FATAL TRAFFIC ACCIDENTS

ON COLORADO STREETS AND HIGHWAYS

CALENDAR YEAR 1964

PREPARED BY

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
PLANNING AND RESEARCH DIVISION

IN COOPERATION WITH

U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

FORM C.D.H. 18

DEPARTMENT OF HIGHWAYS

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
4201 E. ARKANSAS AVE.
DENVER, COLORADO 80222

NIL SINE NUMINE

CHAS. E. SHUMATE
CHIEF ENGINEER

STATE OF COLORADO

June 15, 1965

TO THE DRIVING PUBLIC:

More than a million resident drivers and equally as many visitors are traveling over 9 billion vehicle miles annually on the various road systems of the State. Yet, in any given year 90 percent of these drivers manage to avoid a serious accident. Even at many of our so-called high accident frequency intersections it may surprise you to learn that half a million vehicles usually pass through safely before one driver experiences an accident. All of this reassures us that the majority of drivers are doing a very commendable job!

In reviewing the record of road casualties we cannot whitewash the fact that 1964 was traffic's blackest year in Colorado, and for that matter, in the nation as a whole. Nevertheless, as recently as 1962 there were 105 fewer fatal accidents in Colorado and the rate dropped to an all-time low of 4.3 accidents per 100 million vehicle miles of travel--evidence that it can be done!

Our entire traffic safety program is devoted to the task of bringing the quality of highway travel into more favorable balance with the quantity of travel. This calls for better drivers, safer vehicles, and adequate roads and controls.

1965 holds much promise as a year of measurable gains. Fatal accidents at mid-year are running below the number a year ago. A $71 million road construction budget is programmed including quite a number of corrective projects aimed at the elimination of trouble spots. The Legislature has updated the basic driving rules so that drivers anywhere in the State may know more precisely what is expected of them. Counties are now authorized by law to speed zone their roads. Field engineers of the Department are presently assessing the needs for standardizing traffic control devices. These are just a few of the efforts being made to save lives and improve highway travel.

The report on "Fatal Traffic Accidents on Colorado Streets and Highways, Calendar Year 1964" is made available on the eve of the peak summer travel months. It is hoped that extensive publicity given to the facts and findings it contains may serve the cause of traffic safety in Colorado.

Sincerely,

L. C. Bower

L. C. BOWER
Deputy Chief Engineer

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FATAL TRAFFIC ACCIDENTS
ON COLORADO STREETS AND HIGHWAYS
CALENDAR YEAR 1964

I. THE PERENNIAL PROBLEM

Colorado streets and highways currently serve about 1.25 million resident drivers and just as many motorists from other states. Persons and goods are being moved over the various road systems of the State more than 9 billion vehicle miles annually. The value of this transportation service hardly needs to be demonstrated. Moreover, the creditable performance of the vast majority of drivers in a movement of this size should not be overlooked. Yet, safety and efficiency are being sacrificed by at least 350 traffic accidents every day causing injury daily to some three score road users. Hardly a day passes that one or more lives are not lost in these accidents. Economic losses in a single year are exceeding Colorado's total annual expenditure for road construction and maintenance.

Traffic accidents have become one of the most challenging problems of our time. Through the years enough distress and despair have been generated to support a host of remedial measures. Most of the corrective steps have been aimed at the driver, many at the road and its environment, and some at the vehicle. Few have been directed with equal emphasis at all three.

A lifetime of struggle with the problem has revealed that there is no simple, quick or direct solution. It has been found that action on one front can produce gains that are neutralized by lack of action on other fronts. A one-sided approach to the problem with undue emphasis on a single factor can work to the detriment of the transportation system. There is a general agreement that engineering, enforcement and education must work as a team to achieve a more favorable balance between the quality of highway travel and the quantity of travel.

The daily box score of highway deaths does little to enlighten drivers and public officials about the true nature of the problem. For this reason, the Department of Highways in cooperation with other State agencies undertakes each year to add to the fund of data about fatal accidents in a manner and form that can prove useful collectively to all concerned. This knowledge must, in turn, be applied with due consideration for the problems of all drivers as reflected in the total accident picture.

II. THE 1964 RECORD

Law enforcement officers investigated some 58,500 traffic accidents in 1964. Drivers themselves reported another 8,000 not covered or investigated by the police or Patrol. Thousands of minor property damage accidents (under $50) were neither investigated nor reported to the State. Allowing for such exclusions in reporting and considering the ratio of injury accidents to property damage accidents, a con-

servative estimate of all traffic accidents in Colorado is placed at twice the number of which we have knowledge.

At the end of the year when all of the 1964 reports had been processed and non-traffic accidents had been eliminated, 565 traffic deaths had been charged to 475 fatal accidents. In the first quarter of 1965 two additional deaths occurred as a result of accidents in the previous year bringing the 1964 toll up to 567 deaths in 477 accidents. In addition, 539 persons were nonfatally injured in these same accidents. The number of fatal accidents and the number of fatalities, both all-time record highs for the State, exceeded by approximately 13 percent and 12 percent respectively the previous highs set in 1963 when 508 persons were killed in 422 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 presently average $180,000 per death for all accidents. Applying this cost factor to the 1964 fatalities, economic losses from traffic accidents in Colorado have now topped the $100 million mark. Nationwide losses for the year are estimated at $8.3 billion.

III. STATE-WIDE RATES (1964)

For year-to-year evaluation, variations in accidents and deaths must be appropriately related to the variations in exposure. The most common unit of measure applied to accidents and fatalities as a whole is the vehicle-mile. Figures on state-wide travel are developed from the amount of gasoline consumed in highway use, and rates are then computed to reflect the number of deaths or accidents per 100 million vehicle miles of travel. Other more suitable measures of exposures are used when dealing with certain types of accidents, particular road sections, or spot locations.

With vehicle-miles of travel placed at 9,349 millions in 1964, the mileage death rate for the year was 6.1 for every 100 million vehicle miles of travel — somewhat higher than the national average of 5.7. The fatal accident rate, however, was 5.1 per 100 million vehicle miles of travel. Much greater significance is attached to the accident rate since it affords a more realistic basis for evaluating highway safety improvement. Due to multiple deaths in certain accidents, the records consistently show more traffic deaths than fatal accidents. During 1964, for example, there were 90 more deaths than there were fatal accidents.

Motor vehicle registrations and population are often used as measures of exposure when considering total deaths and accidents. In such cases the rates are usually expressed in terms of the number of deaths or accidents per 10,000 vehicles registered or per 100,000 population. Motor vehicle registrations in Colorado during 1964 totaled 1,120,011 and population reached the 2 million mark. Accordingly, for every 10,000 vehicles in the State there were 5.0 deaths and 4.2 fatal accidents. Likewise, for every 100,000 people there were 28.3 deaths and 23.8 fatal accidents.

IV. RATE TRENDS (1948-1964)

A history of death and accident rates permits study and assessment of the trends in fatal accident experience. Line graphs in Charts I and II and figures in Table I represent what has been happening over a period of seventeen 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 1964. In sharp contrast, death and fatal accident rates, at peaks of 8.6 and 7.4 respectively in 1948, have gradually receded to lower levels.

Looking at the recent 1962-1964 record it will be seen that rates moved upward two years in a row. However disturbing this increase may be, the graphs show that a similar extended rise occurred previously in the period 1959-1961 only to be followed by a marked drop thereafter. There may well be an irreducible minimum for death and accident rates, but at the same time it is reasonable to expect that constant improvement in drivers, vehicles, and roads can bring about appreciable and corresponding improvement in the existing rates.

Charts III and IV and Table II depict the fatal accident and death rates in terms of motor vehicle registrations for the period 1954-1964. Motor vehicle registrations have almost doubled in the span of ten years. Registration accident and death rates, at peaks of 5.0 and 5.8 respectively in 1955, have shown marked drops in the succeeding years.

Chart V and Table III permit an examination of nonfatal injury accidents and their rates. The accident data is considered quite reliable since accidents resulting in injury of any kind are almost always reported. In the seventeen year period represented on the line graph it will be seen that travel has doubled, but injury accidents have tripled. It is worthy of note that a peak rate of 119 nonfatal injury accidents per 100 million vehicle miles of travel set in 1951 was not exceeded until 1959—the year that 65 m.p.h. and 70 m.p.h. speed limits were legalized in Colorado. In recent years the injury rate has leveled off after a series of sharp increases that began in 1957.

Graphs on a long-term series of data relating to road travel and traffic casualties give us only a rough idea of the growth factor involved. By computation the tendency can be measured with some accuracy. Using the "least-squares" method of trend analysis it is estimated that by 1970 travel in Colorado will reach 11.3 billion vehicle miles, traffic deaths 720 and injuries 32,000. The mileage death rate, according to the trend, is projected to a level of about 6.3 — about two-tenths of a point above the 1964 rate.

For several years the severity of injury in accidents has been recorded on the investigator's report and has also been coded on the accident punch card. The cumulative data reveals that more than half of the nonfatal injury accidents have resulted in serious or disabling injury requiring that victims be carried from the scene.

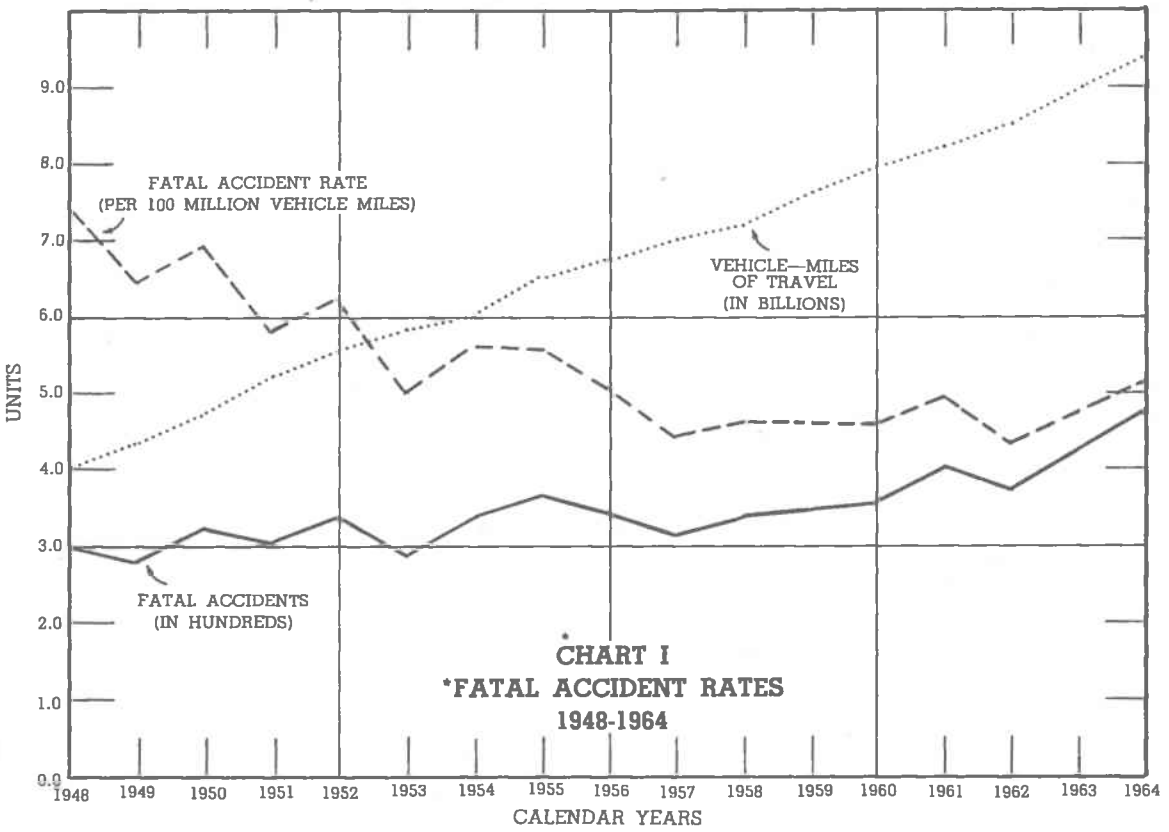


CHART I
***FATAL ACCIDENT RATES**
1948-1964

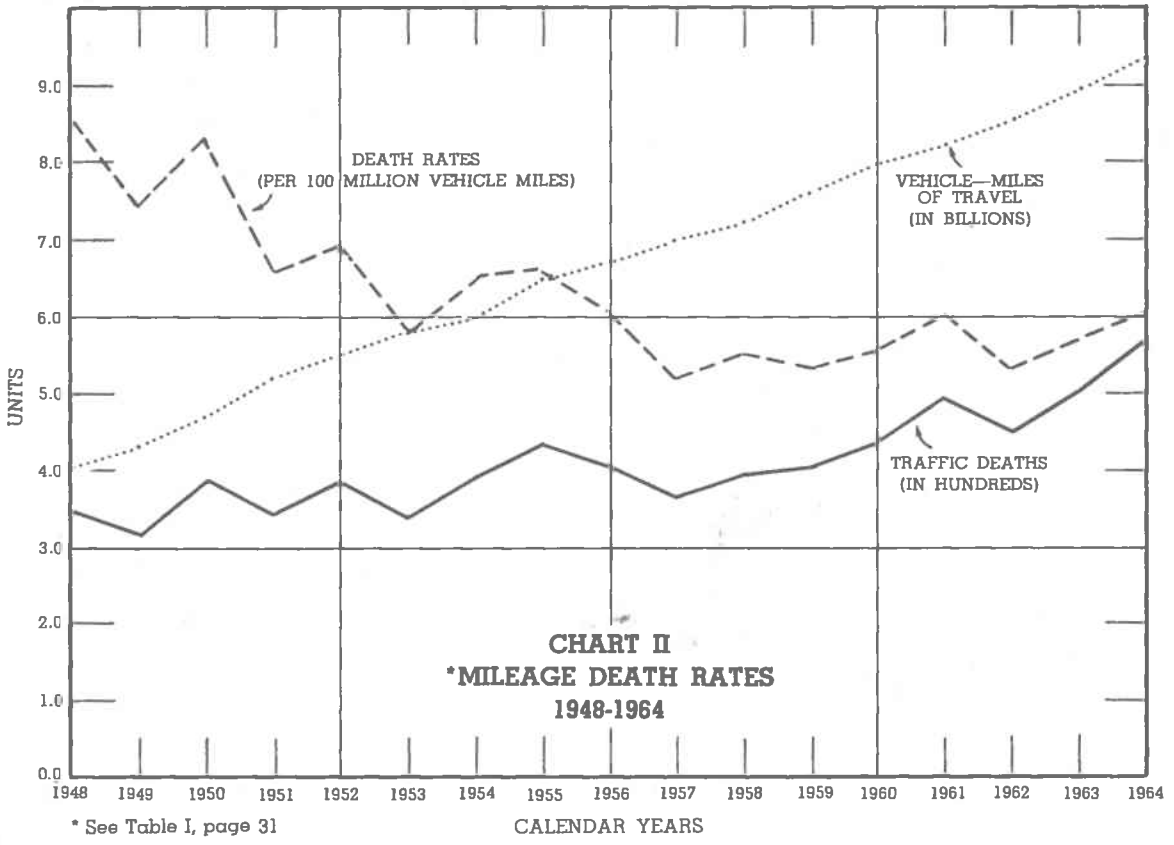


CHART II
***MILEAGE DEATH RATES**
1948-1964

* See Table I, page 31

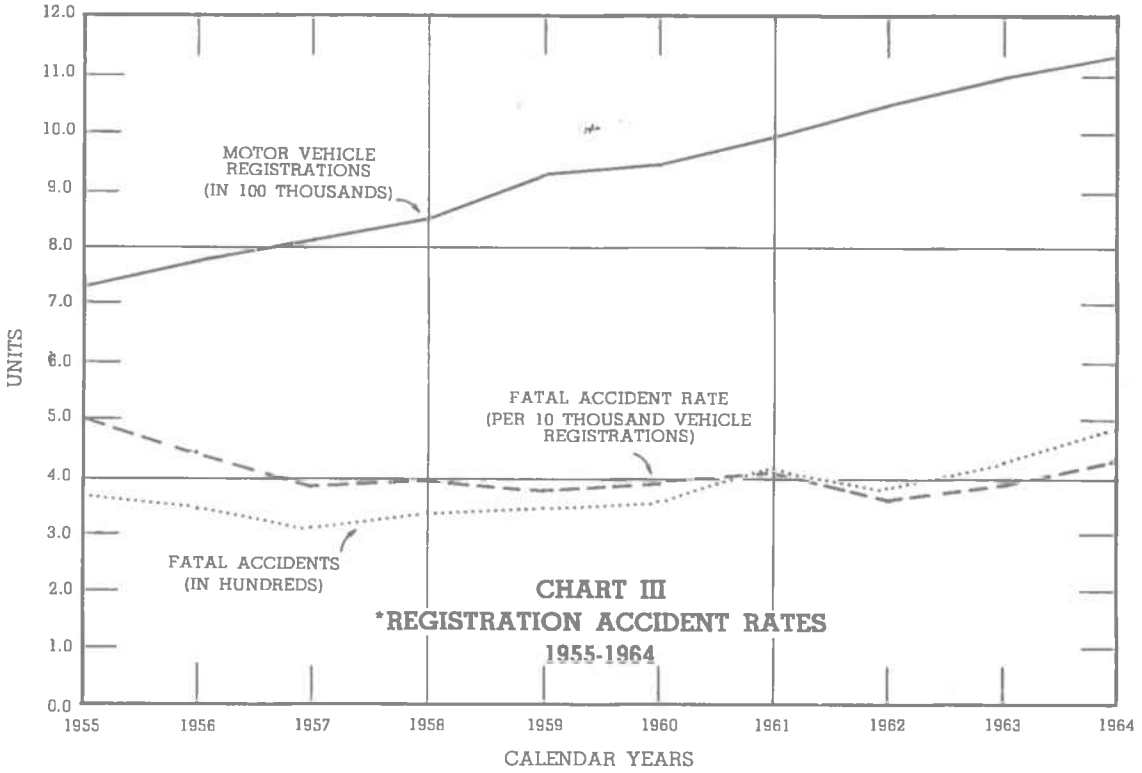


CHART III
***REGISTRATION ACCIDENT RATES**
1955-1964

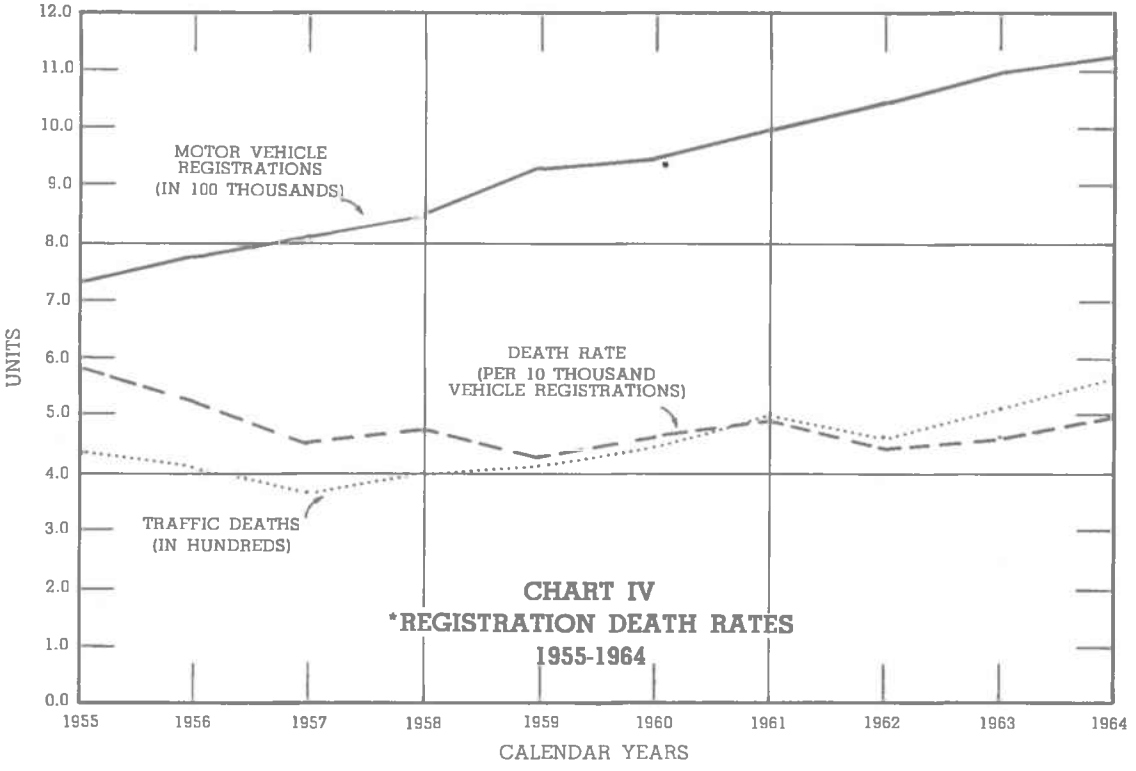
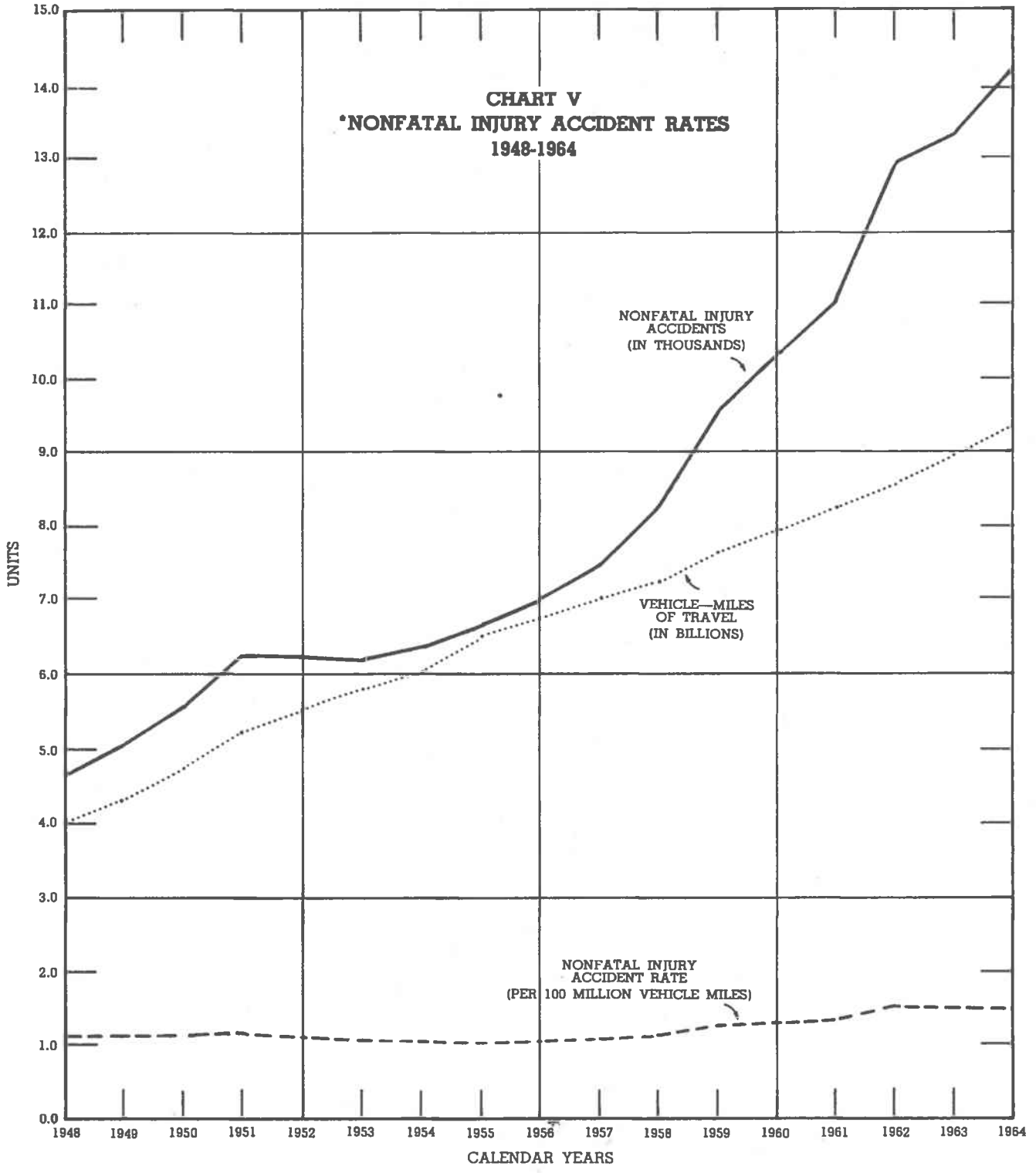


CHART IV
***REGISTRATION DEATH RATES**
1955-1964

* See Table II, page 32



* See Table III, page 33

V. ROAD SYSTEM RATES (1964)

Basically, the public trafficways to which motor vehicle accidents are charged consist of State Highways, County Roads, and City Streets. During 1964 State Highways outside incorporated cities and towns, predominately rural roads, accounted for 46 percent of motor vehicle travel state-wide and for 57 percent of the fatal accidents. County roads, mostly rural in character, accounted for 13 percent of the travel and for 17 percent of the fatal accidents. Jointly, the rural roads of both these systems carried 57 percent of the travel and were the scene of 74 percent of the accidents. City streets, including the urban State Highway connecting links, accommodated 43 percent of the travel but accounted for only 26 percent of the fatal accidents. Rates on both County Roads and State Highways rose substantially in 1964; those on City Streets dropped appreciably. Table IV shows the death and fatal accident rates for each road system, based on an apportionment of vehicle miles of travel.

By the end of 1964 some 406 miles of Interstate roads were in operation. This represents about 45 percent of Colorado's allocation in the Federal System of Interstate and Defense Highways. Completed highway sections consisted of 275.9 miles of Class I Interstate roads and 130.7 miles of Class II, as defined in the footnote to Table IV. Travel in 1964 on the completed portion of the System amounted to an estimated 1.4 billion vehicle miles, about 23 percent of that on all State Highways.

It will be seen from Table IV that rural sections of both Class I and Class II Interstate are exhibiting considerably lower fatal accidents and death rates than those found on conventional rural roads. Urban freeways in both Class I and Class II, however, are experiencing about the same rates as conventional urban streets and highways.

VI. ASSIGNMENT OF CAUSE

Assignment of cause and assessment of responsibility for cause in a traffic accident can be extremely difficult. Everyday accident investigation has practical limitations and does not ordinarily permit exhaustive probing and inquiry. Pre-accident events and other pertinent factors are sometimes unknown to us. Intensive study of the available accident data usually leads to a variety of appraisals and explanations, depending upon the professional background and specialty of the analyst.

The enforcement officer, mindful of the statutes, will be inclined to place the responsibility of cause squarely with the driver. He will remind us that the vehicle operator is required by law to keep his vehicle under control so as to avoid colliding with any person or other vehicle. He will point out the shortcomings of drivers

and pedestrians, and call attention to the evidence of irresponsibility and unfit driver condition.

The educator will take a hard look at the indoctrination and training the driver has received. He will concede that today's driving task has become quite complex and requires special skills and much good judgment to cope with traffic conditions. He will question the driver's knowledge of traffic control devices and his understanding of the many local and State regulations.

The road or traffic engineer will take note that the greatest number of fatal accidents and the highest rates are occurring on roads and streets built to earlier concepts of adequacy. He will acknowledge the difference in calculated risk between driving 70 m.p.h. on a two-lane, two-way open country road and driving the same speed on a divided, controlled-access highway. He will display the accident maps and point to the many trouble spots where groups of drivers experience similar difficulties.

Vehicle inspectors, licensing authorities, critics of vehicle design, medical men, lawmakers and judges will introduce many other casual elements in evaluating the traffic accident experience. In varying degrees all of these considerations have a bearing on the problem insofar as they relate to the driver, his vehicle, and the roadway. It becomes obvious from the host of factors to be weighed that the accident event cannot be reduced to a simple cause and effect relationship. It is also an oversimplification to label all accidents "driver failure" or to attribute most of them to any other single weakness in the transportation system.

While research and study continue into the highly complex aspects of causation, accident prevention and reduction can best be served by application of what we already know and can further learn about the people involved, the mistakes and errors they commonly make, the road and traffic conditions with which they cannot always cope, vehicle deficiencies, and shortcomings in regulations and controls. What follows in this report is devoted to a review and analysis of these particular areas of concern.

VII. PEOPLE INVOLVED

Roads are designed, built, and controlled to serve people. All vehicle movement on these roads takes place at the instigation of the driver. It has long been felt that the real gap in our knowledge about traffic accidents is in the understanding of human factors. Research into human behavior at the wheel seeks to learn more about the driver—who he is, what he does, why he does what he does, and why he fails to do what he should do. One type of research investigation that is being conducted in this field is the use of tell-tale devices and instruments to measure maneuvers of the vehicle and record the responses of the driver as he proceeds over a given course.

It is indeed a tribute to the great mass of Colorado drivers that 9 out of every 10 managed to avoid a traffic accident despite the astronomical number of vehicle

movements and the increasing complexity of the driving task. Only 5 percent of the driving population reported accidents, and less than one percent of these were actually involved in fatal accidents. Even if we assume that only one-half of all traffic accidents are reported and investigated, we may reasonably conclude that 90 percent of the drivers remained accident free.

Some 1,507 persons played a part in the 1964 fatal accidents. These included 653 drivers, 784 passengers, 54 pedestrians, 15 bicyclists or riders of nonmotor vehicles, and one horseback rider. Killed were 294 drivers, 209 passengers, 51 pedestrians, 12 bicyclists, and one horseback rider. Nearly one out of every two drivers involved became a fatality; only about one of every four passengers were fatally injured.

Classification by age group indicates that immaturity and advancing age continue to take their toll in traffic. There were 226 drivers age 25 or under including 109 under 21. Another 48 were over 65. The age group 25 and under represented 35 percent of the vehicle operators involved. A high incidence of involvement among the young and the elderly also appeared in the fatal pedestrian accidents. Seventeen pedestrians were teen-age or below; 18 were over 65.

The number of out-of-State drivers involved in Colorado's fatal accidents has been increasing from year to year: 68 in 1962, 101 in 1963, and 114 in 1964. An appreciable number of the drivers from other states have been military personnel. In 1964 there were 24 military personnel involved and 12 killed in these accidents.

The driving record of 504 resident drivers involved in the fatal accidents was investigated by the State Patrol. It was found that 56 percent of these drivers had a record of at least one moving violation; 30 percent had a history of serious and repeated violations. Nearly one-half of the drivers who were chronic violators were 25 years of age or under. Approximately 40 percent of the drivers investigated had been involved in an accident during the previous three years. However, relatively few drivers involved in all accidents in any given year are involved the following year.

According to the investigators' reports relatively few of the drivers involved in the 1964 fatal accidents had any sort of formal driving training. Some 44 drivers, mostly 25 years of age and under, were known to have had such training. The great majority of drivers involved, however, had considerable driving experience: 10 percent had 40 years or more; 50 percent had between 10 and 39 years; 36 percent had between one and 9 years; and 4 percent had less than one year.

VIII. DRINKING DRIVERS AND PEDESTRIANS

Considerable publicity has been given to the problem of drivers and pedestrians under the influence of alcohol. The records show that a drinking driver was involved in about 37 percent of the 1964 fatal accidents. The percent of involvement may actually be much higher considering the number of instances in which it was

unknown whether or not a driver had been drinking. In only one out of every two cases of known drinking was it actually established by Blood Alcohol Test or other strong evidence that drivers had been drinking to an extent which could be said to have impaired driving ability.

Not so widely publicized, but nonetheless worthy of note, is a consideration of the drinking pedestrian. Among the 1964 accidents fatal to adult pedestrians 23 percent were reported to have been drinking, and the presumption of intoxication was supported by Blood Alcohol Test in all but two cases. In one accident a drunk pedestrian was struck and killed by a drunk driver; in another fatal accident two drunk drivers collided broadside.

Drunk drivers (those legally presumed to be intoxicated) were involved in 56 one-car accidents and in 34 multiple vehicle collisions. Since most of the two-car accidents involved only one drunk driver the proportion of accidents involving a drunk driver was higher than the proportion of drivers who were drunk.

Attempts were made in the last General Assembly to enact an Implied Consent Law, but the efforts were not successful. Reconsideration of such a Bill is expected at the next session of the Legislature.

IX. HOUR, DAY, AND MONTH

The timetable of the 1964 fatal accidents may be found in Table X. This permits an analysis of the calendar year experience by hour, day, and month. The data serves to confirm a number of the findings in past years.

Almost 53 percent of the fatal accidents happened during hours of darkness, despite the reduced amount of travel at night. As usual, the weekly distribution fell heavily on the last three days of the week, and holiday weekends exhibited a noticeable concentration.

A record number of traffic deaths on Colorado roads for any given month was charged to the month of June when 65 people were killed in 49 accidents. The highest number of fatal accidents for any single month in the recorded accident history of the State was experienced in July when 53 accidents brought death to 64 persons. Seven fatal accidents occurred on a single day of that month—the 18th of July. Although the summer season with its peak travel is commonly a critical accident period, an unusual rash of fatal accidents was experienced in the Christmas to New Year period (December 24 through December 31) when 25 persons were killed in 20 accidents.

X. ACCIDENT LOCATIONS

The accident scene is of particular concern to the road authority. Inspection and study of fatal accident locations, especially where accidents have occurred repeatedly and to a degree markedly above average, sometimes disclose accident-in-

ducing features which can be corrected by practical highway and traffic engineering.

Almost three-fourths of the 477 fatal accidents in 1964 occurred on highways outside incorporated cities and towns on roads predominantly rural in character. The spot map on the center pages of this report shows the distribution and concentration of these accidents. For the most part, the fatal accidents were widely dispersed throughout the State. Only eight spot locations were scenes of more than one fatal accident. However, a location analysis reveals that one out of every three of the accident scenes was an accident repeater spot. Those which exhibited an above-average frequency of accidents, considering the amount of traffic served, are under study by the Department.

About one-half of the fatal accidents in urban areas took place within the capital city of Denver. The city spot map preceding the state map shows the dispersement and general location of these accidents. There were 100 intersections at grade in Denver with 25 or more total accidents, but none where more than one fatal accident occurred. The 46th Ave. Interchange on the Denver Valley Highway (Interstate Route 25), under construction a good part of the year topped the list with 121 reported accidents including 3 fatal accidents. Tallies of fatal accidents within other Colorado cities and towns are provided in Table VIII.

Not all of the 1964 fatal accidents occurred on conventional roads and streets built to earlier concepts of adequacy. Despite the obvious safety features of freeway design, there were 52 fatal accidents on modern roads of the Interstate System: 31 on Class I and 21 on Class II road sections. The largest concentration of these occurred on heavily-traveled sections of Route 25 (see spot map). Urban freeway sections exhibited an experience of 15 fatal accidents including 8 in Denver, 6 in Pueblo, and one in Colorado Springs. The accident experience on these superior roads appears in a more favorable light when translated into rates and compared with other road systems, as may be seen in Table IV. Actually, the number of fatalities on Interstate roads in 1964 corresponded exactly with the number recorded in 1963 despite the opening of additional miles to the System in 1964.

XI. TYPICAL SCENES

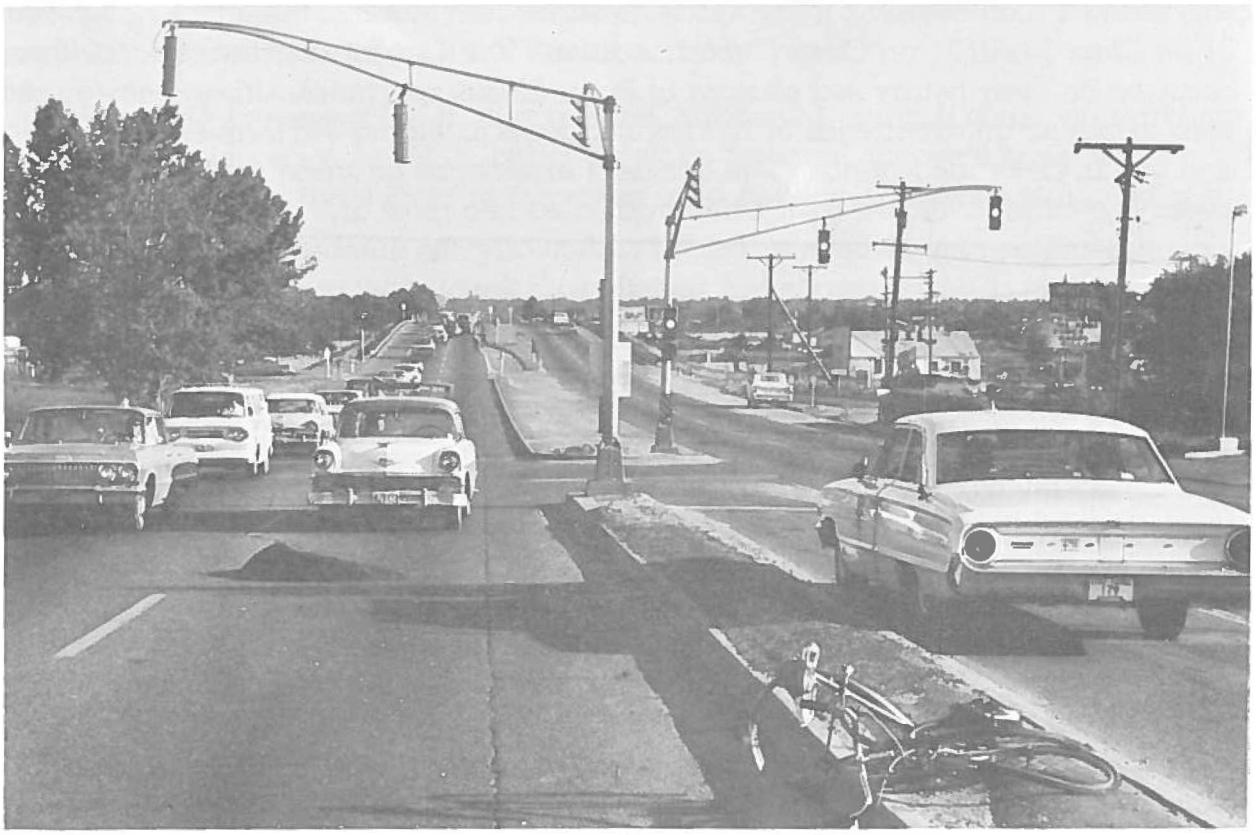
Of special interest to the road designer and the traffic engineer is the specific character of the accident location. Table VI lists various types of locations where drivers experienced fatal injury. Heading the list again in 1964 is the road curve where 110 fatal accidents took place. Almost equally as conspicuous is the intersection at grade where 103 were recorded, 22 of them uncontrolled by regulatory sign or signal. Next, in order of frequency, was the structure, sometimes a narrow bridge or underpass, which was associated with 24 of the accidents. The interchange figured in 19 accidents, several on ramp curves. Railroad crossings were scenes of 15 accidents, most of them off the State Highway System, and 9 of them unprotected by signals. Construction sites had a record of 12 fatal accidents, 5 of them on Inter-

state road projects. In addition, there were quite a number of accident spot locations where the presence of a structure at a curve, a crossing on a curve, or an intersection on a curve or at a hillcrest compounded the demands upon the driver's judgment and capability.

Road sufficiency studies indicate that Colorado, like other states is a few billion dollars and a lifetime behind in updating older roads and streets to a level of adequacy for present-day and prospective traffic. Modern design criteria applied in new construction guards against geometrics which experience has shown are conducive to accidents. As a practical matter, however, design correction on roads built to earlier concepts of adequacy must be quite selective. The Colorado Department of Highways with the partcipation of the U. S. Bureau of Public Roads is now undertaking certain safety improvement projects where there is a clearly identifiable accident potential or where accident rates are markedly above average. This is a part of a nationwide spot improvement program to eliminate serious hazards and to accelerate the attack on traffic accidents.

Typical scenes of 1964 fatal accidents on both conventional roads and freeways are illustrated on the exhibits which follow. Drivers will readily recognize the commonplace situations which are portrayed.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964



1. Left-turn conflict between vehicle and bicycle at signalized intersection.

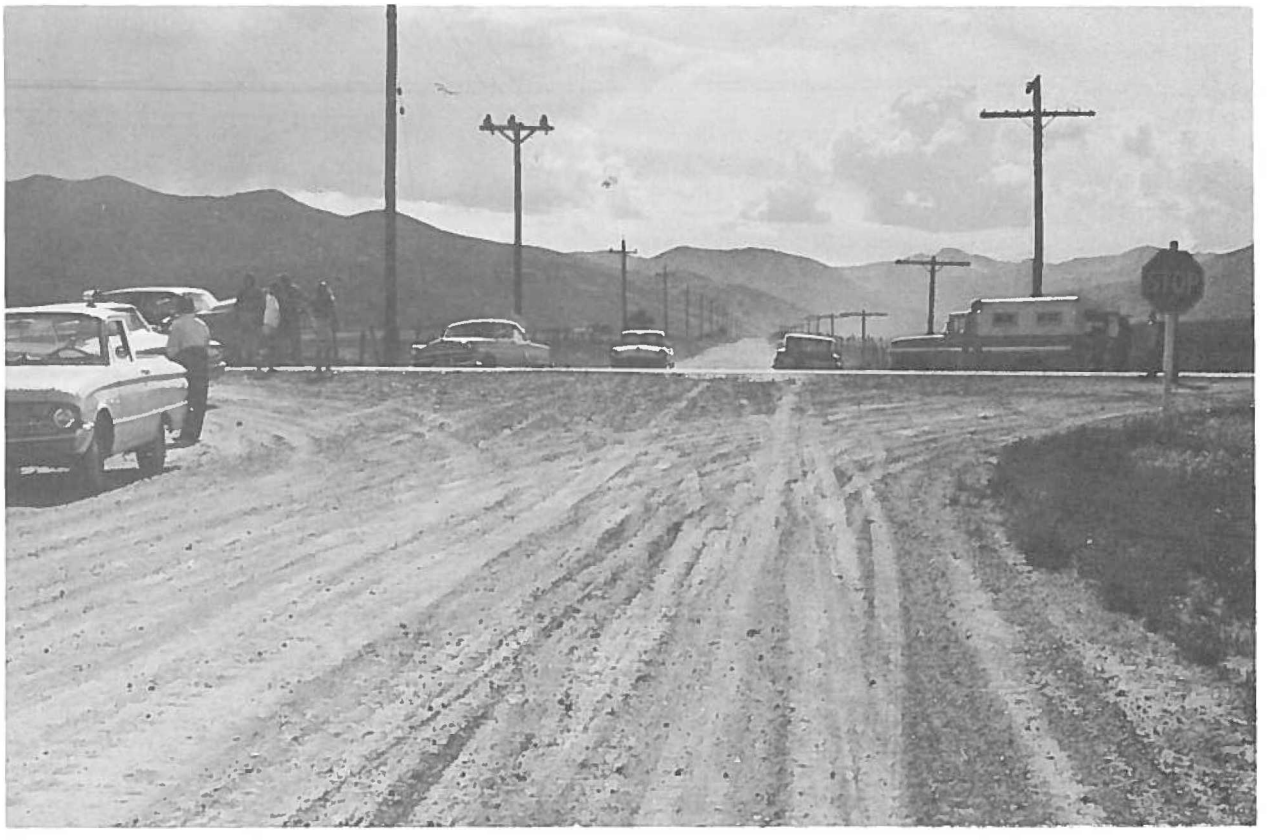
TYPICAL SCENES OF FATAL ACCIDENTS IN 1964

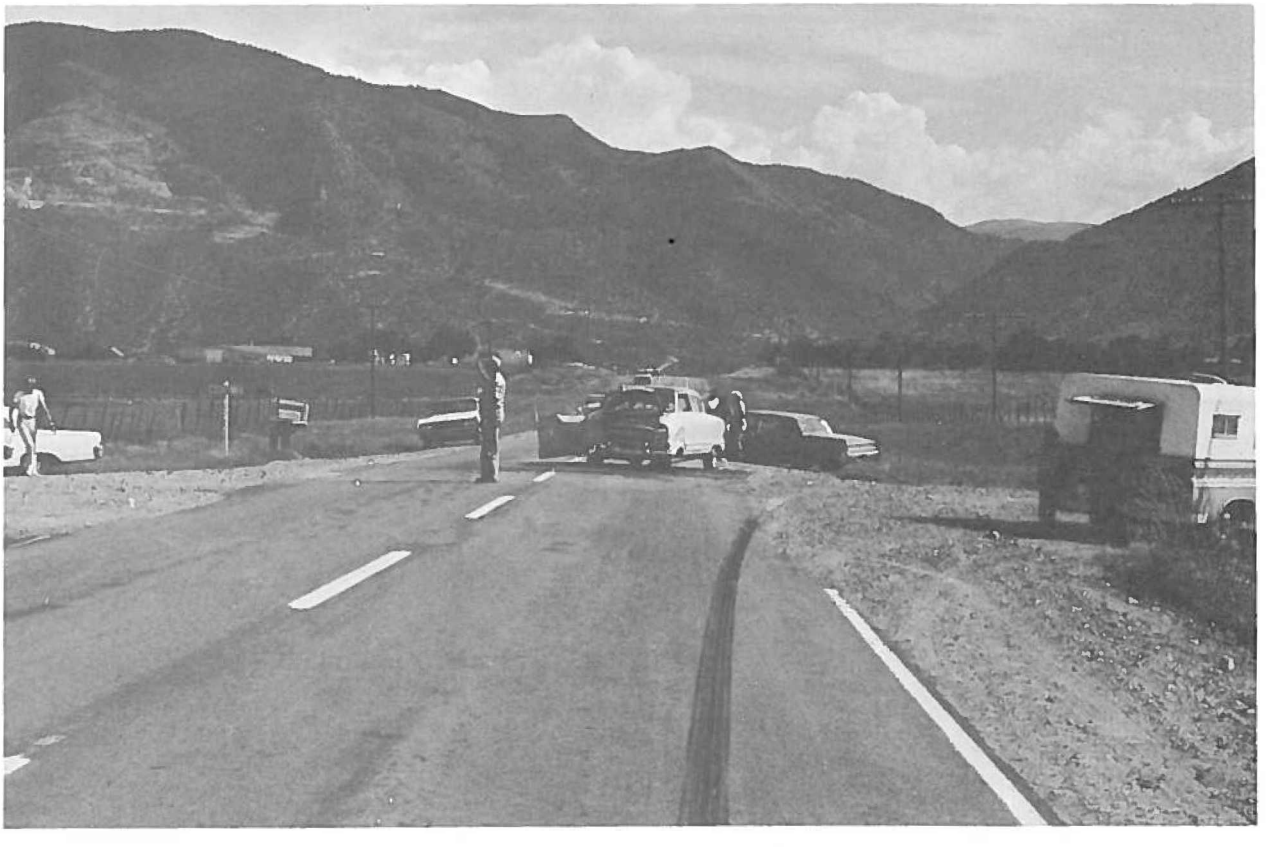
2. Wrong-way movement on one-way roadway of divided highway.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964

3. Crash into railroad underpass pier on freeway.

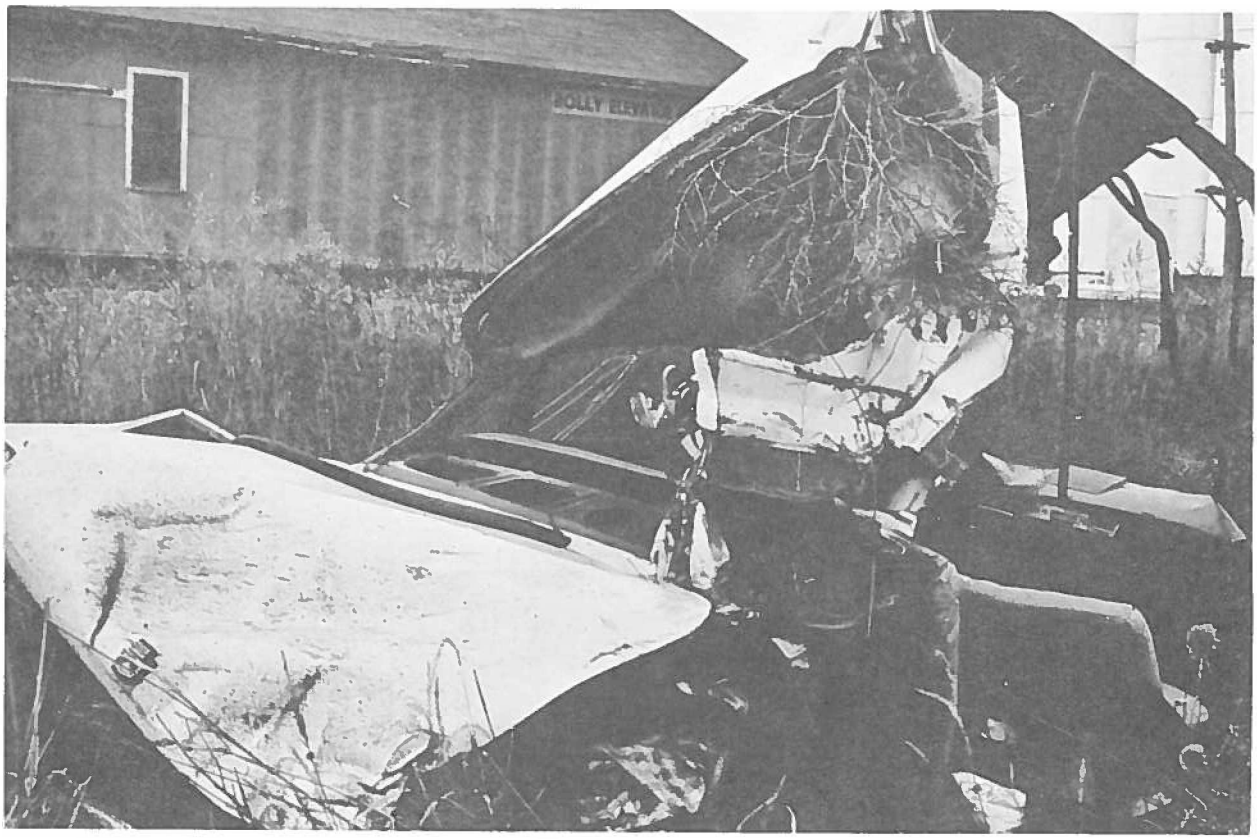
TYPICAL SCENES OF FATAL ACCIDENTS IN 1964





4. Right-of-way conflict at intersection of State Highway and local road.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964

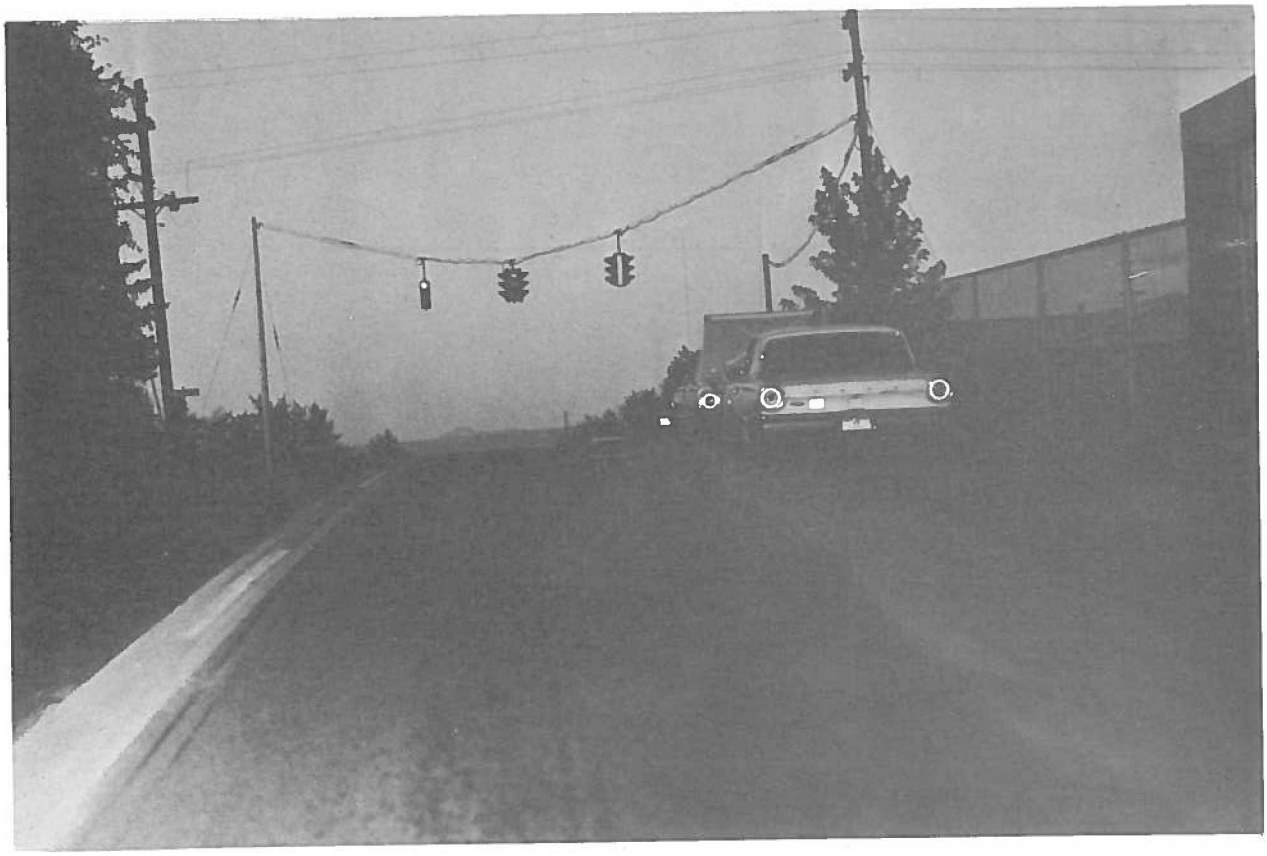


5. Signal violation at railroad crossing on State Highway.

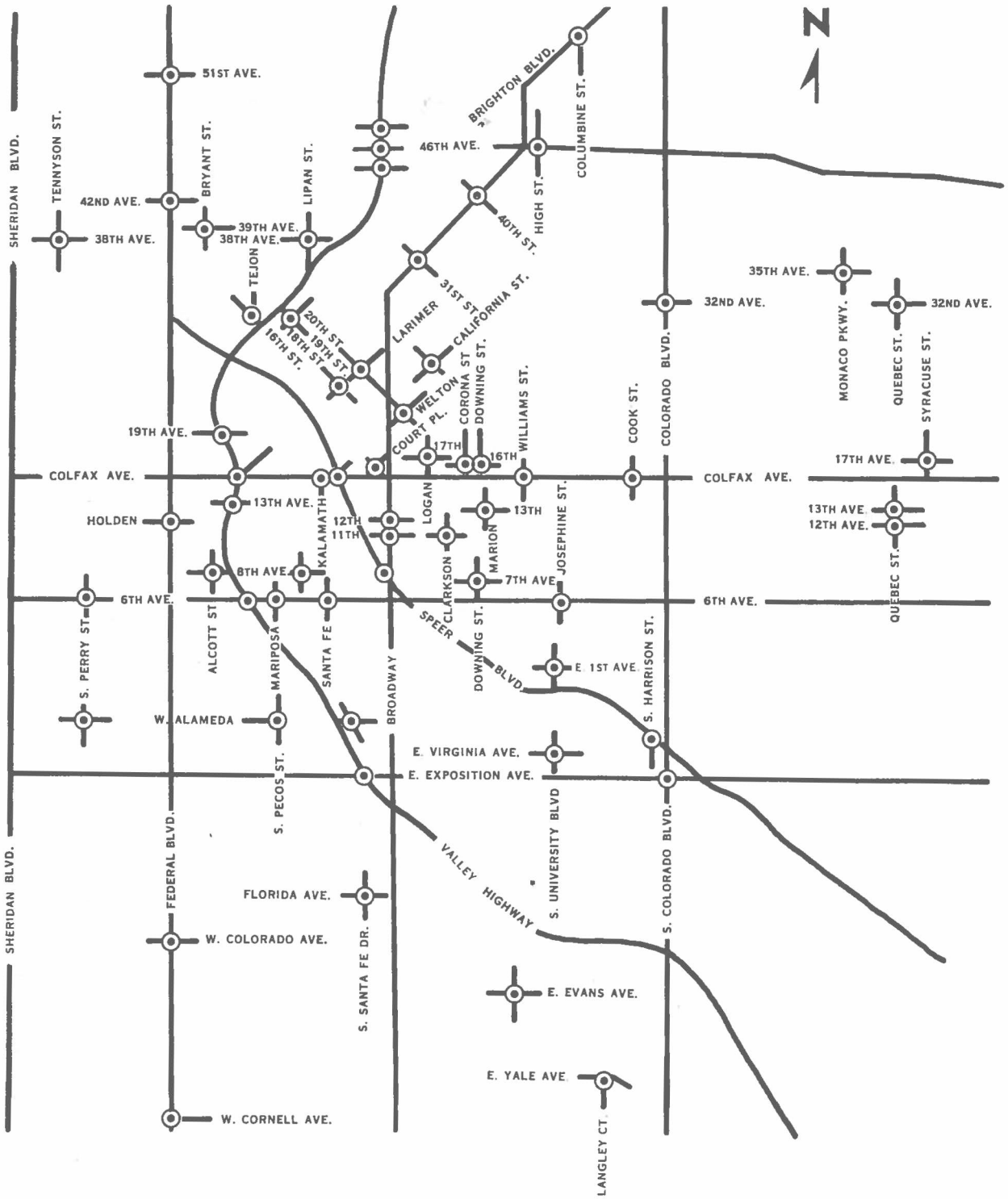
TYPICAL SCENES OF FATAL ACCIDENTS IN 1964

6. High-speed crash into bridge railing at night.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964



7. Signal violation at intersection on hillcrest.



The 62 traffic accidents involving fatalities in the city and county of Denver during 1964 are located by circles.

COLORADO

1964 FATAL TRAFFIC ACCIDENTS OUTSIDE INCORPORATED AREAS

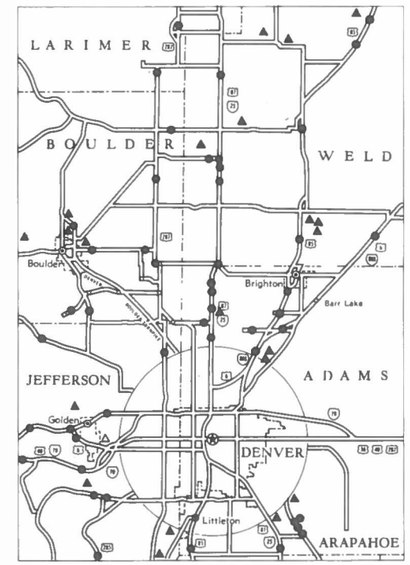
(Total — 352 Accidents)

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

SCALE OF MILES

LEGEND

STATE BOUNDARY LINE
COUNTY BOUNDARY LINE
STATE CAPITAL
INTERSTATE HIGHWAY NUMBER
COUNTY SEAT
U. S. HIGHWAY NUMBER
OTHER TOWNS AND CITIES
FATAL ACCIDENT { STATE HIGHWAY TOTAL 271 / COUNTY ROAD TOTAL 81



PLATTE VALLEY INSET
SCALE OF MILES

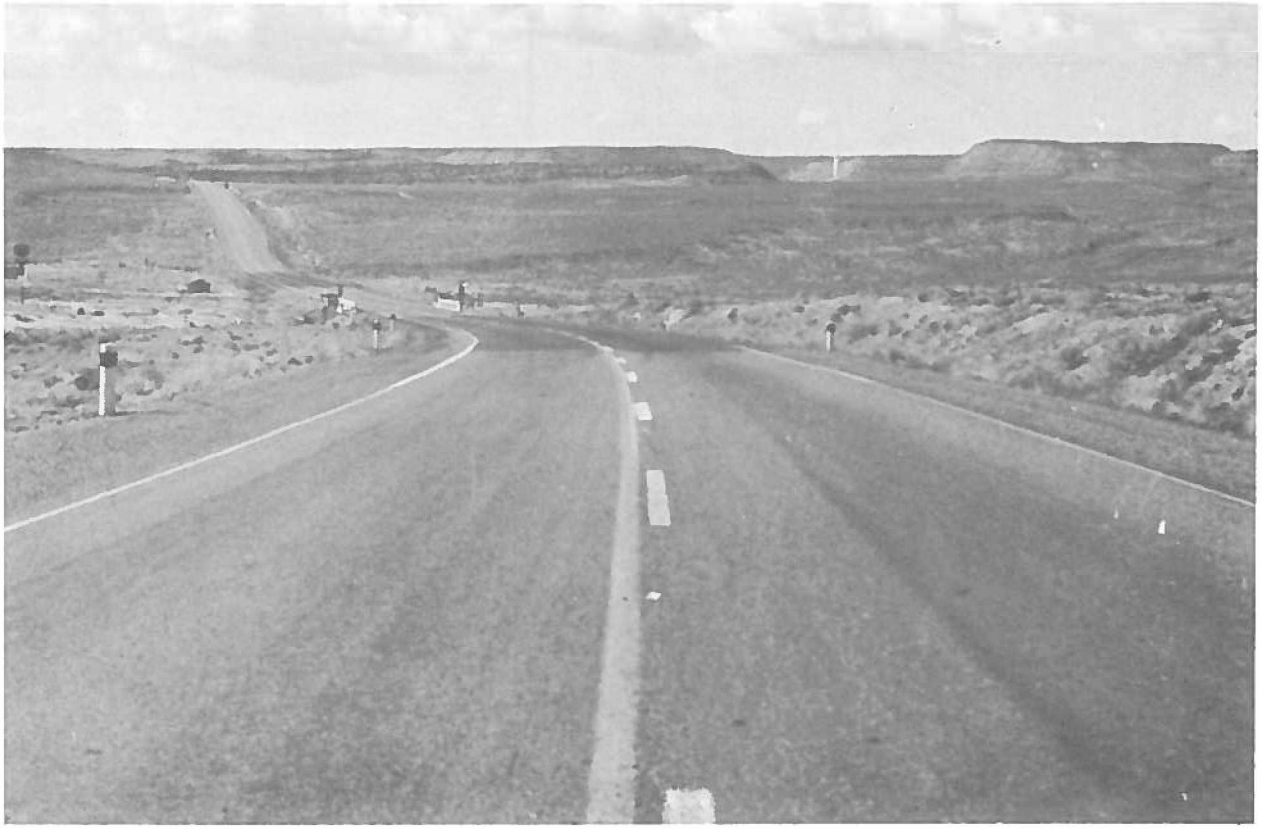
DENVER AREA DETAIL
SCALE OF MILES

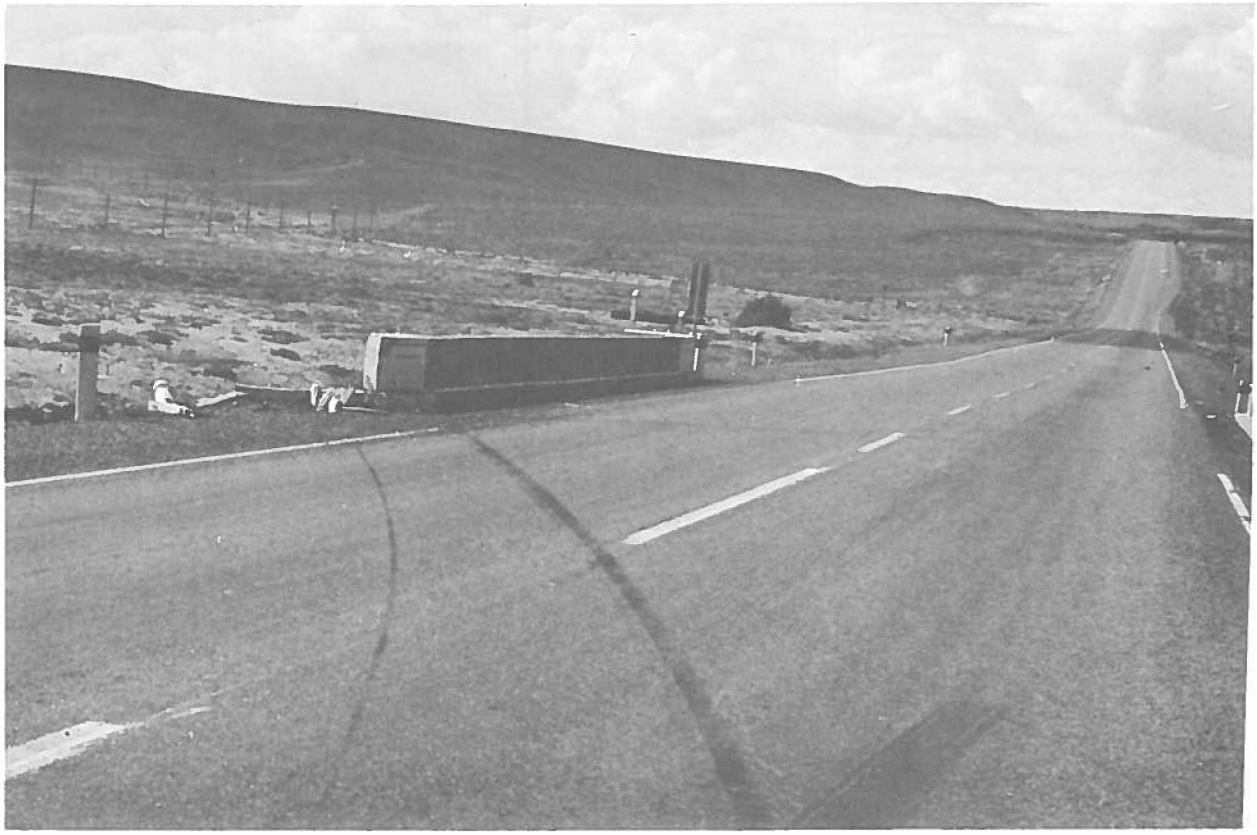
WYOMING
NEBRASKA
KANSAS
OKLAHOMA
NEW MEXICO
ARIZONA
UTAH

MOFFAT
ROUTT
JACKSON
LARIMER
WELD
LOGAN
SEDGWICK
PHILLIPS
YUMA
MORGAN
GRAND
BOULDER
RIO BLANCO
GARFIELD
SUMMIT
GILPIN
CLEAR CREEK
DENVER
ADAMS
WASHINGTON
ARAPAHOE
JEFFERSON
EAGLE
ELBERT
LINCOLN
MESA
PITKIN
PARK
DOUGLAS
KIT CARSON
DELTA
LAKE
TELLER
CHEYENNE
GUNNISON
CHAFFEE
EL PASO
MONTROSE
FREMONT
CROWLEY
KIOWA
OURAY
SAGUACHE
BENT
HINSDALE
SAN MIGUEL
CUSTER
PUEBLO
DOLORES
SAN JUAN
MINERAL
ALAMOSA
HUERFANO
OTERO
PROWERS
LA PLATA
BACA
RIO GRANDE
LAS ANIMAS
MONTEZUMA
COSTILLA
CONEJOS
ARCHULETA

Julesburg
Crook
Sterling
Holyoke
Maybell
Craig
Steamboat Springs
Walden
The Forks
Fort Collins
Ault
Greeley
Loveland
Snyder
Fort Morgan
Akron
Wray
Yuma
Artesia
Phippsburg
Meeker
Hot Sulphur Springs
Kremmling
Granby
Boulder
Brighton
Central City
Golden
Georgetown
Idaho Springs
Watkins
Joes
Deer Trail
Littleton
Rifle
New Castle
Glenwood Springs
Eagle
Breckenridge
Conifer
Bailey
Sedalia
Castle Rock
Franktown
Kiowa
Limon
Arriba
Flagler
Burlington
Leadville
Fairplay
Aspen
Grand Junction
Twin Lakes
Hugo
Ramah
Colorado Springs
Arapahoe
Cheyenne Wells
Buena Vista
Crested Butte
Gateway
Delta
Crawford
Cripple Creek
Montrose
Sapinero
Gunnison
Salida
Eads
Sargents
Canon City
Penrose
Ordway
Norwood
Ouray
Lake City
Saguache
Westcliffe
Manzanola
La Junta
Las Animas
Holly
Lamar
Telluride
Dove Creek
Silverton
Creede
Center
Hooper
Timpas
Del Norte
Walsenburg
Cortez
Mancos
Durango
Pagosa Springs
Chimney Rock
Alamosa
Fort Garland
Springfield
San Luis
Conejos
Weston
Trinidad

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964





8. Out of control on road curve downgrade.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964

9. Off the road at unsafe speed in construction area at night.

TYPICAL SCENES OF FATAL ACCIDENTS IN 1964

10. Loss of control avoiding animals on road.

XII. CONDITIONS AND CIRCUMSTANCES

The 567 persons who perished on Colorado's roads and streets in 1964 met death in devious and shocking ways. Most of them were killed outright; many succumbed to injury sometime afterwards. Investigators' accounts of the accidents are reviewed and analyzed in relation to the specific highway location and become the subject of reports issued monthly by the Colorado Department of Highways. Table X summarizes the 1964 fatal accidents by type and highlights such items as day and time, operating speed, road surface condition, vehicle condition, weather, and the like.

Single-vehicle accidents, even excluding vehicle-pedestrian conflicts, outnumbered all other types of fatal accidents combined. Some 48 percent of the accidents state-wide fell into this category. Usually vehicles left the roadway and crashed into fixed objects or careened out of control into ditches or down embankments. Not infrequently, signs and other traffic safety devices were the very instruments of destruction. In some instances drivers encountered animals and objects in the roadway. For the most part, single-car accidents occurred in rural areas, on road curves or at structures, during hours of darkness, and at speeds generally reported to be unsafe for existing conditions. A good many took place on icy, wet, or snowpacked roads. In relatively few of the one-car accidents were drivers accompanied by passengers.

Multiple-vehicle collisions accounted for about 35 percent of the total fatal accidents. In these the vehicle units collided head-on or at an angle, sideswiped one another, ran into the rear of vehicles ahead, or turned in front of other vehicles. Head-

on collisions were most conspicuous at curves on two-lane highways in rural areas. Angle and sideswipe collisions were prominent at intersections, especially in urban places. Obstruction to vision was a factor in about 10 percent of the multiple-vehicle crashes. Vehicles pulling out from Stop signs or entering an intersection at the moment of signal change frequently clashed with through vehicles.

Vehicle-pedestrian conflicts, down 27 percent from 1963, produced about 11 percent of the fatal accidents. Nearly two-thirds of these took place within incorporated areas. Only one out of three such accidents occurred at an intersection, and in only 5 instances were pedestrians run over while crossing in a crosswalk. Most of the fatal pedestrian accidents took place at night, and in most cases pedestrians were considered to be at fault when crossing near or between intersections or walking or running in the traffic lanes.

Examination of the circumstances and conditions of the 52 fatal accidents on Interstate facilities draws attention to some of the problems common to roads of freeway design. Sixty-one percent of these were single-vehicle accidents, mostly at night, in which drivers crashed into fixed objects including bridge abutments, sign poles or light standards, guard posts, and curbing. Next, in order of frequency, was collision into the rear of vehicles slowing down or stopping in the traffic lanes or at ramp entrance points. Quite unexpected on divided highways, but nonetheless recurring, was the head-on collision. There were 5 such accidents in which drivers were traveling the wrong way on the divided roadways. In one case it was established that a driver deliberately crossed over the depressed median and continued in the same direction on the opposing traffic roadway. Vehicle-pedestrian conflicts continued to be numbered among fatal accidents on freeways. Last year 3 were struck down at night while crossing such facilities.

XIII. REGULATIONS AND CONTROLS

A sound set of driving rules and efficient system of traffic control devices is basic to all traffic safety. Nonobservance or ignorance of the regulations and controls plays no small part in traffic accidents. Right of way questions when proceeding through an uncontrolled intersection, making a left turn, or pulling out from a Stop or Yield sign figured in almost one-third of the fatal accidents. Failure to heed or observe curve warning signs and advisory speeds contributed to equally as many. Technicalities of signal operations, no-passing-zone restrictions, and construction signing also entered the accident picture.

Although evidence of flagrant violation or irresponsible action is all too obvious in many cases, it must be conceded that willful noncompliance or disobedience is not a satisfactory explanation of all accidents. Looking beyond the immediate responsibility of the driver for due care, traffic engineering and enforcement cannot escape the challenge and obligation to apply their skills and resources to move traffic safely. For example, at an urban interchange under reconstruction most of the year, a record 121 accidents were reported in which 5 persons were killed and

80 injured, and in which total economic loss reached close to $350,000. The rash of rear-end, sideswipe, and fixed-object collisions which developed under construction conditions pointed unmistakably to an abnormal road and traffic situation of a temporary nature with which a great number of drivers simply could not cope even with a blazing array of signs and flashers. Hazards warned against can never produce the margin of safety to be gained by elimination of hazards. When work conditions impose temporary and unusual hazards, engineering must often look to enforcement for supervision of the driving public.

It is generally believed that a great deal of confusion and uncertainty in the movement of traffic can be eliminated by consistency in traffic control fundamentals and uniformity in the basic driving rules. State and local authorities are taking positive steps to reconcile vehicle laws and ordinances which are in conflict. Road authorities are pressing for uniform control standards in all jurisdictions. In May of 1965 the Colorado Legislature enacted a Bill updating the statutory rules of the road and the meaning of traffic control devices in harmony with the national Uniform Vehicle Code. Field engineering Districts of the Department of Highways are presently taking inventory of traffic control devices to determine the needs to bring about conformance with the national uniform standards. These measures should lend greater impetus to the drive for state-wide uniformity of regulation and control in Colorado.

XIV. VEHICLES AND SEAT BELTS

Six hundred and fifty-five motor vehicles of all types were involved in the 1964 fatal traffic accidents. Vehicle units included 487 standard-size passenger cars, 78 small or compact cars, 67 trucks and truck combinations, 17 motorcycles and motorscooters, 4 buses and a few other miscellaneous types. About 50 percent of the vehicles were models 5 years old or less; 33 percent between 5 and 10 years old; and 17 percent older than 10 years. Very little is actually known about the condition of vehicles involved in the accidents due to destruction or inaccessibility of the evidence. Only 21 vehicles were described by investigators as being defective. Most of these were cases of brake or tire failure.

By actual count there were 1,437 people riding in the motor vehicles involved in the 1964 fatal accidents. Among these occupants only 49 persons (37 drivers, 12 passengers) were reported to be using seat belts. Twenty-three of the drivers and 6 of the passengers using belts survived the accidents.

Table XI shows the various types of rural and urban accidents in which the 49 seat belt users were involved. In all of the urban accidents all seat belt users survived; in the rural accidents about 53 percent survived. It is worthy of note that among the drivers and passengers not restrained by seat belts 241 were thrown from the vehicles, and 193 of those ejected were killed.

There does appear to be more widespread use of seat belts than might be suggested by the study of fatal accidents alone. From a machine run of accident punch

cards it was determined that seat belts were in use by one or more occupants of vehicles involved in some 2,528 traffic accidents—about 4 percent of all reported accidents. The records show that 917 seat belt users and 1,167 non-users were non-fatally injured in 1,218 of the 2,528 accidents. About 23 percent of the seat belt users and 25 percent of the non-users incurred serious injury in the form of bleeding wound, distorted member, or condition requiring that they be carried from the scene. The specific nature and degree of injury suffered by people restrained by seat belts and those not so protected becomes an appropriate area of study for the medical profession. Cases of seat belt use in fatal accidents are being investigated by a Committee of the Colorado State Medical Society. A report of some of their findings to date is available in printed form from the office of the Colorado Highway Safety Council.

XV. SUMMARY OF FINDINGS

Many aspects of Colorado's fatal accident experience in 1964 have been explored or touched upon in this report. Much of the data has been correlated with that developed in previous years. Among the findings in the study the following should stimulate thought and action:

ACCIDENTS

(1) Motor vehicle travel in Colorado soared to an all-time high in 1964 as did fatal traffic accidents and fatalities. Exposure rates, climbing for the second consecutive year, rose above the national average and were higher than at any time in recent years.

(2) Economic losses from traffic accidents in the State have now topped the $100 million mark.

(3) Single-vehicle accidents, even excluding vehicle - pedestrian conflicts, outnumbered all other types of accidents combined.

(4) Nonfatal injury accident rates have leveled off after a series of sharp increases in previous years.

DRIVERS AND PEDESTRIANS

(5) At least 100,000 drivers experienced traffic accidents in 1964, but less than one percent of these were involved in the fatal accidents.

(6) Drunk drivers, drowsy drivers, unlicensed drivers, drivers under suspension and drivers with a history of violations and accidents again figured prominently in the fatal accident experience.

(7) Drinking drivers, considered in unfit condition to drive, were involved in about 37 percent of the fatal accidents. In one out of every two cases the presumption of intoxication was supported by Blood Alcohol Test.

(8) One out of every six drivers implicated was an out-of-state motorist.

(9) Relatively few of the drivers had any sort of formal driver training. The great majority, however, had considerable driving experience.

(10) Drivers 25 years of age and under represented 35 percent of all vehicle operators involved. Children below teen-age and adults over 65 years of age were casualties in almost two-thirds of the fatal pedestrian accidents.

(11) Seventy-five percent of the pedestrians struck and killed were at fault when walking or running into the path of moving vehicles.

ROADS, REGULATIONS, AND CONTROLS

(12) Most of the fatal accidents occurred on the older, conventional roads and streets. Intersections, road curves, bridges, hillcrests, construction sites, and railroad crossings were scenes of two-thirds of the accidents.

(13) About one out of three of the fatal accident locations was an accident repeater spot, but few of the trouble spots exhibited an accident rate markedly above average. Only 8 spot locations were scenes of more than one fatal accident.

(14) Fatal accidents on Interstate highways continue to reveal problems of wrong-way movements on one-way roadways, unexpected slowing or stopping in the traffic lanes, improper actions entering or leaving the ramps, collision into fixed-objects at the roadside, and conflicts with pedestrians on the roadway.

(15) Failure to see or heed advance warnings calling for reduction of speed below the posted regulatory limit contributed to more than half of the accidents. Unsafe speed at road curves, especially at night, was the most common circumstance in such accidents.

(16) Collisions between vehicles at intersections frequently raised the question of right of way when proceeding through an uncontrolled crossing, making a left turn, and pulling out from a Stop or Yield sign.

VEHICLES AND SEAT BELTS

(17) Little is actually known about the condition of vehicles at the time of an accident other than the most obvious defects. Vehicle failures were reported in only 3 percent of the accidents.

(18) Bantam-size vehicles, motorcycles and motorscooters were involved in a disproportionate share of the accidents considering the numbers registered and assuming normal exposure.

(19) About 50 percent of all vehicle units were models older than 5 years.

(20) Only 3 percent of the drivers and passengers riding in vehicles involved in the fatal accidents were restrained by seat belts. All of the seat belt users survived the urban accidents. About one out of every two using belts escaped fatal injury in the rural accidents.

XVI. CONCLUSION

Human fallibility including a certain amount of irresponsibility produces traffic accidents involving about 10 percent of the road users every year. Strict denial of highway use to unfit drivers and those with very poor driving records might produce a marked improvement in fatal accident experience if all such people could be identified and removed from traffic. Fatal accidents in themselves, however, constitute less than one percent of all reported accidents, and it appears that this effort alone would result in little more than a fractitional reduction of the total accident experience. The records show that there is almost a complete turnover in the group of drivers involved in all accidents from one year to the next. This leads to the conclusion that more is to be gained from the identification and solution of the problems which confront drivers as a whole.

Traffic safety efforts to reduce the margin of human error and offset the staggering economic losses must be exerted with equal emphasis on many fronts. Enforcement and licensing agencies, with the help of the courts, cannot relax efforts to remove drivers who are unwilling or unable to meet the reasonable demands of the highway system. Education and training facilities must be used to intensify public instruction in the use of both old and new highways. Road engineering must make allowances in design and control for driver limitations and seek to minimize the possiblities for human error. Vehicle engineering must give more consideration to crash-injury protection. All concerned agencies must continue to press for uniform traffic controls and regulations.

TABLES

TABLE I

STATE OF COLORADO
*MILEAGE DEATHS AND ACCIDENT RATES
1948 - 1964

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	508	5.7
1964	9.3	477	5.1	567	6.1

*See Charts I and II, page 4

TABLE II

STATE OF COLORADO
DEATH AND ACCIDENT RATES
*BASED ON VEHICLE REGISTRATIONS

1955 - 1964

Year	Motor Vehicle Registrations (In 100 Thousands)	Fatal Accidents	Fatal Accident Rate	Persons Killed	Registration Death Rate
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	508	4.6
1964	11.2	477	4.3	567	5.1

*See Charts III and IV, page 5

TABLE III

STATE OF COLORADO
*NONFATAL INJURY ACCIDENT RATES
1948 - 1964

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
1964	9.3	14,093	150.7

*See Chart V, page 6

TABLE IV

STATE OF COLORADO
ROAD SYSTEM MILEAGE AND RATES IN 1964

ROAD SYSTEM		1964 Road Mileage	Vehicle-Miles of Travel (In Millions)	Fatal Accidents	Persons Killed	1964 Fatal Accident Rate	1964 Mileage Death Rate
A. Interstate (Class I)*	Rural	238.1	575	22	28	3.8	4.9
	Urban	37.8	231	11	11	4.8	4.8
	Rural & Urban	275.9	806	33	39	4.1	4.8
B. Interstate (Class II)**	Rural	110.5	320	7	10	2.2	3.1
	Urban	20.2	279	12	14	4.3	5.0
	Rural & Urban	130.7	599	19	24	3.2	4.0
C. Denver-Boulder Toll Road		17.3	58	2	2	3.4	3.4
D. Highways Under State Highway Jurisdiction (Other than A, B, or C)	Rural	7,584.9	3,167	221	276	7.0	8.7
	Urban	404.5	1,417	62	71	4.4	5.0
	Rural & Urban	7,989.4	4,584	283	347	6.2	7.6
E. All Highways Under State Highway Jurisdiction (A, B, C, and D)	Rural	7,951.8	4,146	252	316	6.1	7.6
	Urban	462.6	1,901	85	96	4.5	5.0
	Rural & Urban	8,414.4	6,047	337	412	5.6	6.8
F. County Roads		65,028.4	1,169	82	91	7.0	7.8
G. City Streets		5,337.3	2,133	58	64	2.7	3.0
Totals All Systems (E, F, and G)		78,780.1	9,349	477	567	5.1	6.1

* Highways built to full or acceptable Interstate standards, full control of access, and open to traffic.
** Highways built to standards adequate for present traffic and open to traffic.

TABLE V

STATE OF COLORADO
DRIVER AND PEDESTRIAN ACTIONS
AND CONDITIONS IN 1964 FATAL ACCIDENTS

Violation, Improper Action, Unfit Condition	State Hwys.	County Roads	City Streets	Total
EXCEEDING SPEED LIMIT FOR AREA	36	2	3	41
UNSAFE SPEED*				294
(a) Road				
(1) Curve or Winding	102	16	4	122
(2) Crossing (Intersection or R. R.)	18	19	9	46
(3) Construction Area	12			12
(4) Hillcrest	7			7
(5) Icy, Snowy, or Wet	37	9	3	49
(6) Gravel or unimproved		28		28
(b) Weather (Rainy, snowing, etc.)	14	10		24
(c) Traffic (Heavy or Pedestrian)	6			6
IMPROPER DRIVING				333
(a) Failure to Grant Right of Way				
(1) Vehicle to Vehicle	43	7	20	70
(2) Vehicle to Pedestrian	7	1	6	14
(3) Pedestrian to Vehicle	19	6	12	37
(4) Vehicle to Bicycle	2	1	1	4
(5) Bicycle to Vehicle	4	3	3	10
(6) Vehicle to Train	4	9	2	15
(b) Wrong Side of Road (Not Passing)	48	3	1	52
(c) Wrong Side of Divided Highway	5			5
(d) Ran Stop Sign or Signal	27	15	16	58
(e) Improper Turning	22	2	2	26
(f) Improper Passing	21	4	2	27
(g) Improper Parking—Unparking	4	2		6
(h) Unsafe Lane Change or Weaving	7	1	1	9
UNFIT DRIVER CONDITION				210
(a) Drinking—Effect Unknown	61	14	8	83
(b) Drinking—Ability Impaired (B. A. Test)	51	14	2	67
(c) Drinking—Ability Impaired (No Test)	20	3	2	25
(d) Fatigued (dozed—fell asleep)	30	1		31
(e) Physical Defect	4			4
UNFIT PEDESTRIAN CONDITION				8
(a) Drinking—Effect Unknown	1			1
(b) Drinking—Ability Impaired (B. A. Test)	5	1		6
(c) Drinking—Ability Impaired (No Test)	1			1
MISCELLANEOUS				18
(a) Driver Distracted	2		1	3
(b) Driver Inexperienced	1	2		3
(c) Passenger Fell from Vehicle	2	5	2	9
(d) Riding on Fender—Obstructing Vision		1	1	2
(e) Police Vehicle in Pursuit Struck Pedestrian			1	1

* "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

STATE OF COLORADO
SCENES OF 1964 FATAL ACCIDENTS

	Type of Location	State Highways: Interstate* Rural	State Highways: Interstate* Urban	State Highways: Other State Highways Rural	State Highways: Other State Highways Urban	County Roads	City Streets	Other	Total
SPOT LOCATIONS	Curve	4	4	67	7	25	3		110
	Curve at Structure	3		8	2		1	1	15
	Curve at Hillcrest			2		1			3
	Curve at Intersection (Controlled)			4	3		1		8
	Intersection (Controlled)			39	28	14	23		104
	Intersection (Uncontrolled)			5	2	4	11		22
	Intersection (Controlled) at Hillcrest			2					2
	Intersection (Controlled) at Curve & Hillcrest			1					1
	Interchange	5	13	1					19
	Structure	5	5	9	2		3		24
	Hillcrest	1		6	1	2	1		11
	Railroad Crossing			3	1	9	2		15
	Lane Transition (4-2)				1		1		2
	Dead End			1					1
	No Special Feature	11	1	75	15	26	12		140
	All Scenes, Above	29	23	223	62	81	58	1	477
ROAD SECTIONS	4-Lane Sections	25	23	33	33				114
	65 & 70 MPH zones (2-lane)			52					52
	65 & 70 MPH zones (4-lane)	25		11					36
	Construction Areas	1	4	6			2		12
	Mountainous Terrain	1		55	1	15			72

* Highways built to full or acceptable Interstate standards, full control of access or built to standards adequate for present traffic and open to traffic.

TABLE VII

STATE OF COLORADO
1964 FATAL ACCIDENTS OUTSIDE INCORPORATED AREAS

County Roads
Total **81**

El Paso	13	Pueblo	2	Lake	1
Jefferson	9	Rio Grande	2	Las Animas	1
Weld	9	Yuma	2	Logan	1
Adams	5	Baca	1	Montrose	1
Arapahoe	5	Bent	1	Morgan	1
Boulder	4	Conejos	1	Rio Blanco	1
Larimer	4	Custer	1	Routt	1
Mesa	3	Dolores	1	San Miguel	1
Delta	2	Douglas	1	Saguache	1
Gunnison	2	Gilpin	1	Washington	1
Phillips	2				

State Highways
Total **271**

FAI 25	30	SH 17	2	SH 88	1
SH 6	27	SH 51	2	SH 89	1
SH 10	25	SH 54	2	SH 91	1
SH 4	20	SH 59	2	SH 93	1
SH 1	18	SH 64	2	SH 95	1
SH 8	12	SH 66	2	SH 105	1
SH 2	11	SH 74	2	SH 106	1
SH 3	7	SH 92	2	SH 112	1
SH 115	7	SH 100	2	SH 119	1
SH 182	6	SH 123	2	SH 121	1
SH 83	5	SH 196	2	SH 125	1
FAI 80S	4	SH 340	2	SH 128	1
SH 13	4	Toll Road	2	SH 131	1
SH 15	4	SH 18	1	SH 136	1
SH 19	4	SH 24	1	SH 142	1
SH 82	4	SH 27	1	SH 145	1
SH 102	4	SH 52	1	SH 160	1
FAI 70	3	SH 58	1	SH 172	1
SH 7	3	SH 63	1	SH 185	1
SH 12	3	SH 72	1	SH 257	1
SH 16	3	SH 75	1	SH 263	1
SH 71	3	SH 80	1	SH 374	1
SH 159	3	SH 86	1	SH 398	1
SH 9	2				

Other Public Roads **1**

Total Outside Incorporated Areas **353**

TABLE VIII

STATE OF COLORADO
1964 FATAL ACCIDENTS WITHIN INCORPORATED AREAS

State Highways Total **66**					
Denver	26	Aurora	1	Lamar	1
Pueblo	6	Canon City	1	Littleton	1
Colorado Springs	4	Commerce City	1	Longmont	1
Cherry Hills	2	Eagle	1	Milliken	1
Cortez	2	Evans	1	Montrose	1
Englewood	2	Golden	1	Nunn	1
Steamboat Springs	2	Grand Junction	1	Sterling	1
Akron	1	Grand Valley	1	Trinidad	1
Alamosa	1	Greeley	1	Wray	1
Arriba	1	La Junta	1		
City Streets Total 58					
Denver	36	Durango	1	La Junta	1
Pueblo	5	Englewood	1	Leadville	1
Boulder	2	Fort Collins	1	Littleton	1
Colorado Springs	2	Golden	1	Loveland	1
Brighton	1	Grand Junction	1	Westminster	1
Deer Trail	1	Greeley	1		

Total Within Incorporated Areas **124**

TABLE IX
STATE OF COLORADO
1964 FATAL ACCIDENTS BY COUNTY, ALL ROAD SYSTEMS

Denver	62	Rio Blanco	6	San Miguel	3
El Paso	37	Washington	6	Bent	2
Adams	31	Yuma	6	Dolores	2
Weld	30	Costilla	5	Grand	2
Jefferson	29	Las Animas	5	Lincoln	2
Pueblo	24	Logan	5	Ouray	2
Arapahoe	23	Prowers	5	Pitkin	2
Boulder	16	Rio Grande	5	Summit	2
Larimer	16	Alamosa	4	Cheyenne	1
Otero	12	Archuleta	4	Crowley	1
Fremont	9	Eagle	4	Custer	1
Mesa	9	Morgan	4	Gilpin	1
Park	9	Routt	4	Jackson	1
Huerfano	8	Saguache	4	Kit Carson	1
Montezuma	8	Baca	3	Mineral	1
Chaffee	7	Clear Creek	3	Elbert	0
Delta	7	Conejos	3	Hinsdale	0
Douglas	7	Lake	3	Kiowa	0
Garfield	7	Moffat	3	San Juan	0
Gunnison	7	Montrose	3	Sedgwick	0
La Plata	7	Phillips	3	Teller	0
				Total	**477**

TABLE X

STATE OF COLORADO
HIGHLIGHTS OF 1964 FATAL ACCIDENTS

FATAL ACCIDENTS **477**

1. TYPE OF ACCIDENT

Collison with	No. Accidents
Vehicle Head-On	46
Vehicle Broadside	50
Vehicle Rear-End	23
Vehicle Approach—Turn	19
Vehicle Sideswipe	15
Vehicle Overtaking—Turn	4
Pedestrian	50
Bicycle	13
Horseback Rider	1
Fixed Object	67
Train	15
Animal	1
Noncollision	**No. Accidents**
Ran-Off-Road	154
Overturned	9
Other	10

2. TIME

Month	No.	Day	No.	Hour	A.M.	P.M.
Jan.	24	Mon.	57	12-1	20	19
Feb.	25	Tues.	57	1-2	23	24
Mar.	34	Wed.	46	2-3	26	26
April	31	Thurs.	57	3-4	7	25
May	39	Fri.	69	4-5	9	26
June	49	Sat.	87	5-6	12	19
July	53	Sun.	104	6-7	6	25
Aug.	50			7-8	12	33
Sept.	39			8-9	9	31
Oct.	46			9-10	21	29
Nov.	44			10-11	14	25
Dec.	43			11-12	15	21

3. MOTOR VEHICLE UNITS PER ACCIDENT

Vehicles	No. Accidents
One	311
Two	149
Three	15
Four	1
Five	1

4. ROAD SURFACE

Condition	No. Accidents
Dry	416
Wet	30
Snowy	11
Icy	19
Muddy	1

5. LIGHT

Condition	No. Accidents
Daylight	226
Dark (Roadway Lighted)	67
Dark (Roadway Unlighted)	184

6. WEATHER

Condition	No. Accidents
Clear	345
Cloudy	93
Raining	23
Snowing	16

DRIVERS AND VEHICLES **653***

7. ESTIMATED SPEEDS

MPH	No.	MPH	No.
0-4	16	45-49	34
5-9	7	50-54	57
10-14	11	55-59	24
15-19	17	60-64	82
20-24	21	65-69	13
25-29	22	70-74	67
30-34	36	75-79	17
35-39	24	80	56
40-44	41	Unstated	108

8. VISION

Condition	No. Drivers
Unobscured	531
Obscured	76
Not Stated	46

9. VEHICLE

Condition	No. Vehicles
No Defects	597
Defective	21
Not Stated	35

* Trains, Machines, and Driverless Vehicles not included.

TABLE XI

SEAT BELT USE IN 1964 FATAL ACCIDENTS

1. Road System	2. Type of Accident	3. No. of Vehicles	4. No. of Occupants	5. Persons Wearing Seat Belts				6. Persons Not Wearing Seat Belts			
				Drivers		Passengers		Drivers		Passengers	
				Killed	Sur-vived	Killed	Sur-vived	Killed	Sur-vived	Killed	Sur-vived
SH Rural	Head-on	2	2	1	—	—	—	—	1	—	—
SH Urban	Head-on	2	2	—	1	—	—	1	—	—	—
SH Rural	Head-on	3	4	—	1	—	—	1	1	—	1
SH Rural	Head-on	2	8	1	—	1	—	—	1	2	3
SH Rural	Head-on	2	8	1	—	—	—	1	—	1	5
SH Rural	Head-on	2	4	1	—	—	—	1	—	—	2
SH Rural	Head-on	3	4	1	—	—	1	1	1	—	—
SH Rural	Head-on	3	3	—	1	—	—	1	1	—	—
SH Rural	Head-on	2	5	—	1	—	1	—	1	1	1
SH Rural	Head-on	2	3	1	1	1	—	—	—	—	—
SH Rural	Head-on	2	5	—	2	—	—	—	—	1	2
SH Rural	Ran-off-road	1	1	1	—	—	—	—	—	—	—
SH Rural	Ran-off-road	1	2	—	1	1	—	—	—	—	—
SH Rural	Ran-off-road	1	1	1	—	—	—	—	—	—	—
SH Rural	Ran-off-road	1	2	—	1	1	—	—	—	—	—
SH Rural	Ran-off-road	1	1	1	—	—	—	—	—	—	—
SH Rural	Ran-off-road	1	1	1	—	—	—	—	—	—	—
SH Rural	Ran-off-road	1	1	1	—	—	—	—	—	—	—
SH Rural	Ran-off-road	1	2	—	1	—	—	—	—	1	—
SH Rural	Approach-turn	3	5	—	1	—	—	—	2	1	1
SH Rural	Approach-turn	2	5	—	1	—	—	—	1	1	2
SH Urban	Approach-turn	2	4	—	1	—	—	—	1	1	1
SH Urban	Approach-turn	2	2	—	1	—	—	1	—	—	—
SH Rural	Broadside	2	3	1	—	—	—	—	1	—	1
SH Rural	Broadside	2	3	—	1	—	—	—	1	1	—
SH Rural	Rear-end	2	4	—	1	—	1	—	1	1	—
SH Rural	Rear-end	2	4	—	1	—	2	1	—	—	—
SH Rural	Fixed-object	1	5	1	—	1	—	—	—	3	—
SH Rural	Overtaking-turn	2	4	—	1	—	—	1	—	—	2
SH Rural	Sideswipe (O.D.)	2	3	1	—	—	—	—	1	—	1
CS	Broadside	2	5	—	1	—	—	—	1	1	2
CS	Broadside	2	3	—	1	—	—	1	—	—	1
CS	Pedestrian	1	1	—	1	—	—	—	—	—	—
CR Rural	Overturn	1	3	—	1	—	1	—	—	1	—
CR Rural	Ran-off-road	1	2	—	1	1	—	—	—	—	—
Totals	35 Accidents	62	115	14	23	6	6	10	15	16	25

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