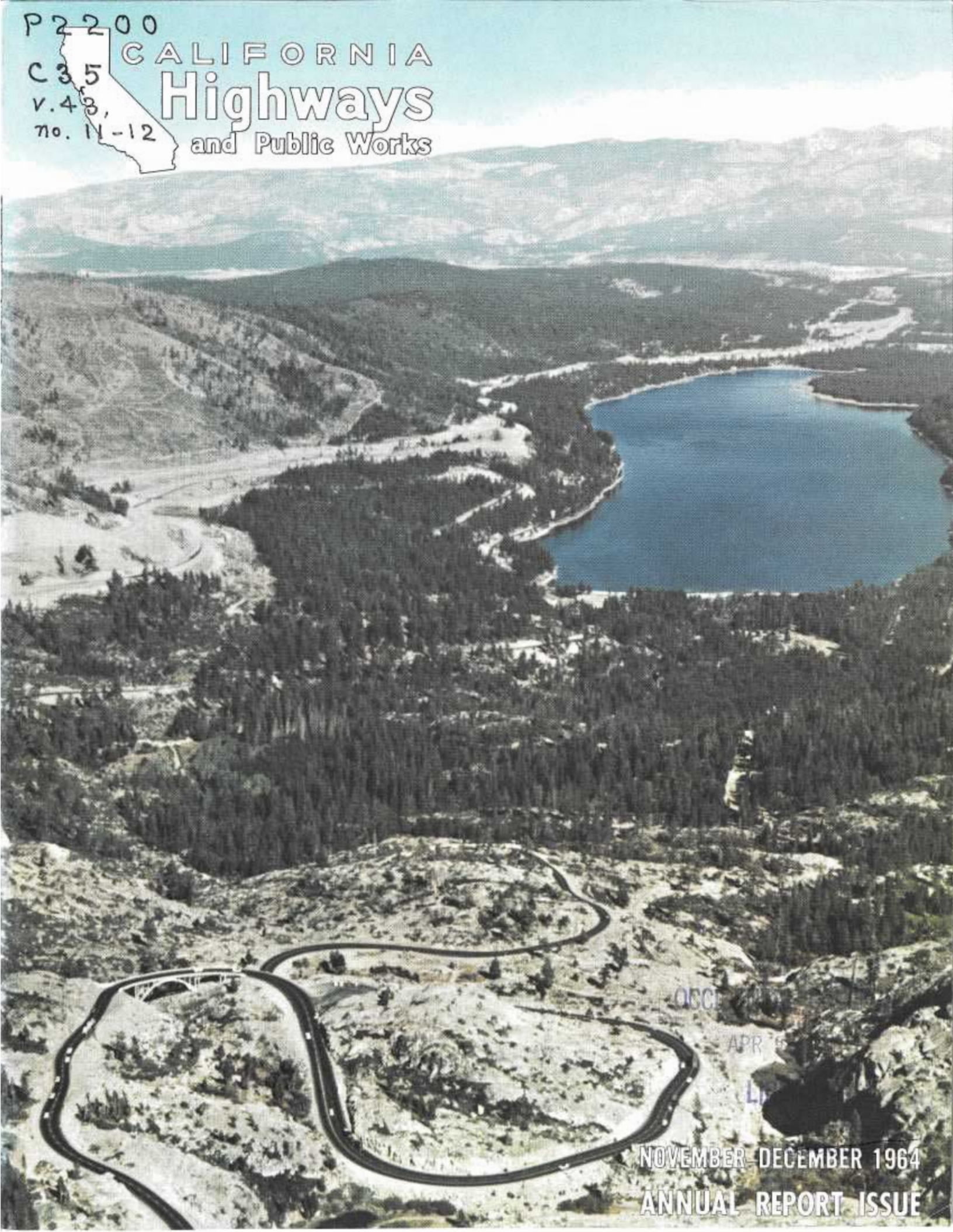
CALIFORNIA Highways and Public Works



NOVEMBER DECEMBER 1964

ANNUAL REPORT ISSUE

STATE OF CALIFORNIA

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California Highways and Public Works

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

Vol. 43 November–December Nos. 11–12

CONTENTS

LESTER S. KORITZ, *Editor*

STEWART MITCHELL, *Associate Editor* MARCIA J. MICKELSEN, *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,

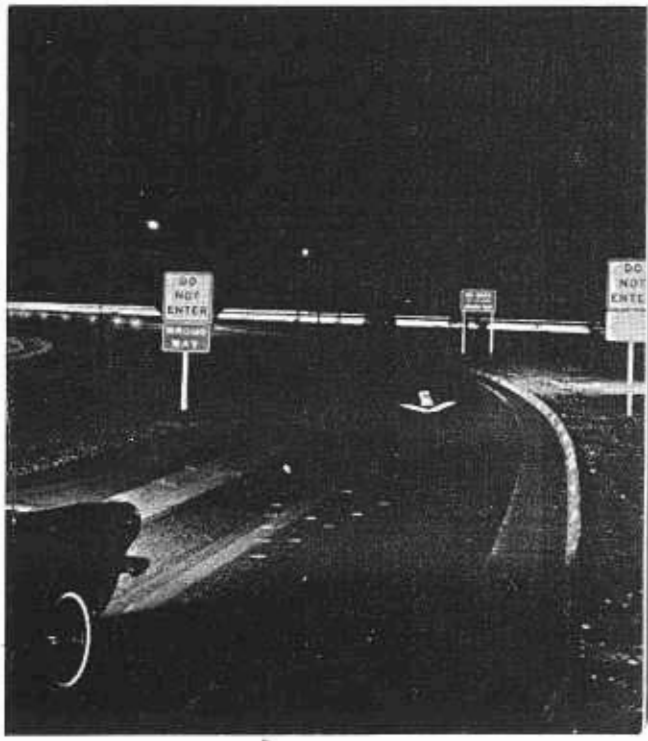
CALIFORNIA HIGHWAYS AND PUBLIC WORKS

P.O. Box 1499

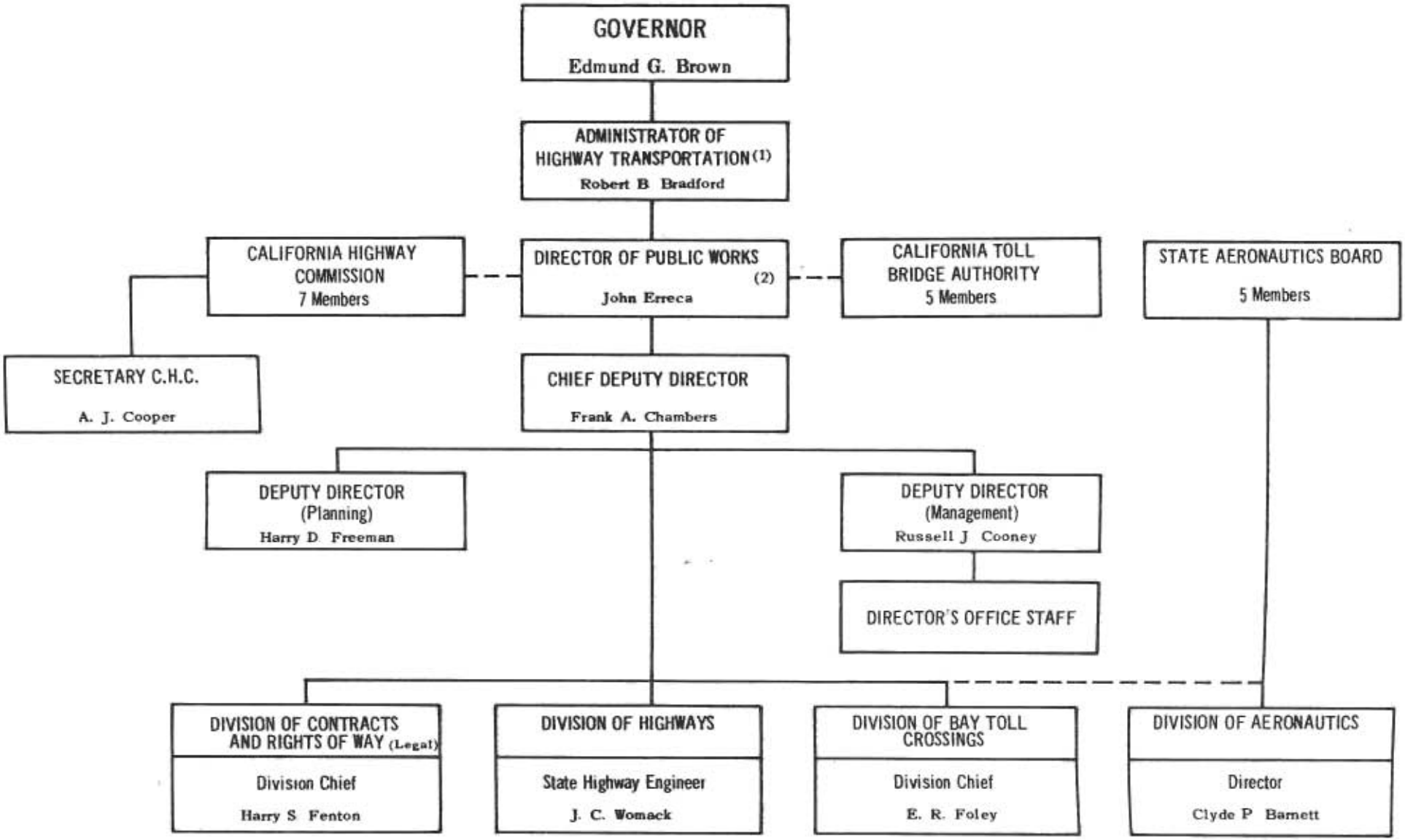
SACRAMENTO, CALIFORNIA 95807

FRONT COVER: In this aerial photo taken above Donner Pass, old US 40 winds down the eastern slope toward Donner Lake in the distance. The new Interstate 80 Freeway, opened to traffic on November 20, can be seen on the slopes to the left of the lake and beyond. (Photo by William R. Chaney).

BACK COVER: This nighttime view of the Antelope Road interchange on Interstate 80 near Sacramento displays the Division of Highways' latest devices aimed at keeping wrong-way drivers off freeways. The white-on-red signs which read WRONG WAY will be similarly placed on all off ramps in the State Highway system. The red pavement arrow (which is invisible to a driver clearing the ramp) and the sign, GO BACK—You Are Going—WRONG WAY, are still in the experimental stage and are now installed at a limited number of locations. (Photo by Bill Ruland.)



State of California
Department of Public Works – Organization Chart



(1) Administrator is Ex-officio Chairman and Member of the California Highway Commission and a Member of the California Toll Bridge Authority

(2) Director is Ex-officio Administrative Officer of the California Highway Commission and Administrative Officer of the California Toll Bridge Authority

NOVEMBER, 1964

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
ROGER S. WOOLLEY	Rancho Santa Fe	March 18, 1959	January 15, 1967
ABRAHAM KOFMAN	Alameda	September 14, 1961	January 15, 1964
FRANKLIN S. PAYNE	Los Angeles	February 3, 1962	January 15, 1966
WILLIAM S. WHITEHURST	Fresno	April 25, 1963	January 15, 1965
JOSEPH C. HOUGHTELING	Sunnyvale	November 28, 1964	January 15, 1967

Administrative Officer: JOHN ERRECA

Secretary: A. J. COOPER

Assistant Secretary: ROBERT T. MARTIN

CALENDAR OF MEETINGS

CALIFORNIA HIGHWAY COMMISSION

July 1, 1963, to June 30, 1964

July 18, 19 and 20, 1963 ..... Crescent City
Inspection of state highways and dedication ceremonies for the Randolph Collier Tunnel

July 22 and 23, 1963 ..... Sacramento

August 20 and 21, 1963 ..... Sacramento

August 22, 1963 ..... San Francisco

August 23, 1963 ..... Antelope Valley
Inspection of state highways and dedication ceremonies for the Antelope Valley Freeway

September 10, 1963 ..... Coronado

September 11, 1963 ..... San Diego

September 24, 1963 ..... Chico
Inspection of state highways and dedication ceremonies of the freeway through Chico

September 25 and 26, 1963 ..... Sacramento

September 28, 1963 ..... San Pedro
Inspection of state highways and dedication ceremonies of the Vincent Thomas Bridge

October 10, 1963 ..... Hayward
((Public hearing, Road IV-Ala-105-Hay, between Route 69 and Route 5 (freeway) near Hillary Street and Road IV-Ala-259-Hay,A, between Route 5 (freeway) near Hillary Street and Route 5, 0.7 mile east of Crow Canyon Road))

October 30, 1963 ..... Sacramento

October 31 and November 1, 1963 .....
Inspection of state highways in Sierra, Plumas, Lassen and Modoc Counties

November 20, 1963 ..... Lompoc
Inspection of state highways in the vicinity of Santa Maria, Lompoc and Vandenberg Air Force Base

November 21, 1963 ..... Los Angeles

December 11, 1963 ..... San Francisco
(Public hearing, Road IV-SM, SF-253-Bsbn,SF between Route 68, 0.6 mile south of the San Francisco-San Mateo county line and Route 253 near Evans Avenue in San Francisco)

December 18, 1963 ..... Sacramento

January 23, 1964 ..... Sacramento

January 24, 1964 ..... Sacramento
(Joint session with the State Park Commission)

February 24, 1964 ..... Santa Monica
Inspection of alternatives for the freeway in Malibu area

February 25, 1964 ..... Santa Monica
(Public hearing, Road VII-L.A., Ven-60-A,A, between Malibu Canyon Road and Calleguas Creek)

February 26, 1964 ..... San Bernardino

February 27, 1964 ..... Palm Springs
Inspection of state highways and review highway problems in the central Riverside-San Bernardino County area

March 12, 1964 ..... Hopland
((Public hearing, Road I-Men-1-L,B, between 0.6 mile south of the Hopland Overhead and Crawford Ranch and Road I-Men-16-A, between Route 1 (new) and 0.1 mile east of Dooley Creek))

March 19, 1964 ..... Sacramento

March 20, 1964 ..... Fresno
(Public hearing, Road VI-Fre-125-Fre,C, between "M" Street in the City of Fresno and 1.0 mile south of the Madera county line)

April 15, 1964 ..... Sacramento

April 16, 1964 ..... Folsom
(Public hearing, Road III-Sac,Pla-249-C,D;A,Rsv,A, between one-half mile south of Grant Line Road and Rocky Ridge Road)

May 20, 1964 ..... Sacramento

May 21, 1964 ..... San Francisco
(Public hearing, Road IV-SF-223-SF, between Route 2 near Haight and Octavia Streets and Route 56 near Golden Gate Park; Road IV-SF-56-SF, between Route 223 near Golden Gate Park and Route 2 on the Golden Gate Bridge approach; and Road IV-SF-2-SF, between Route 2 near McAllister and Franklin Streets and Route 2 on the Golden Gate Bridge Approach)

June 24, 1964 ..... Oakland

June 25, 1964 ..... Willows
Inspection of the Mendocino Pass Highway

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	Died Nov. 1, 1962
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 W. 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
Robert E. McClure	Santa Monica	Jan. 18, 1954	Jan. 15, 1962
John Erreca	Los Banos	Jan. 16, 1961	Sept. 20, 1963
Arthur T. Luddy	Sacramento	Feb. 16, 1959	Resigned July 31, 1964
Alfred E. Heller	Grass Valley	July 17, 1964	Resigned Nov. 26, 1964

PHOTO RIGHT: Shown is an interchange near completion in West Los Angeles, connecting the Interstate 10 (Santa Monica) Freeway, crossing from left to right, and the Interstate 405 (San Diego) Freeway. Interstate 10 is completed or under construction between the East Los Angeles Interchange and the Pacific Coast Highway (Route 1) in Santa Monica.

California Highways...1964

California's highway progress was spotlighted in 1964 by a significant anniversary date—in September it was just 25 years since the enactment of the state's first freeway law.

What the Legislature did in 1939 was to adopt a series of additions to the Streets and Highways Code which, first, defined a freeway as a highway to which owners of abutting property had no right or easement of access or only limited or restricted access; second, authorized the Department of Public Works to lay out, acquire and construct freeways; third, provided for purchase or condemnation of access rights, with compensation; and, fourth, required agreements between the state and local governments for street and road closures incidental to freeway construction.*

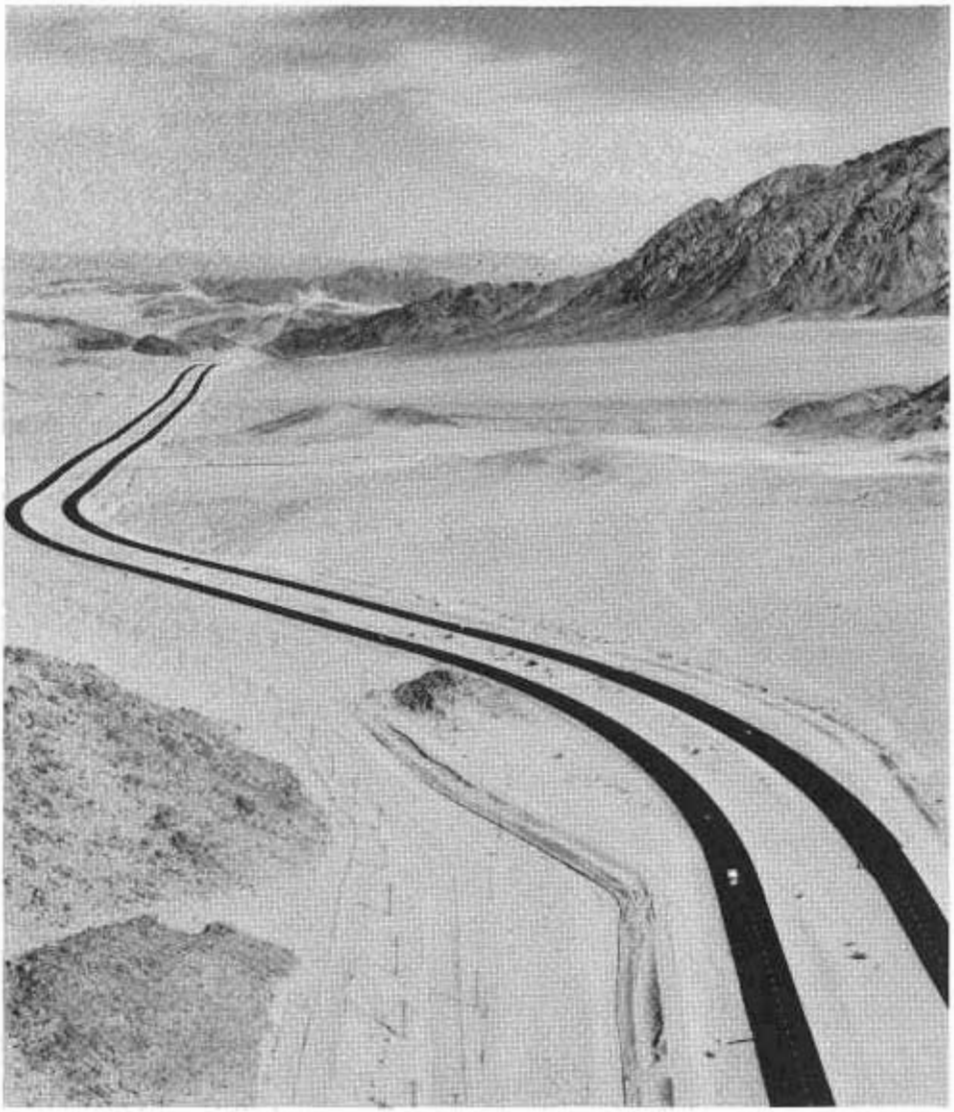
* *Editor's note:* The story of the 1939 legislation is fully told in "The Freeway Law," by Frank B. Durkee, in the September–October 1964 issue of *California Highways and Public Works.*

This legislation, the foundation on which California's rapidly growing freeway network has taken shape, protected the state's investment in highway construction from the encroachments of uncontrolled roadside developments that sooner or later choke any major traffic artery, multiply accidents and often defeat the very purpose for which the facility was built.

Legislative concern for highway development in California is based on the

A 5.9-mile section of the Redwood Parks Freeway (US 101) in Humboldt County south of Miranda was completed in October, which together with a 2.6-mile section under construction near Sylvandale and a 7.7-mile unit to be advertised for bids this winter north of Englewood, will complete 33 miles of full freeway on this route south of Scotia.

The 1,500th Mile . . .



This four-lane freeway section of Interstate 15, in the Mojave Desert about midway between Barstow and the Nevada state line, is part of a recently completed 17-mile project which carries California's total of full freeways past the 1,500th-mile mark. An 18-mile project northeasterly of this section will be finished in early 1965, completing full freeway between the Nevada line and Barstow, and freeway and expressway to San Bernardino.

facts of the state's history and development. California's era of greatest growth came after the peak of railroad expansion had passed; half of the state's communities lack rail service of any kind. Safe, high-capacity highways were essential if people and goods were to move freely through California's 825-mile length.

Twenty years after the pioneering freeway law, the Legislature looked again to the state's future and adopted a master plan for a statewide system of freeways and expressways. This 1959 law was based on a comprehensive study which the Legislature had ordered in 1957.

One of the most significant features of the freeway system study was the breadth of cooperation by state, county and city officials—planners as well as engineers. Not only did an advisory committee of seven county and seven city officials assist the department, but a number of the counties and cities, in cooperation with the Division of Highways, also drafted their own comprehensive traffic plans, the results of which were used in preparing the final freeway system proposal.

The system as enacted by the Legislature in 1959 contained 10,722 miles already in the state highway system and 1,519 miles then under local jurisdiction. Routes subsequently added have brought the total to 12,414 miles. Freeway routings adopted by the Highway Commission now total more than 7,100 miles.

This statewide system, the first in the nation, will connect all cities of 5,000 or more people, and will serve every major industrial, agricultural, commercial and recreational region. It will be substantially completed by 1980.

The system will be reviewed by the Legislature early in 1965 and every four years thereafter to keep it in line with possible changes in traffic conditions.

As specified in the 1939 legislation, control of access is the hallmark of a freeway. Thus, the 1959 master plan encompasses a substantial mileage of freeways which are only two lanes wide—at present—but which have built-in provision and sufficient right of way for additional lanes when needed and feasible; and additional mileage of multilane expressways, which have a median divider between the roadways but on which there may be some cross traffic still at grade.

Most of the recent and current construction on heavily traveled routes, however, has been initially of the "full freeway" type. This is a multilane divided highway with not only full control of access but also with all cross traffic carried over or under the freeway.

At year's end, of the 2,940 miles of multilane divided highways opened to traffic, 1,589 miles were constructed to full freeway and 733 miles to expressway standards. Another 745 miles of freeways and 61 miles of expressways are under construction or budgeted.

Completed multilane expressway mileage is 28 less than that of last year, reflecting conversion of expressway sections to full freeway standards.

Additionally, 918 miles of two-lane expressways, mostly in rural and mountain areas, are completed, under construction or budgeted.

Having more than one-ninth of the nation's registered motor vehicles, Californians today drive more than 82 billion miles a year. By 1980 this figure will increase to 200 billion. But, thanks to the freeway and expressway system, a network that will constitute only one-tenth of the state's total road mileage but will carry 60 percent of all traffic—leaving the remaining nine-tenths of the mileage composed of streets, county roads and conventional state highways to carry only 40 percent—highway officials are confident that there will be less traffic congestion in 1980 than exists today.

The Interstate System

The 41,000-mile national system of interstate and defense highways, the largest construction project in history, will link the principal metropolitan areas and industrial centers of all the states but Hawaii and Alaska by high-capacity ultrasafe freeways.

California's portion of this network, a system within and totaling approximately 17.5 percent of the state's freeway and expressway system, is 2,178 miles, of which routings have been adopted for all but 18 miles.

A total of 701 miles are now completed and another 527 miles are under construction or budgeted. An additional 169 miles are in operation as expressways but will be upgraded to full freeway standards by 1972.

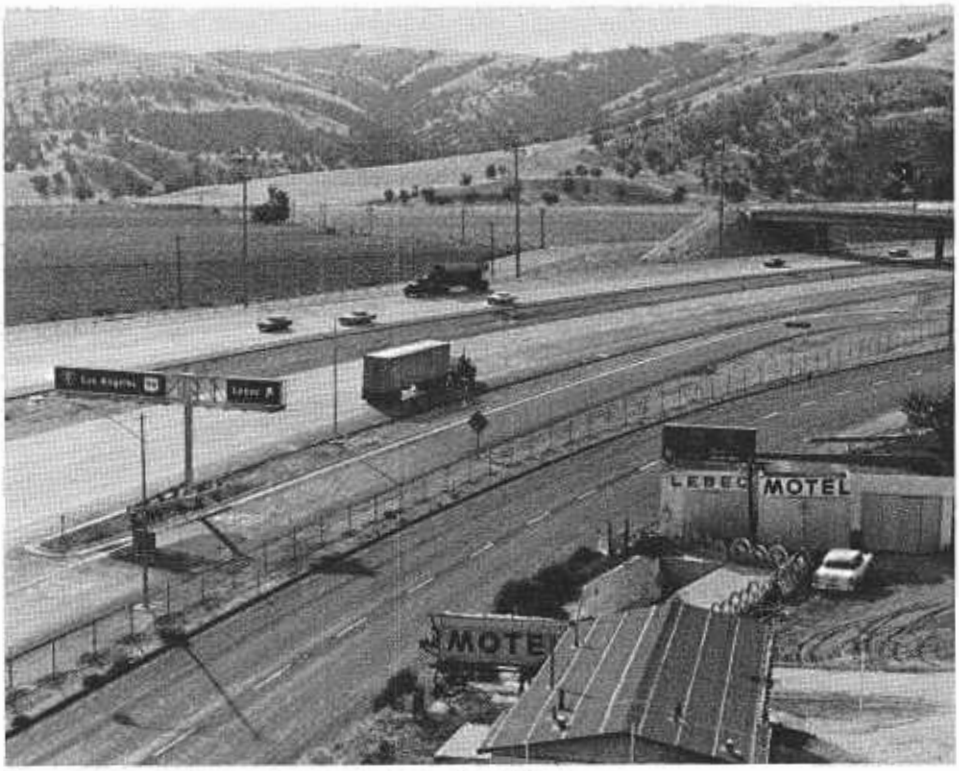
The percentage of completed mileage might be misleading in the light of the 1972 deadline. However, the Highway Commission and Division of Highways have emphasized early completion of the most expensive mileage in densely populated metropolitan areas, plus difficult stretches in the mountains and deserts, where the greatest traffic relief could be afforded, before tackling some of the less complicated sections through rural areas.

This state leads the nation in the amount of interstate system funds expended, obligated or budgeted—$2,275,000,000 counting projects in the 1965-66 budget—and is among the leaders in the amount of rights-of-way purchased.

Traffic Safety

Many traffic safety programs are underway. They are needed. In 1963, 4,318 people were killed and another 200,000 injured in traffic accidents in California. Property damage was estimated at $750,000,000.

Highway safety research programs range from investigations into all causative factors for negligent driving to studies of roadway design. But the most important single thing being done to combat the appalling accident rate is the replacement of conventional highways with controlled access freeways.



An eight-lane freeway section near the summit of the Ridge Route (Interstate 5) between Kern and Los Angeles Counties was completed this fall, extending the Grapevine Grade Freeway (completed in 1960) 4.7 miles southerly.

A newly budgeted Interstate 680 Freeway project will extend this completed freeway south of Scotts Corner in Alameda County to one mile north of the Contra Costa county line. Projects under construction or budgeted will provide full freeway between Fremont in Alameda County and Vallejo in Solano County on this bay area circumferential route.

The above photo of experimental signs installed this summer at an Interstate 80 Freeway off-ramp northeast of Sacramento indicates the Division of Highways' concern with the "wrong way" driver.

Every day more than one life is spared and 65 persons saved from injury by the safety factors built into California freeways. These are deaths and injuries which would occur if the freeways did not exist and if the same travel had taken place on conventional highways.

In 1962 and 1963, the accident rate on urban conventional highways was 5.29 per million vehicle-miles—on urban freeways, 1.57. On rural conventional highways during the same period, the accident rate was 2.43—on rural freeways, 0.97.

The fatality rate on urban conventional highways, per 100 million vehicle-miles, during those years was 4.03—on urban freeways, 2.73; on rural conventional highways, 9.10—on rural freeways, 4.52.

Other Benefits

Although statistics showing the reduction in traffic deaths and accidents resulting from the use of freeways are fairly well known, many people are less aware of the wide range of other benefits. These include lowered costs for insurance, fuel and equipment, and tremendous savings in travel time.

The Automobile Club of Southern California two years ago studied its employees' travel time to and from home in metropolitan Los Angeles during peak traffic hours. This travel took place not only on freeways but also on conventional highways and city streets.

It was found that travel speeds averaged 30.5 miles per hour in 1962, contrasted with 26 miles per hour in 1960 and 24 in 1957.

This significant decrease in travel time was ascribed to the completion of freeway segments which relieved traffic on alternate routes as well as expediting heavy volumes of traffic themselves.

The speedup of travel time, important as it is to the individual motorist, if of far greater significance in commercial operations. The cost of retail goods at the point of purchase reflects the cost of delivery from the manufacturer or wholesale outlet.

Operating costs of private motor vehicles are more than a half-cent a mile less on freeways in fuel and upkeep than on conventional highways and city streets. Trucks and motorbuses realize far greater savings.

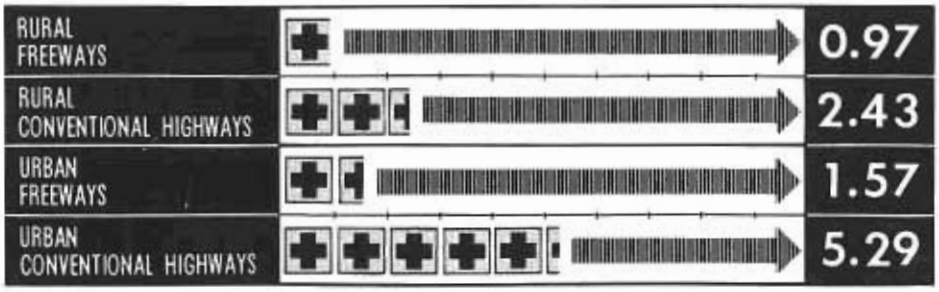
Community Effects

Shifting travel from "Main Street" to the new freeway facility gives the former back to the merchants and their customers, who, before, were prevented by traffic congestion from parking and shopping. Heavy through traffic is normally unproductive of sales, yet the local shopper—the mainstay of an area's business—frequently

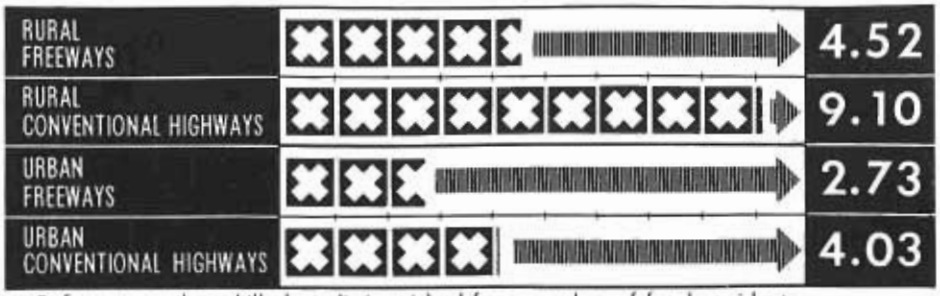
FREEWAYS and SAFETY

(1962-63 AVERAGES)

ACCIDENT RATE PER MILLION VEHICLE MILES



*FATALITY RATE PER 100 MILLION VEHICLE MILES



*Refers to numbers killed as distinguished from number of fatal accidents.

was forced farther and farther away to outlying shopping centers or even neighboring towns by the pressure of nonstopping vehicles.

Community residents discover that the opening of a paralleling freeway removes most of the exhaust fumes and bothersome noise associated with the older highway through town. The older route, superseded as a state highway by the freeway and relinquished to the community, no longer acts as a barrier, fearsome and time-consuming to cross.

Since freeways reduce time-distance factors and transportation costs, they make communities more attractive to industries seeking sites for relocation or expansion. Equally important, they offer the area's working force greater areas in which to market its skills.

National studies of the sale prices of homes by the U.S. Department of Commerce have been confirmed by similar studies by the Research and Development Section of the Division of Highways Right of Way Department. Both show that the sale prices of homes adjacent to modern landscaped freeways generally are comparable to homes a few blocks away.

Shown is a section of two-lane expressway on Route 299 northeast of Adin in Modoc County completed in midyear.

The California Highway Commission

The Legislature established the California Highway Commission in its present form in 1943 to insure not only continuity of highway policy, but also its removal from sectional or political considerations.

Its membership comprises six business and professional men, appointed by the Governor and confirmed by the Senate, plus, as its chairman, the Administrator of the Highway Transportation Agency. The State Director of Public Works serves as its administrative officer.

The six members serve without pay for four-year staggered terms. They are required by law to represent the entire state rather than a particular area.

The commission's duties include the budgeting and allocating of state highway funds, the determining of routings for freeways and other highways, and the approval of select systems of county roads and city streets, the authorizing of condemnation proceedings, and approving the terms and conditions of deeds and right-of-way relinquishments and abandonments.

The commission adopts an annual budget each October for the coming fiscal year. For fiscal year 1965–66, it budgeted $612,432,000 for state highway construction purposes, including rights-of-way and engineering. However, to insure that all savings from individual projects can be made available quickly for other work, it adjusts budgeted amounts at its regular monthly meetings.

The Division of Highways

The Division of Highways, a unit of the Department of Public Works, is an organization of career employees chosen and promoted on the basis of competitive examinations. It is responsible for the actual operation of the highway program including planning, design, right-of-way acquisition, construction and maintenance.

Its chief, the State Highway Engineer, is assisted by a headquarters staff in Sacramento and by 11 highway district engineers and their staffs who are responsible for all aspects of the highway program in their areas.

Experience has shown that this decentralization makes the program more responsive to local conditions and needs.

Information on local highway matters may best be obtained from the following, their areas delineated by the accompanying map:

District 1—Sam Helwer, District Engineer, 430 West Wabash Avenue, Eureka

District 2—H. S. Miles, District Engineer, 1657 Riverside Drive, Redding

District 3—W. L. Warren, District Engineer, 703 B Street, Marysville

District 4—Alan S. Hart, District Engineer, 150 Oak Street, San Francisco

District 5—R. J. Datel, District Engineer, 50 Higuera Street, San Luis Obispo

District 6—W. L. Welch, District Engineer, 1352 West Olive Avenue, Fresno

District 7—E. T. Telford, District Engineer, 120 South Spring Street, Los Angeles

District 8—C. V. Kane, District Engineer, 247 Third Street, San Bernardino

District 9—C. A. Shervington, District Engineer, South Main Street, Bishop

District 10—J. G. Meyer, District Engineer, 1976 East Charter Way, Stockton

District 11—J. Dekema, District Engineer, 4075 Taylor Street, San Diego

Highway Financing

Based firmly on pay-as-you-go highway-user taxes which provide such fairly predictable sources of revenue as gasoline and diesel fuel, drivers' licenses and registration fees, weight fees on commercial vehicles, and taxes on for-hire trucking, California's highway program can be planned many years in advance.

The accompanying chart shows the sources and expenditures of all revenues received.

California's Constitution requires that revenues from highway-user taxes be used for road construction and maintenance, and the administration of the Division of Highways, the Department of Motor Vehicles and the Highway Patrol.

Federal monies stemming from the U.S. government's taxes on the highway user are returned to the state according to complicated formulae. More than 91 percent of the cost of constructing the state's portion of the interstate system is recompensed from federal funds, as is 58 percent of the amount spent on certain federal-aid primary, secondary and urban highway projects.

The Highway Commission is required by law to allocate 55 percent of construction funds to the 13 southern counties and 45 percent to the remaining 45 counties each year. The law further requires certain minimum expenditures in each highway district, including a minimum of $4,000,000 in each county over each four-year period, except in sparsely populated Alpine and Sierra Counties, where this minimum is $1,000,000.

Freeway Route Selection

The Legislature, not the Highway Commission, designates routes as state highways, both freeway and conventional, and fixes their general termini. It sometimes specifies certain general control points through which they must pass. It remains for the Highway Commission, however, to determine specific routings.

Like the old-time policeman on the beat, the local district highway engineer knows the area for which he is responsible. When he finds that freeway location studies are indicated, he obtains authority to make them from the State Highway Engineer.

Governing bodies of cities and counties are informed at the start of such studies. Both are asked to cooperate and to provide available information on any master plan for transportation and development of the area concerned.

The district engineer's staff develops several feasible alternates, considering the destination desires of motorists, community plans for land use, the controls imposed by terrain and other factors, the effect of each alternate on individual properties and on community values, and the relative costs for construction and right-of-way acquisition.

All concerned—interested agencies of federal, state and local governments, water and school districts, and utility and transportation companies, among others—are consulted during the development of the several alternates. All alternates under study are mapped and fully discussed at public hearings at which area residents are urged to express their views.

When the completed report of route studies is received by the State Highway Engineer, he reviews and analyzes it and recommends a routing to the Highway Commission. The commission, however, never adopts a routing without informing the local governing body of its intention to do so and asking if a public hearing by the commission itself is desired. On occasion, it will set a hearing date without such a request when it determines that a hearing would be in the public interest.

STATE HIGHWAY DISTRICTS

The route finally chosen is that which the commission considers will best serve the general public, taking all factors into consideration.

Cooperation continues between the state and local government following route selection. Representatives of both negotiate a freeway agreement covering local street and road adjustments necessitated by the new freeway facility.

Right-of-way Acquisition

Agents of the Right of Way Department of the Division of Highways rightly regard themselves as working both for the state and for the affected property owner.

To permit intelligent planning by those whose properties will be required by freeway construction, agents visit affected residents to explain acquisition procedures, as soon as design studies are sufficiently advanced to identify properties in the freeway's path.

Property appraisal is always based on "fair market value," defined by the courts as "the highest price in terms of money which the land (property) will bring if exposed for sale in the open market with a reasonable time to find a purchaser, buying with full knowledge of all the uses and purposes to which it is adapted and for which it is capable of being used."

In fairness to all, the appraisers consider only objective factors and are completely uninfluenced by bargaining procedures.

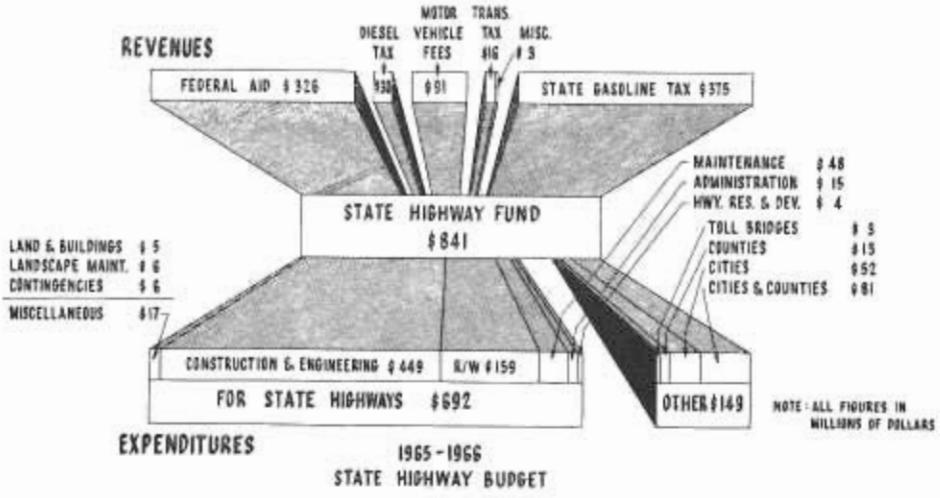
During the past fiscal year, the Right of Way Department acquired 7,333 properties for highway construction purposes. In these transactions, the owners of 96.1 percent of the parcels involved accepted the state's offer of settlement. Only 3.9 percent were acquired by court action in eminent domain proceedings.

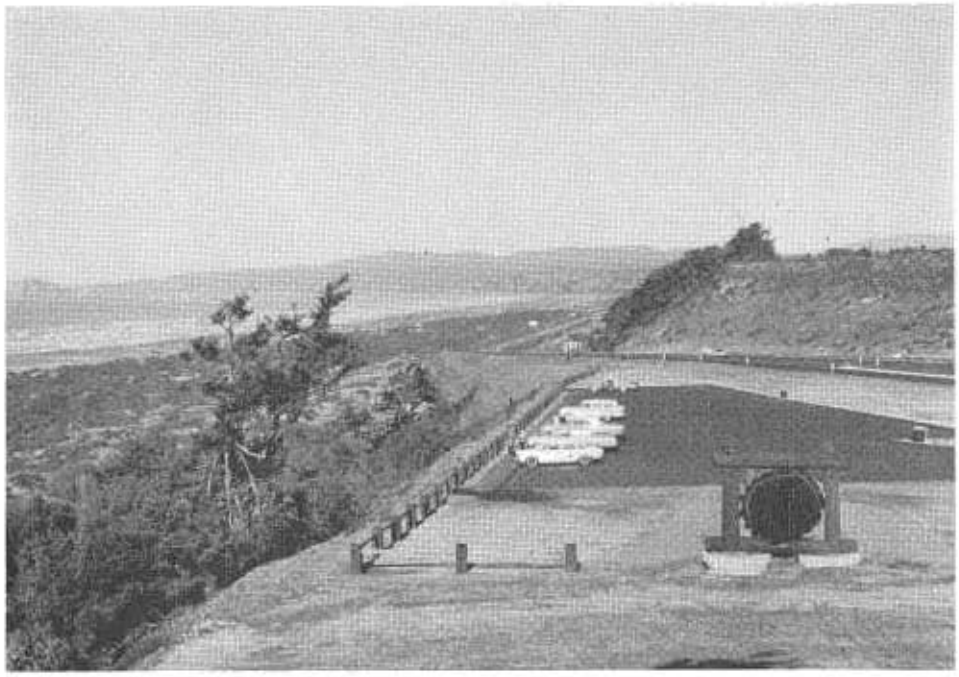
In acquiring rights-of-way, not only does the state pay cash but no real estate commissions or title costs and document fees are involved. Additionally, the U.S. Internal Revenue Service does not tax income or capital gains on the increase in the sale price above original cost when properties are sold to governmental agencies for public purposes, provided that the money received is used to purchase similar properties within specified time limits. U.S. Veterans Administration and California Department of Veterans' Affairs' loans may be transferred to the new properties.

Shown is a portion of the 11.3-mile freeway section of US 101 between south of San Ardo and north of Bradley in Monterey County which was completed in August. This section connects on the south with a 6.7-mile freeway project, which will be opened to traffic next fall. The latter, in turn, connects with a recently completed 4.8-mile freeway section extending to north of San Miguel in San Luis Obispo County.

Route Renumbering

Senate Bill 64, providing for the renumbering of the state highway system, became effective July 1, 1964.





This vista point is on an eight-mile freeway section of US 101 north of Arcata, completed in late October. This stretch along the beach provides the first view on this route of the Pacific Ocean north of San Francisco. In distance is Trinidad Head.

This legislation decreed that there be only one route number for each highway section, with minor exceptions at locations where certain routes are coincident for short distances. Formerly, many routes were known by several different numbers – legislative, state sign route, U.S. sign route, and, more recently, by numbers on the interstate system.

In establishing the new numbering, precedence was given to retention of present sign route numbers in the following order: interstate routes, U.S. numbered routes, and state sign routes.

Every effort was made to retain numbers on existing sign routes, not only to minimize confusing the travelling public, but to reduce the costs of re-signing.

The renumbering program was carried out in cooperation with mapmakers and met with favorable public reaction.

Highway Aesthetics

Approximately 5,000 miles of the state highway system were designated as state scenic highways by the 1963 Legislature, which also created an Advisory Committee on a Master Plan for Scenic Highways.

The seven-man committee was appointed by Governor Brown in January 1964 from among officials of cities and counties, persons having special competence in the field of landscape architecture as it relates to scenic conservation, and others interested in highways, land planning and parks.

Meeting monthly, the committee is studying standards for the preservation of values in the scenic corridors outside the highway right-of-way but within sight of the motorist. It is assisted in this study by the State Office of Planning and an interdepartmental staff committee composed of representatives of the Departments of Public Works, Water Resources, Parks and Recreation, and the State Office of Planning.

At the same legislative session, Senate Bill 173 was enacted which authorized an eventual total of 250 safety roadside rests along state highways, at approximate half-hour intervals of normal driving time, and at the approaches to metropolitan centers, for map inspection purposes, at an estimated cost of $5,845,000 for construction and $1,164,000 each year for maintenance.

The Division of Highways now has 24 such rest areas in operation, including 11 transferred to it from the Division of Beaches and Parks. Seven more are under construction, and work will start in 1965 on an additional 26.

During the past fiscal year, 30 landscaping and functional and tree planting projects were financed at a cost of more than $3,196,000. These projects involved the planting of approximately 118,700 trees and shrubs and 4,880,800 ground cover plants.

Contract Data

During the 1963–64 fiscal year, the Division of Highways opened bids on 551 projects with an estimated construction value of $414,127,800, including construction engineering. Of these, contracts were awarded for 516 projects with a value of $402,980,400 and 20 bids were rejected as not being in the best interest of the state. The 15 remaining contracts were awarded after the close of the fiscal year.

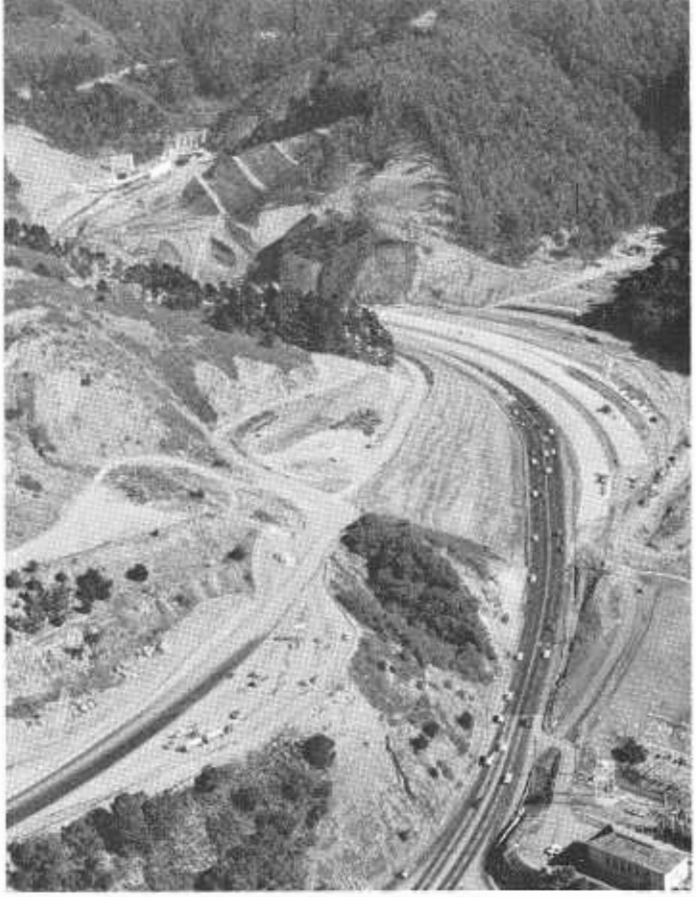
Contracts also were awarded during the year for nine projects, valued at $8,442,300, on which bids had been received during the previous fiscal year.

The cost of right-of-way acquisition and utility relocation, exclusive of land clearance, overhead, and acquisitions for other agencies, amounted to approximately $165,943,700.

The total of $411,422,700 in contracts awarded during the year, was made up of $367,810,400 for construction on state highways; $18,861,300 for work on county roads, including the federal aid secondary system; and $24,751,000 for maintenance and emergency repair, and work for other agencies.

The contracted state highway work involved improvement of 1,519 miles of highways and construction of 444 bridges and separation structures.

Construction Progress



This view looks easterly to the new 3,371-foot two-lane bore on Route 24 (upper left), paralleling the existing bores of the Caldecott Tunnel through the Berkeley Hills. When the eight-lane freeway (to right of existing highway) is completed next fall, the middle bore will be used on a reversible basis so as to provide four lanes in the direction of peak commuter traffic morning and evening. Construction in the embankment area at left and above the existing highway involves the relocating of a portion of Tunnel Road.

On November 1, 1964, while officials of California, Nevada and the federal government were preparing to dedicate the Donner Summit stretch of the Interstate 80 Freeway across the high sierra, the first snow of the season was falling.

A truck skidded on the existing two-lane highway. The resulting traffic tieup dramatized the need for the new, all-weather route, now open to traffic as freeway and expressway for its full 206 miles from San Francisco to the Nevada line, except for a section now under construction or budgeted through Sacramento.

The final 10.5-mile freeway segment replaced the slow and tortuous climb over Donnor Summit, a steep and dangerous section plagued by snow, congestion and accidents.

Meanwhile, about 370 miles to the south, the state's 1,500th mile of full freeway was completed in October on Interstate 15. It was contained in a 17-mile unit between Field and Cronese Valley, west of Baker, in the Mojave Desert.

Construction emphasis in 1964 again focused on these and other routes in California's 2,173-mile portion of the national system of defense and interstate highways.

In metropolitan areas, important freeway sections were started, continued or completed on Interstate 5 in and near San Diego, on Interstate 10 (Santa Monica Freeway), Interstate 405 (San Diego Freeway), and Interstate 605 in Los Angeles and Orange Counties, on the Route 82 Freeway in San Francisco, on Interstate 580 in Alameda County, on Interstate 80 in Sacramento, and on Interstate 5 and US 101 in northern California, to name a few.

In addition, various highways were widened, curves eased, and traffic signals and left-turn lanes were installed in the interest of traffic safety.

In other words, the construction program was balanced geographically as well as between remedying today's highway deficiencies and providing for tomorrow's traffic needs in all sections of the state.

San Diego and Imperial Counties

Interstate 5 in and north of the San Diego area continued to get a major share of attention in the southernmost end of the state, but construction activity was also stepped up on Interstate 8 to the east and carried forward on other routes.

The Interstate 5 Freeway between Palm Street and 28th Street in San Diego was extended southerly to 13th Street in National City in April, and work is underway to continue this eight-lane facility to the south city limit, linking with the Montgomery Freeway to the Mexican border.

A northerly extension of Interstate 5 from Palm to Washington Street in San Diego will be completed next summer, and work will start soon to continue it to Rosecrans Street.

The 1965–66 budget provides funds to construct a one-mile freeway section on I-5 north of the San Diego River to eliminate a highway section with a high fatality rate.

Construction began in the fall on two I-5 Freeway projects totaling seven miles through Rose Canyon to Camp Mathews, and betwen Miramar and Carmel Valley Roads. A connecting section will be advertised for bids this winter.

The new budget finances construction on I-5 for four miles northerly to Via de la Valle near Del Mar, and

Plants and ground cover installed in a landscaping project, completed in September 1963, begin to develop at the four-level interchange between the Interstate 5 and US 395 Freeways in San Diego.

construction is in progress for an additional 11 miles to the south city limit of Carlsbad. From there, a 1.5-mile newly budgeted section to Cannon Road in Carlsbad will connect with the existing four-lane freeway extending to the San Luis Rey River at Oceanside, and another 10-mile newly budgeted project north of the river will connect to a four-lane expressway to the Orange county line.

Widening of Interstate 8 from six to eight lanes was completed in the fall for five miles in and west of La Mesa, and a four-mile, four-lane freeway project extending the freeway from San Diego to Harritt Road east of El Cajon will be completed next April. Bids were opened in November for a three-mile project to continue it toward Alpine.

Farther east, the new budget provides funds for a 10-mile freeway section on I-8 between Boulevard and the Imperial county line, connecting to a 10-mile section in the Mountain Springs area, the completion of which has been delayed by a slide until spring, and for five miles in Imperial County between El Centro and Route 111.

A 3.5-mile four-lane freeway on US 395 north and south of Poway Road west of Poway in San Diego County will be completed next spring, and work is starting on a two-mile section connecting to the four-lane expressway into San Diego.

North of Poway Road, a five-mile freeway extension of US 395 to Rancho Bernardo Road has been budgeted. A two-mile four-lane expressway south of Escondido was nearing completion at year's end and another two-mile expressway section north of the city is in progress.

A four-lane Route 78 Freeway westerly from US 395 in Escondido was completed in December, providing freeway and expressway service on this route to Interstate 5 in Oceanside.

A 2.5-mile four-lane freeway project on Route 67 near Santee in San Diego County will be completed next summer, and a four-lane Route 111 Expressway between the north city limit of Calexico and the future Interstate 8 Freeway was started in the fall.

San Bernardino and Riverside Counties

On the three Interstate routes crossing the vast deserts of southeastern California, construction emphasis has moved from the nearly completed Interstate 15 (Barstow Freeway) to Interstate 40 (US 66) and Interstate 10 east of Indio.

The Interstate 15 Freeway between Yermo and Field, northeast of Barstow, was completed last spring, and a 16.8-mile northeasterly extension to Cronese Valley was completed in October. This latter section contained California's 1,500th freeway mile.

Construction is also in progress on this freeway route for 18 miles northeasterly to Baker. This final project will complete Interstate 15 as full freeway between the Nevada line and Barstow, and freeway and expressway southwesterly to San Bernardino.

Bids were opened in December to convert 6.7 miles of I-15 from expressway to freeway standards in and near Victorville.

On I-40, an 8.7-mile freeway project southeast of Barstow will be completed next spring, and construction has started on the approaches and four-lane freeway bridge across the Colorado River near Needles.

Funds for I-40 in the 1965–66 budget will provide for construction of almost 32 miles between east of Daggett and west of Ludlow, and for nearly 13 miles east and west of Needles, at an estimated cost of about $17,500,000. Work is scheduled to start next spring to connect the future freeway east of Needles with the Colorado River Bridge.

Widening of the San Bernardino Freeway (I-10) from four to eight lanes for six miles in and east of Ontario is starting, and the new budget's funds will continue this widening easterly to Pepper Avenue near Colton.

Another 11-mile project in progress on I-10 will convert this route from four-lane expressway to six-lane freeway between Redlands in San Bernardino County and Beaumont in Riverside County by next spring.

An eight-lane freeway on I-10 was completed in November for the five miles between Banning and the east city limit of Cabazon, and work will start soon on a five-mile easterly extension to Route 111 west of Whitewater.

East of Indio, a 10-mile stretch of four-lane I-10 Freeway was completed in April and work is in progress on another 14-mile easterly extension. The new budget will finance another 27 miles between east of Desert Center and 18 miles west of Blythe.

On noninterstate routes, construction of an interchange at Crestline in San Bernardino County between Routes 18 and 138 is scheduled for completion by the end of 1965. Funds in the new budget will permit construction of a four-lane freeway on Route 18 through Waterman Canyon in the San Bernardino Mountains.

A 5.4-mile freeway section on US 60 was opened to traffic in June between Sunnymead and Route 177, completing freeway and expressway construction on this route between Ontario in San Bernardino County and its terminus at I-10 at Beaumont in Riverside County.

The conversion of US 60–395 from four-lane expressway to six-lane freeway is just starting between the University of California in Riverside and the separation of the two routes east of the city.

Widening of Route 111 to four lanes between Cathedral City and Palm Desert was completed and widening to four-lane divided expressway between Palm Springs and I-10 was begun this fall.

Los Angeles Metropolitan Area

Just as the I-10 (Santa Monica) and the I-5 (Golden State) Freeways formed an inner loop around the Los Angeles downtown area in 1962, the I-405 (San Diego) and I-605 Freeways will form an outer loop west, south and east of the Los Angeles central district.

The I-405 (San Diego) Freeway, opened to traffic in 1963 from its junction with the I-5 (Golden State) Freeway north of San Fernando to southeast of the Route 7 (Long Beach) Freeway at a cost of more than $50,000,000, was extended southeasterly to the Orange county line early in 1964, and partly opened to Bolsa Chica Road in Seal Beach in October. The latter section will be completed in the spring and work has been advertised for bids to extend it to Fountain Valley.

The I-605 Freeway was completed from Whittier to Industry in June, and was extended northerly to the I-10 (San Bernardino) Freeway in Baldwin Park in October. It is also under construction southerly to the I-405 (San Diego) Freeway. The new budget will finance a portion of its extension as the Route 240 Freeway, a noninterstate facility, southerly to the Route 22 (Garden Grove) Freeway.

A 1.7-mile section of the Garden Grove Freeway was completed in July east and west of Route 39 (Beach Boulevard) in Orange County. This freeway route, which eventually will extend from the Route 55 (Newport) Freeway in Orange County to Route 1 (Pacific Coast Highway) in Los Angeles County, is under construction between the I-5 (Santa Ana) and the I-405 (San Diego) Freeways.

A 1.9-mile four-lane section on the Route 55 (Newport) Freeway south of the Santa Ana Freeway was completed in December.

The I-10 (Santa Monica) Freeway was completed for 5.5 miles west to La Cienega Boulevard in November, and work is underway to connect it with the Pacific Coast Highway (Route 1) in Santa Monica by late 1965.

The 1965–66 budget will finance projects to connect and extend two jobs under construction on the Route 60 (Pomona) Freeway between the East Los Angeles Interchange and south of Industry.

The Route 14 (Antelope Valley) Freeway will be extended northeastward for eight miles to the Angeles Forest Highway by next summer, and the 1964–65 and 1965–66 budgets will finance additional construction northerly to Palmdale, plus the grading and structures on a section between southwest of Lancaster and the Kern county line.

The new budget will finance completion of the interchange between the I-5 (Golden State) Freeway and the Route 134 Freeway in Los Angeles; the construction of the eight-lane Route 134 Freeway from this interchange to Glendale, and the addition of auxiliary lanes on I-5 north of the interchange area.

Budgeted funds will also provide for extending the Route 170 (Hollywood) Freeway 1.7 miles northerly to Victory Boulevard in North Hollywood.

Widening of the Interstate 5 (Santa Ana) Freeway in and near Santa Ana

The interchange between the Garden Grove (Route 22) Freeway (upper) and the Interstate 5 (Santa Ana) Freeway in the Orange–Santa Ana area was completed in September. The former freeway is now under construction between the Santa Ana and the Interstate 405 (San Diego) Freeways.

PHOTO LEFT: A bulldozer finds rough going in the difficult terrain of Lee Vining Canyon east of Yosemite National Park in Mono County. Two miles of the Tioga Pass Road (Route 120) are under construction as a two-lane expressway, and another 4.1 miles have been budgeted.

was completed in February, and the new budget provides funds to widen 3.5 miles of the Ventura Freeway (US 101) west of Los Angeles, and 1.4 miles of the Route 7 (Long Beach) Freeway between Vernon and Los Angeles.

On the Ridge Route section of Interstate 5 (US 99) in northern Los Angeles County and extending into Kern County, freeway sections were completed in the fall of 1964 at the Castaic Junction end (3.7 miles) and at the Lebec end north of the summit (4.7 miles). The latter project serves as a southward extension of the Grapevine Grade Freeway completed in 1960.

Conversion of the entire Ridge Route to interstate freeway standards also moved closer to completion with the inclusion in the 1965–66 budget of projects costing a total of nearly $50,000,000 to construct 13 more miles of freeway and do the heavy grading for an additional 12.4 miles in mountainous terrain.

San Joaquin Valley and Central Mountain Counties

As the conversion of US 99 to full freeway status throughout the length of the San Joaquin Valley moved closer toward realization in 1964, large-scale work was just getting underway on the vast project which will occupy the construction spotlight for the next few years—the Westside Freeway (Interstate 5). Progress was also made on some of the lateral routes in the valley and neighboring mountain areas.

Conversion of US 99 from four-lane expressway to six-lane freeway from the completed Bakersfield Bypass Freeway north to Cawelo in Kern County was scheduled to be completed by the end of 1964.

An eight-mile freeway section on US 99 between south of the Tulare-Fresno county line and Selma was completed in October, providing full freeway between McFarland in Kern County and the San Joaquin River northwest of Fresno.

A four-mile freeway extension of this route to south of Madera was completed in May, and a newly budgeted project will complete expressway-to-freeway conversion to Madera, linking with the freeway through that city.

Farther north, a US 99 Freeway through Ceres and Modesto in Stanislaus County will be completed by next spring, and a 7.1-mile expressway-to-freeway conversion north of Stockton in San Joaquin County was opened to traffic in December.

A newly budgeted project will convert US 99 to six-lane freeway north from the Stanislaus-San Joaquin county line to Ripon, and the Lodi Bypass Freeway on this route was completed in February.

On the Interstate 5 (Westside) Freeway, the 1965–66 budget provides funds for construction of 36.4 miles, extending construction now in progress (between west of Los Banos and southwest of Gustine in Merced County) northerly through Stanislaus and southern San Joaquin Counties to a junction with the Interstate 580 Freeway near Tracy.

Another newly budgeted project on the Interstate 580 Freeway will connect with projects now under construction or previously budgeted to one mile west of the Alameda-San Joaquin county line.

The 1965–66 budget also provides for preliminary work on the Interstate 5 (Westside) Freeway in Kern and Fresno Counties.

In Kern County, a 5.2-mile freeway stretch on Route 178 in and east of Bakersfield is scheduled for completion by mid-1966. The grading of 7.6 miles of the Route 58 Freeway between Keene and Tehachapi was completed in October, and a contract for paving this section has been awarded.

An 8.5-mile freeway and expressway project on Route 198, extending the completed section east of the Lemoore Naval Air Station to Hanford in Kings County, will be finished next spring. The 1965–66 budget provides funds to extend it through and east of Hanford.

Farther east, a four-lane freeway on this route through Visalia in Tulare County will be completed in the spring; the grading of a 9.4-mile east-

erly extension is in progress, and its completion has been budgeted.

A 7.3-mile two-lane expressway on Route 41 was completed in November north of the North Fork Kings River in Kings and Fresno Counties, and a project for the construction of a six-lane freeway viaduct on this route in the City of Fresno will start this winter.

In Merced County, a 12.4-mile four-lane expressway on Route 152 around the area to be inundated by the San Luis Reservoir in the Pacheco Pass area will be opened to traffic in February.

A two-lane expressway was completed in July on Route 49 in Mariposa County between south of Coulterville and the Tuolumne county line, and a realignment project on Route 132 west of Coulterville was completed in September.

A two-lane expressway on Route 108 in Tuolumne County east and west of Long Barn will be completed by summer; a 5.6-mile two-lane expressway on Route 4 in Calaveras County west of the Alpine county line is scheduled for completion in July; 5.7 miles of two-lane expressway on Route 88 near Silver Lake in Amador County were completed in September, and an 8.7-mile easterly extension to the Alpine county line will be completed next summer.

East of the Sierra Nevada, two miles of two-lane expressway are under construction on the Tioga Pass Road (Route 120) in Mono County west of Lee Vining, and another 4.1 miles have been budgeted.

Sacramento Valley and Northern Counties

Long stretches of the two interstate routes in northern California—Interstate 5, a north-south arterial between the Oregon and Mexican borders, and Interstate 80, between San Francisco and the Nevada line—were completed, under construction or budgeted in 1964.

On Interstate 5, a total of 81.5 miles are involved in projects which are completed, under construction or budgeted between south of Willows in Glenn County and north of Redding in Shasta County.

This section of the Interstate 5 Freeway is part of a 12.2-mile project completed in April between Red Bluff and the Shasta county line. A total of 81.5 freeway miles on this route are completed, under construction or budgeted between south of Willows in Glenn County and north of Redding in Shasta County.

Farther north, the Pit River bridge across an arm of Shasta Lake on Interstate 5 will be widened by next summer, and a short section of this route in and north of Dunsmuir is being converted from expressway to freeway standards.

The new budget provides funds for the construction of 4.6 miles of Interstate 5 Freeway between north of O'Brien and the south end of the Sacramento River Bridge at Antler.

A 6.8-mile section of this route north and south of the City of Mount Shasta in Siskiyou County was completed in November, and a 1.5-mile section south of the Oregon border will be constructed with funds in the new budget.

On Interstate 80, freeway projects in Solano County include conversion of 7.1 miles southwest of Vacaville from four-lane expressway to six-lane freeway, to be completed by the end of 1965; a 5.1-mile freeway between Vacaville and northeast of Route 505, completed in October; and a 3.7-mile six-lane freeway northeast of Route 505, to be completed next fall.

Also on Interstate 80, the substructure of a new bridge across the Sacramento River was completed last summer, and construction of the superstructure and two miles of freeway approaches in Yolo County and the City of Sacramento was started in August.

The new budget authorizes projects which will provide 2.3 freeway miles east of the bridge approach in Sacra-

This view looks southeasterly at the 29th–30th Street Freeway (Interstate 80) construction now in progress in Sacramento. The graceful tapered columns will support the viaduct structures.

mento between W and X Streets, connecting with two projects underway on this route between 29th and 30th Streets and completing construction on I-80 through the city.

In the mountains a 12-mile project on Interstate 80 between Emigrant Gap and Hampshire Rocks was completed this fall, and the 10.5-mile freeway stretch superseding the slow and difficult climb over Donner Summit was opened to traffic on November 20.

Other newly budgeted projects in Sacramento County include the widening of 2.8 miles of the existing I-80 Freeway and the American River Bridge from four to six lanes, and the widening of 1.1 miles of the Route 160 Freeway from four to six and seven lanes. The latter project involves constructing an additional structure paralleling the 16th Street Bridge.

On US 50, freeway construction is underway between east of Folsom Junction in Sacramento County and east of the El Dorado county line. A two-mile expressway section west of Camino was completed in August, and a 5.5-mile freeway section near Pollock Pines is nearing completion.

In Butte County, the Route 99 Freeway in Chico will be extended southerly to south of the Skyway Turnoff by the end of 1964, and a project to complete this freeway route through the city has just started.

A 1.9-mile Route 44 Freeway easterly from Market Street in Redding in Shasta County is under construction and an 8.5-mile section east and west of Palo Cedro was completed in October.

Bids were opened in December on the first unit of the four-lane Grass Valley-Nevada City Freeway on Route 20, a 3.3-mile section in Nevada County.

In Sutter County, 3.6 miles of four-lane expressway on Route 20 west of Yuba City were completed in June.

A 3.3-mile two-lane expressway on Route 299 northeast of Adin in Modoc County was completed in mid-year, as was a 4.8-mile two-lane expressway on Route 36 in Lassen County between Susanville and east of Johnstonville. The new budget provides funds for two-lane expressway projects on Route 36 in Lassen County near Susanville and on US 395 in Modoc County north of the Lassen county line.

In Yuba County, the 12th Street Underpass on Route 20 in Marysville was completed in December.

Central Coast Counties

There was steady progress in 1964 in the continuing program of converting US 101 to full freeway standards, and in constructing freeway and expressway sections on Route 1, the scenic route along the coast.

In Ventura County, a 4.5-mile expressway to freeway conversion project on US 101 near El Rio will be completed as 1964 ends. Funds have been budgeted for the conversion of a 3.6-mile section between El Rio and Montalvo from four-lane expressway to six-lane freeway, and for the construction of interchanges in Newbury Park and Camarillo.

Santa Barbara County projects on this route include a 2.3-mile freeway section in the City of Santa Barbara, completed in January, and a freeway bypass of Buellton, now under construction.

Farther north, a two-mile expressway to freeway conversion of US 101 south of San Luis Obispo was completed in July. The new budget provides funds for additional conversion between Atascadero and Paso Robles.

A 4.8-mile US 101 freeway section between north of San Miguel in San Luis Obispo County and north of Camp Roberts in Monterey County has just been completed, and a 6.7-mile northerly extension to north of Bradley will be opened to traffic next fall. This will connect to an 11.3-mile freeway section to south of San Ardo which was completed in August.

A 4.1-mile freeway section in and north of Salinas is scheduled for completion next summer.

On scenic Route 1, a project is nanced in the 1965–66 budget to construct a two-lane expressway for the 8.8 miles between US 101 at Las Cruces and San Julian Ranch in Santa Barbara County.

In San Luis Obispo County, a 4.4-mile two-lane expressway bypass of Cambria on this route was completed in the spring, and a 2.8-mile four-lane freeway in and north of Cayucos will be completed next fall. Funds in the new budget will finance adding two lanes on Route 1 for 4.4 miles north of Camp San Luis Obispo, completing four-lane expressway between San Luis Obispo and Morro Bay.

Budgeted projects on Route 1 in Monterey County include a four-lane freeway section in and near Castroville and completion of the Watsonville Bypass Freeway.

Construction of the US 101 Freeway in the City of Santa Barbara, completed last January, was complicated by the proximity of a railroad (at left), Mission Creek (at right of the freeway fence) and Wilson School.

Shown is part of a recently completed 5.1-mile freeway section on Interstate 80 between Vacaville and northeast of Route 505 in Solano County. Another 7.1 miles of this route southwest of Vacaville will be converted from four-lane expressway to six-lane freeway by the end of 1965, and a 3.7-mile six-lane freeway northeast of Route 505 will be opened to traffic next fall.

On other routes, Ventura County projects include budgeted jobs to construct 3.9 miles of the Route 118 Freeway through Santa Susana Pass, and the extension of the Route 33 Freeway 2.9 miles northerly to Casitas Pass Road south of Ojai.

An 8.6-mile project on the Route 126 Freeway to extend it easterly to Santa Paula is scheduled for completion in the summer.

Seven miles of two-lane expressway on Route 154 north of San Marcos Pass in Santa Barbara County were opened to traffic in February, which, together with a bridge across Cold Springs Canyon completed late in 1963, eliminated tortuous curves and steep grades on the older highway.

The new budget provides funds for the construction of a two-lane expressway on Route 180 in San Benito County between south of Hollister and north of Tres Pinos, a distance of 3.1 miles.

The Route 82 Freeway in San Francisco extends northeasterly across the US 101 (James Lick Memorial) Freeway as a two-level structure to the vicinity of a future interchange with the adopted freeway routing via Hunters Point. The new budget provides funds to extend it northerly as the Route 87 Freeway to north of 18th Street.

San Francisco Bay Region

Four projects were completed or in progress in Alameda County in 1964 to extend the eight-lane Interstate 580 Freeway, which was opened to traffic in 1962 from the San Francisco-Oakland Bay Bridge distribution structure to Park Boulevard in Oakland, another 11 miles to south of San Leandro.

A new 3,371-foot two-lane bore on Route 24, paralleling the existing bores of the Caldecott Tunnel through the Berkeley Hills, plus a two-mile eight-lane freeway between the tunnel's east end and Orinda, were opened to traffic in October. The new tunnel will permit the renovation in stages of the older two-lane bores.

A 1.3-mile eight-lane freeway from the tunnel to the Temescal interchange in Oakland will be completed next fall, permitting use of all six lanes of the tunnel, with the middle bore on a reversible basis so as to provide four lanes in the direction of peak commuter traffic morning and evening.

On the Interstate 680 Freeway in Alameda and Contra Costa Counties, a newly budgeted project for 8.7 miles north of Route 84 near Scotts Corner will connect to construction now in progress to one mile north of the Contra Costa county line. A northerly extension to Danville will begin in early 1965, connecting to newly completed freeway construction which in turn extends to Walnut Creek.

The above listed I-680 projects, together with previously completed sections, will provide full freeway between Fremont in Alameda County and Vallejo in Solano County on this bay area circumferential route.

On Route 21, about 12 miles of four-lane freeway are under construction between I-680 at Benicia and 0.5-mile south of I-80 at Cordelia. This project is financed by toll bridge revenue bonds to improve the approaches to the bridge between Benicia, Solano County, and Martinez in Contra Costa County.

A 1.3-mile Route 13 (Warren Boulevard) freeway section now under construction between Atlas Avenue and the I-580 Freeway will complete this route through Oakland.

Bids were opened in late November to convert three miles of Route 92 from a two-lane highway to a four-lane freeway between the San Mateo-Hayward Bridge and Hesperian Boulevard in Hayward.

The new budget finances the widening of the Route 17 (Nimitz) Freeway from four to six lanes between Route 92 in Hayward and Washington Avenue in San Leandro.

In San Francisco, the Route 82 Freeway was completed as a viaduct between the James Lick Memorial (US 101) Freeway and Newcomb Street in the spring, and construction progresses northeasterly, with ramps, to Army Street. The new budget finances construction from the site of the future interchange with the adopted freeway via Hunters Point, northerly as the Route 87 Freeway to north of 18th Street.

Southwest of the James Lick Memorial Freeway, construction completed last year to Mission Street was extended 2.9 miles to Orizaba Avenue.

A project now underway will connect the Route 82 Freeway at Orizaba Avenue with the I-280 Freeway in Daly City, San Mateo County, by mid-1966, and a southerly extension of I-280 to South San Francisco will start next summer.

The 1965–66 budget provides funds for constructing this freeway between south of Route 186 in San Bruno and Millbrae, and for rough grading southerly to Hillsborough. It also will complete the financing of an eight-lane freeway bridge across San Mateo Creek in and near Hillsborough.

Other San Mateo County projects will provide a completed Route 1 Freeway section in Pacifica by next spring, and a Route 114 Expressway connection between El Camino Real (Route 82) and US 101 in Redwood City by next summer.

In Santa Clara County, about two miles of six-lane I-280 Freeway were opened to traffic in March west of San Jose; a 3.5-mile northwesterly extension to Cupertino has just been completed; and a 0.7-mile section to Sunnyvale, including a connection to the Route 85 Freeway will be completed next spring.

Budgeted funds will finance the completion of the I-280 Freeway between the I-680 Freeway in San Jose and Los Altos Hills.

A 5.5-mile section of the Route 85 Freeway will be completed next fall between Cupertino and US 101 in Mountain View.

In Marin County, the freeway interchange between US 101 and Route 37 near Ignacio was completed in the summer, and a 3.1-mile US 101 freeway section between Novato and north of San Rafael will be completed this winter.

Conversion of one mile of Route 29 from two-lane expressway to four-lane freeway in and near Napa in Napa County was completed in April, and the 1965–66 budget provides funds for the conversion of an additional 1.3 miles.

Sonoma County projects include a 5.3-mile US 101 freeway section near Cloverdale, completed in December; a 1.1-mile section in and near Santa Rosa, to be completed next spring; and a 4.3-mile Route 12 freeway section in and west of Santa Rosa, completed in October.

Northern Coastal Counties

In Mendocino County, two four-lane US 101 freeway sections totalling 10.6 miles north and south of Ukiah were completed this year, and a connecting section completing the bypass of the city will be opened to traffic next fall.

Farther north, a 2.6-mile freeway section on this route in Humboldt County will be completed next summer between Dean Creek and Sylvandale, connecting to a 5.9-mile section completed in October to south of Miranda.

A project will be advertised for bids this winter for 7.7 miles north of Englewood, completing 33 miles of four-lane Redwood Parks freeway between Dean Creek and south of Scotia.

North of Arcata, an eight-mile freeway on US 101 around McKinleyville was completed in late October, filling the gap between the Arcata and Trinidad freeway sections.

Since this section provides a magnificent view of the Pacific Ocean from US 101, the first such opportunity on this route north of San Francisco, a vista point and a 1.5-mile frontage road along the beach were constructed as part of the project to give ready access to this recreational area.

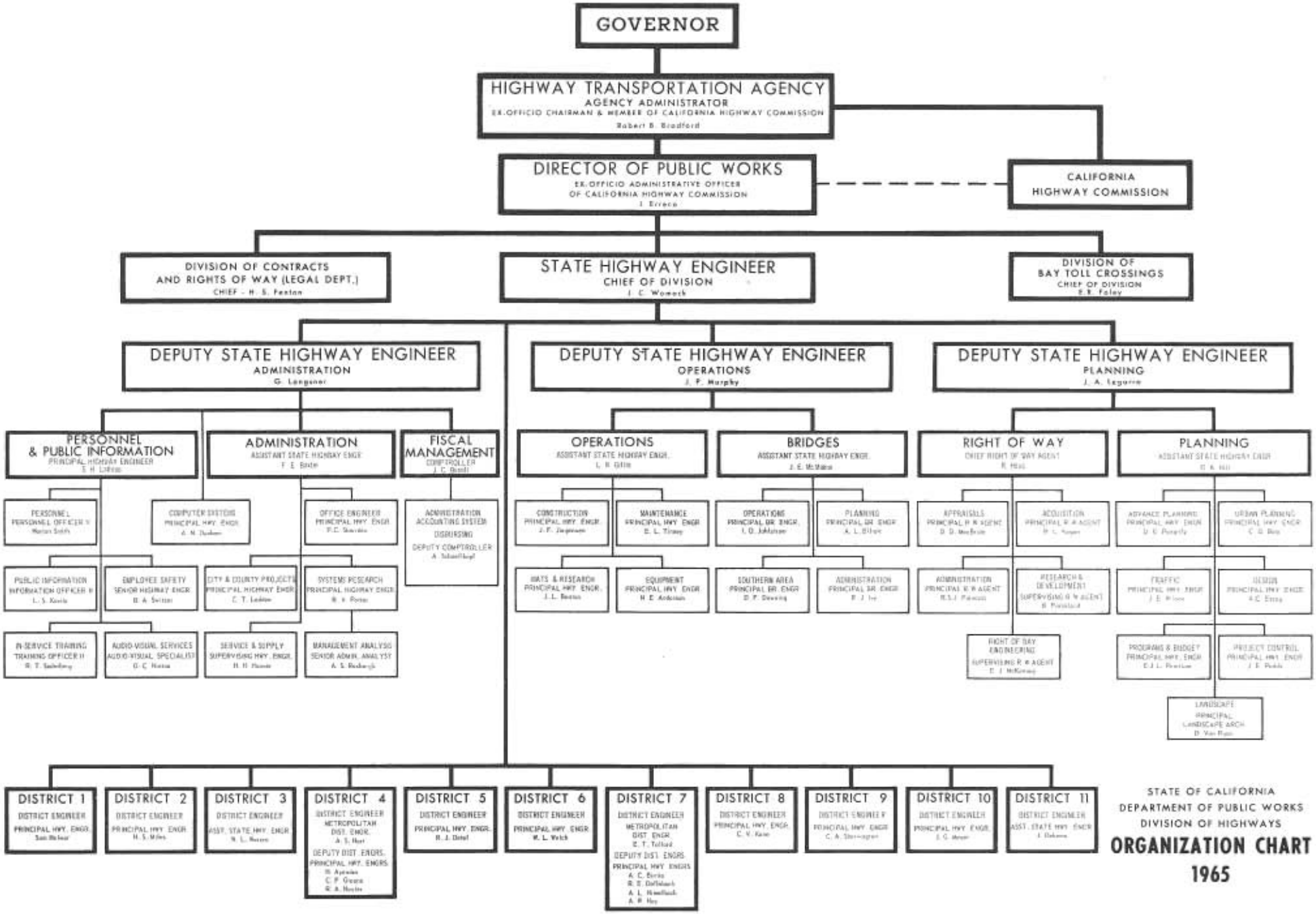
A five-mile four-lane freeway grading project will be completed this winter on US 101 from a mile south of the Humboldt–Del Norte county line to Klamath, and work is progressing on construction of bridges across the Klamath River and its overflow channel. A contract for paving the graded section will be underway next spring.

A 3.2-mile two-lane expressway on Route 1, the Shoreline Highway, near Mendocino was completed in August and another 4.5 miles north of Russian Gulch was started in the fall. A third Route 1 project opened 3.3 miles of two-lane expressway between Ferndale and Fernbridge in September.

A four-lane freeway on Route 299 for 4.5-miles between the Mad River east of US 101 and Blue Lake in Humboldt County will be completed next fall.

The 1965–66 budget will finance a 6.2-mile two-lane expressway on Route 29 in Lake County between south of Kelseyville and Route 175.

PHOTO RIGHT: A 10.5-mile section of Interstate 80 (divided freeway in distance) was opened to traffic on November 20, superseding the steep and twisting climb over Donner Summit (foreground).



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

ORGANIZATION CHART
1965

Operations

The Construction, Maintenance, Equipment, and Materials and Research Departments are administered under the direction of the Assistant State Highway Engineer—Operations

CONSTRUCTION

Administration of construction contracts, except for those consisting primarily of structures and administered by the Bridge Department, is the responsibility of the district in which the project is located.

This assignment is carried out through the teamwork of a staff of engineers, technicians and others whose primary duties are to assure that the terms of the contract are met. This involves interpretation and enforcement of specifications and plans. Headquarters Construction Department acts as a staff department for the State Highway Engineer for purposes of coordination and uniformity of contract administration.

The work itself is performed by the contractor's organization and forces. It is the contractor's job to plan his work, determine what methods and equipment he will use, procure and produce the necessary materials, and to accomplish the planned project according to the lines and grades set by the engineer, in compliance with the specifications governing the work.

The workmen at right prepare to set demolition charges during the construction of a 12.4-mile, four-lane expressway on Route 152 to bypass an area which will be used for the San Luis Reservoir.

Special Projects

There is a continuing appraisal of methods of handling traffic through construction areas. The results of this study will be incorporated in expanded instructions for the guidance of field forces.

The frequent occurrence of high overfills over pipe culverts has emphasized the necessity for anticipating all combinations of loading and installation conditions. A reappraisal of conventional installation practice has been undertaken in conjunction with the Bridge, Design, and Materials and Research Departments.

The divisionwide program of training in inspection procedures for portland cement concrete construction, commenced in the spring of 1963, was completed in April 1964. This program was presented by the Headquarters paving engineer with the cooperation of the division training officer and the Portland Cement Association. Approximately 1,700 highway personnel attended this comprehensive 12-hour program of lectures which were supplemented by more than 400 colored slides and an hourlong 16-mm. film.

Now in preparation is a program of training in inspection procedures for asphalt concrete paving. It is expected that this program will be ready for divisionwide presentation during the winter months 1964–65.

Construction Practice

Slipform paving methods were used for more than 80 percent of the portland cement concrete pavement placed during the past year. Several of these projects achieved outstanding production records wherein average output was in excess of 400 cubic yards per hour, practically doubling the usual figure; and monolithic 36-foot-wide paving has become common practice for several contractors on those projects requiring 36-foot-wide pavements.

The use of central mixed concrete for paving has rapidly expanded until it is now uncommon to see onsite paving mixers in operation. This is largely due to the fact that a 50-second mixing time has generally been found to be adequate for the large capacity mixers now available and to the econ-

omies inherent in a central plant set-up. Common end dump trucks, with but very slight modification to effect a self-cleaning dumping action, have proved very successful, also, for hauling air-entrained paving concrete, and have become the accepted means of transporting central mix.

Many contractors have successfully coupled the use of slipform paving methods with the use of central plant mixing, while others have coupled the use of the newly developed tilt-drum truck paving mixers with slipform paving methods.

The trend in asphalt concrete pavement construction is similarly directed toward more efficient batching and mixing plants and high production lay-down equipment. The 24-foot-wide asphalt paving machines made their initial appearance during the year. Fully automated plants are making more frequent appearances; however, while they are now available from several manufacturers, automatic paver controls have not been extensively utilized.

Honor Camp Projects

The Division of Highways and the Department of Corrections continued the joint operation of Camp No. 41 near Happy Camp on the Klamath River in Siskiyou County, and Camp No. 42 near Lord Ellis Summit in Humboldt County on Route 299.

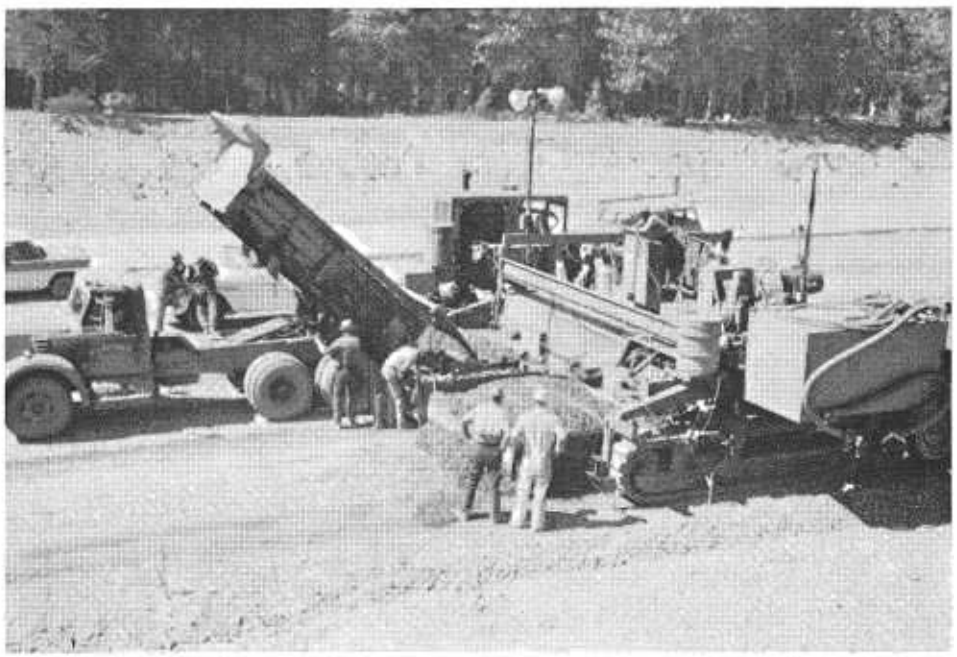
Camp 41 crews extended construction work down the Klamath River toward Ti Bar Ranger Station, with clearing well along in the section between the present Klamath River Bridge near Dillon Creek and Ti Bar.

A 2½-mile section of road extending downstream to Swillup Creek was oiled and screenings placed. Grading and placement of selected material has been extended 3½ miles downstream from Swillup Creek and currently grading is being completed in the Vicinity of Dillon Creek downstream to the proposed new crossing of the Klamath River.

A rest area and rubble masonry drinking fountain has been built at a scenic location along the new roadway.

Work performed by Camp 42 on Route 299 consisted primarily of grading and related drainage installations from Redwood Creek to 2½ miles east, and clearing from Preston Ranch Camp westerly toward Blue Lake.

It is anticipated that the grading in this area will be completed by the end of 1965. A subsequent base and surfacing contract will provide a usable unit of roadway from Lord Ellis Summit to 2½ miles east of Redwood Creek.



Placing 24-foot-wide portland cement concrete highway pavements with an automatically controlled slip form paver. At top, end-dump truck delivers concrete mixed in a stationary tilt-drum central mix plant away from the construction scene. At bottom, tilt-drum truck paving mixers deliver concrete mixed in transit to the job site.

MAINTENANCE

During the 1963–64 fiscal year, approximately 3,850 maintenance men were employed to work out of 280 maintenance stations. A total of $47,816,800 was expended in the maintenance of 14,740 miles of highways, including state highways in cities.

New Routes Maintained

A total of 34.6 miles of former county roads was taken over for maintenance during this last fiscal year. These routes were added to the state highway system by the 1959 Legislature. The location, mileage, and route designation of these roads follow:

Butte County – Route 191, from Route 70 near Wicks Corner to Paradise–11.5 miles.

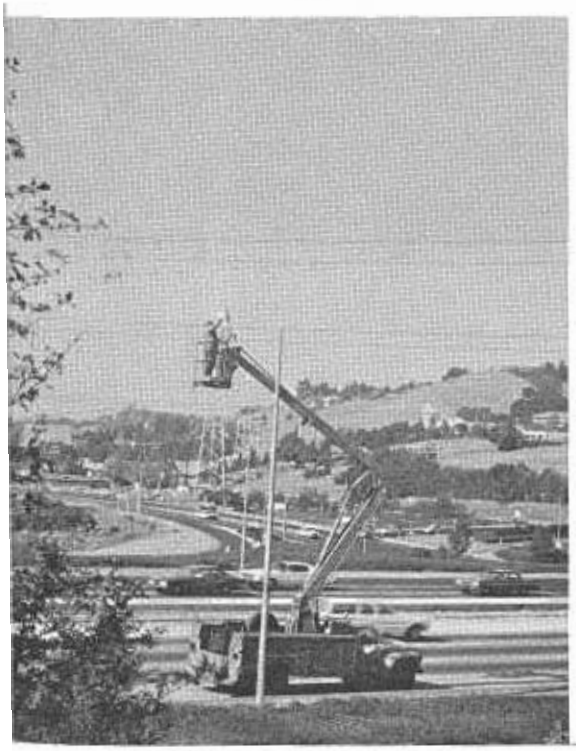
Riverside County–Route 79, from Route 127 north of San Jacinto to Route 10 near Beaumont–6.4 miles.

Calaveras County–Route 26, from Route 49 near Mokelumne Hill to West Point–16.7 miles.

Pavement Repair, Bridge Maintenance

The annual "thin blanket" program for which the Highway Commission sets aside $5,000,000 of construction funds is an important factor in providing the best possible road service to state highway users. Each year the Maintenance Department reviews and selects those sections of state highway where a one-inch asphaltic blanket will best serve to prolong the surface life and provide better riding qualities. Some 614 miles of resurfacing was accomplished under this program in the fiscal year.

"Giraffe" is used to relamp an electrolier on freeway.



Although exact segregation of costs is not possible, at least half the cost is believed attributable to thoughtlessly and even deliberately discarded trash.

Roadside Vegetation, Tree Care and Landscaping

In past years roadside vegetation control work included fire hazard control, soil sterilization, mowing, discing, blading and noxious weed control. An expanded chemical program has been developed, combining many phases of this work, to eliminate duplication and effect economy. As expected, the use of chemicals continues to show a decrease in cost of vegetation control as compared to mechanical methods. The cost of noxious weed control on state highways, by counties is decreasing by virtue of expanded vegetation control by state forces. New chemicals are being tested on a continuing basis, and new spray rigs are being constructed for their application.

Rotary mowers, used for mechanically controlling roadside vegetation, are being replaced by flail-type mowers due to the hazards from thrown objects.

The landscaped area maintained per man is steadily increasing as a result of improved techniques, a better knowledge and application of chemical vegetation control, and improved irrigation systems. In view of the scarcity of water, a campaign has been launched to reduce the amount of irrigation on planted areas to a minimum. Heavy watering and fertilizing for the first two years is sufficient in most cases to attain the purpose for which a planting was made. Plants are then gradually weaned and furnished only enough water to maintain a healthy plant. After plantings of native or drought-resistant plants have become established, irrigation water is eliminated or greatly reduced. However, in such plantings, traffic smudge and dust must be washed from the foliage by a tank truck equipped with a high pressure pump and a fishtail spray. To the bath water is added a material which reduces surface tension, improving the leaf cleaning operation.

Lighting, Signals, Electrical Devices

All of the facilities maintained by the state highway signal and electrical crews continued to increase during the 1963–64 fiscal year. Traffic signals are increasing slowly, but highway lighting, illuminated signs, and electrical devices are increasing at a very rapid rate.

There was a 0.5-percent increase in traffic signals maintained, despite those relinquished to cities and counties, for a new total of 1,705 signals. The number of fluorescent tubes and incandescent lamps used in illuminated signs increased 10 percent to a new total of 21,473 lamps. In highway lighting, mercury vapor and sodium vapor lamps and fluorescent tubes increased by 12.8 percent for a new total of 31,248 lamps and tubes.

This is exclusive of tunnel lights. There are 10,507 tubes and incandescent lamps maintained in tunnels. Overall, the state maintains 63,228 lighting tubes and lamps on state highways.

Pavement Markings

The placement of traffic lines and pavement markings was accomplished during the year by the use of larger and more efficient striping machines and increased manpower. Depreciated small motor-driven striping machines are being replaced by larger, more efficient units capable of fulfilling the increasing needs for traffic stripe and pavement markings.

Thermoplastic striping operations have been extended in the metropolitan districts, eliminating the necessity for striping of crosswalks and gore stripes; the thermoplastic material should serve a minimum of five years. Several types of lane delineators are being tested in various locations throughout the state, with a view to increased traffic service and less frequent restriping.

During the year four machines placed 500 tons of thermoplastic marking material on highways, at the rate of one pound per square foot. Experience indicates that usually sandblasting or mechanical cleaning of the pavement must be done before application of this material.

Remote areas subjected to high wear, such as stop bars and pavement markings, are being renewed with permanent marking material preformed with a cold adhesive base.

Considerable use has been made of raised pavement markings of the "Botts Dots" type. These have varied from 4-inch round to wedges with and without plain white tops. Particularly promising are the reflex reflectors. These are placed at 24-foot centers, producing a clearly visible line both in clear and inclement weather. During the six months of operation, no loss of visibility due to damage to the reflectors has been observed.

In the 1963–64 fiscal year $2,808,400 was expended in replacing traffic stripes and pavement markings and repairing and replacing signs.

Communications

The statewide radio system at the end of the fiscal year consisted of 1,514 mobile radio units, 204 radio stations, 52 microwave stations, and 125 hand-carry units.

Improvements were made in the radio system to provide more reliable mobile radio coverage. One such project was the completion of the first phase of the microwave circuit on US 50 between Sacramento and Echo Summit. While the major use of radio is in maintenance work, the use of radio on construction projects was greatly expanded. In addition, radio is used in bridge maintenance and in various other operations functions.

The division continued operation of its leased, private-line teletypewriter system. The system is fully automatic with pushbutton or tape selection, with automatic message intercept and trouble indicators. The system operates at 75 words per minute, and approximately 2,700 messages per month are transmitted.

The division again provided a winter service of up-to-date road information to news media, radio and television stations, newspapers, automobile clubs, trucking concerns, other governmental agencies and the traveling public.

Outdoor Advertising

The administration of the Outdoor Advertising Act is financed solely through revenues derived from license and permit fees. A 1959 amendment to the Outdoor Advertising Act increased structure and sign permit fees.

Recent trends, creating a fiscal imbalance, made it necessary again to seek an increase in fee schedules. New legislation known as the Collier-Z'berg Act was enacted during the 1964 First Extraordinary Session of the Legislature. In addition to effecting tighter controls along interstate and defense highways when it becomes operative May 15, 1965, it provides for higher fee schedules.

Following are tabulations of comparative date for the last three calendar and fiscal years:

Number of advertising operators licensed for each fiscal year:

1961–62	880
1962–63	884
1963–64	818

Number of permits issued during the calendar year:

	Signs on sign structures	*Other signs*
1961	34,357	972
1962	33,258	1,826
1963	31,891	1,086

Gross receipts—licenses and permit fees and penalties for each fiscal year:

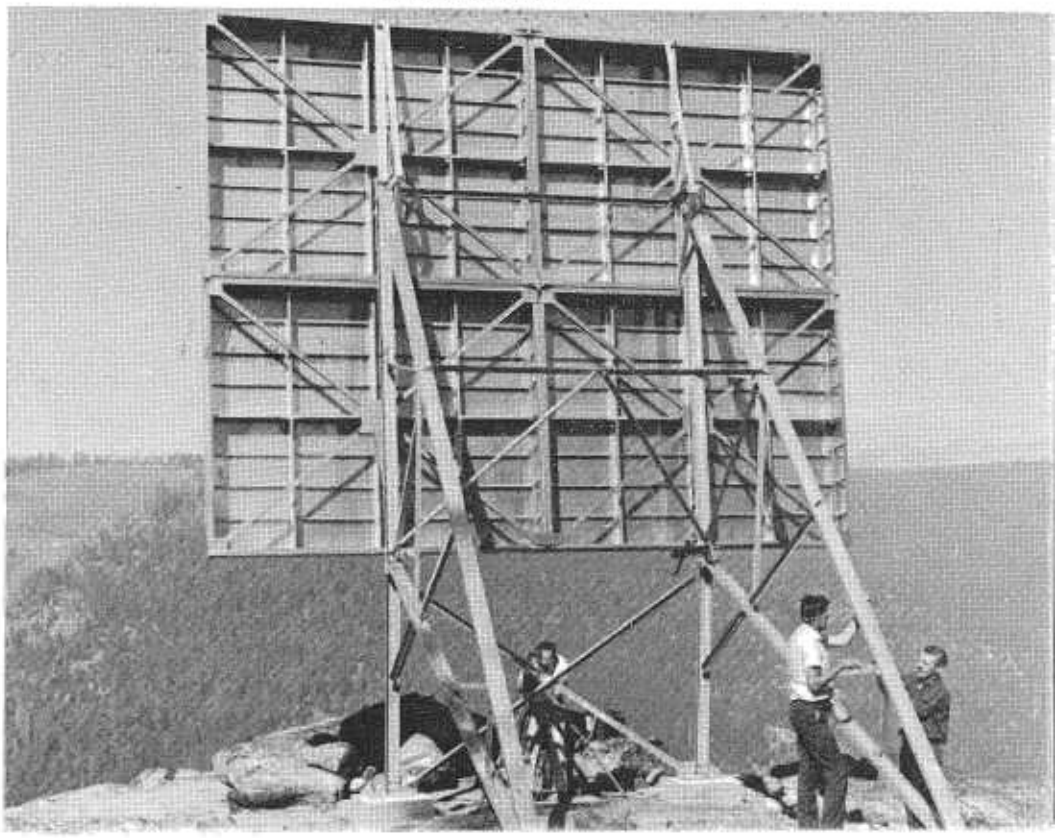
1961–62	$124,693.32
1962–63	118,047.78
1963–64	114,390.64

Permits

As anticipated, there was a significant reduction in the number of transportation permits issued for extralegal hauling operations. During the past fiscal year, some 15 percent fewer permits were issued as a direct result of 1963 legislation restoring the annual permit procedure for overwidth trailer coaches. Military certifications processed during the fiscal year increased slightly in averaging about 43 cases per month.

Encroachment permits cover installations or activities within state highway rights-of-way by other than the state or its contractors. As shown by the following tabulation there has

Installing a passive microwave reflector on Alder Ridge west of the Kyburz Maintenance Station on US 50. The reflector is part of the new US 50 microwave system communications which will link Sacramento and the Marysville district office with mobile units on this route. All equipment at this site was airlifted by helicopter.



been little change in the number of permits issued:

	1961–62	1962–63	1963–64
Encroachment permits	12,778	12,453	12,507
Transportation permits	75,603	101,542	86,181
Totals	88,381	113,995	98,688

Truck Scales

Plans have been developed by the Office of Architecture and Construction of the Department of General Services for three new truck scale installations located as follows:

Greenville, on US 50 in Altamont Pass.

Industrial Road, near the junction of Routes 92 and 17 in the vicinity of Hayward.

Tehachapi on Route 58 approximately one mile east of the junction with Route 223.

Three new truck scale installations are under construction. They are located as follows:

Little River, north of Arcata on US 101.

Northbound Castaic scale expanded to include brake inspection facility south of Castaic Junction.

Banning scales (replacing the existing ones at Whitewater) expanded to include a brake inspection facility for westbound movement only.

New loadometer pits have been made at several locations through the state where problems in connection with overloads justify their installation.

Maintenance Stations

Contracts were awarded for major construction at seven maintenance stations during the fiscal year. These include projects for the construction of new stations located at Elk Grove, South Sacramento, Whittier, McGee Creek, Calistoga and Redwood City and the enlargement of the station at Newhall. The total cost of these combined projects amounted to approximately $1,380,000. All seven contracts were handled by the Office of Architecture and Construction.

Land acquisition and/or preliminary engineering for major projects were undertaken on a number of stations, the most noticeable of which are Eureka, Santa Maria, Bakersfield, Chula Vista, Colusa and Lodi. It is expected that these installations will be under contract during the 1964–65 fiscal year.

Road Closures

There were numerous road closures, but of short duration, during the fiscal year. One six-day closure, on Route 116 in the Guerneville area of Sonoma County, was due to a forest fire. Most of the other closures were the result of flooding, debris and washouts.

The longer closures occurred on the Emerald Bay section of Route 89, which was blocked for 96 days; the Crescent City section of US 101, a five-day closure resulting from a seismic ocean wave, aftermath of the Alaska earthquake in late March; and on Route 1 near Thornton Beach in San Mateo County, November 24–December 13, 1963.

Numerous small slides closed other highways for one-day periods or less. There were seven such closures due to rock slides on Route 96, six miles southwest of Orleans, between September and May.

From February 1 to September 27, all IS 80 traffic in the vicinity of Whitmore Maintenance Station was carried on the westbound roadway due to two separate slipouts on the eastbound roadway.

Snow Removal

Snow removal and pavement sanding cost $3,467,200 in this rather mild winter. This was 7.2 percent of the total maintenance expenditures.

The snowpack on Donner Summit at the end of March amounted to 31 inches, compared to 53 inches the previous year and 85 inches for March 1962. The maximum snowpack at Donner Summit was 106 inches, recorded in January. There was only two inches of snow remaining on May 1. Unusually heavy snow closed the pass from Colfax to Donner Lake Gate for 16 hours on January 21 and 22.

As mentioned in the Equipment Department report, a used rotary snowplow was repowered with a new diesel powerplant and the fan was redesigned to increase the capacity of the unit by about 100 percent. In addition to its increased capacity, the rebuilt unit is able to cope with "tramp iron" pieces of tire chain, etc.) in the roadway without breaking down. The ability of this unit to stay in service under difficult operating conditions will mean more snow removal capacity with fewer units.

The regular winter closure of mountain routes where snow is not regularly removed occurred during the first week of November for the highways in the northern half of the state, a little later in November in the central sierra, and not until late in January for Monitor and Luther Passes. The northern routes were reopened in May, and the southern ones somewhat earlier.

On many of the routes maintained during the winter there were temporary closures, most of them ranging from two to six days, during periods of heavy snow or poor visibility.

The Santa Monica-San Diego Freeway interchange in Los Angeles. The view is northward along the San Diego Freeway.

Motor grader is used to remove icepack.

"Sno Blo" was redesigned and rebuilt at Headquarters Shop. It has approximately double the capacity of the old rotary plow.

MATERIALS AND RESEARCH

Control of materials for California's highway construction program has become a complex problem, involving both district construction and materials forces as well as the Materials and Research Department in Sacramento.

On each construction project the resident engineer's personnel perform a portion of the sampling and testing in order to have immediate knowledge of the materials entering the work. Additional and more complex control tests are performed in the 11 District laboratories.

District laboratory forces also obtain progress samples and perform progress tests, as a part of the independent record sampling and testing procedures required by the Bureau of Public Roads and the Division of Highways to provide added assurance of specified material quality.

The Materials and Research Department in Sacramento has a specific responsibility for testing, inspecting, and releasing the many manufactured products which are used in highway construction.

Two new district laboratories were completed and put into operation during the year. One of these, the District 4 Laboratory, located on the Bayshore Freeway right-of-way, is unique in that it was constructed directly under the freeway. A laboratory for District 7 and a new Headquarters Branch Laboratory were constructed on the right-of-way adjacent to the Santa Monica Freeway in Los Angeles.

Testing and Inspection

The magnitude of the testing program at the Materials and Research Department's Sacramento Laboratory is illustrated by the following statistics on some of the major testing items:

- 4,000 samples of soil and aggregates were processed
- 920 petrographic examinations were made
- 9,500 tests were performed on aggregate base, subbase, and asphalt pavement mixtures
- 12,300 samples of asphalt were tested
- 7,500 concrete cylinders were tested for compressive strength
- 960 samples of cement were tested
- 15,000 tests were performed on concrete, sand, and other materials

Inspection, which plays an important role in fabrication control and in the release of fabricated materials, accounted for another major part of the materials work. Following are the amounts of fabricated and manufactured products inspected prior to arrival on construction projects during the 1963–64 fiscal year:

Product	*Quantity*
Reinforced concrete pipe	202,016 lin. ft.
Clay pipe	18,603 lin. ft.
Steel pipe	208,927 lin. ft.
Miscellaneous iron and steel	1,620,085 lbs.
Guardrail	206,366 lin. ft.
Prestressed concrete members	56,179
Untreated timber	14,450 b.m.
Expansion joint	203,689 sq. ft.
Waterstop	16,200 lin. ft.
Corrugated metal pipe for culverts	497,414 lin. ft.
Structural steel	19,694,968 lbs.
Reinforcing steel	82,742,225 lbs.

Chemical analyses were also made on such items as paints, sealants, thermoplastics, and other miscellaneous materials.

The District laboratories reported an estimated 157,000 additional individual tests on aggregate base, subbase, bituminous mixtures, concrete aggregates and basement soils.

Sixty-seven settlement platforms and 109 piezometers were installed for embankment control at various locations throughout the State. Laboratory field forces installed 20,815 lineal feet of horizontal drains and cleaned 8,543 feet of existing drains.

Record Sampling and Testing

Record sampling and testing is carried on by both the district and headquarters laboratories. The district forces obtain samples and make tests during the progress of the work. The Materials and Research Laboratory takes final record samples, obtains thickness measurements of various layers in the pavement structural section, and makes confirming tests on a percentage of the final samples.

District laboratory personnel accounted for taking and performing tests on a total of 8,200 progress samples. Headquarters forces made 2,658 final record tests on samples taken from 1,899 sampling locations.

Preliminary Investigations

The district forces do the bulk of the routine investigations during the planning and design stages of projects

District 4's unique new materials laboratory, constructed under the James Lick Memorial Freeway in San Francisco, is well equipped to handle the large volumes of samples that must be tested.

whereas headquarters laboratory, with its large drill rigs, is called in to do jobs requiring heavier and more specialized equipment.

The districts reported that during the fiscal year they drilled holes totaling 148,733 feet in their sampling operations.

Headquarters forces made 125 borings for a total footage of 13,236 feet. This included 2,366 feet of soil samples, 3,030 feet of rock cores, and 7,840 feet of rotary drilling.

The geology unit of the laboratory made 23 seismic, resistivity, or geologic investigations in eight districts. These investigations pertain primarily to cut slope design and rippability of inplace rocky formations. The soils mechanics laboratory prepared 43 reports of embankment investigations.

The traveling deflectometer was used to obtain 21,250 individual pavement deflection measurements on 45 different projects involving 200 miles of roadway, 65 miles of which was city streets and county roads. Data from this instrument were used to make recommendations for reconstruction of roadways.

Research Projects

More than 200 research projects, both large and small, were processed during the fiscal year. In the area of foundation work, studies included the effect of size and type of soil sampler on soil disturbance, and related soil strength; strength of compacted soils; effect of sand drains on rate of settlement and rate of increase in strength of soft foundation soils; use of nuclear equipment to determine soil moisture and density; and several geologic studies including the development of a quantitative procedure to identify soil and aggregate minerals by X-ray diffraction.

A joint research program with the Department of Water Resources is being conducted to determine the properties of various nuclear systems to measure soil density. For the first time a nuclear gauge is being used to determine soil moisture and density on a project under construction in District No. 1.

The construction of high fills has been under study, since some future projects anticipate construction of 300- to 400-foot-high fills. Two fills, 190 and 260 feet high, on the San Luis Dam relocation project in District 10 have required instrumentation to determine where plastic flow is occurring within the fill mass.

On this same project, in cooperation with the Bridge Department, a total of 116 soil and concrete pressure cells along with 10 settlement platforms were installed in connection with the arch culvert.

The economical use of materials is the subject of continuing research. Serpentine aggregates are plentiful in California but have widely varying resistance to weathering; therefore, a research project has been carried on attempting to correlate an artificial weathering of serpentine, as well as other aggregates, with that occurring due to natural causes.

A continuing cooperative project with the University of California is designed to develop and use instrumentation capable of recording subaudible noises emitted by unstable rock masses. The application of this method to the predetermination of potential slide areas is currently being studied.

Work has continued on improving techniques to identify clay minerals by use of X-ray diffraction apparatus and analysis by differential thermal techniques.

Special studies have been made of Swedish foil-type soil sampler which was designed to obtain continuous undisturbed samples of soft foundation soils. Closely coupled sample tubes, 10 feet long, are pushed into the ground, and ribbon foil lining reduces to a minimum the disturbance to the sample and assures 100-percent recovery.

An operation has been undertaken involving lime treatment of a potentially unstable embankment near Whitmore Maintenance Station on Interstate Highway 80.

Studies are continuing on the durability and adhesion of asphalts. Various test methods for measuring the percentage of stripping of asphalt from aggregates in the presence of water are being evaluated.

Two experimental road test sections have been constructed to test methods

of preventing reflection cracking in bituminous, resurfacing, overlays. A study was made comparing the uniformity of bituminous paving mixtures as spread by different makes of paving machines.

Studies of the results of the AASHO road test were completed and a revised design method for structural sections of flexible pavements was submitted to and approved by the Design Department.

Research is continuing on the development of a flexible pavement design procedure based on the resiliency of the structural elements. The project includes a study of 25 different flexible pavements throughout the state to determine the effect of load applications and the changes in physical properties of the asphalt binder on the life of the pavement. Concurrent studies are being carried on at the University of California to evaluate the fatigue life of bituminous pavements.

A special investigation was carried on to compare the destructive effect of flotation (wide base) tires and dual tired systems.

Tests of various types of bridge bearing pads were continued; studies of creep and stresses in a precast, prestressed concrete girder without end blocks were made in a fabrication plant; tests were continued to evaluate epoxy as a shear connector, in lieu of welded studs, for composite beams; tests were performed to evaluate the seam strength of aluminum culvert pipe; comparison tests of bridge roller bearings were completed, and special laboratory fatigue tests of overlays for steel decks were performed.

A project to develop a high-speed method for measuring pavement irregularities and profiles was initiated; in cooperation with the Bridge Department, instrumentation was provided for stress studies of two bridge structures and an arch culvert; a project to develop warning system for icing was started; substantial progress was made in evaluating traffic counters; and assistance was given to the Bridge Department in studying the use of insulation for bridge decks.

Studies of freeway noise as related to design were continued and additional data on truck muffler noise were obtained.

Field and laboratory studies of new sign materials were conducted; dynamic impact tests on various types of barriers and bridge rail were performed in cooperation with the Traffic and Bridge Departments; studies were made to develop and evaluate special lane barriers for merging traffic; and a project for study of various glare shield materials was initiated.

A project was carried on to develop welding techniques and procedures for newly marketed high-strength reinforcing steels, as well as new alloy steels. A project has been started to test the fatigue properties of an orthotropic bridge section.

Studies were continued on the use of ultrasonic inspection of welds and the use of protective coatings for steel structures.

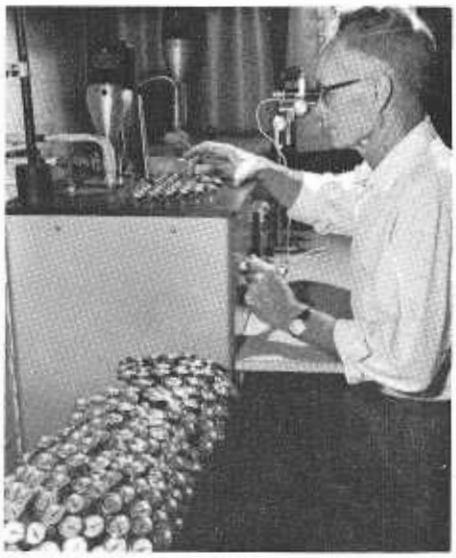
Research continues on paints, adhesives, thermoplastics, marking materials, and joint sealants. Field evaluations have been made on many traffic paints. A special study using inorganic zinc silicate paints was made on a coastal bridge. Several installations of various reflective pavement markers have been made for evaluation purposes.

Use of the X-ray diffraction equipment is being expanded to include the screening of cement samples, and thereby reduce the number of chemical analyses necessary to control the quality of cement.

Corrosion research has been continuing to determine the causes and methods for inhibiting the corrosion of reinforcing steel. A report has been written on the completed work.

The effects on concrete quality of water-cement ratio, hydration, and cement factor are also being studied. Several field surveys on corrosion problems have been made during the year for other State agencies.

A project to determine the effect of various factors on the shrinkage of concrete was carried out for the Department of General Services. Among the items evaluated were admixtures, dirty aggregates, lightweight aggregates, and aggregates from various sources including Spain and Mississippi.



Bimetal thermometers, used by construction inspectors, are checked for accuracy.

A second test section to evaluate shrinkage-compensated cement was incorporated in the Lodi Bypass project. An experimental section was established on the Fresno Bypass to evaluate polyethylene strips used for both the transverse and longitudinal joints in concrete pavement. Research studies affecting the quality and durability of concrete included the ef-

The electrical resistivity of concrete is measured to determine the relative conditions of corrosion potential to reinforcing steel by this instrument developed by the Materials and Research Laboratory.

fect of steam curing on volume change of mortar, the sulfate resistance of portland cement, and the mortar strength of concrete sand. Several other projects concerning concrete are continuing. These include restrained shrinkage of concrete, abrasion resistance, and the effects of air entraining agents.

A new test method was designed to evaluate epoxy resin systems at low temperatures by flexural creep measurements.

Training

The Materials and Research Department's training course, "Procedures, Testing Methods and Use of Materials for Highway Purposes," was conducted on four occasions and was attended by 74 engineers. In addition 39 engineers and technicians were given a special training course in inspection of materials by the Los Angeles branch laboratory. The district laboratories have also been quite active in training engineers and technicians for materials inspection on highway construction projects. Seven districts carried on such training programs, which were attended by 319 people and involved 11,920 man-hours of training.

Headquarters laboratory continues to be popular with visitors from colleges, counties, federal agencies, other state agencies, and particularly foreign visitors. There were 79 foreign engineers, representing 18 countries, among the visitors during the year.

Technicians use nuclear moisture density gauges in field comparisons with conventional methods.

The new model traffic striper is shown in operation in Oakland.

EQUIPMENT DEPARTMENT

The Division of Highways operates a fleet of 10,604 units of highway equipment. At the end of the 1963–64 fiscal year, this fleet comprised 7,128 automotive and 3,476 maintenance and construction units.

The expense of equipment operation is financed through an equipment rental system. During the 1963–64 fiscal year, rental was based on the equipment's depreciation, its repair cost, and indirect charges such as accident damage and loss, insurance and administration. These rental charges, plus the funds derived from the sale of retired equipment are sufficient to recover the original cost as well as normal Equipment Department operating costs.

Improved Snowplow

During the past fiscal year the Equipment Department completed studies, design and construction of an improved rotary snowplow. This unit, the Snow-Blo, was tested this past winter and is capable of completing a great deal more work than previous units.

A standardized truck body was designed especially for repairs to median barriers and roadside fencing. This unit provides for more efficient fence and barrier repair and improved crew safety.

An asphaltic heating kettle has been designed which can serve as a multipurpose unit capable of distributing hot or cold asphaltic emulsions, hot road oils, and may be used to heat asphaltic crack filler.

A combination spraying and watering truck has been developed for landscaping work. This unit has an automatic proportioning system that allows the operator to change types and amounts of additives by selection from concentrate tanks. It is antici-

pated that these improvements will result in considerable savings in materials and time.

Preliminary work is being carried out on the perfection of a windshield deicing system for snow removal equipment. This unit employs chemicals as a melting and cleaning agent.

During the past year repair and fabrication of equipment has been closely analyzed. Assembly line methods have been installed wherever feasible. Field mechanics have been strategically placed to give more economical service. Work weeks have been changed to reduce overtime. Better tools and equipment have been provided. The result of this emphasis has been a reduction in costs not only on repair work but also on equipment fabrication. One example of this is the assembly cost of four-cubic-yard maintenance trucks. A reduction of $1,700 per unit has been realized by using assembly line methods.

Average Repair Cost

The average repair cost per unit per year during 1963–64 was $400. This is a reduction of $34 per unit below the previous year and an $80 per unit reduction for the past 10 years.

In an effort to reduce equipment recordkeeping and adapt it to data processing, the department's management set up several new procedures.

One was to provide for renting the automotive equipment on a mileage basis, and maintenance and construction equipment on a hourly basis. The new rental rates include fuels, oil, and other operating charges. This eliminated the need of the operating departments to set up separate rents to include the operating expense such as gasoline, oil, grease, etc. Only one office (the Equipment Department) will be charged with setting rates which will be standard on a statewide basis. The new rates were placed in effect on July 1, 1964.

During the past year the Equipment Department has written specifications for 344 units of equipment. Specifications are written in a manner to permit the various manufacturers to compete in bidding.

During the last half of the fiscal year, the first half of the Equipment Department Rental Equipment Catalog was completed. This catalog, when completed, will illustrate and describe all the types of equipment available from the Equipment Department. The first section, describing automotive equipment, is published and in use. Completion is expected by early in 1965.

Volume Buying Brings Saving

The continuation of volume purchasing has resulted in a considerable saving. During the past year $6,987,600 was expended to purchase automotive and construction equipment as additional and replacement units.

This year one contract was issued for all standard maintenance trucks. By mass buying, 215 trucks were purchased, resulting in a savings of approximately $500 per truck.

The Equipment Department disposed of 437 obsolete units with sealed bids during the 1963–64 fiscal year for a total of $105,390. This amounted to approximately 16.8 percent of the capital cost of these units.

The technical research and training section has continued in equipment research and operation problems. This has involved fuels and lubricants and the preventative maintenance program. The section has handled technical training activities. Research problems included a fire problem with asphalt kettles and investigation for corrective maintenance problems associated with crankcase pollution control devices.

A paper, "A Preventative Maintenance Program for Highway Maintenance Equipment," was prepared and presented at the 43rd annual meeting of the Highway Research Board. The facts presented illustrated the advantages and economies experienced by the Equipment Department during the past 10 years as a result of the organized preventative maintenance program.

During the 1963–64 fiscal year studies were completed on the economical life of automotive equipment units. As a result of these industrial engineering studies and those completed by other state agencies, the vehicle replacement policy has been revised. It provides for replacement of automotive equipment at any time, regardless of age or mileage when it is economical to do so. The new policy means that the equipment will be utilized only for the most economic period of its life.

The Procurement Section, during the past fiscal year, processed 289 fewer requisitions and 4,247 fewer purchase orders, under a policy of consolidating orders for parts and supplies.

The physical plant consists of 12 major shops and 17 subshops to serve

EQUIPMENT DEPARTMENT SUMMARY

	June 30, 1963	*June 30, 1964*
Equipment repairs	$4,426,936.80	$4,246,330.29
Miscellaneous expense	659,914.06	825,887.30
Administration and other expense	1,210,311.00	1,273,944.69
Depreciation Expense	3,912,864.82	4,313,748.03
Total expense	$10,210,026.68	$10,659,910.31
Total income	10,144,578.25	10,933,862.67
1963–1964	−$65,448.43	+$273,952.36

Inventory: The original investment in equipment is as follows:

TRUCKS AND PASSENGER VEHICLES

All trucks—½ to 15 tons	$17,413,610.95
Buses, jeeps, and station wagons	590,256.55
Passenger automobiles	4,511,948.44
	$22,515,815.94

MAINTENANCE AND CONSTRUCTION EQUIPMENT

Motor graders	$4,958,394.89
Rotary snowpows (truck mounted)	1,685,968.87
Rotary snowplows (grader mounted)	131,649.78
Loaders	2,160,606.18
Shovels, power	416,739.70
Tractors	916,041.57
Snowplows, push	795,585.64
Compressors	398,177.18
Miscellaneous other equipment—rollers, mixer, trailer, pumps, drills, mowers, etc.	5,927,581.64
	$39,906,561.32

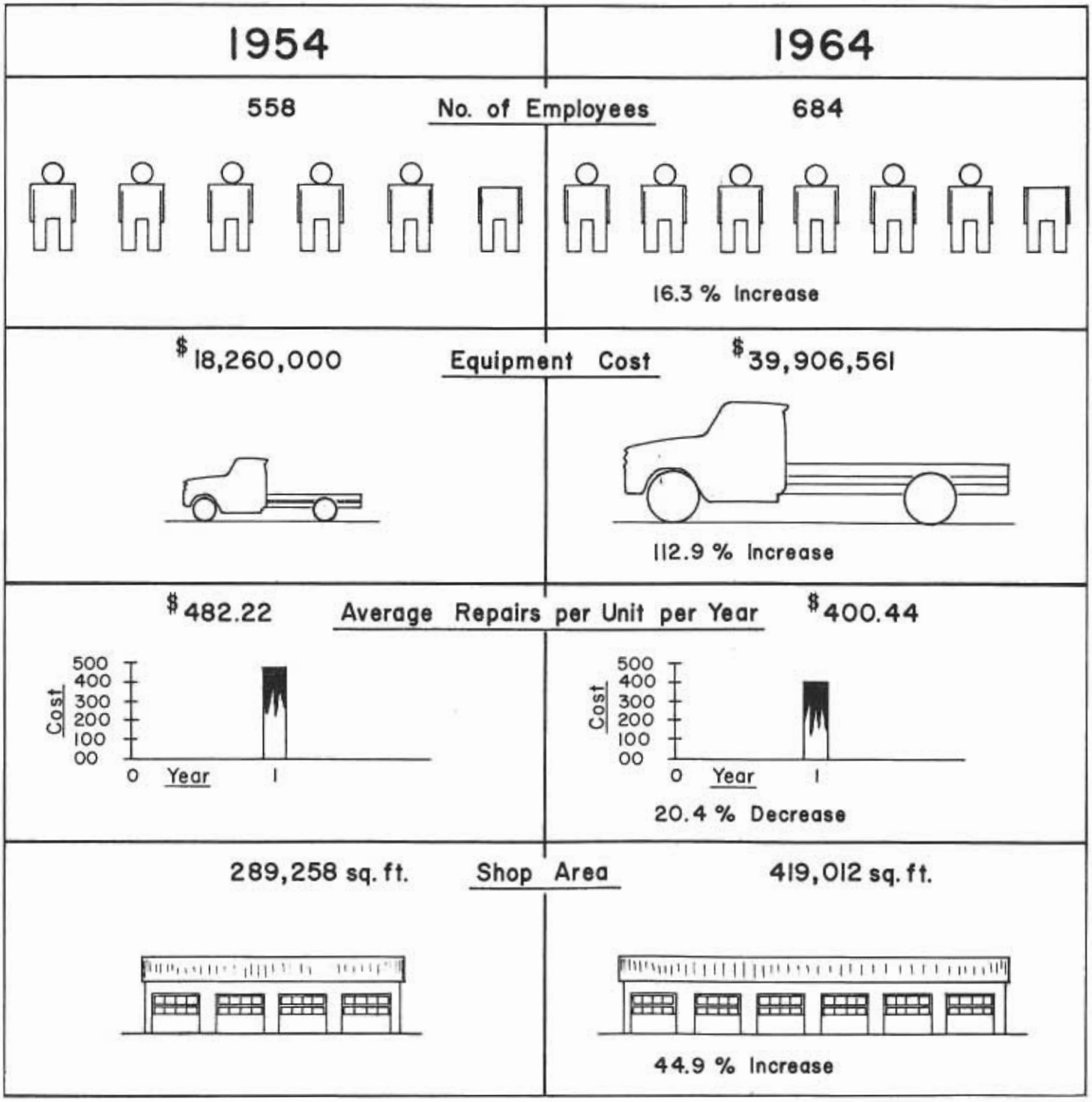
the 11 highways districts and the Division of Bay Toll Crossings. These shops, in addition to normal repair and fabrication, also handle special work such as maintenance and repair of movable-span bridges, pumping plants, ferryboats, and other miscellaneous work. Field forces are provided to accomplish emergency repairs on the road.

Construction was started on a new facility for Shop 3 at Marysville.

Plans and specifications for construction of a new shop at San Leandro to replace the existing Shop 4 at Oakland were completed.

These new shops, plus the others constructed in the past 10 years, have assisted in providing a more economical repair cost per unit.

During the past 10 years the Equipment Department has grown with the workload of the Division of Highways. The accompanying diagram (below) shows this growth. During this period repair costs per vehicle per year have been reduced by $80 per unit, while the total increase in equipment value has been 113 percent. This has been accomplished with an increase of only 16 percent in personnel.



Administration

- *The Assistant State Highway Engineer, Administration, is in charge of the following functions: office engineer; city and county 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 and processing of plans, specifications, estimates, and bid and contract documents; budget and expenditure control; administration of federal funds; industry contacts; bidder prequalification records; reports and statistics; and mail 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 financial documents submitted to the California Highway Commission; issuance of work orders; and maintenance of construction records.

During the year 500 financial resolutions were prepared for commission action; 559 projects were advertised for bids with an estimated cost of $390,390,900; and 525 projects were determined to be satisfactory for recommending contract award.

In addition to the major contract work, the financing of 380 minor and informal contracts with a total value of $569,800 was cleared.

More than 10,000 expenditure authorizations were coded for use with the new EDP accounting system to be placed in operation on July 1, 1964.

Plans and Estimates

Preparation of projects for advertisement requires reviewing and correlating the plans and specifications to assure that they are in agreement. Estimates of cost for all projects are reviewed periodically prior to opening of bids so that estimates can be adjusted to conform with prevailing construction costs whenever necessary.

Title sheets are prepared for the larger construction projects and location maps for many of the smaller projects; last-minute changes or additions are made to the detail plans for such projects prior to advertising; and place "as built" changes on the contract plans. Standard construction plans, three series of district and metropolitan area maps, various state maps including the road map supplementing the annual report of the division and the progress map, California freeway and expressway system, are prepared and maintained; and charts and maps for other units and occasionally for other state agencies are prepared.

A monthly project record-consolidated status estimate, used in conjunction with the progress and payment of all regularly advertised going contracts, is prepared. An annual tabulation entitled "Contract Item Data" is prepared as an administrative aid and management tool.

Specifications

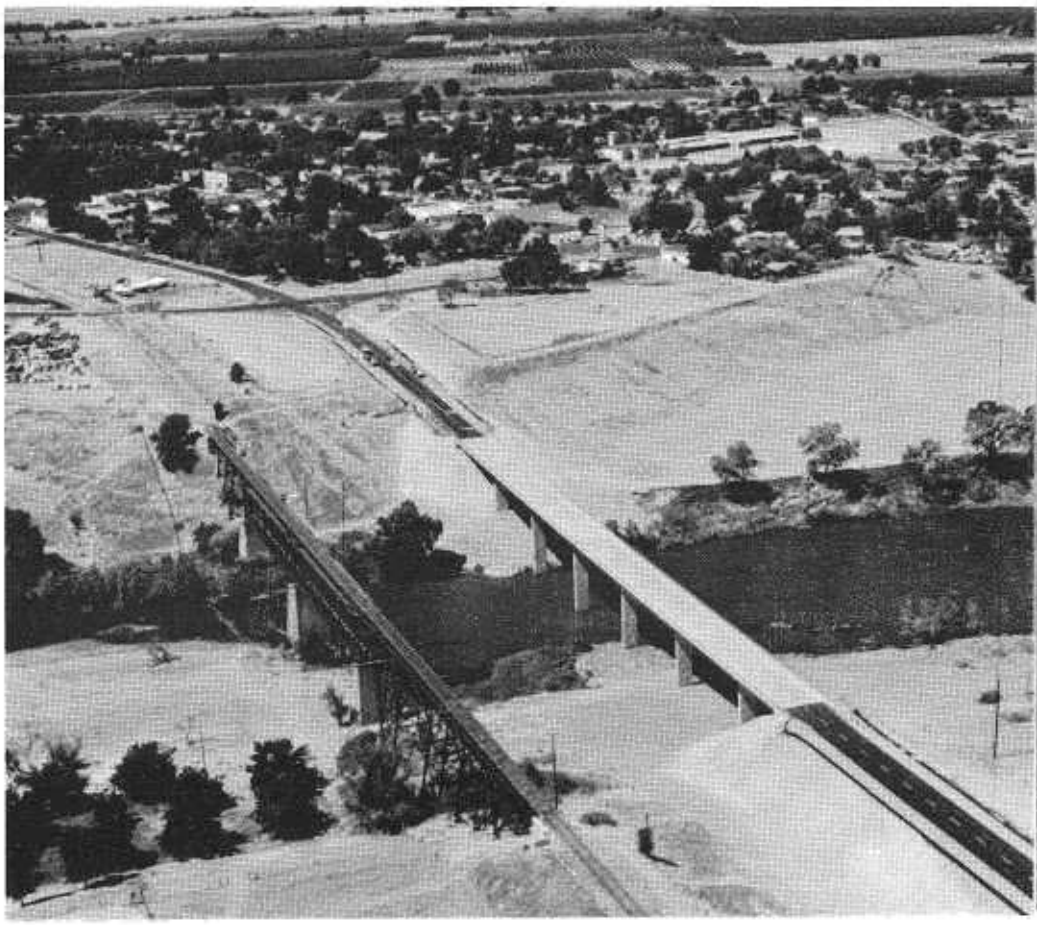
The Division of Highways *Standard Specifications* for highway projects was revised and republished, effective July 1964. The previous edition was dated 1960. These standards are used not only by the state but also by many counties, cities, and other agencies and guides and references for highway type of work.

Specifications for 559 projects were prepared during the year.

Reports and Statistics

Statistical records were kept on highway construction contracts awarded, numbering 525 during this fiscal year, the quarterly California Highway Construction Cost Index was prepared and periodic reports are prepared showing the value and prog-

Bridge (right) was constructed on new alignment over the Tuolumne River near Waterford by Stanislaus County under the federal aid secondary program. It replaces a bridge built in 1914 which is now inadequate for present day traffic.



STATE HIGHWAY MILEAGE BY SURFACE TYPES

Type	NORTH			SOUTH			TOTALS		
	Outside cities	Inside cities	Total	Outside cities	Inside cities	Total	Outside cities	Inside cities	Grand total
Concrete	506.892	171.809	678.701	565.760	420.662	986.422	1,072.652	592.471	1,665.123
High bituminous	4,323.235	513.653	4,836.888	3,434.526	607.572	4,042.098	7,757.761	1,121.225	8,878.986
Low bituminous	1,422.743	28.793	1,451.536	850.979	15.446	866.425	2,273.722	44.239	2,317.961
Oiled earth, gravel	492.050	0.714	492.764	584.700	3.738	588.438	1,076.750	4.452	1,081.202
Graded and drained earth	31.041		31.041	26.300		26.300	57.341		57.341
Bridges	71.171	35.305	106.476	34.419	31.659	66.078	105.590	66.964	172.554
TOTALS—CONSTRUCTED ROAD	6,847.132	750.274	7,597.406	5,496.684	1,079.077	6,575.761	12,343.816	1,829.351	14,173.167
Unconstructed road	1,177.074	145.855	1,322.929	703.720	217.274	920.994	1,880.794	363.129	2,243.923
TOTAL HIGHWAY SYSTEM	8,024.206	896.129	8,920.335	6,220.404	1,296.351	7,496.755	14,224.610	2,192.480	16,417.090

ress of budgeted and nonbudgeted programs. The Statistical Supplement to this annual report is another reporting function.

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.

Seven hundred seventy-four contractors were prequalified on July 1, 1964, to bid on the various types of state highway construction, with a bidding capacity of $2,543,966,000, which is $11,085,000 more than a year ago, though there are 59 fewer prequalified contractors.

In arriving at a combined bidding capacity, no portion of the individual ratings in excess of $20,000,000 has been included.

The following tabulation gives the number of contractors prequalified by the Division of Highways on July 1, 1964, arranged by the several brackets if bid ratings:

Rating	*Number of Contractors*
$10,000,000 and over	81
5,000,000 to $10,000,000	146
2,500,000 to 5,000,000	236
1,500,000 to 2,500,000	299
1,000,000 to 1,500,000	366
500,000 to 1,000,000	508
250,000 to 500,000	647
100,000 to 250,000	752
50,000 to 100,000	774

Bids and Bidders

The average number of bidders per project during the year was 5.4, slightly higher than last year's level of 5.3. The highest monthly average of 6.6 was in January 1964. The low of 4.5 was in July 1963.

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 are the number and total value of projects making up each bracket and the percentage each bears to the total.

CONTRACT VALUE RANGE

	Number of projects	*Percent*	*Value of projects*	*Percent*
Under $50,000	223	42.5	$4,408,925	1.3
$50,000 to $100,000	64	12.2	4,517,587	1.3
100,000 to 250,000	86	16.4	14,906,706	4.3
250,000 to 500,000	50	9.5	16,995,658	5.0
500,000 to 1,000,000	30	5.7	21,415,768	6.2
1,000,000 to 2,500,000	24	4.6	39,785,781	11.6
2,500,000 to 5,000,000	29	5.5	111,813,647	32.6
Over $5,000,000	19	3.6	129,008,217	37.6
Total	525	100.0	$342,852,289	100.0

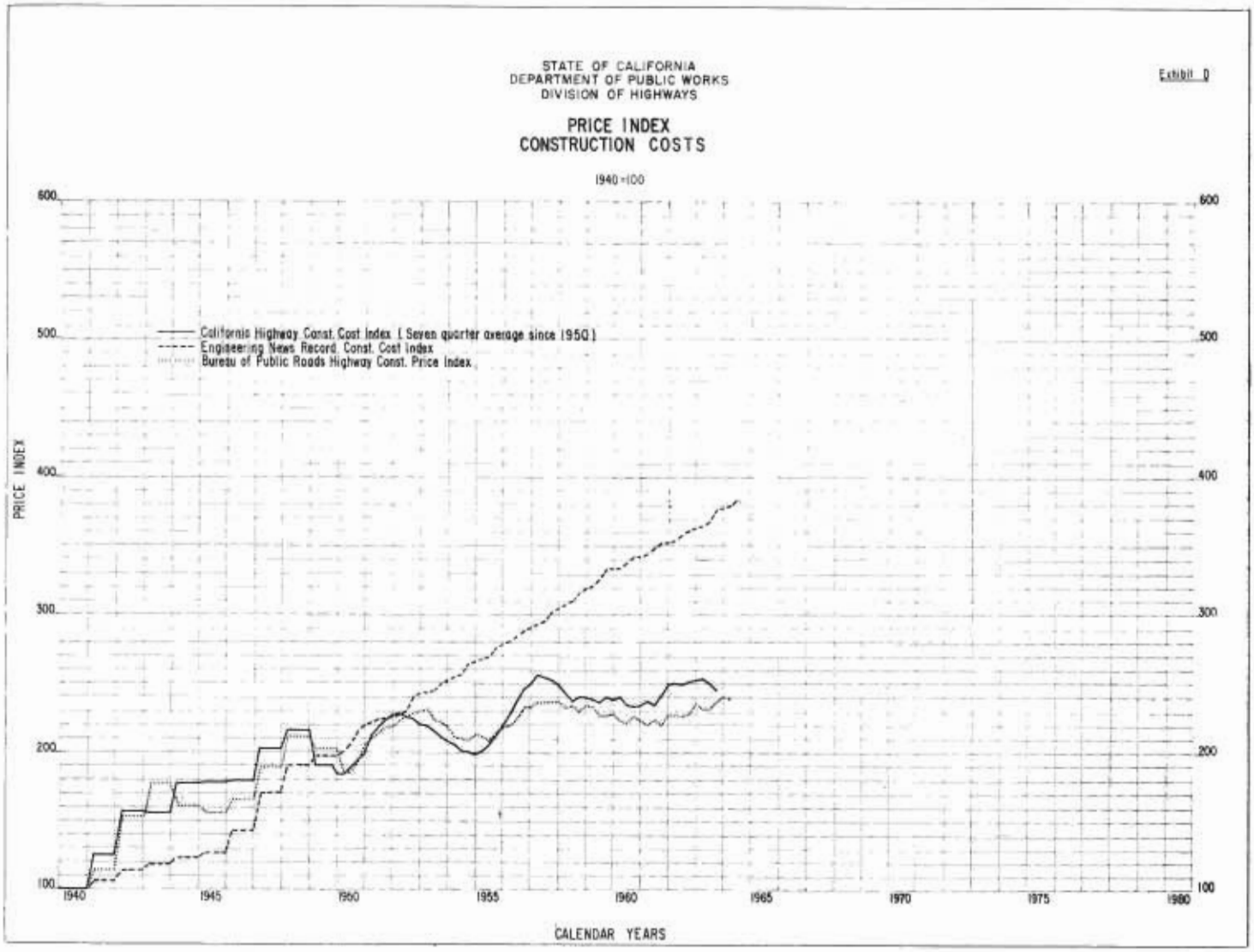
Street and Highway Mileages

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)		16,417
Highways proposed for construction where roads do not exist		2,244
Constructed state highways		14,173
Federal-aid System		
Primary rural (12-31-63)	8,043	
Primary urban (12-31-63)	1,610	
Total		9,653
Federal-aid interstate system (included in above)		2,177
Federal-aid secondary system (6-30-64)		
On state highways	3,527	
On county roads	9,129	
Total		12,656
County maintained system (6-30-64)		70,646
City streets (estimated 12-31-63)		34,709
City streets on state highway system		1,829

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 fiscal year began with an index value of 249.5 in the third quarter of 1963, dropped to 243.0 in the following quarter, increased slightly to 246.1 in the first quarter of 1964 and again to 248.7 in the second quarter of 1964. The average value for 1963 is 246.8.

The above graph shows a comparison between the California index, the Bureau of Public Roads Index and the Engineering News-Record Construction Cost Index. Plotting of the California Index has been changed to an average basis.

CONTRACTS BY TYPE

The following tabulation gives the number of contracts with mileage by types awarded during the 1963–64 fiscal year.

Number of contracts		*Centerline miles*
46	Portland cement concrete	206.3
152	Asphalt concrete	978.7
9	Road mix	13.3
6	Seal coat	175.9
2	Grading	1.3
87	Traffic signals and lights	.....
27	Bridges	.....
131	Miscellaneous	.....
460	Total	1,375.5

NOT ON STATE HIGHWAY SYSTEM

County Roads—Federal Aid Secondary

Number of contracts		*Centerline miles*
1	Portland cement concrete	1.1
32	Asphalt concrete	102.2
2	Road mix	8.1
2	Seal coat	4.3
5	Grading	24.8
6	Bridges	.....
14	Miscellaneous	.....
62	Total	140.5

STATE PARKS, ETC.

Number of contracts		*Centerline miles*
1	Asphalt concrete	3.0
1	Miscellaneous	.....
1	Traffic signals and lights	.....
3	Total	3.0

Federal Aid

A total of $314,631,779 in federal aid funds was apportioned to California for 1964-65 under the Federal Aid Highway Acts of 1961 and 1962. This included $22,069,229 for primary highways, $10,198,330 for secondary routes, $26,214,680 for urban routes and $256,149,540 for interstate highways. The federal matching ratio on primary, secondary and urban projects is 59.68 percent; on interstate projects, 91.59 percent.

At the start of the fiscal year, construction was in progress on 111 contracts totaling $434,981,000, of which $329,832,000 were federal aid funds.

There were 84 construction contracts involving $12,160,000 of primary funds, $23,635,000 of urban funds and $110,838,000 of interstate funds completed during 1963-64. These amounts, together with the required state matching funds, bring the combined total cost of such improvements completed during the year to approximately $190,586,000.

There were 118 contracts awarded with a total cost of $312,256,000 exclusive of preliminary engineering, involving primary, urban and interstate federal aid funds totaling approximately $234,846,000.

Seventy-six of these contracts provide for improvements on the national system of interstate highways with a total cost of $189,693,000 of which the federal share amounts to $169,567,000.

Right-of-way project agreements with the Bureau of Public Roads increased the total of interstate federal aid funds under agreement for participation in right-of-way acquisition costs by $102,507,937 to a total of $542,156,108.

Industry Contact

The industry contact function of the Division of Highways includes collection of prevailing wage contract data from contractor and labor organizations; collection of information for the establishment of equipment rental rates to be used on force account work; and the following other activities.

Service Contracts. 4,880 service contracts were processed, involving a total expenditure of $5,948,000.

This type of contract is used for renting equipment and obtaining a wide variety of services. Its use is confined to work not covered by the State Contract Act and not adaptable to other prescribed procedures.

The principal use of service contracts, involving an expenditure of nearly $1,611,200, was for the rental of equipment for highway maintenance, for use by honor camps, and for occasional day labor projects.

Minor Contracts. Small projects for which the cost will not exceed $5,000 are handled by the districts. A total of 380 minor contracts with a value of almost $569,750 were awarded during the fiscal year. The average per contract was approximately $1,500.

Standard Agreements. Certain types of personal services are obtained under standard agreement. During the fiscal year 129 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.

Right-of-way Clearance Contracts. As in past years, contracts were awarded to clear rights-of-way in advance of construction. There were 464 contracts totaling $987,200 awarded for the demolition of buildings. Another 14 contracts totaling $154,400 were awarded for altering and moving buildings, relocating irrigation systems and fences, and drilling wells.

CITY AND COUNTY PROJECTS

The Collier-Unruh Local Transportation Development Act, which became effective on September 20, 1963, greatly increased the responsibilities of the division's City and County Projects Department. This function includes administration of the apportionment and expenditure of the portions of the gasoline taxes that are paid to the cities and counties. Other activities involve administration of the federal aid secondary highway program, the federal aid secondary urban extension program, the local street and highway flood relief program and the updating of the division's county road maps and tabulations.

City and County 1.04-cent Program

The Collier-Unruh Act, as of October 1, 1963, increased the motor vehicle fuel tax from 6 cents to 7 cents per gallon along with other changes and made the equivalent of these new funds available to the cities and counties. A new program of apportionment was provided under Section 186.1 of the code whereby 1.04 cents per gallon of gasoline taxes collected is apportioned and paid monthly to eligible cities and counties through a four-step formula using lump sums, county vehicle registrations, assessed valuation of property and city populations. The payment of a part of these funds is limited under Section 186.5 of the code to those cities and counties that match them with funds derived from other than the Highway Users Tax Fund or the State Highway Fund.

Though the new 1.04-cent funds do not require formal budgeting and prior approval by the department, the administration of the program does require the review of each improvement to verify conformance with the requirements of the act in regard to eligible work, standards of design and location on an approved select system of roads and streets. Plans for 418 projects were reviewed by district and headquarters engineers, and many other projects were reviewed at the site of construction. The expenditure of these funds and those considered as matching are reported to the department in two annual reports; a matching fund report and a fully detailed report of all expenditures on the system.

During the portion of the initial fiscal year that this act has been in operation, $24,310,000 was apportioned to the cities and $10,774,400 to the counties. Of this total, $1,199,600 was available for expenditure without matching. The remainder will require 50 percent matching during the year of expenditure but only $4,279,700 had been expended by the end of the fiscal year. Since reported matching expenditures totaled $48,368,100, there is a

A safety roadside rest on the two-lane Route 49 expressway east of Sierra City in Sierra County. It is one of 24 such facilities throughout the state now used by motorists. Seven more are under construction and work is scheduled to begin on an additional 26 in 1965.

sizeable excess which is eligible for matching future expenditures of apportioned funds.

City 0.725-cent Program

The former ⅛-cent gasoline tax that was apportioned quarterly to the cities from the State Highway Fund was increased 1/10 cent by the Collier-Unruh Act to 0.725 cent per gallon. These moneys are sometimes referred to as the "2107 funds" after that section of the Streets and Highways Code providing them.

The allocations of funds to cities for engineering costs in respect to city streets remained unchanged under Section 2107.5. This allocation ranges from $1,000 to $20,000 annually to each city, and totaled $1,338,500 during the 1963–64 fiscal year.

City budgets approved by the division for the expenditure of ⅛-cent and 0.725-cent funds during the 1963–64 fiscal year included $28,578,100 for construction, $15,925,400 for maintenance, and $7,491,800 for rights-of-way. One of the changes provided by the Collier-Unruh Act was a reduction in the percentage required to be expended for construction and rights-of-way from 60 percent to 40 percent.

State-allocated ⅛-cent and 0.725-cent funds available to cities for budgeting during the fiscal year were:

Unbudgeted funds in city treasuries and in the State Highway Fund, June 30, 1963	$9,100,800
Apportionments during the fiscal year	42,131,600
Savings on completed projects and canceled projects and interest and rental receipt accruals	9,704,800
Total available for budgeting during the fscal year	60,937,100
Actual amount budgeted	51,995,300
Carryover for budgeting in the 1964–65 fiscal year	8,941,900

During the year 557 sets of plans, specifications, and estimates were reviewed and approved for construction. These projects provided for the improvement of 188 miles of streets at an estimated cost of $57,064,700. About 70 percent of the projects were approved by the districts, a procedure inaugurated at the beginning of the year in order to improve service to the cities.

New Cities and Populations

Seven new cities filed incorporation papers with the Secretary of State during the fiscal year, bringing the total number of cities in California to 389 as of June 30, 1964. There were 1,137 city annexations during the same period. The new cities and dates of incorporation were: Cotati, Sonoma County, July 16, 1963; Desert Hot Springs, Riverside County, September 24, 1963; Ridgecrest, Kern County, November 29, 1963; Clayton, Contra Costa County, March 18, 1964; Hawaiian Gardens, Los Angeles County, April 9, 1964; Tiburon, Marin County, June 23, 1964; Lomita, Los Angeles County, June 25, 1964.

The population increase of incorporated territory during the year is summarized as follows:

As of June 30, 1963	12,517,780
By annexation	35,277
By special federal census	18,105
By Department of Finance estimates	519,991
By new incorporations	13,338
As of June 30, 1964	13,104,491

Road and Street Systems

The Collier-Unruh Act provided for a new "select system" of county roads to replace the former county primary road system and a new "select system" of city streets to replace the former major city street system.

Initially, as of January 1, 1964, the "select system" consisted of the roads and streets system of "arterials" and "collectors" contained in the Report of County Road and City Street Deficiencies prepared by the division in 1959 for the Legislature in compliance with Senate Concurrent Resolution 62. The Collier-Unruh Act required that each city and county propose a new select system for the Highway Commission approval prior to October 1, 1964. The commission is required to approve or modify all proposals by April 1, 1965.

The act specifies criteria designed to create a system of arterial highways supplementing the state highway system, while at the same time allowing for inclusion of collectors. The entire system, including the state highways, may not, except under special conditions, include more than 50 percent of the entire system of public thoroughfares in any city or county.

With the approval of the select system in progress, the division is embarking upon the task of amending its record maps which are kept up to date for use by those whose functions require information concerning county roads, city streets and city limit lines. These revisions are in addition to those required annually by the Collier-Burns Highway Act of 1947. Fifty-seven counties reported changes in their mileage of maintained roads as follows:

	Miles
New roads	1,076.94
Deletions (by annexations)	915.77
Net increase	161.17
New total as of June 30, 1964	70,646.30

During the fiscal year, 316 miles of local roads were added to the federal aid secondary highway system, bringing the total in that class to 9,152 miles. At the same time, 70 miles of state highways were added to the federal aid secondary system, making that total 3,527 miles.

FAS Program

During the fiscal year, 48 county FAS contracts were awarded at a total cost of $19,092,100. These funds covered construction on 136.018 miles of road and 20 bridges.

California received $10,013,700 of federal funds for secondary highways authorized for the 1964-65 fiscal year. In accordance with state statute, 87½ percent, or $8,762,000 was reapportioned to the counties. The Division of Highways retains 11 percent of the total allocation for construction on state highways on the federal aid secondary system, and 1½ percent for planning purposes. During the 1963-64 fiscal year, $429,200 of "state share" funds were utilized for the improvement of 11.2 miles of state highways.

A total of $4,151,000 for the 1964-65 fiscal year was provided from the State Highway Fund in accordance with state law to pay the counties' share of the FAS construction projects up to a maximum of $100,000 per county.

Urban Extension Program

The federal aid secondary urban extension program authorized by Section 143.3 of the Streets and Highways Code in 1959 is summarized as follows:

Fiscal year	*Projects*	*State highway funds*	
		To cities	*To counties*
1960–61	5	$456,500	$406,500
1961–62	10	591,500	761,250
1962–63	4	106,000	269,500
1963–64	6	866,800	975,200
1964-65	13	2,064,700	1,240,150
1960–65	38	$4,085,500	$3,652,600

The above funds represent allocations made by the Highway Commission on an equal matching basis to qualified cities and counties that made application on the basis that the local road or street projects were considered to be more important to the local community than improvements which would otherwise have been made to state highways in the same area.

Flood Damage Repair

The duties of the Division of Highways include the investigating and reporting on flood damage suffered by local agencies to establish eligibility under the State Emergency Flood Relief Law, the federal aid highway acts and the federal disaster relief program.

Twelve counties, 10 cities and 2 special districts applied for financial assistance in costs of about $6,550,000 for repair and restoration of roads, streets and bridges damaged or destroyed by the storms beginning in October 1962 and January 1963.

"State of disaster" proclamations by the Governor resulted in federal financial assistance being made available to the City of Los Angeles and to Culver City in emergency measures made necessary by the rupture of the Baldwin Hills Reservior Dam, and to Crescent City in emergency measures made necessary by the seismic sea wave of March 28, 1964.

A nearly completed four-lane divided section on Poway Road in a rapidly developing area north of San Diego. This project was financed under the federal aid secondary county road program.

SERVICE AND SUPPLY

Service and supply activities of the Division of Highways fall generally into the following seven primary areas:

1. *Specifications*, or establishing standards for property to be purchased.

2. *Acquisition* of property by procurement through the Office of Procurement, General Services.

3. *Traffic management*, or the transporting of property from the point of purchase or storage to the point of need.

4. *Inspection*, or insuring adherence to purchase specifications.

5. *Identification*, or getting property under a standard system so as to facilitate identification.

6. *Storage and issue*, or the storing of necessary reserves of property and their distribution.

7. *Utilization*, or seeing that property is efficiently used and is suitably disposed of when no longer needed.

A general streamlining of the Service and Supply Department, including the use of scientific inventory control methods, is being undertaken. Studies are being made to utilize electronic data processing in the warehousing operation, with an ultimate goal of divisionwide use in property management.

Reproduction. Last year's record 7.5 million square feet of prints was equaled. The duplicating unit ran 21,800,000 impressions, up 45 percent from last year.

Photography. This year's 1,922 orders represent no significant change from last year.

Records Management. The North Record Center has 22,436 cubic feet of records, up 15 percent from last year. South Record Center received 700 cubic feet of new records and disposed of 600 cubic feet, and now has 4,300 cubic feet of records.

Supply

Procurement. The increase in procurement reflects the growth of the division. Warehouse purchases were up 14 percent to $5,800,000. Total purchases were up 3 percent to $15,800,000. Warehouse disbursements were up 10 percent to $5,700,000, while warehouse inventories remained approximately the same at $2,200,000. The resulting turnover factor of 2.6 is the best ever attained by the warehouses.

The growing use by the districts of the subpurchase order pad initiated last year is saving time, paperwork and expense. This method of expediting local purchasing is helpful to the field forces.

Warehouse Operations. The reduction of stockpiles of H-piling and beams has continued. Improved packaging and storing methods are being initiated. An example is the packaging of small construction stakes into cartons, which saves over 60 percent in warehouse space, as compared to the old method of using sacks, yet costs no more.

There were 35,386 requisitions filled (up 3 percent) for a total of 125,327 items (up 6 percent) at the warehouses. This required 14,863 shipments (up 5 percent).

Signs. The major sign purchasing contract was split to afford better competition and to provide more flexibility. There were 86,964 signs handled, up 29 percent from last year. The cost of the signs increased 24 percent to $2,138,903.

Nonrental Budget. Actual expenditures for nonrental budget items were about $925,000, up 4 percent from last year. The nonrental inventory as of June 30, 1964, was $16,066,000, up 5.5 percent.

Printing. Service and Supply provides the liaison service between the division and the Office of State Printing. There were 2,731 standard printing orders processed, a 6-percent increase over last year. Also, 131 "outside" orders were cleared for work by private firms.

MANAGEMENT ANALYSIS

The development of budget policies and procedures to include all personnel and related operating expenditures for the Division of Highways was completed and implementation started during this past year. The process developed thus far has facilitated the reduction of anticipated expenditures through the review of the manpower requests.

A Stenographers and Typists Manual has been developed, issued, and a means developed whereby periodic training is provided to the users of the manual, as well as a means of maintaining the manual in up-to-date form.

A comprehensive and far reaching study to determine the authorities and responsibilities of approximately 250 key people throughout the division was undertaken, from the State Highway Engineer to the resident engineer. This study should not only permit establishing in writing the respective authorities and responsibilities, and the delegation thereof, but should also provide a useful tool for the examination of procedures and the flow of work in the division.

Basic records usage studies were completed for three of the 11 highway districts and several special record studies were also completed. Included in the latter was a map and plans usage and retention pilot study.

An improved means of reporting disposition of records was developed. Study was commenced on the utilization of microfilm equipment for retrieval of records, as well as storage of records. This study is designed to realize the greatest present and potential use at the lowest possible cost by applying the recent developments in the microfilm field.

SYSTEMS RESEARCH

In collaboration with the Fiscal Management Department, a detailed study was undertaken of the division's labor cost codes (activity codes) with the objective of reducing the unusually large number of existing codes and still retaining a classified definition of overall work effort susceptible for meaningful analysis by management. A consolidation of new codes was written and placed in operation.

As a consequence of recommendations made by a private consulting firm and under policy direction of the Division of Evaluation Committee, a system of computer-produced management reports for key personnel in all functions of the division was implemented. Report formats were designed to accommodate departmental requirements. District and headquarters organization charts were coded to render a progressive reporting system.

. Planning

● *The Assistant State Highway Engineer, Planning, is in charge of advance planning, programs and budgets, design, traffic, and urban planning*

ADVANCE PLANNING

Advance planning involves processing project reports, coordinating route adoptions and freeway declaration procedures, processing freeway agreements, and coordinating the Division of Highways planning work with that of other state, federal, or local agencies.

Project Reports

Reports for 283 proposed projects were processed during the year, 199 of which were major projects.

A project report covers the engineering investigation and analysis of a specific project. This report discusses the need for and the type of the planned highway improvement and how it should be accomplished.

Project reports are required for all proposed improvements. They constitute a control mechanism in planning and budgeting, and provide information for basic design features. They are prepared in the district offices.

The reports are reviewed at the Sacramento headquarters where analysis by various departments is coordinated by the Advance Planning Section after field review.

Aerial mapping is being used more and more to evaluate topographic controls and expedite the preparation of project reports.

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 consideration of community values and potential land uses, as well as traffic needs and benefits.

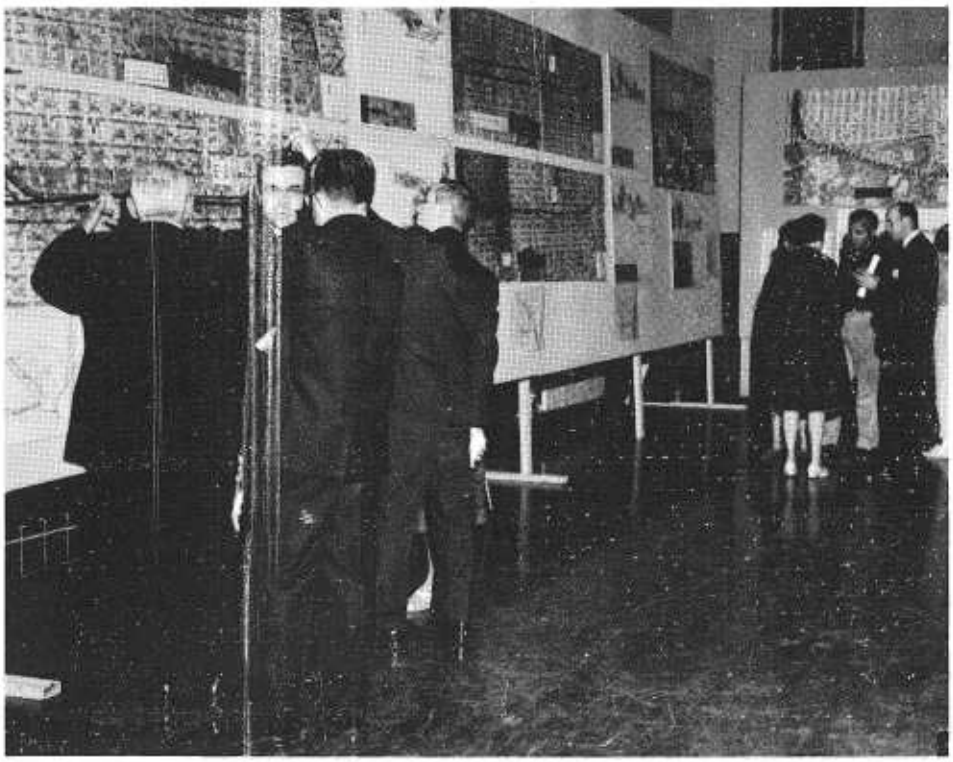
The Division of Highways informs all local authorities of the initiation of freeway route studies and of the general features of proposed freeway units as the studies progress. When sufficient information has been developed on a specific freeway project, a well-publicized public hearing is held in the general area to present the results of the study to local officials and the interested public; and to learn the local reaction to the project as well as to receive any information which may be pertinent to the routing. (Current commission procedural policy, which is contained in subchapter 4 of the California Administrative Code under which the Division of Highways operates in freeway route location matters, is included in the statistical supplement of the Annual Report.)

Transcripts of proceedings of public hearings, together with reports on the results of conferences, are made available to the Highway Commission for consideration in the determination of freeway routings.

During the 1963–64 fiscal year, the district staffs of the Division of Highways held 43 of these formal public hearings to discuss proposed freeway routings. Numerous conferences with city and county officials and their technical staffs were also held, as were several hundred preliminary informational meetings and map displays. The California Highway Commission itself also held seven public hearings during the year, four at the request of the local authorities and three on its own initiative. (The public hearings are listed in the statistical portion of the Annual Report.)

The California Highway Commission had under consideration during the year some 61 freeway projects and adopted routings on 49 of them. These adoptions increased the freeway mileage 348.3 miles, making a new state-

Engineers from the District 4 planning staff answer questions from interested citizens at a pre-public hearing map display showing alternate routing studies in San Francisco.



wide total of 6,971 miles of declared freeway as of June 30, 1964.

Freeway Agreements

Close cooperation between the state and cities and counties resulted in working out and concluding 236 freeway agreements 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

Approval of the U.S. Bureau of Public Roads is required on the final locations of all routes on the interstate highway system. This is done for each interstate section after adoption by the California Highway Commission. At the end of the fiscal year, the locations for approximately 2,141 miles, representing over 98 percent of the interstate system in California, had been approved. This leaves only approximately 33 miles of interstate routing yet to be approved, nearly all of which is now under active consideration.

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 2,580 miles, about 77 percent of which is on state highway routes.

The California apportionment of forest highway funds for the 1963–64 fiscal year was $4,726,004. The amount placed under contract or otherwise obligated during the year was $4,366,880, about three fourths of which was for projects on state highways. The unobligated balance is to be supplemented with 1964–65 fiscal year funds and allocated to a contract to be awarded early in the latter year.

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

Water Projects

It is a planning responsibility to determine whether the water development projects proposed by various federal, state and local agencies will affect state highways. Highway planning, due to such a project, may entail provision for anything from a simple distribution system crossing to the relocation of a substantial length of highway. It may also include the negotiation of an agreement with the sponsors of the water facility to apportion the cost of the work to be done among the parties concerned.

PHOTOGRAMMETRIC MAPPING AND AERIAL PHOTOGRAPHY

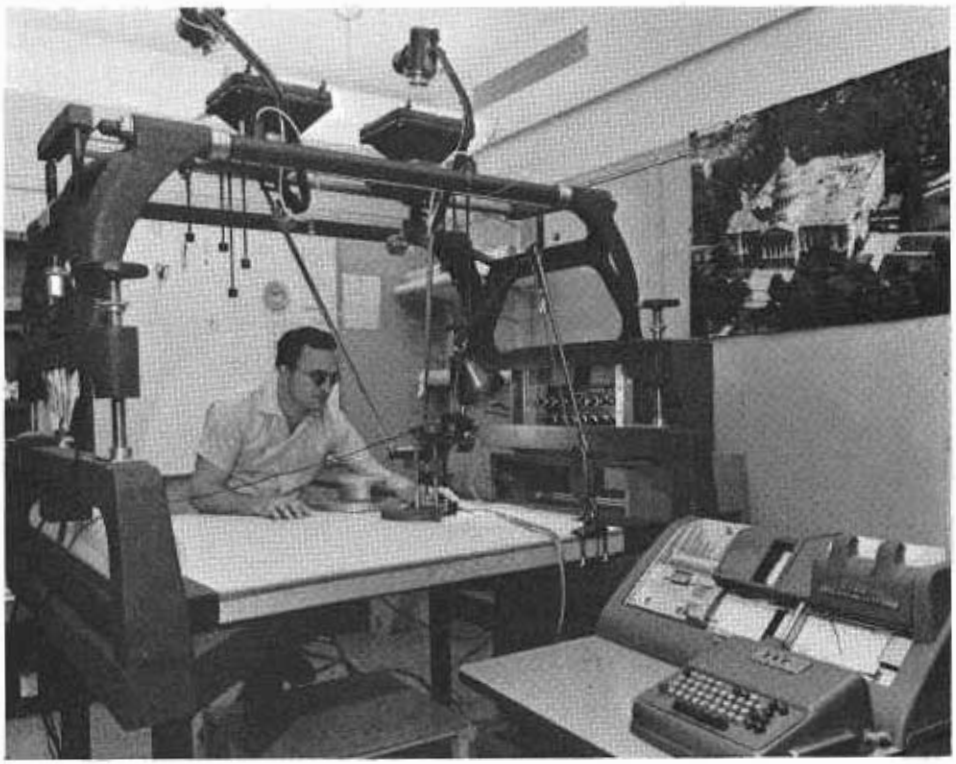
Aerial photography is used in advanced planning, design, right-of-way, and traffic studies, and also to some extent in other aspects of the highway program.

Photogrammetric mapping is frequently used during the advanced planning phase in conjunction with the study of possible alternate routes, and is used on most projects for the location and design of adopted routes. Most of this work has been obtained by contract, although part was done by the Photogrammetry Unit.

Total contracts completed during the fiscal year were:

	Contracts	*Highway strip miles*	*Contract amount*
Contour mapping projects for design	23	204.0	$229,111.00
Contour mapping projects for reconnaissance	3	37.6	62,768.00
Stereoplotter rental contracts	30	—	127,933.16
(Compilation for design)	—	222.1	—
(Compilation for reconnaissance)	—	18.5	—
Aerial photography contracts	9	—	21,908.00
Aerial photography contracts (blanket)	13	—	97,961.86
Total			$539,682.02

Another important activity is the taking of photogrammetric cross sections for particular construction projects. The cross-section data are automatically recorded on punch cards by means of an electronic attachment to



The Kelsh plotter with Auto-trol digital scaler is used for taking terrain cross sections and recording directly on punch cards.

a stereoscopic plotting instrument. Six projects, a total of about 32.5 miles, have been completed this year.

Precision aerial photography of the terrain prior to construction provides a permanent and valuable record which can be referred to any time after construction has commenced. For this purpose it is necessary to premark or target the staked centerline, or its equivalent, before the photography is taken to insure positive identification of the line.

About two-thirds of the total mapping mileage obtained by contract is reviewed photogrammetrically. This service provides advanced information to the districts as a guide for performing accuracy test surveys by field methods.

Control Bridging

Photogrammetric control bridging is an operation aimed at the reduction of field survey effort, and provides a means of obtaining control data of sufficient accuracy for map compilation by direct-projection stereoscopic instruments. It is particularly applicable to remote, rugged, or otherwise difficult terrain which makes field surveys difficult to perform. Nine projects, mostly for reconnaissance mapping, have been completed this year.

Right-of-way Surveys

Photogrammetric determination of positions on the California Coordinate System are of sufficient accuracy for many right-of-way needs. Six relinquishment projects have been completed this year for District 4. In addition, on several projects for District 3 the positions of premarked property corners have been established in conjunction with photogrammetric control bridging.

Special Project

A contract between the U.S. Coast and Geodetic Survey and the Division of Highways was effected the previous fiscal year for a geodetic control survey of the San Diego metropolitan area. The purpose of the survey is to establish correct geodetic positions of the intersections of many state highways in this area; it is expected to alleviate confusion in future development of highway routings.

The fieldwork is being performed by state forces and is nearly complete. All computations and adjustments will be handled by the Coast and Geodetic Survey. Final position values are expected by January 1965.

PROGRAMS AND BUDGETS

Programs and budgets work includes coordinating the development of statewide long-range planning programs, preparing the annual state highway budget, scheduling and controlling the advertising of construction projects, maintaining a constant check on the present and future availability of funds, and administering the division's buildings and plants program.

Planning Programs

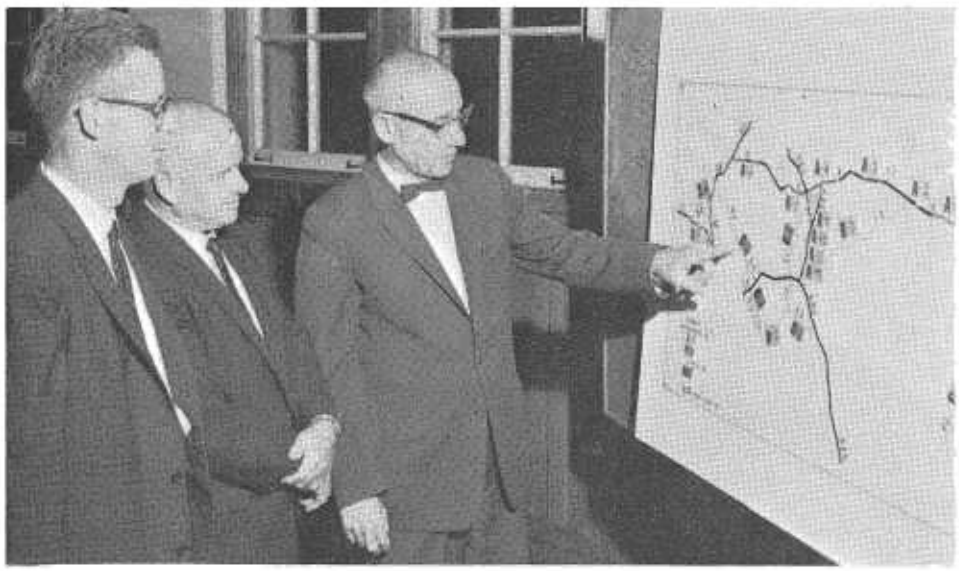
Planning program development is a continuing process which is formalized annually to reflect current data with respect to highway needs, availability of funds, and legislation.

The annual planning program is prepared by each district office for its area. These district programs are carefully reviewed by affected headquarters departments for conformity with established controls and continuity on a statewide basis.

The district programs, as adjusted and combined, become the formal statewide planning program and are then presented to the California Highway Commission for review.

State Highway Budget

The annual state highway budget is based on the planning program as a guide to project priorities. Many factors must be carefully analyzed to insure the most efficient use of funds.



Views of local groups and officials on project priorities are brought into the long-range highway planning picture each spring and summer through "on-the-scene" tours and meetings sponsored by the California State Chamber of Commerce. At a meeting in Martinez, Assistant Planning Engineer W. D. Bethell of the Division of Highways (left) and Norris Wiggins of the Contra Costa County Highway Advisory Committee take note as County Road Commissioner Victor W. Sauer points to a route map.

Estimates of revenue from both state and federal sources are made after consultation with other agencies involved.

After allowance for the operating needs of the division, the remaining funds estimated to be available are allocated to specific construction and right-of-way acquisition projects, in accordance with applicable legislative controls, to best serve the needs of

traffic and the overall economy of the state. The responsibility for final adoption of the final budget rests with the California Highway Commission.

The 1963–64 fiscal year budget included approximately $696,000,000 of which approximately $305,000,000, or 44 percent, represented federal aid apportionments. The budget included nearly $474,000,000 for construction and right-of-way acquisition, providing 279 miles of multilane freeway, 31 miles of multilane expressway, 26 miles of two-lane expressway, and 137 miles of conventional highway.

Advertising Schedules

Since California's highway program is operated on a pay-as-you-go basis, careful scheduling of expenditures is necessary to insure solvency of the State Highway Fund.

Revenue comes from two sources, state highway user taxes and fees and federal aid subventions. User taxes are received monthly and motor vehicle fees annually, and can be estimated rather accurately. Federal aid revenue is received on a reimbursement basis and is therefore dependent on the rate at which those projects which are financed in part with federal funds are placed under construction. Care must be exercised to maintain a balance between federal aid and regular state highway projects to insure that expenditures do not exceed revenues.

To maintain a steady flow of construction work throughout the state and thus make the most efficient use of both state and contractors' personnel, it is necessary to maintain a close liaison with the various district offices to coordinate the many functions necessary to eliminate delays in completion of plans, acquisition of right-of-way and clearance with other agencies.

Buildings and Plants

During the fiscal year construction was begun on the expansion of the District 11 Office Building in San Diego and the District 1 Office Building at Eureka. Construction of the new Shop 3 facility at Marysville, South Sacramento Maintenance Station, Elk Grove Maintenance Station, District 4 Materials Laboratory in San Francisco, and maintenance stations at Calistoga, Redwood City, Newhall, and Whittier was also undertaken.

Funds were provided for acquiring additional land for expansion of the District 7 Office Building at Los Angeles, parking facilities at the District 4 office, and the District 11 Office Building.

Plans were being developed and/or property was being acquired for new maintenance stations or additions at 19 locations throughout the state.

DESIGN

Preparation of contract plans for the construction of state highways requires determination of the geometric plan of the roadway and interchanges, the development of the roadbed structural design, the development of a plan to collect and dispose of drainage and a plan for erosion control and landscaping. In addition, special criteria and standards are applied to projects on the state scenic highway system. Roadside safety rest areas and other auxiliary facilities may also be included in the design of state highways. In addition, research and special studies are carried on continuously in all areas of highway design so that standards and concepts may be improved and techniques developed to reduce costs.

Four-quadrant cloverleaf interchange at the junction of two major freeways in the Santa Ana–Tustin area of Orange County. View is north along the recently opened Newport Freeway (Route 55), with the Santa Ana Freeway (Interstate 5) crossing over it.

With the exception of some of the roadside development plans the preparation of contract plans is performed by each of the 11 districts for projects within their separate jurisdiction. Headquarters Office aids the districts in establishing standards, furnishing advice, coordinate research projects, providing liaison with other agencies and maintaining uniform application of policy on a statewide basis. Preparation of some of the roadside development plans is done in Headquarters Office.

Geometric Design and Plan Preparation

Each interchange location or design situation presents individual circumstances, usually with some unique features. The development of an interchange plan requires considerable study and analysis of alternate plans in order that the freeway system may become an integral part of the total motor vehicle transportation system which will provide maximum traffic service, maximum safety, the least disruption of the community, and the least possible expenditure of tax funds.

During the past year geometric designs for 538 interchanges or channelized intersections were prepared. Contract plans were completed for 404 projects including 5,361 plan sheets.

Structural Design

The structural design of a roadbed includes a study of the availability and quality of roadbuilding materials in the area of the project, an analysis of the subdrainage and foundation treatment necessary, the determination of stable cut and fill slopes, an economic comparison of alternative pavement types and the preparation of specifications for the construction of the roadbed. The objective is to insure the most economical and effective use of available materials to meet the structural requirements.

The structural design portion of the *Planning Manual* has been revised and is now in effect. A major change is the modification of the procedure for determination of thicknesses of the various elements of flexible pavement sections based upon more recent experience and test track data.

Roadside Rests

The Design Department has been assigned responsibility for the planning and programing of the safety roadside rest system authorized by the 1963 Legislature. In this regard a tentative master plan for roadside rests has been established as a guide for financing and programing.

During the past year 21 project reports concerning roadside rests and geometric plans for 34 roadside rests along the interstate highway system were processed.

The current planning schedule proposes 30 rest areas for construction in the 1964–65 fiscal year. This makes a total of 46 rest areas presently completed, under construction or programed.

Scenic Highways

The Design Department during the past year has had the responsibility for the implementation of the scenic highway law passed by the 1963 Legislature. Work was undertaken on the preparation of a scenic highway planning and design booklet to establish basic criteria to be used in scenic highway design. This booklet was prepared with the advice and counsel of the Advisory Committee on a Master Plan for Scenic Highways.

In addition to the design booklet, instructions were issued regarding planning and design procedures to be followed in scenic highway development. Included in these procedures are field reviews by design personnel and the division's landscape architects in order that scenic features will be given special consideration in the design of the highway to provide maximum preservation of the existing scenery and advantageous presentation of this scenery to the road user.

Research and Special Studies

Efforts have continued toward obtaining the optimum use of modern innovations such as the electronic computer, photogrammetry instruments and new reproduction methods in order that engineering manpower may be conserved and more efficiently used.

Operational reports are prepared on each completed freeway project after it is opened to traffic in order that existing standards and concepts may be critically reviewed. Analysis of accident records and operational experience has led to the following developments in the past fiscal year:

1. New standards were developed which will provide more efficient traffic service at major freeway-to-freeway interchanges.
2. The standards for the basic width of medians on divided highways have been increased which, experience has shown, will provide a safer facility.
3. The steady uptrend in operating speed on California's freeways has led to the adoption of curvature and sight distance criteria which will be adequate for speeds up to 80 mph for rural freeways in lieu of the former 70 mph design speed.
4. To provide a greater margin of safety in view of the increasingly heavy traffic on major highways, shoulder widths were increased on freeways from 8 to 10 feet.
5. Experience with traffic operation on existing bridges has led to a modification of the criteria for determining which of the longer bridges should be provided with full shoulder width. As a result almost all new bridges which will be carrying traffic volumes approaching their capacity will be wide enough to accommodate emergency parking without blocking a traffic lane.

One of the illustrations in a recent manual of design standards for scenic highways, this photograph of US 101 at Ortega Hill east of Santa Barbara shows how turnouts may be provided for vista points at suitable locations.

Drainage and Cooperative Agreements

The investigation of new techniques for improved drainage practices is continuing. In cooperation with the Bridge Department, Materials and Research Department and Construction Department, the entire field of culvert installation practice is being reviewed. A new type of corrugated culvert is being introduced using a different corrugation, and the permissible height of cover is being investigated.

The number of cooperative agreements have increased largely because of the increased use of cooperative drainage projects with local agencies and also cooperative improvements of local road patterns. These changes are made in conjunction with the construction of freeways and have resulted in mutual benefits to the local agencies and the highway projects.

Erosion Control and Landscaping

Four roadside development units operating in Headquarters Office and three districts are responsible for the design and development of all planting projects. The Headquarters unit perpares landscape projects in all districts except 4 and 7 and functional and tree planting projects in all districts except 4, 7, and 8. Planting must be consistent with public safety and designed for ease of maintenance.

Typical cross sections for highway projects are reviewed by the roadside development unit for the purpose of recommending erosion control and preparatory landscape work. Certain preparatory items of work, where it is known that landscaping will follow construction, are more easily and more economically done during the road construction. These include contour grading, deep cultivation, topsoil-

The interchange of the Santa Ana and Long Beach Freeways in Los Angeles illustrates the dual role of low-maintenance shrubs and ground cover to control erosion on slopes and to complement bridge structures.

Good contour grading combined with simplicity in planting design provide effective landscaping at the interchange of the Nimitz Freeway (Route 17) with Route 92 near Hayward.

ing, paving small areas too confined for planting, and placing conduits and water lines under roadways for future irrigation systems.

Availability of plant material influences to some extent the design of planting projects. Many plants are purchased by the state from commercial nurseries while others are propagated and grown under contract between the state and a commercial grower. Some plants not generally popular for garden use, and therefore not available in quantity commercially, have proven adaptable for highway use. These are propagated at the state nursery near Davis. Whatever the method of procurement at least an approximate quantity determination is made well in advance of project preparation.

Representatives of the landscape section inspect roadside development projects under contract in order to assist resident engineers in the interpretation of plans and specifications.

Landscape personnel have also assisted in the review of safety roadside rest plans, with a view to increasing the value of the rest area to patrons by improving the aesthetic appearance of the general area as well as that of the individual units.

During the fiscal year 30 projects for landscaping, functional and tree planting were financed at an approximate total cost of $3,196,409.42. These projects involved the planting of approximately 118,729 trees and shrubs and 4,880,879 ground cover plants and cuttings.

TRAFFIC

Motor vehicle travel on the state highway system in 1963 was approximately 39 billion vehicle-miles, an increase of 7.3 percent over 1962. This was almost half (47 percent) of the total motor vehicle travel in California. Practically all of the increase was on freeways.

Urban areas accounted for more than half (57 percent) of the travel, although they comprise only one-eighth (13 percent) of the mileage. Freeways totaling 1,327 miles accounted for 17 billion vehicle-miles, or 43.5 percent of the travel on the 14,164-mile state highway system and 20.6 percent of the total motor vehicle travel throughout the state. There were 2⅓ billion freeway trips in 1963 averaging 7.3 miles in length.

Accidents

Average accident rates on the state highway system in 1963 were as follows:

	Total accidents per million vehicle-miles	*Fatalities per 100 million vehicle-miles*
Rural freeways	0.99	4.65
Rural expressways	1.77	7.40
Rural conventional	2.55	9.77
All rural highways	2.06	8.20
Urban freeways	1.57	2.38
Urban expressways	3.91	7.85
Urban conventional	5.44	4.03
All urban highways	3.03	3.14
All state highways	2.61	5.34

There were 101,801 accidents reported on the state highway system in 1963. This was approximately 3,000 more than in 1962. However, the amount of vehicle-miles traveled increased at a greater rate, which results in a slight decrease in the total accident rate. The number of accidents, amount of travel and accident rates in recent years are shown in the accompanying table.

The increased safety shown in the accident-travel rates table is attributable to the fact that almost all of the increase in travel on the state highway system occurred on freeways where the accident rate is less than half that of all other roads. If the amount of freeway travel in 1963 (3.44 billion vehicle-miles in rural areas and 13.52 billion vehicle-miles in urban areas) had been on conventional highways and expressways, on the basis of the higher accident rates, there would have been an additional 58,700 acci-

ACCIDENT-TRAVEL RATES

Year	Number of accidents	Travel (billion vehicle-miles)	Accident rate (accidents per million vehicle-miles)
1961	95,024	34.45	2.76
1962	98,292	36.36	2.70
1963	101,801	39.04	2.61

dents and 418 more fatalities. On the same basis, it is estimated that the freeway system completed as of the end of 1963 has saved more than 2,500 lives since 1949.

Research on Safety and Traffic

The following highway safety research projects were completed during the fiscal year ending June 30, 1964:

1. Analysis of fatal accidents on freeways in 1961 and 1962. *Highlights:* One-half of all fatal accidents on freeways were single vehicles and nearly one-third (31 percent) were single vehicles which hit fixed objects. About one-third (30 percent) of all freeway fatal accidents were between 11 p.m. and 3 a.m.

2. The effectiveness of median barriers. Before and after studies indicate that median barriers practically eliminate cross-median head-on accidents. Fatal accidents were reduced, but total accidents and injury accidents increased.

3. Comparative freeway study (a study to determine why certain sections of freeway had accident rates substantially above or substantially below the statewide average). In general, the higher accident sections were found to have inferior alignment and older design standards.

4. Freeway pedestrian accidents from 1958 through 1962. Contrary to previous belief, it was found that the hitchhikers are not the problem. About three-quarters of freeway pedestrian accidents are disabled motorists and trespassers crossing the freeways.

Other safety research projects underway were:

1. Evaluation of minor improvements. This is a continuing study to determine the effectiveness of minor improvements in reducing accidents and to establish or improve warrants for such projects.

2. Phase II of a study of wrong-way driving on freeways. This study so far shows that the pavement arrows painted at all off-ramps have reduced the number of wrong-way entries at off-ramps.

3. A study to correlate ramp geometry to accident frequency.

4. A study to determine whether continuous highway illumination reduces nighttime accidents.

5. A study of accidents under conditions of reduced visibility to determine their cause and possible means of alerting drivers to the hazards.

Research continued on several phases of freeway operation. Studies of the effects of trucks on highway capacity and operation were stressed, and warrants for the use of climbing lanes should be available soon.

Considerable study was made of possible operational controls on freeways including ramp closures, and effects of these controls on the performance of both the freeway and city street network.

Other work included completion of a motion picture for training purposes which illustrates freeway operation as affected by various design features, and collection of data to be incorporated in the revised *Highway Capacity Manual* of the Bureau of Public Roads.

The *Traffic Manual of Instructions* was completely revised and will soon be distributed.

Traffic Counting

During the year a manual classified count of commercial vehicles (trucks and buses) was made to update the 1960 count. Traffic was not classified by number of axles in 1961 and 1962 because the mechanical counting methods in use since 1960 cannot differentiate vehicles by number of axles.

The 1963 classified count showed that the composition of commercial vehicles is substantially the same as in 1958 and 1960 except for a moderate increase in buses. The ratio of commercial vehicles to total traffic declined slightly, although commer-

A section of Interstate 5 in the City of San Diego, with steel cable barrier in the median.

cial vehicle travel increased 16.5 percent since 1960.

Traffic Signals and Illumination

Contract plans were completed for 142 new traffic signals and modernization of 182 existing signals. Contract plans were also completed for 3,577 lighting standards and 423 illuminated guide signs. The total estimated cost of the electrical work was $7,187,352, not including the cost of the steel sign structures.

A total of 156 traffic reports reviewing conditions at approximately 365 intersections were made to determine the need for traffic signals and lighting.

Research projects underway or completed include the following:

1. Completed installation of experimental pavement guidance lights to aid motorists to negotiate a curve on an expressway.

2. Completed development of the design for a fluorescent lighting fixture to be mounted in the fence rail on pedestrian overcrossing, thus eliminating the need for light poles on such structures.

3. Initiated development of a new lighting pole using fewer parts and providing a more pleasing appearance. This has been adopted as a standard for use on freeways.

4. Developed a new type electrical pullbox for use on the newer type structures to improve structure esthetics.

5. Continued studies of operation of the experimental emergency callbox system on freeways.

Traffic Regulation and Control

State highway routes have been renumbered and re-signed as required by state legislation enacted May 14, 1963. Some US routes have also been changed to the new interstate highway numbers or eliminated. All these changes were reported to the several auto clubs and map makers throughout the country so that their maps could be corrected prior to the tourist season.

A white message on a green background was adopted as the standard color for state shields. All new shields being installed conform to this new standard. On the basis of a recently completed study, replacement of existing black-on-white route shields with the new white-on-green shields is being undertaken, and should be completed by the summer of 1965.

The program was well underway to eventually make all state highway signing comply with the 1961 *National Uniform Manual for Traffic Control Devices* as required by the Bureau of Public Roads for federal aid highways. Plans are being approved for contracts to be awarded in the 1964–65 fiscal year and priorities are being established for the orderly completion of the program by the 1968–69 fiscal year.

A revised sign chart was distributed in April 1964.

Speed Zones

As a result of the addition of Section 22356 to the Vehicle Code permitting the establishing of a 70-mile-per-hour speed limit on freeways upon the basis of traffic and engineering surveys, the maximum speed was increased to 70 mph on five sections of highway totaling about 120 miles. Other sections are being considered as they are completed to freeway status.

The reviewing and processing of traffic regulations initiated by cities, counties, and the districts involving parking, turning movements, and one-way operation of streets in the state highway system continued throughout the year. Two hundred such documents were processed.

Traffic Control Summary

Traffic control measures taken during the year included:

1. 184 restricted speed zones were established and 68 speed limit orders were rescinded, resulting in 252 additional miles of speed restriction on state highways.

2. 86,964 signs were approved for installation. A breakdown of this total shows 26,278 warning signs, 17,336 regulatory signs, 23,806 guide signs and 19544 miscellaneous and construction signs will be installed.

Looking north along a recently opened section of Interstate 605 north of Whittier. Median barrier is supplemented by aluminum glare shield.

URBAN PLANNING

Until April 1, 1964, the Urban Planning Department operated in four general units: urban transportation, highway inventories and legislative reports, research and special studies, and electronic data processing. On April 1, transition of the electronic data processing section into full department status was begun, the new Computer Systems Department becoming one of the administrative functions of the division.

In cooperation with the administrative departments, the library, which serves the entire Division of Highways, embarked on an expansion of activities to provide a coordinated library service. Initial steps included an inventory and limited indexing of reference material which can be made available on loan from one department to any other department of the division.

City and county officials comprising the advisory committee for the local road and street needs study (Section 2156) meet with Division of Highways staff members. At head of table are E. A. Fairbairn, city manager of Sacramento, committee chairman (right); and A. S. Koch, road commissioner of Orange County, committee secretary.

Legislative Reports

Senate Concurrent Resolution 23 of 1963 requested a feasibility study of a controlled-access highway between San Simeon and Monterey. SCR 26 (1963) requested a feasibility study of a highway from the Westside Freeway to Turlock and Merced. These studies were completed for the Legislature.

Other legislative resolutions requested consideration of proposed state highways at various locations. The need for such other state highway routes is being considered during the review of the entire state highway system, which was started during the year as provided in Section 256 of the Streets and Highways Code. Liaison was maintained with the League of California Cities and the County Supervisors Association in this study. Each county and city was contacted and invited to suggest changes in the state highway system in addition to those being considered by the Division of Highways. At the close of the year this study was still underway.

Chapter 385 of the 1963 Statutes (Senate Bill 64) renumbered the state highway system of California effective July 1, 1964. Various instructions, maps, tables, cross indexes, etc., were prepared to assist in the changeover to the new numbering system. Concurrently state highway routes were placed on a post-mile basis and alphabetic sections were abolished. Post-mile maps, tabulations, and cross indexes were prepared and distributed to aid in this change.

In cooperation with the districts, preliminary work was completed for the State Highway Needs Study (Section 188.8 of the Streets and Highways Code).

The first quadrennial California city street and county road progress and needs report was undertaken as called for by Section 2156 of the Streets and Highways Code. With the help of the advisory committee and others, street and road standards relating traffic to geometric design were drawn up to guide the 11 state highway districts, 384 cities, and 58 counties, in the conduct of the study. Estimates of needs and progress were received from all cities and counties in the state. At the close of the year, work of final audit and preparation of the required report to the Legislature was underway.

Federal Projects

Coordination and assembly of the work of the districts and several headquarters departments in the preparation of the estimate of cost to complete the interstate system for California was almost completed by the end of the fiscal year.

Monthly reports on the status of completion and development of the interstate system were prepared for the Bureau of Public Roads.

Urban area maps of all 267 urban places were completed and distributed to the districts during the year. Federal aid primary system strip maps were prepared. Federal aid secondary system strip maps were still underway at the close of the year. A state map showing the interstate and primary systems and the renumbered state highways was updated and distributed.

Urban Transportation Planning

An important segment of urban planning activity in the past year has been directed toward the qualification of the state's 11 urbanized areas under the requirements of the 1962 Federal Aid Highway Act relating to comprehensive transportation planning processes. Written memorandums of agreement with local governments, supported by a narrative of the planning process and past accomplishments, have resulted in qualification of the Fresno and San Diego areas by the Bureau of Public Roads. Executed agreements have been obtained in two other areas but require narrative development before submission for approval; negotiation of agreements and documentation are underway in the remaining areas.

A coordination process for highway planning studies financed by the Bureau of Public Roads funds and local planning studies financed by U.S. Housing and Home Finance Agency grants was established in cooperation with the State Office of Planning, which administers the HHFA funds.

Metropolitan Transportation Studies

The Los Angeles Regional Trans-Study (LARTS) published a base year report in February 1964. The report described the 1960 data collection surveys including the land use survey, the O&D home interview, and the external trip survey. The models developed by the study for estimating trip generation and for obtaining traffic profiles were also described.

In the latter part of the fiscal year, work was continued on the 1980 input information for the LARTS model.

The data collection phase of the Eureka Area Planning and Transportation Study was completed in October 1963. The basic data, after expansion, have been furnished to the City of Eureka and Humboldt County. These data, together with other information obtained during the study, will be utilized for long-range planning and route location purposes.

Field operations for a similar study in the Santa Barbara area called "South Coast Transportation Study (SCOTS)" were begun April 1, 1964.

Looking west along the Santa Monica Freeway (Interstate 10) in Los Angeles, shortly before the freeway was completed westward to La Cienega Boulevard in November, 1964. Barricades in photo, now removed, indicated previous temporary end of freeway at Vermont Avenue interchange.

Looking northerly from the Calaveras River Overcrossing toward the Hammer Lane Overcrossing and Lodi on the new freeway between Stockton and Lodi.

Statistical and Nonmetropolitan Studies

Extensive use was made by the districts of the machine processing services provided for economic and traffic analyses of alternative freeway locations and major street networks. During the year a total of 805 hours of 704 computer time were required for the processing of 36 urban route location studies involving 87 alternates. To further encourage and facilitate the use of these services an instructional booklet entitled, "Urban Area Freeway and Major Street Network Traffic Analysis," was prepared and distributed to district offices.

Field operations for the 1963 Loadometer (Truck Weight) Survey produced axle weights, trip characteristics, and commodity data for 18,420 trucks at 25 locations throughout the state.

The Road Life and Pavement Cost Study was continued for the 12,200 miles under study with 60 percent recorded to 1962 and the remainder to 1959.

Research and Special Studies

Coordination of all research and special studies conducted or participated in by the division was continued. Research funds were received from federal aid 1½-percent planning and research funds, state highway user taxes, Chapter 2110 of the 1961 Statutes, Item 357 of the 1963 Budget Act, and Item 321 of the 1964 Budget Act. A five-year highway safety research planning program was developed, which totaled $1,330,740, using some funds from all these sources.

Close liaison with the Transportation Agency Research Council, as well as participation in its Staff Research Committee, was maintained. Formal review and encouragement of research activities within the Division of Highways were begun under the direction of a newly formed Research and Special Studies Committee. Recommendations were made seeking a balanced program in traffic, safety, physical, economic, and behavioral highway research.

The State Highway Inventory data sheets were continually updated as new data became available from project reports, planning studies, planning programs, and district review. The capacity adequacy rating procedure was refined and completed for the entire constructed state highway system.

Special maps and exhibits of a general planning nature were prepared for other departments as requested. Special maps were also prepared as requested by members of the Legislature and other state agencies.

Bridges

- ***The Bridge Department 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 design work, are handled at headquarters in Sacramento.

The department is divided into five sections—planning, operations, special studies, office engineering, and special projects.

BRIDGE PLANNING

Advance Planning

During the past fiscal year the Bridge Department continued its work of investigating bridge sites, preparing preliminary reports for bridge design, producing architectural sketches and models of bridges and interchanges, assuming responsibility for the aesthetic treatment of structures and maintaining close liaison with headquarters and the districts throughout the project planning and design stages.

There was a trend toward larger and more complicated, though fewer, structures than the previous year. Engineering design was started on 508 structures.

During this period an unusual number of viaducts and tunnels were studied. Possible use of viaduct construction was studied for sites in San Diego, Los Angeles, Santa Barbara, Stockton, San Francisco, and Sacramento. Studies were completed for depressed roadway structures, cantilevered highways, and numerous large tunnels, both cut-and-cover and bored, in connection with route studies in San Francisco.

The Bridge Department worked closely with the districts, local interested groups, architects, architectural consultants and the Design Department in endeavoring to improve the appearance of structures generally, with particular emphasis on major structures and structures on the scenic highway system.

Continued emphasis on aesthetics in bridge design was also evident in work on scale models and sketches.

Sixteen models, including four models showing substantial portions of the Sacramento freeway system, were constructed and placed on public display. More than 180 architectural sketches and retouched photographs were completed also to assist the public, in a visual way, in understanding the plans of the department.

Foundation Section

A total of 475 foundation studies for bridge, freeway and retaining wall structures were completed. A total of 121,126 lineal feet of exploratory borings were drilled during the year to determine foundation conditions at various sites.

One of the foundation highlights of the year was the successful installation of the six-foot-diameter "cast in drilled hole" piles for the Fort Sutter Viaduct in Sacramento which is presently under construction. The second contract for the Fort Sutter Viaduct (Unit No. 2) will utilize six-foot-diameter piles belled out to 12-foot diameter at the bottom. This will be the first major freeway structure in California utilizing this type of foundation.

Design

Spectacular bridge design projects were rather rare in 1963–64.

Looking west along the Garden Grove Freeway at the interchange which carries it over the Santa Ana Freeway.

In the south the bridge on Interstate Route 40 across the Colorado River at Topock is now under construction. This is a $2,400,000 job, of which Arizona pays half. This is the third state highway bridge in this location. The original highway bridge is now used to carry a high-pressure gasline which runs from Texas into California. The second bridge was built by the Santa Fe Railway and was remodeled for highway use after the Santa Fe built a new and heavier bridge.

Some important projects were completed in San Francisco. The largest is the $7,500,000 third unit of the Route 82 Freeway. A $4,000,000 project consisting of 13 bridges, including a three-level interchange, was completed on Interstate Route 280 at the San Francisco-San Mateo county line.

Plans were completed for a new bridge across the Sacramento River in the vicinity of W-X Street in Sacramento. This $15,000,000 structure is now under construction. The bridge is the first link in the construction of the East-West Freeway through Sacramento on Interstate Route 80. The main river spans of the bridge are 275 feet in length with a vertical clearance of 55 feet above flood plain.

Plans were started for approximately 30 bridges and grade separations for Interstate Route 880—a new route skirting the northern limits of Sacramento. Included in this project is a bridge across the Sacramento River at Bryte Bend.

During the past year a design was made for the new bridge across the Klamath River at Klamath. This $1,500,000 structure will be on new and improved alignment of US 101.

The existing historic Klamath River Bridge, built in 1924 will remain to serve local traffic. Continuing the 40-year tradition of the existing bridge, the new structure will have two large golden bears guarding each entrance.

Bridge Construction Costs

Bridge construction costs are measured by the Bridge Department Construction Cost Index, which utilizes the cost data of the years 1939 and 1940 as a base equal to 100. During the fiscal year 1963–64, the corresponding indexes for the four successive quarters were 275, 274, 264, and 272. The general level of costs represented by the foregoing indexes is about equal to the average level of construction costs of the past three years, which was within the range of 270 to 275.

BRIDGE OPERATIONS

Sixty-nine structures in 41 Bridge Department - administered contracts were completed during the year at a total dollar value of $30,826,201. This included the Vincent Thomas Bridge superstructure (the third largest suspension bridge in California) for approximately $11,000,000 and the Randolph Collier Tunnel for $4,400,000.

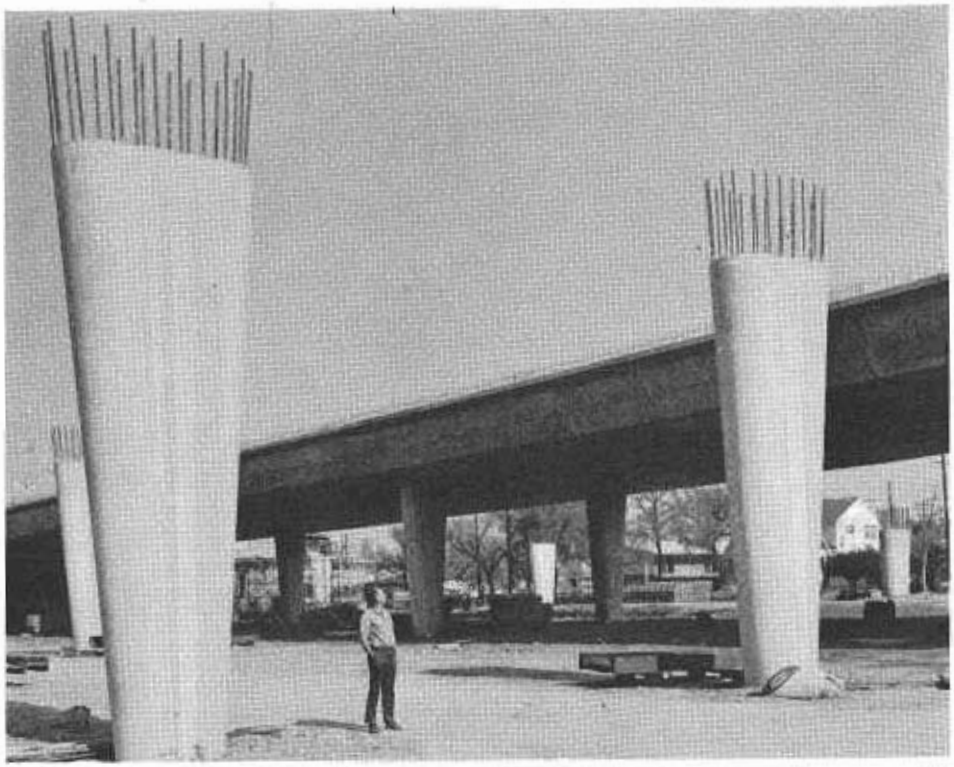
There were completed during the year 375 structures in 80 district-administered contracts, with the structures having a dollar value of $55,649,663. A number of retaining walls were constructed, bridges widened, and existing structures repaired.

Structure work having an estimated cost of $163,000,000 is included in 179 projects underway at the end of the fiscal year. These included the Caldecott Tunnel contract, projects financed from various fiscal year budgets, and work on federal aid secondary projects.

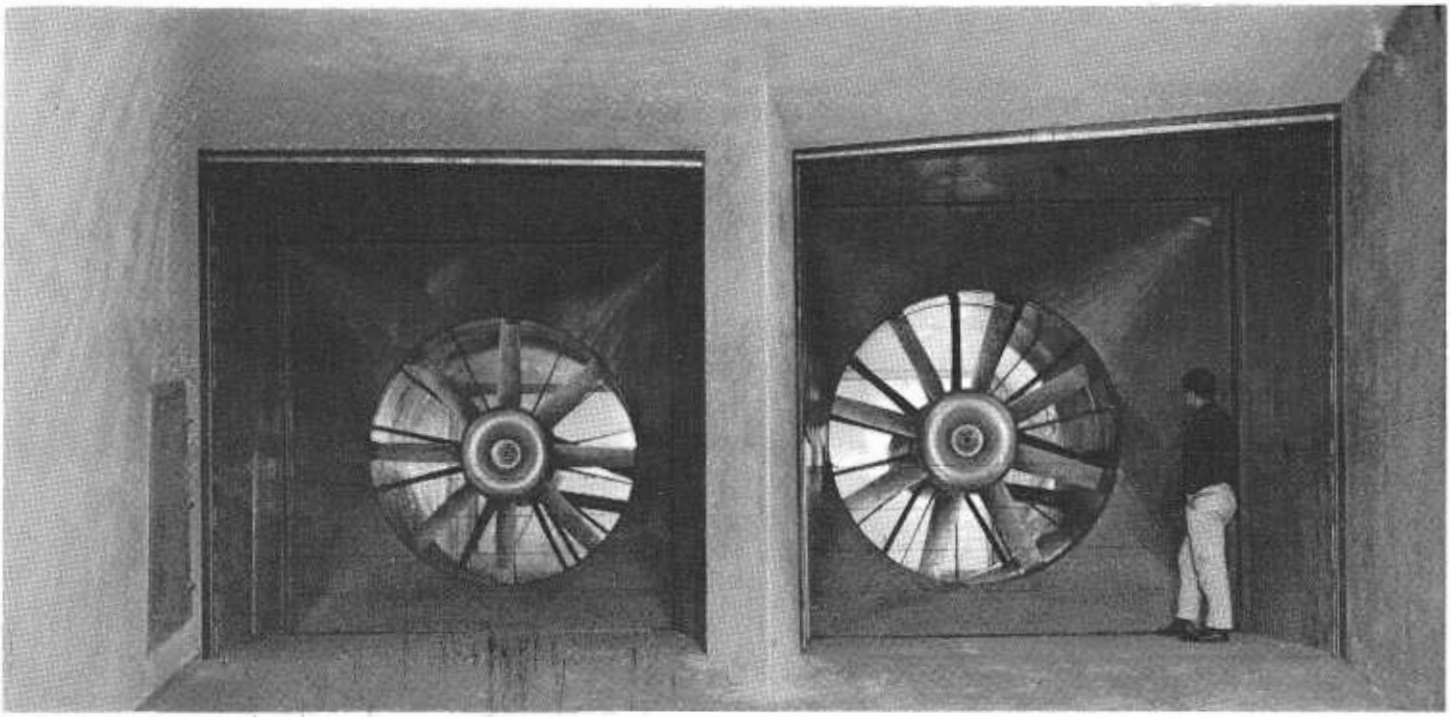
The 1963–64 state highway budget had $77,042,000 in structure work in 116 projects. Miscellaneous contracts, including maintenance, FAS, and work for other agencies, amounted to $5,341,000 structure work in 27 projects. The grand total of all structures in this budget year that were advertised and placed under contract was $82,383,000.

Metropolitan Area Freeway Structures

In the San Francisco Bay area, the Southern Freeway in San Francisco was completed from its west end to the Mission Street Overcrossing and from Newcomb Avenue to Army Street. A half-mile double-deck viaduct section extending northeast from



Now under construction is the Fort Sutter Viaduct between 29th and 30th Streets in Sacramento, which will carry traffic on Interstate 80. Tapered piers and sloping sides of girders are used to enhance the appearance of the structure.



These ventilation fans will supply fresh air to the new bore of the Caldecott Tunnels between Oakland and Orinda on Route 24.

the Bayshore Freeway was completed in February 1964. A $5,000,000 contract to construct a section of the viaduct for the freeway from the section of the double-deck viaduct completed in February to Army Street is underway, as is a two-mile section of freeway extending south from the Southern Freeway, having 13 structures.

In Alameda County, a troublesome intersection was eliminated on Warren Boulevard with the completion of the Moraga Interchange. This intricate three-level interchange includes three bridges plus extensive retaining walls. The extension of the Route 680 Freeway down the San Ramon Valley into Alameda County will include nine bridges. The interchange between Routes 580 and 680 on the project will feature a variety of steel superstructure designs, including four orthotropic spans.

In Contra Costa County two major projects are of interest on Route 680. One, through Concord between Monument Boulevard and Olivera Road, includes seven bridges. One of these bridges is of unusual design in that the superstructure contains a long three-span segment of continuously prestressed concrete box girder. The spans are 160, 214, and 160 feet, and the steel stressing tendons are threaded through the open cells of the deck.

Bridge work on the second project includes 13 bridges. This unit extends from Danville to Walnut Creek.

In the Los Angeles, San Bernardino and San Diego areas, a total of 194 structures were completed and 323 additional structures were under construction at the end of the fiscal year.

Major construction activity centered on the Santa Monica Freeway and the San Gabriel River Freeway in the Los Angeles area. Eight structures were completed and the final 49 structures are under construction on the Santa Monica Freeway. Ten structures were completed and 50 are under construction on the San Gabriel River Freeway between the San Diego Freeway and the San Bernardino Freeway.

An additional 10 structures were completed on the San Diego Freeway and 29 are under construction in the Long Beach-Santa Ana area. In this same area 5 structures were completed and 28 are under construction on the Garden Grove Freeway.

Work continued on the Ventura Freeway with 14 structures completed and 11 under construction.

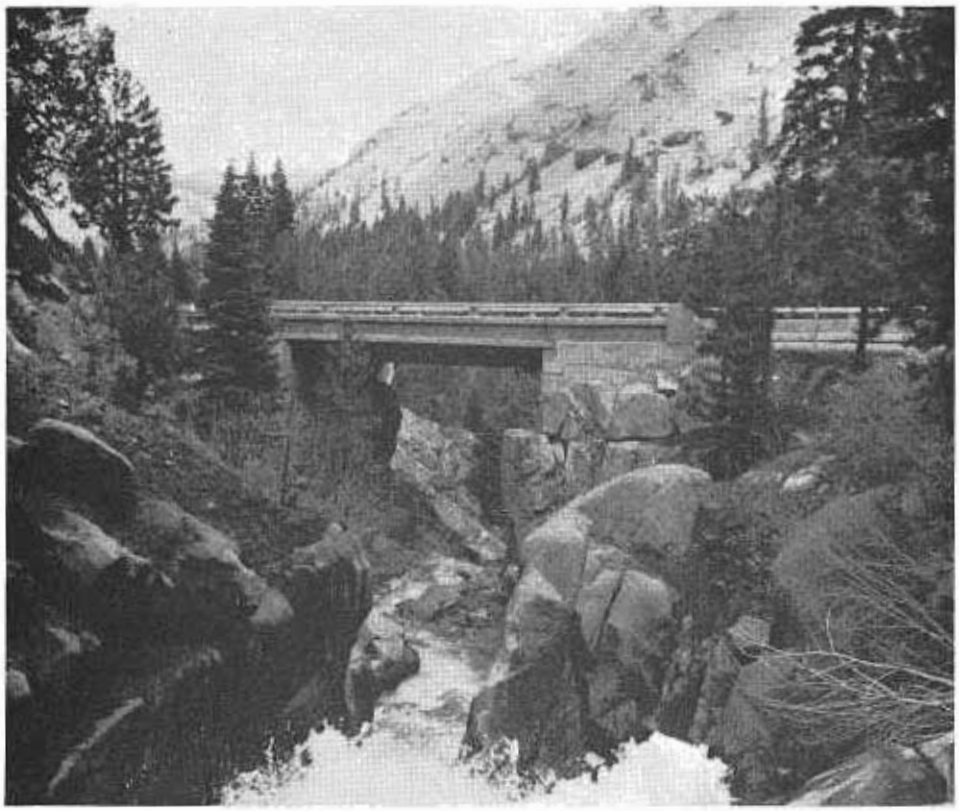
The Pomona Freeway was started and now has 13 structures under construction.

Two notable projects were the construction of the interchange between the San Diego Freeway and the Santa Monica Freeway in the Los Angeles area and the interchange between the Santa Ana Freeway and the Garden Grove Freeway in the Santa Ana area.

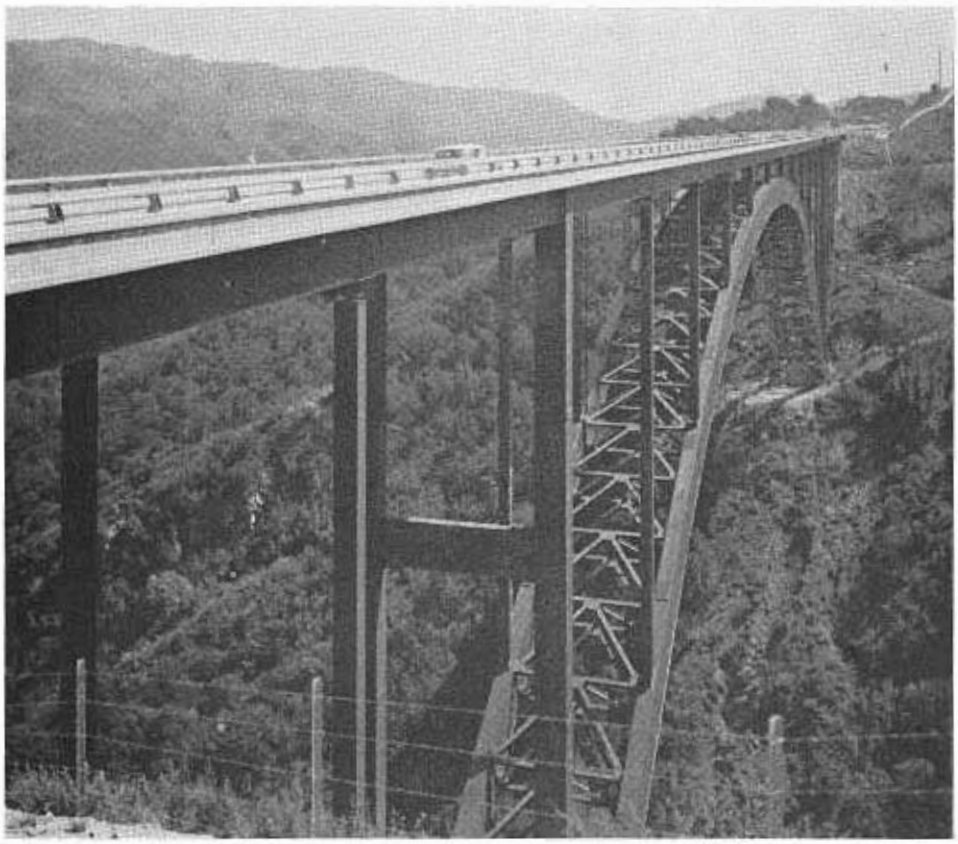
The Route 15 Freeway between San Bernardino and the Nevada state line southwest of Las Vegas was placed one step nearer completion with the awarding of the last contract, including 19 structures between Cronese Valley and Baker. Twenty-seven structures were completed and 27 are under construction on this highway.

Progress is continuing in the San Diego area on the Route 5 Freeway with 29 structures completed and 13 under construction. A total of 53 structures were completed in the San Diego area and 51 are under construction.

In the Sacramento metropolitan area work is in progress on the first of two contracts on 29th and 30th Streets, which will connect the previously constructed South Sacramento and Elvas Freeways on Routes 99 and In-



The new concrete bridge across Raymond Meadow Creek on Route 4 in the rugged terrain of Alpine County.



The 700-foot steel arch span across Cold Springs Canyon on Route 154 between Santa Barbara and Santa Ynez.

terstate 80. Work on the second contract started during the latter part of 1964.

The substructure work for the Sacramento River Bridge at W and X Streets, consisting of three river piers was completed in September of 1964. Construction of the remainder of this structure, which will extend from Jefferson Boulevard in West Sacramento to Fifth Street in Sacramento, on Interstate Route 80, started during the latter part of 1964.

Other Major Projects

Work was completed on the last stage of the bridge and fill crossing of the Yolo Bypass. The structures were opened to divided traffic on October 25, 1963.

The steel arch bridge spanning Cold Spring Canyon on new Route 154 in Santa Barbara County was completed December 24, 1963, and opened to traffic soon afterward with the completion of an adjacent road contract.

At the completion of the Webster Street Tube, the Posey Tube was closed for a renovation contract. The renovated tube in turn was opened to traffic November 21, 1963, and divided traffic began flowing between Alameda and Oakland. The renovation contract was completed January 30, 1964, for approximately $1,200,000.

The new 3,300-foot-long Caldecott Tunnel through the Berkeley Hills was within a few days of completion at the end of the fiscal year (June 30, 1964). The project is parallel and adjacent to the two existing bores, which are scheduled for renovation following opening of the new tunnel to traffic.

The tunnel, including two portal buildings and operating system, roadwork, and exterior bridges and retaining walls, will cost nearly $11,050,000. The project was awarded on November 25, 1960.

The tunnel bore is 3,300 feet long with a pavement width of 28 feet between curbs and a vertical clearance of 17 feet to ceiling slab. The inside dimensions to the arch tunnel lining are 34′ 6″ horizontally and 33′ 9″ vertically. The tunnel walls and ceiling are lined with tile and illuminated with the latest fluorescent lighting system. Included in the tunnel operat-

This new bridge across the Cosumnes River near Sloughhouse in Sacramento County was built with federal aid secondary funds, replacing an old steel truss span built in 1906.

ing system is an electrical power system, ventilating system, plumbing system, fire alarm and firefighting equipment, closed circuit television system to maintain traffic flow, emergency telephone, public address and intercommunication systems.

City and County Bridges

During the year, the city and county bridge projects engineer reviewed plans and specifications for bridges and minor structures in 60 projects under the modified gas tax financing provided by the Collier-Unruh Local Transportation Development Act.

In addition, 13 federal aid secondary bridges with an estimated cost of $1,400,000 were in the final planning stage and 29 bridges in 19 FAS contracts with a contract structure cost of $3,200,000 were completed or under construction. The county engineering departments prepared the plans for 26 of the latter structures and provided the construction engineering for 19.

Bridge Maintenance

The bridge maintenance section continued the periodic field investigation of the 7,762 bridges on the state highway system. Reports and plans were developed for needed repairs and minor improvements, the review and updating of capacity ratings, and scheduling of replacement of structurally critical bridges as necessary.

During December 1963 a critical problem developed on the bridge over the Bear River on Route 65 between Roseville and Marysville. The continuous T-beam structure was constructed in 1915 and suffered scour and foundation settlement in recent years. A transverse failure required closing the bridge to all traffic. While traffic was detoured over local roads, state forces formed and poured concrete to replace the defective deck and strengthen the girders. In the spring of 1964 a contract was awarded to construct a new bridge downstream to replace the old bridge.

On December 18, 1963, the Danish ship MV *Pasadena*, a freighter traveling upstream, struck and damaged a span of the San Joaquin River Bridge (Antioch) on Route 84. The lift span of the structure was open, but the ship was off course passing through a fixed span. Several stringers were severely damaged, flanges of the main members were nicked and kinked and a section of concrete floor in one panel was knocked out. The members were heat-straightened or replaced by state forces.

The bridge maintenance section made engineering investigations at the request of local authorities for 122 city and county bridges to establish their load-carrying capacity. Thirteen public hearings were held to consider speed and load postings for these bridges.

Bridge Maintenance Painting

During the past fiscal year, four maintenance painting contracts involving eight structural steel bridges were initiated by the Bridge Department. The steel surface area of these bridges is about 325,000 square feet which represents less than 2 percent of the total steel surface area on bridges in the state highway system. The low percentage of bridge steel requiring repainting indicates the superior quality of protective coatings applied during the past decade.

Much of the success in extending paint service life has been made possible through an experimental program. Twenty-seven separate panels are now hanging on bridges near the seacoast for destructive testing of different paint coatings.

SPECIAL STUDIES

The aim of the bridge special studies section is to find and make available the means of providing improved economy, usefulness and safety of highway structures through research and development. Its raw materials are the new, untried or incompletely understood structural system or detail, construction material or method, engineering procedure or tool. Its products are related facts, observations, recommendations and implementing services or procedures.

During the past year, some of these products have taken the form of reports on the use of high strength steel in bridge bearings; the behavior of epoxy bonded aggregates as shear connections in composite concrete-steel girders; the performance of bituminous surfacing at bridge deck expansion joints; and the deflection characteristics of a major steel arch bridge.

Climaxing several years of effort jointly with the University of California and the Materials and Research Department, the final manuscript of a report on the box girder research project has been submitted to the Highway Research Board for publication. It describes extensive testing and investigation of a reinforced concrete bridge superstructure system whose elemental shape is a rectangular box. The work involved observation of behavior under controlled loads by means of electronic devices embedded in both a full-scale bridge and a quarter-scale laboratory model of the same bridge.

Approval has been obtained to proceed with a study of similar scope on another superstructure system, this time of orthotropic configuration in steel. Its appearance in crosssection can be compared to the cellular structure of a layer of dividers in a common egg crate. It, too, will involve construction of a bridge which is instrumented to make possible the subsequent collection and analysis of performance data. A pilot effort on this subject has already advanced beyond the data collection stage, using a limited segment of a bridge that is now open to traffic.

Other subjects currently under study include culvert behavior under a high earth fill; vehicular tunnel ventilation; and loss of prestressing force due to friction along the tendons of a prestressed concrete girder.

A library, which furnishes information on technical subjects, and a hydraulics unit, which provides information and analyses on bridge waterway and bank protection problems, are other services of the section. A computer services unit develops electronic data processing services to perform engineering and administrative tasks and maintains them after they become usable.

Emphasis this past year in E.D.P. work has been on extension and refinement of structural engineering services. Programming efforts on substructure frame, concrete column, composite girder, prestressed girder, influence line, and slope stability problems were substantially completed, though some have not yet been published for use.

Bridges on the State Highway System Segregated as to Number, Length and Area by Structure Type, as of June 30, 1964

Structure type	Number 1964	Number 1963	Length [a] (feet) 1964	Area [b] (square feet) 1964
Concrete arch	229	232	36,609	841,104
Concrete girder	2,361	2,158	542,370	34,887,189
Concrete slab	2,483	2,414	151,549	6,543,693
Masonry arch	32	33	945	21,735
Subtotal concrete and masonry	5,105	4,837	731,473	42,293,721
Steel arch	6	5	2,618	42,655
Steel plate girder	374	358	182,983	8,056,799
Steel stringer	274	277	58,739	3,671,297
Steel deck truss	30	30	33,166	1,550,439
Steel pony truss	29	29	10,524	168,548
Steel through truss	62	63	115,814	1,485,801
Suspension	3	2	21,159	1,014,821
CMP multiplate and arch	76	77	1,467	49,243
Subtotal steel	854	841	426,470	16,039,603
Timber arch	1	1	59	780
Timber stringer	538	585	39,575	1,405,646
Timber deck truss	5	6	1,156	20,782
Timber pony truss	0	0	0	0
Timber through truss	0	1	0	0
Subtotal timber	539	593	40,790	14,278,208
TOTAL BRIDGES	6,498	6,271	1,198,733 (227 miles)	72,611,532 (1,667 acres)
Underpasses	183	181		
Overheads *	292	266		
Combined bridge and overheads *	56	54		
State highway separations *	323	294		
Road undercrossings *	1,292	1,179		
Road overcrossings	934	813		
Pedestrian undercrossings *	182	176		
Pedestrian overcrossings	99	86		
Cattlepasses *	90	90		
Tunnels	22	21	22,247	
Retaining walls	6	6	4,707	
Miscellaneous	20	20	400	10,325
TOTAL STRUCTURES	7,762	7,398	1,226,087	72,621,857
Drainage pumping plants	206	193		
Railroad grade crossings	629	641		

* Separations so noted are listed under structure type above.

NOTE: One underpass, 23 overheads, 1 tunnel, and 4 bridge and overheads also serve as state highway separations.

[a] Structures of assorted types and lengths of spans are by number and length of main span.

[b] Areas are based upon clear width of roadway between curbs and clear sidewalk width.

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.

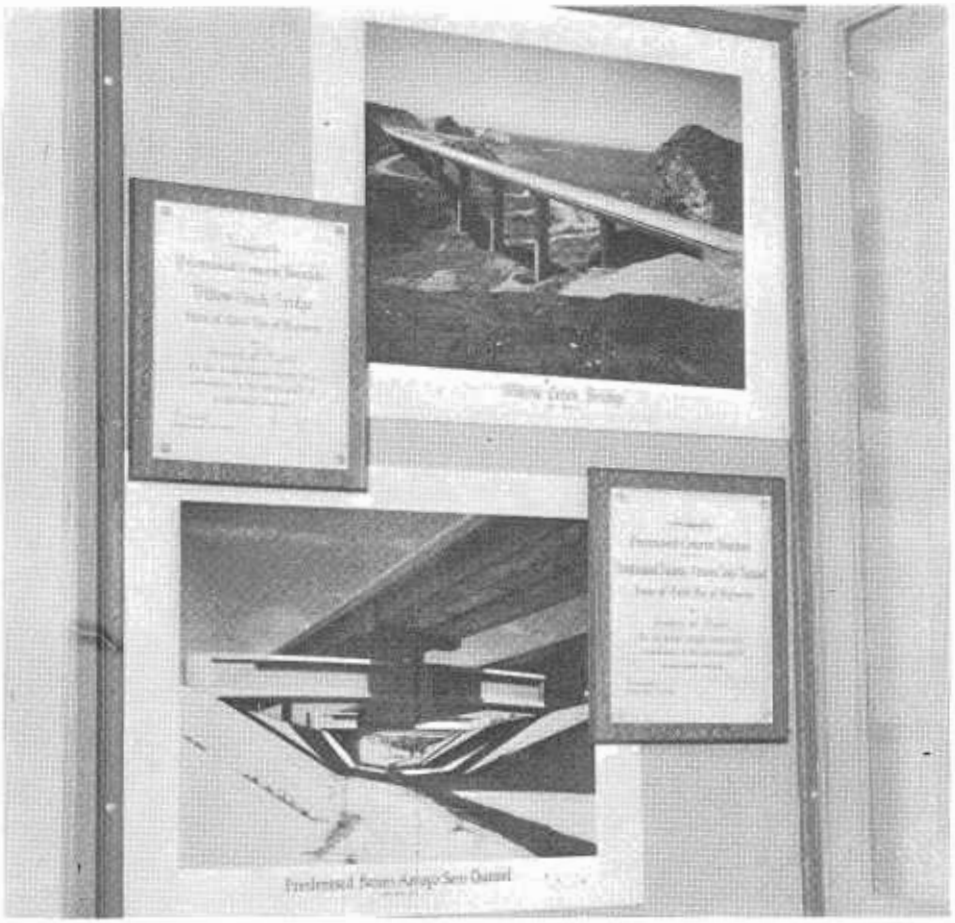
Railroad Grade Crossings

Construction was started, underway or completed on 46 highway projects requiring negotiations with railroads which involved right-of-way encroachments, installation of additional crossing protection, construction, alteration or abandonment of grade crossings. At the end of the fiscal year, negotiations with the railroads were in progress for 31 additional highway projects on which construction had not yet started. In addition, 17 projects involving improvement of existing crossing protection were completed or underway.

On federal aid secondary routes, negotiations were underway or completed on 14 projects with railroad involvement.

Railroad Grade Separation Structures

At the beginning of the fiscal year, 71 railroad-highway grade separation structures were under construction. A total of 43 separation structures were placed under contract during the year of which 8 were underpasses and 35 were overhead structures. During the year, a total of 54 separation structures were completed. The railroads are contributing an estimated $748,455 towards the cost of constructing 11 of the 54 completed structures.



Two state highway bridges won awards of merit from the Prestressed Concrete Institute in 1964, as illustrated in this photo of a display in the Public Works Building in Sacramento. The Willow Creek Bridge is on Route 1 on the Monterey County coast; the prestressed carrying beams support the concrete and steel spans which carry freeway ramps and other structures over the Arroyo Seco Channel in Los Angeles.

$5 Million Grade Crossing Fund

The California Public Utilities Commission issued its 1963 Priority List containing 26 proposed projects, to eliminate existing railroad grade crossings by structures or reconstruct existing separation structures, on county roads and city streets. In accordance with state law, $5,000,000 in state highway funds are set aside by the Highway Commission each year to pay half the cost of these projects after deducting the railroad's contribution.

As of June 30, 1964, allocations totaling $4,471,093.89 had been made by the Highway Commission from the 1963–64 fiscal year fund for 8 of the 26 projects on the PUC priority list.

SPECIAL PROJECTS

The Vincent Thomas Toll Bridge between San Pedro and Terminal Island in the Los Angeles Harbor area was opened to traffic on November 15, 1963. Some painting of the structural steel remained to be done at the time of opening and this was completed and the superstructure contract for the project was accepted on April 28, 1964.

The Carquinez Strait Bridge revenue bonds were refinanced as authorized by the California Toll Bridge Authority to provide funds for reconstructing the Solano County approach to the Benicia-Martinez Bridge. A contract in the amount of $8,875,000 was awarded on May 13, 1964, for this approach work which extends 12 miles, from the toll plaza at the north end of the Benicia-Martinez Bridge to IS 80 at Cordelia.

Personnel & Information

The functions of personnel, training, safety, audio-visual services and public information are grouped administratively under the direction of the engineer in charge of personnel and public information

PERSONNEL

Recruitment

Two hundred sixty-nine engineer graduates were hired this year as the result of recruitment at engineering colleges throughout the country.

In a highly competitive engineer recruitment situation, California colleges are not able to provide sufficient numbers of qualified engineers to meet the demands of employers. Consequently, an assertive recruitment plan began in 1957, including the sending of recruiters to engineering colleges in all regions of the country with the authority to make employment offers to promising graduates. Other state agencies participate in this program, which is coordinated by the State Personnel Board.

The result of this effort has paid off by placement of 1,782 engineer graduates from nearly 100 colleges since 1957. These men have brought to our organization a new breadth of background and fresh approaches. We are looking forward to continued efforts in this direction.

Personnel Management

The result of another plan initiated in 1957 deserves comment. The division has a large reservoir of able manpower with extensive experience in engineering, but without completed formal college training. These men fill essential roles in the division's engineering services, yet their advancement was often stymied by competing directly with professional engineers in promotional examinations.

This situation was resolved by the introduction of a separate engineer series of "technicians" which parallels the professional classes through the associate engineer level. This has resulted in improved use of manpower through increased promotional opportunities to positions of responsibility, and the recognition of the complementary nature of professional and technical backgrounds on various projects.

The development of supervisory, management, and administrative staff personnel for future years is a continuing effort. Currently, age profiles are being worked out to enable management to determine future needs in this area. The Right of Way Department continues to make extensive use of employee development appraisal techniques to insure the spotting of potential talent in making promotions.

New Series

A new classification series was introduced last year known as highways administrative officer. This step is intended to focus the supervision of nonengineering services in the hands of administrative staff personnel through a class series of increasingly responsible levels. The new series should provide a broader range of staff activities under nonengineering personnel than has existed in the past and more opportunity for employee development in this area.

A new program is being put into effect which offers full apprenticeship training for highway equipment mechanics. This is being done with the help of the Division of Apprenticeship Standards.

The new Division of Highways accounting and reporting system required comprehensive and detailed development for accounting personnel throughout the state. Training included a five-day developmental program including coding, form usage and preparation, accounting and control procedures and accounting and management reports. Here Oliver Pool, District 7 Maintenance (standing left), E. J. Wintermute, Headquarters Training, John Gliebe, Fiscal Management and Ken Hammon, District 3 Accounting, teach a class in District 10 (Stockton). *(See "Fiscal Management," page 68.)*

Alterations were made in the landscape maintenance classifications so that landscape maintenance crews could be brought under the direction of highway maintenance superintendents. The purpose was to provide closer coordination in the maintenance of the highway and its adjacent landscaping.

Changes in the division's accounting system eliminated the need for bookkeeping machines and the 33 operators who manned these machines throughout the state. As most of these operators have had more than a decade of experience with the division, every effort was made to retain them through retraining in new assignments. All of these employees have been placed and changes in classification are being completed.

In connection with the Governor's program for equal employment opportunities, an ethnic census of division employees was conducted. Efforts to implement the division's longstanding policy of nondiscrimination are continuing through review of recruitment and promotion procedures.

Statistics

On July 1, 1964, there were 16,758 employees on the Division of Highways' staff, an increase of 472 over the previous year. The staff includes 8,872 engineering employees, 592 right-of-way employees, 413 equipment repair employees, 3,878 maintenance employees, and 3,030 clerical and administrative staff personnel. During the fiscal year, 1,633 promotions were made.

During the current year, 19 employees were dismissed—10 from permanent positions. Twenty-six were rejected during probation, none were demoted, and 43 were suspended. A total of 190 employees retired. Fifty 25-year awards were given, making a total of 2,271 for the division.

During the year, 192 visitors from 35 countries were guests of the division, generally under the auspices of federal government programs. Discussions and training programs, varying from a few hours to several months, were arranged for each individual.

TRAINING

The name of training activities used by the Division of Highways include planned individual development, formal division training courses, and workshops, interagency programs, on-the-job training, and short courses at colleges and/or universities.

Formal training courses were given in almost every job-related subject and in orientation, management and supervision, professional and technical, engineering, right-of-way, maintenance, and clerical, among others. These courses took 312,855 hours, an average of 24.36 hours per employee.

Supervision and Management

Formal training of supervisors used 46,935 man-hours, or 15 percent of the total training time.

The major management training effort during the fiscal year was the installation of a new "management reporting system." This system is designed to provide each supervisor, on a monthly basis, accurate and up-to-date summary information on the cost, projects, and types of work performed in his portion of the organization.

The regular "management and supervisory" course was given to supervisors in engineering, right-of-way, and staff functions, who had not participated in the 40-hour course before. This is a continuing program which soon will have reached all current supervisors and will be given to new supervisors as they are appointed. It is a part of an overall management development curriculum, which includes formal training and development activities for all levels of management.

Top level managers participated in the interagency management development program. Examples of courses and workshops attended are the "Governor's Annual Management Conference," "Regional Management Conferences," "Data Processing for Managers," "Legislative Processes," "School of Management" and "Public Administration."

A 16-hour critical path method seminar, taught by representatives of the Bureau of Public Roads, was given to 62 engineers and administrative staff personnel.

Technical and Professional

A wide variety of courses were given this year throughout the division in the professional and technical fields.

More than 1,500 engineers, aid and technicians participated in a 12-hour course, "Inspection Procedures for Portland Cement Concrete Construction," which was presented by headquarters instructors. The course covered new developments in correct procedures for the inspection and testing of portland cement concrete.

An eight-hour "Effective Letter Writing" course was given to 396 right-of-way agents.

Training in the use of electronic data processing for engineering computation was given to 458 engineers.

Within the districts, 153,424 man-hours of training were conducted in a wide variety of technical subjects,

Specialized Programs

Fifty-one employees also participated at state expense in training presented by universities or other educational facilities. These courses introduced new technology or developed needed skills that could not be provided as efficiently through the in-service training program.

Courses covered a wide spectrum of technological training needs; such as "Real Estate Appraisals," "Photogrammetric Methods in Cadastral Surveying," "Advanced Hydrology," "Technique of Using Radioisotopes," "Introduction to Industrial Statistics and Quality Control," "Fundamental Principles of Gas Chromatography Chemistry," "Regional Economic Analysis," and "Analog Computations."

Future Programs

In conjunction with the Governor's Code of Fair Practices, Scott H.

Lathrop was appointed human relations coordinator for the Division of Highways. The role of the human relations coordinator is to promote equal job opportunity and fair employment practices in accordance with the long-established policy of the division.

A training course in "Cultural Differences," to explain and implement the equal opportunity program, was scheduled to be given to all top managers in the fall of 1964, to assure that the Code of Fair Employment Practices is understood and carried out statewide.

EMPLOYEE SAFETY

Assistant Safety Engineer Frank Bunyard (right) discusses a model of work area protection on multilane freeways with District 4 (San Francisco) maintenance personnel.

Safety Committees

There is a division safety committee consisting of the deputy state highway engineer, Administration, as chairman, the division maintenance engineer, the equipment engineer, the engineer in charge of personnel and public information, and an attorney from the Legal Department as members. The safety engineer acts as secretary.

The division safety committee (a) formulates the details of the safety program within whose framework the districts operate; (b) reviews monthly reports of district committees and makes recommendations relative to the problems referred to in them; (c) acts as a clearinghouse for safety ideas and suggestions; (d) reviews and acts on reports of accidents involving Headquarters personnel; and (e) reviews from time to time the effectiveness of the program as carried out.

The district and departmental safety committees are appointed by the district engineers and department heads. They meet monthly and are charged with the following responsibilities:

(a) Reviewing motor vehicle accident reports and deciding on their recordability; (b) interviewing state operators or employees who have been involved in accidents when it is considered advisable; (c) making recommendations as considered appropriate; (d) recommending disciplinary action to the district engineers or department heads when in the judgment of the committee such action is justified; (e) holding monthly meetings, with the reports being submitted to Headquarters; and (f) carrying out an educational program to acquaint highway employees with safe work practices, safety codes, hazardous operations, accident causes, etc.

Safety Supervisors

Each of the 11 districts has a full-time safety supervisor with part-time safety supervisors assigned to the Bridge Department, Service and Supply, Materials and Research, and Equipment Departments. They serve as secretaries to the district and department safety committees, investigate accidents, and do such work as is necessary to carry out the program and assignments determined by the district committees.

Accident Analysis

All personal injuries and motor vehicle accidents involving Division of Highways personnel or equipment are coded and processed by electronic equipment to develop annual and special statistical reports. The "American Standards Method of Recording and Measuring Work Injury Experience" is used as a basis of reporting and recording accidents. Frequency and severity rates are compiled monthly and compared to previous monthly and yearly rates to determine the program's effectiveness.

With minor exceptions, there has been a continuous reduction in frequency rates of both industrial injuries and motor vehicle accidents since the Safety Section was established in 1941. The frequency rate has been reduced from 22.08 in 1953 to 9.93 in 1963. The frequency rate for motor vehicles has been reduced from 1.00 in 1953 to 0.63 in 1963.

The reduction in the personal injury frequency rate has been accompanied by a reduction in the compensation insurance rate per $100 of payroll. In 1953 the compensation rate per $100 of payroll was 0.41 and in 1963 it was 0.37.

The frequency rate for personal injuries is the number of lost-time accidents per million work hours of exposure. For motor vehicles the fre-

quency rate is the number of recordable accidents per 100,000 miles.

The National Safety Council has recognized the 1963 record of the Division of Highways as an outstanding achievement and presented an award for the accomplishment.

Employees of the division who drive highway motor vehicles are given a driver improvement course by the safety section. New employees must be given a road observation run by an instructor or the employee's supervisor before being allowed to drive a state vehicle. The employees must complete the lecture and psychophysical test within three months of their employment.

When an employee has three or more recordable accidents or there is a reason to question his attitude or skill he may be referred to the Department of Motor Vehicles for review of his driving record or may be counseled by representatives of the safety section. If these steps prove ineffective he may be "grounded" or disciplined.

Fire Prevention

The safety section maintains a continuous program of demonstration of fire control by fire extinguishers so that employees are familiar with different types of fire and the characteristics of fire extinguishers and are given an opportunity to use the equipment.

Employee Merit Award Program

The division's employee suggestion program is administered by the headquarters safety section. The section also coordinates the portion of the State Merit Award Board program which provides recognition for special acts, special service and superior accomplishment.

Suggestions submitted during fiscal year 1963–64 totaled 616. This represents an increase of 20 percent over the 1962–63 total of 513. Other figures on the program are as follows:

Number of money awards	56
Amount of money awards	$1,710
Certificates of commendation	22
Total amount of estimated savings resulting from adopted suggestions where savings capable of being measured	$54,900
Total number of suggestions where award presented was based upon intangible savings	38

State Liability for Damage Claims

The safety section coordinates the program of accident investigations with the legal division and the districts if the division may be involved in damage claims.

AUDIO-VISUAL

The audio-visual section originates and produces a wide variety of graphic material and films for use in employee training and public information.

The section maintains a comprehensive library of colored slides on statewide highway scenes, conditions, and operations. It also maintains a variety of film, slide projection, sound recording, and other miscellaneous equipment for departmental use for training or public presentations.

Some of the material produced during 1964 included: publications, reports, or brochures on "WASHO Conference," "Communications Media," "Progress and Needs—County Roads and City Streets," "Scenic Highway Report Supplement"; sound-slide presentation on "Map Reading" for Right-of-Way Training Academy; motion pictures on "Concrete Paving Methods," "Snow Maintenance Equipment," traffic studies on "Freeway Capacity," "Freeway Operation (Grades and Interchanges)," "Bridge Rail Impact tests."

PUBLIC INFORMATION

Progress in the construction and the planning of California's interstate system and other freeways continued to attract public interest during the year, along with increased emphasis on the engineering aspects of traffic safety.

There was also evident an intensified concern with the aesthetic and community values aspects of highway location and design, as reflected in public hearings and in widespread discussion of route locations in the vicinity of state parks. News releases on scenic highways, and particularly an illustrated release on the roadside rest program, received exceptionally wide attention in the press.

The opening of important new sections of freeways and other highways also drew a major share of public attention. These tangible signs of transportation progress (see "California Highways—1964," beginning on page 5) were climaxed in the latter part of 1964 by several major dedications during National Highway Week (October 4–10), plus the opening of the Donner Summit Freeway on Interstate 80 in November.

These opening ceremonies were planned and conducted by local organizations, with the district offices of the Division of Highways supplying information and sketch maps to news media.

News releases were issued on an increasing number of regular developments such as bid advertising and opening, contract awards, completion of projects, speed zones and construction progress, as well as on actions of the California Highway Commission. Several of the district offices also issued periodic comprehensive county-by-county reports on the status of planning, design and construction on various routes.

News releases accompanied by sketch maps were issued in advance of district public hearings in connection with route planning studies.

Displays of freeway interchange models at county fairs and the State Fair were more extensive than ever. Numerous other displays were set up, especially during National Highway Week.

Television Series

Two new ventures in public information were undertaken during the

Scale models of freeway interchanges and other structures planned for the Sacramento area and San Mateo County were featured in an exhibit at the 1964 State Fair. The display, prepared by the Bridge Architectural Section, occupied double the usual space of the Division of Highways exhibits at the fair. Bridge Department representatives were on hand to answer questions.

year. One was a 13-week series of television shows in Los Angeles entitled "King's Highway," featuring freeway developments along with other activities of the Highway Transportation Agency. Another was the neighborhood distribution, with the aid of the Boy Scouts of America, of informational leaflets concerning planned and current highway construction.

Traffic safety information included, in addition to established procedures, the distribution of widely published news releases on special safety projects in each district. Such experiments as fog warning signs and wrong-way ramp warning signs received statewide and even nationwide attention.

Publications

The bimonthly magazine *California Highways and Public Works*, the principal publication of the Division of Highways, continued to serve as a source of general and technical information and as an illustrated chronicle of the state highway program for the employees of the Department of Public Works and for other interested persons. The magazine also served as a source of reprints on a variety of subjects. Prints of its illustrations were supplied on request to many writers and editors all over the world as well as in California.

A leaflet entitled "California's Freeway Planning Team," prepared primarily for the use of legislators and public service organizations, was reprinted during the year.

Thousands of copies of the latest edition of "Freeway Facts" were distributed to persons attending public hearings on freeway routes as conducted by the district engineers of the Division of Highways and by the California Highway Commission.

Employee bulletins were published monthly by each district office and some headquarters departments. Local information was supplemented by material contained in the statewide "Clip Sheet."

Representatives of the division continued to welcome invitations from service clubs, chambers of commerce, neighborhood groups and other organizations to appear and provide information on local and statewide highway matters. They also appeared on television and radio programs, and were available at all times for interviews with newsmen.

Right-of-Way

The land on which state highways will be constructed must be identified, valued, obtained, managed and cleared to receive the proposed facility

Right-of-way Engineering

Few possessions are so rigorously regarded as land, large or small, private or public.

Determining the geographic and legal identity of parcels of land required for right-of-way is fundamental to the acquisition process. Maps must be made, descriptions written and the required areas computed.

The right-of-way engineering unit provides this service for all phases in the right-of-way process, appraisal, acquisition, management, and for itself as keeper of the permanent public record.

Appraisal

Property owners and taxpayers are particularly concerned with the price which will be paid for right-of-way. The appraisal unit, using universally acknowledged methods, provides valuation reports on every parcel of land to be acquired for highway purpose.

The determination of *fair market value*, that unique price which is willingly offered and accepted in a sale, is the criterion controlling the work of appraisals.

Statewide, at every locale where highway construction will occur, the right-of-way appraiser has made a detailed search and study of the real estate market. Community character, economic environment and sales history are meticulously analyzed and

Interstate 280 will serve an area of Santa Clara County which is rapidly undergoing the transition from agricultural to intensive residential uses. This aerial view shows the completed section eastward from the Saratoga Avenue Interchange (center), with construction underway on a four-mile section extending westward into Cupertino.

carefully related to the required property.

Acquisition

All other aspects of the right-of-way function are oriented to the support and success of this unit. Its responsibility is to deliver the right of occupancy of required land space into the title of the state, within allotted time.

Negotiated settlement, through amicable relations and mutual respect, is the California policy for right-of-way acquisition. This is accomplished by right-of-way agents who are appreciative of the property owner's circumstances and skilled in the fields of title, escrows and real estate economies.

Despite increasingly complex circumstances, public acceptance of the concepts and practice of the acquisition program is reflected, year after year, in the low percentage of cases involving condemnation. Of all acquisitions this fiscal year, only 3.9 percent required that compensation be determined by contest in the courts.

Property Management

The preceding activities deliver properties of varied character into public ownership. Rarely are they ready for use as right-of-way.

Whether the land is raw or highly improved, the province of property management is to prepare it for the certification—"clear for construction."

The unit also assists both individuals and communities through the transition occasioned by proposed highway construction. Many of the properties are capable of productive interim use. A sound program of rentals, leasing and sale of useful improvements, not only lessens the abruptness of rehabilitation, but in 1963–64 also recovered $15,150,000, thereby effectively stretching right-of-way acquisition dollars.

Relocation advice and assistance is extended on request. Although the relocation advisory assistance program has been widely publicized, only 4 percent of eligible persons subscribed to this available service in 1963–64.

Utilities

The utilities unit's contribution to the production of highway rights-of-way 6.8 percent of the 1963–64 right-of-way expenditures.

The service and supply of commodities furnished by the utilities industry in California (water, power, gas, drainage, sewers), requires a network of facilities second only to highways. Avoidance or adjustment of conflict in these networks is a major concern. A mutual program of planning and cooperation developed and intensified for more than 25 years, has yielded large savings to the public. The effort of the utilities unit in maintaining this accomplishment resulted in 793 separate utilities agreements in the fiscal year with total expenditures of $11,352,537.15.

1963–64 RIGHT OF WAY PROGRAM

Value of parcels acquired		$165,943,691.32
Number of parcels acquired	7,333	
Average value per parcel	$22,629.71	
Utility relocation reimbursements		$11,352,537.15
Acquisitions for other agencies		$4,040,422.66
Total expenditures		$181,336,651.13

In 1963–64 a new cost analysis method was developed whereby productivity in all functions of right-of-way were related to cost. The method yielded accurate, detailed data, identified sources and distribution of costs and made possible specific interdistrict comparisons.

These comparisons have intensified the competition in program accomplishment within the districts and greatly stimulated cost consciousness at all levels in all functions of right-of-way.

Personnel and training are concurrent concerns. Skilled practitioners, experienced in land acquisition are in great demand. Other organizations seek solution of their staffing problems in the ranks of the Right of Way Department. By substituting salaries and shortcut advancement for training time, they lure many competent people.

In 1960–61 the attrition rate was 7 percent; in 1961–62, 9 percent and in 1962–63, 14 percent. Reversal of this trend in 1963–64 with a loss rate of less than 12 percent is attributable to successful efforts in three important areas.

1. The Right of Way Academy was inaugurated. (See *California Highways and Public Works*, September-October 1963)

First of its kind nationally, this intense, indoctrination-level training program consolidated and replaced the district-conducted counterparts. Held for two weeks at the University of California's Davis Campus, it generated an academic atmosphere and "esprit de corps" among agents attending from every district. Being one course compared to the former 11, it attained homogeneity of purpose and process.

Terminations at this personnel level fell from 19.9 to 12.8 percent. Additionally, training costs were cut from an estimated annual figure of $20,870 to an actual sum of $6,777.74, a saving of more than 200 percent.

Salary studies were made which led to the increase of pay scales on January 1, 1964, to be more nearly commensurate with those of external employers. Of the 66 terminations in 1963–64, nearly two-thirds occurred prior to the pay raise.

Promotional procedures were revised to encourage the "career" service of right-of-way agents. The department adapted a procedure whereby evaluation of the candidate's performance is primarily delegated to his closest supervisors. At the same time, advancement avenues were redefined and clarified.

Research and Development

A major source of these tools and methods, enabling management improvement of the production-economy ratio, is right-of-way research and development. During the fiscal year, while analyzing time-cost-production data and conducting special studies for technical growth in right-of-way, it also produced "Glendale Report" (see *California Highways and Public Works*, March-April 1964) and "Community Effects Upon Remainder Parcel Valuation" which was presented at the 43rd annual meeting of the Highway Research Board.

The unit continued to research and relate the impact of freeway location to provide highway planners with useful, valid information in their consideration of community values.

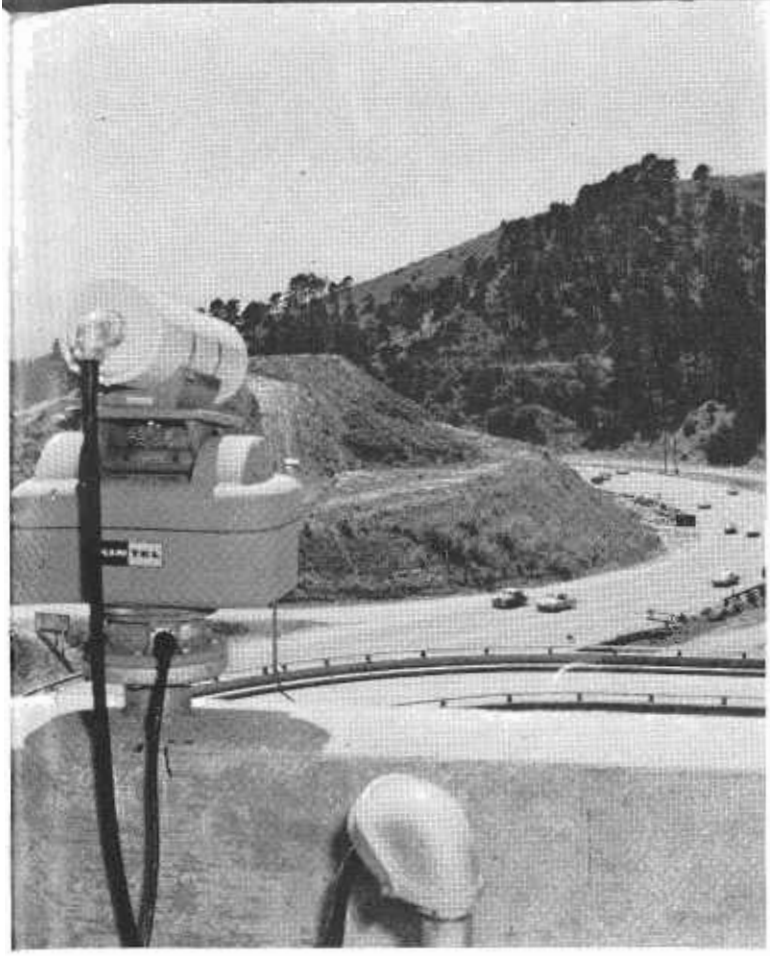


PHOTO ABOVE: This television camera mounted on the new two lane Caldecott Tunnel bore on Route 24 will keep maintenance personnel posted on traffic conditions. Increasing traffic volume could show the need for switching on additional fans and blowers. PHOTO BELOW: The Santa Monica–San Diego Freeway interchange in Los Angeles, looking south along the San Diego Freeway.

PHOTO ABOVE: A section of the Interstate 5 Freeway near the City of Mount Shasta (foreground) was completed in November. The interchange at Lake Street is at lower right. Lake Street will be extended by the city to the Everitt Memorial Highway (center of photo), the route to the ski area. PHOTO BELOW: Looking north along a section of Interstate 580 Freeway through San Leandro, completed this summer. The loop of Grand Avenue (left) was used as a detour during construction. The trees across the middle distance delineate San Leandro Creek.

Legal

- ***The Division of Contracts and Rights of Way is the Legal Division of the Department of Public Works and renders a variety of legal services to the department and its Division of Highways***

The following tabulations indicate the volume of work performed by the Legal Division involving court appearances before various administrative agencies for the past fiscal year.

Condemnation Proceedings

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

Suits filed	448
Parcels involved	2,163
Defendants involved	14,205
Suits closed	604
Contested trials	266
Uncontested judgments	384
Default judgments	31
Suits pending 7–1–63	1,004
Suits pending 6–30–64	848

The total suits closed, 604, represented total awards of $29,427,868.79 and represented 1,432 days in court.

Appellate Cases

During the fiscal year the Legal Division prepared more briefs and argued more appeals, both in state and federal courts, than in prior years. Decisions were rendered in *People* v. *Jones*, 218 Cal. App. 2nd 747; *People* v. *Lillard*, 219 Cal. App. 2nd 368; *People* v. *Edgar*, 219 Cal. App. 2nd 381; *People* v. *City of Los Angeles*, 220 Cal. App. 2nd 345; *People* v. *Lagiss*, 223 A.C.A. 24; *People* v. *Brusati*, 223 A.C.A. 718; *People* v. *Fink*, 226 A.C.A. 27; *Miles* v. *Superior Court* (unpublished opinion); *U.S.A.* v. *State of California*, 328 F. 2nd 729; and *State of Arizona* v. *State of California*, 84 S.Ct. 1330.

The most unusual decision concerned an attempt by the State of Arizona to invoke the original jurisdiction of the U.S. Supreme Court and sue the State of California and its contractor, Charles L. Harney, Inc., for damages from an automobile accident which occurred on the San Francisco-Oakland Bay Bridge during 1962.

Arizona had paid workman's compensation benefits to one of its employees, the Dean of Women at Grand Canyon College, and alleged that she was injured as a result of a dangerous condition on the bridge.

The U.S. Supreme Court denied the petition of the State of Arizona and which implied that the action should be brought in state court rather than in the U.S. Supreme Court.

In another federal decision, the Court of Appeals for the Ninth Circuit decided in *U.S.* v. *State of California*, that the United States could sue the State of California in U.S. District Court for damages allegedly resulting from negligent acts of state employees in starting a fire in a national forest and in attempting to extinguish it. State highway construction work was being carried on in the Angeles National Forest by the Division of Highways with the assistance of prison inmate laborers.

The Legal Division has filed a petition for a writ of certiorari in the U.S. Supreme Court, contending that the decision is erroneous and that the action cannot be brought against the State of California in the U.S. District Court.

Frontage Road Benefits

Two decisions in condemnation proceedings should prove most helpful in establishing special benefits as a result of the construction of frontage roads. In *People* v. *Lillard*, defendants' property fronted on US 40 and had direct access thereto at three locations. As a result of the condemnation suit, defendants' remaining property had no direct access to US 40, but fronted on a newly constructed frontage road. The jury verdict, awarding defendants nothing for severance damages (and finding special benefits in the amount of $32,000) was upheld on appeal.

The facts were somewhat similar in *People* v. *Edgar*, where defendants former frontage on and access to a state highway were replaced by the construction of a new frontage road. The jury found that the special benefits to the remaining property far exceeded the severance damages, and the judgment was affirmed on appeal.

People v. *City of Los Angeles* was a proceeding to condemn a portion of Griffith Park for freeway purposes. A difficult question had arisen as to the proper method of valuation of park property. The court rejected both the "public trust" theory that the valuation should be nominal when transferred from one public agency to another, and the "federal substitution" rule under which the measure of compensation is the cost of supplying a substitute facility of substantially equal utility. The court also held that it was error to value the property on the basis that it could be used only for park purposes and that it could not be sold. The proper test, the court held, is the fair market value of the property in terms of what private purchasers would be willing to pay for it if it were placed on the market available for all uses to which it is adapted.

Several other cases are now pending before the appellate courts, awaiting argument or decision, including two very important cases involving the constitutionality of the 1963 California Tort Claims Act, which regulates the tort liability of all governmental entities. (*Flournoy* v. *State of California*, and *Hayes* v. *State of California.)*

Other Litigation

In addition to the condemnation proceedings, the department's attorneys handled a large number of miscellaneous cases. The following figures cover a wide variety of litigation and indicate the sizable increase in this phase of the department's work:

At the start of the fiscal year there were 759 cases pending; 738 cases were filed during the year, for a total of 1,497 cases being processed. There were 651 cases closed during the year, leaving 846 cases pending on June 30, 1964.

Some of these cases involve 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 from these cases by the division amounted to $115,531.45.

The case total includes many cases where the department was represented as a defendant, such as inverse condemnation, suits by contractors for additional compensation on construction contracts, proceedings for damage to public property by reason of the state highway operations, and suits filed because of alleged dangerous or defective condition of state highways, and suits for injunction against the state and its contractors enjoining the construction and building of highways.

Other types of suits, such as stop notice actions, are defended by the department, and interpleader actions have been filed by the department in which it assumes a neutral position between the contractor and the party suing on a stop notice.

Proceedings Before Public Utilities Commission

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

Fiscal Year 1963–64	
Applications pending (decisions not issued) 6/30/63	10
Applications pending (decisions issued) 6/30/63	24
New applications filed during year	27
Total applications before P.U.C.	61
Decisions received during year	53
Applications pending, June 30, 1964	8

In addition to formal applications, nine proceedings under P.U.C. General Order 88, relating to crossings at grade, were processed and six are still pending. In all instances the approval of the Public Utilities Commission must be obtained as to engineering details 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 Public Utilities Commission.

A rotary broom cleaning a gutter on the Bayshore Freeway south of San Francisco.

Board of Control and Other Claims

Claims against the state by reason of activities of the department are filed with the State Board of Control. The following tabulation illustrates the volume of work:

	Number of claims	*Amount*
Pending on 7/1/63	153	$12,477,674.27
Filed	387	27,943,087.36
Total	540	$40,420,761.63
Claims disposed of	475	38,368,494.59
Pending 6/30/64	65	2,052,267.04

There was an increase of 78 claims filed over the previous year, amounting to $13,039,956.55. This was an increase of 25¼ percent. The principal types of Board of Control claims as listed above are for negligence, dangerous or defective condition of state highways, breach of contract, and inverse condemnation.

Liability Expanded

The increase in the number of claims filed with the board is due in a large part to the recent decision by the California Supreme Court in the case of *Muskopf* v. *Corning Hospital District*, 55 Cal. 2d 211. This decision greatly expanded the liability of the state, particularly for accidents arising out of the dangerous or defective conditions of state highways.

The 1963 session of the Legislature enacted Chapter 1681, which expands the liability of the Department of Public Works. The legislation makes the state liable for the negligent acts or omissions of its employees as well as for the dangerous condition of public property, including state highways. This liability will necessitate the careful investigation by Division of Highways personnel of all claims. Because of the *Muskopf* decision and this legislation, the number of claims have increased substantially as well as the work in investigating these claims and the handling of the resulting litigation.

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 analysis and handling of claims and in the 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.

House Counsel Work

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

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 33 contested hearings before the State Personnel Board, an increase of 3 over the previous fiscal year.

Fiscal Management

- ***Administration of all accounting activities of the Division of Highways, and the other Divisions of the Department of Public Works, is under the direction of the Comptroller of the Division of Highways and his staff***

Organization

Organizational changes during the fiscal year included the establishment of a position of Deputy Comptroller and four Assistant Comptrollers, with each of the Assistant Comptrollers responsible for one of the following areas:

1. Budgetary and control and toll bridge accounting,
2. General administrative accounting,
3. Federal aid and special activities, and
4. Accounting systems.

The accounting function of the City and County Projects Department was transferred to the Fiscal Management Department, although the physical location remained in the City and County Project Department to facilitate the work without creating duplicate files.

With the establishment of the Division of Bay Toll Crossings on November 18, 1963, many accounting changes were necessary to accommodate the responsibilities assigned to this division which had not been performed by the superseded Division of San Francisco Bay Toll Crossings. These new responsibilities included the operation and maintenance of existing toll bridges, formerly a Division of Highways Bridge Department responsibility, and the planning for new toll crossings in various areas of California. The Bay Bridge Accounting Office was transferred from the Division of Highways to the Division of Bay Toll Crossings.

The accounting function for the Division of Aeronautics was transferred from the Department of General Services to the Division of Highways.

Fiscal Management Improvement

1. The backlog of unbilled federal reimbursement was reduced $22,800,000. This compares with the reduction of $18,000,000 during the preceding year. Not only did this improve the cash balance of the State Highway Fund, but it also increased revenues through investment of temporary cash surpluses.

2. A procedure was developed to charge use of construction warning signs against highway projects on a rental basis. The new procedures, will permit the collection of approximately $100,000 additional per year of federal funds on interstate highway projects.

A seminar for district accounting officers of the Division of Highways was held in Sacramento on June 4 and 5, 1964.

3. In May 1964, approval of the Bureau of Public Roads was obtained for the reimbursement of state audit costs in connection with the examination of force accounts of contractors working under the provisions of a federally approved construction agreement relating to the interstate program.

4. The payment for credit card deliveries of petroleum products was shifted to the Equipment Department. This change permitted a more efficient handling of voluminous delivery tags and facilitated the adoption by the Equipment Department of equipment rates covering complete costs of operation.

5. The consolidated reporting of sales of tangible personal property was shifted from the Equipment Department to the Fiscal Management Office. This resulted in more efficient reporting to the Board of Equalization for sales tax collected by the Division of Highways, and eliminated one copy of accounts receivable invoices.

6. Effective January 1, 1964, a procedural change affecting deposits in the Condemnation Deposit Fund was adopted which expedited federal reimbursement covering such deposits for acquisition of rights-of-way on the interstate highway system. This revision improved the cash position of the State Highway Fund by approximately $11,000,000.

7. Between May 1963 and January 1964, the accounting input equipment in the district offices was replaced with keypunches and verifiers which are compatible with the Headquarters Office computers.

Toll Bridges

The establishment of the Division of Bay Toll Crossings on November 18, 1963, with complete responsibility for toll bridge operations, as well as construction, did not remove toll bridge accounting, fiscal and insurance responsibilities from the Fiscal Management Department of the Division of Highways. The involvement of the Fiscal Management Department arises from:

1. Director of Public Works Order General No. 6, naming the Comptroller of the Division of Highways as the Chief Fiscal Officer of the Division of Bay Toll Crossings, and

2. Appropriations from the State Highway Fund for toll bridge maintenance, toll crossing feasibility, studies, and preliminary engineering of approved crossings.

During the year, a number of important toll bridge financing and fiscal matters required active participation by the Fiscal Management Department. Seven of these are cited:

1. *Carquinez Strait Bridges Refunding Bonds*

The unusually favorable bond market in the summer of 1963 led to a recommendation to the Toll Bridge Authority to authorize the sale of refunding bonds in the amount of $75,000,000 to refund the oustanding Carquinez Strait bridges bonds. In all, considering the cost of the call premiums on the outstanding $33,390,000 of Series B bonds, there was a net interest saving of approximately $1,000,000 on this transaction. Another major benefit of the preceding transaction was that it freed $10,000,000 for the construction of an additional bridge approach from IS 80, in the vicinity of Cordelia, to the Benicia-Martinez Bridge. This could not have been done until the restrictions of the prior bond issue were eliminated by the retirement of outstanding bonds. This 12-mile connection to the Benicia-Martinez Bridge from IS 80 is thus being provided years before it could have been constructed with State Highway Fund money.

2. *San Francisco-Oakland Transbay Tube*

Sections 30770–30782, of the Streets and Highways Code, pledge toll revenue of the three bond-free bay bridges, earned after December 31, 1964, to pay the cost of construction of the Transbay Tube for rapid transit. An agreement has been executed between the Department of Public Works and the Bay Area Rapid Transit District (BARTD), providing for progress payments to BARTD not to exceed $4,500,000, to finance the cost of preliminary engineering and right-of-way.

3. *San Diego-Coronado Bridge*

The California Toll Bridge Authority, on May 14, 1964, authorized the Department of Public Works to proceed with the design and acquisition of right-of-way for a toll bridge from San Diego to Coronado. Funds totaling $3,600,000 have been appropriated from the State Highway Fund by the Legislature to cover these costs. Highway funds expended are repayable from proceeds of the sale of toll revenue bonds.

4. *Southern Crossing Studies*

Financial and engineering studies are in progress to determine the feasibility of constructing additional toll crossings of San Francisco Bay south of the San Francisco-Oakland Bay Bridge. The location, design, and number of additional crossings have not yet been established, but the Fiscal Management Department produced several financial projections to assist the Toll Bridge Authority in considering the financing problems.

5. *Vincent Thomas Bridge Opening*

On November 15, 1963, the Vincent Thomas Bridge, between San Pedro and Terminal Island, was opened to toll traffic. Fiscal Management established a bridge operating fund with the State Treasurer and provided the Division of Bay Toll Crossings with accounting procedures.

6. *Toll Bridge Insurance*

The Comptroller of the Division of Highways is responsible for administering the toll bridge insurance program. Present insurance coverage on all toll bridges is $195,000,000, of which $163,000,000 is physical damage insurance, and $32,000,000 is use and occupancy insurance. During the 1963–64 fiscal year, a major accomplishment was the renewal and increase of the physical damage insurance on the San Francisco-Oakland Bay Bridge to $55,000,000. Previously, the most coverage that could be ob-

tained for the "Bay Bridge" was $33,008,494, with an additional $9,037,500 for a loss in excess of $40,000,000. It would be desirable to carry coverage in the amount of 80 percent of the replacement value, the amount specified in bond resolutions for bonded bridges.

7. Investment of Funds

The Comptroller also administers the temporary investment of toll revenue funds and bond funds in U.S. government securities. On June 30, 1964, the par value of investments held for toll bridge funds by the State Treasurer amounted to $61,865,000. Investment income for the year was in the total amount of $2,326,227.94.

Training Activities

A major effort of the Fiscal Management Department during the year consisted in participation for preparation for a simplified accounting system to be installed July 1, 1964. As a portion of this effort, an extensive training program was conducted. This consisted of three subprograms:

1. Training of 1,400 management, engineering and right-of-way personnel at the senior level and above. This training was conducted by a four-man team, headed by the division training officer. This training effort occupied a major portion of the time of these team members from November 1963 through April 1964.

2. Training of accounting personnel in all districts and at Headquarters. This training consisted of five full days of instruction in each district, and was conducted by another four-man team, headed by the assistant division training officer, supplemented by three representatives of Headquarters Office Fiscal Management Department. During the final month, a representative of District 7 replaced one of the fiscal management members. This training required the full time of this team from January 1964 through June 1964. *(See photo on page 58.)*

3. An intensified training for district accounting officers in a two-day seminar, June 4–5, 1964. *(See Photo.)*

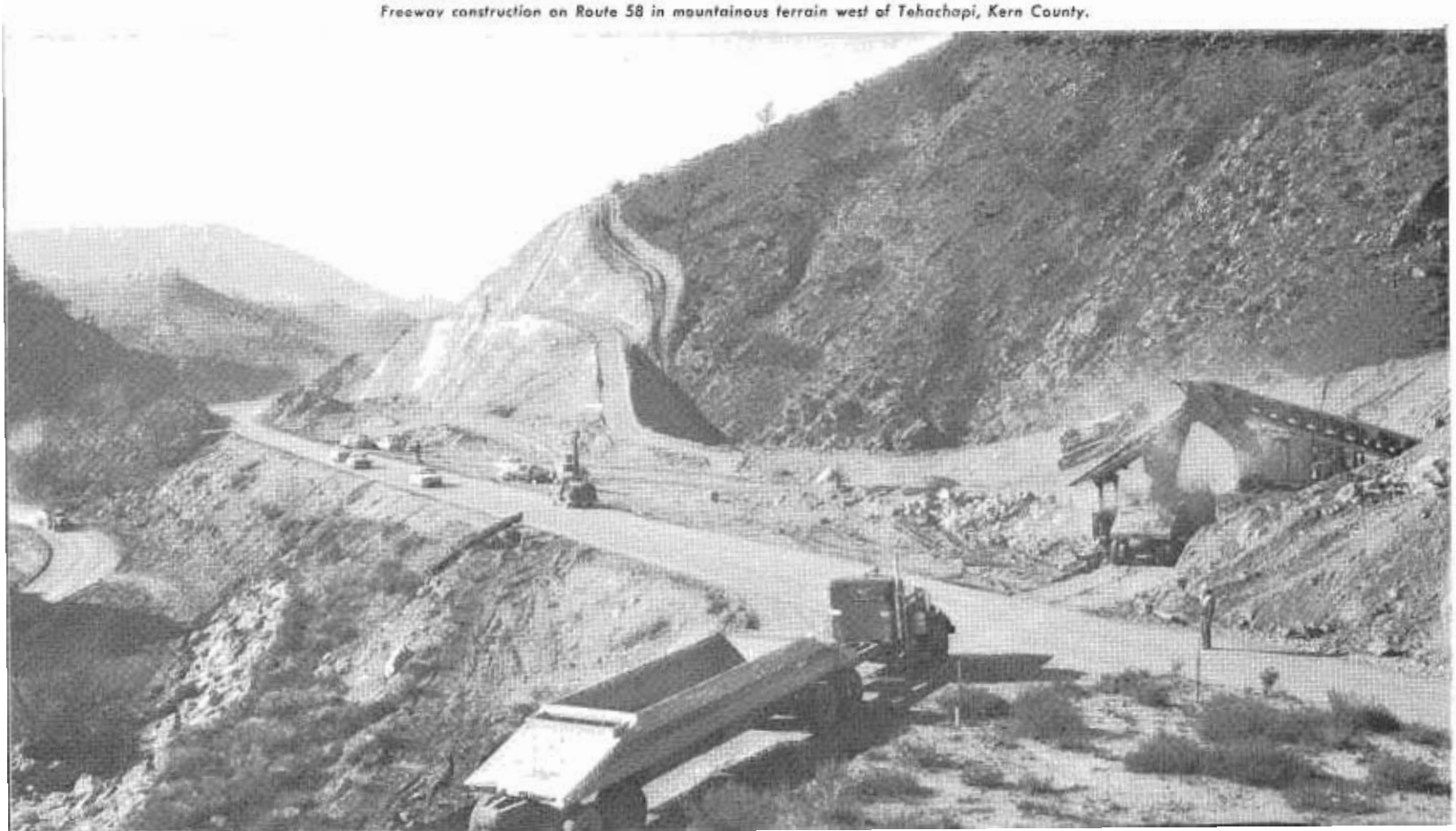
Because of the large backlog of unbilled federal aid and the loss of several key staff members, an intensified training program was conducted in federal aid vouchering procedures from October 1963 through January 1964.

In order to insure effective performance of the accounting function for the city and county projects unit, on April 21–22, 1964, a two-day training course was conducted at Headquarters for two representatives from each district. This course covered the statutes, including the new Collier-Unruh Local Transportation Act, administration problem solving, and methods, forms, and procedures applicable to this accounting function. This course was followed by a four-hour training session in five districts, where a need for additional training developed.

Financial Data

Budgeted revenues for the 1963–64 fiscal year amounted to $781,847,768, of which $264,186,121 remained to be collected on June 30, 1964. Revenue not received consists of $250,670,562 of federal aid and $8,516,259 contributions from state and local agencies and other sources, which will be collected as applicable work is completed. Expenditures and obligations incurred applicable to the fiscal year ended June 30, 1964, amounted to $733,543,416.

Freeway construction on Route 58 in mountainous terrain west of Tehachapi, Kern County.



1965-66 Highway Budget

The California Highway Commission on October 30 budgeted $612,432,000 for state highway construction purposes, including rights-of-way and engineering, for the 1965–66 fiscal year.

This figure, up $34,020,000 from the 1964–65 highway budget adopted a year ago, contains $431,781,000 for major construction and improvement (including engineering); $158,651,000 for rights-of-way; plus smaller amounts for contingencies, resurfacing programs, signs and striping, traffic safety projects, highway planning studies and minor improvements.

In submitting the budget to Governor Edmund G. Brown, Robert B. Bradford, chairman of the commission and Administrator of the Highway Transportation Agency, pointed out that the newly adopted budget will provide for about 350 miles of new multi-lane freeways and adding lanes on another 37.2 miles of existing freeways.

"Freeways are well recognized as the best solution to the safety problem on our overcrowded highways," Bradford said. "We wish we could finance all the needed freeways at once. In line with Governor Brown's emphasis on maximum traffic safety, the new budget also provides substantial funds for spot safety projects as curve correction, widening, and channelization on certain sections where freeway construction is not yet feasible."

Construction emphasis in the new budget continues on California's 2,173-mile share of the national system of interstate and defense highways. The budget contains $317,442,281 in federal funds, of which $266,988,400 is included for the completion of this system, which by federal law, must be accomplished by 1972.

"As in the past few years," Bradford said, "our progress on the interstate freeway system is on schedule except in San Francisco. We placed our early interstate moneys on freeway routes in the more expensive metropolitan areas where traffic volumes were greatest. Now we are concentrating on interstate projects connecting these metropolitan areas and on long sections in more rural and desert areas.

"For example," he continued, "the new budget authorizes projects costing nearly $50,000,000 to construct 13 miles of the eight-lane Interstate 5 Freeway, and to do the heavy grading for an additional 12.4 miles, in the difficult terrain along the Ridge Route south of the Kern-Los Angeles county line.

"Also, the new budget provides funds for projects totaling more than $34,000,000 on the Westside Freeway (Interstate 5 and 580), a new route along the west side of the San Joaquin Valley, with spurs to the San Francisco Bay and Stockton-Sacramento areas.

"This money will buy about 42 miles of full freeway in Merced, Stanislaus and southern San Joaquin Counties," Bradford said, "plus an additional 45 miles of preliminary construction work in Fresno and Kern Counties."

He noted that when two projects already under construction and the 42-mile section are completed, motorists will be able to travel from the San Francisco Bay area to US 99 south of Chowchilla in Madera County via the Westside Freeway and Route 152 easterly from near Los Banos, pending completion of the southerly section of the Westside Freeway a few years hence.

The commission chairman added that the new budget provides $6,229,000 for landscaping, functional and tree planting along various freeway routes.

As it did last year, the commission approved some projects which are only partly financed in the 1965–66 budget, but which under current federal and state procedures can be placed under contract in their entirety with the assurance that the balance will be included in the 1966–67 budget.

It also allocated $48,740,000 to finance the balance of projects totaling $106,602,000, which were approved in the 1964–65 budget.

In addition to the construction items, the commission budgeted $79,200,000 for state highway purposes other than construction, including $48,000,000 for maintenance; $15,500,000 for administration; $6,050,000 for maintenance of landscaping, functional planting and safety roadside rests; $5,000,000 for buildings and land; $3,500,000 for highway research and development; $1,100,000 for honor camps; and $50,000 for legislative claims.

A third budget segment totaling $149,401,526 was allocated for functions not under state highway jurisdiction.

The largest nonstate highway items are $72,502,857 for construction and rights-of-way for streets and roads on the select system of cities and counties as established by the 1963 Legislature, and $50,492,857 for improvements and maintenance work on city streets.

The other such items are $8,600,873 in federal aid for county roads on the federal aid secondary system, and $4,107,439 in state funds to counties for use in matching these federal funds; $5,000,000 in state funds to help finance railroad grade separation projects on local streets and roads; $3,396,500 in state funds to pay part of the cost of extending federal aid secondary county roads into urban areas; $3,670,000 for maintenance of state-owned toll bridges; $1,500,000 in engineering funds for cities; and $131,000 for administration of the Outdoor Advertising Act.

The total estimated revenue from all state sources is $514,990,758, a gain of $33,705,336 over such revenue for the present fiscal year. It will derive from $375,339,286 in gasoline taxes, $90,720,472 in motor vehicle fees, $29,800,000 in taxes on diesel fuel, $15,500,000 in taxes on for-hire vehicles, $3,500,000 in interest, and $131,000 in outdoor advertising fees.

1965-66 State Highway Budget by Region, Counties

NOTE 1—The term "freeway" means a multilane divided highway with full access control, no crossings at grade, no stoplights and no left-turn movements. An "expressway" has the same access control as the freeway but does permit left turns and crossings at grade at some intersections which may or may not be signalized. "Two-lane expressways" are two-lane highways with some measure of access control, and are usually planned for future expansion to four lanes.

NOTE 2—Projects which overlap county lines are listed in both counties.

NOTE 3—Construction contracts financed in this new budget may be awarded beginning January 1965; right-of-way funds may not be spent until July 1, 1965, the start of the fiscal year.

NOTE 4—At the 1963 session of the Legislature, a bill was passed which renumbers the state highway routes effective July 1, 1964. Projects in this budget are listed by both old and new route designations. If only one route number appears, the route number will not change.

NORTH COASTAL COUNTIES PROJECTS

Del Norte County

Complete paving of the two- and four-lane US 101 Freeway between 0.9 mile south of the Humboldt-Del Norte county line and 0.2 mile north of its junction with Route 169, a distance of 5 miles. Estimated cost, $1,300,000. (Grading, construction of an interchange with Route 169, and construction of a bridge across the Klamath River and its overflow channel are in progress.)

Humboldt County

Extend the four-lane US 101 Freeway (under construction or completed between Dean Creek south of Phillipsville and Englewood) another 7.7 miles northerly to 4.2 miles south of Scotia, with interchanges at Redcrest, the southern entrance to Pepperwood, and the old US 101 Highway south of Jordan Creek. Estimated cost, $7,100,000.

Complete paving of the two- and four-lane US 101 Freeway between 0.9 mile south of the Humboldt-Del Norte county line and 0.2 mile north of its junction with Route 169, a distance of 5 miles. Estimated cost, $1,300,000. (Grading, construction of an interchange with Route 169, and construction of a bridge across the Klamath River and its overflow channel are in progress.) (This project repeated above in Del Norte County.)

Construct a bridge across Redwood Creek on Route 299 approximately 1 mile south of the existing bridge, 16 miles east of Blue Lake. Estimated cost, $515,000. (This project is part of two-lane expressway construction, completed or in progress, between Lord Ellis Summit, 12.6 miles east of Blue Lake, and 2.2 miles east of Redwood Creek.)

Replace a structurally inadequate bridge across Willow Creek on Route 96 and construct 0.6 mile of two-lane expressway approaches in Willow Creek. Estimated cost, $415,000.

Improve curves on portions of Route 36 between 1.5 and 9.6 miles east of Bridgeville. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$935,000.

Lake County

Construct a two-lane expressway on Route 29 between 1 mile south of Kelseyville and Route 175, a distance of 6.2 miles. The project involves constructing a bridge across Kelsey Creek. Estimated cost, $1,900,000.

Rights-of-way on various state highway routes—$240,000.

Mendocino County

Construct 1 mile of Route 1 on new alignment to replace an existing bridge across Mallo Pass Creek with a reinforced concrete arch culvert, approximately 11 miles north of Point Arena. Estimated cost, $870,000.

Replace a structurally deficient overhead on US 101 across the Northwestern Pacific Railroad tracks, approximately 1.4 miles south of Hopland, with a new structure on same alignment. Estimated cost, $170,000.

Rights-of-way on various state highway routes—$765,000.

SACRAMENTO VALLEY AND NORTHERN VALLEY PROJECTS

Butte County

Widen Route 99 from two to four lanes between 1 mile south and 0.3 mile north of Gridley. Estimated cost, $300,000, of which the state will pay $290,000, and the city and county the balance.

Rights-of-way on various state highway routes—$35,000.

Colusa County

Rights-of-way on various state highway routes—$735,000.

El Dorado County

Widen an existing two-lane section of US 50-Route 89 to four lanes between 0.8 mile and 0.2 mile south and between 0.2 mile and 1.5 miles north of the Tahoe Valley Wye. Estimated cost, $310,000.

Add passing lanes on US 50 3 miles west of Strawberry and just east of Phillips. Estimated cost, $300,000.

Rights-of-way on various state highway routes—$930,000.

Glenn County

$3,851,000 to complete the financing of two four-lane freeway projects on Interstate 5 between two miles south of Willows and the Tehama county line, with interchanges at Route 162 in Willows, County Roads 39, 33, 57B, 16, 7, and Route 32-Newville Road. The project includes extending Route 162 and Route 32 westward from their present termini at the existing highway in Willows and Orland to the new freeway. Estimated cost, $11,651,000, of which $7,800,000 was budgeted in the 1964-65 fiscal year.

Rights-of-way on various state highway routes—$100,000.

Lassen County

Construct a two-lane expressway on Route 36 between 1 mile west of Devil's Corral and 0.6 mile west of Eagle Lake Road, and widen and add a truck climbing lane for westbound traffic between 0.6 mile west of Eagle Lake Road and Main Street in Susanville, a distance of 8.2 miles. Estimated cost, $2,030,000.

Rights-of-way on various state highway routes—$50,000.

Modoc County

Construct a two-lane expressway on US 395 between 0.5 mile north of the Lassen county line and Jess Valley Road at Likely, a distance of 2.9 miles. (This will complete two-lane expressway construction between 1 mile south of the Lassen-Modoc county line and 6 miles south of Alturas, except for a short section in Likely.) Estimated cost, $430,000.

Rights-of-way on various state highway routes—$90,000.

Nevada County

Rights-of-way on various state highway routes—$350,000.

Placer County

Widen the Rocky Ridge Road Interchange and revise ramps on the Interstate 80 Freeway in Roseville to accommodate the widening of Rocky Ridge Road from two to four lanes and the future widening of Interstate 80 from four to six lanes. Estimated cost, $970,000.

Construct interchanges on Interstate 80 at Illinoistown and Heather Glen, approximately 1 mile west of Weimar, converting an expressway section to full freeway (and extending completed full freeway from the Nevada state line to Applegate). Estimated cost, $980,000.

Rights-of-way on various state highway routes—$750,000.

Plumas County

Construct truck climbing lanes, resurface and improve the banking of curves on Route 89 between 1 mile north of Crescent Mills and 1.5 miles south of Greenville, a distance of 1.6 miles. Estimated cost, $210,000.

Rights-of-way on various state highway routes—$180,000.

Sacramento County

Construct the eight-lane Interstate 80 Freeway in Sacramento in two units between the west side of Fifth Street and Alhambra Boulevard, a distance of 2.3 miles, which together with the 29-30th Street (Interstate 80) Freeway, already under construction or budgeted, will complete freeway construction on this route through the city. Estimated cost, $19,100,000, of which $9,900,000 will be budgeted in the 1966-67 fiscal year.

$5,410,000 to complete the financing of the superstructure of the eight-lane Interstate 80 Freeway bridge across the Sacramento River, between Jefferson Boulevard in Yolo County and Fifth Street in Sacramento. Estimated cost, $16,410,000, of which $11,000,000 was budgeted in the 1964–65 fiscal year.

$2,974,000 to complete the financing of the eight-lane Interstate 80-99 Freeway between 0.2 mile south of Fifth Avenue and 0.1 mile north of A Street in Sacramento, a distance of 2.9 miles. Estimated cost, $11,724,000, of which $8,750,000 was budgeted in the 1964–65 fiscal year.

Widen the Interstate 80 Freeway, including the American River Bridge near Elvas from four to six lanes between A Street in Sacramento and the North Sacramento Freeway, just south of the Arden Way Interchange a distance of 2.2 miles. Estimated cost $1,400,000.

Landscape and plant trees along the Interstate 80 Freeway between the Elvas Underpass in Sacramento and 0.4 mile east of Arden Way a distance of 2 miles. Estimated cost, $150,000.

Widen the Route 160 Freeway from four to six and seven lanes between Sproule Street, just south of Richards Boulevard in Sacramento, and 0.1 mile east of the North Sacramento Undercrossing, a distance of 1.1 miles. The project involves widening the 16th Street Bridge across the American River and the North Sacramento Viaduct. Estimated cost, $2,100,000.

Construct an initial two-lane expressway on the alignment of the future four-lane Interstate 5 Freeway between near Route 99 at El Centro Road in Sacramento and Garden Highway near the Elkhorn Ferry, a distance of 4.8 miles. Estimated cost, $1,250,000.

Rights-of-way on various state highway routes—$13,990,000 (including $10,000,000 on Interstate 5 in the vicinity of Sacramento).

Shasta County

Construct the four-lane Interstate 5 Freeway between 1.9 miles north of O'Brien and the south end of the Sacramento River Bridge at Antler, a distance of 4.6 miles. The project involves construction of an interchange with county roads at Salt Creek. Estimated cost, $4,650,000, of which $1,550,000 will be budgeted in the 1966–67 fiscal year.

Place base and surface to complete the four-lane Interstate 5 Freeway between the Sacramento River north of Anderson and two miles north of Redding, extending freeway construction now in progress through Anderson another 11.9 miles northerly. Estimated cost, $4,180,000.

$1,620,000 to complete the financing of the state's share of construction now in progress on the four-lane Interstate 5 Freeway between two miles north of the Shasta-Tehama county line and the Sacramento River north of Anderson, a distance of 5 miles, with interchanges at South Anderson, Deschutes Road, Balls Ferry Road, North Street and Riverside Avenue, and a grade separation between Deschutes Road and the Southern Pacific Railroad. Estimated cost, $4,156,000, of which $2,400,000 was budgeted in the 1964–65 fiscal year. The county and Anderson will pay an estimated $136,000 for the grade separation with the railroad.

Construct truck climbing lanes and channelization on portions of Route 299 between 5.8 miles west and 3.4 miles east of Montgomery Creek. Estimated cost, $125,000.

Replace an inadequate timber bridge on Route 299 across Churn Creek with a concrete structure, approximately 1.6 miles east of Interstate 5. Estimated cost, $75,000.

Rights-of-way on various state highway routes—$1,060,000.

Sierra County

Extend the two-lane Route 49 Expressway (between Bassetts and 0.8 mile east of Sierra City) westerly to Sierra City. Estimated cost, $190,000.

Siskiyou County

Construct the Hilt Road Interchange and add two lanes to convert the existing two-lane US 99 highway to four-lane Interstate 5 Freeway between the Oregon state line and 1.5 miles southerly. Estimated cost, $1,720,000.

Rights-of-way on various state highway routes—$810,000.

Sutter County

Install traffic signals, construct left-turn storage lanes and widen Route 99 from two to four lanes between 0.3 mile south of Franklin Road and 0.4 mile north of Bridge Street in Yuba City, a distance of 1.1 miles. Estimated cost, $130,000, of which the state will pay $110,000, and the city and county the balance.

Rights-of-way on various state highway routes—$700,000.

Tehama County

$1,200,000 to complete the financing of construction now in progress on the four- and six-lane Interstate 5 Freeway between Corning Road and Kimball Road at Red Bluff, a distance of 16.1 miles, with interchanges at Finnel Avenue, Gyle Road, Flores Avenue and South Red Bluff. The six-lane section will be between the South Red Bluff Interchange and 2.3 miles southerly. Estimated cost, $7,750,000, of which $6,550,000 was budgeted in 1964–65 fiscal year.

Construct the four-lane Interstate 5 Freeway between the Glenn-Tehama county line and Corning Road, a distance of 9.3 miles, with interchanges at Liberal Avenue, South Avenue and Corning Road. Estimated cost, $4,650,000. (This construction will connect a recently started project between 1 mile north of Artois and the Glenn-Tehama county line with construction in progress to 0.6 mile north of Red Bluff, a total distance of 41.3 miles.)

Rights-of-way on various state highway routes—$100,000.

Trinity County

Construct truck climbing lanes on Route 299 between 2.9 miles and 5 miles east of Douglas City. Estimated cost, $385,000.

Rights-of-way on various state highway routes—$90,000.

Yolo County

$5,410,000 to complete the financing of the superstructure of the eight-lane Interstate 80 Freeway bridge across the Sacramento River, between Jefferson Boulevard in Yolo County and Fifth Street in Sacramento. Estimated cost, $16,410,000, of which $11,000,000 was budgeted in the 1964–65 fiscal year.

Rights-of-way on various state highway routes—$910,000.

Yuba County

Rights-of-way on various state highway routes—$25,000.

SAN FRANCISCO BAY REGION PROJECTS

Alameda County

Extend the Interstate 680 Freeway 8.7 miles northerly from Route 84 near Scotts Corner to construction now in progress between south of Interstate 580 and one mile north of the Alameda-Contra Costa county line. The project involves construction of interchanges at Route 84, Sunol Road, Pleasanton-Sunol Road, Vernal Avenue, and twin bridges across the Arroyo de la Laguna. This project, together with a previously budgeted project between 0.9 mile north of the Alameda-Contra Costa county line and Danville, will complete the Interstate 680 Freeway from Fremont in Alameda County to Vallejo in Solano County. Estimated cost, $8,450,000, of which $4,335,000 will be budgeted in the 1966–67 fiscal year.

Widen the Route 17 (Nimitz) Freeway from four to six lanes between Route 92 (Jackson Street) in Hayward and Washington Avenue in San Lorenzo, a distance of 4.2 miles. Estimated cost, $1,300,000.

Resurface pavement and shoulders on the Route 17 (Nimitz) Freeway between 1.1 miles north of Washington Avenue and 0.3 mile north of Davis Street (Route 112) in San Leandro, a distance of 2 miles. Estimated cost, $300,000.

Landscape the Interstate 580 Freeway between Gabriel Court in San Leandro and 0.1 mile west of 108th Avenue in Oakland, a distance of 1.9 miles. Estimated cost, $200,000.

Widen Mission Boulevard (Route 238) from two to four lanes at Driscoll Road in Fremont, and install traffic signals. Estimated cost, $120,000, of which the state will pay $100,000 and the city the balance.

Rights-of-way on various state highway routes—$14,405,000 (including $5,800,000 on Interstate 580 in the Castro Valley area, and $5,150,000 on the Route 24 Freeway in Oakland.

Projects under the city and county urban extension program:

Widen one-half mile of Hesperian Boulevard to six-lane divided highway between State Route 17 and State Route 238 in San Leandro urban area. Estimated cost $548,000 (state's share $274,000).

Construct 0.3 mile of Redwood Road between Joseph Drive and Buti Park Drive in Hayward urban area as four-lane undivided highway. Estimated cost, $240,000 (state's share $120,000).

Construct one-half mile of Lake Chabot Road between Castro Valley Boulevard and Somerset Avenue in Hayward urban area as four-lane, undivided highway. Estimated cost, $250,000 (state's share $125,000).

Contra Costa County

$2,300,000 to complete financing of a budgeted project to construct the six-lane Interstate 680 Freeway between 0.9 mile north of the Alameda county line and one mile south of Danville, a distance of 5.5 miles, with an interchange at Crow Canyon Road, completing freeway construction between Dublin and Walnut Creek. Estimated cost, $7,000,000, of which $4,700,000 was budgeted in the 1964–65 fiscal year.

Landscape the Interstate 680 Freeway between Walden Road and the south city limit of Concord, a distance of 3.2 miles. Estimated cost, $235,000.

Install trees and functional planting on portions of Interstate 680 between 0.3 mile south of Sycamore Valley Road and 0.2 mile north of Crest Avenue in Walnut Creek. Estimated cost, $150,000.

Rights-of-way on various state highway routes—$720,000.

Projects under the city and county urban extension program:

Widen 0.6 mile of Concord Avenue between Walnut Creek Channel and Market Street in Concord to four-lane, divided highway and construct parallel bridges. Estimated cost, $1,000,000 (state's share, $500,000).

Marin County

Extend Tiburon Boulevard (Route 131) 1 mile easterly as a four-lane highway from Blackfield Drive to Reed Ranch Road, grade an additional 0.4 mile, and place rock riprap protection along Richardson Bay to 0.7 mile west of San Rafael Avenue, approximately 2 miles west of Tiburon. Estimated cost, $610,000.

Construct parking facilities on the west side of US 101 immediately north of the Golden Gate Bridge to permit southbound motorists to use an existing pedestrian walkway to Vista Point, overlooking San Francisco Bay. Estimated cost, $65,000.

Rights-of-way on various state highway routes—$800,000.

Napa County

Convert the two-lane Route 29 Expressway to four-lane freeway between Napa Creek and 0.1 mile south of Trancas Street-Redwood Road in Napa, a distance of 1.3 miles, with an interchange at Lincoln Avenue. Estimated cost, $1,305,000, of which the state will pay $1,260,000, and the city and county the balance.

Widen portions of Route 128 between Route 29 and Route 121, approximately 12.5 miles east of Rutherford. Estimated cost, $50,000.

Rights-of-way on various state highway routes—$245,000.

San Francisco County

Extend the six-lane Route 82 Freeway construction now in progress (between Newcomb Avenue and Army Street) northeasterly to the site of the Islais Creek Interchange with the future freeway via Hunters Point, thence northerly as the eight-lane Route 87 Freeway to 0.1 mile north of 18th Street, a distance of 1.4 miles. Estimated cost, $9,500,000, of which $2,800,000 will be budgeted in 1966–67 fiscal year.

Landscape the Route 82 Freeway between San Jose Avenue and 0.4 mile north of Ocean Avenue, a distance of 1.3 miles. Estimated cost, $135,000.

Landscape portions of the Route 82 Freeway between the James Lick Memorial Freeway (US 101) and Revere Avenue. Estimated cost, $60,000.

Rights-of-way on various state highway routes—$6,555,000.

San Mateo County

$8,625,000 to complete the financing of a budgeted project to construct the eight-lane Interstate 280 Freeway between Eastmoor Avenue in Daly City and 0.5 mile south of Arroyo Drive west of South San Francisco, a distance of 3.3 miles, with interchanges at Westborough Boulevard, the future Hickey Boulevard Extension at Collins Avenue, and the future Route 1 Freeway. Estimated cost, $10,425,000, of which $1,800,000 was budgeted in the 1964–65 fiscal year.

Rough grade portions of the Interstate 280 Freeway between Summit Drive in Hillsborough and Larkspur Drive in Millbrae, and construct an eight-lane freeway on this route between Larkspur Drive and 0.3 mile south of Route 186 in San Bruno, with interchanges at Skyline Boulevard (Route 35) and Junipero Serra Boulevard (Route 117), a distance of 2.2 miles; and rough grade portions for a four-lane freeway on Route 1 between St. Francis Boulevard in Daly City and Interstate 280. Estimated cost, $9,700,000, of which $5,500,000 will be budgeted in the 1966–67 fiscal year.

$4,785,000 to complete the financing of an eight-lane bridge for the future Interstate 280 Freeway across San Mateo Creek in and near Hillsborough. Estimated cost, $7,285,000, of which $2,500,000 was budgeted in the 1964–65 fiscal year.

Widen the Bayshore Freeway (US 101) from six to eight lanes between 19th Avenue in San Mateo and Broadway in Burlingame, a distance of 4.8 miles, and improve signing and lighting. Estimated cost, $1,110,000.

Reconstruct and resurface Route 84 between Route 1 near San Gregorio and 2.5 miles easterly. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$7,245,000 (including $5,775,000 on the Interstate 280 Freeway).

Santa Clara County

$5,725,000 to complete the financing of a previously budgeted project to construct Interstate 280 as a six-lane freeway between Mountain View-Stevens Creek Road in Los Altos and Magdalena Avenue, and as an eight-lane freeway between Magdalena Avenue and 0.5 mile north of Page Mill Road in Los Altos Hills, with interchanges at Magdalena and El Monte Avenues, and ramp connections to Page Mill Road, a distance of 7.3 miles. Estimated cost, $8,725,000, of which $3,000,000 was budgeted in the 1964–65 fiscal year.

Extend the six-lane Interstate 280 Freeway construction now in progress (between Saratoga Avenue and Stelling Road in Cupertino) another 1.9 miles westerly to 0.6 mile west of Foothill Boulevard (Mountain View-Stevens Creek Road), with interchanges at Route 85 and Foothill Boulevard, and twin bridges across Stevens Creek. (These projects, together with a previously budgeted freeway project from Foothill Boulevard to Page Mill Road, will provide a full freeway between the Interstate 680 Freeway at US 101 in San Jose and Los Altos Hills.) Estimated cost, $3,600,000, of which $1,600,000 will be budgeted in the 1966–67 fiscal year.

Landscape the Interstate 280 Freeway between 0.3 mile west of Saratoga Avenue in San Jose and 0.2 mile west of Route 85 (Saratoga-Sunnyvale Road) in Cupertino, a distance of 3.5 miles. Estimated cost, $300,000.

Construct a four-lane freeway on Route 237 between 0.1 mile west of Borregas Avenue and 0.5 mile east of Lawrence Station Road in Sunnyvale, a distance of 2 miles, with an interchange at Lawrence Station Road. Estimated cost, $2,905,000, of which the state will pay $2,655,000, and the city and county the balance.

Construct the San Antonio Street Overcrossing and the Story Road Interchange on US 101 to convert an expressway section to full freeway, and resurface portions of this route between 0.4 mile north of Coyote Creek Bridge and 0.2 mile north of San Antonio Street in San Jose. Estimated cost, $1,900,000.

Reconstruct the outer lanes and resurface the inner lanes of US 101 between Leavesley Road and I.O.O.F. Avenue in Gilroy, a distance of 0.7 mile. Estimated cost, $120,000.

Install left-turn storage lanes and modify traffic signals on US 101 at 16 intersections between Llagas Creek and the north city limit of Gilroy. Estimated cost, $110,000.

Widen Route 9 in Saratoga between Oak Place and the junction of Route 85 (Saratoga-Sunnyvale Road), and Route 85 from the junction to 0.3 mile north of Harriman Avenue, from two to four lanes; and widen and construct shoulders on the existing two-lane Route 85 highway between 0.3 mile north of Harriman Avenue and 0.4 mile south of Pierce Road; and widen this route from two to four lanes between 0.4 mile south of Pierce Road and 0.1 mile north of the Southern Pacific Railroad tracks, a total distance of 2.3 miles. Estimated cost, $706,000, of which the state will pay $581,000, and the county and city the balance.

Construct the Dana Street Overcrossing and approaches on the Route 85 Freeway in and near Mountain View. Estimated cost, $421,800, of which the state will pay $260,000, and the city the balance.

Reconstruct shoulders and resurface Route 152 (Pacheco Pass Highway) between 0.3 mile west and 1.4 miles east of Bloomfield Road east of Gilroy, a distance of 1.7 miles. Estimated cost, $160,000.

Rights-of-way on various state highway routes—$910,000.

Projects under the city and county urban extension construction program:

Widen two miles of Stevens Creek Boulevard between Saratoga-Sunnyvale Road and Lawrence Expressway in Santa Clara, Cupertino and San Jose urban area to six-lane, divided highway. Estimated cost, $700,000 (state's share, $350,000).

Widen 2.2 miles of Foothill Expressway between Arastradero Road and El Monte Avenue in San Jose urban area to four-lane, divided highway. Estimated cost, $680,000 (state's share, $340,000).

Widen 0.6 mile of Foothill Expressway between Permanente Creek and Grant Road in San Jose urban area to four-lane, divided highway. Estimated cost, $200,000 (state's share $100,000).

Santa Cruz County

Complete the Route 1 Freeway (Watsonville Bypass) between the Monterey county line and 0.2 mile northwest of Roache Road, with interchanges at Route 129, Harkins Slough Road and Route 152, a distance of 3.4 miles (grading is underway under previous financing); and extend Route 129 from 0.1 mile east of Main Street in Watsonville to a connection with the new freeway, a distance of 1.6 miles. Estimated cost, $3,000,000. (This project connects with one in Monterey County to pave the freeway bypass of Watsonville between the Santa Cruz-Monterey county line and 1.2 miles southerly. Grading and the construction of the Pajaro River Bridge are in progress. Estimated cost, $785,000.)

Reconstruct and resurface Route 1 between Green and Rigg Streets in Santa Cruz, a distance of 0.5 mile. Estimated cost, $110,000.

Rights-of-way on various state highway routes—$150,000.

Sonoma County

Reconstruct Route 1 and improve drainage between 10.9 and 12.5 miles north of Fort Ross. Estimated cost, $350,000.

Install underdrains on portions of Route 1 between 0.5 mile south of Stewart's Point and the Mendocino county line. Estimated cost, $90,000.

Relocate Route 116 as a two-lane conventional highway on improved alignment between 1.2 and 1.7 miles east of Austin Creek at Big Bend, northwest of Monte Rio. Estimated cost, $320,000.

Rights-of-way on various state highway routes—$290,000.

CENTRAL COAST COUNTIES PROJECTS

Monterey County

Construct a four-lane freeway on Route 1 between 0.7 mile south of Castroville and the intersection with Route 156, and on Route 156 to 1.2 miles north of the city, a total distance of 1.9 miles. The project includes construction of the Route 1/156 interchange and an overhead across the Southern Pacific tracks. Estimated cost, $1,450,000.

Pave the four-lane Route 1 Freeway (Watsonville Bypass) between 1.2 miles south of the Pajaro River (Santa Cruz county line) and the county line. (Grading and the construction of the Pajaro River Bridge are in progress.) Estimated cost, $785,000. (This project connects with one in Santa Cruz County to complete the freeway bypass of Watsonville between the Monterey County line and 0.2 mile northwest of Roache Road, a distance of 3.4 miles, with interchanges at Route 129, Harkins Slough Road and Route 152. Grading is now in progress; and extend Route 129 from 0.1 mile east of Main Street in Watsonville to a connection with the new freeway, a distance of 1.6 miles. Estimated cost, $3,000,000.)

Replace structurally inadequate bridges on Route 1 across Buck Creek, 10.6 miles north of Lucia, and across San Jose Creek, three miles south of Carmel. Estimated cost, $530,000.

Install retaining walls on portions of Route 1 between the San Luis Obispo county line and Kirk Creek, four miles south of Lucia. Estimated cost, $320,000.

Construct the four-lane Route 68 Freeway between 0.5 mile south of Reservation Road and 0.2 mile north of Foster Road, near the south city limits of Salinas, a distance of 1.9 miles, with an interchange at Spreckels Road. (The Salinas River Bridge is now under construction.) Estimated cost, $1,510,000.

Construct an additional northbound off-ramp on US 101 at Soledad. Estimated cost, $145,000.

Rights-of-way on various state highway routes—$1,125,000.

Projects under the city and county urban extension program:

Widen 0.8 mile of Lighthouse Avenue between Reeside Avenue and Washington Street in Monterey to six-lane, divided highway. Estimated cost, $380,000 (state's share, $190,000).

San Benito County

Construct a two-lane expressway on Route 180 between 2 miles south of Hollister and 0.4 mile north of Tres Pinos, a distance of 3.1 miles. Estimated cost, $630,000.

Rights-of-way on various state highway routes, $285,000.

San Luis Obispo County

Construct interchanges on US 101 at Del Rio Road, San Ramon Road, Vineyard Road and Las Tablas Road to complete expressway - to - freeway conversion between Atascadero and Paso Robles. Eestimated cost, $1,670,000.

Add two lanes to Route 1 between the Main Gate of Camp Luis Obispo and 0.4 mile north of San Luisito Creek, a distance of 4.4 miles, to complete a four-lane expressway between San Luis Obispo and Morro Bay. Estimated cost, $850,000.

Rights-of-way on various state highway routes—$300,000.

Santa Barbara County

Construct a two-lane expressway on Route 1 between US 101 at Las Cruces and San Julian Ranch, a distance of 8.8 miles, and add a northbound truck climbing lane near Las Cruces. Estimated cost, $5,000,000.

Reconstruct US 101 between Gaviota and 1 mile north of Nojoqui Summit, a distance of 7.1 miles. Estimated cost, $500,000.

Landscape US 101 between De La Vina and Pueblo Streets in Santa Barbara, a distance of 3 miles. Estimated cost, $300,000.

Relocate ramps and frontage roads to improve the interchange between US 101 and Route 154 (Hollister Wye) at the north city limits of Santa Barbara. Estimated cost, $190,000.

Rights-of-way on various state highway routes—$300,000.

Ventura County

Construct six lanes of the Route 118 Freeway from Kuehner Drive in Simi Valley, Ventura County, through Santa Susana Pass to Route 27 (Topanga Canyon Boulevard), a distance of 3.9 miles; and grade an additional 0.7 mile eastward to Variel Avenue in Chatsworth, Los Angeles County; and extend Route 27 1.5 miles north from Devonshire Street to this freeway. The project includes construction of partial interchanges at Kuehner Drive, Los Angeles Avenue (the summit of Santa Susana Pass), and Route 27. Estimated cost, $9,500,000.

Widen Los Angeles Avenue (Route 118) from two to four lanes and install traffic

signals and lighting at 3 intersections and channelization at 13 intersections between Tierra Rejada Road in Simi and Katherine Road, 8.7 miles easterly. Estimated cost, $1,100,000, of which the state will pay $1,035,000 and the county the balance.

Extend the four-lane Route 33 Freeway another 2.9 miles northerly to 0.4 mile north of Casitas Pass Road, with interchanges at Canada Larga Road and Casitas Pass Road (Route 150), and an overhead crossing of the Southern Pacific Railroad tracks, 0.4 mile south of Bounds Road, west of Ojai. Estimated cost, $2,800,000.

Construct the Wendy Road Interchange in Newbury Park and the Arneill Road Interchange in Camarillo as part of a continuing program to convert the four-lane US 101 (Ventura) Freeway from expressway to full freeway standards. Estimated cost, $1,380,000.

Construct a westbound off-ramp from the US 101 (Ventura) Freeway to Borchard Road in Newbury Park, relocate a frontage road and install a drainage facility to provide additional traffic capacity at this interchange. Estimated cost, $250,000.

Complete construction of the Victoria Avenue Interchange on the Route 126 Freeway, approximately 2 miles west of Saticoy. Estimated cost, $275,000.

Install and modify traffic signals and lighting and construct channelization at six intersections on Oxnard Boulevard (Route 1) between 0.2 mile south of Date Street and 0.1 mile north of Roderick Avenue in Oxnard. Estimated cost, $80,000, of which the state will pay $50,000 and the city the balance.

Rights-of-way on various state highway routes—$5,033,000 (including $2,700,000 on the Route 23 Freeway in the Thousand Oaks-Simi area).

SAN JOAQUIN VALLEY AND CENTRAL MOUNTAIN COUNTIES PROJECTS

Alpine County

Extend two-lane expressway construction now in progress on Route 4 (Ebbetts Pass Highway), between Ganns Meadow and Tamarack easterly to 0.6 mile east of the Calaveras-Alpine county line, a distance of 2.7 miles. Estimated cost, $820,000.

Rights-of-way on various state highway routes—$15,000.

Amador County

Reconstruct Route 124 as a two-lane expressway between Preston Avenue in Ione and 2.6 miles northerly, connecting to construction now in progress to Route 16 near Central House. Estimated cost, $700,000.

Rights-of-way on various state highway routes—$35,000.

Calaveras County

Extend two-lane expressway construction now in progress on Route 4 (Ebbetts Pass Highway), between Ganns Meadow and Tamarack easterly to 0.6 mile east of the Calaveras-Alpine county line, a distance of 2.7 miles. Estimated cost, $820,000. Project repeated above in Alpine County.

Add truck climbing lanes on 1.2 miles of Route 12 between 0.9 mile and 2.1 miles east of its junction with Route 26, approximately 2.5 miles west of San Andreas. Estimated cost, $115,000.

Rights-of-way on various state highway routes—$25,000.

Fresno County

Grade for the future four-lane Interstate 5 (Westside) Freeway between 0.3 mile west of Manning Avenue, west of Fowler, and the Merced county line, a distance of 20.7 miles, with interchange structures at Manning Avenue, Panoche Road, Russell Avenue, Shields Avenue - Little Panoche Road and Ness Avenue, and a bridge across Panoche Creek. Estimated cost, $4,950,000, of which $950,000 will be budgeted in the 1966-67 fiscal year.

Reconstruct and widen Route 33 between Route 180 in Mendota and Outside Canal, one mile south of Firebaugh, a distance of 6.3 miles. Estimated cost, $650,000.

Construct new on- and off-ramp connections from the US 99 Freeway to Fresno, Tuolumne and Stanislaus Streets in Fresno, and one-way distributor roads between Stanislaus and Fresno Streets. Estimated cost, $445,000.

Landscape US 99 between 0.2 mile southeast of Church Avenue and Kern Street in Fresno, a distance of 1.5 miles. Estimated cost, $200,000.

Plant trees along US 99 and oleander bushes in the median between 0.2 mile southeast of Church Avenue, south of Fresno, and the Kings River in Tulare County, a distance of 20.2 miles. Estimated cost, $124,000.

$65,000 as the state's share of the cost of installing channelization and modifying traffic signals at the intersection of Shaw and Clovis Avenues (Route 168) in Clovis. The county will perform this work as part of a major improvement of Clovis Avenue between California and Shaw Avenues.

Rights-of-way on various state highway routes—$1,570,000.

Inyo County

Construct a two-lane expressway on US 395 between 0.5 mile south of Coloseum Road, approximately 5 miles north of Independence, and Black Rock, just north of Aberdeen, a distance of 10.9 miles. Estimated cost, $1,300,000.

Rights-of-way on various state highway routes—$45,000.

Kern County

Grade for the future four-lane Interstate 5 (Westside) Freeway between US 99 at Wheeler Ridge and 0.1 mile north of Taft Highway (Route 119), a distance of 24.1 miles, with interchange structures at US 99, Route 166, Copus Road, Old River Road, Bear Mountain Boulevard and Taft Highway. Estimated cost, $5,720,000.

$350,000 to continue landscaping and screen planting in progress on US 99 between 0.2 mile south of Planz Road and Minkler Spur, in and near Bakersfield, a distance of 5.9 miles.

Construct a truck weighing station for eastbound traffic on Route 58, approximately one mile east of the junction with Route 223 (Bear Mountain Boulevard), south of Caliente. Estimated cost, $139,000.

Widen and surface Route 155 (Greenhorn Mountain Road) between 0.6 mile and 5.8 miles east of Woody, completing improvement of this highway between Woody and Alta Sierra. Estimated cost, $50,000.

Rights-of-way on various state highway routes—$4,200,000.

Projects under the city and county urban extension program:

Widen one mile of South H Street between Brundage Lane and Ming Avenue in Bakersfield to four-lane, divided highway. Estimated cost, $350,000 (state's share, $175,000).

Kings County

Extend Route 198 freeway construction now in progress (between Route 41 and 11th Avenue in Hanford) another four miles easterly as a freeway and expressway with interchanges at 11th Avenue, Douty Street, 10th Avenue and Central Valley Highway (Route 43). Estimated cost, $2,500,000.

Rights-of-way on various state highway routes—$569,000.

Madera County

Construct an interchange at Avenue 12 and an overcrossing at Avenue 13 to complete the conversion of US 99 from expressway to freeway between the Fresno-Madera county line and Madera, and resurface portions of this route between the county line and 0.2 mile north of Avenue 13½, south of Madera. Estimated cost, $1,910,000.

Rights-of-way on various state highway routes—$379,000.

Mariposa County

Improve a curve on Route 140, about six miles east of the Merced county line. Estimated cost, $124,000.

Rights-of-way on various state highway routes—$75,000.

Merced County

Extend the four-lane Interstate 5 (Westside) Freeway construction now in progress (between Route 152, west of Los Banos, and 2.8 miles north of Route 33, southwest of Gustine in Merced County) another 36.4 miles north through Stanislaus and southern San Joaquin Counties to its junction with Interstate 580; and construct the four-lane Interstate 580 Freeway for 5.2 miles, northwesterly from the junction to projects under construction or budgeted to one mile west

of the San Joaquin-Alameda county line, about seven miles west of Tracy. The project involves construction of interchanges at Sullivan, Stuhr, Fink-Ward, Del Puerto Canyon, Ingram Creek and Chrisman roads, and bridges across the Delta Mendota Canal; 10 creeks, and the California Aqueduct. Roadside safety rests will be provided on each side of the freeway just south of the Stanislaus-San Joaquin county line. A vista point will be constructed for southbound traffic approximately 1.5 miles south of Orestimba Creek and for northbound traffic at Salado Creek in Stanislaus County. Estimated cost, $23,345,000, of which $4,410,000 will be budgeted in the 1966–67 fiscal year. The State Department of Water Resources will contribute $195,000 to the overall cost. (Also listed in Stanislaus and San Joaquin Counties.)

Widen the Route 152 Expressway (Pacheco Pass Highway) from two to four lanes between Route 207, 8 miles west of Los Banos, and 1.9 miles westerly. This project connects to expressway construction in progress around the site of the future San Luis Reservoir. Estimated cost, $685,000.

Widen Route 152 (Pacheco Pass Highway) in Los Banos from two to four lanes between Mercy Springs Road and 0.1 mile east of Ward Road, a distance of 1.1 miles. Estimated cost, $340,000.

Replace the structurally inadequate Boris and Ex overflow bridges and reconstruct approaches on Route 152 (Pacheco Pass Highway), approximately five miles east of the Don Palos Wye. Estimated cost, $150,000.

Landscape and install trees and functional planting on the recently completed US 99 Freeway between 0.9 mile south of Merced and Black Rascal Creek, 1.5 miles north of the city, a distance of 4.6 miles. Estimated cost, $400,000.

Construct a pedestrian overcrossing on the US 99 Expressway at El Capitan Way in Delhi. Estimated cost, $110,000.

Widen portions of South Avenue, Sixth Avenue and Fourth Street (Route 33) in Gustine from 24 to 43 feet. Estimated cost, $210,000.

Rights-of-way on various state highway routes—$310,000.

Mono County

Extend two-lane expressway construction now in progress on Route 120 (Tioga Pass Road) 4.1 miles easterly to 2.7 miles west of Lee Vining. Estimated cost, $3,800,000.

Rights-of-way on various state highway routes—$250,000.

San Joaquin County

Extend the four-lane Interstate 5 (Westside) Freeway construction now in progress (between Route 152, west of Los Banos, and 2.8 miles north of Route 33, southwest of Gustine in Merced County) another 36.4 miles north through Stanislaus and southern San Joaquin Counties to its junction with Interstate 580; and construct the four-lane Interstate 580 Freeway for 5.2 miles, northwesterly from the junction to projects under construction or budgeted to one mile west of the San Joaquin-Alameda county line, about seven miles west of Tracy. The project involves construction of interchanges at Sullivan, Stuhr, Fink-Ward, Del Puerto Canyon, Ingram Creek and Chrisman roads, and bridges across the Delta Mendota Canal; 10 creeks, and the California Aqueduct. Roadside safety rests will be provided on each side of the freeway just south of the Stanislaus-San Joaquin county line. A vista point will be constructed for southbound traffic approximately 1.5 miles south of Orestimba Creek and for northbound traffic at Salado Creek in Stanislaus County. Estimated cost, $23,345,000, of which $4,410,000 will be budgeted in the 1966–67 fiscal year. The State Department of Water Resources will contribute $195,000 to the overall cost. (Also listed in Merced and Stanislaus Counties.)

Construct paired bridges and approaches for the Interstate 5 (Westside) Freeway across Smith's Canal, the Calaveras River and Fourteen Mile Slough, in and near Stockton. The first pair will carry eight lanes of traffic, and the second and third, six lanes. Estimated cost, $2,500,000.

Construct two-lane paired bridges on the Interstate 5 (Westside) Freeway across the California Aqueduct, two miles north of the Stanislaus county line. Estimated cost, $333,000, of which the state highway budget will provide $190,000, and the State Department of Water Resources the balance.

Extend Route 132 five miles westerly from its present terminus in Vernalis as an initial two-lane expressway of an ultimate four-lane freeway, and another one mile westerly as a four-lane freeway, to connect with the Interstate 580 (Westside) Freeway construction now in progress. The project involves construction of a crossing over the existing Route 33 highway and the Southern Pacific Railroad tracks in Vernalis, paired bridges across the California Aqueduct, and an interchange with Chrisman Road. Estimated cost, $3,510,000, of which the state highway budget will provide $3,360,000, and the State Department of Water Resources the balance.

Convert the four-lane US 99 Expressway to a six-lane freeway between the Stanislaus county line and 0.2 mile north of Ripon, a distance of 2.2 miles. The project involves construction of the Main Street Interchange and a pedestrian overcrossing at Acacia Avenue in Ripon, and widening the southbound bridge across the Stanislaus River from two to three lanes. Estimated cost, $2,330,000.

Widen the southbound lanes of the US 99 Freeway between the French Camp Road and Weber Road interchanges, and the northbound lanes between the Weber Road and Mariposa Road interchanges, just south of Stockton, a distance of 4.9 miles, and construct shoulders. Estimated cost, $315,000.

Construct the East Fourth Street Overcrossing and a connecting road to Golden Gate Avenue at Charter Way (Route 26) in Stockton to eliminate the Section Avenue intersection and convert a 0.6-mile expressway section of US 99 to full freeway. Estimated cost, $210,000.

Install functional and tree planting on the recently completed US 99 Freeway bypass of Lodi, between Armstrong Road and the Mokelumne River, a distance of 4.2 miles. Estimated cost, $200,000.

Reconstruct portions of US 50 between 1.1 miles west of Tracy and Kasson Road, 3.5 miles east of that city, a distance of 6.8 miles. Estimated cost, $250,000.

Rights-of-way on various state highway routes—$4,570,000 (including $3,500,000 on the Interstate 5 Freeway in the Stockton area).

Projects under the city and county urban extension program:

Construct parallel bridges for four-lane, divided highway on West Lane across the Calaveras River north of Stockton. Estimated cost, $350,000 (state's share, $175,000).

Widen 0.3-mile section of west lane south of the Calaveras River in Stockton to four-lane, divided highway. Estimated cost, $143,000 (state's share, $71,500).

Solano County

Install functional planting and trees on the Interstate 80 Freeway between 0.5 mile west of Vacaville and just west of the east city limit, a distance of 4.4 miles, and between Sweeney Creek, approximately 4 miles west of Dixon, and 1.2 miles northeast of Route 113 southwest of Davis, a distance of 6.5 miles. Estimated cost, $170,000.

Rights-of-way on various state highway routes—$35,000.

Stanislaus County

Extend the four-lane Interstate 5 (Westside) Freeway construction now in progress (between Route 152, west of Los Banos, and 2.8 miles north of Route 33, southwest of Gustine in Merced County) another 36.4 miles north through Stanislaus and southern San Joaquin Counties to its junction with Interstate 580; and construct the four-lane Interstate 580 Freeway for 5.2 miles, northwesterly from the junction to projects under construction or budgeted to one mile west of the San Joaquin-Alameda county line, about seven miles west of Tracy. The project involves construction of interchanges at Sullivan, Stuhr, Fink-Ward, Del Puerto Canyon, Ingram Creek and Chrisman roads, and bridges across the Delta Mendota Canal, 10 creeks, and the California Aqueduct. Roadside safety rests will be provided on each side of the freeway just south of the Stanislaus-San Joaquin county line. A vista point will be constructed for southbound traffic approximately 1.5 miles south of Orestimba Creek and for northbound traffic at Salado Creek in Stanislaus County. Estimated cost, $23,345,000, of which $4,410,000 will be budgeted in the 1966–67 fiscal year. The State Department of Water Resources will contribute $195,000 to the overall cost. (Also listed in Merced and San Joaquin Counties.)

Rights-of-way on various state highway routes—$455,000.

Tulare County

Complete the four-lane Route 198 Freeway construction now in progress between Ben Maddox Way and Road 164, and four-lane expressway construction between Road 164 and 0.3 mile east of Route 69, east of Visalia, a total distance of 9.4 miles, with interchanges at Lovers Lane and Roads 156 and 164. Estimated cost, $2,138,000.

Plant trees along US 99 and oleander bushes in the median between 0.2 mile southeast of Church Avenue, south of Fresno, and the Kings River in Tulare County, a distance of 20.2 miles. Estimated cost, $124,000.

Rights-of-way on various state highway routes—$100,000.

Tuolumne County

Rights-of-way on various state highway routes—$55,000.

RIVERSIDE–SAN BERNARDINO COUNTIES PROJECTS

Riverside County

Construct the four-lane Interstate 10 Freeway between 1.2 miles east of Desert Center and 1.3 miles west of Wiley Wells Road, about 18 miles west of Blythe, a distance of 27.4 miles. Estimated cost, $9,200,000, of which $4,200,000 will be budgeted in the 1966–67 fiscal year.

Construct the Palm Drive Interchange on Interstate 10, about two miles east of Garnet, to convert this route from expressway to freeway between Garnet and the future Date Palm-Vista Chino Interchange, a distance of 5.5 miles. Estimated cost, $470,000.

Construct an additional lane for westbound traffic on Interstate 10 between 22nd Street and the east city limit of Banning, a distance of 3.3 miles. Estimated cost, $435,000.

Construct decking between paralleling roadway bridges at four locations on the Interstate 10 Freeway, approximately eight miles west of Thousand Palms, to reduce maintenance costs caused by blown sand accumulation in creek channels. Estimated cost, $120,000.

Construct sanitary facilities and picnic tables at the roadside rests on the Interstate 10 Freeway, one mile northwest of Calimesa and three miles northwest of Beaumont, and on the Interstate 15 Freeway four miles east of Field. Estimated cost, $80,000. (Also listed in San Bernardino County.)

Construct a four-lane freeway on Route 71 between 0.7 mile north of Glen Ivy Road and Ontario Avenue in Corona, a distance of 5.5 miles, with interchanges at Weirck Road, Cajalco Road and El Cerrito Road. Estimated cost, $3,500,000.

Widen the US 395 Expressway from two to four lanes between 0.5 mile south of Grand Avenue near Sun City and Route 74 south of Perris, and construct an interchange at Grand Avenue. Estimated cost, $1,500,000.

Widen San Jacinto Street (Route 79) from two to four lanes between Florida Avenue (Route 74) in Hemet and Main Street in San Jacinto, a distance of 2.5 miles. Estimated cost, $160,000.

Landscape the Route 91 (Riverside) Freeway between Lincoln Avenue and the east city limit of Corona, a distance of 1.7 miles. Estimated cost, $150,000.

Widen the Adams Street Overcrossing on the Route 91 (Riverside) Freeway in Riverside from two to four lanes. Estimated cost, $120,000.

Install traffic signals on Hamner Avenue (Route 31) at Fifth Street and at Norco Drive in Norco, and at the ramp connections to the Interstate 10 (San Bernardino) Freeway from Euclid Avenue (Route 83) in Ontario and Upland. Estimated cost, $75,000, of which the state will pay $60,000, and Riverside County the balance.

Rights-of-way on various state highway routes—$2,705,000.

San Bernardino County

Construct a four-lane freeway on Interstate 40 between 2.5 miles east of Daggett and 8.5 miles west of Ludlow, a distance of 31.8 miles, with interchanges at Airport Road, the existing highway at Newberry, Fort Cady Road and Hector Road; and overhead across the A.T. & S.F. Railroad tracks, about 10 miles west of Ludlow; and 10 bridges across washes. Estimated cost, $12,300,000, of which $5,300,000 will be budgeted in the 1966–67 fiscal year.

Construct a four-lane freeway on Interstate 40 between 0.5 mile east of Java and the north city limit of Needles, and two additional lanes for westbound traffic to provide a four-lane freeway between the south city limit of Needles and three miles west of the Colorado River, a total distance of 12.8 miles, with interchanges at River Road Cutoff and National Old Trails Road, and 15 bridges across washes. Estimated cost, $5,110,000, of which $500,000 will be budgeted in the 1966–67 fiscal year.

Widen the Interstate 10 (San Bernardino) Freeway from four to eight lanes between Valley Boulevard, southwest of Fontana, and Pepper Avenue near Colton, a distance of 9.4 miles. The project involves major revision of the Cedar Avenue interchange and construction of an overhead across the Southern Pacific Railroad tracks at Cedar Avenue in Bloomington. Estimated cost, $4,000,000, of which the state will pay $3,400,000, and the county the balance.

$2,250,000 to complete the financing of a previously budgeted widening of the Interstate 10 (San Bernardino) Freeway from four to eight lanes between Valley Boulevard and Vineyard Avenue in Ontario, a distance of six miles. Estimated cost, $4,750,000, of which $2,500,000 was budgeted in the 1964–65 fiscal year.

Construct a four-lane freeway on Route 18 through Waterman Canyon in the San Bernardino Mountains, between 2.5 and 4.5 miles north of the city limit of San Bernardino. Estimated cost, $1,575,000.

Widen one mile of Route 62 to four lanes to permit passing on a steep grade, about 1.5 miles west of Yucca Valley; and eliminate six dips between Morongo and Yucca valleys. Estimated cost, $120,000.

Construct sanitary facilities and picnic tables at the roadside rests on the Interstate 10 Freeway, one mile northwest of Calimesa and three miles northwest of Beaumont, and on the Interstate 15 Freeway four miles east of Field. Estimated cost, $80,000. (Also listed in Riverside County.)

Rights-of-way on various state highway routes—$4,265,000.

LOS ANGELES REGION PROJECTS

Los Angeles County

Grade for the future eight-lane Interstate 5 Freeway between 6.8 miles north of Parker Road at Castaic and approximately 15 miles south of the Kern county line, a distance of 12.4 miles. Estimated cost, $36,500,000, of which $13,800,000 will be budgeted in the 1966–67 fiscal year.

Construct the eight-lane Interstate 5 Freeway between 6.8 miles south and 0.6 mile north of Route 138; and construct a four-lane freeway on Route 138, 2.1 miles easterly of Interstate 5. The project includes construction of interchanges with Quail Lake and Hungry Valley Roads and Route 138. Estimated cost, $9,400,000, of which $2,400,000 wil be budgeted in the 1966–67 fiscal year.

Add auxiliary lanes to the Interstate 5 (Golden State) Freeway between 0.1 mile north of Colorado Street in Los Angeles and 0.2 mile south of Western Avenue in Glendale; complete the interchange between the Interstate 5 (Golden State Freeway) and the Route 134 Freeway in Los Angeles; and construct the eight-lane Route 134 Freeway easterly from the interchange across the Los Angeles River to 0.2 mile east of San Fernando Road in Glendale. The project includes constructing an interchange between the Route 134 Freeway and San Fernando Road. Estimated cost, $7,500,000, of which $2,500,000 will be budgeted in the 1966–67 fiscal year.

Extend the eight-lane Interstate 5 Freeway construction now in progress (between Castaic Creek and 1 mile south of the Santa Clara River) 3.6 miles southerly to 4.1 miles north of Route 14, with interchanges at San Francisquito and Pico-Lyons Road. Estimated cost, $3,500,000.

Landscape the Interstate 5 (Golden State) Freeway between Peoria Street and San Fernando Road in Los Angeles, a net length of 8.2 miles. Estimated cost, $785,000.

Landscape the Interstate 5 (Santa Ana) Freeway between the San Gabriel River and Rio Hondo in Downey. Estimated cost, $200,000.

Extend the eight-lane Route 60 (Pomona) Freeway construction now in progress (between the East Los Angeles Interchange and Woods Avenue), another 4.2 miles to Arroyo Drive in South San Gabriel, connecting with a previously budgeted project for 4 miles easterly to Workman Mill Road; and extend this previously budgeted project 7.7 miles easterly to Jellick Avenue just south of Industry. Estimated cost, $15,185,000.

Construct six lanes of the Route 118 Freeway from Kuehner Drive in Simi Valley, Ventura County, through Santa Susana Pass to Route 27 (Topanga Canyon Boulevard), a distance of 3.9 miles; grade an additional 0.7 mile eastward to Variel Avenue in Chatsworth, Los Angeles County; and extend Route 27 1.5 miles north from Devonshire Street to this freeway. Estimated cost, $9,500,000.

Construct the eight-lane Route 90 Freeway between Centinela Boulevard and Slauson Avenue in Los Angeles, a distance of 1.5 miles, and complete its interchange with the Interstate 405 (San Diego) Freeway. (Portions of the interchange were previously budgeted.) Estimated cost, $6,500,000, of which $4,500,000 will be budgeted in the 1966–67 fiscal year.

Grade and install structures for the future four-lane Antelope Valley Freeway (Route 14) between Avenue I, southwest of Lancaster, and the Kern county line, a distance of eight miles. Estimated cost, $3,700,000.

Realign the Sierra Highway (Route 14) in Palmdale, between 0.4 mile south and 0.1 mile north of Avenue R, to provide for a planned railroad crossing and to improve the Avenue R intersection. Estimated cost, $50,000.

Widen the US 101 (Ventura) Freeway from four to eight lanes for 3.5 miles between the west city limit of Los Angeles and Las Virgenes Road. Estimated cost, $2,700,000.

Add two lanes in the median to widen the Route 7 (Long Beach) Freeway between Bandini Boulevard in Vernon and Olympic Boulevard in East Los Angeles, a distance of 1.4 miles. Estimated cost, $2,500,000.

Construct undercrossings at eight city streets in the route of the future Interstate 210 Freeway, between near Magnolia Avenue in Monrovia and Highland Avenue in Duarte, a distance of 2.4 miles. Estimated cost, $2,200,000.

Modify traffic signals and install lighting and channelization at 13 intersections on Foothill Boulevard (Route 210) between Oro Vista Avenue and Tujunga Canyon Boulevard in Los Angeles. Estimated cost, $170,000, of which the state will pay $90,000, and the city the balance.

Landscape the Interstate 405 (San Diego) Freeway between the Orange county line and the Los Angeles River in Long Beach; and between Artesia Boulevard in Torrance and El Segundo Boulevard in Hawthorne, a net length of 10.9 miles. Estimated cost, $1,160,000.

Regrade a slope on the Interstate 405 (San Diego) Freeway 1.5 miles north of Route 118 (Devonshire Boulevard) in the Mission Hills area to eliminate slides. Estimated cost, $75,000.

Grade for the future eight-lane Route 91 Freeway between 0.3 mile west of Normandie Avenue in Gardena and Vermont Avenue, just west of the Harbor Freeway, a distance of 0.9 mile. Estimated cost, $750,000.

Widen Artesia Boulevard (Route 91) from two to four lanes between Canehill Avenue in Bellflower and Gridley Road in Artesia, a distance of 1.2 miles, including widening the bridge across the San Gabriel River. Estimated cost, $300,000.

Widen Pacific Coast Highway (Route 1) from four to six lanes, and modify channelization and traffic signals at six intersections, between the San Gabriel River in Orange County and the Traffic Circle in Long Beach in Los Angeles County, a distance of 4.1 miles. Estimated cost, $800,000, of which the state will pay $780,000, and Long Beach the balance.

Modify traffic signals, improve drainage and widen the intersection of Lincoln Boulevard (Route 1), and Jefferson Boulevard, near Marina Del Rey. Estimated cost, $102,000, of which the state will pay $70,000, and the county the balance.

One hundred thousand dollars as the state's share of the cost of improving drainage at the intersection of Pacific Coast Highway (Route 1) and Sunset Boulevard in Los Angeles. The project, totaling $1,700,000, will be undertaken by the Los Angeles County Flood Control District.

Widen Norwalk Boulevard-Workman Mill Road (Route 605) from two to four lanes between El Rancho Drive and Strong Avenue, in and near Whittier, a distance of 0.8 mile. Estimated cost, $445,000.

Construct an overcrossing and approaches on the Interstate 605 Freeway at Wardlow Road in Long Beach. Estimated cost, $400,000.

Landscape the Interstate 10 (Santa Monica) Freeway and its interchange with the Interstate 405 (San Diego) Freeway between 0.3 mile west of Sawtelle Boulevard and Overland Avenue, and between 0.4 mile south of National Boulevard and Olympic Boulevard in Los Angeles, a net length of 2.7 miles. Estimated cost, $285,000.

Resurface portions of Olympic Boulevard (Route 10) between Centinela Boulevard in Santa Monica and Vermont Avenue in Los Angeles, prior to relinquishment to the cities of Santa Monica, Beverly Hills and Los Angeles. Estimated cost, $130,000.

Construct a pedestrian overcrossing on the Interstate 10 (San Bernardino) Freeway between City Terrace Drive and Whiteside Street, approximately one mile east of Soto Street in Los Angeles, across the freeway and the Pacific Electric Railway tracks. Estimated cost, $150,000, of which the state will pay $70,000, and the county the balance.

Modify traffic signals, lighting and channelization at 15 intersections on Lakewood Boulevard (Route 19) between Pacific Coast Highway (Route 1) in Long Beach and Alondra Boulevard in Bellflower. Estimated cost, $310,000, of which $240,000 will be paid by the state. The balance will be shared by the Cities of Long Beach, Lakewood and Bellflower.

Pave the medians of the Interstate 5 (Golden State) Freeway between Lanark Street and Osborne Street in Los Angeles; the Harbor Freeway (Route 11) between the Pacific Coast Highway (Route 1) in Wilmington and 111th Place in Los Angeles; the Ventura Freeway (US 101) between 0.5 mile west of Balboa Boulevard and 0.2 mile east of Lindley Avenue in the San Fernando Valley; and the Ventura Freeway (Route 134) between the Hollywood Freeway (US 101) in North Hollywood and the Interstate 5 (Golden State) Freeway in Los Angeles, a total distance of 19 miles. Estimated cost, $175,000.

Resurface and improve gutters on Topanga Canyon Boulevard (Route 27) between Mulholland Drive and Avenue San Luis in Los Angeles, a distance of one mile. Estimated cost, $150,000.

Modify traffic signals and lighting at 12 intersections on Verdugo Road (Route 2) between York Boulevard in Los Angeles and Glendale Avenue in Glendale. Estimated cost, $148,000, of which the state will pay $86,000, and the two cities the balance.

Modify traffic signals and lighting at nine intersections on Colorado Street (Route 134) between Pacific Avenue and Chevy Chase Drive in Glendale. Estimated cost, $103,000, of which the state will pay $52,000, and Glendale the balance.

Resurface Linda Vista Avenue (Route 159) between Holly Street and the vicinity of the Route 210 Freeway in Pasadena, a distance of three miles. Estimated cost, $70,000.

Rights-of-way on various state highway routes—$55,169,000 (including $14,300,000 on the Interstate 210 Freeway in the Pasadena-Arcadia-Glendora area; $7,700,000 on the Route 2 (Glendale) Freeway in and near Glendale; and $3,550,000 on the Route 134 Freeway in the Glendale-Eagle Rock area).

Projects under the city and county urban extension program:

Widen 2.6 miles of Azusa Avenue between Francisquito Avenue and Amar Road in West Covina and in Los Angeles urban area to four-lane, divided highway. Estimated cost, $1,200,000 (state's share, $600,000).

Orange County

Construct the six-lane Route 22 (Garden Grove) Freeway between 0.3 mile east of Main Street in Orange and the Route 55 (Newport) Freeway, a distance of 1.9 miles. The project involves completing the interchange at Main Street and constructing interchanges at Glassell Street, Tustin Avenue and the Newport Freeway. Estimated cost, $4,400,000.

Landscape the Route 22 (Garden Grove) Freeway between Garden Grove Boulevard and Newland Street in Garden Grove, and between Devon Road in Santa Ana and 0.3

mile east of Main Street in Orange, a net length of 1.9 miles. Estimated cost, $315,000.

Four million dollars to complete the financing of the eight-lane Interstate 405 (San Diego) Freeway construction now in progress between 0.2 mile northwest of Beach Boulevard (Route 39) and 0.2 mile southeast of Brookhurst Avenue in Fountain Valley, with interchanges at Cannery Street-Warner Avenue and Brookhurst Avenue. Estimated cost, $7,500,000, of which $3,500,000 was budgeted in the 1964–65 fiscal year.

Construct the four-lane Route 240 Freeway, a noninterstate southerly extension of the Interstate 605 Freeway, 0.7 mile between the Interstate 405 (San Diego) and Route 22 (Garden Grove) freeways. The project involves constructing portions of the interchanges with the two freeways. Estimated cost, $3,000,000.

Widen Pacific Coast Highway (Route 1) from four to six lanes, and modify channelization and traffic signals at six intersections, between the San Gabriel River in Orange County and the Traffic Circle in Long Beach in Los Angeles County, a distance of 4.1 miles. Estimated cost, $800,000, of which the state will pay $780,000, and Long Beach the balance.

Replace the Anaheim Bay Bridge and approaches on Pacific Coast Highway (Route 1) southeast of Seal Beach to provide additional width and vertical clearance over the channel. Estimated cost, $647,000, of which the state will pay $156,000, and the county the balance.

Widen portions of the Pacific Coast Highway (Route 1) from a conventional four-lane facility to a four-lane divided highway, and modify traffic signals between Diamond Street and Viejo Street in Laguna Beach, a distance of 1.2 miles. Estimated cost, $140,000, of which the state will pay $95,000 and the city the balance.

Widen Imperial Highway (Route 42) from two to four lanes divided between Beach Boulevard in La Habra and 0.3 mile east of Harbor Boulevard in Fullerton, a distance of 2.2 miles. Estimated cost, $570,000, of which the state will pay $530,000, and the two cities the balance.

Modify traffic signals, lighting and channelization, improve drainage and reconstruct portions of Imperial Highway (Route 42) between Sievers Avenue and Orange Avenue in Brea, a distance of 0.3 mile. Estimated cost, $80,000.

Replace the left-hand southeastbound on-ramp from Stanton Avenue in Buena Park to the Interstate 5 (Santa Ana) Freeway with a right-hand on-ramp. Estimated cost, $250,000.

Widen South Main Street (Route 73) between 0.5 mile north of relocated MacArthur Boulevard and Warner Avenue in Santa Ana, a distance of 1.1 miles, from three to four lanes, and modify and install traffic signals at three intersections. Estimated cost, $190,000, of which the state will pay $175,000, and the city the balance.

Modify traffic signals, lighting and channelization at nine intersections on Beach Boulevard (Route 39) between Main Street-Ellis Avenue in Huntington Beach and La Palma Avenue in Buena Park. Estimated cost, $145,000, of which the state will pay $105,000.

Resurface and paint channelization lanes on Los Angeles Street (Route 72) between 0.1 mile south of Cerritos Avenue and 0.1 mile north of Ball Road in Anaheim, a distance of 0.7 mile. Estimated cost, $65,000.

Rights-of-way on various state highway routes—$14,652,000 (including $8,600,000 on the Interstate 405 (San Diego) Freeway, and $3,700,000 on the Route 57 Freeway between Santa Ana and the Los Angeles county line north of Brea.)

SAN DIEGO–IMPERIAL COUNTIES PROJECTS

Imperial County

Construct the four-lane Interstate 8 Freeway between 0.4 mile west of Imperial Avenue in El Centro and 0.4 mile east of Route 111, a distance of 4.8 miles, with interchanges at Imperial Avenue, Fourth Street, Dogwood Road and Route 111. Estimated cost, $6,100,000, of which $3,100,000 will be budgeted in the 1966–67 fiscal year.

Rights-of-way on various state highway routes—$1,287,000.

San Diego County

Extend the Interstate 5 (San Diego) Freeway 9.7 miles northerly as an eight-lane facility between 0.4 mile north of the San Luis Rey River at Oceanside and 2 miles north of Las Pulgas Road, approximately 12 miles south of San Clemente, with interchanges at Vandergrift Boulevard and Las Pulgas Road. Estimated cost, $9,600,000, of which $3,900,000 will be budgeted in the 1966–67 fiscal year.

$6,000,000 to complete the financing of a previously budgeted project which will extend the eight-lane Interstate 5 (San Diego) Freeway in San Diego 2.2 miles northerly to Rosecrans Street, with interchanges at Washington and Trias Streets; a viaduct crossing of the AT&SF railroad tracks, US 101 and Rosecrans Street; and temporary connections to US 101. Estimated cost, $9,000,000, of which $3,000,000 was budgeted in 1964–65 fiscal year.

Construct the eight-lane Interstate 5 (San Diego) Freeway between the San Diego River and 0.3 mile north of Tecolote Creek, a distance of 0.9 mile, with an interchange at Sunset Cliffs Boulevard. Estimated cost, $2,750,000.

Pave to complete the eight-lane Interstate 5 (San Diego) Freeway between 0.6 mile south of Carmel Valley Road and 0.4 mile north of Via de la Valle near Del Mar, a distance of 4.1 miles. Estimated cost, $2,200,000.

Extend a previously budgeted eight-lane construction project on the Interstate 5 (San Diego) Freeway (between San Marcos Road near Encinitas and 4.8 miles south of Route 78 in Oceanside) another 1.6 miles northerly, with an interchange at Palomar Airport Road. Estimated cost, $1,200,000.

Landscape and install functional planting on the Interstate 5 (San Diego) Freeway between 28th and Market Streets in San Diego, a distance of 1.5 miles. Estimated cost, $360,000.

Add one southbound lane on the Interstate 5 (Montgomery) Freeway between 0.4 mile south of H Street in Chula Vista and 0.1 mile south of 24th Street in National City, a distance of 2.4 miles, pending future widening of this section to eight lanes. Estimated cost, $216,000.

Extend the soon-to-be-completed four-lane Interstate 8 Freeway section in the Mountain Springs area, near the Imperial-San Diego county line, another 10 miles westerly to County Road J-35 near Boulevard, with interchanges at Carrizo Gorge Road near Jacumba, and at Inkopah County Park at the county line. Estimated cost, $8,562,000, of which $4,562,000 will be budgeted in the 1966-67 fiscal year.

Extend the four-lane US 395 Freeway construction now in progress (between 2 miles north of Miramar Road at the Miramar Naval Air Station and north of Poway Road) another 5.2 miles northerly to 0.6 mile north of Rancho Bernardo Road, with interchanges at Carmel Mountain Road and Rancho Bernardo Road. Estimated cost, $3,580,000.

Construct an interchange between the Route 78 Freeway and El Camino Real at the city limits of Oceanside and Carlsbad. Estimated cost, $1,150,000.

Construct a frontage road for the future Route 67 Freeway between Pepper Drive and Broadway in El Cajon, and portions of interchanges with Bradley Avenue and Fletcher Parkway-Broadway. Estimated cost, $1,000,000.

Grade and construct an undercrossing for the future Route 94 Freeway between 0.2 mile east of Palm Avenue and Conrad Drive near La Mesa, a distance of 1.4 miles. Estimated cost, $900,000.

Widen Route 76 from two to four lanes between 0.8 mile and 2.4 miles east of Interstate 5 in Oceanside, pending future freeway construction of this route on new alignment. Estimated cost, $400,000.

Rights-of-way on various state highway routes—$12,907,000 (including $6,800,000 on Interstate 805 in the San Diego area).

Projects under the city and county urban extension program:

Widen 2.3 miles of Broadway between Magnolia Avenue and East Main Street in El Cajon to four-lane highway. Estimated cost, $1,015,000 (state's share, $376,000).

Letter of Transmittal

December 2, 1964

R. JOHN ERRECA
Director of Public Works
State of California

ear Sir:

The 18th Annual Report of the Division of Highways for the scal year ending June 30, 1964, is submitted herewith for our approval and transmittal to Governor Edmund G. Brown. It was prepared in compliance with Section 143 of the Streets and Highways Code.

The report updates information on the statewide construction program through the end of this calendar year and describes projects in the 1965–66 fiscal year budget, adopted by the Highway Commission at its October meeting.

Construction emphasis again was focused on California's 2,178-mile share of the national system of defense and interstate highways, a system within and comprising approximately 17.5 percent of the state's 12,414-mile freeway and expressway system. This emphasis will be continued over the next several years to meet the federal requirement that it be completed by 1972.

Attention to the interstate system, however, has not prevented the division from making good progress in converting noninterstate routes to freeway standards, or in improving traffic safety and mobility by widening conventional highways, easing curves and installing left-turn lanes.

The text portion of the annual report is illustrated and published as the November–December issue of our bimonthly magazine, *California Highways and Public Works*. A supplement containing financial statements, apportionment tables, contract statistics and other data will be available to interested persons on request.

J. C. WOMACK
State Highway Engineer

December 2, 1964

EDMUND G. BROWN
Governor of California

My dear Governor:

California's continuing progress in improving traffic safety and mobility is described in the 18th Annual Report of the Division of Highways, Department of Public Works, which I am pleased to submit to you. The report also covers the activities of the division's various units for the fiscal year ending June 30, 1964.

I am particularly pleased to report that the state's 1,500th mile of full freeway, included in an Interstate 15 project in San Bernardino County, was opened to traffic in October. Completed freeway mileage will increase to 1,589 by the end of this year.

To mention only a few of the notable freeway openings during 1964, there were the Donner Summit section of Interstate 80; several projects on heavily traveled freeway routes in the Los Angeles metropolitan area; and several projects on US 99, US 101 and Interstate 5 in the northern areas of the state.

Steady progress is also being made in extending freeway mileage in the San Diego area and a good start has been made on the Interstate network in Sacramento.

Also, while the records clearly show that construction of modern freeways is the single greatest advance we can make in the cause of traffic safety, we are conducting intensified research into methods of making existing highways safer through engineering improvements.

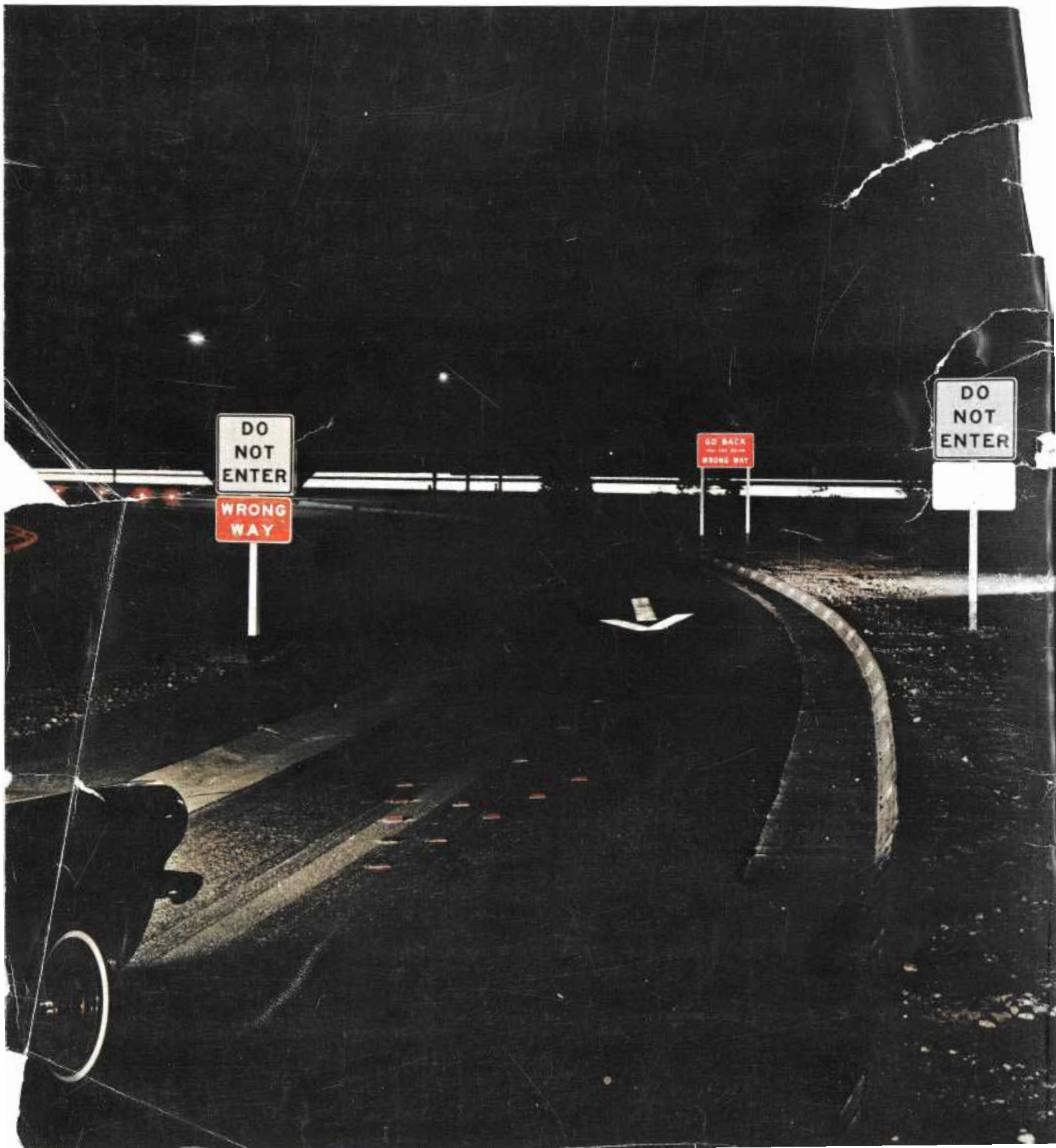
Routings have been adopted by the Highway Commission for all but 18 miles of California's share of the national system of defense and interstate highways; 701 miles of this system have been completed, and another 527 miles are under construction or budgeted. Additionally, 169 miles are in operation as expressways but will be upgraded to full freeway standards by 1972.

Most of this completed mileage has been in densely populated metropolitan areas and in the mountains and deserts, thereby affording the greatest traffic relief. A great portion of the remaining mileage will be constructed in relatively easy rural terrain.

Despite firm predictions that motor vehicle travel in California will increase to 200 billion miles a year by 1980, the state's orderly program of freeway construction and other highway development will insure less traffic congestion at that time than exists today.

Respectfully,

JOHN ERRECA
Director of Public Works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