CALIFORNIA highways and public works

ANNUAL REPORT ISSUE

november-december 1965

Letters of Transmittal

December 13, 1965

MR. JOHN ERRECA
Director of Public Works
State of California

Dear Sir:

In compliance with Section 143 of the Streets and Highways Code, the 19th Annual Report of the Division of Highways for the fiscal year ending June 30, 1965, is submitted herewith for your approval and transmittal to Governor Edmund G. Brown.

The report also includes the highlights of the division's construction through calendar year 1965, as well as a description of the projects in the 1966–67 fiscal year budget, adopted by the Highway Commission at its October meeting.

As in the past several years, construction emphasis has been on the completion of California's portion of the national system of defense and interstate highways, a system within and comprising about 17 percent of this state's 12,497-mile freeway and expressway system.

I am pleased to report that 66 percent of these interstate freeways, which by 1975 will carry 30 billion of an expected 141 billion motor vehicle miles of travel in California, has been completed, or is under construction or budgeted.

Simultaneously, the division has made good progress in converting conventional highways to freeway standards, and in enhancing safety and mobility on other routes in every area of the state by engineering improvements.

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 14, 1965

EDMUND G. BROWN
Governor of California

My dear Governor:

It is my pleasure to submit to you the 19th Annual Report of the Division of Highways, Department of Public Works, which presents the activities of the division's various units in the past fiscal year, and describes our progress in planning and constructing today for our future transportation needs.

California began 1965 while reeling under the blows of last winter's devastating floods. However, through the combination of the skill and determination of the Division of Highways personnel with legislation that provided emergency flood damage repair funds, our highways and bridges were replaced or repaired in record time. Our overall construction schedule was not delayed.

In addition to the progress on the interstate system freeways, that the State Highway Engineer reported in the attached letter, California made steady gains in 1965 toward the completion of its 12,497-mile freeway and expressway system, master-planned by the Legislature.

This year, of the estimated 47 billion motor vehicle miles traveled on state highways, approximately half took place on freeways. This not only represents a decrease in the traveled miles on formerly high volume conventional highways, but a great gain in terms of the saving of human lives and suffering.

In a report prepared in October in cooperation with the U.S. Bureau of Public Roads, the Traffic Department of the Division of Highways stated, "If the amount of freeway travel that occurred in 1964 on California's state highway system had been forced to occur on conventional highways and expressways, there would have been approximately 78,500 additional accidents and over 650 additional fatalities."

Knowing that the conversion of routes to full freeway standards where traffic conditions warrant is the single greatest advance we can make in the cause of traffic safety, we are confident that the more than 200 miles of freeway opened to traffic in 1965 will result in additional prevention of highway carnage.

We are not only building safer traffic facilities, but we are paying increasing attention to making them more attractive. This has resulted in additional emphasis on design aesthetics and in stepped-up programs for landscaping and driver amenities.

Respectfully,

JOHN ERRECA
Director of Public Works

California Highways and Public Works

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

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FRONT COVER: The men raking leaves on the front cover are Robert Johnson and R. D. Collins, both of District 11 Maintenance Department. The leaves are in the median of the US 395 freeway through Balboa Park, just a few blocks from the heart of downtown San Diego. In this year of great emphasis on highway beautification, the California Division of Highways can proudly point to this urban freeway, and dozens of other such landscaped freeways throughout the state, as proof California has long been a leader in highway beautification. Photograph by Bill Ruland.

BACK COVER: The replacement of the old sidehill viaduct at Dodge Point near the summit of Tioga Pass on State Route 120 will make passage of this route safer and easier for motorists. The new structure is part of the modernization program on the eastern end of this route. A comprehensive article on Tioga Pass will appear in the next issue of this magazine. Photograph by Bill Ruland.

This photo of the California Highway Commission was taken at its April meeting in Sacramento. Seated clockwise around the table are (left): Robert B. Bradford, Administrator of the Transportation Agency and Chairman; John Erreca, Director of Public Works and Administrative Officer; Roger S. Woolley; Franklin S. Payne; Joseph C. Houghteling; Jack Cooper, Commission Secretary; Robert T. Martin, Assistant Secretary; J. C. Womack, State Highway Engineer; William S. Whitehurst, Abraham Kofman, and James Guthrie.

CALENDAR OF MEETINGS

CALIFORNIA HIGHWAY COMMISSION
JULY 1, 1964, TO JUNE 30, 1965

July 9, 1964 — Los Angeles
Public hearing, 07-LA-118, between 0.3 mile west of DeSoto Avenue and the adopted Route 210 Freeway near Hansen Dam

July 29, 30 — Sacramento

July 31 — Woodside
Public hearing, 04-SM,SCl-24, between Route 35 (Skyline Boulevard) and Santa Cruz Avenue in Menlo Park

August 31 — Sacramento

September 1 — Sacramento

September 10 — Pasadena
Public hearing, 7-LA-2,7,210, Route 2, between Verdugo Boulevard and Foothill Boulevard; Route 210, between Wheatland Avenue and Linda Vista Avenue; Route 7, between Huntington Drive and Route 134; Route 210, between Linda Vista Avenue and 0.3 mile east of junction of Route 134

September 23 — San Diego

October 22, 23 — Echo Summit
Inspection of state highways in El Dorado, Alpine and Calaveras Counties

October 28, 29 — Sacramento

November 18 — Sacramento

December 16 — Sacramento

January 8, 1965—Business meeting — Los Angeles
Public hearing, 7-Ven-118, between First Street and Patterson Ranch Railroad spur near Tapo Street

January 26
Inspection of flood-damaged state highways in Mendocino, Humboldt and Del Norte Counties

January 27 — Sacramento

February 24, 25 — Los Angeles
Inspection of state highways in Riverside and San Bernardino Counties

March 24 — Sacramento

March 25 — Los Banos
Public hearing, 10-Mer-152, between junction of existing Route 207 and the Madera county line

April 28, 29 — Sacramento

May 25 — Long Beach
Public hearing, 7-LA-1,22, Route 1, between Pacific Coast Highway at Colorado Street and Vermont Avenue; Route 22, between Pacific Coast Highway at Colorado Street and Cerrito Channel

May 26 — Los Angeles

June 17 — San Bruno

June 29, 30 — Sacramento

The list of past members of the California Highway Commission which has appeared yearly in the annual report will now be published every fourth year.

Copies of the organization charts of the Department of Public Works and the Division of Highways which formerly were included in the report are now available upon request.

California Highways... 1965

Building a freeway is a complex task that requires the services of skilled workers. On the average, for every $1,000,000 spent on highway construction, $325,000 goes to pay the salaries of individuals such as these two men who were photographed during May as they did cement work on Routes 82 and 87 in San Francisco.

The repair and renovation of highways and bridges in northern California that were either damaged or swept away by last winter's floods was of primary concern during 1965.

Because state highways are the economic lifelines on which the citizens of the ravaged area must depend, there was no wasted motion in the campaign to reopen them. The engrossing story of the way in which this was done and the cost in time, manpower, materials and cash required to accomplish the task have been reported in previous 1965 issues of *California Highways and Public Works*.[1]

But there was not complete preoccupation with bringing the northland back to normal. In addition to the routine tasks, increasing emphasis and greater centralized control of other programs that have been in effect for a number of years took place. Of the latter, the two most significant and of great obvious interest to the public were highway beautification and traffic safety.

The Division of Highways philosophy regarding highway beautification was embodied in a document that originated from within the California Highway Commission. In the form of a resolution, and passed unanimously by the commissioners, it called for practical cooperation from the commission, the Department of Public Works and the division with various federal agencies and the California State Legislature in implementing the Federal Highway Beautification Program.

The commission lauded the effective programs of identical or allied nature that the division has been pursuing toward ultimate completion for the past several years.

Scenic System Included

Included is the 5,000-mile scenic highway system. Its general standards and criteria were adopted by Governor Edmund G. Brown's Advisory Committee on a Master Plan for Scenic Highways.

A complimentary program is the construction of roadside rests at 257 locations scattered throughout California. A number of them have been completed and the total open to the public increases on an almost month-to-month basis.[2]

The commission drew attention to the $45 million already spent on installing landscaping along state highways and the additional like sum spent in the maintenance of existing landscaped areas.

In the budget for the coming fiscal year, the commission boosted that previous $90-million total to well over the $100-million level by earmarking approximately $17 million more for new

[1] January–February 1965, *California Highways and Public Works.*

[2] July–August 1965, *California Highways and Public Works.*

landscaping and maintenance during the 1966–67 fiscal year.[3]

The commission also pledged support to the accelerated interest in highway beautification that is sweeping the state and the nation and charged the division with making the public aware of both its interest and its policy.

Similar pride, concern and interest were evidenced by Governor Brown in October when he announced the contract award of the largest highway landscaping job in the division's history at a press conference.

The contract calls for the beautification of a 5.8-mile stretch of the San Diego Freeway between Long Beach and Signal Hill. Among the requirements are the planting of more than 18,000 shrubs, approximately 4,000 trees and almost a million and a half ground cover plants.

Work Started

Actual work started during November by Valley Crest Landscape, Inc., of Van Nuys. The amount of their contract was in excess of $429,000.

On July 30, State Highway Engineer J. C. Womack announced changes in the financing of the long-established "spot correction" program. ("Spot correction" is simply the identification and correction of any point in the highway system that has caused an accident concentration.)[4]

In the past, individual projects were financed from available contingency funds but on Womack's recommendation, the commission established a $3-million budget item as the prime source of funds for these traffic engineering safety improvements. Because counties and cities often are involved in the projects, it is anticipated that another $1,500,000 will be provided by those local governments.

Traffic engineering safety improvements include easing curves, installing or modifying signals, constructing left-turn storage lanes, applying antiskid treatment to the road surface, providing truck climbing lanes, and many more. Some of these will also serve to reduce congestion and delay to the motorist.

Womack said that more costly and extensive projects for accident reduction, such as replacing narrow bridges, installing median barriers on freeways, and correcting curves in rugged terrain, will continue to be financed by the general state highway construction budget, and sometimes in part by federal moneys, rather than by the special fund.

Statistics are not yet available for 1965, but in 1964 there were 32 accident reduction projects costing more

[3] 1966–67 highway budget, this issue.
[4] July–August 1965, *California Highways and Public Works*.

STATUS OF CALIFORNIA'S 43 SAFETY ROADSIDE RESTS

County	Location	Status
Amador	Route 88, 4 miles west of Jackson	Open, but no water supply
Calaveras	Route 49, 4 miles south of Angels Camp	Open, but no water supply
Calaveras	Route 49, 7 miles south of San Andreas	Open, but no water supply
Del Norte	US 199, at south portal Collier Tunnel, 3 miles south of Oregon border	Open
Glenn	Interstate 5, pair; about 2 miles south of Artois	Under construction
Imperial	Interstate 8, 20 miles west of Arizona border	Open; comfort facilities to be added
Inyo	US 395, near Haiwee Reservoir	Open
Inyo	US 395, near Division Creek north of Independence	Budgeted
Kern	Interstate 5, near Lebec	Open, but no comfort facilities
Lassen	Route 44, 28 miles northwest of Susanville	Budgeted
Lassen	US 395, 12 miles south of Ravendale	Open
Los Angeles	Interstate 5, near Castaic	Map inspection station; under construction
Mariposa	Route 140, 8 miles east of Mariposa	Open, but no water supply
Merced	Interstate 5, pair; near San Luis Dam near Los Banos	Under construction
Nevada	Interstate 80, pair; near Donner Summit	Open
Plumas	Route 70, 46 miles east of Quincy	Open, but no water supply
Riverside	Interstate 10, pair; 15 miles east of Indio	Open, with comfort facilities to be added later
San Bernardino and Riverside	Interstate 10, pair; between Redlands and Beaumont	Open; comfort facilities under construction
San Bernardino	Interstate 10, near Fontana	Map inspection station; under construction
San Bernardino	Interstate 15, 3 pairs; all east of Barstow	All open; two pair with comfort facilities, which will be provided later for the third pair
San Bernardino	Interstate 40, three rests; between Needles and Barstow	Open, but no water supply
San Diego	Interstate 5, near Leucadia	Map inspection station; under construction; no restrooms
Shasta	Route 299, 38 miles east of Redding	Open, but no water supply
Tehama	Interstate 5, pair; north of Red Bluff	Open
Trinity	Route 299, 5 miles south of Weaverville	Open
Tulare	US 99, pair; 5 miles north of Tipton	Open

than $50,000 each included in the 301 safety improvement projects completed. They brought the total cost of such projects to nearly $8,200,000 for that year. This total includes more than $350,000 in projects costing less than $5,000 each.

Fewer Accidents

The State Highway Engineer estimated that 800 to 1,000 fewer accidents each year will occur at these 301 improved locations. These safety benefits are in addition to the large number of accidents that will be prevented by routine improvements carried out by the division's maintenance crews on a day-to-day basis. These include installing warning signs, striping, and the delineation of curves and fixed objects.

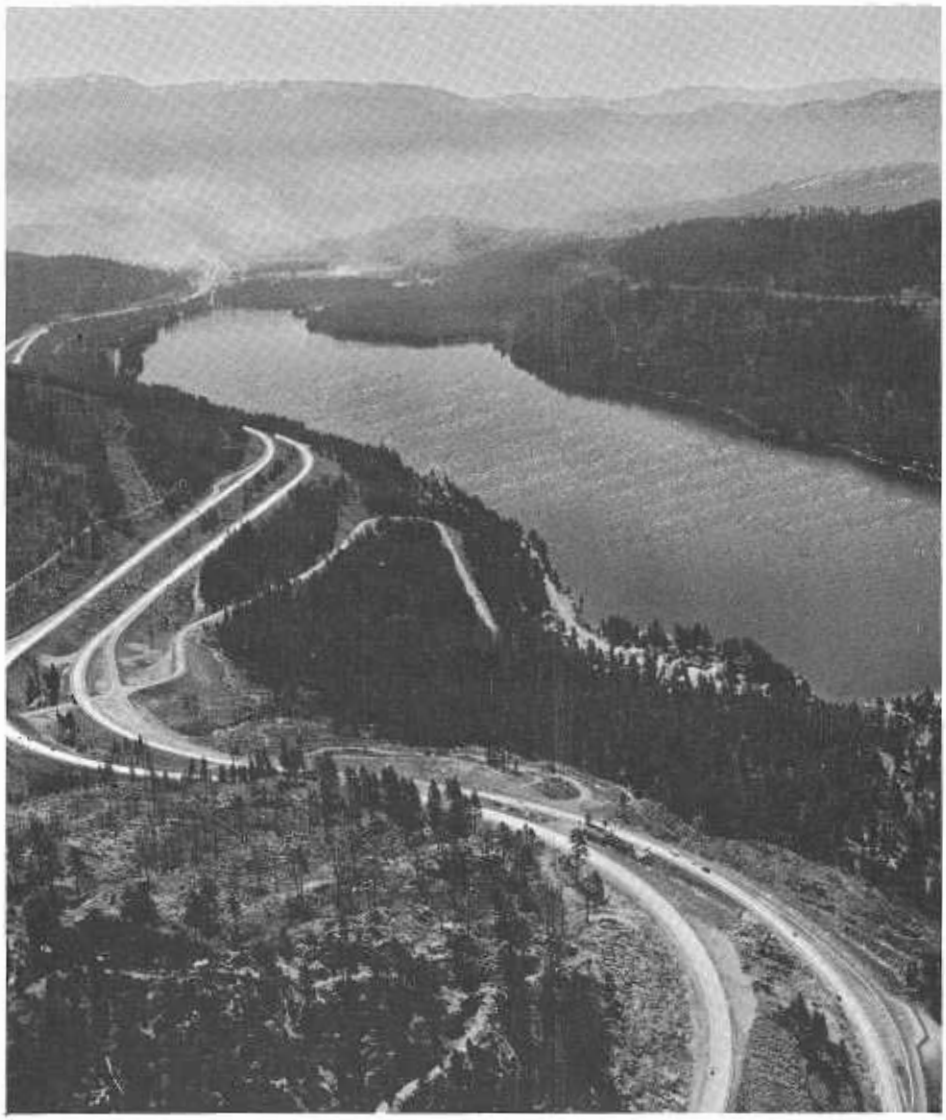
Going back even further, a study in 1962 of former problem locations improved by projects in the $5,000–$50,000 range reflected about a one-third reduction in accidents. A recent review of the benefits to be expected indicates a 25-percent reduction in accidents, probably because many of the worst locations have been corrected, Womack added.

While the California "spot correction" program is in line with the stepped-up nationwide emphasis on traffic safety projects announced recently by Federal Highway Administrator Rex M. Whitton, Womack explained that federal aid funds are not channeled into these projects in this state.

Instead, the federal aid moneys are applied to construction of the major freeway projects, which, Womack pointed out, provide maximum benefits in term of safety as well as efficiency and economy. Freeways now in operation in California are credited with saving one life and preventing 65 injuries every day, as compared with what the records show would have happened if the same amount of travel had taken place on conventional roads.

He emphasized that the continual surveillance of the highway system to locate accident concentration locations has been a long-established procedure, but has received increased attention in recent years. This has been aided by the use of electronic data processing methods to pinpoint trouble spots.

How high were the waters over US 101 in Humboldt County during last winter's floods? The signpost shown on the left side of the above photograph is accurate. The water actually covered the road and adjacent lands to the level of the horizontal striped bar.



One of the most important and spectacular freeway openings during the year was the new section of Interstate 80 over the Donner Pass area. This photo, taken from above the summit, is looking eastward across Donner Lake.

Dangerous Locations Reported

Other dangerous locations are reported by enforcement officers, public agencies and individual citizens.

"Equally important as finding hazardous spots," Womack said, "is determining if and how they can be neutralized.

"Too many people see cure-alls in recommending such things as traffic signals, for example, where possibly these would increase the number of accidents. There are more rear-end accidents at signalized intersections, although these are usually less severe than the broadside accidents the signals reduce."

The $3,000,000 special fund will be divided among the 11 state highway districts according to their amount of travel and accident percentages.

The concept of using airspace over and under freeways for other productive purposes by public agencies and for private use has been under study for the past five years.[5]

[5] September–October 1965, *California Highways and Public Works.*

In July, a meeting of state, county and city officials was called by Robert B. Bradford, Administrator of the State Transportation Agency, to discuss the matter.

He opened the meeting by outlining the state's philosophy in the following words.

"California is gaining 1,750 people a day. By 1980, we are convinced that resulting land shortage will force building over and under freeways.

"This will happen even if we do no long-range planning. What we must do now is see that this building is designed purposefully rather than through neglect of the highest and best use—a use in keeping with local community plans."

Team Effort Needed

He emphasized that this can be accomplished only by the team efforts of the state, cities and counties, and that all such construction must be approved by local government.

"We are not talking about any total use of this airspace," Bradford added, "but selective development of property sensitively done in selected areas."

An on-the-spot inspection by Governor Edmund G. Brown of new MacArthur Freeway construction in Oakland took place in October. He was accompanied by (left) Alan Hart, district engineer, and (right) Gordon Ball, the contractor whose firm accomplished the construction. The Governor cited the fact that vehicles that travel the new stretch of approximately four freeway miles in lieu of city streets save eight minutes.

The California Highway Commission will not be interested solely in high bids in leasing airspace but will insist that proposals benefit the community, he promised.

Delegates from all cities and counties represented agreed that full consideration must be given to aesthetics and that no use of space over and under freeways be authorized where landscaping is more appropriate. Unanimous concern for motorists was expressed and warnings voiced to disregard any temptation to approve construction that might result in disservice to drivers by routing traffic through a series of boxlike tunnels.

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 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.

Commission Duties

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 1966–67, it budgeted $651,919,655 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, a unit of the Department of Public Works, is

This section of Route 1 in Monterey County is a portion of the first official scenic highway to be adopted by the State Department of Public Works. The entire link is between the San Luis Obispo county line and the Carmel River. To be classified a scenic highway, a road must traverse areas of outstanding beauty; and in location design and construction receive special attention regarding its visual appearance and ability to blend into the surrounding landscape.

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

California subscribes to the philosophy that pay-as-you-go is the best way to plan, construct and maintain highways. But that theory could have been put to the acid test early in the year when it became obvious that $50–$60 million would be required to finance the immediate program envisioned for restoring flood-damaged roads and bridges.

Instead, however, the funds were derived from a special 1-cent-a-gallon gasoline tax that went into effect on April 1 and was rescinded on August 31. The tax was imposed by Senate Bill 268, which was introduced by Senator Randolph Collier, Chairman of the Senate Transportation Committee. It could have remained in force for a maximum of nine months but was lifted at the end of August by Governor Brown because of excellent progress made in the repair program and the availability of enough additional funds from federal and other sources to ensure completion.

Revenue Sources

With the exception of this very temporary tax, funds were derived from 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 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 moneys 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.

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

	Miles Completed and in operation Dec. 31		*Miles under construction or budgeted Dec. 31*	
	1964	*1965*	*1964*	*1965*
Full freeway	1,570	1,825	758	735
Multilane divided expressway	740	704	58	53
Subtotal	2,310	2,529	816	788
Two-lane expressway	777	823	129	111
Conventional highway	11,113	10,848	69	82
Total, state highway system	14,200	14,200	1,014	981

Freeway and expressway figures include interstate.

Spring always comes late in the year to some California highways. This statement is proved in the above photograph taken in June at Carson Pass on Route 88 in Alpine County.

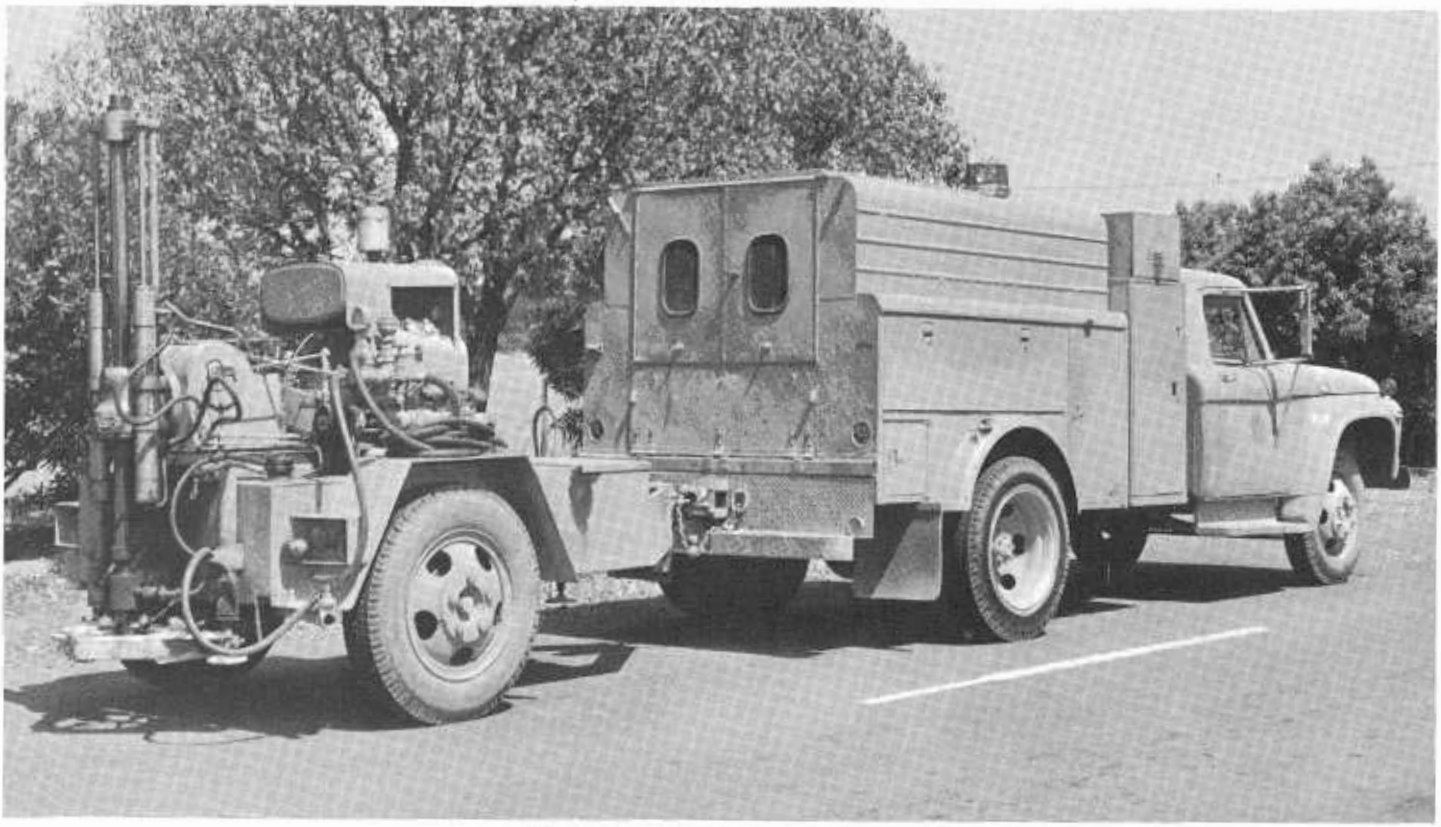
control points through which they must pass. It remains for the Highway Commission, however, to determine specific routings.

District Engineer's Duties

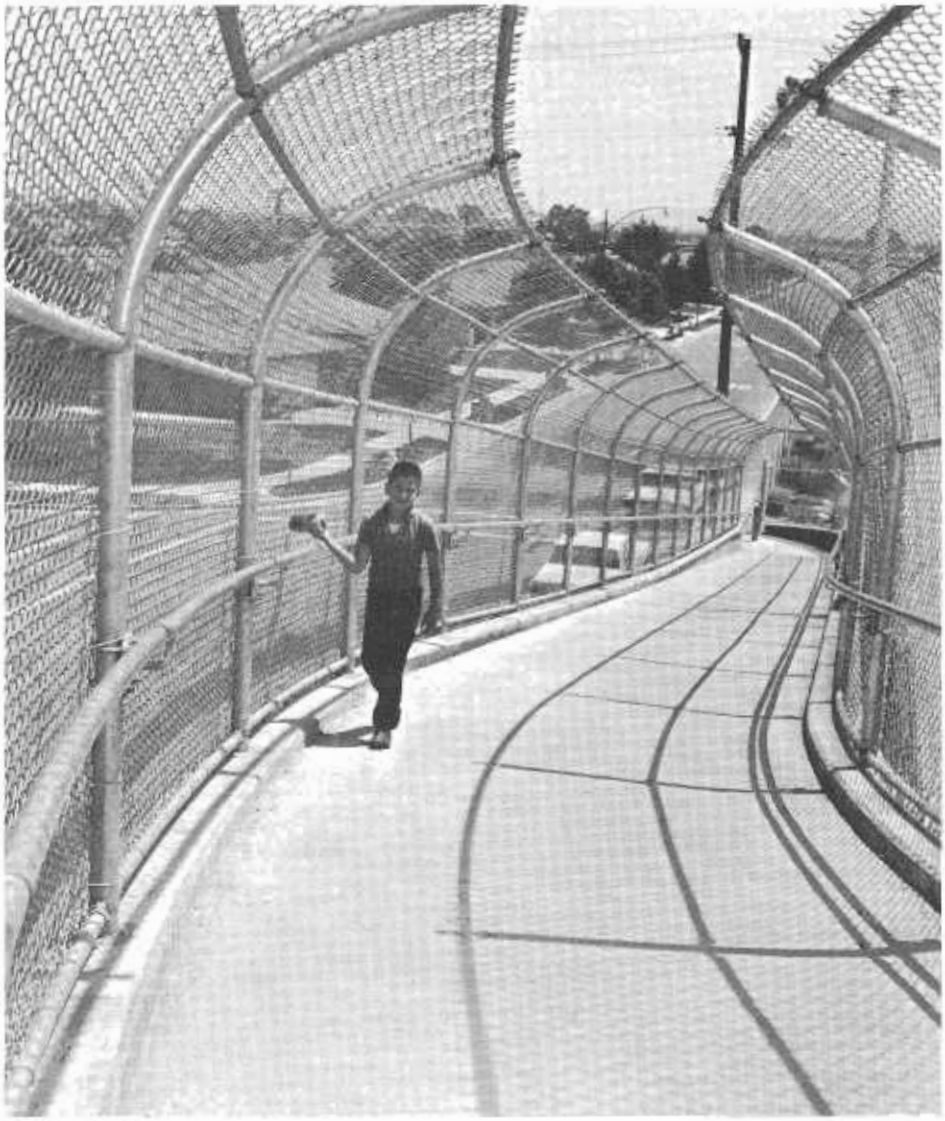
Like the old-time policeman on the beat, the local district highway engineer knows the area for which he is responsible. When he finds that freeway location studies are indicated, he obtains authority to make them from the State Highway Engineer.

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



Mobile coring machines like the one shown here are used for cutting cores up to 12 inches in diameter from finished roadways to check compliance of the as-built roadway against the specifications.



The chain link fences that form protective barriers on freeway overcrossings designed in recent years for pedestrian use have been modified from a square cagelike effect to this less confining structure. This type provides full protection and at the same time avoids any tunnel effect.

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.

NATIONAL SYSTEM OF INTERSTATE AND DEFENSE HIGHWAYS

(Total miles: 41,000—to be completed in 1972)

	Completed and in operation		*Under construction or budgeted*		*Adopted*	
	Dec. 1964	*Dec. 1965*	*Dec. 1964*	*Dec. 1965*	*Dec. 1964*	*Dec. 1965*
California allotment interstate mileage	694	817	534	620	819	610

Total miles: 2,166.

All Factors Considered

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.

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.

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 the 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.

The 1965 Construction Picture

Repairs to the highways and bridges that were destroyed or damaged by last winter's floods required major construction effort in 1965. However, since they were described extensively in previous issues, they will not be repeated here.

Construction emphasis this year remained on California's 2,166-mile portion of the interstate system, which under present federal law must be completed by October 1972, while, at the same time, increasing safety and mobility in all parts of the state.

The recently adopted 1966–67 fiscal year budget again provides for split-financing of some projects which legally can be placed under contract in their entirety with the assurance that next year's budget will finance their completion. Additionally, the new budget completes financing of projects similarly split-financed last year.

San Diego and Imperial Counties

On the Interstate 5 Freeway, which when completed will extend between the Mexican and Canadian borders, a project completed in August between the south city limit of National City and 13th Street provided an eight-lane connection between the four-lane US 101 Freeway extending southward to the Mexican border, and the eight-lane I-5 Freeway extending northward to Palm Avenue in San Diego.

A viaduct was completed in August to connect the I-5 Freeway near Palm Avenue to the existing highway (US 101) near Lindbergh Field, and work progresses to extend the freeway to just south of the San Diego River.

The 1966–67 fiscal year budget provides funds for projects which will extend this eight-lane facility to an interchange under construction near Tecolote Creek and from this interchange to 0.5 mile north of Balboa Avenue in San Diego, where it will connect to a project under construction in Rose Canyon.

North of Balboa Avenue, construction is underway to near Del Mar, connecting to a project northerly to near Encinitas which was completed in April. This in turn connects to another section under construction to the previously completed freeway through Carlsbad and Oceanside to north of the San Luis Rey River.

Work is just starting on a 9.7-mile northerly extension of the completed freeway and the new budget provides funds to continue it to just north of the San Diego-Orange county line.

An Interstate 8 Freeway section was completed in June, which with a project under construction and one newly budgeted will extend this freeway from El Cajon to 2.5 miles east of Alpine.

Farther east, a budgeted project will provide six miles of freeway west of Boulevard, connecting to a 10-mile project under construction between Boulevard and the Imperial county line.

The eastbound lanes of this freeway in the rugged terrain of the Mountain Springs area east of the San Diego-Imperial county line were completed this year. The westbound lanes had been completed in 1964.

A project has just begun on I-8 between El Centro, Imperial County, and east of Route 111. The 1966–67 budget will finance construction 7.5 miles from south of Seeley to El Centro.

It also provides funds for the first unit of the eight-lane Interstate 805 Freeway in San Diego between north of Home Avenue and I-8.

The US 395 Freeway between Miramar Road at the Miramar Naval Air Station and north of Poway Road was completed in November, and another section extending this construction to north of Rancho Bernardo Road was begun in October.

The new budget will complete a six-lane freeway on Route 67 between I-8 in El Cajon and 1.7 miles northerly. It also provides funds for constructing an interchange on the Route 103 (Murphy Canyon Road) Expressway at Friars Road in San Diego.

Los Angeles Metropolitan Area

The 33 miles completed to full freeway standards in Los Angeles and Orange Counties in 1965 included the final section of the Santa Monica (Interstate 10) Freeway between the East Los Angeles Interchange and Pacific Coast Highway (Route 1) in Santa

This section of the Interstate 5 Freeway near Cardiff-by-the-Sea between Del Mar and Encinitas was completed in April. All of this important interstate route has been completed, is under construction, or has been budgeted, except for the widening and modernization of this route between south of National City and the Mexican border and through Carlsbad and Oceanside, scheduled for completion by 1972.

This seven-span bridge under construction on the Interstate 40 Freeway between California and Arizona will be completed next spring, replacing the two-lane structure at right, built for railroad use in 1890 and converted for highway traffic in 1947.

The recent opening of the Santa Monica (I-10) Freeway between Bundy Drive in West Los Angeles and the Pacific Coast Highway (Route 1) at the Santa Monica Tunnel (center) completed this freeway between the East Los Angeles Interchange and the Pacific Ocean.

Monica, and the first unit of the Pomona (Route 60) Freeway—a section between the East Los Angeles Interchange and Third Street in East Los Angeles.

Progress underway will complete the outer loop formed by the San Diego (Interstate 405) and Interstate 605 (San Gabriel River) freeways, west, south and east of the Los Angeles central district, by next summer when the I-605 Freeway will be completed southerly to I-405.

A 4.7-mile section of the I-605 Freeway was opened to traffic in September south of Whittier, completing this freeway between the San Bernardino (I-10) and Santa Ana (I-5) freeways. A connection using the Route 240 Freeway, a noninterstate facility, will complete the interchange between I-605 and the Garden Grove (Route 22) freeways by next fall.

The first completed section of the Pomona Freeway connects to four projects underway to extend it about nine miles easterly to Workman Mill Road in Industry by late 1966. This new freeway will attract much of the traffic from the older, paralleling San Bernardino Freeway in this area.

A 4.7-mile section of the Garden Grove (Route 22) Freeway was opened to traffic in late fall within Garden Grove, and another section under construction to the I-405 Freeway in Westminster will be completed by midyear, providing a continuous freeway stretch of about 10.5 miles.

Work on this route has just started from Santa Ana to the Newport (Route 55) Freeway. This latter route is under construction between Santa Ana and Costa Mesa.

The San Diego (I-405) Freeway was extended southeasterly from the Orange county line to Westminister in May and Huntington Beach in November. Another six miles will be completed next year to Costa Mesa, and funds have been budgeted to extend it another 4.5 miles southeasterly.

The Antelope Valley (Route 14) Freeway was extended eight miles easterly to the Angeles Forest Highway near Vincent in August, and is under construction northerly from this point to Palmdale.

Grading and structures for this freeway from west of Lancaster to just north of the Kern county line will start soon, and the new budget finances paving this section.

Work started in August to construct seven bridges for the future Interstate 210 (Foothill) Freeway in Monrovia and Duarte. The new budget provides funds for constructing four miles of this eight-lane freeway route between Duarte and Arcadia.

The Long Beach (Route 7) Freeway was extended northerly from the San Bernardino Freeway to Valley Boulevard west to Alhambra in February.

Construction in progress on the Route 170 (Hollywood Extension) Freeway will be completed late next year northward to Victory Boulevard in North Holywood. The new budget contains funds to extend it another 1.2 miles northerly.

Newly budgeted projects will construct five miles of the eight-lane Route 91 Freeway between just west of Bellflower and Dairy Valley; 1.5 miles of the Route 90 Freeway between Centinela Boulevard and Slauson Avenue in Los Angeles; and 0.8 mile of the first unit of the Route 57 (Orange) Freeway between the Route 91 (Riverside) Freeway east of Anaheim and Placentia.

On the Ridge Route portion of the eight-lane Interstate 5 Freeway in the mountainous terrain between the north city limit of Los Angeles and the Kern county line, 6.5 miles will be completed in mid-1967 to about a mile south of Saugus Junction, connecting to a project completed last December to south of Castaic.

The 1966–67 budget provides for funds for projects estimated to cost $17,000,000 to extend this freeway 11 miles northerly to grading construction in progress at the summit of Five Mile Grade.

Another 11.2 miles of this route is under construction from the grading project to completed Interstate 5 Freeway just north of the Kern county line.

Bids were opened in November for completing the interchange between I-5 and Route 134 freeways, and for constructing the eight-lane Route 134 Freeway from the interchange to east of San Fernando Road in Glendale. The new budget will extend this freeway another 2.9 miles to Glendale's east city limit.

Another budgeted project will widen the Santa Ana (I-5) Freeway from four to eight lanes between the Pacific Coast Highway (Route 1) south of San Juan Capistrano and the San Diego (I-405) Freeway, and to six lanes northwesterly to the Route 133 Freeway, a total distance of 16.4 miles.

San Bernardino and Riverside Counties

An 18-mile Interstate 15 Freeway project between Cronese Valley and Baker in San Bernardino County was finished in October, completing full freeway between the Nevada line and Barstow, and freeway and expressway southwesterly to San Bernardino.

Widening and conversion of about seven miles to full freeway standards in and south of Victorville is nearing completion, and work will start this winter to widen this freeway to eight lanes between the new I-5/US 395 Interchange and Cajon Summit.

The new budget allocates $20,000,000 for approximately 10.3 miles of eight-lane I-15 Freeway between Devore and Route 138 at Cajon. The project involves constructing an interchange with the future Route 31 (Devore Cutoff) Freeway, and about 1.8 miles of this future freeway route southerly from the interchange.

On the other interstate freeway route across the San Bernardino desert easterly of Barstow, Interstate 40, about nine miles were completed in the spring between Barstow and just east of Daggett, and construction of both the approaches and the four-lane I-40 freeway bridge across the Colorado River south of Needles will be completed by mid-1966.

On the remainder of I-40, three additional sections of freeway have been budgeted for construction—about 32 miles between Daggett and Ludlow; about five miles between Java and the north city limits of Needles; and eight miles extending southerly from the south city limits.

Widening of the Interstate 10 Freeway to six lanes in Ontario and to eight lanes in the Fontana area of San Bernardino County, a total distance of 14 miles, was completed in late fall.

Another 11-mile project was completed last summer to convert I-10 to a six-lane freeway between Redlands in San Bernardino County and Beaumont in Riverside County.

In the Palm Springs area, an eight-lane I-10 Freeway will be completed next summer between just east of Cabazon and Route 111, and conversion to eight-lane full freeway between Route 111 and Garnet, a distance of nine miles, has been budgeted. Included in this budgeted project are two safety roadside rests near Whitewater. Route 111 will be completed as a four-lane expressway between I-10 and Windy Point next spring.

A 10-mile stretch of four-lane I-10 Freeway to 23 miles east of Indio was completed in September; a 5.1-mile stretch east and west of Cottonwood Springs Road was completed this summer; and a 27-mile section between east of Desert Center and 18 miles west of Blythe should be completed in early 1967. The new budget provides funds to extend this freeway 20.6 miles easterly from the Cottonwood Springs Road project.

On noninterstate routes, the freeway interchange between Routes 18 and 138 near Crestline is under construction, as are two sections of the Route 18 Freeway between the interchange and San Bernardino.

The new budget will finance constructing a connecting freeway (locally known as the Crosstown Freeway) between I-15 near 16th Street in San Bernardino and Waterman Avenue (new Route 18), which will be widened and extended from 30th Street northerly to provide better interim traffic service to the mountain recreational areas.

Also newly budgeted is a 3.7-mile relocation of Route 138 as a four-lane expressway north of Crestline, because the future Cedar Springs Reservoir will inundate the existing highway. The Department of Water Resources will pay $2,200,000 of the estimated $2,700,000 cost.

The conversion of US 60-395 to six-lane freeway between east of Riverside and the University of California campus in that city will be completed this winter.

Widening of the US 395 Expressway to four lanes between south of Grand Avenue near Sun City and Route 74 south of Perris will be completed by midyear.

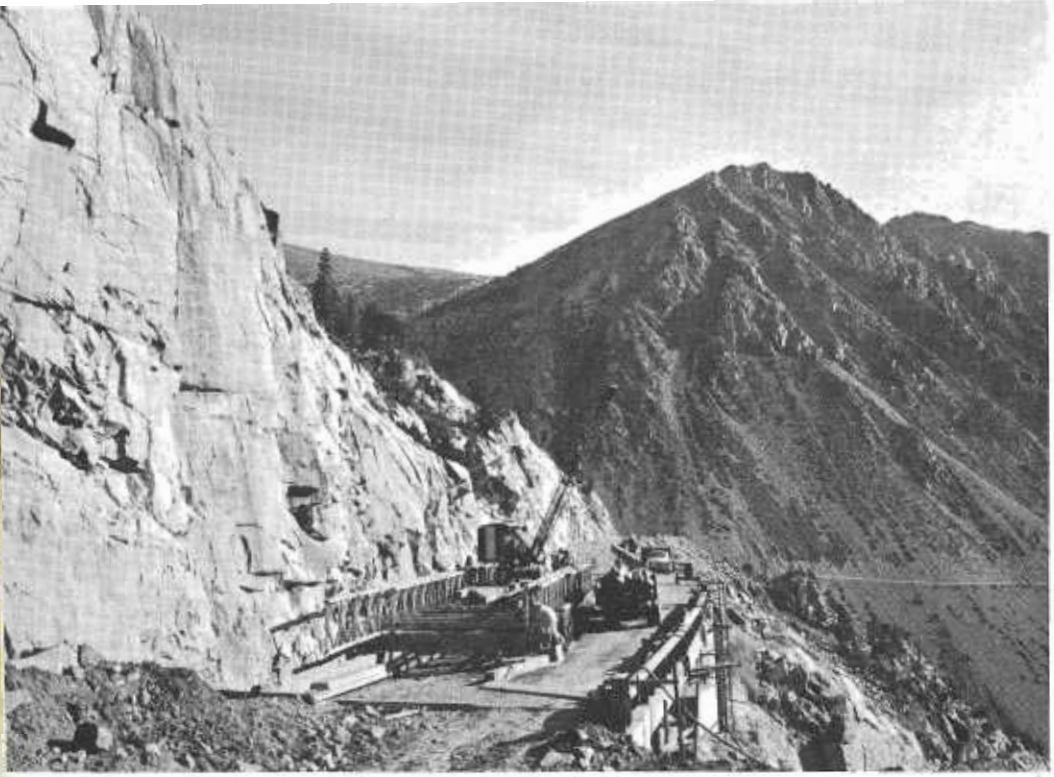
A four-lane, 5.5-mile Route 71 Freeway section will be completed next summer between the south city limit of Corona and the Glen Ivy Hot Springs area.

San Joaquin Valley and Central Mountain Counties

Although work continues on completing the conversion of US 99, still the major traffic arterial route through the San Joaquin Valley, to full freeway standards, construction emphasis has shifted to the Interstate 5 (Westside) Freeway, a new route along the west side of the valley that will substantially reduce travel time between the Sacramento and San Francisco Bay areas and the Los Angeles basin.

Bids were opened in September for grading about 24 miles of the future I-5 Freeway between US 99 at Wheeler Ridge in Kern County and just north of Taft Highway (Route 119), and the new budget provides funds to construct another 11.3 miles from the Lerdo Highway to Route 46 near Lost Hills.

The first unit of the Pomona (Route 60) Freeway from the East Los Angeles Interchange has been completed, connecting to construction in progress easterly to Industry. The older freeway at left is the Santa Ana (Interstate 5).



Two miles of the two-lane Route 120 (Tioga Pass Highway) Expressway in Mono County between Lee Vining and Yosemite National Park were completed this fall and another seven miles are under construction.

In Fresno County a newly budgeted 45.5-mile grading and structures project north of the Kings county line will connect to a similar 20.7-mile project northerly to the Merced county line west of Mendota, which will be completed next summer.

Construction of this new freeway between west of Los Banos and southwest of Gustine in Merced County will be completed in the spring, and work is underway to extend it northerly another 36 miles through Stanislaus County to the San Joaquin county line. A previously budgeted project will extend it to the Interstate 580 Freeway near Tracy, a spur route to the San Francisco Bay region, as well as 5.2 miles of this latter route to construction underway to 1 mile west of the Alameda-San Joaquin county line.

A newly budgeted project will construct 1.7 miles of I-5 as an eight-lane freeway north of the Stockton Channel in Stockton, and as a six-lane freeway for an additional 1.5 miles northerly.

On US 99, the new budget provides funds for expressway to freeway conway conversions in Kern County south of Bakersfield and north of Cawelo. Another is underway in Madera County, which, when completed, will provide an unbroken section of full freeway for 108 miles from McFarland in Kern County through the City of Madera.

Freeway bypasses of Ceres and Modesto in Stanislaus County were completed in the spring and summer, and work will begin soon on a freeway bypass of Ripon in southern San Joaquin County.

The new budget provides funds to extend the four-lane Antelope Valley (Route 14) Freeway 4.9 miles north of the Los Angeles-Kern county line, and to grade the first unit of the future Route 178 Expressway in the Kern River Canyon.

A 5.2-mile project on Route 178, which includes construction of a freeway section in and east of Bakersfield, will be completed next winter, and paving of 7.9 miles of the Route 58 Freeway between Keene and Tehachapi was completed by year's end.

In Kings County, a nine-mile freeway and expressway extension of Route 198 to Hanford was completed in late spring, and work began in September to continue it through and east of that city.

A freeway section on this route through Visalia in Tulare County was completed in July, and a 9.4-mile easterly extension is scheduled for completion in March.

A six-lane freeway viaduct on Route 41 to connect the US 99 Freeway with Fresno's business district began early this year.

A 12.4-mile Route 152 Expressway through Pacheco Pass around the area to be inundated by the San Luis Reservoir was opened to traffic this spring. Budgeted projects will finance extending this route as a four-lane expressway to Los Banos and adding two lanes for one mile within that city, and for converting to four-lane freeway and expressway standards between 0.8 mile west of the Merced-Madera county line and 7.3 miles easterly.

A two-lane expressway on Route 108 in Tuolumne County east and west of Long Barn will be completed by year's end and a newly budgeted project will complete a three-mile expressway bypass of Twain Harte; an 8.8-mile two-lane expressway on Route 4 from Ganns Meadow in Calaveras County to one mile east of the Alpine county line is underway.

Newly budgeted projects will finance construction of 5.2 miles of two-lane expressway on Route 49 southeast of Mariposa, and 5.4 miles of Route 132 on improved alignment between southwest of the Mariposa-Tuolumne county line and four miles west of Coulterville; and nearly four miles of two-lane expressway on Route 16 in northwestern Amador County.

East of the Sierra Nevada, two miles of two-lane expressway were completed this fall on Route 120 (Tioga Pass Highway) in Mono County west of Lee Vining; a three-mile westerly extension to the east boundary of Yosemite National Park will be completed next spring; and another 4.1 miles to three miles west of Lee Vining are scheduled for completion in late 1967.

The new budget provides funds to extend the recently completed reconstruction of Route 168 in Inyo County another 6.9 miles westerly to Camp Sabrina.

Work will start soon to construct nearly 11 miles of two-lane express-

way on US 395 between about five miles north of Independence and just north of Aberdeen.

Sacramento Valley and Northern Valley Projects

On the Interstate 5 Freeway, work has been completed, is under construction or is budgeted for 104.6 continuous miles between two miles south of Willows, Glenn County, and the Sacramento River Bridge at Antler in Shasta County.

In Sacramento County, the new budget allocates funds for about seven miles of eight- and six-lane I-5 Freeway between J Street in Sacramento and Route 99 at Bayou Way, connecting with initial two-lane expressway construction in progress on this route westerly to the Sacramento River near Elkhorn.

This budgeted project, estimated to cost $27,636,000, involves constructing paired freeway bridges across the American River upstream from the Jibboom Street Bridge.

This 1966–67 fiscal year budget also provides funds for a project costing an estimated $7,500,000, to extend a completed four-lane I-5 Freeway section in Arbuckle, Colusa County, both 5.5 miles southerly and eight miles northerly.

Work will be completed by next fall on freeway construction from two miles south of Willows to Red Bluff in Tehama County, connecting to a previously completed freeway section to south of Anderson. About 20 miles from this point to two miles north of Redding also will be completed next fall.

The new budget will finance about 16 miles of construction northerly to three miles north of O'Brien, connecting to freeway construction in progress to the Sacramento River Bridge at Antler. North of the Pit River Bridge, the work will consist of constructing two lanes for northbound traffic and reconstructing and widening the existing two-lane highway to complete conversion to four-lane freeway.

Widening the four freeway lanes and installing a median divider on the Pit River Bridge was completed in late fall.

In Siskiyou County, conversions of a short section of I-5 in and north of Dunsmuir and a 1.5-mile section south of the Oregon line to full freeway standards are nearing completion, and the budget will finance the construction of 3.3 freeway miles on this route, approximately 11 miles north of Yreka.

This newly budgeted project includes a bridge across the Klamath River to connect the existing highway north of the river with a future safety roadside rest which will be constructed on the river's south bank.

On Interstate 80, freeway progress includes conversion of 7.1 miles southwest of Vacaville in Solano County from four-lane expressway to eight-lane freeway, now nearing completion, and a 3.7-mile six-lane freeway northeast of Route 505, completed in late fall.

Construction of the superstructure of a new I-80 Freeway bridge across the Sacramento River, together with its approaches from US 40 in West Sacramento, Yolo County, to Fifth Street between W and X Streets in the City of Sacramento, will be completed by late summer.

From this point, eight-lane freeway construction is in progress for 2.3 miles easterly to Alhambra Boulevard, scheduled for completion for early 1968, joining with I-80 Freeway construction underway northerly between 29th and 30th Streets to a connection with the Elvas Freeway near A Street, to be completed by late 1966.

The Elvas Freeway and its bridge across the American River are being widened from four to six lanes to the Route 160 Freeway near the Arden Way Interchange.

The new budget will finance construction of an interchange between the I-80 and the future US 50 Freeway at the intersection of W-X and 29th-30th Streets in Sacramento. An interchange between this section of the I-80 Freeway and the Route 99 (South Sacramento) Freeway is under construction.

Work will start soon to widen 1.1 miles of the Route 160 Freeway across the American River in Sacramento from four to six and seven lanes, including construction of an additional

Shown is one of the highest highway fills in this country, required by the completion of the 12.4-mile Route 152 Expressway through Pacheco Pass around the area to be inundated by the San Luis Reservoir.

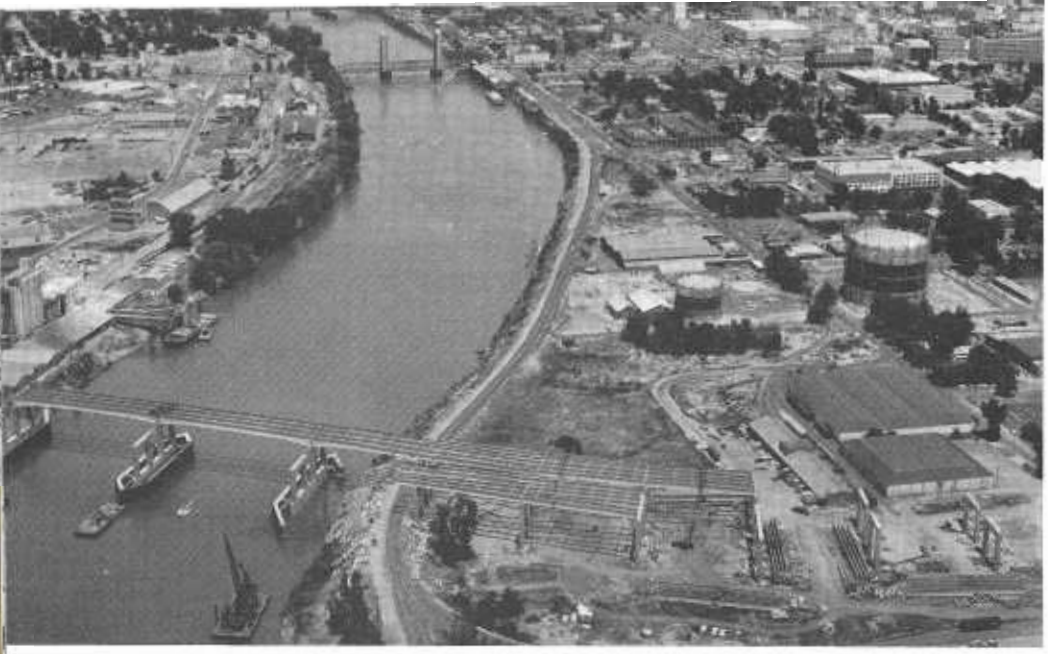
structure paralleling the 16th Street Bridge and the North Sacramento Viaduct.

On US 50, freeway construction between east of Folsom Junction, Sacramento County, and 2.2 miles east of the El Dorado county line was completed in November, connecting with a 2.2-mile easterly extension to be completed next year. A 5.5-mile section near Pollock Pines was opened to traffic last summer.

The new budget allocates funds for a 7.5-mile, US 50 Freeway section easterly from just west of Shingle Springs to the completed freeway section to Placerville.

A project to complete the Route 99 Freeway through Chico, Butte County, will be opened to traffic by midyear, and the first unit of the four-lane Grass Valley-Nevada City Freeway on Route 20, a 3.3-mile section

This section of US 50 Freeway near Pollock Pines was opened to traffic last summer.



The bridge shown at bottom under construction across the Sacramento River will carry I-80 traffic between Yolo County (left) and the W-X Street extension of this route in Sacramento, to the 29th-30th Street construction, scheduled for completion by late 1966.

in Nevada County, will be completed in 1966.

Newly budgeted are the initial two lanes of an eventual four-lane freeway on Route 70 in Yuba County between Bear River and south of Olivehurst, and a four-lane freeway from this point to Route 65 south of Marysville, including one mile of four-lane Route 65 Expressway southerly from this junction.

The new budget also provides funds to replace a bridge on Route 113 across the Sutter Bypass north of Knights Landing in Sutter County.

A 1.9-mile Route 299 Freeway section easterly from Market Street in Redding, Shasta County, was completed in August.

A two-lane expressway on Route 36 near Susanville in Lassen County will be completed next year, and the new budget provides for a 6.9-mile two-lane expressway on this route east of Chester in Plumas County.

Another Plumas County project, a 4.6-mile two-lane expressway on Route 70 near Blairsden, is nearing completion.

The 1966–67 budget will finance grading a portion of Route 139 on new alignment between Route 299 near Canby in Modoc County and 8.2 miles northerly, and for paving the northernmost 2.2 miles as the first step of two-lane expressway construction.

A 2.9-mile two-lane expressway on US 395 in Modoc County north of the Lassen county line was opened to traffic in October, completing a two-lane expressway between south of the county line and six miles south of Alturas, except for a short section in Likely.

The new budget provides for grading a portion of the Trinity County route between Weaverville and Etna via Scotts Mountain (Federal Secondary County Road 189) on new alignment between Coffee Creek and 5.8 miles northerly, and for paving the first 2.8 miles, as the first stage of two-lane expressway construction. This entire route will eventually be constructed to expressway standards as Route 3 in the state system of scenic highways.

Central Coastal Counties

Construction of interchanges on expressway sections of US 101, and replacing conventional highway sections of Route 1 with freeways and expressways, continued steadily in 1965.

Conversion of the US 101 (Ventura) Freeway near Montalvo in Ventura County to six-lane freeway is under construction, and the new budget will finance an interchange west of Thousand Oaks.

The Buellton Bypass (US 101) Freeway in Santa Barbara County was completed in June. Newly budgeted is the conversion to freeway standards of sections of this route west of Carpinteria and near Summerland.

In San Luis Obispo County, a conversion of US 101 to freeway standards north of Pismo Beach was completed in June, and work is underway to complete the conversion to such standards between Atascadero and Paso Robles.

Construction of a 4.8-mile US 101 Freeway between north of San Miguel in San Luis Obispo County and north of Camp Roberts in Monterey County was completed in August. An extension to north of Bradley will be open to traffic next summer, connecting to completed freeway northerly to San Ardo.

A US 101 Freeway bypass of King City has been financed in the new budget. Farther north, a freeway bypass of Salinas on this route was opened to traffic in early November.

On other routes in Ventura County, an 8.6-mile easterly extension of the Route 126 Freeway to Santa Paula was completed in November and construction will start early next year for 3.9 miles of the Route 118 Freeway through Santa Susana Pass. The extension of the Route 33 Freeway northerly to south of Ojai was budgeted in the 1965–66 fiscal year.

The new budget allocates $10,000,000 for a Route 23 Freeway section north of Thousand Oaks.

Work is underway to construct a two-lane expressway on Route 1 in Santa Barbara County between US 101 at Las Cruces and San Julian Ranch. About eight miles of this route will be constructed to freeway and expressway standards between Harriston and west of Orcutt next fall, as will be a two-mile, four-lane Route 135 spur between Route 1 and Orcutt. The new budget includes funds for the construction of the initial two lanes of an expressway on Route 246 west of Buellton.

Adding two lanes to the Route 1 Expressway for 4.4 miles north of the Main Gate of Camp San Luis Obispo is in progress; a 2.8-mile freeway bypass of Cayucos on this route will be completed next spring; and the new budget will finance extending the initial two lanes of the Route 1 Expressway Bypass of Cambria to north of San Simeon.

This section of US 101 Freeway was opened to traffic in late summer, between Sylvandale and Dean Creek in Humboldt County.

A project estimated to cost $10,000,000 has been budgeted for a 6.7-mile section of Route 1 Freeway between the south city limit of Monterey and Fort Ord, and work was started this fall on a freeway section through Castroville.

Construction of 1.9 miles of freeway is underway in Monterey County on Route 68 just west of Salinas.

Preliminary work for the Watsonville Bypass Freeway on Route 1 was completed in February, and the rest of the job will be advertised for bids in January.

In San Benito County, conversion of Route 156 to four-lane expressway between US 101 and San Juan Bautista was completed this fall, and the new budget provides funds for the initial two lanes of an ultimate four-lane expressway on this route between north of Hollister and the Santa Clara county line.

A two-lane expressway on Route 180 between south of Hollister and just north of Tres Pinos will be completed next spring.

San Francisco Bay Region

The Interstate 580 (MacArthur) Freeway was opened to traffic between Buell Street in Oakland and the east city limit in October, and will be completed by late spring between San Leandro and 173rd Avenue near Hayward. These two projects, costing about $17,500,000, will complete 15 miles of this eight-lane facility between the East Bay Distribution Structure and Castro Valley Junction.

The 1966–67 fiscal year budget provides for a project estimated to cost $14,500,000 for 8.5 miles of this route through Altamont Pass from just west of the San Joaquin county line to near Livermore.

Renovation of the two older two-lane bores of the Caldecott Tunnel on Route 24 through the Berkeley Hills was completed this summer, and construction of a unique system of lane control has just been completed, concurrently with 1.2 miles of eight-lane freeway from the tunnel to the future Temescal Interchange in Oakland, permitting the use of the middle bore on a reversible basis and providing four freeway lanes for the heavier direction of peak-hour traffic through the Caldecott Tunnel.

The new budget allocates funds to start the first of two projects on the Route 24 (Grove-Shafter) Freeway in Oakland which will incorporate facilities of the Bay Area Rapid Transit District in the median.

Three miles of the Interstate 680 Freeway between I-580 at Dublin and one mile north of the Alameda-Contra Costa county line were opened to traffic in December, and construction northerly to Danville will be completed by midsummer. Work started this fall on the section between I-580 and Scotts Corner, which will complete this bay area circumferential interstate freeway route from Fremont in Alameda County to Vallejo in Solano County.

About 12 miles of the four-lane Route 21 Freeway connecting I-680 at Benicia and I-80 at Cordelia will be completed in midyear. This project is financed by toll bridge revenue bonds to improve the approaches to the I-680 Bridge between Benicia, Solano County, and Martinez, Contra Costa County.

A 1.3-mile Route 13 (Warren Boulevard) Freeway section will be opened to traffic in early 1966, completing this route through Oakland.

Conversion of Route 92 to four-lane freeway between the San Mateo-Hayward Bridge and Hayward will be completed next fall.

Widening of the Nimitz Freeway (Route 17) to six lanes between Washington Street in San Leandro and Route 92 in Hayward is underway and the new budget will extend this widening another 1.7 miles southerly.

The 1966–67 budget also provides funds for an interchange on this freeway at 66th Avenue in Oakland to serve the future sports arena near this location.

In San Francisco, the Route 82 (Southern) Freeway will be extended northeasterly by next May as a six-lane facility to the site of the Islais Creek Interchange with the future freeway via Hunter's Point, and work is just starting to extend it as the eight-lane Route 87 Freeway to north of 18th Street.

The new budget provides funds to widen the James Lick Memorial (US 101) Freeway to eight lanes in the Army Street area and to add an auxiliary lane between the Army Street on-ramp and the Route 82 Freeway.

A project now underway will connect the Route 82 Freeway at Orizaba Avenue in San Francisco with the Interstate 280 Freeway in Daly City, and this latter route to Eastmoor Avenue in Daly City by mid-1966. A southerly extension of the I-280 Freeway to west of South San Francisco has just begun, and an eight-lane freeway section from near San Bruno Avenue to Millbrae is scheduled for completion in late 1967.

The new budget allocates funds for extending this route southerly to the San Mateo Creek Bridge in and near Hillsborough, now under construction, and for an additional 2.5 miles in Woodside.

In Santa Clara County, a 4.3-mile, eight-lane I-280 Freeway section south of Page Mill Road plus a 3.9-mile, six-lane extension southerly to Cupertino are in progress. A short stretch southerly to Saratoga-Sunnyvale Road was completed in June.

A 5.5-mile section of the Route 85 Freeway between Cupertino and US 101 in Mountain View was opened to traffic at year's end.

Other San Mateo County projects completed this year include Route 1 Freeway section in Pacifica, and a Route 114 Expressway connection between El Camino Real (Route 82) and the US 101 (Bayshore) Freeway in Redwood City.

Newly budgeted is the extension of the Route 92 (19th Avenue) Freeway westerly to the site of an interchange with the future I-280 Freeway west of Belmont, and the construction of 2.1 miles on Brewer Island west of the San Mateo-Hayward Bridge.

North of the bay, a 3.1-mile US 101 Freeway section was completed in early 1965 between Novato and north of San Rafael, Marin County, and a Napa County project converted the Route 29 Expressway to four-lane freeway between Napa Creek and Napa.

A 1.1-mile section of the US 101 Freeway in and near Santa Rosa was completed in the spring, and the new budget will finance the completion of conversion of this route from expressway to full freeway standards between south of Petaluma and north of Healdsburg.

Northern Coastal Counties

A 5.5-mile US 101 Freeway bypass of Ukiah in Mendocino County was completed in November, connecting sections previously completed.

The new budget provides funds for the construction of a four-lane freeway on this route in the rugged terrain near Cummings at an estimated cost of $15,500,000. This project involves constructing the tallest highway embankment in California, and possibly the world, at Squaw Creek. It will be 372 feet high and 900 feet long.

Farther north in Humboldt County, a US 101 Freeway section between Sylvandale and Dean Creek was opened to traffic in late summer, completing 25 miles of freeway between Dean Creek and Redcrest. From this point, construction is underway to about four miles south of Scotia. The new budget will finance construction southerly from Dean Creek to Garberville.

The Fourth Street Interchange on US 101 in Arcata was completed in September as part of a continuing program of converting this route to full freeway standards.

Grading of five miles of US 101 Freeway from one mile south of the Humboldt-Del Norte county line to Klamath was completed early in 1965, and paving plus completion of the bridges across the Klamath River and its overflow channel were finished at year's end.

Another Mendocino County project, a 4.4-mile, two-lane expressway on Route 1 (Shoreline Highway) north of Russian Gulch will be completed by the middle of next year.

A much-needed, 4.5-mile, four-lane freeway on Route 299 in Humboldt County between Mad River and Blue Lake was completed in November, as was a 4.1-mile stretch of two-lane expressway on this route, including a bridge across Redwood Creek.

A 6.2-mile, two-lane expressway on Route 29 in Lake County between south of Kelseyville and Route 175 began this summer.

The budget provides funds to extend the Route 20 two-lane expressway from about six miles east of Calpella another 5.1 miles easterly.

An extension of the Route 82 (southern) Freeway in San Francisco is shown under construction toward the site of and interchange near Islais Creek with the future freeway via Hunters Point. The section shown under construction will connect with the Embarcadero Freeway at the San Francisco-Oakland Bay Bridge.

Operations

CONSTRUCTION

The current construction program includes approximately 350 active contracts amounting to nearly $600,000,000. An increase in the yearly number of contracts and total amount can be expected for the next few years, if the interstate system of highways is to be completed substantially within the allotted time and other highways are improved to meet traffic demands. This will require not only more and larger contracts, but also increased production in order to meet predetermined completion dates. Since the projects must be completed within the allotted time and funds, unless unforeseen conditions arise as the work progresses, it is necessary that experienced and well-qualified engineers be assigned to the construction work in headquarters and in the district organizations.

Construction Cost

The cost of construction has not increased as rapidly as the cost of living index, wages, or other industrial costs. This is due primarily to the introduction of new, larger and more efficient equipment which permits greater rates of production by the construction industry. During the past few years we have seen great strides in the development of equipment for all segments of heavy construction, including earthmoving equipment and machines for the construction of structures and for the placing of bases and pavements. Examples, to mention a couple, are the use of scrapers that now hold 55 cubic yards of earth each, and concrete plants capable of producing 600 cubic yards per hour. By comparison, 10 years ago scrapers may have normally hauled about 25 cubic yards and concrete production was in the neighborhood of 150 cubic yards per hour.

Along with increased production rates to meet completion dates, closer tolerances have been set up for the contractors to meet in construction of state highways. The development of the new equipment, therefore, not only must provide increased production rates but must be capable of completing the work to closer tolerances than was expected several years ago. To meet these tolerances more equipment is now appearing that is automatically controlled in both horizontal and vertical direction, such as machines for spreading and finishing bases and pavements.

The past year has seen more emphasis on the aesthetic treatment of projects in the construction phase. Thus greater attention has been given to the attempt to blend cuts and fills into the surrounding terrain, provide pleasing appearance, by texture and color, of slope paving at bridges and such features.

Advisory Capacity

The Construction Department in Headquarters acts in an advisory capacity to the various districts in construction matters. Each district provides a general program of training for its construction people, as the needs dictate. To supplement this, Headquarters Construction selects training programs in specialized complex areas such as paving and prepares the material and provides the leadership for implementing such training. These programs are directed toward practical application of construction methods and are primarily for construction personnel. However, others from Highways and from other political bodies are accommodated to the extent that space permits. Such training activities are conducted during the time of year that least interferes with the work in progress on the various construction projects.

Honor Camps

The Division of Highways and the Department of Corrections continued the joint operation of Camp 41, near Happy Camp on the Klamath River in Siskiyou County, on Route 3, and Camp 42, near Lord Ellis Summit in Humboldt County, on Route 299. Construction continued downstream on the Klamath River as far as Sandy Bar Creek, with an oiled surfacing completed between Aubry Creek and Dillon Creek. Camp 42 operations on Route 299 shifted from east of Lord

The Junipero Serra Freeway (Interstate 280) under construction between Eastman Avenue and Orizaba Avenue south of San Francisco.

Ellis Summit to the west side between Pine Creek and Preston Ranch. Paving will be completed by contract in December 1965 on a four-mile section. Construction of the new bridge at Redwood Creek is also underway with completion also scheduled in late 1965.

State route numbering has been standardized and simplified to conform with recently established national standards. Here state maintenance workers replace one old US 101 shield near Point Mugu in Ventura County with new Highway 1 sign.

Completion of the Santa Monica Freeway, shown above under construction, will provide West Los Angeles with its first east-west freeway.

MAINTENANCE

In the 1964–65 fiscal year the Division of Highways employed approximately 4,200 maintenance personnel in maintaining 14,744 miles of highways, working out of 281 maintenance stations and expending approximately $49,210,000. The above costs include maintaining state highways in 355 incorporated cities.

Roadside Rests

There are 21 roadside rests in operation throughout the state which were maintained during the past fiscal year for approximately $44,200. There are five more roadside rests under construction which will be in operation in the immediate future.

Landscaping

The Division of Highways employs approximately 770 employees in maintaining all types of landscaping on the state highway system. The cost of this work is approximately $5,250,000. At the present time there are approximately 4,300 acres classified as landscape, 2,000 acres as functional ground cover, 570 miles of screen planting for headlight glare, and 345,000 trees which are all a part of landscape maintenance. It is estimated that the cost of watering on landscape, functional planting, trees, mass ground cover and screen plantings cost approximately $870,000 for the past fiscal year.

New Routes Maintained

A total of 4.4 miles of former county roads and city streets was taken over for maintenance during the fiscal year:

Monterey County — Route 68, from Asilomar Beach State Park to the junction of Route 1—4.3 miles.

City of Oakland—Route 77, from Melrose Underpass to 14th Avenue —0.1 mile.

Pavement Repair and Bridge Maintenance

Pavement repair consists principally in applying leveling blankets, seal coat application, base restoration, surface planing, and other routine maintenance operations essential in the restoration of the surface and grade to a safe and serviceable condition. Much of this work is on heavily traveled highways and requires careful traffic control. Review by maintenance and district personnel of road surface needs justified the expenditure of $5,000,000 in the annual resurfacing and

seal coat program. This program, called the annual thin blanket program, is financed from construction funds and included 581 miles of one inch blanket of asphaltic concrete and 44 miles of deferred seal coat, at a total cost of approximately $5,000,000.

During the 1964–65 fiscal year a total of $1,900,600 in maintenance funds was expended on pavement repair. These repairs include 1,717.0 miles of traveled way and shoulder work.

Expenditure for painting and repairs to bridges as recommended by the Bridge Department amounts to $780,300.

Roadside Cleanup and Maintenance in Cities

Laws prohibiting the disposal of litter along highways and the continued distribution of litter bags by service stations have not curtailed the litter problem. In spite of the efforts of service organizations to prevent the littering of highways, roadside cleanup continues to be an expensive maintenance item. During the 1964–65 fiscal year approximately $2,600,000 was expended on roadside litter cleanup and street sweeping.

Roadside Vegetation, Tree Care and Landscaping

Roadside vegetation control has been accelerated during the past fiscal year in keeping with increasing roadside areas and development.

Roadside vegetation outside of the planted areas was controlled with chemicals where practicable and with mowers where otherwise required. The use of mowers for roadside weed control was reduced somewhat by chemical spraying. Spraying reduced the noxious weed population, thereby reducing the amounts of service contracts formerly issued to county agricultural commissioners to do the work on state roads. Spraying also eliminated several mowings normally required. Clean areas where fireguards were required were obtained by preemergence spraying, whereas grass roots were retained for erosion control where required by use of post emergent sprays while the vegetation was small and would not require subsequent mowing. Special weed spraying was required in the summer to control certain weeds which were resistant to the chemicals used in the pre and post emergent applications. Twenty-four different herbicidal materials were used for weed control on roadsides and within the landscaped plantings. It is estimated that the total quantities used covered 82,160 acres of sprayed area.

Several new chemical herbicides tested by the department during the past year showed promise of further aiding in weed control problems heretofore unsolved.

A proportioner truck was built by our Headquarters Shop for use in varied spraying with more than one material. Two 60-gallon stainless steel tanks supply concentrate of separate chemicals as required, into a proportioner pump which measures and releases the chemical into the fresh water supply coming from a 2,000-gallon stainless steel tank. The mixing of concentrate and water takes place in the main pump, where they are thoroughly mixed and sent under pressure to the discharge boom.

Experimental work was started through the year on a number of ground cover projects to determine the feasibility of spraying young tender edge growth with a contact herbicide to replace the former method of edging with a mechanical edger, a practice which was slow, expensive and hazardous in heavy traffic. It is expected that contact spraying may be done more frequently than was the mowing at a great saving of time and hazard.

Highway Signs and Pavement Markings

A trial installation of inserted epoxy markers proved successful on the mountain portion of Interstate 80 under the action of severe snowplowing and the accompanying sand, salt and ice conditions.

Thermoplastic marking material is proving economical in areas of high traffic wear at the lower elevations where no freezing is encountered.

The use of preformed marking material with a pressure sensitive adhesive base is proving very successful. This can be applied by the maintenance crew without special equipment and no waiting time for curing. The service life is comparable to that of thermoplastic material.

In the 1964–65 fiscal year $2,987,000 was expended in replacing traffic stripe, pavement markings, repairing and replacing signs.

Communications

The statewide highway radio system at the end of the 1964–65 fiscal year consisted of 1,755 mobile radio units, 241 base stations, 52 microwave stations, and 173 hand-carry units. Radio communications is currently utilized in the Maintenance, Construction, Equipment, Service and Supply, Survey, Bridge and Materials and Research Departments.

A maintenance crew does patching work on the Eastshore Freeway in Alameda County.

The division's radio system is on a scheduled replacement basis to reduce both obsolescence and high maintenance costs. At the present time approximately 60 percent of the mobile units and 10 percent of the base stations have been changed out utilizing the latest solid state technique.

During the severe storms and floods of December 1964 and January 1965, the division's communications system provided reliable communications between Sacramento and the northern districts in Eureka and Redding. In addition, communication facilities within these districts were expanded, particularly mobile radio units and hand-carry units. The reliable communications within the districts, particularly to isolated jobsites, assisted in the rapid restoration work of the state highway road system.

The division's leased private-line teletypewriter system handled approximately 2,800 messages per month. This fully automatic system, operating at 75 words per minute, interconnects all 11 highway districts and various departments at Sacramento.

The winter road information to news media, radio and television stations, newspapers, auto clubs, trucking concerns, other governmental agencies, and the traveling public was furnished by the division.

Outdoor Advertising

California's legal controls on outdoor advertising—administered by the Department of Public Works under specific mandate of the Legislature since 1933 (except within incorporated cities)—were augmented on May 15, 1965, with respect to some state highways.

On that date the Collier-Z'berg Act of 1964 became operative. It provides for more stringent regulation of certain types of outdoor advertising, limiting them as to size and frequency, on portions of the interstate highway system in California. Regulations spelling out the new restrictions were issued by the Director of Public Works, following a public hearing in Sacramento.

The number of signs and structures subject to the Outdoor Advertising Act continued the downtrend which has been evident over the past several years, as indicated by the following calendar year figures for permits issued:

	Signs	*Structures*
1962	1,826	33,258
1963	1,086	31,891
1964	1,777	30,265

The decrease in advertising structures is attributable to various factors: incorporation of new cities, annexations to existing cities, more restrictive county zoning ordinances, and additional mileage of landscaped freeways (along which billboards are prohibited). The peak year for structure permits was 1958, when 37,782 were issued. They have been going down by about 1,500 per year.

The number of advertising signs on buildings is subject to wide fluctuations—it goes up markedly in even-numbered years because of elections.

The number of advertising operators licensed for the last three fiscal years has also declined: from 884 in 1962–63 to 818 in 1963–64 and 795 in 1964–65.

The cost of administering the act has increased somewhat in recent years, largely because of the construction of many miles of access-controlled divided highways, which require additional patrolling by outdoor advertising inspectors. The Legislature increased the fee schedules for licenses and permits in 1959 and 1964 in accordance with its policy of keeping the program on a self-sustaining basis. Gross receipts from licenses, permit fees and penalties amounted to $119,473.19 for the 1964–65 fiscal year.

One of the yearly tasks of maintenance crews is snow removal from state highways. Here, a rotary snowplow removes snow from a section of Interstate 80 in the Donner Summit area.

Transportation and Encroachment Permits

Following is a comparison of the number of permits issued for both functions during the past three fiscal years:

	1962–63	*1963–64*	*1964–65*
Encroachment permits	12,453	12,507	13,508
Transportation permits	101,542	86,181	83,370
Totals	113,995	98,688	96,878

Lighting, Signals and Electrical Devices

Traffic signals, while not increasing greatly in number of intersections, are increasing very noticeably in com-

plexity. Traffic controllers and the auxiliary equipment are being transistorized, and the pressure detector is giving way to the inductive loop detector. The phasing of the intersections is becoming more complex due to traffic demand. This results in more complex equipment in the intersection. Where two or more intersections are interconnected for better flow of traffic, telemetering interconnect units are being used.

Because of the freeways with their on- and off-ramps and the large freeway interchanges, highway lighting and illuminated signs are increasing at a very high rate.

The maintenance of tunnels and tubes has increased to a point where a special crew headed by a supervising technician is being formed to handle the work. The specialized nature of this work calls for a wide knowledge of electrical and mechanical equipment.

Truck Scales

Three new truck scale installations have been completed and 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.

Plans are being developed for a new truck scale installation which will include a brake testing facility south of San Onofre on Interstate 5.

New loadmeter pits have been installed at several locations throughout the state where problems in connection with overloads justify their installation.

Maintenance Stations

The total cost of upkeep and repairs to the various maintenance stations throughout the state amounted to approximately $725,000.

Major new stations completed during the fiscal year include those at Elk Grove, South Sacramento, Whittier, McGee Creek, Calistoga and Redwood City, at an approximate cost of $1,021,000.

A rotary sweeper cleans gutters on the Bayshore Freeway in San Mateo County south of San Francisco.

New stations under contract and not completed are at Chula Vista, Eureka, Redding and San Diego, at an estimated cost of $922,000.

During the year, 14 major maintenance station projects were turned over to the Office of Architecture and Construction for development of plans and specifications. Most of these are new stations which are needed because of increasing work loads brought about by the constantly expanding state highway system. Every reasonable effort is being made in the design of our maintenance station facilities to insure that these stations will not only be aesthetically pleasing, but will also be compatible in construction and design to similar buildings in the surrounding area.

Road Closures

There were numerous road closures during the first part of the fiscal year of short duration, due to forest fires, minor slides at various locations throughout the state. What started out to be a normal year was brought to a sudden climax by the Christmas floods of 1964. The severity of this storm eclipsed anything that the Division of Highways had experienced since it began its operation in 1912.

There had been weeks of precipitation in the northern part of the state prior to the heavy rainfall which began on December 21 and extended through to the first part of January. The destructive storm of 1955 was almost insignificant in comparison. Rainfall at the Gasquet Ranger Station 12 miles inland along the middle fork of the Smith River for the period December 19 to 27 was 26.59 inches. At Scotia the Eel River reportedly peaked at around 750,000 cfs and 70 feet, over 200,000 cfs and 8 feet above the previous maximum in 1955. At Weitchpec the Klamath peaked 20 feet higher than in 1955. The saturated soil, due to the weeks of precipitation, had caused some local slides and road closures common in this area in any winter. State highway closures in Districts 1, 2 and 3 started on December 21 and were due in most part to flooding and debris followed by serious slides and slipouts and damaged or washed out bridges until every highway in the north coastal area was closed at one or more points with many communities including Eureka completely isolated.

To further complicate matters the weather continued bad and turned to snow in many sections so that damage assessments could only be made by foot. This resulted in the Governor's declaration of a state of disaster on December 21, 1964, resulting in emergency measures, and all available men and equipment were put to work as quickly as possible. A more detailed explanation of the Christmas flood of 1964 will be found in the January–February and March–April 1965 issues of the *California Highways and Public Works* magazine.

The magnitude of this damage can only be measured in the total cost of restoration which is approximately $36,000,000. Also $7,000,000 was re-

A maintenance crew use a giraffe and personnel hoist to make sign repairs on the San Diego Freeway in Los Angeles.

quired for emergency restoration to open the affected routes to traffic. This emergency restoration was financed with other than maintenance funds.

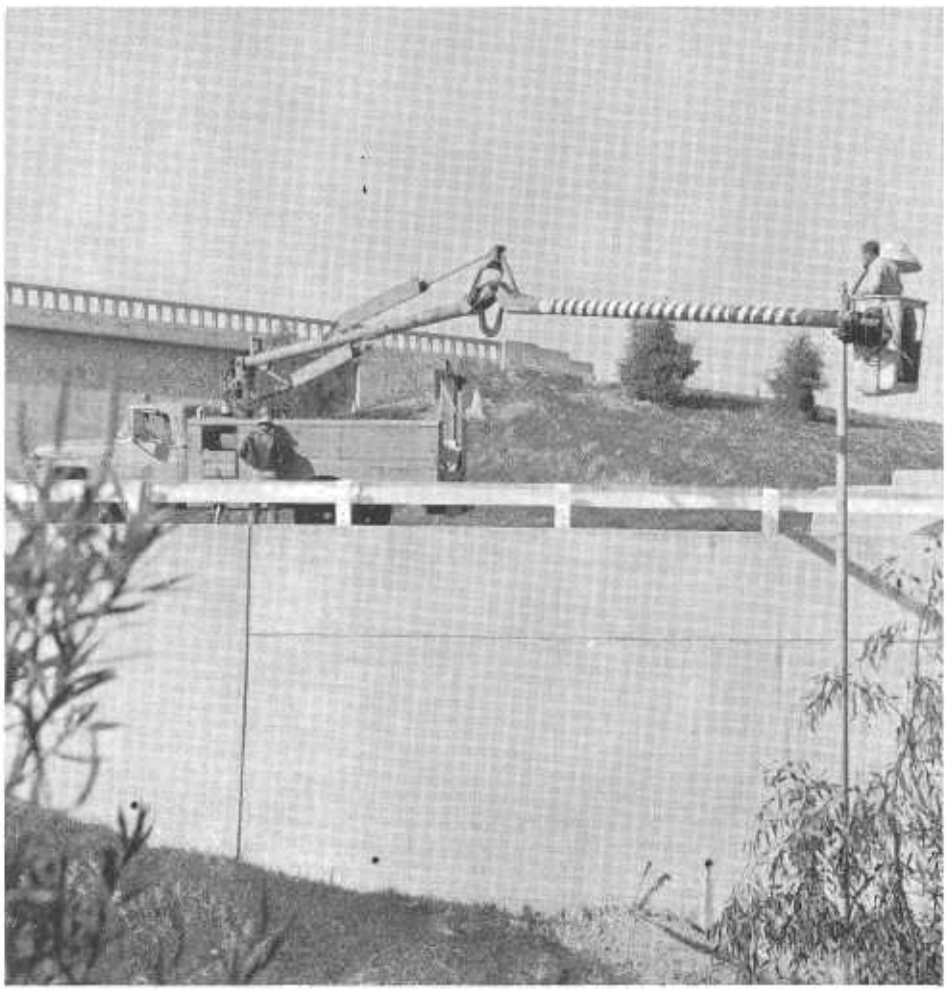
The unprecedented winter was not over, for the southern part of the state was enveloped in a severe storm which began the latter part of March and extended over until the middle of April. Heavy snowfall occurred in the San Bernardino Mountains and on the Angeles Crest Highway, resulting in road closures of several days' duration between Cedar Springs and Islop Saddle. Road closures of short duration occurred on several of the mountain routes in the San Bernardino Mountains.

Snow Removal

Snow removal and sanding icy pavements cost approximately $4,775,000, or 9.6 percent of the total maintenance expenditure.

The snow pack on Donner Summit started on October 29, 1964, with a 2-inch snowfall and reached a maximum depth of 114 inches on January 9, 1965.

The last snowfall reported in the Sierra was on May 7, and there were snow flurries at higher elevations in the late spring storms.

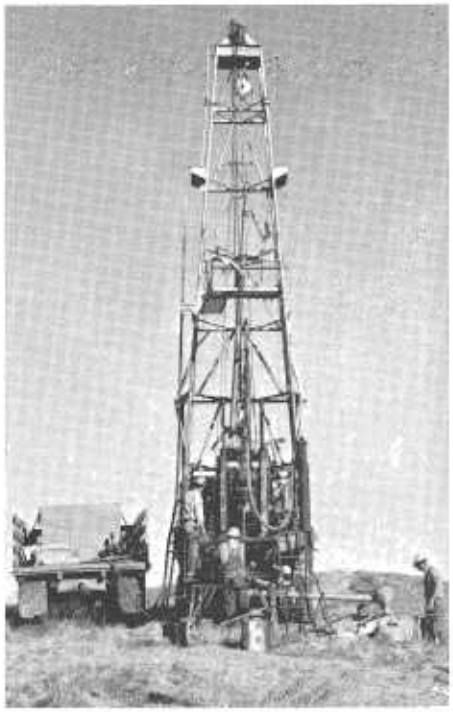


Maintenance crew uses personnel hoist to service highway lighting.

MATERIALS AND RESEARCH

The Materials and Research Department serves the highway building program in several ways: It tests materials to determine their potential quality and manufactured articles to determine their compliance with specifications; provides inspection service at fabrication shops and manufacturing plants to insure the soundness of structural members and other manufactured items supplied for bridge and highway use; develops and maintains testing standards; investigates new materials, products and methods to determine their worth for highway use; initiates and performs research on testing methods and uses of materials; develops new methods of evaluating materials or quality of work; cooperates with other departments in providing technical services for research projects; supervises the record sampling and testing program; and trains certain division personnel in the use and testing of materials.

Much of the department's work is done in collaboration with other headquarters units or with the districts. The laboratories in the various districts perform some 35 different preliminary and construction control tests on soils, aggregates and paving materials, providing immediate control of materials as they enter the work and reduce time lags and costs associated with transporting test samples from remote locations, as well as insure, that only quality material enters the work.



Drilling crews sample subsurface materials for foundation exploration.

In-place densities of compacted roadway material is determined by measuring weight and volume of material removed from a carefully excavated hole.

Branch Offices

The Materials and Research Department operates from its central laboratories in Sacramento and its branch offices located in Berkeley, Los Angeles and Bakersfield. The Berkeley and Los Angeles offices are maintained in these two major industrial centers to accommodate the inspection work during and after fabrication on a wide variety of manufactured products used in highway construction. The Bakersfield Laboratory, on the other hand, is primarily for asphalt testing in the oil-producing areas in central California. Headquarters Laboratory performs 120 different types of tests, in addition to the 35 performed by the districts, on materials such as paint, asphalt, cement and steel that are more economically tested and controlled by a central agency.

Record sampling and testing as a backup service to the resident engineers continued to be an important function of this department. The progress record sampling portion has been delegated to the districts as well as a portion of the final record work. The results of this program continue to show that job control efforts are effective and that our specifications in general are realistic.

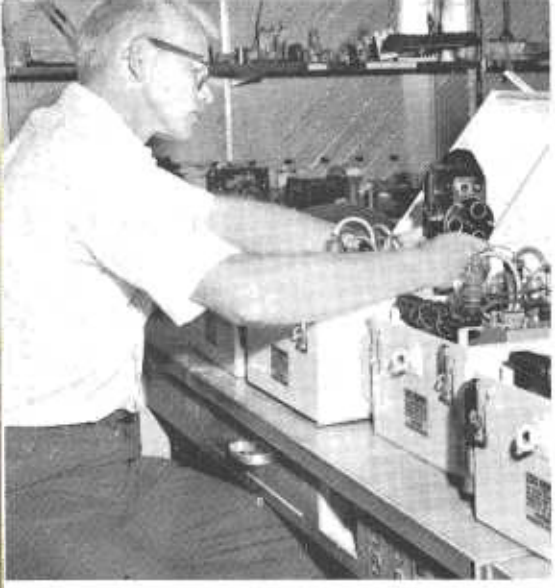
Major Items Are Listed

The magnitude of the direct control inspection operations of the department is illustrated by the following statistics on some of the major items released for use in highway construction during the past year.

Concrete pipe	354,000 lineal feet
Clay pipe	73,000 lineal feet
Steel pipe	1,347,000 lineal feet
Miscellaneous iron and steel	6,251,000 pounds
Guardrail	807,000 lineal feet
Treated timber	713,000 board feet
Untreated timber	48,000 board feet
Treated timber piling	362,000 lineal feet
Expansion joint	344,000 square feet
Waterstop	43,000 lineal feet
Corrugated metal pipe for culverts	716,000 lineal feet
Structural steel	40,000 tons
Reinforcing steel	218,000,000 pounds
Prestressed concrete girders, panels, deck units, etc.	1,500 each

The Field Exploration Unit drilled 4,381 lineal feet of borings for foundation investigations and slightly more than half of this work was done for the Office of Architecture and Construction in the Department of General Services. Samples were obtained

A construction inspector teaches a trainee in the proper determination of concrete slump with the Kelly-ball device.



An engineer installs a motion picture camera into its control box for gathering data on wrong-way drivers as part of a safety study.

PHOTO ABOVE—An engineer checks data being received from a recorder inside a trailer at a jobsite. The trailer contains all the receiving and recording equipment for collecting information transmitted by strain gages used in a research study of an orthotropic bridge constructed near Dublin in Alameda County. BELOW—a chemical engineer uses a gas chromatograph to determine the constituents of paints and solvents.

from 1,517 lineal feet of borings for cut slope design.

As ground water problems are being recognized early in the investigational stages for our highways, more and more of the horizontal drains are being set up as contract items. The Field Exploration Unit was still called on to install 18,515 lineal feet of horizontal drains as corrective measures on embankment slipouts and slides of cut slopes. Maintenance of existing drainage systems called for the cleaning of 3,529 lineal feet of horizontal drains. Approximately 17 percent of this work was done at the site of the Lawrence Radiation Building for the University of California, Berkeley.

Less Inconvenience to Public

This control of ground water and quick emergency corrective measures means less inconvenience and more time for use of our highways by the traveling public.

While 75 percent of our work is associated with preliminary engineering and routine materials work, the remaining 25 percent is devoted to research. During the past year over 100 active research projects have been underway. Some of the more significant projects are included in the following outlines.

Research is being conducted on the design of embankments so that fills from 300 to 500 feet high can safely be built to permit better horizontal and vertical alignment of our modern high-speed highways.

The study of potential slipouts, including treatment with lime to increase soil strength and to reduce the tendency of soils to become unstable during wet conditions, has been underway in cooperation with personnel in District 3 in the Whitmore area on Interstate Highway 80. Data are being taken from slope indicators and inclinometers which reveal any movement of the embankment. This lime-treated embankment was placed to repair a slide which occurred during the winter of 1963–64. So far the experimental repair work is proving to be satisfactory.

The Geology Unit has completed a study on the use of color air photographs for facilitating the location of potential sources of gravel and sand suitable for highway construction materials. Preliminary studies indicate that the use of color photography may ultimately replace black and white photography in this type of work.

Evaluation of Nuclear Devices

Work is continuing in the evaluation of nuclear devices used to determine the moisture content of soils and the density of compacted earth materials. The laboratory phase of this work is now terminating and its practical field application is being evaluated. In a pilot program involving 10 construction projects these devices are being used for routine control of compaction. From this study it is expected that information will be gained on field problems concerning their use over a wide range of geographic conditions and soil types.

Among the more unusual operations of the Geology Unit has been the successful attempt to locate water well sites in desert regions for highway rest areas to be used by the motoring public and for tree planting programs.

Considerable work has been done to evaluate the skid resistance of highway surfaces. This past year over 100 road tests were performed and evaluated at different locations over the state.

Wider acceptance of the use of highway deflection measurements in selecting designs for highway reconstruction has resulted in the constant use of the traveling deflectometer. This truck and trailer instrument applies a 15,000-pound axle load and measures the resultant movement of the roadway to the nearest thousandth of an inch. Generally large movements indicate need for more extensive reconstruction than would corresponding smaller deflections. Recommendations on 50 projects were based on deflection data over the past year. A high percentage of this work was performed directly for cities and counties throughout the state.

Railing, Barriers Tested

In cooperation with the Traffic and Bridge Departments and the Bureau of Public Roads dynamic, full-scale testing has continued to improve and

perfect the design of bridge and guard rails as well as median barriers so that the traveling public can enjoy a greater degree of security on our highways.

A traffic problem which has attracted considerable attention over the past year is that of the motorist who enters freeway off-ramps from the wrong direction. The Laboratory has been assisting the Traffic Department in evaluating proposed solutions and in making photo-instrumentation studies for analysis of these wrong-way movements.

During the year the electrical laboratory instrumented a new type of steel bridge known as an orthotropic deck plate girder. This Bridge Department project involved the use of a large number of strain gages and a sophisticated complex of recording equipment housed in a field trailer. The project required over 1,200 instrumentation circuits and 30 miles of instrument cable. The Bridge Department proposes to use the stress data from this project to develop more efficient and economic bridge designs in the future.

Heavy ground water runoff through one of the horizontal drains near the Whitmore slide area in Interstate 80. The drains were successful in preventing further earth movement and damage to the roadway. Previously, slides induced by excessive trapped water had caused complete failure of the roadway.

Durability of Paint

Even the best conventional traffic paints are not durable under adverse conditions and do not provide visability at nighttime in the rain. This has encouraged continuing investigations of other materials for traffic delineation. Thermoplastic traffic marking materials now available are expected to have an increased service life, however, the wet weather visibility problem still persists with their use. To solve this problem several types of raised reflective markers have been installed at various critical areas in the state. Some have good to excellent night wet weather visibility and others which are not so effective at night have better daylight visibility. A combination of types has been recommended for adequate traffic delineation for both night and day and wet and dry conditions.

Paint research studies continue for a variety of uses. One of the more significant results of these studies comes from a 10-year study of bridge paints along coastal areas. This study has shown that an inorganic zinc-rich paint with a lithium sodium silicate binder will give up to three times the service life of the present vinyl paint system and up to six times the life of a red lead primer system.

An electrical engineer checks some of the 30 miles of cable necessary to instrument an orthotropic bridge for research purposes.

Quality Control

In a cooperative project with the Bureau of Public Roads, the Division of Highways undertook a study of construction projects to determine the potential of statistical methods for quality control. The project involves a wide variety of materials and an extremely large total number of samples and tests. Within the Division of Highways the project is a joint effort of the Construction, Bridge, Design, and Materials and Research Departments with most of the sampling and testing being performed by District and Bridge Department personnel with the Materials and Research Department performing the laboratory testing and analysis of all data.

EQUIPMENT

During the 1964–65 fiscal year, a number of changes to reduce costs were made in the Equipment Department's operation. Major changes involved rental rates, replacement of passenger vehicles, and car pool charges.

The basis for charging rental rates was changed from a monthly rent to a rate based on usage. Automotive equipment is charged now on a mileage rate. Construction type units such as rollers, motor graders, tractors, etc., are charged on the basis of hours used.

Rental rates now include the cost of fuels and lubricants. The new rates include all costs of the equipment, with the exception of the operator.

In the past, passenger vehicles were replaced at approximately the hundred-thousand-mile point. The new policy provides that these vehicles are to be replaced at any time regardless of age or mileage, when it is economical to do so. This new policy has resulted in a savings on the cost of owning and operating passenger vehicles.

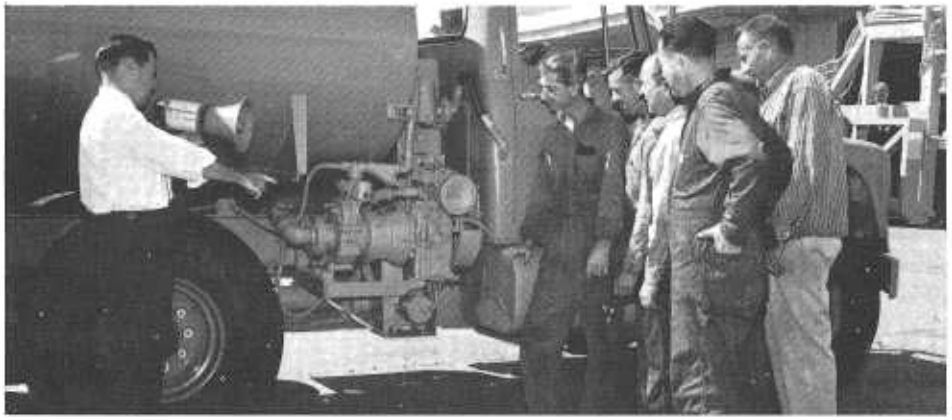
The costs involved in car pool operations were transferred to the Equipment Department from the using units to give a better overall automotive cost.

Technical Training

The Technical Research and Training Section continued working on problems involving equipment research and operation. A special research project was activated to study corrective maintenance problems associated with crankcase pollution control devices. The section handled technical training activities with special emphasis on training of operators concerning the mechanical features of equipment operation. This specialized MEFEO training was given to 703 operators of the Maintenance Department for a total of 3,500 man-hours involving 42 different models of equipment.

The Design Section develops the specialized working equipment items required by the Division of Highways.

During the past year, greater emphasis has been placed on standardization. This has also resulted in substantial savings in manufacturing costs and equipment delivery. The desirability of this concept is reflected in the cost reductions experienced on numerous equipment types, although materials and labor have increased.



Equipment employees receive instruction on the operation and maintenance of the new roadside spray proportioner. This unit was developed to automatically proportion spray material while it is being sprayed and has resulted in substantial savings in material and labor.

Some Equipment Built

Whenever possible, equipment is purchased rather than built. However, in the interest of efficiency and economy, it is sometimes necessary to design and develop specialized equipment to fulfill a specific need. Typical equipment items designed and built for specialized application are listed below.

1. "Jet" Sweeper. Originally built for airfield runway cleaning, this unit was purchased for use on freeways in

EQUIPMENT DEPARTMENT SUMMARY

	June 30, 1964	*June 30, 1965*
Equipment repairs	$4,246,330.29	$4,222,519.50
Miscellaneous expense	825,887.30	1,227,844.43
Indirect and other expense	1,273,944.69	1,543,684.01
Depreciation expense	4,313,748.03	4,971,490.61
Equipment operating expense	.00	2,747,105.19
Total expense	$10,659,910.31	$14,712,643.74

EQUIPMENT INVENTORY

Trucks and passenger vehicles	*Number of units*	*Original cost*
All trucks—½ to 15 tons	4,706	$19,258,785.34
Buses, jeeps, and station wagons	195	486,087.34
Passenger cars	2,607	4,620,705.52
	7,508	$24,365,578.20
Maintenance and construction equipment		
Motor graders	275	4,800,101.48
Rotary snowplows, grader mounted	1	41,804.64
Rotary snowplows, truck mounted	57	1,982,482.98
Loaders	238	2,170,697.42
Shovels, power	11	339,961.92
Snowplows, push	558	870,997.17
Tractors	116	998,695.92
Compressors	78	334,607.24
Miscellaneous other equipment—rollers, mixers, pumps, drills, mowers, trailers, etc.	2,322	6,909,819.61
Total inventory, June 30, 1965	11,164	$42,814,746.58

southern California. Sweeping speed is approximately 25 miles per hour. Several alterations have been made to improve performance on the roadway.

2. Roadside Spray Proportioner and Water Tank. This unit was developed to automatically proportion spray material while it is being sprayed, resulting in substantial savings in material and labor.

3. Direction Chute for Rotary Snowplow. Increased roadside development has made it necessary to equip a number of these machines with operator-controlled directional chutes which are especially designed to prevent clogging with snow.

4. Fence Truck. This unit is especially designed for quick repair of center barrier freeway fence. Extra long, low-height bed and large storage boxes, hydraulic-lift tail gate and self-contained water tank contribute to the effectiveness of this unit.

5. Four-ton Maintenance Truck. This is a self-contained unit with emulsion tank and tool storage box. The emulsion tank is pressurized from the truck's airbrake compressor and has a five-gallon diesel oil storage section which is used to flush hose and gun.

6. Floating Drilling Barge. This portable platform is used by the Bridge Department geology section to make underwater drillings for bridge foundations. A standard portable drill unit is mounted on the float when in use. The unit is made up of six sections which are transported on a special trailer. Each section is filled with styrene foam to insure against leakage.

12 Shops in State

The operations of the Equipment Department are carried out in the Headquarters Shop in Sacramento and the 11 shops throughout the state. There is one of these in each of the districts of the state and, operating out of these 11 major shops, there are an additional 17 subshops as well as field mechanics. To carry out this operation requires a total staff of 704 positions.

During the past fiscal year several improvements in operations have increased shop efficiency. Among these improvements were reduced paperwork, more efficient repair policies, a department wide supervisory training course, upgrading repair equipment, and additional shop facilities.

Eliminating the use of a vehicle transfer record for local movement of units and an improved vehicle inspection process have given shop personnel more time to perform maintenance and repair jobs.

More efficient repair policies, coupled with a general upgrading of repair tools available for the mechanic's use, have reduced the time that the equipment spends undergoing repairs.

All supervisors have recently completed an extensive course in management and supervision. Improvement in their techniques has already been noted, particularly in the area of personal relations.

A new repair facility was put into operation at Shop 3, Marysville. This modern shop has greatly increased the repair and service capabilities for this district. Currently, another new shop similar in design to Shop 3, is being constructed in San Leandro to service and maintain equipment in District 4.

The general increase in efficiency and productivity at Headquarters Shop in Sacramento continued, as reflected in the decrease in cost of many of the units fabricated and assembled there.

Increase in Equipment

Overall, there has been an increase in equipment of 458 units to make a total of 11,164 units and a reduction of 14 in the number of employees required to build and repair them.

All equipment purchased by the Equipment Department is obtained by bids on specifications which are prepared to permit the maximum number of manufacturers to compete on each unit. Specifications are established to meet the needs of the operating department. During the past year, the Equipment Department has submitted specifications for 396 units of equipment. Volume purchasing of standard items has been expanded to eliminate unnecessary requisitions and purchase orders.

During the past year, $9,034,450 was expended to purchase additional and replacement equipment. 1,532 obsolete units were disposed of during the 1964–65 fiscal year. These units were sold on sealed bids for which a total of $642,763 was received. To obtain a higher recovery value on equipment, newspaper advertising has been increased with special ads and, at the present time, 1,646 names are on the prospective bidders mailing list.

The Procurement Section purchased $1,192,316 worth of spare parts for repairing items of equipment. An inventory of "hard-to-locate" items is maintained to help reduce the downtime of urgently needed equipment.

The last half of the Equipment Department *Rental Equipment Catalog* was completed and distributed. This catalog illustrates and describes the types of equipment available from the Equipment Department.

The Technical Research and Training Section works on problems involving equipment improvement and operation. The session shown above concerned maintenance problems associated with crankcase pollution control devices.

Administration

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; economic analysis; and headquarters mail and general files.

Budget and Project Control

The Budget and Project Control Section has the responsibility of insuring that the division complies with the provisions and amounts specified in the state highway budget; the processing of contract documents; preparation of financial documents submitted to the Highway Commission; preparation of reports for submission to the Highway Commission relative to projects and project financing; issuance of expenditure authorizations and maintenance of construction statistical records.

During the year, 505 financial resolutions were prepared for commission action; 602 projects having an estimated cost of $471,512,500 were advertised for bids of which 563 were determined to be satisfactory for recommending contract award.

In addition to the major contract work, the financing of 285 minor and informal contracts having an approximate value of $570,000 was cleared.

An unanticipated major work load was caused by the storms in the northern part of the state in the latter part of December 1964, the intensity of which exceeded all records and resulted in state highway damage of approximately $44,000,000. To provide for road reopening, a total of 57 emergency contracts was processed.

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 prior to opening of bids so that estimates can be adjusted to conform with prevailing construction costs whenever necessary. Material information hand-outs are prepared for use by prospective bidders.

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. Contractors' bid price extensions are checked and a complete bid summary is prepared. Contract plans are revised to show "as built" changes, right-of-way maps are recorded and filed; freeway strip maps for the interstate system are prepared. Plans showing standards of construction, four series of district and metropolitan area maps, various state maps including the highway 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.

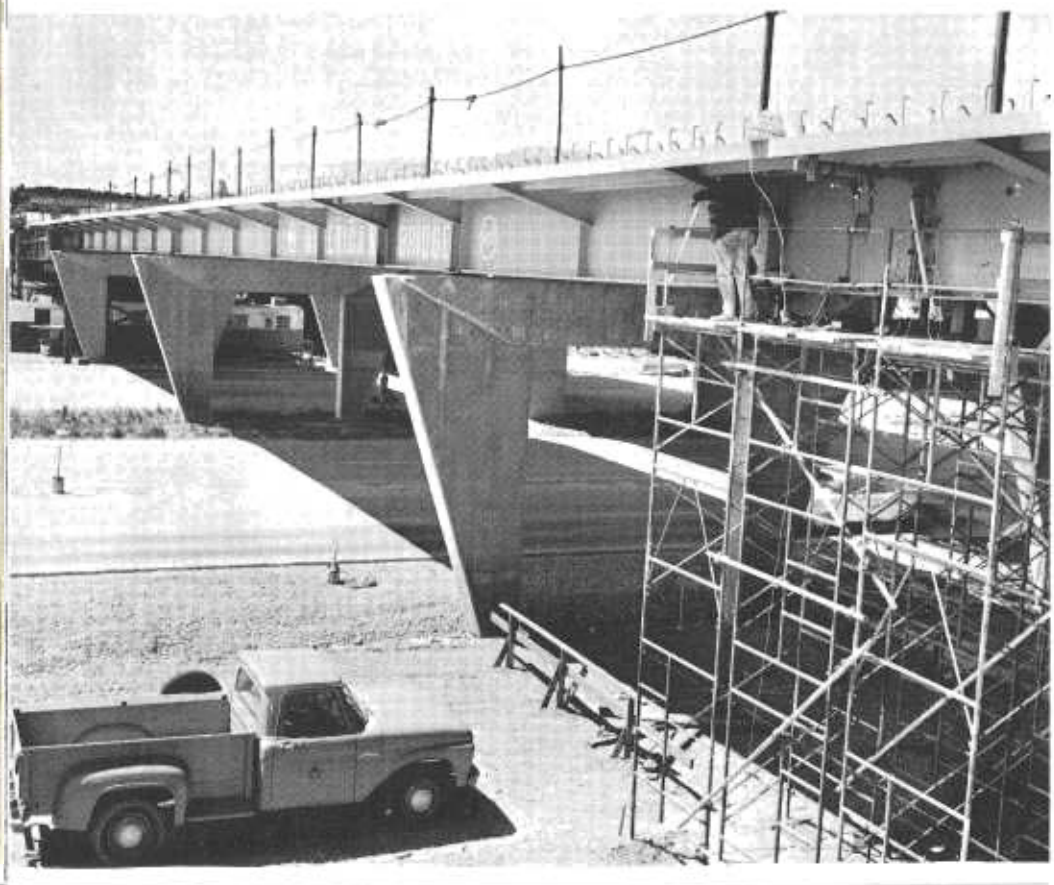
A monthly project record-consolidated status estimate, used in conjunction with the progress and payment of all regularly advertised going contracts, is prepared. An annual tabulation entitled "Contract Item Data" is prepared as an administrative aid and management tool.

Specifications

Specifications were prepared for 602 financed projects during the year. In addition, specifications were prepared for future projects to expedite advertising for bids when funds will be available.

During the second half of the year specifications were prepared for 57 storm damage projects on state highways in the northern part of the state. The heavy rains and flooding of December 1964 necessitated the expeditious preparation of specifications, so advertising for bids and construction could be accomplished at the earliest possible date. Many of the projects were timed to permit completion of the work or opening of the road to traffic before the winter rains. These

The Division of Highways instrumented this bridge near Dublin, Alameda County, with 1,152 circuits for strain gage and deflectometer as part of a study to check design theories.



STATE HIGHWAY MILEAGE BY SURFACE TYPE

Type	Mileage
Concrete	1,737.884
High bituminous	8,890.799
Low bituminous	2,317.475
Oiled earth, gravel	1,025.976
Graded and drained earth	48.541
Bridges	179.716
Totals constructed roads	14,200.391
Unconstructed road	2,214.447
Total state highway system	16,414.838

STATE HIGHWAY MILEAGE BY HIGHWAY TYPE

Lanes	Freeway	Expressway	Conventional	Total
2 and 3	.428	4.035	10,784.551	10,789.014
4 and 5	1,065.348	746.580	939.163	2,751.091
6 and 7	333.949	5.170	98.351	437.470
8 and over	219.782	—	3.034	222.816
Total	1,619.507	755.785	11,825.099	14,200.391
Unconstructed roads				2,214.447
Total state highway system				16,414.838

projects were in addition to the regular planned program.

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

Economic Analysis

The Economic Analysis Unit maintains statistical records pertaining to highway construction contracts awarded, numbering 563 during this fiscal year. Records are kept for use in preparation of the quarterly California Highway Construction Cost Index, and for use in forecasting future materials requirements. Weekly and monthly reports for management purposes also are prepared showing the value of budgeted and nonbudgeted programs, and of other projects for which bids are received. The statistical supplement to this report is also compiled by this unit.

The contracts placed underway during 1964–65 covered a total of 1,363 centerline miles of state highway, including resurfacing. In addition, the Department of Public Works awarded contracts for construction on approximately 134 miles of federal-aid secondary county roads and 11 miles on state park and other miscellaneous roads, a total of 1,508 miles.

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. Ratings in excess of $20 million have been entered at $20 million.

The total number of contractors prequalified to bid on the various types of state highway construction increased from 774 on July 1, 1964, to 789 on July 1, 1965. The combined bidding capacity of these 789 prequalified contractors is $3,055,941,000—using the $20 million cutoff figure—which is $11,975,000 more than a year ago.

The following tabulation gives the number of contractors prequalified by the Division of Highways on July 1, 1965, arranged by the several brackets of bid ratings:

Rating	Number of contractors
$10,000,000 and over	88
5,000,000 to $10,000,000	168
2,500,000 to 5,000,000	248
1,500,000 to 2,500,000	327
1,000,000 to 1,500,000	395
500,000 to 1,000,000	529
250,000 to 500,000	663
100,000 to 250,000	764
50,000 to 100,000	789

Bids and Bidders

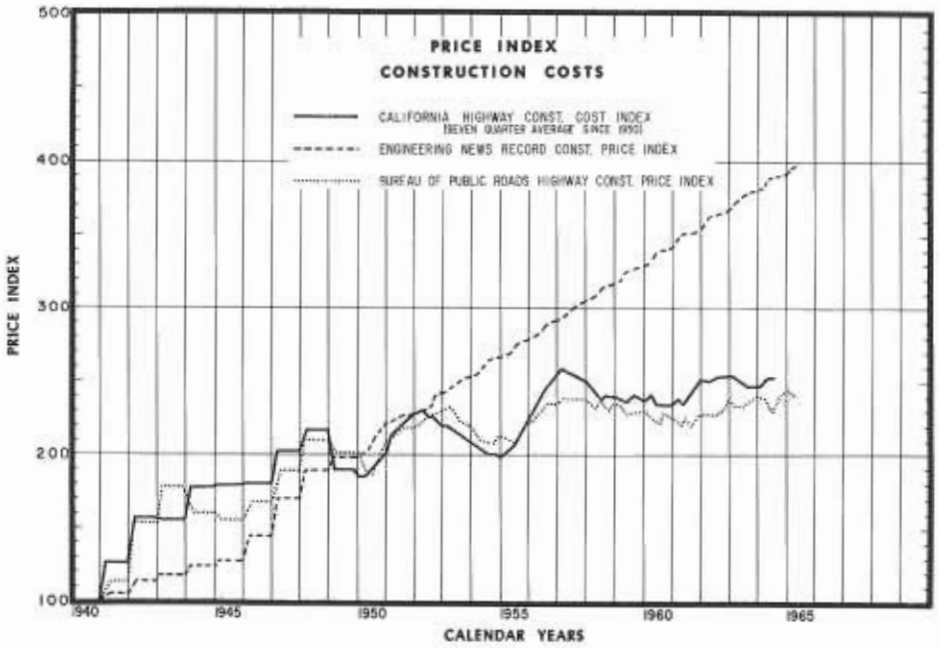
The average number of bidders per project during the year was 5.0 which was slightly lower than last year's level of 5.4. The highest monthly average of 6.1 was in January 1965. The low of 3.7 was in June 1965. The contracts awarded during the fiscal year have been arranged in eight value ranges as shown 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.

Street and Highway Mileages

Various highway and street mileages, with which the Division of

CONTRACT VALUE RANGE

		Number of projects	Percent	Value of projects	Percent
Under	$50,000	229	40.7	$4,938,863	1.2
	50,000 to $100,000	47	8.3	3,447,399	0.8
	100,000 to 250,000	98	17.4	16,397,439	3.9
	250,000 to 500,000	64	11.4	22,088,554	5.3
	500,000 to 1,000,000	31	5.5	22,808,179	5.5
	1,000,000 to 2,500,000	38	6.7	59,828,004	14.4
	2,500,000 to 5,000,000	33	5.9	123,042,898	29.5
Over	5,000,000	23	4.1	163,920,231	39.3
Total		563	100.0	$416,471,567	100.0



Highways is directly or indirectly concerned, are shown below:

	Miles	*Miles*
Total state highway system (including portions of city streets and FAS system)		16,415
Highways proposed for construction where roads do not exist		2,215
Constructed state highways		14,200
Federal aid system		
Primary rural (12-31-64)	7,956	
Primary urban (12-31-64)	1,682	
Total		9,638
Federal aid interstate system (included in above)		2,178
Federal aid secondary system (6-30-65)		
On state highways	3,539	
On county roads	9,342	
Total		12,881
County maintained system (6-30-65)		71,013
City streets (estimated 12-31-64)		36,561
City streets on state highway system		1,993

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 249.3 in the third quarter of 1964, increased to 268.1 in the following quarter, dropped again to 249.6 in the first quarter of 1965 and rose to 269.0 in the second quarter of 1965. The average value for calendar year 1964 is 249.2.

The above graph shows a comparison between the California Index, the Bureau of Public Roads Index and the *Engineering News-Record* Construction Cost Index. The latter two indices are based on nationwide construction costs. The California Index is plotted on an average basis which describes the trend more clearly by smoothing out the fluctuations between the individual quarters.

CONTRACTS BY TYPE

This tabulation gives the number of contracts with mileage by types awarded during the 1964–65 fiscal year.

State Highway System

Number of contracts		*Centerline miles*
47	Portland cement concrete	201.6
189	Asphalt concrete	1,016.4
3	Road mix	7.6
7	Seal coat	121.5
6	Grading	16.4
76	Traffic signals and lights	...
39	Bridges	...
117	Miscellaneous	...
484	Total	1,363.5

Not on State Highway System

	County Roads—Federal Aid Secondary	
1	Portland cement concrete	1.4
41	Asphalt concrete	104.4
3	Road mix	16.7
4	Grading	11.0
1	Traffic signals and lights	...
4	Bridges	...
23	Miscellaneous	...
77	Total	133.5
	State Parks, Etc.	
2	Asphalt concrete	11.0
563	Totals	1,508.0

Federal Aid (1964–65)

A total of $326,043,154 in federal aid funds was apportioned to California for 1965–66 under the Federal Aid Highway Acts of 1961 and 1964. This included $21,945,130 for primary highways, $9,979,258 for secondary routes, $27,130,366 for urban routes and $266,988,400 for interstate highways. The basic federal share of primary, secondary and urban projects is 50 percent; of interstate projects, 90 percent. These percentages are increased slightly by a public land area factor.

At the start of the fiscal year, construction was in progress on 160 contracts totaling $558,551,000, of which $415,933,000 were federal aid funds.

There were 104 construction contracts involving $39,258,000 of primary funds, $34,440,000 of urban funds and $151,218,000 of interstate funds completed during 1964–65. These amounts, together with the required state matching funds, bring the combined total cost of such improvements completed during the year to approximately $301,550,000.

There were 110 contracts awarded with a total cost of $327,683,000, exclusive of preliminary engineering, involving primary, urban and interstate federal aid funds totaling approximately $264,551,000.

Eighty-five of these contracts provide for improvements on the national system of interstate highways with a total cost of $240,739,000 of which the federal share amounts to $216,295,000.

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 $31,728,000 to a total of $573,884,300.

In addition to the regular federal aid funds, the state receives funds for repair of highways which have suffered serious damage as the result of disaster over a wide area.

Because of the storms in northern California during December 1964, and the resultant extensive damage, estimated at $44,000,000 to state highways, the state became eligible for federal aid emergency relief funds. As of June 30, 1965, 102 projects for repair of state highways have been programmed with a total cost of $36,939,953 of which the federal share is $26,017,920, not including approximately $2,750,000 of work administered by the Bureau of Public Roads.

Industry Contact

The Industry Contact Section establishes general prevailing wage rates for heavy construction and building crafts in accordance with the applicable provisions of the statutes of the State of California. These general prevailing wage rates are published periodically and are available to other public agencies throughout the state, and many agencies make use of this material.

Establishment of equipment rental rates for use on construction force account work is accomplished in this section, and extensive files are maintained relative to heavy construction machinery and associated owning and operating costs.

Liaison is maintained with the Public Utilities Commission with respect to tariffs affecting the operation of this division, and information relating to Tariff No. 7 is distributed periodically by this office.

Regulations and procedure for the drawing up of minor contracts, right-of-way clearance contracts, informal contracts, emergency contracts, service contracts, interagency agreements and standard agreements are formulated within this section. All of these contracts and agreements are processed in varying degree within the Industry Contact Section.

Service Contracts

5,883 service contracts were processed involving a total expenditure of $11,665,000.

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 minor contracts, right-of-way clearance contracts and other prescribed procedures.

The principal use of service contracts, involving an expenditure of nearly $4,500,000, was for the rental of equipment for highway maintenance, for highway construction by honor camps, and for occasional day labor highway construction projects.

Minor Contracts

Small projects for which the cost will not exceed $5,000 are handled by the districts. A total of 285 minor contracts with a value of almost $570,000 were awarded during the fiscal year. The average amount per contract was approximately $2,000.

Standard Agreements

Certain types of personal services are obtained under standard agreement. During the fiscal year 133 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. 549 contracts totaling $1,786,890 were awarded for the demolition of buildings; 26 contracts totaling $225,535 were awarded for altering and moving buildings, relocating irrigation systems and fences, and drilling wells.

Emergency Contracts

Due to the floods in the northern part of the state in mid-December 1964, the Governor proclaimed a state of disaster for this area, and suspended as necessary all laws of the State of California which do or may require advertisement for bids for the purchase of supplies, employment of services, or performance of work and which prescribe procedures for the conduct of state business, including any applicable regulatory statutes, in connection with the taking of emergency and remedial measures in mitigation of the disaster. In connection with this disaster, 57 emergency contracts were processed in the total amount of $7,862,500. All of these contracts were for work to be paid for on a force account basis since there was no time to prepare plans and specifications for the necessary repair work.

CITY AND COUNTY PROJECTS

The division's City and County Projects Department continued the expansion begun in the previous fiscal year. Much of this expansion was due to the temporary increase in the gasoline tax for financing flood damage repairs (see last section of this topic titled "Flood Damage Repair"). In addition, increased staff was found necessary to administer the new 1.04-cent program described in the next section.

City and County 1.04-cent Program

The relatively new program of apportionment of the 1.04-cent gasoline tax, which funds are made available to the cities and counties under the Collier-Unruh Local Transportation Development Act, is steadily increasing in scope as the agencies avail themselves of the funds. These funds are 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. A part of the program which has attained a major stature in the administration is the provision requiring that the cities and counties match a portion of the 1.04-cent funds with funds derived from other than the Highway Users Tax or State Highway Fund.

On June 29, 1965, Governor Edmund G. Brown signed Senate Bill 380, which amends portions of the existing statutes. These amendments were developed by a city-county-state committee to provide a more workable street and road improvement program under the purpose of the act. Generally, Senate Bill 380 simplifies the reporting procedures by elimination of duplication, provides more

flexibility in the select system modification process, permits review of the standards when necessary, and broadens the concept regarding matching funds. The immediate effect of this bill on the previous year will be to permit many agencies to claim matching credit for projects under construction by the beginning of the program and matching credit for projects undertaken by certain public agencies.

Though the portion of the act dealing with the new 1.04-cent program does not require formal budgeting nor prior approval of each project, as is required under the older city street program, it does provide for the review of each improvement during or following construction to the extent considered necessary by the department to verify that the act's requirements have been met. This review includes projects for which matching credit is claimed as well as projects upon which 1.04-cent funds are expended. The facets considered include verification of the project's location on the select system, its conformance to the required design standards, and the eligibility of the work for financing with the act's funds.

Approximately 2,800 project plans were reviewed by the district and headquarters engineers during the year. Many projects are also reviewed at the construction site. During the first full year that the act has been in operation, $47,299,487 was apportioned to the cities and $20,497,485 to the counties. Of this total, $2,432,800 was available for expenditure without matching. The remainder will require 50-percent matching during the year of expenditure. During the 1963–64 fiscal year, there was approximately $48,000,000 matching credit accumulated which was available to apply against 1964–65 expenditures.

Reports on actual expenditures will be made available in the agencies' annual street and road reports to the State Controller.

City 0.725-cent Program

A total of $48,051,455 was apportioned to the 395 incorporated cities during the fiscal year under Section 2107 of the Streets and Highways Code. The amount represents 0.725 cent per gallon of the gasoline tax and was apportioned on the basis of population in the incorporated cities.

The allocations of funds to cities for engineering on city streets amounted to $1,396,000 under Section 2107.5. This allocation is based on certain population brackets and ranges from an annual minimum of $1,000 to $20,000.

City budgets totaling $51,815,000 and approved by the division for delegated expenditures by the cities included $20,362,000 for construction and $6,794,000 for rights-of-way on the select system of streets and $24,659,000 for maintenance on local and select streets.

A total of 443 sets of plans, specifications, and estimates were reviewed and approved for construction during the year. These plans provided for the improvement of 182 miles of streets at an estimated cost of $31,252,000, to be financed from gas tax and other local source funds. About 65 percent of the projects were approved at the district level.

Approximately 245 cities took advantage of the increased allowance for maintenance to 60 percent. This raised the Section 2107 expenditures for maintenance some $9,000,000 and reduced the expenditures for construction and right-of-way by a like amount.

New Cities and Populations

There were seven new incorporations of cities filed with the Secretary of State during the fiscal year. There were 891 annexations to cities in the same period. There was also one merger and one official name change. The City of Dairyland became the City of La Palma on February 11, 1965. The City of North Sacramento merged with Sacramento as of January 1. The new cities and dates of incorporation were:

City	*County*	*Date*
Portola Valley	San Mateo	July 14, 1964
Morro Bay	San Luis Obispo	July 15, 1964
Thousand Oaks	Ventura	Oct. 7, 1964
Camarillo	Ventura	Oct. 22, 1964
Norco	Riverside	Dec. 23, 1964
Yountville	Napa County	Feb. 4, 1965
Rio Dell	Humboldt County	Feb. 26, 1965

This section of Putah Creek Road southwest of Winters in Yolo County was built under the federal aid secondary highway program. Lake Solano is to the left of the roadway.

The total number of incorporated cities was 395 as of June 30, 1965.

The population increase of incorporated territory is summarized as follows:

As of June 30, 1964	13,160,726
By annexation	47,255
By special federal census	34,255
By Department of Finance estimates	369,722
By new incorporations	72,378
As of June 30, 1965	13,684,336

Road and Street Systems

As specified in the Collier-Unruh Act a new "select system" of roads or streets was submitted to the department by each eligible city and county prior to October 1, 1964, and approved or modified by the Highway Commission prior to April 1, 1965. Two cities having no public streets were ineligible to submit proposals. New cities incorporated after October 1, 1964, automatically "inherited" the corresponding portion of the select system in the county area incorporated.

Initial select systems submitted and approved as above number 446 (57 counties and 389 cities). In addition 2 counties and 13 cities were granted system modifications during the fiscal year in accordance with the provisions of the act.

The total mileage in the select system at the end of the fiscal year was 37,-830.64. This compares with a total mileage of public streets and roads of 105,741.20 on the same date.

During the year an additional 366.77 miles of county-maintained roads were certified to the State Controller in accordance with Section 2121 of the Streets and Highways Code. This figure is the net increase after deducting 727.57 miles lost by annexations or other causes from the 1,094.34 miles of new roads. Thirty-seven counties reported a net increase and 17 reported a decrease. Four counties reported no change. The new total of county-maintained roads was 71,013.07 on June 30, 1965.

The year's activity concerning changes in the federal-aid secondary system approved by the U.S. Bureau of Public Roads is reflected by the following mileage figures:

	6/30/64	*Change*	*6/30/65*
Local roads	9,152	+190	9,342
State highways	3,527	+12	3,539
Totals	12,679	+202	12,881

Among the new pieces of equipment purchased by the Division of Highways is this new forklift truck shown loading freeway signs on to a trailer.

Most of the changes were in the following counties:

San Luis Obispo (including Kern)	+126
Monterey	+28
San Diego	+17

FAS Program

The federal-aid secondary program in California is primarily a cooperative endeavor for the improvement of a system of principal county roads involving the use of federal, state and county funds. Projects are selected by the counties in cooperation with the Division of Highways and approved by the U.S. Bureau of Public Roads. Design standards for the improvement of these important county farm-to-market and recreational roads are similar to those used on state highways carrying comparable volumes of traffic. Projects are engineered by county forces and constructed under contracts awarded by the Department of Public Works.

During the fiscal year, 60 county FAS contracts were awarded at a total cost of $18,838,720. These funds covered construction on 120.42 miles of road and 18 bridges. In addition, two FAS contracts totaling $1,848,280 were awarded covering construction of 15.26 miles of state highway on the FAS system.

California received $10,198,300 of federal funds for secondary highways authorized for the 1964–65 fiscal year. In accordance with state statute, 87½ percent or $8,923,500 was reapportioned to the 57 counties participating in the program. The Division of Highways retained 11 percent of the total allocation or $1,121,800 for construction on state highways on the FAS system and the remaining 1½ percent for planning purposes.

A total of $4,183,300 for the 1964–65 fiscal year was allocated from the State Highway Fund in accordance with state law to supplant the counties' share of approximately 40 percent of the FAS construction costs up to a maximum of $100,000 per county. These funds were sufficient to provide the full matching requirement in 33 counties.

Urban Extension Program

The federal-aid secondary urban extension program authorized by Section 143.3 of the Streets and Highways Code in 1959 permits the Highway Commission to make allocations on an equal matching basis to cities and counties for the purpose of extending rural FAS construction into urban areas.

In the six years this program has been in operation there have been 54 projects representing allocations of state highway funds to cities in the total amount of $5,958,158 and to counties in the total amount of $6,026,203.

Allocations are limited to $500,000 to any one agency in any fiscal year and are granted 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

Flood damage investigating and reporting again became a primary function of the division's staff assigned to City and County Projects when during the last half of December 1964 history was not only repeated but was surpassed. As previously reported in this publication, the flood records of nine years ago (December 1955) were shattered. The crest of many of the rivers of the northwestern portion of the state exceeded the 1955 record by 20 feet and more.

In spite of the record deluge and runoff the damage to county roads and city streets was little greater than in 1955. This may be attributed in a large extent to the fact that the most vulnerable roads and bridges had been replaced with modern facilities under the Flood Relief Law of 1956. Only one such bridge was lost during the 1964 flood.

Twenty-six counties, 14 cities, and 11 special districts have applied or are planning to apply for federal or state financial assistance, or both. The costs of restoring roads and bridges on public roads not on the state highway system are estimated to be in the approximate amount of $24,500,000. After deducting the forest highway damage repaired by federal authorities there remained costs of $22,800,000 to be met by local government.

The Legislature, recognizing that the magnitude of these costs was beyond the capacities of the local agencies, enacted Chapter 27 during its 1965 Regular Session. This legislation provided for a temporary (nine months or less) increase in the gasoline tax of 1 cent per gallon beginning April 1, 1965, which was designed to provide $57,000,000, including the $22,800,000 required for the restoration of local roads, streets and bridges. After the state legislation was enacted, federal-aid under Public Law 875 was made available to local governments to provide emergency highway service. This aid was in the form of cash reimbursements totaling $3,700,000 and work by the U.S. Corps of Engineers costing $2,100,000.

The permanent restoration costs remaining estimated to approximate $17,000,000 will be met by other federal funds, since made available by Congress in the approximate amount of $5,400,000, state funds available from the temporary increase in gasoline taxes of approximately $8,700,000 and local agency matching funds of $2,900,000. The state statute provides for loans to those local agencies that are unable to immediately produce the required matching funds.

SERVICE AND SUPPLY

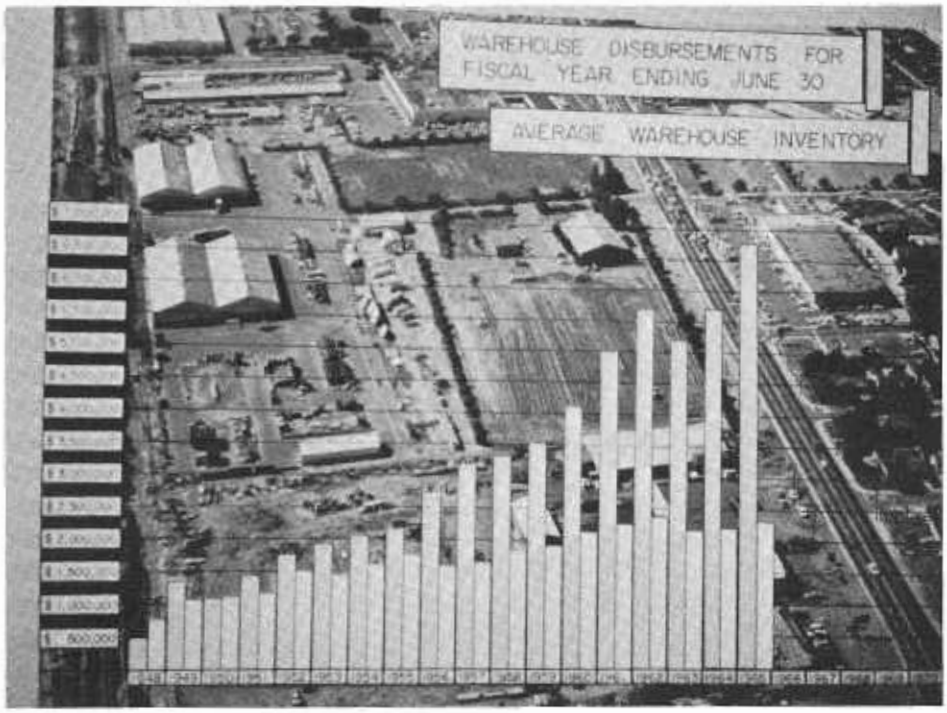
The Service and Supply Department administers the budgeting, procurement, warehousing, utilization, and disposition of property and supplies other than real estate and automotive equipment. In addition, the service section is in charge of building management, reproduction and photography in Headquarters.

The warehousing, reproduction and photography functions are self-supporting. The reimbursements from these functions account for over 85 percent of the Service and Supply budget.

Supply

Over $18,000,000 in purchases were made to keep our enormous and complex highway program in operation. Of this total, almost $7,000,000 in supplies were disbursed through the two warehouses. These warehouses, one in Sacramento and one in Los Angeles, provide rapid delivery to all points in the state. In addition to the usual warehouse items, considerable quantities of emergency materials are stocked. During the floods last winter in northern California, large quantities of these materials were airlifted to the disaster area. Many steel beams from the stockpiles have been used to restore the bridges destroyed by the flood.

A new program is being initiated to provide faster and more efficient handling of orders. The orders from the districts will be sent by teletype, checked and cleared by centralized electronic data processing inventory control in Headquarters, and then



The above chart shows the comparative increase of warehouse disbursements and average warehouse inventory over the past 18 years.

teletyped to the proper warehouse for shipment. New loading and hauling equipment at the warehouses, as well as the greater use of pallets to store and haul materials, will expedite the flow of goods to the users. The division's supply needs will be met faster and with less expense. Rapid service from the warehouses will permit smaller stocks at the user level and, consequently, savings in inventory, stockroom facilities and paperwork.

In addition, future planning includes placing all unused materials into a statewide reporting system. Using a "control by information" concept will insure maximum utilization.

To be self-supporting, the warehouses charge a markup to defray their expenses, including the freight charges to destination. This markup usually is from 10 to 15 percent; however, this year due to the streamlining of operations and the use of the 5-percent discount to reduce the previous cash surplus, the average markup was a surprisingly low 6 percent. A common measure of efficiency for warehouses is the turnover factor which is the ratio of disbursements to the inventory. This year the turnover factor was up 15 percent to a new high of 3.0.

During the past year the Supply Section experienced an increase of about 15 percent in output with no increase in personnel.

Service

The Reproduction Section provides an important service in Headquarters. The plans and specifications for highway contracts are reproduced, along with maps, manuals, forms and reports. A growing function of this section is the use of new techniques to reduce the work of draftsmen. New camera equipment being installed will facilitate the integration of many plans of different scales into one standard plan scale. "Sales" in this section total almost $600,000 during the year, which is about the same as last year.

The Photography Section continues its primary mission to provide photographic services to the districts. This includes aerial photos, ground photos, and movies. Both black and white and color pictures are taken. Other services provided by this section include pictures for the *Public Works Magazine*, services to the Public Information Section, and cooperation with the Audio-Visual Section in the production of training movies. A total of 2,167 photographic orders was processed (up 12 percent from last year).

In order to provide a more efficient relationship, 16 orientation-training meetings were held with the districts and other departments. Points of conflict were discussed and new policies and procedures were explained. Over 400 employees attended these meetings and gained a better understanding of the problems involved in the service and supply area.

The new forklift greatly speeds up the filing and removal of boxes of records in the Division of Highways records center.

SYSTEMS RESEARCH

After six months' production runs of computer-produced management reports for key personnel in all functions of the division, deficiencies were noted and, in cooperation with other headquarters units and the districts, a study was initiated to modify certain report formats to provide more meaningful information.

Utilizing EDP data, charts and graphs were developed relating actual monthly expenditures to funds budgeted by the California Highway Commission in the administration, maintenance, preliminary engineering and right-of-way functions. These charts show expenditures comparatively by districts and are used to indicate areas where the division's operations should be analyzed for reduction of costs.

In the capacity of chairman of the Budget Staff Committee, the systems research engineer assisted in analyzing the division's annual personnel and operating expense budget submittals and summarizing the data for presentation to the Budget Review Committee. Data was prepared and issued advising the districts and Headquarters units of the budget decisions made.

MANAGEMENT ANALYSIS

The Management Analysis Section, which was attached to the Systems Research Department on November 1, 1964, is a service unit established to provide assistance to districts and Headquarters departments, on request, in solving administrative and management problems through consultation and investigation. The following projects are currently under study:

Forms management program
Passenger vehicle use study
Engineering data retrieval
Staff assistance—P. & O.E. budget
Divisionwide responsibilities and authorities study
Records management study
C/L indexing system
Drafting services in Headquarters
Interdistrict mail routing
Staff assistance—project scheduling and control task force

. Planning

ADVANCE PLANNING

Freeway Routings

During the 1964–65 fiscal year the district staffs of the Division of Highways held 29 public hearings to discuss proposed freeway routings. The California Highway Commission, itself, held six public hearings during the year, four at the request of local authorities and two on its own initiative. The public hearings held by both the Highway Commission and the Division of Highways are listed in the statistical portion of the annual report.

The California Highway Commission had under consideration during the fiscal year some 45 freeway projects and adopted routings on 38 of them. These adoptions increased the freeway mileage by 212.6 miles, making a new statewide total of 7,183.6 miles of declared freeway as of June 30, 1965. This represents approximately 58 percent of the authorized freeway and expressway system as of that date.

Project Reports

The Advance Planning Section processed project reports on 240 proposed projects. Of these, 140 were major projects.

Significant Trends

There are some significant trends or developments taking place in the state highway program which are of interest.

One of these is the continual upgrading of the type of facilities provided. Just as the American consumer is buying bigger and fancier automobiles, they are demanding bigger, safer, more beautiful highways. This trend has been going on for years, but has recently accelerated. After World War II, highway construction money was very short and deficiencies were overwhelming. Of necessity, new highway construction was the minimum necessary to meet the traffic situation. In the following years, however, pavement widths have been made slightly wider; shoulders have been made wider and now are generally surfaced; median widths are greater and separated roadways are being used increasingly where terrain is appropriate; higher design speeds are being used; interchanges and separations are being placed at more frequent intervals and to higher standards; lighting and signing have been upgraded—increased use is being made of signalization, delineation, and other safety devices; a program of roadside rests is under way; and much attention is being given to landscaping, aesthetics, and beautification of highways.

All of the above incremental items in themselves have added or are adding a small degree to the cost of high-

One of the new rest areas on the state highway system is this one east of Baker on Interstate 15.

ways; however, when grouped together, the aggregate is a quite substantial increase in the cost per mile of construction. Several years ago it was estimated that the average cost per mile of the freeway and expressway system would run about $1 million. During calendar year 1964, the Highway Commission adopted about 300 miles of routes representing an average cost of about $2.6 million per mile. The most expensive single project cost was through a developed urban area, which ran somewhat over $14 million per mile. The division is now studying projects within urban areas where costs may range even higher on a mileage basis. In urban areas where costs are so high, all freeway routing studies are being coordinated in an urban transportation planning process to insure that their location and construction are integrated with other facilities to provide optimum benefits to the public and to the communities through which they pass.

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 2,641 miles, about 77 percent of which is on state highway routes.

The California apportionment of forest highway funds for the 1964–65 fiscal year was $4,726,004. The amount placed under contract or otherwise obligated during the year was $4,051,480, about three-fourths of which was for projects on state highways. The unobligated balance of the apportionment is to be supplemented with 1965–66 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 right-of-way, including clearance of utilities and options on material sites.

In addition to the above forest highway funds, about $21,000,000 has been allocated in emergency relief funds for repair of forest highways which were heavily damaged by the exceptionally high waters of flooding rivers during this past winter. The repair of this forest highway flood damage is financed 100 percent from federal funds with preparation of plans and supervision of construction by both State Highways and Bureau of Public Roads personnel. The necessary work is being accomplished under a large number of separate contracts which range in cost from about $5,000 to $1,600,000.

During the past year the portion of State Highway Route 190 between about two miles east of Springville in Tulare County and about four miles southwest of Olancha, a distance of approximately 61 miles, was added to the forest highway system. It has been designated Forest Highway 101.

Water Projects

It is a planning responsibility to determine whether the water development project 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.

PHOTOGRAMMETRY

The principal functions of the Photogrammetry Unit are the acquisition of aerial photography and photogrammetric mapping for various phases of the highway program.

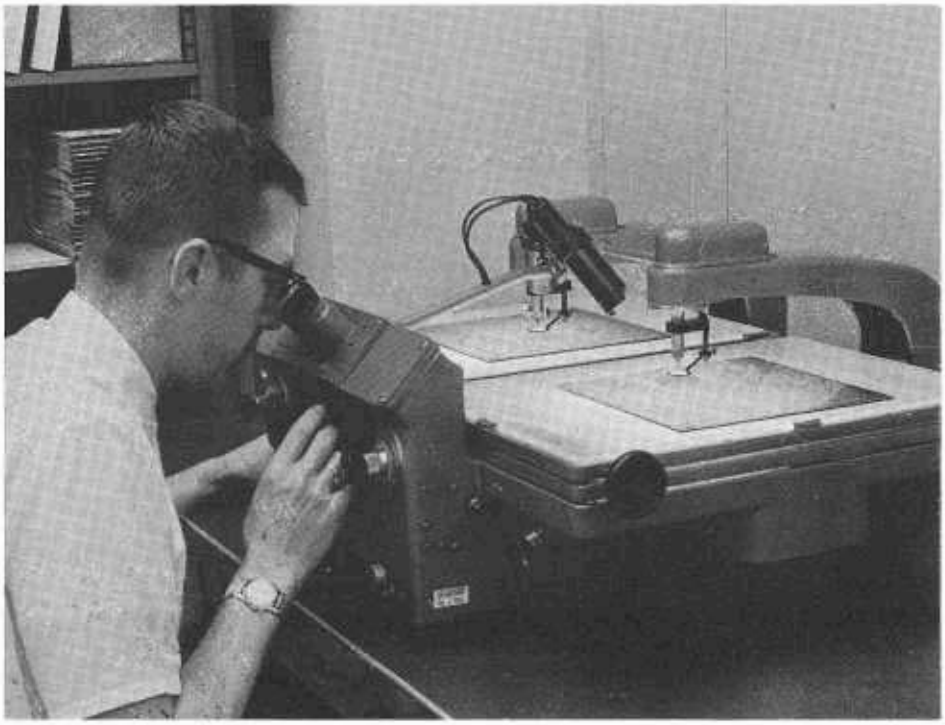
Volume of Contracted Work

Aerial photography and most of the photogrammetric mapping has been obtained by contract, although some was done directly by Photogrammetry Unit. The volume of all contracted work for fiscal year 1964–65 is summarized as follows:

	Contracts	*Highway strip miles*	*Contract amount*
Contour mapping projects for design	16	121.9	$166,391.00
Contour mapping projects for reconnaisance	2	23.7	21,411.00
Stereoplotter rental contracts	44		179,029.78
(Compilation for design)		496.7	
(Compilation for reconnaisance)		373.8	
Aerial photography contracts	16		177,067.00
Aerial photography contracts (blanket)	16		105,161.48
Analytical Photogrammetry	2		13,190.00
Total			$662,250.26

All mapping obtained by contract procedures is checked or verified by the Photogrammetry Unit using various photogrammetric methods. This is a continuing service to district offices and provides advanced information as a guide for performing accuracy test surveys by field methods.

Photogrammetric procedures are also used for making measurements in numerical form which are not involved in the making of maps. One important application is the taking of terrain cross section data for particular design and construction projects. The cross section data are automatically recorded on punch cards by means of an electronic attachment to the photogrammetric equipment, and are used for the computation of earthwork quantities. Following is a summary of the projects completed during fiscal year 1964–65.



This point transfer device is a precision stereoscopic instrument used in the operation of photogrammetric control bridging.

Number of projects	21
Station miles	144.11
Points read and recorded	508,935
Average cost per mile	$382.68

Other applications of photogrammetric data in numerical form include photogrammetric control bridging and determination of positions of property corners and section corners.

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 costly to perform. Twenty-seven such projects were completed during fiscal year 1964–65.

Position determination of property corners and section corners is a relatively new application. Research and test projects have shown that photogrammetric positioning produces results of uniformly consistent accuracy which have many applications to various design and right-of-way problems. For a corner to be definitely verified and positioned, it is necessary to find it on the ground and place a target around it to assure positive identification on the photographs.

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 land program.

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. 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 and authority for final adoption of the budget rests with the California Highway Commission.

The 1964–65 fiscal year budget included approximately $807,000,000 of which approximately $315,000,000, or 39 percent, represented federal aid apportionments. The budget included nearly $500,000,000 for construction and right-of-way acquisition, providing for construction of 308 miles of multilane freeway, 25 miles of multilane expressway, 38 miles of two-lane expressway, and 118 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 func-

tions necessary to eliminate delays in completion of plans, acquisition of right-of-way, and clearance with other agencies.

Buildings and Land

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 began on the new Shop 3 facility at Marysville, District 4 Shop at San Leandro, and maintenance stations at Eureka, Redding, Napa, Point Reyes, San Francisco, Santa Maria, Seaside, Lompoc, Culver City, Riverside, Lodi, and Chula Vista.

Plans were being developed and/or property was being acquired for new maintenance stations or additions at 28 locations throughout the state.

Full-scale dynamic impact tests such as that shown in this photo are conducted by the Division of Highways to test design of bridge rails and median barriers.

PROJECT CONTROL

During the 1964–65 fiscal year, this new department was added within the planning function. Its purpose is to: (1) establish effective schedules for project development from first determination of need to award of contract; (2) set up necessary procedures for continuous evaluation as to the progress of each project undertaken by the Division of Highways; (3) advise division management regarding the status of projects and problem areas involved; (4) evaluate present procedures and systems in regard to the handling of projects and recommend improvements; (5) coordinate the establishment of new standardized procedures among the various districts within the Division of Highways.

In the past, the various Headquarters departments monitored their own particular phases of project development. This new department will provide an effective means of coordinating these efforts.

A special task force has been set up to accomplish the initial procedure review phase of the project control program. This task force is composed of the engineers in charge of advance planning, design, urban planning, computer systems, systems research, and office engineering. The project control engineer is the chairman of this task force.

A detailed analysis is being made of the design of off-ramps and the effectiveness of traffic control signs and devices to determine whether certain features discourage wrong-way entry more than others.

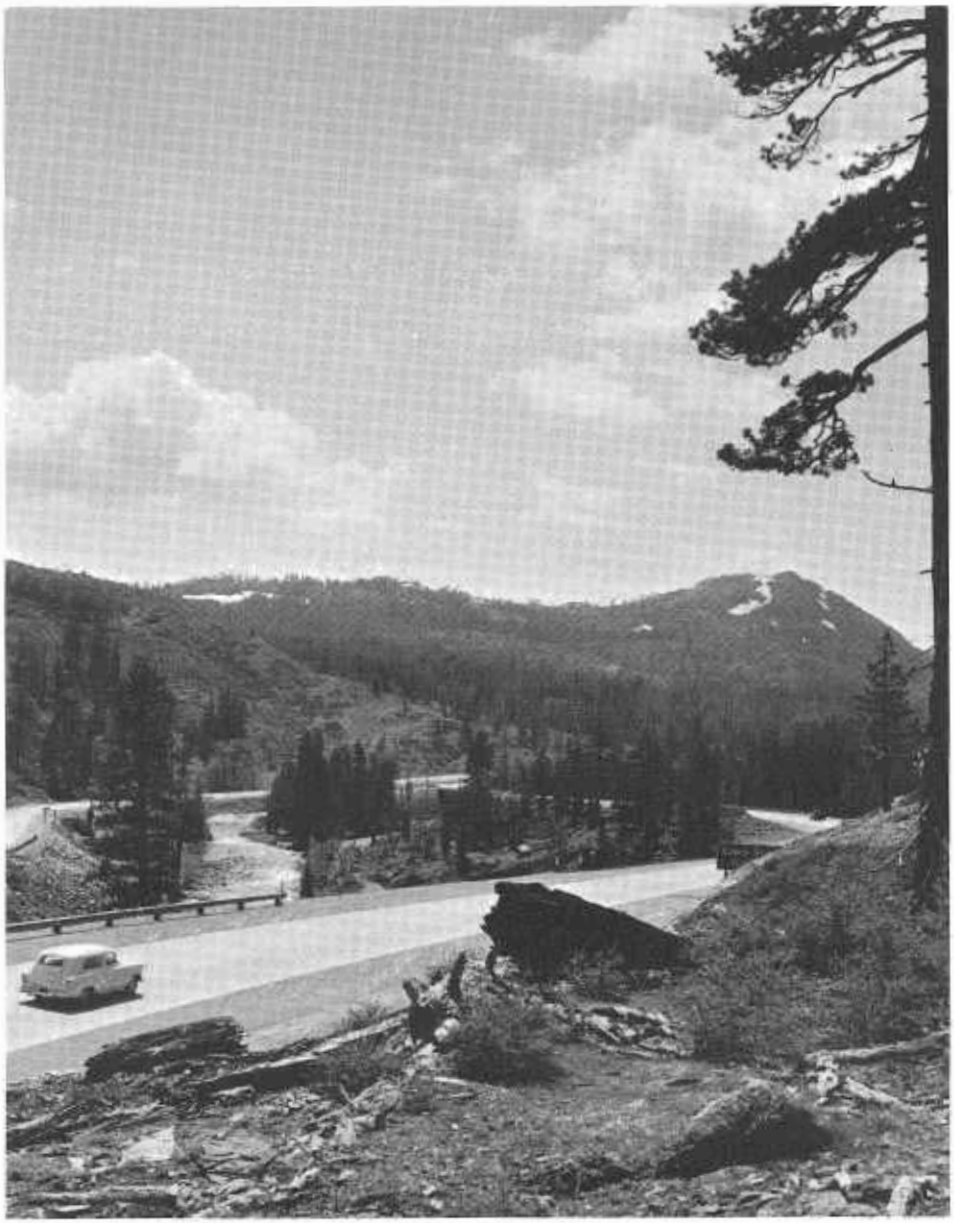
DESIGN

The Design Department and the Roadside Development Department share the responsibility for the planning and programing of the safety roadside rest system authorized by the 1963 Legislature. A tentative master plan for roadside rests has been established as a guide for financing and programing.

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 192 interchanges or channelized intersections were prepared. Contract plans were completed for 464 projects, including 7,584 plan sheets.



Successful efforts to preserve the natural beauty along highways are shown in this typical scene along Interstate 80 near Cisco Grove in the Sierra Nevada. The Yuba River forms the median between the separated roadways.

Structural Design

Continuing statewide studies and field reviews are being conducted of the service performance of various structural features for the purpose of evaluating present design procedures and standards. This activity includes analysis and consideration of new pavement design methods for possible adoption.

Freeway Agreements

Agreements between the state and cities and counties establishing the treatment of local roads affected by freeway development are required for all freeway projects. In January 1965, processing of freeway agreements became a Design Department responsibility.

Through close cooperation with local agencies, 211 freeway agreements were executed during the past fiscal year.

Scenic Highways and Highway Aesthetics

The current emphasis on highway aesthetics led to the appointment this year of a Headquarters committee called the Committee on Aesthetics and Highway Beautification. The membership is composed of the engineer of design, the bridge planning engineer, and the landscape architect. The committee has general responsibility for the aesthetics of state highways. Its duties include recommending policies and procedures to effect more pleasing highways and to review and make recommendations to the State Highway Engineer on specific problems involving aesthetics. One of the first actions of this highway beautification committee was to recommend a divisionwide training course be established in the near future. This course would provide a comprehensive educational program for the design engineers throughout the Division of Highways to instruct them in design practices calculated to improve the appearance of state high-

ways as well as to display and protect the scenic wonders of the country through which the highways pass. This course is currently under consideration.

A booklet entitled *Aesthetic Considerations in Planning and Design of Scenic Highways* was issued during the past year. This booklet outlines basic principles and techniques and serves as the division's manual for scenic highway design.

Field reviews by Design Department personnel and the division's landscape architects, which were initially conducted only on scenic highways, are now being conducted on all highways. During the past year, 81 projects covering 450 miles of state highways were reviewed.

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.

Tests of the standard guard rail and median barrier designs were made throughout this fiscal year. This is a joint venture involving the Design and Traffic Departments and the Materials and Research Department. The latter performed full scale collision tests of the barriers and guard rail. These have resulted in raising the guard rail from a height of 24 inches to a height of 27 inches and placing the posts at closer intervals.

Studies were made to determine a design for a glare screen to be used in the median to prevent glare from opposing headlights.

An experimental installation of a trial glare screen on Route 1 in Marin County between Waldo and Corte Madera Creek, is worthy of note. The object was to obtain relative costs of seven types of glare screen used as part of the standard cable median barrier, their durability in a coastal environment and their effectiveness as a glare screen. Future glare screen installations are under consideration.

Relaxing in comfort is easily achieved in roadside rests such as this one north of Red Bluff on Interstate 5. Beyond the comfort station on the left are additional shaded picnic tables.

The importance of project management and cost control has been emphasized in the past year. There has been increasing use of critical path methods among the designers in the Division of Highways.

The study for adopting the ring compression theory to metal culverts has been completed and the allowable height of cover has been revised. This study was made in cooperation with the Bridge Department and the Materials and Research Department.

An investigation has been made for revising the requirement of bedding and backfill for large culvert pipe and the requirements for shaped bedding under large culverts have been revised.

A model study has been sponsored at the University of California at Berkeley for the use of an aero-type culvert outlet structure in lieu of the conventional bucket dissipators used on major hydraulic structures. This work is being done in cooperation with the staff of the districts and Bridge Department. The work will be completed next fiscal year.

Drainage and Cooperative Agreements

The investigation of new techniques for improved drainage practices is continuing.

The increased use of very high embankments has necessitated special designs for drainage structures to obtain culverts of structural adequacy and economy. Increased structural problems resulting from extreme embankment heights have been handled in cooperation with the Bridge Department and Material and Research Department for obtaining designs for metal culverts and reinforced concrete arches.

The number of cooperative agreements has again increased because of the increased use of cooperative drainage projects with local agencies and also cooperative improvements of local road facilities. These have resulted in mutual benefits to the local agencies and the state.

ROADSIDE DEVELOPMENT

Previously a section of the Headquarters Design Department, Roadside Development became a separate department within the Headquarters Planning Function on July 13, 1964. In conjuction with this new organizational status, a principal landscape architect was appointed to head this department, and an increase was provided in the professional staff of landscape architects. This reorganization and expansion reflects the intention of the Division of Highways to place ever increasing emphasis upon aesthetic considerations in the design and construction of our urban and rural highways.

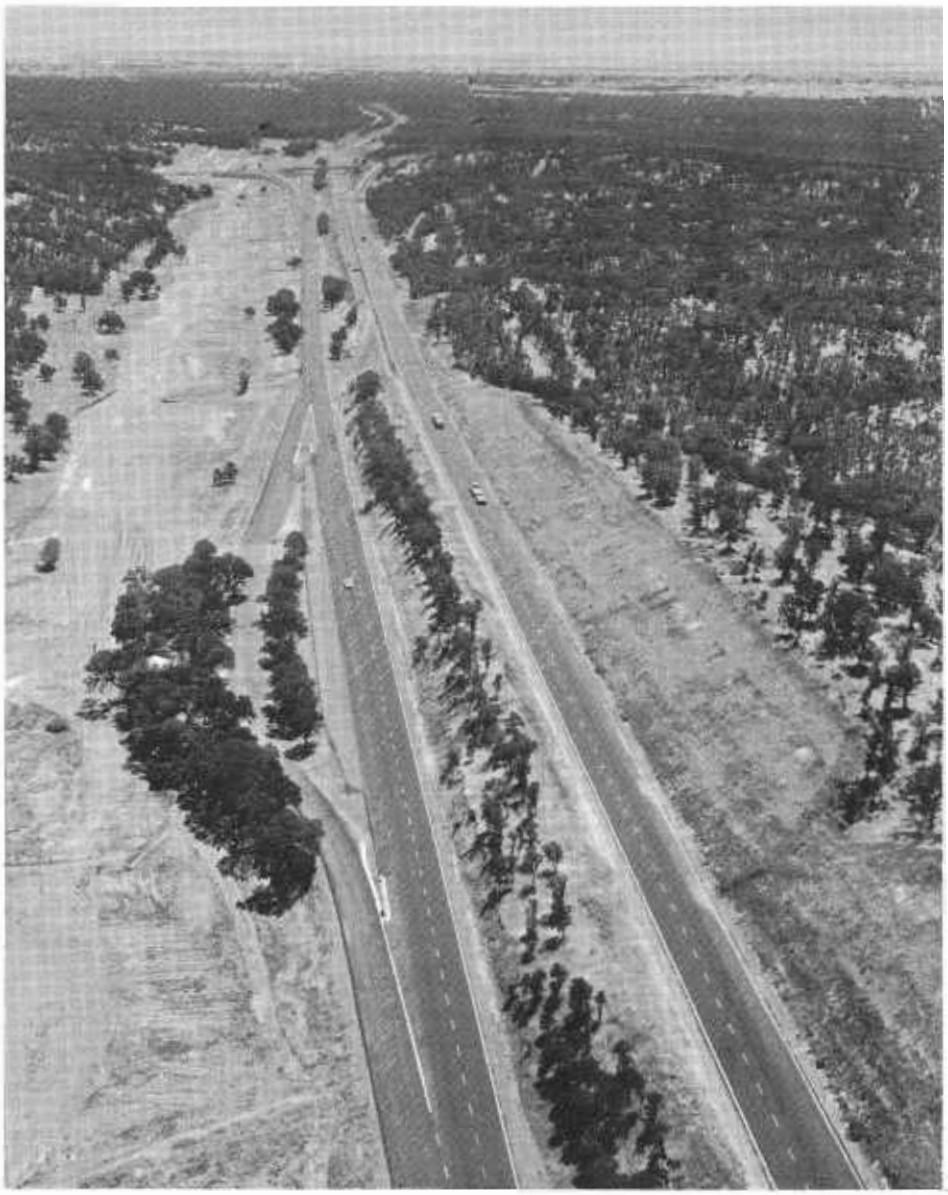
The responsibilities of this newly created department include the furtherance of such programs as the recently created scenic highway system, the safety roadside rest program, the screening of unsightly roadside areas, erosion control planting, and the general beautification of all of our state highways.

Scenic Highways

The principal landscape architect or his representative reviews formally and informally, with other division personnel, scenic highway projects through all phases of development from project report to actual construction. At least two formal reviews are made—one in the early planning phase, and one in the early design phase. Special considerations are given in these reviews to all scenic features to insure that the highway design will provide maximum protection and preservation of the existing scenery and will offer the most advantageous presentation of that scenery to the traveling public. The work of the Roadside Development Department in this regard is coordinated very carefully with that of the Design Department, which formulates the many aesthetic considerations into the actual roadway design plan.

Safety Roadside Rests

The Headquarters Design and Roadside Development Departments also work very closely together in regard to necessary provisions for roadside rests on our interstate and state highway routes. Planning and programing the safety roadside rest activities is the responsibility of the Design Department, and the basic design of the actual facilities is accomplished in the individual district offices. The Headquarters Roadside Development Department assists the districts by consulting with them, by reviewing site and facility plans, and by making recommendations for improvements of the designs in both functional and aesthetic aspects. This cooperative effort assures thorough consideration of the safety, comfort, and aesthetic features of each roadside rest area.



A pleasant group of native oak trees furnish a natural and comfortable roadside rest along this section of Interstate 5 in Tehama County. Facilities include a comfort station, chilled drinking water, and picnic tables and benches.

A statewide master plan of safety roadside rests has been developed to serve the traveling public. 257 roadside rest areas are included in this plan, of which approximately 26 are constructed and in use, while another 18 are under construction or budgeted. When all of the rest areas contained in the plan are in operation, motorists on major highways will be no farther than 30 minutes' driving time from some sort of rest facility (roadside rest area, local park adjacent to the highway, or commercial tourist facilities).

Roadside Planting

The Headquarters Roadside Development Department is responsible for the design and preparation of plans, specifications, and estimates for planting projects in all areas except metropolitan Districts 4 and 7. In these metropolitan districts the landscape sections do the actual plans which are then reviewed by the Headquarters Department. These projects range from small tree-planting jobs to major landscaping projects costing $500,000 or more.

During fiscal year 1964–65, approximately 36 planting project plans were completed, and 33 were processed for contracting, including both major and minor projects. The total estimated cost of these projects is $5,150,000.

Other Activities

Since many types of plants found extremely useful in highway planting are not commonly used in normal residential or commercial landscaping, a source other than commercial nurseries is necessary. The Division of Highways District 3 office administers a plant nursery at Davis which propagates and furnishes these plants for all planting projects in various areas of the state. Headquarters Roadside Development Department is responsible for seeing that appropriate varieties and quantities of plants are available, either through the nursery or by contract with commercial sources.

This department also maintains a file on city billboard ordinances and coordinates the necessary review of the legal aspects of these local ordinances. The necessity of these actions stems from the section of the law that requires an approved billboard ordinance before a planting project of "landscaping" classification can be accomplished in a given area.

TRAFFIC

Motor vehicle travel on the state highway system in 1964 was approximately 42.8 billion vehicle-miles, an increase of 9.6 percent over 1963. This was almost half of the motor vehicle travel in California. Practically all of the increase was on freeways.

Urban areas accounted for more than half (59.1 percent) of the travel although they comprise only slightly more than one-eighth (14.1 percent) of the mileage.

Freeways totaling 1,570 miles (Jan. 1965) accounted for 21.1 billion vehicle-miles, or 49.4 percent of the travel on the 14,200 mile state highway system and 24.0 percent of the total motor vehicle travel throughout the state. There were more than 2½ billion freeway trips in 1964 averaging about 9.4 miles in length.

Accidents

Average accident rates on the state highway system in 1964 were as follows:

	Total accidents per million vehicle-miles	*Fatalities per 100 million vehicle-miles*
Rural freeways	0.97	3.94
Rural expressways	2.02	8.12
Rural conventional highways	2.78	10.58
All rural highways	2.17	8.41
Urban freeways	1.61	2.21
Urban expressways	3.71	6.13
Urban conventional highways	6.09	4.51
All urban highways	3.06	3.04
All state highways	2.70	5.24

There were 115,453 accidents reported on the state highway system in 1964. This was approximately 13,600 more than 1963, an increase of 13 percent compared to an increase of 9.6 percent in the amount of vehicle-miles traveled. Increases were as follows:

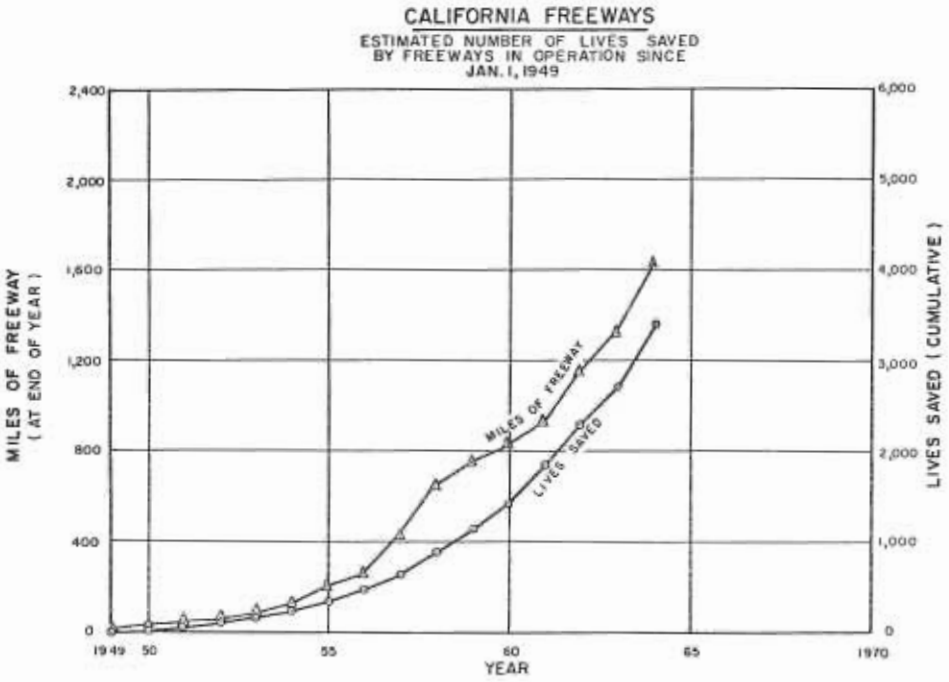
Type	*1963*	*1964*	*Increase*
Fatal	1,725	1,818	5.4%
Nonfatal injury	39,246	43,766	11.5
Property damage only	60,830	69,869	14.9

The number of accidents, amount of travel and accident rates in recent years are shown in the accompanying table.

Accident–Travel Rates

Year	*Accidents*	*Travel (billion vehicle miles)*	*Accident rates (accidents per MVM)*
1961	95,024	34.45	2.76
1962	98,292	36.36	2.70
1963	101,801	39.04	2.61
1964	115,453	42.78	2.70

If the amount of freeway travel in 1964 (4.444 billion vehicle-miles in rural areas and 16.678 billion vehicle-miles in urban areas) had been on



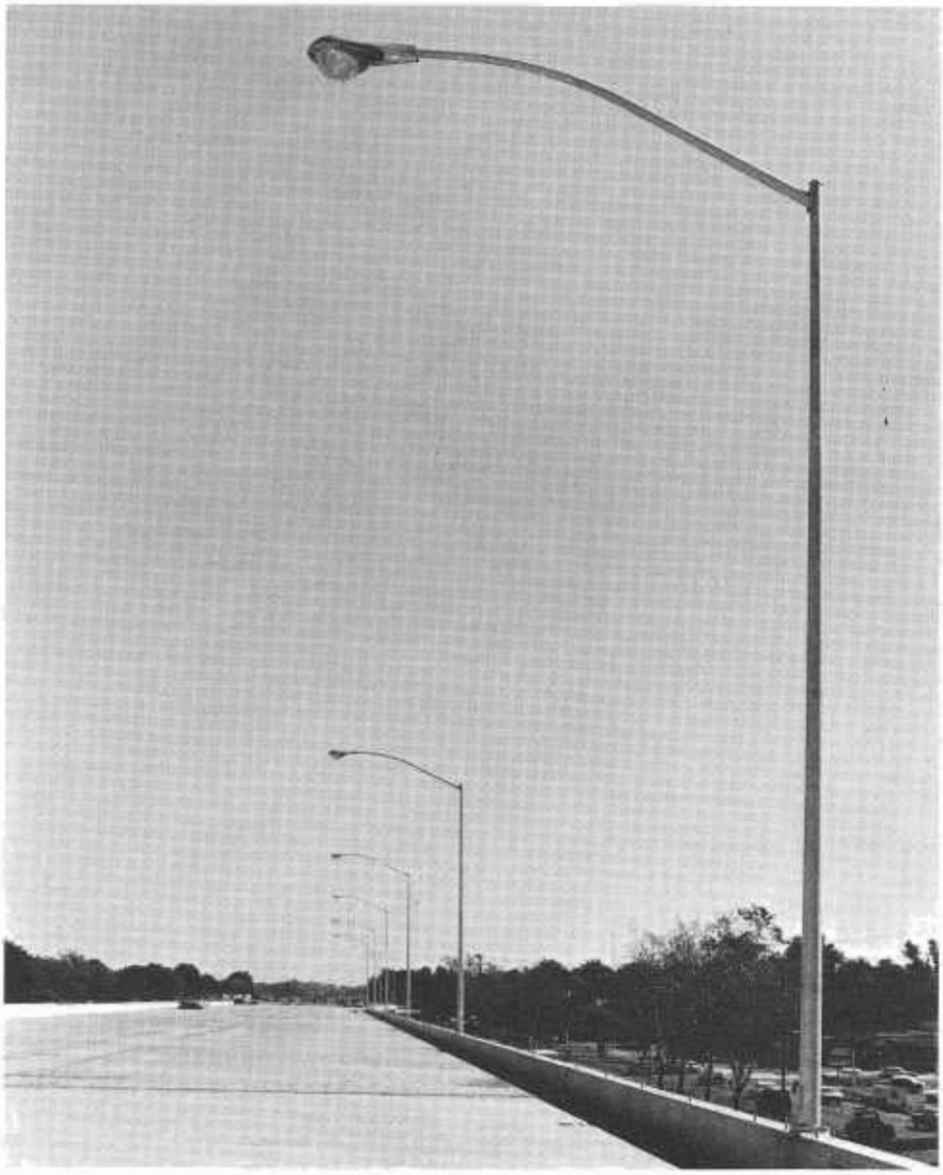
conventional highways and expressways, on the basis of the higher accident rates there would have been about 78,000 more accidents and more than 650 additional fatalities. On this same basis it is estimated that the freeway system completed at the end of 1964 has saved about 3,400 lives since 1949.

The installation of milepost markers on the entire state highway system was started in July 1964, following the establishment of the official post mile system on January 1, 1964. Milepost marker installations (showing reference point locations to the hundredth of a mile) will be completed by July 1966.

The milepost system of location identification is being used by the Division of Highways for all project and file reference purposes. The California Highway Patrol will also be using it to more readily pinpoint the locations where accidents occur.

Beginning in July 1965, a surveillance tabulation of accidents on the state highway system is being processed by the Traffic Department and the Computer Systems Department. Monthly tabulations show the precise milepost location of each accident and its characteristics.

The computer accident surveillance programs relieve district personnel of considerable routine work and will effect an estimated net savings of $30,000 per year in accident report studies.



The mastarm for newly designed lighting standards on freeways is a tapered curve which improves the overall aesthetics of the freeway. The standards in the photo are being installed on Interstate 80 through Sacramento.

Traffic Counting

The automatic and mechanized annual traffic census program is now in its fifth year. It provides more useful and more accurate data, and has reduced operating costs more than $400,000 per year.

The continuing need to obtain traffic counts on all freeways (especially high-volume urban freeways), the hazards involved in placing the standard counter tubes across these facilities, and the impracticability of the tubes on multilane freeways, led the Division of Highways to adopt electric inductive loop vehicle detectors for traffic counting.

Beginning in June 1964, loop detectors have been placed in the pavement in each traffic lane between interchanges on all freeway projects except low-volume four-lane freeways. They will provide counts without hazard to departmental personnel or to the motoring public.

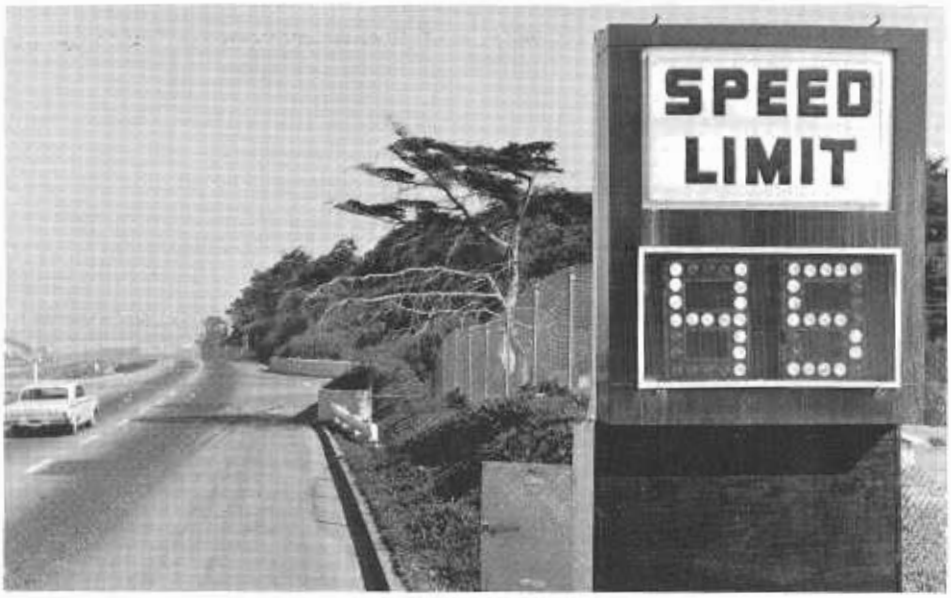
Safety Research

During the past fiscal year the Traffic Department has continued its accelerated research on highway safety. The following research projects were completed:

1. *Effect of Traffic Volumes and Number of Lanes on Freeway Accident Rates.* A study of almost 36,000 freeway accidents revealed that the accident ratio increases as the traffic volume increases. The study also found that for any given traffic volume, the accident rate is lower for six- and eight-lane freeways than it is on four-lane freeways.

2. *Effectiveness of Median Barriers.*

3. *Wrong-way Driving (Phase II).* Phase II consisted mainly of further examination of wrong-way incidents and accidents and testing on the high-



This variable message speed sign on Skyline Boulevard in San Francisco makes it possible to regulate the flow of traffic as conditions during the day vary.

way and in the U.C.L.A. driving simulation laboratory of various signs and devices to prevent wrong-way entry at off-ramps. Special warning signs have been developed and are now being installed.

4. *Continuous Freeway Illumination.* This study was an attempt to determine whether continuous freeway lighting is effective in reducing nighttime accidents.

5. *The Effect of Ramp Type and Ramp Geometry on Accidents.* Other highway safety research studies which were under way at the end of the fiscal year were:

1. *Reduced Visibility (Fog) Study.* This is a study to develop means of giving advance warning to drivers during periods of reduced visibility. A special variable speed limit sign being tested is shown in the photograph on page 47.

2. *Reporting Level of Accidents.*

3. *Machine Accident Surveillance.* Electronic data processing methods are being developed for obtaining accident information early and at frequent intervals.

4. *Evaluation of Minor Improvements.*

5. *Wrong-way Driving (Phase III).* A detailed analysis is being made of the design of off-ramps and the effectiveness of traffic control signs and devices to determine whether certain features discourage wrong-way entry to freeways more than others.

6. *Construction Zone Accidents.*

7. *Guardrail Accidents and Warrants.*

8. *Headlight Glare Study.*

Traffic Research

Research was conducted and reported to the Highway Research Board in January 1965 on a method of adapting traffic assignment data from large network traffic assignments to small area route location studies. This procedure will make it possible to use data developed in large urban transportation studies, such as the Los Angeles Regional Transportation Survey (LARTS) in route location studies.

During the year six origin and destination surveys were conducted for the purpose of gathering data on travel patterns for use in studying locations for future freeway routes. Traffic assignments were completed or underway for 25 route location studies, involving 128 alternate locations.

It is known that travel speeds and quality of service on a freeway are determined by the relationship of actual traffic demand to the capacity of the freeway or section of freeway. Research is continuing on this phase of operation and includes studies of freeway performance when this relationship is altered, in one case where channelization changes altered the capacity of various legs of an interchange and another case where a ramp closure will change the demand pattern of a section of freeway.

These studies are being conducted using aerial photography in order to test this method of evaluating freeway and street performance.

Newly designed PREPARE TO STOP signs are being placed on state highways. At the time this photo was taken on Interstate 280 near San Francisco the signs were not in operation.

The same location as in the above photo a few minutes later showing the PREPARE TO STOP signs in operation, giving motorists a warning of conditions in advance.

New in-the-railing fluorescent lighting fixtures are being installed on pedestrian overcrossing structures. The new fixture eliminates lighting poles (see next photo) and improves the appearance of the structure.

A cooperative study with the Design Department has been started to evaluate operations with various types of ramp connections and the relative merits of single ramps, multiple ramps and collector systems.

Traffic Signals and Illumination

Contract plans were completed for 175 new traffic signals and modernization of 168 existing signals. Contract plans were also completed for 4,037 lighting standards and 584 illuminated traffic guide signs. The total estimated cost of the electrical work was $9,324,680, not including the cost of the steel sign structures.

A new design for lighting standards on freeways was placed into effect.

A newly designed PREPARE TO STOP sign for use with traffic-actuated signals was placed into operation. This sign is less expensive, easier to read and more economical to operate than previous types.

Several new pedestrian overcrossing structures using the new "in-the-railing" fluorescent lighting fixture were constructed.

Traffic Regulation and Control

The program of upgrading state highway signing to comply with the *National Uniform Manual for Traffic Control Devices* was continued throughout the year. A sign contract was awarded for the new wrong-way signing package developed by the wrong-way research. The signs are being installed as rapidly as they become available.

One hundred seventy-one speed limit zones were established and 27 speed limit orders were rescinded, resulting in 273 additional miles of speed zones on state highways. One hundred thirty-eight miles of the above total were 70-mile-per-hour zones established under the provisions of Section 22356 of the Vehicle Code.

URBAN PLANNING

Legislative Reports

During the past year a number of reports were prepared for submission to the Legislature. Most noteworthy were those required by Sections 188.8, 256, and 2156 of the Streets and Highways Code.

The Section 188.8 study is made every four years to determine the state highway construction needs for a 10-year period to be used in determining percentages for computing minimum expenditures for each state highway district. A tabulation of needs for each highway district, totaling $7,368,512,000, through June 30, 1974 (10-year needs less proposed budgets through 1966–67) was submitted to the Legislature and was printed in the Senate and Assembly *Daily Journals* on January 11, 1965.

The Section 256 study is a quadrennial review of the California freeway and expressway system and the entire state highway system. The first such review and report was completed and submitted to the Legislature in December 1964 including recommended revisions and changes in these systems. During the 1965 Legislative Session, legislation was passed enacting a majority of the changes recommended by this report.

The Section 2156 report is a quadrennial report of the California city street and county road construction and improvement program, and an estimate of the local road and street needs of the next 5- and 10-year periods. All counties and cities prepared individual reports which were reviewed and consolidated by the Division of Highways. A report combining all information and estimates furnished by the cities and counties was forwarded to the California Legislature in December 1964. This report summarized the costs of the road and street needs through 1974, totaling $6,521,032,000. A 14-member advisory committee was appointed by the Legislature, which gave guidance and assistance to the department during the preparation of the report.

During the 1965 Legislative Session a report was prepared and submitted on the feasibility of including in the state highway system the county road from Truckee to Kings Beach.

Federal Studies and Projects

Two major reports were prepared and submitted to the U.S. Bureau of Public Roads during the past year. A study to determine the 1965 estimate of costs to complete the interstate highway system by 1972 was completed and the report of these costs totaling $2,416,708,000, was forwarded to the Bureau of Public Roads in July 1964.

The Recreation Advisory Council, created by the President in 1962, recommended that a national program of scenic roads and parkways be developed and asked the U.S. Department of Commerce to undertake a study of this recommendation. The U.S. Department of Commerce, through the Bureau of Public Roads, requested each state highway department to conduct this study within their respective states. With the assistance of the Advisory Committee on a Master Plan for Scenic Highways, and the participation of the cities and counties, this study was completed and the report for the State of California was submitted to the U.S. Bureau of Public Roads in January 1965.

To examine highway needs after the scheduled completion of the interstate highway system in 1972, the Bureau of Public Roads requested each state to make a study of its highway needs to 1985 less anticipated accomplishments through the end of the interstate period in 1972. At the close of this fiscal year a report for this study was being prepared summarizing statewide the mileage of roads and streets, vehicle miles traveled, and costs of improvements.

Drafting Section

Drafting for other headquarters departments amounted to one-third of the production of the section during the past year, and included preparation of maps and charts, multiple color base maps with transparent overlays, for California Highway Commission hearings and special maps of the areas damaged by the December floods. Included in the drafting services provided for the Urban Planning Department were the preparation and updating of urban area maps and maps for metropolitan studies.

Urban Transportation Planning

The documentation and description of the continuous cooperative transportation planning process required by the 1962 Federal Aid Highway Act has been accomplished for each of the state's 12 urbanized areas.

Metropolitan Transportation Studies

A formal agreement extending organizational and working arrangements for comprehensive transportation planning was accomplished in the Los Angeles Regional Transportation Study area (LARTS). The participating agencies included Los Angeles, Orange, Ventura, San Bernardino, and Riverside Counties; the Southern California Rapid Transit District; the Highway Transportation Agency; and approximately 100 cities within the region.

A technical appendix to the LARTS base year (1960) report and a brief report containing projections of 1980 population, employment, land use and vehicular traffic are under preparation. Machine techniques for traffic assignment were utilized extensively for highway system analysis and specific route location purposes within the LARTS area.

The basic report covering the origin and destination survey phase of the Eureka Area Planning and Transportation Study was published early in 1965.

The data collection phase of the South Coast Transportation Study (SCOTS) conducted in the Santa Barbara area was completed in November 1964.

Field operations for a similar study in the Bakersfield area were begun in May 1965 and are expected to be completed in November 1965.

Under agreement with the San Francisco Bay Area Transportation Study Commission, a task force of division employees was assigned to assist in the study, operating out of the Bay Area Transportation Study Commission headquarters in Berkeley.

Statistical and Nonmetropolitan Studies

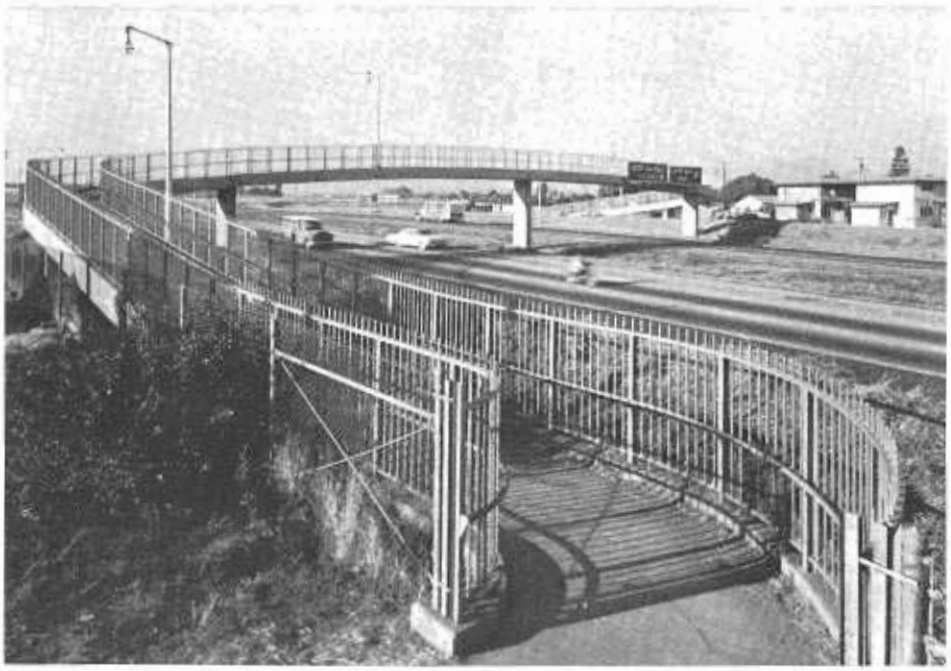
The districts continued to make extensive use of the mechanical processing services provided for route location analyses. During the year processing was completed for 31 studies involving 85 freeway alternates.

Field operations for the 1964 loadometer (truck weight) survey provided axle weight, trip characteristics, and commodity data for more than 13,000 trucks at 19 locations throughout the state.

Extensive roadside interviewing and machine processing were accomplished to provide data for a feasibility study of a system of toll bridges north of the San Francisco-Oakland Bay Bridge.

As required by Senate Concurrent Resolution No. 68, 1963, the services of an independent consultant were engaged to conduct a complete investigation into the field of refunds for gasoline purchased for boats, airplanes, and agriculture. In cooperation with the consultant a representative sample of all California boat owners was selected resulting in a mailing list of some 52,000 addresses. Replies to questionnaires sent to the selected boat owners approached 40 percent of the total mailout. Analysis of the resulting data was approaching completion at the end of the fiscal year; the agricultural and aviation phases of the study were in the formative stages.

Three studies undertaken cooperatively with the Bureau of Public Roads were continued: the annual local road and street finance report covering county, city, and special district transactions for the fiscal year 1962–63 was completed; the 1964 Status of Highways on the new legislative route numbering basis was produced, and mileage tables were compiled for Bureau of Public Roads and state use; and the



This pedestrian overcrossing on the Highway 99 Freeway through Sacramento shows the old-style lighting poles on the structure which are being replaced by new in-the-railing fixtures. (See previous photo.)

Road Life and Pavement Cost Study, covering 12,200 highway miles progressed, with most mileage recorded through 1962.

Research and Special Studies

Expansion of the Division of Highways research program was continued and now includes more than 200 individual research projects, which represent an annual expenditure of almost $2 million. The Research and Special Studies Section of Urban Planning Department is charged with coordinating these projects and providing regular written status reports on each project.

This section also provides staff services for the Research and Special Studies Committee. At the direction of the committee a more detailed five-year research program was prepared which provides for a balanced research effort among the fields of: (1) reduction in accidents; (2) reduction in costs and improvement in quality of highway construction and maintenance; and (3) increase in the efficiency of highway administration and operations. An estimate was prepared, for study by the committee, of savings due to research for the fiscal years 1961–62 through 1963–64. This estimate showed that an investment of $1,938,000 in research had resulted in savings to the division of more than $18 million.

Included in the research coordinated by the Division of Highways was the Highway Safety Research Program of the Highway Transportation Agency. This program is a joint effort of the Department of Public Works, Department of Motor Vehicles, California Highway Patrol, and the Institute of Transportation and Traffic Engineering of the University of California. It is aimed at the reduction of the accident toll on California highways through a critical study of the four elements of traffic safety—the driver, the vehicle, the roadway, and law enforcement.

The Division of Highways also cooperated in national highway research activities. In May 1965 the Urban Planner was appointed to represent the State Highway Engineer in contacts with the Highway Research Board, which will include participation in an expansion and streamlining of the collection and dissemination of information relating to the nationwide highway research effort.

COMPUTER SYSTEMS

The Computer Systems Department came into existence in April 1964. The establishment of a separate department for electronic data processing functions resulted from a growing need for a general service unit which could concentrate on the provision of computer services to all parts of the division.

Advanced Planning and Research

To further the development of new computer applications, a special section called Advanced Planning and Research has been organized. Its purpose is to seek new ways of applying computer methods in such fields as highway engineering, accounting and management.

Richard A. Bjorklund, senior tabulating machine operator, runs the IBM 1460 computer system console which may be used to control the computer system and monitor its operation. Other computer system employees standing, left to right, are Theodore S. Douglas, accounting tabulating machine operator III; William J. Ellis, assistant highway engineer; and Gloria M. Anthony, highway engineering technician I.

Increasing Work Load

All computing services have increased in volume steadily over the years. For example, approximately 220,000 traverse courses are presently processed, and the earthwork program computes quantities for 25,000 cross sections per month. The vertical alignment program now computes 700,000 elevations per month, a 75 percent increase over a year ago. To meet the needs of this increasing work load the department is currently working on a three-shift basis.

New Services

Among new programs is one which allows the engineer to submit a traverse network to the computer for a network adjustment by the least squares method, a complex and time consuming calculation when attempted by manual methods. For planning and scheduling project activities such as planning, design, right-of-way, traffic, etc., a critical path program has been written to meet division needs.

A new program on accident surveillance has been developed to provide an up-to-date analysis of accident data.

A series of programs has been written to process data from the Department of Employment to code employment information for Los Angeles County into census tract. These records will eventually be processed and analyzed with other data for the Los Angeles Regional Transportation Study.

The basic accounting and reporting system underwent major revisions. These revisions decreased computer costs and increased efficiency. A system of quarterly reports was also initiated.

Pictorial communication between the computer and the engineer has been realized with the purchase of automatic plotting equipment. Of the new plotter programs now in production, two are of special interest to highway engineers. Geometrics can be plotted given a coordinated beginning point, distances and bearings. Earthwork cross sections can be plotted given cross section notes submitted for the earthwork program. For the Bridge Department, a program has been written to plot design moment envelopes.

New Equipment

During the past year, an exhaustive study of all available makes of computing equipment resulted in the decision to acquire an IBM 360 computer system. The new 360 system will be a complete departure in concept and operation from anything in the past. It offers some dramatic innovations to district users. Not only faster service and lower costs will result, but possibly direct district-to-computer input of problems and direct computer-to-district answers.

Using ultrasonic equipment, a Division of Highways crew checks the anchor bolts of the Richmond-San Rafael Bridge which were feared to have been damaged when a ship collided with the bridge pier.

. Bridges

BRIDGE ADMINISTRATION

During the past fiscal year an Administration Section has been established, which includes the functions of office engineer and personnel officer, agreements, special studies and city and county projects.

Office Engineer

Management reports indicating output, output per man and operating expenses have been prepared for Planning and Operations. To create more efficient and usable management reports the Bridge Department is moving towards greater use of electronic data processing equipment.

Railroad Grade Crossing Agreements

Construction was started, underway, or completed on 45 highway projects requiring negotiations with railroads which involved right-of-way encroachments, installation of additional crossing protection, construction, alteration or abandonment of grade crossings. Negotiations with the railroads were in progress for 31 additional highway projects. In addition, 25 projects involving negotiations and construction for improvement of existing crossing protection were completed or underway.

On federal aid secondary routes, negotiations were underway or completed on 15 projects with railroad involvement.

Railroad Grade Separation Structures

At the beginning of the year, 60 railroad-highway grade separation structures were under construction. A total of 36 separation structures were placed under contract during the year. During the year 35 separation structures were completed.

$5 Million Grade-crossing Fund

The Public Utilities Commission issued the 1964 priority list containing 34 proposed separation projects to eliminate railroad grade crossings and reconstruct existing separation structures on county roads and city streets. In accordance with state law, $5,000,000 in state funds is set aside by the Highway Commission each year to pay half the cost of each separation project after deducting the railroad contribution.

As of June 30, 1965, allocations totaling $5,000,000 had been made by the Highway Commission from the 1964–65 fiscal year funds for eight of the top priority projects on the PUC list.

Corps of Engineers and State Reclamation Board Permits

During the past year, permits have been received from the Corps of Engineers to construct three bridges across the Sacramento River, and one bridge each across San Rafael Harbor and Anaheim Bay. Permits were received to construct a ferry slip at Franks Tract Recreation Area, replace pier and boating facilities at Angel Island State Park, rehabilitate an existing bridge across Anaheim Bay and redesignate the American River Bridge at Jibboom Street as a fixed-span bridge.

The State Reclamation Board approved plans to construct 17 new bridges across tributaries of the Sacramento and San Joaquin Rivers.

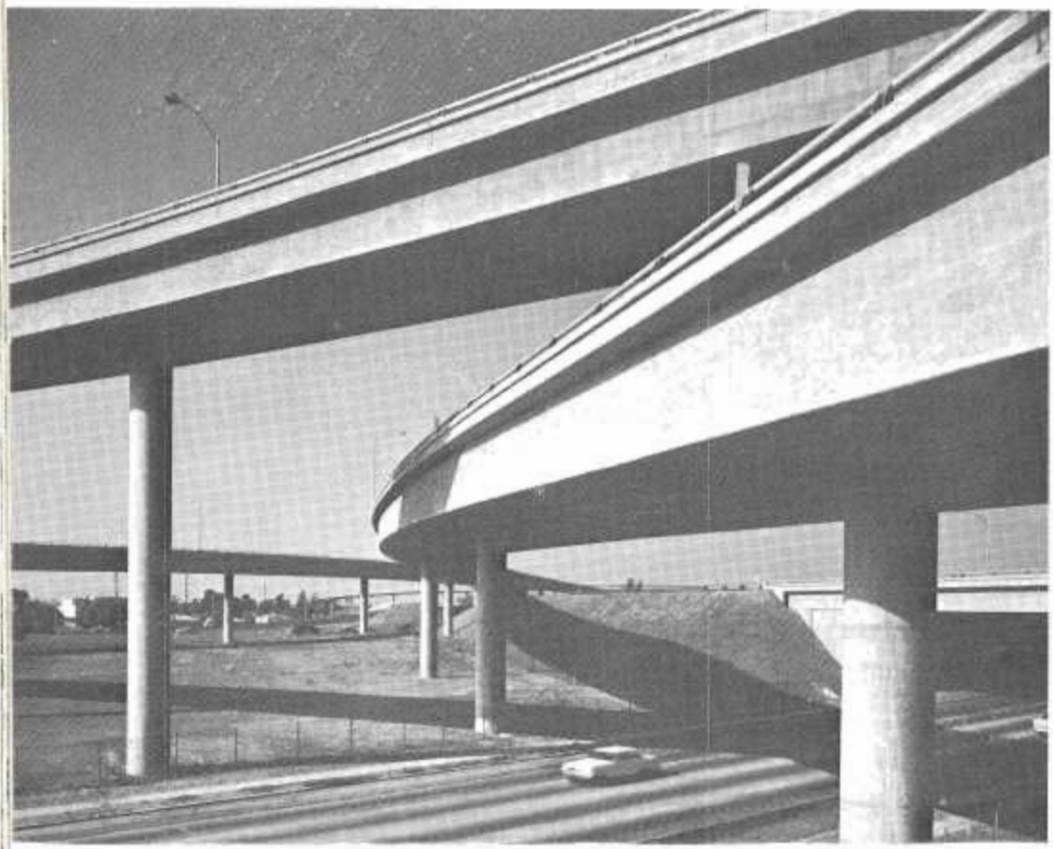
City and County Projects

The city and county bridge projects office reviews the plans and specifications for structures built by local governments and financed from gas tax funds. Structures for which the local governments request credit as matching fund projects receive a similar review. During the year plans and specifications were reviewed for 95 such structures.

Plans were checked and specifications were written for 19 federal aid secondary structures valued at $4,700,000. Contracts were awarded for construction of 18 federal aid secondary structures at a cost of $5,900,000. Design work for 18 of the planned structures was performed by county engineering staffs or consultants retained by the counties. One structure was designed by the state as a part of a state freeway contract.

The floods of October 1963, February 1964, and December 1964 were particularly injurious to city and county bridges. During the December 1964 floods, 109 city and county bridges were destroyed and 88 were damaged. Loss to city and county bridges is estimated at $8,000,000. The city and county bridge projects engi-

A view of the graceful ramp system on the Santa Monica-San Diego Freeway interchange in Los Angeles. Ground level street in foreground is National Boulevard.



Bridges on the State Highway System Segregated as to Number, Length and Area by Structure Type as of June 30, 1965

Structure type	Number 1965	Number 1964	Length [a] (feet) 1965	Area [b] (square feet) 1965
Concrete arch	216	229	35,603	814,089
Concrete girder	2,657	2,361	621,125	39,412,429
Concrete slab	2,581	2,483	154,886	6,807,236
Masonry arch	31	32	933	21,133
Subtotal, concrete and masonry	5,485	5,105	812,547	47,054,887
Steel arch	6	6	2,618	42,655
Steel plate girder	369	374	182,227	8,393,814
Steel stringer	261	274	57,376	3,582,280
Steel deck truss	27	30	31,684	1,528,060
Steel pony truss	28	29	10,374	169,631
Steel through truss	62	62	114,264	1,468,629
Suspension	2	3	20,494	1,007,621
CMP multiplate and arch	79	76	1,514	51,512
Subtotal, steel	834	854	420,551	16,244,202
Timber arch	1	1	59	780
Timber stringer	525	538	40,592	1,395,039
Timber deck truss	4	5	809	17,734
Timber pony truss	0	0	0	0
Timber through truss	0	0	0	0
Subtotal, timber	530	544	41,460	1,413,553
TOTAL BRIDGES	6,849	6,503	1,274,558 (241 miles)	64,712,642 (1,486 acres)
Underpasses	185	183		
Overheads *	324	292		
Combined bridge and overheads *	63	56		
State highway separations *	367	323		
Road undercrossings *	1,483	1,292		
Road overcrossings	1,067	934		
Pedestrian undercrossings *	195	182		
Pedestrian overcrossings	112	99		
Cattlepasses *	91	90		
Tunnels	22	22	22,242	
Special retaining walls	6	6	4,707	
Miscellaneous	20	20	400	10,325
TOTAL STRUCTURES	8,261	7,767	1,301,907	64,722,967
Drainage pumping plants	213	206		
Railroad grade crossings	618	629		

* Separations so noted are listed under structure type above.

NOTE: Twenty-five overheads, one tunnel, and four bridge and overheads also serve as state highway separations.

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

[b] Areas are based upon clear widths of roadways between curbs and clear sidewalk widths.

neer provided estimates, catalogued damage, offered advice to local government engineers as to repairs or replacement, and reviewed plans for projects using state or federal flood relief funds.

Special Studies

The past year's efforts in the field of bridge research were highlighted by the instrumentation and testing of an experimental orthotropic plate bridge at Dublin and the initiation of major research on flexible culverts under high fills. Other research included investigations of the problems encountered in widening bridges, a study of magnitudes of our bridge movements produced by variation in temperature and climate, a study of factors influencing slab deflections, and continuing efforts in the search for a satisfactory joint sealer.

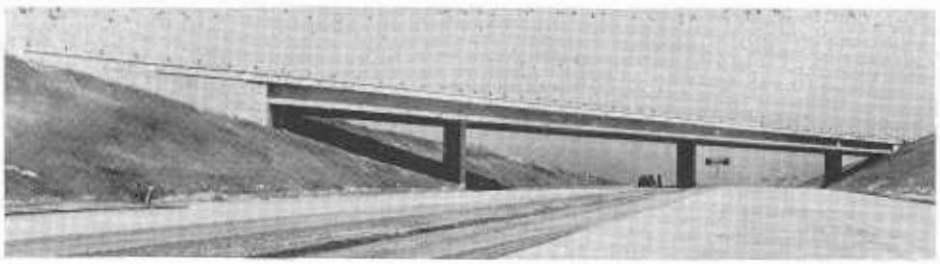
Research projects completed at the University of California and administered by the Special Studies Section included a bridge barrier rail literature search, analysis of seismic effects on piles in deep clay deposits and a study of a skewed anisotropic plate. Current investigation being performed by the university for the division include the influence of load and environment history on the cracking of concrete and a computerized theoretical analysis of box girders.

A research agreement with Sacramento State College was initiated for studies concerning soil pressures surrounding buried conduits.

During the year, results of the Harrison Street box girder studies, performed as a joint effort of the Bridge Department, Materials and Research Department and the University of California at Berkeley, were published by the Highway Research Board.

The well-publicized floods of December 1964 instigated many special hydraulic and bank protection studies in the northern part of the state. Hydraulic studies were confined to investigation and analysis at specific sites by the section's hydrologist, while work in the bank protection field comprised representation on the division's bank protection committee, members of which toured the flood devastated area to provide consultation and make recommendations.

The year's accomplishments in electronic data processing included the production of several management reports to assist in the department's administrative tasks and the introduction of several new programs, including composite steel girder analysis, substructure analysis, prestressed girder analysis, prestressing cable friction analysis, geometric layout plotting and equipment inventory.



One of the 1965 awards of merit by the Prestressed Concrete Institute was to Mackinnon Avenue Overcrossing on Interstate 5 in San Diego County.

BRIDGE PLANNING

Advance Planning

During the past fiscal year 567 preliminary bridge reports representing about $146,000,000 of contract work were prepared and forwarded to Design. There was increasing emphasis on structure appearance and the relationship of structures to overall highway aesthetics. Twenty-four architectural models were constructed by the Bridge Architecture Section for legal use and public display, and as an aid in design.

Extensive studies were made for the "Panhandle" and "Golden Gate" Freeways in San Francisco. In an effort to make the proposed construction compatible with local problems, these studies included cut-and-cover tunnels, bored tunnels, subaqueous tunnels and cantilever viaducts as well as the more usual type structures.

The December 1964 flood in northern California resulted in heavy bridge loss and damage. This imposed an unexpected burden to an already crowded schedule of advance planning activities. Notwithstanding this, all storm damage planning work was completed by the end of the fiscal year without impairment of the normal work load.

Foundation Section

The Engineering Geology Section conducted over 500 foundation investigations including 130,700 lineal feet of exploratory borings for bridges and retaining walls during the past year. Major projects included the Stockton Channel Viaduct, the American River Bridge on Route 5, Route 80 Freeway structures in Sacramento, the San Diego River Interchange, and Crestline Viaducts. A considerable amount of work was done on studies for flood damaged bridges in Districts 1 and 2.

The successful installation of bell-type caissons for the Fort Sutter Viaduct (I-80 in Sacramento) was accomplished during the year. This is the first major job in California using this type of foundation.

Design

One of the largest and most interesting bridges for which plans were completed was the San Mateo Creek Bridge (I-280) in San Mateo County. The bridge is presently under construction as a separate contract at a cost of $5,795,000.

The bridge carries eight lanes of traffic and a 22-foot divider and is 1,695 feet long.

The feature of the San Mateo Creek Bridge is the unusual piers which have a maximum height of 250 feet above the creekbed. The entire superstructure is supported on the two-legged piers.

In the bay area the plans for the third and final unit of the Southern Freeway were completed. The cost of the structures in this unit was $6,000,000.

Included in the project was an unusual retaining wall at Potrero Hill. This wall is 880 feet long and has a maximum height of 60 feet. The wall consists of a series of thin arches which are anchored with prestressed rods into the rock behind the wall.

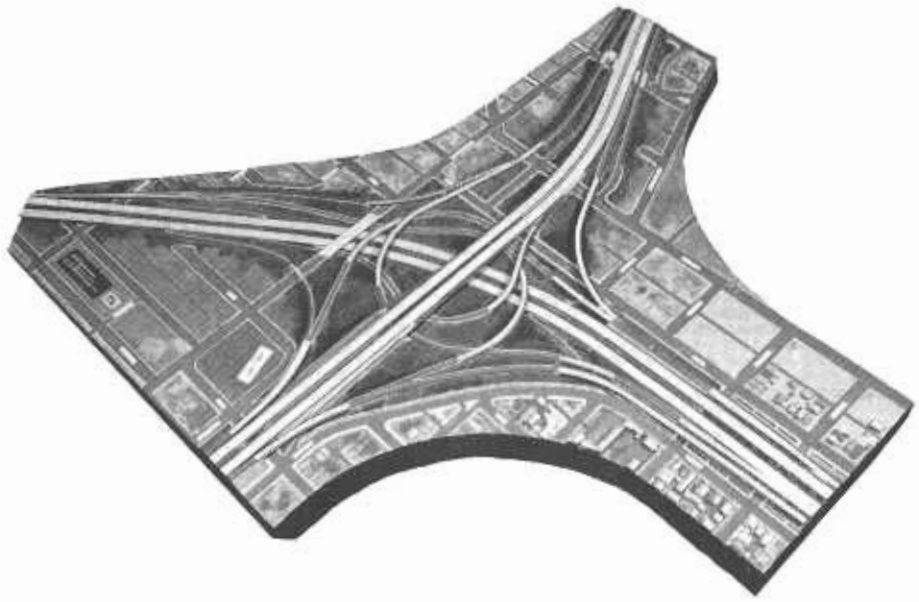
In the Los Angeles area plans were completed for the first unit of the interchange between Routes 90 and 405. The ultimate cost of the structures in the complete interchange will be $7,705,000.

An important first for the Los Angeles area was the completion of the first unit (near Covina) of Interstate 210 which will eventually extend from Interstate 5 near the foot of the Ridge Route through the foothill country and connecting with the San Bernardino Freeway near Pomona.

A new four-lane bridge was designed to replace the existing narrow Anaheim Bay Bridge on Pacific Coast Highway (Route 1). The adjacent county bridge will be used as a detour during construction.

In the San Diego area, plans were completed for the Old Town Interchange located on Interstate 5 near the San Diego River in San Diego. The interchange will cost about $7,500,000.

An unusual project completed during the year was the lane control system at the Caldecott Tunnels between Alameda and Contra Costa Counties. Upon completion of the third tunnel and until the future fourth tunnel is built, the center tunnel is operated to carry peak traffic. There are eight traffic lanes approaching the tunnels and only six lanes available through the three tunnels. The traffic control system permits the direction of traffic through the center tunnel to be oriented to coincide with the predominant flow. This will provide four lanes in the direction of the heavier flow and two lanes in the direction of the lighter flow. This Division of Highways designed equipment consists of electric



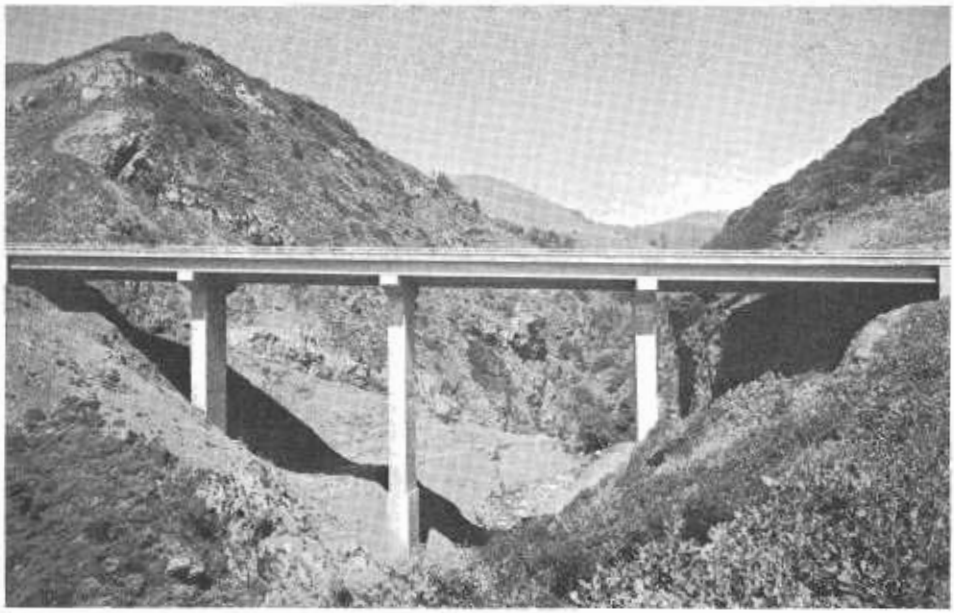
This model of the Oak Park interchange in Sacramento shows the ramp system connecting Interstate 80 and Highways 50 and 99.

changeable message signs to direct traffic into proper lanes, plastic cones which pop up under pneumatic pressure to delineate the lanes in service, and finally, positive cable barriers to insure against wrong-way mistakes. These barriers retract into underground galleries alternately depending on direction of traffic flow.

Plans were completed for all structures on the Interstate 80 Freeway between the Sacramento River and the connection with the construction underway on 29-30th Streets. The most notable structure in this group is the Camellia City Viaduct running from 18th to 24th Streets.

The plans for widening of the American River Bridge at Elvas on Interstate 80 were completed. Design for the structures on Interstate 5 north of J Street in Sacramento to the Sacramento River at Elkhorn are well underway.

The December 1964 flood damage to the bridges increased the workload in Design. In addition plans were prepared for 23 new bridges to replace ones that were washed out or severely damaged. Plans for another 14 structures requiring major repairs were also turned out.



Vincente Creek bridge on Highway 1 also received an award of merit from the Prestressed Concrete Institute for 1965.

Bridge Construction Costs

Bridge construction costs, as measured by the Bridge Department Construction Index (1939–40 = 100), showed readings of 267, 296, 302 and 318 for the four successive quarters of the 1964–65 fiscal year. The rising costs were due to the generally increased demand for construction services. An especially heavy demand was generated by the reconstruction of bridges in the northern area due to the December 1964 floods.

BRIDGE OPERATIONS

Bridge Construction

Eighty-two structures in 70 Bridge Department-administered contracts totaling $30,000,000 were completed during the year. This included the Caldecott Tunnel (9.8 million) and the substructure of the Interstate 80 Freeway Bridge over the Sacramento River (1.2 million).

There were also 469 structures totaling $70,000,000 in 103 district-administered contracts.

There were 186 structure projects with an approximate cost of $184,264,000 underway at the end of the fiscal year.

The 1964–65 state highway budget had $143,192,000 in structure work in 159 projects. Emergency contracts for flood work in the northwestern part of the state amounted to $3,383,000 for structure work in 22 projects. The total of all structures in this budget year that were advertised and placed under contract, in 181 projects, was $146,575,000.

Metropolitan Area Freeway Structures

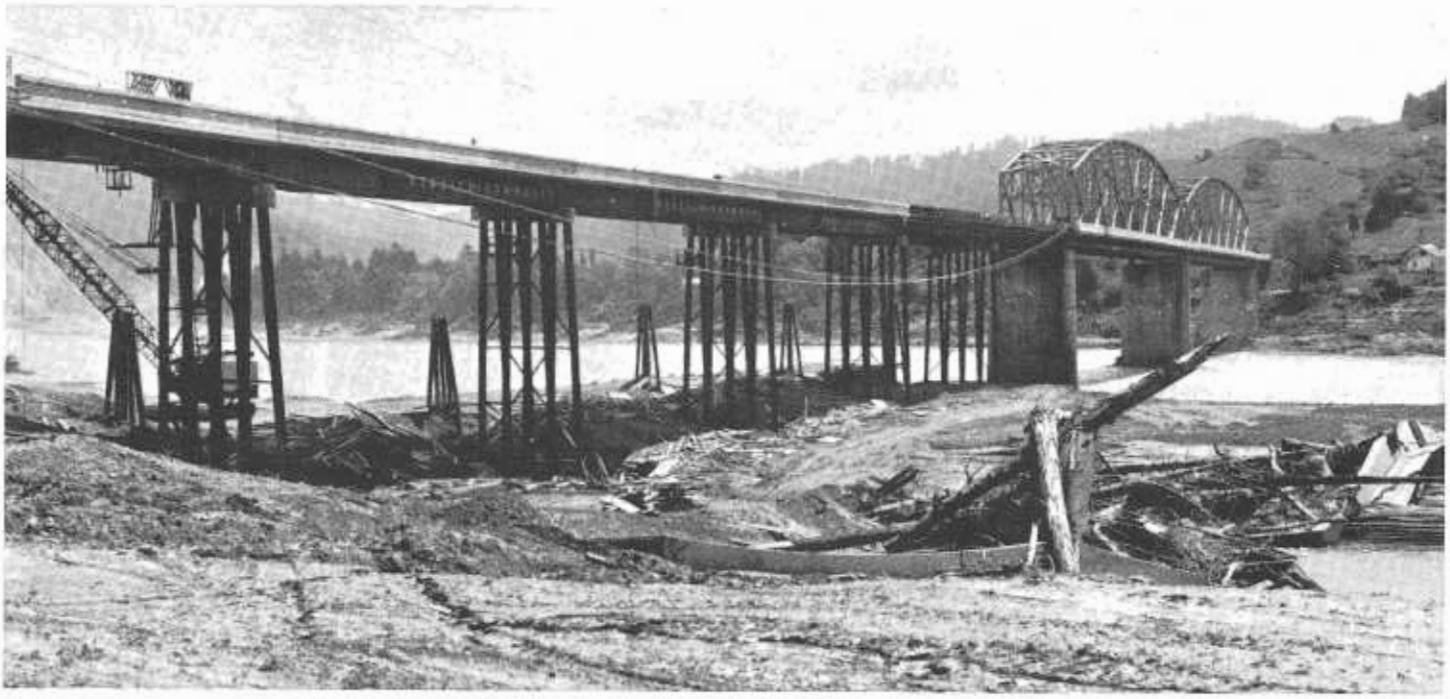
In San Francisco the Clay-Washington ramps to the "Embarcadero" Freeway were completed. These ramps were integrated with the overall plan for the Golden Gate Gateway Redevelopment Project. A $5,000,000 contract for a portion of the Route 82 double- and single-deck viaduct between Newcomb Avenue and Army Street is close to completion. The completion of this section will allow the portion of the double-deck viaduct completed previously, from the Route 82/101 Interchange to Newcomb Avenue, to be opened to traffic; which, together with the new portion will provide freeway access to the Army Street-Third Street area of San Francisco.

In San Mateo County work has been completed on the construction of 10 major grade separation structures on the first section of Interstate 280 (Junipero Serra Freeway) south of San Francisco. Included in this project is a three-level intersection at the 280/1 Interchange.

In Alameda County work continues on construction of the nine bridges to carry Route 680 between Dublin and the Contra Costa County line. The 325-foot-long steel deck-plate superstructure of orthotropic design used on one of these bridges in attracting international interest. It is one of the first bridges of this design to be completed in this country and considerable technical research has been done during its construction.

In Contra Costa County, work is just getting underway on the five bridges for the Franklin Canyon Freeway, Route 4, between Martinez and Cummings Skyway.

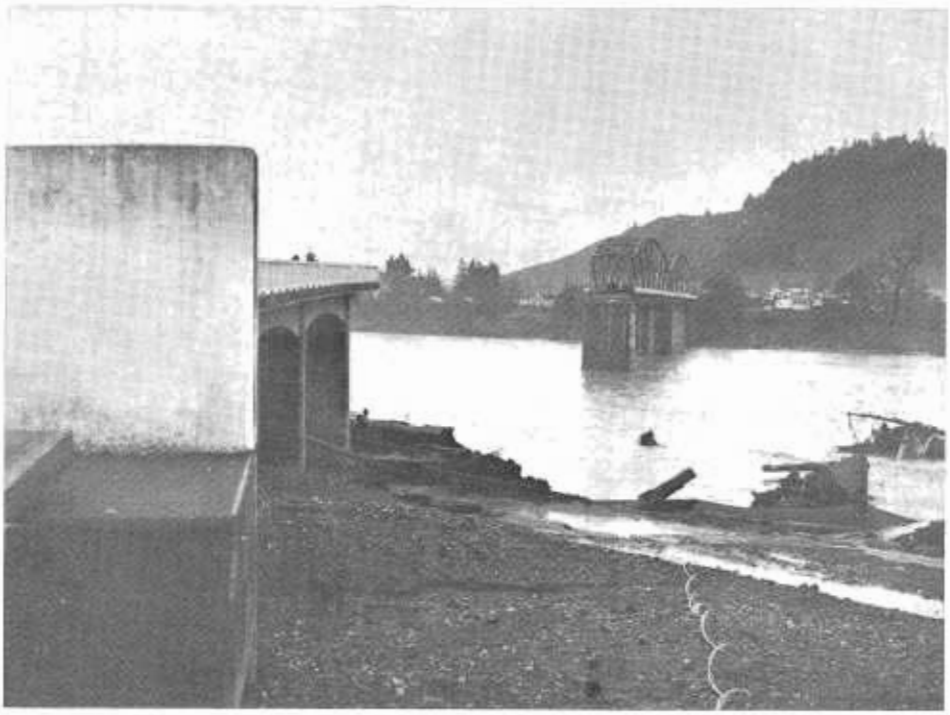
At the Caldecott Tunnel, on Route 24 between Alameda and Contra Costa Counties, construction is nearing completion on the new system of approach roadways incorporating intricate lane control equipment.



The reconstructed Eel River Bridge at Rio Dell was opened to traffic in May 1965. (See next photo.)

In the Sacramento metropolitan area work is in progress on two contracts on 29th and 30th Streets, (Routes 99 and Interstate 80). Structures on these projects have received national recognition, due to aesthetic design, and have been featured in technical and trade magazines. The portion of Interstate 80 between A Street and Arden Way is being widened to provide three lanes of traffic in each direction.

Construction of the Interstate 80 freeway along W and X Streets in Sacramento is in the initial stages.



The Eel River Bridge at Rio Dell after it was washed out during the December 1964 flood. (See previous photo.)

The $12.7 million, eight-lane Interstate 80 freeway bridge crossing the Sacramento River is about 50 percent complete. Operations included the driving of 5,000 foundation piles and erecting huge 275-foot steel girders over the Sacramento River. Current work includes construction of the concrete roadway deck and connection of the bridge with Interstate 80 in Yolo County.

The first project on the 2nd-3rd Streets Freeway, Interstate 5, started in late 1964. Structure work consists of a grade separation structure on Capitol Mall which will eventually span the depressed section of the freeway.

Structures along the Santa Monica Freeway in Los Angeles were completed and opened to traffic from the Harbor Freeway to a point west of the San Diego Freeway. The remaining structures along the Santa Monica Freeway are completed and when this section is opened to traffic in the early fall will provide the first complete east-west freeway in West Los Angeles.

All structures on the Pomona Freeway were under construction from the East Los Angeles interchange to east of Workman Mill Road in the City of Industry.

Structures along the San Gabriel Freeway were either completed or under construction from the San Bernardino Freeway to the San Diego Freeway.

Bids were received for the first structure contracts along the Foothill Freeway in the San Gabriel Valley.

Construction work continued at a high tempo on Interstate 5 in San Diego. Four contracts with 21 structures were completed during the year and there are six major contracts with 36 structures now underway.

Other Major Projects

Two bridges were completed over the Sacramento River along with an underpass and two overcrossings of the Interstate Route 5 Bypass of Red Bluff.

Completed during the past year, were 15 structures on the Modesto Freeway.

In a contract between Cisco and Hampshire Rocks on Interstate Route 80, 14 structures were constructed. Also on Interstate 80, 17 structures in Solano County near Vacaville were completed and opened to traffic.

During the 1964–65 fiscal year, the structures on two widely separated Redwood Highway freeways were completed. Eighteen reinforced-concrete bridge and interchange structures were completed on the City of Ukiah Bypass in Mendocino County, and 13 reinforced-concrete girder bridges and interchange structures were completed on the McKinleyville Freeway in Humboldt County.

The Klamath River south span repairs shortly after the bridge was opened to traffic in March 1965. The span was washed out during the December 1964 floods. Contractor's crews are completing the timber sheathing of the pile bents to protect them from floating debris. (See next photo.)

In San Mateo County on Interstate 280 there are three contracts underway, including 12 grade separation structures designed with the new special architectural look to blend with the scenic area in which they are located.

The new structure over the Colorado River on Interstate 40 near Topock is well underway. Three other contracts in the vicinity of Needles are scheduled for construction during the 1965–66 fiscal year.

On Interstate 10, between Indio and Blythe, 14 structures were completed in the first unit, and two additional units are underway in the construction of the full freeway across the desert.

Two overcrossings were completed over Interstate 15 near Victorville.

Eighteen structures between Cronese Valley and Baker have just been completed in a contract on Interstate 15 in San Bernardino County. This route is now a four-lane freeway between Barstow and the Nevada state line near Las Vegas. These new structures replace the last of the 87 timber bridges built on this road in the late 1920's and early 1930's.

The Klamath River Bridge looking north at the remains of the town of Klamath on December 30, 1964. Note the debris that has collected in the supporting members of the bridge. The large log leaning against the side of the bridge weighed about 30 tons. (See previous photo.)

The Klamath River Bridge, looking south, shortly after it was opened to traffic. The steel trestle with timber deck is visible at the far end. The famous bears at each end of the bridge survived the flood.

Seven new structures were completed on State Route 14, the Antelope Freeway, which is entirely on new alignment leading to the south edge of Palmdale. A recently awarded contract is now underway which extends the freeway through Palmdale toward Lancaster.

Flood Damage

The floods in the northern part of the state, which occurred during December 1964, caused structural damage to 38 bridges on the state highway system. At 21 of these bridges one or more spans were washed out. At 14 major structures the spans which were washed out were from 100 to 300 feet in length. Cost of the bridge damage is estimated at $15 million.

Major damage was caused to four bridges on US 101, three across the Eel River near Scotia and the other across the Klamath River. On US 199 from Crescent City to the Oregon border, three bridges across the Middle Fork Smith River were seriously damaged. The structures on Route 96 from Willow Creek to its junction with Route 5 suffered the greatest damage. Washed out were bridges across Willow Creek, Klamath River at Orleans, Salmon River at Somesbar, Dillon Creek, Clear Creek and Indian Creek. The bridge at Canyon Creek on US 299 at Junction City was washed out as were two culverts and the resulting gulleys had to be spanned with temporary bridges. A steel girder bridge across North Fork American River on Route 49 near Auburn was destroyed when an upstream dam gave way. Other bridges washed out or seriously damaged were across Cold Creek on Route 20 and South Fork Eel River at Dyerville on Route 254. Numerous other bridges at various locations throughout the northern part of the state suffered some damage.

To expedite the required repair work, 23 emergency contracts were negotiated to reconstruct or replace the damaged bridges with temporary structures. Permanent reconstruction was made at three bridges, three temporary Bailey bridges were erected, trestles were constructed at five locations, log bridges placed at five sites and repairs made to seven bridges. In addition, 12 temporary log bridges were constructed by maintenance forces.

Contracts for the permanent reconstruction of all damaged bridges have been awarded and work is now either underway or has been completed.

Bridge Maintenance

Periodic field investigations were made of the 8,261 bridges on the state highway system. Capacity ratings for all structures were reviewed and kept up to date and the replacement of structurally critical bridges was scheduled.

The maintenance section initiated a project to apply an epoxy coating to 34 bridge decks located on or crossing over Interstate 80 at the higher altitudes. The top surfaces of the concrete decks had disintegrated, some severely, as a result of frost action, abrasion by tire chains and the heavy applications of salt applied during the winter for deicing purposes. The coatings should result in a significant reduction in maintenance and an increase in the deck life.

On February 5, 1965, a sand barge ran aground in the channel under the opened lift span of the bascule bridge across Sonoma Creek on Route 37 west of Vallejo. Settlement of the barge against the bascule rest pier at low tide caused considerable damage to both the pier timbers and the protective fender system. Repairs were completed by state maintenance personnel in July 1965.

On March 26, 1965, an overheight load struck and extensively damaged the girder and bridge deck of the Indian Avenue Overcrossing on Interstate 10 in Riverside County. All work was completed on July 12, 1965, under emergency contract.

The Bridge Maintenance Section made engineering investigations at the request of local authorities for 85 city and county bridges to establish their load-carrying capacity. Fourteen public hearings were held to consider speed and load posting for these bridges.

Bridge Maintenance Painting

A new paint system, developed by the Bridge Department and the laboratory, was applied to the sign bridges. This work, done in cooperation with District 1 maintenance department, provided an excellent opportunity to assemble cost data and to ascertain the most efficient procedures for similar work throughout the state when needed.

As a result of this Bridge Department experimental paint program the service life of paint on coastal bridges will be more than doubled.

Personnel & Information

PERSONNEL

Continued growth of the highway program increased the total personnel of the division by 819 during the fiscal year to a total of 17,604. This includes 9,064 engineering staff, 4,156 maintenance employees, 630 right-of-way agents, 383 equipment repair employees, and 3,371 in administrative services, accounting and clerical classes.

Recruitment

Nationwide recruitment tours still are being conducted to attract graduate engineers to state service. Examinations are scheduled for graduates in California colleges. Other state agencies participate in this program which is coordinated by the State Personnel Board. As a result, 126 engineering graduates were hired from out of state and 91 from California schools during the past year.

Because of a shortage of engineering candidates for the Los Angeles area the State Personnel Board conducted a special nationwide recruiting tour during the fall of 1965. Prospective applicants for both the classes of junior civil engineer and assistant engineering specialist (highways) were interviewed.

Personnel Management

A new class of highway equipment mechanic apprentice was established along with a program of full apprenticeship training.

By joining the neighborhood youth corps program of the Stockton Unified School District, the Division of Highways is providing work experience training for high school dropouts under the federal government's "War on Poverty." Twenty-two trainees were assigned during the spring of 1965 to work with our regular crews in highway and landscape maintenance and reproduction activities. The trainees did effective work which stimulated a helpful interest on the part of the crews with which they are working.

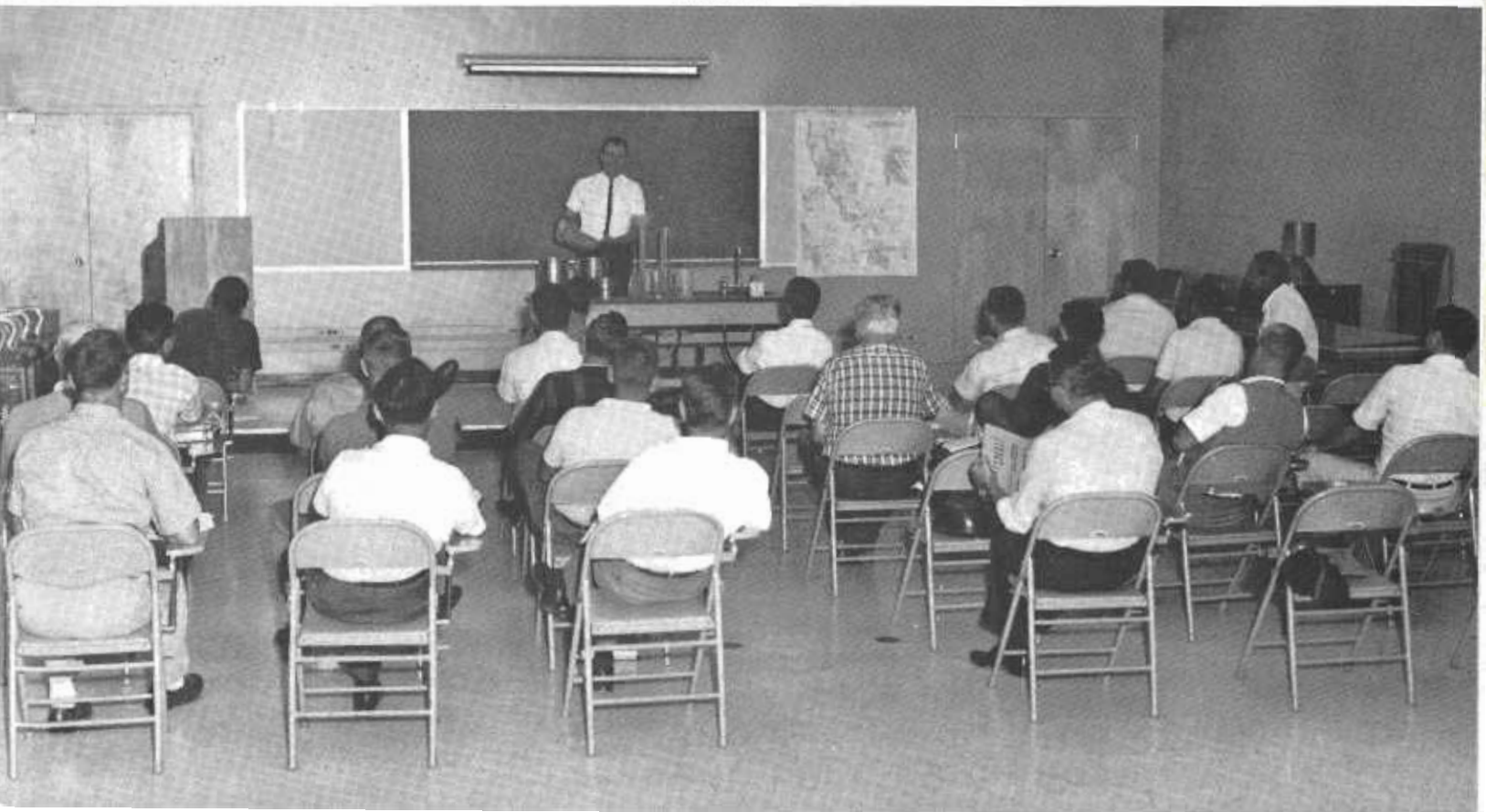
The Stockton youth trainee program will be expanded and other areas of the state may be included during the 1965–66 fiscal year. The division also plans to carry on similar cooperative projects with county welfare departments under the community work and training program.

Statistics

During the current year, 22 employees were dismissed—13 from permanent positions. Twenty-two were rejected during probation, three were demoted, and 48 were suspended. A total of 181 employees retired. Forty-three 25-year awards were given.

Three hundred thirty-nine visitors from 33 countries visited the division generally under the auspices of federal government programs and coordinated by the U.S. Bureau of Public Roads. Discussions and training programs were arranged for each individual or group.

Construction personnel are given training in the performance of construction control tests to insure that proper techniques and procedures will be followed on the job.



TRAINING

Training activities in the Division of Highways have two purposes: to improve the manner in which employees carry out the highway program; and to provide them with a reservoir of skills needed to cope with the highway program of the future.

IN-SERVICE PROGRAMS

Organizational Development

Programs to increase productivity, efficiency and flexibility of the division include study and improvement of communications, internal and external relationships, employee attitudes, motivation and morale, management and supervision, internally caused recruitment problems and turnover, employees relationships to systems and procedures, future demands for trained personnel, present and anticipated employees' potential to fill them.

Organizational development activities also include a continuing training program in the Fiscal Management Department, the Bridge Department and the Computer Systems Department where changes in computer capabilities have had a tremendous impact.

Management Development

Under civil service, employees rise through the ranks to fill almost all high-level division positions. College graduates, first employed as junior engineers or right-of-way agents, gain experience and are promoted by examination to higher levels. At the third or associate level they supervise others. At the sixth or principal level they are in charge of districts or have headquarters staff responsibilities for major programs.

The majority have technical, rather than management educations. Through the division's management development curriculum, they acquire needed supervisory, administrative and management skills. Employees begin a series of supervisory workshops when they reach the third level, and continue to take special programs as they climb the career ladder. Participation is automatic.

A major gap in this management development curriculum closed when we held the first Highways management conference this spring. Employees who pass examinations for sixth-level positions attend an intensive 40-hour conference, where they examine highway operating policies, problems, goals and objectives. In this manner we help employees newly promoted to decision-making levels to maintain a continuity of purpose and effort in implementation of the highway program.

Employees from the fifth or supervising level up participate in the state's interagency management development program, which comprises courses and conferences designed to improve managerial efficiency. Eligible employees and their supervisors determine which courses each employee most needs. To assure that overall division objectives are met, nominations are centrally coordinated. We have evaluated the courses carefully to determine which best fit our requirements.

Equal Opportunity

The division has always been nondiscriminatory in its personnel practices. However, because of increased nationwide focus on equal opportunity regardless of race, creed or color, and the Governor's strong leadership in this area, it was decided to emphasize this position. All fifth-level employees participated in workshops designed to eliminate misconceptions about minority groups, explain policy and show how it applies in practice. The result has been intensified support for equal opportunity among employees responsible for hiring and promotion.

Employee Training

Division training helps give employees the skills and knowledges needed to perform effectively and to apply technological advances in their work.

For example, the division's two-year rotation-training program for junior civil engineers speeds the new engineer's application of his civil engineering education to highway activities.

With right-of-way agents a different problem exists: The basic requirements of their jobs are not covered by college courses. The division holds an annual two-week right-of-way academy to introduce new agents to basic right-of-way skills. Coupled with planned job rotation, this helps assure effective performance in their new careers. As agents are promoted, they are given advanced training, usually after working hours, through contract with the University of California.

To continue the inspector training started last year with "portland cement concrete inspection," an "asphalt concrete inspection" course was given to all construction personnel. These programs, periodically repeated, help insure that inspectors are effective with both major types of highway surface.

Other technical and professional courses conducted by the division were "traffic signal controls" and "engineering uses of electronic data processing" covered technological change. Others, such as "mechanical features of equipment operations" and "radiological monitoring," promoted the safety of employees and equipment. A few, including "traffic forecasting and estimation," were done under contract by the Institute of Transportation and Traffic Engineering, University of California.

With respect to nontechnical training, supervisory programs for first-line clerical and highway maintenance supervisors neared realization when courses for both groups were developed and tested.

Many bay area residents have been interviewed by Bay Area Transportation Study Commission employees surveying transportation needs. To assure that interviews were conducted effi-

ciently, with minimum public inconvenience, a weeklong course was used both to train interviewers and to screen out those who did not show sufficient skills.

Continuing efforts to improve written communications to the public, "effective letter-writing clinics" were held for supervising engineering personnel.

OUT-SERVICE PROGRAMS

In some subjects, it is more efficient to use existing university short courses and workshops. Sparked by spectacular technological advances, this type of training plays an increasingly important role. This year, 72 employees participated in such courses at state expense. Examples are "abstracting and coordinate indexing," "non-destructive testing," "statistical quality control methods," and "urban transportation planning processes."

SAFETY

The Safety Section has one prime objective: to keep every division employee safe and sound and on the job.

To accomplish this it uses a variety of devices: safety posters, films, employee safety meetings, periodic inspections for unsafe conditions, and providing employees with necessary protective equipment.

Characteristic of the new tasks being assumed by the Safety Section is one in regard to nuclear soil gages now being used on construction jobs by the Division of Highways to test the density and moisture content of earth fills. District representatives using radioactive isotopes in testing procedures and the district safety supervisors have received special training by the Materials and Research Department.

The Safety Section has the responsibility to monitor working conditions in this program.

There has been a generally continuous reduction in frequency rates of 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 8.66 in 1964. The frequency rate for motor vehicles has been reduced from 1.00 in 1953 to 0.55 in 1964.

There are few significant changes in the motor vehicle accident rate in the division within the last four years. One of the most serious problems has been accidents and injuries resulting from equipment backup. Backup warning devices are being installed on all trucks of two-yard capacity or greater, and on those vehicles with limited visibility.

During the past year a color motion picture for maintenance crews entitled, "TCLCM" (The California Lane Closure Method), developed by the Safety Section, was produced by the Audio-Visual Section at Headquarters.

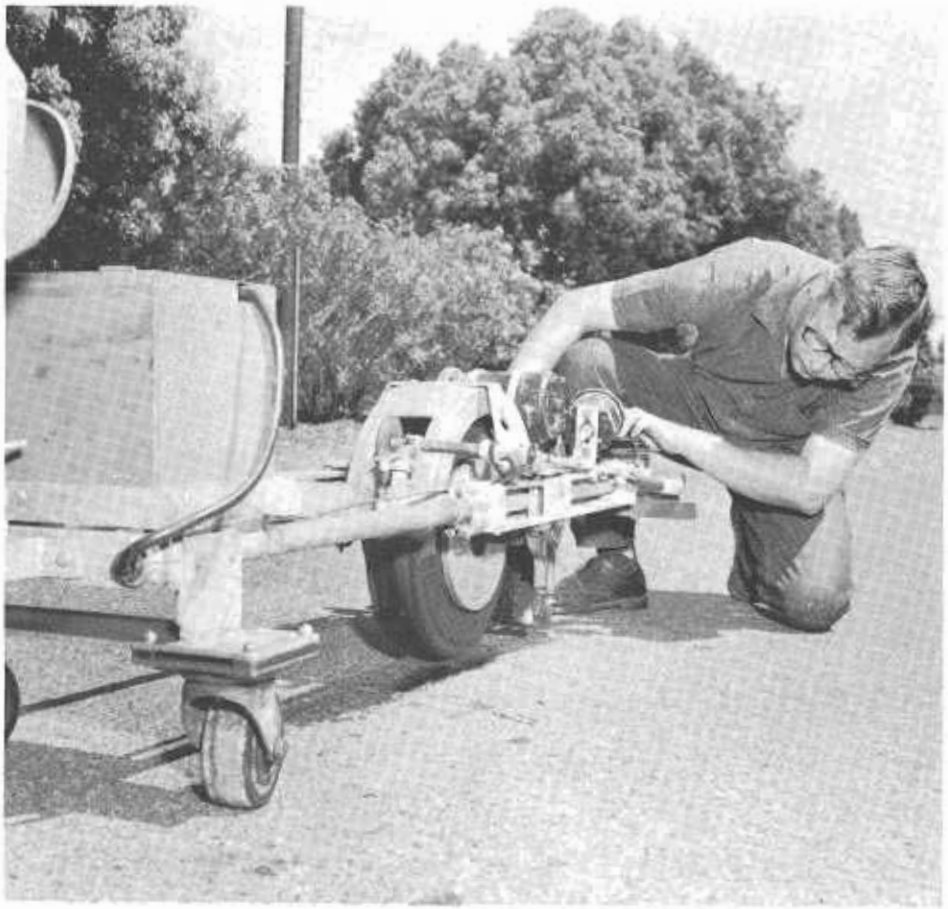
Purpose of the film is to demonstrate the recommended policy for lane closure methods on various types of highways and to establish uniformity for work area protection throughout the state.

Employee Suggestion Program

The Division of Highways employee suggestion program is administered by the Headquarters Safety Section. The section also coordinates that portion of the employee suggestion program which provides recognition for special acts, special service and superior accomplishment.

Suggestions submitted during fiscal year 1964–65 totaled 402. Other figures on the program were as follows:

Certificate of commendation	8
Suggestions based upon intangible savings	14
Number of money awards	28
Amount of money awards	$1,710
Estimated savings	$12,588



A Division of Highways technician operates the California skid tester. The device can be used in safety studies to evaluate the friction between a rubber tire and a wet pavement surface.

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 and movies 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.

In 1965 there has been an increasing emphasis on motion pictures for personnel training and information. This section has furnished many tape and motion picture clips for radio or TV use to illustrate a variety of highway activities and conditions.

Revisions have been made to 16-mm. motion pictures on "Freeway Traffic Flow" and "Balboa Park Landscaping," both of which should be available by late 1965. Work is underway on "Work Area Protection," a training movie on lane closure methods to protect maintenance crews working on the roadway; "Design Aesthetics," a training movie for highway designing personnel; "Wrong-way Driving," a training and informational movie on results of a research project on wrong-way driving at freeway off-ramps.

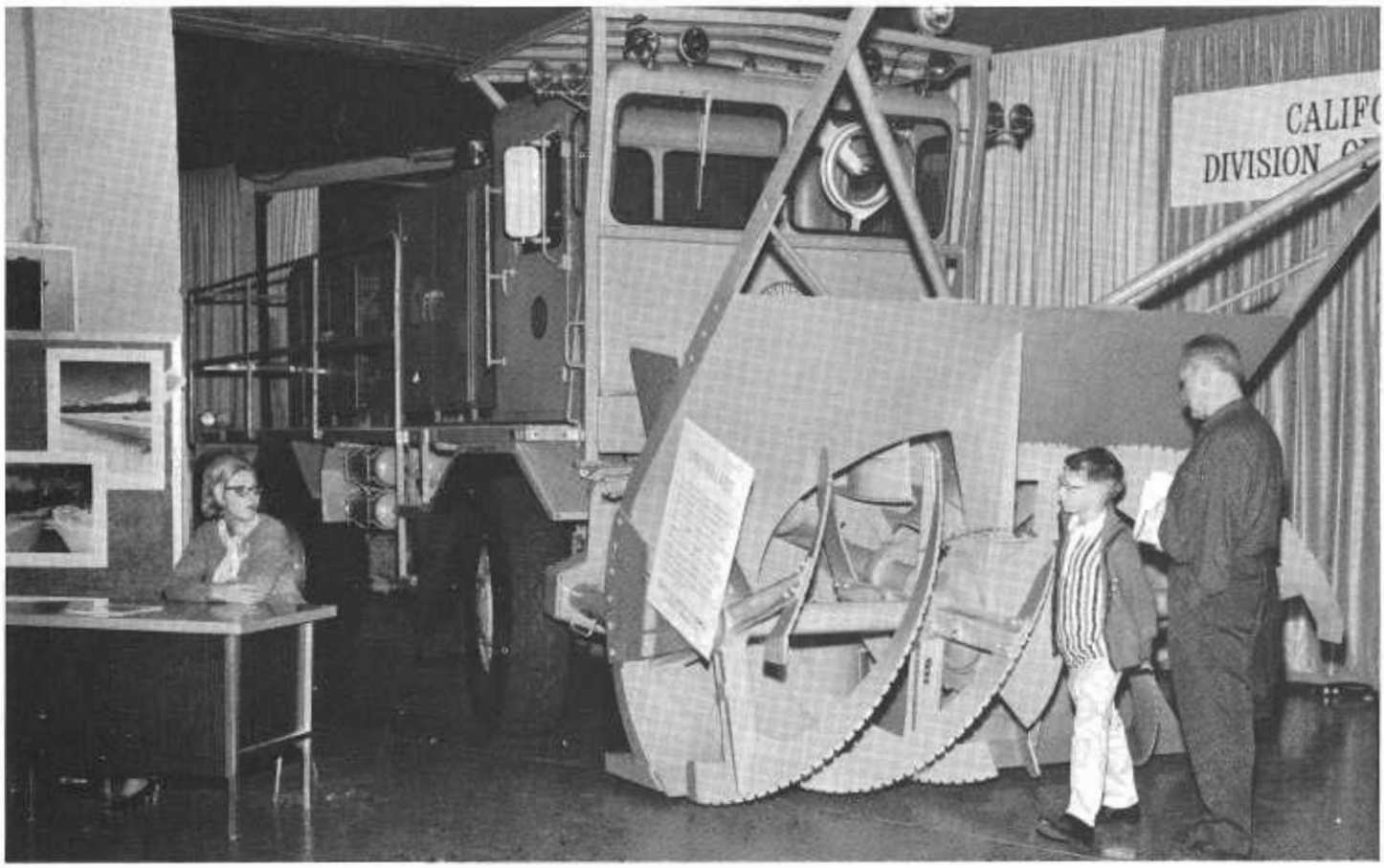
PUBLIC INFORMATION

Although traffic safety was of as great interest as it has been in the past, both the press and the public at large this year displayed an increased and constructive curiosity in highway projects where aesthetic values can be integrated into the finished product.

Roadside rests, scenic highways, landscaping and multiple uses of airspace over and under freeways were of particular interest to all because of their high adaptibility. But perhaps the keynote was sounded in a telegram sent by Mrs. Valley Knudsen, president of Los Angeles Beautiful, to Administrator of Transportation Robert B. Bradford on July 20. The occasion was a meeting of city, county and state officials called together by Bradford to study the concept of using airspace over and under freeways for additional productive purposes.

Aesthetic Values

Mrs. Knudsen said in part: "Los Angeles Beautiful hopes that your discussion on July 20 will be concerned not



Assistant Information Officer Marcia Mickelsen (seated, left) staffs the Division of Highways exhibit at the Winter Sports Fair in San Francisco. The exhibit featured one of the division's new 19-ton, 50-foot-long rotary snowplows which can throw up to 2,200 tons of snow an hour.

merely with the economic and engineering aspects of the use of airspace over freeways, but also with those human needs and aesthetic values which the parklike open space of landscaped freeways provides our increasing urban populations.

"We realize each proposal must be judged on its individual merit. But as California now leads the national trend toward beauty in freeway and scenic road design, we hope this same philosophy will be a strong factor in judging proposals that come before your office and the many local agencies which are concerned."

The state's first *complete* safety roadside rest was opened to the public in July. Located near Red Bluff, it received statewide attention in the press and was lauded for the manner in which it blends into its environment.

Also acclaimed was the selection of Route 1 in Monterey County between the San Luis Obispo county line and the Carmel River as our first official "scenic highway." This action was taken by John Erreca, Director, State Department of Public Works, upon the unanimous recommendation of the State's Advisory Committee on the Master Plan for Scenic Highways.

Research in the field of traffic safety was given special mention in one of Governor Edmund G. Brown's televised press conferences. Public response was so great that the full-time services of two persons were required for a 10-day period just to answer letters the program elicited from private citizens.

Wrong-way Drivers

Almost equal response was derived from a series of four articles (see May–June 1965 issue) that described wrong-way drivers and another that told of experiments with "talking highways"—an electronic system capable of relaying warnings and messages to drivers (see July–August issue).

Perhaps the peak effort of the information staff was providing the nation with up-to-the-minute news from northern California where last winter's floods wrought massive destruction. Daily reports were made from the scene until emergency workers had repaired highways to the degree that traffic could use them once again.

The tempo that began in 1959 in regard to the opening of important new freeways and other highways was maintained and drew the normal share of public attention. The number of such openings increased during National Highway Week. Although dedication ceremonies were planned and conducted by local organizations, district offices assisted by supplying information and sketch maps to the news media.

The number of news releases announcing bid advertising and opening, contract awards, speed zones and construction progress increased over previous years.

Greater emphasis was placed on visual displays. Several districts participated in county fairs and District 3 joined with headquarters in such a project at the State Fair. Districts 7, 8, and 11 sponsored a joint exhibit at the Los Angeles County Fair during National Highway Week.

Motion Pictures

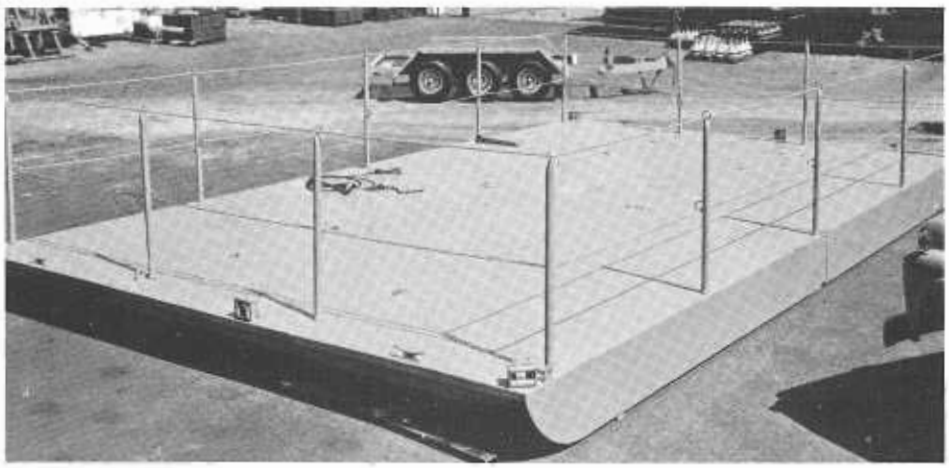
Motion pictures also were important. The script for the film *Heritage* was produced in the information office. *Heritage* was a joint venture of the Departments of Architecture, Parks and Recreation, and the Division of Highways. It depicts the restoration of some of California's first buildings and "ghost towns." The division also participated in producing a 30-minute film on the northern California floods. Several clips on varied subjects were produced for television newscasts and were distributed on a statewide basis.

The principal publication of the Division of Highways, *California Highways and Public Works*, continued to serve as a vehicle of general and technical information. As in the past, it was in great demand by engineering schools, libraries, Department of Public Works employees and the general public.

Several reprints derived from it were of special interest, and numerous other magazines, trade journals and newspapers were granted permission to reproduce material from it. Black-and-white glossy prints of illustrations that accompanied articles were in great demand and requests from editors and free-lance authors from all parts of the world were received and filled.

Each district office publishes employee bulletins on a monthly basis. Local information was furnished to them through the "clip sheet" that originates each month within the information office.

Guest speakers were provided to service clubs, civic groups, chambers of commerce and similar organizations throughout the year. Senior officials of the division also appeared on television and radio in newscasts and programs concerned with state highways.



The portable floating drill barge is one of the latest pieces of equipment developed by the Division of Highways.

Legal

The following tabulations indicate the volume of work performed by the Legal Division involving court appearances and appearances before various administrative agencies for the past year.

Condemnation Proceedings

Some idea of the volume of the condemnation casework is given by the following tabulation:

Suits filed	411
Parcels involved	2,110 *
Defendants involved	13,853
Suits closed	505
Contested trials	266
Uncontested judgments	280
Default judgments	25
Suits pending 7/1/64	848
Suits pending 6/30/65	754

* The parcel count is based on a count of parcels filed on as described in condemnation resolutions.

The total suits closed, 505, represented total awards of $21,114,247.77, and represented 1,233 days in court.

Appellate Cases

More appellate decisions were rendered during the fiscal year than in prior years, both in condemnation proceedings and in public liability actions against the department. The condemnation cases decided were *Peo. v. Fair*, 229 Cal. App. 2d 801; *Peo. v. Elsmore*, 229 Cal. App. 2d 809; *Peo. v. Kawamoto*, 230 A.C.A. 18; *Peo. v. Glen Arms Estates, Inc.*, 230 A.C.A. 912; *Peo. v. Dickinson*, 230 A.C.A. 1002; *Peo. v. Miller*, 231 A.C.A. 166; *Swartzman v. Superior Court*, 231 A.C.A. 230; *Peo. v. Donovan*, 231 A.C.A. 382; *Peo. v. Bond*, 231 A.C.A. 486; *Peo. v. Graziadio*, 231 A.C.A. 581; *Peo. v. Garden Grove Farms*, 231 A.C.A. 713; *Peo. v. Donaldson*, 231 A.C.A. 813; *Peo. v. Quinones-Quintana*, 231 A.C.A. 860; and *Peo. v. Malone*, 232 A.C.A. 667.

The legal issues involved on these appeals included a determination of the extent of the larger parcel *(Fair, Dickinson)*, the use of purchases by the state as evidence of market value *(Kawamoto, Donaldson)*, whether staff or independent appraisal reports are within the attorney-client privilege *(Glen Arms, Donovan)*, severance damages and special benefits *(Elsmore, Bond)*, Discovery *(Swartzman)* and the admissibility of offers of settlement *(Graziadio)*.

A most significant decision was rendered in *Peo. v. Garden Grove Farms, supra*, upholding the validity of Streets and Highways Code Section 104.2 and authorizing the department to condemn private property for purposes of exchange for school district property needed for a freeway.

In the public liability area, decisions were rendered in *Zeppi v. Beach*, 229 Cal. App. 2d 152; *Flournoy v. State*, 230 A.C.A. 579; *Hayes v. State*, 231 A.C.A. 73; *Hilltop Properties, Inc. v. State*, 234 A.C.A. 101; and *County of Los Angeles v. Superior Court*, 62 A.C. 889.

It was mentioned in the last annual report that the *Flournoy* and *Hayes* cases were pending to determine the constitutionality of the 1963 California Tort Claims Act, which regulates the tort liability of all governmental entities. These cases have now been decided and the validity of the new law was upheld by the district court of appeal.

In the first case on this subject to be heard by the Supreme Court, the department appeared as amicus curiae in support of the County of Los Angeles. The new law was ruled constitutional and fully retroactive to pending actions in a unanimous opinion of the Supreme Court in *County of Los Angeles v. Superior Court, supra*. The Flournoy case was cited with approval and the law is now settled in favor of public entities.

The decision in *Zeppi v. Beach, supra*, has finally put an end to litigation which commenced with an automobile accident in Butte County in February of 1957. After three different appeals *(Zeppi v. State*, 174 App. 2d 484; *Zeppi v. State*, 203 Cal. App. 2d 386; and the present decision), it was determined that neither the state nor two highway maintenance employees sued individually were liable for any damages resulting from the accident.

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 immense increase in this phase of the department's work during the fiscal year 1964–65:

Cases pending	847
Filed during 1964–65 fiscal year	920
Total being processed	1,767
Cases closed	776
Cases pending 6/30/65	991

Some of these cases involve claims for damage to state highway facilities, such as bridges, signals, guardrails, or damage to state vehicles, also unlawful detainer actions. During the fiscal year collections from these cases by the division amounted to $129,486, an increase of $13,955 over the amount collected in the previous fiscal year.

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 1964–65

Applications pending (decisions not issued) 6/30/64	8
Applications pending (decisions issued) 6/30/64	27
New applications filed during year	30
Total applications before Public Utilities Commission	65
Decisions received during year	54
Applications pending 6/30/65	11

In addition to formal applications, six proceedings under PUC General Order 88, relating to crossings at grade, were processed, making a total of 12 on file. 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.

Board of Control and Other Claims

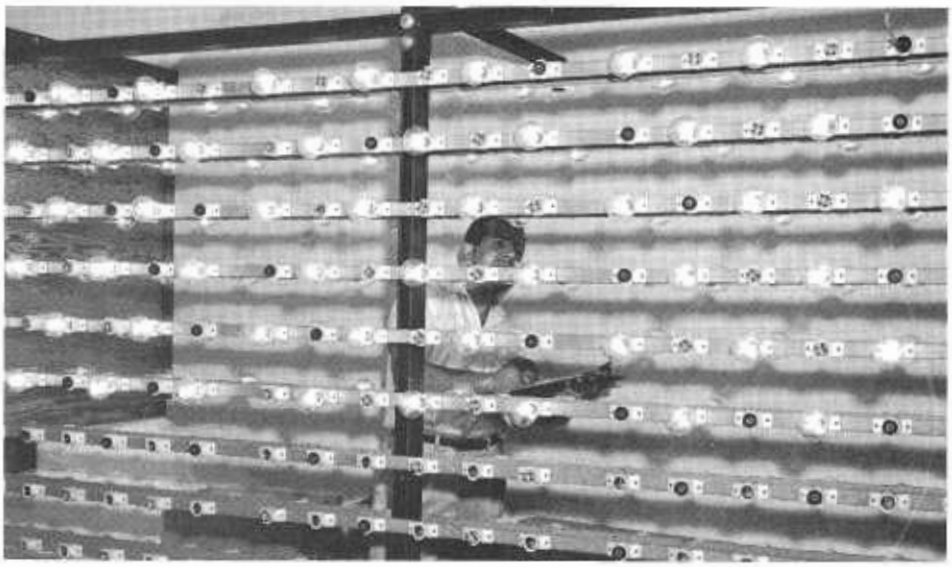
Claims against the state by reason of activities of the department are filed with the State Board of Control.

The following tabulation illustrates the increase in the volume of work handled by the department's attorneys before the Board of Control:

	No. of claims	*Amount*
Pending on 7/1/64	42	$2,052,267.04
Filed	470	43,377,952.72
Total	512	45,430,219.76
Claims disposed of	403	37,266,794.47
Pending 6/30/65	109	8,163,425.29

There was an increase of 83 claims filed over the previous year, amounting to $15,434,865.36. This was an increase of 21½ 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.

The continuing increase in the number of claims filed with the board is due in a large part to the 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 condition 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.



Samples of traffic lights are tested at accelerated rates in this aging rack to see if they meet bulb life requirements. Longer and uniform life means less maintenance cost and greater safety to the motoring public.

FOREIGN VISITORS. French engineers inspect fanroom controlling ventilation in the Caldecott Tunnel.

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 as well as 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 31 contested hearings before the State Personnel Board.

. Right of Way

For more than 100 years people have been rushing to California in ever-increasing numbers. By this time tomorrow nearly one thousand more will have arrived. In a year they will fill a city larger than the state capital—Sacramento.

What must be done to accommodate the new arrivals? In part, more homes and jobs will be needed to shelter and support them. California's potential productivity and wealth will be increased by their many talents. Moreover, California's highway builders will have to produce more and better highways to move them from home to work, home to store, and home to recreation.

The Right of Way Department plays a very important role in the production of more and better highways. This department will provide the land on which the highways will be built. In an environment of explosive population growth and land development the task is difficult and complex.

Right-of-way work is characterized in part by its many special performance areas such as right-of-way engineering, appraisals, acquisition, utility relocation and property management. The brief tabulation below illustrates the magnitude of this work. But it is more than a series of separate tasks. It is a complete service. Some of the less known facets are contributing more and more to the whole Right of Way product.

1964–1965 RIGHT-OF-WAY PROGRAM

Value of parcels acquired	$166,767,433.44
Number of parcels acquired	8,533
Average value per parcel	$19,543.82
Utility relocation payments	$13,334,668.48
Acquisitions for other agencies	$6,157,566.97
Total expenditures	$186,259,668.89
Receipt from sales and rental income	$12,249,428.95

Three such functions are: relocation assistance, right-of-way estimating and airspace management. Each has for sometime been part of the Right of Way process. Each has, in the past year, become more important as a factor in the total Right of Way service.

Relocation Assistance

When the Right of Way Department buys a man's home and he wants help finding a replacement, the department provides help. This process is called relocation assistance. In past years property owners displaced by highway acquisitions have been assisted on an informal basis. Help came from the state acquisition agent. For example, an elderly couple might be furnished a ride so they could look at a replacement cottage, or a groceryman might be put in touch with a number of local commercial realtors who know of stores for sale. Help was furnished whenever property owners indicated a need.

More recently relocation assistance has become more extensive and more formal. Where, in past years, assistance was primarily for property owners, the recent trend has been toward providing tenants with the same service.

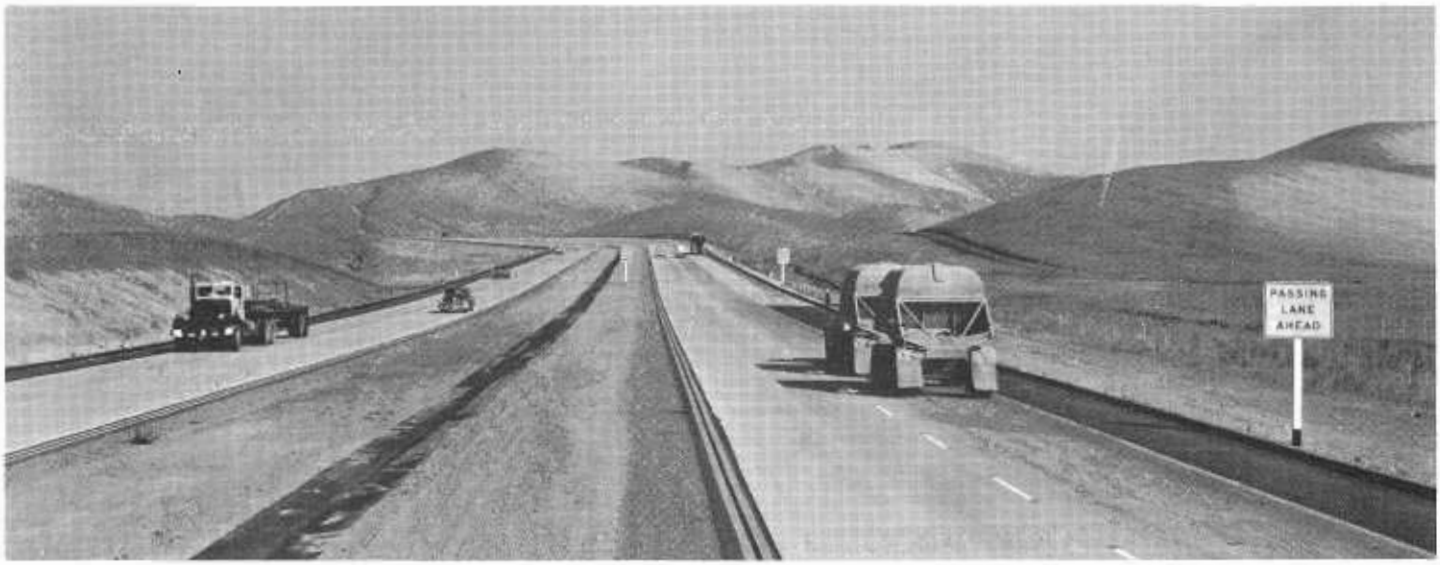
A small, but very important, part of the Right of Way staff now works full time assisting both owners and tenants to find replacement farms, homes, and businesses. Where the demand warrants, separate project offices have been opened to handle the relocation program.

Until mid-1965, relocation followed its historical trend of providing *service* only. However, in 1965 the California Legislature passed a bill which provides that people displaced by highway property purchases, will be compensated for their moving costs.

Payments will vary depending upon the type of property involved and the amount of belongings which must be moved. However, payment may not exceed $200 for residential and $3,000 for business-type properties. Both tenants and owner occupants are eligible for moving cost payments.

Relocation assistance has evolved from an informal help-your-neighbor activity to a formal and fully devel-

What will land cost be in five years? Future highway plans for this part of Santa Clara County will be based in part on the answer.



Construction was completed on the Pacheco Pass highway relocation. The highway is heavily used by trucks to link the farming areas of the southern San Joaquin Valley with the San Francisco area market.

oped Right of Way function. Evolution of this function has come about, in part, to provide a more complete Right of Way service.

Right-of-way Estimating

The headline, "Land Cost Exceeds Construction Cost" focuses attention on another activity of growing importance—right-of-way estimating. Right-of-way estimates are predictions of what land needed for a highway will cost. Traditionally, land cost, though sizable, has been much less than construction in total highway cost. But today this is no longer true. Land is becoming more scarce and more costly—particularly in the metropolitan areas.

For example, southern California's planned freeway network now includes projects where land costs are three times construction costs. Other parts of the state may look forward to the same circumstances—more dollars for land.

One result of California's near hysterical rise in land value is that tomorrow's highway locations will depend more and more on land costs. Therefore, in order to soundly plan for tomorrow, we must, today, more accurately predict what land costs will be.

This past year, a more comprehensive, estimating procedure was instituted. As a result, future property value estimates will be more valuable as tools for use in highway planning and in the route selection process.

Airspace

Today the term "space" suggests adventure, the unknown, great speed, daring, and profound technical advance. Man's exploration of space has been motivated by many things, among them: curiosity, military advantage, and perhaps anticipated need for more room for man himself. To the highway-minded, the term "airspace" has a similar flavor of adventure and daring. Its exploration too has been motivated in part by man's anticipated need for more room.

Airspace is the expanse above and below highways. It generates interest because land is a fixed, scarce, commodity. Where horizontal land development is no longer feasible, man must look up or down for more space. America's skyscraper is the product of man's upward glance.

The fact that modern highways occupy a relatively small amount of vertical space but considerable horizontal space suggests multiple use of the airspace. This is particularly true in areas where competition for land is high and development intense.

To date, use of airspace in California has been confined to development of auto parking lots under elevated highways. In other parts of the country, where conditions are different, several imaginative projects have been conceived and constructed. For example, in New York City a quartet of 32-story giants called the Bridge Apartments straddles the approach to the George Washington Bridge. In Detroit, Cobo Hall, a municipal government center, has been placed over a major interstate highway. In Illinois and Oklahoma restaurants bridge tollways at various locations. (The restaurant developments are based more upon unique location than upon a need for use of vertical space, therefore they illustrate a different motive for airspace use.)

In California more daring, diverse, development of airspace above and below highways is now being considered. Very soon some California highways will share their bit of earth with some other use—perhaps shop, school, home or hospital.

Summary

Recent Right of Way Department growth has paralleled the growth of California. With growth have come complex problems and progress. Until recently, providing land for highways was enough. Today it is not. Right of Way must now provide land and service. Illustrations of the service trend are: (1) relocation assistance—a service to those displaced by a highway; (2) estimating—a service to those who must plan and locate tomorrow's highways; (3) management of airspace—a service to provide more complete utilization of public land devoted to highways.

. Fiscal Management

Accounting Systems

During the fiscal year ended June 30, 1965, sweeping changes were made in the division's budgeting, cost analysis, and reporting procedures. The goal was to obtain more significant information for management decisions, while reducing the cost of clerical and other labor required to produce that information. These changes included the following:

1. The production of the first computer-prepared management cost reports for the division.
2. Reduction of the number of activity codes by 176 from 242 to 66. (An activity code describes what a Highways employee is doing at any given time. Reducing the number of these codes saves each employee time in preparing his time sheet with attendant savings in accounting labor and computer machine time.)
3. Object codes were reduced by 101, from 170 to 69.
4. Total coding was reduced an average of 30 characters per accounting transaction, approximately 50 percent.
5. Of 300,000 monthly accounting entries, 50,000, or one-sixth, are now generated by the computer, saving accounting labor.
6. The approximately 17,000 employees of the division have been organized into approximately 1,550 cost centers to pinpoint source of costs and to facilitate budgeting and cost control. The supervisor of each cost center receives a monthly computer-printed report, with a detailed analysis of the costs incurred by his unit.
7. Higher levels of management receive summaries of reports for cost centers under their supervision.
8. All costs are collected under a six-digit expenditure authorization number, of which the first four digits remain the same for advance planning, design, right-of-way, construction engineering, and construction phases of the work. Thus, ratio analysis of costs will be facilitated in the future.
9. The first of three volumes of the new *Accounting Manual* was issued.

Training

A training and staff development committee was formed to develop a comprehensive, long-range plan to integrate high-priority current training, and long-range needs in order to produce a highly skilled staff of professional accountants.

The training conducted during the year included a series of middle management confer. These conferences consisted of six solid days and evenings of intensified training in leadership, in-

Fiscal Management conducted a series of middle management development courses aimed at strengthening leadership, individual and group communications and current accounting practices. Here, a class is in progress at the armory in Sacramento. The course lasted 70 hours, of which 30 was on the employees' own time.

dividual and group communications, and current accounting practices. Conducted off the jobsite and on an informal basis, this training reflected some of the latest concepts employed in private industry and upper level educational institutions.

Other courses conducted during the year included:

1. Fundamentals of computers.
2. Flow charting for fiscal management.
3. Fundamentals of manual writing.
4. Accounting for city and county cooperative projects.
5. Implementation of electronic data processing.
6. Right-of-way accounting procedures.

The training for the year concluded with an intensified training seminar for district accounting officers.

Budgetary Control, Toll Bridge, Aeronautics, Flood Relief and Other Special Accounting

"Southern Crossing Studies"

The 1965 State Legislature, by Senate Bill 695, authorized the Department of Public Works to study the feasibility of southern crossings of San Francisco Bay at two separate locations. $300,000 was appropriated from the unencumbered balance of the San Francisco-Oakland Bay Bridge Toll Revenue Fund as of December 31, 1964. (Revenue after that date is pledged by law to finance the Transbay Tube of the Bay Area Rapid Transit District.) Fiscal Management personnel devised and executed the necessary action to make the study funds available. The study is now being conducted by the Division of Bay Toll Crossings.

San Francisco-Oakland Transbay Tube

Under prior year legislation, the Department of Public Works is required to finance the cost of the Transbay Tube and Approaches from the bridge revenue earned after December 31, 1964, by the three southern bond-free bridges. The 1965 State Legislature, in Senate Bill 660, establishes a ceiling of $133,000,000 on state obligation, and provides for repayment to the state, of approach costs at the annual rate of $2,500,000, starting December 31, 1971.

Toll Bridge Insurance

Toll Bridges with bonds outstanding must be insured with commercial insurance companies against physical damage and loss of revenue in order to guarantee payment of bond interest, since these are revenue bonds which are not a general obligation of the state. In addition, the major bridges on which bonds have been retired, are also insured, in order to facilitate any rebonding of such bridges and provide a hedge against the high repair or replacement cost in the event of catastrophic damage. It has always been difficult to obtain adequate insurance for certain bridges designated as "target risks," especially the Bay Bridge. During the past year the insurance on the Bay Bridge was successfully increased in order to facilitate the forthcoming sale of bonds to finance the rapid transit tube. As of June 30, 1965, the total coverage on all toll bridges was $244,000,000. This insurance program is administered by the Comptroller, Division of Highways.

Flood Relief Program

When the devastating floods of December 1964 hit northern California, the Division of Highways was better prepared to cope with the complex problems of obtaining and administering emergency relief funds, because its Fiscal Management Department had published revised flood relief accounting instructions applicable to all state departments in August 1963. New legislation enacted by the 1965 Legislature, Senate Bill 268, provided a temporary 1-cent-per-gallon increase in the state gas tax for flood repair work (rescinded September 1, 1965, when the necessary $57,000,000 of flood relief funds had been obtained from a combination of the state gas tax and federal funds). Because Senate Bill 268 modified the flood relief law, the statewide emergency flood relief accounting instruction had to be substantially revised in 1965 to incorporate changes in the financing and allocation of funds. (SB 268 became effective March 31, 1965.) The role played by the Fiscal Management Department has not been solely that of financial watchdog and recordkeeper. This department has also assisted local agencies to submit necessary documentation to obtain all state and federal flood relief funds properly due them.

Investment of Funds

The income of the State Highway Fund and the various toll bridge funds is received unevenly, while expenditures also fluctuate throughout the year. Thus, there are peaks and valleys in fund balances. These balances are invested in order to insure maximum interest return, while insuring the availability of funds to meet expenditures. Interest income earned during the year in this method totaled $6,415,750.

Budgets and Accounts

Budgeted revenues for the 1964–65 fiscal year amounted to $861,451,675, of which $300,822,514 remained to be collected on June 30, 1965. Revenue not received consists of $254,941,705 of federal aid and $45,880,809 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, 1965, amounted to $854,769,639.

Federal and Local Government Relations Accounting

Cities and Counties Accounting

Amendments to the Collier-Unruh Local Development Transportation Act enabled the consolidation of reports to be submitted by cities and counties. This will save considerable effort and administrative cost in the cities, counties, and the Division of Highways.

Federal Aid Vouchering Section

During the year the backlog of unbilled federal aid was reduced by $14,000,000. Assuming an average additional balance in the State Highway Fund of half of this amount invested at the current rate of return, which is close to 4 percent, this reduction in backlog produced added income for the State Highway Fund of approximately $280,000.

1966-67 Highway Budget

The California Highway Commission budgeted $651,919,655 for state highway construction purposes, including rights-of-way and engineering, for the 1966–67 fiscal year.

This figure, up $39,487,655 from the 1965–66 highway budget adopted a year ago, contains $450,621,000 for major construction and improvement (including engineering); $179,848,655 for rights-of-way; plus other amounts for contingencies, resurfacing programs, signs and striping, highway planning studies and minor improvements.

A total of $3,000,000 has again been earmarked in the new budget for traffic safety and operational improvement projects in the $5,000–$50,000 bracket, particularly at points of accident concentration. These range from easing curves, installing or modifying signals, constructing left-turn storage lanes, applying antiskid treatment to the road surface, providing truck climbing lanes, and many more.

State Highway Engineer J. C. Womack had told the commission that more costly and extensive projects for accident reduction, such as replacing narrow bridges, installing median barriers on freeways, and improving highway alignment through rugged terrain, as well as the most important measure of all for accident reduction, the replacing of conventional highways with access-controlled freeways, will be financed out of general construction funds.

In submitting the budget to Governor Edmund G. Brown, Robert B. Bradford, chairman of the commission and Administrator of the Transportation Agency, pointed out that the newly adopted budget will provide for about 320 miles of new multilane freeways and adding lanes on another 29 miles of existing freeways.

"Thanks to wise and timely legislation which added an extra 1-cent-per-gallon tax on gasoline between April 1st and August 31st to repair the highways ravaged by last winter's floods," Bradford said, "all of the moneys for state highway construction in the new budget will continue progress on our master-planned freeway and expressway system, as well as to improve traffic safety and mobility in all areas of the state."

He emphasized that the major construction effort in the new budget continues on California's 2,166-mile share of the national system of interstate and defense highways. The budget contains $339,409,355 in federal funds, of which $289,205,850 is included for the completion of this system, which by federal law, must be accomplished by 1972.

In line with increased emphasis on aesthetics and highway beautification, the commission chairman added that funds for landscaping, and functional and tree planting along various freeway routes have been increased from $6,229,000 in last year's budget to $9,259,000.

"This great increase was made possible by the Legislature's raising its statutory limitation on funds for landscape maintenance at its last session," he added. "Our landscaped freeways frequently provide much needed green belts in the urban areas they traverse, but they are expensive to maintain."

"Our travel today is approximately 90 billion vehicle-miles per year," Bradford said. "By 1980, Californians will drive a staggering 200 billion such miles. We must budget every penny of available funds to guard against future traffic congestion choking our economy and way of life."

The commission approved some projects which are only partly financed in the 1966-67 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 next fiscal year budget.

It also allocated $59,774,000 to finance the balance of projects approved in the 1965-66 budget.

In addition to the construction items, the commission budgeted $87,160,000 for state highway purposes other than construction, including $50,900,000 for maintenance; $17,400,000 for administration; $7,460,000 for maintenance of landscaping, functional planting and safety roadside rests; $5,000,000 for buildings and land; $2,200,000 for highway research; $1,150,000 for honor camps; and $50,000 for legislative claims.

A third budget segment totalling $157,036,025 was allocated for functions not under state highway jurisdiction.

The largest non-state-highway items are $76,750,000 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 $53,483,000 for improvements and maintenance work on city streets.

The other such items are $8,513,325 in federal aid for county roads on the federal aid secondary system, and $4,200,000 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; $3,797,700 in state funds to pay part of the cost of extending federal aid secondary county roads into urban areas; $3,400,000 for maintenance of state-owned toll bridges; $1,500,000 in engineering funds for cities; and $142,000 for administration of the Outdoor Advertising Act.

The total estimated revenue from all state sources is $548,193,000, a gain of $33,202,242 over such revenue for the present fiscal year. It will derive from $397,498,000 in gasoline taxes; $99,753,000 in motor vehicle fees, $31,100,000 in taxes on diesel fuel, $15,700,000 in taxes on for-hire vehicles, $4,000,000 in interest, and $142,000 in outdoor advertising fees.

1966-67 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 stop lights 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 many not be signalized. "Two-lane expressways" are two-lane highways with 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 1966; right-of-way funds may not be spent until July 1, 1966, the start of the fiscal year.

NOTE 4—Questions concerning individual items can best be answered by your Division of Highways district office. This includes questions about route numbers, which, as you probably recall, were extensively revised two years ago.

NORTH COASTAL COUNTIES PROJECTS

Del Norte County

Add truck climbing lanes on the uphill sections of US 101 through Del Norte Coast Redwood State Park south of Crescent City. Estimated cost, $680,000.

Rights-of-way on various state highway routes—$91,500.

Humboldt County

Extend the recently completed four-lane US 101 Freeway construction between Sylvandale and Dean Creek another 4.3 miles southerly to 0.8 mile south of Garberville. The project involves constructing interchanges at the existing highway near Dean Creek, one just north of Garberville, and with Sprowel Creek Road. Estimated cost, $6,250,000.

Grade portions of the future two-lane Route 299 Expressway between 10.4 and 11.6 miles east of Blue Lake, and install culverts. Estimated cost, $300,000.

Improve curves on portions of Route 36 between 1.3 and 10.0 miles east of Bridgeville. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$545,450.

Lake County

Widen the northern half of the intersection of Routes 29 and 53 at Lower Lake, and a 0.2 mile section of Route 53 north of the intersection to provide channelization. The project involves installing highway lighting at the intersection and constructing a service road from Route 29 to a subdivision southwest of the intersection. Estimated cost, $100,000.

Resurface Route 29 between 0.9 mile south of Kelseyville and Route 175, a distance of 6.8 miles, prior to relinquishing this highway section to the county upon completion of a paralleling freeway, now under construction. Estimated cost, $95,000.

Rights-of-way on various state highway routes—$520,000.

Mendocino County

Construct US 101 as a four-lane freeway between 1.2 miles south of Cummings Post Office and Cedar Creek, a distance of 5.2 miles, with an interchange to serve the community at Cummings. The project involves constructing the highest highway embankment in California, and probably the world, at Squaw Creek. It will be 372 feet high and 900 feet long. Another huge embankment at Grizzly Creek will be 247 feet high and 800 feet long. The project also involves constructing four sidehill viaducts totaling one-half mile in length to carry the traffic lanes because of the rugged nature on the terrain. Estimated cost, $15,500,000, of which $9,700,000 will be budgeted in the 1967–68 fiscal year.

Extend the two-lane Route 20 Expressway east of US 101 near Calpella another 5.1 miles easterly to 0.6 mile east of North Fork Cold Creek. Estimated cost, $2,100,000.

Construct Route 20 on new alignment between US 101 and 0.6 mile westerly. Estimated cost, $210,000.

Rights-of-way on various state highway routes—$340,000.

SACRAMENTO VALLEY AND NORTHERN VALLEY PROJECTS

Butte County

Relocate Route 32 from First and Main Streets to Oroville Avenue and Eighth and Ninth Streets in Chico to permit the expansion of Chico State College. Estimated cost, $360,000. The city will contribute the cost of improving drainage.

Rights-of-way on various state highway routes—None.

Colusa County

Extend a completed four-lane Interstate 5 Freeway section in Arbuckle 5.5 miles southerly and approximately 8.0 miles northerly to Husted Road south of Williams, where the future freeway will depart from the alignment of the existing highway. The project involves revising the Hillgate Road Interchange and constructing an interchange north of Arbuckle. Estimated cost, $7,500,000, of which $3,100,000 will be budgeted in the 1967–68 fiscal year.

Rights-of-way on various state highway routes—$410,000.

El Dorado County

Extend a four-lane US 50 Freeway section 7.5 miles westerly to a connection with an existing two-lane expressway section, 0.8 mile west of Shingle Springs. The project involves constructing interchanges at Missouri Flat, Greenstone and Pondorosa Roads. Estimated cost, $7,700,000, of which $4,700,000 will be budgeted in the 1967–68 fiscal year.

Rights-of-way on various state highway routes—$250,000.

Glenn County

Rights-of-way on various state highway routes—$150,000.

Lassen County

Replace substandard timber bridges across Meadow Channel and Willow Creek on Route 139, approximately 17 miles north of Susanville, with wider concrete structures. Estimated cost, $60,000.

Rights-of-way on various state highway routes—$111,000.

Modoc County

Grade a portion of Route 139 on new alignment between Route 299 near Canby and 8.2 miles northerly, and pave the northerly 2.2 miles as the first stage of two-lane expressway construction. Estimated cost, $1,430,000.

Rights-of-way on various state highway routes—$39,000.

Nevada County

Construct portions of Route 49 on improved alignment between 1.5 miles north of the South Fork Yuba River and North San Juan. Estimated cost, $100,000.

Rights-of-way on various state highway routes—None.

Placer County

Construct paired safety roadside rests on the Interstate 80 Freeway at Gold Run and install water, comfort facilities and picnic tables. Estimated cost, $229,000.

Landscape the Douglas Boulevard Interchange on the Interstate 80 Freeway in Roseville. Estimated cost, $170,000.

Rights-of-way on various state highway routes—$705,000.

Plumas County

Construct a two-lane expressway on Route 36 between Chester and 6.9 miles easterly. The project involves constructing a safety roadside rest at the top of Johnson Grade, overlooking Lake Almanor. Estimated cost, $1,000,000.

Rights-of-way on various state highway routes—$211,000.

Sacramento County

Construct the eight-lane Interstate 5 Freeway between J Street in Sacramento and the future Interstate 880 Freeway near San Juan Road, and extend this route as a six-lane freeway from this point to Route 99 at Bayou Way, a total distance of approximately seven miles. This freeway section will connect with inital two-lane expressway construction in progress on Interstate 5 westerly to Elkhorn. The project involves constructing a northbound on-ramp from L Street in Sacramento to this freeway, an interchange at J-I Streets to serve the I Street Bridge and the Old Sacramento Historic Project area, an interchange at Richards Boulevard, paired freeway bridges across the American River, plus interchanges at Garden Highway, West El Camino Avenue extended, Interstate 880, Del Paso Road and Route 99. Estimated cost, $27,636,000, of which $9,224,000 will be budgeted in the 1967–68 fiscal year. A total of $3,000,000 was budgeted in the 1965–66 fiscal year for the construction of the bridges across the American River and the interchange at Richards Boulevard.

$8,360,000 to complete the financing of the Interstate 80 (W-X Street) Freeway in Sacramento between Fifth Street and Alhambra Boulevard, a distance of 1.8 miles. Estimated cost, $17,560,000, of which $9,200,000 was budgeted in the 1965–66 fiscal year. This project will complete freeway construction on Interstate 80 from Jefferson Boulevard in Yolo County through the City of Sacramento.

$1,050,000 to complete the construction of the interchange between the Interstate 80 and US 50 Freeways at the intersection of W-X and 29th and 30th Streets in Sacramento, with connections to 34th Street.

Landscape the Interstate 80 Freeway between P and E Streets in Sacramento, a distance of 0.9 mile. Estimated cost, $110,000.

Rights-of-way on various state highway routes—$13,355,000.

Shasta County

Extend freeway construction in progress on Interstate 5 (between Anderson and two miles north of Redding) another 16.1 miles northerly to three miles north of O'Brien, connecting to freeway construction in progress to the Sacramento River Bridge at Antler. The first 3.5 miles to Shasta Dam Boulevard (Route 151) will have six lanes and the remainder four. North of the Pit River Bridge, work will consist of constructing two lanes to carry northbound traffic and reconstructing and widening the existing two-lane highway for southbound traffic. The project involves constructing interchanges at Oasis Road, Pine Grove, Shasta Dam Boulevard (Route 151), Mountain Gate, Fawndale Road, Bridge Bay, Turntable Bay and O'Brien, and safety roadside rests one mile north of the Pit River Bridge and 1.5 miles south of O'Brien, overlooking Shasta Lake. It also involves constructing truck climbing lanes on steep uphill grades. Widening of the Pit River Bridge is in progress under previous financing. Estimated cost, $14,330,000, of which $5,830,000 will be budgeted in the 1967–68 fiscal year.

$1,550,000 to complete the financing of the four-lane Interstate Freeway between 1.9 miles north of O'Brien and the south end of the Sacramento Bridge at Antler, a distance of 4.6 miles. The project involves constructing an interchange with county roads at Salt Creek. Estimated cost, $4,650,000, of which $3,100,000 was budgeted in the 1965–66 fiscal year.

Widen the Sacramento River Bridge at Antler on Interstate 5 to provide a median divider between opposing traffic lanes. Estimated cost, $300,000.

Construct channelization on Route 299 at Old Oregon Trail Road, approximately 2.5 miles east of Interstate 5 at Redding. Estimated cost, $100,000.

Landscape the Route 299 Freeway between Liberty Street in Redding and the Interstate 5 Freeway, a distance of 1.5 miles. Estimated cost, $66,000.

Widen Placer Street (Federal Aid Secondary Route 1393) to two lanes of an eventual four-lane highway between Wisconsin Avenue and San Francisco Street in Redding as an urban extension project, a distance of 0.9 mile. Estimated cost, $151,000 of which the state will pay $75,500 and Redding the balance.

Rights-of-way on various state highway routes—$554,000.

Sierra County

Reconstruct Route 49 between 1.3 and 5.2 miles east of Sierraville. Estimated cost, $180,000.

Widen portions of Route 49 and improve drainage between Yuba Pass and 1.6 miles west of Route 89. Estimated cost, $100,000.

Rights-of-way on various state highway routes—None.

Siskiyou County

Construct the four-lane Interstate 5 Freeway between 11.1 miles north of Yreka and Bradley-Henley Road, a distance of 3.3 miles. The project involves constructing paralleling freeway bridges across the Klamath River, and a third bridge to connect the existing highway, north of the river, with a future safety roadside rest which will be constructed on the river's south bank. Estimated cost, $6,300,000, of which $3,300,000 will be budgeted in the 1967–68 fiscal year.

Construct two bridges to carry the future Interstate 5 Freeway traffic across the Southern Pacific Company's railroad tracks near the Weed Airport and at Granada. Estimated cost, $885,000.

Rights-of-way on various state highway routes—$1,483,050.

Sutter County

Replace a mile-long timber bridge on Route 113 across the Sutter Bypass north of Knights Landing with a wider concrete structure, and construct about one mile of approaches. Estimated cost, $1,810,000.

Rights-of-way on various state highway routes—$450,000.

Tehama County

Replace a substandard timber bridge on Route 36 across the North Fork Deer Creek, approximately one mile west of Route 32 west of Chester, with a wider, steel structure on new alignment, and construct 0.9 mile of two-lane expressway approaches. Estimated cost, $480,000.

Lengthen the Burch Creek Bridge on Route 5, approximately 0.4 mile south of Corning, prior to the relinquishment of this highway section to the county upon completion of the Interstate 5 Freeway, now under construction. Estimated cost, $80,000.

Rights-of-way on various state highway routes—$61,500.

Trinity County

Grade a portion of the county route between Weaverville and Etna via Scotts Mountain (Federal Aid Secondary Road 189) on new alignment from Coffee Creek to 5.8 miles northerly, and pave the first 2.8 miles, as the first stage of two-lane expressway construction. This entire route will eventually be constructed to expressway standards as Route 3 in the state system of scenic highways. Estimated cost, $1,650,000.

$130,000 to complete the financing for widening and surfacing Bramlot and Cold Creek Roads, newly acquired in the state highway system to carry Route 36 on improved alignment, between Dubakella Mountain Road and 4.5 mile west of the Shasta county line, a distance of 9.6 miles. The 1964-65 fiscal year budget contained $200,000 for this project.

Rights-of-way on various state highway routes—$77,000.

Yolo County

Rights-of-way on various state highway routes—$1,450,000.

Yuba County

Construct the initial two lanes of an eventual four-lane freeway on Route 70 between Bear River and just south of McGowan Road, south of Marysville, and construct a four-lane freeway from this point to Route 65, a total distance of 8.4 miles, with interchanges at McGowan Road and Route 65. The project involves constructing almost one mile of Route 65 south of the completed freeway to Marysville as a four-lane divided highway. Estimated cost, $3,300,000 of which $800,000 will be budgeted in the 1967–68 fiscal year.

Rights-of-way on various state highway routes—None.

SAN FRANCISCO BAY REGION PROJECTS

Alameda County

Construct the eight-lane Route 24 (Grove-Shafter) Freeway in Oakland between south of 27th Street and north of 51st Street, a distance of 1.8 miles. The project involves constructing interchanges at 27th Street, Interstate 580, Grove Street and 52nd Street, and provision in the median for trains of the Bay Area Rapid Transit District. Estimated cost, $19,540,000, of which $9,740,000 will be budgeted in the 1967–68 fiscal year. The BARTD will contribute $1,925,000 as its share of the project.

Extend the eight-lane Interstate 580 Freeway from construction in progress (at the interchange of Interstate Routes 580 and 205, west of San Joaquin county line) through Altamont Pass to 0.5 mile east of Vasco Road near Livermore, a distance of 8.5 miles. Approximately half this distance will have wide separation between eastbound and westbound traffic lanes. The project involves constructing interchanges at Grant Line Road, North Flynn Road and Greenville Road, and the reconstructing of the Agricultural Inspection Station at Laughlin Road. It also involves constructing a roadside rest at the Grant Line Road Interchange, and truck stop facilities at the North Flynn Road Interchange. Estimated cost, $14,500,000, of which $9,500,000 will be budgeted in the 1967–68 fiscal year.

Landscape the Interstate 580-Warren Boulevard (Route 13) Freeway Interchange at Mills College in Oakland, plus the stretch of Interstate 580 between 108th and Birdsall Avenues, a distance of 4.4 miles, and along the Warren Boulevard Freeway between Interstate 580 and Redwood Road, a distance of 1.3 miles. Estimated cost, $771,000.

Landscape the Interstate 580 Freeway between 0.2 mile west of 173rd Avenue and 0.4 mile west of Gabriel Court, in and near San Leandro, a distance of 2.9 miles. Estimated cost, $300,000.

$4,245,000 to complete the financing of a budgeted project to extend the Interstate 680 Freeway 8.7 miles northerly from Route 84 near Scotts Corner to construction in progress between south of Interstate 580 and one mile north of the Alameda-Contra Costa county line. The project involves constructing 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 project under construction 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, $8,360,000 of which $4,115,000 had been budgeted in the 1965–66 fiscal year.

Landscape the Interstate 680 Freeway between 0.4 mile south of Interstate 580 in Alameda County and 1 mile north of the Alameda-Contra Costa county line, a distance of 3.2 miles. Estimated cost, $380,000. (Also listed in Contra Costa County.)

Construct an interchange on the Nimitz Freeway (Route 17) at 66th Avenue in Oakland, and add one lane for northbound traffic between 0.4 mile north of Hegenberger Road and High Street, to serve the future sports arena to be built at this location. The city will provide the necessary rights-of-way. Estimated cost, $1,800,000.

Widen the Winton Avenue Overcrossing on the Nimitz Freeway (Route 17) in Hayward from two to four lanes, and construct additional ramps to provide a complete four-leaf-clover interchange. Estimated cost, $720,000.

Widen the Nimitz Freeway (Route 17) from four to six lanes between 0.5 mile south of Tennyson Road and 0.1 mile north of Jackson Street (Route 92) in Hayward, a distance of 1.7 miles, and construct a median barrier in this section, extending southerly to 0.4 mile south of Jarvis Avenue in Fremont. Estimated cost, $590,000.

Add ramps to the Dixon Road Overcrossing of the Nimitz Freeway (Route 17) in Milpitas, Santa Clara County, and Fremont, Alameda County, to convert it to a full interchange. Estimated cost, $205,000. (Also listed in Santa Clara County.)

Add auxiliary lanes to the northbound Interstate 80 Freeway between the distribution structure east of the San Francisco-Oakland Bay Bridge in Oakland and Ashby Avenue, 1.4 miles northerly. Estimated cost, $765,000.

Widen Route 238 (Mission Boulevard) to four lanes divided and install channelization, curbs, gutters and parking lanes between Highland Blvd. and Jackson Street (Route 92) in Hayward, a distance of 0.4 mile. Estimated cost, $165,000.

Construct shoulders on Route 84 between Interstate 680 near Scotts Corner and Livermore, a distance of 7.2 miles. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$6,529,000.

Contra Costa County

Landscape the Interstate 680 Freeway between 0.4 mile south of Interstate 580 in Alameda County and 1 mile north of the Alameda-Contra Costa county line, a distance of 3.2 miles. Estimated cost, $380,000. (Also listed in Alameda County.)

Resurface portions of Route 680 and improve drainage between one mile north of the Alameda county line and 1.6 miles south of Sycamore Valley Road in Danville. This highway section will be relinquished to the county upon completion of freeway construction on this route. Estimated cost, $58,000.

Widen Taylor Boulevard (Federal Aid Secondary Route 1326) to four lanes divided as an urban extension project between Morello Avenue and Ruth Drive in Pleasant Hill. Estimated cost, $136,800, of which the state will pay $59,400 and Pleasant Hill the balance.

Rights-of-way on various state highway routes—$2,150,000.

Marin County

Resurface portions of US 101 between the Richardson Bay Bridge and Corte Madera Creek. Estimated cost, $275,000.

Resurface portions of US 101 between 0.7 mile north of Atherton Avenue in Novato, Marin County, and 0.9 mile south of the Northwestern Pacific Company's railroad overhead south of Petaluma, Sonoma County. Estimated cost, $175,000. (Also listed in Sonoma County.)

Rights-of-way on various state highway routes—$720,000.

Napa County

Landscape the Route 29 Freeway between Old Sonoma Road and Napa Creek in Napa, a distance of 1 mile, including the First Street Interchange. Estimated cost, $105,000.

Widen about 0.4 mile of Route 128 on slightly improved alignment in Sage Creek Canyon, 10 miles east of Rutherford. Estimated cost, $100,000.

Add 0.5 mile of passing lanes to Route 29 north of the summit of Mount St. Helena. Estimated cost, $87,000.

Rights-of-way on various state highway routes—$20,000.

San Francisco County

$2,800,000 to complete the financing for extending the six-lane Route 82 Freeway 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 $6,700,000 had been budgeted in the 1965–66 fiscal year.

Widen the James Lick Memorial Freeway (US 101) to eight lanes in the Army Street area of San Francisco, and add a southbound auxiliary lane between the Army Street on-ramp and the Route 82 (Southern) Freeway. Estimated cost, $1,600,000.

Landscape the Interstate 280 Freeway between Eastmoor Avenue in Daly City, San Mateo County, and the San Francisco county line, and the Route 1 (Southern) Freeway between its junction with Interstate 680 in Daly City and San Jose Avenue in San Francisco, a total distance of 2.7 miles. Estimated cost, $500,000. (Also listed in San Mateo County.)

Rights-of-way on various state highway routes—$155,000.

San Mateo County

Construct 5.7 miles of the eight-lane Interstate 280 Freeway connecting the freeway bridge across San Mateo Creek, now under construction, with construction in progress between Larkspur Drive in Millbrae and San Bruno Avenue in San Bruno. The project involves constructing a temporary connection between the bridge and Skyline Boulevard (Route 35) at Bunker Hill Drive,

and interchanges at Hayne Road, Trousdale Drive, Millbrae Avenue-Hillcrest Boulevard, and Larkspur Drive, and a safety roadside rest for northbound traffic just north of the bridge. Estimated cost, $8,800,000, of which $3,900,000 will be budgeted in 1967–68 fiscal year.

Construct 2.5 miles of the eight-lane Interstate 280 Freeway between 0.1 mile south of Woodside Road (Route 114) and 0.1 mile north of Raymundo Drive at Canada Road in Woodside. The project involves constructing an interchange at Woodside Road and another at Farm Hill Boulevard to serve the future South County Campus of the College of San Mateo. Estimated cost, $5,380,000, of which $1,000,000 will be budgeted in the 1967–68 fiscal year.

$1,805,000 to complete the financing for constructing 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, $10,430,000, of which $8,625,000 had been budgeted in the 1965–66 fiscal year.

$896,000 to complete the financing of rough grading portions of the eight-lane Interstate 280 Freeway between Summit Drive in Hillsborough and Larkspur Drive in Millbrae, and constructing an eight-lane freeway on this route between Larkspur Drive and 0.3 mile south of future Route 186 near San Bruno Avenue in San Bruno, with interchanges at Skyline Boulevard (Route 35) and Junipero Serra Boulevard, a distance of 2.2 miles. Estimated cost, $6,896,000, of which $6,000,000 had been budgeted in the 1965–66 fiscal year.

Landscape the Interstate 280 Freeway between Eastmoor Avenue in Daly City, San Mateo County, and the San Francisco county line, and the Route 1 (Southern) Freeway between its junction with Interstate 280 in Daly City and San Jose Avenue in San Francisco, a total distance of 2.7 miles. Estimated cost, $500,000.

Extend the four-lane Route 92 (19th Avenue) Freeway 2.3 miles westerly to the site of an interchange with the future Interstate 280 Freeway at Ralston Avenue west of Belmont, with interchanges at West Hillsdale Boulevard, Monterey Street Extended, and Ralston Avenue-Polhemus Road, and construct 2.1 miles of this freeway on Brewer Island between east of Marina Lagoon and the San Mateo-Hayward Bridge, with an interchange at Foster City Boulevard. Route 92 traffic will use 19th Avenue between the eastern end of the existing freeway at Grant Street and South Norfolk Street pending future freeway construction. The project involves construction of a temporary connection to South Norfolk Street in San Mateo, including a bridge that will serve a future frontage road across Marina Lagoon. Also involved is the addition of ramps on the nearby Bayshore (US 101) Freeway at East Hillsdale Boulveard in San Mateo to provide a full four-leaf-clover interchange. Estimated cost, $6,590,000, of which the state will pay $6,500,000 ($2,000,000 in the 1967–68 fiscal year) and the county the balance.

Resurface and construct shoulders on Skyline Boulevard (Route 35) between 0.3 mile north of Crystal Springs Road in San Bruno and Route 1 in Daly City, a distance of 5.2 miles. Estimated cost, $300,000.

Landscape portions of the Route 1 Freeway between 0.5 mile south of Sharp Park Road and 0.4 mile north of Manor Drive in Pacifica. Estimated cost, $250,000.

Resurface La Honda Road (Route 84) between La Honda and 6.2 miles westerly. Estimated cost, $175,000.

Rights-of-way on various state highway routes—$4,350,000.

Santa Clara County

$1,782,000 to complete the financing for extending the six-lane Interstate 280 Freeway 1.9 miles westerly from Stelling Road in Cupertino 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. Estimated cost, $4,233,000, of which $2,317,000 had been budgeted in the 1965–66 fiscal year. Santa Clara County has contributed $134,000 toward the project.

Add ramps to the Dixon Road Overcrossing of the Nimitz Freeway (Route 17 in Milpitas, Santa Clara County, and Fremont, Alameda County, to convert it to a full interchange. Estimated cost, $205,000. (Also listed in Alameda County.)

Add a southbound lane in the median of the Route 17 Freeway between Hamilton Avenue in Campbell and Interstate 280 in San Jose, a distance of 1.8 miles. Estimated cost, $126,000.

Construct a pedestrian overcrossing of the Route 17 Freeway between Westfield Drive in San Jose and Downing Avenue in Campbell. Estimated cost, $64,000, of which the state and San Jose will share equally.

Landscape the Route 85 (Stevens Creek) Freeway between Homestead Road in Cupertino and the Bayshore (US 101) Freeway, and the Route 237 Freeway between El Camino Real (Route 82) in Mountain View and 0.2 mile north of the Southern Pacific Company's railroad tracks, a total distance of 6.4 miles. Estimated cost, $550,000.

Complete the landscaping of the interchange between the Bayshore (US 101) Freeway and the Oregon Expressway-Embarcadero Road in Palo Alto. Estimated cost, $98,000.

Tree and functional planting on the Bayshore (US 101) Freeway between south of Mathilda Avenue in Sunnyvale and Matadero Creek in Palo Alto, a distance of six miles. Estimated cost, $54,000.

Resurface portions of the US 101 Freeway between San Antonio Street and Silver Creek in San Jose. Estimated cost, $50,000.

Construct the San Tomas Expressway (Federal Aid Secondary Route 1010) as a four-lane divided highway on new alignment as an urban extension project between the Bayshore Freeway (US 101) and Forbes Avenue near San Jose. Estimated cost, $6,180,000, of which the state will pay $625,000 and the City and County of Santa Clara the balance.

Construct the San Tomas Expressway (Federal Aid Secondary Route 1010) as a four-lane divided highway on new alignment as an urban extension project between Budd Avenue and Camden Avenue at the Los Gatos Freeway near San Jose, a distance of 0.6 mile. Estimated cost, $1,390,000, of which the state will pay $695,000 and Campbell and Santa Clara County the balance.

Widen Homestead Road (Federal Aid Secondary Route 1004) to the initial four lanes of an ultimate four-lane divided highway as an urban extension project between the Lawrence Expressway and Kennewick Drive near Cupertino, a distance of 2.7 miles. Estimated cost, $860,000, of which the state will pay $430,000 and Cupertino, Sunnyvale, Santa Clara and Santa Clara County the balance.

Rights-of-way on various state highway routes—$22,877,000.

Santa Cruz County

Construct an interchange and frontage roads on the four-lane Route 1 Expressway at Rio del Mar Boulevard in the Aptos area. Estimated cost, $700,000.

Widen and add shoulders to Route 152 between the northeast city limit of Watsonville and Casserly Road, 2.4 miles northeasterly. Estimated cost, $305,000, of which the state will pay $235,000, and the county the balance.

Extend Green Valley Road (Federal Aid Secondary Route 1270) as a two-lane facility of an ultimate four-lane divided highway, an urban extension project, between existing Route 1 and the new Route 1 Freeway in Watsonville, a distance of 0.3 mile. Estimated cost, $70,000, of which the state will pay $35,000 and Watsonville the balance.

Rights-of-way on various state highway routes—$50,000.

Sonoma County

Construct interchanges on US 101 at College Avenue and at 3rd-4th-5th Street, and an undercrossing at 9th Street, in Santa Rosa to complete the conversion of this route from expressway to full freeway standards between north of Healdsburg and south of Petaluma. Estimated cost, $3,809,000.

Landscape the US 101 Freeway between Edwards Avenue and the Mendocino Avenue Overcrossing in Santa Rosa, a distance of 1.4 miles. The project involves landscaping the Steele Lane Interchange. Estimated cost, $95,000.

Install underdrains at various locations on Route 1 (Shoreline Highway) between Fort Ross and Stewarts Point. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$10,000.

CENTRAL COASTAL COUNTIES PROJECTS

Monterey County

Construct a four-lane freeway on Route 1 between Viejo Road at the south city limit of Monterey and Fort Ord, a distance of 6.7 miles, with interchanges at Munras Avenue, Aguajito Road, Route 68, Casa Verde Avenue, Del Monte Avenue, Humboldt Street and Fremont Street. Estimated cost, $10,000,000, of which $2,600,000 will be budgeted in the 1967–68 fiscal year.

Construct a four-lane freeway on US 101 between one mile south of King City and one mile north of the Salinas River, a distance of 3.1 miles, as a bypass of King City. The project involves constructing interchanges at First Street, Canal Street, Broadway and Jolon Road, and replacing a narrow steel bridge carrying southbound traffic across the Salinas River with a wider concrete structure. Estimated cost, $4,200,000, of which $1,700,000 will be budgeted in the 1967–68 fiscal year.

Tree and functional planting along the US 101 Freeway between Sherwood Drive Overcrossing in Salinas and 0.5 mile south of Espinosa Road, a distance of 3.3 miles. Estimated cost, $105,000.

Rights-of-way on various state highway routes—$2,280,000.

San Benito County

Extend the initial two lanes of an ultimate four-lane expressway on Route 156 from 2.3 miles north of Hollister another 5.1 miles northerly to the Santa Clara county line. The project involves constructing bridges across Tequesquito Slough and Pacheco Creek. Estimated cost, $1,250,000.

Reconstruct and widen Route 25 on new alignment between 0.7 mile south of the San Benito River and 5 miles northerly, approximately 16 miles south of Hollister. Estimated cost, $915,000.

Replace a narrow timber bridge on Route 25 across Willow Creek, 22 miles south of Hollister, with a wider, concrete structure on improved alignment and construct approaches. Estimated cost, $80,000.

Rights-of-way on various state highway routes—$205,000.

San Luis Obispo County

Extend the initial two lanes of the ultimate four-lane Route 1 (Cambria Bypass) Expressway 5.9 miles northerly between 0.6 mile south of San Simeon Creek and 0.5 mile north of San Simeon. The project involves widening a bridge across San Simeon Creek. Estimated cost, $1,500,000.

Reconstruct the base and pavement of ramps to and from US 101 in the City of San Luis Obispo north of the Marsh Street Interchange. Estimated cost, $160,000.

Tree and functional planting on portions of US 101 between 0.4 mile south of the US 101-Route 1 Interchange in Pismo Beach and 0.1 mile north of Marsh Street in San Luis Obispo. Estimated cost, $115,000.

Replace a narrow steel truss bridge on Route 227 across the East Fork Pismo Creek, north of Arroyo Grande with a wider, concrete structure. Estimated cost, $90,000.

Rights-of-way on various state highway routes—$480,000.

Santa Barbara County

Revise an interchange at Santa Monica Road west of Carpinteria and construct interchanges at the east and west ends of Padaro Lane and at Evans Avenue near Summerland to convert five miles of US 101 from expressway to full freeway standards. Estimated cost, $2,900,000.

Construct an interchange on US 101 at Clark Avenue, six miles south of Santa Maria, as part of a continuing program to convert this route to full freeway standards. Estimated cost, $700,000.

Widen Fairview Avenue in Goleta across the US 101 Freeway and the Southern Pacific Company's railroad tracks from two to four lanes. Estimated cost, $460,000.

Tree and functional planting along the US 101 Freeway between 0.7 mile south of the Santa Ynez River and 0.7 mile north of Buellton, a distance of 1.8 miles. Estimated cost, $120,000.

Construct the initial two lanes of the ultimate four-lane Route 246 Expressway between 0.6 mile west of Santa Rosa Creek and 3.5 miles west of Buellton, a distance of 2.8 miles. Estimated cost, $1,120,000.

Widen Route 1 from two to four lanes between Pine Avenue in Lompoc and 0.7 mile north of the Santa Ynez River, a distance of 2.1 miles. The project includes constructing a two-lane bridge for southbound traffic across the Santa Ynez River. Estimated cost, $1,000,000.

Landscape the Route 217 (Ward Memorial) Freeway between 0.5 mile north of the University of California Campus at Santa Barbara and US 101, five miles north of the City of Santa Barbara, a distance of 2.5 miles. Estimated cost, $170,000.

Rights-of-way on various state highway routes—$845,000.

Ventura County

Construct the four-lane Route 23 Freeway between Hillcrest Drive in Thousand Oaks and Tierra Rejada Road, 6.7 miles northerly, with interchanges at Hillcrest Drive, Janss Road, Avenue de Las Arboles, Olson Road and Tierra Rejada Road. Estimated cost, $10,000,000, of which $8,000,000 will be budgeted in the 1967–68 fiscal year.

Construct an interchange on the Ventura Freeway (US 101) at Lynn Road west of Thousand Oaks. Estimated cost, $900,000.

Construct access roads from private properties to the Rice Road and Rose Road interchanges on the Ventura Freeway (US 101), which together with a beginning 2.8-mile freeway project near Montalvo, will complete the conversion of this route from expressway to full freeway standards between the Conejo Summit and the City of Ventura. Estimated cost, $50,000.

Landscape and install functional planting on the Route 126 (Santa Paula) Freeway between 0.1 mile west of Wells Road (Route 118) at Saticoy and 0.7 mile east of Santa Paula, a distance of 8.5 miles, and construct a landscape maintenance building on Harvard Street (existing Route 126) near 10th Street in Santa Paula. Estimated cost, $363,000.

Widen Vineyard Avenue (Route 232) from two to four lanes between Oxnard Boulevard (Route 1) and the Ventura Freeway (US 101) near Oxnard, a distance of 0.4 mile. Estimated cost, $200,000.

Rights-of-way on various state highway routes—$6,000,000.

SAN JOAQUIN VALLEY AND CENTRAL MOUNTAIN COUNTIES PROJECTS

Alpine County

Clear and grade portions to extend the two-lane Route 4 Expressway now under construction 2.6 miles easterly to 3.2 miles east of the Calaveras county line. Additional grading and paving will be financed by subsequent budgets. Estimated cost, $250,000.

Rights-of-way on various state highway routes—$20,000.

Amador County

Construct a two-lane expressway on Route 16 between 0.1 mile west and 3.8 miles east of the Sacramento-Amador county line. Estimated cost, $800,000. (Also listed in Sacramento County.)

Rights-of-way on various state highway routes—$137,000.

Calaveras County

Rights-of-way on various state highway routes—$10,000.

Fresno County

Extend the grading and structures project now underway on the Interstate 5 (Westside) Freeway, between the Merced county line and 20.7 miles southeasterly, another 45.5 miles to the Kings county line. The project involves constructing interchanges at Lassen Avenue, Jayne Avenue, Route 198, Fresno-Coalinga Road, Route 33 and Kamm Avenue. Estimated cost, $8,620,000, of which $2,240,000 will be financed in the 1967–68 fiscal year.

Reconstruct Route 33 on new alignment as a two- and four-lane conventional highway between Laguna Canal in Fresno County and 0.1 mile north of Dos Palos in Merced County, a distance of 5 miles. The

section within the city will be four-laned. Estimated cost, $923,000, of which the state will pay $908,000, and the city the balance. (Also listed in Merced County.)

Landscape the US 99 Freeway between Kern Street and 0.1 mile northwest of Thorne Avenue in Fresno, a distance of 1.4 miles. Estimated cost, $85,000.

Rights-of-way on various state highway routes—$3,032,000.

Inyo County

Extend the recently completed reconstruction of Route 168 on improved alignment another 6.9 miles westerly from 0.5 mile west of the Southern California Edison Company's Powerplant No. 3 west of Bishop to Camp Sabrina. Estimated cost, $2,000,000.

Widen, reconstruct and improve drainage on Route 190 in Death Valley between 3.9 and 6.1 miles east of Stovepipe Wells. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$200,000.

Kern County

Construct the four-lane Interstate 5 (Westside) Freeway between 0.4 mile south of Lerdo Avenue, west of Shafter, and 0.4 mile north of Route 46, east of Lost Hills, a distance of 11.3 miles. The project involves constructing interchanges at Lerdo Avenue and Route 46, and a bridge across the Kern River Flood Canal. Estimated cost, $6,000,000.

Add one lane to the northbound roadway and reconstruct and widen the southbound roadway of US 99 between Cawelo and 1.4 miles south of Route 46, a distance of 7 miles, and construct interchanges at Kimberlina Road and Merced Avenue, to convert this route from four-lane expressway to six-lane freeway standards. Estimated cost, $3,380,000.

Construct interchanges on US 99 at Sandrini Road and Herring Road, north of Wheeler Ridge, to complete the conversion of this route from expressway to full freeway standards between Bakersfield and the Los Angeles county line. Estimated cost, $843,000.

Plant trees along the US 99 Freeway and Oleander bushes in the median as a headlight screen between Minkler Spur near the north edge of Bakersfield and Cawelo, a distance of 8.7 miles. Estimated cost, $57,000.

Pave the four-lane Antelope Valley (Route 14) Freeway between Avenue I and 0.4 mile north of the Kern county line, a distance of 8.4 miles. Grading and structures were financed in the 1965–66 fiscal year. Estimated cost, $4,400,000. (Also listed in Los Angeles County.)

Extend the four-lane Route 14 (Antelope Valley) Freeway 4.9 miles northerly between the Los Angeles-Kern county line and 1.9 miles north of Rosamond. The project involves constructing an interchange at Rosamond Avenue. Estimated cost, $2,280,000.

Grade for the future Route 178 Expressway between one-quarter mile west of Borel Powerhouse and 1.1 miles easterly. The project involves constructing a bridge across the Kern River. Estimated cost, $1,325,000.

Resurface Route 58 between 1.2 miles west of Tehachapi and 12 miles easterly to Cameron Road. Estimated cost, $300,000.

Rights-of-way on various state highway routes—$2,132,000.

Kings County

Rights-of-way on various state highway routes—$145,000.

Madera County

Construct two additional lanes for westbound traffic on Route 152 to convert this highway to four-lane freeway and expressway standards between 0.8 mile west of the Merced-Madera county line and 0.6 mile west of County Road 10 in Madera County, a distance of 7.3 miles. The project involves constructing an interchange with Route 59 at the county line. Estimated cost, $1,650,000. (Also listed in Merced County.)

Right-of-way on various state highway routes—$40,000.

Mariposa County

Construct a two-lane expressway on Route 49 between 0.7 mile west of Usona Road and 0.1 mile west of Allred Road, a distance of 5.2 miles, approximately 3.5 miles southeast of Mariposa. The project includes constructing a bridge across the West Fork Chowchilla River. Estimated cost, $1,685,000.

Construct 5.4 miles of Route 132 on new and improved alignment between 0.5 mile west of the Tuolumne-Mariposa county line and 4.1 miles west of Coulterville. Estimated cost, $1,180,000. (Also listed in Tuolumne County.)

Reconstruct 0.2 mile of Route 140 to ease a curve, approximately two miles northeast of Midpines. Estimated cost, $90,000.

Rights-of-way on various state highway routes—None.

Merced County

$1,992,000 to complete the financing for extending the four-lane Interstate 5 (Westside) Freeway construction, now nearing completion in Merced County between Route 152 west of Los Banos and 2.8 miles north of Route 33, southwest of Gustine, another 36.1 miles northerly through Stanislaus County to the San Joaquin county line. The project involves constructing interchanges at Sullivan, Stuhr, Fink-Ward, Del Puerto Canyon and Ingram Creek Roads, and bridges across the Delta-Mendota Canal, 10 creeks and the California Aqueduct. Roadside safety rests are being provided on each side of the freeway just south of the San Joaquin county line. A vista point is being constructed for southbound traffic approximately 1.5 miles south of Orestimba Creek, and for northbound traffic at Salado Creek in Stanislaus County. Estimated cost, $17,443,000, of which $15,240,000 had been budgeted in the 1965–66 fiscal year. The Department of Water Resources has contributed $211,000 of the overall cost. (Also listed in Stanislaus County.)

Construct two additional lanes for westbound traffic on Route 152 to convert this highway to four-lane freeway and expressway standards between 0.8 mile west of the Merced-Madera county line and 0.6 mile west of County Road 10 in Madera County, a distance of 7.3 miles. The project involves constructing an interchange with Route 59 at the county line. Estimated cost, $1,650,000. (Also listed in Madera County.)

Extend the four-lane Route 152 Expressway 2.6 miles easterly to near the west city limit of Los Banos, and widen an additional 1 mile within the city from two to four lanes. Estimated cost, $690,000.

Reconstruct Route 33 on new alignment as a two- and four-lane conventional highway between Laguna Canal in Fresno County and 0.1 mile north of Dos Palos in Merced County, a distance of five miles. The section within the city will be four-laned. Estimated cost, $923,000, of which the state will pay $908,000, and the city the balance. (Also listed in Fresno County.)

Rights-of-way on various state highway routes—$1,298,000.

Mono County

Rights-of-way on various state highway routes—$30,000.

San Joaquin County

Construct Interstate 5 as an eight-lane freeway between Stockton Channel in Stockton and Country Club Boulevard, 1.7 miles northerly, and as a six-lane freeway between this point and March Lane, 1.5 miles farther north. This project involves constructing a bridge to carry Weber Avenue across relocated Mormon Slough and the substructures of the future paired Interstate 5 Freeway bridges across Stockton Channel. It also involves constructing interchanges at Pershing Avenue, Mount Diablo Boulevard, Country Club Boulevard-Telegraph Avenue, and March Lane. The construction of paired bridges and approaches across Smith's Canal and the Calaveras River was financed in the 1965–66 fiscal year budget. Estimated cost, $12,290,000, of which $4,905,000 will be financed in the 1967–68 fiscal year.

Widen Route 132 from 28 to 40 feet by constructing shoulders between Welty Road in San Joaquin County and the west city limit of Modesto at Carpenter Road, Stanislaus County, a distance of 14.3 miles. Estimated cost, $700,000. (Also listed in Stanislaus County.)

Reconstruct portions of Charter Way (Route 4) in Stockton between Center and B Streets, a distance of 1.5 miles. Estimated cost, $150,000.

Rights-of-way on various state highway routes—$4,653,000.

Solano County

Reconstruct West Texas Street (Route 12) between Pennsylvania Avenue and Washington Street in Fairfield, a distance of 0.5 mile,

and replace the traffic signals at Union Avenue, Madison Street, Webster Street and Pennsylvania Avenue. Estimated cost, $170,000, of which the state will pay $140,000, and the city the balance.

Construct 1.8 miles of the four-lane Route 37 freeway approaches to the Napa River Bridge, with interchanges at Walnut Street on Mare Island and Wilson Street near the west city limit of Vallejo. Construction of the bridge was financed in previous fiscal years. Estimated cost, $1,312,000.

Install trees and functional planting on the Interstate 80 Freeway between 3.0 and 6.7 miles east of Vacaville. Estimated cost, $89,000.

Rights-of-way on various state highway routes—$75,000.

Stanislaus County

Widen Route 132 from 28 to 40 feet by constructing shoulders between Welty Road in San Joaquin County and the west city limit of Modesto at Carpenter Road, Stanislaus County, a distance of 14.3 miles. Estimated cost, $700,000. (Also listed in San Joaquin County.)

Realign Route 132 at Hazel Dean Road to ease curves, between 2.9 and 3.4 miles east of Waterford. Estimated cost, $75,000.

$1,992,000 to complete the financing for extending the four-lane Interstate 5 (Westside) Freeway construction, now nearing completion in Merced County between Route 152 west of Los Banos and 2.8 miles north of Route 33, southwest of Gustine, another 36.1 miles northerly through Stanislaus County to the San Joaquin county line. The project involves constructing interchanges at Sullivan, Stuhr, Fink-Ward, Del Puerto Canyon and Ingram Creek Roads, and bridges across the Delta-Mendota Canal, 10 creeks and the California Aqueduct. Roadside safety rests are being provided on each side of the freeway just south of the San Joaquin county line. A vista point is being constructed for southbound traffic approximately 1.5 miles south of Orestimba Creek, and for northbound traffic at Salado Creek in Stanislaus County. Estimated cost, $17,443,000, of which $15,240,000 had been budgeted in the 1965–66 fiscal year. The Department of Water Resources has contributed $211,000 of the overall cost. (Also listed in Merced County.)

Rights-of-way on various state highway routes—$626,000.

Tulare County

Landscape the Route 198 Freeway between West Main Street and 0.3 mile east of Ben Maddox Way in Visalia, a distance of three miles. Estimated cost, $465,000.

Rights-of-way on various state highway routes—$798,000.

Tuolumne County

Construct 5.4 miles of Route 132 on improved alignment between 0.5 mile west of the Tuolumne-Mariposa county line and 4.1 miles west of Coulterville. Estimated cost, $1,180,000. (Also listed in Mariposa County.)

Place base and surface on a previously graded roadbed to extend the four-lane Route 108 Expressway as a two-lane facility bypassing Twain Harte, between 8.6 miles east of Sonora and one mile east of Twain Harte, a distance of three miles. The project includes constructing an overhead structure across a lumber company's railroad tracks. Estimated cost, $800,000.

Rights-of-way on various state highway routes—$120,000.

LOS ANGELES REGION PROJECTS

Los Angeles County

Extend the eight-lane Interstate 5 Freeway northerly from Castaic Creek, south of Castaic, to construction in progress at the summit of the Five Mile Grade, a distance of approximately 11 miles. The project involves constructing interchanges at Hasley Canyon Road, Parker Road and Violin Canyon Road, and a bridge across Castaic Creek. Estimated cost, $17,000,000, of which $8,400,000 will be budgeted in the 1967–68 fiscal year.

$9,000,000 to complete the financing for grading 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, $31,700,000, of which $22,700,000 had been budgeted in the 1965–66 fiscal year.

$1,800,000 to complete the financing for constructing the eight-lane Interstate 5 Freeway between 6.8 miles south and 0.6 mile north of Route 138; and for constructing a four-lane freeway on Route 138 from the Interstate 5 Freeway to 2.1 miles easterly of Interstate 5. The project involves constructing interchanges with Quail Lake and Hungry Valley Roads and Route 138. Estimated cost, $8,800,000, of which $7,000,000 had been budgeted in the 1965–66 fiscal year.

Construct an interchange on the Interstate 5 (Golden State) Freeway at McBean Parkway (former De Witt Canyon Road), west of Saugus. Estimated cost, $400,000.

Landscape portions of the Interstate 5 (Santa Ana) Freeway between Carmenita Road in Norwalk and 0.2 mile north of Florence Avenue at the border of Downey and Santa Fe Springs. Estimated cost, $357,000.

Replacing a pedestrian crossing under the Interstate 5 (Santa Ana) Freeway with a pedestrian overcrossing at Eastern Avenue in the East Los Angeles area, and attaching a directional sign. Estimated cost, $90,000, of which the state will pay $80,000, and the county the balance.

$3,391,000 to complete the financing for adding auxiliary lanes to the Interstate 5 (Golden State) Freeway between 0.1 mile north of Colorado Boulevard in Los Angeles and 0.2 mile south of Western Avenue in Glendale; for completing the interchange between the Interstate 5 (Golden State) Freeway and the Route 134 Freeway in Los Angeles; and for constructing the eight-lane Route 134 Freeway easterly from this interchange across the Los Angeles River to 0.2 mile east of San Fernando Road in Glendale. The project involves constructing an interchange between the Route 134 Freeway and San Fernando Road. Estimated cost $8,391,000, of which $5,000,000 had been budgeted in the 1965–66 fiscal year.

Extend the eight-lane Route 134 Freeway (between its interchange with Interstate 5 and 0.2 mile east of San Fernando Road in Glendale) 2.9 miles easterly to the east city limit of Glendale, and construct 0.4 mile of embankment easterly from this point for future freeway construction. The project involves constructing interchanges at San Fernando Road, Pacific Avenue, Central Brand Avenue, and Glendale Avenue, and portions of the interchange with the future Route 2 Freeway.

Modify traffic signals, highway lighting and channelization on Colorado Boulevard (Route 134) between Broadway and the existing Colorado Freeway in the Eagle Rock area of Los Angeles, a distance of two miles. Estimated cost, $160,000, of which the state will pay $90,000, and the city the balance.

Construct the eight-lane Interstate 210 (Foothill) Freeway between Santa Anita Avenue in Arcadia and Highland Avenue in Duarte, a distance of four miles. This project involves constructing interchanges at Santa Anita Avenue, Huntington Drive, Myrtle Avenue, Mountain Avenue and Buena Vista Street. Undercrossings at eight city streets between Magnolia Avenue in Monrovia and Highland Avenue in Duarte were budgeted in the 1965–66 fiscal year. Estimated cost, $13,550,000, of which $4,550,000 will be budgeted in the 1967–68 fiscal year.

Construct the eight-lane Route 91 Freeway between 0.2 mile west of Lakewood Boulevard in Bellflower and Artesia Boulevard in Dairy Valley, a distance of five miles. The project involves constructing interchanges at Bellflower Boulevard, Pioneer Boulevard and Norwalk Boulevard, and partial interchanges at Lakewood Boulevard, Clark Avenue, Studebaker Road and Bloomfield Avenue. Estimated cost, $12,400,000.

Widen Artesia Boulevard (Route 91) between Pioneer Boulevard in Artesia, Los Angeles County, and Knott Avenue in Buena Park, Orange County, a distance of 4.1 miles, and install traffic signals and highway lighting. Estimated cost, $765,000, of which the state will pay $660,000, and the Cities of Dairy Valley, La Mirada and Buena Park, and the Los Angeles Flood Control District will pay the balance. (Also listed in Orange County.)

Resurface, widen and install channelization on Artesia Boulevard (Route 91) between Sepulveda Boulevard (Route 1) in Hermosa Beach and Pier Avenue in Redondo Beach, a distance of 0.8 mile. Esti-

mated cost, $250,000, of which the state will pay an estimated $150,000 and Hermosa Beach, Manhattan Beach and Redondo Beach the balance.

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 which were previously budgeted. Estimated cost, $6,500,000.

Pave the four-lane Antelope Valley (Route 14) Freeway between Avenue I, west of Lancaster, and 0.4 mile north of the Kern county line, a distance of 8.4 miles. Grading and structures were financed in the 1965–66 fiscal year. Estimated cost, $4,400,000. (Also listed in Kern County.)

Widen Sierra Highway (Route 14) from three to four lanes between Soledad Canyon Road and 1.9 miles southwesterly. Estimated cost, $345,000.

Grade and pave the eight-lane Route 170 (Hollywood) Freeway between 0.1 mile north of Victory Boulevard and 0.3 mile north of Sherman Way in Los Angeles, a distance of 1.2 miles. The project involves constructing an interchange at Sherman Way. Portions of the grading were financed in a previous budget. Estimated cost, $3,800,000.

Widen the Ventura (US 101) Freeway from six to eight lanes between 0.3 mile east of Topanga Canyon Boulevard (Route 27) and 0.3 mile west of Mulholland Drive, a distance of 2.7 miles. Estimated cost, $2,450,000.

Install a traffic control system for northbound traffic on the Hollywood (US 101) Freeway between the Mulholland Drive and Barham Boulevard Overcrossing to give advance warning in the event of traffic slowdown ahead, and possibly reduce the speed of drivers approaching both a hill and a curve with restricted visibility. Estimated cost, $90,000.

Widen Venice Boulevard (Route 187) from four to six lanes with channelization, traffic signals and a curbed median between Sepulveda Boulevard adjacent to Culver City, and the Interstate 10 (Santa Monica) Freeway in Los Angeles, a distance of 2.9 miles. Estimated cost, $2,400,000, of which the state will pay $1,200,000, and the cities and county the balance.

Landscape the Interstate 10 (Santa Monica) Freeway in Los Angeles between Overland Avenue and 0.3 mile east of La Cienega Boulevard, and between West Boulevard and Vermont Avenue, a total distance of 5.5 miles. Estimated cost, $682,000.

Add an eastbound on-ramp to the Interstate 10 (San Bernardino) Freeway at the Hoyt Avenue Interchange in El Monte. The project involves widening Hoyt Avenue at the interchange and installing traffic signals. Estimated cost, $235,000, of which the State will pay $217,000, and the city the balance.

Construct an interchange on the Pomona Freeway (Route 60) at Paramount Boulevard in Montebello. Estimated cost, $550,000.

Modify traffic signals and safety lighting at 12 intersections on Fifth Avenue (Route 60) between Hansen Avenue in Pomona and Roswell Avenue in San Bernardino County Estimated cost, $106,000, of which the State will pay $55,000, and Pomona and San Bernardino County the balance.

Improve drainage and reconstruct Whittier Boulevard (Route 72) between Bluff Road and Garfield Avenue in Montebello, a distance of 1.7 miles, and install and modify traffic signals and highway lighting at 11 intersections. Estimated cost, $580,000, of which the State will pay $400,000 and Montebello the balance.

Landscape portions of the Interstate 405 (San Diego) Freeway between 0.2 mile south of Burbank Boulevard and the Interstate 5 (Golden State) Freeway in the San Fernando Valley area of Los Angeles, and construct a landscape maintenance building immediately west of the interchange between Interstate 5 and Interstate 405. Estimated cost, $307,000.

Install and modify traffic signals, highway lighting and channelization on Hawthorne Boulevard (Route 107) at the Interstate 405 (San Diego) Freeway ramp connections, and at Manhattan Beach Boulevard in Lawndale. Estimated cost, $70,000.

Widen Rosemead Boulevard (Route 164) from four to six lanes between 0.2 mile north of the Pomona Freeway (Route 60) in the South San Gabriel area of Los Angeles County and Garvey Avenue in South El Monte, a distance of 1.3 miles. Estimated cost, $250,000, of which the state will pay $200,000, and South El Monte the balance.

Landscape the Long Beach (Route 7) Freeway between the Interstate 10 (San Bernardino) Freeway and Valley Boulevard in Los Angeles, a distance of 1 mile. Estimated cost, $282,000.

Widen the ramp connection from the northbound Long Beach (Route 7) Freeway to the Interstate 405 (San Diego) Freeway near Long Beach, and modify signs. Estimated cost, $140,000.

Modify traffic signals and highway lighting at nine intersections between the south junction of Canada Boulevard (Route 2) and Crescenta Avenue in Glendale, a distance of 1.5 miles, and resurface the portion of this highway between Towne Street and Verdugo Road in Glendale. Estimated cost, $190,000, of which the state will pay $135,000, and the city the balance.

Resurface and reconstruct portions of Pacific Coast Highway (Route 1) between Crenshaw Boulevard and Avenue I in Torrance, a distance of 3.4 miles. Estimated cost, $130,000.

Widen Colima Road (Federal Aid Secondary Route 1274) to a four-lane divided highway as an urban extension project between Mar Vista Street and Whittier Boulevard in Whittier, a distance of 1 mile. Estimated cost, $860,000, of which the state will pay $430,000 and local agencies the balance.

Widen Azusa Avenue (Federal Aid Secondary Route 634) to a four-lane divided highway as an urban extension project between Amar Road and Renault Street in Industry. Estimated cost, $492,000, of which the state will pay $246,000 and Industry, La Puente, West Covina and Los Angeles County the balance.

Rights-of-way on various state highway routes—$72,000,000.

Orange County

Extend a previously budgeted section of the Interstate 405 (San Diego) Freeway approximately 4.5 miles northwesterly from 0.2 mile northwest of Jamboree Road, northeast of the Orange County Airport, to Harbor Boulevard in Costa Mesa. The project involves constructing interchanges at Bristol Street, Fairview Road and Harbor Boulevard. Estimated cost, $11,900,000, of which $1,100,000 will be budgeted in the 1967–68 fiscal year.

Widen the Interstate 5 Freeway from four to eight lanes between Route 1 south of San Juan Capistrano and the Interstate 405 (San Diego) Freeway, and to six lanes from this point northwesterly to the Route 133 (Laguna Canyon Road) Freeway, a distance of 16.4 miles. Estimated cost, $12,500,000, of which $7,000,000 will be budgeted in the 1967–68 fiscal year.

Construct the eight-lane Route 57 (Orange) Freeway between the Riverside (Route 91) Freeway east of Anaheim and Orangethorpe Avenue in Placentia, a distance of 0.8 mile, plus portions of an interchange with the Riverside Freeway, plus an interchange at Orangethorpe Avenue; and add 1.9 miles of auxiliary lanes to the Riverside Freeway between Placentia Avenue at the Anaheim-Placentia border and Dowling Avenue in Anaheim. Estimated cost, $5,000,000.

Landscape the interchange area of the Interstate 5 (Santa Ana) Freeway, Garden Grove (Route 22) Freeway, and the future Orange (Route 57) Freeway in Santa Ana and Orange and construct a landscape maintenance building in this vicinity. Estimated cost, $502,000.

Widen Brea Boulevard (Route 57) from two to four lanes between Harbor Boulevard (Route 72) in Fullerton and Acacia Street in Brea, a distance of 2.2 miles. Estimated cost, $165,000, of which the state will pay $125,000, and the city the balance.

Widen Artesia Boulevard (Route 91) between Pioneer Boulevard in Artesia, Los Angeles County, and Knott Avenue in Buena Park, Orange County, a distance of 4.1 miles, and install traffic signals and highway lighting. Estimated cost, $765,000, of which the state will pay $660,000, and the cities of Dairy Valley, La Mirada and Buena Park, and the Los Angeles Flood Control District, the balance. (Also listed in Los Angeles County.)

Reconstruct portions and resurface Santa Ana Canyon Road (Route 91) between Crescent Drive and the Riverside county line, 8.9 miles easterly. Estimated cost, $400,000.

Landscape the area of the interchange between the Interstate 405 (San Diego) Freeway, the Interstate 605 (San Gabriel River) Freeway, the Route 22 (Garden Grove) Freeway and the Route 240 Freeway near Seal Beach and Long Beach. Estimated cost, $766,000.

Widen Broadway-Laguna Canyon Road (Route 133) to 24 feet and construct shoulders between 0.2 mile north of Canyon Acres Drive in Laguna Beach and Laguna Road south of Irvine, a distance of 6.5 miles. Estimated cost, $470,000.

Widen MacArthur Boulevard (Route 73) from two to four lanes and modify traffic signals between Ford Road and the Interstate 405 (San Diego) Freeway, northeast of the Orange County Airport, a distance of 2.6 miles. Estimated cost, $440,000.

Widen portions of the Pacific Coast Highway (Route 1) between Warner Avenue near Huntington Harbor and Bay Boulevard in Seal Beach, and construct channelization and modify traffic signals. Estimated cost, $335,000, of which the state will pay $310,000, and Huntington Beach and Orange County the balance.

Rights-of-way on various state highway routes—$6,000,000.

SAN BERNARDINO AND RIVERSIDE COUNTIES PROJECTS

Riverside County

$1,900,000 to complete the financing for constructing the four-lane Interstate 10 Freeway between 1.3 miles west of Wiley Wells Road, about 18 miles west of Blythe, and 1.2 miles east of Desert Center, a distance of 27.4 miles. This project will cost an estimated $6,900,000 of which $5,000,000 had been budgeted in the 1965–66 fiscal year; and $8,000,000, of which $4,900,000 will be budgeted in the 1967–68 fiscal year, for extending this construction another 20.6 miles westerly to four miles east of Cottonwood Springs Road. The latter project involves constructing a pair of safety roadside rests at Cactus City and interchanges at Eagle Mountain and Rice Roads.

Add four lanes to Interstate 10 between Route 111 and Garnet, a distance of 9 miles, and construct interchanges at Whitewater and Garnet to convert this section from expressway to full freeway standards. Estimated cost, $4,200,000.

Widen Route 111 from two to four lanes between Miles Street west of Indio and Deep Canyon Road, 2.8 miles westerly. Estimated cost, $450,000.

Reconstruct Route 195 between Route 86 and Route 231, southwest of Mecca, a distance of 5.4 miles. Estimated cost, $290,000.

Landscape the interchange between US 395, US 60 and Route 91 in Riverside, and a stretch of US 395 fronting the University of California at Riverside. Estimated cost, $225,000.

Resurface and widen Route 74 from two to four lanes between three miles east of US 395 and Homeland, a distance of 1.8 miles. Estimated cost, $170,000.

Install traffic signals at the Route 91 Freeway connections with Arlington Avenue, Central Avenue and 14th Street in Riverside. Estimated cost, $100,000, to be shared equally by the state and city.

Widen Alessandro Boulevard (Federal Aid Secondary Route 1249) from two to four lanes as an urban extension project between Canyon Crest Drive and Chicago Avenue in Riverside, a distance of 1.9 miles. Estimated cost, $403,600, of which the state will contribute $201,800, and Riverside the balance.

Rights-of-way on various state highway routes—$2,980,000.

San Bernardino County

Construct the eight-lane Interstate 15 Freeway on new alignment between Devore and Route 138 at Cajon, a distance of approximately 10.3 miles. The project involves constructing an interchange with the future Route 31 Freeway (Devore Cutoff) and constructing the first unit of approximately 1.8 miles of the Route 31 Freeway southerly from the interchange. Estimated cost, $20,000,000 of which $15,000,000 will be budgeted in the 1967–68 fiscal year.

Construct a connecting four-lane freeway between Interstate 15 near Baseline Street in San Bernardino and Route 30, and a six-lane freeway on Route 30 between this point and Waterman Avenue (new Route 18), a distance of 2.4 miles, and construct Waterman Avenue as a four-lane conventional highway between 40th Street and the north city limit of San Bernardino, a distance of 0.9 mile. The freeway construction involves constructing interchanges at Interstate 15, Highland Avenue, E Street and Waterman Avenue, and the installation of traffic signals and channelization between Route 30 and the north city limit. Estimated cost, $6,870,000, of which $1,160,000 will be budgeted in the 1967–68 fiscal year.

$4,900,000 to complete the financing for constructing 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 Gady Road and Hector Road; an overhead across the A.T. & S.F. Railroad tracks, about 10 miles west of Ludlow; and 10 bridges across washes. Estimated cost, $11,900,000, of which $7,000,000 had been budgeted in the 1965–66 fiscal year.

$300,000 to complete the financing for constructing a four-lane freeway on Interstate 40 between 0.5 mile east of Java and the north city limit of Needles, a distance of 4.8 miles. Estimated cost, $2,700,000, of which $2,400,000 had been budgeted in the 1965–66 fiscal year.

Relocate Route 138 as a four-lane expressway between Summit Valley and Cleghorn Road north of Crestline, a distance of 3.7 miles, in connection with the future construction of the Cedar Springs Reservoir which will inundate the existing highway. Estimated cost, $2,700,000, of which State Highway funds will pay $500,000, and the Department of Water Resourecs the balance.

Replace the Mount Vernon Avenue Interchange on the Interstate 10 Freeway in Colton in connection with a county project for improving this road and its elevation across the Southern Pacific Company's railroad tracks immediately south of the freeway. As rebuilt, the interchange will serve the future widening of the freeway at this location. Estimated cost, $1,650,000, of which the state will pay $600,000 and the county the balance.

Convert Route 18 from a two-lane highway to a four-lane expressway between 0.8 mile and 3.4 miles north of the San Bernardino city limit. Estimated cost, $1,000,000.

Eliminate dips and humps at 12 locations on Route 62 between Yucca Valley and 5 miles west of Twentynine Palms. Estimated cost, $130,000.

Modify traffic signals and safety lighting at 12 intersections on Fifth Avenue (Route 60) between Hansen Avenue in Pomona and 0.1 mile east of that city in San Bernardino County. Estimated cost, $106,000, of which the State will pay $55,000, and Pomona and San Bernardino County the balance. (Also listed in Los Angeles County.)

Resurface and widen Route 30 from two to four lanes between Patton and Route 106, a distance of 0.9 mile, and install traffic signals at Palm Avenue. Estimated cost, $100,000.

Rights-of-way on various state highway routes—$6,071,000.

SAN DIEGO AND IMPERIAL COUNTIES

San Diego County

Extend eight-lane Interstate 5 Freeway construction in progress (between just north of Palm Avenue in San Diego and 0.2 mile south of the San Diego River) northerly to another project north of Tecolote Creek, and extend this construction to 0.5 mile north of Balboa Avenue. The new project involves completing the interchange with Interstate 8, Route 209 and the future Route 109, constructing paired freeway bridges across the San Diego River, relocating a sewer in the path of the freeway construction, and constructing an interchange at Clairmount Boulevard. Estimated cost, $17,370,000, of which the state will pay $17,030,000 (of which, $9,530,000 will be budgeted in the 1967–68 fiscal year), and the City of San Diego the balance.

Extend a budgeted eight-lane freeway section on Interstate 5, between Oceanside

and south of San Clemente, 8.9 miles northerly to 0.2 mile north of the San Diego-Orange county line, with an interchange at San Onofre Road. This project, together with others completed, under construction or budgeted, will provide full freeway from the Mexican border to northern Los Angeles County. Estimated cost, $7,400,000, of which $2,400,000 will be budgeted in the 1967–68 fiscal year. (Also listed in Orange County.)

$4,084,000 to complete the financing for extending the eight-lane Interstate 5 Freeway 9.7 miles northerly between 0.4 mile north of the San Luis Rey River at Oceanside and two miles north of Las Pulgas Road, about 12 miles south of San Clemente, with an interchange at Las Pulgas Road. Estimated cost, $9,784,000, of which $5,700,000 had been budgeted in the 1965–66 fiscal year.

Landscape and install functional planting on the Interstate 5 Freeway between 0.2 mile south of 24th Street in National City and 28th Street in San Diego, a distance of 3.6 miles. Estimated cost, $630,000.

Extend the four-lane Interstate 8 Freeway 5.3 miles easterly to 2.5 miles east of Alpine, and construct an interchange at Tavern Road. Estimated cost, $7,100,000, of which $5,100,000 will be budgeted in the 1967–68 fiscal year.

$4,370,000 to complete the financing for extending the four-lane Interstate 8 Freeway section in the Mountain Springs area, near the San Diego-Imperial 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. The project involves constructing bridges across Carrizo Creek, and an overhead across the San Diego and Arizona Eastern Railroad tracks near Jacumba. Estimated cost, $8,370,000, of which $4,000,000 has been budgeted in the 1965–66 fiscal year.

Landscape and plant trees along portions of the Interstate 8 Freeway in San Diego between Presidio Interchange and Fletcher Parkway. Estimated cost, $490,000.

Improve ramps and weaving sections on the Interstate 8 Freeway in San Diego between Route 103 and Fairmount Avenue, a distance of 0.7 mile. Estimated cost, $200,000.

Construct the first unit of the eight-lane Interstate 805 Freeway in San Diego between 0.2 mile north of Home Avenue and Interstate 8, a distance of 3.6 miles. The project involves constructing interchanges at University Avenue and El Cajon Boulevard, and a partial interchange at Madison Avenue. Estimated cost, $11,000,000, of which $9,400,000 will be budgeted in the 1967–68 fiscal year.

Construct an interchange on the Route 103 (Murphy Canyon Road) Expressway at Friars Road in San Diego. Estimated cost, $2,350,000, of which the state will pay $2,100,000, and the city and county the balance.

Grade and pave to complete a recently advertised project for the construction of a six-lane freeway on Route 67 between Interstate 8 at El Cajon and 1.7 miles northerly. Estimated cost, $1,000,000.

Pave the four-lane Route 94 Freeway between 0.5 mile east of the Route 125 (former Route 67) Freeway and Conrad Drive in Spring Valley, a distance of 1.1 miles. Estimated cost, $760,000.

Construct an interchange on Route 78 at College Boulevard near the boundary of Oceanside and Carlsbad. Estimated cost, $750,000.

Extend Route 78 in Escondido as a two-lane highway 0.9 mile easterly from its present terminus at US 395 to Broadway, pending freeway construction on this route. Estimated cost, $297,000.

Install channelization at the intersections of Rosecrans Avenue (Route 209) with Lytton, Evergreen and Hancock-Moore Streets in San Diego. Estimated cost, $100,000.

Construct Friars Road (Federal Aid Secondary Route 731) as a four-lane divided urban extension between 0.1 mile west of Mission Village Drive and Mission Gorge Road near San Diego, a distance of 1.3 miles. Estimated cost, $2,076,000 of which the state will divide $1,000,000 between the city and county. The balance will be paid by the two agencies.

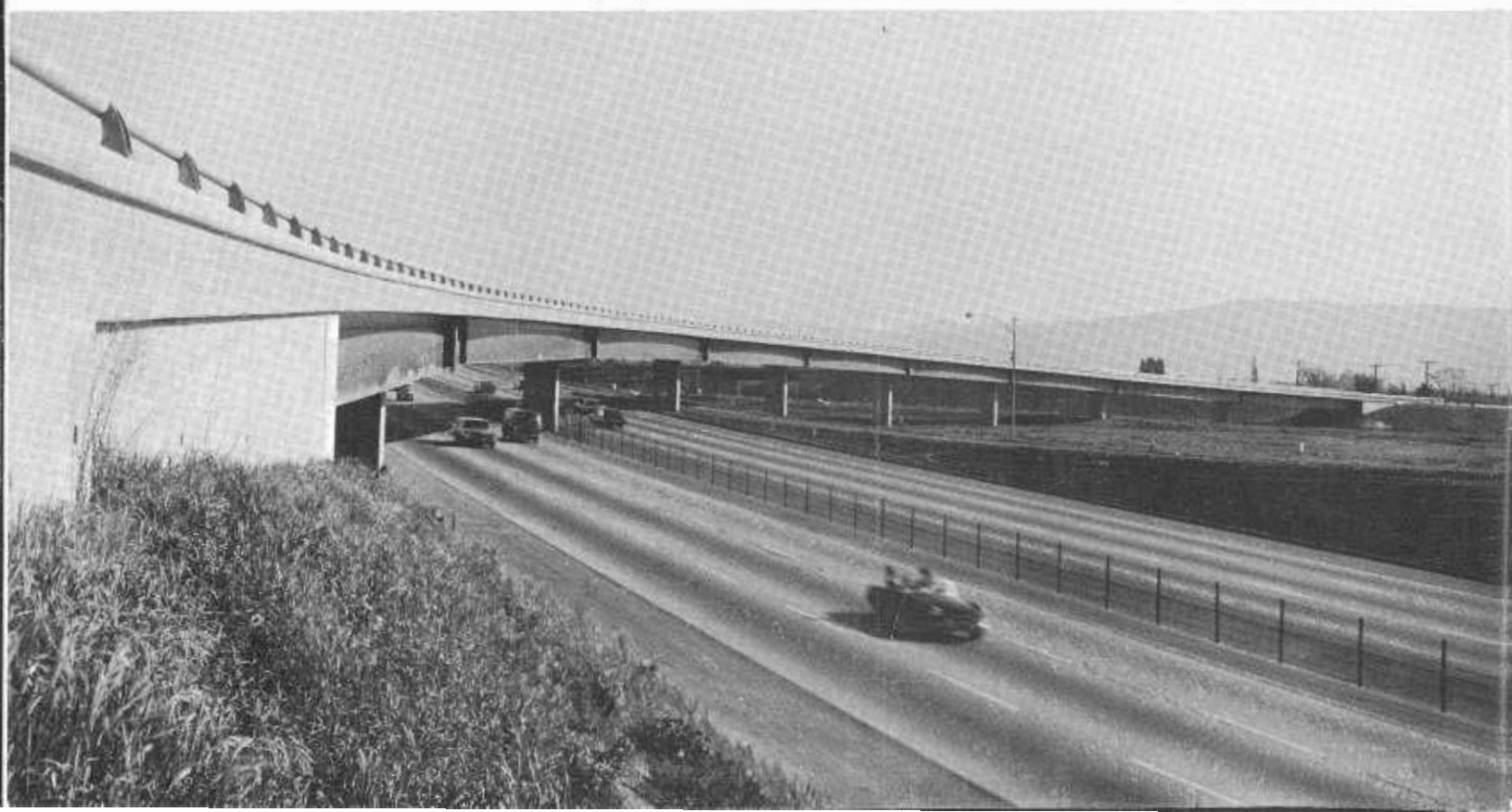
Rights-of-ways on various state highway routes—$16,547,000.

Imperial County

$3,057,000 to complete the financing of a project estimated to cost $6,057,000, of which $3,000,000 had been budgeted in the 1965–66 fiscal year, for constructing a four-lane Interstate 8 Freeway section between 0.4 mile east of Route 111 and 0.4 mile west of Imperial Avenue in El Centro, and an estimated $4,375,000 for extending this construction 7.5 miles westerly to 0.5 mile west of Federal Aid Secondary County Road 724 south of Seeley. The latter project involves constructing a safety roadside rest for eastbound traffic near Sunbeam Lake.

Rights-of-way on various state highway routes—$653,000.

One of three bridges designed and constructed by the Division of Highways which won an award this year in national competition sponsored by the American Institute of Steel Construction was this highway grade separation on Interstate 280 and Route 17 a few miles northeast of San Jose.



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