• ANNUAL • REPORT •

1984 1985

Colorado Department of Highways

Colorado Department of Highways
Division of Transportation Planning
Program Support Branch

A Message from the Executive Director

Much of the Colorado Department of Highways progress, from administering federal grants to managing road construction projects, is "behind-the-scenes" work the motoring public doesn't view. Only when a road is widened or resurfaced, or a bridge replaced, does the citizen recognize that a real effort was made.

During fiscal year 1984-85 the Department made some quiet progress and also experienced its share of drama. While Department employees began to develop a Year 2001 Forecast of highway needs and revenues with the State Highway Commission, Interstate 70 lanes were built in Glenwood Canyon, the rebuilt Colfax Viaduct was opened, and significant progress was made on Denver's C-470 southwest circumferential parkway. In addition, much time and energy was devoted to minimizing the adverse economic effects of the accidental loss of an important bridge on State Highway 50. On February 7, 1985, a tractor-trailer collided with the U.S. 50 bridge at Parkdale west of Canon City. Within 36 days the Department coordinated the replacement of the Parkdale bridge with a temporary one, and a permanent replacement was opened in four months.

This Annual Report shares some of the Department's dramatic and "behind the scenes" accomplishments and activities.

Joseph Dolan

Contents

Major Events

New and continuing construction projects, highway-related legislation, and quick responses to emergency situations, all contribute to safety and convenience for Colorado motorists. This section of the report highlights major activities of those areas.

Parkdale Bridge

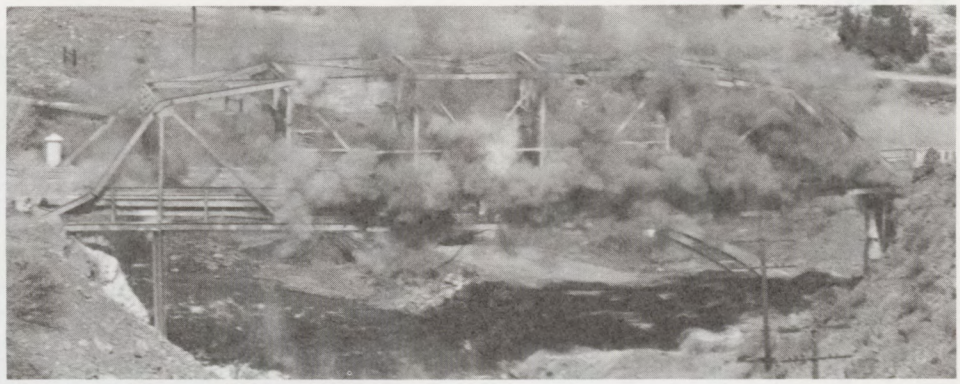
On February 7, 1985, a tractor-trailer went out of control on the Parkdale Bridge on U.S. 50, west of Canon City. The accident caused irreparable damage to the 49-year-old structure.

The Department of Highways moved quickly to arrange a temporary bridge near Parkdale allowing lightweight vehicles access to the Salida - Parkdale - Canon City commercial areas. It opened to traffic on March 15, 36 days after the accident.

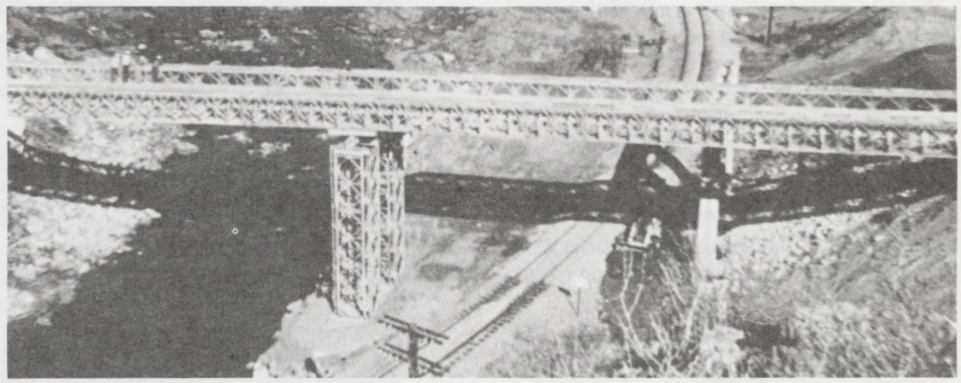
On March 1, the old bridge was demolished. Efforts were made to protect existing railroad tracks from damage and the Arkansas River from debris.

An incentive bonus of $3,000 per day was offered to the contractor of the new bridge for each day prior to the construction deadline of June 1, 1985 (a $3,000 per day penalty was to be assessed for each day construction fell behind the deadline for completion).

The bridge was opened to the public on May 25, 1985, six days before the completion deadline.



Demolition of Damaged Bridge



Temporary Bridge

Newly Constructed Bridge

C-470
Centennial Parkway

As long ago as 1958, a need for a southwest route around the metropolitan Denver area was expressed. Ground-breaking for this $219 million project took place in 1982. Additional federal funds for Interstate transfer projects became available in 1983, thus helping to increase activity and progress on C-470. Progress has continued on the construction of this 26-mile new highway around the southwest quadrant of the Denver metro area. The nine and one-half mile segment between I-25 and Santa Fe (U.S. 85) is scheduled to open late in 1985. With the existing segment between Santa Fe and Wadsworth, nearly half the total mileage will be open to traffic, easing congestion in the southwest corner of the Denver metro area.

During excavation on the Ken Caryl interchange on C-470, a prehistoric Indian hunting camp and buffalo butchering area were discovered. Excavation revealed the presence of a circular habitation structure and numerous levels of butchered bone and stone tools dating from between 2500 and 6500 years ago. This time period is termed the "Archaic" and artifacts recovered indicated that the inhabitants lived a nomadic lifestyle. Other sites from this time period have been documented along Colorado's Front Range although buffalo processing sites are somewhat rare.

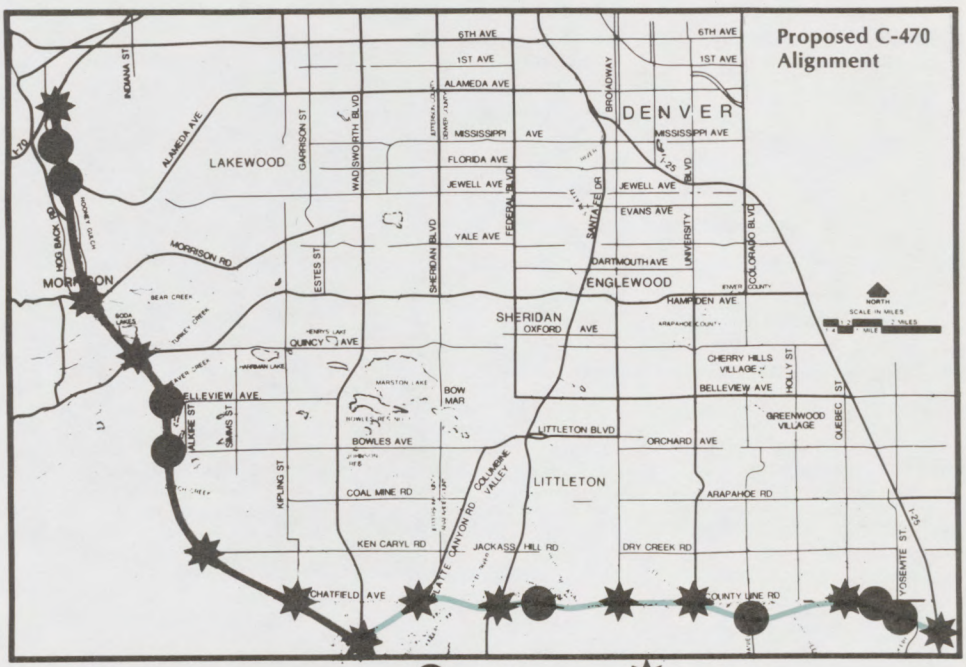
Interstate 70
Glenwood Canyon

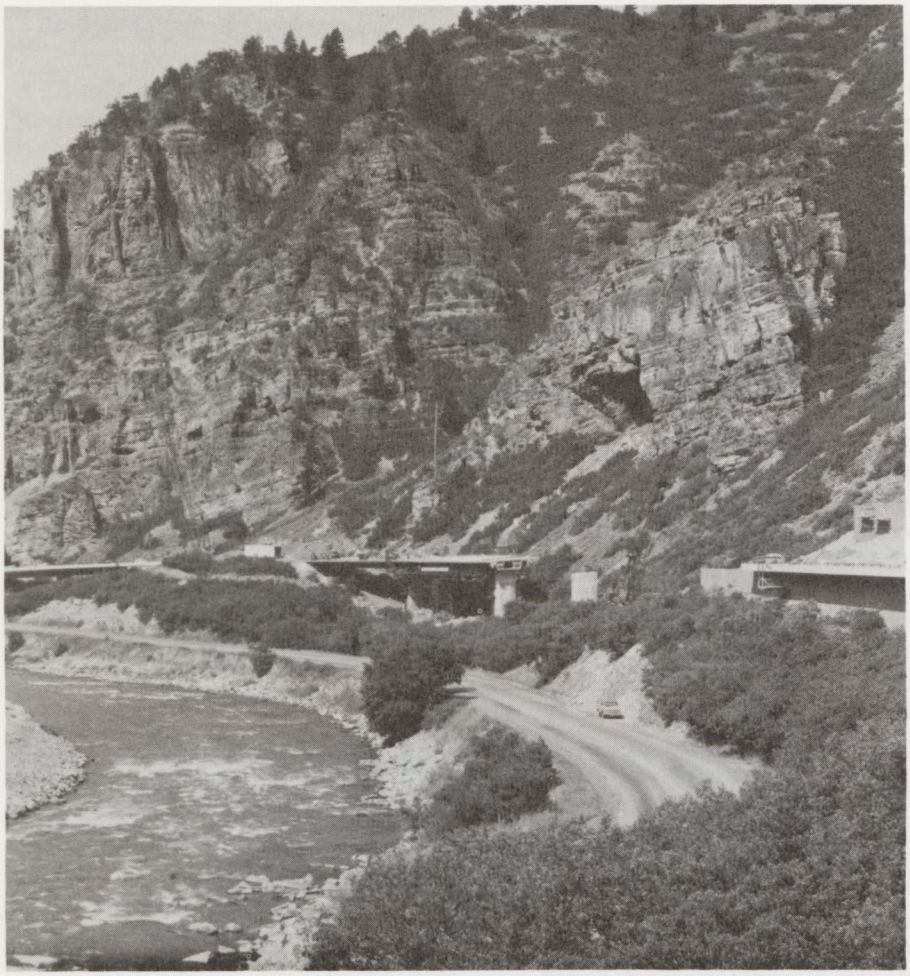
In 1983, the Highway Commission allotted $27 million to begin work on a scenic four-lane section of I-70 through Glenwood Canyon. The 12.5-mile segment through the canyon is one of two unfinished links of I-70 in Colorado, as it stretches across Colorado from the Kansas to Utah borders.

The project requires moving U.S. 6 slightly to the north to construct two eastbound lanes which will connect both ends to I-70. Traffic in both directions will then be diverted to the newly constructed lanes while the two westbound lanes are built at an upper level, chiseled out of the canyon wall. A bike lane will parallel the highway.

Preservation of the canyon's beauty is a serious element in the design and construction of the $320 million project. Construction, expected to be complete sometime in 1993, is within the U.S. 6 corridor, constructed in 1938.

Several large Glenwood Canyon I-70 projects were completed in F.Y.1984-85. These projects will result in the opening of over two and one-half miles of westbound lanes in the fall of 1985.





Completed section of I-70 in Glenwood Canyon

Traffic Control During Construction

To keep construction proceeding on schedule and motorists proceeding on theirs, a one-way pilot car system was implemented. It resulted in smoother flow during the summer months when traffic was heaviest.

A Glenwood Canyon road conditions telephone message informed callers about the length of construction delay they would encounter.

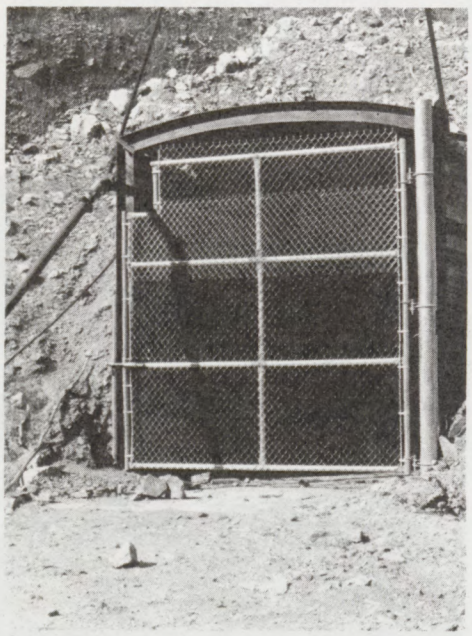
The Highway Department also made weekly news releases and contacted Glenwood Springs officials in an effort to ease any construction-related problems that might occur in the community.

Exploratory Tunnel

In order to maintain the visual character and recreational potential of the Shoshone Dam/Hanging Lake area, as well as removing much of the visual and noise impacts of the highway, design calls for two vehicular tunnels, a plan which will also aid in returning the canyon to a more natural state.

In late 1984, the Hanging Lake exploratory tunnel was completed. This "pioneer bore" is a small 12-foot X 13-foot opening constructed in the future eastbound tunnel.

The purpose of this project was to give the tunnel engineers a true idea of the properties of the rock which will be encountered during the final tunnel construction. This exploratory tunnel will enable tunnel contractors to view the rock condition, and should result in a savings of millions of dollars by eliminating some of the risks inherent in tunnel construction.



Replacement of the Larimer and Lawrence Street Viaducts

This three-phase construction project began to replace the deteriorating viaducts on major eastbound access routes to the Denver central business district, Auraria campus, Mile High Stadium, McNichols Sports Arena and historic Larimer Street area.

Phase one, the Colfax Avenue Viaduct, was completed August 7, 1984. Phase two, the Walnut Street Viaduct, just north of Larimer Street, began in late F.Y. 1984-85. This is a new viaduct on the Walnut Street alignment which will replace both the Larimer Street and Lawrence Street Viaducts. Initially, three outbound (westbound) lanes of a Walnut Street Viaduct will connect to the Colfax Avenue Viaduct. Then three inbound lanes will be added. Phase three of the project, with removal of the Larimer Street Viaduct, is scheduled to begin in 1986. Completion of the three-phase project will aid in handling existing traffic movements, and in solving some future needs, while replacing two of Denver's oldest and most deficient bridge structures.

East Riverside Avalanche Shed

The East Riverside avalanche shed project on Red Mountain, U.S. 550 south of Ouray, is the product of a long history of problems and studies associated with the East and West Riverside avalanche areas.

The East Riverside avalanches, in particular, have been a deadly maintenance problem for Colorado Department of Highways' personnel. It became notorious in February of 1963 when a minister and his two daughters were caught in an avalanche and swept away to their deaths. Since that time, two highway maintenancemen lost their lives to East Riverside avalanches.

As protection against the main chute of the East Riverside avalanche, it was decided to proceed with an avalanche shed of 180 feet in length, costing $2,450,195. The project should minimize the threat posed to the traveling public and to Colorado Department of Highways' maintenancemen from the notorious East Riverside avalanches.

Debeque Canyon

A 7.3 mile segment of I-70 through Debeque Canyon, 20 miles east of Grand Junction, is one of two links on this Interstate highway through Colorado yet to be improved to a four-lane roadway.

During F.Y. 1984-85, a $10 million construction project to build twin tunnels through Beavertail Mountain in the canyon got underway. The project is scheduled for completion in the fall of 1986 and will shorten the trip through the canyon by one mile. Four connecting bridges have been completed at a cost of $12 million, while six miles of roadway remain to be completed.

Sisyphus Shelter, a rockshelter complex composed of two shelters and a natural rockfall enclosure, was discovered northwest of the Colorado River, midway between Parachute and DeBeque. During excavations, 26 features of human origin were discovered, one of which appears to be a slab-lined habitation floor that possesses remnants of coursed wall bases and a hearth area. The habitation is unusual for the time period (2000 to 3000 years ago) in that it is rectangular rather than circular in shape and is a structure within a rockshelter. Artifacts retrieved from the floor context appear to be of late Archaic styles. A total of 17 radiocarbon dates obtained from charcoal samples from the three site areas ranged from a modern sample to a sample dated at 4400 years ago.

Aerial photo of the "Beavertail" section of I-70 in Debeque Canyon showing work on tunnel and bridges.

55TH Colorado General Assembly

Each General Assembly consists of two years (two sessions). The 55th General Assembly convened on January 2, 1985. The odd-numbered year sessions are not limited in length and usually average 168 days (even-numbered sessions are limited to 140 calendar days). This year, however, the legislative session recessed in June, reconvened in July and August to complete unfinished business, and adjourned Sine die on August 21, 1985.

Some of the highway-related concerns of the Legislature this past session are described below.

Bid Preference—House Bill No. 1223

In response to the growing number of states that provide some type of preference to resident bidders, the Colorado General Assembly adopted a bill to require that when a construction contract for a public project is awarded, a Colorado bidder shall be allowed a preference against a bidder from a state or foreign country equal to the preference given by the state or foreign country in which the bidder is a resident. Projects funded with federal funds are exempt from the provisions of the bill if such a preference is in conflict with federal requirements. The law is automatically repealed on July 1, 1988.

"Noble Bill"—House Bill No. 1375

In 1985, the Legislature voted to extend the "Noble Bill" which dedicates a percentage of the state's sales and use tax to the Highway Users Tax Fund instead of to the general fund. The dedicated amount represents a portion of the taxes attributable to the sale of motor vehicles. The "Noble Bill" was due to expire on July 1, 1986, but the General Assembly passed legislation to extend the bill permanently and to cap the funds at $50 million beginning in F.Y. 1986-87. In F.Y. 1985-86, the Highway Users Tax Fund (HUTF) is expected to receive $56 million from this source.

Gasohol Tax Exemption—Senate Bill No. 105

Colorado's five-cent gasohol tax exemption would have expired on July 1, 1985, but the General Assembly voted to extend this law for one additional year with stiffer qualifications to receive the exemption and restrictions on the agricultural products that may be used to produce the alcohol. In F.Y. 1984-85, the exemption caused a $11.3 million revenue loss to the HUTF; the new law is projected to reduce that loss to $1.75 million.

Littering—Senate Bill No. 27 Vehicle Overweight/Oversize—Senate Bill No. 157

Two laws were adopted to increase fines. One bill increases the fine for littering from a maximum of $25 to a maximum of $1,000 with provisions for requiring a convicted person to pick up litter at a time and place specified by the court. The General Assembly also substantially increased the fines for violating an oversize or overweight permit.

Transportation of Hazardous Materials

The General Assembly considered several pieces of legislation to regulate the transportation of hazardous materials through the state. There has been an increasing number of reported incidents in Colorado, in particular a potentially dangerous spill involving Navy torpedoes on the interchange of I-25 and I-70 in Denver. After extensive deliberation on the type of permit that should be required, the materials that should be regulated, the state department that should be the lead agency for such a permit system, and the degree to which the state may regulate this field without violating federal authority, the General Assembly established an interim committee on Highways and Hazardous Materials Transportation to completely discuss this issue during the summer and fall and to recommend legislation to its 1986 session beginning in January.

Employee/ Community Events

United Way Campaign

The Department was designated a "pacesetter" for the 1984 Mile High United Way Campaign. District I and VI and headquarters pledged $33,205 to the Denver metro area foundations, a 57 percent increase over the 1983 contributions.

Blood Donor Program

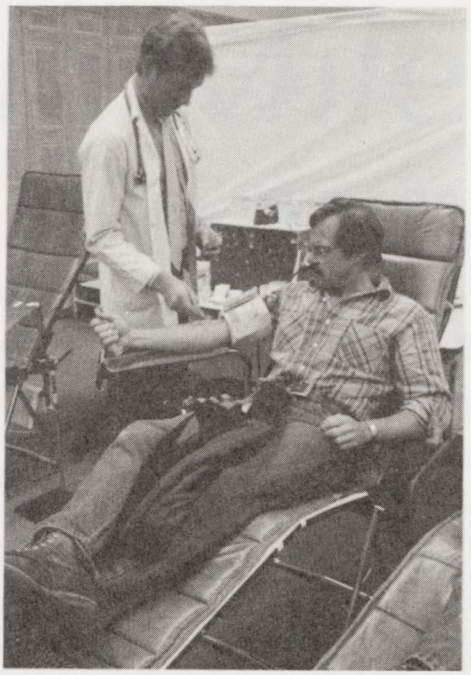
Since March 1974, employees of the Highway Department have contributed over 3,000 pints of blood to the Department's Blood Bank Program, sponsored by the Bonfils Blood Donor Program of Denver. The statewide project offers protection for all Department employees and their families.

On March 30, 1984, employees donated 110 pints of blood during the semiannual drive, with 132 pints donated during the second drive of the year held on September 28, 1984, in the Department's headquarters auditorium in Denver.

Highway employees also responded to a blood shortage crisis on June 1, 1985, donating an additional 40 pints to the Bonfils Program.

Governor's Cup

A 13-member team represented the Department of Highways at the annual Governor's Cup 10K run held in October, 1984. The competition, sponsored by the Governor's Council on Health Promotion and Physical Fitness, drew a field of 6,000 runners. Greg Lowery of District VI completed the run with the fastest time for Highways.



Employee-of-The-Year

The Colorado Department of Highways recognizes the outstanding efforts of its employees with the Employee-of-the-Year program. This year's recipient is Bert E. Sanders, a highway maintenanceman from District V. While operating a snow plow in January 1985, Sanders observed tire tracks going over a bank. They led to an overturned vehicle. Unable to free the driver pinned inside, Sanders summoned help, saving the victim from freezing to death.

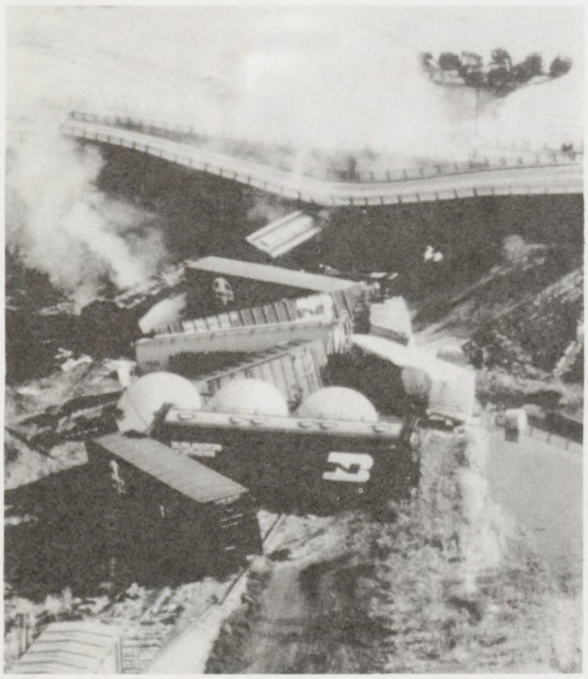
On March 29, 1985, during another snowstorm, Sanders again helped a driver in trouble. This time the driver was pinned in the cab of a semi-trailer truck following an accident.

"Miracle Mile" on the Denver-Boulder Turnpike

The photographic mosaic that follows displays the Department's extraordinary ability to respond to a recent tragic event, which occurred shortly after the end of FY 1984-85. Engineering and administrative skills, the ability to work well with the private sector, and determination to assist the traveling public, brought about Colorado's "Miracle Mile."

On Friday, August 2, 1985, two Burlington Northern freight trains collided head-on below U.S. 36, the Denver-Boulder Turnpike, in Westminster. Five railroad employees were killed and auto traffic was immediately rerouted through residential neighborhoods.

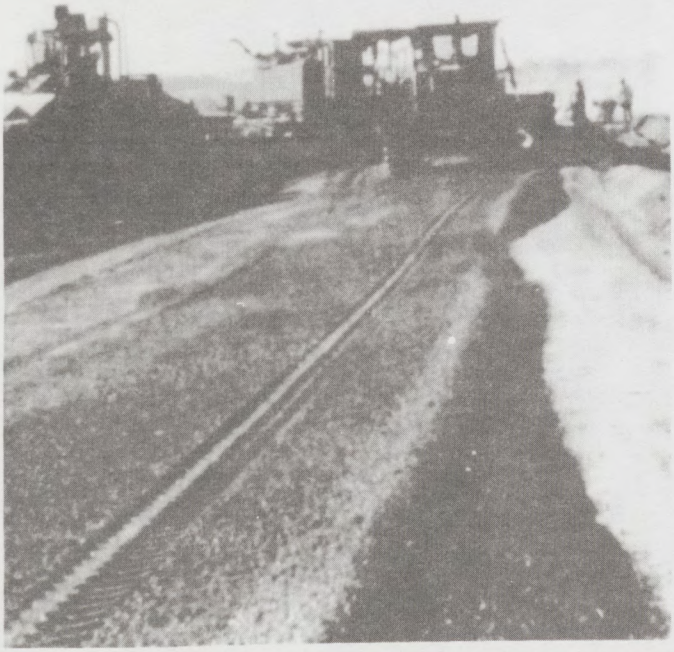
Right of Way employees got the Jefferson County Sheriff to open the courthouse during the night to get records showing who owned the Right of Way needed for the temporary detour. The detour had to be aligned quickly, and construction crews hired during the night mobilized by Saturday dawn.



Fortunately, no vehicles were on the twin bridge structures when they were engulfed by the fireball. Temperatures from the fire rose in excess of 1200 degrees, virtually melting the twin U.S. 36 bridges.

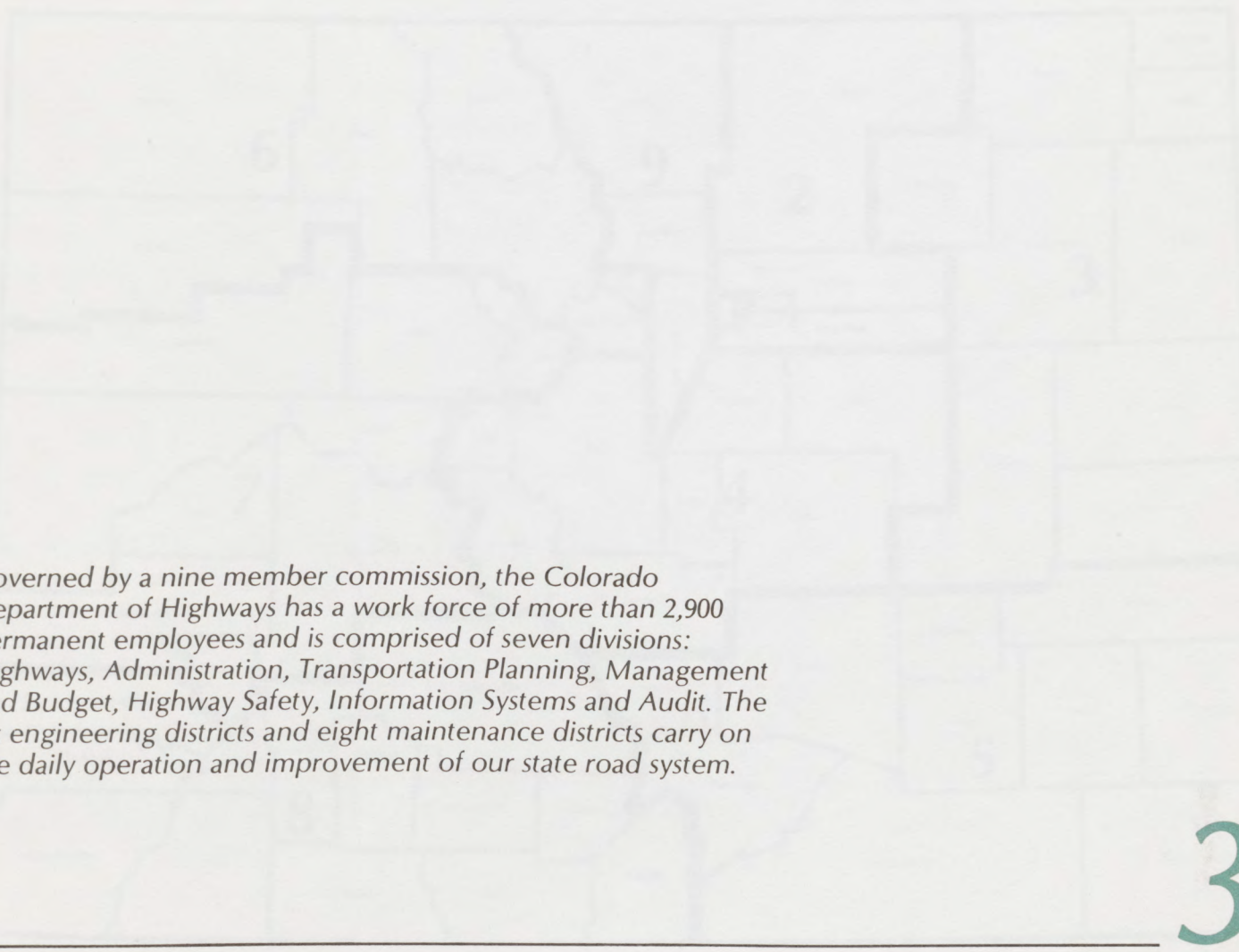
Department of Highways Bridge Design employees worked at the headquarters building on Saturday, while maintenance and field crews dealt with the accident wreckage. Crews worked around the clock under portable lights. By Sunday, the wrecked bridges were dismantled.

The mile-long temporary four-lane detour crosses railroad tracks just north of the U.S. 36 bridge site. After a new $2 million concrete bridge is opened to traffic December 1, the temporary detour will be removed.



Grading, paving and striping continued until four o'clock Monday morning, August 5. Crews beat the Monday morning peak traffic period, and Governor Richard Lamm congratulated all involved.

Department Organization



Governed by a nine member commission, the Colorado Department of Highways has a work force of more than 2,900 permanent employees and is comprised of seven divisions: Highways, Administration, Transportation Planning, Management and Budget, Highway Safety, Information Systems and Audit. The six engineering districts and eight maintenance districts carry on the daily operation and improvement of our state road system.

About the Commission

Colorado's 9,200 mile state highway system is managed by the State Department of Highways under the guidance of the Colorado Highway Commission. The Commission is composed of nine citizens appointed by the Governor and approved by the State Senate to serve four-year terms.

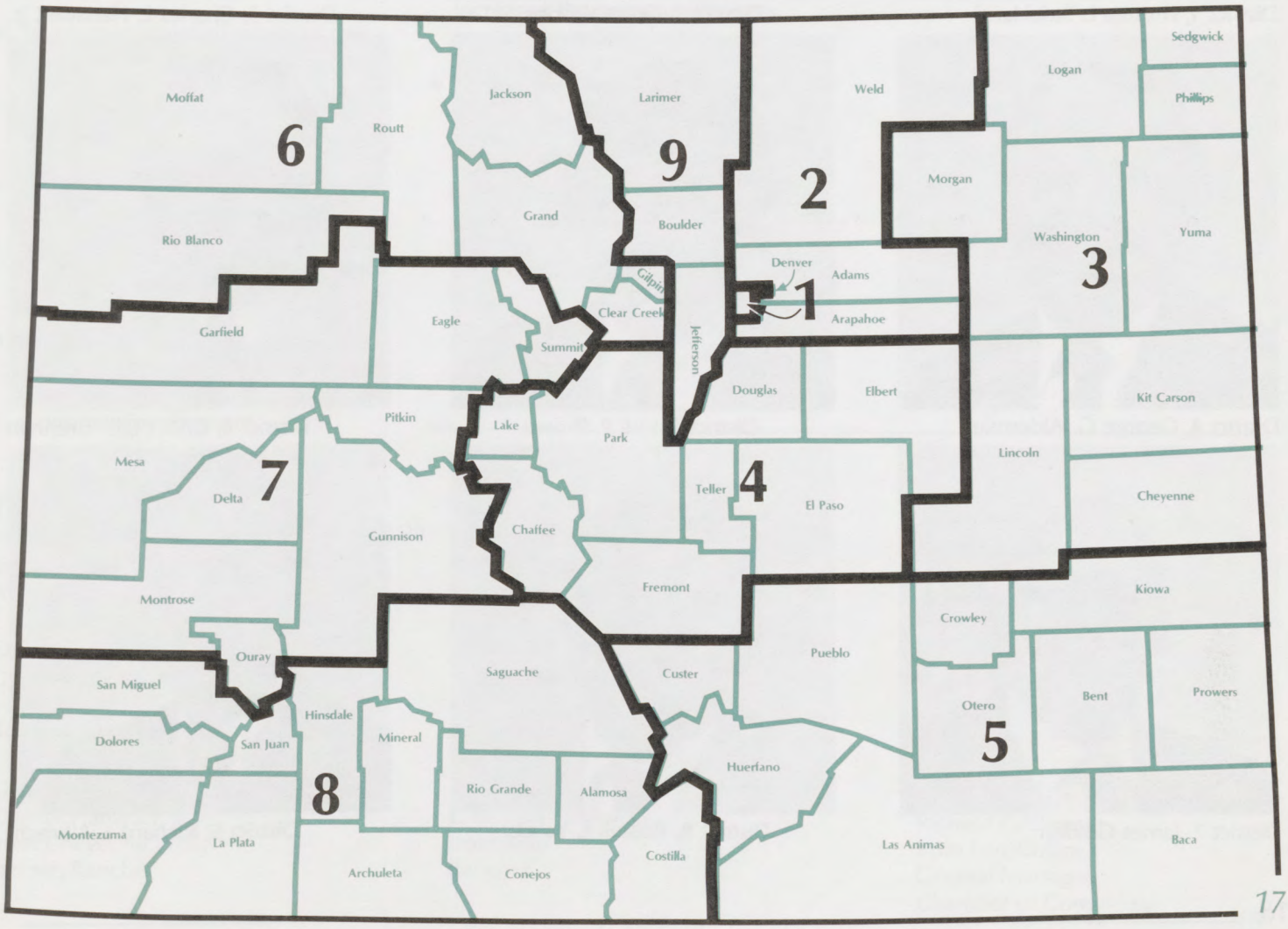
Prior to 1983, eight of the commissioners were from specific districts, one was appointed at-large. Pursuant to a legislative change, in March 1983 all nine members represent a geographic area of Colorado.

Duties of the Commission

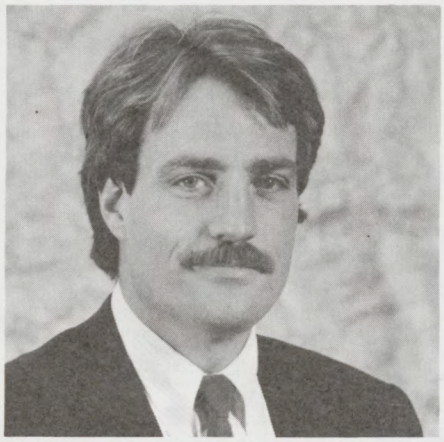
Under the state law, the powers and duties of the Highway Commission include the following:

- Formulating general policy with respect to the management, construction, and maintenance of public highways in the state.
- Advising and making recommendations to the Governor and the General Assembly relative to highway policy.
- Promulgating and adopting all state highway budgets and programs, including construction priorities and the approval of extensions or abandonments of the state highway system.

Commission Districts



Highway Commissioners


District 1, Thomas L. Strickland


District 2, Grant Wilkins


District 3, Charles L. Hanavan, Jr.


District 4, George G. Alderman


District 5, Kirk P. Brown


District 6, C.W. "Bill" Brennan


District 7, James Golden


District 8, Russell E. Yates


District 9, Richard J. Albrecht

Colorado Department of Highways Goals

It is the policy of the Colorado Department of Highways to direct its efforts toward the accomplishment of the following goals for the health, safety, and welfare of the people of Colorado:

- To improve the structural integrity of the transportation system.
- To improve the usefulness of the transportation system.
- To improve travel efficiency of the transportation system.
- To reduce transportation-related accidents.
- To improve the energy efficiency of the transportation system.
- To vigorously support compliance with the 55 MPH speed limit.
- To utilize the statewide transportation system as a positive influence toward achieving state and local priorities for economic development.
- To minimize the adverse social and environmental effects of transportation systems development.
- To increase the minority population's participation in the economic benefits of the transportation system through direct employment, contracting policies, and route decisions.
- To maximize the effectiveness of Department resources through increased Department efficiency, economy, and productivity.
- To provide assistance to public and private entities in transportation matters.

District 1
Thomas L. Strickland
from Denver
Attorney

District 2
Grant Wilkins
from Littleton
Businessman, Marketing

District 3
Charles Hanavan, Jr.
from Cheyenne Wells
Farmer, Rancher

District 4
George G. Alderman
from Colorado Springs
Truck/Equipment Dealer

District 5
Kirk P. Brown
from Pueblo
Attorney

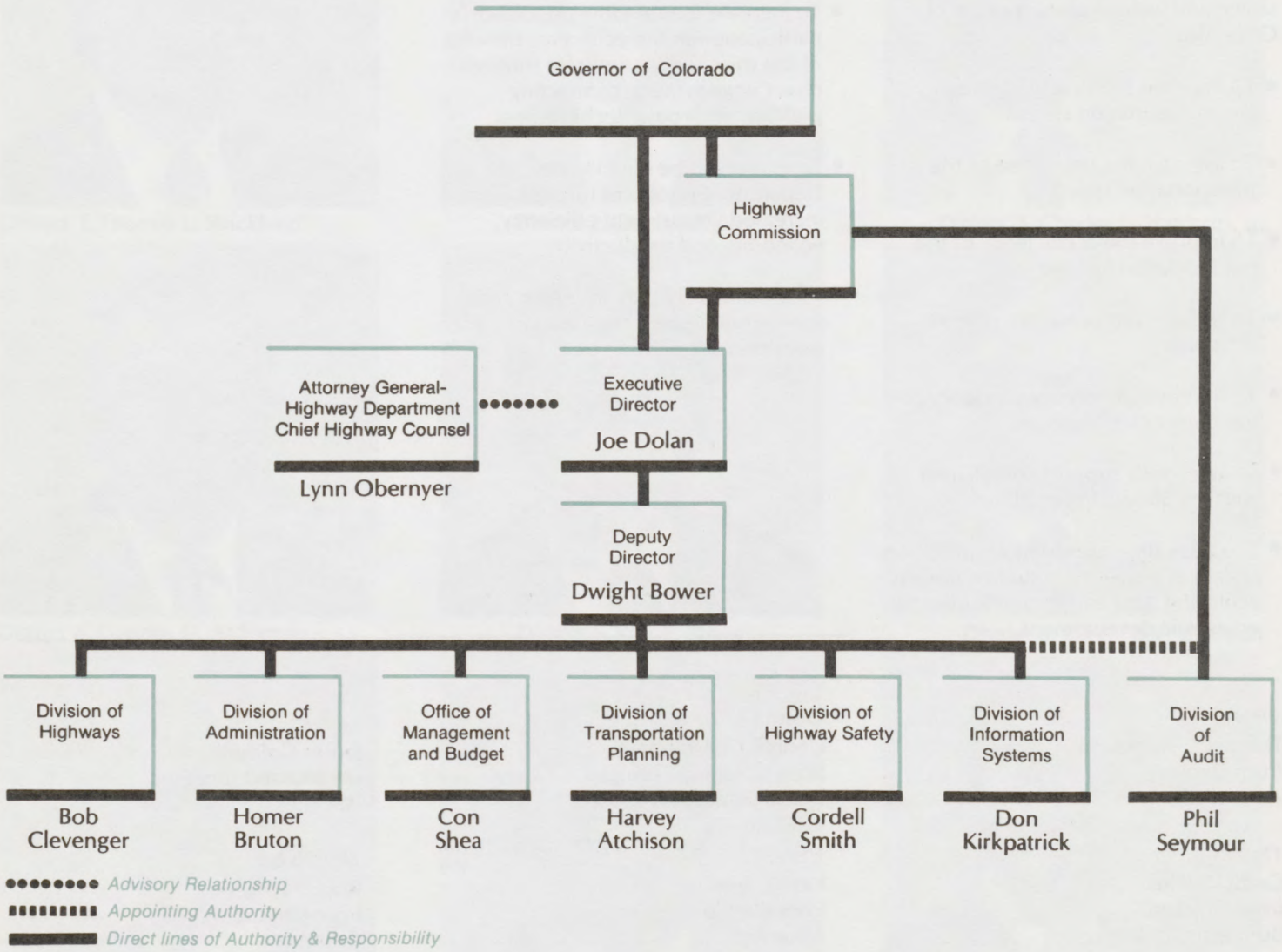
District 6
C.W. "Bill" Brennan
from Rifle
Rancher

District 7
James Golden
from Grand Junction
Attorney

District 8
Russell E. Yates
from Durango
Attorney

District 9
Richard J. Albrecht
from Fort Collins
General Manager,
Chamber of Commerce

Organization of the Department of Highways



As of July 1, 1985

District 1

Phillip R. McOllough
18500 E. Colfax Ave.
Aurora, Colorado 80011
303-757-9371

District 2

Frank L. Sollee
P.O. Box 536
905 Erie Ave.
Pueblo, Colorado 81002
303-544-6286

District 3

Robert P. Moston
P.O. Box 2107
222 S. 6th St. #317
Grand Junction, Colorado 81502
303-248-7210

District 4

Albert Chotvacs
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1420 2nd St.
Greeley, Colorado 80632
303-353-1232

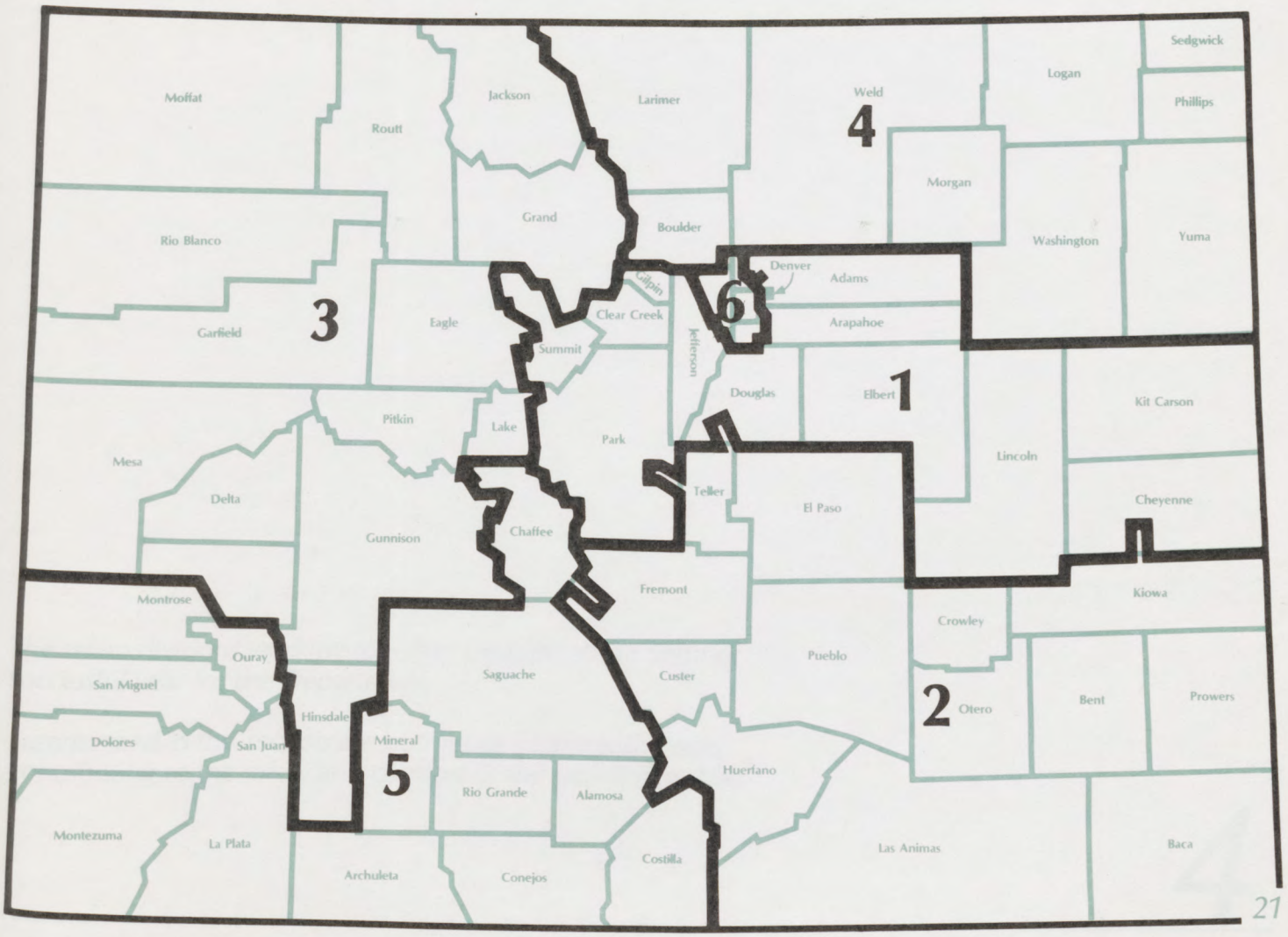
District 5

Alfred A. Shablo
214 W. 6th St.
Highway Building
Durango, Colorado 81301
303-259-1241

District 6

Richard J. Brasher
2000 South Holly
Denver, Colorado 80222
303-757-9251

Engineering Districts



Program Highlights

The seven divisions working together brought about another successful year for the Department.

Summarized in this section are numerous accomplishments contributing to the safety and comfort of the traveling public.

Engineering/Construction Activities

Construction Projects

Concrete Pavement Overlay

A Portland Cement Concrete Pavement (PCCP) overlay was completed on an 11-mile portion of I-25 between S.H. 66 and Johnson's Corner in early fall of 1985. The PCCP unbonded overlay, the first of its kind in Colorado, was placed on the old eight-inch PCCP which has four-foot and ten foot asphalt shoulders. The new surface features a smoothness specification, providing for a maximum allowable roughness measured in inches per mile.

The Department has established test sections with and without tied shoulders and reduced thickness sections with tied shoulders. Their performance will be compared to each other and to the standard project section for future design considerations.

I-25 Mountain Vista Drive Interchange In Fort Collins

The Mountain Vista Drive interchange, located on the northeast edge of Fort Collins two miles north of S.H. 14, was opened to traffic in August 1985. The interchange is the first to be built on I-25 north of the Denver metro area since construction of the Interstate highway in the 1960's.

The interchange will serve the new Anheuser-Busch brewery, now under construction, as well as other industrial, commercial and residential developments. The city of Fort Collins, in an agreement with Anheuser-Busch Companies, paid roughly two-thirds of the cost of the interchange. The other third was funded by the federal Interstate 4R program.

Night Paving

While limited to warm months, a nighttime resurfacing project on I-70 near the airport tunnels proved to be successful. The I-70 project worked so well that during the summer of 1985, a large section of I-25 through central Denver was paved at night. Department maintenance crews will continue nighttime resurfacing projects on several road segments, relieving traffic congestion and providing convenience in heavily traveled areas.

Ramp Metering

The Department continued efforts to get the most out of the existing freeway system through ramp metering. This traffic control device was initiated during the evening peak hours at the Orchard and Belleview interchanges on I-25. With ramp metering, vehicle speeds on I-25 increased an average of 12 miles per hour, reducing congestion. During the summer of 1985, installation of ramp meters began on northbound I-225 ramps from Parker Road to Colfax.

National Historic District Signs

The Department, in cooperation with the Colorado Historical Society, has developed guidelines for installing signs for qualified national historic districts. The unique white-on-brown signs designed for this purpose incorporate the symbolic logo of the Society.

Of the limited number of eligible national historic districts, signs have been installed, or soon will be, for Ouray, Silverton, Telluride, Idaho Springs and Central City. As tourist attractions, visibility of these areas will be enhanced by the attractive new signs. Signs will also be installed for other eligible districts as arrangements are made with the towns or as existing signs are in need of replacement.

Minority Business Enterprise

During F.Y. 1983-84, $28.5 million was awarded to MBEs and WBEs (Women's Business Enterprise) for prime contracts, subcontracts and construction materials. In F.Y. 1984-85, the Department changed its method of accounting for MBE/WBE contract awards which resulted in an apparent decrease of $.3 million. Actual contracts, including professional consultant services, totaled $28.2 million.

The Surface Transportation Assistance Act of 1982 requires that not less than ten percent of all federal-aid highway dollars be awarded to DBE (Disadvantaged Business Enterprise) firms. In federal F.Y. 1983-84, the Department awarded 12.8 percent of its total construction contracts to DBE firms. By June 30, 1985, the Department had 11.6 percent DBE participation in federal-aid contracts during federal F.Y. 1984-85.

Preconstruction Engineering Management System

The Department placed into operation a multi-project scheduling system known as Preconstruction Engineering Management System (PCEMS).

The system will be a valuable tool to the Department in planning for manpower requirements (up to five years), planning for more appropriate timing of advertising projects, and the ability to monitor the progress of the design process for specific projects.

Anticipated design projects for F.Y. 1985-86 have been loaded into the system, thus putting the Department in a position to look ahead and to anticipate problem areas.

Interactive Graphics System

The Interactive Graphics System (IGS) is enjoying its second year of operation. This computer-aided drafting and design system has been instrumental in automating the Department's highway design activities. While the system has not been free of growing pains, it is proving to be a cost effective system.

The system increases productivity with its ability to place portions of a drawing on various layers allowing Department staff to pull out selected layers, avoiding the need for redrafting. By interfacing with the electronic distance meters (EDMS), the survey information is loaded into the IGS files and drafted without the use of a draft person. This labor-saving potential is tremendous.

The use of quick actions (preprogrammed drafting routines), ability to easily recall selected portions of previous drawings for reuse, standardization of symbols and consistency of lettering and line intensity, help make IGS a functional, viable tool.

Currently IGS is plotting over 600 drawings per month, including both proofing and final sheets.

PLANNING

Special Programs and Studies

Resource Allocation and Project Prioritization

The Resource Allocation and Project Prioritization Program, which provides recommendations as to "how" funds should be expended by project type and prioritized within project types, was refined and utilized for the allocation of Interstate 4R, Primary and Secondary funds.

Pavement Management System

The Pavement Management System is designed to allocate resurfacing funds for asphalt pavements in the most optimal manner. In addition, activities were begun to develop a framework for rutting and concrete pavements to further allocate available funds most effectively.

Year 2001 Highway Forecast

The Forecast of the year 2001 Highway System was developed for the purpose of identifying all improvements and related costs necessary to provide a transportation system the Highway Commission believes the public desires over the next 15 years; an effort that has never been undertaken by Colorado's Highway Commission. The Commission took an active role in the compilation of this document, including participation in several "2001 Highway Forecast" workshops with Department staff.

The initial result of the study indicated that $10.8 billion would be required to meet the performance standards on the state highway system by 2001.

The required investment was stratified as follows:

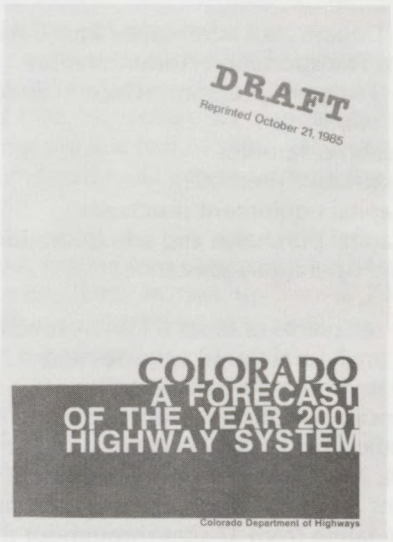
SURFACE CONDITION	$1,957,500,000
CAPACITY	$3,350,100,000
GEOMETRICS	$777,800,000
ADDITIONS	$2,380,300,000
BRIDGES	$107,200,000
INTERSTATE COMPLETION	$451,100,000
INTERSTATE TRANSFER	$47,700,000
MAINTENANCE & OPERATIONS	$1,197,000,000
OTHER	$509,600,000
TOTAL	**$10,778,300,000**

It was estimated that only $5.5 billion would be generated from existing revenue sources between now and the year 2001. Therefore, the state appears to be faced with a shortfall of almost $5.3 billion.

The State Legislative Interim Committee on Hazardous Materials Transportation and Highways requested that the Department develop a menu of revenue options to meet this identified shortfall as well as a projected shortfall of $5.4 billion for city streets, county roads, and the transit system identified by the Regional Transportation District (RTD).

Data Collection

Roadway condition data collection efforts were substantially improved with the acquisition of a state-of-the-art skid truck and trailer along with a new ultrasound profilometer, equipped with a rut depth measurement capability. Traffic counting efforts were also substantially improved with the acquisition of 180 new traffic counters tied to a microcomputer in the main office. The new traffic equipment, coupled with a new approach toward our traffic field collection, has enabled the Department to receive more accurate data in a faster time period.



North Front Range Corridor Study

In the spring of 1985, a North Front Range Corridor Study focusing on the I-25 area north of Boulder to the Wyoming state line was begun. The study will examine the feasibility of commuter rail service, operational strategies toward improving I-25, and the identification of future state highway needs along with options toward addressing those needs. This study, which represents a cooperative effort between local governments and the Department, should be completed in the latter part of 1985.

Transit Program

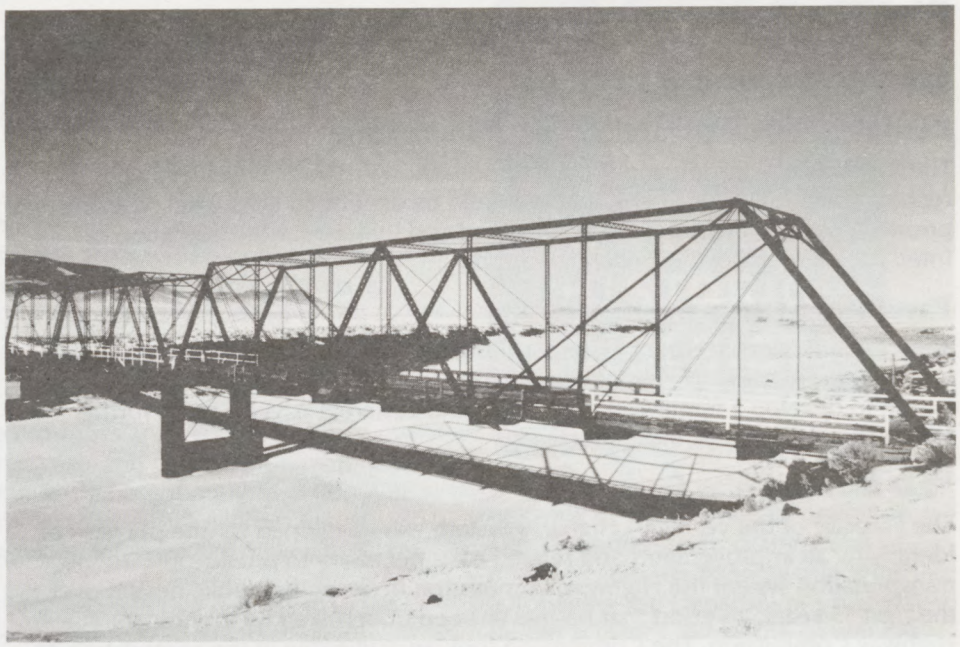
The Department administers four Urban Mass Transportation Administration (UMTA) grant programs which include the following:

- Technical studies
- Innovative methods
- Capital equipment purchases
- Capital purchases and administration and operations assistance

The recipients of federal UMTA funds are small rural transit agencies and private nonprofit transportation agencies which serve the elderly and handicapped. During calendar year 1984, 2,271,734 rides were provided in buses and vans under UMTA programs, originating from 37 sites throughout the state.

Rail Program

The Department has been involved in rail planning since 1976, analyzing issues relating to Colorado's rail transportation network. The Annual State Rail Plan provides an overview of these issues and presents a statistical and graphic summary of rail freight activities.



Costilla Crossing Bridge Over the Rio Grande River between Costilla and Conejos Counties.

A pinned iron and steel Thatcher through truss built in 1892 by the Wrought Iron Bridge Company of Canton, Ohio. A rarely-used truss type-one of only three of this type known to exist anywhere today - the state's most technogically significant bridge.

The Department also administers a Federal Railroad Administration program which provides funding for track rehabilitation and rail facilities construction projects. More than $1.8 million has been invested in improving Colorado's rail network since 1980 through this program.

Colorado Historic Bridge Survey

In 1984, the Department sponsored a statewide historic bridge survey. Five hundred and fifty bridges were evaluated for historical and engineering significance. Of these, 64 bridges were determined eligible for the National Register of Historic Places.

The Federal Highway Administration supported this survey as part of the Highway Bridge Replacement and Rehabilitation Program. The data collected will facilitate responsible evaluations on the significance of individual structures, which in turn will assist in compliance with federal regulations and help in planning bridge replacement projects.

The Department is also preparing a publication summarizing the results of the survey to be used as a planning and research tool.

Research and Development Accomplishments

There are currently 70 active research studies, 15 of which were initiated during F.Y. 1984-85. These studies include a wide range of subjects, from asphalt and concrete pavement components and procedures to driver behavior and safety devices.

A bridge deck cathodic protection system (electricity induced onto the reinforcing steel to stop corrosion) was installed near Watkins, Colorado, as a Research Demonstration Project. The protection system, due to its ability to prevent further deterioration, will save the Department thousands of dollars for repair and replacement of the bridge decks. The system will be evaluated over the next few years.

The Technology Transfer Program continued to be an effective function for research implementation. Distribution of technical materials and presentations to Highway personnel and other agencies is a continuing duty throughout the year. The annual ReACH (Research Activities on Colorado Highways) presentation was given in the CDOH headquarters auditorium during January. The presentation, consisting of exhibits, slide and video displays, samples and models is an effective method of keeping public employees, universities and other interested groups in touch with the latest research and state of the art technology.

SAFETY

During the past federal fiscal year (October 1, 1984, through September 30, 1985), approximately $2.4 million in funds from the United States Department of Transportation were administered by the Department, with grants directly benefiting highway safety projects throughout the state.

Traffic Death Rate

It is safer to travel Colorado's roads today than at any time in our history. Two decades ago, Colorado's traffic death rate (the number of lives lost per 100 million miles of vehicle travel) was 5.91. That has been cut more than half, down to 2.49, meaning that over 4,000 lives have been saved and over 90,000 injuries prevented. Those reductions translate into economic benefits for Colorado of approximately $1.5 billion. Still, with over 600 people dying in crashes each year in our state, more needs to be done.

The Drinking Driver

The abusive drinking driver continues to be the most serious highway safety problem. Historically, around half of all fatal crashes in Colorado are alcohol-related. In the peak year of 1981, drunk drivers were responsible for 54 percent of the fatal crashes. That percentage gradually declined, most likely because of tougher drunk driving laws passed in 1982 and 1983. Now there are signs that the tougher laws may have lost some impact. During the first half of 1985, 48 percent of the fatal crashes involved a drunk driver, compared to 42 percent during the same period in 1984.

In most areas of the state, enforcement of drunk driving laws is aggressive. There were 39,436 arrests for Driving Under the Influence (DUI) in 1984, up from 37,706 in 1983. The Department provides training courses on DUI detection and apprehension to well over 1,000 police officers each year.

An integral part of drunk driving enforcement is breath-testing equipment. There are 103 breathtesting instruments in Colorado, 77 provided by funds administered by the Division of Highway Safety. Last year, 22 new intoxilyzers were placed in the field.

Colorado has taken an innovative lead in developing a tracking system for drunk driving cases. Implemented with the help of the Colorado District Attorneys Council, this statewide data base contains all DUI summons and disposition information.

Law Enforcement Assistance Fund

The Law Enforcement Assistance Fund (LEAF) was created by the Legislature in 1982 to help cities and counties enforce DUI laws. The Department was assigned the responsibility of allocating LEAF monies to law enforcement agencies.

Presently there are 44 LEAF projects in the state, with $1.1 million in LEAF monies allocated for the 1985 calendar year. Sixteen new LEAF projects were originated in 1985. In LEAF communities, DUI arrests increased an average of 75 percent; alcohol-related crashes decreased as much as 60 percent.

Occupant Restraints

Traffic deaths of children under the age of four dropped 33 percent in 1984, compared to both 1983 and 1982. Colorado's child restraint law - requiring children under the age of four and under 40 pounds to ride in an approved safety seat in a motor vehicle - took effect on January 1, 1984.

This positive trend continued into 1985, with just three traffic deaths involving children under four during the first half of the year. To further encourage widespread use of child safety seats, the Department helped establish 114 loan-a-seat programs, with over 5,000 seats on loan throughout the state.

The Department has many programs designed to increase voluntary use of safety belts. A corporate/employer seat belt program is underway in Grand Junction, reaching 22 businesses with a goal of increasing employee seat belt use by 20 percent, and a model community seat belt program has been established in Fort Collins.

Hazardous Materials Training

The Department operates the Colorado Training Institute (CTI), the first hazardous materials training program in the country (established 1980). The demands for CTI's expertise are continually increasing. In 1984, 795 students were trained in the proper handling of hazardous materials spills, with another 421 students trained during the first half of 1985. Students came from throughout Colorado, the U.S. and Canada.

Hazardous Locations Studies

A comprehensive study of dangerous locations on both state highways and city streets was continued by Department personnel. Noteworthy is a traffic engineering study in the city of Aurora, designed to reduce crashes along a specific major artery. A broader study is underway in Arapahoe County, identifying hazardous locations and developing the county's own analytical capabilities. The Department is actively pursuing a rural addressing program, designed to help emergency responders identify specific locations in rural areas.

Performance Indicators

An increase in population, especially along the Front Range, the increasing amount of vehicle miles traveled, and the wear and deterioration of the present road system, have increased the need for highway maintenance and restoration. Despite these obstacles, the Colorado Department of Highways has been able to meet the needs of the traveling public.

Demonstrated in this section of the report are the state's highway needs and the Department's accomplishments in meeting these needs.

Employee Statistics

Department of Highways	1981-82	1982-83	1983-84	1984-85
Number of employees	2886	2888	2907	2924
Number of protected-class employees (minorities and women)	555	581	629	670
Number of minority employees	297	325	361	385
Percentage of protected-class employees	19.2%	20.1%	21.6%	22.9%
Percentage of minority employees	10.3%	11.3%	12.4%	13.2%

Roadway Surface Accomplishment Statistics[1]

(Federal Fiscal Year - October 1, 1984 through September 30, 1985)

	1982	1983	1984	1985
Miles treated	N.A.	N.A.	795.90	1,365.43
Lane miles treated	N.A.	N.A.	1893.92	3,031.49
Surface treatment costs	N.A.	N.A.	$66,153,881	$77,094,660
Surface treatment cost per lane mile	N.A.	N.A.	$34,930	$25,431

Highway and Bridge Program Statistics

	1981-82	1982-83	1983-84	1984-85
Prime contract awards *(number of projects)*	181	197	213	187
Prime contract awards *(in dollars)*	$96,820,292	$123,187,852	$181,068,827	$178,419,642
Minority business enterprise prime contracts *(number of projects)*	14	30	36	24
Minority business enterprise prime contracts *(in dollars)*	$ 5,671,653	$10,523,460	$13,083,000	$9,257,754
Average number of bids received for each project	6	5	5	4

Truck Weight and Safety

	1981-82	1982-83	1983-84	1984-85
Trucks cleared[2]	2,517,210	2,577,746	3,563,910	3,794,299
Trucks weighed	1,639,057	1,824,112	2,329,701	2,848,893
Overweight violations[3]	16,861	15,637	24,858	18,633
Percentage of weight violations	1.029	.857	1.07	.654

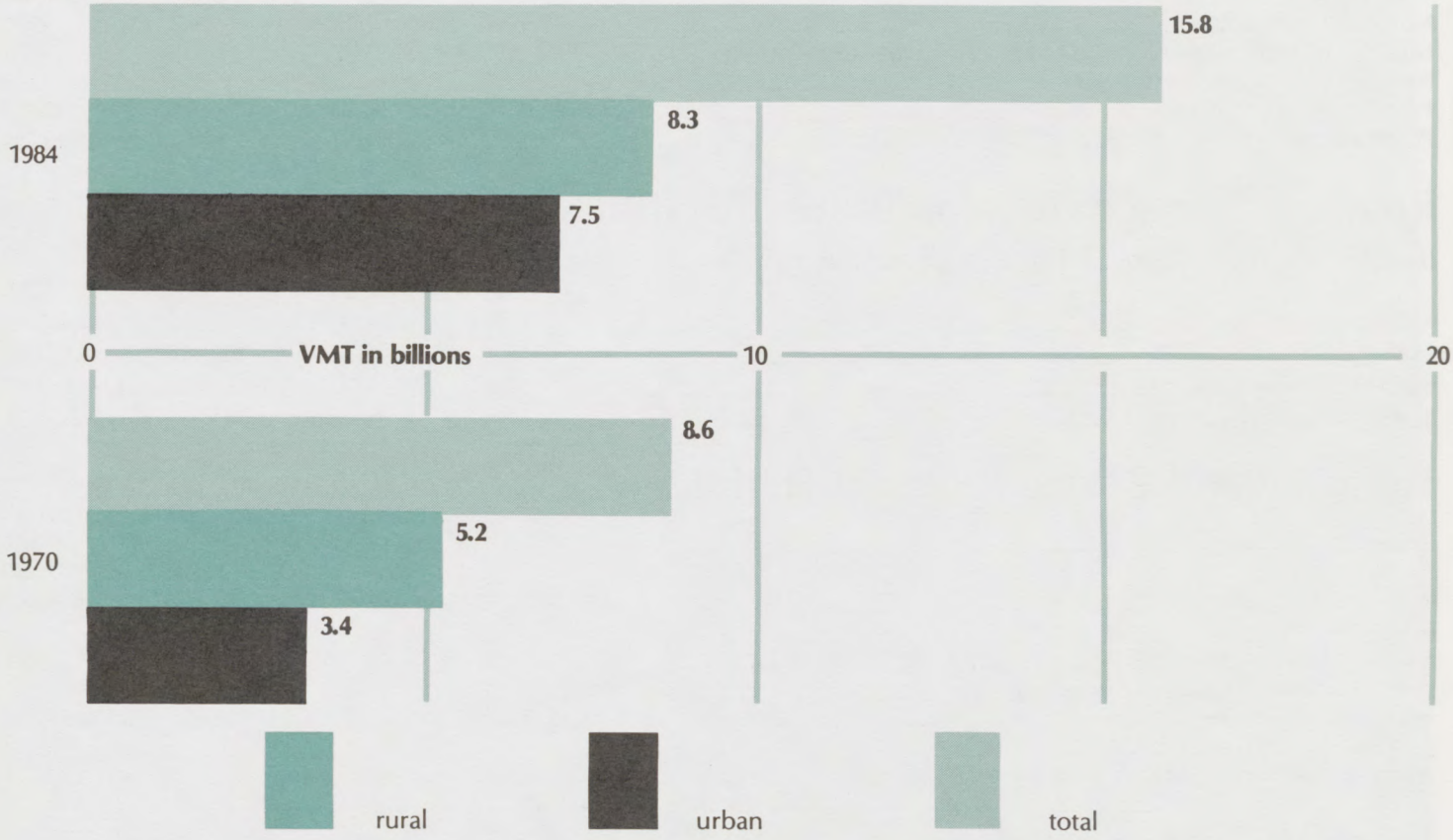
[1] Includes construction resurfacing, new construction, asphalt and seal coat.

[2] Total number of trucks cleared by the Port of Entry Division, Department of Revenue.

[3] Overweight violations include the total number of violations where enforcement was an oral warning, a written warning, or a citation.

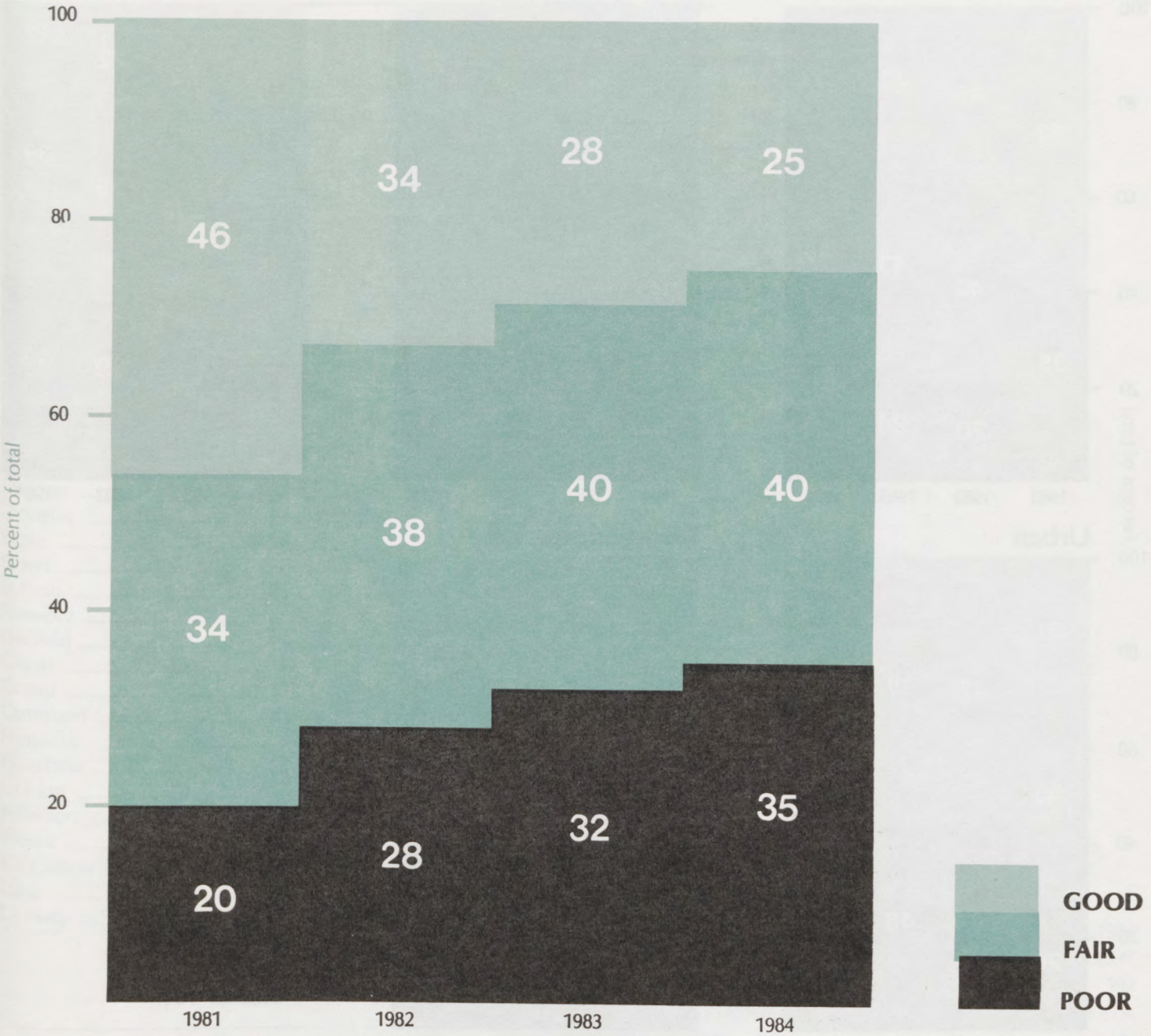
Annual Vehicle Miles of Travel (VMT)

state highway system only



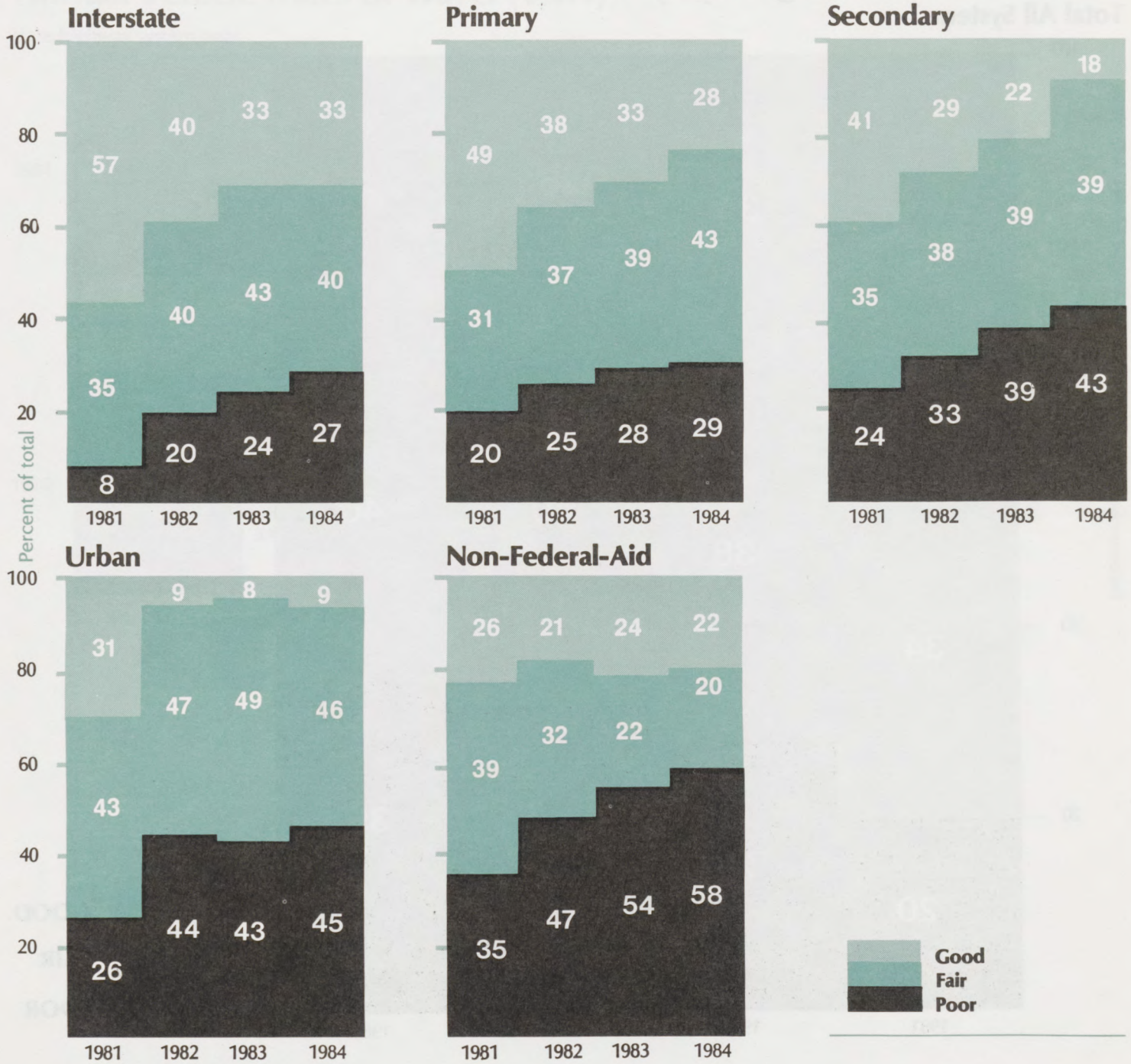
Condition of State Highway System [1] 1981-1984

Total All Systems



[1] Condition information based on roadway roughness and cracking as defined by the Colorado Pavement Management System.

Condition of State Highway System[1] 1981-1984, by Type



Condition information based on roadway roughness and cracking as defined by the Colorado Pavement Management System.

Deficient Bridges on the State System, by County 1984

	total bridges by county	total bridges found structurally deficient	total bridges found functionally obsolete
Adams	190	9	0
Alamosa	4	0	0
Arapahoe	147	4	0
Archuleta	17	1	0
Baca	32	4	2
Bent	28	1	0
Boulder	91	5	2
Chaffee	31	2	1
Cheyenne	36	0	1
Clear Creek	65	5	0
Conejos	16	0	0
Costilla	5	1	1
Crowley	15	2	0
Custer	14	3	0
Delta	25	1	2
Denver	150	2	2
Dolores	10	0	0
Douglas	74	1	0
Eagle	96	2	1
Elbert	67	1	1
El Paso	228	6	4
Fremont	67	5	6
Garfield	95	4	1
Gilpin	7	1	0
Grand	35	9	3
Gunnison	28	4	1
Hinsdale	3	0	0
Huerfano	68	4	2
Jackson	10	1	0
Jefferson	170	7	1
Kiowa	17	5	0
Kit Carson	71	1	0
Lake	14	1	3
La Plata	24	0	0
Larimer	173	9	7
Las Animas	106	7	4
Lincoln	86	5	6
Logan	73	9	0
Mesa	149	5	1
Mineral	10	1	0
Moffat	30	2	0
Montezuma	19	0	0
Montrose	41	2	1
Morgan	75	7	0
Otero	84	5	2
Ouray	16	2	1
Park	37	4	5
Phillips	12	0	0
Pitkin	10	1	1
Prowers	47	7	1
Pueblo	172	7	1
Rio Blanco	30	2	1
Rio Grande	17	0	0
Routt	24	6	0
Saguache	25	2	0
San Juan	5	0	0
San Miguel	6	0	0
Sedgwick	31	1	0
Summit	30	0	0
Teller	12	2	0
Washington	32	2	2
Weld	228	9	0
Yuma	17	3	0

	1983	1984
Total bridges	3,531	3,547
Total structurally deficient	194	192
Percent total structurally deficient	5.49%	5.41%
Total functionally obsolete	70	67
Percent total functionally obsolete	1.98%	1.89%

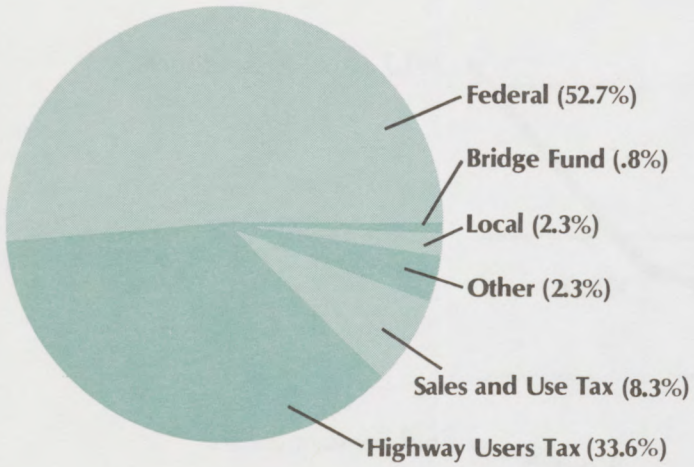
Financial Data

The federal government's Highway Trust Fund is the largest single source of Colorado's highway revenue.

The increase in motor fuel efficiency and the continuing inflation of road repair and construction costs have seriously trimmed the generating power of the state's second largest source of highway revenue, the state Highway Users Tax Fund (HUTF). The base of this fund is the gas tax, gross ton-mile tax, and motor vehicle registration fee. In addition, a portion of the state's general sales tax attributed to auto-related products is dedicated to the HUTF.

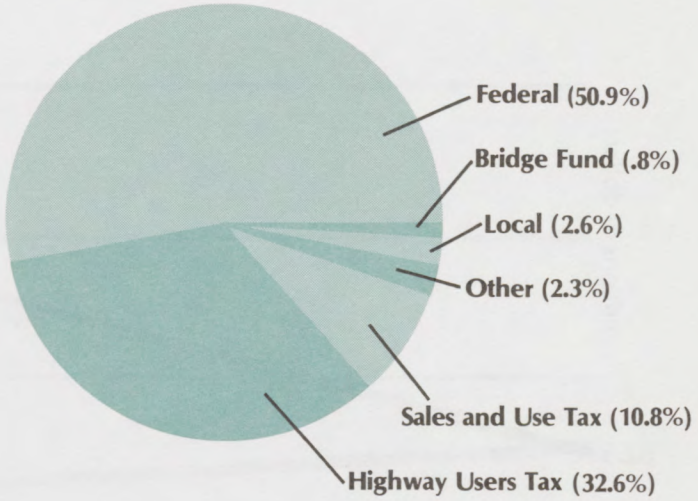
The remaining portion of highway revenue is received through several miscellaneous sources such as the drivers' license fee, motor vehicle title fee, HUTF interest, and certain motor vehicle penalty assessments.

Revenues - FY 1983-84 - $385 Million



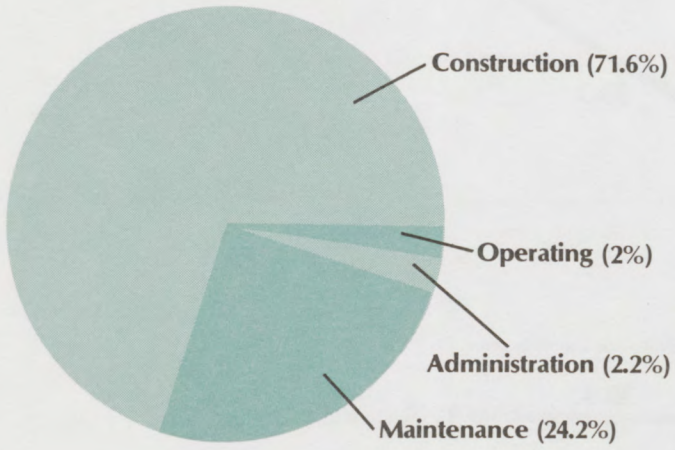
State share only of bridge fund
Local share of project costs

Revenues - FY 1984-85 - $386 Million



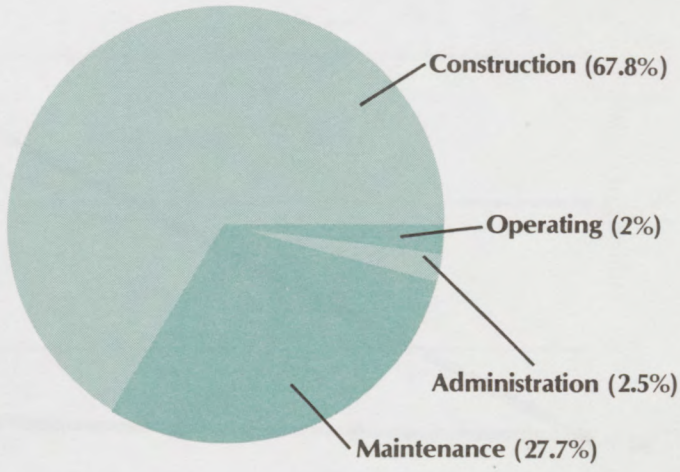
State share only of bridge fund
Local share of project costs

Expenditures - FY 1983-84 - $385 Million



Construction includes new projects, resurfacing, and restoration of existing highways. This figure also includes projects budgeted.

Expenditures - FY 1984-85 - $386 Million



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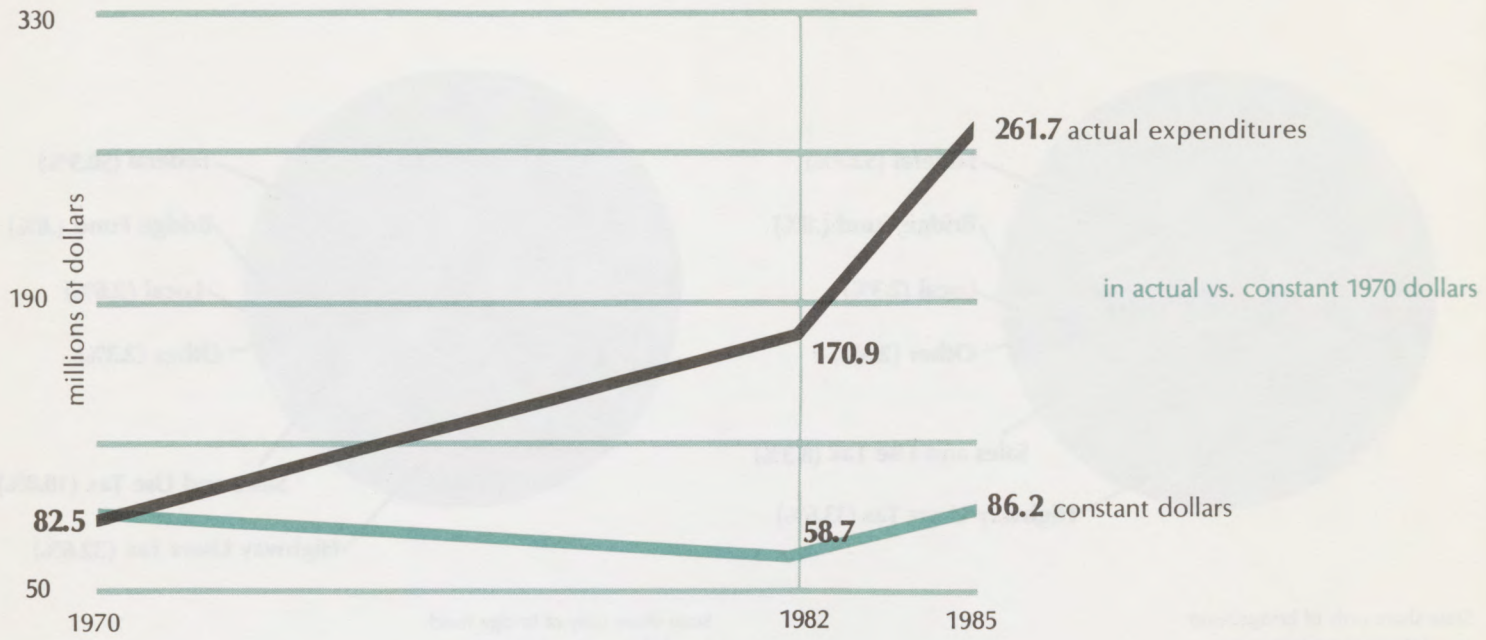
Colorado Department of Highways Construction Expenditures



Colorado Department of Highways Maintenance Expenditures