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FATAL TRAFFIC ACCIDENTS

ON COLORADO'S STREETS AND HIGHWAYS

CALENDAR YEAR 1963



DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
PLANNING AND RESEARCH DIVISION

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

CALENDAR YEAR 1963

I. FOREWORD

During 1963 approximately one million resident drivers and just as many out-of-State motorists together drove almost nine billion miles on Colorado's streets and highways. Despite the astronomical number of vehicle conflicts possible in a movement of this size, about 95 percent of the road users managed to avoid a traffic accident. The remaining 5 percent experienced accidents and produced a record toll for the State of 507 dead, 20,540 injured, and an estimated economic loss close to \$90,000,000.

Fatal traffic accidents receive almost daily publicity. They are usually the subject of more than routine investigation and study. Actually, they constitute less than one percent of all reported accidents. As a cross section of the total accident experience they provide insights for accident prevention. It is the purpose of this report to review as a whole the known facts about the 1963 fatal accident experience in Colorado: to examine exposure rates, to consider the people and vehicles involved, and to draw attention to the scenes and circumstances. With this knowledge, some light may be shed for strengthening the State's traffic safety program.

II. THE 1963 RECORD

Police and Patrol investigators reported some 56,000 accidents in 1963. Drivers themselves reported another 10,000 not covered by police. It is a matter of speculation just how many thousands of minor property damage accidents (under \$50) were uninvestigated or unreported to the State. Allowing for exclusions in reporting, a conservative estimate of all traffic accidents in Colorado might easily be placed at 75,000 for the calendar year.

When all the 1963 reports had been processed, 507 traffic deaths had been charged to 422 fatal accidents. Moreover, it was found that 531 persons had sustained nonfatal injury in these accidents. The number of fatal accidents and the number of fatalities exceeded by approximately 3 percent and 4 percent respectively the previous highs set in 1961 when 492 persons were killed in 405 accidents.

Economic loss in motor vehicle accidents is an important consideration in justifying road improvements and other traffic safety measures. The calculable costs are wage loss, medical expense, overhead cost of insurance, and property damage. According to the National Safety Council these costs now average \$180,000 per death for all accidents. Other economic studies place the loss at 1¢ per mile of travel. Applying either of these cost factors, the economic loss in Colorado reached a level of \$90,000,000 in round numbers.



III. STATE-WIDE RATES (1963)

For proper perspective in year-to-year evaluation it has become standard practice to measure the number of deaths and accidents in terms of vehicle-miles of travel. Figures on State-wide travel are developed from the amount of gasoline consumed in highway use. The annual mileage death rate and the fatal accident rate are then computed by applying the following formula:

$$\text{Rate} = \frac{\text{Number of Deaths (or Accidents)} \times 100,000,000}{\text{Vehicle Miles of Travel for Calendar Year}}$$

With vehicle-miles of travel placed at 8,876 millions, the mileage death rate in 1963 was 5.7 deaths for every 100 million vehicle miles of travel, somewhat higher than the national average of 5.4. The fatal accident rate, however, was 4.8 fatal accidents per 100 million vehicle miles of travel. Much greater significance is attached to the accident rate since it provides a more realistic basis for evaluating highway safety improvement. Due to multiple deaths in certain accidents, the records consistently show more traffic fatalities than fatal accidents. During 1963, for example, there were 85 more traffic deaths than there were fatal accidents.

Another measure of exposure lies in the motor vehicle registrations, usually expressed as the number of deaths or accidents per 10,000 vehicles registered. Motor vehicle registrations in Colorado during 1963 reached a total of 1,097,077. The rate computations are as follows:

$$\text{Death Rate}_{1963} = \frac{507 \times 10,000}{1,097,077} = 4.6$$

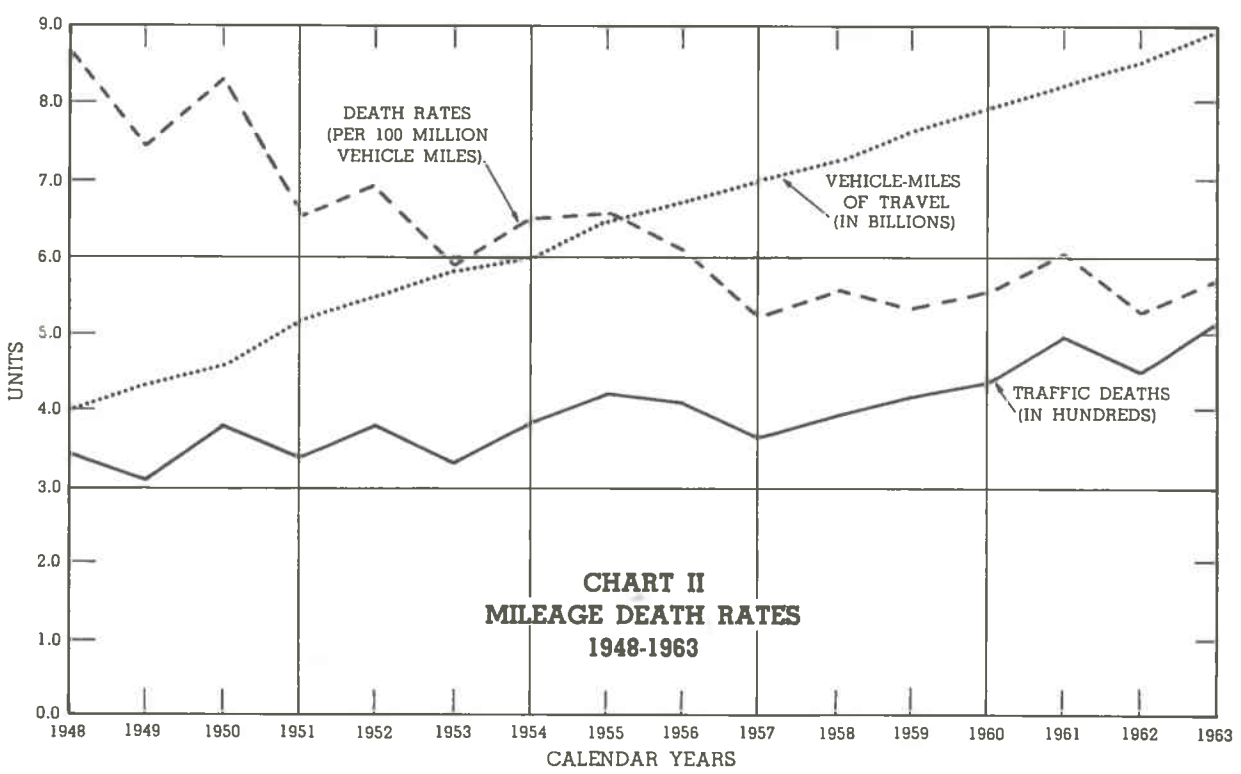
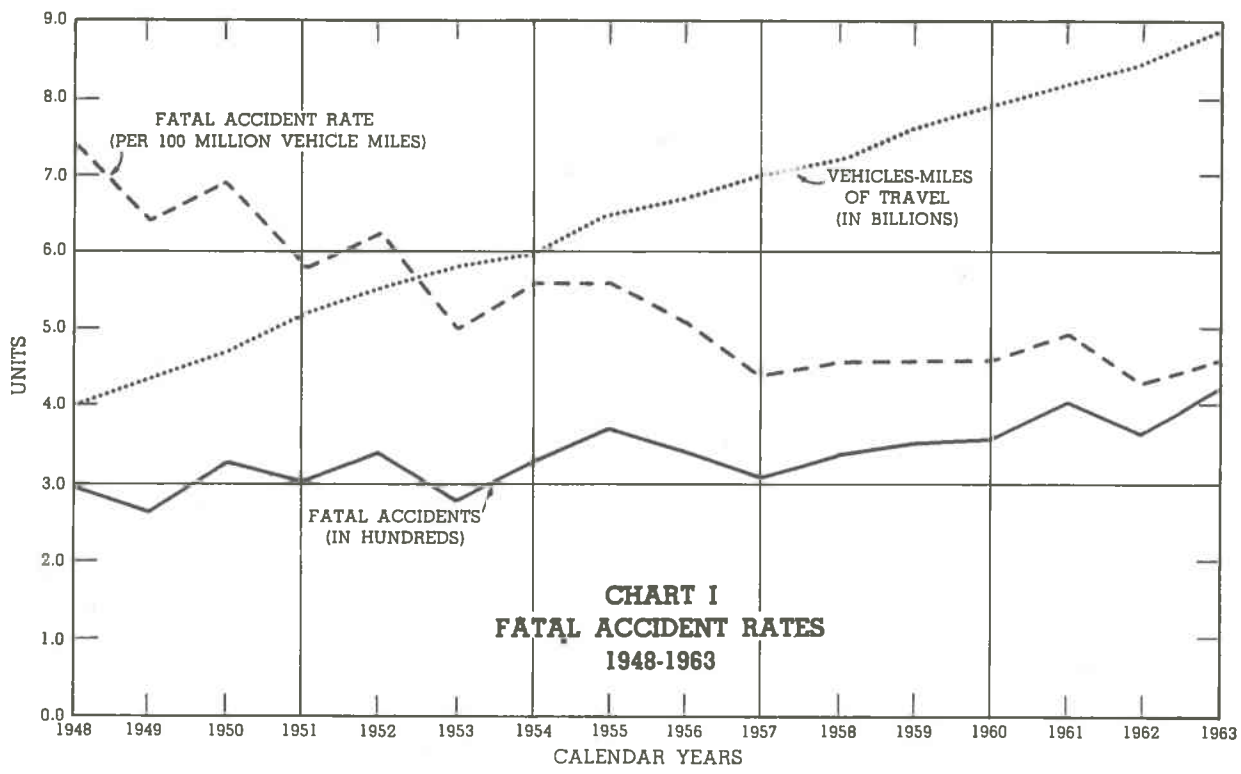
$$\text{Fatal Acc. Rate}_{1963} = \frac{422 \times 10,000}{1,097,077} = 3.8$$

Death rates and fatal accident rates for previous years, based on vehicle-miles and registrations, are shown in Tables I and II on pages 27-28.

IV. RATE TRENDS (1948-1963)

A long-range view of death and accident rates reassures us that highway safety efforts have not been in vain. Line graphs in Charts I and II on page 3 represent what has been happening over a period of sixteen years. It will readily be seen from the graphs that vehicle travel in Colorado has been climbing steadily and has more than doubled in the span of years between 1948 and 1963. In sharp contrast, death and fatal accident rates have gradually taken a downward course and receded to lower levels.

The fatal accident rate has dropped from a high of 7.4 in 1948 to a level below 5 in recent years, receding to an all-time low of 4.3 in 1962. The mileage death rate has exhibited a similar decline from a high of 8.6 in 1948 to a level of 6 and below, receding to an all-time low of 5.2 in 1957. *Despite the fact that record highs were established in 1963 for fatal accidents and fatalities, the rates for that year were actually lower than those for certain previous years with fewer deaths and accidents!*



Motor vehicle registrations in Colorado have almost doubled within the past ten years. Death rates and fatal accident rates for the period 1954-1963, computed on a registration basis, are plotted in Charts III and IV on page 5. By comparison with Charts I and II it will be seen that the line graphs based on registration rates closely parallel those based on mileage rates. Rates in the earlier years have gradually receded to lower levels with the succeeding years.

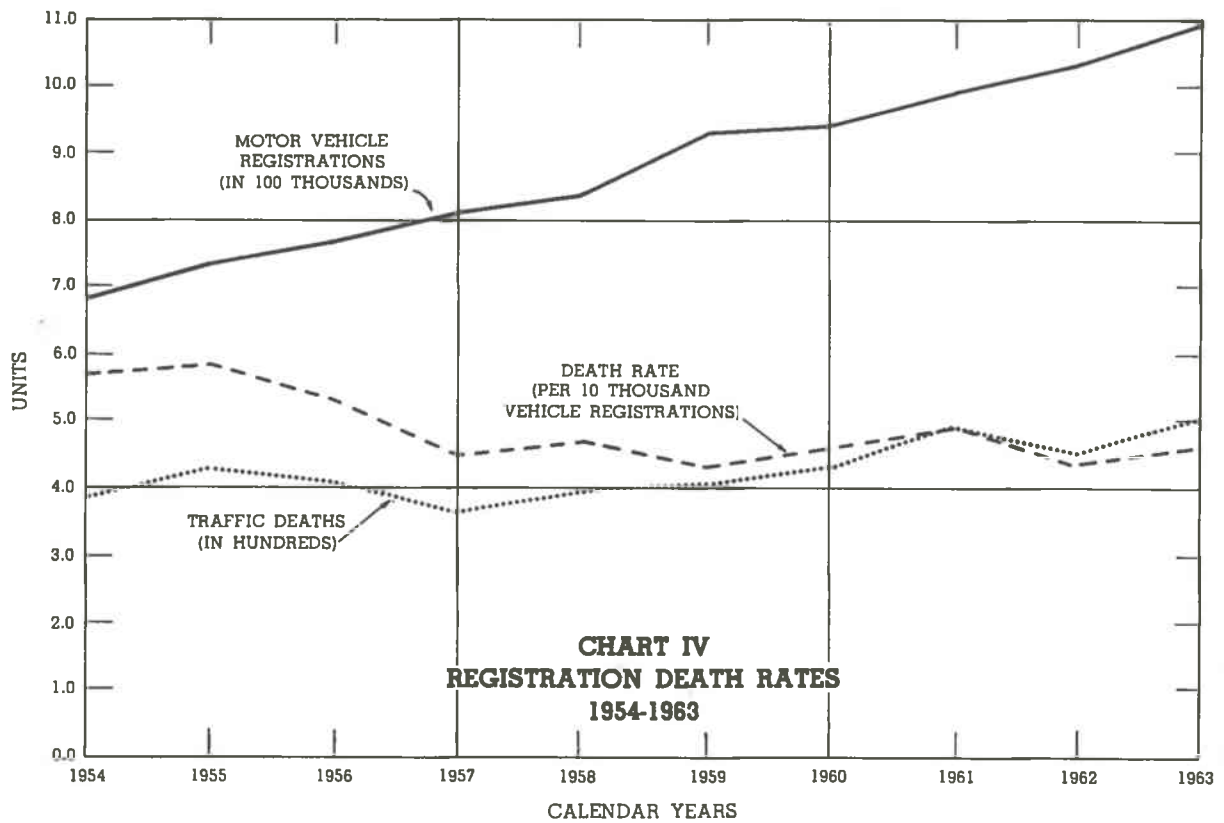
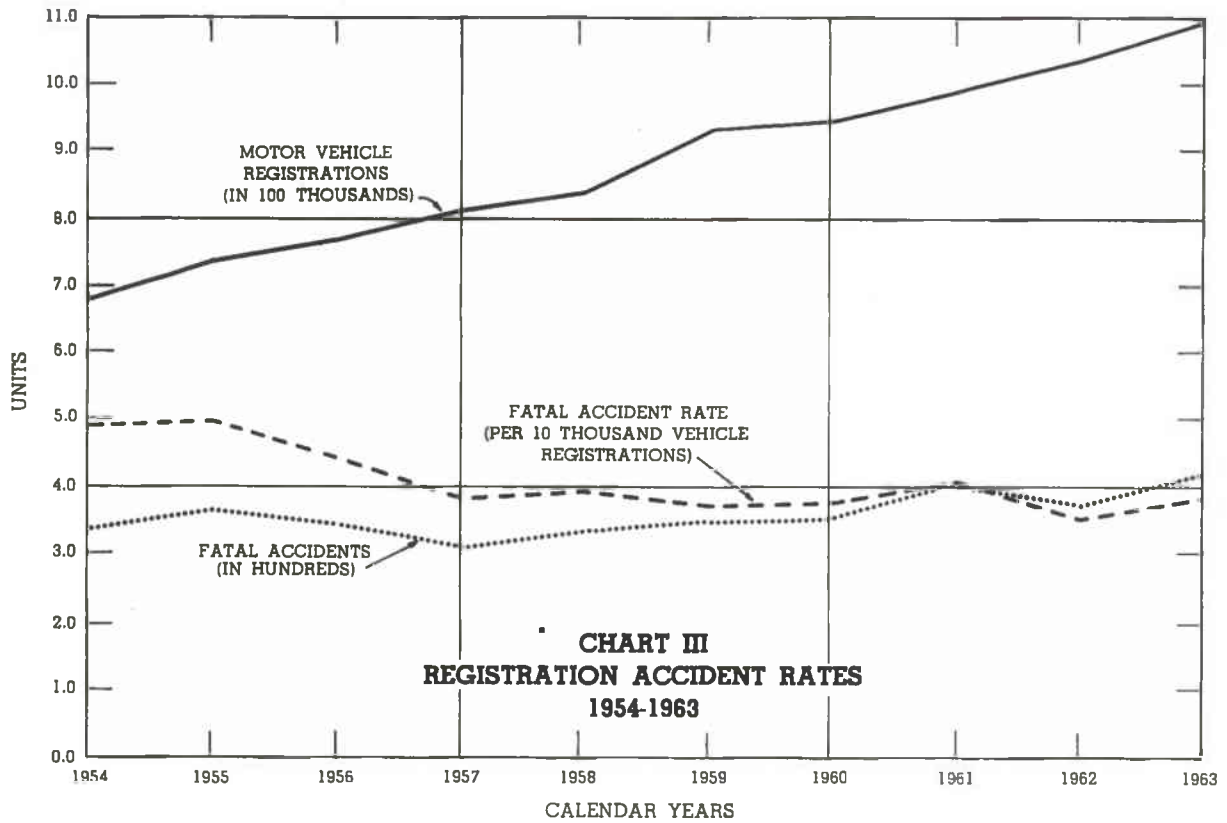
Accidents resulting in injury of any kind are almost always reported. For this reason, it is appropriate to examine the trend in nonfatal injury accidents. It will be seen from the line graph in Chart V on page 6 that injury accident rates remained fairly constant for the ten-year period 1948 through 1957. Since then, however, rates have exhibited an upward surge. A very probable explanation of the rate increase may be found in the higher average operating speeds which have shown up in traffic speed studies State-wide in recent years. A peak rate of 119 nonfatal injury accidents per 100 million vehicle miles of travel, recorded in 1951, was not exceeded until 1959—the year that 65 m.p.h. and 70 m.p.h. speed limits were legalized for certain highways in Colorado. The higher limits on freeways and expressways have quite possibly influenced higher operating speeds on conventional highways as well. It is generally recognized that increase in average speed also heightens the chances of injury and death when accidents do occur. Figures on injury accidents from 1948 to 1963 may be found in Table III, page 29.

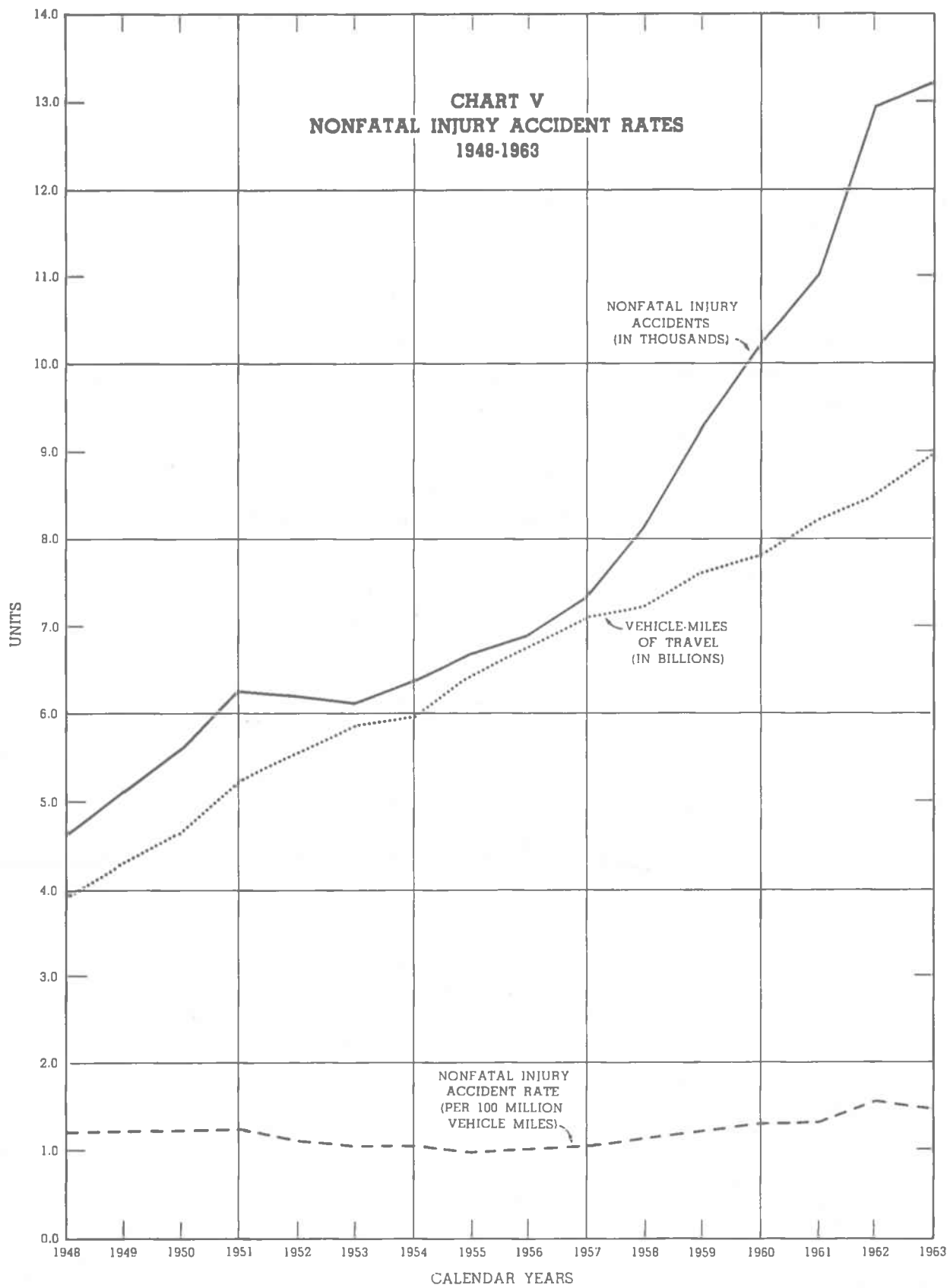
National research studies indicate that while exposure to single-vehicle accidents varies directly with the mileage, the opportunity for two-vehicle collisions varies as the square of the mileage. Applying this knowledge to rate considerations, we would expect deaths and injuries in such collisions to go up more percentage-wise than travel has gone up. Consistent with this assumption, the Colorado records show that in the period of years that travel has doubled, injuries in two-car collisions have almost quadrupled. Traffic deaths in two-car collisions, however, have hardly doubled in the same period.

V. ROAD SYSTEM RATES (1963)

Basically, the public trafficways to which motor vehicle accidents are charged consist of State highways (including Interstate facilities and urban connecting links), County roads, and City streets. During 1963 the State Highway System accounted for about 70 percent of the fatal accidents, County roads for about 15 percent, and City streets for about 15 percent. Table IV on page 30 shows the death and fatal accident rates for each road system based on an apportionment of vehicle miles of travel.

Almost 380 miles of Interstate roads of freeway design were in operation by the end of 1963. This represents about 40 percent of Colorado's allocation in the Federal System of Interstate and Defense Highways. Completed sections consisted of 257.4





miles of Class I Interstate roads (acceptable Interstate standards, full control of access) and 122.2 miles of Class II Interstate roads (near Interstate standards, partial control of access). It will be seen from Table IV that rural sections of both Class I and Class II Interstate are exhibiting considerably lower fatality rates than those found on conventional rural roads. Quite to the contrary, however, the urban freeways in Class I (including the Monument Valley Freeway and the Pueblo Freeway) are experiencing unusually high rates—higher, in fact, than any of the conventional roads and streets. Class II urban freeways (including the Denver Valley Highway) show more moderate rates. Of all the controlled-access facilities in the State, the Denver-Boulder Toll Road, having only one major interchange within its 17.3-mile length, has the lowest death and fatal accident rate.

Conventional rural roads have rates between two and three times as high as those on urban streets. This is explained, in part, by the higher speeds which prevail on the open roads. County roads comprising the bulk of the State's road mileage, but carrying a comparatively small amount of the traffic, have a higher fatal accident rate but a lower death rate than rural roads of the State Highway System.

VI. WHO?

Analysis of traffic accidents cannot fail to consider the people involved. Some 1,308 persons played a part in the 1963 fatal accidents. These included 603 drivers, 635 passengers, 61 pedestrians, and 9 cyclists or riders of nonmotor-vehicle conveyances. Killed were 240 drivers, 195 passengers, 61 pedestrians, and 11 in other categories.

Classification by age group shows a relatively high incidence of involvement among the young and the elderly. Eighty teen-agers and 35 senior citizens were involved as drivers in the fatal accidents. Very few teen-agers were involved as pedestrians. The record of pedestrian fatalities shows 27 children under 13 years of age and 15 senior citizens 65 years of age or over.

The number of out-of-State drivers involved in Colorado's fatal accidents rose from 68 in 1962 to 101 in 1963. Eleven of the 1963 number were military personnel.

Investigation by the State Patrol of the driving record of resident drivers involved in fatal accidents disclosed that one-third of them had a serious record of moving violations or previous accident experience. Thirty-two drivers had no operator's license from any state. Seven of these were operating vehicles despite the fact that their license to drive had been revoked or suspended.

VII. WHY?

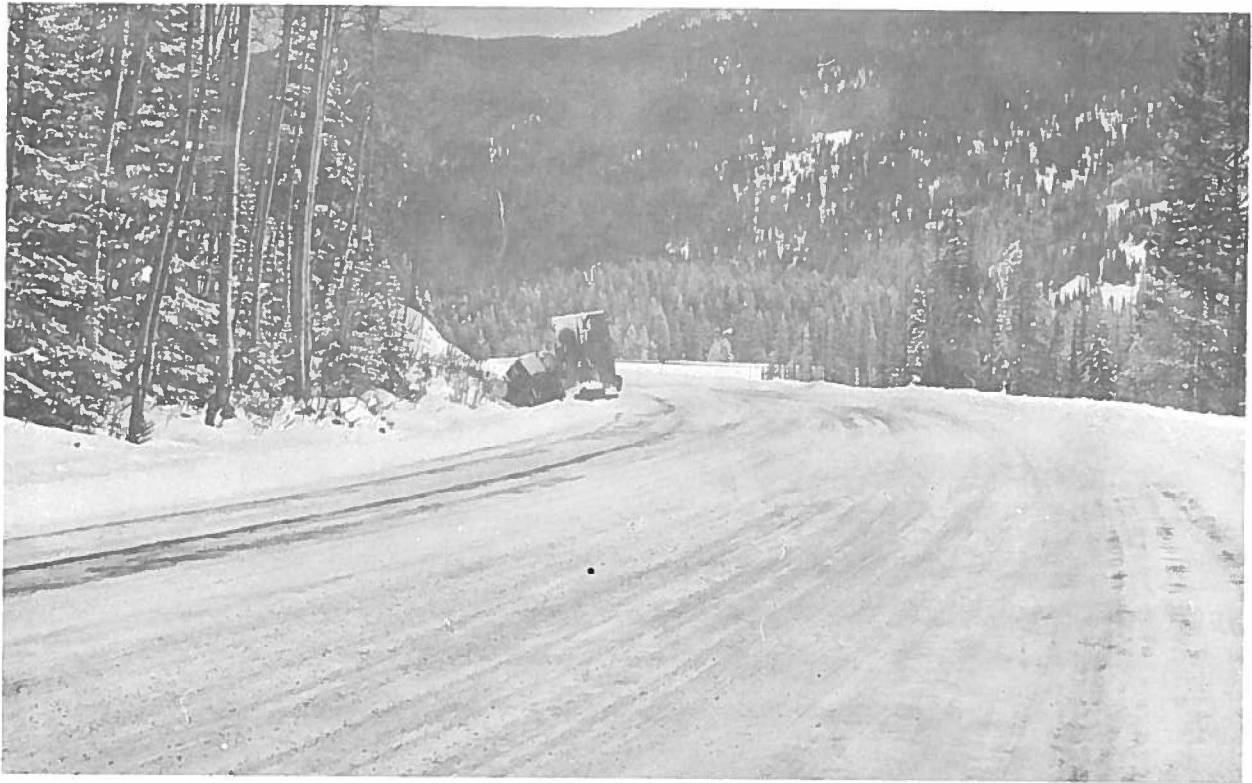
The "why" of a traffic accident is the most difficult question to answer in accident analysis. It is decidedly misleading to label all accidents "driver failure" and let it go at that. A host of particulars relating to the driver, his vehicle, and the roadway must be thoroughly investigated and analyzed to explain an accident. Everyday accident investigation has practical limitations, and does not ordinarily permit exhaustive probing and inquiry. Consequently, many factors are unknown to us. Care must be taken to avoid an oversimplification of causation in terms of a single action, condition or circumstance not sufficient in itself to produce an accident.

There is little question that driver performance leaves much to be desired. Investigators' reports of the fatal accidents present ample evidence of human error and even irresponsible action. The shortcomings of drivers and pedestrians are enumerated in Table V on page 32. Conspicuous among the citations are such familiar faults as unsafe speed, right of way violation, improper passing, and disregard of traffic control devices. Almost 25 percent of the drivers involved in fatal accidents were reported to have been drinking; however, in only one out of three cases was it actually established by Blood Alcohol Test (usually from autopsy) that drivers were intoxicated. Almost 20 percent of the drivers involved were traveling over 70 m.p.h.; almost 10 percent were driving over 80 m.p.h.

Ignorance of road rules and noncompliance with traffic controls are no small part of the fatal accident problem, but the regulations and the devices themselves are sometimes in question. Local traffic ordinances are not always in harmony with State law. The statutes of Colorado are seriously in need of updating to bring them into conformity with the National Uniform Vehicle Code. There is virtually nothing in State law to govern operations on present-day freeways and expressways, and instruction in freeway driving is quite limited. Progress is being made in advancing traffic control standards, but there is still much lack of uniformity in traffic control devices State-wide.

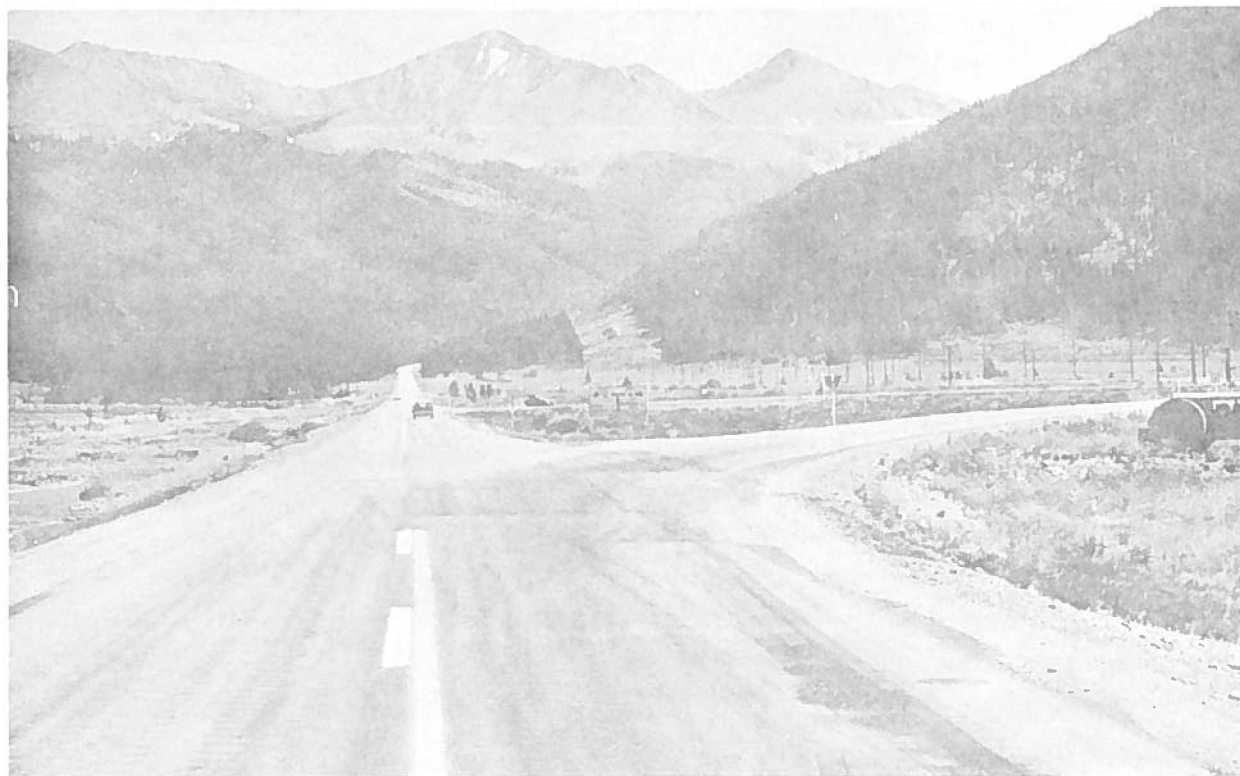
The Washington office of the U. S. Bureau of Public Roads suggests that road agencies look more closely in their accident analysis to conditions and circumstances which place unreasonable demands on the human operator and confront him with situations with which he cannot cope. To do this, it is necessary to study and understand driver errors and to apply the data to the design and improvement of roads, vehicles, and controls which simplify the driving task and eliminate or minimize the possibilities for human error. From this viewpoint a study of the where, when, and how of the accidents holds special significance for possible life-saving results.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



1. Out of control on icy road curve downgrade.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



2. Right of way conflict at "Y" road junction.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



3. Passing at narrow bridge at night.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



4. Head-on collision near structure on 65 m.p.h. road.



5. Overtaking downgrade on rain-slick highway at night.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963

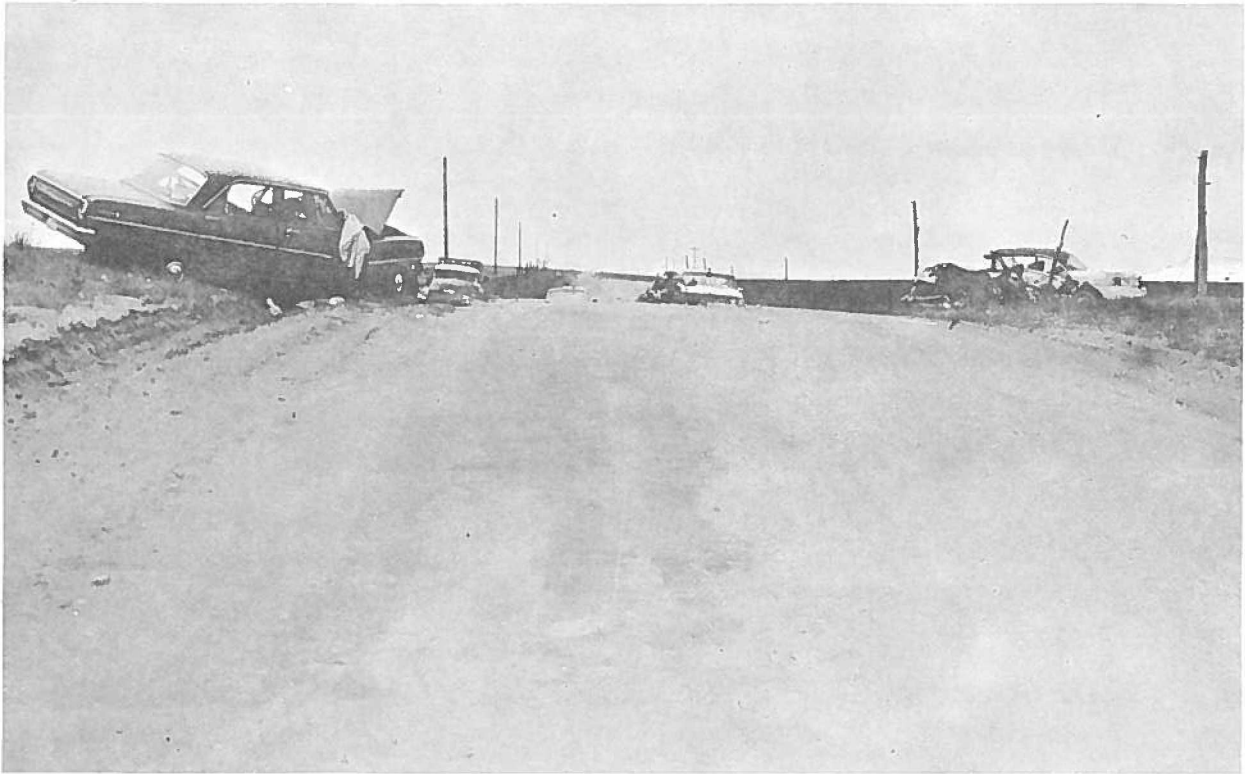


6. U-turn at median crossover causes freeway driver to lose control.



7. Crash into underpass pier on freeway.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



8. Head-on encounter at blind hillcrest on gravel road.



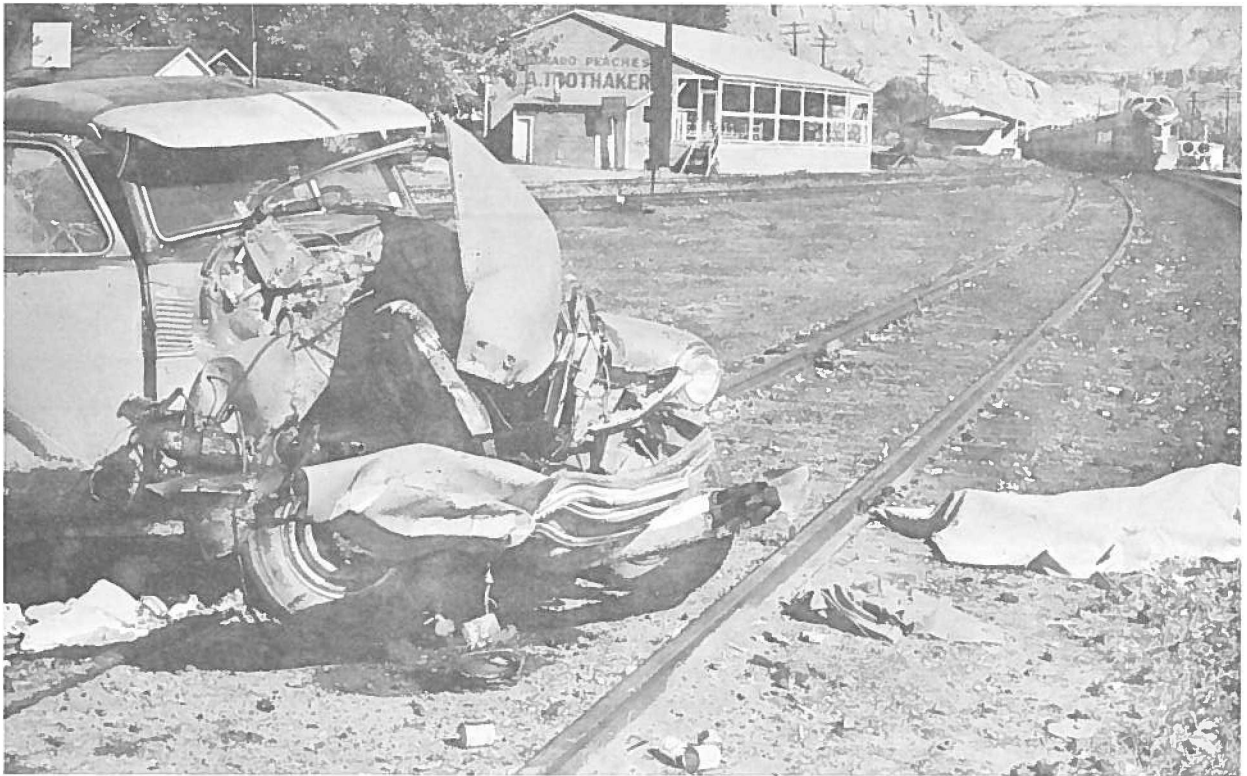
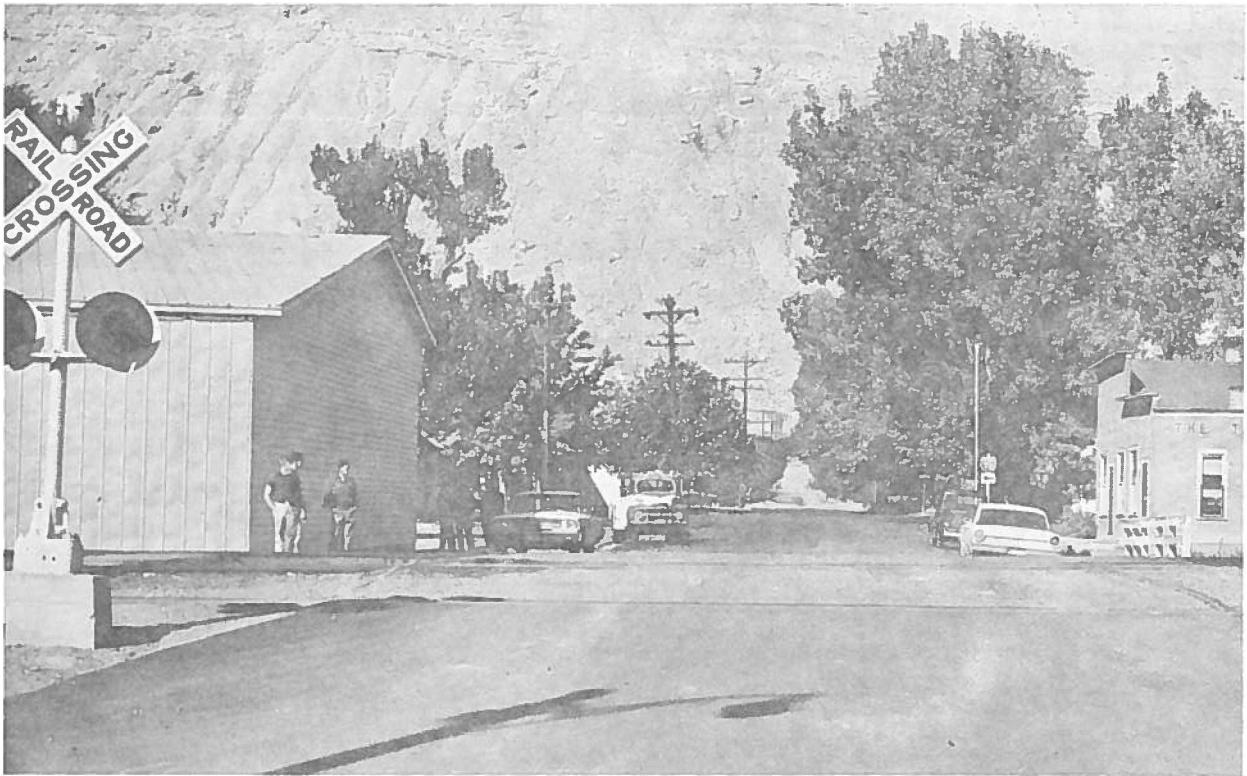
9. Bicyclist struck by motorist driving into setting sun.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



10. Stop sign violation where local road meets State highway.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1963



11. Unheeded signal at railroad crossing on local street.

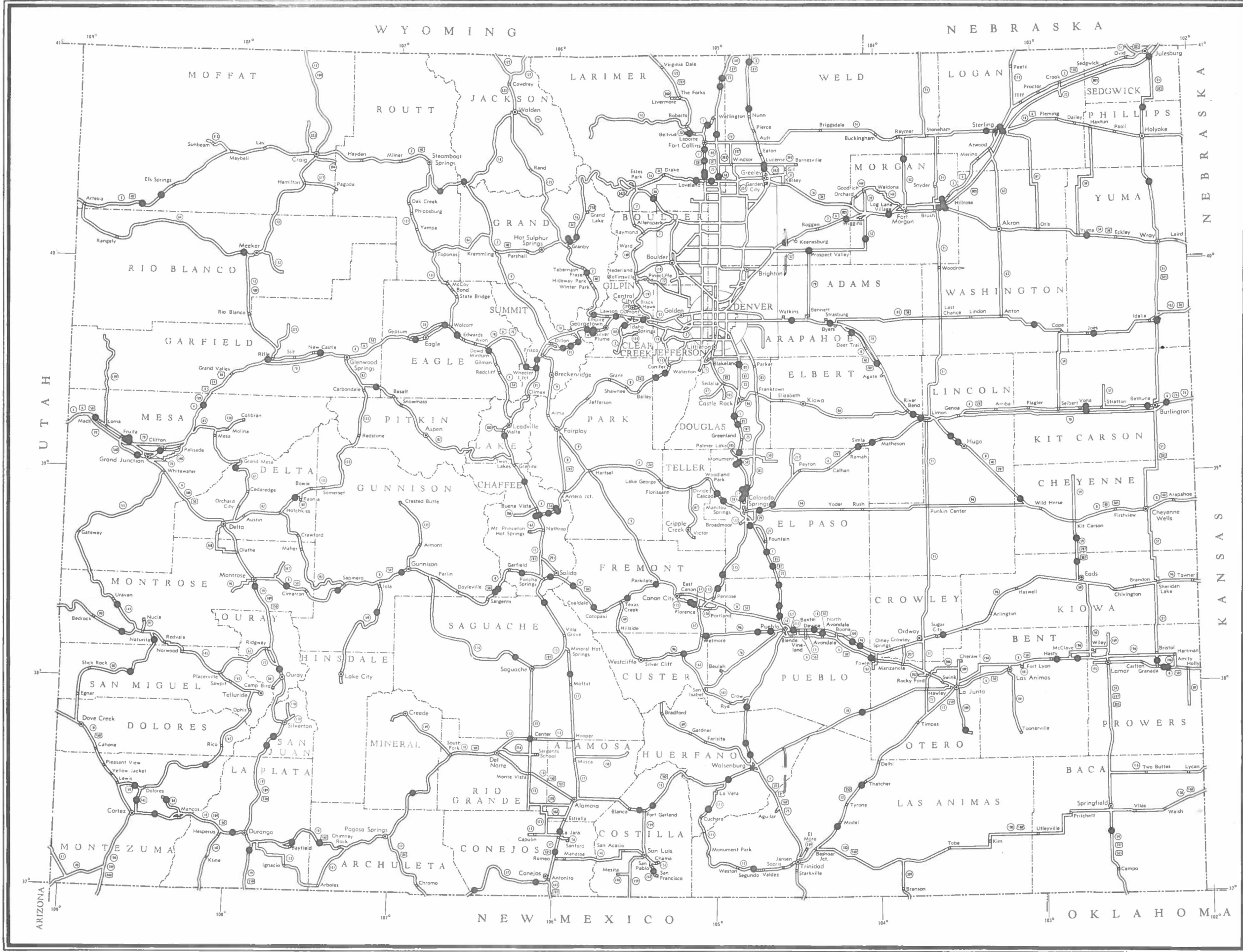
VIII. WHERE?

The accident scene is of particular concern to the road authority. Conditions at the scene invite inspection and study, especially where there are repeated or recurring accidents. More than one-half of the fatal accidents during 1963 occurred on the rural portion of the State Highway System. The spot map on the center pages of this report serves to indicate the distribution and concentration of the accidents on rural State highways. Local jurisdictions will find in Tables VI-VIII, pages 31-34, tallies of fatal accidents on roads and streets within the various counties and incorporated areas of the State.

Table VI lists the various types of locations by road system where drivers experienced fatal injury accidents. Topping the list is the road curve where 141 fatal accidents took place. Next is the intersection at grade, many of them uncontrolled by regulatory sign or signal, where 117 fatal accidents occurred. A structure, sometimes a narrow bridge or underpass, was associated with 55 accidents. An interchange figured in 21 of the accidents, several on ramp curves. A railroad crossing was the scene of 6 fatal accidents, all but two of them on County roads and all but one unsignalized. In some cases, the presence of a structure at the end of a curve, an intersection on a curve, or a curved alignment at a hillcrest compounded the demands upon the driver's judgment and capability. A check of accident spot maps reveals that 103 fatal accident locations on State highways were accident repeater spots. Four locations were scenes of more than one fatal accident.

Despite the obvious safety features of freeway design, there were 54 fatal accidents on road sections fully or substantially developed to Interstate standards. Thirty-one of these occurred on divided highways with full control of access; 21 on divided highways near Interstate standards; and 2 on newly-constructed two-lane sections considered adequate for present-day traffic. Characteristics of these accidents are described in Item X, pages 20-21. The largest concentration of fatal accidents on the Interstate System appears on a heavily-traveled section of Route 25 between Denver and Pueblo (see spot map). Urban freeways within Denver, Colorado Springs, and Pueblo accounted for 14 of the accidents: 7 on the Denver Valley Highway, 5 on the Pueblo Freeway, and 2 on the Monument Valley Freeway.

Typical and actual scenes of fatal accidents on conventional roads and freeways in 1963 are illustrated on pages 9-16. Represented among the exhibits are the road curve, the Y-type road junction, the narrow bridge, the underpass, the median crossover, the Stop intersection, the hillcrest, and the railroad crossing. Such locations were the setting for almost one-third of the fatal accidents. Photos were taken by the Colorado State Patrol.



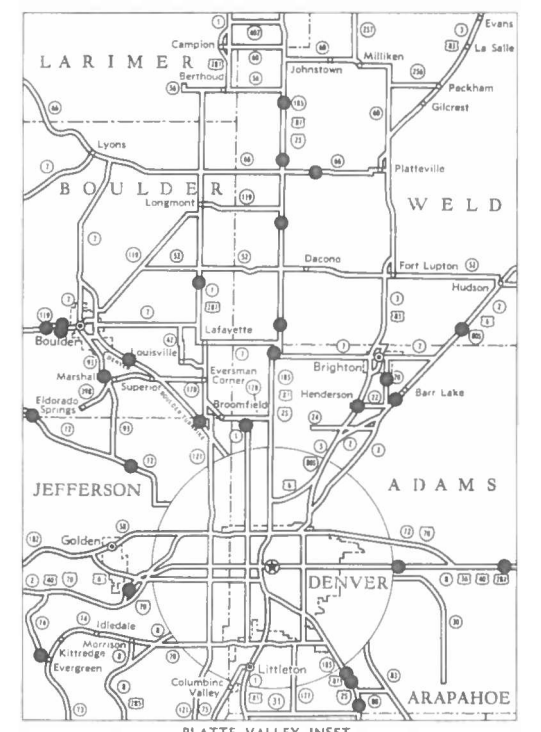
**COLORADO
1963 FATAL TRAFFIC ACCIDENTS
ON RURAL STATE HIGHWAYS**

PREPARED BY
DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
PLANNING AND RESEARCH DIVISION



LEGEND

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



PLATTE VALLEY INSET



DENVER AREA DETAIL

IX. WHEN?

About 51 percent of the fatal accidents in 1963 took place during hours of darkness, despite the reduced amount of travel at night. More than one-half of the accidents occurred during the last three days of the week. The highest toll for any 7-day period of the year was recorded during the first week of August when 13 fatal accidents produced 24 fatalities. Traffic deaths in August outnumbered all other months with 60 persons killed in 46 accidents. Several of the national holidays celebrated over a four-day week-end added noticeably to the road toll. Independence Day for example, fell on a Thursday and in the four-day period through the week-end eight deaths were charged to traffic accidents in the State. Table IX on page 35 presents additional particulars with respect to the month, day, and hour of the fatal accidents.

X. HOW?

The "how" of a traffic accident, not to be confused with the "why," is simply a factual description of the circumstances and conditions under which the accident occurred. This information in combination with the "where" and the "when" sometimes points the way to correction or remedy. Case descriptions of fatal accidents on State highways are outlined in reports issued monthly by the Colorado Department of Highways. Table V on page 32, previously discussed, sets forth improper actions of drivers and pedestrians leading to many of the accidents. Table IX on page 35 classifies the accidents by type and highlights such items as day and time, operating speed, road surface condition, vehicle condition, and the like.

One-car accidents, excluding vehicle conflicts with pedestrians, accounted for approximately 45 percent of the fatal accidents State-wide. In these accidents drivers lost control and vehicles overturned, collided with fixed objects and animals, or ran off the road. A majority of the single-vehicle accidents occurred in rural areas, on road curves and at structures, during hours of darkness, and at speeds generally reported to be unsafe for existing conditions. Many took place on icy, wet, or snow-packed roads.

Multiple-car collisions accounted for about 36 percent of the fatal accidents State-wide. In these accidents vehicles collided head-on, sideswiped one another, ran into the rear of vehicles ahead, or turned in front of other vehicles. A majority of the multiple-car collisions occurred outside the limits of incorporated areas, at intersections, during daylight hours, and under favorable road surface conditions.

Vehicle-pedestrian conflicts accounted for about 14 percent of the fatal accidents. In these accidents pedestrians were struck down while crossing roadways or while walking in the traffic lanes. A majority of the pedestrian accidents took place within the limits of incorporated areas, usually at night and at nonintersection points. In most of the accidents the pedestrian apparently took the right of way. In only 13 out of 61 cases were pedestrians run down in crosswalks.

The single-car accident was very conspicuous on roads of freeway design. Thirty-four of the 54 fatal accidents on first- and second-class Interstate roads were of this type. Typical of the reported circumstances was the lone nighttime driver who lost control at high speed and either struck a fixed object at the roadside or ran off the road and overturned. Driver fatigue, intoxication, and wet or icy road surface was often an attending condition. Next, in order of frequency, was collision into the rear of vehicles slowing down or stopping in the traffic lanes. Two of these occurred when drivers sought to reverse their direction of travel at a median cross-over. Quite unexpected on divided highways, but nonetheless recurring, was the head-on collision. Three of these in 1963 were attributed to wrong-way movements on the one-way roadways; others to vehicles out of control which crossed the median into the opposing traffic lanes. Several drivers lost control in making the transition from a 4-lane divided road section to a 2-lane undivided road section or the reverse. Vehicle-pedestrian conflicts continue to be numbered among fatal accident events on freeways. There were three such cases in 1963, two involving children.

XI. VEHICLES AND SEAT BELTS

Six hundred and three motor vehicles were involved in the 1963 fatal accidents. Vehicle units included 474 passenger cars, 109 trucks and combination truck tractor-trailers, and various miscellaneous types. Approximately 80 percent of the passenger cars involved in the fatal accidents were 1954-1963 models, less than ten years old. About 50 percent were five years old or less. Some 20 percent were ten years old or older. Due to destruction or inaccessibility of the evidence after the crash, very little is known about the condition of the vehicle at the time of the accident. Vehicle defects such as improper lights, brake or tire failure, and the like were reported in only 22 of the fatal accidents.

Reports show that 145 persons were killed in 1963 accidents when ejected from vehicles. Yet, among 1,308 occupants of vehicles involved in the accidents only 25 persons (17 drivers, 8 passengers) were reported to be using seat belts. Ten of the drivers and 4 of the passengers using belts survived the accidents. The other 7 drivers and 4 passengers were killed.

Table X on page 36 summarizes the known facts about the fatal accidents in which seat belt use was reported. Persons wearing the belts were involved in 19 of the accidents. Almost 50 percent of the accidents were head-on collisions at speeds of 50 m.p.h. or more. Cases of seat belt use in fatal accidents are being investigated and studied by a Committee of the Colorado State Medical Society as a phase of national research in human impact survival and trauma in automobile collisions.

XII. SUMMARY OF FINDINGS

Many aspects of Colorado's fatal accident experience in 1963 have been explored or touched upon in this report. Some warrant further investigation and study. Among the facts developed, the following should stimulate thought and action:

ACCIDENTS

(1) 1963 was the busiest year on record for motor vehicle travel in Colorado. At the same time, it was the deadliest and the costliest in terms of traffic accidents. Exposure rates, though edging upward, were actually lower than in a number of other recent years.

(2) Injury accidents and nonfatal injury rates have been on the rise since the introduction, in 1959, of 65 m.p.h. and 70 m.p.h. speed limits in Colorado. The influence of freeway speeds is reflected in higher average operating speeds on conventional roads.

DRIVERS AND PEDESTRIANS

(3) Drunk drivers, drowsy drivers, unlicensed drivers, drivers under suspension, and drivers with records of past violations and accidents figured prominently in the fatal accident experience.

(4) One out of every six drivers involved in the 1963 fatal accidents was an out-of-State motorist.

(5) Unsafe speeds, especially at night, reflect failure to see or heed advance warnings or to recognize conditions which call for reduction of speed below the posted regulatory limit.

(6) The predominance of single-car, off-the-road accidents on rural highways indicates that drivers on the open road have more to fear from themselves than from other drivers.

(7) Children below teen-age and adults over sixty-five years of age were casualties in two-thirds of the fatal pedestrian accidents. In most cases, the pedestrian appeared to be at fault by taking the right of way or walking in the traveled way.

ROADS, REGULATIONS, AND CONTROLS

(8) Ninety percent of the fatal accidents occurred on older, conventional roads and streets. Uncontrolled intersections, critical curves, narrow bridges, blind hillcrests, construction sites, and railroad crossings were scenes of one-third of the accidents on two-lane highways.

(9) Approximately 25 percent of the fatal accident locations had exhibited previous accident experience.

(10) Loss of control on a road curve was the most common circumstance of the fatal accidents. In most cases, critical speed postings below curve warning symbols advised the motorist of the safe speed for the curve. Obstacles at the roadside such as trees, highway fixtures, sharp ditches, and steep slopes usually left little chance for recovery of control or return to the roadway.

(11) Freeway accidents reveal problems of wrong-way movements on one-way roadways, U-turn maneuvers at crossovers, unexpected slowing or stopping in the traffic lanes, improper actions entering or leaving the ramps, difficulties in merging from 4-lane divided to 2-lane undivided road sections, and conflicts with pedestrians on the roadway.

(12) Driver confusion and error may sometimes be traced to non-uniformity in traffic control devices, conflicting State traffic laws and local ordinances, and traffic statutes out of step with the National Uniform Vehicle Code. Regulation and instruction in freeway driving is needed for safer operations on Interstate highways.

VEHICLES AND SEAT BELTS

(13) Little is actually known about the condition of vehicles at the time of the accident. This phase of post-accident investigation may warrant greater attention.

(14) One out of every six vehicles involved in the fatal accidents was a truck of some sort. One out of every ten passenger cars was a compact or bantam-size vehicle.

(15) Approximately 80 percent of the passenger cars involved in the fatal accidents were 1954-1963 models, less than ten years old. About 50 percent were five years old or less.

(16) Seat belts were in use by only 2 percent of the occupants of vehicles involved in the fatal accidents. One out of every two persons using the seat belts survived.

XIII. CONCLUSIONS

Traffic safety efforts to reduce road casualties and offset the staggering economic loss in traffic accidents must be exerted on many fronts. Enforcement and licensing agencies, with the help of the courts, must remove drivers who are unwilling or unable to meet the reasonable demands of the highway system. Education and training must intensify instruction for using both old and new highways and better prepare drivers to meet a crisis or make a critical decision. Road engi-

neering must give more thought in design and control to driver shortcomings and limitations, and seek to predict and compensate for driver error. Vehicle engineering must give more consideration to human impact survival. All agencies must continue to press for uniform traffic controls and regulations.

T A B L E S



TABLE I
STATE OF COLORADO
MILEAGE DEATH AND ACCIDENT RATE
1948 - 1963

Year	Veh. Miles of Travel (Billions)	Fatal Accidents	Fatal Accident Rate	Persons Killed	Mileage Death Rate
1948	4.0	296	7.4	344	8.6
1949	4.3	276	6.4	317	7.4
1950	4.7	321	6.9	386	8.3
1951	5.2	303	5.8	344	6.6
1952	5.5	334	6.2	382	6.9
1953	5.8	288	5.0	337	5.8
1954	6.0	335	5.6	388	6.5
1955	6.5	365	5.6	429	6.6
1956	6.7	342	5.1	409	6.1
1957	7.0	312	4.4	367	5.2
1958	7.2	331	4.6	396	5.5
1959	7.6	347	4.6	404	5.3
1960	7.9	356	4.6	433	5.5
1961	8.2	405	4.9	492	6.0
1962	8.5	372	4.3	452	5.3
1963	8.9	422	4.7	507	5.7

TABLE II
STATE OF COLORADO
DEATH AND ACCIDENT RATES
BASED ON VEHICLE REGISTRATIONS

1954 - 1963

Year	Motor Vehicle Registrations (In 100 Thousands)	Fatal Accidents	Fatal Accident Rate	Persons Killed	Traffic Death Rate
1954	6.8	335	4.9	388	5.7
1955	7.3	365	5.0	429	5.8
1956	7.7	342	4.4	409	5.3
1957	8.1	312	3.8	367	4.5
1958	8.4	331	3.9	396	4.7
1959	9.3	347	3.7	404	4.3
1960	9.4	356	3.8	433	4.6
1961	9.9	405	4.1	492	4.9
1962	10.4	372	3.6	452	4.4
1963	10.9	422	3.8	507	4.6

TABLE III
STATE OF COLORADO
NONFATAL INJURY ACCIDENT RATES
1948 - 1963

Year	Vehicle Miles of Travel (Billions)	Number of Injury Accidents	Nonfatal Injury Accident Rate
1948	4.0	4,620	115.5
1949	4.3	5,029	116.9
1950	4.7	5,543	117.9
1951	5.2	6,228	119.7
1952	5.5	6,218	113.0
1953	5.8	6,184	106.6
1954	6.0	6,374	106.2
1955	6.5	6,619	101.8
1956	6.7	6,955	103.8
1957	7.0	7,390	105.5
1958	7.2	8,164	113.3
1959	7.6	9,429	124.0
1960	7.9	10,222	129.3
1961	8.2	11,004	134.2
1962	8.5	12,848	151.1
1963	8.9	13,201	148.3

TABLE IV
ROAD SYSTEM MILEAGE AND RATES IN 1963

ROAD SYSTEM		1963 Road Mileage	Vehicle-Miles of Travel (In Millions)	Fatal Accidents	Persons Killed	1963 Fatal Accident Rate	1963 Mileage Death Rate
A. Interstate (Class I)*	Rural	230.3	453	20	24	4.4	5.3
	Urban	27.1	135	11	13	8.1	9.6
	Rural & Urban	257.4	588	31	37	5.3	6.3
B. Interstate (Class II)**	Rural	96.1	231	11	14	4.8	6.1
	Urban	26.1	329	12	12	3.6	3.6
	Rural & Urban	122.2	560	23	26	4.1	4.6
C. Denver-Boulder Toll Road		17.3	54	2	2	3.7	3.7
D. Highways Under State Highway Jurisdiction (Other than A, B, or C)	Rural	7,699.9	3,206	201	262	6.3	8.2
	Urban	381.5	1,299	36	39	2.8	3.0
	Rural & Urban	8,081.4	4,505	237	301	5.3	6.7
E. All Highways Under State Highway Jurisdiction (A, B, C and D)	Rural	8,043.6	3,944	234	302	5.9	7.6
	Urban	434.7	1,763	59	64	3.3	3.6
	Rural & Urban	8,478.3	5,707	293	366	5.1	6.4
F. County Roads		65,147.8	1,147	65	71	5.7	6.2
G. City Streets		5,185.3	2,022	64	70	3.2	3.5
Totals All Systems (E, F and G)		78,811.4	8,876	422	507	4.8	5.7

* Highways built to acceptable Interstate standards, full control of access

** Highways near Interstate standards, partial control of access

TABLE V
DRIVER AND PEDESTRIAN ACTIONS
AND CONDITIONS IN 1963 FATAL ACCIDENTS

Violation, Improper Action or Condition	State Hwys.	County Roads	City Sts.	Other Location	Total
UNSAFE SPEED† or LOST CONTROL					
(a) On Curve—Dry	77	11	7	3	98
—Wet, Snowy, Icy	16	4			20
(b) On Straight Road—Dry	66	22	8		96
—Wet, Snowy, Icy	26	2	2		30
(c) Racing (speed contest)	1		1		2
(d) Police in Pursuit		1			1
IMPROPER DRIVING					
(a) Failure to Grant Right-of-Way					
(1) Vehicle to Vehicle	27	8	9		44
(2) Vehicle to Pedestrian	6	1	9		16
(3) Pedestrian to Vehicle	20	3	19		42
(4) Vehicle to Train	1	4	1		6
(b) Wrong Side of Road (Not Passing)	46	10	2		58
(c) Wrong Side of Divided Hwy.	3				3
(d) Ran Stop Sign or Signal	9	5	14		28
(e) Improper Turning	21	3	8		32
(f) Improper Passing	21		2		23
(g) Improper Parking—Unparking	5	1	1		7
(h) Unsafe Lane Change or Weaving	8		1		9
UNFIT DRIVER CONDITION					
(a) Had Been Drinking	48	14	11	2	75
(b) Intoxicated (B.A. Test)	43	9	3	1	56
(c) Ability Impaired (No Test)	12	3	2		17
(d) Fatigued (dozed - fell asleep)	29	3	1		33
(e) Physical Defect	3	2	1		6
UNFIT PEDESTRIAN CONDITION					
(a) Had Been Drinking	1		1		2
(b) Intoxicated (B.A. Test)	3				3
(c) Ability Impaired (No Test)	2				2
(d) Physical Defect	2	1			3
MISCELLANEOUS					
(a) Driver Distracted by Passenger	2				2
(b) Driver Distracted by Dog in Vehicle			1		1
(c) Inexperienced Driver	1				1
(d) Passenger Steering Vehicle	1				1
TOTALS BY JURISDICTION	500	107	104	6	717

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

TABLE VI
SCENES OF 1963 FATAL ACCIDENTS

Type of Location	Interstate*		State Highways		County Roads	City Streets	Other	Total
	Rural	Urban	Rural	Urban				
Curve	13	6	91	3	18	7	3	141
Intersection (controlled)	3		20	18	8	30		79
Intersection (uncontrolled)			14	4	8	12		38
Interchange	8	9	2	2				21
Structure	12	7	25	3	6	2		55
Hillcrest	2	1	7		4	1		15
Railroad Crossing			1		4	1		6
Construction Site	3		3	1	1	1		9
Lane Transition (4-2)	2							2
Median Crossover	2							2
No Special Feature	13	2	78	10	24	17		144
All Scenes, Above	58	25	241	41	73	71	3	512

65 & 70 MPH Zone	29		41					70
Mountainous Terrain	2		60		8		3	73
4-Lane Sections	37	14	13	12				76

* Sections fully or substantially improved to Interstate standards

TABLE VII

1963 FATAL ACCIDENTS WITHIN INCORPORATED CITIES AND TOWNS

State Highways Within Incorporated Cities Total = 48					
Denver	22	Boulder	1	Granada	1
Colorado Springs	6	Brighton	1	Johnstown	1
Pueblo	5	Commerce City	1	Littleton	1
Sheridan	3	Eads	1	Steamboat Springs	1
Gilcrest	2	East Canyon	1	Walsenburg	1
City Streets Total = 64					
Denver	40	Arvada	1	Durango	1
Pueblo	4	Aurora	1	Englewood	1
Colorado Springs	2	Broomfield	1	Lamar	1
Greeley	2	Commerce City	1	Ordway	1
Thornton	2	Cortez	1	Palisade	1
Trinidad	2	Craig	1	Rockvale	1

Total Within Incorporated Areas = 112

1963 FATAL ACCIDENTS OUTSIDE INCORPORATED CITIES AND TOWNS

County Roads Total = 65					
Jefferson	16	Baca	2	Las Animas	1
Weld	7	Otero	2	Logan	1
El Paso	6	Alamosa	1	Montrose	1
Larimer	5	Archuleta	1	Morgan	1
Adams	4	Delta	1	Phillips	1
Boulder	3	Dolores	1	Prowers	1
La Plata	3	Douglas	1	Rio Grande	1
Mesa	3	Kit Carson	1	Teller	1
State Highways Total = 242					
Other Rural Locations = 3					

Total Outside Incorporated Areas = 310

TABLE VIII
1963 FATAL ACCIDENTS BY COUNTY, ALL ROAD SYSTEMS

Denver	61	Gunnison	5	Custer	2
Jefferson	30	Huerfano	5	Kiowa	2
El Paso	28	Kit Carson	5	Lincoln	2
Adams	25	Conejos	4	Phillips	2
Weld	25	Douglas	4	Rio Grande	2
Pueblo	20	Eagle	4	Routt	2
Arapahoe	19	Grand	4	San Juan	2
Larimer	19	Logan	4	Dolores	1
Mesa	12	Otero	4	Jackson	1
Boulder	11	Yuma	4	Lake	1
Fremont	10	Baca	3	Mineral	1
Chaffee	9	Costilla	3	Ouray	1
Morgan	8	Delta	3	Rio Blanco	1
Clear Creek	7	Garfield	3	San Miguel	1
La Plata	7	Moffat	3	Sedgwick	1
Montezuma	7	Saguache	3	Teller	1
Las Animas	6	Alamosa	2	Washington	1
Montrose	6	Archuleta	2	Gilpin	0
Prowers	6	Bent	2	Hinsdale	0
Summit	6	Cheyenne	2	Park	0
Elbert	5	Crowley	2	Pitkin	0

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TABLE IX
HIGHLIGHTS OF 1963 FATAL ACCIDENTS

FATAL ACCIDENTS = 422

1. TYPE OF ACCIDENT

Collision With	No. Accidents
Vehicle Head-On	56
Vehicle Broadside	44
Vehicle Rear-End	24
Vehicle Approach—Turn	15
Vehicle Sideswipe	10
Vehicle Overtaking—Turn	4
Pedestrian	61
Fixed Object	54
Train	6
Animal	2
Noncollision	No. Accidents
Ran-Off-Road	129
Overtaken	13
Other	4

2. TIME

Month	No.	Day	No.	Hour	A.M.	P.M.
Jan.	28	Mon.	47	12-1	12	13
Feb.	20	Tues.	59	1-2	23	23
Mar.	35	Wed.	46	2-3	26	20
April	33	Thurs.	51	3-4	12	31
May	38	Fri.	63	4-5	5	33
June	43	Sat.	73	5-6	8	36
July	38	Sun.	83	6-7	5	25
Aug.	46			7-8	6	24
Sept.	38			8-9	8	19
Oct.	28			9-10	9	22
Nov.	32			10-11	10	17
Dec.	43			11-12	8	25
				Unknown		2

3. VEHICLE UNITS PER ACCIDENT

One	260
Two	145
Three	15
Four	2

4. ROAD SURFACE

Dry	360
Wet	40
Snowy	12
Icy	10

5. LIGHT

Daylight	207
Dark (Roadway Lighted)	54
Dark (Roadway Unlighted)	161

6. WEATHER

Clear	317
Cloudy	67
Raining	23
Snowing	11
Fog	4

DRIVERS AND VEHICLES = 603

7. ESTIMATED SPEEDS

MPH	No.	MPH	No.
0-4	25	45-49	25
5-9	10	50-54	78
10-14	13	55-59	34
15-19	16	60-64	81
20-24	14	65-69	17
25-29	14	70-74	49
30-34	26	75-79	13
35-39	27	80+	41
40-44	38	Unstated	82

8. VISION

Unobscured	505
Obscured	51
Not Stated	47

9. VEHICLE

No Defects	527
Defective	22
Not Stated	54

TABLE X
SEAT BELT USE
IN 1963 FATAL ACCIDENTS

Road System	Type of Accident	Number of Vehicles Involved	Vehicle Speed M.P.H. (Investigator's Estimate)	Seat Belt Use By	Persons Killed	Persons Injured (Nonfatal)
SH	Head-on	2	#1, 15; #2, 50	D#1, RFP#1	RFP#2	<u>D#1, RFP#1, LRP#1, MRP#1, RRP#1, D#2</u>
SH	Head-on	2	#1, 60; #2, 50	D#2	<u>D#2, D#1, RFP#1</u>	RFP#2, MRP#2
SH	Head-on	2	#1, 60; #2, 40	D#1	<u>D#1, D#2, MFP#2, RFP#2, LRP#2, MRP#2</u>	RRP#2
SH	Head-on	2	#1, 50; #2, 60	D#2	<u>D#2</u>	None
SH	Head-on	2	#1, 40; #2, 45	MRP#2	RFP#1	D#2, <u>MRP#2</u>
SH	Head-on	3	#1, 50; #2, 50; #3, 50	D#1	<u>D#1</u>	D#2
SH	Head-on	2	#1, 55; #2, 40	D#2, RFP#2	<u>D#2, RFP#2</u>	D#1, RFP#1, RRP#2
SH	Broadside	2	#1, 10; #2, 50	D#2	RRP#1	D#1, RFP#1, LRP#1, <u>D#2, RFP#2</u>
SH	Broadside	2	#1, 30; #2, 70	D#2	D#1	<u>D#2</u>
SH	Ran-off-road	1	90	D, RFP	<u>D, RFP</u>	None
SH	Ran-off-road	1	50	D	MRP	<u>D, RRP</u>
SH	Pedestrian	1	Unknown	D	Pedestrian	None
SH	Pedestrian	1	50	D	Pedestrian	None
SH	Overtaken	1	70	RFP	D	<u>RFP</u>
SH	Animal	1	70	D, RFP	<u>D</u>	<u>RFP</u>
CR	Head-on	2	#1, 60; #2, 45	D#1	MFP#2	D#1, MFP#1, RFP#1, D#2, RFP#2
CR	Broadside	2	#1, 50; #2, 40	D#2, LRP#2	<u>LRP#2</u>	<u>D#2, RFP#1</u>
CS	Head-on	2	Unknown	D#2, RFP#2	D#1	<u>D#2, RFP#2</u>
CS	Approach-turn	2	Unknown	D#2	RFP#2	D#1, <u>D#2</u>

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Col. 1.: SH = State Highway
CR = County Road
CS = City Street

SYMBOLS
Col. 5, 6, & 7: D = Driver
P = Passenger
RF = Right Front
LR = Left Rear, etc.

Cols. 6 & 7: Underlined symbols indicate persons wearing seat belts.

