR YEAR SUMMARY

1962 FATAL MOTOR VEHICLE TRAFFIC ACCIDENTS ON COLORADO'S STREETS AND HIGHWAYS

Foreword.—Fatal injury traffic accidents constitute less than one percent of all reported road accidents in the State. Although a comprehensive analysis of recurring accident problems must be based upon total accident experience, a study of the fatal accidents alone does yield some useful insights for traffic accident prevention. An analysis of the actions, conditions, and circumstances which combined to produce these accidents has been the subject of monthly reports. It is the purpose of this summary to assemble the case data presented in the monthly reports and to review the facts as a whole.

State-wide Toll.—During 1962 police and Patrol investigators reported some 57,000 accidents on Colorado's streets and highways. At the close of the year, 450 traffic deaths had been charged to 370 of these accidents. In these same accidents 460 persons sustained nonfatal injury. Compared to the previous year 1961, both the number of fatal accidents and the number of fatalities decreased about 8%. The total number of reported accidents in 1962, however, was 10% higher than in 1961. Nonfatal injury accidents also increased about 10%.

Rates.—With ever-increasing vehicle miles of travel each year on Colorado's streets and highways it has become standard practice to measure the number of deaths and accidents in terms of this exposure. Based on vehicle miles of travel computed from gasoline consumption, the mileage death rate dropped from 6.0 in 1961 to 5.3 in 1962. Applying the same method of measurement to accidents, the fatal accident rate dropped from 4.9 in 1961 to 4.3 in 1962. Greater significance is attached to the accident rate since it provides a basis for evaluating highway safety improvement. Due to multiple deaths in certain accidents, the records consistently show more traffic casualties than fatal accidents.

Trends.—As roads and vehicles are engineered to higher standards of safety and convenience, and driver skills are improved by increased training and more demanding licensing requirements, it is generally expected that accident experience will take a downward course or at least level off in relation to the amount of travel. Some indication of the trends in motor vehicle travel and accident experience throughout Colorado over the past fifteen years may be obtained from the line graphs on pages 6-7 of this report.

It will be seen from an examination of Chart I that the fatal accident rate has dropped from a high of 7.4 in 1948 to an all-time low of 4.3 in 1962 despite the fact that motor vehicle travel in Colorado has more than doubled in the span of years between 1948 and 1962. The mileage death rate, represented in Chart II, exhibits a similar decline through the years dropping from a high of 8.6 in 1948 to a low of

5.2 in 1957 and 5.3 both in 1959 and 1962. A plotting of all reported accidents (Chart III), excluding counter reports of minor damage, indicates that for the most part total accident experience has been climbing quite steadily along with increased travel, ranging in round numbers from 23,000 accidents in 1948 to 57,000 in 1962. The nonfatal injury accident rate (Chart IV) remained fairly constant between 1948 and 1957, but has been rising slightly during the past five years.

A subdivision of all reported urban and rural accidents into categories of injury and property damage (Charts V and VI on page 10) discloses that in urban areas there have been four property damage accidents for every injury accident while in rural areas there have been two property damage accidents for every injury accident. Percentagewise, property damage accidents in urban areas account for almost 60% of all reported accidents State-wide.

Road Jurisdiction.—Basically, the public trafficways to which motor vehicle accidents are charged consist of State highways including the Interstate facilities and urban connecting links, County roads, and City streets. Last year State highways accounted for 67% of the fatal accidents, County roads for about 17%, and City streets for about 16%.

Table I on page 11 shows the number of fatal accidents and fatalities in relation to road mileage and vehicle miles of travel on the various administrative systems. County roads comprising the bulk of the State's road mileage, but carrying a comparatively small amount of traffic, exhibit the highest fatal accident rate among the road systems. Urban state highways representing a small part of the urban road mileage, but serving a sizable amount of urban traffic, have a higher fatal accident rate than the City street system. The completed portion of the Interstate system presently has a fatal accident rate at about the same level as the rest of the State Highway System. City streets, usually having relatively low operating speeds, exhibit the lowest fatal accident rate.

Spot Map.—The distribution and concentration of fatal accidents on rural State Highways is shown on pages 8-9. Each spot on the map represents a fatal accident. It will be noted that the most conspicuous concentration of fatal accidents (28 in number) appears along a high-volume section of Interstate Route 25 extending from Denver to a point south of Pueblo, a facility substantially improved to Interstate road standards. Four fatal accidents are found on the Denver-Boulder Toll Road which in three other years operated with no fatalities at all. Highways around Greeley and in the mountainous area to the west of the State show an appreciable fatal accident experience. The distribution of fatal accidents within and outside incorporated areas and within the various counties of Colorado is shown in Tables II and III on pages 12-13.

Where?—The location and setting of fatal accidents is of special interest to the road authority. Normally, the accident scene becomes the subject of study for possible road and traffic control improvement especially where recurring accidents are experienced. Table IV on page 14 shows the various types of locations in each road jurisdiction where drivers or pedestrians experienced fatal injury accidents.

Most conspicuous in the listing is the road curve, scene of 96 fatal accidents. Next, is the intersection at grade (many of them uncontrolled by Stop sign, Yield sign or signal) where 89 fatal accidents occurred. An expressway interchange was the scene of 15 of the accidents. A structure was associated with 27 of the accidents. A railroad crossing figured in 8 fatal accidents, all but two on County roads and all but one unsignalized. It is not without significance that at least one-third of the total fatal accidents took place along a road section which presented no special driving decision with respect to alignment, constriction of roadway, intersection at grade, or similar feature of road design.

When?—About 52% of the fatal accidents in 1962 occurred during hours of darkness. The higher ratio of night to day accidents follows a nation-wide pattern. Nearly 56% of the accidents took place during the last three days of the week. More than 50% of the accidents happened during the summer months and the fall period of the year. The highest monthly toll was recorded in August when 55 persons were killed in 42 accidents.

Who?—Some 1,067 persons played a part in the 1962 fatal accidents including 507 vehicle operators, 495 passengers, 58 pedestrians, and 7 cyclists or riders of non-motor-vehicle conveyances. Of these, 450 were killed and 460 others were non-fatally injured. Among those killed were 210 drivers, 175 passengers, 58 pedestrians, and 7 others. Eighty-one teenagers were involved as drivers, and 6 were involved as pedestrians. Sixteen children under thirteen years of age were involved as pedestrians. Forty-six senior citizens (age 65 or over) were involved as drivers, and 9 as pedestrians. Twenty-seven military personnel were involved as drivers, and 1 as a pedestrian. Sixty-eight of the drivers, including 16 military personnel, were licensed out of State. Nineteen of the drivers had no operator's license.

How?—The "how" of an accident, sometimes confused with the "why", is simply a factual account of the circumstances and conditions under which the accident occurred. Case descriptions of all the 1962 fatal accidents occurring on State highways have been set forth in the monthly reports issued by the Department of Highways. Viewed as a whole, certain significant patterns appear in connection with accident type, operating speed, weather, road surface condition, etc. These are summarized in Table V on page 15.

Why?—The "why" of a traffic accident is usually associated with causation. This should not be oversimplified in terms of a single condition or circumstance which is not sufficient in itself to produce an accident. It does serve a useful purpose in accident prevention, however, to single out from the host of causal elements those factors relating to the driver, his vehicle, and the roadway.

Evidence of human error and failure appeared in essentially all of the fatal accidents. The human side of these accidents was usually expressed in the reports in terms of traffic violation, improper action, or unfit driver or pedestrian condition as shown in Table VI on page 16. Analysis of the accidents reveals that more than one-half of the drivers and pedestrians fatally injured were not exactly the respon-

sible agent in the sense of committing an unlawful or improper driving or walking act. Some of the victims, however, may be said to have neglected to drive defensively or to take appropriate evasive action upon perception of danger. In a few cases, a passenger was considered to be at fault for distracting the driver. A listing of the most conspicuous driver faults in connection with road use provides some pertinent facts for the Highway Department's traffic safety program:

(1) Failure of the driver to handle the vehicle or to properly adjust speed on icy, snowy or wet pavement was a factor in 30 of the fatal accidents.

(2) Nonobservance of a curve warning symbol or an advisory speed indication for a curve was alleged in 49 of the fatal accidents on road curves.

(3) Failure to grant the right of way to a vehicle or pedestrian at a crossing played a part in 72 of the fatal accidents.

(4) Excessive or imprudent nighttime speed accounted in part for a majority of the 35 fatal accidents on Interstate expressways.

Seat Belts.—From among 1,002 occupants of motor vehicles involved in fatal accidents last year, only 13 persons (nine drivers, four passengers) were reported to be using seat belts. Five of the 13 persons using the belts survived the accidents, but sustained serious injury. Operating speed of the vehicles in which these 13 people were riding was relatively high (50 m.p.h. and above). The use of seat belts by occupants of vehicles involved in all reported accidents has not yet been determined.

Road and Traffic Control Considerations.—Under the motor vehicle laws of Colorado a driver is expected to keep his car under control at all times and to exercise due care to avoid colliding with any person or vehicle, especially when special hazards or unfavorable conditions are present. Actually, adverse road conditions such as holes, ruts, bumps, soft shoulders and the like were reported in less than 5% of the fatal accidents. The lack or adequacy of regulatory controls or advance warning devices was in question in about 10% of the cases. There are practical limitations as to what can be done in the way of traffic control on a network of some 79,000 miles of roads under several jurisdictions. However, on all important roads carrying appreciable volumes of traffic, road authorities must constantly seek to spare the driver a critical decision or reduce the driving risk by highway engineering measures, periodic road maintenance, and uniform application of traffic control devices.

From a study of the 1962 fatal accident experience, considered as a cross-section of the total accident experience, the following road and traffic control measures are advocated:

(1) It is not in the interest of traffic safety to confront the driving public with conflicting right-of-way rules in State and local jurisdictions. Positive assignment of right of way by Stop sign or Yield sign should be established wherever application of the normal right-of-way rule is unduly hazardous.

(2) Road curves which have been the scene of fatal or recurring accident experience should be inspected to determine condition of road and shoulder and ade-

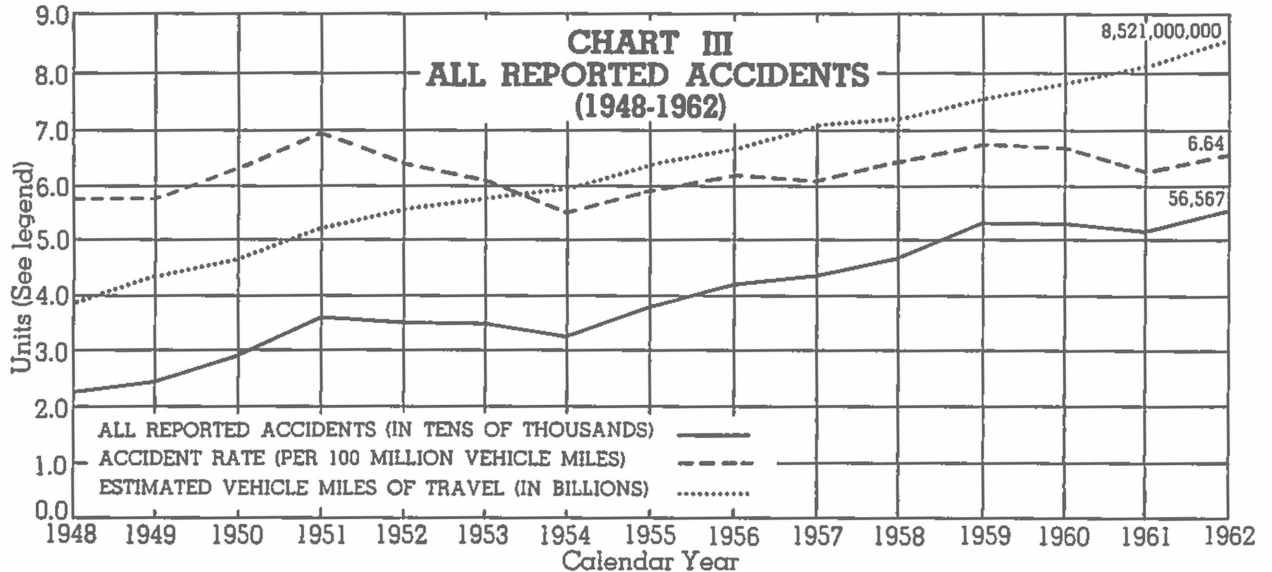
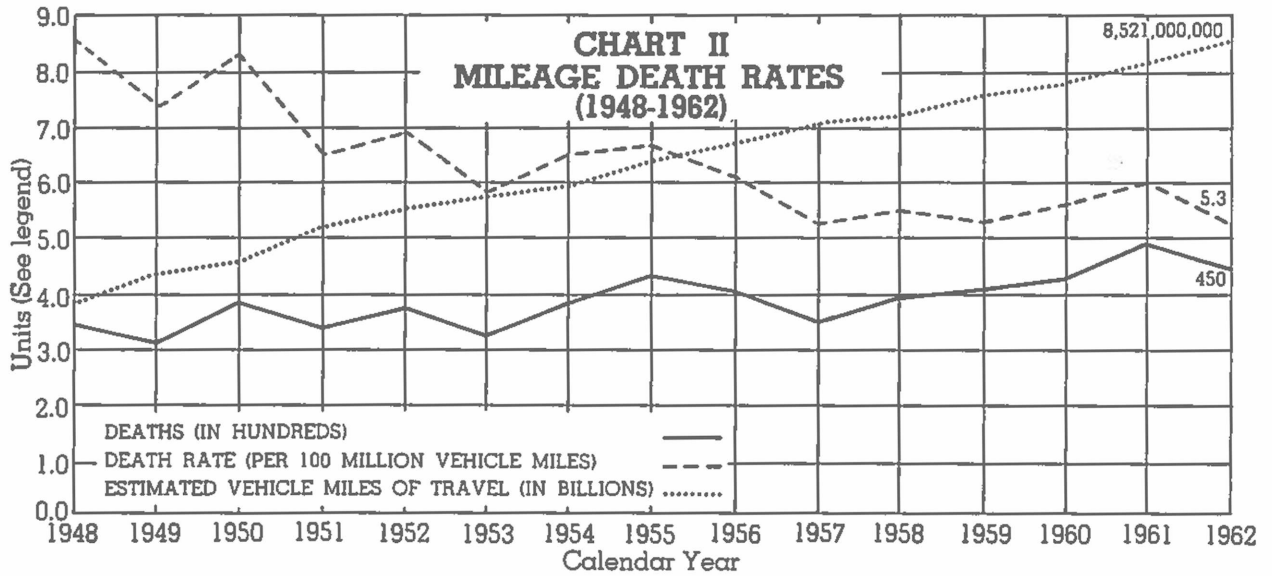
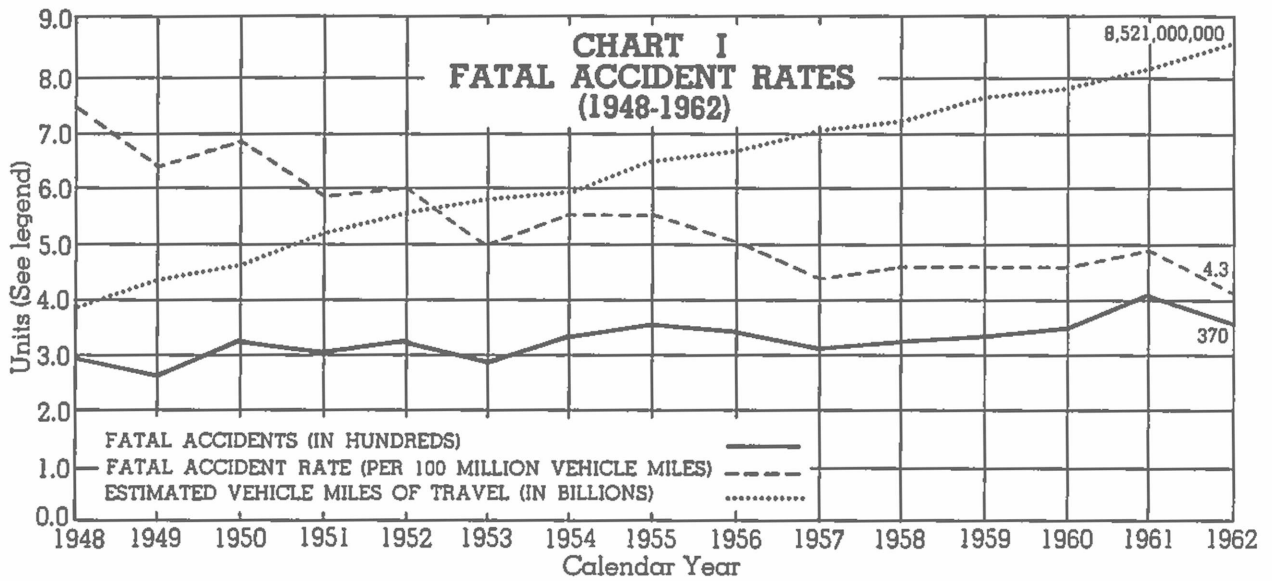
quacy of signs and markings, especially at night. Consideration should be given to the applicability of road curve warning symbols, advisory speed signs, no-passing zone markings, pavement edge lines, and road-delineation markers.

(3) Railroad crossings where fatal or other accidents have taken place should be studied to determine appropriateness of existing controls in relation to the degree of hazard.

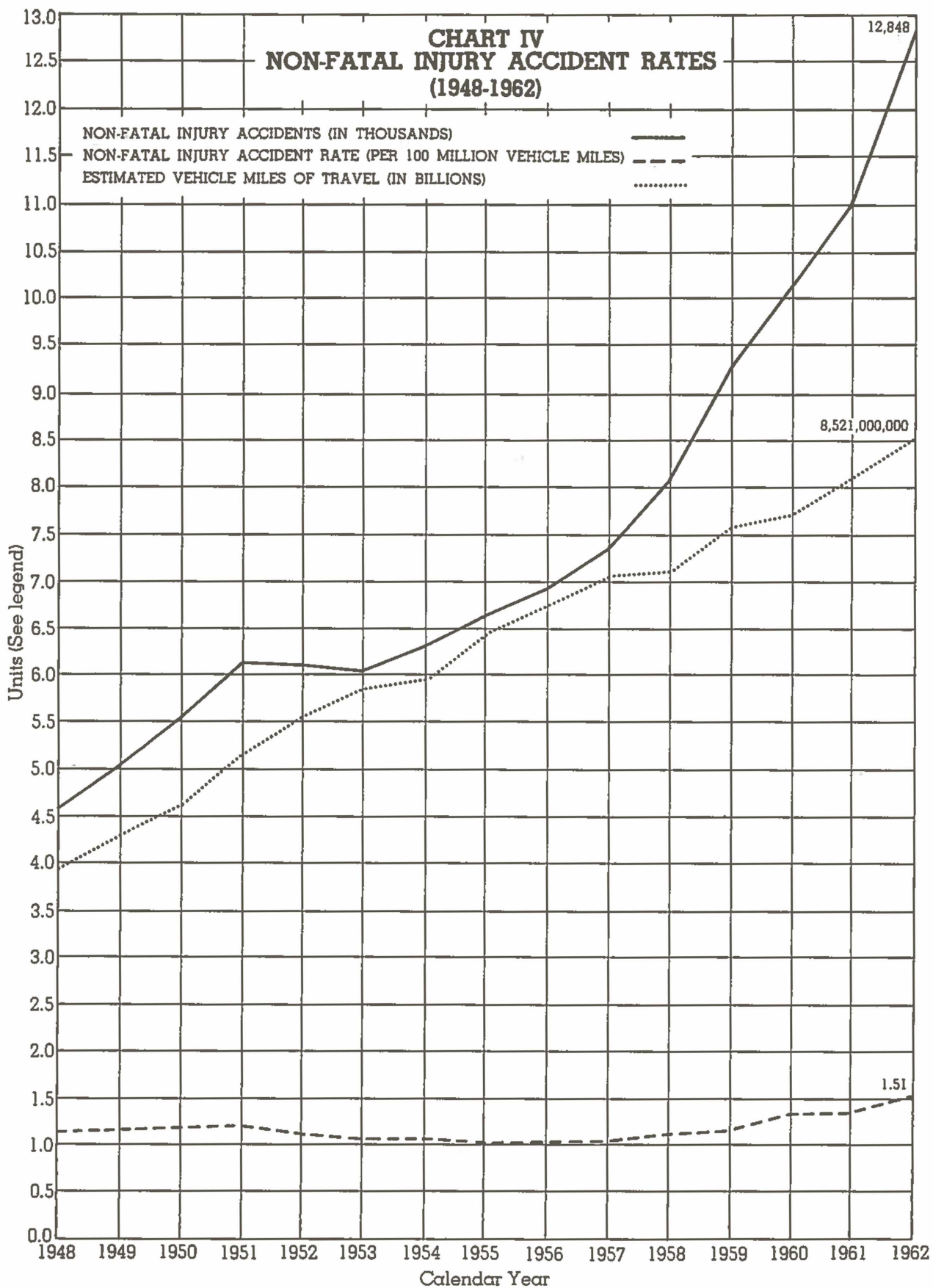
(4) Road sections presently posted above 60 m.p.h. and exhibiting relatively high accident experience should be considered for re-study to test their suitability for high speed operation on the basis of established engineering criteria.

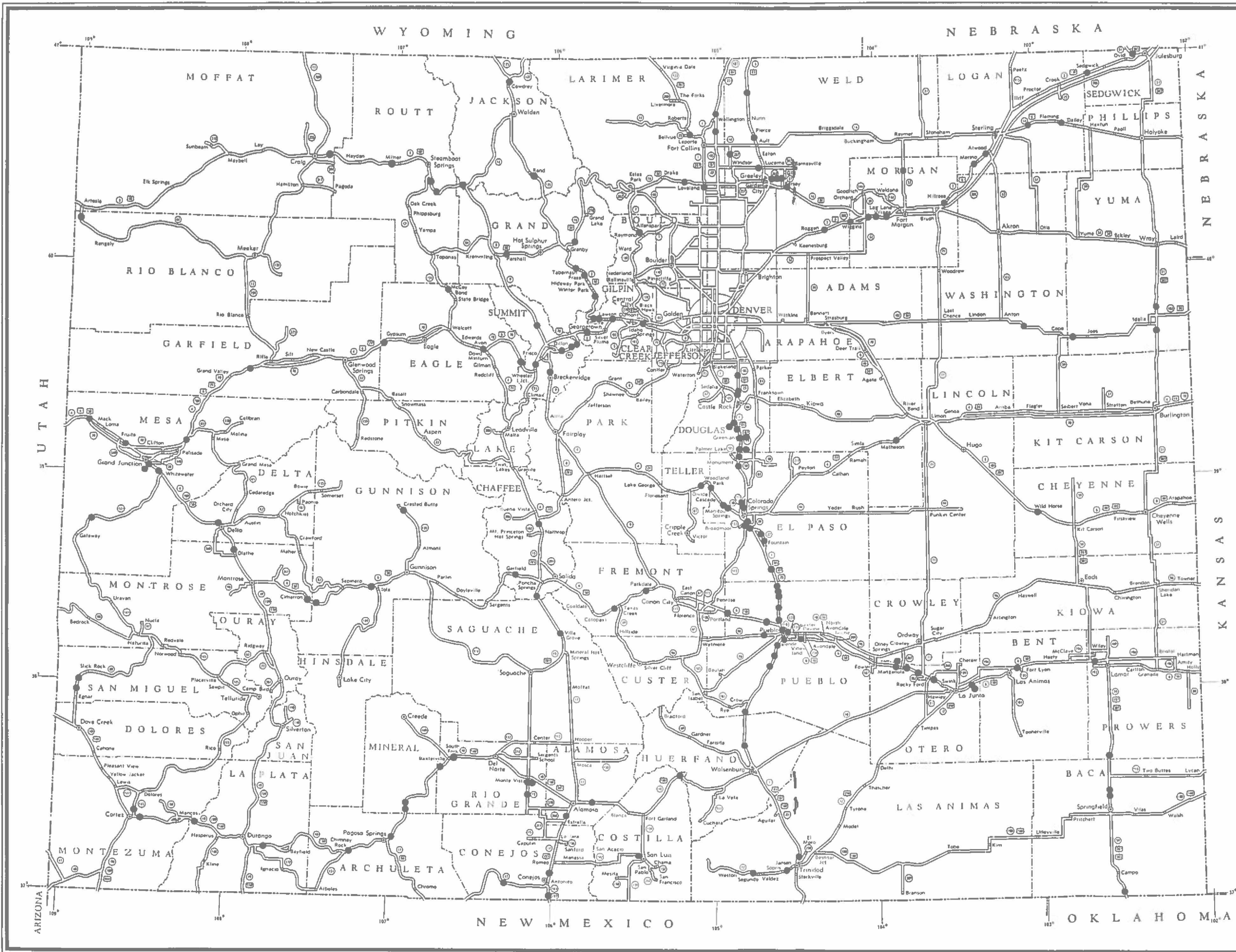
(5) With the growth and development of the Interstate System drivers should be given special instruction in the fundamentals of expressway driving and alerted to the hazard of 4-2 lane transitions which are to be expected under the stage construction program. The Department of Highways has already collaborated with the Motor Vehicle Agency in developing a special section on "Freeway Driving" for the current edition of "FACTS for Colorado Drivers." Committees on Traffic and Public Information of the American Association of State Highway Officials are presently considering the issuance of an instructional brochure on freeway driving for public distribution.

(6) The prominence of out-of-State drivers in fatal accident experience lends added importance to the program for uniform traffic control in all road jurisdictions. In this connection, the first parts of the "Colorado Manual on Uniform Traffic Control Devices for All Classes of Streets and Highways" will be issued in 1963.



**CHART IV
NON-FATAL INJURY ACCIDENT RATES
(1948-1962)**

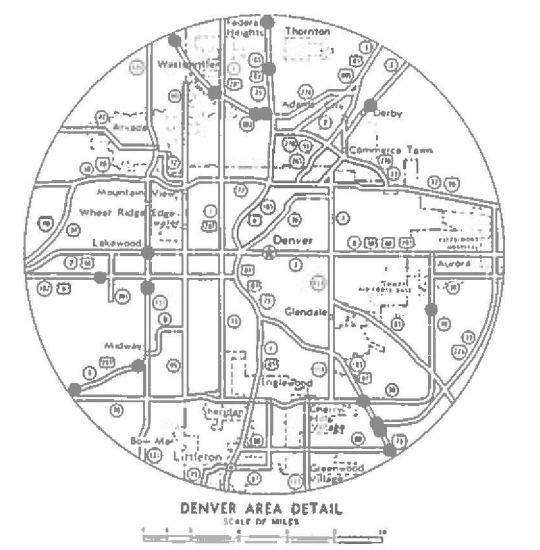
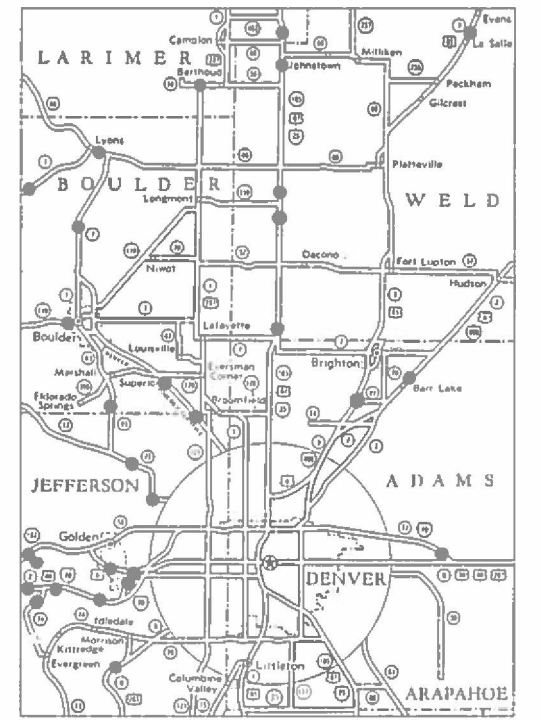




COLORADO
1962 FATAL TRAFFIC ACCIDENTS
ON RURAL STATE HIGHWAYS
 PREPARED BY
 COLORADO DEPARTMENT OF HIGHWAYS
 COLORING AND RESEARCH DIVISION
 TRAFFIC OPERATIONS SECTION



- LEGEND**
- STATE BOUNDARY LINE
 - COUNTY BOUNDARY LINE
 - STATE CAPITAL
 - COUNTY SEAT
 - OTHER TOWNS AND CITIES
 - FATAL RURAL ACCIDENT
 - INTERSTATE HIGHWAY NUMBER
 - U. S. HIGHWAY NUMBER
 - STATE HIGHWAY NUMBER



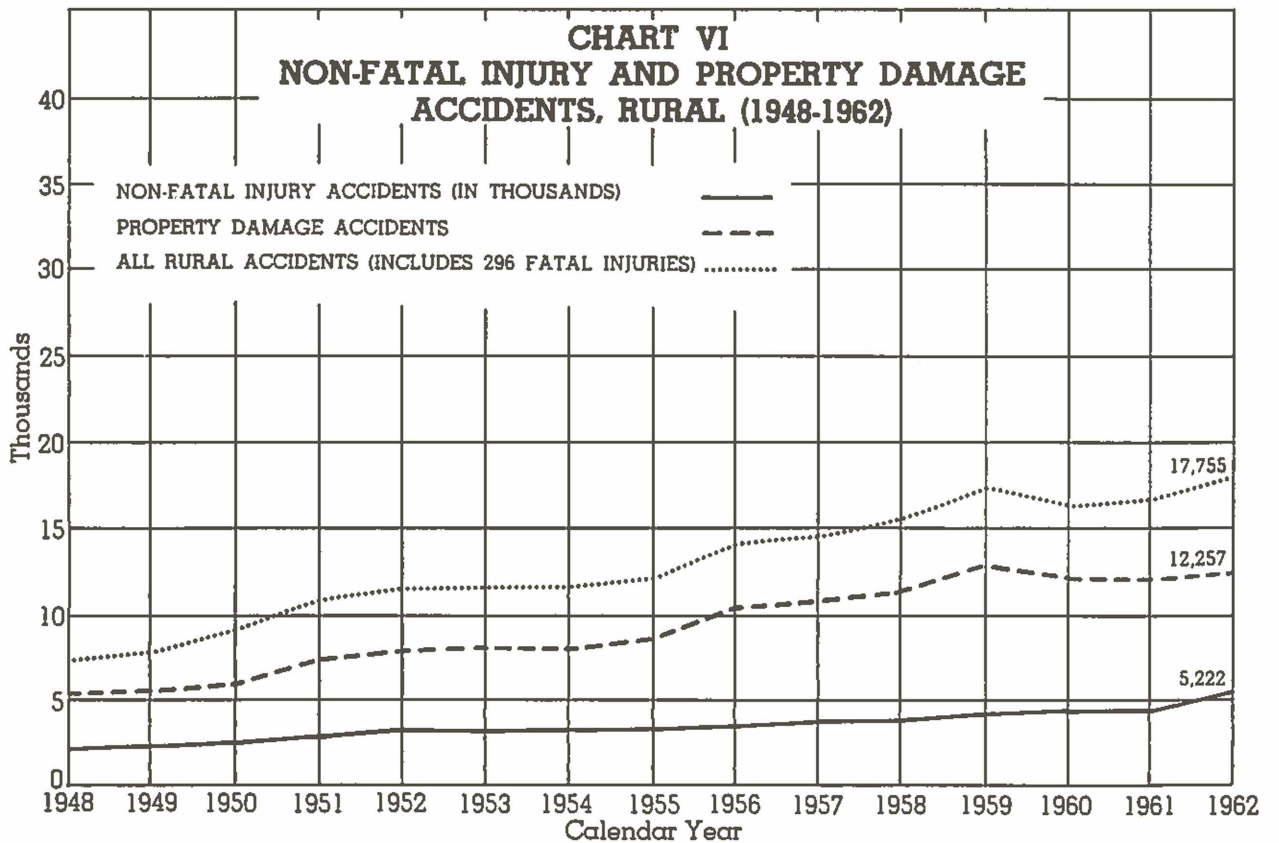
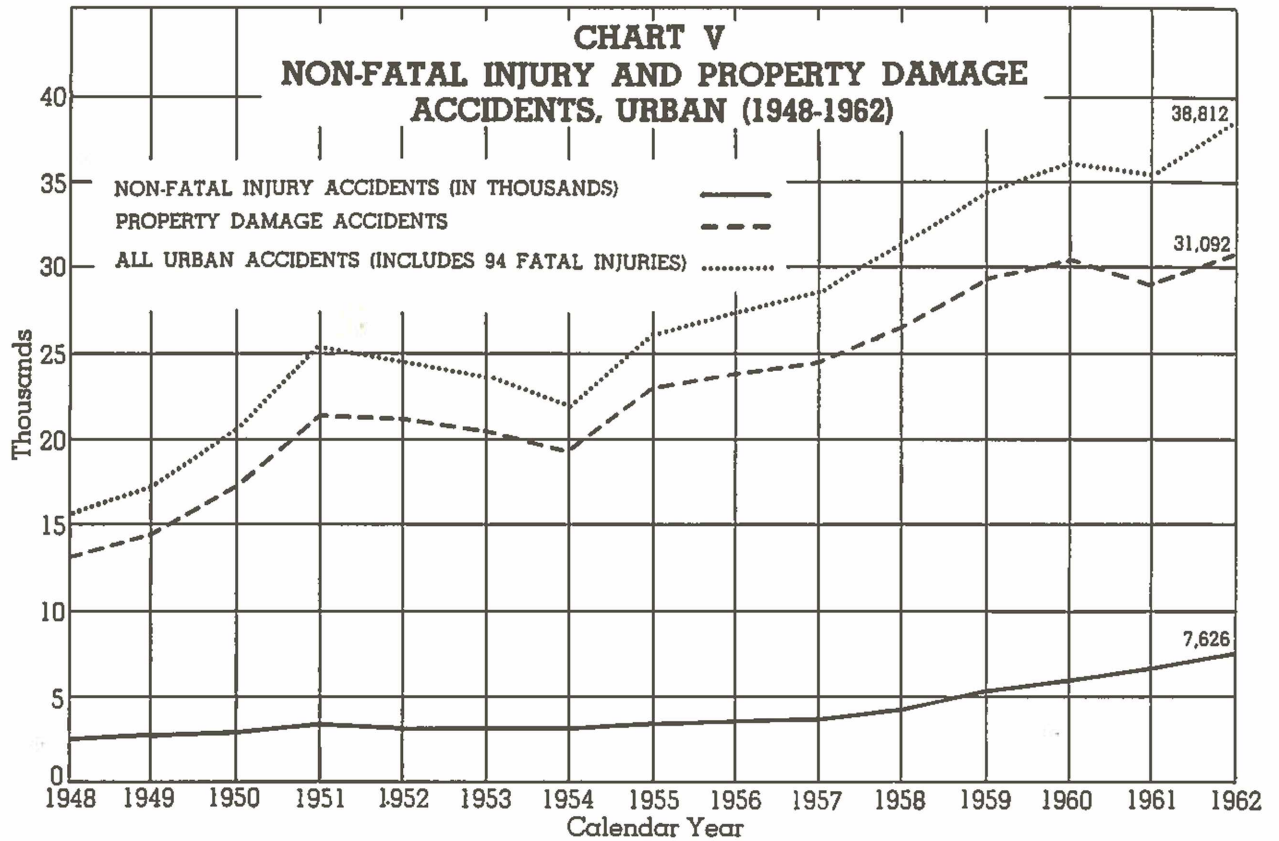


TABLE I
FATAL ACCIDENTS AND PERSONS KILLED
IN RELATION TO
ROAD SYSTEM MILEAGE AND VEHICLE MILES OF TRAVEL

ROAD SYSTEM	Mileage 1962¹	Fatal Accidents	Persons	100 Million Miles of Vehicle Travel²	1962 Fatal Accident Rate
Interstate ³	292.0	35	37	7.1	5
SH Rural (Including Toll Road)	8006.6	183	232	38.8	5
SH Urban	377.1	29	43	7.0	4
All State Highways	8675.7	247	412	52.9	5
County Roads	64935.6	64	79	11.0	6
City Streets	5019.2	59	59	21.3	3
Total all Systems	78630.5	370	450	85.2	4

Source: ¹ 1962 Route Descriptions and Mileage Statistics, pg. 118-120.

² Based on vehicle gas consumption and 1956 and 1960 traffic volume studies.

³ Rural and urban sections, fully or substantially improved to Interstate standards.

TABLE II

A. FATAL ACCIDENTS WITHIN INCORPORATED CITIES AND TOWNS

State Highways Total = 40					
Denver	13	Durango	2	Hudson	1
Colorado Springs	4	Castle Rock	1	Littleton	1
Pueblo	4	Cortez	1	Manitou	1
Englewood	3	Fort Collins	1	Naturita	1
Canon City	2	Georgetown	1	Pagosa Springs	1
Commerce City	2	Greeley	1		

City Streets Total = 59					
Denver	35	Grand Junction	2	Commerce City	1
Pueblo	6	Aurora	1	Delta	1
Colorado Springs	3	Burlington	1	Durango	1
Alamosa	2	Canon City	1	Evans	1
Englewood	2	Cherry Hills Village	1	Montrose	1

Total Within Incorporated Areas = 99

B. FATAL ACCIDENTS OUTSIDE INCORPORATED CITIES AND TOWNS

County Roads Total = 64					
Jefferson	9	Kiowa	2	Cheyenne	1
Weld	9	Mesa	2	Conejos	1
Adams	8	Montrose	2	Crowley	1
El Paso	4	Pitkin	2	Garfield	1
Larimer	4	Rio Grande	2	Montezuma	1
Delta	3	Alamosa	1	Morgan	1
Boulder	2	Archuleta	1	Otero	1
Elbert	2	Bent	1		
Fremont	2	Chaffee	1		

State Highways Total = 207	
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Total Outside Incorporated Areas = 271

Grand Total = 370

TABLE III
FATAL ACCIDENTS BY COUNTY, ALL ROAD SYSTEMS

Denver	48	Archuleta	4	Pitkin	2
Jefferson	27	Baca	4	Prowers	2
Pueblo	27	Chaffee	4	San Miguel	2
El Paso	26	Conejos	4	Crowley	1
Weld	25	Eagle	4	Huerfano	1
Adams	22	Logan	4	Moffat	1
Arapahoe	12	Montezuma	4	Rio Blanco	1
Larimer	12	Montrose	4	Saguache	1
Douglas	11	Elbert	3	Teller	1
Mesa	11	Gunnison	3	Washington	1
Boulder	10	Jackson	3	Custer	0
Otero	8	Las Animas	3	Dolores	0
Fremont	7	Routt	3	Gilpin	0
Morgan	7	Sedgwick	3	Hinsdale	0
Rio Grande	7	Yuma	3	Kit Carson	0
Clear Creek	6	Bent	2	Lake	0
Summit	6	Cheyenne	2	Lincoln	0
Alamosa	5	Costilla	2	Ouray	0
Delta	5	Garfield	2	Park	0
Grand	5	Kiowa	2	Phillips	0
La Plata	5	Mineral	2	San Juan	0
				TOTAL	370

TABLE IV
SCENES OF FATAL ACCIDENTS

LOCATION	NUMBER OF FATAL ACCIDENTS					
	Interstate	S. H. Rural	S. H. Urban	County Roads	City Streets	Total
Curve	8	62	3	20	3	96
Intersection (controlled)	2	23	11	11	24	71
Intersection (uncontrolled)			3	7	8	18
Interchange	8	5	2			15
Structure	4	18	3	1	1	27
Hillcrest		1		1		2
Railroad Crossing			1	6	1	8
Construction Site		3			1	4
Lane Transitions (4-2)	1					1
No Special Feature	12	71	6	18	21	128
All Scenes	35	183	29	64	59	370
65 & 70 MPH Zone	19	36				55
Mountainous Terrain		47	2	11		60

TABLE V
HIGHLIGHTS OF 1962 FATAL ACCIDENTS
FATAL ACCIDENTS = 370

1. TYPE OF ACCIDENT

Collision With	No. Accidents
Vehicle Head-On	38
Vehicle Rear-End	25
Vehicle Broadside	34
Vehicle Sideswipe	9
Vehicle Approach Turn	18
Vehicle Overtaking Turn	5
Pedestrian	60
Fixed Object	49
Train	8
Noncollision	No. Accidents
Overtuned	5
Ran Off Road	115
Other	4

2. TIME

Month	No.	Day	No.	Hour	A.M.	P.M.
Jan.	24	Mon.	40	12-1	30	9
Feb.	22	Tues.	35	1-2	15	16
Mar.	23	Wed.	40	2-3	12	8
Apr.	25	Thur.	48	3-4	10	20
May	29	Fri.	63	4-5	6	29
June	35	Sat.	69	5-6	12	29
July	41	Sun.	75	6-7	6	26
Aug.	42			7-8	9	20
Sept.	38			8-9	3	18
Oct.	37			9-10	6	23
Nov.	26			10-11	12	22
Dec.	28			11-12	12	17

3. VISION

Unobscured	322
Obscured	33
Not Stated	15

4. ROAD SURFACE

Dry	321
Wet	32
Snowy	6
Icy	11

5. LIGHT

Daylight	176
Dark (Roadway Lighted)	57
Dark (Roadway Unlighted)	138

6. WEATHER

Clear	304
Cloudy	30
Raining	17
Snowing	16
Fog	3

7. VEHICLE UNITS PER ACCIDENT

One	241
Two	121
Three	6
Four	1
Seven	1

DRIVER and VEHICLES = 512

8. ESTIMATED SPEEDS

MPH	No.	MPH	No.
0-4	9	45-49	12
5-9	12	50-54	48
10-14	9	55-59	15
15-19	13	60-64	87
20-24	19	65-69	14
25-29	15	70-74	38
30-34	20	75-79	8
35-39	22	80+	30
40-44	36	Unstated	85

9. VEHICLE

No Defects	469
Defective	14
Not Stated	29

10. DRIVER

Had Not Been Drinking	256
Had Been Drinking	67
Drunk	54
Asleep	27
Blacked Out	1
Drugged	1
Unknown	106

11. TOLL

Fatal Accidents	370
Persons Killed	450
Persons Injured	460

TABLE VI
CAUSATIVE FACTORS IN FATAL ACCIDENTS

CAUSATIVE FACTOR ¹	State Hwy.	County Road	City Street	Sub-Total	Total
UNSAFE SPEED or LOST CONTROL ²				104	
(a) On curve—Dry	36	12	1		49
—Wet, Snowy, Icy	17	1			18
(b) On Straight Road—Dry	17	5			22
—Wet, Snowy, Icy	9	2	1		12
(c) Racing (speed contest)	2		1		3
UNFIT DRIVER OR PED. CONDITION				93	
(a) Alcohol (Driving ability impaired)	44	8	7		59
(b) Fatigued (Dozed - Fell Asleep)	29				29
(c) Physical Defect	1				1
(d) Unfamiliar With Vehicle		2	2		4
IMPROPER DRIVING				137	
(a) Failure to Grant Right of Way					
(1) Vehicle to Vehicle	9	6	4		19
(2) Vehicle to Pedestrian		6			6
(3) Pedestrian to Vehicle	21	3	22		46
(4) Vehicle to Train	1	5			6
(b) Wrong Side of Road (Not Passing)	14	4			18
(1) Wrong Side of Divided Highway	2				2
(c) Ran Stop Sign or Signal	4	8	8		20
(d) Improper Turning	5	1			6
(e) Improper Passing	10	1			11
(f) Improper Parking on Roadway	2				2
(g) Wrong Way on One Way Street	1				1
MISCELLANEOUS				11	
(a) Road & Shoulder Obscured By Flood Water	1				1
(b) Avoiding (Object, Animal, Etc.)	2	1			3
(c) Farm Tractor Involvement	1	1			2
(d) Passenger Jumped from Moving Vehicle	1				1
(e) Towed Vehicle on Wrong Side of Road	1	1			2
(f) Driver Distracted by Passenger	1				2
(g) Traffic Control Device Covered With Snow	1				1
DEFECTIVE VEHICLE	9	2	2	13	13
CAUSE UNKNOWN				12	
Ran Off Straight Dry Road	4	1	4		9
Ran Through Bridge Railing			1		1
Ran Into Bridge Abutment	1				1
Lost Control - Straight Wet Road	1				1
TOTALS BY JURISDICTION	247	64	59	370	370

NOTES: ¹ The above classifications show prominent causative factors from among multiple contributing circumstances.

² "Unsafe" speed is construed to mean speed in excess of the advisory posting or in excess of prudent operation for existing conditions. In most fatal accidents this amounted to exceeding the lawful speed limit for the zone as well.

