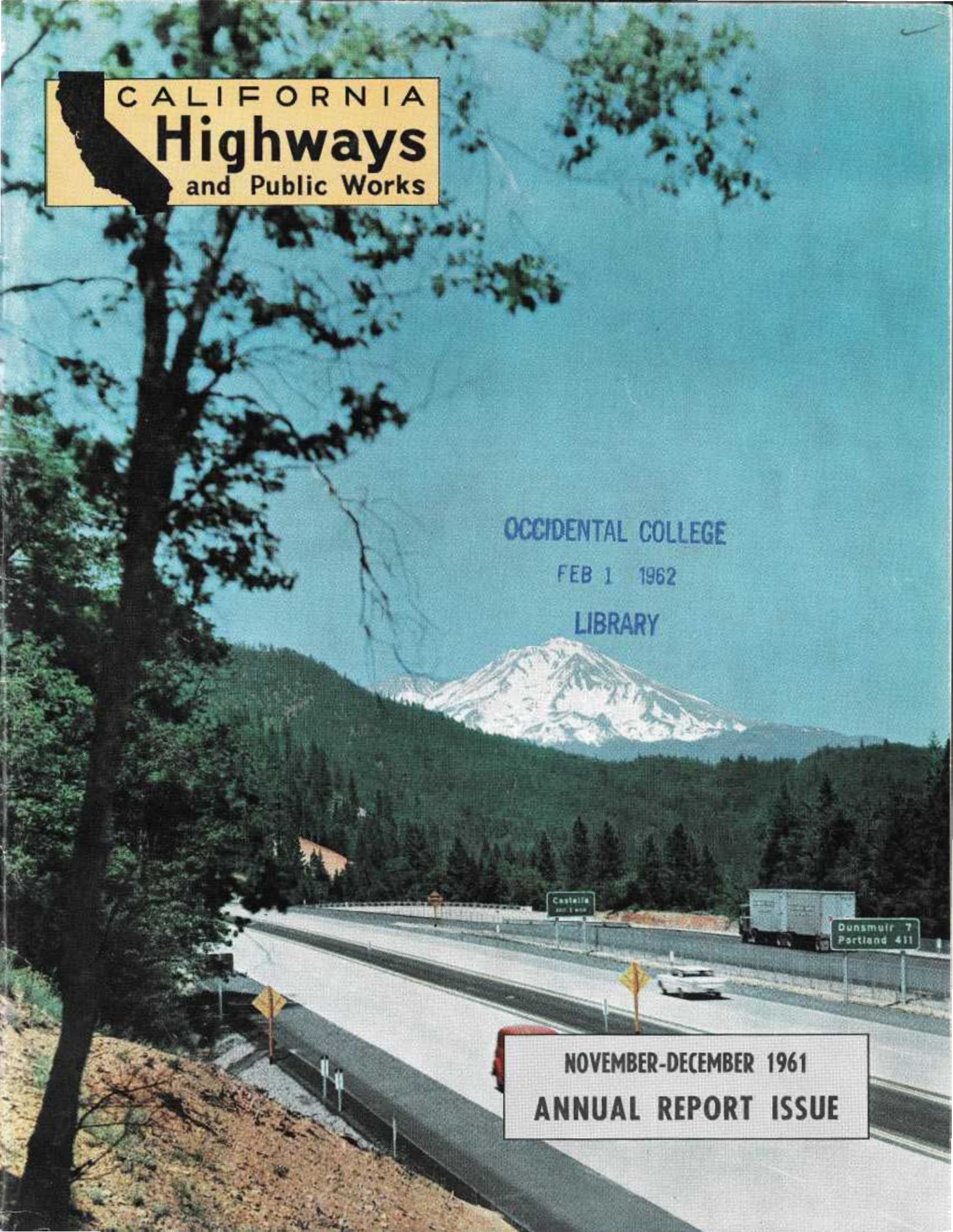


NOVEMBER-DECEMBER 1961

ANNUAL REPORT ISSUE

Letters of Transmittal

December 7, 1961

Edmund G. Brown
Governor of California

My Dear Governor:

I am pleased to submit the 15th Annual Report of the Division of Highways, Department of Public Works. The report presents an overall view of the California highway program for the 1960-61 Fiscal Year, and outlines the tremendous highway improvements which are being made.

Highway transportation will continue for many years to be our principal means of moving people and goods, even though other methods of mass transportation may be introduced or improved. Motor vehicle travel in this State will triple in the next 20 years.

Facing this prospect, we are building highways designed to assure present and future mobility in a dynamic California society.

The highway construction program has been accelerated to record levels during the past year. New sections of freeway or improved highway are being opened nearly every week. In the past three years we have increased the total freeway mileage in California by some 300 miles, yielding large dividends of safety and convenience for the State's motorists.

While the construction program moves ahead, advances are also being made on the planning front. Co-operation between the State and local communities is being emphasized, particularly in regard to freeway planning. During the past 12 months, the California Highway Commission has adopted routes for 435 miles of freeway, increasing the statewide mileage total for adopted routes to 5,825.

This is a significant accomplishment in view of the many complex problems involved in almost every route selection.

With construction proceeding according to established long-range plans, and the emphasis on fiscal continuity in budgeting, the extensive program of highway development in this State continues as an impressive example of your administration's sustained and orderly progress in meeting the needs of growing population in California.

Respectfully,

Robert B. Bradford

ROBERT B. BRADFORD
Director of Public Works

December 7, 1961

Robert B. Bradford
Director of Public Works
State of California

Dear Sir:

Submitted herewith for your approval and transmittal to Governor Edmund G. Brown is the Fifteenth Annual Report of the Division of Highways. The report is prepared in compliance with Section 143 of the Streets and Highways Code and generally covers the fiscal year ending June 30, 1961, although some later information on the construction program is included.

Progress in freeway planning and construction, particularly on routes included in the National System of Interstate Highways, continues as the salient feature of the state highway program. More than 100 miles of new freeway have been opened in the past year. Construction is now in progress on an additional 400 miles.

The national target date for completion of the Interstate System is 1972. California must continue to place great emphasis on interstate construction if the State's 2,200 miles of interstate routes are to be completed on time.

At present, work has been completed on 642 miles of interstate highway and construction is underway or budgeted on another 317 miles. About one-third of the completed mileage is developed to ultimate interstate standards, while the remainder is considered adequate for present traffic requirements. Freeway routes have been adopted for about 85 percent of the interstate highway in California.

Continuing the practice started last year, the text portion of the annual report is again included in our bimonthly magazine, *California Highways and Public Works*. Financial statements, apportionment tables and contract statistics will be published in a supplement which will be available to interested persons.

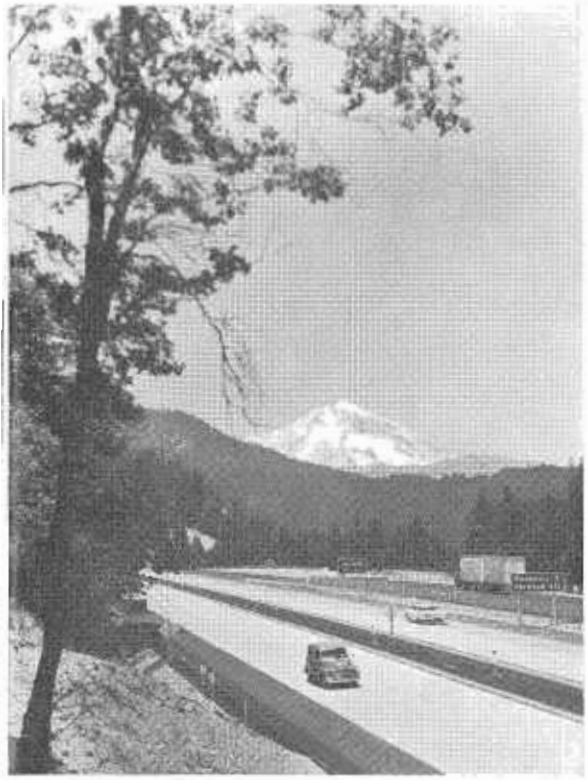
J. C. Womack

J. C. WOMACK
State Highway Engineer

California Highways and Public Works

Official Journal of the Division of Highways, Department of Public Works, State of California

Vol. 40 November-December 1961 Nos. 11-12



FRONT COVER—Set against a backdrop of evergreen forests and the snow-covered slopes of Mount Shasta, this new section of Interstate highway now speeds motorists along U.S. 99 south of Dunsmuir, Siskiyou County. The paved section at far right is part of a vista area where travelers may safely park and enjoy a spectacular view of the 14,162-foot peak.—Color photo by Jack Meyerpeter

BACK COVER—Heavy grading was under way when photographer Bob Dunn snapped this color picture of freeway construction on U.S. Highway 40 (Interstate 80) on the Rindler Fill section just east of Vallejo. This project is one of a series of major freeway jobs now in progress or budgeted on this important cross-state route. Note the old four-lane undivided highway (left) which will be eliminated when the new freeway is opened to traffic.

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LESTER S. KORITZ, *Editor*

STEWART MITCHELL, *Associate Editor* JOHN C. ROBINSON, *Associate Editor*

HELEN HALSTED, *Assistant Editor*

WILLIAM R. CHANEY, *Chief Photographer*

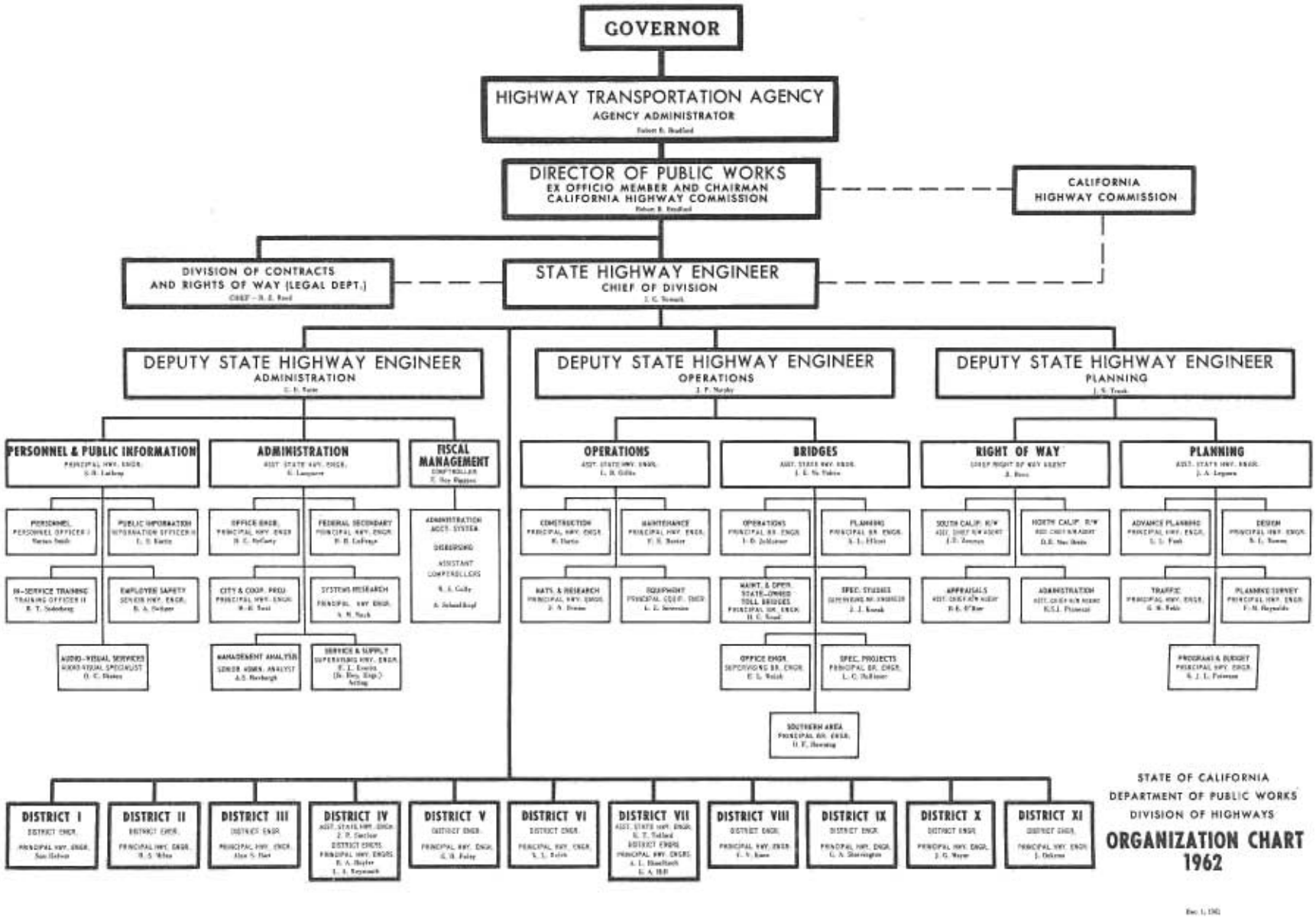
Editors are invited to use information contained herein and to request prints of any black and white photographs.

Address communications to: EDITOR,

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

P. O. Box 1499

SACRAMENTO, CALIFORNIA


GOVERNOR
HIGHWAY TRANSPORTATION AGENCY
AGENCY ADMINISTRATOR
DIRECTOR OF PUBLIC WORKS
EX OFFICIO MEMBER AND CHAIRMAN
CALIFORNIA HIGHWAY COMMISSION
CALIFORNIA HIGHWAY COMMISSION
DIVISION OF CONTRACTS AND RIGHTS OF WAY (LEGAL DEPT.)
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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
ORGANIZATION CHART
1962

STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS

CALIFORNIA HIGHWAY COMMISSION

ROBERT B. BRADFORD, *Chairman, Ex Officio*

Member	*Residence*	*Date of original appointment*	*Term expires*
JAMES A. GUTHRIE	San Bernardino	September 14, 1943	January 15, 1965
ROBERT E. McCLURE	Santa Monica	January 18, 1954	January 15, 1962
ARTHUR T. LUDDY	Sacramento	February 16, 1959	January 15, 1963
ROGER S. WOOLLEY	San Diego	March 18, 1959	January 15, 1963
JOHN ERRECA	Los Banos	January 15, 1961	January 15, 1965
ABRAHAM KOFMAN	San Jose	September 14, 1961	January 15, 1964

Secretary: A. J. COOPER

Assistant Secretary: GEORGE N. COOK

CALENDAR OF MEETINGS

CALIFORNIA HIGHWAY COMMISSION

July 1, 1960 to June 30, 1961

* July 19, 1960 — Los Angeles

* July 20, 1960 — San Diego

* August 31, September 1 and 2, 1960 — Sacramento

* September 27 and 28, 1960 — Sacramento

October 11, 1960 — Hayward
(Special session to vote $750,000 to road VII-LA-167-LA, from at or near Botschke Slough to Terminal Island.)

October 18, 1960 — Chino
Special session for inspection of roads VII,VIII-LA,SBd, Riv.-19-Pom;A,Chn,Ont,B;A and VII-LA-161-LA,Gndl.)

* October 25, 1960 — Sacramento

October 27, 1960 — Los Angeles
(Public hearing on freeway location, road VII-LA-161-LA, Gndl, between Route 4 and Figueroa Street.)

October 28, 1960 — Chino
(Public hearing on freeway location, road VII,VIII-L.A,SBd, Riv-19-Pom;A,Chn,Ont,B;A, between State Sign Route 71 and one mile east of the Mira Loma Grade Separation.)

* November 22, 1960 — Sacramento

* December 14, 1960 — Sacramento

* January 25, 1961 — Sacramento

* January 26, 1961 — San Francisco

January 27, 1961 — San Jose
(Public hearing on freeway location, road IV-SC1-2-C,Gil, MgH,B,SJs, between 0.4 mile south of Thomas Road and Route 68 near Ford Road.)

* February 23 and 24, 1961 — Sacramento

* March 22, 1961 — Los Angeles

March 23, 1961 — San Bernardino
(Special session for inspection of roads in Riverside and San Bernardino Counties.)

* April 13, 1961 — Sacramento

April 14, 1961 — Hayward
(Public hearing on freeway location, road IV-Ala-5-D,Hay, C,UnC,Fmt, between Route 228 and Washington Boulevard in the Irvington District of Fremont.)

May 2, 1961 — Daly City
(Public hearing on freeway location, road IV-SM-56-D1C,F, State Highway Route 56 (State Sign Route 1) in San Mateo County between Skyline Boulevard and Junipero Serra Freeway.)

* May 24 and 25, 1961 — Sacramento

* June 21 and 22, 1961 — Sacramento

* Regular meetings.

PAST MEMBERS OF THE CALIFORNIA HIGHWAY COMMISSION

Name	Residence	Date of appointment	Termination of membership
Burton A. Towne*	Lodi	Aug. 2, 1911	Resigned Jan. 14, 1914
Charles D. Blaney*	Saratoga	Aug. 2, 1911	Resigned Mar. 1, 1917
N. D. Darlington*	Los Angeles	Aug. 2, 1911	Resigned Jan. 8, 1923
Charles F. Stern	Eureka	Jan. 15, 1914	Resigned Dec. 21, 1918
Henry J. Widenmann*	Vallejo	Mar. 1, 1917	Died Oct. 6, 1918
Charles A. Whitmore*	Visalia	Nov. 29, 1918	Resigned Jan. 8, 1923
Emmett Phillips*	Sacramento	Dec. 21, 1918	Died June 18, 1919
George C. Mansfield*	Oroville	June 24, 1919	Resigned Jan. 9, 1923
Harvey M. Toy*	San Francisco	Jan. 9, 1923	Resigned Jan. 3, 1927
Louis Everding*	Arcata	Jan. 9, 1923	Resigned Jan. 17, 1927
Nelson T. Edwards*	Orange	Jan. 10, 1923	Resigned Jan. 3, 1927
Ralph W. Bull*	Eureka	Jan. 6, 1927	Resigned Jan. 6, 1931
J. P. Baumgartner*	Santa Ana	Jan. 6, 1927	Resigned Jan. 6, 1931
M. B. Harris*	Fresno	April 18, 1927	Resigned Jan. 6, 1931
Joseph N. Schenck*	Los Angeles	Aug. 19, 1927	Resigned Jan. 6, 1931
Fred S. Moody*	San Francisco	Aug. 19, 1927	Resigned Jan. 6, 1931
Earl Lee Kelly	Redding	Jan. 6, 1931	Resigned Oct. 18, 1932
Frank A. Tetley*	Riverside	Jan. 6, 1931	Resigned July 31, 1935
Timothy A. Reardon*	San Francisco	Jan. 6, 1931	Resigned May 7, 1936
Harry A. Hopkins*	Taft	Jan. 6, 1931	Resigned Oct. 14, 1937
Philip A. Stanton*	Anaheim	Jan. 6, 1931	Resigned Mar. 3, 1939
Dr. W. W. Barham	Yreka	Dec. 20, 1932	Resigned May 21, 1935
Ray Ingels	Ukiah	May 21, 1935	Resigned Oct. 4, 1935
C. D. Hamilton*	Banning	Aug. 1, 1935	Died April 24, 1936
H. R. Judah*	Santa Cruz	May 7, 1936	Resigned Oct. 5, 1937
Paul G. Jasper*	Fortuna	May 7, 1936	Resigned Mar. 3, 1939
William T. Hart*	Carlsbad	July 7, 1936	Resigned Mar. 3, 1939
Robert S. Redington	Los Angeles	Oct. 5, 1937	Resigned Jan. 27, 1939
Frank W. Clark	Los Angeles	Jan. 27, 1939	Resigned Mar. 10, 1939
Lawrence Barrett	San Francisco	Mar. 3, 1939	Resigned Jan. 11, 1943
Iener W. Nielsen	Fresno	Mar. 3, 1939	Resigned Jan. 11, 1943
Amerigo Bozzani	Los Angeles	Mar. 3, 1939	Resigned Jan. 11, 1943
Bert L. Vaughn	Jacumba	Mar. 3, 1939	Resigned Jan. 11, 1943
L. G. Hitchcock	Santa Rosa	Mar. 10, 1939	Resigned Jan. 11, 1943
Gordon H. Garland†	Sacramento	Jan. 11, 1943	Resigned Sept. 14, 1943
Mrs. Dora Shaw Heffner†	Sacramento	Jan. 11, 1943	Resigned Sept. 14, 1943
Miss Helen MacGregor†	Sacramento	Jan. 11, 1943	Resigned Sept. 14, 1943
Verne Scoggins†	Sacramento	Jan. 11, 1943	Resigned Sept. 14, 1943
William Sweigert†	Sacramento	Jan. 11, 1943	Resigned Sept. 14, 1943
C. Arnholt Smith	San Diego	Sept. 14, 1943	Resigned Jan. 1, 1949
C. H. Purcell*	Sacramento	Sept. 14, 1943	Resigned July 31, 1951
Homer P. Brown*	Placerville	Sept. 14, 1943	Resigned Oct. 26, 1951
Harrison R. Baker	Pasadena	Sept. 14, 1943	Jan. 15, 1954
Charles T. Leigh	San Diego	May 11, 1949	Jan. 15, 1955
F. Walter Sandelin	Ukiah	Sept. 14, 1943	Jan. 15, 1956
Frank B. Durkee	Sacramento	Aug. 4, 1951	Resigned Dec. 31, 1957
H. Stephen Chase	San Francisco	Oct. 30, 1951	Resigned Feb. 25, 1958
Fred A. Speers	Escondido	Jan. 21, 1955	Jan. 15, 1959
C. M. Gilliss	Sacramento	Jan. 1, 1958	Resigned Nov. 10, 1958
John O. Bronson	Sacramento	Feb. 26, 1958	Jan. 15, 1959
T. Fred Bagshaw	Mill Valley	Nov. 10, 1958	Resigned Jan. 4, 1959
Robert L. Bishop	Santa Rosa	Jan. 15, 1956	Jan. 15, 1960
Chester H. Warlow	Fresno	Sept. 14, 1943	Jan. 15, 1961
John J. Purchio	Hayward	Jan. 15, 1960	Resigned Sept. 9, 1961

* Deceased.
† Member of the Interim Commission.

California Highways....1961

California's growth and development in the second half of the 20th Century is dependent on sound planning and mobility.

Since World War II the State has been coping vigorously with the need for construction of major public facilities of all types—to conserve and develop its resources, to meet the immediate needs of its continuously expanding population and to plan and build for the future.

With Californians now driving nearly 9,000,000 motor vehicles, about one for every two residents of the State, and with these vehicles covering a total of more than 70 billion miles in 1961, the State's need for modern highway facilities is a prime example of the problems and challenge which accompany rapid growth.

California's program of pay-as-you-go highway modernization was stepped up in 1947 and further accelerated in 1953 with additional financing and again in 1956 through the Federal Aid Highway Act.

In 1947, there were about 480 miles of multi-lane divided highway mileage on the State Highway System. There are now 2,360 miles in operation, most of it of the freeway or expressway type, with the built-in permanence of traffic capacity assured by control of access.

There are still critical deficiencies on state highways, although the worst of them are being remedied as funds permit. There is serious congestion at peak traffic hours on some partly completed metropolitan freeway systems.

But on the whole, traffic is generally moving better and more safely than it was in 1947, even though the number of cars and trucks has more than doubled.

And the new freeways are being designed and built so that when the traffic volume doubles again—as it is expected to do within two decades—it will still flow smoothly and safely, even at the staggering estimated total movement of 200 billion miles a year.

This recently completed section of Santa Monica Freeway viaduct will be part of the 29-mile "loop bypass" which will skirt downtown Los Angeles and provide relief from traffic pressure on other central district freeways. The Los Angeles River Bridge and the East Los Angeles Interchange are at upper left.

Long-Range Planning

Because of a sound legislative and financing structure, a solid record of highway construction accomplishment and experience in long-range planning, California will be prepared to handle the anticipated increases in its population and traffic.

A master plan for the State's freeway and expressway system emerged from engineering and economic studies in 1957 and 1958 and was adopted by the State Legislature in 1959.

This plan, the "California Freeway-Expressway System," calls for $10.5 billion in freeway and expressway construction over a 20-year period. It includes 12,500 miles of the overall 16,000-mile State Highway System.

In 1980, the system will connect all cities of 5,000 or more persons, carry 59 percent of the total motor vehicle travel, and serve every major industrial, agricultural and recreation region.

For the big metropolitan areas, the plan envisions strategically located freeways and expressways which will function in combination as a system, providing maximum highway capacity between main points of traffic origin and destination.

Routes in the freeway-expressway system, like other state highways, have been designated by the Legislature in a general way. In most cases, only the termini have been specified.

WOMACK SERVES AS AASHO PRESIDENT

State Highway Engineer J. C. Womack, Chief of the California Division of Highways, has been named president of the American Association of State Highway Officials for 1962.

Womack was elected to head the national association at its annual meeting held in October at Denver, Colorado.

He has previously served as first vice president of the organization and has presided over several AASHO committees. He has also been a member of numerous committees over the years, mainly in the field of design policy and liaison with contractor groups.

He was appointed to the State Highway Engineer position in December 1959. He joined the Division of Highways staff in 1929. For the past 15 years, and especially since his appointment as Planning Engineer in 1948, he has been closely identified with the State's long-range program of highway improvement.

These general legislative descriptions provide the guidelines for detailed studies and public discussions leading to the adoption of the specific routes and to decisions on design matters.

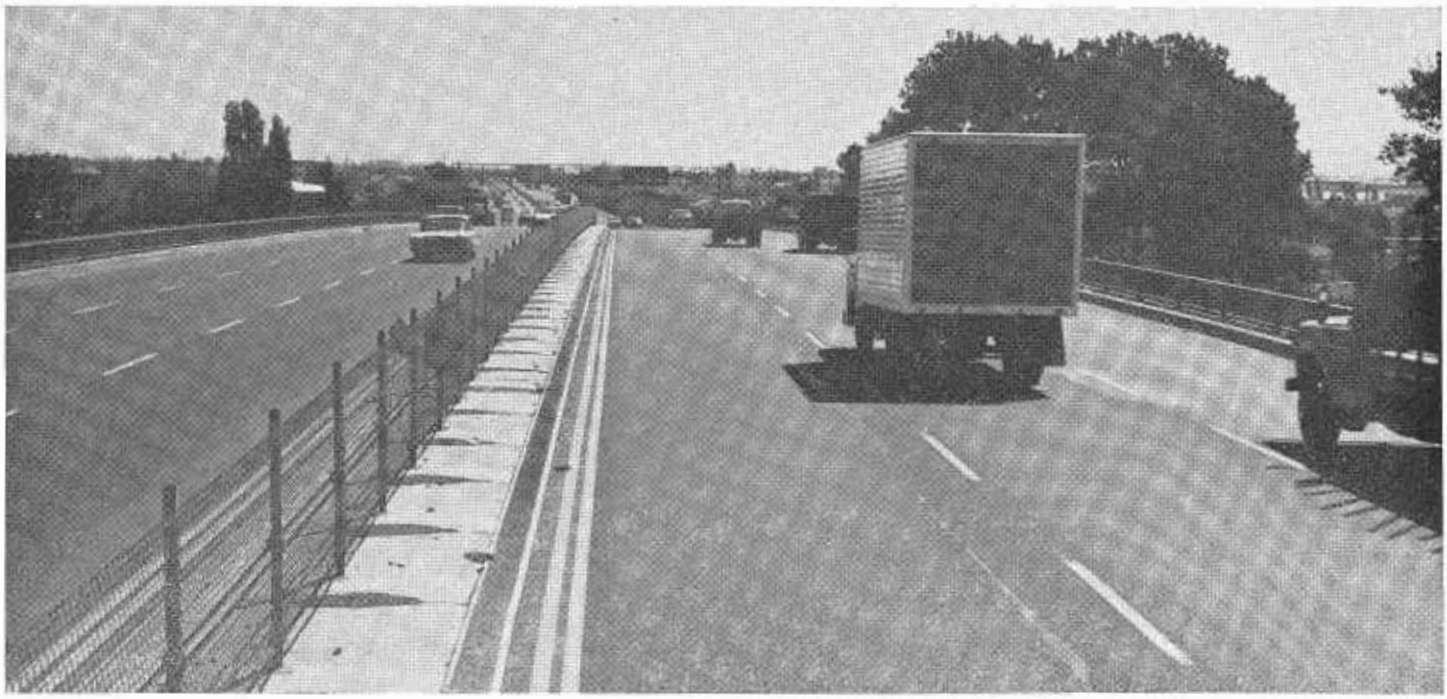
The master plan takes advantage of the orderly progress and careful advance planning of the past. Specific routes have already been established for nearly half of the total freeway-expressway system mileage, including freeways and expressways now constructed and in operation.

Access Control

Throughout the world, highway engineers and planners have now adopted the access control principle in designing high-capacity highways. California helped pioneer the access control concept. Its basic freeway law was enacted in 1939.

Although the State Highway System includes hundreds of miles of conventional highway, the emphasis in recent years has been on two types of modern highway with access control—full freeways, and expressways.

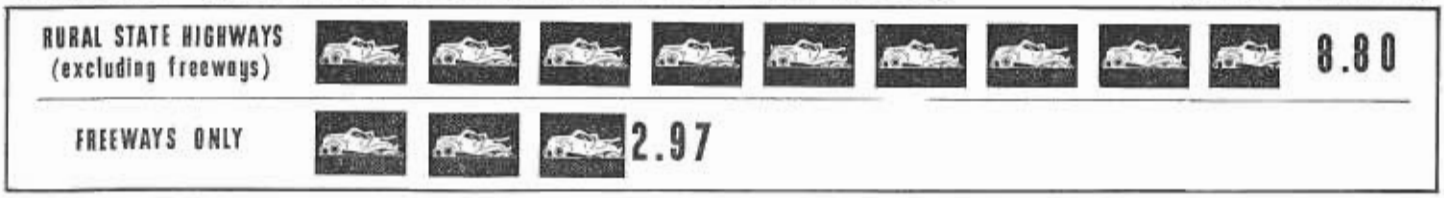
Under California law, both types are "freeways"; that is highways with a varying degree of access control. To the motorist, however, these highways are entirely different in appearance.



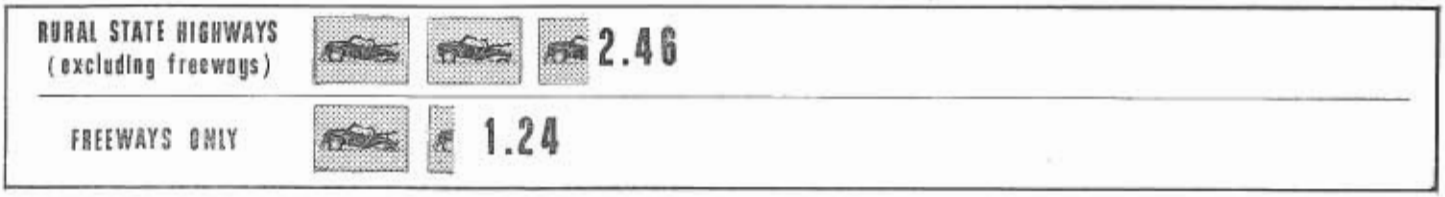
Median barriers are being installed to prevent cross-median headon collisions on heavily traveled freeways such as this section of the Nimitz Freeway in Oakland. Shown here is the fence-cable barrier developed by the Division of Highways in a series of crash tests.

FATALITY RATE PER 100 MILLION VEHICLE MILES

(1956-1960 AVERAGES)



ACCIDENT RATE PER MILLION VEHICLE MILES



A *full freeway* is a divided highway with from four to eight lanes. Access is restricted to locations where traffic may enter and leave the highway safely. There are no left turn movements in front of oncoming cars on freeways, and intersecting roads cross over or under the highway by means of separation structures. There are 922 miles of full freeway in operation in the State and another 397 miles under construction.

An *expressway* is a four-lane divided highway with most of the features of a full freeway, except that cross traffic and sometimes private access may be permitted at some locations. Most expressways are designed for eventual conversion to full freeway standards. California now has 900 miles of four-lane expressway in operation or under construction.

California also builds *two-lane expressways*, usually in rural or mountain areas where the present traffic load is relatively small. These highways are much like ordinary two-lane facilities, but access is planned to eliminate potential hazard and congestion. Enough right of way is initially required to permit future upgrading to four-lane expressway.

Why Build Freeways?

Freeways are now planned, under construction or in operation in most parts of the world where the automobile is a primary method of transportation.

There is good reason for this. Modern freeways carry more traffic in greater safety than any other type of highway.

A freeway is the engineer's answer to the challenge of today's massive traffic volumes. One freeway lane has three times the traffic capacity of a normal city street lane.

The tremendous efficiency of freeways in handling heavy traffic is evident in Los Angeles where some portions of the partly completed metropolitan freeway system are now carrying more than 200,000 vehicles a day.

A more significant freeway benefit, however, is safety. California's freeways for many years have had a better safety record than all other types of highways in the State.

For the past five years, the fatality rate on freeways has been about one-third the rate on conventional rural highways, and the overall accident rate has been about one-half the conventional highway rate. (*See accompanying chart.*)

Freeways promote safety for foot traffic, too. Pedestrians and bicycles are not permitted on freeways, and crossing structures and fencing prevent children from darting into the path of fast-moving vehicles.

From the long range viewpoint, freeways are a real "blue chip" investment. The capacity and safety benefits of freeways are permanent. Freeways built 20 years ago in this State still are capable of handling the

US Highway 101 is rapidly being converted to freeway and expressway standards. This new freeway bypass at Greenfield, Monterey County, is typical of the tremendous improvements which are being made.

large traffic volumes for which they were originally designed, in contrast with the old style boulevards which quickly became choked with traffic due to roadside strip development and unrestricted access.

It costs motorists less to operate their cars on a freeway. Studies have shown a saving of more than a half-cent a mile on freeways, as compared to ordinary streets, in gasoline and upkeep alone. There are also great savings resulting from travel time reductions and reduced accident exposure.

Community Benefits

Experience shows that properly located freeways help local business by removing traffic from overburdened streets, thus easing business district congestion for the local people who do most of the buying.

At the same time, freeway connections and interchanges, marked by large directional signs, make it easier to get to the business district.

Records of real estate transactions show that practically all commercial property along or near a freeway increases in value after the freeway is completed. This strengthens the local tax base and usually more than offsets the value of the land used for the freeway itself.

After a freeway is built through a community, residents frequently discover that they may once again drive from one side of town to the other without encountering frustrating delays due to traffic congestion. They find that the freeway crossing structures have reunited the community which was formerly split in two by a moving barrier of heavy traffic.

With a freeway in operation, traffic noise and fumes generated by stop and go traffic on city streets are reduced because there are no stop signals on a freeway and traffic moves along smoothly.

In short, freeways save time, lives and money, provide a wide range of community benefits, and preserve the mobility which is so much a part of the California way of life and a necessity in the State's growth.

The Highway Organization

California legislators have enacted the laws and established the policies which provide the basic legal and policy framework for the highway program.

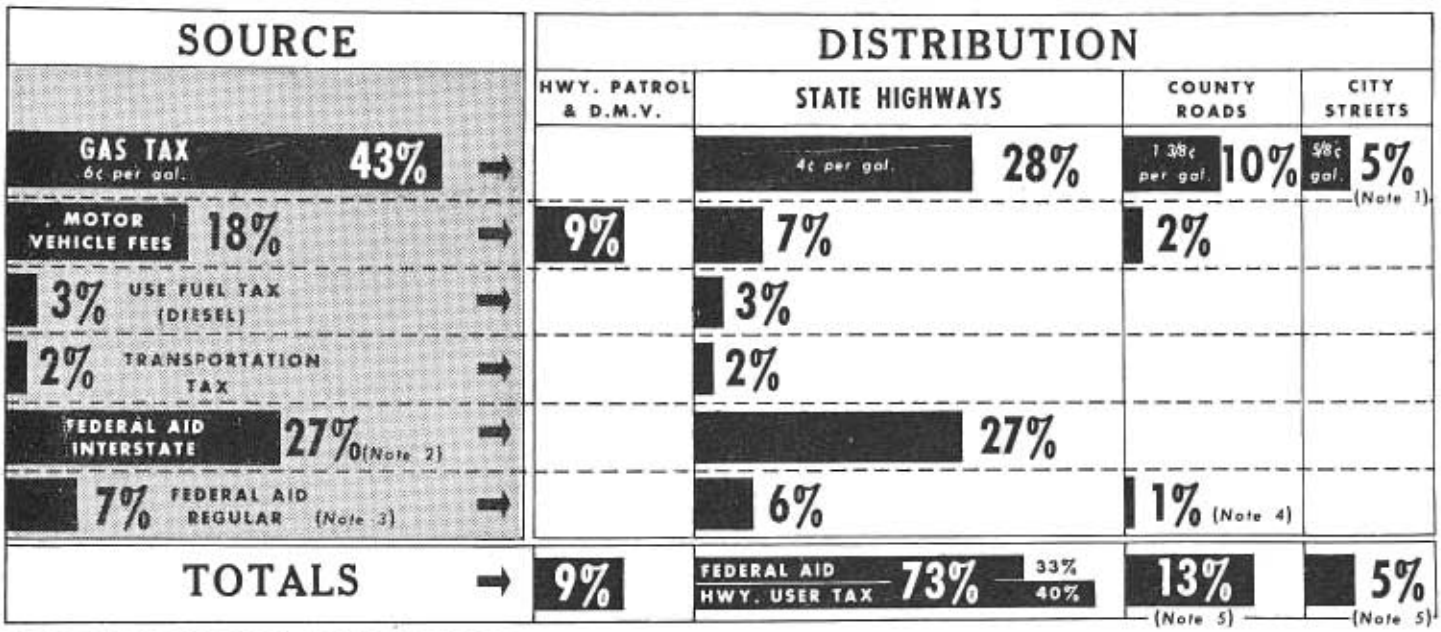
While maintaining a keen interest in highway matters, both local and statewide, the legislators have delegated to the California Highway Commission the authority and responsibility for determining highway routes and allocating construction funds.

This long-standing legislative policy has assured the continuity of the high-

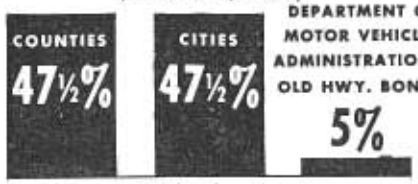
Highway User Taxes Including Federal Aid

Percentages based generally on 1962-63 Budget.

State of California
Department of Public Works
Division of Highways



'IN LIEU' (PROPERTY) TAX ON VALUE OF MOTOR VEHICLES
(collected by State)



For general local government purposes

NOTES:

1. State Highways within cities financed wholly by State and Federal funds.
2. Federal Aid Interstate must be matched 9% by State funds from above sources.
3. Federal Aid Primary, Secondary, and Urban must be matched 42%, mostly by State funds from above sources.
4. Does not include matching funds, up to $100,000 per county per year, from State Highway Fund.
5. Does not include $5,000,000 per year State highway matching funds for local railroad grade separations, or about $1,500,000 a year for urban extensions of F.A.S. county roads.

way program over the years, fostering the steady progress which has characterized California highway development.

The effect of these policies has been to free the highway organization from the pressures of partisan politics and sectionalism, permitting highway planning to proceed on the basis of statewide need and benefit. As a result, our highways are safer, more efficient, and designed to provide the greatest good for the greatest number of Californians.

California Highway Commission

The California Highway Commission is a nontechnical board of business and professional men. Commissioners are appointed by the Governor with confirmation by the State Senate.

The State Director of Public Works is commission chairman. The other members serve without pay for four-year staggered terms. Commissioners represent the entire State, not a specific city or area.

In addition to budgeting highway funds and adopting freeway and highway routes, the commission also approves county primary road systems and authorizes condemnation proceedings, the execution of deeds, and right-of-way relinquishments and abandonments.

Division of Highways

The State Division of Highways, a unit of the Department of Public Works, handles the day-to-day administration of the highway program, operating according to the requirements of state law and policies of the Highway Commission.

The division is in charge of all state highway planning, design, right-of-way acquisition, construction and maintenance. Its activities cover the entire range of highway work from large scale freeway and bridge construction to small but essential maintenance jobs.

Chief of the division is the State Highway Engineer. He is assisted by a headquarters staff in Sacramento. As shown on the accompanying map, the State is divided into 11 state highway districts to provide for localized administration of the highway program. The engineer in charge in each district is responsible for all phases of the highway program in his region. (An organization chart is included on page 2.)

All of the engineers, maintenance crews, technicians, statisticians and others who work for the Division of Highways are state-paid civil servants. They are dedicated to serving the entire State, and their only goal is to provide the best possible value in safe and efficient highways for the taxpayer's dollar.

Information about local highway matters may best be obtained at the various district offices as follows:

District I—Sam Helwer, District Engineer
430 West Wabash Avenue
Eureka

District II—H. S. Miles, District Engineer
1657 Riverside Drive
Redding

District III—Alan S. Hart, District Engineer
703 B Street
Marysville

District IV—J. P. Sinclair, Assistant State Highway Engineer
150 Oak Street
San Francisco

District V—E. R. Foley, District Engineer
50 Higuera Street
San Luis Obispo

District VI—W. L. Welch, District Engineer
1352 West Olive Avenue
Fresno

District VII—E. T. Telford, Assistant State Highway Engineer
120 South Spring Street
Los Angeles

District VIII—C. V. Kane, District Engineer
247 Third Street
San Bernardino

District IX—C. A. Shervington, District Engineer
South Main Street
Bishop

District X—J. G. Meyer, District Engineer
1976 East Charter Way
Stockton

District XI—J. Dekema, District Engineer
4075 Taylor Street
San Diego

Highway Financing

The mainstay of California's highway financing is the state gasoline tax of 6 cents a gallon. Four cents is applied to state highways, 1⅜ cents goes for county roads, and ⅛ of a cent for city streets other than state highways.

In addition to the gasoline tax, other sources of highway revenue are use (diesel) fuel taxes, transportation taxes, and motor vehicle registration and weight fees. (Revenue sources and distribution for road purposes are shown on the chart on page 8.)

About one-third of the total highway revenue in California comes from federal sources for expenditure on various federal-aid highway systems of secondary, primary, urban and especially the interstate highways.

The 1960-61 State Highway Budget contained an overall total of $569,244,000 of which $452,785,000 was for state highway construction purposes including rights-of-way. The corresponding totals for the current 1961-62 budget are $633,460,000 and $509,078,000. As adopted by the Highway Commission in October, 1961, the record 1962-63 budget provides a gross total of $658,370,017 of which $527,792,917 is for state highway construction. (See article on 1962-63 budget on page 72.)

According to law, 55 percent of the money available each year for state highway construction and rights-of-way is allocated to the 13 southern counties. The remaining 45 percent goes to the northern 45-county group.

Each county is guaranteed a minimum share of the state highway construction funds in a specified period of years according to statutory formula.

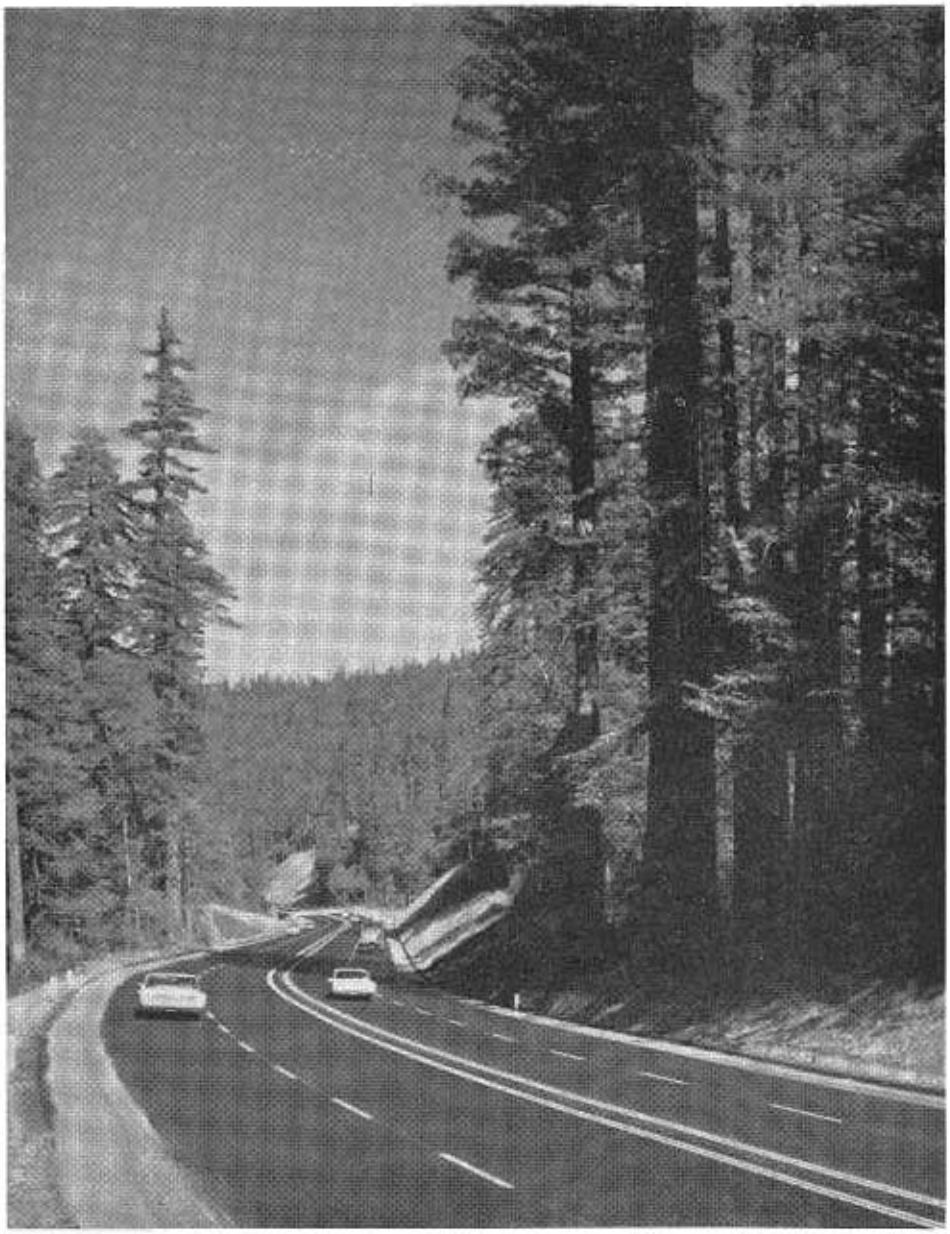
In drawing up the annual state highway budget, Highway Commissioners must review hundreds of high-priority projects and attempt to choose those which will meet the most critical local and regional needs, comply with federal requirements, and fit logically into the long-range statewide program.

Careful attention is paid to the requests made by various highway-user groups, public service organizations, and individuals. Thorough study and comparison of all available data, including comprehensive information on traffic volumes, accidents, population changes, road conditions and other factors, is required.

Despite the tremendous number of projects which are financed each year, it is never possible to do everything that should be done in any given year.

The cities' ⅛-cent share of the gas tax, about $36,000,000 a year, is distributed by the Division of Highways on a population basis.

The counties' 1⅜ cents share, along with a portion of the motor vehicle fees amounts to about $94,000,000 a year. These funds are distributed directly to the counties by the State Controller, and their expenditure for road purposes is administered by local boards of supervisors.



Work was completed this year on this section of freeway on the Redwood Highway, US 101, near Myers Flat in Humboldt County.

Freeway Route Selection

The selection of freeway routes is nearly always a difficult task for the Highway Commission and the Division of Highways – especially in built-up areas, where there are many complex factors involved.

In many cases, any route selected may be unsatisfactory to some individuals or special groups, even though it offers the best range of services and benefits at a reasonable cost.

Although every freeway route proposal is potentially controversial, most route selections are accomplished without prolonged disagreement. Considering the many freeway routes adopted, about 400 miles a year, major controversies have been relatively rare.

This progress may be attributed to selection policies and procedures which have been followed by the commission and the Highway Division over a long period.

The object of these procedures is to insure painstaking study, careful consideration of all data, and complete public discussion of each possible route. California was one of the first states to insist that the people of a community must be informed and consulted early and often about freeway plans.

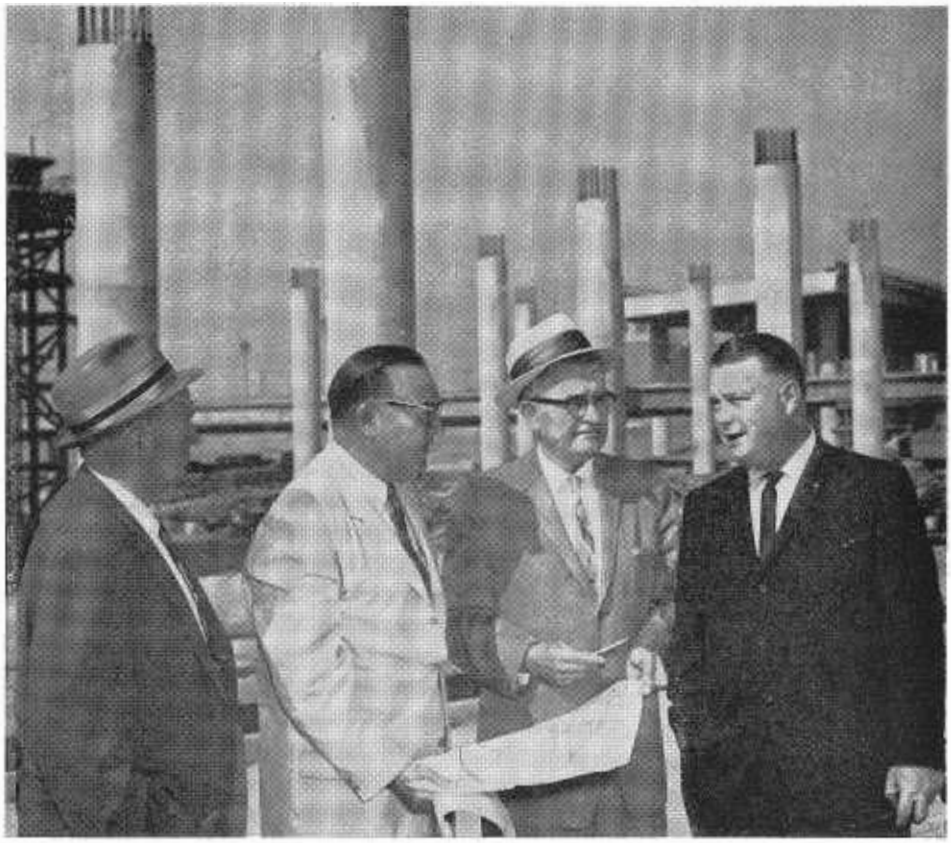
Briefly, the route selection process works like this:

General termini for state highways are set by the Legislature. Before possible alternate routes between these termini are even laid out on a map, the Division of Highways gets together with city or county planners and traffic engineers to determine the area's needs and general plans. Local government agencies are notified that route studies are starting. Informal public meetings are often held at this point, to explain the problems involved and to obtain preliminary ideas.

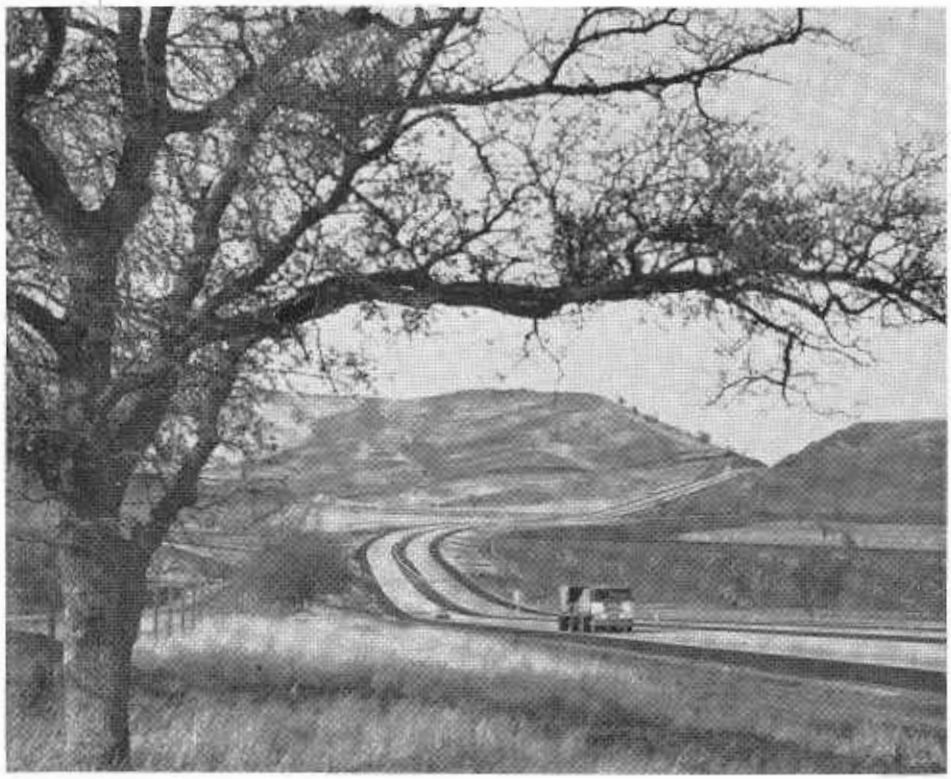
Working in close co-operation with local technical staffs, the division conducts extensive traffic, engineering and economic studies. All local master plan information is carefully reviewed.

These studies provide the facts necessary for the projection and evaluation of various alternate routes which might be considered.

Some alternates may be undesirable because they would adversely affect



Governor Edmund G. Brown (light suit) gets a firsthand view of freeway construction on the Santa Monica Freeway in Los Angeles. The Governor discussed construction progress with (left to right) State Highway Engineer J. C. Womack, Assistant State Highway Engineer E. T. Telford of Los Angeles, and State Director of Public Works Robert B. Bradford.



Cross-state traffic now rolls along on this new section of US 466 freeway in eastern Kern County, which was opened earlier this year.

such "controls" as schools, hospitals, cemeteries, recognized landmarks, or recreation facilities.

Other routes will be impractical for engineering reasons, or because they would cost too much in relation to anticipated benefits. Still others will be unsatisfactory because they would not provide adequate traffic service.

Finally, after study and restudy, the division boils down the possibilities to what are considered to be the most suitable choices from the standpoint of traffic service, effect on the community, economic influence, construction costs, and right-of-way cost.

These alternate routes are then subjected to intense public review at a series of map displays, meetings and hearings conducted by the Division of Highways. Often these public discussions reveal a course for additional study.

Upon completion of this additional investigation, the State Highway Engineer recommends to the Highway Commission the route which he believes offers the best combination of traffic service, economy and community or area benefits. Information on all alternates studied is also presented to the commission.

Highway Commission

The Highway Commission itself then takes the matter under consideration.

In all cases, local governing agencies are notified that if it is considered necessary or desirable, the commission will hold a public hearing in the area concerned. Even when no hearing is requested, the commission will announce its intention to adopt a route and withhold action for at least 30 days to permit submission of additional information and proposals.

In some instances, when it appears advisable, the Highway Commission will call a public hearing on its own.

All information presented at public hearings held by the commission and the Highway Division, along with the data developed during the comprehensive studies, is carefully considered in the route deliberations.

After the commission adopts a route, there is still another important step.

Under California law, the loval governing body and the State must enter into a freeway agreement setting forth local street adjustments for the freeway. This gives local agencies a voice in design factors such as the location and type of interchanges and traffic separation structures.

Right-of-Way Acquisition

A total of 8,305 right-of-way transactions involving parcel acquisitions were concluded in the 1960-61 fiscal year. Of these, nearly 98 percent were negotiated settlements with property owners. Slightly more than 2 percent were concluded through court proceedings.

One principal reason for the large number of amicable settlements is the division's policy of paying fair market value for required property. No "horse-trading" is permitted and values are determined on the basis of expert appraisals.

Landscaping and Planting

California's freeways are the scene of a large number of planting and landscaping projects each year. In recent years, the annual state highway budget has contained from $4,000,000 to $5,000,000 for these projects.

Landscaping work on freeways in built-up regions usually involves the planting of thousands of trees, shrubs and ground cover plants. Often the freeway planting may be one of the largest landscaping projects ever undertaken in the community.

Freeway landscaping and planting projects are worked out by the division's staff of landscape architects to serve both functional and beautification purposes.

Planting of selected trees, shrubs and plants not only improves the appearance of a section of freeway, it also serves such functional purposes as the screening of headlight glare and noise and the prevention of erosion damage. Trees and shrubs are frequently used to help mark curves, bridges, intersections and other highway features.

A major problem in planting and maintaining roadside greenery is the cost, which is going up each year. Roadside maintenance, including the care of trees, shrubs and ground cover, now costs nearly $5,000,000 a year. The Highway Division employs hundreds of landscaping and tree specialists for this work, and extensive irrigation systems are required to sustain roadside landscaping throughout much of this semiarid State.

The division also carries out weed and fire hazard control programs designed to provide protection for agricultural and forest lands bordering state highways. These programs are often conducted in co-operation with other agencies.

Contract Data

During the 1960-61 fiscal year, the Division of Highways opened bids on 587 projects with an estimated construction value of $485,414,900 including construction engineering.

Of these 587 projects, contracts were awarded for 548 projects with a value of $440,481,700 and bids not in the best interest of the State rejected on 18 projects. Of the 21 remaining projects, 18 were awarded after the close of the fiscal year, and three rejected.

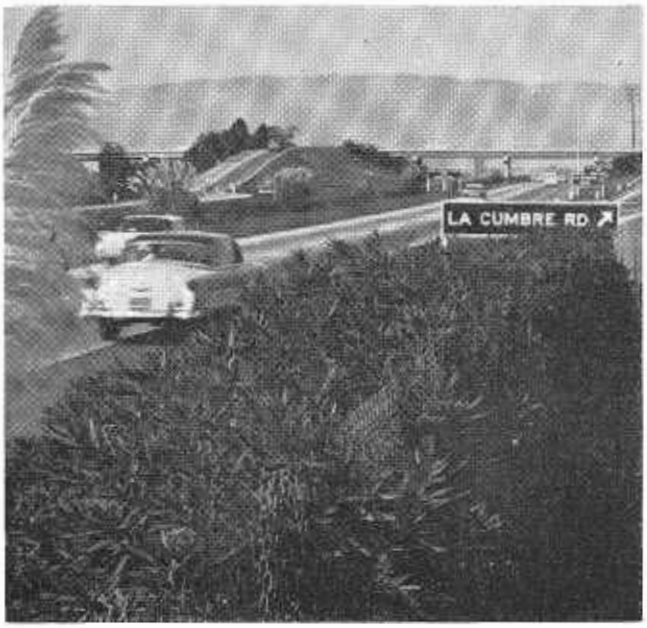
Contracts were also awarded during the year for 13 projects, valued at $13,934,500, on which bids had been received during the previous fiscal year.

The cost of right-of-way acquisition and utility relocation, exclusive of land clearance, overhead, and acquisition for other agencies, amounted to $142,431,387 for the year.

The total of $454,416,200 in contracts awarded during the year was made up of $406,178,500 for construction on state highways, $19,307,200 for work on county roads including the Federal Aid Secondary System, and $28,930,500 for maintenance, emergency repair, and work for other agencies.

The State Highway System contracts of $406,178,500 consisted of $328,080,400 from the 1960-61 Budget, and $78,098,100 from the 1961-62 Budget which were awarded under statutory provisions permitting the award of contracts as early as January 1, six months before the start of the fiscal year.

The contracted state highway work involved improvement of 1,598 miles of highways and construction of 603 bridges and separation structures.



Mature landscaping gives a park-like atmosphere to many of California's freeways. Plantings also serve functional purposes such as erosion control. The State is spending some $4 to $5 million for new plantings each year.

CONSTRUCTION PROGRESS

Throughout California, motorists are enjoying constantly improving travel conditions resulting from the State's high-gear program of highway construction.

Ribbon-cutting ceremonies for major highway improvements are held frequently, and large-scale highway construction projects are in progress or pending in nearly every locale.

In metropolitan areas, work is proceeding on long-planned freeways to provide alternate routes and relieve the overload on those already completed. On major through routes, new freeways are traversing or bypassing more cities, while between the cities many miles of previously built expressway are being converted to full freeway standards by addition of crossing structures. Improved sections in rural and scenic regions are being extended.

Los Angeles Metropolitan Area

In the Los Angeles region, a spectacular series of highway construction projects is concentrated on the Golden State, Santa Monica and San Diego Freeways. These three interstate freeways are essential components of the planned metropolitan system.

Projects in progress on the Golden State and Santa Monica Freeways will complete the 30-mile "loop bypass" of the central district. (See map on next page.) This facility, extending from the Santa Monica-Harbor Freeway junction to San Fernando, will provide an alternate route for a portion of the traffic now using the overtaxed central district freeways and the four-level interchange near the civic center.

The 1962-63 Budget, adopted in October 1961, contains $28,500,000 for four new projects on the Santa Monica Freeway which, along with current construction, will complete this route for 14 miles from the Santa Ana Freeway (East Los Angeles Interchange) to Sawtelle Boulevard.

Now completed, under construction or budgeted on the San Diego Freeway are 50 miles of eight-lane freeway between Westminster in Orange County and the Golden State Freeway near San Fernando.

Work is in progress on a 4.7-mile extension of the Harbor Freeway which will complete freeway development on this 22-mile route from the four-level interchange to San Pedro.

The 1962-63 Budget carries allocations for initial large-scale projects on the San Gabriel River and Garden Grove Freeways and for conversion from expressway to freeway standards on sections of the Ventura Freeway east of Ventura. Work is now in progress on the U.S. 101 Freeway through Ventura.

Widening of heavily traveled sections of the San Bernardino Freeway continued during the year. The Long Beach Freeway extension between the San Bernardino and Santa Ana Freeways was opened to traffic. Construction crews are moving ahead with two major projects on the easterly extension of the Ventura Freeway to connect with the Golden State Freeway.

The long-discussed toll bridge over the Main Channel of Los Angeles Harbor between San Pedro and Terminal Island is now under construction, after successful sale of revenue bonds to help finance the project.

Sixteen miles of freeway are under construction on the Antelope Valley Freeway (US 6) east of Solamint, and work is progressing or budgeted on units of the Newport Freeway (Sign Route 55) in Orange County.

Other Southern California Areas

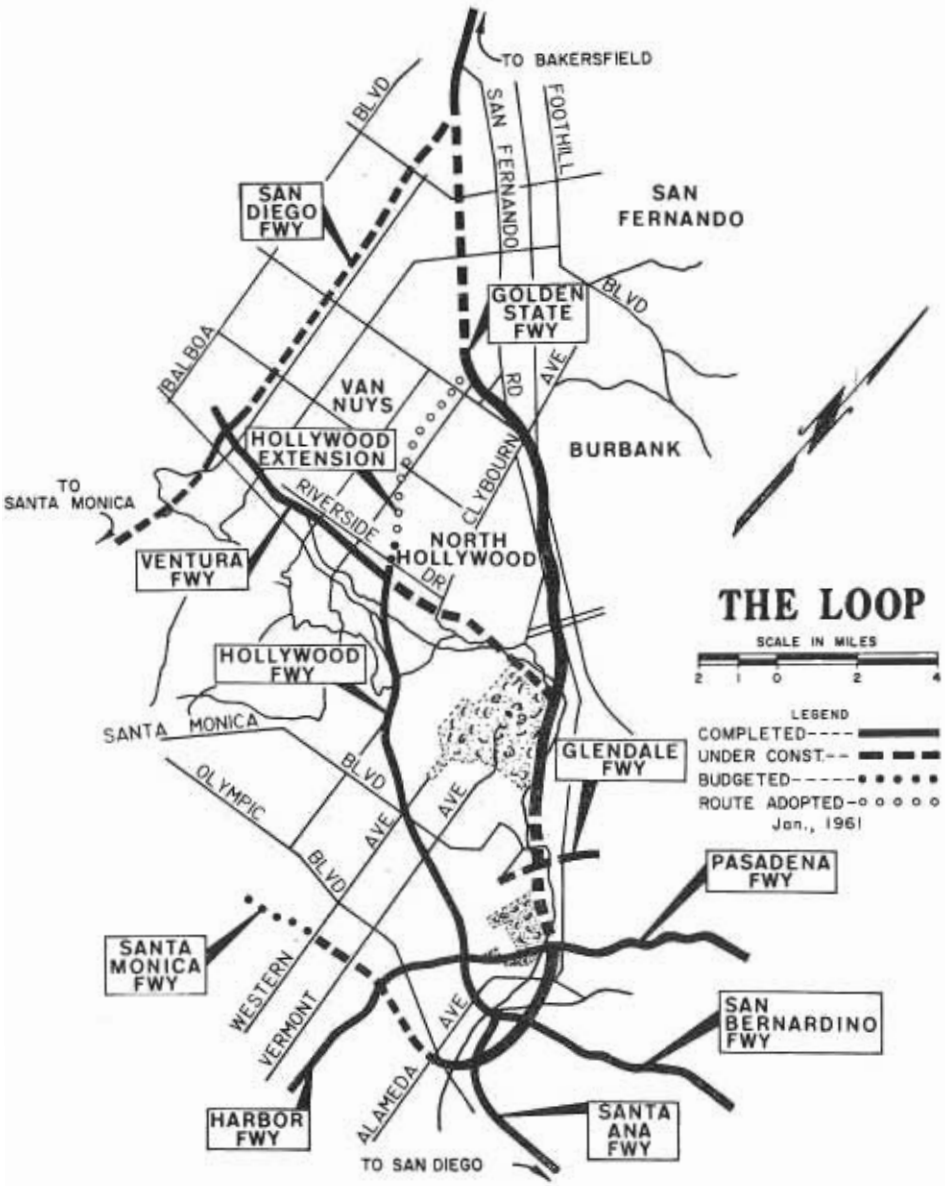
The 7.7-mile Corona Bypass on the Riverside Freeway was recently opened to traffic, and work is under way on a section of US 60 freeway in the Riverside area, extending a newly completed freeway unit.

Construction is in progress on two large scale freeway projects on US 70-99 through Redlands. This work, plus the recently completed freeway from Beaumont to Banning and a budgeted project east of Banning, will complete 125 miles of continuous freeway and expressway from downtown Los Angeles to Indio.

A long section of Interstate freeway on US 91-466 east of Baker was opened this year, and a newly budgeted project will provide an additional 23 miles, making a total of more than 50 miles of continuous freeway from east of Baker to the Nevada border. The freeway bypass at Barstow was opened this year.

In the San Diego area, US Highway 80 is nearly completed to freeway standards between San Diego and east of El Cajon. Most of the current heavy construction is centered on the future US 101 freeway through the metropolitan area. The newly adopted budget provides funds for the start of freeway construction to eliminate the outmoded section of US 101 in the vicinity of Del Mar and Solana Beach.

A seven-mile freeway job on US 80 in the Sand Hills region of Imperial County was completed recently and the 1962-63 budget provides funds for another US 80 freeway project near Mountain Springs.



San Francisco Bay Region

Many major highway projects are now under construction throughout the San Francisco Bay Area, and work will be starting in the coming months on additional improvements.

Largest project now in progress is the $17,000,000 Webster Street Tube beneath the estuary separating Oakland and Alameda. This new tube parallels the existing Posey Tube. The two underwater crossings will be operated as a divided highway when the Webster Street facility is finished, early in 1963.

Large scale projects now under construction or budgeted on Oakland's MacArthur Freeway (US 50) will provide 12 miles of continuous freeway from the Bay Bridge Distribution Structure to San Leandro.

Construction continues on the third two-lane tunnel at the Caldecott Tunnel on Sign Route 24 at the east city limit of Oakland. Work is also progressing on budgeted freeway jobs on Sign Routes 24 and 21 in Contra Costa County which will connect with the current Benicia-Martinez Toll Bridge construction.

The 1962-63 budget provides $12,900,000 for interstate freeway construction on Sign Route 21 between south of Danville and Walnut Creek.

Projects are under construction or budgeted on the Southern Freeway in San Francisco, including the extension easterly from the James Lick (Bayshore) Freeway.

Two budgeted freeway projects on US 101 north of San Rafael will complete freeway development on this route from the Golden Gate Bridge to Novato, a distance of 19 miles. Additional freeway is under construction on US 101 north of Santa Rosa.

Two nearly completed projects on the Bayshore Freeway (US 101 Bypass) in Santa Clara County will complete freeway development on this route for 49 miles from San Francisco to San Jose.

Freeway is under construction on Highway Route 105 in San Mateo, and the Division of San Francisco Bay

Toll Crossings has started the trestle work for the widening of the San Mateo-Hayward Bridge.

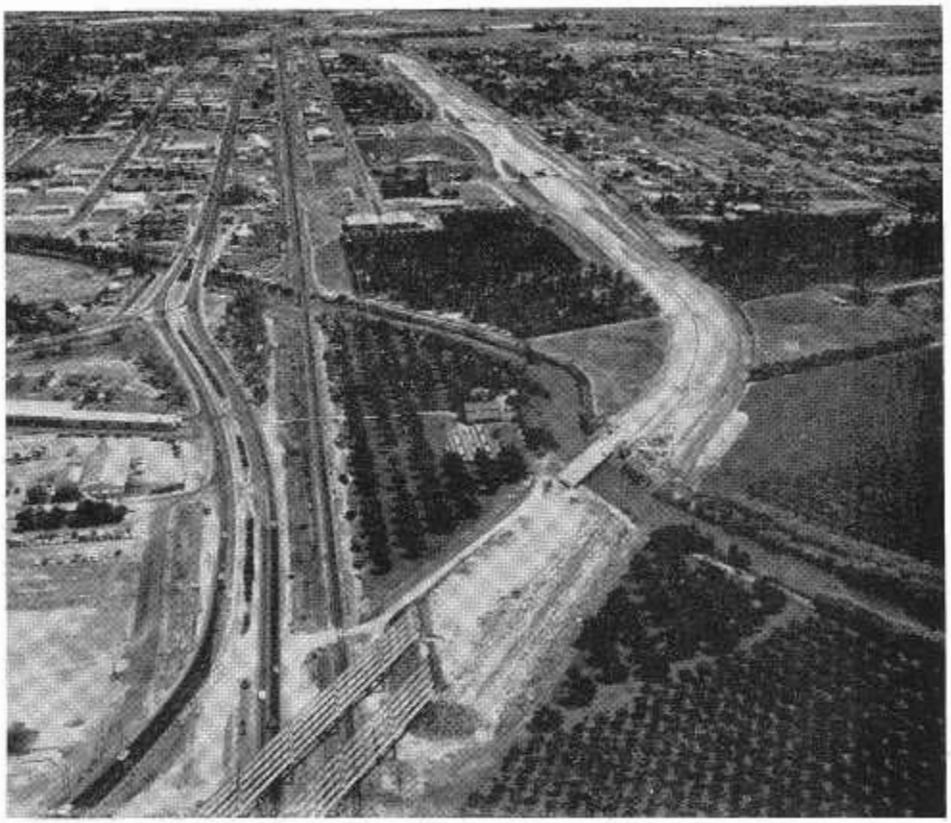
A 3.3-mile stretch of four-lane expressway was completed on Sign Route 17 north of Santa Cruz, and two budgeted interchange projects will convert Sign Route 1 from expressway to freeway standards south of Santa Cruz.

Central Coast Area

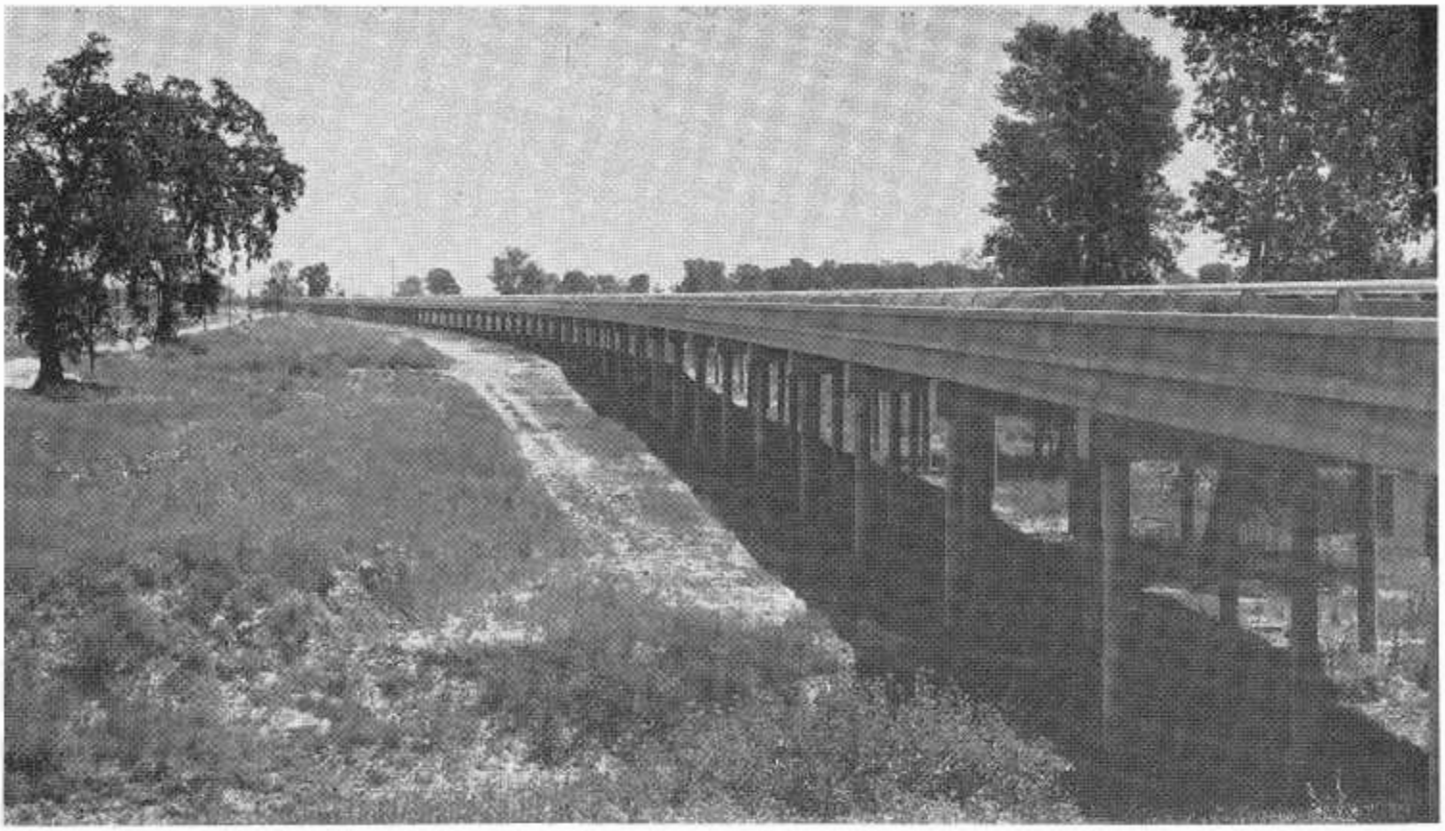
Work is continuing on the Santa Maria Bypass on US 101 which will eliminate the only remaining gap in 100 miles of continuous freeway and expressway from Buellton to San Miguel. Completed on this stretch during the year was the new freeway section at Pismo Beach.

Nearly completed is 8.5 miles of freeway on US 101 west of Santa Barbara, and work is under way on the Ward Memorial Highway which will serve the Goleta Campus of the University of California.

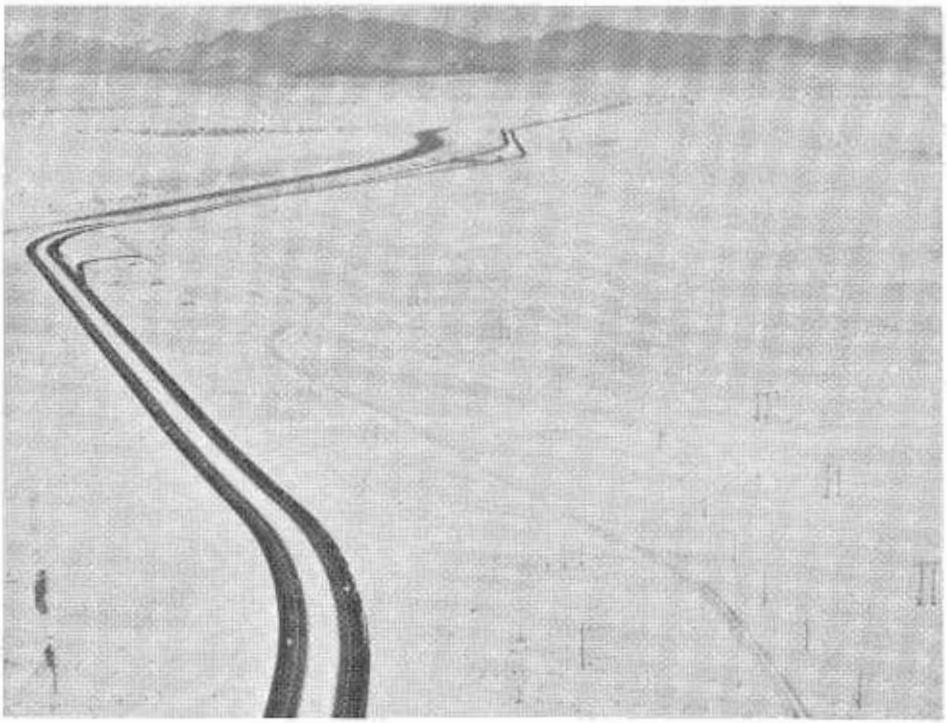
On Sign Route 1 in San Luis Obispo County, a total of 18 miles of two-lane expressway is under construction



A new section of US 99 freeway now under construction at Merced will eliminate a long-standing bottleneck on this route. The present highway (left) passes through business district via a crowded city street.



Glenn County motorists are now enjoying use of this new causeway across a Sacramento River overflow channel on the Willows-Butte City Highway. The causeway will permit year-round operation of this highway, which formerly had to be closed during winter floods.



Shown in this aerial photograph is part of a new 7-mile section of interstate freeway on US Highway 80 through the Sand Hills of Imperial County. The old highway is shown at right and the All American Canal parallels the freeway in the distance.

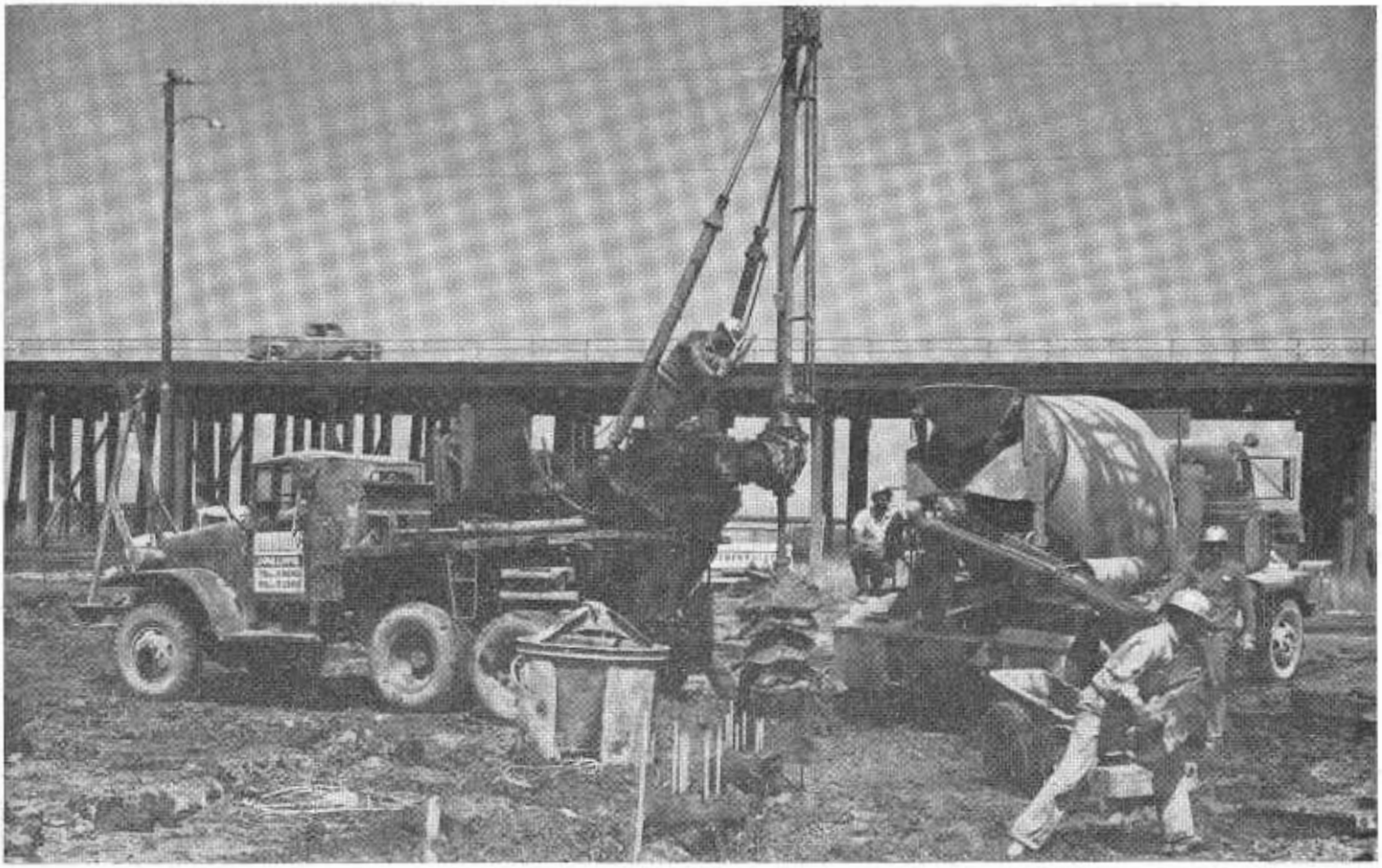
in projects north of Morro Bay and north of Cayucos, and the 1962-63 Budget contains an allocation for two-lane expressway at Cambria. Four expressway-to-freeway conversion projects are budgeted on US 101 in this county.

Funds are also budgeted for 11 miles of four-lane freeway on US 101 between north of Bradley and south of San Ardo in southern Monterey County.

The Greenfield Bypass on US 101 was opened during the year, and construction is under way at Gonzales to complete 46 miles of continuous freeway and expressway from north of King City to Salinas.

San Joaquin Valley

Nearly all of US 99 is now developed to freeway or expressway standards between Sacramento and Los Angeles. Four of the remaining gaps will be eliminated by current projects at Bakersfield, Merced, Modesto and Lodi. This leaves only the section at



Construction workers are building a new bridge-fill freeway crossing of the Yolo Bypass on US Highway 40 west of Sacramento. The freeway will replace an existing causeway which carries the only remaining section of undivided highway between San Francisco and the state capital.

Turlock for which design and right-of-way acquisition must be completed and funds budgeted.

Expressway conversion or freeway construction is also under way, budgeted or recently completed through and near Bakersfield, north of Pixley, north of Tulare, north of Goshen, near Traver, near Kingsburg, south of Fresno, north of Merced, south of Modesto, and at Stockton.

A large scale freeway job is in progress on US 466 west of Tehachapi in Kern County, extending a 12-mile project opened during the year. Major projects are also under way or budgeted on Sign Route 198 in Visalia and near the Lemoore Naval Air Station, on Sign Route 190 in Porterville, and on the new Interstate Route 5W bypassing Tracy on the west.

North State Region

Interstate highway construction is resulting in rapid progress in freeway development on US Highway 40. Existing expressway is being converted to freeway in the valley, and heavy freeway construction is in progress in the Sierra Nevada.

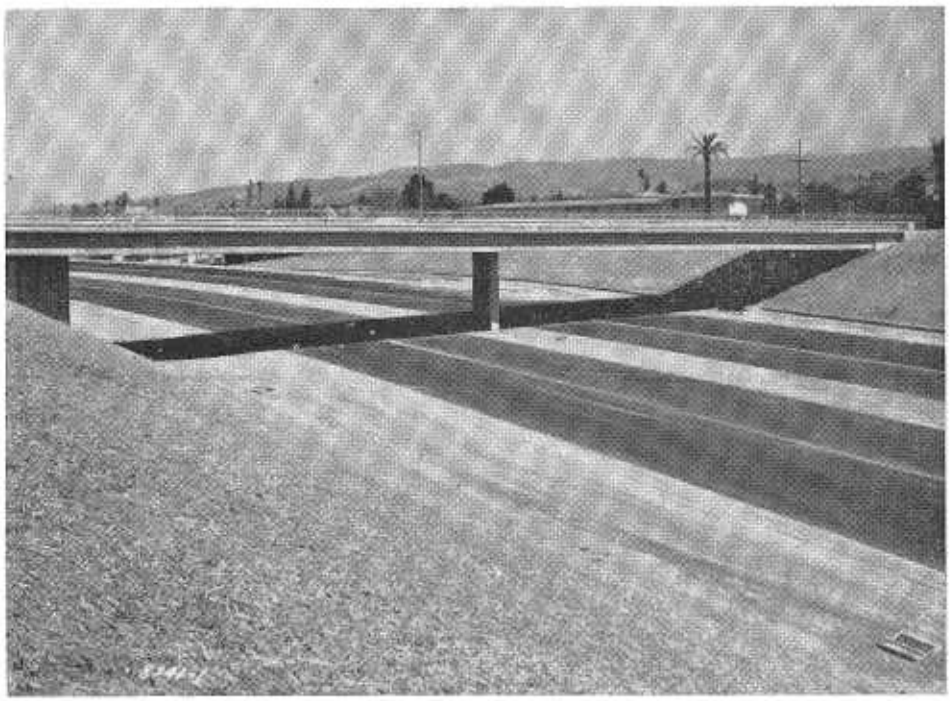
Freeway is under construction east of Vallejo and through Vacaville. Two freeway projects were completed recently between Cordelia and Fairfield. Funds are budgeted for an additional project east of Vacaville.

Construction crews are making good progress in building a new bridge-and-fill crossing over the Yolo Bypass east of Davis. This crossing will replace the present four-lane undivided causeway.

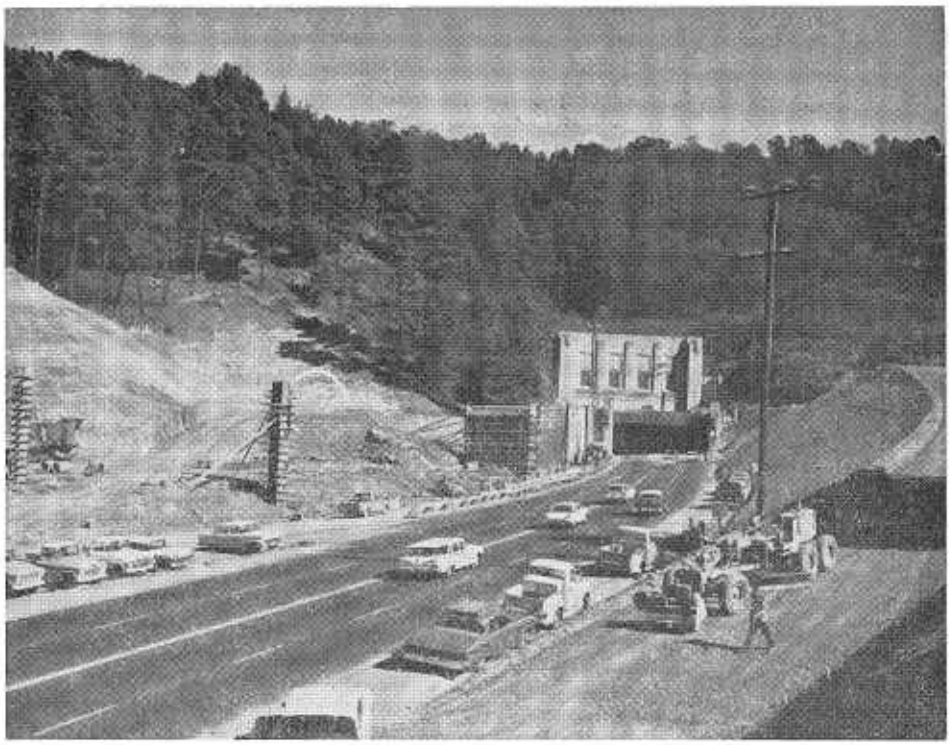
The 120-mile stretch of US 40 between Sacramento and Nevada continues to be the scene of heavy construction activity. Three freeway setions remain to be completed on this stretch—5.4 miles now under construction near Emigrant Gap; an adjacent 6.3 miles near Cisco for which funds are budgeted; and the 10-mile section over Donner Summit. A 5-mile stretch west of Baxter was completed in November. Heavy grading and structure work is now in progress in two projects on the summit section.

On the north state portion of US 99, work has been completed on a major Interstate freeway project south of Dunsmuir and work is continuing on a job which will close the last gap in 30 miles of continuous freeway and expressway in the Sacramento River Canyon.

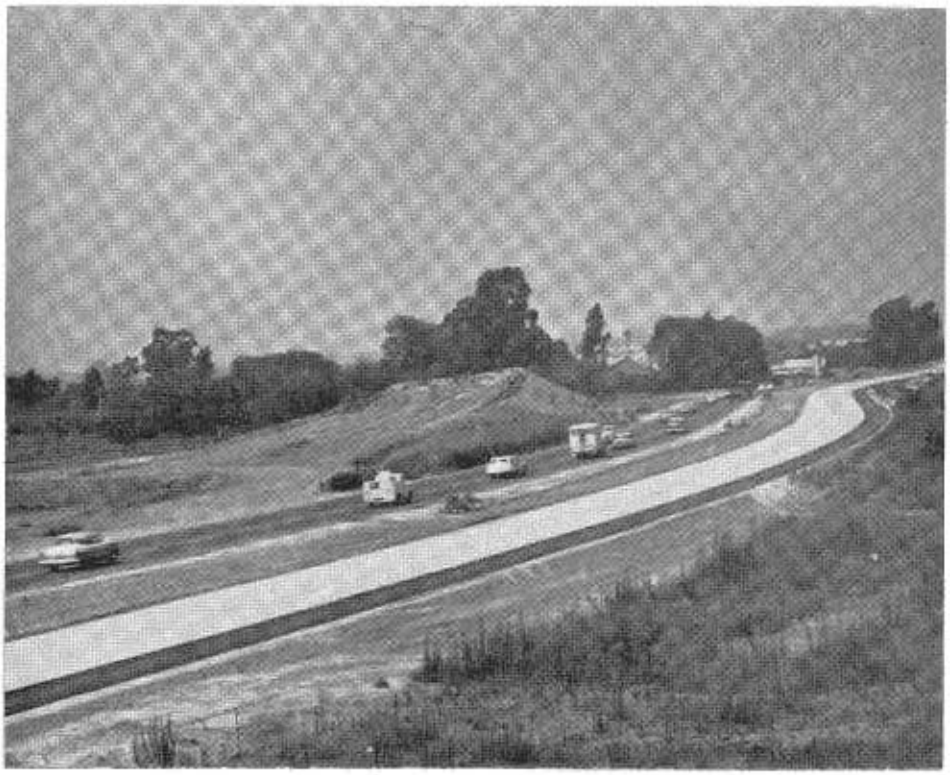
Freeway construction is also under way on US 99 between Cottonwood and Anderson and from Red Bluff to south of Cottonwood. Funds are budgeted for freeway at Cottonwood and for the first unit of the US 99E freeway through Chico. The 1962-63 budget also carries an allocation for



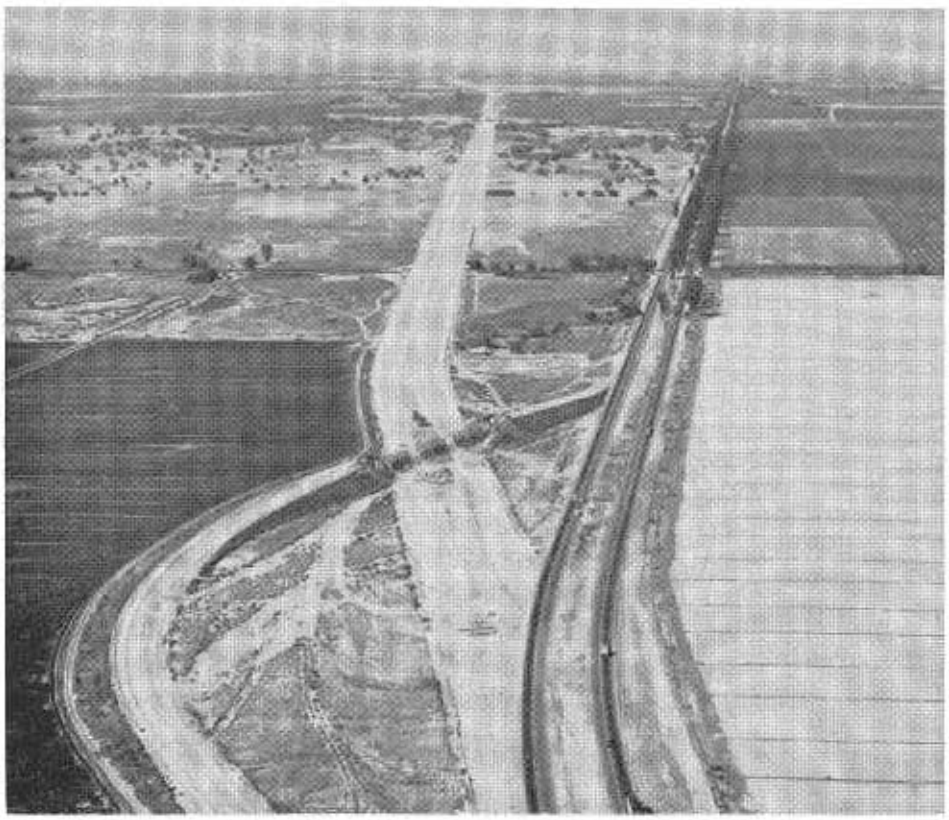
This crossing structure will carry local traffic over the MacArthur Freeway (US 50) which is now under construction in Oakland.



Workers are drilling a new two-lane tunnel to supplement the existing four lanes at the Caldecott Tunnel on Sign Route 24 in and east of Oakland. When the new tunnel is completed, traffic flow will be regulated to provide four lanes in one direction during peak periods.



Traffic continued to use the old highway while work was in progress on new freeway lanes (right) on US Highway 101 west of Santa Barbara. The project is one of a series of recent major improvements on US 101 through the central coast counties.



Looking north along the future US 99 freeway route (left) and the present highway near Wheeler Ridge in Kern County. This new freeway section will be a part of a bypass freeway now under construction in and north of Bakersfield.

two-lane expressway construction on Sign Route 20 near Meridian.

The South Sacramento Freeway (US 99-50) was opened to traffic in November and a large scale freeway widening was completed on US 40-99E northeast of the capital city.

On US 50 east of Sacramento, freeway construction is under way near Folsom and just west of Placerville, while a freeway section just east of Placerville was completed in November. At the higher elevations, approaching Echo Summit, additional passing lanes and turnout areas were constructed.

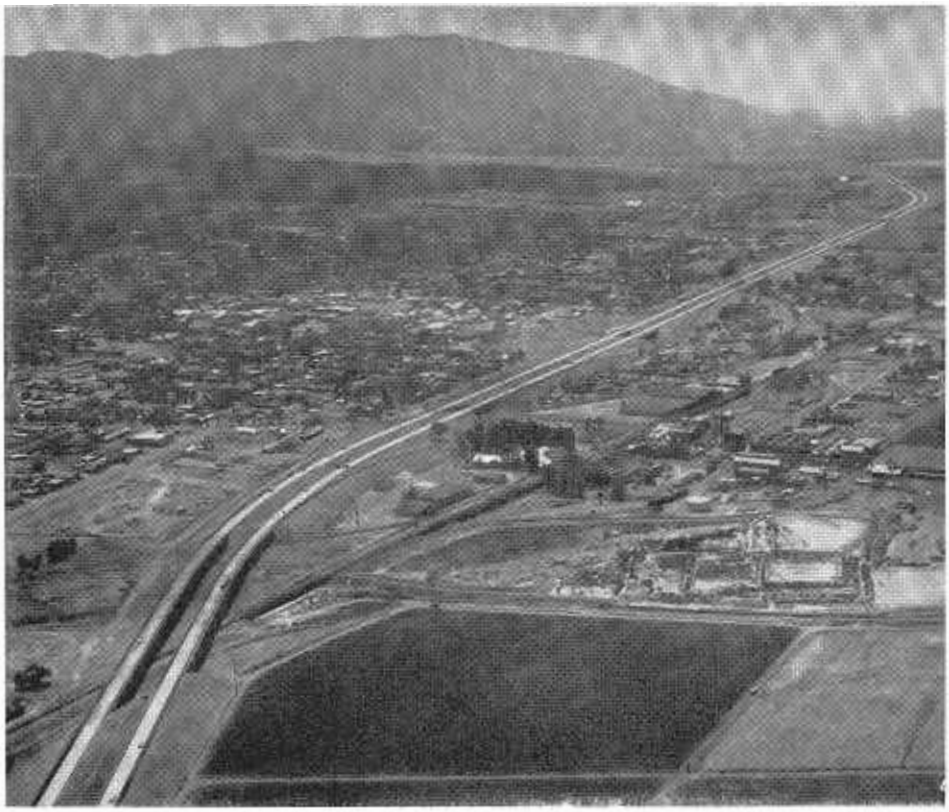
Foothill and Mountain Routes

Improvements on highways approaching or crossing the Sierra Nevada and the Cascades have been completed in recent months and additional work is now under construction or budgeted.

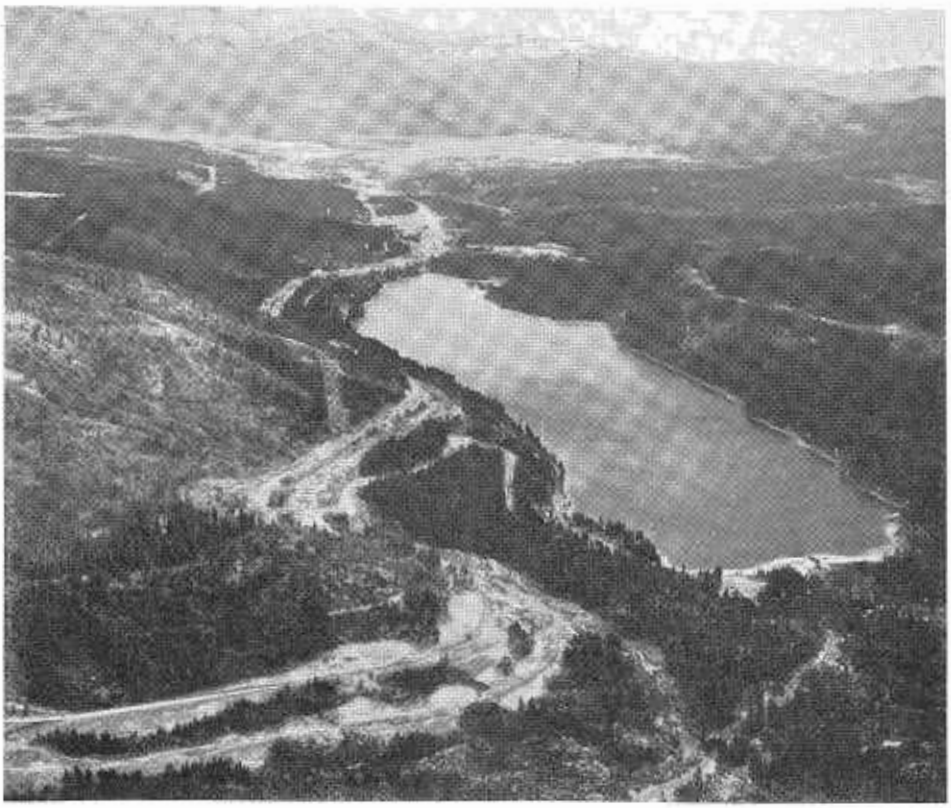
Work is in progress on major highway improvements on Sign Route 88 east of Peddler Hill, on Sign Route 49 north on Mariposa, on Sign Route 36 in eastern Tehama County, on Sign Route 89 between Mt. Shasta and McCloud, and on the Etna-Yreka Highway southwest of Yreka. Projects have been completed recently on Sign Route 4 between Angels Camp and Murphys on Sign Route 16 southwest of Plymouth, and on US 40 Alternate in Plumas County.

Two freeway projects are under construction on US 40 Alternate near Oroville. The relocation of US 299 around Shasta County's Whiskeytown Dam and Reservoir is nearly completed. Construction crews have made considerable progress on the relocation of US 395 on Conway Grade in Mono County.

The 1962-63 budget provides funds for two-lane expressway construction on Sign Route 88-89 in Alpine County; Sign Route 88 in Amador County; Sign Route 108 in Tuolumne County; US 395 in Lassen and Modoc Counties; US 299 in Lassen and Modoc Counties, and US 299 in Trinity County. Large scale two-lane highway improvements are slated on Sign Routes 49 and 132 in Mariposa County and on Sign Route 49 in Calaveras County.



A traffic bottleneck on US 91 at Corona was eliminated during the year with the completion of this new section of the Riverside Freeway.



Work is progressing on the relocation of US Highway 40 to provide an interstate freeway over Donner Summit and past Donner Lake. The new freeway will replace the present twisting highway at right. As shown in the photo, part of the summit freeway will be a "split level" design with roadways separated by a stand of trees.

North Coast Region

The Collier Tunnel and approaches are under construction on U. S. Highway 199 at Hazelview Summit just south of the Oregon border.

The second unit of the Redwood Parks Freeway on US 101 near Myers Flat, Humboldt County, has been opened, and construction is under way on an additional section to the south. The 1962-63 budget provides funds for further freeway construction to complete 22 miles of four-lane freeway in the Redwood Parks area.

Freeway sections are also under construction on US 101 south of Eureka and at Fortuna. Work has been completed on the parallel bridge over the Eel River south of Scotia.

In Mendocino County, traffic is now using a new section of freeway on US 101 about 15 miles north of Willits, and work is continuing or budgeted on freeway units in the vicinity of Ukiah. Two-lane expressway construction was completed recently on State Sign Route 53 in Lake County.

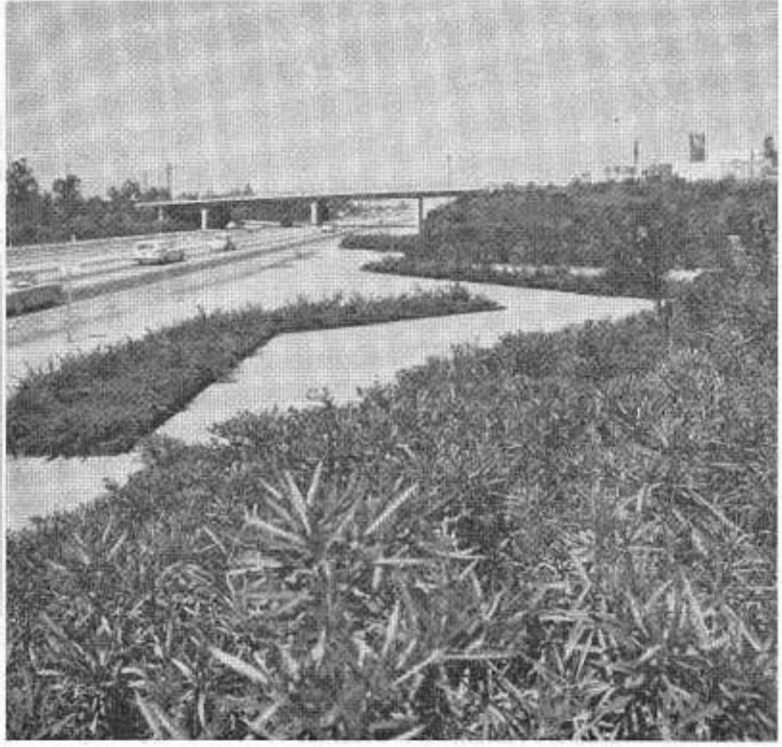
Summary

Major freeway projects and other large scale improvements must share the highway construction spotlight with the hundreds of smaller projects completed each year.

Though less costly and spectacular than the heavy freeway construction, these minor projects often result in dramatic relief from traffic congestion and sharp reductions in accident and injury rates.

Motorists are quick to notice and appreciate the travel benefits growing out of the straightening of a curve, the widening of a narrow section of pavement, or the installation of traffic signals at a busy intersection.

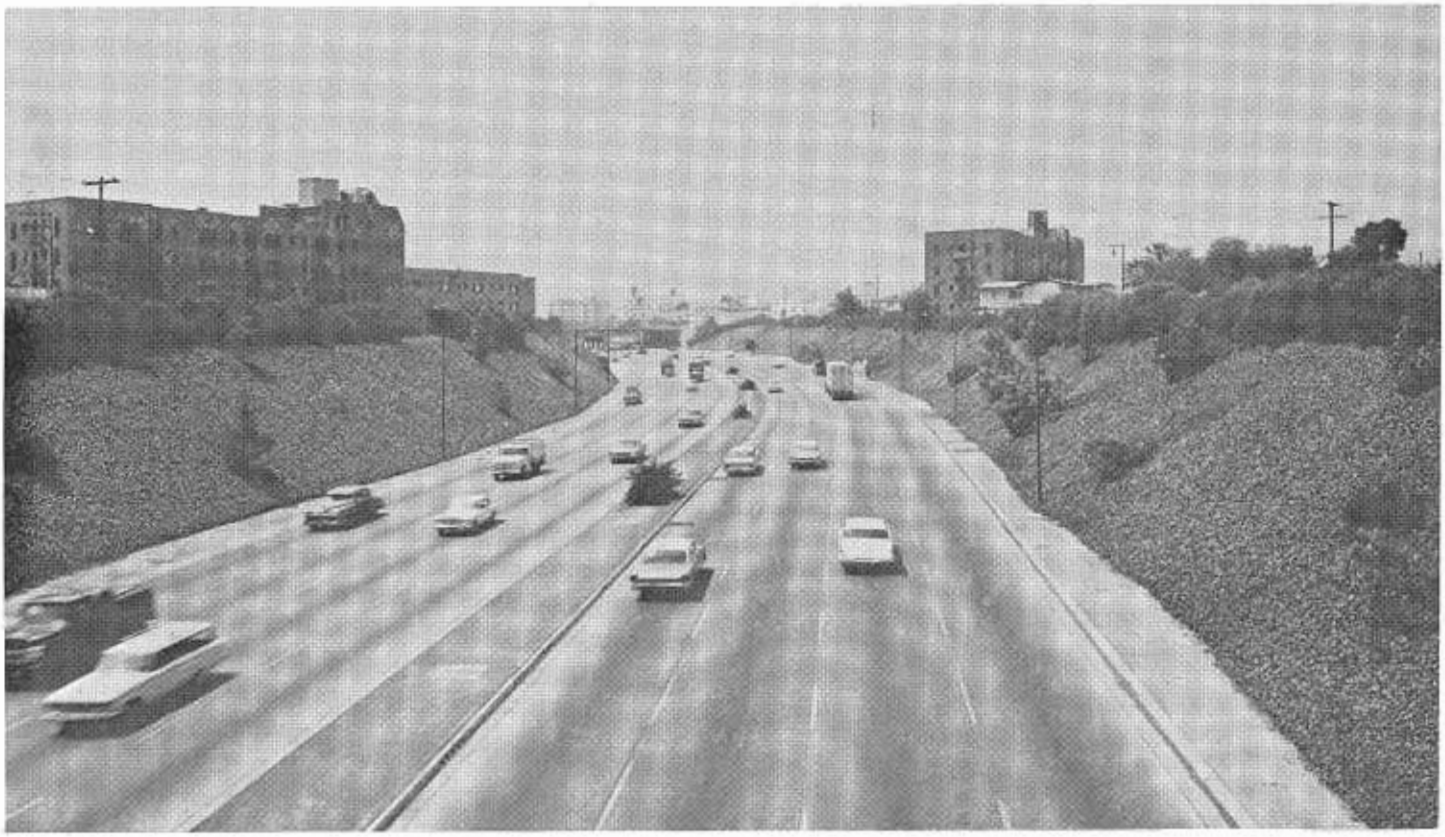
But the major emphasis in the highway program continues to belong on the freeways. Freeways are designed to incorporate into a single, permanent facility all the devices and design features that have yet been devised to make motor vehicle travel safer, smoother-flowing and more expeditious. The freeways in operation have proved their worth, and those now under construction or being planned will do their job even better.



FREEWAYS

Modern full freeways carry more traffic in greater safety than any other type of highway. Accident and fatality rates on freeways are much lower than on conventional highways. Freeways are also more efficient. A freeway lane has three times the capacity of a normal city street lane because access is controlled and cross traffic is eliminated by traffic separation bridges. California has more than 900 miles of full freeway in operation, with another 400 miles under construction.

ABOVE—San Bernardino Freeway near Covina. RIGHT—U.S. Highway 101 at Chualar. BELOW Hollywood Freeway in Los Angeles.



• Operations

• *The construction, maintenance, equipment and materials and research departments are administered under the direction of the Assistant State Highway Engineer—Operations*

CONSTRUCTION

The availability of increased federal and state highway funds resulted in a sharp upturn in the volume of construction under way during the past fiscal year. For the first time contracts under way, excluding bridge, day labor and minor contracts, totaled over four hundred million dollars.

Special Projects

During the year, the Construction Department culminated a program which started three years ago to revamp the system of keeping the records and accounting on highway contracts. Training programs were conducted in all districts and most districts were using the new system by May 1961. Effective July 1, 1961, the new system officially became the approved method of recording-keeping and accounting on all contracts let after that date.

The construction departments in the districts are delegated the responsibility for assuring that contracts are built in conformance to the specifications. A program in which Headquarters Construction reviews the record tests, project control tests and specifications and recommends the finished product to the State Highway Engineer for his certification to the Bureau of Public Roads was instituted, although this amounted to no more than a formalization of existing procedures.

A study of tolerances which are practicable, both from the standpoint of design and construction operations, was started during the past fiscal year. This study is closely related to the testing and certification procedure outlined above.

Concrete construction was the subject of a series of training sessions. Representatives of the Portland Cement Association co-operated with the department in putting on this program.

Construction Practice

With more projects being paved by means of the slip-form paver, the added experience gained in this method of laying portland cement concrete pavement has resulted in improvements in the equipment and operations.

The trend to more and more automatic operation on road building ma-machines continues. Crossfall is automatically controlled on grading and paving machines, while profile grade control is maintained by following established guide wires, or by means of long skids or sleds which ride the grade and control the spread of material.

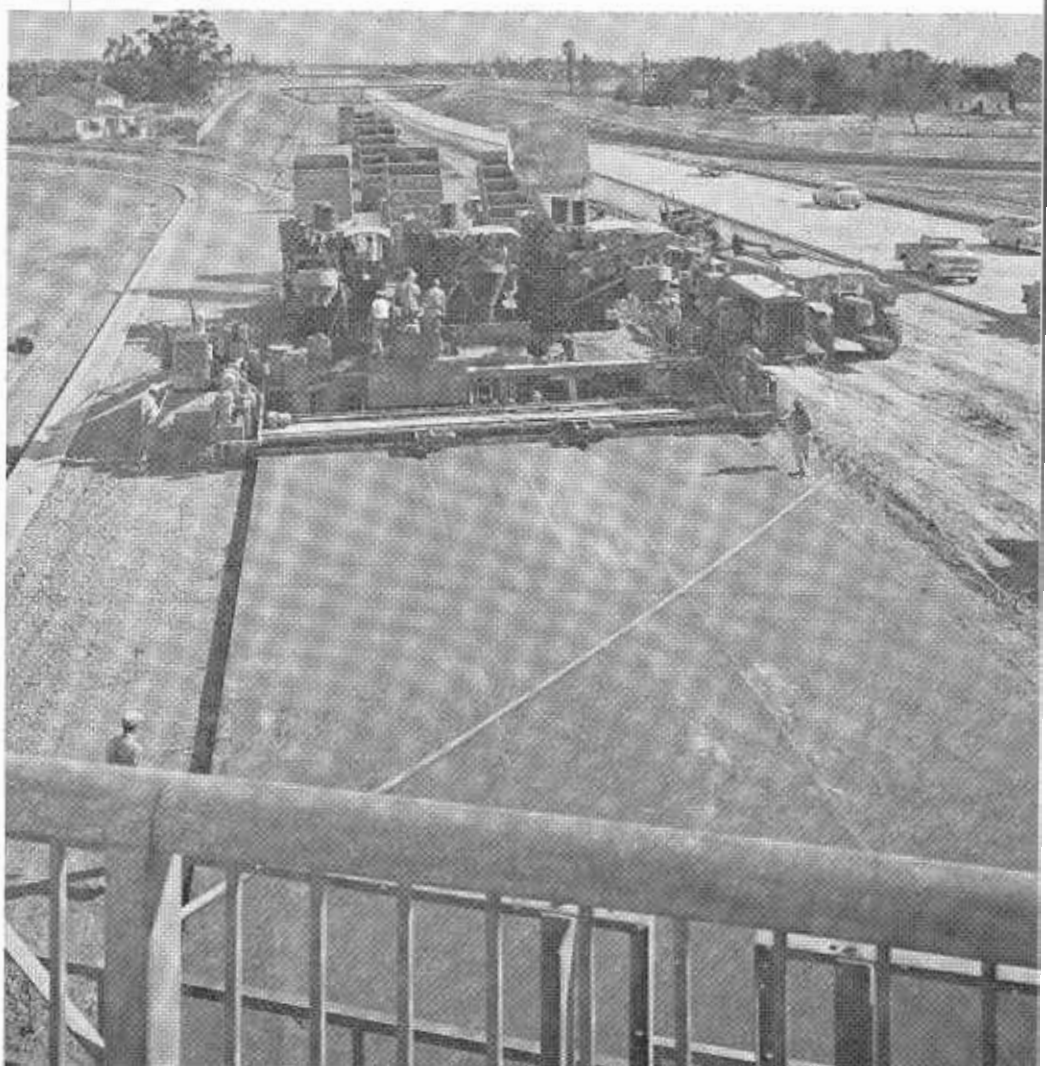
Additional profilograph units have been made available to the districts for their use in checking the smoothness of finished pavement.

The combination of more efficient automatic equipment for building the structural elements of the roadway, plus more effective means of inspecting and verifying the finished product, has resulted in better highways for the taxpayers.

Honor Camp Projects

During the year, the Division of Highways and the Department of Corrections continued the joint operation of Honor Camp No. 37 at Cedar

An increasing number of projects are being paved by means of the slip-form paver, a comparatively new device which eliminates time-consuming side form construction. Here the giant machine is shown in operation on the new US 99-50 Freeway south of Sacramento.



Springs, Los Angeles County; Camp No. 41 near Happy Camp on the Klamath River in Siskiyou County; and Camp No. 42 near Lord Ellis Summit in Humboldt County.

By the end of the fiscal year, Camp 37 forces had rough-graded the last 6.5 miles of roadway on the Angeles Crest Highway and had brought approximately three miles of this length to finish grade. All work proposed for this camp was to have been completed by late fall of 1961. Plans were being readied for paving the project by contract and for demolishing the camp facilities.

Camp 41 continued construction on the nine-mile portion of the Klamath River Highway between Swillup Creek and Clear Creek, and on the two-mile stretch between Wright Ranch and one-half mile west of Happy Camp. Construction was also started on the next three-quarter mile section extending to two-tenths of a mile east of Happy Camp.

Camp 42 continued work on U. S. Highway 299 between Blue Lake and Berry Summit. Of the total of 23 miles proposed, 4.1 miles have been brought to grade; grading and stabilization work were in progress on another 0.7 mile, and clearing was proceeding on other portions.

At the end of the year there were 74 inmates at the Cedar Springs Camp, 61 at the Clear Creek Camp and 42 at the camp near Lord Ellis Summit.

The Division of Highways and the Department of Corrections jointly operated road building Honor Camps at three remote locations during the fiscal year. Pictured here is Camp 42 in Humboldt County. At the end of the year, some 60 inmates were stationed at this camp for work on U. S. Highway 299.

MAINTENANCE

The total expenditure for all maintenance work on state highways including upkeep and repair of the Benicia-Martinez Ferry, was $37,742,735 in 1960-61.

Maintenance crews are responsible for maintaining California's highways in serviceable condition and for keeping the roads open when possible during times of emergency. Last year there were numerous emergencies occasioned by landslides, flash floods, and forest fires, but winter snow conditions were generally mild.

Pavement Repair, Bridge Maintenance

Throughout the year, Division of Highways maintenance crews undertake emergency road surface restoration as required, and, as a routine assignment, the repair of broken areas and the restoration to grade of depressed or distorted pavement. Work on heavily traveled highways requires careful traffic control and the placement of protective devices as a safety measure.

During 1960-61, it cost $1,864,822 for the repair of traveled way and shoulders, including work in cities, under specific fund allotments. Of this amount, $1,584,700 (direct field cost or obligation) was for the restoration of 1,175 miles of traveled way and 1,018 miles of shoulders. Included in this total is $280,122 for seal coat (screening contract) on 161 miles of roadway. These cost and mileage totals do not include routine patching and repair work undertaken by maintenance crews on a day-to-day basis.

The annual resurfacing and seal coat program, sometimes called the "thin blanket program," was carried on. Contracts for this approximately $5,000,000 yearly program are financed from construction funds.

The repair and painting of bridges on state highways, as recommended by the Bridge Department, required a maintenance fund obligation of

$692,262. Of this total, $310,426 was for work under contract and $381,836 for work by state and city forces.

Ferry Operation, Maintenance in Cities, and Roadside Cleanup

The Division of Highways continued to operate the Benicia-Martinez Ferry across the Carquinez Strait, and during the year it carried 123,812 vehicles and 158,378 passengers. The ferry was out of service for five hours in October during the annual Coast Guard inspection, and for three days in November and one day in May for inspection and repairs. A motor launch was rented to haul foot passengers at these times.

State law authorizes contracts with cities or counties covering construction, or maintenance on state highways. Under this authority, certain features of maintenance work are delegated to cities. The direct field cost for maintenance of state highways in cities was $9,160,330 for the year, including $7,569,930 for work by state forces and $1,590,400 for work by city personnel.

Publicity campaigns by public service organizations and others, the distribution of litter bags at service stations, and laws prohibiting the disposal of rubbish on highways have aided in controlling the roadside litter problem. Despite increased public awareness, roadside cleanup continues as a costly maintenance item. In 1960-61 it cost $1,638,979 for removal of roadside litter and street sweeping.

Roadside Vegetation, Tree Care and Landscaping

Additional mowers were put into use during the year, enabling maintenance workers to mow roadside vegetation at more frequent intervals and to cover greater area. Large brush mowers and chemical sprays are used to control roadside brush in coastal and mountain regions. Noxious weed elimination in most cases was handled by county agricultural departments under service contracts. At appropriate locations, clear roadside strips were maintained as a fire prevention and control measure.

The care of landscaping and functional planting along the state highways and freeways is a bigger job every year.

Although signs warn that it is against the law, "litterbugging" continues to be a serious problem. Roadside cleanup, including removal of litter such as that pictured here, costs about $1,600,000 a year.

Chemical sprays are used to control weeds during the first few years after planting. Selected fertilizers must be applied to help in the establishment of new plants and to maintain the health of mature ground cover, trees and shrubs.

Roadside plantings in some areas of the state have suffered as the result of several years' drought. Many acres of coastal ice plant were lost last year, and water tankers were pressed into action in an effort to save as much of this ground cover as possible. Many mature trees and oleander shrubs, which had been self-sufficient previously, required supplemental watering. In Southern California it was necessary to remove hundreds of eucalyptus trees that died as the result of the lower water table.

Lighting, Signals, Electric Devices

The number of highway lighting, traffic signal, and electrical devices maintained on state highways continues to increase.

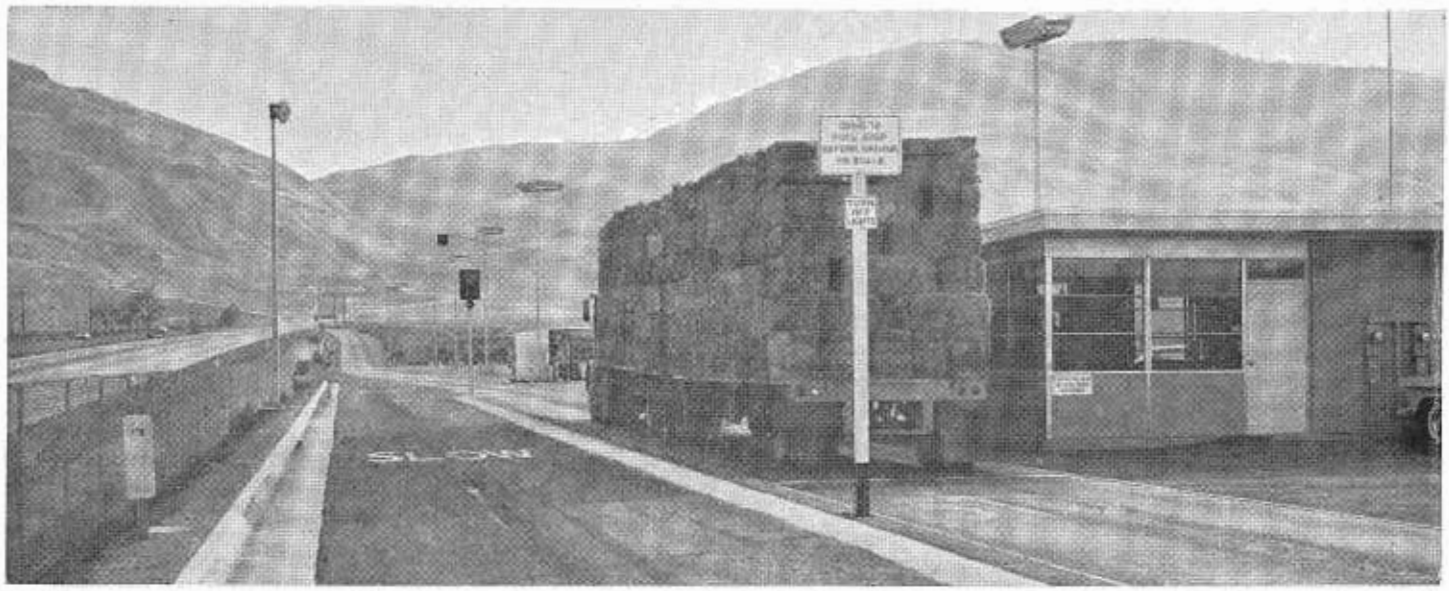
There was a 13 percent increase in the number of fluorescent tubes and incandescent lamps used in illuminated signs, and a 15.7 percent gain in mercury and sodium vapor lamps, incandescent lamps and fluorescent tubes for highway lighting, exclusive of tunnel lights. There were 4,509 tubes and incandescent lamps maintained in tunnels. Overall, the State maintains 32,461 lighting tubes and lamps on state highways.

Seventy-two traffic-actuated signal controllers were added to those maintained, making the new total 1,330.

Highway Signs and Pavement Marking

To conform with Interstate Highway markings, arrangements were made during the year to re-stripe with yellow paint at specified locations such as no-passing zones and along the double center line on multilane pavement. A total of $1,353,525 was spent for traffic striping and pavement marking by state forces.

Study of the use of thermoplastic material for pavement marking continued. An experimental project was undertaken in which thermoplastic

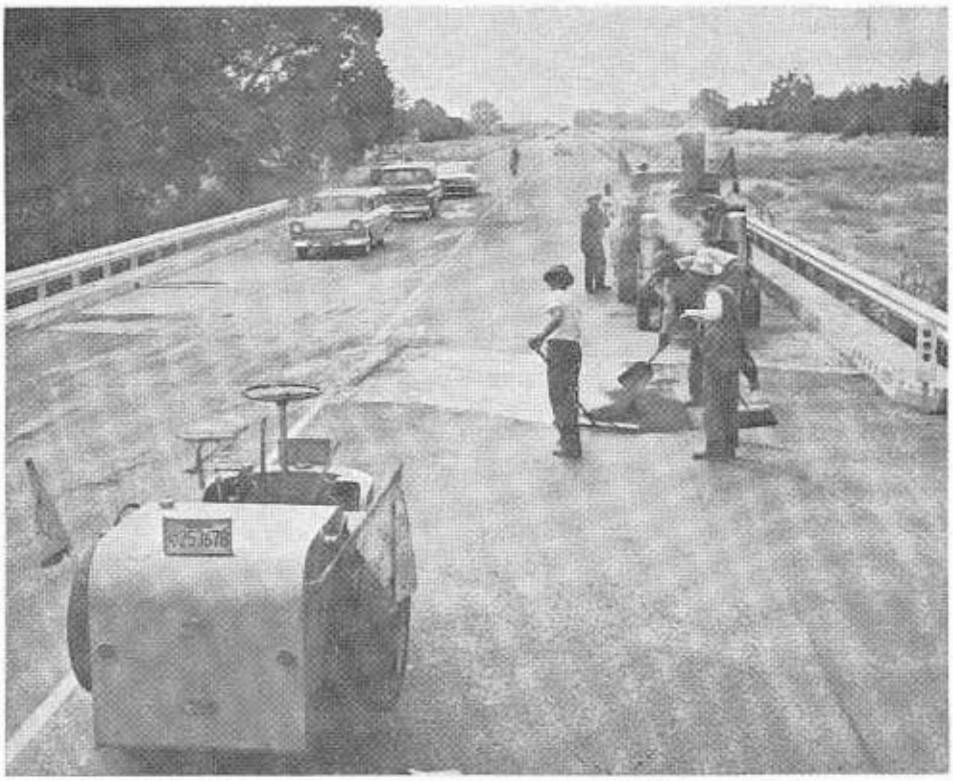


Modern truck weighing station on U. S. Highway 99 near Wheeler Ridge in Kern County.

material was used to stencil a word message on the pavement.

Sign maintenance crews engaged in these work items during the year: New installations, 14,961; replacements, 10,691; signs washed and cleaned, 55,785; signs repaired and painted, 112,933; signs relocated or rebuilt, 13,934; signs removed, 6,826.

During the year, repair and upkeep of state highway signs cost $646,884. This does not include the cost of work performed by cities or the cost of electricity.



Maintenance crew is shown patching pavement on U. S. Highway 99E near Chico. Work of this type is part of the day-to-day routine for highway maintenance workers throughout the State.

Communications

Further improvements were made in the VHF mobile radio system in Districts I (Eureka), III (Redding), VI (Fresno), IX (Bishop), and X (Stockton), providing better coverage in these areas. The microwave radio system from Marysville to Truckee was completed except for one station. Work started on additional microwave facilities between Redding and Eureka and between Los Angeles and San Diego.

At the end of the year, the Division of Highways was operating 180 radio stations, 35 microwave stations, 85 hand-carry units, and 1,100 mobile radio units.

Private line teletypewriter equipment was replaced by a more modern system to provide greater flexibility, and to overcome technical problems. The system now consists of 20 stations connecting Sacramento offices with the 11 district offices. During the winter months, special teletypewriter receivers are connected to this circuit to provide late road and weather information to news media, automobile clubs, trucking concerns, and other subscribing agencies.

Outdoor Advertising, Transportation, and Encroachment Permits

Increases in fees authorized by the 1959 Legislature permitted operations

and enforcement activities of the Outdoor Advertising Section to be restored to an appropriate level, and accounted for a substantial gain in gross receipts. In 1960-61 there were 838 licensed advertising operators as compared to 843 the previous year. Permits were issued for 1,115 signs and 35,126 structures, an increase from the 989 sign permits and 30,978 structure permits issued for 1959-60. Gross receipts for 1960-61 were $127,104, a gain from $109,180 in 1959-60.

Some 30 percent fewer transportation permits were issued as a result of the first full year of operation under the new annual permit procedure for oversize trailer coaches. Formerly, permits were required for each trip. There was also increased use of blanket permits for construction equipment. The number of encroachment permits declined slightly from the previous year. In 1960-61, 70,306 transportation permits and 13,151 encroachment permits were issued. The previous year's figures were 92,156 and 13,415.

Truck Scales

Work started on two new truck scale yards as part of freeway construction on U.S. Highway 40 between Cordelia and Fairfield. The yard area at these locations will be sufficient for Highway Patrol brake and registration inspections.

Plans were completed by the Division of Architecture for a similar scale yard and brake station on U.S. 60-70-99 east of Banning.

Maintenance Stations

Contracts were awarded for the final phases of construction by the Division of Architecture for the Whitmore and Kingvale Maintenance Stations on U.S. Highway 40 in the Sierra. These yards were expected to be ready for the 1960-61 snow removal operations. Maintenance station buildings were also being built at Lee Vining for snow removal on U.S. 395.

Contracts were let for new maintenance station facilities at nine locations in northern California and at six places in southern California. New offices, employee cottages, equipment garages or other facilities were being built at nine stations. Preliminary work, site selection or land acquisition work was undertaken for eight new maintenance stations.

Expenditures for maintenance stations and radio system structures totaled $3,206,950, of which $250,490 was for land acquisition, $2,801,350 for improvements (does not include architecture funds), and $155,110 for repair and replacement.

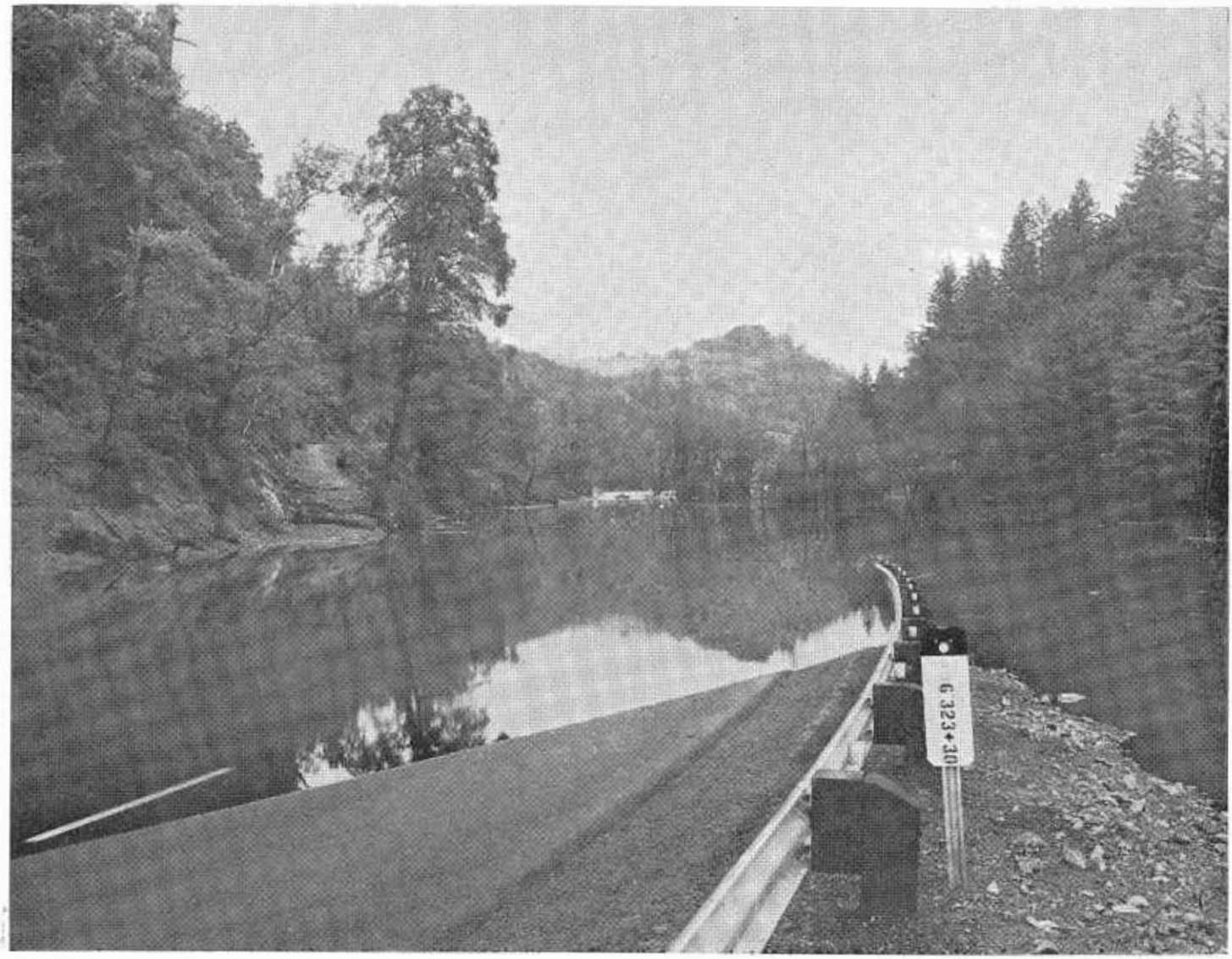
Road Closures

Forest fires in the summer and fall of 1960 forced closing of the San Gabriel Canyon Road (Sign Route 39) for 10 days, and the Angeles Crest Highway (Sign Route 2) for 28 hours.

A fire on Donner Ridge August 21 caused the closing of U.S. Highway 40 for six hours near Donner Summit and of Sign Route 89 for 30 hours between Truckee and Sierraville.

The San Gabriel Canyon Road was also closed due to fire for two days in June. Fires in June also temporarily halted traffic on the Mint Canyon Highway (U.S. 6) and the Camp Angeles Highway (Sign Route 38).

A bulldozer cuts a channel through a slide which blocked Long Valley Creek and caused flooding on U.S. Highway 101 in Mendocino County. *(See picture on page 26.)*



This section of U. S. Highway 101 north of Willits was flooded when a slide blocked Long Valley Creek, causing water to back up. A channel was later cut through the slide to lower the water and permit reopening of the road.

A cloudburst north of Sonora Junction caused U.S. 395 to be closed for 12 hours in July. Desert flash floods during September resulted in numerous short road closures in southern California on U.S. 66 east of Ludlow, U.S. 91 near Valley Wells, and Sign Route 195 east of Mecca.

Loss by fire of a timber bridge at Segal Wash, 17 miles east of Desert Center, closed U.S. 60-70 for two days in December. A truck accident in April started a fire which destroyed a timber bridge on U.S. 66 east of Amboy. In both cases detours were available.

An unusual condition developed in February on the Redwood Highway (U.S. 101) about 15 miles north of Willits. A 500,000-cubic-yard slide on Long Valley Creek, adjacent to the highway, blocked the creek and caused water to back up and flood the roadway. The road was closed for 45 hours, with water over the highway to a maximum depth of 11 feet.

A channel was cut through the upper portion of the slide under difficult and hazardous conditions. This lowered the water level sufficiently to permit the opening of the road to controlled traffic.

Later, as a temporary measure, a 72-inch pipe was placed in the relief channel. Stream flow exceeding the capacity of this temporary pipe caused intermittent closing of the road for 55 hours during storm periods in March. A construction contract was let in the summer to install a 19-foot diameter culvert at the base of the slide near the grade of the original channel.

Slides and Storm Damages

Slides developed on a number of mountain highways during severe storms early in November. The principal routes affected were the San Gabriel Canyon Road and the Angeles Crest Highway in Southern California, and the Feather River Highway (U.S. 40 Alternate) and the

Smith River Highway (U.S. 199) in the north state.

With the exception of the north coast, rainfall during the rest of the winter was below normal, and there were few interruptions to traffic.

Snow Removal

Although snow fell at the higher elevations in October, causing some temporary road closures, the major snow clearing on mountain highways was not started until the intense November storms. The snowfall at Donner Summit in November was 72 inches. By the end of that month, the snow pack was 34 inches. Subsequent storms, however, added little to the pack. At the end of December it measured 10 inches, and it was only 13 inches two months later.

The total snowfall in the Donner Summit area for the year was 309 inches, and a maximum pack of 64 inches was measured March 28. By contrast, the amounts for the 1951-52 season were 793 inches and 314 inches, respectively. This comparison illustrates the range of the snow removal work load.

Pavement sanding operations next winter will be aided by the addition of new sand houses constructed at strategic locations, either in conjunction with major highway projects or as supplemental maintenance station facilities. The larger sand storage structures will handle about 1,275 cubic yards.

CLOSING-OPENING DATES

The closing and opening dates on mountain roads from which snow is not regularly removed during the winter:

Route	*Name*	*Closing Date*	*Opening Date*
SR 89	Lassen Park	November 11	June 3
SR 89	Luther Pass	—	—
SR 88	Carson Pass	November 12	May 4
SR 4	Ebbetts Pass	November 11	May 3
SR 108	Sonora Pass	November 3	May 12 †
SR 120	Tioga Pass	November 11	April 26 †
SR 89	Monitor Pass	December 2	April 14
SR 89	Emerald Bay Section	November 26	February 7 *
SR 120	Big Oak Flat	November 11	April 24 †

* Temporarily closed two days in February, and eight days in March.

† First openings of Sonora Pass, Tioga Pass, and Big Oak Flat were on April 27, April 21, and April 8, respectively. Subsequent storms closed these roads intermittently with final openings as shown.

MATERIALS AND RESEARCH DEPARTMENT

The work of the Materials and Research Department may be grouped under these general categories:

Standard methods of inspecting, sampling, testing and reporting on materials furnished for highway construction; special investigations; research aimed at developing new tests, new techniques and new materials; training and providing information to other engineers.

The headquarters laboratory in Sacramento carries on both materials testing and research work. Its three branches in Berkeley, Los Angeles, and Bakersfield are mainly concerned with inspection and testing of manufactured products used in highway construction. The laboratories in the 11 highway districts perform most of the soils and aggregates tests, both in the preliminary and construction phases of projects.

At headquarters laboratory, the work of the department is carried on by four operating sections and an administration and services section.

The materials and research department has responsibility for the post audit testing of materials on construction projects as required by U.S. Bureau of Public Roads regulations for projects involving federal aid funds. The same post audit testing is also performed on projects financed entirely from state funds.

Administration and Services

The administration and services section handles such activities as the general operation and supervision of the physical facilities of the laboratory and includes such functions as accounting, purchasing, photography, drafting, reproduction, the design and fabrication of new testing equipment, the preparation and revising of special reports and specifications, and the reviewing of materials and preliminary reports submitted by the districts. Approximately 1,100 such reports were reviewed.

During the past fiscal year, tours and training courses were arranged for 76 visitors, 26 of them engineers from foreign countries. Eighty-one Division of Highways engineers attended the materials and research training course, "Procedures, Testing Methods and Use of Materials for Highway Purposes."

Foundation Section

The extent of major highway construction in mountain areas has increased the investigative workload of the foundation section. In the wetter areas, elaborate and extensive subsurface drainage systems often have been found essential to the construction of stable roadways. Efforts have been continued in the search for practical and economical standards for filter materials.

New standards for "permeable materials" were set up during the year. As in past years, the section has been called upon by the districts for advice in the design of large cuts and fills and in the correction of slides.

Primarily because of the audit testing program initiated by the Bureau of Public Roads in May 1960, the number of samples processed and tested by the aggregates unit was more than twice the number recorded for the previous fiscal year. Of the approximately 5,000 samples received, 48 percent were for construction audit.

Two types of aggregate splitters were developed during the year. Extensive research studies have con-

Blasting in connection with a geological investigation using a refraction seismograph.

A Materials and Research Department crew takes a sample of pavement base and subbase on a new section of highway. The sample will be checked to make sure that specifications have been met. This auditing of materials and construction assures high quality work on state highway projects.

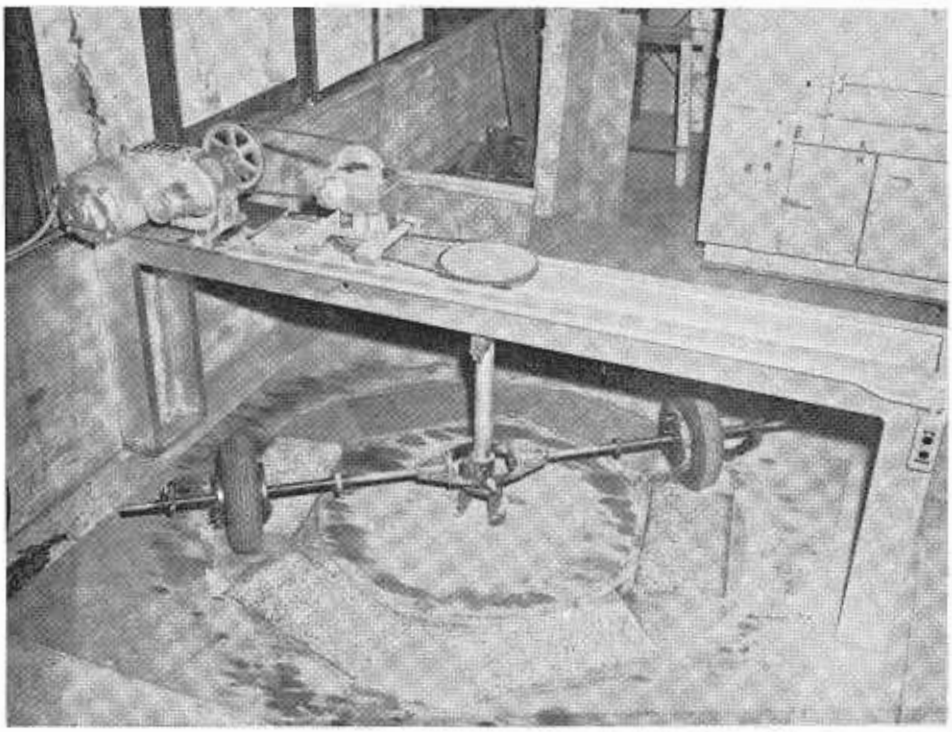
tinued to find a test method to determine the relative resistance of various mineral aggregates to harmful degradation. Fabrication of a rod-mill type soil pulverizer was completed.

The settlement devices developed several years ago to disclose the settlement of the native ground beneath embankments, and in some instances the compression within the embankment, are being installed in ever increasing numbers. Some 150 installations were completed during 1960 as compared to 50 units for the preceding year.

During the year, other construction control devices installed under fills on marsh lands and other weak or compressible foundations included piezometers, ground movement tubes, and heave stakes.

While the findings to date have not been entirely conclusive, studies of the nuclear method for determining moisture and density of the compacted fills have been made in an effort to speed construction control testing. A program of statewide field surveys to observe new construction machinery and methods was initiated.

The explorations unit made over 9,800 lineal feet of borings on 21 different jobs. The list of projects includes a number of swamp foundations (some were so bad that other locations had to be found), building



This "simulated traffic polisher" is operated in the laboratory to test various seal coat surfaces.

Exposure racks are used to test durability of signs and sign materials under the state's varying climatic conditions.

foundations, and damaging slides such as those at Crystal Springs and Towle on U.S. Highway 40.

The soils mechanics unit prepared or assisted in the preparation of 28 foundation investigation reports. Nine other investigations were in progress at the end of the fiscal year. During the year, more than 500 consolidation, 1,900 unconfined compression and 760 triaxial shear tests were performed as part of the testing of nearly 4,000 samples.

During the year, the geology unit completed 16 field jobs, consisting of nine geologic, six seismic and one resistivity survey.

Pavement Section

The pavement section does routine testing, and research work with asphalts, asphalt paving mixtures, base and subbase materials, and conducts special field investigations.

Deflection measuring crews, using special equipment, evaluated 35 projects involving 125 miles of pavement during the year for the purpose of determining the supporting capacity of the existing roadway. Recommendations for improvement of existing highways, based on deflection data obtained, were given the districts for 13 of these projects.

The engineering audit of materials and construction program cover 1,550 lane-miles on 140 projects during the year. Thickness measurements of the layers composing the structural section were made and physical tests were performed on the samples obtained. These tests determine whether the materials used in construction complied with project specifications.

Approximately 2,713 routine tests were performed on bituminous paving mixtures in connection with cooperative check testing with the district laboratories, field investigations, research work and the B.P.R. Audit Program, which alone accounted for some 600 routine acceptance tests.

Testing of aggregate bases, cement treated bases, aggregate subbase and imported borrow has also increased. A total of about 2,200 samples were tested.

A new test is being developed for the identification and measurement of expansive properties of soils proposed for use under portland cement concrete pavements.

Field and laboratory studies on paving asphalts have been continued. Special equipment has been developed for measuring wear and polish of seal coat screenings. Studies are continuing on the skid resistance of various types of pavement surfaces.

Structural Materials Section

During the fiscal year, inspectors of the structural materials section inspected and released considerable quantities of fabricated and manufactured materials, including the following: concrete pipe, 1,361,593 lineal feet; miscellaneous iron and steel, 11,169,088 pounds; corrugated metal pipe, 723,558 lineal feet; structural steel, 62,589,165 pounds; and reinforcing steel, 227,316,883 pounds.

Approximately 1,900 tests were performed on such diverse materials as structural steel, reflective sheeting, roofing insulation, ceramic tile, luminaires and ballasts, rubber gloves, and corrugated plastic headlight glare sheets.

The physical testing laboratory, in addition to testing numerous samples

of construction materials, continued studies and observations of fabrication procedures for prestressed concrete structures. This unit also continued tests of elastomeric bearing pads; began a series of tests to determine the bond of seven-wire prestressing strand to concrete and cement grout; and investigated bonding of concrete slabs to steel beams by use of epoxy adhesives in lieu of shear keys.

The welding laboratory investigated the use of ultrasonic methods to detect imperfections in fillet welds; inspected welding on various completed bridges to obtain information that might be useful in the future; investigated fatigue and mechanical properties of weld metal; tested new high strength alloy steels; and studied the effect on concrete of the eccentricity associated with lap-welded reinforcing steel.

The commodity test group continued to analyze data from field installations of median barriers for application to design and specifications. A new series of dynamic crash tests was initiated near the end of the year to supplement and check field data.

Tests and investigations of signs and sign materials were continued and tests were also performed to determine the effects of scored concrete shoulder strips (proposed as a means of alerting motorists who might drift off the highway) on vehicles.

The electrical laboratory expanded compliance testing of electrical items; performed field tests to evaluate various types of traffic counter devices; conducted service life tests of mercury vapor lamps; tested reflective materials for signs and luminaires; determined tristimulus values for sign colors; and provided instrumentation for determining vehicle response to various types of pavements.

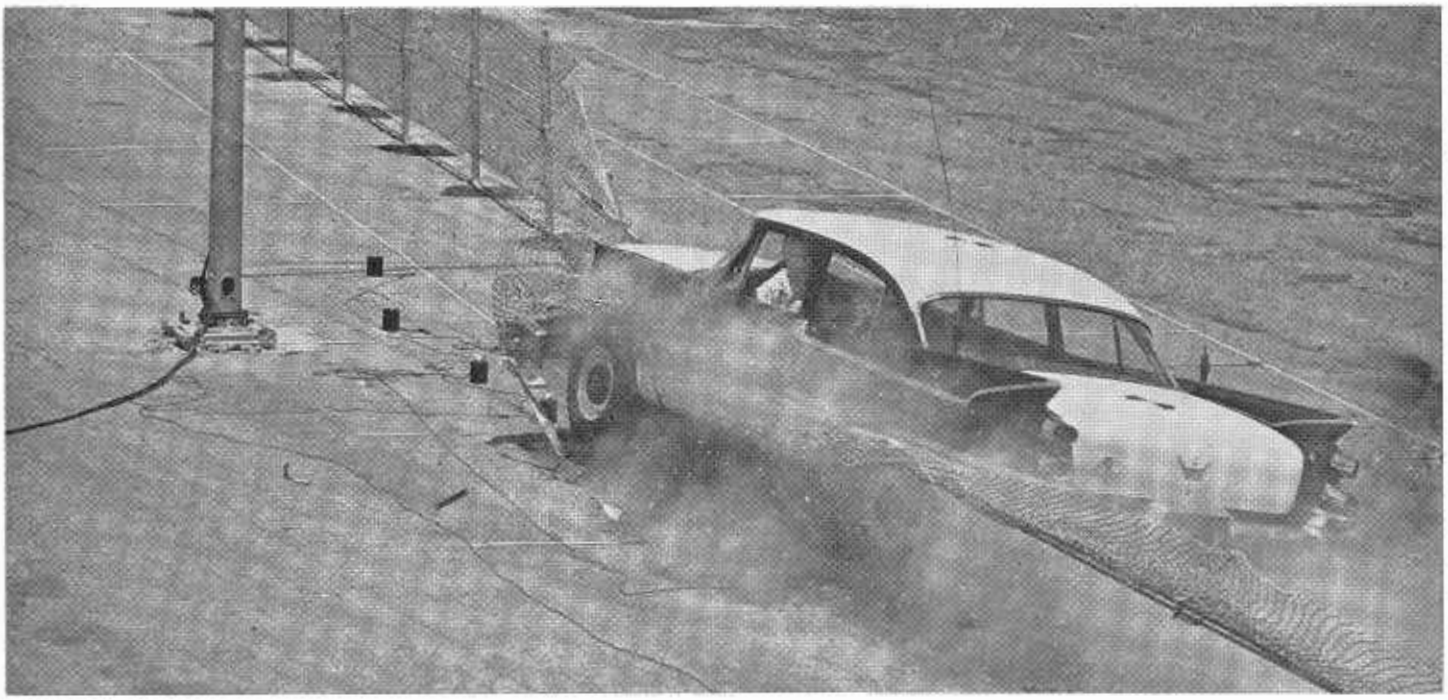
The corrosion laboratory assisted the districts in putting into use a new test procedure for estimating the effect of the environment on culvert life. Surveys were conducted to determine necessary measures to correct pipeline corrosion. Test sites were selected and installation procedures recommended for a field test program to compare corrosion and abrasion resistance of corrugated aluminum culvert pipe and corrugated culvert pipe made of galvanized steel.

The electronics and wave propagation laboratory made acoustical surveys of noise problems in various state buildings, and performed similar surveys at several locations adjacent to freeways. A factfinding study of freeway noise problems was undertaken to determine relative effects of freeway elevation on the noise transmitted to the vicinity; and, in co-operation with the Highway Patrol, to attempt to evaluate and measure muffler noise emanating from heavy trucks. Assembly was begun on a comprehensive reference summary, in report form, of pertinent information on acoustical data applicable to highways.

Technical Section

The concrete unit has nearly completed a one-year study dealing with the relationship between drying shrinkage of laboratory test specimens and shrinkage of full-size beam sections in an outdoor exposure. No information of this type was known to be available. As a result of these tests, much of the "guesswork" and conjecture should be eliminated from appraisals of concrete performance relative to volume changes due to drying.

Since the inauguration of an aggregate evaluation program late in 1959, a total of 30 commercial aggregate sources have been tested for strength-producing properties. The purpose has been to upgrade concrete made with aggregates which were found to be substandard by increasing the cement factor. An increased cement fac-



A new series of crash tests is being conducted to obtain supplemental data on median barriers. Here a radio-controlled car crashes into a barrier at a speed of 80 miles an hour.

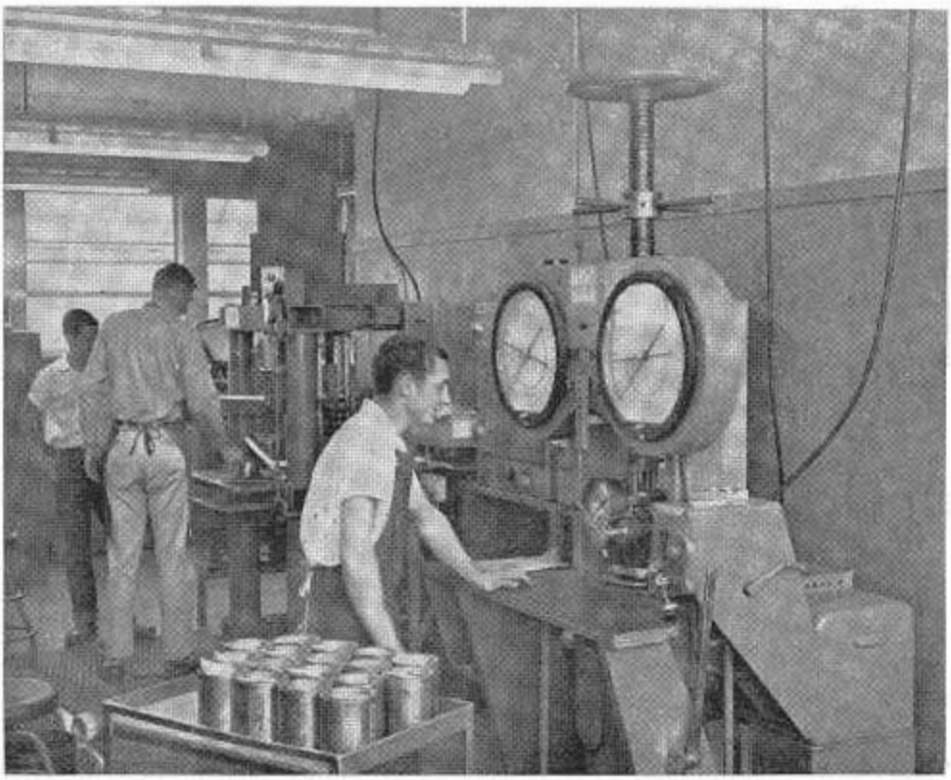
tor has been recommended for 12 of the 30 sources tested.

The concrete unit is also developing information on the effect of vibration on density of concrete and determining some acceptable measure of workability. Additional pavement profiles are being obtained as part of a continuing study of pavement and base performance. Hand-propelled profilographs were distributed to the districts and are currently being used in connection with controlling smoothness of new pavement.

The cement subsection performed a record number of routine tests on cement, concrete cylinders from the field, concrete curing compounds, concrete sands, and air-entraining agents. Extensive test programs were also conducted in co-operation with the National Bureau of Standards and the American Society for Testing Materials.

The cement unit has continued the development of a simple field test for better evaluation of the quality of sands used in concrete. A continued program of tests to measure volume change characteristics of portland cement has advanced to the stage that specification requirements have been prepared.

The chemical subsection, in addition to routine chemical testing, did extensive research on traffic paints and bridge paints during 1960-61. Formulations of epoxy adhesives were also developed for the installation of experimental reflective pavement markers. The use of concrete admixtures of the organic type has required the development of methods for the chemical determination, both qualitative and quantitative, of these components. The laboratory purchased an infrared spectrophotometer which has been used not only for concrete admixture analysis, but for the identification and determination of organic materials in plastics and paints. An instrument which will give controlled concentrations of ozone was purchased for the testing of ozone resistant synthetic rubbers and plastics.



District laboratories performed tests on approximately 31,000 soil samples during the fiscal year. This photograph shows a stabilometer soil test in the District I laboratory in Eureka.

Branch and District Laboratories

The branch laboratories in Berkeley, Los Angeles and Bakersfield are primarily inspection laboratories where materials are inspected and released at the point of manufacture. Only those tests necessary to insure specification materials are performed. Some of the commodities inspected and released are asphalt, corrugated metal pipe, prestressed concrete members, steel fabricated products, reinforcing bars, fencing and many other items purchased directly from the producers.

Each of the State's 11 highway districts has a laboratory. The principal functions of these district laboratories are to develop materials sites, determine the character of the soils to be excavated and used in fills along the highway alignment, determine fill slope designs, recommend foundation drainage systems, and perform control tests to determine compliance of contractor-produced materials with the job specifications. In some districts, the materials department has the additional responsibility of recommending the thickness of layers of materials required in the pavement structure. In carrying out their work during the past fiscal year, the district laboratories made approximately 9,500 borings, tested 31,300 samples and explored 554 materials sites.

EQUIPMENT DEPARTMENT

The operation of California's state highways requires a large equipment fleet consisting of 8,939 units. This includes 5,766 automotive units ranging from sedans to heavy trucks, and 3,173 construction units. The construction equipment is used primarily for maintenance purposes and includes large motor graders, loaders, and shovels as well as smaller items such as jackhammers.

The Equipment Department is responsible for the purchase, repair and eventual disposal of such equipment. There are 12 major shops throughout the State at which Division of Highways equipment is serviced and repaired.

In the past year, equipment repairs cost approximately $3,790,000. Some of the repairs were of an emergency

nature, resulting from breakdowns or operational damage. Other repairs were subject to scheduling, such as the overhaul of snow removal equipment during the summer, and the overhaul of summer maintenance equipment during the winter. The shops also handle certain special work such as maintenance and repair on movable bridges, state-owned and operated ferry boats, ventilation equipment in tunnels, and other miscellaneous items as required by the operating departments.

Specialized Equipment Design and Construction

Many specialized maintenance units and laboratory testing equipment units are not available on the open market. These must be designed and constructed by the shop organization in collaboration with the users. The department maintains a design section to handle this specialized work. A typical equipment unit developed by this section and constructed by the shops is a new bridge repair truck that is fitted with a special body constructed at the headquarters shop.

This body houses a complete complement of tools and equipment for work ranging from bridge structure repairs and ferry boat maintenance to steam plant and subway pump servicing.

The unit is equipped with a power driven front-end winch, a 300 ampere electrical arc welder, and a complete oxygen-acetylene welding outfit. To provide a working platform for overhead bridge work, a specially designed hydraulically operated scissors-type lift table is mounted on top of the truck body to provide a safe working area for three men.

The design section is also developing a special sign washing unit fitted with an overhead personnel hoist. The unit has its own water and detergent supply. It is equipped with an electric generator to provide power for buffing equipment and for various electrical tools.

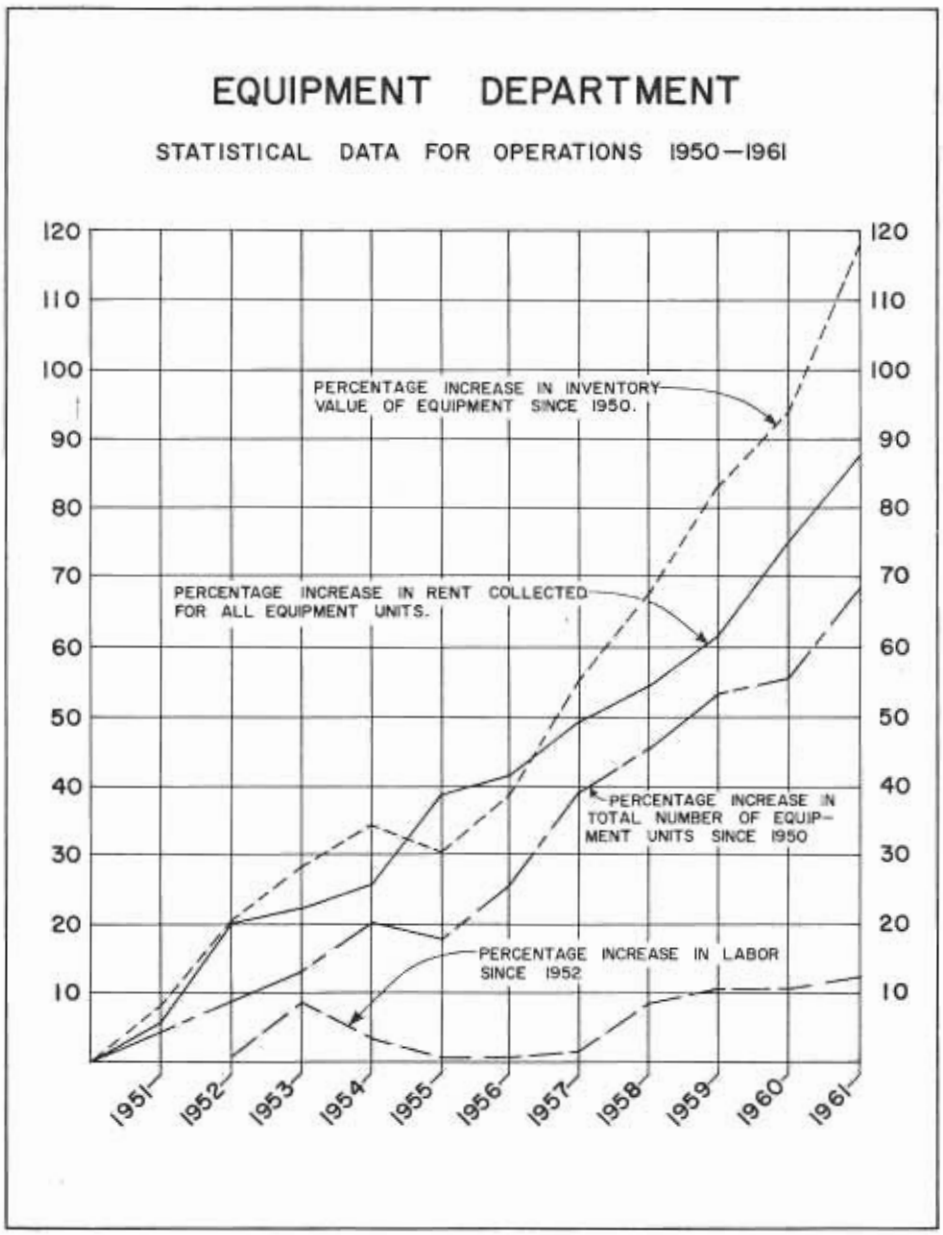
Operations

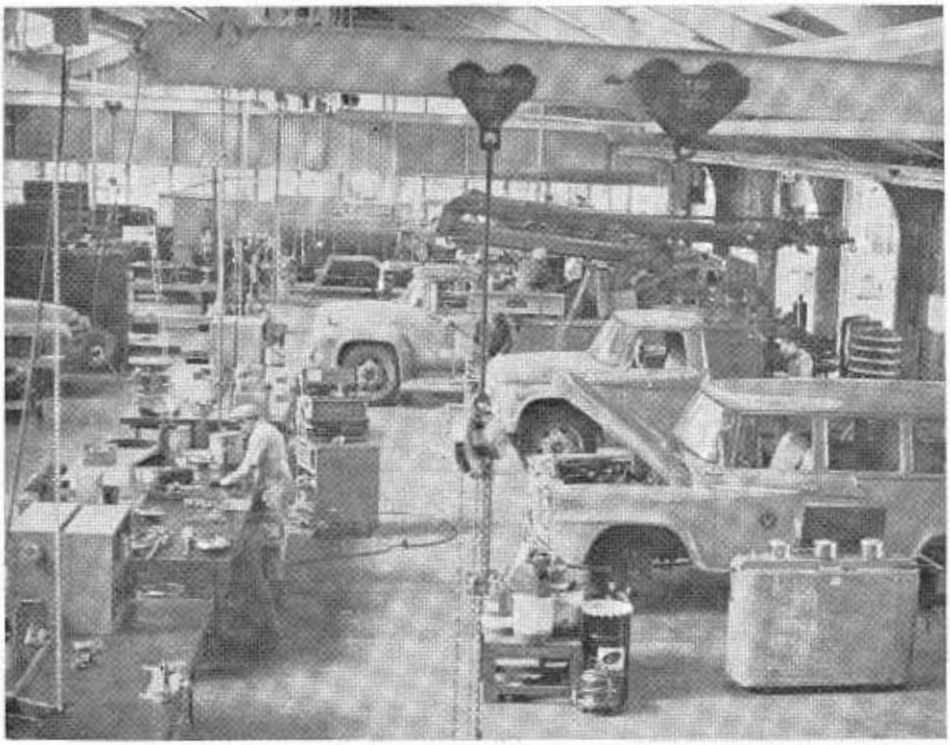
The operations section is responsible for the purchase of all new and replacement equipment. The section also disposes of worn out equipment. Newly developed equipment is studied and equipment specifications are revised accordingly. Equipment units are purchased by competitive bids. Specifications are written to include the various manufacturers of satisfactory units.

During the past year, specifications have been written for 156 different types of equipment and 1,647 units costing $5,075,831.52 were added to the equipment inventory. As equipment units reach the end of their economical life, they are disposed of. The operations section sold, by sealed bids, 921 units with an original inventory value of $2,384,973 for $367.312. This represented a return of 15.4 percent of the original cost, a very satisfactory return under present market conditions.

Parts Purchasing

A sizeable supply of parts and components must be kept in stock at all of the shop storerooms to minimize delays in the repair of equipment. The inventory value of the parts kept on hand averages approximately $600,000. To maintain this supply throughout





Interior view of Equipment Department's newly constructed truck shop in Sacramento.

the past year, the department's parts purchasing sections spent approximately $1,665,000. Intershop catalogs showing inventories of all critical and hard to obtain parts are kept up to date at all of the shops so that there is flexibility and speed in obtaining them when and where needed. A complete library of manufacturer's parts catalogs, covering all of the Division of Highways equipment units, is also maintained at each shop.

Federal Surplus Acquisition

The parts purchasing section also acquires federal surplus property. A large tonnage of steel, for fabrication work by the shops, was acquired through this surplus program. Other items obtained in this manner have been complicated and expensive machine tools, large aircraft fuel service trailers which are converted to water wagons, auxiliary engines for use on powered units, air compressors and electric generators.

Rental Rates

Rentals, charged to the operating departments for use of equipment units, cover the cost of depreciation, administration, and repairs. The rate section determines equitable rental rates for all types of equipment. Generally, new rental rates are published at the start of each fiscal year. The latest revised equipment rental rate schedule was placed in effect on July 1, 1961.

Building and Plants

The past fiscal year saw the completion of new Shop XI subshops at El Centro and Indio, a new Shop IV subshop at San Jose, additional shop facilities at Shop II in Redding, and additional shop facilities at Shop VII in North Hollywood. Construction at the headquarters shop in Sacramento included additional office space, a new truck repair shop, and an addition to the automobile repair shop. New shop construction costing approximately $2,000,000 was either completed or in process during the fiscal year.

Research and Training

The research and training section investigates problems involving equipment operation and construction and the use of fuels and lubricants, and offers training for employees of the Equipment and Maintenance Departments.

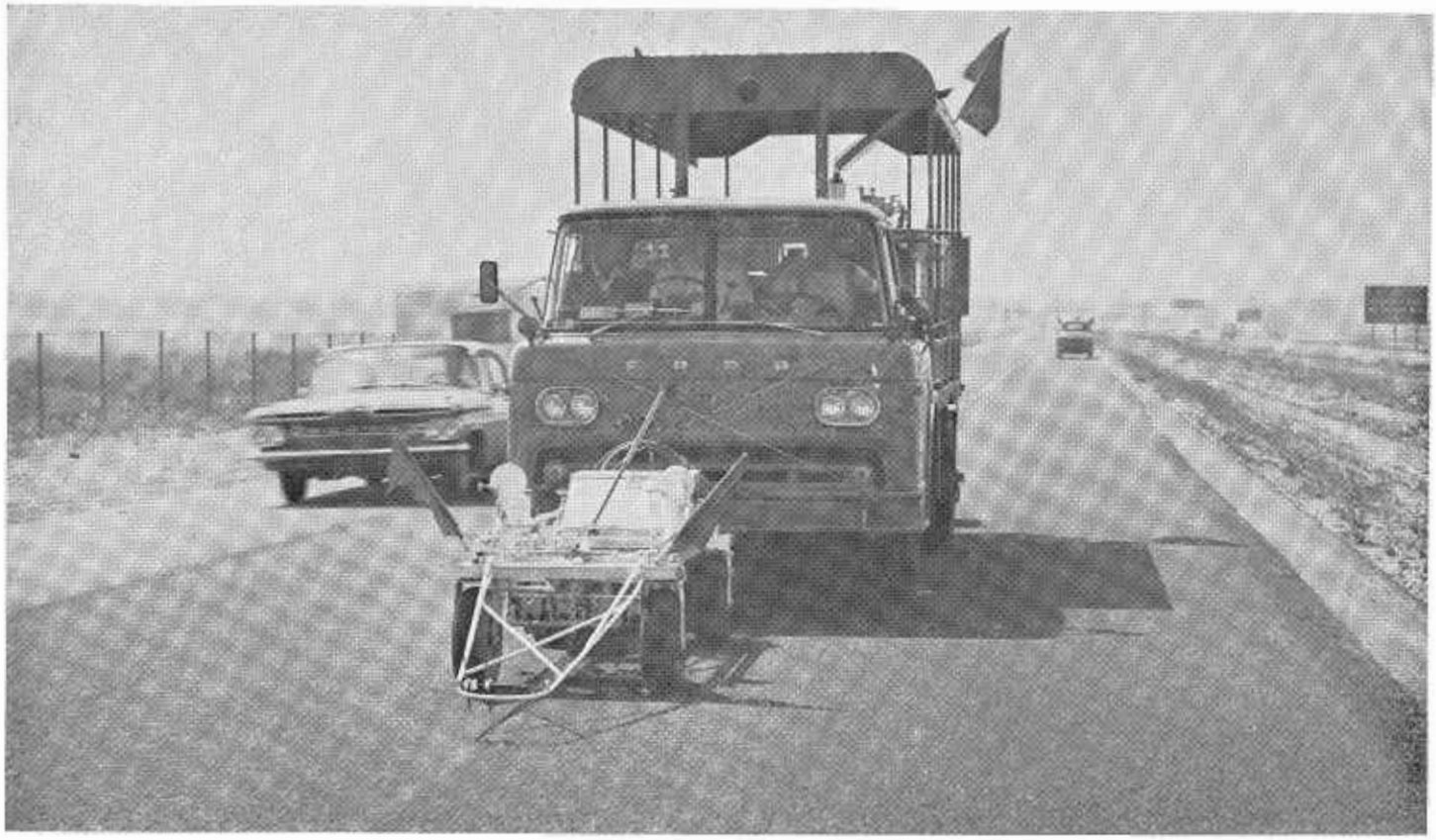
Investigations included problems on loaders, motor graders, emulsion kettles, traffic striping machines and a special mowing machine for steep side hill mowing. Specifications for several new lubricants were prepared.

Special training programs given during the year included automotive electricity, the mechanical features of equipment operation, and driver training. Training also continued in mechanical and office subjects, in addition to training taken by employees on their own time.

Summary

Equipment Department operations have grown, in the past 10 years, at a rate paralleling the expansion of the

Trimmer prepares new fender flaps for installation on heavy trucks.



Pushbutton traffic striper used to paint the yellow and white lines on pavement.

Division of Highways. The accompanying diagram graphically shows this growth. It is of interest to note that from 1950 to 1956 the percentage increase in rent collected and inventory value of all equipment closely corresponded. From 1956 on, the percentage increase in rent fell below the percentage increase in inventory value. The rent collected for the equipment pays for the depreciation of the equipment as well as for repairs and administration. The smaller percentage increase in rent indicates that the cost of repairs and administration became less on a proportionate basis. The proportionately lower cost of repairs may be attributed to more efficient personnel, equipment and operation.

The chart also indicates that from 1952 to the present time, there has been an increase of only 13 percent in the number of employees.

EQUIPMENT DEPARTMENT SUMMARY

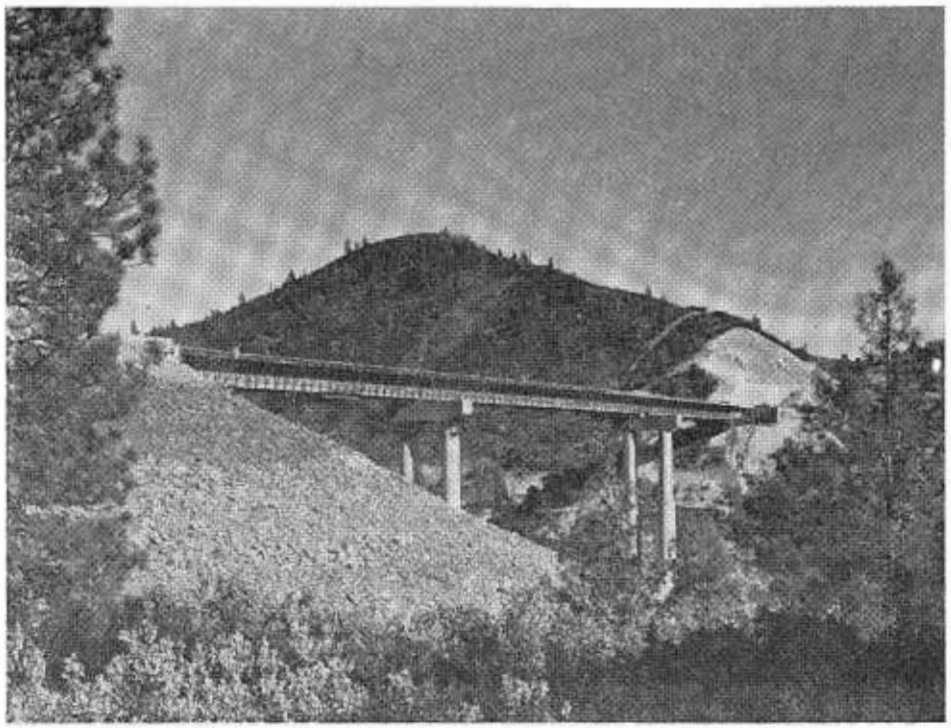
	June 30, 1960	*June 30, 1961*
Equipment repairs	$3,644,496.54	$3,792,216.82
Miscellaneous expense	582,293.33	633,685.38
Administration and other expense	958,586.96	1,048,065.57
Depreciation expense	2,463,367.02	2,819,928.05
Total expense	$7,648,743.85	$8,293,895.82
Total income	7,410,123.22	8,222,445.00
1960-1961 excess of expense over income		$71,450.82

Inventory: The original investment in equipment is as follows:

Trucks and Passenger Vehicles	
All trucks, ½ ton to 10 ton	$12,113,609.03
Buses, jeeps, and station wagons	344,508.16
Passenger automobiles	3,478,814.74

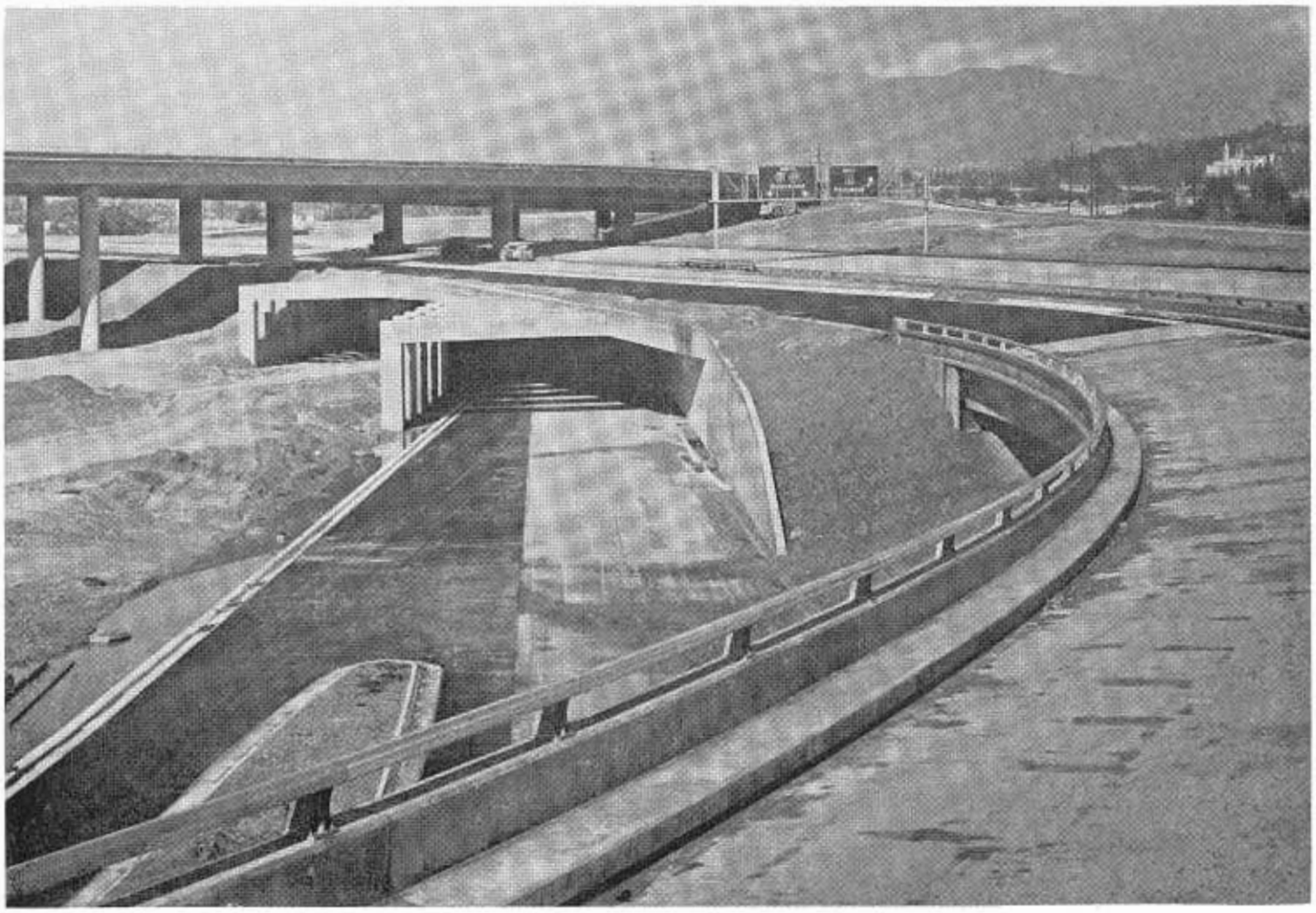
Maintenance and Construction Equipment	
Motor graders	$4,296,114.15
Rotary snowplows (truck mounted)	1,681,454.60
Rotary snowplows (motor grader mounted)	131,649.71
Shovels, power	426,070.84
Loaders	1,886,559.24
Tractors	906,872.15
Snowplows, push	639,002.50
Compressors	321,253.87
Miscellaneous other equipment: rollers, mixers, trailers, pumps, drills, mowers, etc.	4,452,733.59
Total	$30,678,642.58

Night construction on the Webber Creek Bridge which will be part of a new section of U.S. 50 freeway west of Placerville.



Partly completed bridge on the section of US 299 in Shasta County which is being relocated to skirt the future Whiskeytown Dam and Reservoir.

Nearly completed interchange at junction of Golden State and Glendale Freeways in Los Angeles.



• Administration

• *The Assistant State Highway Engineer, Administration, exercises control over the following functions: Office Engineer; Federal Aid Secondary and County Co-operative Projects; City and Co-operative Projects; Service and Supply; Management Analysis; and Systems Research*

OFFICE ENGINEER

The Office Engineer is responsible for a wide range of administrative activities including preparation, review or processing of plans, estimates, and bid and contract documents; budget and expenditure control; administration of federal funds; right-of-way engineering; industry contacts; bidder prequalification records; reports and statistics, and general files.

Budget and Project Control

Engineering control of the state highway budget involves procedures to insure that provisions and amounts specified in the budget are observed; preparation and processing of contract documents; preparation of final documents submitted to the California Highway Commission; issuance of work orders; and maintenance of construction records.

During the year, 418 financial votes were prepared for commission action; 589 projects were advertised for bids with an estimated cost of $455,473,700; and 561 projects were determined to be satisfactory for contract award.

In addition to the major contract work, the financing of 320 minor and informal contracts, having a total value of $534,400, was cleared.

Plans and Estimates

This unit is responsible for the review and co-ordination of plans and specifications to assure that they are in complete agreement before the projects are advertised for bids.

Estimates of cost on all projects are reviewed at various stages up to opening of bids.

Progress and final estimates of work done by contractors are checked and processed by this unit, as are contract change orders. On June 30, 1961, there were 353 contracts valued at $615,532,300 under way.

Draftsmen attached to this unit prepare maps for the various projects, prepare summary of bids received, and draw sketches for various uses including work for other state agencies. The map included in the annual report supplement is prepared by this unit.

Specifications

Specifications were prepared for more than 600 projects during the year. In addition, specifications were established for future projects to expedite advertising for bids when funds are available.

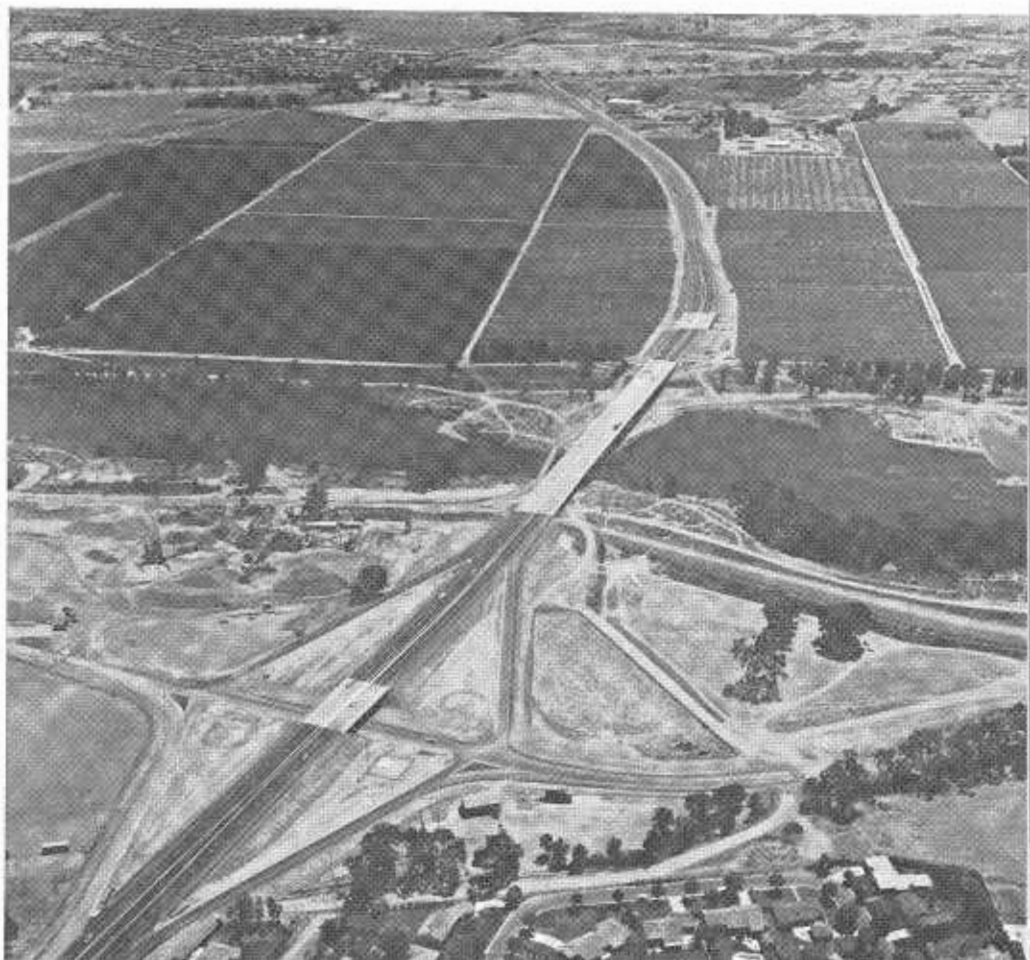
The Division of Highways Standard Specifications for highway projects, placed in use in January 1960, are being revised to include late improvements in construction methods, and new materials and equipment. The revised specifications were expected to go into effect in July 1962.

Right-of-Way Engineering

The Right-of-Way Engineering Section works in close co-operation with the Right-of-Way Department. It also works closely with the Division of Contracts and Rights-of-Way for advice in preparing complex condemnation resolutions and in satisfying legal requirements in relinquishing superseded highways, frontage roads and other local roads, and in abandoning superseded roads.

Right-of-way requirements for the year called for preparation and engineering review of 573 condemnation resolutions involving 3,584 parcels of

This high standard county highway was built by Sacramento County on Watt Avenue under the Federal Aid Secondary County Road Program. The four-lane bridge (center) spans the American River.



property. This represents about 46 percent increase in the volume of this type of work over last year.

Property no longer required for state highway purposes is transferred to other ownership, either by abandonments, relinquishments or director's deeds. To accomplish these transfers of ownership, it was necessary to prepare 23 abandonment votes and 80 relinquishment votes for California Highway Commission action. The total length of superseded highways, frontage roads and other local roads relinquished or abandoned during the fiscal year was 151 miles.

The descriptions for 829 Director's Deeds were certified for correctness prior to processing the deeds for commission action.

Reports and Statistics

The reports and statistics unit maintained statistical records pertaining to the 561 highway construction contracts awarded during the fiscal year. Records were kept for use in preparation of the quarterly California Highway Construction Cost Index, and for use in forecasting future materials requirements. Weekly and monthly reports for management purposes also were prepared showing the value of budgeted and non-budgeted programs, and of other projects for which bids were received.

The contracts placed under way during 1960-61 covered a total of 1,431 center-line miles of state highway, including resurfacing. In addition, the Department of Public Works awarded contracts for construction on 167 miles of federal-aid secondary county roads.

Prequalification of Contractors

Prequalification is required of all contractors who desire to bid on state highway projects estimated to cost more than $50,000. The prequalification rating, representing the maximum bidding capacity for each of the several types of work which a bidder is capable of undertaking, is established from a review of each contractor's statement of experience and financial condition.

The total number of contractors prequalified to bid on the various types of state highway construction decreased from 987 on July 1, 1960, to 913 on July 1, 1961. This decrease is partly due to the waiving of the prequalification requirement for projects estimated to cost $50,000 or less. The combined bidding capacity of these 913 prequalified contractors is $2,435,440,000, which is $72,214,000 more than a year ago.

The following tabulation gives the number of contractors prequalified by the Division of Highways on June 30, 1961, arranged by the several brackets of bid ratings:

Rating	*No. of contractors*
$10,000,000 and over	76
5,000,000 to $10,000,000	129
2,500,000 to 5,000,000	214
1,500,000 to 2,500,000	293
1,000,000 to 1,500,000	365
500,000 to 1,000,000	519
250,000 to 500,000	697
100,000 to 250,000	715
50,000 to 100,000	913

Bids and Bidders

The average number of bidders per project during the year was 5.5, a slight drop from last year's level of 6.1. The highest monthly average of 6.6 was in February 1961. The low of 4.7 was in May 1961. The contracts awarded during the fiscal year have been arranged in eight value ranges as shown in the accompanying "Contract Value Range" table. Included in the table is the number of projects making up each bracket and the percentage it bears to the total. Similar information is shown regarding the value of the projects in each group.

Construction Cost Index

The California Highway Construction Cost Index reflects changes in highway construction costs. The index is founded upon weighted average contract prices for seven principal construction items in place, all referred to the base year of 1940 with a value of 100.

The California Highway Construction Cost Index for the four quarters of the 1960-61 fiscal year showed a variation in costs between a low of 228.5 and a high of 252.8. The year began with an index value of 229.1 in the third quarter of 1960, dropped to 228.5 in the fourth quarter, increased slightly to 229.6 in the first quarter of 1961, and then climbed to 252.8 in the second quarter of 1961. Over all, the index reflects a trend of stable prices during the year. The increase in the second quarter of 1961 was partly caused by projects in mountainous areas where difficult conditions tend to increase price averages and partly by increases in materials and wages which have occurred in the construction industry.

The accompanying graph shows a comparison between the California In-

STREET AND HIGHWAY MILEAGE

Various highway and street mileages, with which the Division of Highways is directly or indirectly concerned, are shown below:

	Miles	*Miles*
Total State Highway System (including portions of city streets and FAS System)		16,307
Highways proposed for construction where roads do not exist		2,282
Constructed state highways		14,025
Federal-aid System		
Primary rural (12-31-60)	7,967	
Primary urban (12-31-60)	1,496	
Total		9,463
Federal-aid Interstate System (included in above)		2,179
Federal-aid Secondary System (6-30-61)		
On state highways	3,843	
On county roads	8,172	
Total		12,015
County primary road system (6-30-61)	24,308	
Other county roads (6-30-61)	45,530	
Total county maintained system		69,838
City streets (estimated 12-31-60)		30,397
City streets on state highway system		1,686

dex, the Bureau of Public Roads Composite Mile Index, and the Engineering News-Record Construction Cost Index. The small fluctuations of the past several years in the Composite Mile Index appear to indicate the continuance of a trend toward stabilization of prices. The bureau index, based on a greater number of projects on a nationwide basis, does not reflect the pronounced rises and falls to be found in an index where local conditions are a controlling factor, as in the California Index. The Engineering News-Record Construction Cost Index, which includes many large construction projects other than highway work, continues to show a steady rise.

Federal Aid

A total of $273,564,197 in federal aid funds was apportioned to California for 1961-62 under the Federal-aid Highway Acts of 1958 and 1960. This included $19,660,098 for primary highways, $9,303,650 for secondary routes, $24,529,637 for urban routes, and $220,070,812 for interstate highways. The federal matching ratio on primary, secondary and urban projects is 59.86 percent. On interstate projects the federal ratio is 91.58 percent.

At the start of the fiscal year, construction was in progress on 82 contracts with a total cost of approximately $326,301,000 financed with federal-aid primary, urban and interstate funds in the amount of $254,974,000.

Sixty construction contracts involving $19,583,000 of primary funds, $6,097,000 of urban funds, and $71,204,000 of interstate funds were completed during 1960-61. These amounts, together with the required state matching funds, bring the combined total cost of such improvements completed during the year to approximately $130,080,000.

Seventy-eight contracts were awarded with a total cost of $268,503,000, involving primary, urban and interstate federal aid funds totaling approximately $210,317,000. Fifty-eight of these contracts provide for improvements on the National System of Interstate Highways with a total cost of $180,709,000, of which the federal share amounts to $160,755,000.

Right-of-way project agreements with the Bureau of Public Roads increased the total of interstate federal aid funds obligated for participation in right-of-way acquisition costs by $67,932,000 to a total of $298,321,000.

Service Contracts

Nearly 4,500 service contracts were processed involving a total expenditure of $6,500,000.

This type of contract (formerly called service agreement) is used for renting equipment and obtaining certain services. Its use is confined to work not covered by the State Contract Act and not adaptable to minor contracts, right-of-way clearance contracts or other prescribed procedures.

The principal use of service contracts, involving an expenditure of nearly $1,700,000, was for the rental of equipment for highway maintenance, for highway construction by honor camps, and for occasional day-labor highway construction projects.

Certain types of services are also obtained under standard agreement. During the fiscal year, 82 standard agreements were processed covering such services as appraisers and expert witnesses in right-of-way matters and professional consultants in unusual design and economic investigations.

Other Functions

The Industry Contact Section obtains prevailing wage contract data from contractor and labor organizations; collects information for the establishment of equipment rental rates to be used on force account work; represents the Division of Highways at hearings of the California Public Utilities Commission concerning dump truck rental and asphalt hauling rates; and processes minor contracts, right-of-way clearance contracts, informal bid and emergency contracts, and service contracts.

Small projects for which the cost will not exceed $5,000 are handled by the districts. A total of 359 minor contracts with a value of almost $557,000 were awarded during the fiscal year. The average amount per contract was approximately $1,550.

STATE HIGHWAY MILEAGE BY SURFACE TYPE

TYPE	NORTH			SOUTH			TOTALS		
	Outside cities	Inside cities	Total	Outside cities	Inside cities	Total	Outside cities	Inside cities	Grand total
Concrete	512.241	159.292	671.533	550.480	341.010	891.490	1,062.721	500.302	1,563.023
High bituminous	4,117.935	482.330	4,600.265	3,424.718	605.262	4,029.980	7,542.653	1,087.592	8,630.245
Low bituminous	1,435.429	28.896	1,464.325	795.796	8.457	804.253	2,231.225	37.353	2,268.578
Oiled earth, gravel	653.253	2.383	655.636	684.913	4.329	689.242	1,338.166	6.712	1,344.878
Graded and drained earth	39.339		39.339	23.162		23.162	62.501		62.501
Bridges	70.052	33.896	103.948	31.525	19.735	51.260	101.577	53.631	155.208
Totals—Constructed road	6,828.249	706.797	7,535.046	5,510.594	978.793	6,489.387	12,338.843	1,685.590	14,024.433
Unconstructed road	1,195.797	125.713	1,321.510	738.795	222.066	960.861	1,934.592	347.779	2,282.371
Total highway system	8,024.046	832.510	8,856.556	6,249.389	1,200.859	7,450.248	14,273.435	2,033.369	16,306.804

As in past years, contracts were awarded to clear rights-of-way in advance of construction, except where improvements were disposed of through sales.

For altering and moving buildings, relocating irrigation systems and fences, and drilling wells, 37 contracts involving a total cost in excess of $1,000,000 were awarded.

Contracts for the demolition of buildings numbered 682 with a total cost of approximately $900,000. Of the total of 719 right-of-way clearance contracts placed underway, 698 have been completed and 21 are still active.

CONTRACTS BY TYPE

This tabulation gives the number of contracts with mileage by types awarded during the 1960-61 fiscal year.

No. of contracts		*Centerline miles*
37	Portland cement concrete	169.0
182	Asphalt concrete	1,036.1
1	Road mix	1.4
10	Seal coat	204.6
4	Grading	20.3
84	Traffic signals and lights	—
38	Bridges	—
146	Miscellaneous	—
502	Total	1,431.4

NOT ON STATE HIGHWAY SYSTEM

County Roads—Federal Aid Secondary

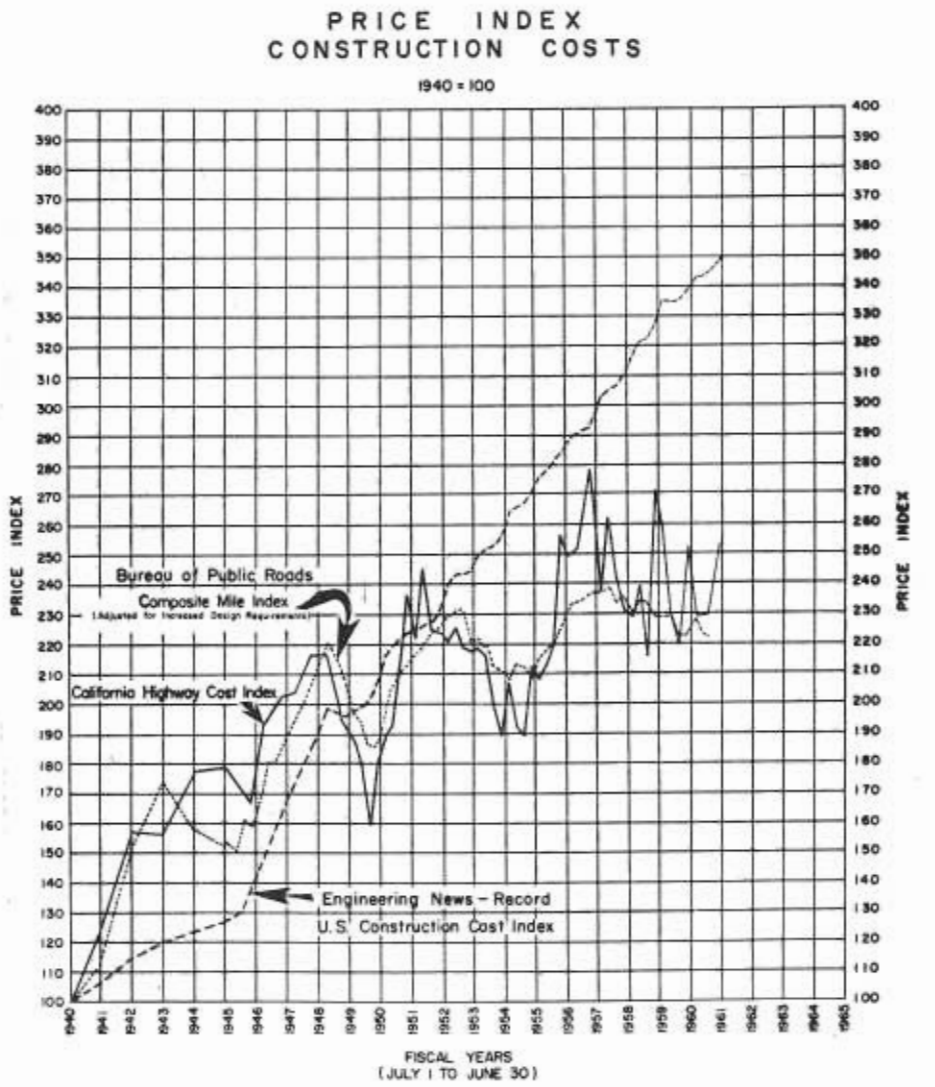
No. of contracts		*Centerline miles*
44	Asphalt concrete	135.1
2	Road mix	9.5
2	Seal coat	2.6
3	Grading	19.5
5	Bridges	—
1	Miscellaneous	—
57	Total	166.7

STATE PARKS, ETC.

No. of contracts		*Centerline miles*
2	Miscellaneous	—

CONTRACT VALUE RANGE

Range	*Number of projects*	*Percent*	*Value of projects*	*Percent*
Under $5,000	231	41.2	$4,434,900	1.2
$50,000 to $100,000	74	13.2	5,357,500	1.4
100,000 to 250,000	100	17.8	15,875,100	4.2
250,000 to 500,000	51	9.1	18,019,000	4.7
500,000 to 1,000,000	33	5.9	22,617,100	6.0
1,000,000 to 2,500,000	23	4.1	37,760,700	10.0
2,500,000 to 5,000,000	28	5.0	105,395,300	27.8
Over $5,000,000	21	3.7	169,220,600	44.7
Totals	561	100.0	$378,680,200	100.0



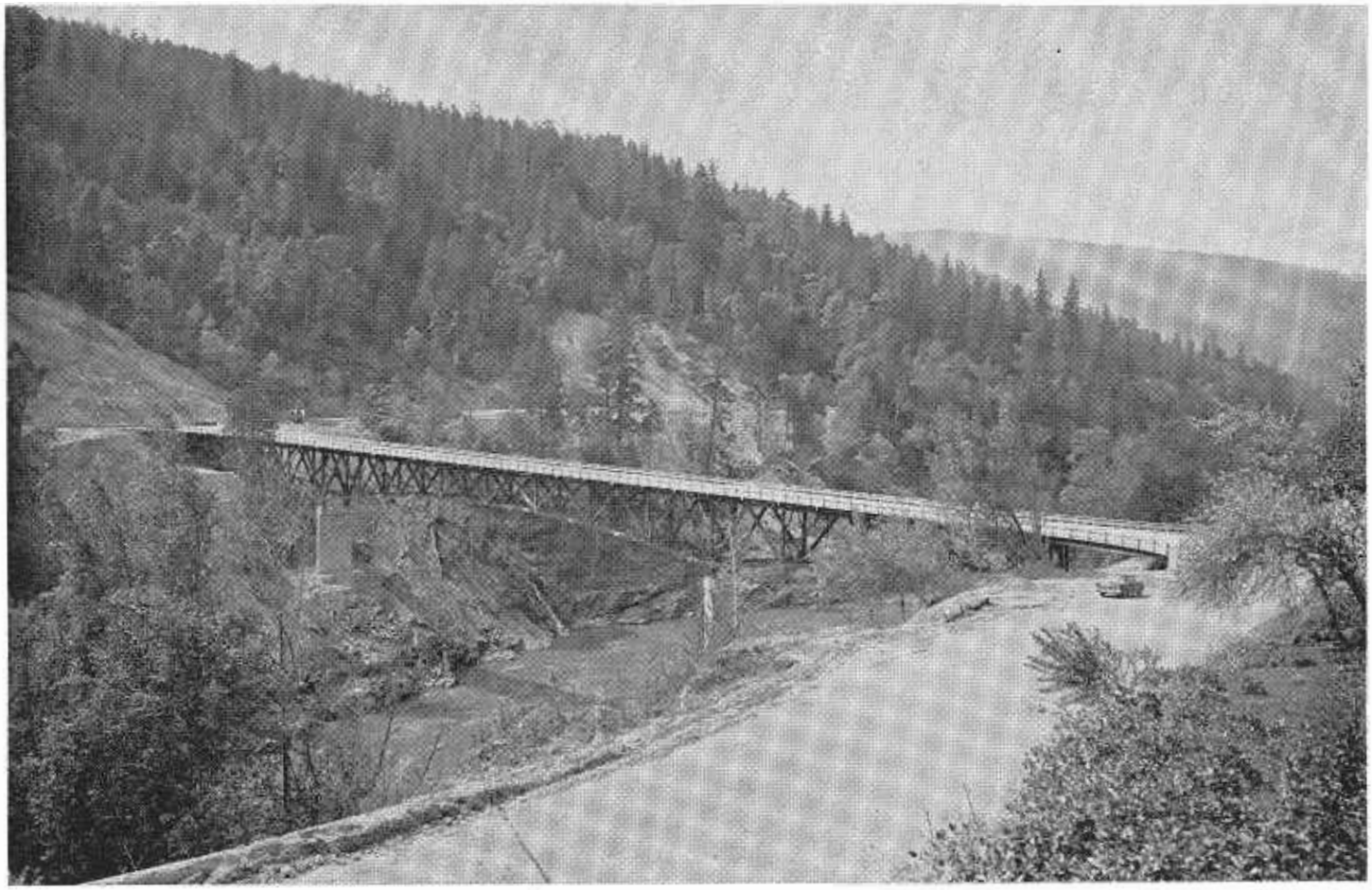
COUNTY AND CO-OPERATIVE PROJECTS

The Federal-Aid Secondary Roads Unit processes all matters pertaining to the FAS Program, acting as liaison between the U.S. Bureau of Public Roads and the counties. This unit also administers county and city projects on the urban extensions of the FAS system, local flood relief projects, county road system records and joint highway district projects.

The last joint highway district No. 9, covering State Sign Route 1 between Santa Cruz and San Francisco, was dissolved during the year. The last project, from one mile north of New Years Creek to Whitehorse Creek, has been completed.

The FAS Program

The Federal-Aid Highway Act of 1944 initiated a program of construc-



This new Klamath River Bridge at Martins Ferry, Humboldt County, was designed and built by the county as a flood repair project.

tion on a system of principal secondary and feeder roads. As of June 30, 1961, there were 12,015 miles of federal-aid secondary routes in California, including 3,843 miles on state highways and 8,172 miles on county roads. During the year, there was a total increase of 161 miles in the system, 160 miles of which were county roads.

Fifty-nine county federal-aid secondary contracts were awarded at a total cost of $17,401,404. These funds covered construction on 159 miles of road and 29 bridges.

Federal funds for secondary highways, authorized for the 1961-62 fiscal year, were apportioned to the State on December 30, 1960. California received $9,303,650 of which $8,457,807 was reapportioned to the counties in accordance with law. Under state statutes, the Division of Highways retains 11 percent of the total allocation for construction on FAS state highways, and 1½ percent for planning purposes.

The Urban Extension Program

This program, authorized by the 1959 Legislature, has now completed its first year of operation. Urban extensions of the federal-aid secondary system are major local arterials integrated with the state freeway network.

The Highway Commission may allocate state highway funds to pay one-half the cost of extending improvements on county federal-aid secondary roads into or through urban areas. Allocations are made on a project basis for approved sections proposed for state assistance by cities or counties.

All the projects approved to date have qualified on the basis of traffic volumes for development to multilane divided status. Their improvement to this modern standard will provide adequate connectors to freeways.

All five projects approved for the 1960-61 fiscal year were placed under construction, utilizing $691,250 of state highway funds.

Allocations totaling $1,292,000 were made by the Highway Commission for 1961-62 to pay half the cost of 10 projects.

County-Maintained Roads

The total county-maintained mileage on June 30, 1961, stood at 69,422. While the annual certification of county-maintained road mileage, issued to the State Controller, showed a net increase of only 416 miles, new roads totaled 1,197 miles. There were 781 miles of road deleted due to new cities being formed, annexations to cities, reservoirs being flooded and miscellaneous abandonment.

County primary road system changes approved by the department resulted in a net increase of 854 miles, bringing the total to 24,308. This large increase was due mainly to the re-evaluation of the county road system in five counties.

CITY AND CO-OPERATIVE PROJECTS

The primary function of the City and Co-operative Projects Engineer is the administration of the gasoline tax funds allocated for use on city streets.

The California Streets and Highways Code provides that ⅛ cents tax per gallon under the fuel tax law shall be allocated annually by the California Highway Commission from the State Highway Fund for expenditures on city streets.

The code also provides for the annual allocation of amounts ranging from $1,000 to $20,000 for each city, to be spent exclusively for engineering costs and administrative expenses in respect to city streets.

Expenditures of state allocated (⅛¢) funds are required by statute to be made within each city in the proportion which the total population of such city bears to the total population of all cities in this State.

Improved Agreement Procedure

A master type of agreement for the budgeting and expenditure of state allocated funds was initiated this last year. Its use has greatly simplified the procedure for processing budget approvals of proposed state allocated expenditures. Such agreements have been signed with almost all the cities.

A total of $42,482,433 was budgeted for city projects during the fiscal year, including $24,988,765 for surveys and plans and construction, $7,521,661 for rights-of-way and $9,972,007 for maintenance. (See accompanying tabulation of budget transactions.)

State-allocated (engineering) funds budgeted for engineering and administration in connection with city streets amounted to $1,339,298 for the fiscal year.

Major City Street Systems

According to the statutes, each city council is required to select a system of major city streets subject to approval of the Department of Public Works. Three-fifths of the state-allocated (⅛¢) funds are to be spent for the construction of streets included in these systems.

Master plans being developed by many cities and counties provide a good basis for the selection of these major city streets by city councils. During this past year, many cities have updated their major city street systems.

During the year, 517 sets of plans, specifications and estimates were reviewed and approved for construction. These plans provided for the improvement of 224 miles of streets at an estimated cost of $27,891,837.50.

Population Figures, New Cities

On December 2, 1960, the population figures of the April 1, 1960 federal census were announced. The total for the incorporated cities was 11,157,059.

Total estimated population of the 372 incorporated cities at the end of the year was 11,443,805 or approximately 70 percent of the estimated 16,445,000 total state population.

The population in cities increased 229,110 during the year or 2 percent over the June 30, 1960 estimate.

There were 1,050 city annexations during the year, and six new cities were formed by incorporation. The new cities, with dates of incorporation and estimated population, are San Dimas, Los Angeles County, August 4, 1960, 7,128; Farmersville, Tulare County, October 5, 1960, 2,427; Cudahy, Los Angeles County, November 10, 1960, 11,202; Arvin, Kern County, December 21, 1960, 3,804; Weed, Siskiyou County, January 25, 1961, 4,686; and San Juan Capistrano, Orange County, April 19, 1961, 1,848.

FUNDS AVAILABLE TO CITIES

State allocated (⅛¢) funds available to cities for budgeting during this fiscal year:

Unbudgeted funds in city treasuries and in the State Highway Fund, June 30, 1960	$11,225,423.15
Apportionments during the fiscal year	33,812,485.46
Savings on completed projects and cancelled projects and interest and rental receipt accruals	7,138,861.35
Total available for budgeting during the fiscal year	$52,176,769.96
Actual amount budgeted	42,482,432.94
Carry-over for budgeting in the 1961-62 fiscal year	$9,694,337.02

SERVICE AND SUPPLY

The Service and Supply Department is organized to relieve the engineers of the division of many necessary functions not directly connected with the design, construction and maintenance of highways.

Procurement and Warehousing

Warehouses are operated in Los Angeles and in Sacramento to conveniently serve all portions of the State. A total of $4,975,843 of warehouse disbursements was made during the year. The average inventory was $2,289,203.

The Division of Highways requisitioned and the Department of Finance purchased $16,449,226 in commodities ranging from ordinary office supplies to maintenance and construction material, including printing and specialized engineering equipment. Purchases for warehouse stock are included in these figures. The purchases do not include automotive or heavy construction equipment which is obtained by the Equipment Department.

As in past years, a large number of surplus U.S. government items were obtained. New maintenance station

cookhouses and bunkhouses have been outfitted from these sources of surplus at considerable savings.

The continuing favorable steel market made it unnecessary for contractors to borrow steel or culvert pipe from the division. A minor amount of "H piling" was furnished from stock as state-furnished material on small bridge contracts where the contractors could not economically obtain small quantities from the steel mills.

Other Auxiliary Services

The Headquarters Reproduction Section had its busiest year. The Blueprint Unit printed 8,150,400 square feet of the blue prints, diazo bluelines, brownlines, duplicate cloth, and direct positive film and paper.

The Duplicating Unit ran a record number of 107,846 masters for a total of 13,525,334 impressions.

New sign acquisition procedures were adopted. Various operations of procurement and inspection are handled by Service and Supply, with the Traffic Department responsible for sign design.

Signs for new projects are ordered well in advance of the anticipated date of installation, stored in the Los Angeles warehouse and shipped at the request of the ordering office when the contractor is ready to install them. This procedure protects the signs and insures delivery at the proper time in good condition.

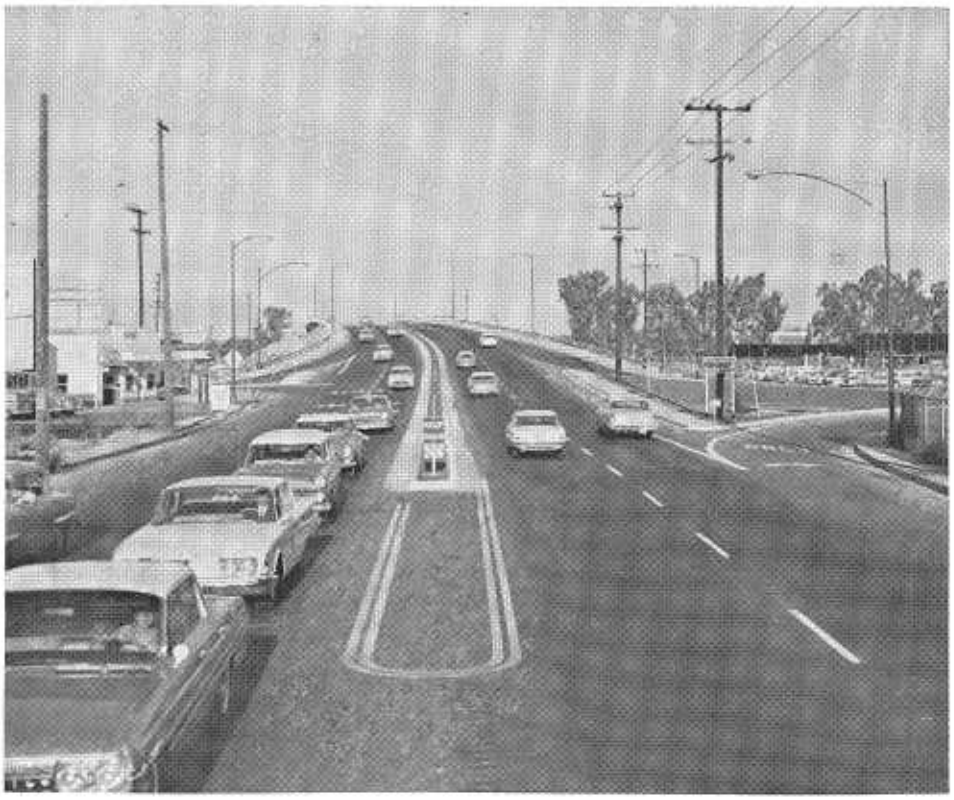
The repair of transits and levels, done under service contract on a low bid basis, has resulted in maintaining in top condition the 1,200 transits and levels used by various survey parties.

During the current year master service contracts have been entered into for the repair of other engineering equipment including theodolites, self-leveling levels, and geodimeters.

Experimental work continued with traffic counter tubing, in an effort to obtain a hose that will give accurate counts over a reasonably long life (2 million vehicles).

The property and equipment inventory for headquarters offices consisted of approximately 30,000 items valued at about $3,000,000.

The Service and Supply Department is responsible for the building



Sacramento used five-eighths cent gas tax funds to help finance construction of this Sutter Road Overpass and approaches. State highway funds from a special railroad grade separation construction fund were also included in the financing, along with railroad funds.

Approximately $900,000 in five-eighths cent gas tax funds were spent on the recent improvement of Washington Street in San Diego.

New section of county expressway on Washington Street and Barton Road in San Bernardino County, constructed under the FAS program.

services, operation and maintenance of the Public Works Building in Sacramento and the service and supply warehouses. It furnishes advisory services for building and office layout as well as for operation, maintenance and minor improvements at the district office buildings.

An engineering function of Service and Supply is the salvage and utilization of construction materials. An engineering inspection is made of each bridge structure or other highway facility which is to be removed during highway construction operations to determine which materials are structurally and economically sound for salvage and future use.

The records center at Sacramento had 16,455 cubic feet of records in storage at the end of the year, an increase of 2,932 cubic feet for the year. Records sold as waste paper totaled 54 tons, of which 25 tons were tab cards. The net unit cost of records storage at the Records Center dropped during the year to 92 cents per cubic foot per year including personnel costs. Exclusive of personnel, storage of records in the center costs 21 cents per cubic foot compared to $5.53 per cubic foot in office space.

Liaison between the State Printing Plant and the Division of Highways regarding printing has been broadened and strengthened. In the interest of economy, an effort is being made to standardize forms to the greatest extent possible. Over 2,600 orders of various types, exclusive of contract special provisions, were placed with the State Printing Plant this year and others were placed with outside vendors through the Department of Finance.

The Photographic Laboratory has continued to give photographic coverage of highway construction projects, traffic patterns, and roadway and structural conditions.

Business Volume

Purchases—Districts and Headquarters (not including warehouses)

Regular purchase orders	$9,320,794.95
Subpurchase orders	1,904,258.66
Total	$11,225,053.61

Warehouse Operations

Purchases	$5,224,182.68
Disbursements	4,975,842.52

Inventories

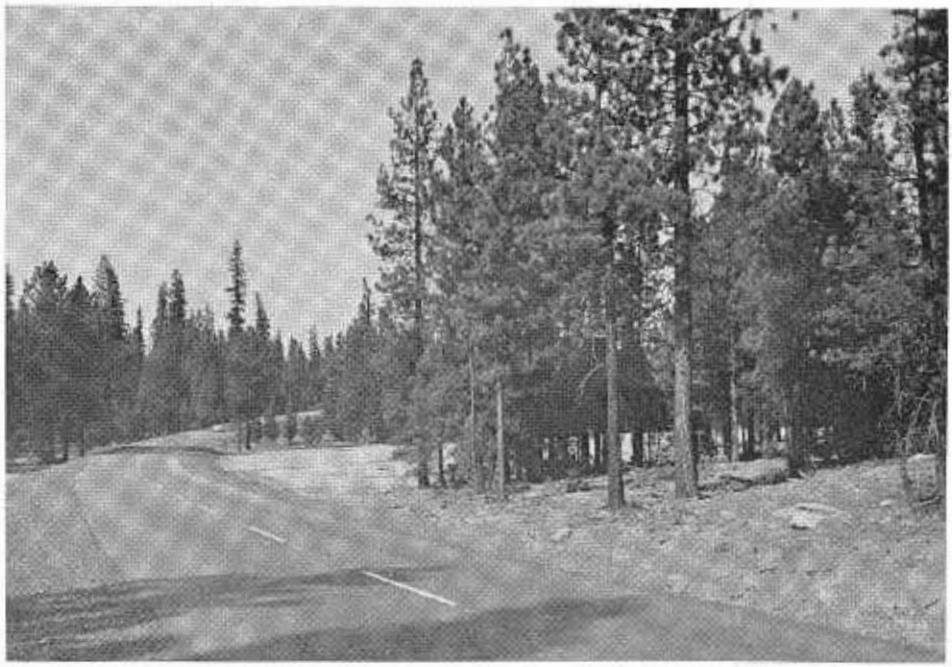
Stores—district office	$1,857,565.91 *
Warehouses	2,352,443.20

* Does not include $74,719.87 in Headquarters Radio Supplies (Departmental Communication Engineers—Highway Radio Shop).

The following is a resume of the allocation and disbursement of funds for acquisition of nonrental equipment during the 1960-61 fiscal year:

Allocated	$1,100,000.00
Funds expended	1,099,947.78
Funds reverted	$52.22

The nonrental inventory as of June 30, 1961, amounted to $13,880,752.30.



The Feather Lake Highway in Shasta and Lassen Counties was improved to modern standards under the Federal Aid Secondary County Road Program and recently became part of the State Highway System.

MANAGEMENT ANALYSIS SECTION

The purpose of this section is to improve the efficiency of the division's work by making assigned studies and recommendations, and providing advisory services on administrative and management problems in the Division of Highways, both in headquarters and in the districts.

Improvements in the sign requisition procedure, as well as reductions in sign records resulted from one study. Assistance was given to a recommended sign task force which followed up on other areas in order to streamline additional aspects of sign procedure.

Development of a railroad agreement flow chart assisted personnel in better understanding the entire process and provided a step toward reducing the processing time.

As a result of another study, a directive was issued outlining the responsibilities of various offices in the processing of co-operative agreements.

A number of file studies completed by the staff assisted the districts and headquarters offices as well as the director's office in better use of manpower and space. Results of previous studies resulted in over $40,000 in savings of space in 1960.

Improvements were also made in the manner of assembling statistical information for these file studies, thus permitting increased efforts in the total records program, including a more current updating of records retention schedules.

Because of the division's advances in solving the records problem and because of the impetus given to a statewide records program by the Governor, a staff member was assigned to co-ordinate department-wide effort in reducing the cost of record keeping.

A manual for use of headquarters personnel as to how to use the Records Center and recommendation for improvement of the operations of the center has been developed.

The first complete and comprehensive index of all circular letters was issued. This has provided a ready source of reference of official instructions not contained in manuals. A revised procedure placed in effect will reduce the cost of preparation of the second annual index.

A secretary's manual for headquarters offices has been drafted and submitted to the users for comment and revision. This manual will lead to a clearer understanding and a more uniform operation of division secretarial procedure.

The fact gathering phase of the Procurement and Warehouse study was completed. Improved procedures and reduction in cost are expected to result from this study.

A Sonoma County FAS project on Trenton Road included construction of this 500-foot bridge which spans Mark West Creek and two roads.

SYSTEMS RESEARCH

The position of "Systems Research Engineer" was created in May 1961. The State Highway Engineer, in establishing this position, stated that the primary purpose was a critical and searching examination into all phases of engineering costs to make certain that engineering operations are conducted on an efficient, effective and economical basis.

Since a study of engineering costs and productivity is intimately related to and dependent on proper and accurate cost accounting, much of the time and energy has been devoted to this phase of the problem in the initial stages of the study.

There has been close co-ordination with the Accounting Department in setting up the procedures for electronic data processing in Division of Highways accounting. This change should make cost records more meaningful and timely for analysis of engineering and other costs.

Studies are also being conducted in improving highway engineering productivity through the use of the latest equipment and processes of electronics.

While California has been one of the leaders in adopting modern technological methods to increase engineering productivity, scientific progress is now so rapid that continuous appraisal is necessary to make certain that early and full use is made of all the applicable time-saving methods and devices developed in this field.

• Planning

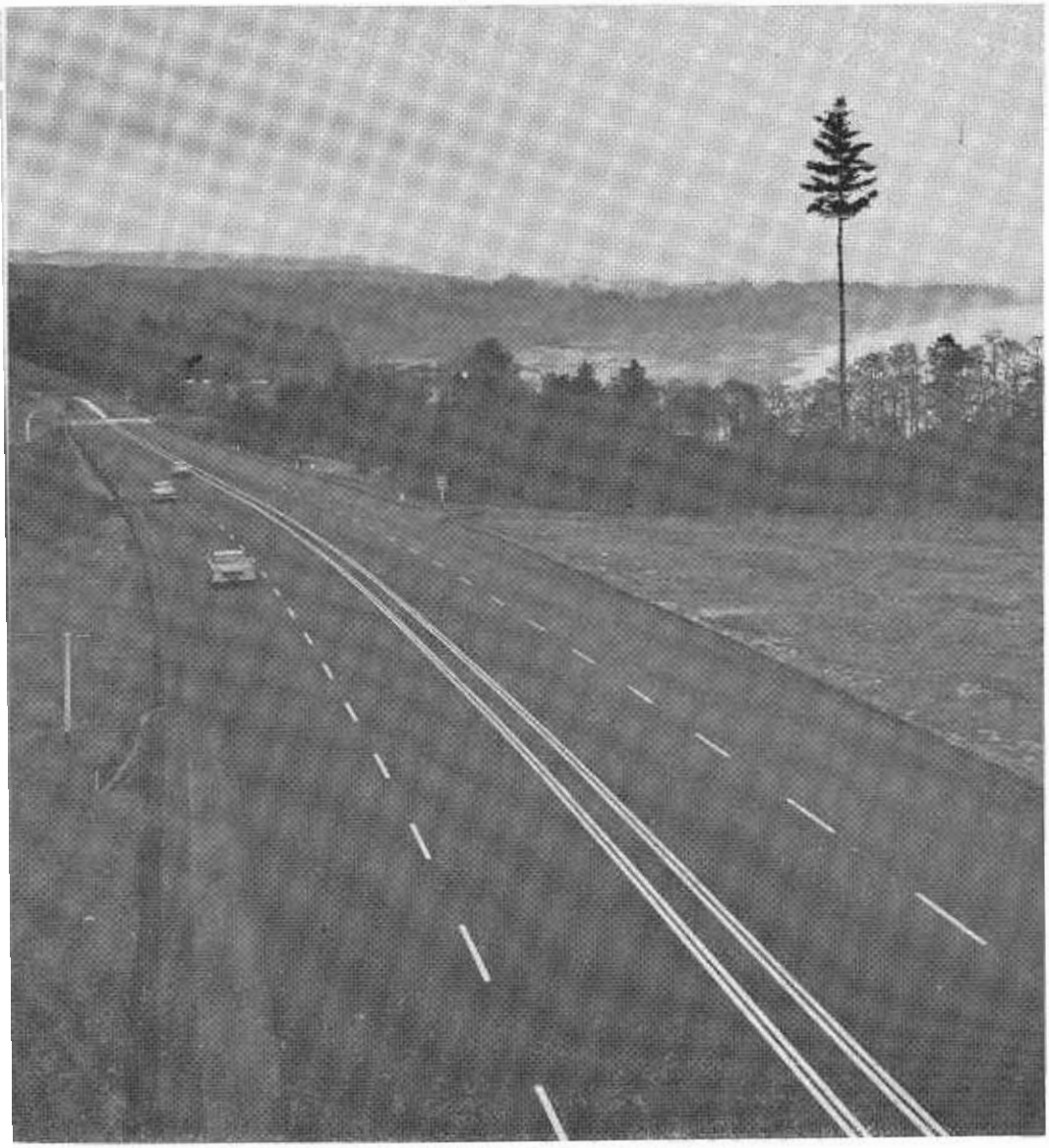
• *The functions of advance planning, programs and budgets, design, traffic, photogrammetry and highway planning survey are the responsibility of the Assistant State Highway Engineer, Planning.*

ADVANCE PLANNING

THE Advance Planning Engineer is in charge of the advance planning and the photogrammetric sections.

The advance planning section processes project reports, co-ordinates steps involved in route adoptions and freeway declarations, processes freeway agreements, and works with other agencies in planning matters.

Recently completed freeway on U. S. Highway 101 in northern Humboldt County.



Project Reports

A project report is made after an engineering investigation and analysis of a specific project. The report sets forth the reasons for and nature of the planned highway improvement and the proposed manner of accomplishment. Approximately 302 projects were processed during the year.

Project reports constitute both a starting point and a control mechanism in planning and budgeting and provide information needed to establish basic design features. They are prepared in the districts and reviewed at the Sacramento headquarters.

Freeway Routes

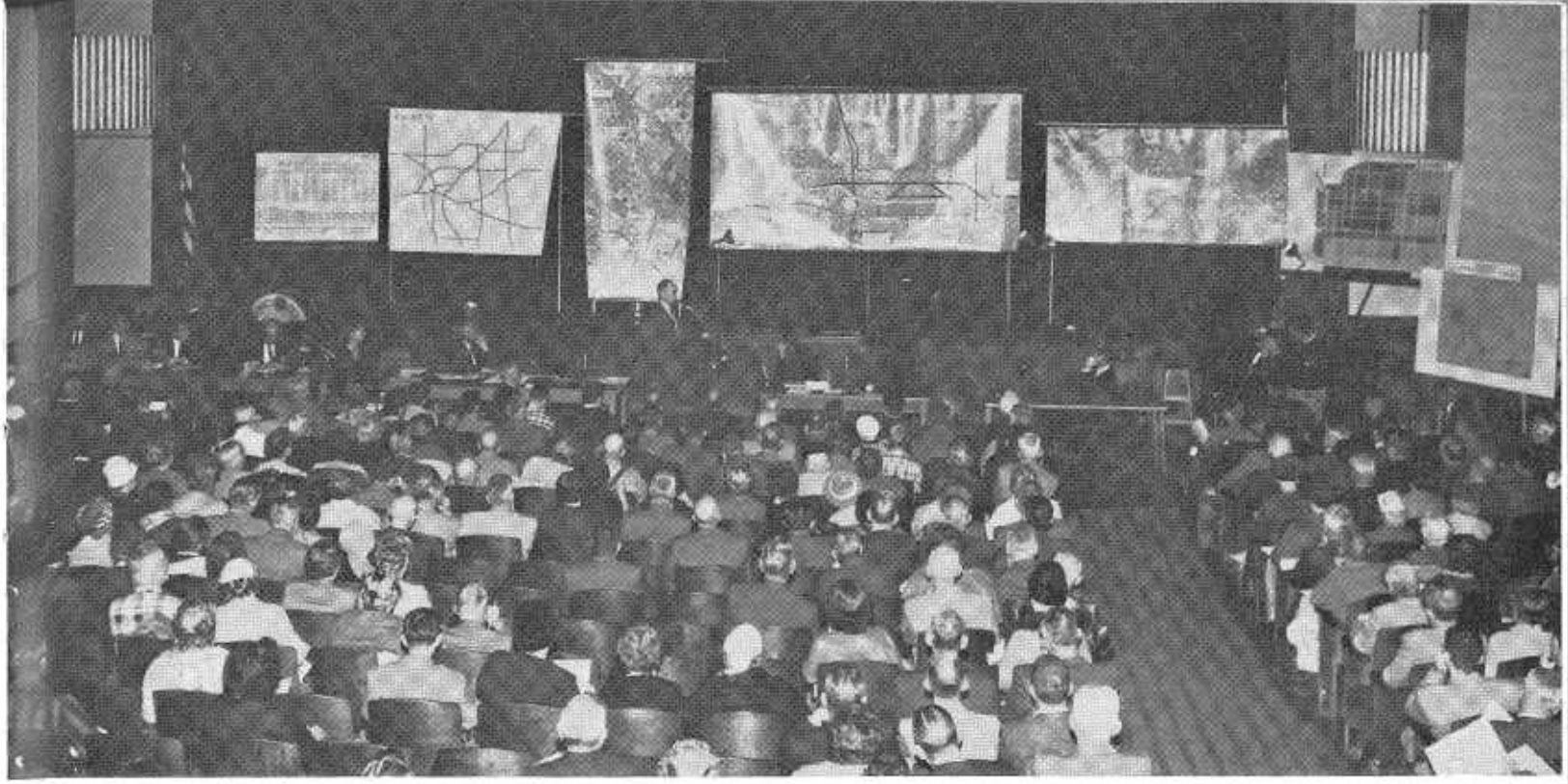
The development of an integrated system of freeways, one of the most important phases of modern highway planning, has been emphasized in California for many years. It involves careful consideration of community values and potential land uses, as well as cost, traffic needs and benefits.

In accordance with long-established policy of the California Highway Commission, local authorities are advised by the Division of Highways of the start of freeway route studies and are also kept informed of the general features of proposed freeway units as the studies progress. Local master plans are consulted. When studies have progressed sufficiently on a specific freeway section, the division holds a public meeting to present facts and obtain local reaction and other pertinent information. (The freeway route selection process is discussed earlier in this report on page 11 and the formal policy statement is included in the statistical supplement to this annual report.)

Transcripts of proceedings of public meetings together with reports on the results of conferences held in conformance with commission policy are made available to the Highway Commission for consideration in the determination of freeway routings.

During the fiscal year, the district staffs of the Division of Highways held 53 formal public meetings to discuss proposed freeway routings. Numerous conferences with city and county officials and their technical staffs were also held during this period, as were several hundred preliminary informational meetings and map displays. In addition, the California Highway Commission itself held five public hearings during the year, two at the request of the local authorities and three on its own initiative. (These public meetings and hearings are listed in the statistical portion of the annual report.)

The California Highway Commission had before it for consideration during the year 57 freeway projects



A formal public hearing, at which local citizens are urged to contribute information and ask questions, is part of every freeway route study conducted by Division of Highways engineers. Pictured is an official division hearing held for discussion of east-west and north-south freeways through Sacramento. Many informal meetings and map displays are also held.

and adopted the routings on 49 of these units, of which 39 involved a major relocation. Through this action of the commission, the freeway mileage was increased approximately 406 miles, resulting in a total of 5,609 miles of declared freeway as of June 30, 1961.

Freeway Agreements

The co-operation achieved with cities and counties in working out and concluding freeway agreements has been extremely satisfactory. Agreements for 148 freeway units were received for processing during the year. In some cases, original agreements were replaced by supplemental agreements which incorporated improved design standards or provided for changes in traffic patterns or local planning.

Interstate Highway System

A new statewide interstate highway deficiency study was completed during the year. In connection with this study, the advance planning section was responsible for obtaining prior approval from the U.S. Bureau of Public Roads on such factors as the route locations and basic design features including the number of traffic lanes, median and right-of-way widths, and the location of separation structures, interchanges, and frontage roads.

Advance planning is also responsible for obtaining bureau approval on the final locations of all routes on the Interstate Highway System, after adoption of each section by the California Highway Commission. At the end of the year, the locations for approximately 1,826 miles, about 84 percent of the Interstate System in California, had been approved. In addition, another 234 miles were being processed for submission to the bureau. The total mileage approved or under consideration at the end of the fiscal year is about 95 percent of the Interstate System in the State.

National Forest Highways

The Division of Highways acts jointly with the U.S. Bureau of Public Roads and the U.S. Forest Service in an annual improvement program on California roads designated as forest highway routes. The forest highway network in California covers approximately 2,465 miles, about 80 percent of which is on state highway routes. (A tabulation showing the status of forest highways appears in the statistical supplement.)

The California apportionment of forest highway funds for the 1960-61 fiscal year was $4,726,004. Including funds remaining from previous apportionments, the distribution of forest highway money in the State during the year was as follows: projects on state highways, $3,376,000; projects on county roads, $925,000; system surveys, $200,000.

The Bureau of Public Roads plans, designs, advertises and supervises the construction of federally financed forest highway projects. On projects on state highways, the Division of Highways works with the bureau in the planning and design phases and also purchases the required rights-of-way, including clearance of utilities and options on material sites.

PHOTOGRAMMETRIC MAPPING AND AERIAL PHOTOGRAPHY

Aerial photography is used in many ways for advance planning, and accounts for approximately 15 percent of photogrammetrics costs. Up-to-date aerial photography is a primary aid for route study.

Photogrammetric mapping of a reconnaissance type is used for route study of locations where earthwork quantities materially influence alignment and grade of possible alternate routes. For final location and design of virtually all highway facilities, large-scale, small-contour-interval mapping is used. Photogrammetric services are obtained under contract with private firms.

Following is a resume of expenditure for contracting during the fiscal year:

	Contracts	*Highway strip miles*	*Contract amount*
Contour mapping projects for design	45	396	$434,950
Contour mapping project for reconnaissance	8	151	69,794
Aerial photography contracts	12	—	26,994
Aerial photography contracts (blanket)	8	—	60,049
Stereoplotter rental contracts	7	—	9,056
Total			$600,843

Developments

The photogrammetric unit has acquired an electronic digital scaler for recording photogrammetric measurements directly on punch cards. The scaler is specifically designed for taking terrain cross-sections along a predetermined final centerline, automatically recording the information on the cards for earthwork quantity computation. The equipment attaches to a direct-project type of stereoplotter. Its use eliminates several intermediate steps associated with determination of the equivalent information from contour maps, and provides a direct link between photogrammetry and electronic computation.

Map Checking

A continuing program of photogrammetric analysis has proved to be an invaluable aid in obtaining accurate photogrammetric mapping by contract. The analysis provides information regarding adequacy of specifications, and isolates areas which warrant field checks to determine accuracies actually obtained. Extensive and costly field checking is thus largely eliminated.

About two-thirds of the total mapping mileage is reviewed by photogrammetric analysis. About 25 percent of the stereoscopic models thus reviewed are recommended for further field checks. This results in a major reduction in field checking requirements.

Geodetic Distance Measurement

During the fiscal year, the photogrammetric unit operated instruments for accurate geodetic distance measurement as a service to the districts.

A Model 4 Geodimeter has been used with outstanding success throughout the year. It is an electronic device which must be used at night. While assuring accurate surveys, the use of this instrument resulted in a savings of $60,000 during the year, as well as a 40 percent saving in time.

PROGRAMS AND BUDGETS

The Programs and Budgets Section makes projections on the availability of funds for highway purposes, establishes target figures to be used in planning, develops the statewide long-range planning program in co-operation with planning survey, prepares budget recommendations for consideration by the Highway Commission, maintains a constant check on the funds available for highway purposes in a fiscal year budget, recommends action on unbudgeted or minor improvement projects, and administers the annual buildings and plants program.

Budget and Revenue

The responsibility for preparing the annual budget for consideration by the Highway Commission rests with the Assistant State Highway Engineer, Planning. Engineering control of the state highway budget is performed under the supervision of the office engineer.

The division's revenues closely correspond to the volume and type of highway traffic. Long established and continuous records of this traffic throughout the State are used as a guide in estimating probable revenues for planning purposes. For budgeting, estimates of probable revenues are determined after consultation with other governmental departments and agencies such as the Departments of Finance and Motor Vehicles, and the Board of Equalization.

Buildings and Plants

During the fiscal year, district office building additions at Los Angeles, Redding, San Bernardino, and San Diego were completed. Construction was begun on the addition to the annex of the Public Works Building in Sacramento and plans for an annex building at the district office in San Francisco were completed. Plans were being developed for maintenance stations at 17 locations throughout the State.

DESIGN

The number of projects for which plans were prepared during the 1960-61 fiscal year was only two less than the record 414 projects set two years ago. More significant than the number of projects, however, is the increasing volume of plans. Approximately 7,300 sheets of plans were reviewed this fiscal year in order to ready the proj-

ects for advertising. This is 1,700 more than last year which reflects the increased volume of freeway construction.

Geometric Design

The geometric design unit processed 680 interchange and intersection designs during the year, as compared to 544 in the previous year. The exhibit maps for 148 freeway agreements were reviewed, and a total of 56 reports involving requests for new connections or separations on freeways were processed prior to presentation to the Highway Commission. A total of 526 bridge designs were reviewed with respect to geometric design features.

Structural Design

Typical sections representing approximately 200 proposed projects were processed by the structural design unit during 1960-61. This involved the review of all structural features, including materials sources, specifications, foundation conditions, subsurface drainage and slope design. Continued emphasis on these details during the early stages of design has resulted in more effective specifications and optimum utilization of available materials.

Continuing progress was made in the observation and compilation of factual data concerning the actual performance of past and current pavement designs. Features under observation include reinforced asphalt concrete and portland cement concrete pavements and thick bituminous pavement sections, variable joint arrangements in portland cement concrete pavements, cut slope and benching details and subsurface drainage installations.

Drainage and Co-operative Agreements

Freeway construction in urban areas has complicated many drainage problems. Urbanization has brought changes in drainage conditions which affect both existing and planned highways. This has increased the time spent in the review of drainage plans during the early design stages.

As in the past few years, drainage modifications and street rearrangements incidental to freeway construction have been handled by co-operative agreements. These co-operative efforts continue to pay increased benefits to both the highway and the local community.

During the early part of 1961, the actual processing of these agreements was made a function of the office engineer's section. Under the new procedure, the design department is continuing to review proposed co-operative agreements in the initial stage to determine the relative benefits and costs to each agency involved.

Research and Development in Design Methods

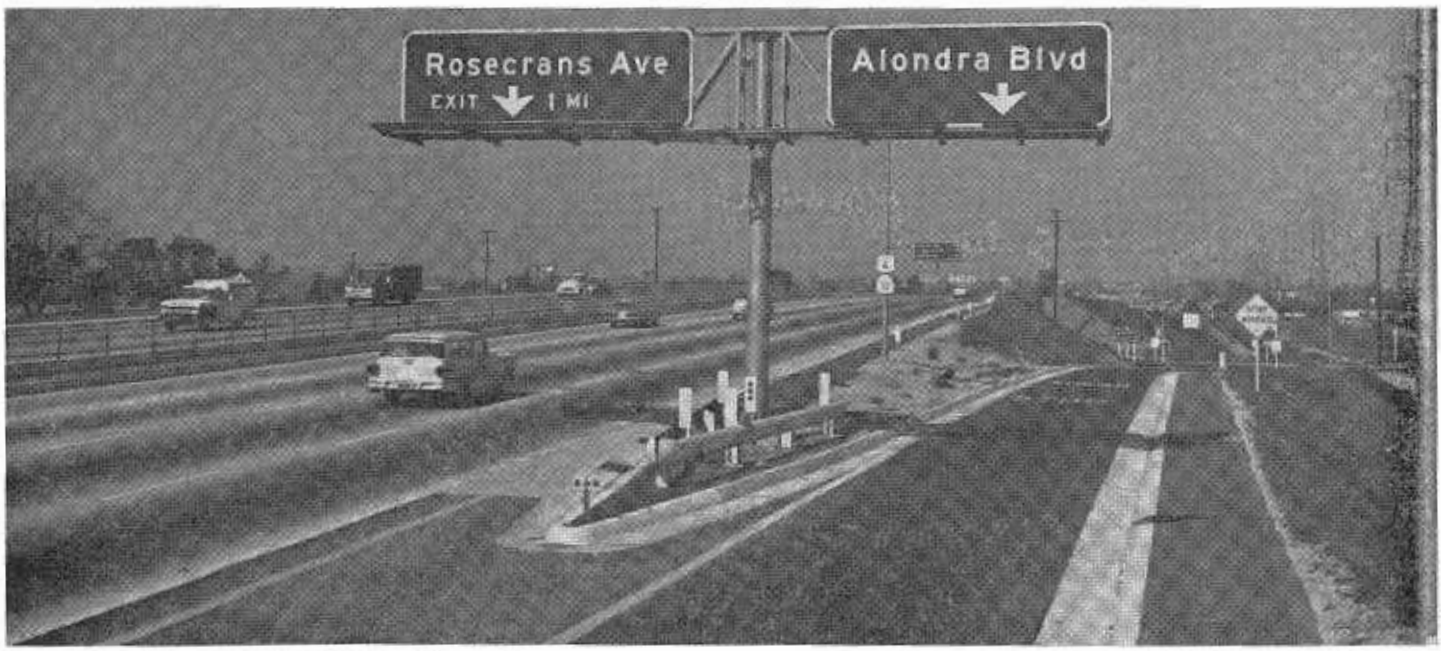
The drafting and plans section of the Planning Manual of Instructions was completed. The new manual establishes policies and standards and gives suggested procedures for the preparation of maps, plans and engineering drawings.

During the year, the electronic computation service for earthwork computation was improved. The new program is capable of evaluating hinge point and variable slope conditions as well as computing the proper hinge point, slope, and catch point values.

Erosion Control and Roadside Development

Since it is a highly specialized activity, the roadside development unit prepares all plans for functional planting and landscaping projects in Sacramento for the districts. During the 1960-61 fiscal year, plans and specifications for 31 projects were completed.

Certain items necessary for erosion control and landscape preparation can more economically be handled under the major construction contracts. All typical cross sections for all projects are reviewed with this in mind. The landscaping preparation includes such items as deep sterilization, spreading top soil and installing water lines or encasements for future water lines under roadways.



Large directional signs assist motorists in getting to their destinations, making freeway travel safer and more convenient. Over the years, directional sign systems for fast freeway traffic have been tremendously improved.

During the fiscal year, 36 functional planting or landscape projects valued at $5,002,800 were financed. The quantities involved in these projects exemplify the amount of work involved in the design preparation. Following is a list of the main items: 4,112 tons of straw, 132,375 pounds of seed, 572 tons of commercial fertilizer, 378,922 assorted trees and shrubs, 3,330,535 ground cover plants and cuttings.

TRAFFIC

In 1960, motor vehicle travel on the State Highway System exceeded 32 billion vehicle-miles, an increase of approximately 6.5 percent over 1959. Motor vehicle travel on rural state highways, based on the annual and monthly traffic counts, was estimated to be over 18 billion vehicle-miles, a slight increase over 1959.

In January 1961, a new statewide traffic census program began operation. A small force of full-time employees in each district, using portable automatic traffic counters, has replaced the approximately 6,000 part-time employees formerly required for the annual July traffic census. The new program provides an estimate of average daily traffic at some 10,000 locations on state highways, including cities. The machine counting program has reduced the annual cost of the census by about $300,000, about half the former cost, while more than doubling the number of locations counted.

Approximately $265,000 worth of new equipment has been purchased for the new program, including 296 recording counters. These counters produce punched tapes showing hourly volumes which are then fed into electric data-processing machines.

The 1960 fatality rate on rural state highways was 7.23 deaths per 100 million vehicle-miles of travel, which is the lowest fatality rate ever recorded on rural state highways in California.

The 1960 fatality rate of freeways, rural and urban combined, was 2.88 deaths per 100 million vehicle-miles of travel.

Geometric Standards and Traffic Service

Research continued during the year on several phases of freeway operations. As part of a nationwide study on ramp capacity being conducted by the Highway Research Board, field observations were taken at several locations in the Los Angeles and San Francisco Bay areas. A study of freeway traffic flow and causes of congestion was conducted on the Hollywood and Pasadena Freeways in Los Angeles. Another study was begun on traffic weaving between freeway on- and off-ramps.

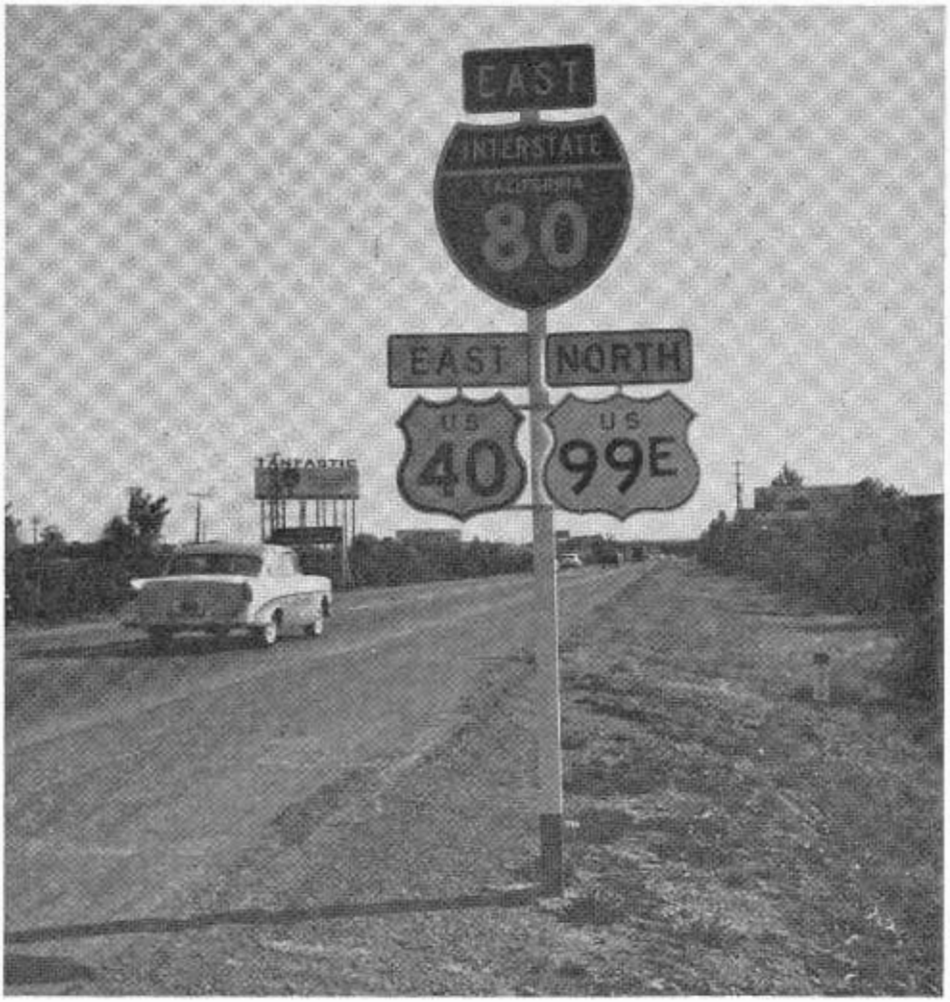
Origin and destination surveys were made at nine locations. These surveys are made to determine present traffic demands and to evaluate the relative service offered by alternate highway locations.

Traffic Signals and Illumination

Contract plans were completed for 154 new traffic signal installations and 119 existing signals to be modernized. Contract plans were also completed for 5,210 lighting standards and 628 illuminated traffic guide signs. The total estimated cost of the electrical work was $9,539,387, not including the cost of steel sign structures.

A total of 164 traffic reports reviewing conditions at approximately 307 intersections were made to determine the need for traffic signals or lighting.

Research projects under way included test installations of new types of vehicle detectors of the ultrasonic infrared and microphone transducer types. A contract was entered into with a private research firm to develop a nuclear energized self-luminous highway directional sign. This



These red, white and blue Interstate route shields are appearing in ever-increasing numbers as construction moves ahead on the State's 2,200 miles of Interstate freeway routes.

project is sponsored by the U.S. Bureau of Public Roads.

A traffic signal system was placed into operation near Sacramento consisting of six signals supervised by a master electronic computer and interconnected by microwave radio covering five miles of highway.

Standard plans for the electrical portions of the new truck weigh stations were developed, including new circuit designs for remote control and read-back of internally illuminated changeable message signs.

Traffic Regulation and Control

A statewide speed survey was conducted during October 1960 which included more than 50,000 individual observations at 146 selected locations on all types of highways. This was the first statewide speed survey since the 65-mile-per-hour maximum became effective January 1, 1960.

A comparison of the 1960 observed speed with previous surveys showed that, except for a leveling off of the average speed in 1958, speeds have risen at a fairly uniform rate since World War II.

The 1960 study showed an appreciably higher percentage of vehicles grouped in the middle speed ranges, 50 m.p.h. to 65 m.p.h. The 15 m.p.h. band between 50 m.p.h. and 65 m.p.h. accounted for 63.8 percent of all vehicles sampled and 67.9 percent of the passenger cars. The comparable figure for passenger cars on freeways showed 70.5 percent in this 15 m.p.h. range.

The average and critical speeds for all vehicles on all types of highways were 54.5 and 61.7 m.p.h., respectively. Comparable speeds of passenger cars were 55.9 and 62.7 m.p.h. for all types of highways, 57.4 and 63.9 m.p.h. for freeways, and 54.1 and 61.4 m.p.h. for two-lane roads. The critical speed, also called the 85 percentile speed, is the speed at or below which 85 percent of the traffic is moving.

As traffic control measures, after investigation and study, the following actions were taken:

- Established 359 speed limit zones on 321 miles of highways, and 43 other traffic regulating measures.
- Approved 115 city and county ordinances regulating traffic movement and parking on state highways.
- Approved requests for a total of 54,270 signs, consisting of 18,643 warning signs, 12,773 regulation signs, 16,000 guide signs, and 6,854 construction and other miscellaneous signs.

HIGHWAY PLANNING SURVEY

The planning survey department is divided into two main operating units, collateral engineering and statistical-financial. Engineering and economic investigations assigned to the Highway Planning Survey usually cover more than one district or are statewide in nature. Many such studies are undertaken at the request of the U.S. Bureau of Public Roads. Most studies are financed partly by federal funds amounting to a maximum 1½ percent of the total annual federal-aid apportionment to California.

Within the statistical unit there is an Electronic Data Processing and Machine Methodology Section which provides data processing and electronic computer services for planning survey and other departments, as well as for other divisions of the Department of Public Works.

The planning library is also attached to planning survey.

Collateral Engineering Studies

City street and county road needs to 1980 were compiled, audited, and summarized by the Division of Highways in accordance with the 1959 Senate Concurrent Resolution No. 62 and were then presented to the Senate Fact Finding Committee on Transportation and Public Utilities in a report dated August 1, 1960. The preparation of the S.C.R. 62 report was accomplished with the close cooperation between all the cities, counties, a 14-member Technical Advisory Committee, and the Division of Highways. This study covered approximately 70,000 miles of county roads and 30,000 miles of city streets.

The first revised estimate of the cost of completing the Interstate System was completed by the districts, reviewed and processed by planning survey, then submitted to the Bureau of Public Roads in September 1960. The estimate covered all of the 2,177 miles of interstate routes in California and included project cost estimates on all sections not completed to standards required to serve estimated 1975 traffic. The revised estimate is being used as the basis of allocating federal-aid interstate funds to the various states for the 1963-66 period.

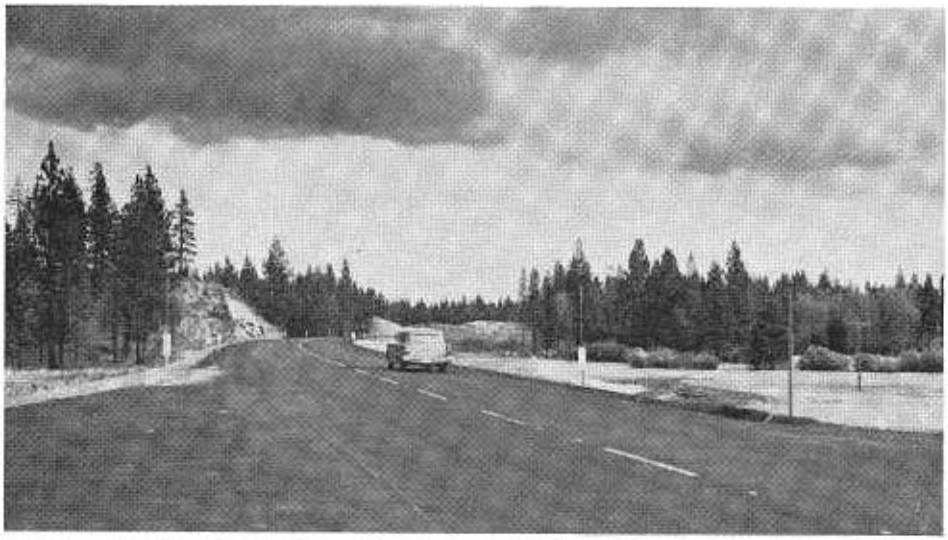
At the request of the Senate Fact Finding Committee on Transportation and Public Utilities, estimates of cost for improvements on the State Highway System to 1980, "State Highway Inventory" (started in the prior fiscal year) were completed. These estimates were used by the committee and the 1961 Legislature in the revision of the statutes relating to the geographic distribution of the state highway construction funds as enacted in Senate Bill No. 1412.

Two special route studies were completed in the fall of 1960 for the State Legislature. Feasibility studies were made for a route from the Arizona state line near Yuma to Niland and to explore either improving the existing State Sign Route 41 or constructing the highway on new location between Paso Robles and Cambria.

A feasibility study of extending State Sign Route 8 from Mokelumne Hill, via West Point, to State Sign Route 88 was also completed and delivered to the Legislature.

The effect of state highway right-of-way acquisition on general assessments, which are a lien against real property levied by irrigation districts, was evaluated for the legal section. This study included estimated future right-of-way acquisitions through 1980 within irrigation and water storage districts.

The 1960 census disclosed a number of new urban areas (places of over 5,000 population). Maps of these new urban areas and maps of all other existing urban areas are being prepared to reflect the latest census data. These maps, which show urban area bound-



This new section of two-lane expressway on U. S. Highway 40 Alternate in Plumas County is typical of the modern two-lane highways which are now being built in many rural and mountain regions.

aries, are made for the Bureau of Public Roads and are used in the administration of federal-aid funds.

A study to prepare in graphical form the physical and traffic features of the existing traversable routes for the through Interstate routes was started in May 1961. This study is being made at the request of the Bureau of Public Roads.

Field surveys of existing geometrics, grades, passing sight distance restrictions, and some topographic features for the entire state highway system, were started in the fall of 1960.

The general plans or elements of a general plan for all cities and counties in the State were tabulated and summarized. The compilation of these data was a joint project of highway planning survey and city and cooperative projects of the division, the State Office of Planning of the Department of Finance, and the Bureau of Public Roads.

Statistical Studies

The methodology and data processing for the long-term Los Angeles Regional Transportation Study (LARTS) is a responsibility of the highway planning survey. Basic surveys for the collection of traffic data were completed in the last six months of 1960. The surveys included a home interview origin and destination survey for about 3,000 dwelling units, a "for hire" truck survey for about 2,500 trucks, a regular commercial truck mail survey for about 15,000 vehicles, and a roadside interview origin and destination survey for autos and trucks at 18 locations on the cordon of the 9,000 square-mile study area.

Data from these surveys and also data from a 350,000 post card subsample (from a 1959 survey carried out by the City of Los Angeles) are being processed and analyzed to develop complete 1960 survey data for all traffic in the study area. A land use inventory for each of about 2,500 traffic zones is also currently being made.

Analysis of all the survey data is providing general relationships as a basis for the development and testing of synthetic trip data to be obtained form a series of mathematical models. The models will utilize trip generation factors derived from the survey data, also land use data for the traffic zones, as a basis for projecting estimates of traffic in future years.

Other studies and services during the year included data collection phases of three special studies carried out primarily for the Bureau of Public Roads—the annual truck weight survey, a passenger car size classification and occupancy study, and the completion of a fuel consumption survey of Division of Highway personnel.

A method was developed for use of the computer to obtain extreme value data in the analysis (information on infrequent occurrences) of rainfall intensities, stream discharge data, and other similar studies. The development of special methods for handling complex metropolitan traffic study routing problems by computer was continued.

Electronic Computer Service

The major programs in the engineering computations field are earthwork computations, traverse computations, and profile grade and grid computations. The use of these programs has greatly increased since they were first introduced in 1956.

The data processing unit is a well-balanced system consisting of key punches, sorters, collators, gang punches, tabulators, and computers. Two new computer units have greatly increased computing capacity in the past year.

Efficient utilization of the capacities of the system requires an understanding of the processes and problems of the department, as well as a capable programming staff. To study problems and possible applications an advisory team has been established. Its function includes co-ordination of the activities of the computing unit to best meet the needs of headquarters and the districts. The team also studies new equipment on the market and new procedures to keep abreast of technological advances.

Financial Studies

Three continuing studies have been carried on in co-operation with the Bureau of Public Roads:

The annual local road and street finance report summarizes the highway transactions of cities, counties, and special districts.

Recording of basic data in the road life and pavement cost study has been continued, and one set of tables of pavement construction and retirement was submitted to the Bureau of Public Roads. Some 12,000 miles of rural state highways are represented in the study.

Improvements were made in the Status of Highways (State Highway Log) and the Federal-Aid Log. Annual mileage reports were compiled for the Bureau of Public Roads and tabulations were provided for state use.

• Bridges

• *The Bridge Department of the Division of Highways is under the administration of the Assistant State Highway Engineer—Bridges and is responsible for the design, construction and maintenance of all bridges and structures on the state highway system.*

A branch office of the Bridge Department is located in Los Angeles to maintain liaison with southern area districts, perform planning functions and supervise construction and maintenance of structures within these districts. All other functions, including all design work, are handled at the headquarters in Sacramento.

For purposes of administration, the department is divided into five sections —Planning, Operations, Special Studies, Office, and Special Projects. The maintenance and operation of state-owned toll bridges are also under the administration of the Assistant State Highway Engineer—Bridges.

The 1960-61 state highway construction budget included $109,836,000 worth of structure work in 86 projects, a 4 percent increase over the preceding year. Most of this was new construction, although some was for widening or strengthening existing structures. Miscellaneous projects including flood damage repair, federal aid secondary projects, maintenance, and work for other agencies financed and contracted during the fiscal year amounted to $22,975,000 for a grand total of $132,811,000.

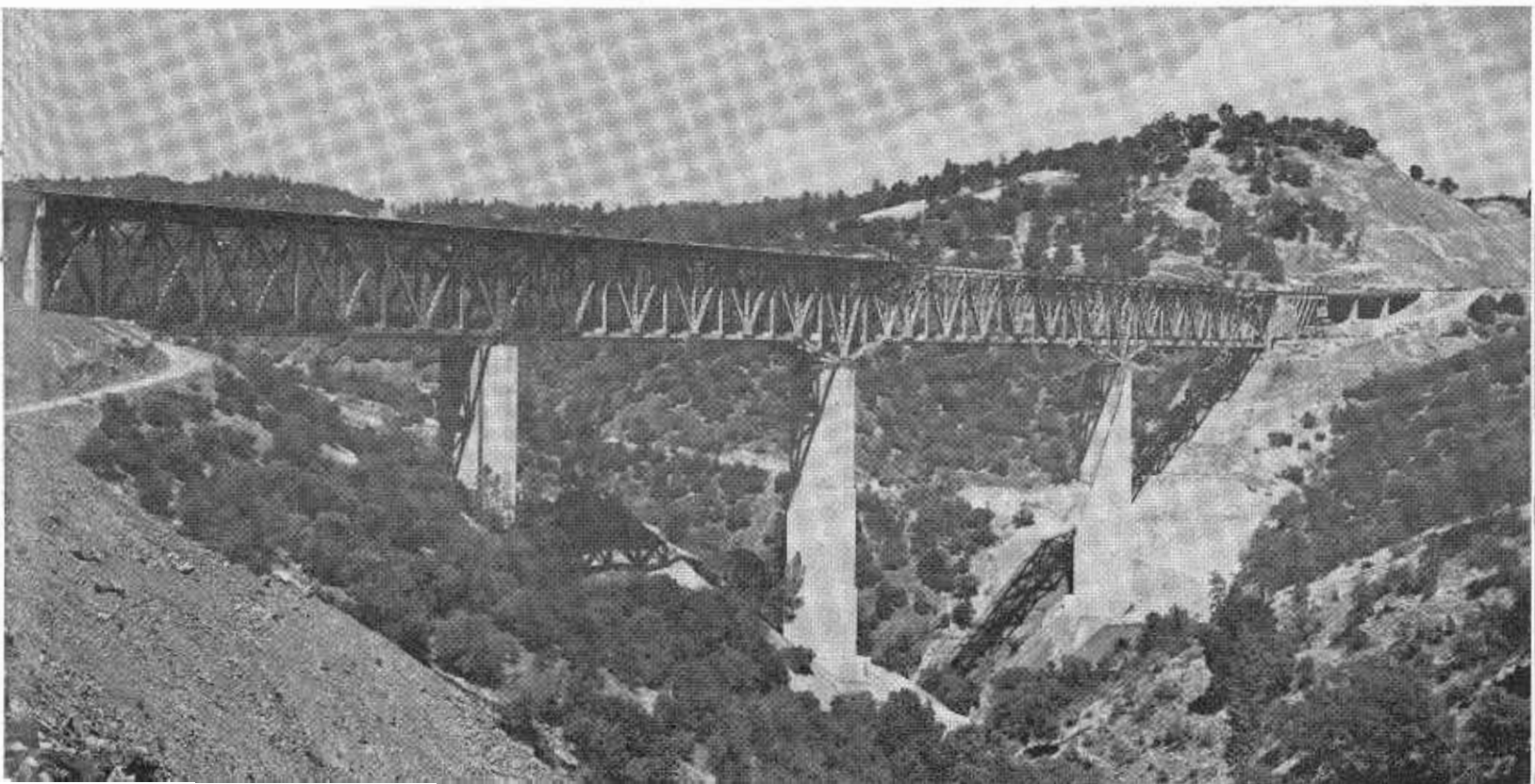
BRIDGE PLANNING

Problems associated with freeway planning through metropolitan areas received special study emphasis. Elevated and depressed alternatives were studied for portions of the freeway system in Sacramento and for the U.S. 101 freeway through Santa Barbara. The feasibility of a two-mile freeway tunnel on U.S. 66 in Beverly Hills was explored. As part of the planning of freeways in the Fresno metropolitan area, 226 different studies and cost estimates of separation structures were made.

The economic effects of fixed bridges over navigable rivers were examined in a report by the U.S. Corps of Engineers after its study of the proposed Sacramento River R Street Bridge on the West Side Freeway (Route 238). While the report contained a clearance recommendation for this crossing only, it also carried economic data to be used later in establishing clearances for six other future bridges between Rio Vista and Chico Landing. The Corps of Engineers is conducting a navigation clearance study for the Route 238 crossing of the Stockton Upper Channel, just above the deep water turning basin. The Advance Planning Section supplied bridge and highway cost data for these studies.

Also investigated during the year were an offshore viaduct for U.S. 101 Alternate near Santa Monica; the feasibility of transporting 400,000-pound missile boosters across bridges; and the co-ordination of the Bridge Department's participation in pre-

Construction crews expect to complete work in 1962 on this new West Branch Feather River Bridge which is being built as part of the relocation of US 40 Alternate around the future Oroville Dam and reservoir. Highway traffic will use the top deck, and the lower deck will carry railroad tracks. — Department of Water Resources Photo



paring of the interstate highway cost estimates and the state highway inventory.

The 526 preliminary bridge design reports completed in the year represented an increase of 24 percent over the previous year and approached the all-time high of 537 reached in 1956-57. Field crews from Sacramento headquarters investigated 315 bridge sites.

Architectural Bridge Design

To show the interested public how freeway structures will look, 70 architectural renderings, 20 photographic retouches and eight models were produced. Many of these were displayed at public meetings or reproduced in newspapers; some were used as exhibits in legal proceedings. These devices were used to show elements of early California style architecture proposed for a freeway viaduct in Santa Barbara and to illustrate the planned landscape treatment of major interchanges in the Monterey area.

The model of a proposed low level bridge across Emerald Bay, which was exhibited at a joint meeting of the California Highway Commission and California Park Commission, had a removable section so that different bridge styles could be viewed in proper setting.

Foundation Section

During the past year, foundations were constructed or nearly completed on several large structures for which foundation studies had been made including the West Branch Feather River Bridge, Benicia-Martinez Bridge and the Webster Street Tube.

The exploration methods utilized in making these studies were seismic, deep water drilling requiring the use of a drilling tower, shallow water drilling from a barge, and surface geological studies.

Practically all foundation supports for these three structures are now in place, and field construction is being checked against predicted foundation conditions.

This year 510 bridge structures and 120 retaining walls, 100 feet to one mile in length, were investigated.

The Randolph Collier Tunnel is being drilled through the mountains at Hazelview Summit on U. S. Highway 199 in Del Norte County. The tunnel and approaches will eliminate the present steep and sharply curving highway.

Design

The most interesting structure for which the design was completed during the fiscal year was the Yolo Causeway across the Sacramento River overflow on U.S. 40 near Sacramento. The $4,800,000 crossing consists of two parallel bridges, each having a total length of 11,680 feet. The two separate bridge sections are 2,880 feet and 8,800 feet long, separated by a one-mile fill. The total deck area, 1,176,000 square feet, is very close to the largest ever placed under one contract and by far the largest in the Central Valley area.

The bridge is remarkable for its low cost. The substructure cost 70 cents per square foot and the superstructure cost $3.10 per square foot. The overall cost of $3.80 per square foot of deck is the lowest since the depression days.

The contractor was permitted the choice of alternative designs consisting of cast-in-place reinforced concrete, precast reinforced concrete and three different types of precast-prestressed construction. The contractor selected the precast-prestressed "M" section which will require 5,256 units each 40 feet long and five feet eight inches wide.

Plans were completed during the year for 43 structures on the San Diego Freeway in Los Angeles County; for the $1,000,000 bridge across the Eel River on US 101 (Redwood Highway) at Myers Flat; and for the last of the 69 structures on the US 40 (Interstate 80) freeway between Weimar and the Nevada line. The total cost of all 69 bridges on the high Sierra freeway will be approximately $11,000,000.

Bridge Construction Costs

Bridge construction costs, as measured by the Bridge Department Construction Cost Index (base year 1939-1940=100), closed the 1959-60 fiscal year with a value of 244 and then moved to successive values of 257, 249, 259, and 261 for the four quarters of fiscal year 1960-61.

Twenty-six bridge contracts were completed during the year at an approximate cost of $13,117,000 which includes $2,581,000 in road work. In the same period, approximately $28,009,000 in structure work was completed in 51 district contracts for an overall total of $41,126,000 on 77 projects involving 252 structures. This compares with 397 structures constructed in the preceding fiscal year. This reduction in number as well as expenditure reflects back to very limited advertising of work in the fall of 1959 and spring of 1960 under temporary federal financing restrictions. At the end of the fiscal year, 185 projects were under construction involving structures amounting to $266,905,000. This included funds for the Benicia-Martinez Bridge, the West Branch of Feather River Bridge and the newly started San Pedro-Terminal Island Toll Bridge, as well as for projects financed from various fiscal year budgets and work on federal-aid secondary projects.

Contracts were approved for two major tunnels on the state highway system: the Caldecott Tunnel on State Sign Route 24 between Oakland and Walnut Creek, and the Hazelview Summit (Randolph Collier) Tunnel approximately 2½ miles from the California-Oregon line on US 199.

Metropolitan Area Freeway Structures

In San Francisco construction started on the Southern Freeway between Milton Street and the James Lick Memorial (Bayshore) Freeway along Alemany Boulevard. The project includes five permanent bridges and one temporary structure, costing an estimated $1,026,000, together with 10 retaining walls at a cost of $1,190,000.

In San Jose, nine bridges and a pumping installation, costing $1,275,000 were completed at the Nimitz-Bayshore Freeway Interchange. Two Bayshore Freeway widening projects, between Mountain View and San Jose, include 16 bridges and one pumphouse at a total estimated cost of $2,139,000.

The third and final stage of the Greenbrae Interchange project on US 101 in Marin County is nearing completion. North of San Rafael on US 101, work started on Miller Creek Road Overcrossing.

By the end of the year, construction was well along on four large contracts, including 25 structures, on the MacArthur Freeway (US 50) in Oakland. About $6,200,000 in structure work was done on this section during the year. Concrete box-girder spans are being used entirely on this freeway, resulting in a pleasant conformity of appearance and in construction economies.

On the various freeways in the Los Angeles area, 137 structures were completed and 372 additional structures were under construction at the end of the year.

The interchange linking the Santa Ana, Golden State, Santa Monica, and future Pomona Freeways, comprising 33 structures, was opened to traffic.

Four contracts on the Santa Monica Freeway, totaling 4.8 miles of the viaduct from the west end of the Los Angeles River Bridge to Vermont Avenue, are well under way, and the section between the Los Angeles River and the Harbor Freeway should be completed in the next year. The total low bid average of the four contracts for structure items for 3,924,500 square feet of viaduct was approximately $25,313,000—or an average of $6.45 per square foot. This very low cost may be attributed to a high degree of standardization, dupli-

An important element in the future freeway system for metropolitan San Diego will be this four-level interchange which is now under construction.

cation and very competitive bidding. The most significant factor in this low cost is the average substructure cost of only $1.20 per square foot achieved through the use of 36- and 48-inch column-piles. A column-pile is a round reinforced concrete column integral with a single cast-in-drilled-hole pile the same diameter as the column.

In the San Bernardino-Riverside area, 14 structures were completed on the Riverside Freeway, and 87 structures are under construction on various freeways and highways in the area.

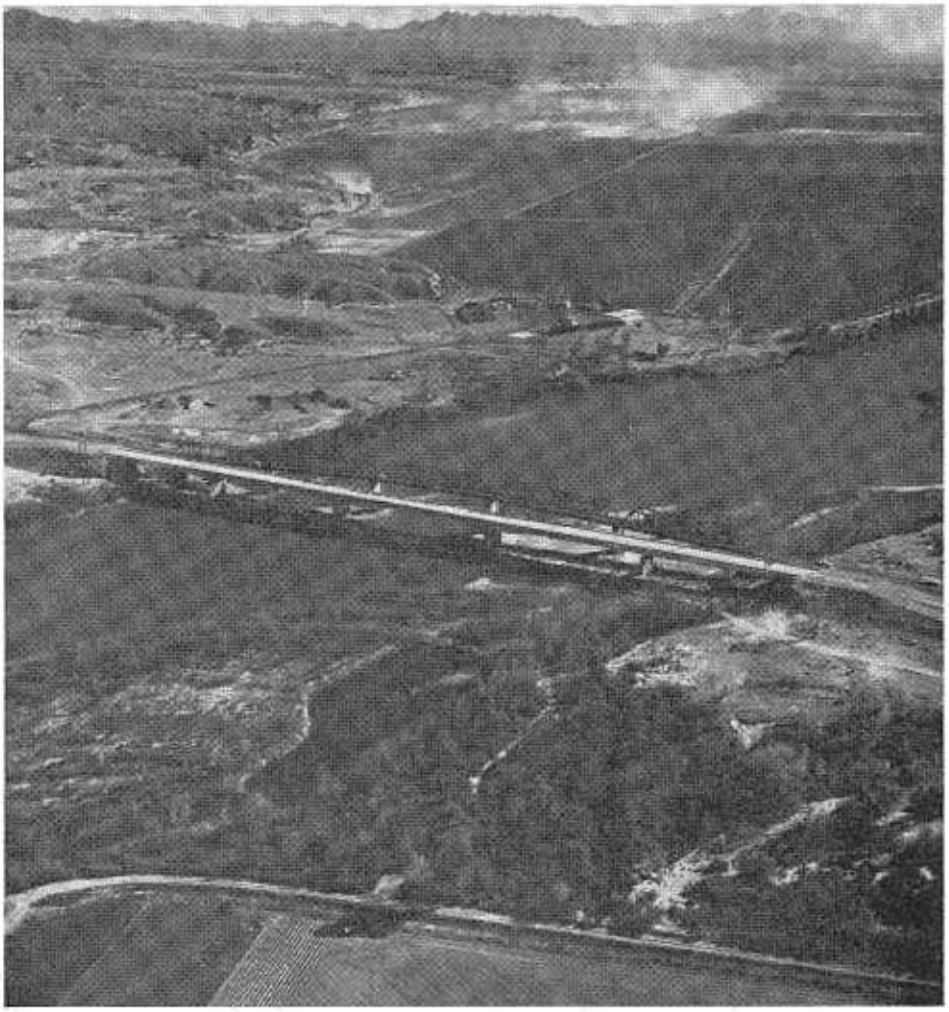
Thirteen structures were completed in the San Diego area, and 69 structures are under construction. Work is well under way on the four-level interchange structure at the junction of the San Diego and the Cabrillo Freeways.

Other Major Projects

Work on the Webster Street Tube under the Oakland Inner Harbor between Oakland and Alameda progressed to the half-way point during 1961.

The total cost of the entire tube project exceeds $20,000,000. The new tube parallels the present Posey Tube, which is one block east. After the new tube is opened to traffic in the fall of 1962, the Posey Tube will be closed for improvements. The two tubes will go into operation early in 1963 as a divided highway with each carrying two lanes of one-way traffic.

At the end of the year, work was approximately 75 percent complete on the combination highway and railroad bridge across the west branch of the Feather River in Butte County. This bridge will carry four lanes of highway traffic on the top deck and a single railroad track on the bottom deck. The project is part of the relocation of the Feather River Highway (US 40 Alternate) and the Western Pacific Railroad around the proposed Oroville Dam and Reservoir. The substructure was completed in the fall of 1960 and structural steel erection was completed in late summer of 1961. The bridge should be completed and opened to highway traffic in the early spring of 1962. Railroad traffic is planned to start on a trial basis during July 1962, after Western Pacific Railroad lays ballast and track.



California and Arizona co-operated in the construction of this new bridge over the Colorado River near Blythe. Photo looks southeasterly into the neighboring state.

A bridge across the Colorado River on US 60-70 near Ehrenberg was completed. The State of Arizona and State of California shared in its cost on an equal basis.

Federal Aid Secondary Bridges

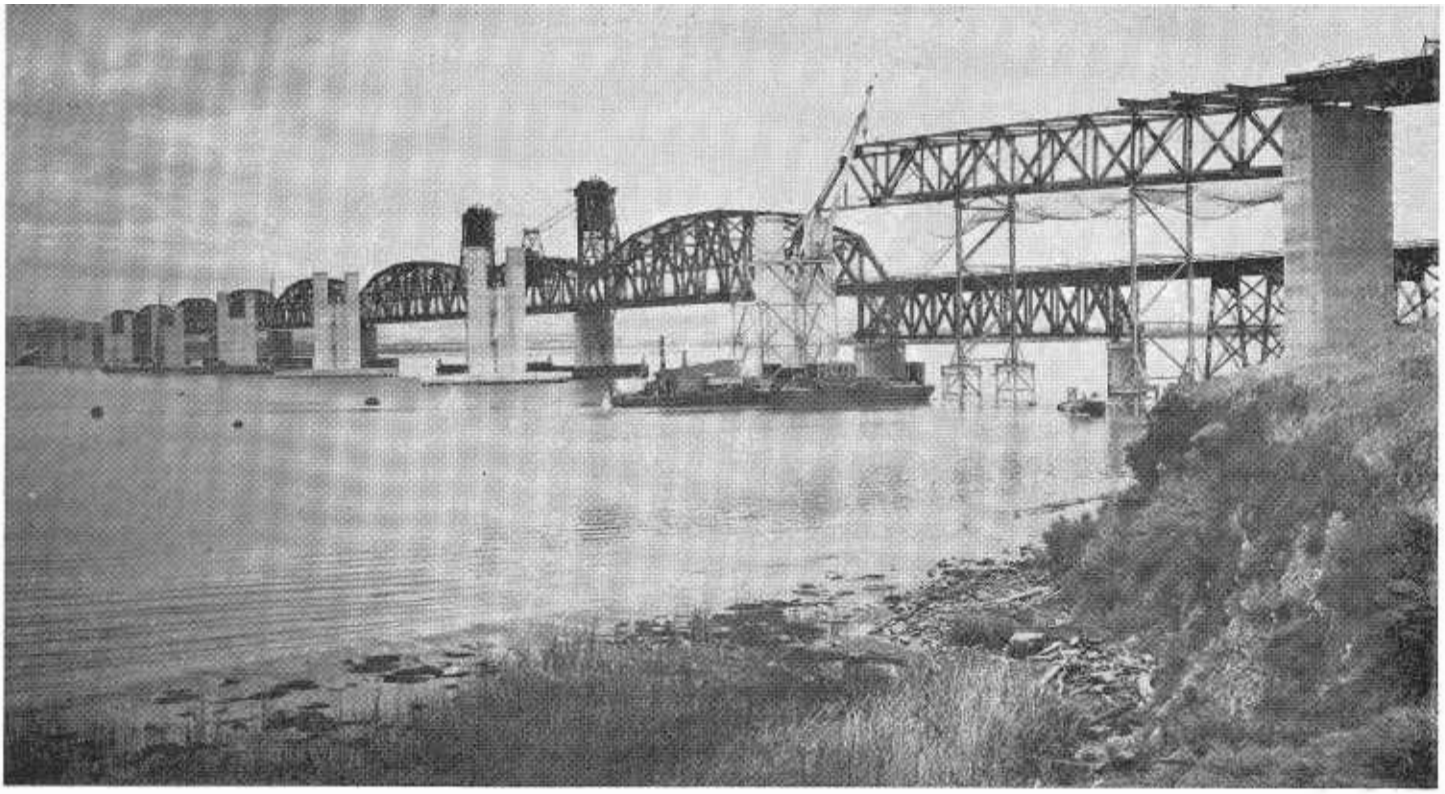
The Bridge Department continued to advise and assist the counties in all matters pertaining to bridges on county roads included in the Federal Aid Secondary System.

Contracts were awarded for the construction of 15 bridges at a total contract cost of more than $2,000,000. Eleven additional bridges, two highway separation structures and one railroad overhead, having a total structure cost of $700,000, were included in road contracts. County engineering departments designed and prepared plans for structures in 16 of the 21 FAS projects that included bridge construction, and furnished construction engineering on all but two of the projects.

Bridge Maintenance

Periodic field investigations were made of the 6,705 bridges of the State Highway System by the bridge maintenance section. Reports and plans were prepared for needed repairs and minor improvements. Capacity ratings for all structures were kept up-to-date. The replacement of structurally deficient bridges was scheduled.

Bridge maintenance work and repairs, not including painting, cost approximately $450,000. A total of $205,000 in construction funds financed other improvements and repairs.



This photograph, taken in May, 1961, shows the pier construction which had been completed and initial superstructure work underway on the Benicia-Martinez Toll Bridge across the Carquinez Strait. The existing lift-span railroad bridge is in the background.

Two timber bridges were destroyed by fire—one west of Blythe on US 60 and the other east of Amboy on US 66. Local detours were provided at these sites pending construction of new bridges.

Engineering investigations were made as required by law and at the request of the local authorities on 40 city and county bridges, for the purpose of establishing their load capacity. Fifteen public hearings were held to post 21 of these bridges for less than legal loads.

New construction made it possible to drop four structures from the list of bridges posted for reduced speeds. On June 30, 1961, there were three bridges and three ferry crossings on the State Highway System which were posted for reduced loads and 34 posted for reduced speed.

The accompanying list of bridges shows all structures of the state highway system. Structures having assorted types and lengths of spans are shown by number and lengths on the basis of the main span, but areas have been segregated and appear under the various type headings. Areas of bridges are based upon the clear width of roadway between curbs plus the clear sidewalk width.

Bridge Maintenance Painting

Five maintenance painting contracts involving nine separate structures were completed, using the new green colors. In addition, three bridges on US 40 near Davis were finished in green. Total allotment for the maintenance painting contracts was about $196,000. Twenty-seven new bridges were also painted under construction contracts. Painting work on the Benicia-Martinez Bridge across Carquinez Strait and the West Branch Feather River Bridge started during the year.

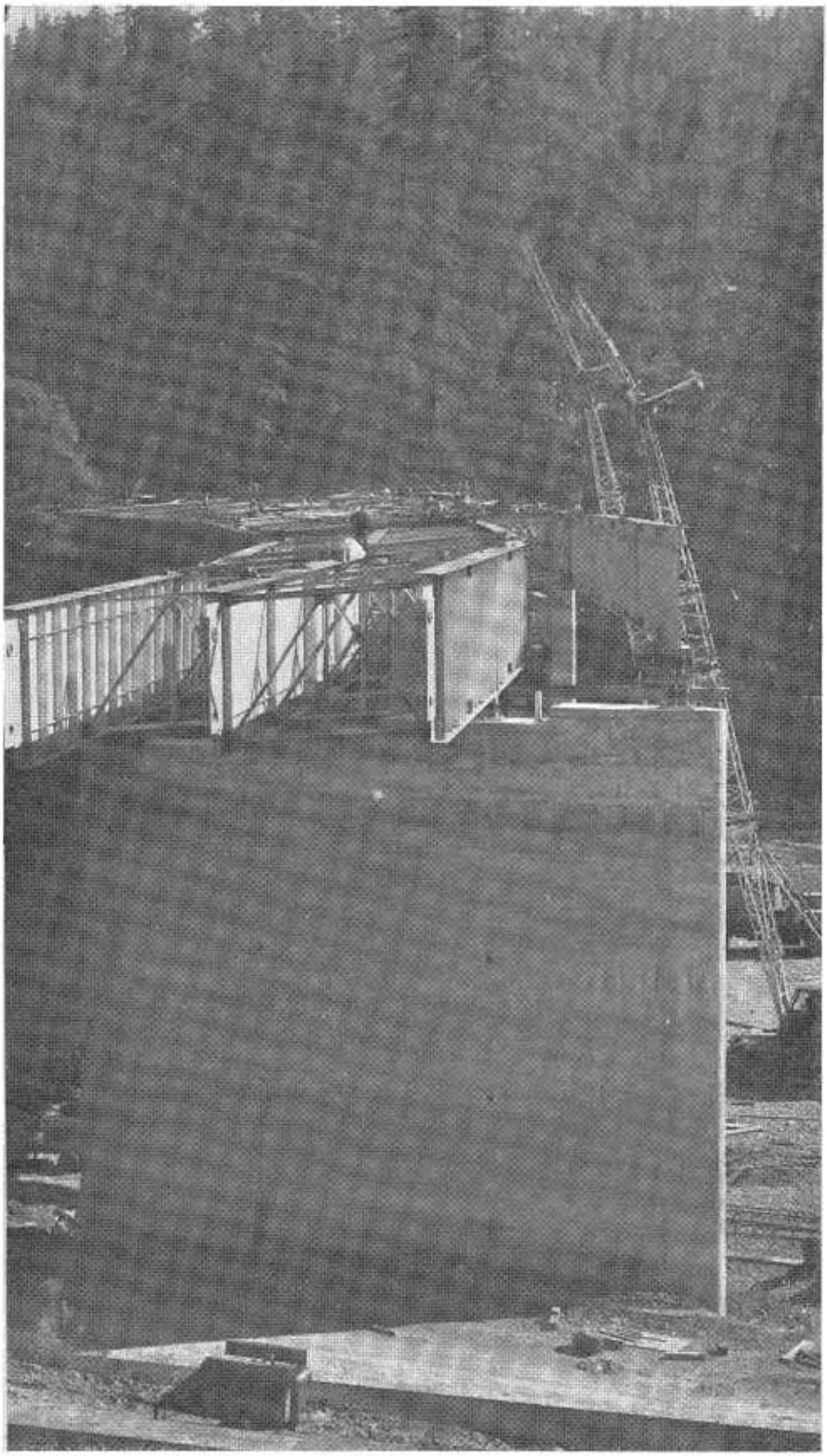
A comparatively new device, which propels small metal spheres at high velocity at the steel surface, is being used in the fabricator's shop to clean much of the steel for the Benicia-Martinez Bridge. The machine eliminates labor in the cleaning process. There is increased use of airless spray methods which reduces to minimum the paint loss through spraying.

Compilation of a more complete record of the humidity range throughout the State has been undertaken to provide for more accurate forecast of the needs in each area and to assist in establishing specifications to meet these requirements.

Special Studies

Activity in structural research increased with the completion of the field phase of testing on the Box Girder Research Project in Oakland. This project, to determine structural characteristics of a concrete box girder bridge, is a joint effort of the Division of Highways and the University of California.

During the past five years, the Bridge Department has participated actively in the development and use of electronic-computed and data processing services. In collaboration with the Planning Survey Department, a library of computer programs has been developed to serve needs peculiar to bridge design and construction. The computor programs relate to structural analysis and design, and materials quantity calculations. They include services for composite steel-concrete girder design, prestressed concrete girder design, concrete column analysis, moment distribution,



Construction is in progress on this new freeway bridge over the South Fork Eel River on U.S. Highway 101 in Humboldt County.

and layout problems involving horizontal and vertical alignment of bridges. Studies in the fields of hydrology, hydraulics, drainage, bridge pier scour and bank protection were continued. The new publication, "Bank and Shore Protection in California Highway Practice" was assembled and edited.

An engineering library on river hydraulics and bridge engineering is maintained.

BRIDGE OFFICE ENGINEERING

Bridge office engineering includes the administration and management of the various service units.

A major function is the negotiation and preparation of maintenance and construction agreements with railroads in connection with construction of railroad grade crossings and grade separations.

Railroad Grade Crossings

Construction was started, underway, or completed on 57 highway projects requiring negotiations with railroads which involved right of way encroachments, installation of additional crossing protection, or construction, alteration or abandonment of grade crossings. At the end of the year, negotiations were in progress for 23 additional projects. Thirty-two projects involving upgrading of crossing protection were completed or underway. On federal-aid secondary routes, negotiations were underway or completed on 36 projects with railroad involvement.

At the beginning of the year, there were 50 railroad-highway grade separation structures under contract, Seventeen grade separation structures were completed during the year. The railroads, in accordance with regulations, contributed a total of $56,000 toward the cost of two of the completed structures. Contracts were awarded for an additional 37 structures.

Railroads will contribute to the construction costs of four separation structures for which contracts were awarded during the year.

$5 Million Grade Crossing Fund

The Public Utilities Commission issued the 1960 priority list containing 18 proposed separation structure projects to eliminate railroad grade crossings on county roads and city streets. In accordance with state law, $5,000,000 in state highway funds is set aside by the Highway Commission each year to pay half the cost of each separation project after deducting the railroad contribution.

As of June 30, 1961, allocations in the amount of $4,771,000 had been made by the Highway Commission from the 1960-61 fiscal year funds for 8 of the 18 projects on the PUC list. list.

SPECIAL PROJECTS

Carquinez and Benicia-Martinez Bridges

The new Benicia-Martinez Bridge is now "out of the water" from a construction standpoint, and the last major phase of construction has been started. Steel truss span erection was started in May, 1961, and the contractor's excellent progress indicates that the bridge may be ready to open to traffic early next summer.

The structure is financed by the sale of revenue bonds which were authorized on October 4, 1955, by the California Toll Bridge Authority in a resolution authorizing the creation of an issue not to exceed $80,000,000. Since this authorization, $46,000,000 in revenue bonds have been sold for the construction of the new, parallel Carquinez Bridge, completed in 1958. The revenues from both structures are to be used jointly to retire the total bond issue. Traffic across the Carquinez Bridge continues to increase. When the Benicia-Martinez Bridge is opened, the added toll revenue should provide for bond retirement earlier than was first anticipated.

BRIDGES ON THE STATE HIGHWAY SYSTEM SEGREGATED AS TO NUMBER, LENGTH AND AREA BY STRUCTURE TYPE, AS OF JUNE 30, 1961

	Number		*Length (feet)*	*Area (square feet)*
Structure type	*1961*	*1960*	*1961*	*1961*
Concrete arch	240	242	39,545	892,823
Concrete girder	1,752	1,649	363,015	21,476,139
Concrete slab	2,278	2,234	137,654	5,711,087
Masonry arch	33	33	962	21,735
Subtotal concrete and masonry	4,303	4,158	541,176	28,101,784
Steel arch	5	5	1,708	26,760
Steel plate girder	339	322	178,815	6,004,254
Steel stringer	285	287	62,328	3,718,707
Steel deck truss	30	29	24,609	1,198,893
Steel pony truss	32	34	10,813	179,674
Steel through truss	69	69	116,965	1,512,874
Suspension	2	2	15,097	884,145
CMP multiplate and arch	67	65	1,365	45,742
Subtotal steel	829	813	411,700	13,571,049
Timber arch	3	3	859	6,352
Timber stringer	622	669	45,310	2,229,722
Timber deck truss	10	10	2,753	39,429
Timber pony truss	1	3	127	2,899
Timber through truss	1	1	79	1,722
Subtotal timber	637	686	49,128	2,280,124
Total bridges	5,769	5,657	1,002,004 (190 miles)	43,952,957 (1,009 acres)
Underpasses	186	185	—	—
Overheads *	223	215	—	—
Combined bridges and overheads *	46	42	—	—
State highway separations *	249	214	—	—
Road undercrossings *	823	738	—	—
Road overcrossings	632	561	—	—
Pedestrian undercrossings *	155	158	—	—
Pedestrian overcrossings	71	67	—	—
Cattlepasses *	84	92	—	—
Tunnels	20	20	14,199	—
Retaining walls	6	6	4,707	—
Miscellaneous	21	22	1,909	20,266
Total structures	6,705	6,518	1,022,819	43,973,223
Drainage pumping plants	180	178	—	—
Railroad grade crossings	682	720	—	—

* Separations so noted are listed under structure type above.

NOTE: One underpass, 16 overheads, one tunnel, and one bridge and overhead also serve as state highway separations.

Construction Moving Along

Construction on the Benicia-Martinez Bridge has moved along quite rapidly the past year. All of the foundation piers were completed and made ready to receive the steel superstructure.

The steel girder approach spans on the Martinez side were erected, and the concrete roadway deck was placed. Erection of the steel truss spans was started in May on the Martinez side.

The bridge is 6,215 feet long. There are nine deep-water piers supported on six foot diameter concrete-filled caissons extending into bedrock about 130 feet below the water surface. The main spans are steel trusses, 330 to 528 feet long. The approach spans are steel girders supported on concrete piers.

In addition to the substructure and superstructure contracts, there were five additional contracts under way as a part of the Benicia-Martinez Toll Bridge Project—the Solano County freeway approach, the Benicia Arsenal right-of-way clearance, the Contra Costa County freeway approach, the widening of Escobar Street in Martinez, and the installation of toll collection equipment.

San Pedro-Terminal Island Bridge

On February 28, 1961, the California Toll Bridge Authority authorized a bond issue not exceeding $7,000,000 toward the construction of the San Pedro-Terminal Island Bridge. On April 11, 1961, $5,000,000 of this issue was sold.

Bids were received March 22, 1961, for work on the substructure and Guy F. Atkinson was low bidder at $2,634,040. The contract was approved and work on the substructure was started May 1, 1961.

On March 23, 1961, bids were received for the steel superstructure. Kaiser Steel Corporation was the successful low bidder at $11,374,000. The contract was approved and work started on May 2, 1961.

The San Pedro-Terminal Island Bridge will be the first major suspension bridge in Southern California. It will be 6,010 feet long, spanning the waters of Los Angeles Harbor. The suspension portion will have a central span 1,500 feet long with two side spans each 506 feet long. The remainder of the structure will consist of steel girder approach spans varying in lengths from 150-220 feet.

The bridge is scheduled for opening to traffic the later part of September, 1963.

STATE-OWNED TOLL BRIDGES

San Francisco-Oakland Bay Bridge

A record total of 39,842,155 vehicles crossed the San Francisco-Oakland Bay Bridge during the year. This is a gain of 3.6 percent over the previous year. The daily average for the year was 109,156 vehicles.

The month of highest average daily traffic was June, 1961, with a new high record of 114,401 vehicles per day. The previous high was in June, 1960, when the daily average was 110,411 vehicles. New high figures for a single day's traffic were established on three successive occasions during the fiscal year—first on August 26, 1960, with 127,803 vehicles, then on May 12, 1961, with 129,140 vehicles, and finally on June 16, 1961, with 131,826 vehicles. The highest record for the preceding year was 126,865 vehicles on September 4, 1959.

The revenue derived from vehicular tolls, rent, and miscellaneous services, exclusive of interest, was $12,094,511. This was an increase of $201,520 over comparable revenue of the previous year.

A contract for reconstruction of the eastbound toll plaza was partly completed. This work, when completed, will provide 17 modern toll booths, and all tolls will be collected from the driver's side of the vehicle.

Work was also under way at the end of the year on major repairs to the timber fenders which protect the bridge piers in the principal navigation channels.

The Division of Architecture completed a modern installation to provide a workshop, lunchroom, and cleanup facilities for the West Bay painters.

The Division of San Francisco Bay Toll Crossings continued work on the $35,000,000 remodeling which will convert the bridge for five lanes of one-way traffic on each deck.

The total amount expended during the year on general paint maintenance was $784,018.36.

San Mateo-Hayward and Dumbarton Bridges

The total traffic on the San Mateo-Hayward Bridge for the year was 3,646,253 vehicles, and the toll revenue amounted to $1,395,183.05. For the same period, the traffic on Dumbarton Bridge was 2,477,290 vehicles, with a corresponding toll revenue of $952,765.75.

The temporary toll plaza facility at Dumbarton Bridge was further improved by the addition of a protective canopy structure over the toll lanes. At the end of the year, additional improvements to the temporary plaza were under way to provide for a fourth toll lane and the installation of electronic toll collection equipment. The fourth lane will make available two traffic lanes in both directions. This improvement was made necessary by steadily increasing traffic, plus the need for additional time to permit an embankment to settle at the site of the permanent toll plaza.

Approaches Improved

Dumbarton approaches were improved to provide two 12-foot lanes with 8-foot shoulders in place of the former 13-foot lanes and 3-foot shoulders.

The Division of San Francisco Bay Toll Crossings continued operations which will ultimately result in expanding the traffic capacity of the San Mateo-Hayward Bridge. During the year, work started on construction of embankments at the future toll plaza site, and bids were called for on construction and reconstruction of the easterly portion of the trestle structure.

The lift span operation was continued on both bridges as required by federal law. During the year, there were 2,201 lifts of the San Mateo-Hayward Bridge and 1,229 lifts of the Dumbarton Bridge.

Maintenance costs of the San Mateo-Hayward and Dumbarton Bridges were paid from the State Highway Fund, in accordance with state law and the bond resolution.

All outstanding bonds on both bridges were called during the fiscal year. Tolls were continued, in accordance with law, to provide funds for improvement and enlargement of the San Mateo-Hayward Bridge.

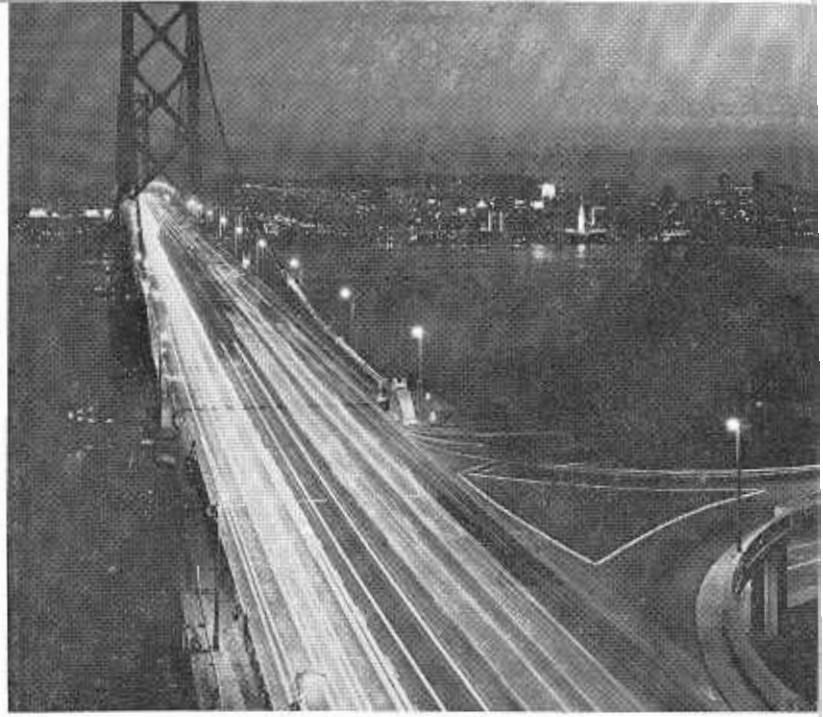
Richmond-San Rafael and Carquinez Bridges

The traffic total on the Richmond-San Rafael Bridge during the year was 3,466,958 vehicles, and revenue was $2,912,458.50. These figures represent increases of 7.71 percent and 5.87 percent, respectively, over the preceding year.

A total of 13,428,582 vehicles used the Carquinez Bridges during the year, and $4,578,444.50 was collected. This was a traffic increase of 8.98 percent over the previous year, and a revenue gain of 5.33 percent.

A contract to stabilize hinges on the Carquinez interchange structure was completed during April, 1961. This work involved placing tie rods diagonally across the hinges to reduce transverse movement. Rods were placed across the three hinges where the bridge is on a curve and the movement was the greatest.

25th Birthday



On November 12, 1961, the San Francisco-Oakland Bay Bridge celebrated her silver anniversary, marking 25 years of traffic service which has long since earned for her the title of "Main Street of the Bay Area."

There can be little doubt about her right to the title. On or about her 25th birthday the 650,000,000th vehicle crossed over one of her two levels of decks bound either from the East Bay to San Francisco or the other way around.

Now, that's quite a few cars. It's enough to extend bumper to bumper from here to the moon nine and a half times. Not only has she born the brunt of commuter traffic across the bay, she is also the western end of two trancontinental highways, US 40 and US 50. On an average day she carries 110,000 vehicles, on peak days as many as 133,000. When current reconstruction work is completed, she will be able to carry many more in five lanes (one way) on each deck.

Yes, the 25-year-old matron has come of age and then some. What's more, after all this time her statistics are still impressive.

Hands down, she's still the longest high-level bridge in the world—eight and a quarter miles.

The top of her highest tower is 519 feet above the water; her deepest pier is 242 feet below water level.

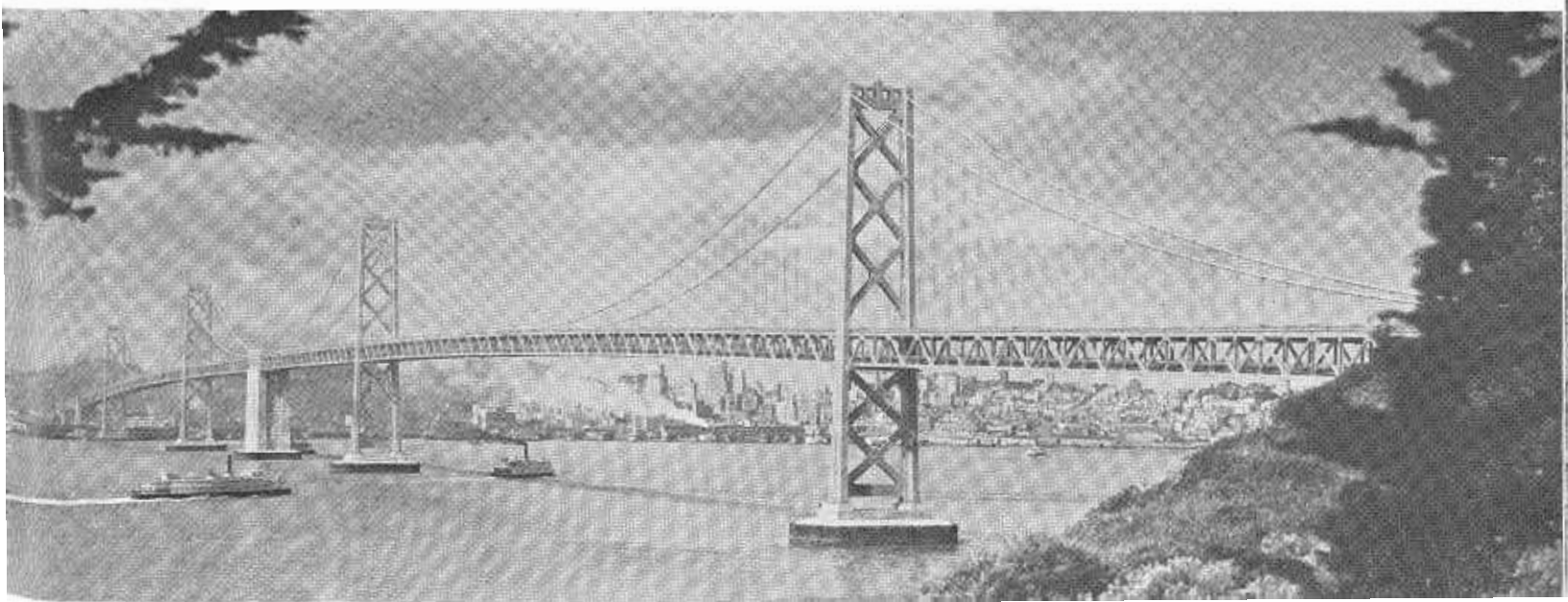
The length of all her cable wire totals 70,000 miles.

The concrete and reinforcing steel in her were enough to rebuild all the large office buildings in downtown San Francisco at the time of her construction.

The timber used during her construction was enough to building 3,000 five-room houses, enough for a town of 15,000 people.

Statistics aside, one thing is certain. After all these years it is still difficult for a Californian and especially a Bay area resident to repress a feeling of pride when he gazes upon the mighty structure across the bay which still holds a place among the wonders of the modern world.

PHOTO ABOVE—A night shot of the Bay Bridge looking west toward the San Francisco skyline from the Treasure Island Turnoff on Yerba Buena Island. PHOTO BELOW—Perhaps more typical of the Bay Bridge in the memory of most Californians is this photo taken some years ago while some of the ferries were still plying the Bay. San Francisco is in the background.



• Personnel & Information

• *The functions of personnel, training, safety, audio-visual, and public information are grouped administratively under the direction of the engineer in charge of Personnel and Public Information*

PERSONNEL

Because of the expanded highway program, the total personnel of the division increased from 14,057 to 15,421 during the year. Most of this was in the engineering staff, with an approximate increase of 960 for a total of 7,908. At year's end, there were also 3,845 maintenance employees, 552 right-of-way agents, 468 in equipment maintenance, and 2,648 employees in administrative service, accounting, and clerical classes.

Position Classification

In order to meet recruitment needs or changing job conditions, a number of new classifications or revised class specifications were adopted. Primary among these were nonprofessional engineering classes at the assistant level in the highway, bridge, and physical testing series. In conjunction with this action, qualifications for other engineering classes were amended to require engineering training or possession of an engineer-in-training certificate to promote the utilization of professional engineers.

Other classifications, such as toll collectors, right-of-way agent series, communications, field office assistants, and accountants have been reviewed for necessary changes. Pertinent data on salary needs have been submitted to the State Personnel Board where appropriate. Examination needs and procedures have been reviewed, with greater participation by division staff in some of the examination processes.

During the last part of the year, the Personnel Office participated with State Personnel Board staff in a classification audit of the positions in the divisions. A sampling of approximately 20 percent of the jobs was made. This audit will result in changes and updating of a number of the classifications used by the division.

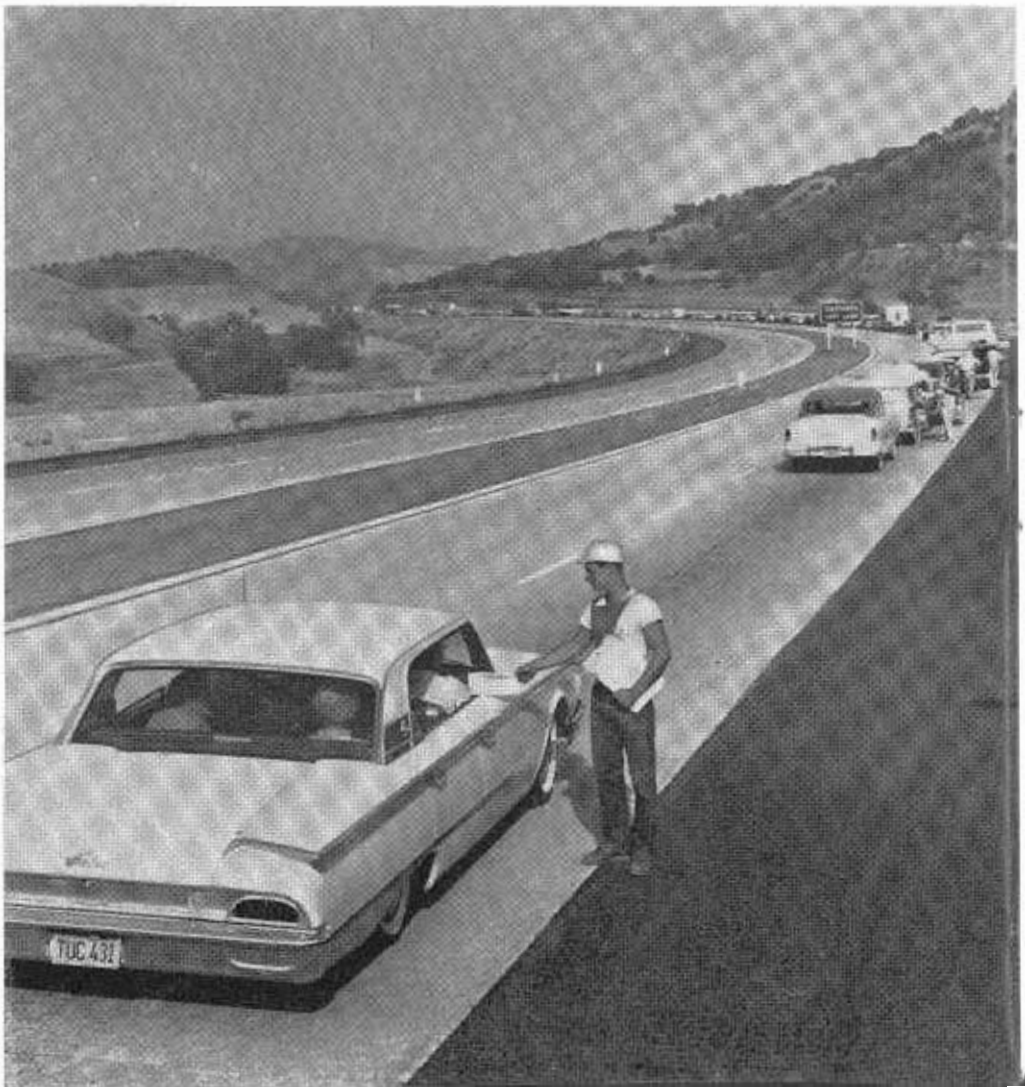
Personnel Management and Recruiting

In conjunction with the classification audit, a personnel management inventory was also conducted by a sampling of employee opinion on such subjects as supervision, communications, working conditions, sick leave and vacation, and overtime policies.

During the year a new performance appraisal and employee development program was installed, tailored to meet the division's needs. All supervisors were trained in this process, and all employees were given information on their expected participation in the program.

The division has continued to participate in the Personnel Board nationwide recruitment program for junior civil engineers. As a result of these tours, approximately 150 appointments

A flagman hands out a leaflet which explains the reasons for a traffic delay on US 466. The Division of Highways has found that motorists appreciate this courtesy when detours cannot be provided and long delays are necessary. Anticipated delays are always publicized ahead of time, and signs are posted to inform motorists of closing schedules.



were made during the fiscal year. This number, however, was not sufficient to meet the needs created by increased work load and normal turnover. Additional recruiting efforts, both in California and on a nationwide scale, are being undertaken.

Statistics

For some time the Personnel Department has been utilizing the services of the electronic data processing section for record keeping purposes. This program is now being expanded, and it is expected that additional personnel records will be automated.

During the year, 27 employees were dismissed (five with permanent status, 22 with temporary status). Eight were rejected during the probationary period. There were 28 disciplinary suspensions and one disciplinary demotion.

A total of 111 employees retired, making a total of 1,641 who have retired from the division. One hundred 25-year awards were given with appropriate ceremonies, making a total of 1,984 since the program started. During the year, 65 visitors from 17 foreign countries were given training and information.

TRAINING ACTIVITIES

The Division of Highways training program encompasses activities designed to meet agency needs by developing employee and managerial proficiency and talent.

During the year there were 174,100 man-hours of training in the major areas of orientation, supervision and management, technical and professional, safety, maintenance, and clerical. Most training was on state time, but there was a substantial amount on the employees' own time. There were 27,002 hours of instructors' time.

Supervision and Management

A new employee appraisal and development plan was placed in operation. Under the plan, the determination of agency training needs is co-ordinated with the supervisory appraisal of each employee's performance.

Supervisors and employees analyze the employee's performance and recommend the development activities necessary to gain maximum use of the employee's potential. All managers and supervisors participated in small-group training sessions covering the new program.

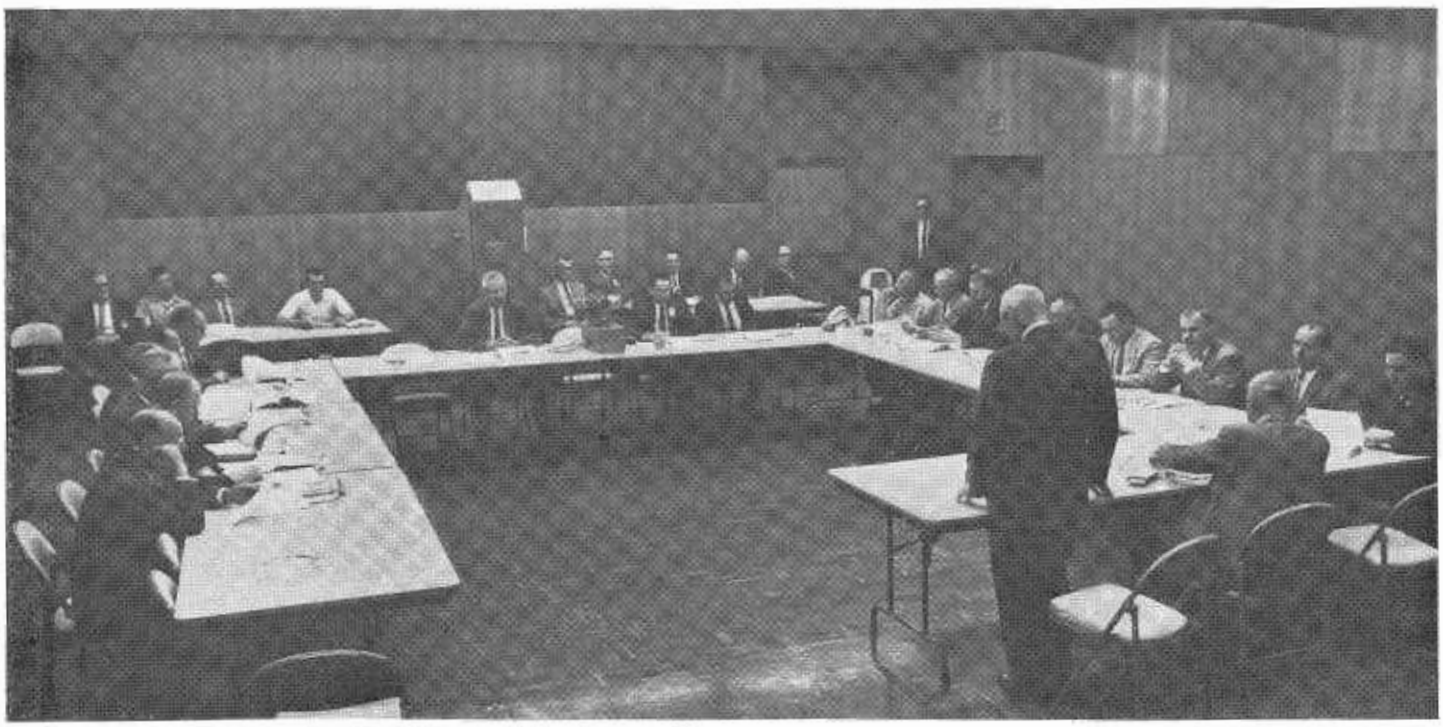
A 70-hour supervisory course for first-line supervisors in engineering, right-of-way, and administration was developed and tested. It includes planned home study, action assignments, and workshop discussion meetings. A 16-hour supervisory training course has also been developed and installed for supervisors of clerical personnel.

Division personnel took part in the annual interagency management conference and in the regional middle management conferences. Individual managers also participated in special interagency management development courses.

Total supervisory and management training time was 18,166 man-hours.

Professional and Technical

Professional and technical training amounted to 100,742 man-hours in both district- and headquarters-originated programs. Training programs covered such subjects as right-of-way negotiations, drainage design in high-



Training sessions on "Procedures, Testing Methods and Use of Materials for Highway Purposes" were held during the year. The Division of Highways conducts extensive training programs for employees at all levels.

way practice, portland cement concrete paving, automotive electricity, and right-of-way engineering.

Formal training was also used to help establish new agency programs in fields such as construction job accounting, and machine accounting methods.

The compulsory two-year rotation program for junior civil engineers continued, with 644 engineers participating. In some instances, employees were sent to educational institutions for special training.

Employees also participated in special courses on real estate appraisal, electronic data processing, fundamentals of traffic engineering, vehicle maintenance, motor vehicle fleet supervision and electric welding procedure.

EMPLOYEE SAFETY

The statewide accident prevention program of the Division of Highways is designed to develop accident prevention methods, to obtain useful statistical information, to prevent industrial accidents and injuries, and prevent motor vehicle accidents where state-owned equipment may be involved.

Full-time employees are designated as safety supervisors in 10 districts. The remaining district has an employee assigned to this function for one-half of his time. The Bridge Department, State-owned Toll Bridges, Service and Supply, Materials and Research and Equipment Departments also have safety supervisors on a part-time basis.

Safety supervisors make investigations and recommend safety programs and protective devices. They also check on compliance with regulations relative to safety, health, and fire prevention. They investigate accidents and advise employees on accident prevention.

Each district and major department has a safety committee, mostly composed of staff officials. The committee meets monthly and reviews accident reports to determine appropriate action to prevent recurrence and may recommend disciplinary action.

The monthly district safety meeting minutes and statistical information on the number and type of accidents are briefed for the Division Safety Committee, which meets each month.

Occupational Accidents

All accidents, both industrial and motor vehicle, involving Division of Highways personnel or equipment are coded monthly and annual statistical reports prepared. Accidents are reported according to the American Standards Method of Recording and Measuring Work Injury Experience. Frequency and severity rates are compiled, and used to determine the effectiveness of the program.

The Division of Highways has shown an almost continuous yearly reduction in accidents since the establishment of a formal safety program. In 1941, the accident rate was 49.85. This rate has been reduced to 14.62 in 1960. The reduction in frequency has been accompanied by an increase of employees from 5,500 in 1941 to 15,566 in June of 1961.

The effect of the accident reduction is indicated in compensation insurance costs which have been reduced from 0.58 per $100 of payroll in 1950 to 0.28 per $100 of payroll in 1960.

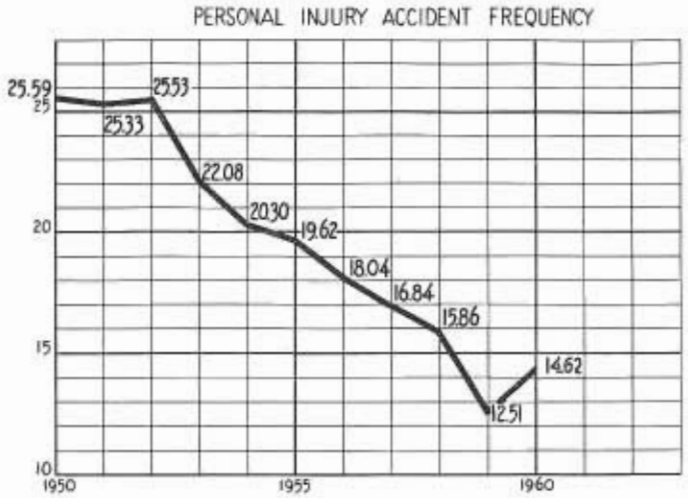
Driver Training

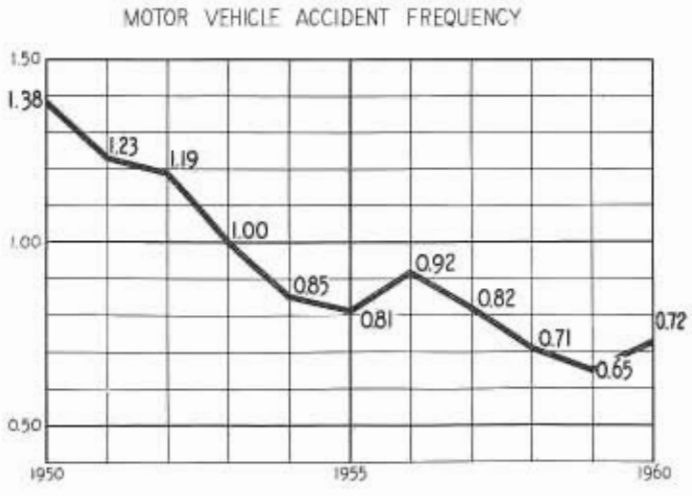
During the year, the Division of Highways generated 31,807,148 miles and had a frequency rate of .72 as determined by the formula,

$$\frac{(\text{number of recordable accidents} \times 100{,}000)}{\text{total mileage}}$$

All employees who drive a state-owned vehicle have now had a course in defensive driving. New employees are given the course and have their previous driving record reviewed. Older employees who have three or more accidents are subject to review of their motor vehicle driving record, additional training, removal of the privilege of driving a state car, or disciplinary action.

The driver training program consisted of a three-hour lecture, a road observation run, and psychological tests to determine visual acuity, depth perception, peripheral vision, color vision, and reaction time. These tests were designed for the employee to determine for himself or be advised of his personal limitations so he could compensate for these limitations in his driving activities. A total of 15,044





were provided this defensive driver training.

Fire Prevention

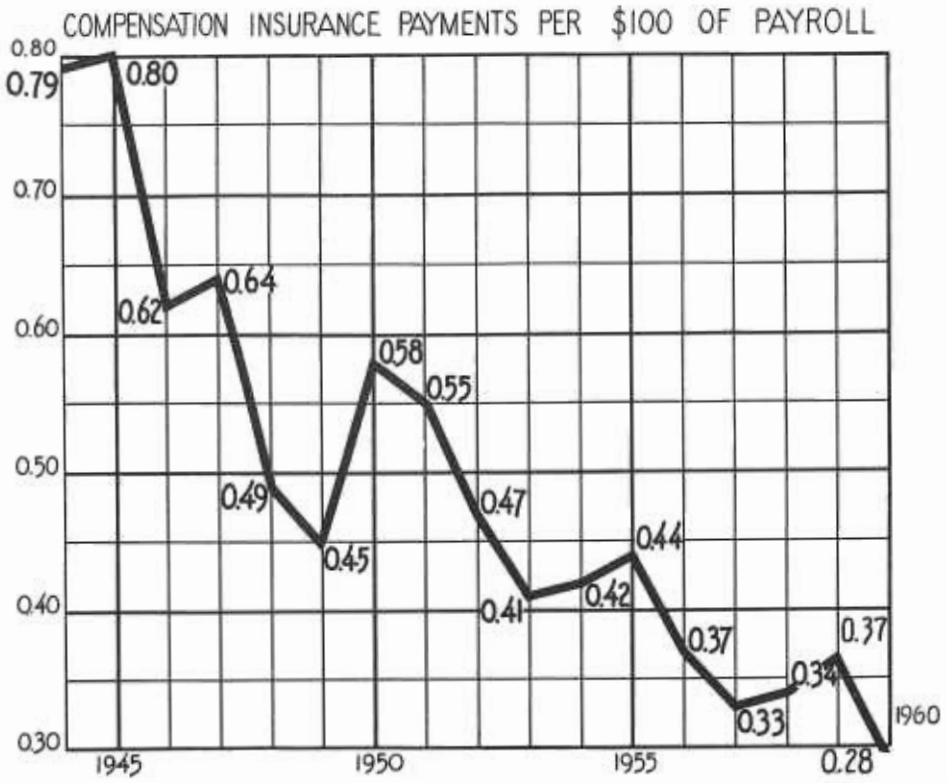
The Safety Section continues to promote meetings throughout the State where fire extinguishers are demonstrated and employees are given an opportunity to practice with them. Fire protection equipment most appropriate to different types of fire are stressed.

Employee Suggestion Program

The Merit Award Program (both employee suggestions and work improvement proposals) within the Division of Highways is handled by the Safety Section.

Work of this activity for the fiscal year 1960-61 is summarized as follows:

Total number of suggestions (including WIP's) processed	960
Total cash awards	160
Total amount of cash awards	$4,150.00
Total number of certificates of commendation awarded	97
Total estimated savings resulting	$41,500.00



AUDIO-VISUAL

The audio-visual section assists headquarters departments and the districts in producing graphic or sound recording aids for personnel training or public information uses.

A large collection of colored slides covering statewide highway scenes and a wide variety of technical engineering and construction operations is kept up to date. Audio-visual equipment is made available for use by headquarters or district personnel in training or public presentations.

The staff of the section has recently prepared slide presentations on "Prestressing Concrete," "Management Development," "Data Processing," and "Slip Form Construction." It has also completed a filmstrip on "Embankment Construction."

PUBLIC INFORMATION

Wide public interest in California's highway program continued throughout the fiscal year. Extensive use was made by the press and other media of both routine and special news releases. Many inquiries by specialist writers were answered and a large number of photographs made available.

Special Events

The Division of Highways joined with other highway departments throughout the nation in observing National Highway Week May 21-27, as proclaimed by President Kennedy and supported in a statement by Governor Brown. Wide use was made of a special statewide news release reporting progress in freeway and other highway construction. The various districts co-operated with news media in presenting the highway picture on the local level.

The division continued State Fair exhibits in 1960 and 1961 after this activity was resumed in 1959. The 1961 exhibit was in the educational area opposite the Hall of Flowers and featured the landscaping of freeways. In the foreground of an exhibit space measuring 36 x 10 feet was a model of a city section of landscaped freeway and on the rear wall enlarged color photographs of existing freeway sections. Ribbons from the photographs keyed the planting to 12 types of shrubs and plantings used, so that the viewer could identify the actual plants with the photographs.

Publications

The bimonthly magazine *California Highways and Public Works* continued as the principal publication of the Department of Public Works and the Division of Highways. While its main distribution is in California to employees of the division and other interested persons, there was a growing demand for it in other states and foreign countries. Numerous articles from the magazine were reprinted, and many photographs were furnished to editors and writers for foreign and domestic publications.

Public information material issued in published form included, in addition to regional material prepared by the various districts:

- —"California Highways-1960", a 12-page illustrated reprint from *California Highways and Public Works* magazine constituting a concise, nontechnical version of the division's annual report.
- —"California's Freeway Planning Team", a leaflet prepared principally for the use of legislators and public service organizations in explaining highway planning procedures.
- —"California Roadsides", a 38-page reprint of four articles on landscaping and functional planting which appeared in *California Highways and Public Works*, plus an exhaustive list of suitable plants.
- —"Freeway Facts", an illustrated booklet containing basic information about freeways and route adoption procedures, widely used at district public meetings (reprinted in 1961).
- —Reprints of articles and district roundups published in *California Highways and Public Works*, used as informational mailing pieces to answer a wide range of inquiries.
- —"Clip Sheet", which provides information for use in employee publications issued by each district and some headquarters departments, as desired by the respective editors.
- —"Report to the Governor", a monthly summary of important developments in the work of the Department of Public Works, intended for the information of department heads in state government and the press.

Route Considerations

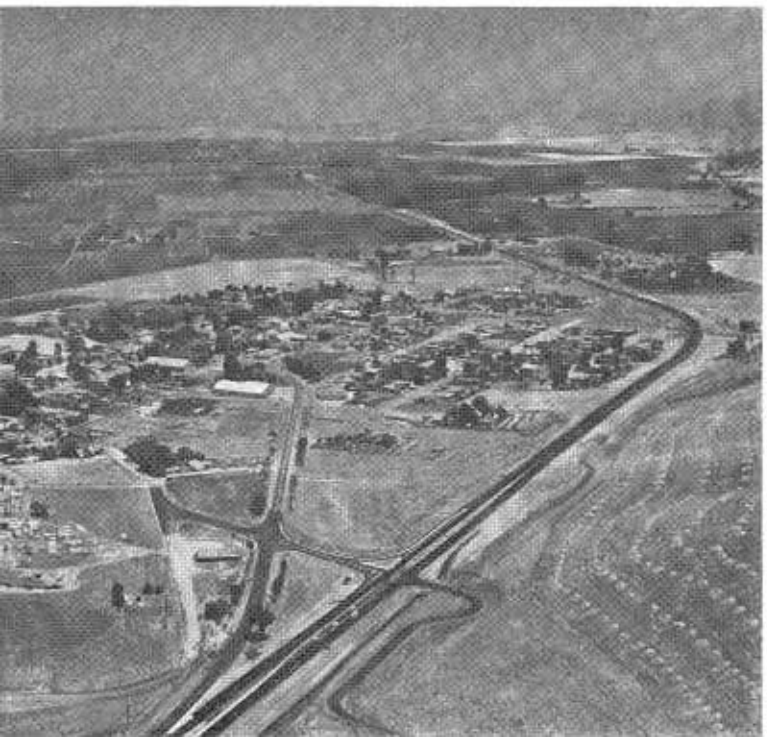
News releases on routings considered and acted on by the California Highway Commission totaled 90 during the fiscal year, of which 33 were accompanied by maps specially prepared for newspaper reproduction. Due advance publicity was given five public hearings scheduled by the commission.

Other News Releases and Media Contacts

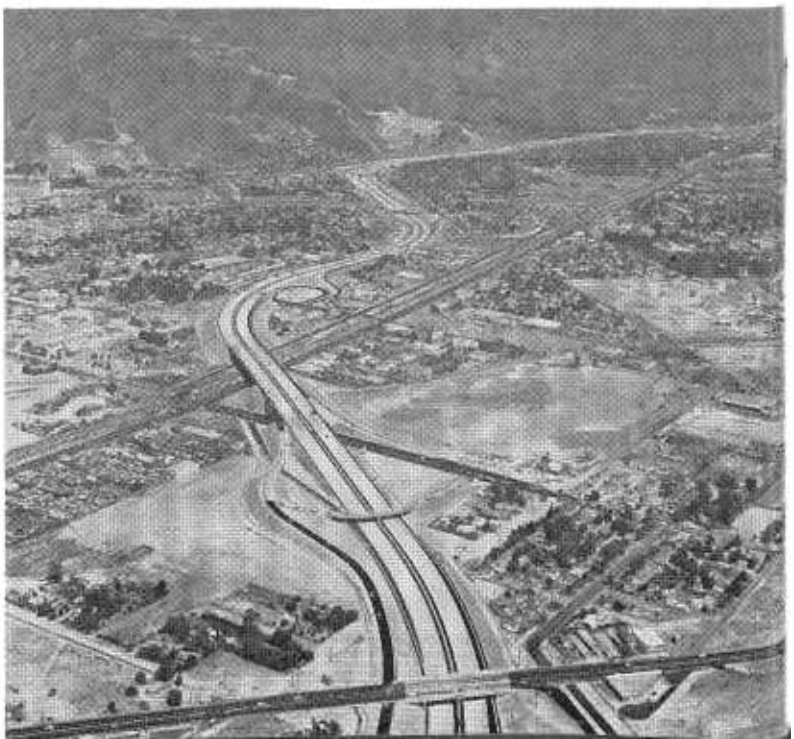
The continued expansion of the California highway program was reflected in the quantity and scope of news releases issued by the division, with a continued increase in this activity in the various districts. A large number of photographs of highway projects were supplied to newspapers and magazines on request, particularly on major freeway projects.

Information on the highway program was also issued through telephone calls, office interviews, correspondence and appearances by division personnel on radio and television programs, and before local civic organizations and service clubs.

Traffic is now using this recently completed expressway bypass of San Juan Bautista on State Sign Route 156. The new route replaced the former highway (left) through the center of town.



Recently completed section of the Golden State Freeway (US 6-99) in the vicinity of Burbank, which will be part of the future "loop bypass" around the central district of Los Angeles.



• Right-of-way

• *The Right-of-Way Department appraises and acquires property required for state highway purposes; manages such property in the preconstruction period, and arranges for the removal or relocation of improvements and utility facilities to clear the right-of-way. It also handles appraisals, negotiations, and purchases for the Department of Water Resources and the State Public Works Board. There was an average of 517 individuals working in right-of-way classes during the year.*

During 1960-61, the right-of-way department completed 9,293 property transactions involving a total expenditure of $159,719,779.30. Of these transactions, 8,305 involved acquisitions for highway right-of-way, 641 were for utility relocations, and 347 for other uses, such as for other state agencies.

The distribution of the total expenditures is as follows:

Highway right-of-way	$129,847,629.12
Utility relocation to clear highway right-of-way	9,032,728.30
Acquisition other than right-of-way (primarily lands purchased for other state agencies)	8,404,025.36
Overhead (total—including right-of-way activities, land management, right-of-way clearance, fees for title services and administration)	12,435,396.52

Land Management

This phase of the department's operation included the leasing of 7,475 properties during the interim period between acquisition and clearance of rights-of-way and also included the sale of improvements and excess properties.

The fiscal year produced a gross return to the State Highway Fund of $12,622,682, which is an increase of $604,166, or 4.8 percent, over the preceding fiscal year.

Excess Land and Utility Relocation

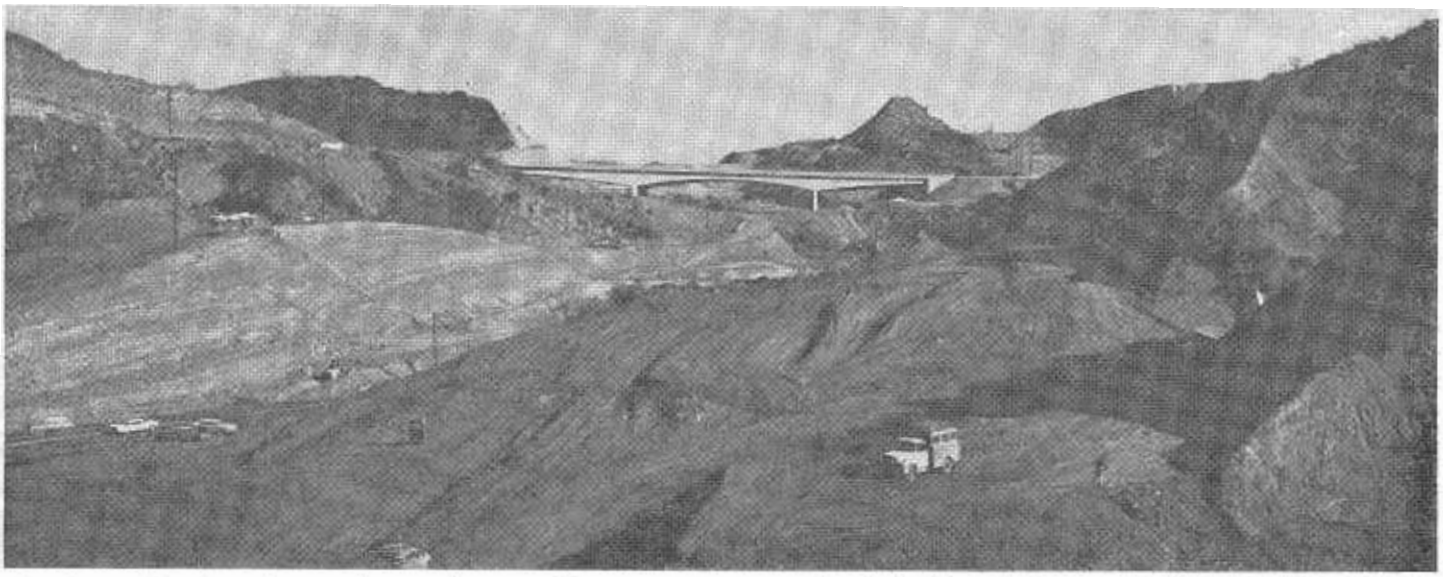
Excess lands not required for right-of-way purposes are returned to private productivity and tax rolls as soon as possible. During the year, 698 parcels of excess land were sold or exchanged. These excess parcels were acquired to avoid payment of excessive damages or because the remainders were too small or irregularly shaped to be developed economically as individual parcels. The department has combined many small and irregularly shaped parcels and by this process has returned many desirable sites to public use.

Relocation of utility facilities to accommodate proposed highway construction, is the responsibility of the right-of-way department. Relocation costs have increased appreciably in the past 15 years. During the year, 641 state-utility owner transactions for relocation totaled nearly $22,000,000.

Acquisition Policy

Acquisition of properties is based on the undeviating policy that all owners be allowed sufficient time to consider the settlement offer and to make arrangements to relocate with a minimum of hardship. A request for resolution of condemnation is not pre-

Freeway is now being built on U. S. Highway 101 through Ventura. The project includes a new bridge over the Ventura River (top center) at the northwest city limit.



This February photo shows heavy grading on the route of the San Diego Freeway through the Santa Monica Mountains in Los Angeles County. The project requires massive excavations. Bridge in background will carry Sepulveda Boulevard over the future freeway.

sented to the California Highway Commission until it is clear that a reasonable time for deliberation and decision has been afforded the property owner.

Despite pressures of meeting construction schedules, the time allowed for the process of appraisal and negotion must be sufficient to permit determination of fair market value.

Acquisition Methods

The department will not permit "horse trading" in negotiations for the purchase of properties. The department's fair market value one-price policy was established many years ago to protect the interests of the property owners, as well as the State, and especially those owners who may be unfamiliar or inexperienced in real estate transactions and values.

The effectiveness of these policies and methods is evident from the ratio of negotiated settlements to contested court cases. During the fiscal year, of the 8,305 parcels acquired, only 208, or 2.5 percent, were secured through contested eminent domain proceedings.

Personnel

The major problem still confronting the right-of-way department in accomplishing its extensive land acquisition program is the serious shortage of experienced personnel with knowledge and abilities in four major occupational fields—appraising, acquisition, property management, and economic analysis of data pertaining to community development.

During this year, the right-of-way department lost 53 experienced agents, or approximately 10 percent of its total personnel. This percentage loss has been constant for the past five years. Since it takes about three years for even the most qualified new agent to attain the associate or journeyman level, it is apparent that the department is forced to carry an extremely high percentage of new and inexperienced personnel. This group requires constant and intensive training.

During 1960-61, it was necessary to devote more than 15,000 classroom and home study hours to right-of-way instruction. This includes attendance at colleges and universities, as well as instruction by staff members.

Land Economic Studies

The land economic studies section is the basic research branch of the right-of-way department. Its major assignment is to document the effects of freeway construction. This is done for four reasons: to furnish material for public guidance; to improve the accuracy of the appraisal process; to permit the relation of engineering factors to public requirements; and to increase the effectiveness of negotiations.

Continuing projects of the land economic studies section include examinations and tabulations of the effects of right-of-way acquisition and freeway construction upon adjoining parcels and lands; the personal and community effects of the displacement of people and homes from within the right-of-way areas; the effects upon business caused by diversion of traffic to new freeway bypasses; and the effects of freeway construction upon various communities and regions.

During the past year, studies were begun in 15 California towns bypassed by new freeway facilities. Reports on 22 separate freeway projects were received and analyzed in the continuing remainder parcel study which deals with property from which a portion was acquired, leaving a remainder outside the right-of-way limits. Agricultural land research was continued. (Results of remainder parcel studies and agricultural land research were reported during the year in *California Highways and Public Works*, the official journal of the Division of Highways.)

Investigation of what happens to people, homes, and businesses displaced by a freeway was also continued. The first report on this study was issued in 1960. Additional data for further study were obtained this year in Merced and Modesto.

• Legal

• ***The Division of Contracts and Rights-of-Way is the legal division for the Department of Public Works and renders a variety of legal services to the department, its Division of Highways and the Highway Commission.***

Some idea of the volume of condemnation casework is given by the following tabulation: (The parcel count is based on a count of parcels in condemnation resolutions.)

Suits filed	458
Parcels involved	2,930
Defendants involved	12,222
Suits closed	233
Trials	223
Uncontested judgments	165
Suits pending 6-30-61	684
Parcels pending 6-30-61	3,069

There was a notable increase in suits filed as compared with the previous fiscal year—a 35 percent increase from 298 suits to 458. The total suits closed, 233, represented total awards of $11,811,421.09 and represented 1,050 days in court.

Appellate Cases

During the fiscal year many appellate court briefs were prepared by the division and appeals argued. Decisions have been rendered in *People* v. *Keligian*, 182 Cal. App. (2d) 771 (6 Cal. Rptr. 680); *Armas* v. *City of Oakland*, 183 Cal. App. (2d) 137 (6 Cal. Rptr. 750); *People* v. *Henry*, 193 A.C.A. 526 (14 Cal. Rptr. 456); *People* v. *Symons*, 54 Cal. (2d) 855 (9 Cal. Rptr. 363, 357 P. 2d 451); *People* v. *Murata*, 55 Cal. (2d) 1, (9 Cal. Rptr. 601, 357, P. 2d 833). The cases of *People* v. *Symons* and *People* v. *Murata* were the subject of an article in the September-October 1961 issue of *California Highways and Public Works* magazine.

The case of *People* v. *Henry*, decided by the First District Court of Appeal, is a square holding that the Department of Public Works may undertake a utility facility relocation when the owner refuses, after notice and demand, to do the work. The department may recover the reasonable cost of the relocation when the owner's rights are subordinate to those of the public. The case is significant in two other respects. First, the relocation in question, undertaken by the department's forces, was in a county highway. Second, the court stated that if a utility having a franchise can be compelled to move its pipes at its own expense, "then *a fortiori* one having no franchise (and no prior easement) can be so compelled."

The case of *Armas* v. *City of Oakland* affirmed the judgment of the Superior Court of Alameda County. The appellate court held that the freeway agreement between the California Department of Public Works and the City of Oakland under Streets and Highways Code Section 100.2 was valid. The appellant argued that the agreement involving closing of city streets by the construction of a freeway could only have been made after notice and where procedures, prescribed by other statutes, had been followed. The court, however, ruled that such formalities need not be followed under Streets and Highways Code Section 100.2. The appellant's motion for a hearing by the Supreme Court was denied.

In each of the above appellate decisions the department was successful in the appellate courts. Several other cases are pending before the Supreme Court and the district courts of appeal, either awaiting argument or decision.

Other Litigation

In addition to the condemnation proceedings, the department's attorneys have handled a large number of miscellaneous cases. The following tabulation covers a wide variety of litigation and indicates the immense increase in this phase of the division's work.

At the start of the fiscal year, there were 526 cases pending, another 526 cases were filed during the year, for a total of 1,052 cases being processed.

Contractor's crews are carving a new route for U.S. 395 over Conway Summit in Mono County to replace the present steep and curving highway.

There were 334 cases closed during the year, leaving 636 cases pending on June 30, 1961. Some of these cases involved claims for damage to state highway facilities, such as bridges, signals, guardrails, or damage to state vehicles, or unlawful detainer actions. During the fiscal year collections in these cases by the Legal Division amounted to $165,960.84.

A substantial portion of this amount is due to the collection by the State for damage to the San Mateo-Hayward Bridge caused when the S.S. Pt. Reyes struck the bridge on November 17, 1959.

The case total includes many cases where the department was represented as a defendant, such as inverse condemnation proceedings for damage to property by reason of the state highway operations, suits by contractors for additional compensation on construction contracts, and suits filed because of alleged dangerous and defective condition of state highways, and suits for injunction against the State and its contractors enjoining the construction and building of highways. And still other types of suits, such as stop notice actions. The department has filed interpleader actions in which it assumes a neutral position between the contractor and claimant.

Proceedings Before PUC

The division handles matters before the Public Utilities Commission having to do with both crossings of grade at highways and railroads, and the construction of grade separations. The following table indicates the volume of work handled by the division in this category:

Applications pending 7-1-60	13
New applications filed	34
Total applications before PUC	47
Decisions received	34
Applications pending 6-30-61	8

In addition to formal applications, 10 proceedings under PUC General Order 88 relating to crossings at grade were processed. In all instances the approval of the PUC must be obtained as to engineering detail and, in the event of a failure to reach an agreement with the railroad involved as to apportionment of cost, the applicant seeks such determination by the PUC. A recent enactment by the Legislature has set up a new formula for apportionment of cost except for federal-aid highways. This has substantially reduced the number of contested cases.

Board of Control and Other Claims

Claims against the State by reason of the activities of the department are filed with the State Board of Control. The following tabulation illustrates the volume of work handled by the department's attorneys before the State Board of Control:

	Number of claims	*Amounts of claims*
Pending 7-1-60	81	$3,149,792.58
Filed	193	7,175,284.12
Totals	274	$10,325,076.70
Disposed of	178	5,590,116.61
Pending 6-30-61	96	$4,734,960.09

There was an increase of 65 claims filed over the previous fiscal year which amounted to $3,051,276.10. The principal types of board of control claims as listed above are for negligence, breach of contract and inverse condemnation.

Other claims filed with the department employees and the governor numbered 38, an increase of six over the previous fiscal year.

The primary reason for the increase in the number of claims filed is due in a large part to the recent decision of the California Supreme Court in the case of *Muskopf* v. *Corning Hospital Dist. Assn.*, 55 A.C. 216. This decision greatly expanded the potential liability of the State, particularly for accidents arising out of the dangerous or defective condition of state highways. The 1961 Session of the Legislature enacted Chapter 1404 which, in effect, reinstates the immunity of the State from liability for a period of two years. This legislation still permits the filing of claims against the State but merely postpones the actual litigation. This enactment will necessitate the careful investigation by district personnel of all claims. It is anticipated that because of the *Muskopf* decision the number of claims will increase substantially.

Contractors' claims before the State Highway Engineer's Board of Review for additional compensation have increased notably. These claims have required considerable work, both in the studying and handling of the claims as well as resulting litigation. Directly proportional to the number of board of review hearings is the increased number of lawsuits against the department arising out of construction contract claims. As of June 30, 1961, 12 lawsuits against the State were pending involving damages totaling $2,120,483.52.

House Counsel Work

The "house counsel work" of the division has also shown a decided increase. This work consists largely of legal opinions directed toward preventing litigation rather than engaging in litigation after damage has occurred.

Also, other routine work has increased, such as approval of contracts and leases, reviewing forms and accident reports. This work is directly proportional to the increased volume of the highway program. In addition, there were six contested hearings before the State Personnel Board.

• Accounting

• *Administration of all accounting and internal audit activities of the Division of Highways is under the direction of the Comptroller of the Department of Public Works and his staff.*

On June 30, 1961, cash and securities on hand amounted to $144,915,679, with $112,545,590 being invested in United States Government obligations. On the same date, there were outstanding budgetary obligations of $357,903,753, of which $68,017,813 were advance obligations of the 1961-62 fiscal year.

Cash and securities on hand decreased $20,473,993 during the year and budgetary obligations increased $77,866,672, indicating a considerable acceleration in the highway construction program.

Revenue and Expenditures

Revenues budgeted for 1961-62 fiscal year amounted to $597,593,268, of which $216,875,742 remained to be collected on June 30, 1961. Collection of the revenue not received, which consists of $210,139,614 of federal aid and $6,736,127 of contributions from state and local agencies and other sources, will be made as work against which the amount applies is completed or billed. Revenues budgeted for the prior fiscal year amounted to $652,699,954, the decrease in the 1961-62 fiscal year being caused by a smaller apportionment of federal funds.

Expenditures and obligations incurred during the fiscal year ended June 30, 1960 amounted to $676,123,729, as compared to $580,464,870 for the prior fiscal year.

Accounting Procedures

Several improvements and revisions in accounting procedures were made during the year.

To facilitate accounting and improve project cost records, construction engineering costs have been included in project fund allotments, except on major construction on state highways. The major projects were excluded from the change, to avoid tying up large amounts of money on projects of long duration.

Separate control accounts were established for county highway construction, emergency damage repair on local roads, and work for other agencies to provide readily available information of the volume of such work and to promote improved functional analysis of expenditures.

Control accounts were changed to include separate figures on highway planning costs financed from federal aid funds and other funds. Provision was also made for charging costs of special investigations and studies, not related to highway planning, to administration accounts.

Procedures were instituted to account for amounts retained on contract payments as project charges and liabilities, in order to better show the current status of project expenditures and obligations.

Revisions were made in the accounting procedures for maintaining and operating traffic signals and intersection lighting in co-operation with other agencies, for the distribution of vacation, sick leave and retirement costs to projects, and for record keeping on construction projects.

Electronic Data Processing

As a result of pilot studies in several districts, it was decided to begin using electronic data processing equipment on a statewide basis to analyze costs as to source, activity and object of expenditure in much greater detail.

In connection with this program, accounting machines were purchased and installed in the district offices. These machines are now being used to post the allotment ledgers from the cost distribution documents. The machines also produce a punched tape which is processed at headquarters office to produce punched cards. The cards are used in other machines to obtain a comprehensive and elaborate analysis of costs for management and other purposes.

Procedural and coding manuals were published setting forth the changes in the cost distribution procedure required and prescribing a system of codes to be used in analyzing expenditures.

Training sessions were held to instruct personnel in the use of the manuals and the new machines and to acquaint district accounting officers with the requirements and possibilities of electronic data processing methods.

Concurrent Audit Program

Initial steps have been taken in conjunction with the United States Bureau of Public Roads to establish a "concurrent audit" program. The objective of the program is to improve the accounting system through the development of uniform cost distribution methods and internal review and internal audit procedures so that cost records may be accepted by the bureau without detailed audit and subject only to continuous tests as to compliance with the procedures prescribed. Attainment of the objective will facilitate and expedite the collection of federal aid funds, with a considerable decrease in effort on the part of the division and the bureau, and will result in an over-all betterment in the accounting system.

• 1962-63 Budget

• *Provides Funds for 202 Projects Including 278 Miles of Freeway*

THE CALIFORNIA HIGHWAY COMMISSION has adopted a record $658,370,017 state highway budget for the 1962-63 fiscal year.

The budget contains $527,792,917 for state highway construction purposes, including rights-of-way.

The previous budget, adopted in October, 1960, contained an overall total of $633,460,812 of which $509,078,312 was for construction purposes.

State Director of Public Works Robert B. Bradford, Commission Chairman, said the budget is up from last year as a result of increases in federal highway apportionments and in estimated revenue from state sources.

A total of $286,631,017 in federal funds has been allotted to California for 1962-63, including $228,847,200 for work on Interstate Highways. The corresponding totals for 1961-62 were $273,570,812 and $220,070,812.

Estimated revenue from state sources is up about $12,000,000 due to the State's improved economic outlook and continuing increases in motor vehicle registration and travel.

The budget provides funds for 202 projects including construction of 278 miles of multilane freeway and expressway and 110 miles of two-lane expressway.

Effective Use of Funds

"The commission is satisfied," Bradford said, "that this budget provides for the most effective use of all available funds.

"It will build many urgently needed freeways in our cities and on major through highways, replace some outdated rural and mountain roads with modern highways, and eliminate scores of local traffic bottlenecks and danger points.

"Although it is never possible to finance all of the state's high priority highway work in a given year, we feel the projects in this budget will provide for substantial transportation improvements in every area of the state."

Major sources of state-collected highway revenue expected for 1962-63 include $270,151,000 in gasoline taxes (up about $6,000,000 from last year's estimate); $60,371,000 in motor vehicle fees (up $4,000,000); $23,690,000 from the use (diesel) fuel tax (down $1,000,000); $14,700,000 from transportation taxes on for-hire carriers (up $1,500,000); and interest on investments and deposits $2,700,000 (up $1,700,000).

The budget contains $57,630,100 for functions other than state highway work.

The largest nonstate highway item is $36,300,000 for major city streets, based on five-eighths cent per gallon of the state gasoline tax. Other nonstate highway items are:

Federal aid for county roads on the Federal Aid Secondary System, $9,215,600; state funds to counties for use in matching these federal funds, $4,200,000; state funds to help finance railroad grade separation projects on local streets and roads, $5,000,000; engineering funds to cities, $1,500,000; and state funds to pay part of the cost of urban extensions of FAS county roads, $1,414,500.

County Share

Bradford pointed out that California's 58 counties receive one and three-eighths cents per gallon from the State's six-cents-per-gallon gasoline tax, plus a portion of the motor vehicle fees. These funds are disbursed directly by the State Controller and are not listed in the State Highway Budget.

For the 1962-63 fiscal year, these state-collected funds for county roads will total an estimated $94,000,000.

The $527,792,917 in the budget for highway construction purposes includes:

Major construction and improvement (contracts plus engineering), $375,973,500; rights-of-way, $135,827,317; contingencies (normally available for construction purposes), $8,000,000; resurfacing program, $4,992,100; signs and striping, $2,000,000; and minor improvements, $1,000,000.

Proposed expenditures for state highway purposes other than construction include: maintenance, $44,700,000; buildings and plants, $9,000,000; administration, $11,500,000; statewide highway planning survey, $3,000,000; maintenance of state toll bridges, $3,500,000; and honor camps, $1,100,000.

The 1962-63 budget contains 28 landscaping, functional planting, or tree planting projects for which $4,178,500 is budgeted. Tree planting projects are listed for the first time, as a result of a policy adopted by the Highway Commission last June which calls for such planting at appropriate locations.

1962-63 State Highway Budget Project by Counties

Note 1: Construction contracts may be awarded beginning January, 1962. Right-of-way funds may not be spent until July 1, 1962 (start of the fiscal year).

Note 2: Projects which overlap county lines are listed in both counties.

Note 3: The term "freeway" means a multilane divided highway with full access control, no crossings at grade, no stop lights and no left turn movements. As used here, an "expressway" is a multilane divided highway with most full freeway features except that traffic may cross at grade at some intersections. "Two-lane expressway" is a two-lane highway with some measures of access control, usually planned for future expansion to four lanes divided.

Route	Description	Approx. mileage	Estimated cost
	ALAMEDA COUNTY		
US 50	MacArthur Freeway—East Bay Distribution Structure to 0.3 mile west of Grand Avenue in Oakland; landscape	2.3	$170,000
US 50	MacArthur Freeway—0.3 mile west of Grand Avenue to Park Boulevard in Oakland; landscape	1.2	195,000
US 50	MacArthur Freeway—0.3 mile west of Buell Street to Kuhnle Avenue in Oakland; construct 8-lane freeway	1.1	4,200,000
US 50	MacArthur Freeway—East city limit of Oakland near Durant Avenue to 0.5 mile east of Sybil Avenue in San Leandro; construct 8-lane freeway (this job and previously listed project, together with current work, will complete 12 miles of 8-lane freeway from the East Bay Distribution Structure to Sybil Avenue)	1.9	4,500,000
US 40	North of El Cerrito Overhead in Albany to San Pablo Dam Road; install median barrier (also listed in Contra Costa County)	4.7	115,000
SR 17	Nimitz Freeway—First Avenue Interchange in San Leandro; add two ramps to interchange		400,000
SR 24	Grove-Shafter Freeway—West of Warren Freeway to Caldecott Tunnel (portions); interchange construction	1.5	2,715,000
HR 108	Alden Lane to El Caminito in and near Livermore; realign curves and humps	0.9	95,000
HR 226	Posey Tube between Alameda and Oakland; entrance revisions, lighting, ventilation equipment and tiling		1,100,000
HR 227	Warren Freeway—Carson Street to MacArthur Freeway near Calaveras Avenue; grading and structure for future freeway	0.6	600,000
Various	Rights of way (including $5,700,000 for Grove-Shafter Freeway in Oakland, $2,600,000 for MacArthur Freeway in Oakland and San Leandro)		9,398,000
FAS 1030 Urban Extension	Redwood Road—Between Heyer Avenue and Castro Valley Boulevard in and near Hayward; construct 4-lane highway (Urban extension of FAS Road—Alameda County's share, $115,000)	0.5	115,000 (State share)
	ALPINE COUNTY		
SR 88-89	0.3 mile east of Woodfords to 2.6 miles east of Picketts; construct 2-lane expressway	3.8	1,070,000
SR 4	Raymond Meadow Creek Bridge south of Markleeville; replace bridge and construct approaches		65,000
Various	Rights of way		50,000
	AMADOR COUNTY		
SR 88	2.5 miles east of Corral Flat to 2.5 miles west of Alpine County line; construct 2-lane expressway	8.7	1,180,000
Various	Rights of way		75,000
	BUTTE COUNTY		
US 99E	Little Chico Creek to East First Avenue in Chico; construct 4-lane freeway (first unit of freeway through Chico)	1.3	1,700,000
US 40 Alt.	West Branch Feather River Bridge north of Oroville; Division of Highways share of the cost of the bridge and approaches (bridge now under construction)		615,000
Various	Rights of way		470,000
	CALAVERAS COUNTY		
SR 49	SR 12 at San Andreas to Mokelumne Hill; grading and bridges for future 2-lane highway (paving to be budgeted in the future)	6.5	1,100,000
Various	Rights of way		180,000
	COLUSA COUNTY		
US 99W & SR 20	On 7th and E Streets in Williams; drainage improvements	0.2	30,000
SR 20	4.5 miles east of Colusa to Drexler Road; construct 2-lane expressway including new Sacramento River Bridge near Meridian (also listed in Sutter County)	5.1	1,980,000
Various	Rights of way		25,000
	CONTRA COSTA COUNTY		
US 40	North of El Cerrito Overhead in Albany to San Pablo Dam Road; install median barrier (also listed in Alameda County)	4.7	115,000
US 40	Barrett Avenue Off-ramp; construct ramp connection from Sierra Avenue ramp to Barrett Avenue		420,000
SR 24	Junction Sign Routes 21 and 24 to 0.2 mile north of Solano Way in Concord; construct 4-lane freeway	2.9	3,150,000
SR 21	1.0 mile south of Danville to Walnut Creek; construct 4-lane freeway	6.8	12,900,000
Various	Rights of way		2,485,000
	DEL NORTE COUNTY		
US 199	Collier Tunnel under construction at Hazelview Summit near the Oregon Border; install tunnel lighting and ventilation equipment		200,000
Various	Rights of way		120,000
	EL DORADO COUNTY		
US 50	West city limit of Placerville to Railroad Crossing; tree planting		80,000
SR 49	0.4 mile south of Hastings Creek to 0.9 mile south of Greenwood Creek north of Coloma; construct 2-lane highway on new alignment including new Greenwood Creek Bridge (connects with current job to the west)	2.0	280,000
Various	Rights of way		275,000
	FRESNO COUNTY		
US 99	Tulare County line to 0.5 mile north of Highland Avenue in Selma; construct 4-lane freeway (completes freeway on US 99 in Fresno County)	6.9	4,490,000
US 99	Dry Creek Canal to north of West Olive Avenue Interchange in and north of Fresno; landscape	1.6	125,000
US 99	North of West Olive Avenue Interchange to the San Joaquin River north of Fresno; functional and tree planting	8.0	75,000

Route	Description	Approx. mileage	Estimated cost
	FRESNO COUNTY—Continued		
SR 33	Zapato Cheno Creek Bridge north of Avenal; replace bridge deck		$25,000
Various	Rights of way		975,000
FAS 815	Jensen Avenue—Between Lyon Avenue and West Avenue in Sanger; construct 4-lane highway (Urban area extension of Federal	0.5	39,500
Urban Extension	Aid Secondary County Road. Sanger's share $39,500)		(State share)
FAS 815	Jensen Avenue—West of Pullman Street to east of Holloway Avenue in Calwa; construct 4-lane divided highway (Urban area ex-	0.7	150,000
Urban Extension	tension of FAS County Road. Fresno County's share, $388,000)		(State share)
FAS 1211	Belmont Avenue—Blackstone Avenue to Fisher Avenue in Fresno; construct 4-lane divided highway (Urban extension of FAS	1.1	110,000
Urban Extension	County Road. Fresno's share $110,000)		(State share)
	GLENN COUNTY		
HR 45	Walker Creek east of Willows to Glenn; reconstruction and widening (completes improvements between Willows and the Sacra-	8.3	950,000
	mento River near Butte City)		
Various	Rights of way		325,000
	HUMBOLDT COUNTY		
US 101	Redwood Parks Freeway—1.3 miles south of Sylvandale to Maple Hills Road; construct 4-lane freeway (This project, and current	5.8	5,600,000
	and completed construction will provide 4-lane freeway for 22 miles from Sylvandale to Englewood)		
SR 36	2.5 miles to 7.7 miles east of Bridgeville (portions); curve improvement and widening		100,000
HR 46	Miners Creek near Weitchpec; replace bridge with culvert and reconstruct approaches	0.3	130,000
HR 56	Salt River Overflow Bridge near Ferndale; bridge replacement		70,000
Various	Rights of way		1,120,000
	IMPERIAL COUNTY		
US 80	San Diego County line to junction with SR 98; construct 4-lane freeway	9.7	5,000,000
HR 146	Glamis Highway—9.0 miles east of Glamis to the Riverside County line; construct 2-lane expressway	29.5	1,000,000
Various	Rights of way		1,630,000
	INYO COUNTY		
US 395-6	1.4 miles south of Little Lake to 3.6 miles north of Little Lake; construct 4-lane expressway	5.0	787,000
SR 190	Centennial Wash to 1.0 mile west of Darwin Junction (portions); reconstruct and widen	5.4	245,000
Various	Rights of way		10,000
	KERN COUNTY		
US 99	Minkler Spur to 0.3 mile south of Cawelo; convert expressway to 6-lane freeway	8.7	5,650,000
SR 178	Stockton Street to Williams Street in Bakersfield; reconstruction for one-way street couplet on Monterey and Niles Streets	1.4	480,000
SR 178	Williams Street to 0.2 mile east of Morning Drive in and near Bakersfield; widen to 4 lanes	3.8	770,000
SR 178	Mirasol Avenue to 0.2 mile east of Meadow Street; widen to 4 lanes through Buttonwillow	0.4	95,000
US 399	Sunset Western Railroad to Cedar Street in and near Taft; tree planting		3,000
Various	Rights of way (including $3,950,000 for SR 178 freeway in and near Bakersfield)		5,607,000
	KINGS COUNTY		
HR 135	Central Valley Highway—1.0 mile north of Corcoran to Tulare County line; reconstruction and widening	3.3	278,000
Various	Rights of way		943,000
	LAKE COUNTY		
SR 20	Morrison Creek to 0.5 mile west in Lucerne; curve realignment	0.5	105,000
SR 29	Cobb Post Office to 2.4 mile south (portions); realign		265,000
Various	Rights of way		70,000
	LASSEN COUNTY		
US 299	1.6 miles to 0.6 mile west of Kramer Road in Nubieber; construct 2-lane expressway	1.0	130,000
US 395	1.0 mile east of Johnstonville to 0.4 mile east of Baxter Creek; construct 2-lane expressway	4.2	700,000
US 395	0.8 mile south of Modoc County line to 4.0 miles north of Likely (two sections); construct 2-lane expressway (also listed in Modoc	5.4	550,000
	County)		
Various	Rights of way		100,000
	LOS ANGELES COUNTY		
US 101	Ventura Freeway—0.4 mile southeast of Chesebro Road to Lewis Road west of Los Angeles; construct interchange to convert from		530,000
	expressway to 4-lane freeway		
US 101	Ventura Freeway—Lewis Road to 0.6 mile northwest of Kanan Drive west of Los Angeles (portions); construct interchanges to		500,000
	convert from expressway to 4-lane freeway		
US 101	Ventura Freeway—0.1 mile southeast of Los Angeles County line to 0.4 mile west of Triunfo Road. Construct interchange to		420,000
	convert to full freeway (also listed in Ventura County)		
US 6-99 & 66	Golden State Freeway—Darwin Avenue to Los Angeles River. Pasadena Freeway—Golden State Freeway to 0.2 mile east of	2.0	200,000
	Cypress Avenue; landscape		
US 6-99	Golden State Freeway—Burbank Boulevard in Burbank to Lankershim Boulevard in Los Angeles; install median barrier	6.1	130,000
US 99 & SR 126	Golden State Freeway—1.3 miles south of Sign Route 126 (southerly intersection) to 0.2 mile south of Castaic Creek; and on	4.5	5,500,000
	Sign Route 126 Freeway between the Golden State Freeway and 0.8 mile west; construct 8-lane freeway on US 99 and 4-lane		
	freeway on Sign Route 126		
US 60-70-99	San Bernardino Freeway—Holt Avenue to 0.4 mile west of San Dimas Avenue near Pomona; widen from 6 to 8 lanes	2.9	925,000
SR 138	47th Street East, Fort Tejon Road and Pearblossom Highway—0.4 mile south of Palmdale Boulevard to 0.2 mile southeast of	2.9	290,000
	of Avenue T, southeast of Palmdale; widening to provide a 4-lane divided highway		
SR 27	Topanga Canyon Boulevard—Ventura Freeway to Roscoe Boulevard in Los Angeles; widening and reconstruction to provide 4-lane	3.4	1,235,000
	divided highway		
HR 158	San Diego Freeway—Orange County line to 0.1 mile west of Atlantic Avenue in Long Beach and Signal Hill; construct 8-lane	6.0	14,000,000
	freeway. (This project, other current work, the newly budgeted job which follows, and a new project in Orange County will		
	complete the San Diego Freeway from Westminster to the Golden State Freeway near San Fernando, a distance of 49 miles)		
HR 158	San Diego Freeway—0.4 mile south of Burbank Boulevard to Golden State Freeway near San Fernando; construct 8-lane freeway	8.9	8,300,000
	(grading and some structure work now in progress on this section)		

Route	Description	Approx. mileage	Estimated cost
	LOS ANGELES COUNTY—Continued		
US 6 & SR 11	San Diego Freeway—Carson Street to 190th Street. Harbor Freeway—0.5 mile north of Del Amo Boulevard to 0.1 mile north of 190th Street in Los Angeles; install median barrier	3.8	$68,000
HR 158	San Diego Freeway—Avalon Boulevard to Main Street near Torrance; install truck scales		131,000
HR 158	San Diego Freeway—190th Street to 174th Street in Los Angeles and Torrance; landscape	3.2	260,000
HR 158	San Diego Freeway—Mulholland Drive to Ventura Boulevard; landscape	1.4	60,000
SR 134	Ventura Freeway—Buena Vista Street to the Golden State Freeway and west side of Golden State Freeway from the Ventura Freeway to 0.2 mile west of Colorado Street extension; landscape in Burbank and Los Angeles	3.3	115,000
US 6-99, SR 2	Golden State Freeway—Los Angeles River to Glendale Boulevard; Glendale Freeway—Glendale Boulevard to the Los Angeles River; landscape	4.0	375,000
US 66	Santa Monica Boulevard—Doheny Drive to Orlando Avenue in and near Beverly Hills; reconstruct and widen	1.2	235,000
US 6-SR 11	Harbor Freeway—0.2 mile north of Sepulveda Boulevard to 0.1 mile south of 208th Street; functional and tree planting	2.1	135,000
SR 35	San Gabriel River Freeway—0.2 mile south of Whittier Boulevard to Peck Road near Industry; construct 8-lane freeway	3.3	4,750,000
SR 35	San Gabriel River Freeway—Peck Road to 0.3 mile north of the San Bernardino Freeway; construct 8-lane freeway in and near Industry and Baldwin Park. (This project, and previously listed job, are first major construction projects on the San Gabriel River Freeway)	3.9	6,850,000
SR 26	Olympic Boulevard—Centinela Avenue to Rimpau Boulevard (portions); modify traffic signals at 24 intersections (Cooperative project—Los Angeles City's share, $60,000)		60,000 (State share)
SR 26 & SR 7	Santa Monica Freeway—0.3 mile west of Sawtelle Boulevard to Overland Avenue. San Diego Freeway—0.4 mile south of National Boulevard to 0.2 mile north of Pico Boulevard; construct 8-lane freeway on the Santa Monica Freeway including interchange at San Diego Freeway near Culver City	2.6	7,300,000
SR 26	Santa Monica Freeway—Overland Avenue to La Cienega Boulevard in Los Angeles; construct 8-lane freeway	2.2	6,700,000
SR 26	Santa Monica Freeway—0.1 mile west of La Cienega Boulevard to Fairfax Avenue; construct 8-lane freeway	0.5	3,700,000
SR 26	Santa Monica Freeway—0.1 mile west of Fairfax Avenue to Hoover Street; construct 8-lane freeway. (The preceding four projects, together with current construction, will complete the Santa Monica Freeway from the Santa Ana Freeway to Sawtelle Boulevard, a distance of 13.3 miles)	5.0	10,300,000
SR 26	Santa Monica Freeway—Vermont Avenue to 8th Street; landscape	4.3	140,000
SR 42	Firestone Boulevard—0.1 mile east of Garfield Boulevard to 0.1 mile west of Lakewood Boulevard; widening to 4 lanes. (Cooperative project—Southgate and Downey share $70,000)	2.5	385,000 (State share)
Various	Rights of way (including $7,500,000 for the Foothill Freeway, $6,000,000 for Colorado Freeway, $5,100,000 for San Gabriel River Freeway, $9,000,000 for Pomona Freeway, $6,900,000 for Santa Monica and $7,100,000 for the Artesia Freeway)		52,722,000
	MADERA COUNTY		
US 99	0.2 mile north of San Joaquin River to Road 30 south of Madera; convert expressway to 4-lane freeway	5.5	2,000,000
Various	Rights of way		514,000
	MARIN COUNTY		
US 101	Miller Creek Road to north of Entrada Drive in Novato; construct 6-lane freeway	2.7	3,500,000
US 101 & SR 37	Sign Route 37-US 101 Interchange; construct interchange and frontage roads, and 6-lane freeway. (This project and previously listed job, together with other current construction, will provide continuous freeway on US 101 for 19 miles from the Golden Gate Bridge to Novato)	1.2	4,000,000
SR 1	Stinson Beach to Bolinas Road (portions); drainage improvements and resurfacing		100,000
Various	Rights of way		630,000
	MARIPOSA COUNTY		
SR 49	1.5 miles south of Coulterville to Tuolumne County line; construct 2-lane highway	5.8	850,000
SR 132	4.0 miles west of Coulterville to junction with SR 49 in Coulterville; construct 2-lane highway	4.0	685,000
Various	Rights of way		115,000
	MENDOCINO COUNTY		
US 101	6.0 miles north of Hopland to Norgard Lane south of Ukiah; construct 4-lane freeway	4.8	2,250,000
US 101	Ford Road north of Ukiah to 0.5 mile south of Forsythe Creek; construct 4-lane freeway (structures and some grading now in progress on this section)	5.6	2,400,000
SR 20	James Creek Bridge west of Willits; replace bridge and construct approaches	0.3	200,000
Various	Rights of way		400,000
	MERCED COUNTY		
US 99	1.1 miles south of Merced to 4.5 miles north of Merced; construct 4-lane freeway through Merced (structure work and grading now in progress). With completion of this project, there will be 12.2 miles of continuous full freeway from south of Merced to north of Atwater.	8.3	4,200,000
Various	Rights of way		710,000
	MODOC COUNTY		
US 299	0.4 mile west of Pit River Bridge to 1.0 mile east of Canby; construct 2-lane expressway including new Pit River Bridge	5.8	976,000
US 395	0.8 mile south of Modoc County Line to 4.0 miles north of Likely (two sections); construct 2-lane expressway (also listed in Lassen County)	5.4	550,000
Various	Rights of way		10,000
	MONO COUNTY		
US 395	1.5 miles north of McGee Creek to 1.1 miles south of Mammoth Junction; construct 1.8 miles of 2 and 4-lane expressway with right of way fencing on additional section	5.6	650,000
HR 111	June Lake Loop—0.1 mile southeast to 0.3 mile northwest of Rush Creek; realignment and widening	0.4	75,000
Various	Rights of way		35,000
	MONTEREY COUNTY		
US 101	1.2 miles north of Bradley to 1.7 miles south of San Ardo; construct 4-lane freeway	11.3	4,180,000
US 101	South city limit to North Main Street in Salinas; functional and tree planting	2.9	90,000
US 101	Little Bear Creek Bridge at Santa Rita; replace bridge and construct approaches		60,000
SR 1	San Luis Obispo County line to Rocky Creek north of Big Sur (portions); construct concrete retaining cribs		260,000
SR 1	Hot Springs Creek Bridge south of Big Sur; replace bridge and construct approaches	0.5	450,000
Various	Rights of way		1,135,000

Route	Description	Approx. mileage	Estimated cost
	NAPA COUNTY		
SR 37	Vichy Springs to Sign Route 128 (portions); reconstruction and widening		$160,000
SR 29	0.3 mile south of Imola Avenue to north of Old Sonoma Road in and near Napa; functional planting and tree planting	0.7	60,000
SR 12-29	Imola Avenue to Kelly Road (portions); resurfacing		100,000
SR 29	Dry Creek to California Drive near Yountville; reconstruction, frontage roads, and drainage improvement	2.5	425,000
SR 29	1.6 miles north of California Drive near Yountville to Oakville; reconstruction and widening	2.3	160,000
SR 29	Calistoga to Lake County line (portions); construct passing lanes on Mt. St. Helena		80,000
SR 128	0.9 mile east of Pope Valley Road to the Monticello Dam Highway Relocation east of Rutherford (portions); curve improvement and widening		50,000
Various	Rights of way		780,000
	NEVADA COUNTY		
SR 49	1.5 miles north of South Fork Yuba River to North San Juan (portions); curve improvement and widening		50,000
US 40	2.8 miles west of Cisco to Hampshire Rocks; construct 4-lane freeway (final gap in freeway construction on 120 miles of US 40 between Sacramento and Nevada. Leaves only the paving over Donner Summit for future budgeting) (also listed in Placer County)	6.3	10,400,000
Various	Rights of way		273,500
	ORANGE COUNTY		
SR 55	Newport Freeway—0.3 mile south of Delhi Road to 0.3 mile south of the Santa Ana Freeway in and near Santa Ana and Tustin; construct 4-lane freeway	1.9	2,700,000
US 101 Alt.	Pacific Coast Highway—South city limit of Newport Beach to Superior Avenue-Balboa Boulevard (portions); resurfacing, channelization and traffic signal modifications		100,000
SR 39	Beach Boulevard—Atchison, Topeka and Santa Fe Railroad Underpass to 0.1 mile south of Central Avenue in and near Buena Park and La Habra; widening to provide four lanes divided	4.2	990,000
HR 158-179	San Diego Freeway—0.6 mile east of Bolsa Chica Road to Los Angeles County line. Garden Grove Freeway—0.7 mile east of Bolsa Chica Road to San Diego Freeway; construct 8-lane freeway (connects with newly budgeted project in Los Angeles County)	4.8	9,000,000
US 101	Santa Ana Freeway—0.3 mile north of South Street in Anaheim to 0.2 mile south of the Santa Ana River in Santa Ana; widen from 4 to 6 lanes	4.1	1,250,000
SR 22	Garden Grove Freeway—Garden Grove Boulevard near Knott Avenue in Westminster to 0.2 mile east of Newland Street in Garden Grove; construct 6-lane freeway	1.8	4,000,000
Various	Rights of way (including $2,300,000 for Garden Grove Freeway)		6,667,000
	PLACER COUNTY		
SR 49	East Auburn Underpass in Auburn; widen to four lanes		260,000
US 40	2.8 miles west of Cisco to Hampshire Rocks; construct 4-lane freeway (final gap in freeway construction on 120 miles of US 40 from Sacramento to Nevada. Leaves only the paving over Donner Summit for future budgeting) (also listed in Nevada County)	6.3	10,400,000
HR 91	Lincoln-Auburn Highway—US 99E to 0.3 mile east of Lincoln; reconstruction and widening	0.8	130,000
Various	Rights of way		876,500
	PLUMAS COUNTY		
US 40 Alt	Grizzly Creek Bridge and approaches about 2 miles east of Portola; replace bridge and construct approaches	0.4	130,000
Various	Rights of way		75,000
	RIVERSIDE COUNTY		
US 60	US 395 to Kitching Street near Sunnymead; construct 4-lane freeway	4.8	2,750,000
US 60-70-99	East city limit of Banning to east city limit of Cabazon; construct 6-lane freeway. (Completes continuous freeway and expressway for 90 miles from Los Angeles to east Cabazon)	5.7	5,100,000
SR 74	7.0 miles east of Hemet to Mountain Center (portions); widening and curve improvement		20,000
SR 79	Lamb Canyon Creek northwest of San Jacinto; replace bridge with culvert		26,000
SR 195	Coachella Storm Drain to SR 111 near Mecca; reconstruction and widening	1.6	85,000
Various	Rights of way		2,636,000
	SACRAMENTO COUNTY		
US 99-50	Sacramento Boulevard to U Street in Sacramento; landscaping on South Sacramento Freeway	3.0	462,000
US 50	Natoma Overhead Interchange at the Aerojet plant east of Sacramento; tree planting		30,000
US 40 & US 99W	Sacramento River Bridge near W and X Streets in Sacramento; bridge substructure for future freeway crossing (also listed in Yolo County)		1,250,000
Various	Rights of way (including $1,600,000 for North-South freeway (29th and 30th Streets), $2,000,000 for East-West freeway (W and X Streets) in Sacramento and $1,000,000 for Interstate Beltline freeway north and west of Sacramento)		5,610,000
	SAN BENITO COUNTY		
SR 156	0.5 mile north to 3.4 miles north of Hollister; construct 4-lane expressway	2.9	590,000
Various	Rights of way		225,000
	SAN BERNARDINO COUNTY		
US 66	At Deer Creek about 3.5 miles east of Upland; culvert replacement		85,000
US 66	Los Angeles County line to Haven Avenue in and near Upland; intersection and center strip improvements	6.7	35,000
Old US 70-99	Hunts Lane to Oak Street; resurface old highway through Redlands prior to relinquishment to local jurisdiction. (New freeway under construction)	8.1	50,000
US 70-99	Colton Avenue to Highland Avenue in Redlands; landscape	3.3	400,000
US 91-466	5.0 miles west of Yermo to Field; construct 4-lane freeway	22.6	8,500,000
SR 18-30	3.0 miles west to 1.2 miles east of Big Bear Dam; construct 3.0 miles of 4-lane expressway and resurface 1.1 miles	4.1	1,400,000
SR 18	Central Road to Navajo Road in Apple Valley; construct 4-lane expressway. (Cooperative project with San Bernardino County)	1.4	150,000 (State share)
SR 30	West Fork to East Fork of City Creek northeast of San Bernardino; construct additional 2 lanes to provide 4-lane expressway	1.2	125,000
SR 91	Riverside County line to Warm Creek; functional and tree planting	5.3	20,000
SR 138	Los Angeles County line to US 395-91-66; eliminate humps and dips	15.2	350,000
Various	Rights of way		3,976,000

Route	Description	Approx. mileage	Estimated cost
	SAN DIEGO COUNTY		
US 101	0.1 mile north of south city limit of National City to 0.4 mile north of Division Street in San Diego (portions); construct 8-lane freeway	2.5	$4,600,000
US 101 & US 395	Park Boulevard to 6th Avenue in San Diego; landscape in vicinity of 4-level interchange now under construction in Balboa Park	0.5	400,000
US 101	0.5 mile south of Carmel Valley Road southeast of Del Mar to 0.6 mile south of 4th Street; grading and structures for future 6-lane freeway (paving to be budgeted in the future)	1.8	1,100,000
US 101	0.6 mile south of 4th Street to Skyline Drive northeast of Solana Beach; grading and structures for future 6-lane freeway (paving to be budgeted in the future)	3.4	2,200,000
US 101	Short Street Overhead in Oceanside; construct interchange		500,000
US 395	Aero Drive to Clairemont Mesa Boulevard; widen frontage road (Cooperative project—San Diego share $321,000)	1.6	60,000 (State share)
US 395	Pomerado Road to north city limit of Escondido; signals and channelization	5.2	185,000
SR 94	Merritt Boulevard to Kenora Drive; widening and reconstruction	1.2	110,000
Various	Rights of way (including $3,900,000 for US 101 freeway in National City and San Diego and $2,700,000 for the section between San Diego and Carlsbad)		12,205,000
FAS 731 Urban Extension	Mission Gorge Road—Between SR 12 at Fairmount Avenue and Simeon Drive in and near San Diego; construct 4-lane divided highway (Urban extension of FAS Road, San Diego County's share, $502,300, City of San Diego, $741,700)	6.0	1,000,000 (State share)
	SAN FRANCISCO COUNTY		
HR 224	Embarcadero Freeway—construct Clay-Washington Street ramps	0.4	1,470,000
HR 224	Embarcadero Freeway—First Street to Steuart Street; landscape	0.4	50,000
HR 253	Southern Freeway Extension—Newcomb Street to Army Street; construct 6-lane freeway (will tie in with a budgeted project to carry easterly extension of Southern Freeway from the James Lick Freeway to Army Street)	0.8	5,580,000
US 101 Byp.	Bayshore Freeway—Butler Road to 3rd Street Overcrossing in South San Francisco and San Francisco (portions); resurfacing (also listed in San Mateo County)		420,000
Various	Rights of way		2,970,000
	SAN JOAQUIN COUNTY		
HR 110	US 50 west of Tracy to about 6 miles west of Vernalis; construct 4-lane freeway (Westside Freeway) bypassing Tracy on the west (new Interstate Highway Route 5W)	11.5	6,080,000
US 99	Miner Avenue to Calaveras River near Stockton; functional and tree planting	3.0	50,000
Various	Rights of way (including $1,500,000 for Westside Freeway in and near Stockton)		2,806,000
	SAN LUIS OBISPO		
US 101	North Pismo Beach Separation to 1.0 mile south of Santa Fe Bridge south of San Luis Obispo; convert expressway to 4-lane freeway	6.0	3,100,000
US 101	1.0 mile south of Santa Fe Bridge to Los Osos Road; convert expressway to 4-lane freeway	2.0	1,270,000
US 101	0.3 mile north of Los Osos Road to Marsh Street in San Luis Obispo; convert expressway to 4-lane freeway (This project, and two listed previously, will provide full freeway on US 101 from north of San Luis Obispo to Arroyo Grande, a distance of 19 miles)	1.9	880,000
US 101	San Luis Obispo Creek to 2.2 miles north of San Luis Obispo (portions); resurface		140,000
US 101	0.4 mile south of Santa Barbara Road to Atascadero; construct interchanges at Santa Barbara Road and at Curbaril Avenue to convert from expressway to 4-lane freeway		833,000
SR 1	Oceano Overhead Bridge south of Pismo Beach; replace bridge and construct approaches on new alignment	0.7	250,000
SR 1	1.5 miles south of Cambria to 0.5 mile south of San Simeon Creek; construct 2-lane expressway bypassing Cambria	4.3	1,250,000
Various	Rights of way		790,000
	SAN MATEO COUNTY		
US 101	El Camino Real—Millwood Drive to Euclid Avenue in Millbrae and San Bruno; widen to six lanes divided (Cooperative project—Millbrae and San Bruno share, $290,000)	1.7	530,000 (State share)
SR 1	1.1 miles south of Sharp Park Road to 0.4 mile north of Manor Drive in Pacifica; construct 4-lane freeway for 2.6 miles with grading and frontage roads for an additional 0.6 mile (first unit of freeway in Pacifica)	3.2	3,850,000
US 101 Byp.	Bayshore Freeway—Butler Road to 3rd Street Overcrossing in South San Francisco and San Francisco (portions); resurface (also listed in San Francisco County)		420,000
US 101 Byp.	Bayshore Freeway—Sierra Point Overhead in South San Francisco to Redwood Creek in Redwood City; install median barrier and signs	17.4	435,000
Various	Rights of way (including $2,000,000 for HR 214 improvement in Redwood City and $3,200,000 for Junipero Serra Freeway in vicinity of Daly City and San Bruno)		6,885,000
	SANTA BARBARA COUNTY		
US 101	South Carpinteria Interchange; interchange construction		350,000
US 101	El Sueno Road to Elwood west of Santa Barbara; install illuminated signs		110,000
HR 2	Orcutt Highway—0.6 mile north of Clark Avenue to 1.5 miles south of Santa Maria; construct additional 2 lanes to provide 4-lane expressway	2.9	350,000
SR 1	Solomon Canyon Creek Bridge south of Guadalupe; replace bridge and construct approaches on new alignment	0.3	80,000
SR 166	Deadman's Gulch to Cuyama Maintenance Station; construct 2-lane expressway	5.6	900,000
SR 154	San Marcos Pass to 7 miles north, northwest of Santa Barbara; construct 2-lane expressway	7.0	5,900,000
SR 154	0.4 mile west of Lompoc Canyon Road to O Street in Lompoc (portions); construct 2-lane expressway from west of Lompoc Canyon Road to Lompoc, and widen to four lanes in the city (Cooperative project—U.S. Navy share, $860,000)	5.8	125,000 (State share)
Various	Rights of way		930,000
	SANTA CLARA COUNTY		
HR 113	US 101 to 0.4 mile north of Southern Pacific Railroad near Bernardo Avenue in Mountain View; construct 2 and 4-lane expressway including an interchange at Dana Street and a railroad grade separation structure	1.5	1,475,000
HR 114	Middlefield Road Overcrossing in Mountain View; construct overcrossing and approaches at route of the future Stevens Creek Freeway		425,000
SR 9	0.2 mile south of Prospect Road in Saratoga to US 101 in Sunnyvale; widen to four lanes (rights of way acquired by local agencies)	5.5	740,000
SR 17, HR 239	Junipero Serra Freeway—Sign Route 17 to west of Doyle Road in and near San Jose; construct 6-lane freeway including an interchange at the junction of the Junipero Serra and Sign Route 17 freeways and widening to 6 lanes on SR 17 between Moorpark Avenue and Forest Avenue. (First southerly unit of the Junipero Serra Freeway)	4.7	4,750,000
SR 17	Forest Avenue to the Bayshore Freeway in San Jose; widen San Jose-Los Gatos Freeway to six lanes and expand Coleman Avenue Interchange	3.4	1,200,000
Various	Rights of way (including $3,900,000 for Junipero Serra Freeway)		6,915,000

Route	Description	Approx. mileage	Estimated cost
	SANTA CRUZ COUNTY		
SR 17	0.3 mile north of Sign Route 1 to 0.3 mile south of Carbonero Creek near Santa Cruz; functional and tree planting	2.9	$110,000
SR 17	0.3 mile south of Glen Canyon Road to 0.4 mile north of Granite Creek Road, north of Santa Cruz; funcitonal and tree planting	2.7	50,000
SR 17	0.6 mile north of Granite Creek Road to the Santa Clara County line; drainage improvements and resurfacing	6.3	500,000
SR 152 & SR 1	Main Street in Watsonville to Rob Roy (portions); resurface		180,000
SR 1	State Park Drive Interchange east of Santa Cruz; construct interchange and frontage roads to convert from expressway to 4-lane freeway	1.5	540,000
SR 1	Park Avenue Interchange in and near Capitola; construct interchange and frontage roads to convert from expressway to 4-lane freeway	1.8	710,000
Various	Rights of way		525,000
	SHASTA COUNTY		
US 99	4.4 miles to 2.3 miles south of O'Brien (portions); grading for fill in Shasta Lake for future 4-lane freeway		600,000
US 99	0.5 mile south to 2.5 miles north of the Tehama County line; construct 4-lane freeway through Cottonwood (connects with current construction to provide continuous freeway from just north of Red Bluff to Anderson, a distance of 16 miles) (also listed in Tehama County)	3.0	3,250,000
Various	Rights of way (including $1,500,000 for US 99 between Anderson and north of Shasta Lake, and $200,000 for SR 44 between Redding and Palo Cedro)		1,880,000
	SIERRA COUNTY		
SR 49	Sierra City to Bassetts; construct 2-lane expressway	4.5	1,300,000
SR 49	Sierraville Creek Bridge and approaches; replace bridge and construct approaches	0.1	45,000
Various	Rights of way		50,000
	SISKIYOU COUNTY		
SR 96	Indian Creek Bridge at Happy Camp; bridge replacement		150,000
HR 82	Etna-Yreka Highway—2.4 miles north of Etna to 0.4 mile south of Kidder Creek; construct 2-lane highway (leaves only one unimproved stretch beteen Yreka and Etna)	3.2	324,700
Various	Rights of way		105,000
	SOLANO COUNTY		
US 40	Near Cordelia Road to west of Travis Boulevard west of Fairfield; functional and tree planting	5.4	75,000
US 40	4.5 miles northeast of Vacaville-Dunnigan Cutoff to 1.3 miles north of Dixon-Rio Vista Highway; construct 6-lane freeway	7.0	2,600,000
SR 48	Napa River Bridge near Vallejo; construct bridge substructure		2,850,000
Various	Rights of way		700,000
	SONOMA COUNTY		
US 101	Russian River to Lytton Forestry Station north of Healdsburg; tree planting	3.9	8,500
US 101	1.0 mile south of Washington School Road to 0.6 mile north of Hiatt Road north of Geyserville; construct 4-lane freeway	3.5	2,400,000
SR 12	Farmers Lane to 0.1 mile east to Brush Creek in and near Santa Rosa; widen existing 2-lane highway to provide 4-lane divided section. (Cooperative project—Santa Rosa share $17,000, Sonoma County Flood Control District, $50,000)	0.8	175,000 (State share)
SR 12	0.4 mile west of Occidental Road to 1.2 miles east of South E Street in and near Santa Rosa; construct 4-lane freeway and expressway for 3 miles with rough grading on an additional 1.1 miles	4.1	5,200,000
Various	Rights of way (including $1,500,000 for US 101 freeway at Santa Rosa)		2,455,000
	STANISLAUS COUNTY		
Various	Rights of way		950,000
	SUTTER COUNTY		
SR 20	4.5 miles east of Colusa to Drexler Road; construct 2-lane expressway including new Sacramento River Bridge near Meridian (also listed in Colusa County)	5.1	1,980,000
Various	Rights of way		100,000
	TEHAMA COUNTY		
US 99	0.5 mile south to 2.5 miles north of the Shasta County line; construct 4-lane freeway through Cottonwood (connects with current construction to provide continuous freeway from just north of Red Bluff to Anderson, a distance of 16 miles) (also listed in Shasta County)	3.0	3,250,000
Various	Rights of way		615,000
	TRINITY COUNTY		
US 299	7.9 miles east to 10.0 miles east of Douglas City; construct 2-lane expressway	1.9	1,350,000
Various	Rights of way		10,000
	TULARE COUNTY		
US 99	Paige Road to 0.6 mile north of Prosperity Avenue in and near Tulare; landscape and tree planting	3.7	200,000
US 99	1.0 mile north of Goshen to Traver; convert expressway to 4-lane freeway	5.9	850,000
US 99	1.3 miles south to Fresno County line; convert expressway to 4-lane freeway. (This project and previously listed job will complete freeway development on US 99 in Tulare County)	1.3	660,000
SR 198	Mooney Boulevard to 0.4 mile east of Road 156 in and near Visalia (portions); structures and frontage roads as the first unit of four-lane freeway construction through Visalia (grading and paving to be included in later project)		2,425,000
SR 190	0.6 mile west of Sign Route 65 near Porterville to 0.3 mile east of Hospital Road; construct 4-lane expressway	3.9	1,700,000
HR 133	Visalia-Woodlake Highway—St. Johns River to Ivanhoe; widening and reconstruction	2.2	200,000
HR 135	Central Valley Highway—Kings County line to 1.0 mile south; reconstruct and widen	1.0	92,000
Various	Rights of way (including $2,000,000 for SR 198 freeway in and near Visalia)		2,368,000
	TUOLUMNE COUNTY		
SR 108	1.0 mile east of Mi-Wuk village to 3.7 miles east of Long Barn; construct 2-lane expressway	7.0	1,500,000
SR 108	Eagle Creek Bridge near Dardanelle; replace bridge and construct approaches		65,000
Various	Rights of way		235,000

Route	Description	Approx. mileage	Estimated cost
	VENTURA COUNTY		
US 101	Ventura Freeway—0.1 mile southeast of Los Angeles County line to 0.4 mile west of Triunfo Road; construct interchange to convert to full freeway (also listed in Los Angeles County)		$420,000
US 101	Ventura Freeway—0.3 mile southeast of Genieve Road to 0.2 mile southeast of Las Posas Road near Camarillo; construct interchange and frontage roads to convert to full freeway		450,000
US 101	Ventura Freeway—0.4 mile southeast of Wood Road to 0.3 mile southeast of Vineyard Avenue near El Rio (portions); construct interchange and frontage roads to convert to full freeway		950,000
US 101	Ventura Freeway—0.3 mile east of Telephone Road to California Street in Ventura; landscape	4.6	240,000
SR 118	Los Angeles Avenue—Moorpark Road to Los Angeles County line (portions); intersection improvements and left turn lanes		100,000
SR 126	0.1 mile west of Wells Road to 0.7 mile east of east city limit of Santa Paula; construct 4-lane freeway (connects with freeway now under construction to west)	8.5	7,000,000
Various	Rights of way		3,000,000
	YOLO COUNTY		
US 40 & 99W	Sacramento River Bridge near W and X Streets in Sacramento; bridge substructure for future freeway crossing (also listed in Sacramento County)		1,250,000
US 99W	0.5 mile north of Russell Boulevard to Mullen Crossing north of Davis; reconstruct and widen	5.6	350,000
Various	Rights of way		360,000
	YUBA COUNTY		
Various	Rights of way		160,000

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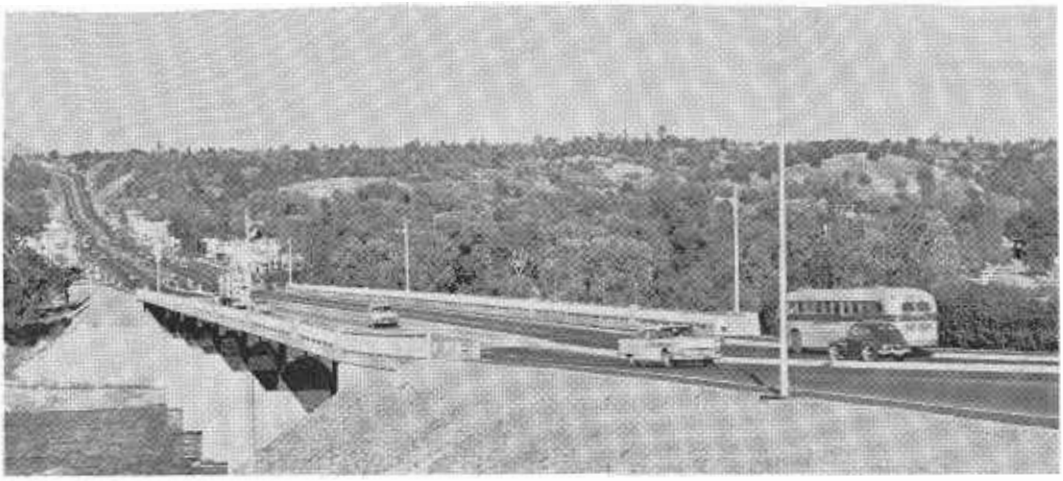
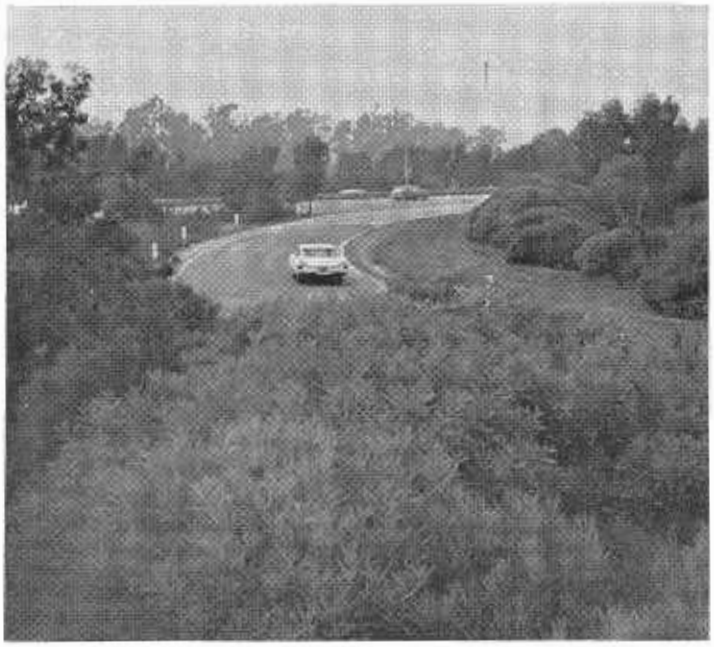


Recently widened Sacramento River Bridge on U.S. 99 at Redding.



Landscaping on the Bayshore Freeway south of San Francisco.

Interstate freeway construction on U.S. 40 near Baxter in the Sierra