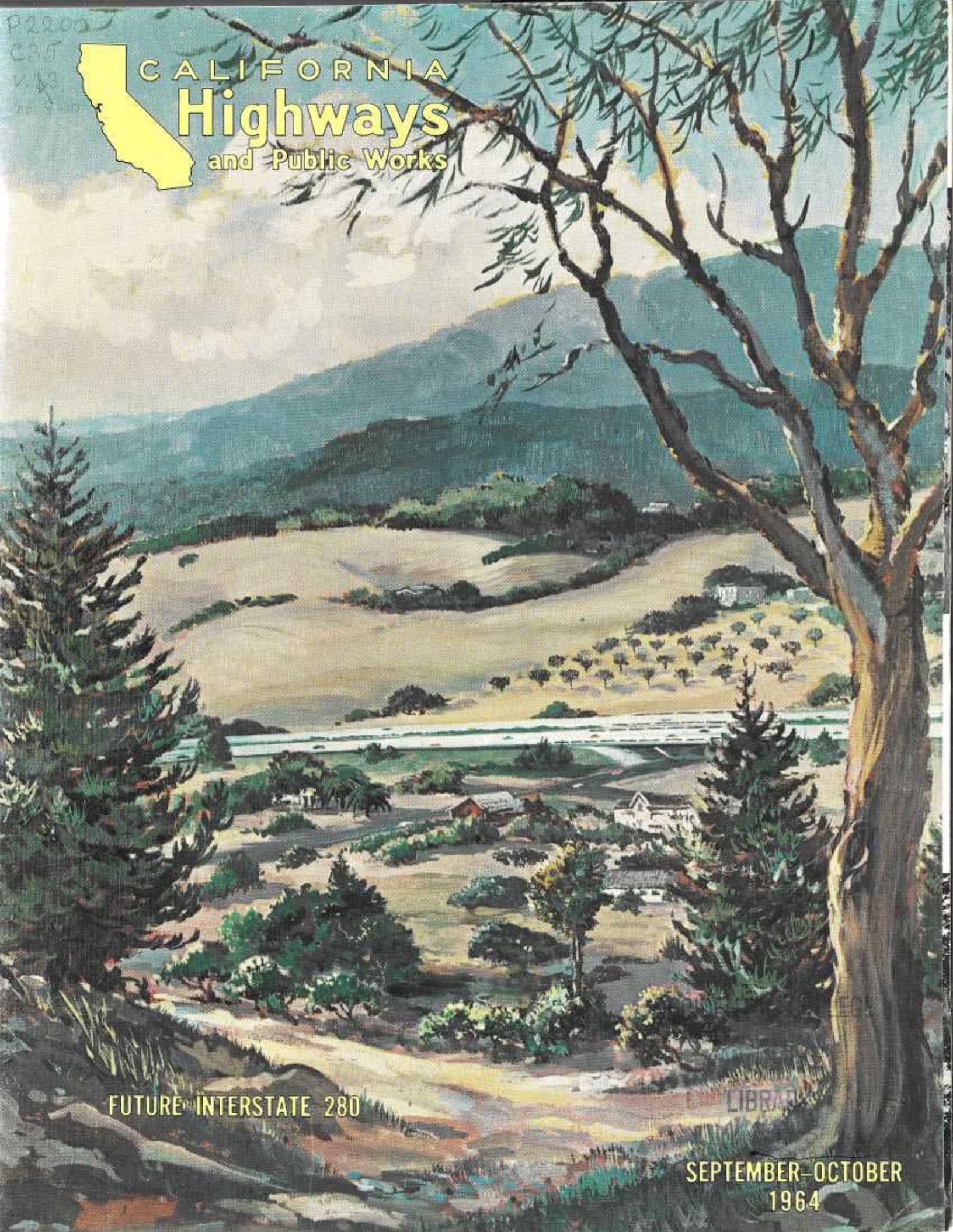


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# CALIFORNIA Highways and Public Works



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SEPTEMBER-OCTOBER  
1964



# National Highway Week—October 4-10

**THE WHITE HOUSE  
BY THE PRESIDENT OF THE UNITED STATES OF AMERICA  
A PROCLAMATION**

WHEREAS safe, efficient, and economical highway transportation is vital to our continued national growth; and

WHEREAS adequate highways promote the social and economic opportunities of every American, and strengthen the defense of our Nation; and

WHEREAS the Federal and State governments are engaged in a cooperative program for the accelerated construction of highways; and

WHEREAS the completion of the National System of Interstate and Defense Highways, and the improvement of other highways, is essential to the attainment of our needs for safe and adequate transportation; and

WHEREAS the death of 43,600 persons in traffic accidents last year emphasizes the need for highway improvements; and

WHEREAS I have directed that an accelerated attack on traffic accidents be undertaken through the Federal-aid Highway Program, with the cooperation of State and local governments:

NOW, THEREFORE, I, LYNDON B. JOHNSON, President of the United States of America, do hereby proclaim the week beginning October 4, 1964, as National Highway Week in recognition of the importance of highway transportation to the social and economic progress and defense of our Nation; and I urge the Governors of the States and mayors of cities to issue similar proclamations.

I also ask appropriate officials of the Federal, State and local governments, as well as public and private organizations and the general public, to join in this observance.

During this week, I urge all Americans to give recognition to the value of highway transportation to their own activities and to our national welfare.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this fourth day of September in the year of our Lord nineteen hundred and sixty-four, and of the INDEPENDENCE OF THE UNITED STATES OF AMERICA the one hundred and eighty-ninth.

By the President  
DEAN RUSK  
Secretary of State

LYNDON B. JOHNSON

## **GOVERNOR'S STATEMENT**

On September 11 Governor Edmund G. Brown issued the following statement:

Part of California's lure for millions of residents and tourists lies in the diversity of its natural scenic grandeur, majestically framed by mountains or carved by the mighty Pacific surf.

California's pioneering freeway law 25 years ago helped put this drawing card on display.

Today, a boldly executed skein of roads provides mobility for more than 10 million California vehicles and thousands of tourists. Today, no more than a day's drive separates the Sierra from the sea, or major metropolitan centers.

Although we have only 1,430 miles of full freeways, they bear 20 percent of our total travel. Despite this heavy traffic, our freeways have proven more than twice as safe per mile of travel as conventional roads.

So the Golden State's lure appropriately glistens with the silver anniversary polish of our freeway law during National Highway Week, October 4 through 10.

Therefore, Californians have special reason that week to rededicate themselves to the principles of sound transportation planning. As Governor, I also hope they pledge themselves to drive safely this year—and every year.

# California Highways and Public Works

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

Vol. 43

September-October

Nos. 9-10

## CONTENTS

	Page
National Highway Week .....	Inside Front
Highway 88 .....	2
By Michael L. McGinley, Highway Administrative Officer	
Route 299 Expressway .....	11
By John V. Kelly and Ray Huck, Resident Engineers	
The Redwood Highway—Part III .....	14
Eagle Point .....	24
By Lowell C. Allen and Ostap Bender, Associate Bridge Engineers	
W-X Street Bridge .....	27
By R. N. Brink, Resident Engineer	
Work, Plans Move Ahead on Capital's Freeways .....	27
Interstate 280 .....	33
By R. A. Hayler, Deputy District Engineer	
Freeway Leaflets .....	42
Route 36 Relocation .....	44
By O. B. Hanson, Resident Engineer	
Harbor Boulevard .....	47
By Charles R. Handy, Director of Public Works, City of Garden Grove	
Highway Districts Lose Roman Numerals .....	50
Tempus Fugit Column .....	50
The Freeway Law .....	51
By Frank B. Durkee	
Roadside Rests .....	58
Bridge Department Engineer Wins Design Award .....	59
Division Wins Safety Council's Award of Merit .....	60
Inspection Procedures .....	61
By Leigh Spickelmire, Assistant Engineer—Construction and Morris Redsun, Training Assistant	
San Mateo—Hayward Bridge .....	65
Safety Glasses .....	66
Driver Opinion Poll Will Be Cooperative Project .....	67
Route Actions .....	68
Parks-Highways Teamwork .....	70
Motor Vehicle Total Will Hit 86,000,000 .....	70
Sutter Jr., Not Sr. ....	70
Retirements	
H. Dana Bowers .....	60
Walter Landers .....	71
Division List .....	71
Obituaries	
In Memoriam .....	49
Joseph A. Caffrey .....	71

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*Address communications to: EDITOR,*

**CALIFORNIA HIGHWAYS AND PUBLIC WORKS**

P.O. Box 1499

SACRAMENTO, CALIFORNIA 95807



*FRONT COVER: The future Interstate 280 will pass through the center of the Peninsula, linking San Francisco with San Jose and providing an alternate to the Bayshore Freeway (US 101). The Robledo Road structure (shown in picture) in Los Altos Hills will incorporate an equestrian path. (Painting by Jack C. Won.)*

*BACK COVER: The recently completed US 101 Freeway about a mile south of Myers Flat passes near the Lansdale Bar recreation area on the Eel River. The Avenue of the Giants, which the freeway has replaced as a through route, is visible in the left center of the picture. (Photo by John Meyerpeter.)*



# Highway 88

Historic Carson Pass Route  
Undergoes Major Improvements

By MICHAEL L. MCGINLEY, Highway Administrative Officer



This route has been known as the Carson Pass Highway ever since the famous scout and trapper, Kit Carson, led Captain John C. Frémont's exploring expedition over the Sierra

Nevada Mountains in 1844. It was first opened to wagon travel in 1849 and became an emigrant road during the gold rush days. Travel increased, tollgates appeared and, although certain sections of the road were kept in some semblance of repair, old emigrant trains trundled for miles through murky clouds of powdered dirt.

During the early thirties, asphaltic road oil was worked into this road to provide a smooth, dustless surface. Until realigning or grading work was

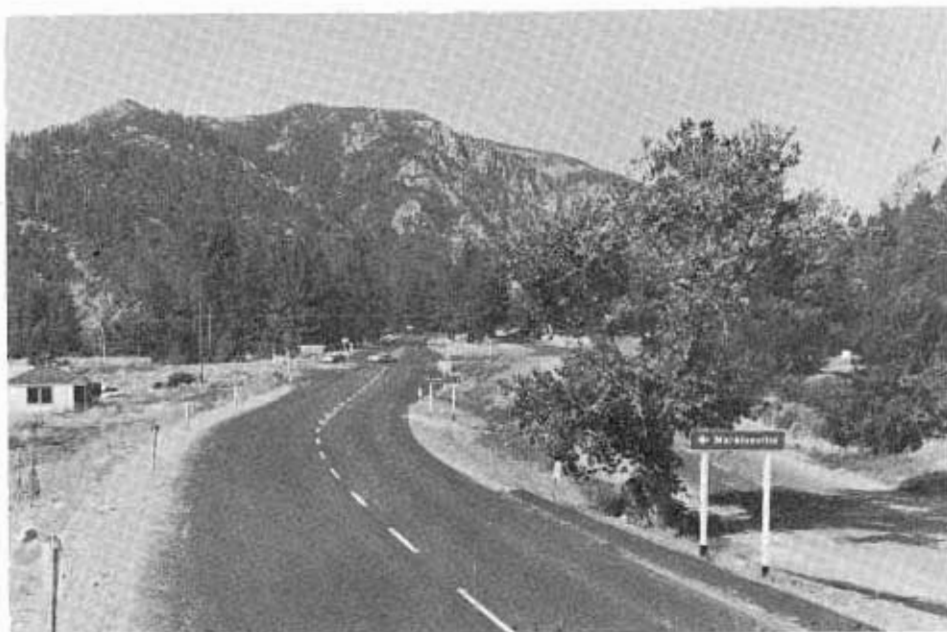


PHOTO ABOVE—A smoother, wider, safer alignment replaces the old road (right) at Woodfords. PHOTO BELOW—Motorists are warned of possible delays on Highway 88 just east of Jackson.





performed, as indicated on the chart, this highway was maintained in good condition. In 1959, it was included in the California freeway-expressway system. Planning and design studies are continuing with this highway, as they are with all highways throughout the State, to keep it as modern as possible within the limitations of available funds.

**Extends 130 Miles**

This route extends 130 miles from Stockton to Nevada and is one of the most scenic drives to the high vacation country south of Lake Tahoe. It runs through historic country made famous by the early trail blazers and the hardships of the '49ers.

Highway 88 is also the most direct route between Stockton and Lake Tahoe. It serves the communities of Lockeford, Clements, Ione, Jackson, Pine Grove, and the High Sierra areas between Cooks Station and the Nevada state line, including Silver Lake and Twin Lakes. In addition to the historical interest and recreational facilities, this route provides an outlet for lumber products from the Amador forests to the shipping docks in Stockton and the Bay area.

Going from west to east, Highway 88 leaves the flat San Joaquin Valley and gently ascends the Sierra foothills into Jackson. The many old stone and brick buildings built in the '50s make a side trip through this now-modern little city well worth while.

**Sign Informs Motorist**

A sign posted just east of Jackson informs the motorist that Highway 88 is under construction and subject to delays of 2½ hours farther up the road. These delays are usually nominal and the detours short; however, the longer delays may occur because there are occasions when it is necessary to blast sections of this rugged and rocky granite terrain. The Division of Highways realizes that these delays inconvenience the motorist, especially during vacation time, but it is impossible to build roadways during the winter because of the snow.



Highway 88, the Carson Pass Highway, extends 130 miles from Stockton to the Nevada state line and is one of the most scenic drives to the high vacation country south of Lake Tahoe.

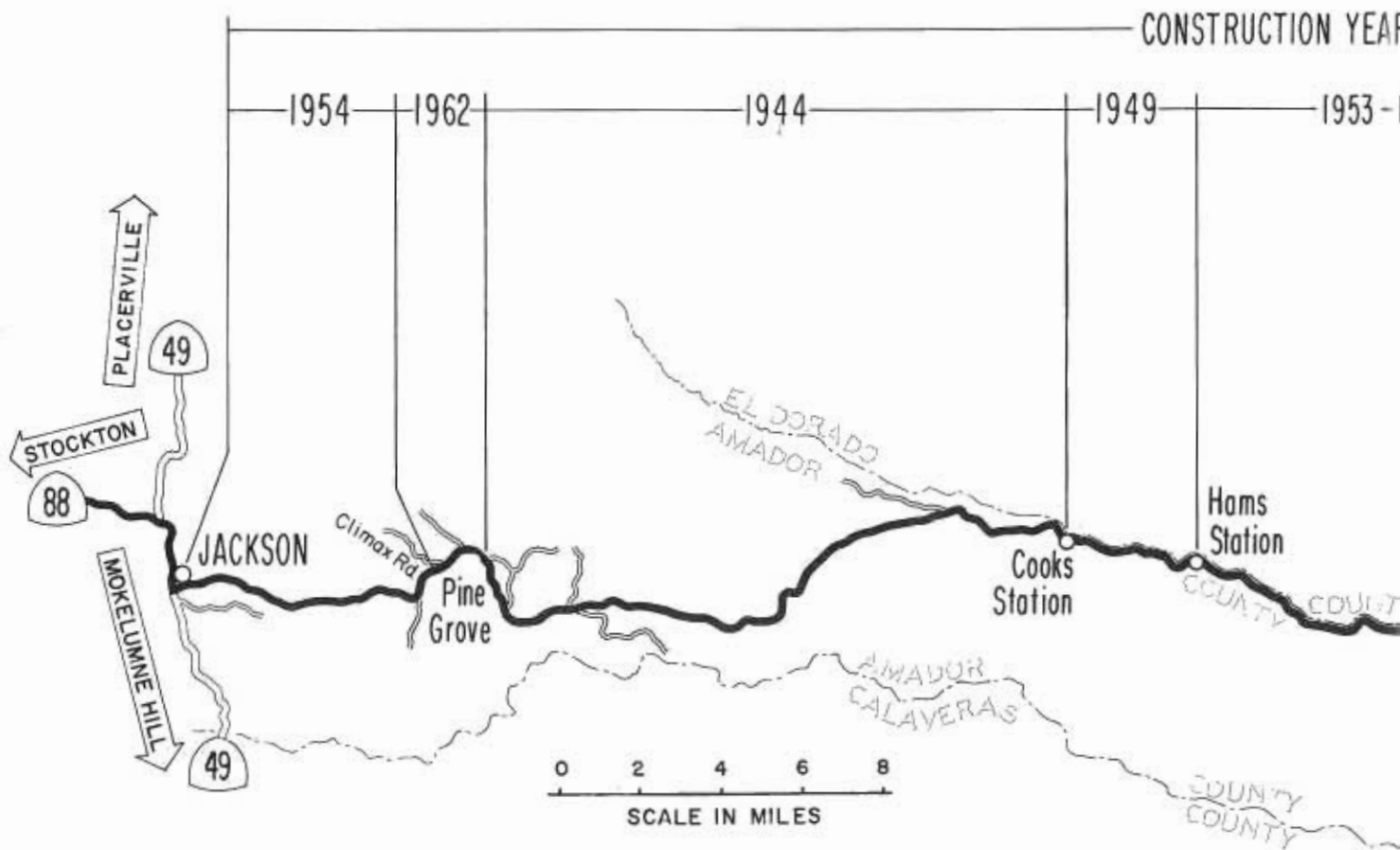


Panther Meadow, east of Hams Station, offers a variety on the scenery.





The once hazardous junction of Climax Road and Highway 88 has been made safer by channelization and widening.





Closing of this highway usually occurs with the first major winter storm and, due to the deep drifts, it is impossible to reopen it until the following spring. Therefore, the contractors have only about a four-month working period each year. They make the most of it by working long hours, Saturdays and holidays.

**East of Jackson**

In 1954, a 6.3-mile project was completed between just east of the city limits of Jackson and one mile west of Pine Grove.

This improvement provided a 32-foot all-paved roadway on a new alignment having a minimum radius of curvature of 600 feet, in contrast to a minimum of 200 feet on the old road. This project eliminated a section of narrow, twisting road.

Construction was completed during 1962 in the vicinity of Pine Grove to provide for the channelization of the junction of Climax Road, formerly

used as a logging road, and the widening of Highway 88.

**Portions Improved**

Portions of the stretch of Carson Pass Highway between Pine Grove and Cooks Station were improved by widening and realignment in 1944. This section of highway traverses tree farms, forests of cedar, fir and pine. Planning studies are now underway to convert the existing two-lane road to modern freeway or expressway standards.

Although most of the existing highway is designed for a speed of about 40 miles per hour, there are a few well-posted sharp turns which are to be improved in future construction.

**Highway Improved**

A bituminous surface treatment improved the portion of the highway which climbs the broad, sloping divide between the Mokelumne River on the south, and the Cosumnes River

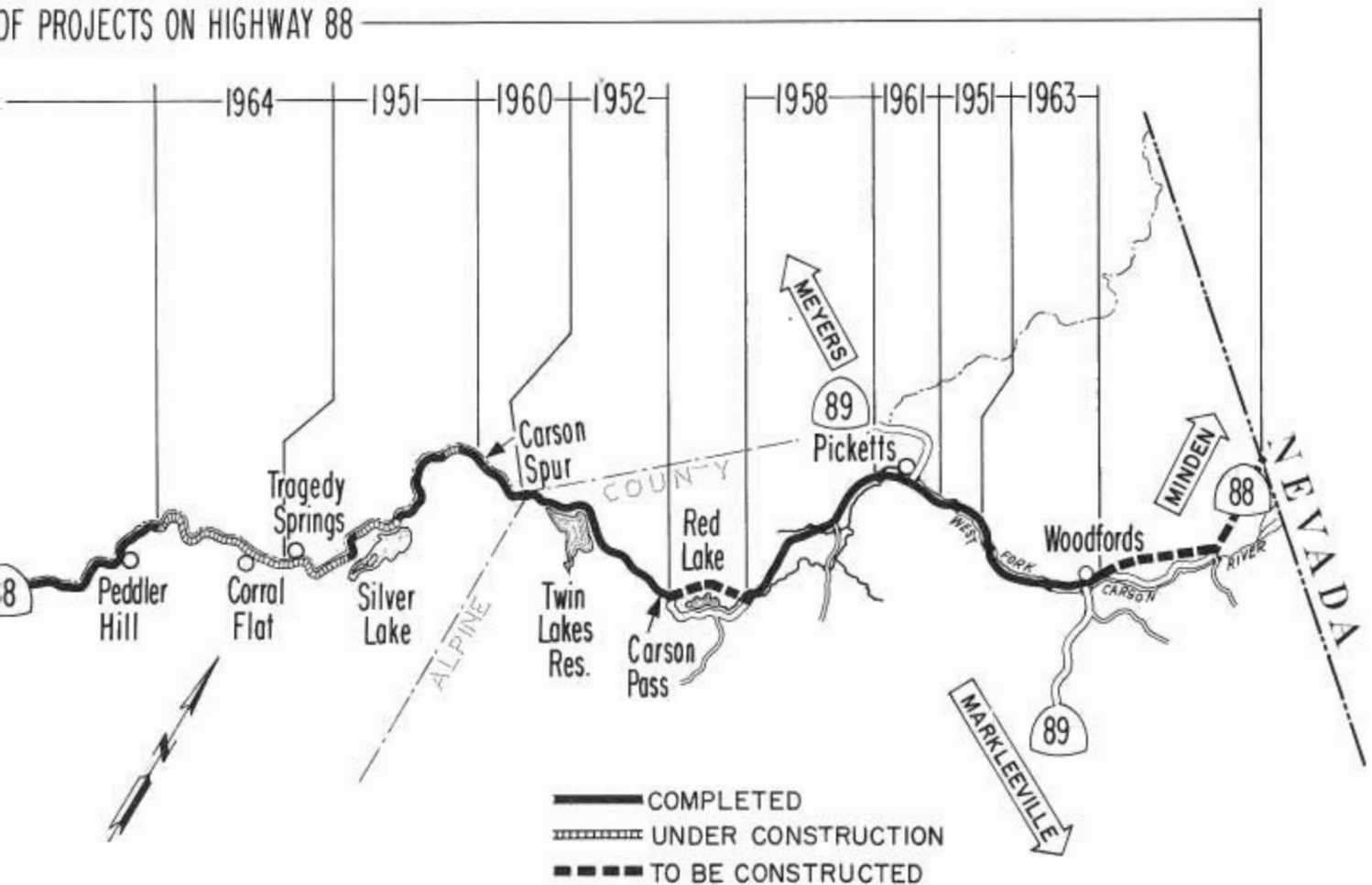
to the north. This section between Cooks Station and Hams Station was completed in 1949.

**Three Projects Completed**

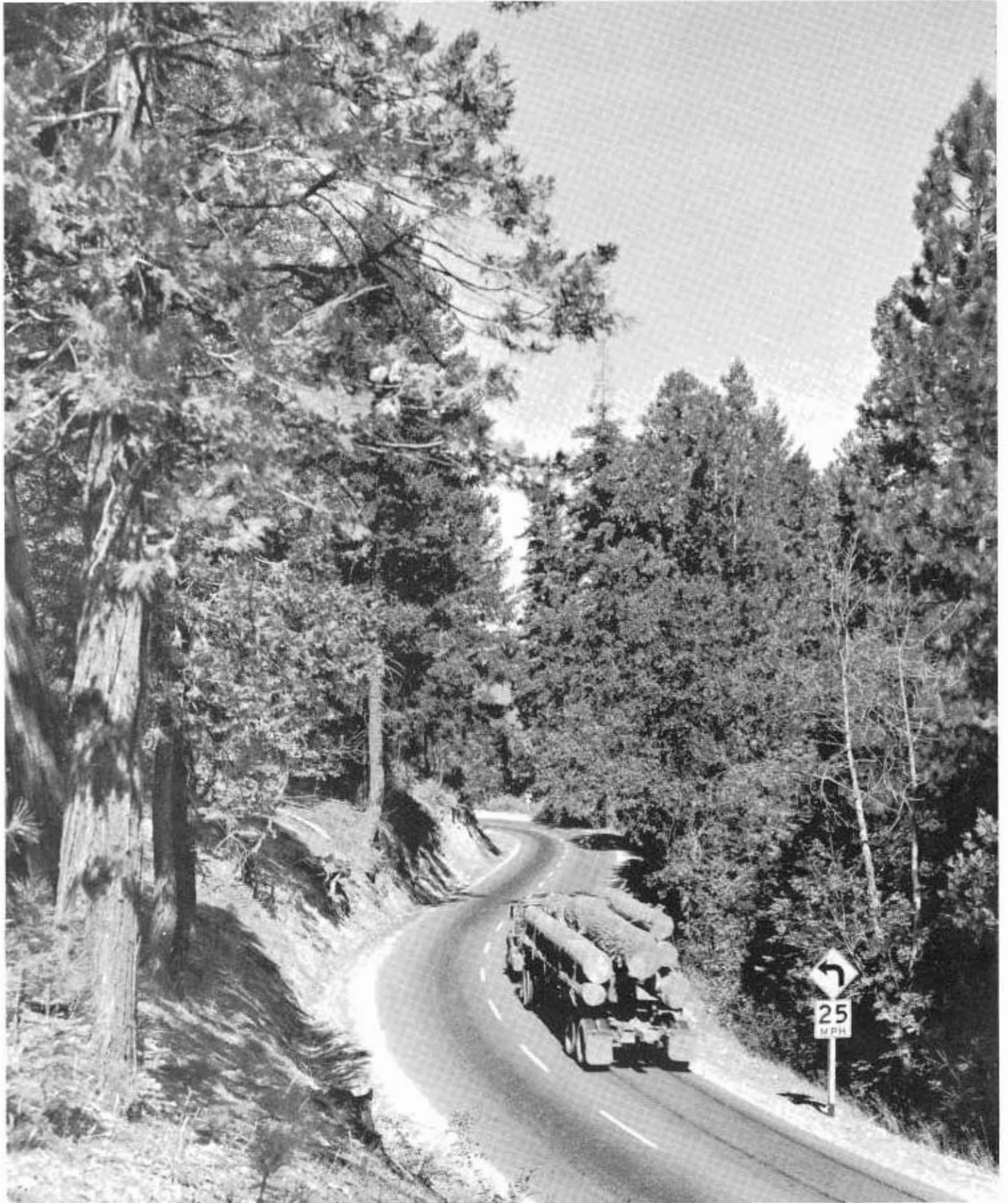
During the years 1953 through 1958, three projects were completed between Hams Station and about two miles east of Peddler Hill to provide a 26-foot all-paved section of highway in the Eldorado National Forest. From the vista point provided by the U. S. Forest Service at Peddler Hill, a popular winter ski area, is a magnificent view over the forested Mokelumne River watershed and the Bear River Reservoir.

Now completed is a \$1.25 million project located about 41 miles east of Jackson. Involving some 5.5 miles of realignment, this project is located between Peddler Hill and Tragedy Springs on the heavily timbered ridge between the Mokelumne and American Rivers at an elevation of more than 7,000 feet.

**OF PROJECTS ON HIGHWAY 88**







*Sharp turns are well posted where it was necessary to blend the highway with the terrain to preserve the beauty of the surroundings.*

#### Continuation of Project

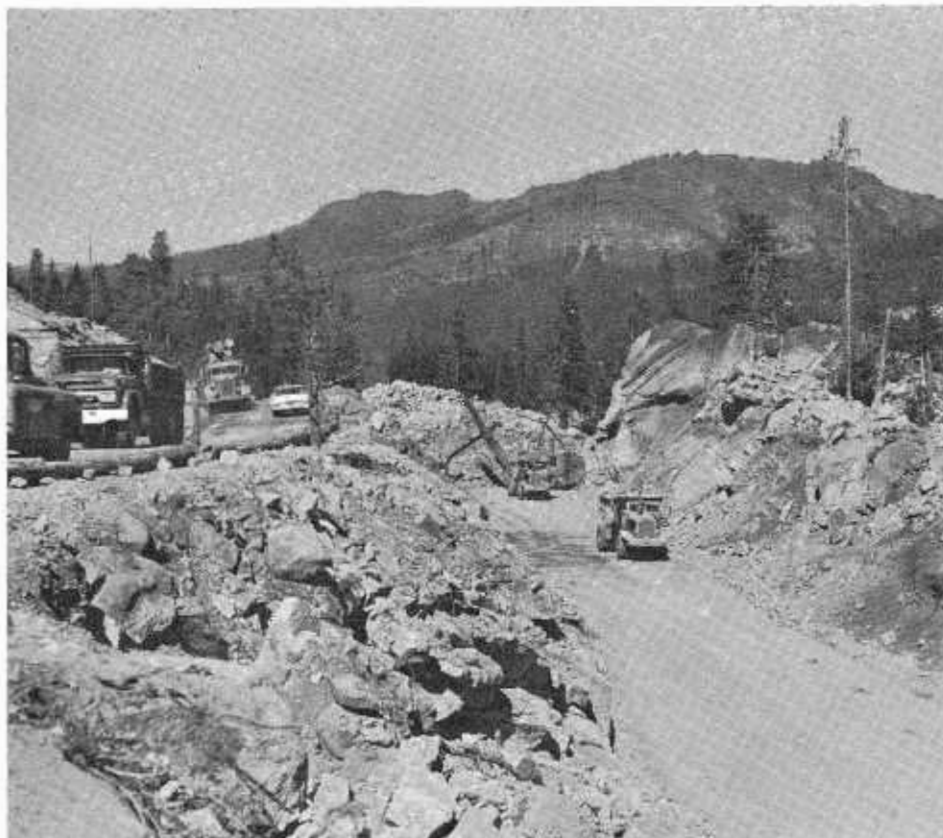
A continuation of the above project extends from Tragedy Springs past Silver Lake to the Carson Spur about 2.5 miles west of the Alpine county line. Roadway improvement costing \$1,600,000 is about 50 percent complete and is expected to be finished in the fall of 1965.

The delay noted on the signs posted at either end of Highway 88, where an alternate route may be chosen by the motorist to go over the Sierra, might occur here. This is where the motorist will be given the opportunity of viewing the ruggedness of the terrain. Solid walls of granite are being blasted to provide a safer, smoother roadway so that the scenic beauty and historic values will be within easy reach of everyone. Since this project is located in the Eldorado National Forest, the blasting operations must be conducted with a minimum of damage to the trees outside of the right of way. The problem is to break up the granite so that it can be loaded with a power shovel and still not throw rock into the trees and cabins in the area.

#### Portable "Hot Plant"

Another sight that can be seen from the detour road is the "hot plant" where asphalt concrete is mixed for surfacing the project mentioned above. This plant is entirely portable, permitting it to be moved from one construction site to another. This "hot plant," or batch plant as it is usually called, produces about 150 tons of asphalt concrete per hour. There are seven rock crushers operating just west of Silver Lake which provide crushed rock for aggregate base, asphalt concrete material, and permeable material to be used for drainage and filtering purposes. These crushers are capable of making any size aggregate material.

The portions of this route between Tragedy Springs and Carson Spur which were not reconstructed in 1951 (see sketch map) are those which are now under construction as described above. The road winds down through the forest to the west shore of Silver Lake. This lake is nearly two miles long and is a favorite spot for fishermen and boating enthusiasts. Improved



A power shovel loads granite rock on dump trucks after blasting operations near Silver Lake.



A new portable batch or "hot plant" near Silver Lake prepares asphalt concrete for the new highway.





*An asphalt spreader (foreground) and a bottom-dump truck add finishing touches to the new roadway between Peddler Hill and Tragedy Springs.*



*The nearly completed roadway on new alignment (right) has wide, sweeping curves and gentle grades.*

campgrounds and resorts await those who enjoy relaxing in the scenic splendor of this area.

Work was completed in 1960 at a cost of almost \$400,000 on a little over two miles of relocation of the Carson Pass Highway from the Carson Spur to just east of the Alpine County line. The work involved heavy grading to improve the alignment and eliminated a steep sidehill section with heavy curvature. This improvement also increased the sight distance, which is the length of highway ahead visible to the driver.

#### Red Lake Grade

Similar work was completed in 1952 from the easterly section of the above stretch of highway past Twin Lakes Reservoir to the Carson Pass near the top of Red Lake Grade. After leaving a beautiful mountain meadow near the Alpine county line at the beginning of this portion of the highway, it climbs easterly to the base of the dam at the west end of the reservoir. Near the water level it curves around the lake where water sports and fishing are popular. The highway continues to ascend gradually until it reaches an elevation of 8,573 feet at Carson Pass.

The existing section of the Carson Pass Highway from the top of Red Lake Grade to the bottom of the grade at the easterly tip of Red Lake closely follows the alignment of the original emigrant trail. Since it was first oiled in the early thirties, no major realignment or grading work has been performed, but efficient maintenance has kept it in good condition. The deficiencies of this portion of the present facility include inadequate width, excessive grade, and substandard alignment with restricted horizontal and vertical sight distances. The northern exposure makes it the last portion of road to be cleared of snow each year.

The Alpine County Board of Supervisors, local civic bodies, and the Highway 88 Association actively promoted the improvement of this route and, in 1961, the California Highway Commission adopted a route to relocate this highway on the north side of the Lake. This new location will

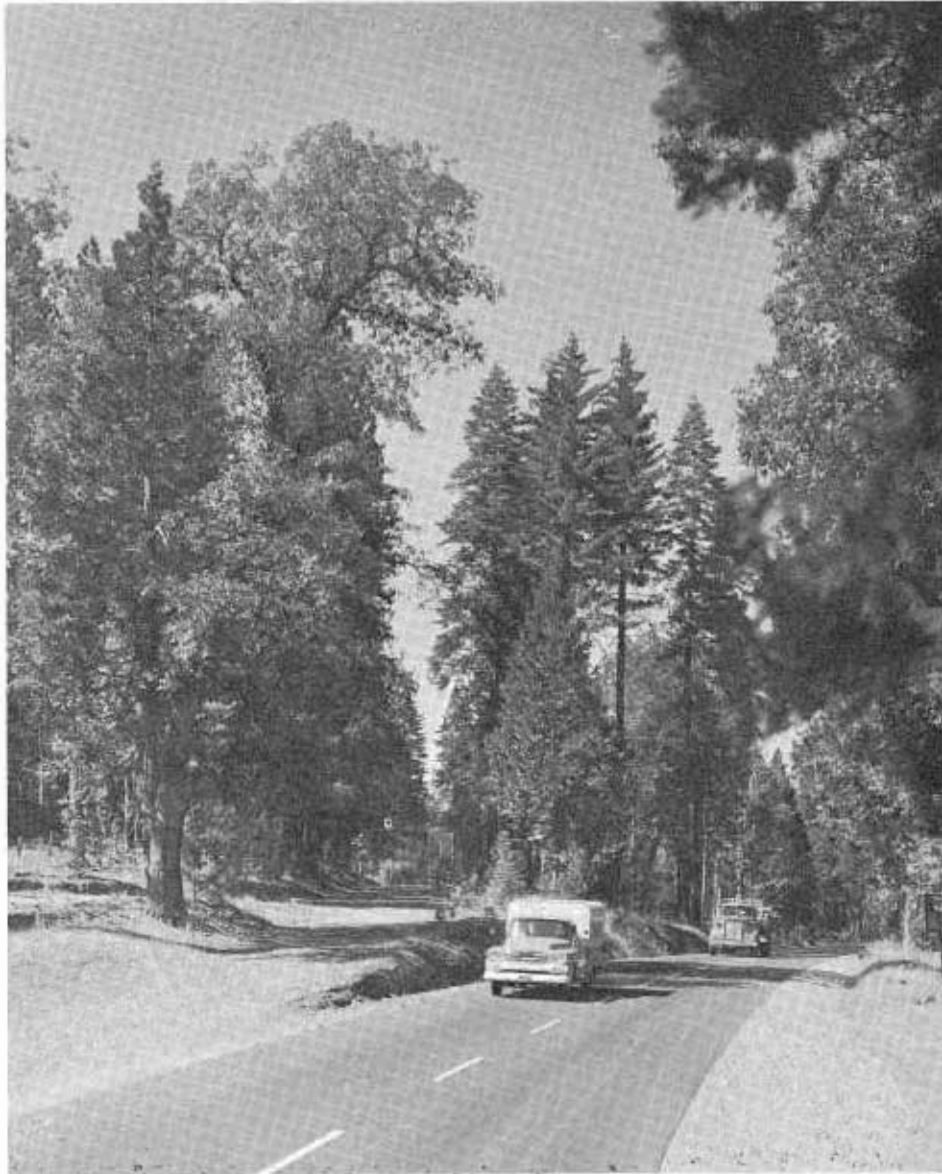


*The Bear River Reservoir viewed from the U.S. Forest Service vista point at Peddler Hill.*



*The summit of Kit Carson Pass, 8,573 feet above sea level.*





Looking toward Jackson on Highway 88 showing how the road was leveled out and widened.

provide lighter grades, greater width, sweeping turns, and a better exposure to the sun, thus permitting it to be opened earlier in the spring.

#### Design Completed

Design has been completed and right-of-way acquisition is expected to begin in late 1964 or early 1965 for a new 32-foot-wide, all-paved, 2.5-mile section of this highway on the north side of Red Lake. Consideration may be given to financing this project from federal forest highway funds.

A new road was completed in 1958 between Red Lake and the West Fork

of the Carson River. The area traversed by this 5.9-mile project is a wide, grassy, pastureland. The meadows lie to the north of the highway while the pine trees begin to find their way up the slope of the mountains to the south of the highway. This road is used primarily by vacationers bound for, or coming from, the High Sierra.

In 1961, the highway was realigned, widened, graded and paved from the Carson River to about a mile and a half east of Picketts.

Similar work was completed in 1951 on a stretch of highway immedi-

ately east of the portion described above to 2.5 miles east of Picketts.

Continuing east, similar construction was completed in 1963 from the point last mentioned above to three-tenths of a mile east of Woodfords.

Design plans have been completed and right-of-way acquisition is in progress to replace the existing narrow, winding two-lane road just east of Woodfords to the Nevada state line with a new and wider two-lane expressway. Construction is dependent on the future availability of funds.

No matter which way the Carson Pass Highway is traversed, this scenic and historic route has enough variety to interest the most seasoned traveler, the avid fisherman, and the experienced hunter.

The Division of Highways is constantly planning and designing safer highways to make driving more pleasant. During planning and design stages, every effort is made to fit the alignment to the terrain, thus preserving the scenic beauty and the natural environment of the area.

## State Freeways Save 400 Lives Each Year

More than 400 lives per year are saved because of California's freeways according to State Highway Engineer J. C. Womack.

Womack made this statement in connection with National Highway Week (October 4-10). He added that the 1,448 miles of freeway now open in California have a safety record nearly three times better than the average road or street.

In 1961 and 1962, an estimated 27,750 accidents were avoided because of freeways, and about 41,800 persons escaped injury. For this two-year period, 831 lives were spared. In addition, he noted, untold time, money, and personal anguish were saved.

The safety record will improve, Womack said, as mileage is added to the statewide freeway and expressway system. By 1980, the target date for completion of the system, the State will have a freeway and expressway network of 12,414 miles.

# Route 299 Expressway

By JOHN V. KELLY and RAY HUCK, Resident Engineers



the final step in providing 40 miles of carefree driving on Route 299 in

The completion in July 1964 of a 3.3-mile section of a two-lane expressway between 4.5 and 7.8 miles northeast of the Town of Adin, through Rush Creek Canyon, was

Modoc County between Adin and Alturas.

This latest addition to California's freeway and expressway network replaced an old road constructed in 1925 by the U.S. Bureau of Public Roads. The alignment of the old highway included 11 curves, 5 with radii from 300 feet to 400 feet, separated by short tangents. In the best weather it was difficult to negotiate portions of this road in excess of 30 miles per hour. In

snow or ice, quite common at this 4,500-foot elevation, the driving could only be described as hazardous. The new road has a design speed of 70 miles per hour, and incorporates many of the features of a freeway in its layout.

#### Unusual Feature

Reinforced concrete bridges, one 140 feet long and another 100 feet long, span the two crossings of Rush Creek, replacing the old narrow struc-

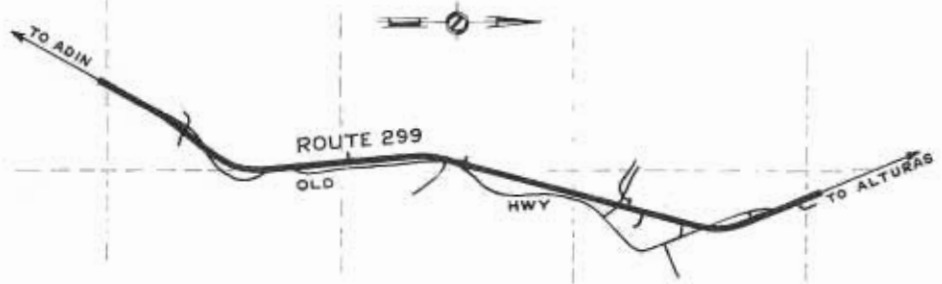


The completed expressway through this mountainous area is constructed to a design speed of 70 miles an hour.



tures. An unusual feature of this construction is a fenced public stock trail extending the full length of the project, and generally following the alignment of the original road.

Though often overshadowed by California's impressive progress in constructing new multilane freeways, the history of Route 299 in Modoc County during the past 10 years has been one of constant improvement. More than 16 miles of the Route between Adin and Alturas have been reconstructed during this period. Nine miles are two-lane expressway on new alignment. In addition to providing regulated access, wider roadways, fewer steep grades, and flatter



The improved alignment of the new Route 299 Expressway is apparent from the old and new routes shown on the above map.

curves, the new expressway sections have sufficient right-of-way for ultimate expansion to four lanes, thus protecting the highway users' investment against future increases in right-of-way costs.

#### Pit River Bridge

Ray Kizer and Ray Kizer Construction Company, Inc., was the successful bidder on the two most recent contracts on this route. Besides the Rush Creek Canyon sections, they



A winter view of Route 299 at Rush Creek before reconstruction.



*Sharp curves and snow combined to make travel slow and dangerous on the old highway.*

completed the 5.8-mile portion in 1962 from 0.4 mile west of the Pit River Bridge to 1 mile east of Canby. The new Pit River Bridge is a reinforced concrete girder structure, 305 feet long.

The portion of Route 299 from 1 mile east of Canby to Chamber's Ranch, a distance of 7.3 miles, was constructed by Peter Kiewit Sons Company of San Francisco in 1954. This stretch has a 32-foot roadbed and good geometric design, but no restricted access.

#### **Further Improvement**

Plans for further improvement of the route call for reconstruction to expressway standards after 1971 of the

9-mile portion between the Rush Creek and the Canby projects. This section rises gradually from an elevation of 4,300 feet at the new Rush Creek Bridge to 5,173 feet at Adin Summit, then descends to the new Pit River crossing. This section was constructed in 1940 to very high standards for that time.

Plans for the proposed Round Valley reservoir site just north of Adin have delayed establishing a freeway route from Adin to Rush Creek. The State Water Resources Department and the U.S. Bureau of Reclamation are currently studying the feasibility of including this dam in the Upper Pit River development for the irrigation of Big Valley. Continuing the

past record of improvement of Route 299 will insure the citizens of Modoc County, and of California, easy and pleasant access to the fast developing recreational areas of Modoc County.

#### **LEVIN NAMED STUDY CHIEF**

Secretary of Commerce Luther H. Hodges has announced the designation of Dr. David H. Levin to direct a study to determine the feasibility of a national program of scenic roads and parkways.

Dr. Levin is deputy director of right-of-way and location in the Bureau of Public Roads, a unit of the U.S. Department of Commerce.



# The Redwood Highway

## Part III — *Bringing It Up to Modern Standards*

Early in 1952 the Legislature adopted Senate Concurrent Resolution 16 which said:

"WHEREAS, The welfare of the people of the State of California demands a free and uninterrupted flow of vehicular traffic and commerce at all times; and

"WHEREAS, Slow-moving trucks and buses and other heavily laden vehicles on dangerous grades greatly impede the flow of traffic until it is often brought to a standstill; and

"WHEREAS, This situation results in a dangerous condition of the highways which needs to be corrected for the safety of all highway users; now, therefore, be it

*"Resolved by the Senate of the State of California, the Assembly thereof concurring,* That the Legislature hereby requests the California Highway Commission to make a study to determine where it may be necessary to provide for the construction of four-lane highways on dangerous

grades and curves on that portion of the State Highway US 101 from the San Francisco to the California-Oregon boundary; and be it further

*"Resolved,* That the Secretary of the Senate transmit copies of this resolution to each member of the California Highway Commission and the State Highway Engineer."

### **Widening Not Answer**

In his reply State Highway Engineer G. T. McCoy said:

"In compliance with SCR No. 16 a detailed study has been made of the traffic conditions and physical characteristics of the route, and from this study it was apparent that it was not practicable to isolate and limit the evaluation of the need for construction of a multilane highway to the specific sections which could be considered as being dangerous grades and curves."

The State Highway Engineer reported that traffic on this route was

increasing more rapidly than on the system as a whole; that the rate was particularly marked in the summer quarter when industrial and recreational traffic merged and reached a peak; that by 1960 60 percent of the mileage would be carrying an average daily traffic in excess of the critical figure of 5,000 vehicles. He also pointed out that alignment was unsuitable for modern travel, 55 percent of it having been built 25 or more years before. (As we have seen, the surveys for large portions of the route were made 50 years ago.)

The State Highway Engineer's report further stated that along 246 miles of 101 between San Francisco and Crescent City, or nearly 65 percent of the total mileage, and over nearly 90 percent of the route from Crescent City to the Oregon border, the sight distance was restricted to less than 1,600 feet. By minimum sight distance standards, it was unsafe to pass on great portions of the highway.

The report also noted that 47 percent of the distance between San Francisco and Crescent City on 101 was on curving alignment, and on the section between Crescent City and the Oregon border 85 percent was on curving alignment.

From these studies it was concluded in 1952 that 224 miles of existing 101 highway should be widened as soon as financially possible, to provide a "multilane, divided, access-controlled highway facility"; in other words, a freeway. It was also recognized that the remaining mileage would probably need improvement to freeway standards before funds would be available.

### **Scenic Factor**

But by the 1950's another element was added to the engineer's problem. Not only must he modernize the Redwood Highway in almost impossible terrain and so design the route that it

*These roadside redwoods near an interchange just south of Santa Rosa are typical of the more than 5,000 redwoods planted by the Division of Highways along newly completed freeway sections of Highway 101 in Sonoma County. Trees in this photo were planted in 1959.*





Near Myers Flat, the new freeway carries the trucks and through traffic . . .

would stay in place during rainy winters with their sliding slopes and raging rivers, but he must now also think in terms of conserving the natural landscape. Increased mobility, increased leisure, increased wealth, added to greatly increased population and diminishing outdoor space, had made the magnificent Redwood groves of the Eel system more than ever a priceless heritage to pass on to generations to come.

Changing the Redwood Highway into a freeway was not a matter of ordinary realignment and improvement. It was a major project which could not expect to be completed for decades. It required the most careful and coordinated planning.

This was by no means a new concept with highway engineers. In 1912 the commission requested permission to buy 100 feet of redwoods on either side of the highway but funds could not be obtained. As early as the 1930's there were joint meetings between highway engineers and state park officials. Many small problems of realignment and improvement were dis-

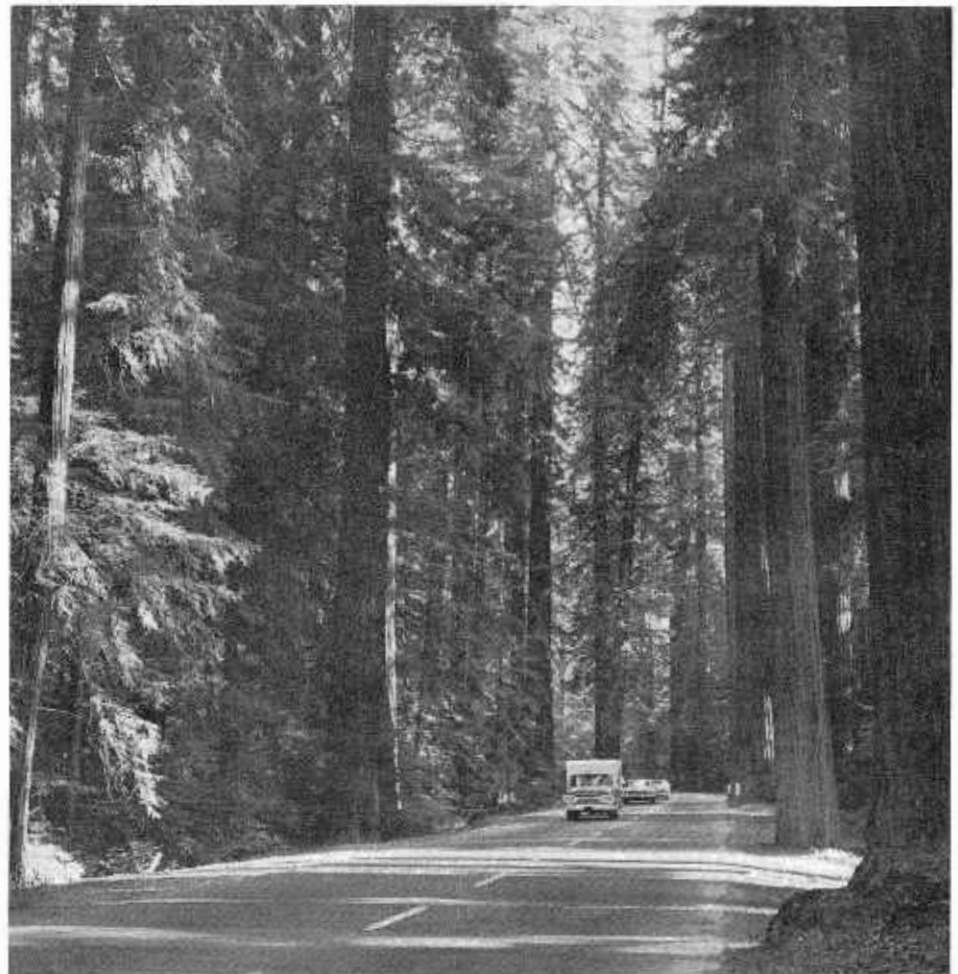
cussed and usually satisfactory solutions arrived at.

**"We Need Roads!"**

On the other side of the coin, the Humboldt *Times* was still carrying on the fight for roads in northwestern California. In November 1951, under a 42-point head saying "We need roads!" it pointed out that in the year of 1950 the "tortuous Redwood Highway carried more traffic than multi-lane Highway 99 to the east of us. Traffic counts so far in 1951 have continued to show large increases."

In 1951 also, the Redwood Empire Association made a direct request to the State Highway Commission asking that US 101 not be located outside the state park boundaries. They said Redwood Empire taxpayers were spending hundreds of thousands of dollars to attract tourists and that the road

. . . Thus leaving the Avenue of the Giants, the former route of 101 just across the Eel River, for the enjoyment of the more leisurely traveler.







Motorists negotiating this narrow viaduct built into the steep terrain in northern Mendocino County can't see the "1923" date on the structure, but it wouldn't surprise them.

should travel through the redwoods for the benefit of these tourists. At the same time this organization and others were pressing a perfectly understandable desire for safer roads throughout the entire Redwood Empire. Thus the engineering studies had to take into account demands from a dozen directions, in addition to coping with the problems of costs and terrain.

The southern end of the road in Marin County and Sonoma County had received considerable attention and expenditure by the early 1950's. Long sections of the route were already developed into four-lane expressways. Plans were going forward for converting them to full freeways. A number of sections such as the Ridgewood Summit area in the vicinity of Willits needed attention and plans went ahead for design and budgeting of realignment to improve vexing traffic problems. Today the

road from the Golden Gate Bridge as far north as Healdsburg is almost all full freeway.

#### Legislative Attention

In 1953 Assemblyman Frank P. Bellotti of Eureka introduced a bill which would give the Division of Highways an easement for a wider, more modern highway through the state park. Several senators from the northwest counties introduced a similar bill in the Senate. These bills aroused conservationists all over the United States and the ensuing publicity resulted in neither of the bills being reported out of committee.

Newton B. Drury, chief of the State Division of Beaches and Parks at that time, said that if the redwoods were "in any other part of the State the inhabitants would be guarding them with rifles." This statement was widely printed.



The highway skirts the Frank and Bessie Smiths Grove (formerly Lane's Redwood Flat) just south of the Mendocino-Humboldt county line.



Eventually a revised bill was passed granting a 25-foot easement.

In the meantime, all through the towns of the Northwest, women's groups, local government groups and taxpayers organizations continued to fight to make the highway safer. The outcome was a decision to remove about 15 large trees in the parks, which allowed the highway to be widened to 25 feet. Prior to this it had been as narrow as 16 feet in some places. Local residents complained there was scarcely room for a school bus and a truck to pass on many sections. One school principal remarked to the Highway Commission that his buses were often late because the drivers were constantly stopping to nail back on the trees the bark that the buses scraped off.

Eventually authorization was given to remove nine trees, for which the State Highway Commission voted \$14,000. These were trees less than 12 feet from the centerline of the highway, along a 13-mile section in the Humboldt Redwoods State Park near Dyerville. Of the nine trees approved for removal none were exceptionally large and several were relatively small. The later removal of six more trees was eliminated by redesign of a short section.

#### "Gratifying Unanimity"

On January 29, 1954, the *Ferndale Enterprise* printed a letter from Mr. Newton B. Drury, Chief of the Division of Beaches and Parks, in which Mr. Drury said "with minor exceptions the State Highway Commission and the State Park Commission achieved gratifying unanimity on three important points. Point 1 was the undesirability of widening the present U.S. 101 through Humboldt Redwood State Park for more than two lane widths (approximately 24 feet). Recognition of this is an important accomplishment.

"Point 2, the desirability of a main route bypassing the park redwood groves with ready access to such groves and to connect these along the present route by short side roads; such bypass routes to be suitable for a high standard freeway capable of accommodating future traffic with ease.

"There was some doubt expressed as to the cost of such a new freeway



PHOTO ABOVE—The main street of Willits still does double duty as a through highway and a local traffic and business artery. BELOW—This mountainside section near Garberville, with its typical string of cars, illustrates one type of terrain problem on the Redwood Highway.

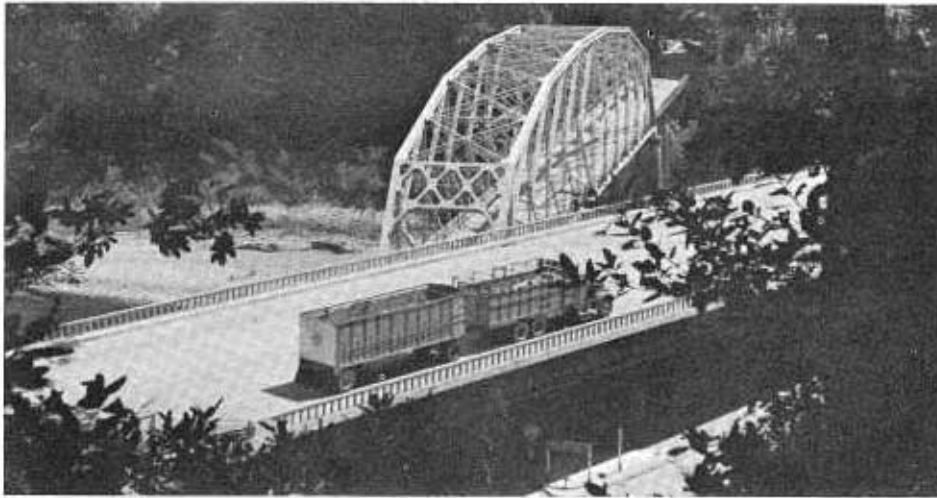
for both construction and maintenance; but we are confident that studies now being carried on will not show such extra cost for the bypass as to justify instead the sacrifice of the redwood parks by plowing a freeway through them.

"Point 3, the desirability, when the freeway bypassing the groves is built,

of the existing highway becoming a park road, maintained with park funds. It would then serve as a parkway, and be, even more than now, one of the famous scenic and recreation routes in America."

Mr. Drury went on to point out that the Department of Public Works was making a study of several pro-





The George Leatherwood Memorial Bridge, near the junction of the Eel River and its south fork south of Redcrest, serves through traffic while the old highway bridge now provides access to scenic redwood groves in Humboldt Redwoods State Park.



South of Eureka a section of freeway traverses the plain adjacent to Southern Humboldt Bay.



In a few locations there is a modern 4-lane highway along the ocean front, such as this short section near Wilson Creek in Del Norte County.

posed bypass routes. This proposal did not meet with approval of all concerned but the two agencies were in general agreement as to the future plans of the Redwood Highway through the Humboldt Redwoods and other redwood parks.

#### **Bypass Concept Not Clear**

An unfortunate circumstance in the mind of the public as a result of this conference was the supposition that a bypass would entail a wide sweep away from the parks. From an engineering viewpoint the costs involved would have been prohibitive, since the only suitable location for the Redwood Highway is in the South Fork Eel River Canyon. Hence, the road still, in some places, had to go through the edge of groves of redwoods. Despite this, costs were to be much higher and maintenance problems greatly increased by building the road on the sidehills instead of along the flats.

This confusion over the meaning of the word "bypass" was not limited to the conservationists who were trying to preserve the redwoods. The resort owners and other business people of the north coast area who depended on tourist traffic were dead set against the idea of a bypass. They wanted the highway retained as close to the trees as possible so that their value as a tourist attraction would not be lessened. They feared that a high-speed highway would carry the tourists far away from their places of business.

With all these conflicting attitudes, the Division of Highways, in the absence of any clear mandate from the state taxpayers, was reluctant to spend large sums of its funds to build the bypass, and preferred to continue with its studies until the situation was clarified. Assemblyman Belotti, however, was anxious to get the highway improved.

#### **Financing Proposal**

In 1955 he introduced a bill which provided that \$10,000,000 of State Parks' money from tideland oil royalties could be used to help finance construction of a redwood highway bypass approximately 23 miles long, in the Garberville-Humboldt Redwoods vicinity.



Aerial view of new freeway section just north of Ukiah, looking north along the Russian River valley toward Ridgewood Summit.

In return the Division of Beaches and Parks would get the old highway as a scenic route. No commercial traffic would be allowed on it except as necessary to service those activities within the park and it would be a scenic, slow-speed highway for tourists who wished to leisurely tour through the groves.

#### Bill Favored in North

Assemblyman Belotti's bill had considerable support from representatives of the north coast counties in the Legislature as well as from many private



The expressway crossing Ridgewood Summit replaced a tortuous bottleneck previously existing between Ukiah and Willits.

interests. To the people of the north coast country it represented a speed-up in the solution of their transportation problems. Relative to the discussions, Mr. Drury pointed out that if the bypass plan was not approved, placing the highway through the groves, it "would involve not the death of a few ancient big trees, but rather the wholesale removal of thousands of redwoods, including probably the virtual elimination of smaller groves."

Mr. Belotti's bill passed through the committees and through the Assembly and the Senate but it was vetoed by Governor Knight. The Governor felt the Division of Beaches and Parks did not have an adequate priority system and long-range policy on park projects at that time.

The 23-mile project was not dropped however, and District 1 continued making studies. Comprehensive traffic counts were made.

#### District Meeting Held

On February 8, 1956, a public meeting was held by the district engineer in Garberville to discuss the "lowline" and the "highline" routes. Approximately 44 miles, running from north of Pepperwood to south of Richardson Grove, were involved. Public opinion was strongly in favor of the lowline route.

At this meeting District Engineer Alan S. Hart said:

"The road will be at the cost of some trees, but most of them are at

some distance from the present road, which is intended to be preserved for its scenic beauty which will be unharmed.

"Between Sylvandale and Myers Flat about 400 'accountable trees' will have to be cut. Most of them are 30 inches or less; a few big ones run to a maximum of 6 feet, but no giants. And none of the trees to be felled are on the redwood flats which are scenically the most valuable" he asserted. "From Weott to Englewood about 2,000 trees are to go, most of them under 30 inches and none over 6 feet in diameter."

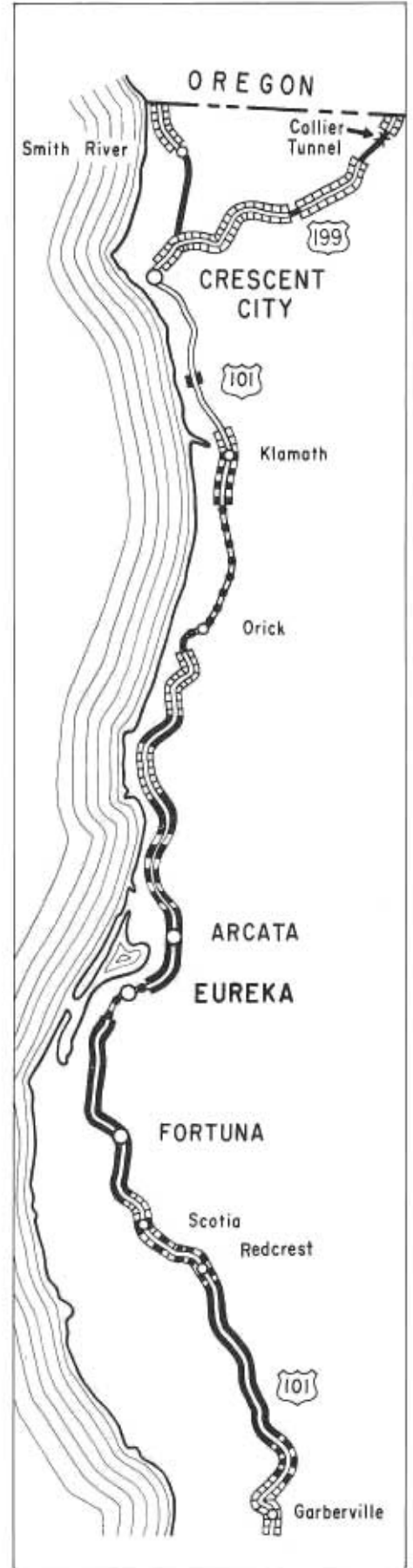
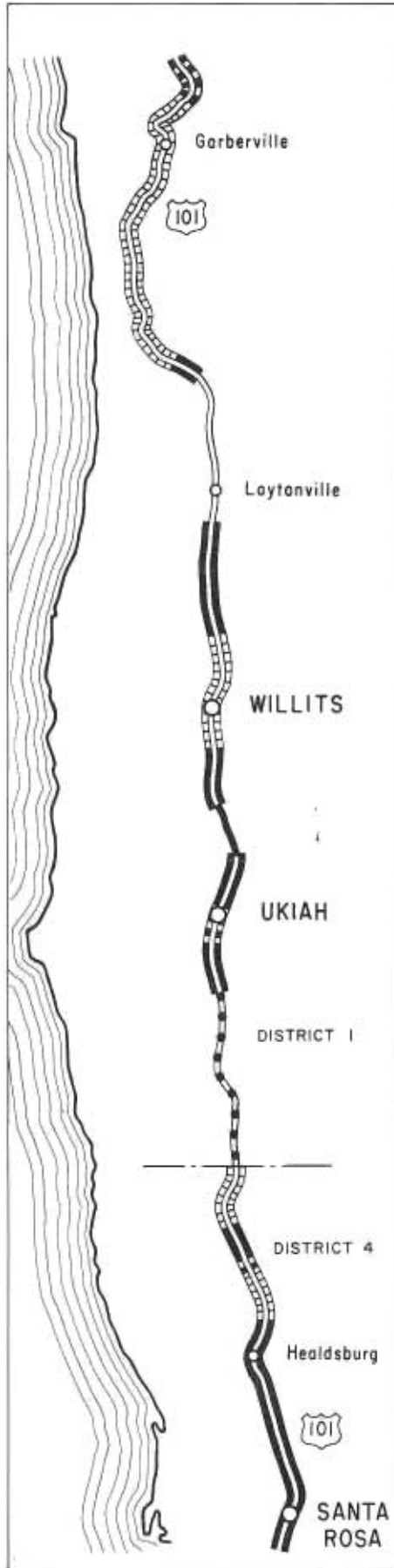
Plans for the new bypass were enthusiastically received in some quarters, in other quarters only tacitly agreed to, but there was no strong opposition. The main problem was finding the estimated \$36,000,000 needed at that time to build the route. Actual costs today have run much higher.

#### First Unit Funded

Assemblyman Belotti continued to work on variations to his plan, and finally managed a compromise on financing the first unit of the new route. In 1956, \$800,000 was contributed from the State Park Fund for acquisition and construction on the first unit of the Redwood Parks Freeway. Later another \$2,605,000 was contributed.

The first freeway stretch was between Dyerville and Englewood, a distance of 4.4 miles. Included was the





George M. Leatherwood Memorial Bridge, named for a highway engineer who had lost his life that same year in a helicopter accident while on aerial reconnaissance over US Highway 299 east of Blue Lake. (This crossing later was given a national award for steel bridge design.)

The contract was let for the 4.4 miles of construction in February, 1957, at a total construction cost of \$6,700,000. This was the beginning of the Redwood Parks Freeway.

As further funds became available additional units have been added to this freeway unit bypassing the redwoods until 22.5 miles are now finished. This includes a new 5.7-mile section from Sylvandale to Maple Hills Road which was opened in October 1964 (see maps herewith).

#### Old Route Preserved

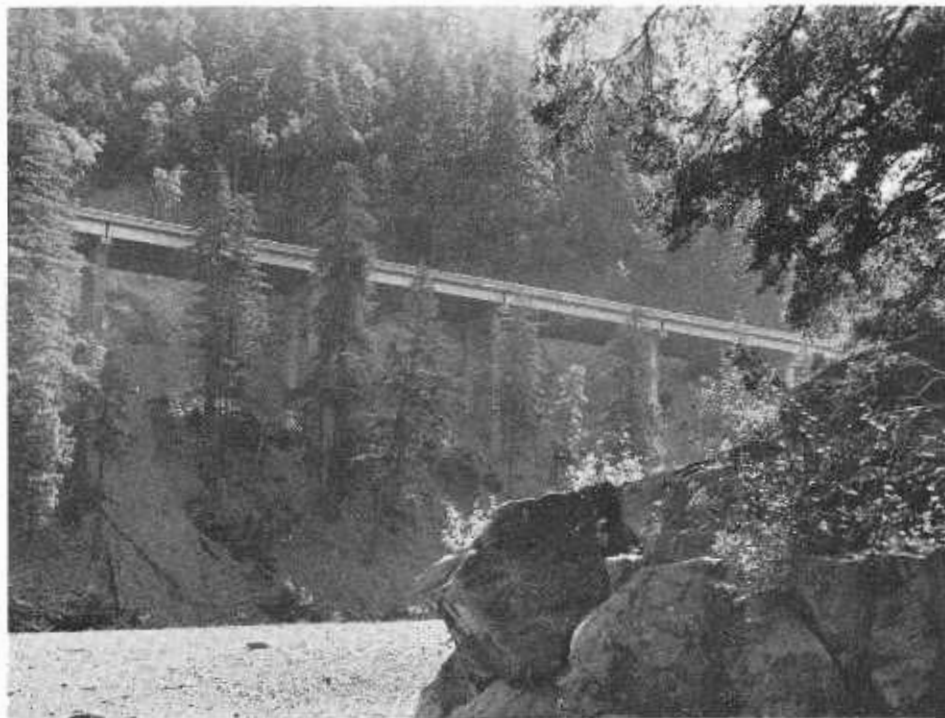
As the increasing length of freeway has been opened to traffic a long section of the old route has been incorporated into the Humboldt Redwoods State Park, now totaling 24 miles. This is used exclusively by sightseers and tourists. However, subsequent legislation has eliminated the concept of making this a state park highway and it is included now as part of the state highway system. The route is signed "Avenue of the Giants."

Route adoption studies have been completed for all other areas where redwood groves are involved with the exception of Prairie Creek Redwoods State Park and Del Norte Coast Redwoods State Park. These parks are located on US 101 south of Crescent City.

One of these sections, involving Prairie Creek Redwoods State Park, has regrettably become the subject of widespread misunderstanding and controversy during the course of the studies, which are not yet complete.

#### Problem Solved

Inasmuch as the freeway has been virtually completed through the Humboldt Redwoods area with the practical arrangement of the freeway for through traffic and retention of the "Avenue of the Giants" for sightseers and tourists, this section is no longer controversial. Construction has, except in one or two cases, avoided the



Eagle Point Viaduct, south of Myers Flat, dramatically illustrates an engineering decision which resulted in complete avoidance of a reduced grove.

groves and either followed the side-hills above the big trees or used the other side of the river, with generous use of bridges.

The Eagle Point Viaduct, for instance, south of Myers Flat, had to be built at considerable cost to carry the road on the west side of the river along a very steep slope. Had the engineers been determined to "cut a swath through the redwoods," they could have built this six-mile section at considerably less than its ultimate cost of one million dollars per mile, by following the river flats through the groves. (See page 24.)

There are three redwood parks through which the Redwood Highway passes north of Eureka. These are, from north to south, Jedediah Smith Redwoods State Park, Del Norte Coast Redwoods State Park, and Prairie Creek Redwoods State Park. At Del Norte Coast Redwoods any new alignment most probably will avoid the trees completely. Jedediah Smith and Prairie Creek have been much in the news recently.

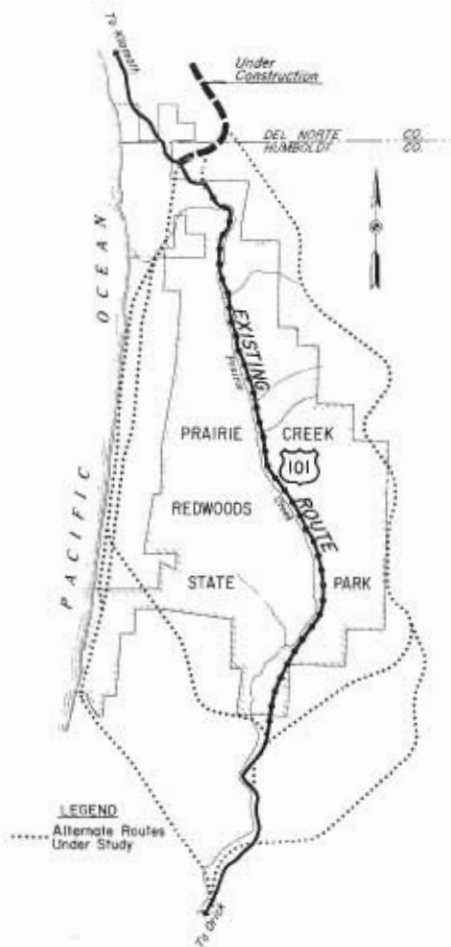
#### Endorsed by Park Officials

Jedediah Smith has had considerable publicity because of reports of a "freeway to be cut through the National

Tribute Grove," although the route adopted was agreed to and even endorsed by the State Division of Beaches and Parks. Actually, the route passes from one-third of a mile to one mile north of the north limit of the National Tribute Grove.







The realignment admittedly will take out some redwoods. This is necessary because a section of the park extends northward across *any* feasible route (see map). To avoid this narrow neck of the park completely would cost several millions of dollars additional and take traffic many miles out of direction.

About 40 miles south of Jedediah Smith, approximately halfway between Crescent City and Eureka, is Prairie Creek Redwoods State Park. The selection of a freeway route in the vicinity of this park has had the most publicity, much of it unfavorable to highway engineers who are trying to seek a solution to the problem. The problem is not simple.

#### Prairie Creek Alternates

Four possible routes for the highway are theoretically under consideration, including the present road which goes through the middle of the park

where the Division of Highways owns a wide right-of-way including more than 1,000 fine redwoods within it. Although widening of the existing road through the park would cost several million dollars less to construct, and would provide the best traffic service, it would have the greatest effect on park values and is not being considered for recommendation to the Highway Commission.

#### Not Through Groves

One of the alternate routes goes along the beach at the base of the bluffs to the west of the park proper. Currently the 3.5 miles of beach required for such a freeway is privately owned, contrary to popular belief, although the Division of Beaches and Parks has indicated it plans to buy this land to add to the park.

Another possibility is a route along the top of the same bluffs. Neither of these routes goes through redwood groves on park land except along the westerly fringe of the park at its very northerly end.

Since the route along the top of the bluffs would require large cuts and fills and would require bridging of several ravines and scenic Fern Canyon, major attention has been focused on the beach route and on an alignment generally east of the park for which a study was requested by the Division of Beaches and Parks.

#### No "Threat" to Redwoods

The discussions over Prairie Creek are still going on. Just as in 1953, the "threat" to the redwoods has become

a *cause célèbre*, interesting thousands of Americans and even individuals in foreign countries. However, contrary to popular belief, the Prairie Creek problem is not a threat to the redwoods. Any location eventually adopted, either to the west along the beach or to the east along the ridge, will require a minor number of smaller trees from the fringes of the park. Governor Edmund G. Brown has stated that any loss of trees to the park from highway construction should be replaced by acquisition, with highway funds, of a like number of privately owned trees. There are thousands of redwood trees on privately owned land immediately adjacent to the park boundaries which can be acquired and added to the park.

The route through Jedediah Smith Park will take only 35 acres, out of this 9,539-acre park. None of the routes under consideration in Prairie Creek would take more than 30 acres of redwoods from this 10,286-acre park. Privately owned trees immediately adjacent to these parks are available as replacement in kind. It is hardly likely any acreage at all will be taken from the undeveloped 5,932 acres of Del Norte Redwoods State Park. It is not probable that in the foreseeable future it will be necessary to consider realignment of any highway in any redwood park except those already discussed.

#### Conclusion

Summing up the story of the Redwood Highway, these facts are evi-



A driftwood-laden beach and Freshwater Lagoon flank the Redwood Highway south of Orick.



The southern end of the Redwood Highway is the Golden Gate Bridge, shown here with the new vista point in Marin County in foreground and a portion of San Francisco in background.

dent. The terrain through which any route must go is as difficult as there is in the world, and the very rainy winters and unconsolidated materials make highway maintenance almost impossible except when extremely expensive construction techniques are employed.

Because of the difficult terrain and the early dependence upon water transportation, road building in the north coast regions has lagged badly, and the inhabitants of the area have suffered as a result. Although traffic counts are as high or higher on the Redwood Highway than on many other main trunk routes in the State, much of its alignment is still based on surveys 50 years old. Traffic problems are particularly aggravated in the summer months when the logging and vacation traffic reach their peaks simultaneously. The district engineer in Eureka estimates it will cost, at present prices, \$340,000,000 to bring to modern standards that portion of the Redwood Highway in his district, namely from the Oregon border to the Mendocino-Sonoma county line.

#### Travel Time Reduced

Nevertheless, progress is being made. From the results of a study made a few months ago, a San Francisco newspaper reported a short time back that the travel time between San

Francisco and Eureka had been cut from eight hours in 1953 to six hours in 1963.

The so-called threat to Jedediah Smith State Park is greatly exaggerated, since the highway is across the river, away from the major portion of the park. Construction has already been completed through the major redwood park, Humboldt Redwoods,

creating a safe, high-speed bypass route with the old route preserved as a tourist route. No more routes remain to be adopted except, as noted, at Prairie Creek and Del Norte Redwoods.

The total acreage taken and to be taken for highway through the redwood preserves is on the order of four-tenths of 1 percent of the total redwood preserves owned by the State. Today, these total more than 68,000 acres, many of them undeveloped for public use. More park acreage is still being acquired. In addition, the federal government owns many thousand acres of redwoods, with an additional great acreage owned by private interests.

The few hundred acres taken and to be taken for modernizing the Redwood Highway represent no threat to this great acreage. They do represent tremendous economic advantage to the route's users. More important, the greatly reduced accident rate on the new sections promises escape from crippling injury and death for hundreds of citizens of California as well as our guests from other states and countries.



The northern end of the highway is in the vicinity of the Oregon line, where the Collier Tunnel and its realigned approach (above) has made travel faster and safer between Crescent City and Grants Pass.



# Eagle Point

*Freeway Construction Requires Bridging of Steep Sidehill*

By LOWELL C. ALLEN and OSTAP BENDER, Associate Bridge Engineers



A bold and imaginative routing of the Redwood Park Freeway (US 101) required bridging of a precipitous sidehill area with minimum damage to the natural scenic

beauty of existing redwood trees. The Eagle Point Viaduct, near Myers Flat, appears to cling tenaciously to the terrain as it provides the motorist with an unusual view of the redwoods from a vantage point 100 feet above the South Fork of the Eel River.

Usual methods of construction would have required massive excavation for footings and were not practicable in this terrain. The supporting columns were extended approximately 40 feet below ground surface to a foundation in rock.

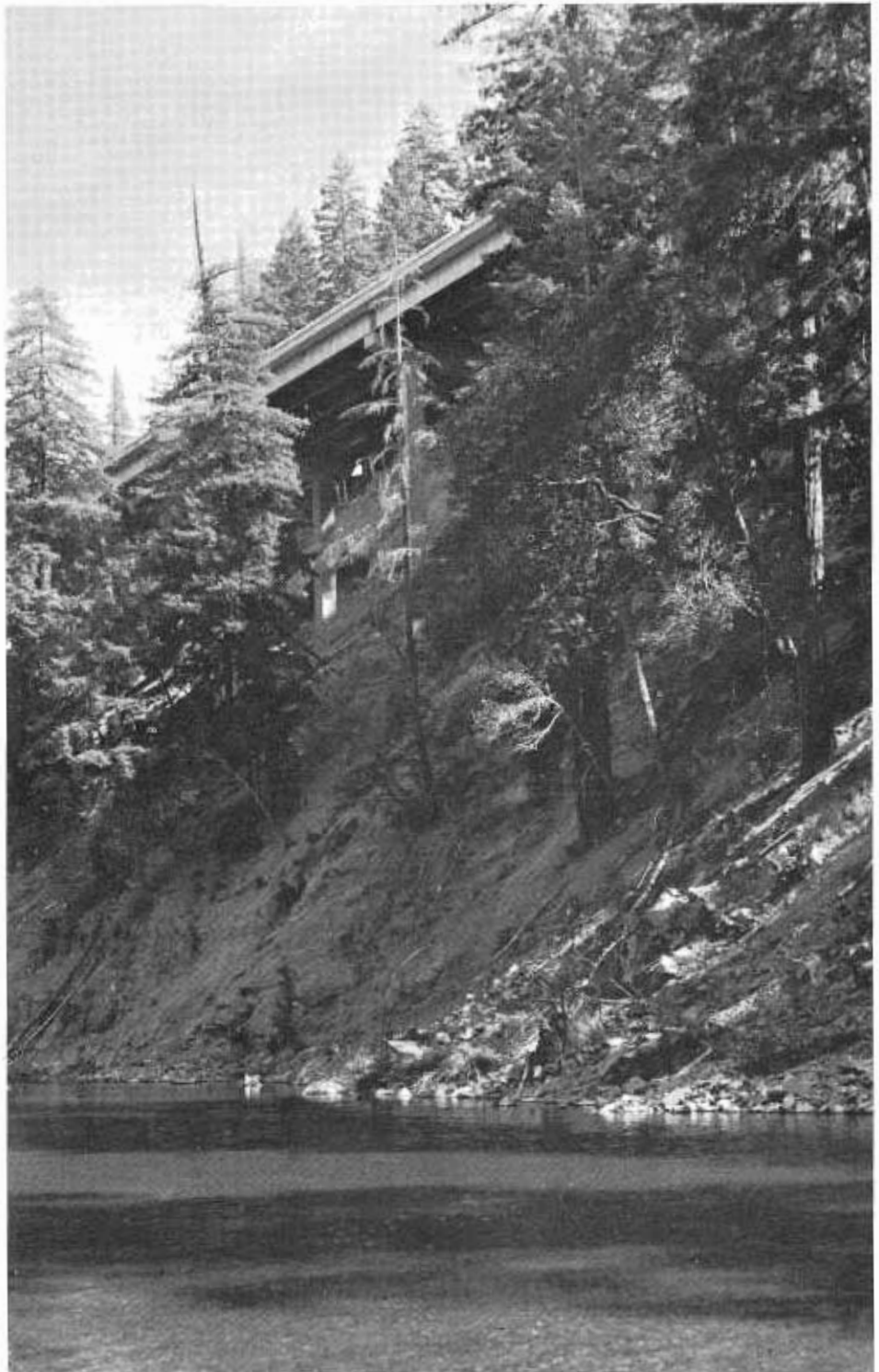
Uphill foundation shafts were excavated with a rotary drilling rig through the overburden and rock excavation was completed by hand mining. The foundation subcontractor used  $\frac{1}{2}$  inch telescoping circular sleeves in 10-foot lengths to shore the drilled holes. Log crib supports for the drilling rigs were used as shown in an accompanying photograph.

#### **Shaft Excavation**

Most of the downhill foundation shafts were completely excavated by hand labor mining methods. The excavations were shored with timbers similar to vertical mine shaft operations, and chain link fencing was used to retain material between the timbers.

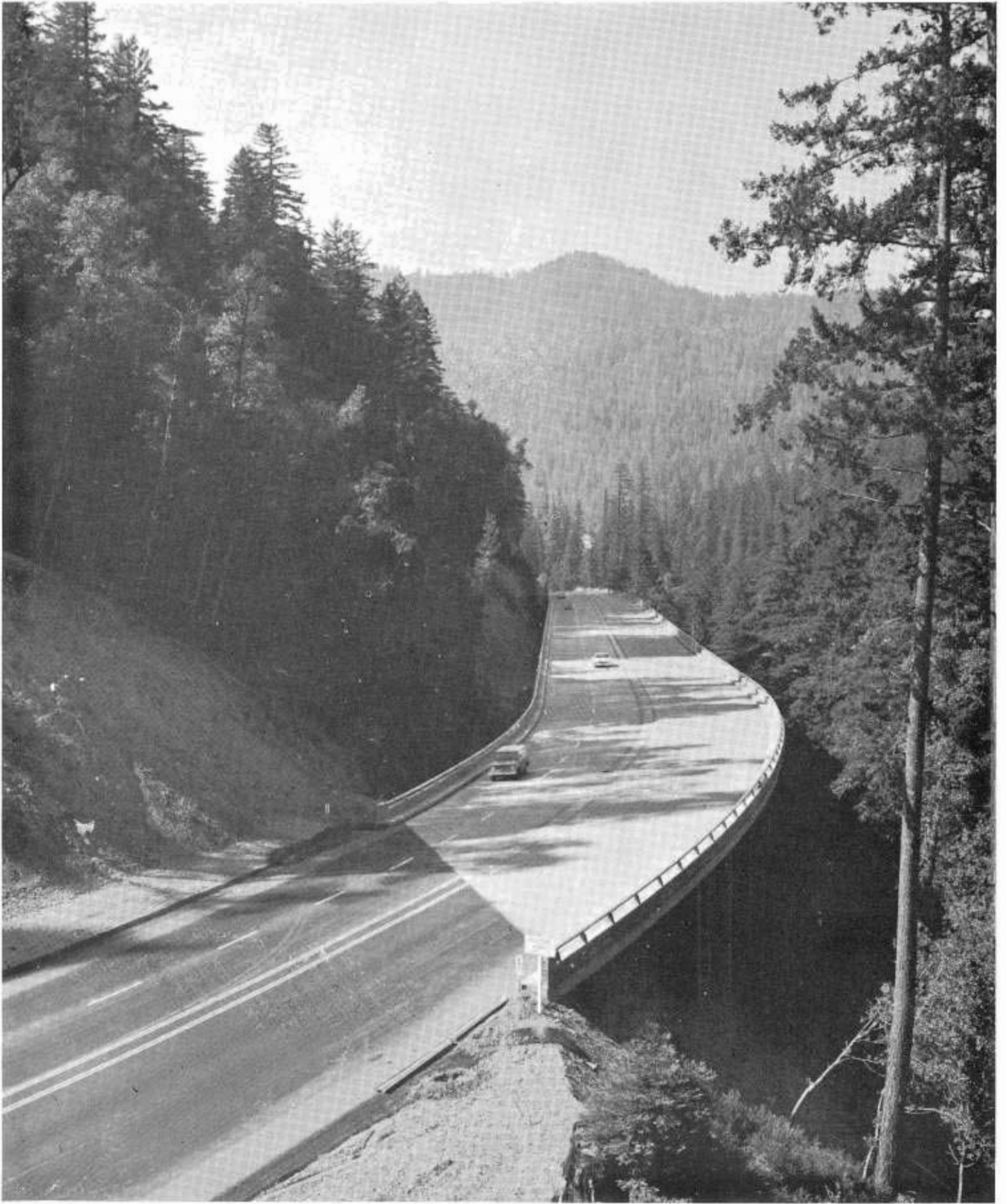
Excavated material was lifted to the surface by an air driven winch and stockpiled for later removal by clamshell. Trees downhill from the construction were wrapped as protection against stray rocks which escaped the careful stockpiling operations.

The foundation shafts were reinforced and concrete placed against original ground for the entire depth



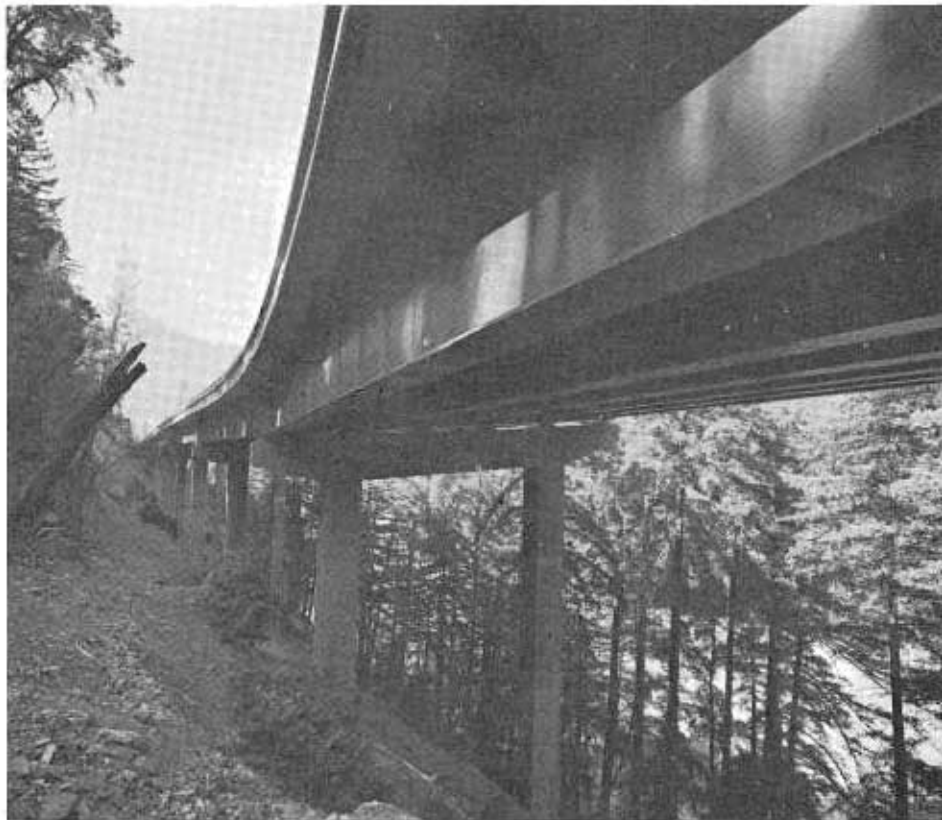
*The Eagle Point Viaduct on US 101 near Myers Flat follows precipitous sidehill terrain providing the motorist with an unusual view of the redwoods from a vantage point 100 feet above the South Fork of the Eel River.*





*The new Eagle Point Viaduct looking southward. The structure was built with minimum damage to the natural scenic beauty of surrounding redwood trees.*





Supporting columns for the viaduct were extended approximately 40 feet underground to a foundation in rock.



A rotary drill rig excavates for uphill shafts of the viaduct while supported on log cribbing.

using conventional methods. Equipment operated from the one-lane construction road which had been benched into the sidehill.

The two-column bents vary in height from 25 feet to 60 feet above the ground. The columns are five feet square, solid below ground and hollow above, and the bent cap is five feet wide and six feet deep.

#### Choice of Girders

Superstructure steel girders were placed with a crane which had to work in the narrow confinement of the construction road. The choice of welded steel girders was made after many studies of different structural types, span lengths, girder depth and girder spacing were completed with the assistance of the electronic computer. For the special conditions at this difficult site the welded girder bridge selected was about 8 percent cheaper than competing types.

#### Has 11 Spans

The structure consists of 11 spans of 110 feet in addition to shorter slab approach spans and a special retaining wall where the structure slices through a projecting point of the sidehill.

Total cost of the structure was \$1,028,000. This represents a cost of \$13.10 per square foot of structure and is extremely economical for a structure at this difficult site.

Ball and Simpson were general contractors with Ira Alderson as structure superintendent. P. & Z. Company was foundation subcontractor with Bob Cook as superintendent.

H. W. Benedict was resident engineer for District I. Lowell C. Allen was Bridge Department representative on construction and Ostap Bender design engineer.

#### SAN DIEGO FREEWAY

The State Department of Public Works has awarded a \$6,384,000 contract for constructing 4.2 miles of eight-lane freeway on the San Diego Freeway (Interstate 5) in Rose Canyon on new alignment between 0.1 mile and 4.3 miles north of Balboa Avenue in San Diego.



# W-X Street Bridge

By R. N. BRINK, Resident Engineer



DISTRICT  
III

The first stage of construction of a new bridge across the Sacramento River started when a \$1,148,000 contract for three huge river piers was approved on January 25, 1963. The

bridge is located about one mile downstream from the Tower bridge in Sacramento and is a portion of Interstate 80 Freeway which will pass east-west through part of the City of Sacramento between W and X Streets,

## Work, Plans Move Ahead on Capital's Freeways

The W-X Street Bridge forms an integral part of the fast-evolving Sacramento freeway system. What is the present status of this system?

First, on Interstate 80 (old U.S. 40), which will pass eastward through the city via the bridge and W-X Street to 29th-30th Street and then north along 29th-30th to connect with the south end of the existing Elvas Freeway:

Work recently started on the superstructure of the bridge includes a mile

of freeway approaches at either end from Jefferson Boulevard in Yolo County to Fifth Street in Sacramento. Total cost: \$15,000,000.

This section of Interstate 80 including the bridge should be open to traffic by late 1966 or early 1967.

Bids for an interchange in the Westacre Road-Jefferson Boulevard area will be advertised later this year at an estimated cost of \$3,000,000.

... Continued on page 32



Early construction stage at the Yolo County side. Two large derrick barges lower a 64-ton steel water system inside the sheet pile cofferdam. A raft of timber foundation piles is in the foreground.

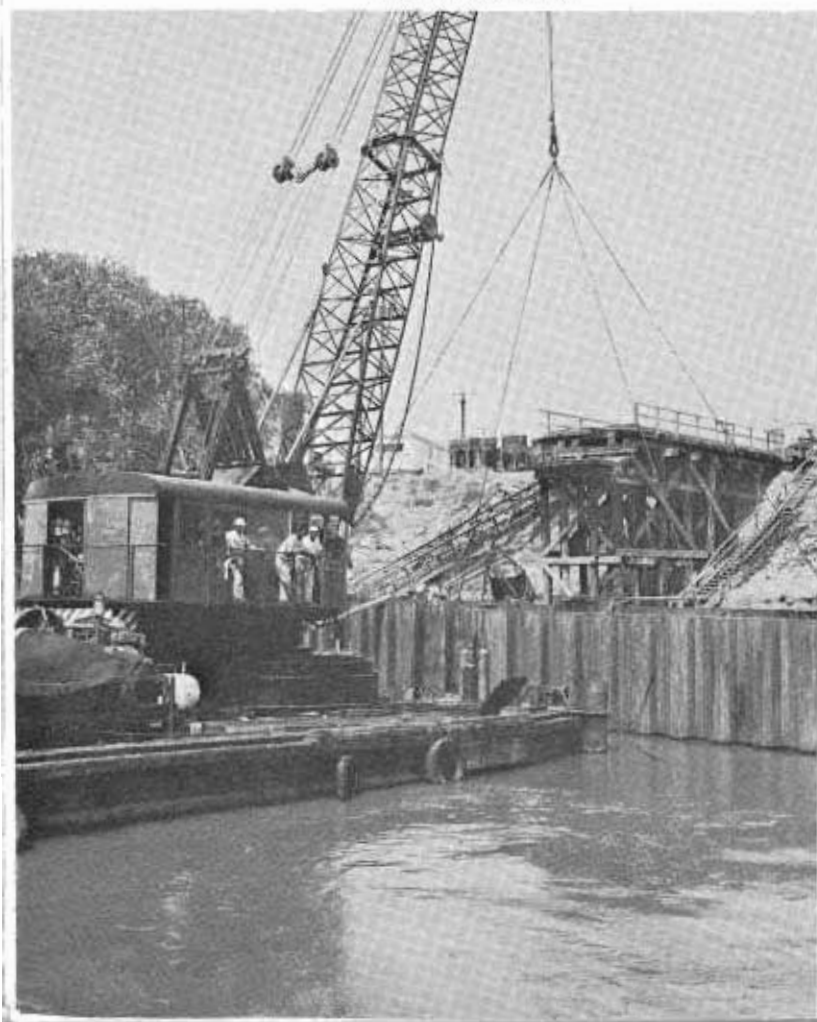


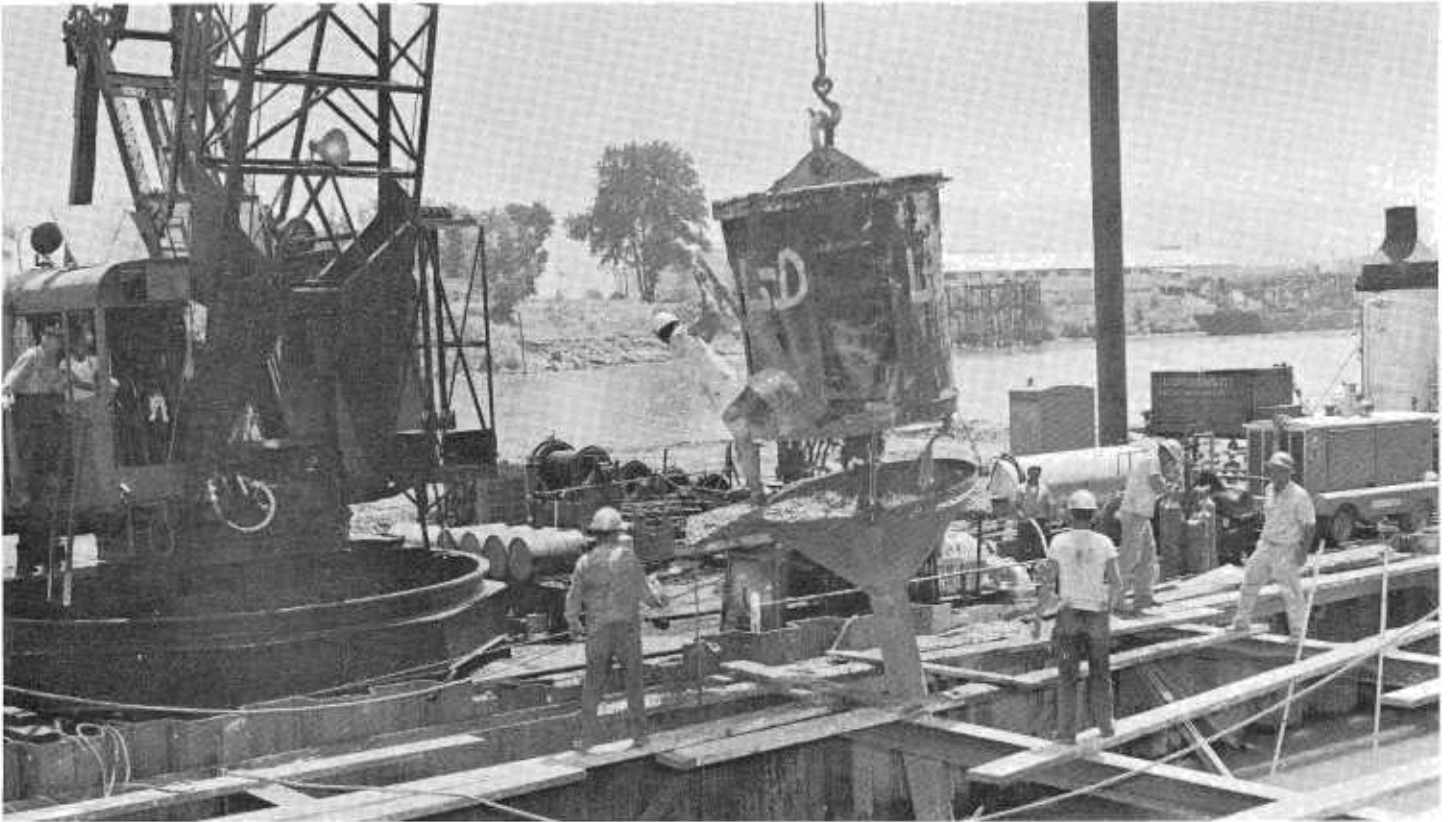


PHOTO ABOVE—Final stages of closing the sheet pile cofferdam (Sacramento side of the river). PHOTO BELOW—One of two large derrick barges lowers a 64-ton water system.

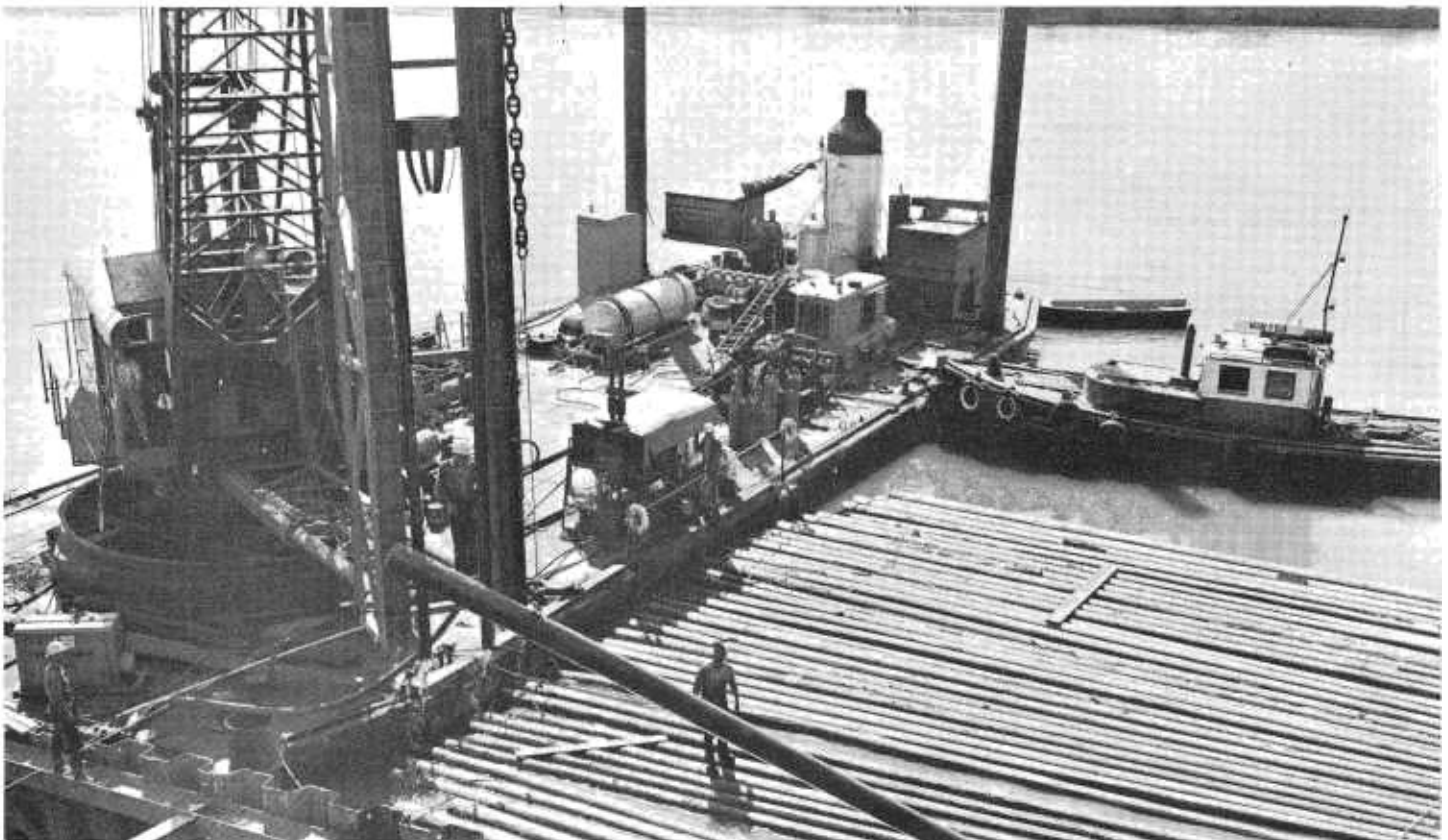


PHOTO ABOVE—An underwater hammer used for driving foundation piles to 35 tons of bearing value per pile. PHOTO BELOW—Driving 50-foot timber piles with underwater hammer.





*Pouring tremie seal concrete. Concrete is deposited 20 feet underwater through the tube with the funnel-shaped top. Flow of concrete through the tube is regulated by raising and lowering the entire assembly shown.*

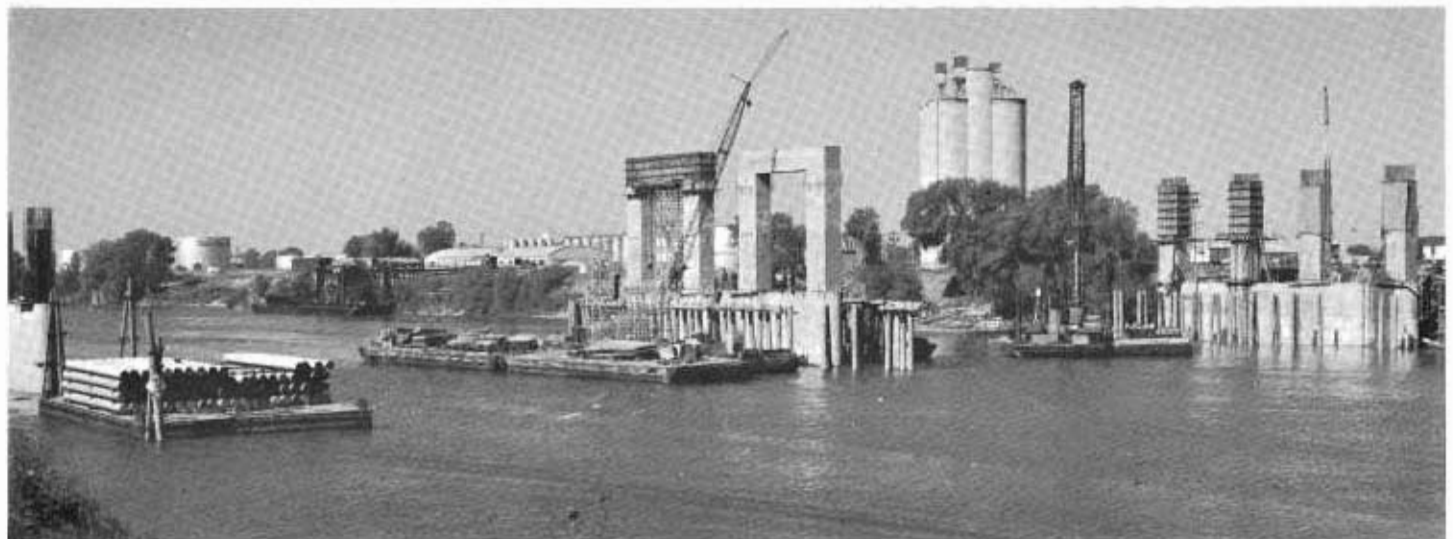


*One of the 300 timber piles for each pier is hoisted for driving at the pier on the Yolo side of the river.*





PHOTO ABOVE—Final stages of pier construction. At Pier No. 1 (background) rock riprap is being placed. Center pier is complete except for treated timber sheeting being placed at the near side. At Pier No. 3 (foreground) the fender system is being constructed. Photo by Sacramento Bee. PHOTO BELOW—Looking downstream and across the Sacramento River to Yolo County at the nearly completed substructure of the bridge.



and connect with US 50 at 29th and 30th Streets.

The completed structure will consist of two fixed parallel bridges which will provide for four lanes of traffic in each direction with no bridge openings to delay highway traffic. Exhaustive preliminary studies were made to determine the vertical clearance necessary for river traffic and the figure which was finally agreed upon by all parties concerned is 55 feet above flood plane. This is the absolute minimum at the haunched portions of girders and will increase to about 59 feet at the center of the main river channel. These figures are based on a flood plane at elevation 31.0; however, the average low water for about eight or nine months of the year is at elevation 5.0, which means that approximately 85 feet maximum vertical clearance will be available to river traffic during low water conditions.

#### Timber Pile Supports

Each of the three river piers are supported by 300 untreated timber piles. The piles were jetted to a tip elevation of -45 and then driven another 15 to 20 feet to a specified bearing value of 35 tons.

Two different sequences of operation were used in placing cofferdams for the piers. The first, used at Piers No. 1 and No. 3, was to drive the sheet pile, excavate to required depth,

and drive the foundation piles inside the cofferdam. The second method used at the center pier, was to excavate a "glory hole" to required depth, drive foundation piles, and then place a sheet pile cofferdam around the foundation piles. Some drifting of sand and silt into the "glory hole" was experienced before the sheet piles were placed, but it was readily removed with an airlift pump.

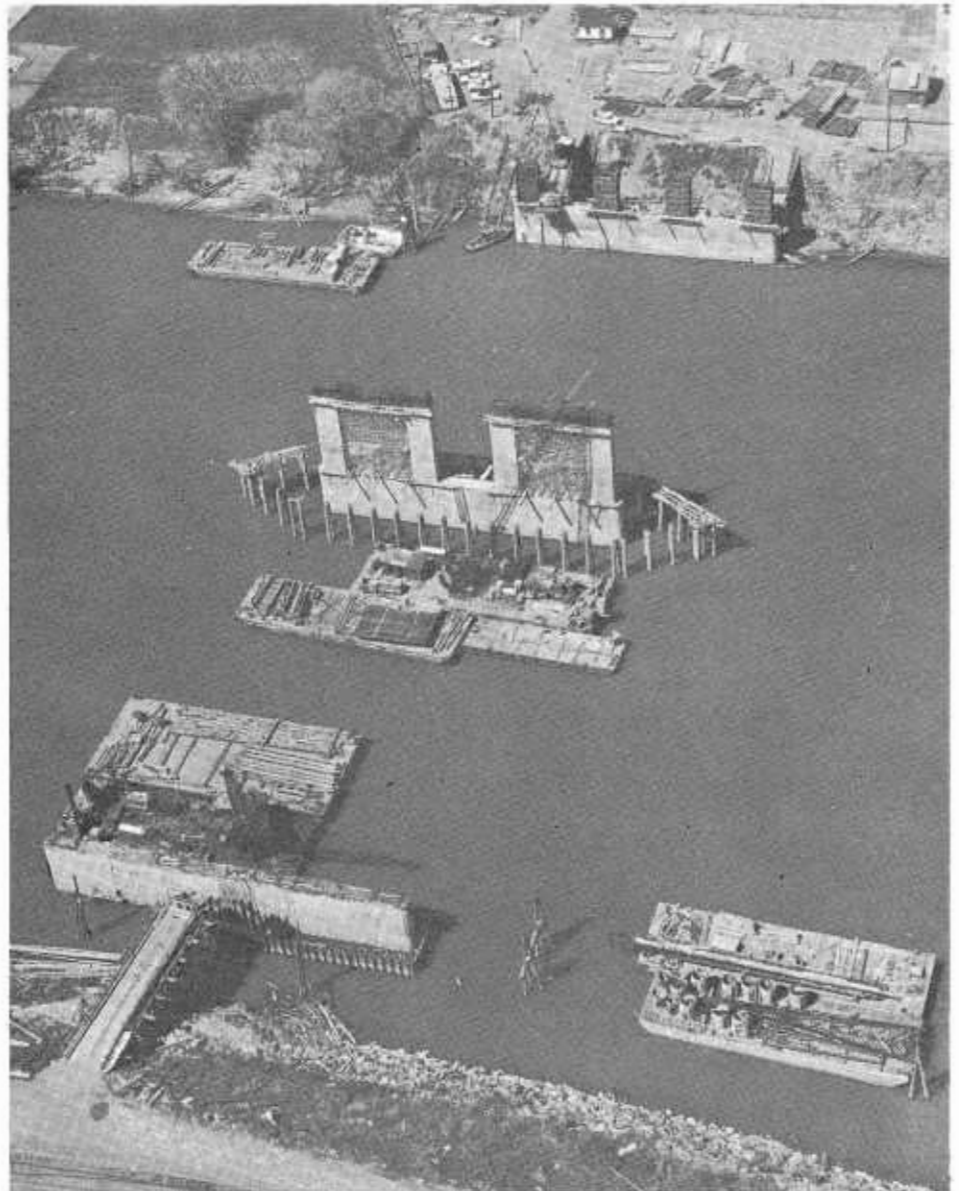
#### Seal Is Poured

Succeeding operations, in order, consisted of pouring a four-foot tremie seal 23 to 27 feet below water and around the foundation piles, pumping water from inside the cofferdam, and completing the remainder of the work (reinforced concrete footing and pier walls) in the dry. Wet sand mixed with coarse sawdust and small wood shavings proved very successful for sealing leaks in the sheet pile interlocks. One six-inch pump kept the 30' x 165' cofferdam dry.

Survey controls were established on dolphin piles driven upstream and downstream from the piers. A tag line was used for positioning the cofferdam frame and sheet piling. Prior to this operation, the tag line (so named because metal tags were attached to the line for pile markers) had been used for establishing excavation limits and exact pile spacing. When the sheet piles were driven to final depth accurate survey controls were then transferred to the steel cofferdam.

#### Major Items of Work

Major items of work involved in constructing the three river piers consisted of 906 timber piles approximately 50 feet long; 200 precast, prestressed concrete piling 62 feet long; 9,000 cubic yards of class A concrete; 650 tons of reinforcing steel; 110 thousand feet board measure treated timber sheathing; 8,000 tons of rock slope protection; and a navigation lighting system. The work was performed under a joint venture contract by Fruin-Colnon Contracting Company of Burlingame and LeBoeuf Dougherty Contracting Company of Richmond. W. E. DeRousse was su-



Early stages of pier construction. At Pier No. 1 (background) forms are being started for the column shaft. At Pier No. 2 (center) cap construction is underway and fender work started which involves driving concrete piles. At Pier No. 3 (foreground) the lower section is completed and the sheet pile cofferdam being removed. Photo by Sacramento Bee.

perintendent for the contractor and R. N. Brink was resident engineer.

#### Superstructure Contract

On July 22, 1964, bids were opened for the superstructure contract, which, when completed, will extend from Jefferson Boulevard in West Sacramento to Fifth Street in Sacramento. The successful bidder was Kaiser Steel Company with a bid of \$12,700,142.50. P. G. O'Halloran is resident engineer.

This superstructure contract is the largest single unit of highway work to be undertaken in the entire metropoli-

tan area of Sacramento. The extent of the project is reflected in the following major items of work involved:

16,275	cubic yards structure excavation
334,700	linear feet concrete piling (class 1)
4,482	driving piles
54,100	cubic yards class A concrete
13,825,000	pounds bar reinforcing steel
4,360,000	pounds structural steel (A-36)
30,085,000	pounds structural steel (A-441)

The bridge contract will be completed within two years and will alleviate much of the traffic "bottleneck" now being experienced at the Tower bridge entrance to Sacramento.



## Work, Plans Move

Continued from page 27 . . .

Construction on Interstate 80 from Fifth Street to 29th-30th Street will start next year.

The section between W-X Street and the Elvas Freeway is under construction and will be completed in 1966.

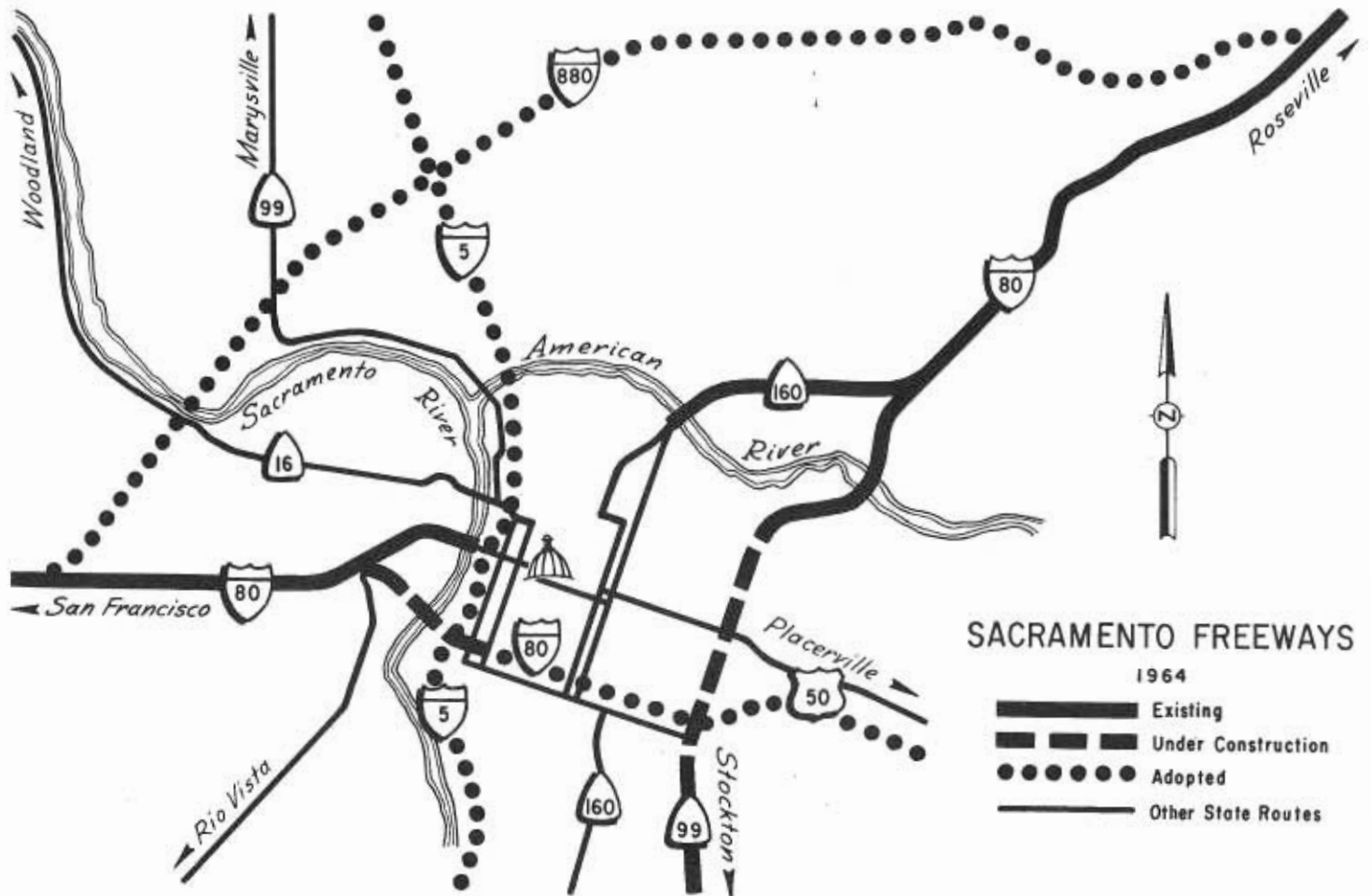
On Interstate 5, which will run north-south through Sacramento in the vicinity of Second and Third Streets:

The north half, from J Street to the American River, is tentatively scheduled for bids in 1966 at a cost of \$11,000,000. Construction will take about two years.

The south portion from J Street to Broadway will probably go to bids in 1967. It will cost around \$21,000,000 and will take two or three years to build. Construction of a Capitol Mall underpass, which will form part of this unit, will get underway soon at a cost of \$1,000,000.



An aerial photo of Sacramento with the freeway routes shown by white lines: W-X Street (Interstate 80) right; 29th-30th Street (Interstate 80 and State Route 99) background; and 2d-3d Street (Interstate 5) foreground.



# Interstate 280

*Design of New Freeway  
Stresses Aesthetics*

By R. A. HAYLER, Deputy District Engineer



The world's most beautiful freeway!

That's the description the residents of the San Francisco Bay area would like to see applied to the new Interstate

Route 280, known locally as the "Junipero Serra" Freeway. And the design engineers of the California Division of Highways are making every effort to oblige them—always keeping in mind the two key words: aesthetics and cooperation. This freeway tra-

verses the foothills of the Peninsula between San Jose and San Francisco.

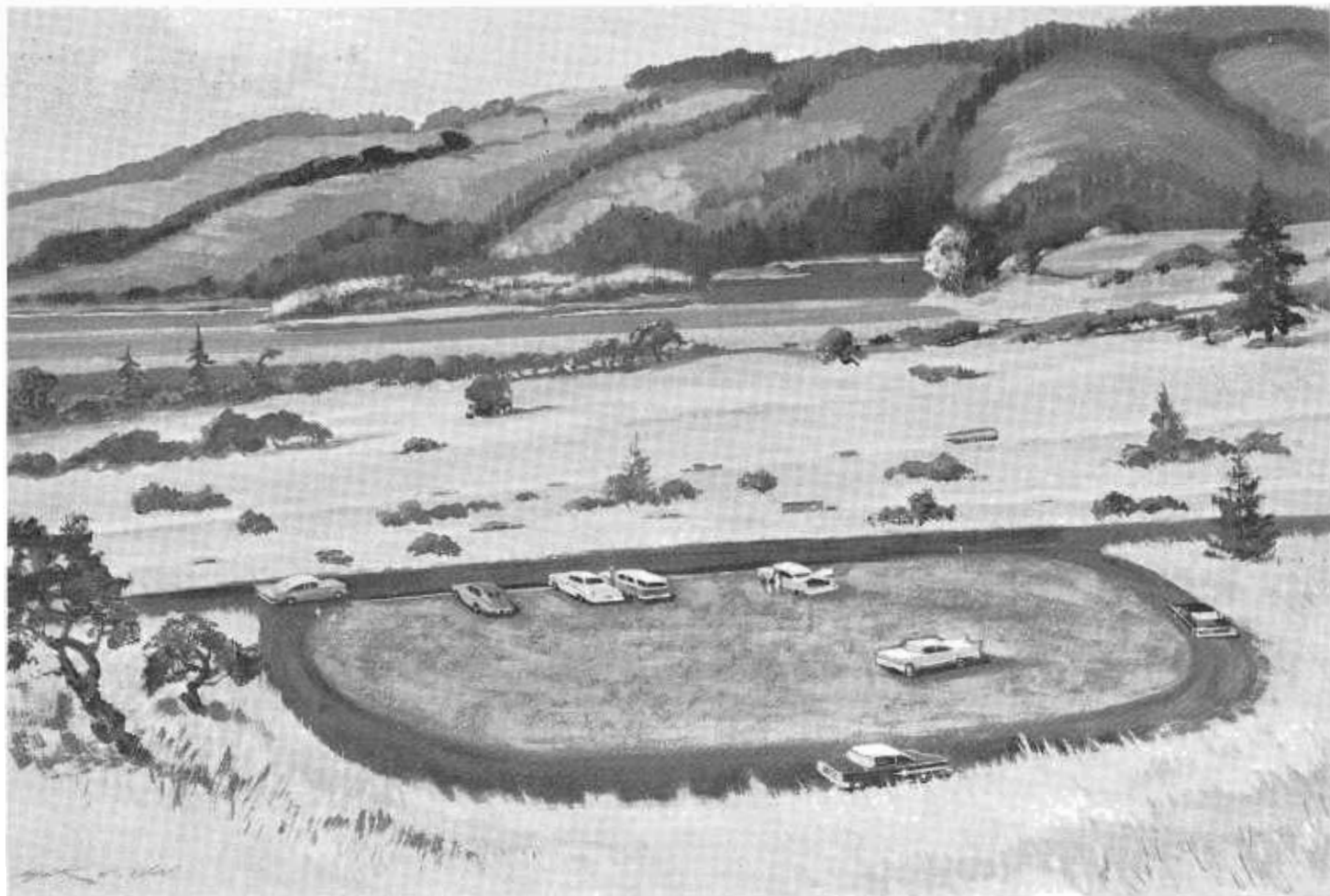
The conception and design of this freeway has truly been a cooperative effort on the part of all concerned. The bridge and highway design engineers of the California Division of Highways have had the problem of designing aesthetics into the route and still meeting the requirements of geometric and structural standards, reasonable cost, and approval of the local citizens.

The U.S. Bureau of Public Roads, which will administer the expenditure of some 92 percent of the \$157,500,000 total cost of this new interstate

freeway, has agreed that reasonable additional costs over those normally allowed may be incurred to provide split-level design, independent roadways, and other techniques of aesthetic treatment. Construction costs on this 50 miles of 6-, 8-, and 10-lane freeway will amount to \$100,000,000, with the balance going to right-of-way acquisition.

#### **Emphasis on Aesthetics**

The increasing emphasis which the Bureau of Public Roads is placing on aesthetics in highway location and design is revealed in a circular memorandum from Federal Highway Adminis-



View looking southwest from Vista Point shows the sparkling waters of Crystal Springs Reservoir and the forested slopes of Cahill Ridge beyond in this artist's rendition.



trator Rex M. Whitton to engineers of the bureau dated March 1, 1963.

He urged them to "give conscious thought to insuring more than ever the pleasing appearance of our highways. . . . Fit the highway to the landscape—take advantage of the topography, wherever economically feasible, to have separate alignments and profiles for each one-way roadway—streamline the cross sections—use judicious planting for the prevention of soil erosion, the joining of the slopes with roadside native growth, and to possibly act as a buffer for noise and sight control—and design structures, small and large, so that they have architectural excellence." Such miscellaneous structures as walls, fencing, guardrails, and signs should also receive that extra touch of consideration which will add to the appearance of the highway, he said.

"I am sure that with proper attention to all of the other steps in the development of highways that this extra effort in insuring pleasing appearance will add greatly to a highway system of which we can all be proud," concluded Mr. Whitton.

The *Planning Manual* of the California Division of Highways urges the consideration of aesthetic factors in the planning and design process in this manner. "Scenic values must be considered along with safety, utility, economy, and all the other factors considered in planning and design. This is particularly true of the many portions of the state highway system situated in areas of natural beauty. . . . Economy consistent with traffic needs will always be of paramount importance, although a reasonable additional expenditure can be justified to enhance the beauty of the highway itself."

It goes on to mention such aesthetic factors as:

1. Location to preserve the natural environment and lead to and unfold scenic positions.
2. Fitting the general alignment and profile of the highway to the area traversed.
3. Curvilinear alignment.
4. Gently rolling profile.
5. Timber screens.

6. Selective clearing to open up scenic vistas.
7. Wide medians.
8. Independent roadways.
9. Flattened slopes.

"Structures should be located and designed to give the most pleasing appearance, planting should be in harmony with the surroundings, and interchange areas should be graded to provide an expanse of naturalistic easy flowing contours, enhanced by planting cover appropriate to the locality."

#### Intense Public Interest

The intense interest of the residents of the area in the location of Route 280 has been well demonstrated by the amply attended map displays and public hearings when the route adoption was being considered; many meetings between officials of San Francisco, San Mateo, Santa Clara Counties, the many cities affected and the Division of Highways; correspondence and discussions with such organizations as the California Roadside Council, the California Cycling Association, the Committee for Green Hills, local property owner organizations, and others.

The State Division of Beaches and Parks, the San Mateo County Park and Recreation Commission, the San Mateo County Horsemen's Association, and the Tri-County (San Francisco, San Mateo and Santa Clara) Committee for Freeway Beautification have presented ideas and information concerning their own particular interests in the area.

One group, formed in 1959 specifically to safeguard the preservation of the natural beauty of the area through which the freeway will pass, and to insure appropriate design standards for the Interstate Route 280 (Junipero Serra) Freeway, is named the Peninsula Highway Policy Committee. Composed of representatives of San Mateo, San Francisco and Santa Clara Counties and particularly planning staffs of the counties and the many cities situated in the three counties and also including a representative of Stanford University, it has held many meetings with officials of the Division of Highways in which plans, photographs and models were exhibited and

suggestions relating to highway aesthetics were offered.

#### Varied Terrain

This freeway route, much of which will be built on new alignment along the 50 miles from San Francisco to San Jose, will consist initially of 10-, 8-, and 6-lane sections. It will be built as a 10-lane freeway between the Route 1 and Route 82 freeways in Daly City. Interstate Route 280 will be a full eight-lane freeway from that point southerly to Magdalena Avenue in the vicinity of Los Altos. From there it will be built as a six- (ultimate eight-) lane freeway for the remainder of the route into San Jose.

The varied terrain of this new freeway lends itself nicely to aesthetic treatment. Its topography ranges from the rugged ridges and forest-covered slopes of the 14 miles of watershed lands owned by the San Francisco Water Department, along the lovely chain of lakes which make up the Crystal Springs Reservoir, past the gracious estates of Woodside, across 4 miles of gently rolling lands of Stanford University, through beautiful Los Altos Hills, and into the flatter country approaching San Jose.

Construction of this route has already begun. In fact, the first completed portion in San Jose was opened to traffic on March 16, 1964. Other contracts are underway with more coming soon—so soon that the entire 50 miles of freeway are scheduled to be either in operation or under construction in the next five years.

Projected traffic figures for 1975 show that from 50,000 to 150,000 cars each day will be using the new route, with the low figure estimated for the less congested areas away from the metropolitan centers of population and industry. This will offer much needed relief to the Bayshore Freeway, El Camino Real and local roads along the way.

#### History

Planning for this route started in 1928 when the Counties of San Francisco and San Mateo formed Joint Highway District 10 to develop a four-lane extension of Junipero Serra Boulevard to the south. On July 5, 1956, the Legislature adopted the



## EQUESTRIAN PATH

*A drawing of one of the equestrian paths being provided for horseback riders to cross under the freeway at Robleda Road, Elena Avenue, Magdalena Avenue and Canada Road in Santa Clara County. The paths consist of graded earth to provide better footing for the horses and to preserve the rustic character of the neighborhood.*

seven-mile constructed portion of this route as State Highway 237 (now Route 117) and also dissolved Joint Highway District 10.

Meanwhile the Division of Highways, in cooperation with the U.S. Bureau of Public Roads, studied possible routes for inclusion in the National System of Interstate and Defense Highways, which had been authorized by Congress in 1944. The U.S. Commissioner of Public Roads approved the inclusion of a route following the Junipero Serra Boulevard extension in the interstate system on September 15, 1955. The 1957 Legislature added Route 239 (now Interstate Route 280) to the state highway system "from Route 56 (Route 1) near Daly City to Route 2 (Route 82) near San Jose on a route to be selected by the California Highway Commission." The present route was adopted on November 27, 1957, July 23, 1958, and July 20, 1960, after the public hearings and map displays mentioned above.

### Cooperation

The theme of cooperation runs like a bar of reinforcing steel through the story of the design of Interstate Route 280, tying together the considerations of design standards and reasonable cost requirements on the one side and the aesthetic values and desires of all concerned on the other into a unified whole that will combine

beauty and utility into the world's finest freeway. This cooperation includes the agreements arrived at in right-of-way purchase and utility relocations as well as the more formal cooperative and freeway agreements.

One example of how seemingly opposite requirements of two agencies was resolved concerns the new Foothill Junior College location. Soon after route adoption it was discovered that the Foothill Junior College District had chosen the junction of the new freeway and El Monte Avenue for the site of its new two-year college. The freeway neatly bisected the proposed 90-acre site. By minor adjustment in freeway location and college site, a compatible plan was developed and what could have been a major battle was resolved through the splendid cooperation of Dr. Calvin Flint, president of the college, and his efficient staff. As Dr. Flint pointed out, the college required the excellent transportation facilities of the freeway and any minor adjustments in college plan were well justified.

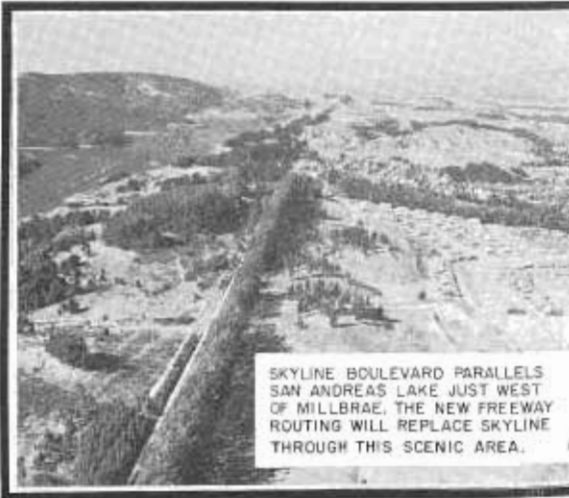
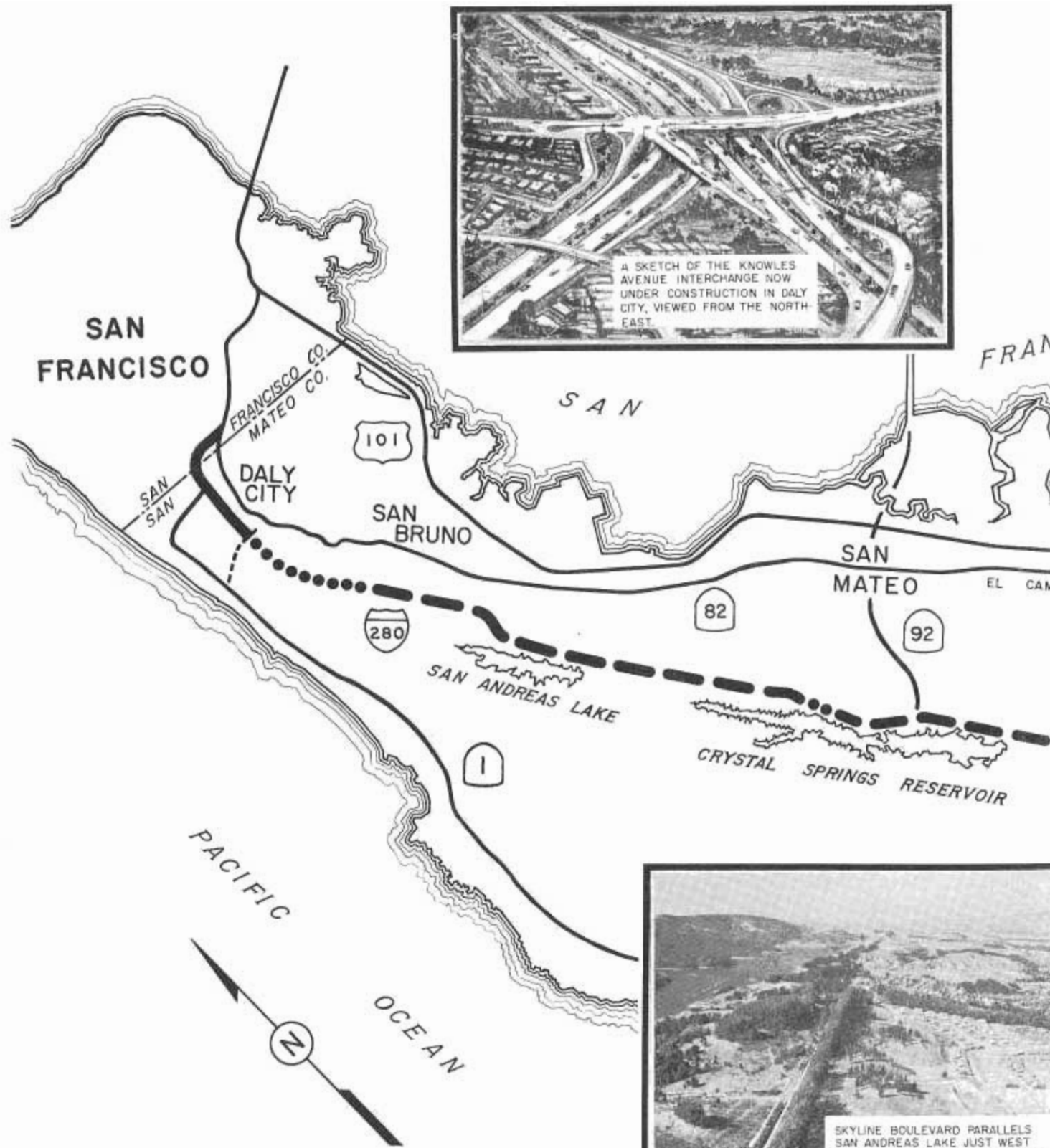
The contributions of various local agencies to the construction of Interstate Route 280 on the sections which have been completed or are currently under construction add up to approximately \$1,000,000 to date. The balance of the agreements yet to be negotiated primarily concern the relocation and betterment of storm

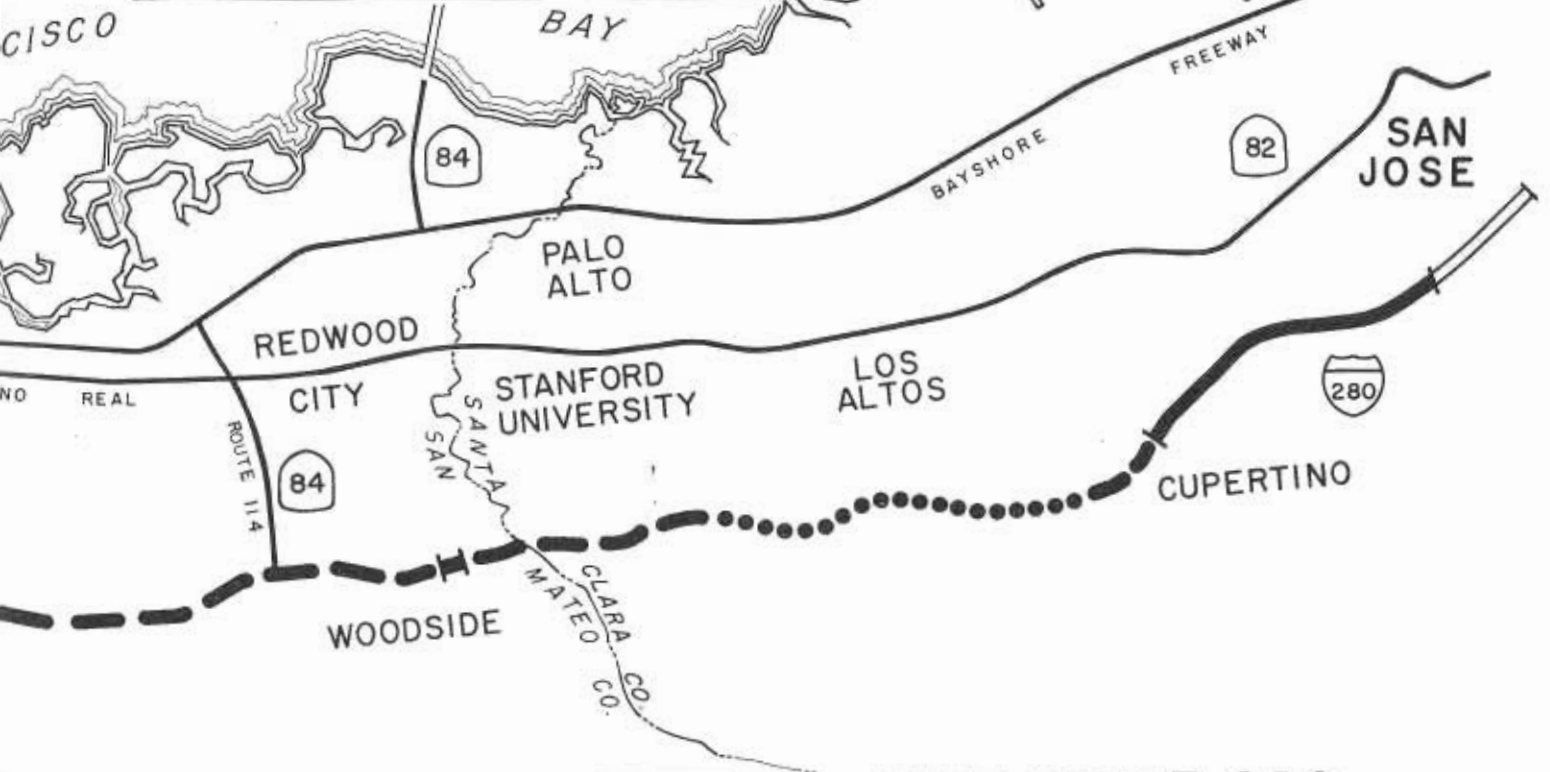
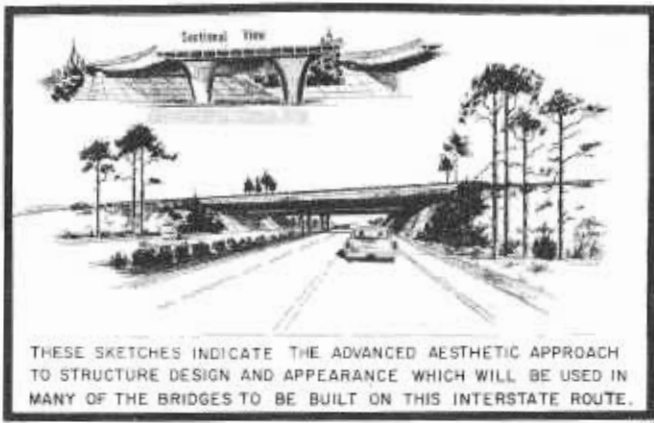
drains, sanitary sewers, or water facilities. Although utility relocations are normally covered by utility agreements, those areas in which new facilities or betterments to existing facilities are requested become subject to cooperative agreements. By this effort an overall improvement benefiting both local and state agencies is the result.

### Design Techniques

The current design of Interstate Route 280 resulted from a complex study of which techniques would best fit the roadway to the contour of the land. Such practices include slope rounding, contour grading, split-level design with the independent roadways varying as much as 70 feet in elevation (in the vicinity of existing Ralston Avenue), variable width median ranging from 22 feet at the San Bruno Avenue grade separation to a maximum of 200 feet at a number of locations along the route, broad sweeping horizontal curves with a minimum radius of 2,000 feet to allow the motorist to enjoy the panoramic views in greater safety, maximum grade of 4 percent throughout the length of the route, and unusual architectural treatment of the more than 70 structures on this freeway to enhance their aesthetic appearance and cause them to blend with the natural beauty of the area which the route traverses.







## INTERSTATE 280 STATUS



### LEGEND

COMPLETED	
UNDER CONSTRUCTION	
BUDGETED	
DESIGN	



### Structures

After spending considerable time with the noted San Francisco architect Mario J. Ciampi, the Bridge Department designers came up with a new look for the structures on this freeway. Some aspects of his proposed treatment are combined with economic structural requirements to produce such new and pleasing features as curved edges on the bridge and superstructure to create the illusion of thinness, variety in form and appearance of the supporting piers, extension of the bridge railing to eliminate the need for metal guard railing at the bridge ends, and liberal use of curved and oblique surfaces to soften the lines, reducing the visual impact of the concrete structures and thus blending into the surrounding area. Those structures which cross over the freeway will be prestressed to reduce the thickness of the overhead structure and provide a thinner, more pleasing profile.

#### San Mateo Creek Bridge

The most impressive structure on the entire length of Interstate Route 280 will be the bridge over San Mateo Creek in Hillsborough. More than 1,600 feet long and soaring 270 feet above the creekbed below, the bridge will have a five-span welded steel girder superstructure resting on four concrete piers consisting of bents with tapered legs meeting at the top in a graceful arch. The twin roadways will be connected by a solid slab in the middle with a 22-foot division area, concrete barrier rails at the outer edges, and a concrete barrier in the division area with expanded aluminum glare shield.

There has been a conscious design of shadow lines in the entire structure by Bridge Department designers, who realized that the adjacent area is one of the more attractive parts of the Peninsula and devoted a great deal of study to it. This structure will complement its surroundings, be a credit to the adjacent community, and a source of pride to its builders. It will be visible from many angles because of its closeness to the parking area at Crystal Springs Dam and its location above the winding Crystal Springs Road.

### Scenic Highway

The beauty of the area in which the San Mateo Creek Bridge will be located has been recognized by the State Legislature. It has included that section of Interstate Route 280 overlooking the chain of lakes in the San Francisco Water Department watershed lands area as part of the California scenic highway system.

The concept of a scenic highway system in California has been under consideration since 1960, when the Legislature asked the Departments of Public Works, Water Resources, and Natural Resources, and the State Office of Planning to collaborate on an investigation and prepare a report and recommendations for a statewide system of scenic highways. The 1961 session authorized appointment of a seven-member committee to consist of officials of counties and cities, of persons having special competence in the fields of landscape architecture as it relates to scenic conservation, and others interested in highway, land planning, and park problems to act in an advisory capacity to this investigation.

This report was considered at the 1963 session of the Legislature, which adopted a system including some 4,900 miles of state highway routes as state scenic highways. The writers of the report defined a scenic highway as having the following attributes:

It is a portion of the state highway system, it traverses areas of outstanding scenic beauty, and its location, design, and construction receive special attention in terms of impact on the landscape and in terms of visual appearance.

It is the intent of the Legislature in designating certain portions of the state highway system as state scenic highways to establish the State's responsibility for the protection and enhancement of California's natural scenic beauty by identifying those portions of the state highway system which, together with the adjacent scenic corridors, require special scenic conservation treatment.

#### Vista Point

In order to give motorists a chance to stop and enjoy this spectacular

view at their leisure, a vista point will be built a half-mile north of Crystal Springs Road in San Mateo westerly of the Hillsborough town limits. Northbound travelers will be able to get a bird's eye view of the Crystal Springs lakes, the tree-covered slopes of Cahill Ridge to the west, the impressive San Mateo Creek Bridge to the south, and the eight lanes of the "Junipero Serra" Freeway, divided by a 200-foot-wide median in this area, some 60 feet below this vantage point.

Just above the adjacent freeway, an oasis for weary travelers will provide fresh water, picnic tables, and sanitary facilities in a full-fledged rest stop, which will be contour graded to blend into the background and planted with trees to provide shade and enhance the area. A pedestrian ramp with decorative handrail will lead up from the rest stop to the vista point.

#### Hiking, Horseback Riding

Residents of both San Mateo and Santa Clara Counties expressed concern about the availability of access to foothill areas, after the freeway is built, for such recreational activities as hiking and horseback riding.

In San Mateo County, assurance has been given to the county park and recreation department, the county hiking and trails committee and other organizations that 13 of the vehicular over- and undercrossings between Crestmoor Drive in San Bruno and the Santa Clara county line will include from 7 to 10 feet of additional space for the use of nonvehicular traffic.

Ten of the separation structures in Santa Clara County will also include space for nonvehicular traffic. At three of these crossings, plus one near Woodside in San Mateo County, for the benefit and safety of both the motorist and the horseback rider, there will be separate graded earth paths provided for equestrian use. These crossings will preserve existing bridle path routes which are extensively used.

#### Overall Design

Because of the size of the job, the design has been divided among Assistant District Engineers M. E. Hardin, J. C. Black, and W. P. Smith, with Design Engineers Barney Camp-



bell, Bart Berger, Drury Elder, E. J. Stewart, and E. A. Jones supervising the project engineers of the individual units.

The design of all bridge structures on the route was supervised by A. L. Elliott, Bridge Engineer—Planning, of Headquarters Bridge Department. Senior Bridge Engineer Bob Cassano was in charge of the structure design, and Bridge Architectural Senior Warren S. Ludlow of the Bridge Department's Architectural Section was instrumental in the finalization of the aesthetic design which will be used.

The Division of Highways makes every effort to provide a balance of earthwork while seeking to avoid long hauls. By hauling excavation from one spot to a fill on the same or an adjacent project the earthwork is in balance and an economical job results. That is essentially the situation on the entire length of the "Junipero Serra" Freeway project.

The 50-mile length of Interstate Route 280 has been separated into 15 units for project purposes. This article will discuss specific features in order from north (San Francisco) to south (San Jose). Since project limits are described by readily identifiable street names or landmarks for the benefit of the general reader, there is considerable overlapping of the areas discussed and more than one project is discussed at a time.

#### Daly City to County Line

This entire job now under construction is essentially a mile-long 6,000-foot interchange of 10- (ultimately 12-) lanes running southerly from the three-level Knowles Avenue Interchange, where Route 1 will lead traffic from the southwesterly part of San Francisco into the Junipero Serra Freeway, to 1,500 feet south of Eastmoor Avenue, where Route 1 will leave Route 280 in a westerly direction. The bottom level of the Knowles Avenue Interchange is a 700-foot-long cut and cover tunnel with box girder construction on the top slab. It will funnel southbound traffic from Route 1 into Interstate Route 280.

Right-of-way acquisition in this area included some 11 acres formerly a part of the Lake Merced Golf and Country Club. Extensive negotiations took place before a settlement was reached. Work is now in progress to reestablish the course to the same standards and length it formerly possessed, including rearrangement of the entire course, filling of a deep gulch at the northerly end of the property, and construction of new club and caddy houses. Play will be restricted to nine holes during the construction period.

#### South San Francisco to Daly City

Design on this unit was delayed for some time while studies were made of alternate interchange plans affecting

adjoining subdivisions. Although big cuts (200 feet maximum) and fills (120 feet maximum) will be made during the freeway construction, the owners will cooperate in grading their lands to match the freeway construction, thus conserving property and providing more economical use for both subdivision and freeway. Regional shopping centers are envisioned by the subdividers at Westborough Boulevard and Serramonte in Daly City.

Although none of the cemeteries in Colma or Daly City will be affected by the new Interstate Route 280 freeway, work is now in progress on the relocation of the Chinese Cemetery Road to a bench on the Route 1 freeway right-of-way in order to continue cemetery access after freeway completion. Before the relocation work could begin, however, a problem had to be solved. The Chinese believe it improper to carry the remains of their deceased through the back gate of a cemetery. Grading operations for the Serramonte subdivision had cut off the cemetery's front gate access road to the west and the Route 1 construction threatened the access road to the east. The only solution was for the subdivider to construct a temporary access road to the main gate from Skyline Boulevard at no charge to the cemetery association, to serve the cemetery until relocation of the regular road is finished.



Drawing of a section of Interstate 280 (looking north) showing the split-level independent roadways for each direction of travel passing through scenic vistas surrounding the Crystal Springs Reservoir. The area shown above is just south of the site of the future San Mateo Creek Bridge.



The Route 280 freeway will cut through the southwesterly tip of the Serra Vista School property in South San Francisco. However, since the freeway will be depressed in this area, it will not be readily visible nor audible from the school buildings.

#### **San Bruno to South San Francisco**

The outstanding feature of this section will be the four-level interchange located between San Bruno Avenue and Sneath Lane where the future Route 186 will provide a cross-county, east-west lateral traffic artery. The lowest level, the branch connection that will carry northbound traffic on Route 280 easterly to Route 186, will be 30 feet below ground level. This structure, to be of box girder design with rounded ends, will present a pleasing picture.

Although the overall design of Interstate Route 280 will avoid the use of retaining walls as much as possible, consideration is being given to their aesthetic appearance where they are used. Studies are being made of one 1,200-foot section between Sneath Lane and Valleywood Drive where it is proposed to place step retaining walls from 6 to 12 feet apart with planting between. One wall will remain a constant 6 feet in height while the other will vary from 0 to 6 feet.

#### **Hillsborough to San Bruno**

The chain of lakes that store the water supply of the City of San Francisco begins near the northerly end of this part of Interstate Route 280. As increasing turbidity of the water and protection of the lakes from pollution has been a matter of concern to the city water department for some time, it has been decided that a new filtration plant will be built at Crystal Springs Road in San Bruno. Grading for the freeway in this area will include preliminary grading for the plant site. An undercrossing will be provided to connect the new plant with the water department work area at Crystal Springs Lake and a continuous service road will be constructed on the westerly side of the new freeway from the vicinity of Larkspur Drive in Millbrae to the Crystal Springs Golf Course. Access to the

service road will be provided at all interchanges.

Another design problem is that of control of drainage from the new freeway slopes during and immediately after construction. Several pumping plants will be provided in a dual drainage system on the westerly side of the freeway to divert turbid water to the easterly slopes, away from the lakes. Clean water will drain down into the lakes.

The old Junipero Serra Boulevard, which the new freeway follows, ends in this area and the new route swings in a southwesterly direction roughly paralleling Crystal Springs Road in San Bruno to join Skyline Boulevard (Route 35) heading south.

The section of the new Route 280 from Millbrae to Woodside overlooking the watershed is one of rare scenic beauty. Motorists in this vicinity will be able to enjoy panoramic views of the lakes and the forested hills behind them from both of the independent roadways, separated by a median varying in width up to 200 feet. Skyline Boulevard between Trousdale Drive and Millbrae Avenue will be superseded by Route 280 after the new freeway is completed.

#### **Woodside to Hillsborough**

The four units included in this section encompass some of the most breathtaking vistas to be seen along the entire "Junipero Serra" Freeway route, which follows a path generally easterly of Skyline Boulevard in this area and will permit motorists to enjoy the pleasing panoramas of the verdant greens of the Crystal Springs Golf Course, the sparkling lakes below, and the deeper green of the mountains in the distance to the west. Northbound travelers may pause at the combination vista point-rest stop, refresh themselves, and enjoy the view at their leisure. The vista point and the San Mateo Creek Bridge have been described earlier in this article.

After long negotiations with the San Francisco Water Department, which owns the property, some 10 acres of the Crystal Springs Golf Course were acquired by our right-of-way agents. While only three holes will be directly affected by the freeway, it will be necessary to revise

the entire first nine and reconstruct the 15th green and the 16th tee. Because of the topography of the land and because the slope is from the freeway to the reservoir, the fairways, tees, and greens must be laid out carefully to minimize the possibility of turbid water draining down into the reservoir. The entire irrigation system must also be revised. A golf course architect has been employed to supervise the necessary course revision.

The work, which is now in progress by the City of San Francisco and which will be paid for by the Division of Highways, is scheduled for completion by June 1, 1965. The division will also build an entrance road to the golf course from the new Black Mountain Road Interchange and is working closely with water department officials to avoid disruption of the landscape and minimize the taking of trees.

This section also includes connections to two cross-county state highway laterals—the Route 92/280 Interchange at Ralston Avenue and the Route 114/280 Interchange at Woodside Road.

A private service road for the watershed area will be built from Ralston Avenue south to the city limits of Woodside with access at all interchanges, roughly parallel to the new freeway. Northerly of Ralston, portions of Skyline Boulevard will also provide access to the watershed area.

The future southern site of the College of San Mateo is located easterly of the freeway between the future Farm Hill Boulevard extension and Godetia Drive. The campus of the proposed new Sequoia Union High School District site in Redwood City will be located nearby on the northerly side of the Farm Hill Boulevard extension. The Division of Highways is cooperating with the school authorities by providing proposed freeway grading and alignment plans for use by their architect and engineer. The interchange at Farm Hill Boulevard will serve both college and high school traffic, as well as the anticipated increased population of the area.

#### **Woodside Road to Cupertino**

This section of Interstate Route 280 winds through the lands of Stanford University and continues southerly

through the beautiful Los Altos Hills area, presenting more enchanting views to the motorist.

The 272-foot-long bridge that will carry freeway traffic over the linear accelerator is under construction on Stanford University property. Designed to harmonize with the linear accelerator buildings, it will have a steel girder superstructure and circular supporting columns. Due to be completed in March 1965, it is being built ahead of the adjacent freeway sections so that its construction can be coordinated with the construction of the linear accelerator by the Atomic Energy Commission.

The pilot studies for aesthetic design of the freeway bridge structures were conducted on structures proposed in the Los Altos Hills section of the freeway. Models and sketches of bridge structures proposed at Mora Drive, St. Joseph Avenue, El Monte Avenue and Magdalena Avenue were shown to various committees and received widespread publicity in newspapers throughout the San Francisco Bay area. The resulting public acclaim encouraged the adoption of this design for most of the bridge structures on Interstate Route 280.

#### Cupertino to San Jose

The newly constructed portion of Interstate Route 280 joins State Route 17 in San Jose. Design of the section within the limits set above involved many intricate problems which required long and involved negotiations with the governmental units and groups concerned before they could be solved satisfactorily.

Design for the freeway in the Los Altos-Cupertino area was held up for approximately two years pending a decision on proposed abandonment of a branch line of the Southern Pacific Railroad. Abandonment approval by the Interstate Commerce Commission was recently affirmed, which will allow construction by Santa Clara County of its Foothill Expressway following the former railroad right-of-way. With this decision, and removal of the rails, the State is now completing its freeway plans in the area based on this new set of facts.

The division plans to relocate the Permanente Spur (serving the Kaiser

Permanente Cement Plant) to parallel the new freeway. Santa Clara County plans to use the railroad right-of-way easterly of Route 280 for its new Foothill Expressway. By terms of a cooperative agreement with the county, the division will build portions of the Foothill Expressway at the Foothill-Route 280 Interchange.

Another knotty design problem is that of providing access to the facilities of the California Water Service Company, the Maryknoll Seminary, and the property of the Roman Catholic Archbishop of San Francisco since access would have been blocked by the freeway and the SPRR Permanente Spur. It will be solved by construction of a combination public-private road designed to provide access to both existing and relocated water tanks, Maryknoll Seminary, and the Catholic lands, on which development of a golf course and cemetery are planned. The private portion of the service road will extend from the vicinity of Arboretum Road to Maryknoll Road and will serve the Maryknoll Seminary only. The railroad service road crossing will be at separated grades.

Several cooperative agreements were reached in this area. In one, the division bought the right-of-way and agreed to build the Junipero Serra channel from Stelling Road to Calabazas Creek on a 50/50 basis, for which the Santa Clara County Flood Control and Water District will pay an estimated \$275,000. Another agreement was reached where Route 280 is located adjacent and approximately parallel to Moorpark Avenue, a two-lane city street. The Division of Highways purchased the right-of-way to widen Moorpark Avenue to a four-lane street from Winchester Road to Saratoga Avenue. The City of San Jose will build the street, which will serve as a frontage road.

The section of Interstate Route 280 between Saratoga Avenue and Stelling Road, now being constructed, is scheduled for completion in March 1965.

The most southerly section of the new freeway, from Forest Avenue in San Jose to Saratoga Avenue, was opened to traffic on March 16, 1964. A major construction feature of the

work was the modification of the full cloverleaf interchange on the existing freeway at Stevens Creek Boulevard to accommodate collector roads and direct freeway-to-freeway connections.

Erosion control will be included as part of each construction contract on this entire route. In addition, it is generally proposed in Santa Clara County northerly of Route 237 and in the San Mateo County contracts to include 10-foot iceplant borders on each side of the freeway shoulders, with the remainder of the cut and fill slopes to be planted with inoculated seed of strawberry clover.

Landscaping is planned to begin during the next planting season after each construction contract is completed. Plans for landscaping the first completed portion of the route, from Forest Avenue to Saratoga Avenue, have been prepared, \$250,000 has been budgeted, and it is anticipated that the work will be well along by the time this article appears. Plans are now being prepared for landscaping that portion of the route now under construction between Saratoga Avenue and Saratoga-Sunnyvale Road.

And this is the design story of Interstate Route 280, the "Junipero Serra" Freeway, the freeway that will traverse some 50 miles of the most beautiful countryside in California.

The route's broad curves and gently rolling profile will unfold new scenic delights to the eye of the motorist from the rugged ridges and forested slopes, past the lakes and through the foothills of Santa Clara County. The split-level, variable-width-median design of the freeway and the new architectural features of the more than 70 structures will add to the enjoyment of the motorist.

With construction underway from San Francisco south and San Jose north, many new contracts will be let during the next few years. The final work in the vicinity of the San Mateo-Santa Clara county line should be completed or under construction within five years. This new freeway will afford much needed relief for traffic using the heavily congested Bayshore Freeway and El Camino Real, and, undoubtedly, will change the driving—and even the living habits—of many Peninsulans.



# Freeway Leaflets

Boy Scouts Help  
Distribute Them



The far-reaching impact of freeway development in the State of California has nowhere been more universally felt than in District VII—Ventura, Los Angeles and Orange Counties—

where annual expenditures for right-of-way and construction amount to \$200 million. As the projected 1,500-mile freeway-expressway system gains headway—it is now almost one-third complete—distant cities and communities are being linked together in an integrated transportation network, promising motorists greater mobility, travel time and distance savings.

#### Affects Many People

A public works undertaking of this magnitude affects a large cross-section of the people, and particularly those who reside immediately adjacent to freeway construction projects. It is with these residents that most questions arise: *When will the freeway be completed? Where will the interchanges be? What's the cost of the job and who's in charge of it?*

In order to answer these questions and others, District VII of the State Division of Highways in January 1964 embarked on a new public information program designed to bring the freeway directly to the people. The pilot project was the starting contract on the Pomona Freeway in East Los Angeles. A package handout, containing a letter from the resident engineer, a job fact sheet and engineering map, was prepared by the Press and Public Information Office and distributed by engineering personnel to tenants and home owners along the construction site.



Mrs. Massengale of 20307 Roseton, Lakewood, was the first recipient of the leaflets distributed by Scouts (left to right) David Hunt, Jerry Zoppa and Michael Moore.

#### Public Reaction Good

Public reaction was instantaneous and enthusiastic, and on this basis the district decided to continue this information program on all jobs of a million dollars or more. The original handout was streamlined into a single, convenient, illustrated leaflet, which

could be kept as a permanent reference during the course of construction. This new leaflet was distributed house-to-house by state engineering personnel and contractors' crews, on portions of the San Gabriel River Freeway (Interstate 605), the Santa Monica Freeway (Interstate 10), the

Ventura Freeway (US 101) and the Garden Grove Freeway (Route 22).

#### Seek Boy Scout Aid

It was at this time that Edward T. Telford, District Engineer, sought out the aid of the Boy Scouts of America, both from the standpoint of freeing field personnel for engineering duties and of providing an opportunity for the Scouts to work in the public service.

In a letter to Walter R. Whidden, Regional Executive, Boy Scouts of America, he wrote: "Our problem at this time is the distribution of the leaflets. It is here that we would like to ask the help of the Boy Scouts of America, who might, among their many other worthy causes, undertake the responsibility of passing out these leaflets on a door-to-door basis. Perhaps this assignment would assist them in earning their merit badges. For our part, I can assure you that the Scouts would be performing an important service for the community and the State of California."

#### Scouts Cooperate

The Boy Scouts of America lost no time in endorsing the idea as a good-turn activity in the public interest, and Deputy Regional Scout Executive Jay W. Clements set the organizational wheels in motion with the staffs of the various councils. On July 13 Scout Troops 81 and 82 of the Long Beach Area Council handed out some 2,000 leaflets on a San Gabriel River Freeway job, and on July 18 Scouts from the Orange Empire Area Council, Troops 70 and 78, distributed 2,500 leaflets on a section of the Garden Grove Freeway. Cooperating with the Scouts were the contracting firms of Kasler Constructors & Gordon H. Ball Enterprises and the Guy F. Atkinson Company, who made a donation to the Scout Fund.

Meanwhile, other leaflets are being readied on future freeway construction projects and in most instances will be delivered to residents soon after work starts—courtesy of the freeway builders and the Boy Scouts of America.



Scouts assemble to receive leaflets and instructions prior to making distribution to residents in the area.



Boy Scout headquarters handled all distribution details. William Hayes (white shirt and sunglasses), district executive of the Long Beach Council, was in charge of the activity in Dairy Valley.



# Route 36 Relocation

By O. B. HANSON, Resident Engineer



On July 13, 1964, a new link was added to the chain of California freeways and expressways with the opening of a completed 4.75-mile section on Routes 36 and 395 in Las-

sen County. This section of highway begins in Susanville, 0.3-mile from the east city limits, and terminates one mile east of Johnstonville. The completion of this project marks a total of 21.3 miles of restricted-access highway which has been constructed within the past four years between Susanville and two miles north of Milford.

The new highway replaces a winding, narrow section which was constructed in 1931. The old highway had 13 curves and a minimum radius of 500 feet. Two of the curves are signed for 35 m.p.h. due to the short radius

and inadequate superelevation. As this was a two-lane conventional highway traveling through the Honey Lake Valley, there were many business places fronting on the old road plus numerous driveways and road connections. The Route 395 portion of the old highway passed through the center of the village of Johnstonville.

## Existing Highway

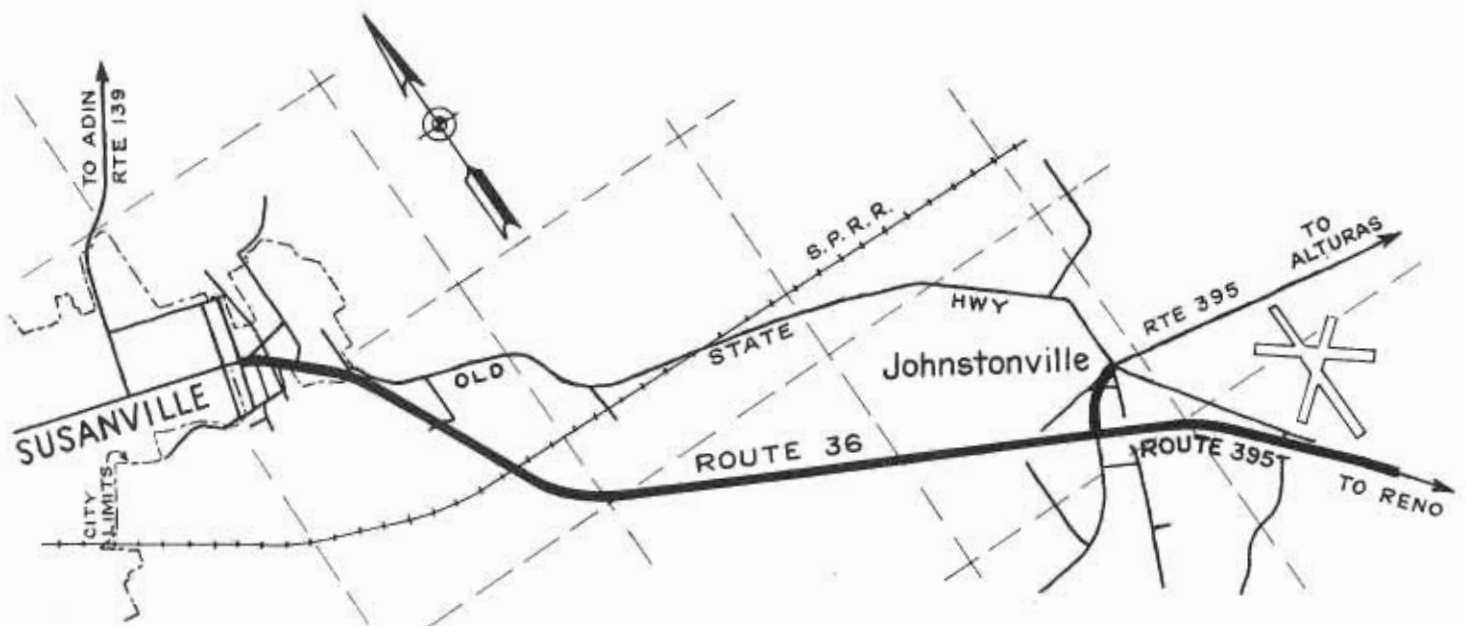
The existing two-lane highway within the city limits of Susanville was converted to a 64-foot all-paved section with asphalt concrete dikes. At the city limits it changes to a 40-foot all-paved section and leaves the existing alignment, proceeding southeast through the Honey Lake Valley. The new alignment conforms to a recently completed project 1.0 mile east of Johnstonville. The realigned portion of Route 395 passes approximately one-quarter mile to the south of the business district of Johnstonville.

The portion of highway constructed on this contract will be the westbound lanes of an ultimate four-lane freeway. Right-of-way has been purchased and fenced for ultimate interchanges at the east city limits of Susanville and at the junction of Routes 36 and 395.

Approximately three miles of the highway was constructed across irrigated meadow with the profile grade held about five feet above the original ground. The bulk of the material used in construction of this embankment came from the interchange area at Johnstonville and from widened cut sections beyond Johnstonville. The cut section at the future interchange area was about 4 feet in depth and varied from 170 to 850 feet in width.

## Embankment Section

Construction of the embankment section through the meadow area deviated from normal construction practices in that ditches were excavated the full length of the embankment



This map shows the location of the new highway in relation to the old route.



*BEFORE. One of the more hazardous curves on the old highway route near Susanville.*

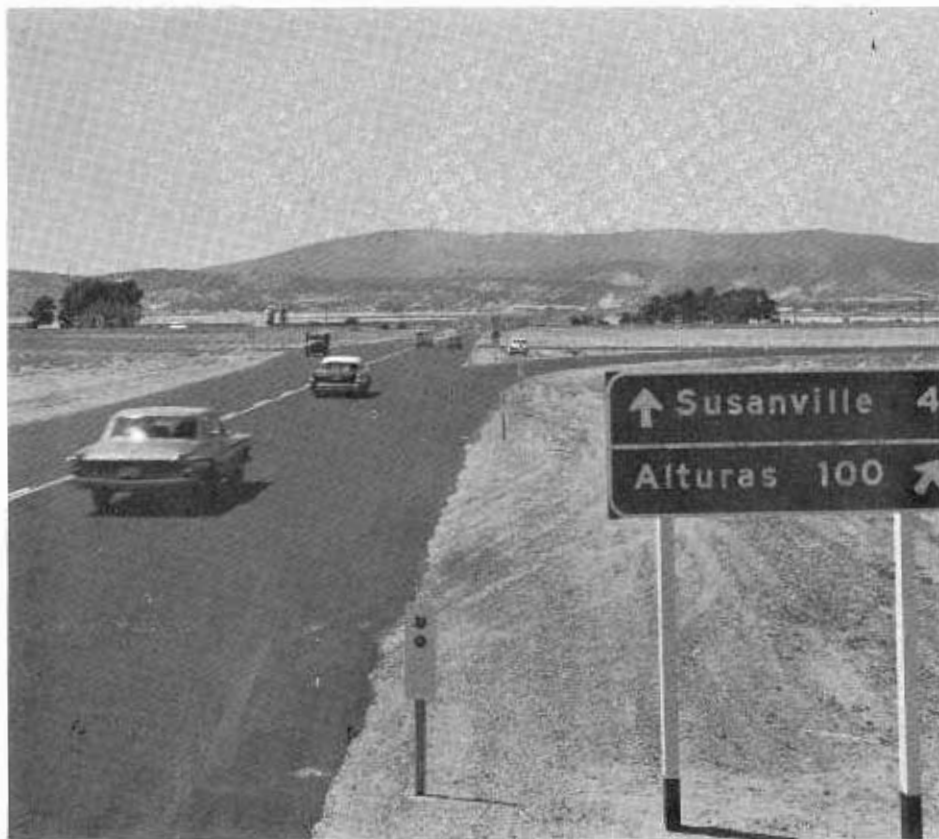


*AFTER. A portion of the new Route 36 relocation near Susanville.*





**BEFORE.** The old intersection of Routes 36 and 395 prior to relocation.



**AFTER.** The completed expressway at the new junction of Routes 36 and 395.

section on each side of the roadway prism to carry off irrigation water, and the sod was left intact as much as was possible. Select material was dozed through the meadow until the spongy material was displaced by the sandy select material. As soon as a stable pad was constructed, normal embankment construction procedures were followed.

Extensive irrigation ditches and pipes were required to maintain flow in the established irrigation areas. Five major structures were installed on this project. Two of these will serve a dual purpose. A double 12-foot by 8-foot reinforced concrete box constructed at Gold Run Creek and a 120-inch field-assembled structural plate pipe installed at Sand Slough will also be utilized as cattle passes during the dry season. A 137-foot-long reinforced concrete bridge was constructed across the Susan River. Prior to the construction of the bridge, the contractor installed an 84-inch-diameter culvert in the river bed and constructed dams at each end of the pipe. This provided a relatively water-free area in which to drive pilings and pour the bridge footings. The contractor utilized the upstream dam as a haul road which enabled him to carry on a continuous grading operation during all phases of bridge construction.

#### **Channelized Intersection**

At the junction of Routes 36 and 395, a channelized intersection was constructed as the initial development.

A public stock trail, located within the right-of-way, was constructed from just east of the junction of Routes 36 and 395 to the end of the project. Metal cattle guards were also installed at all road connections in the vicinity of the stock trail to further protect the motorist from stray cattle. This type of facility is a customary provision in this part of the State where livestock raising is an important part of the local economy.

This project was constructed by the L. B. Wells Construction Company of Visalia. John W. Hufford was the Bridge Department representative, and the writer was the resident engineer.

# Harbor Boulevard

Accident Survey Shows 54%  
Drop Since Reconstruction

By CHARLES R. HANDY, Director of Public Works, City of Garden Grove



On October 26, 1962, Mrs. Katherine Barr, Vice Mayor of the City of Garden Grove, cut the traditional ribbon opening Harbor Boulevard to public use. This ceremony signified

the completion of a \$746,000 street improvement project that had created much controversy between the local businessmen and the city over the design which incorporated raised dividers in an urban commercial area.

## History

Harbor Boulevard was constructed as a three-lane county highway in 1947 by the Orange County Road Department and was included in the federal aid secondary system prior to the incorporation of the City of Garden Grove in 1956.

Soon after the City of Garden Grove incorporated it became apparent that Harbor Boulevard was outstanding in its need for a major improvement to increase capacity and safety. As a result of an ADT of 25,000 on a three-lane facility, the accident rate was extremely high with corresponding enforcement problems.

In 1958 the improvement of Harbor Boulevard was initiated after its being selected as the most deficient street in the city street system.

## Financing

The tentative cost of widening the project to four lanes was estimated to be approximately \$500,000. It was apparent that the city could not finance a project of this magnitude; fortunately, two events occurred that enabled the project to be built as a four-lane divided highway.

In 1958 the cities of Orange County and the County of Orange reached an agreement concerning the combined use of the highway users gas tax funds for the improvement of qualified



Harbor Boulevard reconstruction looking southwest. Garden Grove Boulevard crosses Harbor Boulevard at an angle in the middleground. The shopping center in the foreground is served by a frontage road. Access is provided by a signalized intersection with a public street (foreground).

arterial highways throughout the county. This program is known as the arterial highway finance program (AHFP).

In 1959 the State Legislature created the Federal Aid Secondary Urban Extension Law, which made it possible for cities to obtain financing for urban extensions of FAS routes.

Thus, it was fortunate that the two supplemental sources of financing

were available to the City of Garden Grove at the time the Harbor Boulevard project was being planned. These funds assured the completion of the project.

## Design

One of the qualifications for receiving funds under the FASUE program was that the project be designed using appropriate standards. The established standards for urban exten-





The southern end of the Harbor Boulevard reconstruction looking north. The future Garden Grove Freeway will cross near the upper part of the photo. The openings and left turn pockets in the center strip were provided for present and future improvements (shopping centers and streets).

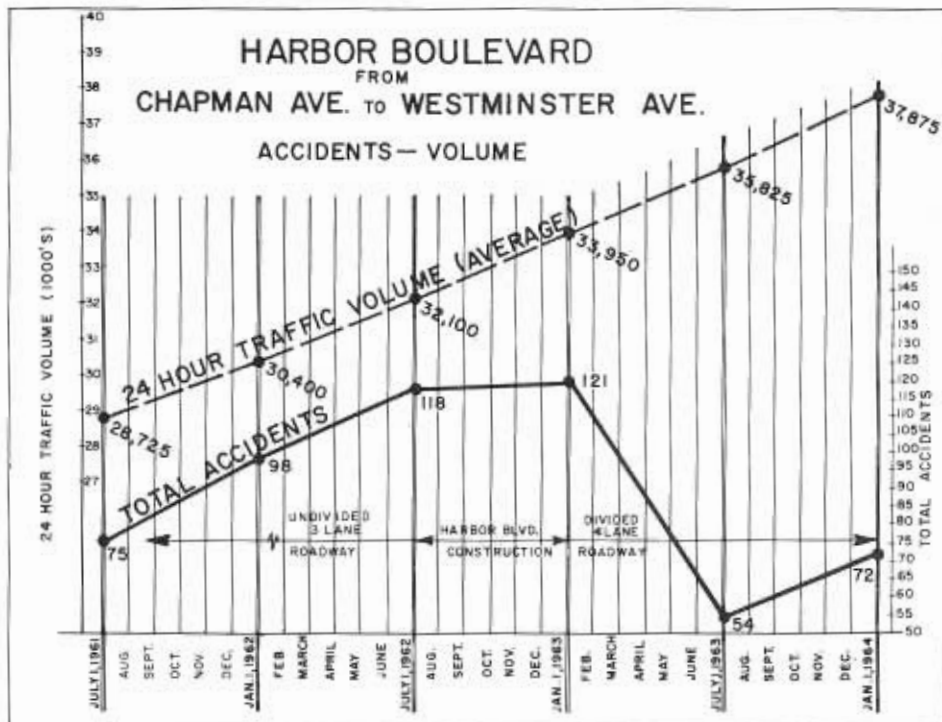
sions of federal aid secondary routes called for raised dividers under the conditions that existed on Harbor Boulevard.

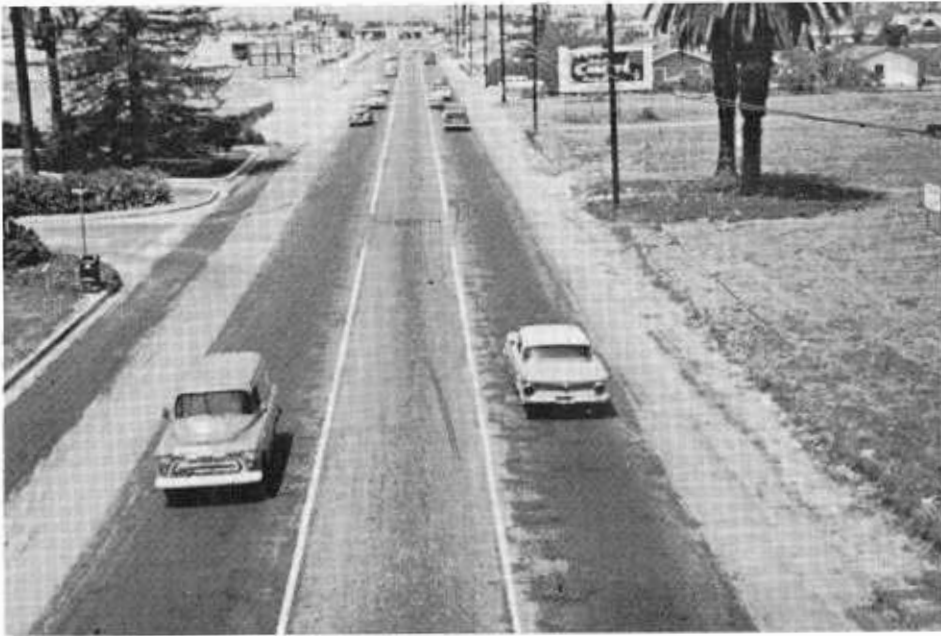
In utilizing raised dividers in an urban commercial area, the city engineering staff was apprehensive concerning possible protests from citizens groups during the contract stage of the project, unless a thorough public educational program was initiated during the design stage.

With the concurrence of the city council, staff officials developed a series of public meetings that were designed to enable affected property owners to meet with the staff and be briefed on the design of the project. As the project was approximately two miles in length, four meetings were scheduled, one for each one-half mile section of the project. The property owners and businessmen within these sections were shown slides, maps, and accident histories of Harbor Boulevard and were invited to offer their suggestions and comments. Needless to say, some of the suggestions were not practical, although it was possible to modify the design in some instances to overcome the most serious objections.

After the four meetings were completed, the staff reported to the city council their findings as a result of the hearings together with staff recommendations. From this time on a very complicated series of events, involving the local chamber of commerce, city council, city engineering staff, state highway officials, State Highway Commission, Bureau of Public Roads, State Assemblymen and Senators, took place regarding the necessity for utilizing raised dividers on the Harbor Boulevard project. The final decision to proceed with the construction of Harbor Boulevard, utilizing raised dividers, was made by the Garden Grove City Council and the design of the project proceeded.

**Construction**  
Bids for the project were opened June 7, 1962, and the contract was awarded to the R. J. Noble Company of Orange. Construction started July 9, 1962, and was completed on October 26, 1962, at a total cost of \$474,523. Right-of-way costs were





BEFORE—A section of the old three-lane Harbor Boulevard prior to improvement.



AFTER—Harbor Boulevard following improvement with divided roadways and left turn lanes. Accidents have been reduced by more than 50 percent.

\$271,449, adding to a project cost of approximately \$746,000.

An interesting technique was utilized during the construction stage wherein the City of Garden Grove administered the contract with the County of Orange supplying the resident engineer, inspection, and construction engineering. This is a fine example of the intergovernmental co-

operation enjoyed in Orange County which has had very satisfactory results.

#### Postconstruction Period

During the preliminary design stages and during the public hearings the engineering staff stressed the increased safety and efficiency of raised divider design over a five-lane undivided design. Accident records and traffic

counts were maintained before, during, and after the construction period to develop accurate traffic data.

It will be noted from the graph that the accidents remain nearly constant through the construction period; however, after the highway was completed, the total accidents decreased by 54 percent. After a year of operation, this section of Harbor Boulevard has developed an extremely low accident rate calculated to be 4.1 accidents per million vehicle miles with an ADT of approximately 38,000. The need for police enforcement has been cut in half as a result of the increased safety features of the design.

Recently, the city landscaped the divider and painted the asphalt an attractive grass green which has received many favorable comments from citizens in the area.

## IN MEMORIAM

### District I

Violet E. Randle, secretary I.

George W. Stanig, highway maintenance man II.

### District II

Raphael A. Kreizenbeck, highway maintenance man II.

### District VII

William E. Melcher, associate highway engineer.

### Headquarters Office

Joshua L. Baker, janitor.

Joseph A. Caffrey, supervising right-of-way agent.

Harry E. Kolkebacker, highway engineering technician I.

### Materials and Research

Donald R. Whetsel, highway engineering technician I.

### ROUTE 58 FREEWAY

The State Department of Public Works has awarded a \$1,451,000 contract for constructing eight miles of four-lane freeway on State Sign Route 58 between one-fifth mile east of Keene and four-fifths mile west of Tehachapi Overhead, about two miles west of Tehachapi.



## Highway Districts Lose Roman Numerals

Since nobody-can-remember-when, Division of Highways' districts have been officially designated by roman numerals. But effective August 6, this ancient custom (pre-1912) was felled by the ax of progress. The credit goes to the popular changemaker: the electronic computer.

District X is now District 10, and likewise for each of the others. Districts 1 through 9 have a further distinction—a zero before their numbers, just to keep the computer straight in its own mind's eye.

While the zero is necessary for accounting by computer, it won't be used, of course, on maps, letterheads, signs, or other material where it would have little worth. On internal correspondence and other documents, however, the zero will be used to agree with fiscal numerology (see Circular Letter No. 64-235).

Fortunately for all oldtimers who may need a moment to revise their former practices, the change in this numbering system is gradual and simple when compared with the recent major revisions of route numbers. Prior records, signs, installations, plans, files, and so on will not be changed to agree with the new system. And so both numbers—friendly or not—will exist, side by side, in the records until the roman numeral system is ultimately completely outdated.

*(Editor's Note: The little maps which identify the location of districts at the start of some articles in California Highways and Public Works will be "deromanized" in the near future.)*

Headquarters Office is affected by the change too, inasmuch as there is a number now for everything. "Sacramento" is, in fiscal essence, District 13, and the Bridge Department is District 14.

This leaves the number 12 unaccounted for, but don't think that the computer has become sophisticated to the point where it has the same aversion to 12 that some people have to 13. Leaving a few gaps here and there is simply the computer's way of coping with future unknowns.

## Tempus Fugit Column

### September 1939—Presidio Tunnel

The Presidio tunnel approach to the Golden Gate Bridge features one of the many unusual types of construction (open cut and backfill) used by highway engineers in these modern days.

The tunnel portion carries the roadway beneath a section of the Presidio used as a parade ground for military maneuvers and a golf course, for which reason an open cut highway was not possible. Due to the sand formation and the small amount of material over the top of the tunnel, it was found more economical and practicable to use the so-called open cut and backfill method.

The tunnel is 1,300 feet long and will accommodate a four-lane highway.

### September 1939—87 Coast Bridges Replaced

An article by E. L. Walsh, Associate Bridge Engineer, states that a heavy burden of maintenance and reconstruction was placed on the Division of Highways when in August 1933 an additional 6,780 miles of road were added to the state highway system.

One section of highway presenting a difficult problem is (old) State Highway 56 from Jenner to Westport along the northern Mendocino County coast.

A thorough engineering investigation of each of the bridges revealed that the majority of them were not safe for legal loads. In the section from the south Mendocino County line at the Gualala River to Westport, a distance of 81 miles, there were 84 timber bridges with a combined length

The gradual change in numbering will make the transition less costly and confusing. Present stocks of supplies which bear the roman numerals will be used up before new materials are ordered.

The new arabic numbering ties in with other changes in the accounting procedures which were made at the beginning of the present fiscal year.

Incidentally, there is no Anti-District Dialing League.

of 16,812 lineal feet. Only five of them were capable of supporting legal loads.

A large percentage of these bridges were constructed previous to 1910; at least ten were constructed before 1900, and one, Dark Gulch Bridge, was built in 1874. These bridges were designed to support a six-horse team with a loaded wagon, a load far below the required capacity of modern traffic.

### October 1939—\$500,000 Storm Damage

Riverside and Imperial Counties, normally desert country, experienced torrential rains last month which washed out 35 miles of highway, approaches to six bridges, and a number of protective dikes between Indio and Blythe on US 60 and 70. Extensive damage was also done on US 95 and 99 and (old) State Highway Routes 111 and 195.

Heavy and steady rainfall on September 4 and 5 was climaxed by rains of record intensity on the 6th. The heaviest fall reported was in Brawley—6.43 inches in approximately 24 hours, or three times the average annual rainfall for that vicinity.

### September 1939—Pacheco Pass Realignment

The 2.2-mile realigned section of State Highway Route 152 traversing the historic Pacheco Pass in Santa Clara County opened to traffic August 12 represents elimination of 31 curves on the old road.

The principal item of the contract involved moving approximately 600,000 cubic yards of excavation. During the period when the dirt was really flying, there were 12 carryalls in operation and 6 bulldozers. Distance of the new highway, 2.63 miles, is eight-tenths mile shorter than the old, and the grade has been reduced to 6½ percent, versus 7 percent for the old.

\* \* \*

"Highway to the Stars" recently constructed up the south slope of Mt. Palomar in San Diego County, leads to the observatory housing the largest telescope in the world. Beginning about five miles east of Rincon on Secondary State Highway 195, it rises from an elevation of 2,670 feet to 5,568 feet in 12 miles, via grades not exceeding 8 percent and curves not sharper than 100-foot radius.

# The Freeway Law

Statute's History Retold  
on Its 25th Anniversary

By FRANK B. DURKEE

The California freeway legislation of 25 years ago evolved from the realization by attorneys and engineers of the State Department of Public Works that the requirements of modern highway transportation could no longer be met by continuing construction of highways that conformed to legal concepts of the rights of abutters which long antedated the day of the motor vehicle. It was an attempt to modernize the highway law; to eliminate hazards and promote safety; and, particularly, to protect and insure the tremendous investment California was making in its highway system.

The thinking that led to what has sometimes been described as a "revolutionary" proposal came out of the hectic years of the 1930s. When the writer looks back at the nearly 18 years he spent in the legal division, this period stands out in many ways as the most exciting. It was a time of change, of new problems to be faced, and development of new ideas for their solution.

## 7,000 Miles Added

Despite the depression, California had available funds for the prompt matching of the millions of dollars of federal aid which became available during those years. The Legislature, in an effort to aid the counties, by a single action in 1933, added 7,000 miles to the state highway system, doubling the mileage. In 1935, it added Section 111 to the Streets and Highways Code making it clear that, henceforth, the State was to assume responsibility for the construction and maintenance of state highways within cities, a reversal of a commission policy first adopted in 1912.

Four-wheel brakes and increased horsepower were contributing to increased speed of motor vehicles. Use of the highways by commercial vehicles was increasing at a rapid rate. The new three-axle trucks, truck-trailer, and other combinations were

## Editor's Note:

Frank B. Durkee, who prepared this article at request of the editor, began his career in state service on November 1, 1923, as editor of *California Highways*, the first issue of which appeared in January 1924. Following his admission to the California bar, he was delegated the task, in 1927, of preparing a plan for the organization of a Right of Way Department by State Highway Engineer R. M. Morton. He resigned in February 1928, but returned to state service as a member of the staff of the Division of Contracts and Rights of Way in February 1931. He held the position of principal attorney when he was appointed Deputy Director of Public Works by the late C. H. Purcell in May 1948.

When Mr. Purcell retired in 1951, Mr. Durkee was appointed on August 3, 1951, to succeed him as Director of Public Works by Governor Earl Warren. He continued in this position until his retirement on January 1, 1958.

Since January 22, 1958, Mr. Durkee has been a member of the Redevelopment Agency of the City of Sacramento under appointment by the city council, and has also engaged in legal and consulting work.

demanding of the Legislature the privilege of carrying increasingly wider and heavier loads which the engineers feared existing pavements could not carry and for which existing traffic lanes were too narrow.

To meet these needs, engineers were adopting thicker pavements, wider traffic lanes, improved shoulders, physically divided highways, outer service roads, and from efforts to build these new highways there arose an ever increasing number of legal problems.

It was also the time of the building of the San Francisco-Oakland Bay Bridge, with the consequent disruption of street patterns at the approaches in San Francisco which gave rise to questions never before settled by the courts of this state.<sup>1</sup>

## Arroyo Seco Parking

In Los Angeles County the late Spencer Cortelyou, District Engineer in District VII, was wrestling with problems of the Arroyo Seco Parkway, eventually to become "the first freeway in the West," and looking forward with great pride to the completion of a new "superhighway" largely on new alignment between Los Angeles and Pomona, old Route 26. For the most part it had been built through open country on new right-of-way donated by owners of the abutting land. It was completed in 1937 as a four-lane highway with only two traffic signals and two boulevard stop signs in 27 miles.<sup>2</sup> Immediately it attracted a large volume of traffic of all kinds, including commercial trucks hauling produce from the Imperial Valley to Los Angeles markets. And what happened?

This volume of traffic at once began to attract a low-grade, heterogeneous ribbon development extending for miles. This in turn brought about more stopping, parking and conflicting movement until Mr. Cortelyou's great achievement had become a congested and hazardous highway, "functionally obsolescent," with a legal speed limit in many sections of 25 miles per hour. The motorist who had helped pay for the badly needed improvement under California's pay-as-you-go plan was taking a tremendous loss on his investment. On the other hand, the property owner, either directly or through his tenants, was asserting his right, as an abutter, to

<sup>1</sup> See *Bacich v. Board of Control*, 23 C. 2nd 343 144 Pac. 2nd 818.

<sup>2</sup> *California Highways*, April 1937, page 4.



direct access to the highway for what he considered legitimate personal gain. From the standpoint of those interested in adequate highways to serve the fast-growing State, proprietors of these roadside businesses were simply exploiting the traffic generated by the public improvement.

All this made Garvey Avenue exhibit A in California of what had to be overcome if our modern highways were to perform the functions for which they were intended. There were, of course, other similar situations in California, but the new District VII improvement seemed to be

the most striking example of what was happening on many routes throughout the State.

#### Origin of Abutters' Rights

While the precise origin of the right of access from abutting property to a public street or highway is said to be somewhat obscure, it is generally agreed that it was created by judicial decision and that its concept had its roots in the common law of England. In the United States, certainly, it has been supported by a long line of cases going back many years. This long-established right of an abutter to ac-

cess to the highway in front of his property was not a matter of great consequence in the days of the horse and buggy. But in the era of modern, high-speed automotive traffic, as the Garvey Avenue Development so clearly demonstrated, it had become utterly inconsistent with the rights and protection the highway user demanded and was entitled to on a through highway of this character. There was also the very important question of the preservation of the public's investment in its new highways.



Work nears completion in early 1937 on the new Garvey Avenue "superhighway" in Los Angeles County, a four-lane roadway with only two traffic signals and two boulevard stops in its entire 27 miles. In a few years it had become lined on both sides with small stores and stalls of all kinds bringing with them traffic congestion and the need for innumerable 25-mile-per-hour zones.

Attorneys in the Department of Public Works, including our trial attorneys in the San Francisco office, were greatly concerned about this problem and it was the subject of continual discussion. We were pretty well agreed that there was grave doubt that the existing statutory authority to acquire rights-of-way would include acquisition or abatement of "abutters' rights."

Engineers were becoming aware that the building of divided highways, and other improvements that were being attempted was not enough. In *American Highways* for July 1937, the late Fred J. Grumm, Engineer of Surveys and Plans for the California Division of Highways, had written:

" . . . Accident analysis . . . shows that dividing roadways can only minimize a relatively small percentage of accidents prevalent on four-lane roads unless the improvement includes other features, such as . . . embodiment of the freeway principle. . . ."

In Los Angeles, a committee set up by the Automobile Club of Southern California had said in a report, dated December 16, 1937:

"It is . . . apparent that this growing congestion and accident toll (on the streets and highways of the Los Angeles area) is the direct result of an attempt to serve both *abutting property* and through traffic upon the same street or highway . . . the only permanent solution is to provide facilities for the exclusive use of motor vehicles."

#### Mr. Carleton's "Boys"

For most of the time during the '30s the Central Office legal staff for highways consisted of the late C. C. Carleton, as Chief Counsel and Chief of the Division of Contracts and Rights of Way, who recently passed away at the age of 85, the late C. R. Montgomery, the late Robert E. Reed, and the writer. Mr. Carleton called the three of us "his boys." We had the highest regard for one another and for our chief. Both Mr. Montgomery and Mr. Reed later succeeded to the position of chief counsel.



Typical of modern, full freeway development is the San Bernardino Freeway which now carries heavy traffic through the same areas as those originally intended to be served by the old Garvey Avenue "superhighway." (See photo previous page.)

It was our custom between sessions of the Legislature to maintain a file, sometimes referred to as our "idea" file, in which we placed memoranda relative to problems concerning which legislation appeared to be needed. Any of us who encountered such a problem would prepare a brief memorandum of the facts together with our suggestions for this file. Prior to a general session of the Legislature, these suggestions would be reviewed, generally with a representative of the State Highway Engineer sitting in, and out of such conferences would come the legislative program of the department for the ensuing session. When the proposed program had been approved to the extent the director might require, drafts of bills would

be prepared and offered to legislators for introduction.

The 1939 freeway bill was developed in this manner. It is the writer's recollection that it was drafted and handled before the legislative committees largely by Mr. Montgomery. Working with him was Mr. Grumm, Engineer of Surveys and Plans, as representative of the late C. H. Purcell, then State Highway Engineer, and later to be Director of Public Works. Frank W. Clark was Director of Public Works, and his special representative in legislative matters was Harold P. Norton.

#### Legislative Progress

The freeway legislation of 1939 was introduced in the Senate by Senator



Arthur H. Breed, Jr., of Oakland. He was introducing it for the Department of Public Works and the bill was in fact what is now designated as a "departmental bill."

Senator Breed had followed his illustrious father as representative of Alameda County in the upper house. The elder Breed, among other distinctions, in his time, had served as President pro Tempore of the Senate and as Chairman of the Highway Advisory Committee of 1923, popularly known as the "Committee of Nine." It was this committee that recommended to the 1925 Legislature that "financing of state highway construction be changed . . . to the 'pay-as-you-go' method" and that "the revenue for this construction program be derived from increased taxes upon the users of motor vehicles . . ."<sup>3</sup>

The elder Breed was also the author of the subsequent "Breed formula" for the allocation of state highway funds to county groups, north and south, the subject of much controversy in connection with the expenditure of the original bond funds.<sup>4</sup>

As editor of *California Highways*, the writer traveled to all parts of California with the "Committee of Nine." Senator Breed frequently brought along his young son, Arthur, Jr., who celebrated his 21st birthday on one of these trips. It was with this background that he came to the Senate and it was only natural that he would be interested in highways.

#### Bill Is Introduced

The freeway bill was introduced on January 25th. As Senate Bill 848, it was referred to the then Committee on Roads and Highways, of which Senator Thomas McCormack, of Rio Vista, was the chairman. Senator McCormack had served as a member of the Board of Supervisors of Solano County prior to his election to the Senate, and was well aware of the problems, financial and otherwise, faced by the California Highway Commission and the Division of Highways. Upon his death in 1949, the commission adopted a resolution expressing its sorrow at his passing and

its deep appreciation for his many years of interest and support.

The bill, as introduced by Senator Breed and favorably reported on by Senator McCormack's committee was a simple one, consisting of but four sections, the first of which added Section 23.5 to the Streets and Highways Code to define "freeway" as:

"A highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access."

This definition has never been amended.

Section 2 added Section 100.1 to the code and it likewise has not been amended. This section is the heart of the law. It reads:

"The Department [of Public Works] is authorized to do any and all things necessary to lay out, acquire and construct any section or portion of a State highway as a freeway or to make any existing State highway a freeway."

#### Sections Are Added

Sections 2 and 3 of the bill added Sections 100.2 and 100.3, respectively, to the code. It was these last two sections that caused controversy as the measure progressed through the Legislature. By referring to the statute as it now reads, the effect of the wording of the adopted amendments may be understood.<sup>5</sup>

The committee had recommended but a single amendment, which was adopted by the Senate on March 24. It consisted of the addition of the following language to Section 100.3 as it was originally written:

"Such declaration [of the California Highway Commission] shall not affect private property rights of access, and any such rights taken or damaged within the meaning of Article I, Section 14, of the State Constitution for such freeway shall be acquired in a manner provided by law."

The adoption of a resolution by the commission could not, of course, have the effect of taking or damaging private property rights. But the additional language of the committee amendment made the legislative intent clear that abutters' rights of access were to be acquired or extinguished only by some lawful means, i.e., donation, purchase, or condemnation.

The bill in this form came to a vote before the Senate on March 27, and, to the consternation of the departmental representatives and its supporters, received only 15 affirmative votes to 20 opposed. Senator Breed immediately gave notice of reconsideration, which was continued from day to day until March 31, when reconsideration was granted. On this date, a further amendment offered by Senator Breed, this time to add additional language to Section 100.2, was adopted.

#### Agreements With Local Bodies

As originally introduced, Section 100.2 simply authorized the Department of Public Works, when required by freeway construction, to close city streets or county highways at their points of interception with freeways or to make provision for connections to or separations of the grades of such streets or roads and the freeway. The additional language providing for agreements with local governing bodies has become a most important part of the whole freeway procedure. Instead of empowering the department to act on its own volition, it was, by the amendment, authorized

"to enter into an agreement with the city council or Board of Supervisors having jurisdiction over the street or highway and, as may be provided in such agreement"

to close streets or highways, or to take the other actions indicated.

Senator Breed recalls that this amendment was one of the two most important questions raised during consideration of the bill. As amended, it came up for vote during a call of the Senate on April 3 and was adopted, with 33 affirmative votes and none in opposition. Of those present and voting for the freeway legislation that day, only Randolph Collier, of Yreka,

<sup>3</sup> Report, page 68.

<sup>4</sup> Streets and Highways Code, Sections 187, 188.

<sup>5</sup> See *Senate Journal*, 1939 session, for amendments and roll calls on the several amendments and on final passage of Senate Bill 848.

is still a Member of the Senate. In the 25 years since then, he has come to be recognized as a forceful exponent of the freeway idea.

#### Bill Reaches Assembly

The bill reached the Assembly on April 4 and was referred to its then Committee on Roads and Highways, of which Assemblyman Albert W. Robertson, of Santa Barbara, was the chairman. On April 19, this committee reported the bill to the Assembly "do pass," and a month later, on May 18, it was adopted with 47 affirmative votes.<sup>6</sup>

Among those present and voting for the measure on that day was a young Assemblyman from Anaheim by the name of Thomas Kuchel, now the senior U.S. Senator from California. Others were Assemblymen Augustus Hawkins and Cecil R. King, now Members of the House of Representatives; George P. Miller, now State Senator Miller; and the late Michael J. Burns, then Assemblyman from Humboldt County, whose name will ever be connected with that most important piece of highway legislation, the Collier-Burns Act of 1947.<sup>7</sup> Paul Peek, now Associate Justice of the State Supreme Court, was the Speaker.

Following Assembly action on May 18, Assemblyman Earl D. Desmond, of Sacramento, gave notice that on the next legislative day he would give notice to reconsider. The record shows, however, that on June 5 reconsideration was granted upon motion of Assemblyman Charles W. Lyon, of Los Angeles, who offered a still further amendment to Section 100.3, reading as follows:

"No State highway shall be converted into a freeway except with the consent of the owners of abutting lands or the purchase or condemnation of their right of access thereto."<sup>7</sup>

It would seem that this would have been the legal effect of the section in any event. The added language, however, was a further expression of the intent of the Legislature that private

property rights of access were to be fully protected and indicated the caution with which the Legislature gave its authorization for the building of this new kind of highway in California.

The bill with the additional amendment, which had been adopted, was finally passed by the Assembly on June 19, with 49 affirmative votes and none in opposition.<sup>8</sup> The Senate concurred and sent the bill to Governor Culbert L. Olson who signed it on July 1. It became effective September 19, 1939, Chapter 687 of the Statutes of 1939.

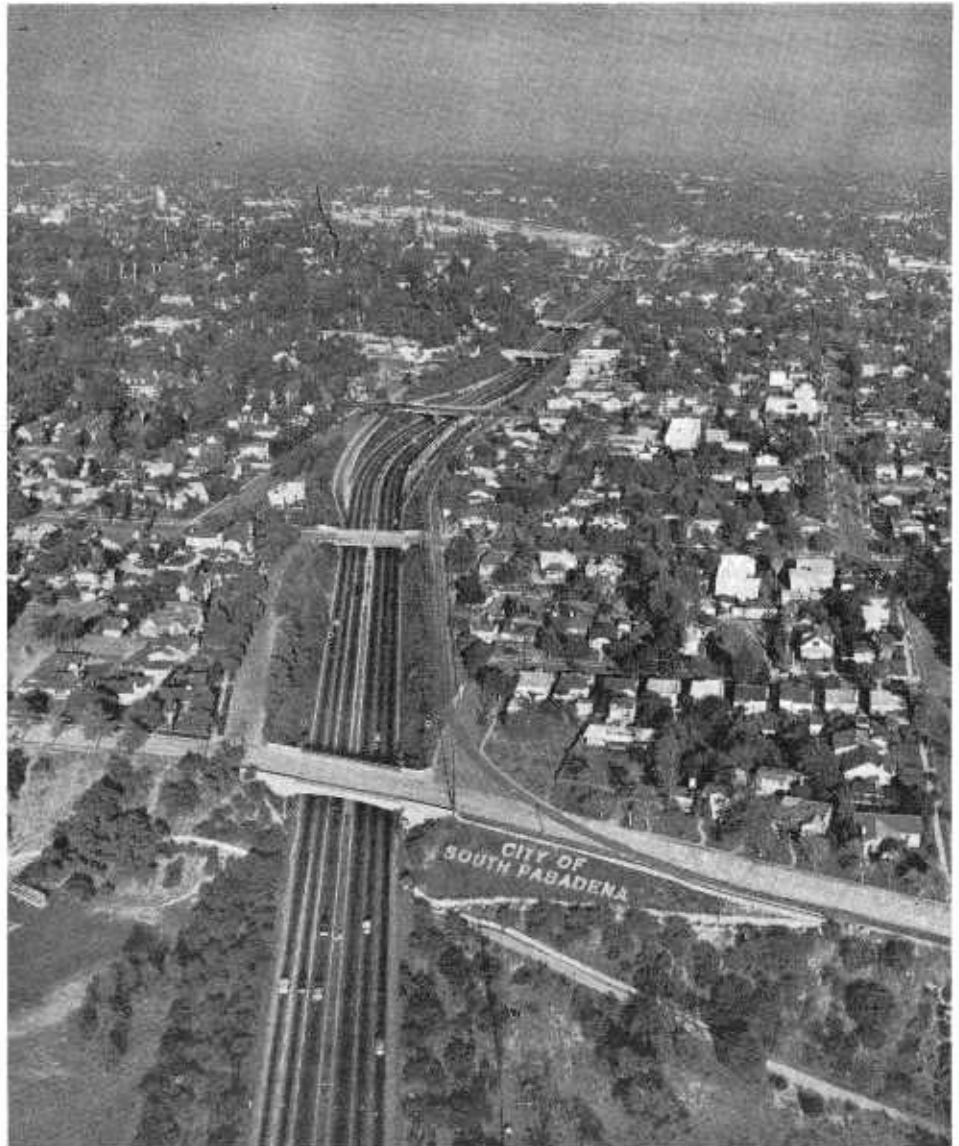
<sup>6</sup> *Assembly Journal*, 1939 session, page 3221.

#### Mr. Carleton's 1939 Report

Reporting on legislation affecting highways adopted by the Legislature at its 1939 session, Mr. Carleton, in the October 1939 issue of *California Highways* said:

"... Three laws enacted . . . should prove of inestimable value in carrying on California's program of developing high-type highways adequate to care for the ever increasing volume of traffic, particularly on the main line routes and in and around the metropolitan centers . . ."

The first listed was Chapter 687, authorizing establishment of freeways



The first freeway to be constructed in California was the Arroyo Seco Parkway (now the Pasadena Freeway). It was opened to traffic in 1940.

<sup>8</sup> *Assembly Journal*, 1939 session, page 2196.

<sup>7</sup> *Assembly Journal*, pages 2754, 2755.



on the state highway system. This statute, he said, places "this State among the highway leaders . . . in the nation . . ."

The other two were Chapters 359, authorizing cities and counties to establish and construct freeways, and Chapter 268, specifically authorizing the Department of Public Works to construct divided highways and highways with paralleling service roads and other safety features on the state highway system.

The act authorizing cities and counties to construct freeways, appears to have received legislative approval with little or no opposition or controversy. It was through the Legislature and was signed by the Governor on June 2, 1939, approximately a month before similar legislation respecting state highways was ready for his approval.

#### Amendments of 1953, 1957

Since its enactment in 1939, two important amendments to the original law authorizing establishment of freeways on the state highway system have been adopted. Both were enacted during the writer's period of service as Director of Public Works.

The first was an amendment to Streets and Highways Code Section 100.2 to clarify the language authorizing agreements between the department and cities and counties and was worked out by the late Robert E. Reed and representatives of the League of California Cities. It was agreed to by the department. Chapter 1200 of the Statutes of 1953 inserted, in Section 100.2, this language:

"No city street or county highway shall be closed, either directly or indirectly, by the construction of a freeway except pursuant to such an agreement or while temporarily necessary during construction operations."

Chapter 1217 of the Statutes of 1957 added a new Section 100.25 to the code, as follows:

"In addition to the other matters that may be covered by the agreements authorized under Section 100.2, provisions for improvements, revisions or extensions of city streets



Interstate 80 (old US 40-99) north of Sacramento was the center of a case in 1949 in which the constitutionality of the freeway statute was affirmed by the State Supreme Court.

or county highways leading to or from a freeway, deemed by the department to be necessary in accommodating the freeway traffic in making proper connections between the existing system of city streets or county roads and the freeway, may be included in such agreements and the department may perform such work as a part of the freeway construction."

This addition was desired by the Department of Public Works to clarify and to some extent extend its authority for the expenditure of state highway funds "for making proper connections between the existing system of city streets or county roads and the freeway." It was also the result of the work of Mr. Reed. It provided statutory authority for spelling out in greater detail the work to be done in connection with interchanges, on and off ramps, and other changes that affected local streets and highways, and no doubt, has aided in bringing about a better solution of these problems as well as more harmonious relations between the department and local governing bodies.

#### Legislation in Other States

Until the writer undertook the preparation of this article, it had been his thinking that the California act was the first freeway law to be enacted by any state. However, the fact is that in 1937 the Legislature of Rhode Island adopted an act relative to "the construction, maintenance and improvement of freeways" (Chapter 2537, Public Laws of 1937), and that a somewhat limited freeway law was also adopted about the same time by the State of New York.<sup>9</sup> Special statutes providing for parkways and toll roads, to which the concept of abutters' rights apparently did not apply, had been adopted in a number of eastern states, but they were not of general application. Inasmuch as the Rhode Island statute is somewhat similar to the California law, as originally proposed, it may be that Mr. Montgomery had available to him a copy of this act. To the best of the writer's recollection, however, there was no discussion in our office at the time of any such law.

<sup>9</sup> Cahill's Consolidated Laws of New York, 1937 Supplement, Chapter 27.



In any event, the action of the California Legislature and what was being done here by the Division of Highways, attracted widespread attention throughout the country and within a short period similar freeway statutes had been adopted in a number of states. All the states are now understood to have this power, either by statute or decisions of courts. The 1956 federal aid legislation, strongly supported by California, provided for access control on the new "national system of interstate and defense highways." This was the first such action by the federal government.<sup>10</sup>

#### Constitutionality

Construction of the new restricted-access type of state highway provided for by the 1939 legislation provoked numerous legal problems, but it was 10 years before the question of the constitutionality of the statute was squarely presented to and decisively disposed of, in the affirmative, by the State Supreme Court in the case of *Holloway v. Purcell*, 35 Cal. 2d 220. In this action the petitioners had sought to enjoin building of the Sacramento-Roseville Freeway in an all-out legal attack on the State's freeway program. The decision was reviewed at some length by the writer in the July-August 1950 issue of *California Highways*.

Just as he had presented the case for the law before the Legislature, C. R. Montgomery defended it before the courts. The State's brief was largely his work. The writer was with him at the hearing before the Supreme Court, and his ability to present a clear, incisive and powerful legal argument was never better demonstrated than on that occasion. The decision of the court was handed down on April 25, 1950, only a few days after Mr. Montgomery's untimely death.

#### Supreme Court Opinion

The thinking of the court is well expressed by two phrases from the opinion of Mr. Justice Traynor, now the Chief Justice, which bear repeating. One of the arguments put forth to support the claim of invalidity of the freeway act was that Article IV,

Section 36, of the State Constitution, adopted by the people in 1902, precluded "construction of any type of highway not in general use in 1902." After pointing out that the type of highway that is adequate to meet highway needs necessarily varies with the character and extent of those needs, Justice Traynor said: "Highways adequate for the horse-and-buggy traffic of 1902 are not adequate for the high-speed traffic of 1950." And at another place in his opinion he said that what the petitioners were really contending for was a "changeless highway in a changing world."

The court unanimously concluded that "construction of freeways and limited access highways is 'necessary or proper to construct and maintain' a modern state highway system." A petition to have the decision reviewed in the United States Supreme Court was denied.

Thus was the right of the department under the freeway statute "to take or damage rights of access," when the owners were compensated therefor, fully upheld.

#### The California Freeway System

A statewide system of freeways for California by statute was envisioned as early as 1945, when legislation having such a purpose was first proposed. The commission and the Division of Highways, however, were already moving ahead with the establishment of such a system, embracing the main trunk highways and major urban routes in the state highway system.

As director, the writer endeavored at every opportunity to point this out in an effort to keep the public fully informed respecting highway developments.

In 1957, the Legislature by Senate Concurrent Resolution 26 requested the Department of Public Works "to undertake a study . . . for an overall statewide plan of freeways and expressways for the State of California . . ." The study was to include highways both on and off the then existing state highway system. This, of course, made it possible to include in the subsequent report all portions of the designated "national system of interstate and defense highways" in the State, as approved by the Bureau of

Public Roads, as well as other highways which the department and its consultants and advisory committee deemed logical parts of such a statewide system.

As was pointed out in the department's report of September 1958 to the Joint Legislative Interim Committee on Highway Problems:

"The establishment . . . of a statewide system of freeways will provide a basis for state, city and county authorities to coordinate all transportation plans, to work out the necessary financial arrangements therefor, and to encourage and promote the development of land use planning."

Such a system was established by the Legislature in 1959.\* For the purposes of the new system only, the terms "freeway" and "expressway" were more specifically defined and, wisely, the authority of the department to construct other state highways, not on the system, as freeways was in no way impaired.

#### First in Nation

As we know, the California freeway system is the first such statewide plan to be authorized in the nation. As now visualized, it totals some 12,250 miles, rural and urban, approximately 11 percent of all public roads in the State. When completed, its planners expect it to accommodate approximately 59 percent of the estimated 1980 statewide travel by motor vehicle.

It was a bold and logical development based on all that had gone before—from the first official recommendation for the establishment of a system of state highways of 4,500 miles, made by the Bureau of Highways in 1896, in the days before the automobile, to the department's Resolution 26 Report of 1958.

Many are entitled to credit for what has been accomplished over the years. But it does not appear beyond the fact to say that in the firm resolve of those who met in conference in the legal office of the Department of Public Works, in the winter of 1938, "to do something about the law of abutters' rights," our great freeway system had its beginning.

<sup>10</sup> Public Law 627—84th Congress, Chapter 462, 2d Session.

\* Chapter 1062, Statutes 1959, as amended; Streets and Highways Code, Section 250 et seq.



# Roadside Rests

250 Units Will Be Built  
Within Next Seven Years

Within the next six or seven years California will have some 250 safety roadside rest areas along its state highways, under a program approved by the California Highway Commission. To implement the program will require an annual appropriation of about \$800,000.

According to State Highway Engineer J. C. Womack, current status shows 46 rest areas now planned or constructed; 16 of these are in use, and 30 are included in the current state highway budget. Construction will continue on approximately 25 units per year until the system is complete. Where possible, the rest areas will be built concurrently with highway construction. On highways where no improvements are scheduled, the facilities will be constructed under separate contract.

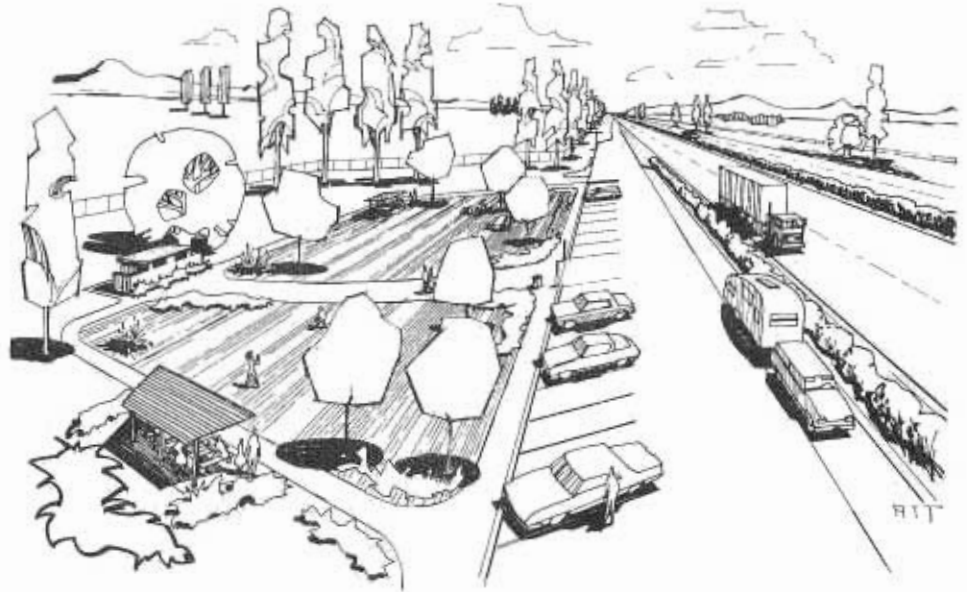
"A great deal of thought and study has preceded the legislation to provide these rest areas," said Womack. "Latest of the investigations and reports was a master plan and cost estimate submitted by the Division of Highways in October 1962 at the request of the Senate Factfinding Committee on Transportation and Public Utilities.

"With the annual 82 billion miles of travel on California highways, these rest areas will not only make travel more pleasant, but can promote safety by preventing driver weariness and thereby reducing accident rates."

### Three Sizes

Three general sizes of rest areas are being provided, most incorporating sanitary facilities, water where feasible, and shade trees.

The largest will contain parking space for 20 to 30 cars and 4 to 6 trucks. They will have 6 to 8 picnic tables, and will be situated along interstate routes and other main highways. On highways of four or more



This artist's sketch shows a typical rest area of the type being constructed along interstate routes. This particular sketch portrays construction now taking place on Interstate 5 at San Luis in Merced County, 10 miles west of Los Banos. As on all major highways, these areas will be constructed in pairs—one to serve each direction of travel.

lanes, rests are provided in pairs—one for each direction of travel. One such "double" area is presently under construction on Interstate 80 near Donner Summit. The future Westside Freeway (Interstate 5) will feature six pairs of rest areas on its new alignment between Wheelers Ridge in Kern County and the vicinity of Tracy in San Joaquin County.

The medium-size units, to be located along less heavily traveled routes, will have accommodations for 13 to 18 cars, and 1 or 2 trucks. Small units with parking for fewer cars, will be constructed along highways of lighter volume. Picnic tables are optional in medium and small rest areas.

It is planned to space these areas so that in combination with other stopping facilities they will be available at intervals of approximately one-half-hour normal driving time. Scenic attractions and points of historic interest will be considered wherever possible.

### Areas Now in Use

Of the areas already in use, five are on the interstate system. They include four between Baker and the Nevada state line on Interstate 15 and one in the vicinity of Midway Wells on Interstate 8 east of El Centro. These are complete only insofar as parking and picnic facilities are concerned. Comfort facilities will be added within this fiscal year.

Thirteen units now under construction are also on the interstate highway system. In addition to those on Interstate 80 near Donner Summit, they are located as follows:

Five are on Interstate 5, with two in the Red Bluff area, two in the Los Banos area, and one near the Los Angeles-Kern county line. Two are on Interstate 15 between Barstow and Baker. Four are on Interstate 10 in Riverside County, two being east of Indio and two between Redlands and Beaumont.

The additional 17 slated for construction in this fiscal year are at

various locations throughout the State. One large unit will be constructed on U.S. 101 at the north end of the Golden Gate Bridge, serving southbound traffic, primarily for map inspection and orientation before entering San Francisco. A footpath underneath the bridge will connect this rest area with the existing vista point on the east side of the road, which is now accessible by auto to northbound traffic only. Another large unit will be located at Batiquitos Lagoon on Interstate 5, 25 miles north of San Diego. Pairs of large units will be in Santa Barbara County near the south portal of Gaviota Tunnel and in Tulare County on U.S. 99 three miles north of Tipton.

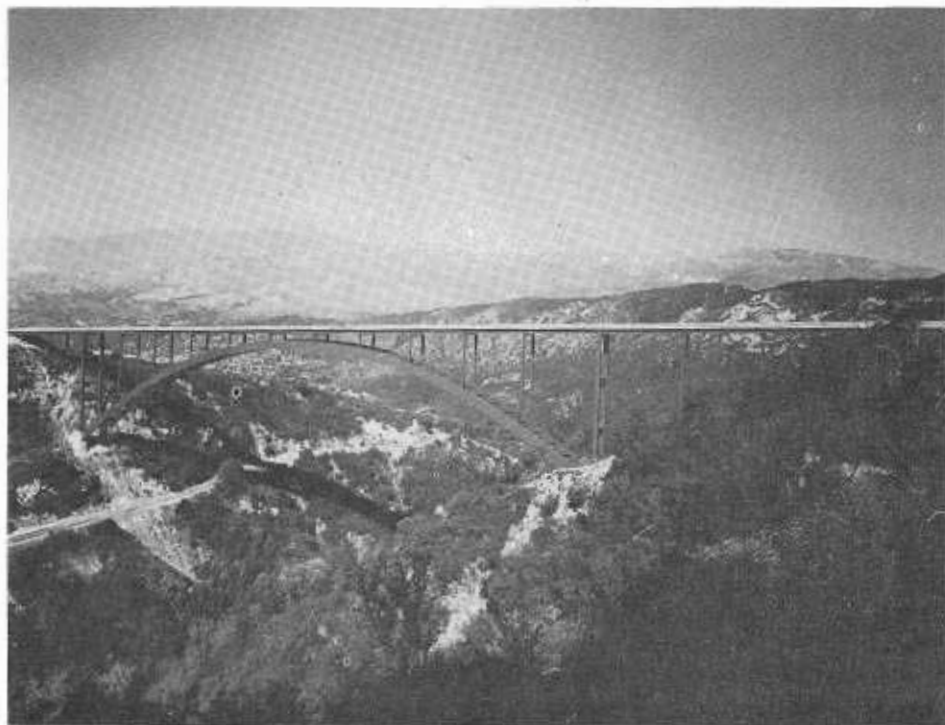
#### Medium-size Areas

Medium-size rest areas will be located in Del Norte County at the south portal of Collier Tunnel; in Humboldt County on U.S. 101 at the Salmon Creek Road interchange near Myers Flat; and a pair of units in Mendocino County on U.S. 101 near Sherwood Road and at Old Irvine Lodge 15 miles north of Willits. Siskiyou County will have a rest area on U.S. 97 at Grass Lake (20 miles north of Weed). Medium-size units will also be constructed on State Route 17 at Saratoga Gap on the Santa Clara-Santa Cruz county line; in Kern County on Route 14, 22 miles north of Mojave; and in Mono County on U.S. 395 near Casa Diablo, 42 miles north of Bishop.

Of the small units slated for current fiscal year construction, one is in Tehama County, on State Route 36 near Mineral, 41 miles east of Red Bluff. One is being considered for Placer County and another for San Luis Obispo County.

Earlier legislation in 1956 had established a limited rest area program to be carried out by the California Division of Beaches and Parks. From the funds allocated, 11 rest areas were established along state highways and 24 within state parks. With the 1963 legislation, the 11 constructed along highways were transferred to the jurisdiction of the Division of Highways, and are included among the 16 now in use.

## BRIDGE DEPARTMENT ENGINEER WINS DESIGN AWARD



The Cold Spring Canyon Bridge is located on Route 154 in Santa Barbara County. Its 700-foot span rises 400 feet above the canyon floor.

Marvin A. Shulman, associate bridge engineer with the State Division of Highways, has been announced as a fifth-place winner by the James F. Lincoln Foundation in its national welding design awards for progress in welded steel design.



MARVIN A. SHULMAN

Shulman's award, which also brings him a cash prize of \$1,500, was given for his design of the Cold Spring Canyon Bridge on Route 154 in Santa Barbara County (See September-October 1963 issue of the magazine).

Reportedly one of the 10 longest steel arch bridges in the United States, the Cold Spring Canyon Bridge is one of the first major arch units entirely fabricated from arc welded steel. The award cites a 22 percent saving in the \$1,900,000 overall price of the 700-foot span through the use of arc-

welded steel. Additional advantages cited in the award were decreased design time and increased aesthetic value.

The bridge provides a 28-foot roadway between 3-foot barrier curbs and is 1,218 feet between abutments.

Shulman was cowinner with the Bridge Department's William J. Jurkovich and Douglas M. Fraleigh of a \$5,000 second honorable mention award in the steel highway bridge design competition sponsored by the American Bridge Division of U.S. Steel in 1959. (See November-December 1959 issue of the magazine.)

He also won first honorable mention in the American Institute of Steel Construction competition in 1957 for a design of the Trinity River Bridge.

Shulman received his engineering degree from the University of California in 1951 and joined the Division of Highways the same year.

He has served as project engineer in preparation of contract plans for various types of bridge structures.



## Landscape Pioneer Dana Bowers Retires

H. Dana Bowers, supervising landscape architect, has retired after 40 years of State service, the last 35 of them with the Division of Highways.

A pioneer in roadside development, Bowers started selecting and developing vista points and fountains along the highways for the State in 1929. He was put in charge of the development of roadsides for the whole state highway system in 1935. Since that time he has supervised the planting of trees, shrubs, flowers and vines along more than 1,000 miles of freeways and expressways.

He recently was recipient of the award of achievement of the Western Chapter of the International Shade Tree Conference at its annual meeting in Seattle. The award is made to a person or firm who has made a significant contribution to promoting and advancing the use of shade trees in the western area. Bowers was honored by a standing ovation when the award was announced.



H. DANA BOWERS

In the presentation of the award, Bowers was cited as one who has "planted more ornamental trees and other plants over a greater area for the enjoyment and safety of more people than any other person in the west during his four decades with the State of California. He has searched for and tried every known plant which might fit somewhere into the varied roadside conditions of his State."

His findings have been used by landscape contractors, government agencies and individuals throughout the United States. Many engineers and students from overseas have come to study his methods and work.

Bowers' work also resulted in new standards for erosion control. He is the author of "Erosion Control on

## Division Wins Safety Council's Award of Merit



J. C. Womack, State Highway Engineer for the Division of Highways, receives the National Safety Council's Award of Merit from James O. Burpo, Sacramento Safety Council President, in ceremonies at a California Highway Commission meeting.

The State Division of Highways has received an award of merit from the National Safety Council.

The award, for "a noteworthy safety performance, 1963" was presented to J. C. Womack, State Highway Engineer, at the start of the two-day monthly meeting of the California Highway Commission on August 31.

In 1963, the State Division of Highways had an accident frequency rate of 9.42 per million work hours, as computed by the American standard method for recording work injuries. The accident frequency rate for California highway personnel for the three years 1960-62 was 12.18, while

the national average for all state highway departments was 12.55 for the same period. California, Womack reports, had had an almost continuous reduction in work accidents by people in the highways program since 1952.

James O. Burpo, president of the Sacramento Safety Council, presented the award of the national safety group. In accepting the wall plaque, Womack paid tribute to the more than 17,000 highway employees throughout the State whose achievements in safety and accident prevention made the award possible.

California State Highway," which has become a basic text for the Division of Highways as well as for other agencies and engineers.

A native of Iowa, Bowers came to California in 1903 and attended grade and high school at Gardena and Santa Cruz. He later studied at the University of California at Davis.

He went to work for the State Division of Forestry in 1924 and joined the Division of Highways in 1929.

Bowers is a charter member of the original Western Shade Tree Conference, which he helped organize in 1934.

Bowers and his wife have one son.

# Inspection Training

By LEIGH SPICKELMIRE, Assistant Engineer—Construction and  
MORRIS REDSUN, Training Assistant

Where should aggregate samples for control tests be taken? When should pigmented curing compound be applied to concrete? Plastic cracking results from what condition?

The answers to these questions and others are contained in a 12-hour training program, "Inspection Procedures for Portland Cement Concrete Construction," developed and

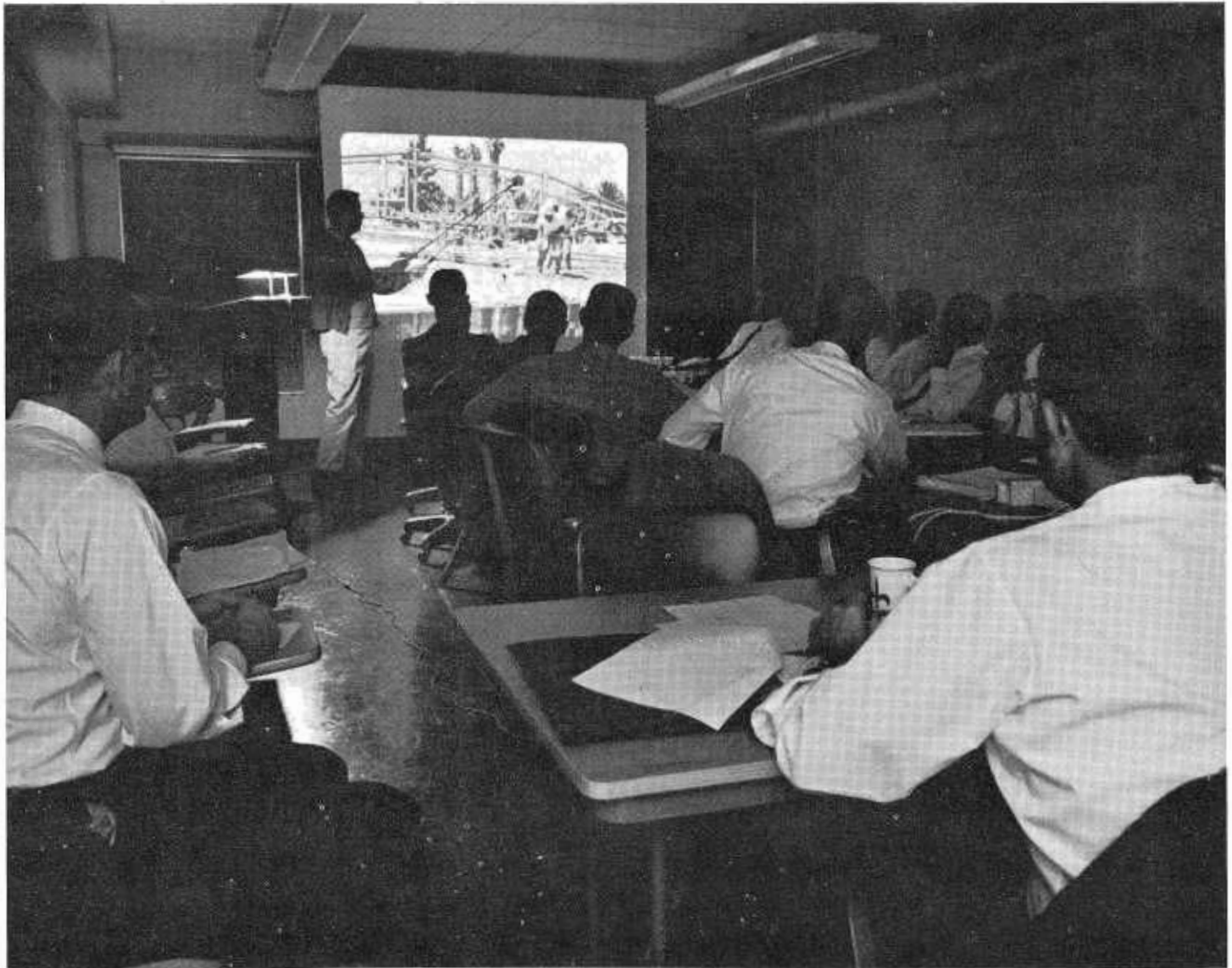
given by the Division of Highways during the last year. The course was taught to 1,280 division engineers.

In 1959 and in 1961, we held training courses covering broad aspects of portland cement concrete paving procedures. In 1963, we needed a course with a different emphasis. New methods and techniques in portland cement concrete construction re-

quired a more comprehensive training program, dealing primarily with inspection procedures.

#### Course Is Developed

The course to meet these needs was developed by Headquarters Construction, with the assistance of the Portland Cement Association and the Division of Highways Training Section. It



Dave Swanson, Bridge Department, uses slides to explain features of the Bidwell Bridge deck finisher to a trainers session for inspection procedures for portland cement concrete construction.





Leigh Spickelmire, Headquarters Construction, holding a test core. The exhibit table contains an Idaho Sand Shaker and aggregate samples used in conducting small group lectures.



Joe Dobrowski, Portland Cement Association instructor, illustrating a point with one of the aggregate samples.

instructs the division's engineers and construction inspectors in the procedures to be followed in *any* portland cement concrete construction project. It stresses quality control, and emphasizes the importance of planning before concrete placement, inspection during placement, and inspection and alteration after placement.

New developments in concrete construction, now being used in California, are covered. These include new equipment and methods in central mixed concrete, slip form paving, experimental cements, pavement joints, cement treated base spreaders and bridge deck finishers.

After a tentative course outline was developed, two trial runs were held to test it. Then, a final "instructors syllabus" and necessary visual aids were prepared. Each district was asked to provide an instructor, who had both knowledge and practice in portland cement concrete paving, to help to teach the course in his district. A training meeting was held in Sacramento in November 1963 to train these instructors.

#### Taught in Each District

The course itself was taught in each district by an instructor team. This team comprised a representative of Headquarters Construction, the Bridge Department, the Division Training Section, and the Portland Cement Association. The district instructor joined the team for the presentation in his district, and was responsible for district arrangements and coordination. Each member of the team taught a part of the course, thus giving variety to the presentation.

Team members and district instructors were:

Portland Cement Association: J. A. Dobrowski, R. H. Cooley, Warren H. Johnson and Gene Wirkus.

Headquarters Construction Department: Leigh S. Spickelmire.

Headquarters Training Section: Morris Redsun.

District 1: H. W. Benedict and Jim R. Kegler; District 2: W. R. Morrill; District 3: Leon R. Hawkes; District 4: Lloyd Fisk; District 5: Roy E.

Alderman; District 6: J. D. Roullard; District 7: Enrico Bissiri and Bob D'Alo; District 8: Hal Lee; District 9: Lloyd J. Hopper; District 10: R. K. Wells; District 11: John R. Cramer.

Bridge Department: D. T. Swanson, R. L. Boulvare, Lloyd R. Johnson, D. N. Weston and L. J. Reese.

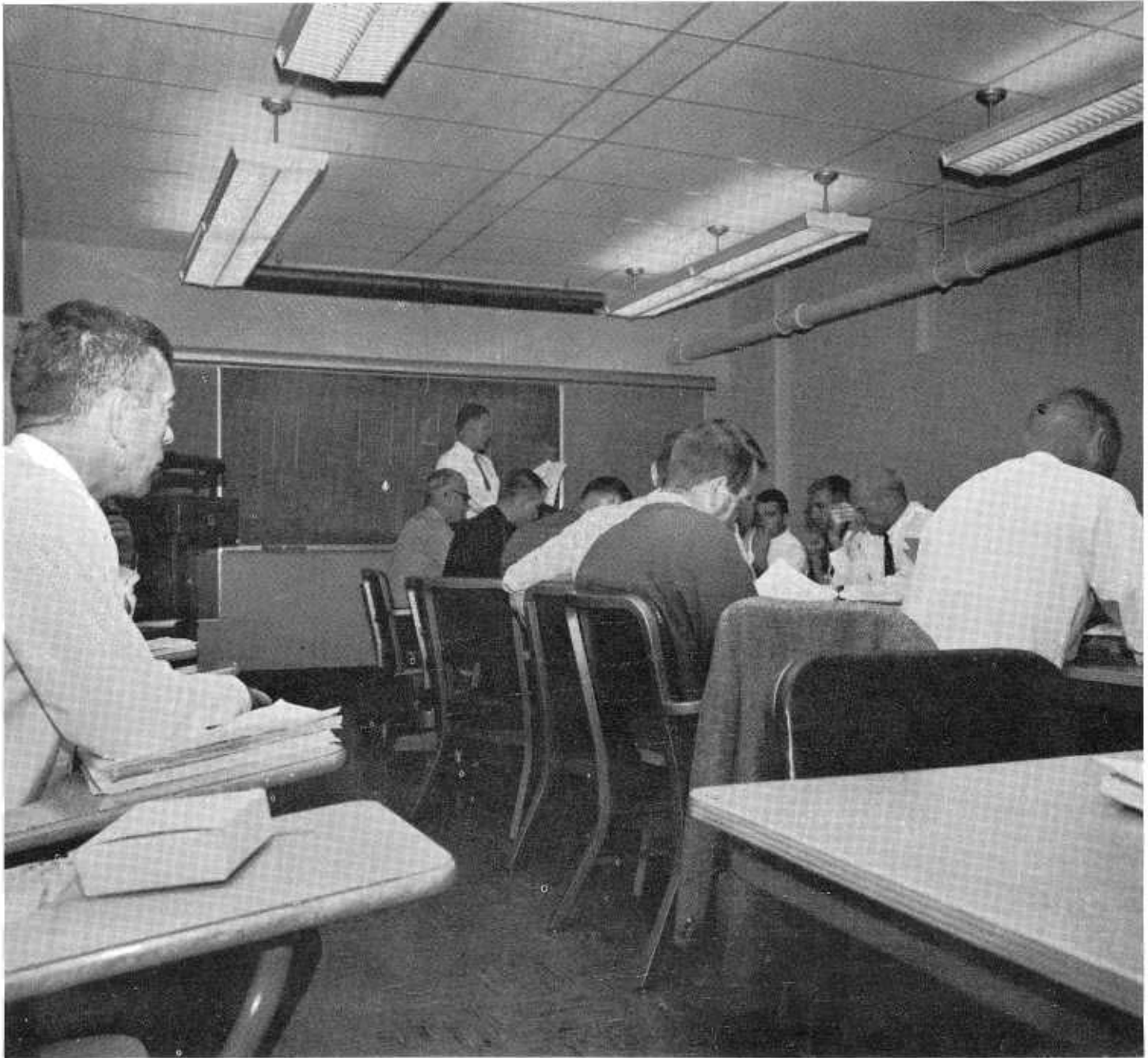
The basic method of instruction was informal illustrated lecture, using colored 35-mm. slides to depict various phases of highway construction. Classes were kept informal, and par-

ticipants encouraged to ask questions at any time. After each hour of lecture, the class was formed into small groups. Each group met with an instructor who conducted a seminar to reinforce important points and to clarify any misunderstanding. Test equipment was demonstrated, exhibits were displayed and discussed, and participants were asked to relate what they had heard in the lectures to their actual jobs.

#### **Motion Picture Made**

To present part of the material, a motion picture was developed, covering important testing procedures. It depicted the Kelly ball slump test, the air meter test, the unit weight test, the compressive strength (beam) test, and the washout test, as they are performed in the field. This motion picture was one of the best liked features of the program.

A pre and post test were used to evaluate how much the participants



*Spickelmire conducting a "training the trainers" session.*





Leon Hawkes, District 3, conducting a session on inspection procedures. Warren Johnson, Portland Cement Association, and Spickelmire await their turn to instruct. In the background are the test equipment and samples used to illustrate specific inspection and testing procedures.

learned. These measured how much more the participants knew about the subject after he took the course. On the average, students scored 30 percent higher on the post test than they did on the pre test. The pre test also helped to show the participant what they needed to learn about the subject, and thus motivated them to concentrate during the training.

#### Questionnaires Submitted

After completing the training, participants filled out and submitted unsigned questionnaires, which asked them how satisfied they were with the material, the presentation, application of the course to their job, and their personal development in the field of construction. Over 80 percent were well satisfied in each of these areas.

Each district now has a trained district instructor who can repeat any or all portions of the course. The motion picture and the course syllabus are available to them. New or newly assigned employees may be trained by the districts, and the districts can give refresher training to those who took the course, as needed. Thus, this course has become a part of our regular training curriculum for engineers.



# San Mateo-Hayward Bridge

Construction of the new San Mateo-Hayward Bridge has progressed to the point that work will soon begin on the steel superstructure that crosses the navigation channel, it was announced today by Robert B. Bradford, California State Highway Transportation Administrator.

"The State advertised for bids on August 28," Bradford said, "and plans call for the new bridge to be open to traffic by mid-1967. Bids will be opened October 22, 1964, in San Francisco."

Bradford cited the fact that the orthotropic design the State's engineers incorporated in the high-level superstructure will make this bridge the first of its kind in the U.S.A.

"Governor Brown, Chairman of the State Toll Bridge Authority, wants this to be the best bridge that can be built," Bradford stated, "for he is aware of its ever-increasing importance as a primary link in the transportation system that connects the cities, communities and industrial complexes on both sides of the San Francisco Bay.

"He also wants a bridge that is pleasing to look at. That is why the Toll Bridge Authority approved the

orthotropic concept on December 6, 1961, and why an outstanding architect, William S. Allen of San Francisco, was selected to advise our bridge engineers on aesthetics as design of the bridge progressed."

Because the development of orthotropic design, which permits steel plates rather than concrete roadway to act as the deck of a bridge and to also be part of the supporting girders, is new in this country, E. R. Foley, Chief, State Division of Bay Toll Crossings, traveled to West Germany last spring. There the orthotropic concept has been used in a number of bridges, and Foley commissioned one of the world's foremost authorities on bridge design, Hans Grassl of Düsseldorf, to review plans for the proposed California project.

Upon completion, the entire bridge will be 7.4 miles long and will incorporate 5,500 feet of orthotropic span construction. Included will be a central span 750 feet long, two 375-foot side spans, and series of spans 292 and 208 feet long. The 5,500-foot length will be the world's longest orthotropic bridge construction and the 750-foot central span the largest

in the United States and third largest in the world.

The entire bridge will cost approximately \$70 million. Foley predicts the superstructure bids will be in the "\$25 million category."

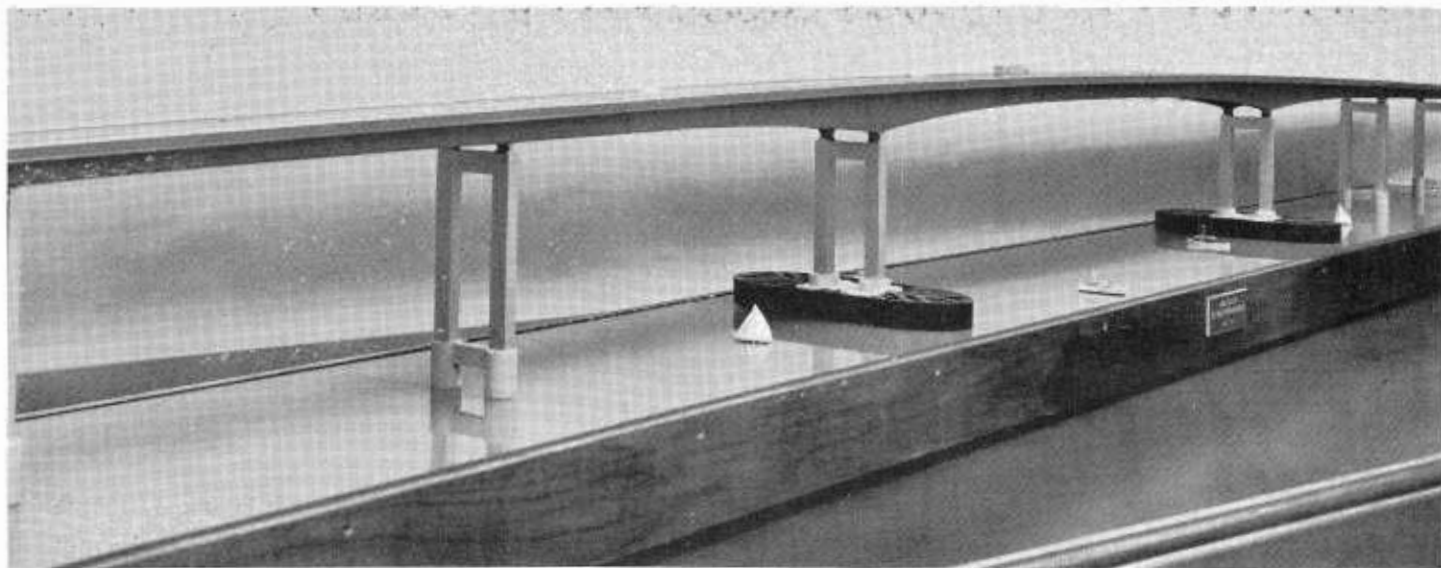
A contract let on July 5, 1963, for building substructures is now approximately half completed.

Average traffic on the present bridge located adjacent to the construction is 13,000 vehicles a day and increasing at the rate of 6 percent annually. The new structure is designed to carry 50,000 vehicles a day and will not reach its capacity until about 1995.

The present toll rate, 35 cents for an automobile, will also apply to the new bridge.

The 135-foot minimum clearance of the future structure will prove a benefit to drivers for it will permit oceangoing vessels to pass beneath at will. The present bridge is a lift type that must be raised several times a day as ships approach it.

When the four-six-lane bridge is opened to traffic, the existing two-lane bridge will be removed.



*This model of the proposed new San Mateo-Hayward Bridge is on display at the Division of Bay Toll Crossings office at 151 Fremont Street in San Francisco.*



# Safety Glasses

*Accident Dramatizes  
Importance of Program*

A near accident which could have resulted in a loss of sight for Glen Thurman, welder at the California Division of Highways' Equipment Department, resulted instead in an award which was presented August 26.

Thurman received a membership in the Wise Owl Club, presented by Lyman R. Gillis, Assistant State Highway Engineer. Neal Andersen, Equipment Engineer for the Division of Highways, accepted a Wise Owl Club charter in behalf of the Equipment Department. The presentation was made by A. C. Macdonald, a member of the Board of Directors of the Sacramento National Safety Council.

The Wise Owl Club, an international organization established by the National Society for the Prevention of Blindness, Inc., is dedicated to preserving the sight of industrial workers. With nearly 30,000 members, the group is striving to eliminate the estimated 300,000 eye accidents which happen in industry each year.

Thurman, wearing safety glasses provided by the State, escaped injury on July 21 when working with an argon gas welder. Malfunction of a rod ejection switch and tension built up in twisting cables caused the welding rod to uncoil with enough force to strike the left lens of Thurman's safety glasses. Evidence indicates that if eye protection had not been worn, the welding instrument would have penetrated Thurman's eye.

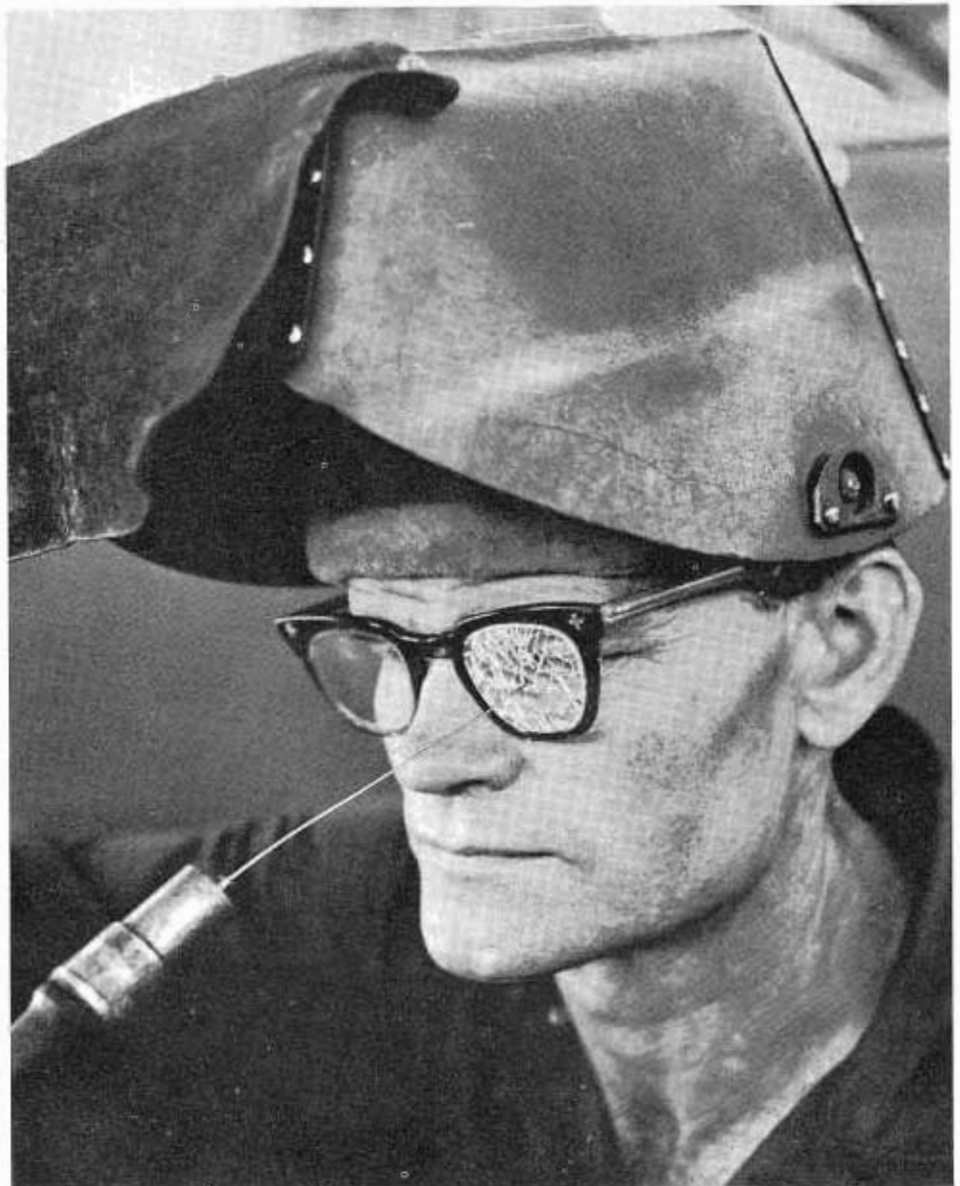
## **Program Established**

In establishing its eye protection program the Headquarters Equipment Department considered the type of glasses, protective quality required, wearer acceptance, cost to the State and availability of replacement and repairs.

In determining the type of protection to supply shop employees, consideration was given to the type of potential injuries that may be encountered in the shop operations. It was found that the potential ranged from light dust and grease-laden dirt par-

ticles falling from the underbody of vehicles to the cutting force of a sharp chip of steel ejected from a metal-working machine. It was decided to protect against the heavy injuries by using a high-impact-resistance, tempered plano safety glass lens. This lens would also protect against the light foreign particles.

The type of frame was considered to be of major importance to wearer acceptance of the program. Plastic, smoke-colored frames with reinforced spatula temples were selected because of their strength, lightness, attractive appearance and similarity to standard frames supplied with regular prescription ground glasses.



*Glen Thurman, welder with the State Division of Highways equipment department, wears the safety glasses which saved his left eye from injury in reenactment of an accident which occurred while he was operating a gas welding machine.*

#### Side Shields Considered

Side shields were considered. Although the protection was superior, it was decided not to use them. Anything gained by their use would be more than voided by the wearer resistance that could be expected to wearing an uncomfortable pair of glasses.

Uncomfortable and ill-fitting safety glasses will not be faithfully worn. In order to assure faithful wearing of the safety glasses and remove wearer resistance to poorly fitted glasses, arrangements were made for the supplier of the glasses to send his optometrist to the shop and individually fit each employee with a set of plano lens safety glasses.

The supplying of sturdy, attractive, well-fitted, plano lens safety glasses has resulted in almost universal acceptance by shop employees.

Before the installation of the eye protection program, eye injuries were approximately 25 percent of the shop total industrial injuries. Since the acceptance of the safety glasses by shop employees, approximately January 1, 1964, only one eye injury has occurred and it was a minor, no-lost-time, "foreign particle in eye" report.

#### Savings Result

In addition to the saving of Glen Thurman's eyesight, many less dramatic incidents have been experienced by shop employees. As evidenced by the practical elimination of eye injuries from Headquarters Shop accidents, the safety glass program is being well received and is effecting a savings to the State.

The average compensation payment for the loss of one eye in an on-the-job accident by a state employee of similar status is approximately \$7,000. The entire cost of the Headquarters Equipment Department eye glass program was \$237. This is a tax dollar saving of \$6,763 through the prevention of injury in just this one instance.

The expansion of this program to include state-provided prescription ground safety glasses as well as plano lens safety glasses to all the Equipment Department shops would undoubtedly result in substantial savings in eye injury costs.

## DRIVER OPINION POLL WILL BE COOPERATIVE PROJECT



Robert B. Bradford, administrator, Highway Transportation Agency (left); Earl F. Campbell, executive vice president, California Traffic Safety Foundation; and H. G. Vesper, president, Standard Oil Company of California, Western Operations, Inc., hold a Standard Oil check for a foundation grant for a special driver opinion study. The poll will be conducted by Field Research Corporation through the offices of the Department of Motor Vehicles.

A statewide opinion poll of drivers will soon be conducted in California through a cooperative effort of the California Traffic Safety Foundation and the Highway Transportation Agency, it has been announced by Robert B. Bradford, Agency Administrator.

The study, the first of its kind in California, was made possible by a special grant of funds from Standard Oil Company of California—one of the founding member companies of the foundation. The survey will be conducted by Field Research Corporation of San Francisco, according to Earl F. Campbell, foundation executive vice president.

One out of every five drivers being issued a driver's license in the field offices of the Department of Motor Vehicles during an undisclosed period will be asked to fill out a questionnaire covering traffic subjects, includ-

ing opinions of driver education, ticket fixing, the handling of the drunk driver, legislation, police and courts. Motorists may also voice opinions of some of the things not being done.

The result will be the average driver's evaluation of present traffic safety programs and as constructive criticism may provide guides that will call for future changes.

"The California Traffic Safety Foundation is an excellent organization to conduct such a survey," Bradford said. "It does not necessarily represent the official state point of view. Rather, it is a citizen group not connected with state or local government in any way. It receives no governmental financing, but acts as a citizen sounding board to official programs.

"All of us in the agency were happy to cooperate with them."



# Route Actions Freeway Locations for Malibu, Other L.A. County Areas Chosen

The California Highway Commission adopted the locations for slightly more than 50 miles of new freeways on five routes at its July and August meetings.

Two of the routings followed public hearings by the commission itself. All of the adoption actions were preceded by district hearings in accordance with established policy.

Possibly the route adoption of greatest public interest was the one for approximately 22.2 miles of State Sign Route 1 (Pacific Coast Highway) in Los Angeles and Ventura Counties between Malibu Canyon Road and Point Mugu, which included a section through the Malibu Beach area.

It was the subject of a commission hearing held in Santa Monica on February 25, 1964.

The newly adopted route follows the general alignment of the existing highway from just west of Malibu Canyon Road westerly to just east of Corral Canyon Road, then swings slightly inland to Latigo Canyon Road, and continues westerly approximately three-quarters to one-quarter mile in-

land from the existing highway, re-joining the latter just west of Trancas Canyon Road.

It continues along the general alignment of the existing highway to the Point Mugu area except for a short stretch near the western limits of the adoption.

### Recommended Route Changed

The commission varied from the route recommended by State Highway Engineer J. C. Womack in about seven miles near Malibu, locating the new facility as close as feasible to the foothills.

In recommending the variance, which will cost approximately \$4,800,000 more than the recommended route, Commissioner Roger Woolley termed it "one that will permit better development of the Malibu Peninsula's coastal plain."

Plans of the Division of Highways call for the construction of a six-lane freeway with provision for expansion to eight lanes when required at an estimated cost of \$41,600,000, including rights-of-way.

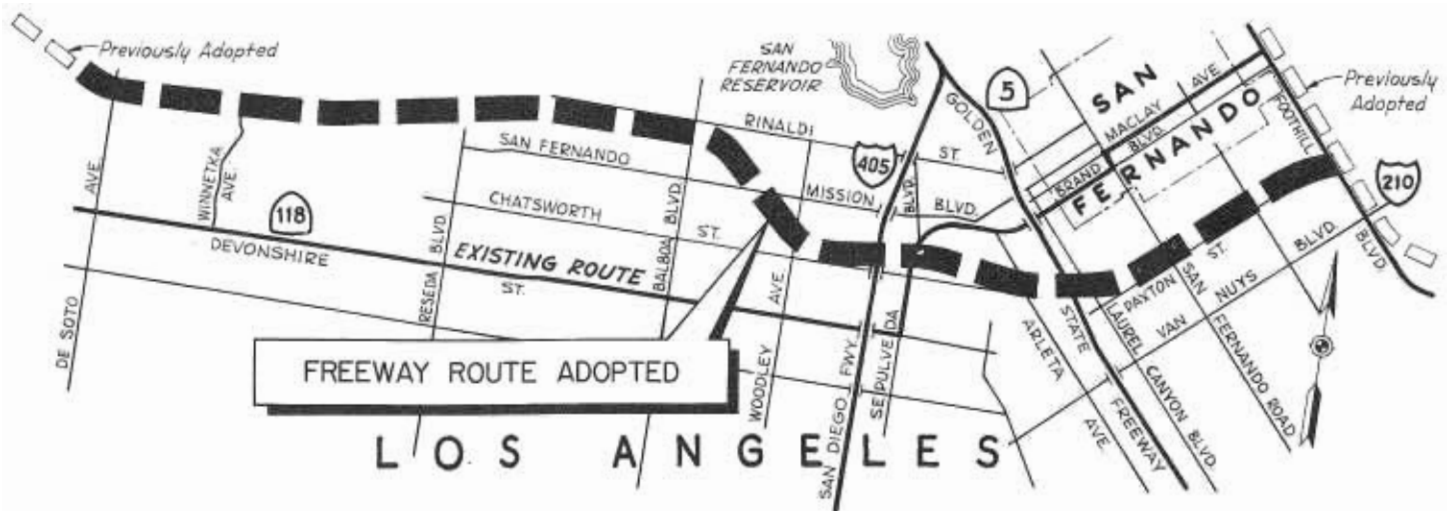
The second freeway route adoption following a commission hearing (San Fernando—July 9, 1964) was for 11.5 miles of State Sign Route 118 in Los Angeles County between 0.3 mile west of De Soto Avenue in Chatsworth and the adopted route for the future Interstate 210 Freeway near San Fernando.

Recommended by the State Highway Engineer, the new route runs easterly to beyond Winnetka Avenue, then northeasterly to where it is north of and adjacent to the Department of Water and Power's transmission lines south of Rinaldi Street. It continues east along this right-of-way, bending southeasterly east of Balboa Boulevard to east of Woodley Avenue, then easterly across the San Diego and Golden State Freeways.

It swings northeasterly beyond Laurel Canyon Boulevard, and continues north of and parallel to Paxton Street to join the adopted route of Interstate 210 just east of Foothill Boulevard.

The commission found that the adopted routing will affect 174 fewer





families while costing \$2,900,000 less than the next most favored routing.

**Less Disruption**

Additionally, the commission's report stated that the adopted route will cause minimum disruption to the community and will provide good traffic service.

Plans of the Division of Highways call for the construction of an ultimate eight-lane freeway at an estimated cost of \$81,900,000, including rights-of-way.

In Madera County, the commission adopted the recommended 8.3-mile freeway routing for State Route 145 between 0.2 mile north of Avenue 5 1/2 and the south city limit of Madera. This highway section is known locally as Madera Avenue.

The new route, positioned along the general alignment of the existing highway, connects on the south with a recently adopted routing for 6.7

miles to White Bridge Avenue in Kernan.

Two of the adoptions were revisions of previously adopted routings of Interstate 5 (US 99) in Los Angeles County.

One adoption, a 3.4-mile section north of San Fernando, is intended to provide separate roadways for automobiles and trucks.

It extends between 0.2 mile south of San Fernando Road and 3.2 miles northerly.

**North Half for Trucks**

The northern half will be reserved for truck traffic and a new route west of the existing alignment and the Southern Pacific Railroad tracks will be used for automobiles. On the southern half, autos and trucks will use the existing alignment but will have separate lanes for trucks.

While revising this section of Interstate 5, the commission adopted

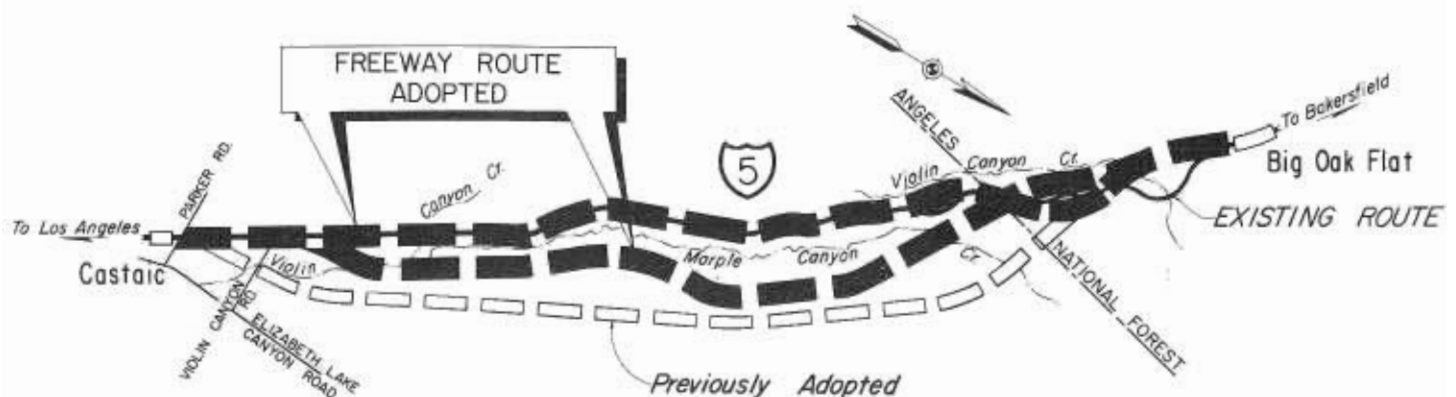
freeway connections to State Sign Route 14 toward Antelope Valley and to the future Interstate 210 Freeway toward Pasadena.

The second revised adoption on Interstate 5 involves 6.8 miles north of Parker Road near Castaic.

The commission had adopted a freeway routing for a section of the Ridge Route between Parker Road and 17.9 miles northerly on April 25, 1962. The new revision affecting the southbound lanes in Marple Canyon was based on State Highway Engineer J. C. Womack's recommendation that \$3,150,000 might be saved in construction and rights-of-way costs.

Womack had told the commission that this saving could be realized by shifting the routing for the southbound roadway somewhat to the west to fit the natural terrain.

The northbound (upgrade) roadway will continue to follow the alignment of the existing highway.





## PARKS-HIGHWAYS TEAMWORK

September 2, 1964

Mr. J. C. Womack  
State Highway Engineer  
Division of Highways  
Department of Public Works  
1120 N Street  
Sacramento, California

DEAR MR. WOMACK:

The fine work of one of your resident engineers, Milton Vlach, at our project in Alpine County has come to my attention. Our district superintendent, Clyde Newlin, reports that Mr. Vlach has worked very closely with our park supervisor and our District 3 engineering and landscape section to protect the natural scene and the tree growth in Grover Hot Springs State Park.

I do not mean to imply that this is a rare occurrence between our two organizations. I did want you to know, however, that both our supervisor and our district superintendent noticed this and commented on it specifically. We appreciate it a great deal.

I think it outstanding in relationships between two agencies of state government that, with 170 units in our state park system, we really have strong differences of opinion in only two, and with the miles and miles of state highway and state freeway in California, we probably have less than 10 miles of road alignment where there is any disagreement at all between our two organizations.

We will continue to work closely with you and with your district engineers in all cases to achieve satisfactory results before any major disagreements arise.

Sincerely,



Director  
Department of Parks  
and Recreation

### INTERSTATE 40 JOB

The State Department of Public Works has awarded a \$3,106,000 contract for constructing a four-lane divided freeway bridge to carry Interstate 40 (former US 66) across the Colorado River in the vicinity of Topock, Arizona, and southeast of Needles.

## Motor Vehicle Total Will Hit 86,000,000

With an increase in both passenger car and truck registrations anticipated in every state, the nationwide motor vehicle registration in 1964 is expected to total 86,193,000, an increase of 3,493,362 over last year's 82,699,638, according to a report by Federal Highway Administrator Rex M. Whitton.

The estimated 4.2-percent rise over 1963's registration, Whitton said, reflects the nation's sustained high level of employment and the general economic activity.

The estimate, made by the U.S. Department of Commerce's Bureau of Public Roads, is based on state reports of registrations early in 1964, coupled with information on current trends, automotive production and other factors.

Passenger car registrations are expected to reach 71,864,000 this year, an increase of 4.2 percent above last year's 68,983,467. Commercial vehicles should rise to 14,329,000, a hike of 4.5 percent.

California with an estimated 9,531,000 vehicles will top all states followed by New York with 5,723,000, Texas 5,332,000, Pennsylvania 4,817,000, and Ohio 4,661,000. At the other end of the scale will be Alaska with 100,000 vehicles, Vermont 170,000, Wyoming 225,000, Delaware 229,000, and Nevada 263,000. Even though Nevada will be fifth from the bottom of the list, it will experience the largest percentage increase—8.2.

Several southern and western states will show substantial percentage increases. They are: Alabama, 6.3 percent; Arizona, 5.8; Arkansas, 5.2; Georgia, 5.9; Mississippi, 5.9; North Carolina, 5.2; Oregon, 5.4; and Texas, 5.2. A comparison of 1964 estimated registrations by states with 1963 actual registrations is shown on the back.

### US 50 FREEWAY JOB

The State Division of Highways has called for bids on a major freeway job on US 50 about 20 miles east of Sacramento in El Dorado County.

The project calls for grading and paving 2.3 miles of four-lane freeway

## SUTTER JR., NOT SR.

September 1, 1964

Mr. Karl Moskowitz  
3836 Cresta Way  
Sacramento, California

DEAR MR. MOSKOWITZ:

I was reading your article in the *California Highways and Public Works* magazine for July-August 1964, and found it very interesting.

However, on page 51, in the right-hand column, in the last paragraph on the page, I was surprised at an obvious error of fact that was allowed to escape previous notice.

The plain sentence from your article, "In 1850 Captain John Sutter laid out the City of Sacramento," appears.

All local historians agree that Captain Sutter founded his now famous fort in 1839. But likewise it is recorded that Captain Sutter was *not* the one who laid out Sacramento, but rather his son, John A. Sutter, Jr., is given that credit.

One of the most interesting books on the subject of early Sacramento (including Sutterville and Suttersville) is one that I had the privilege of working on while attending Sacramento Junior College: *John A. Sutter, Jr.: Statement of Early California Experiences*, edited with a biography by Allan R. Ottley.

This book can be secured readily, I am sure, at the State Library.

I trust that this information may prove helpful to you in any future writing, or even future publishing of your interesting article on auto-oriented cities.

Sincerely,

RONALD A. WARFORD  
7261 Stanwood Way  
Sacramento, California

Editor's Note:

Mr. Moskowitz informs us that Mr. Warford is right. John A. Sutter, Jr., not his father, laid out the street plan of Sacramento, and it was in 1849, not 1850.

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between two miles east of the Sacramento County Line and 1.2 miles east of Bass Lake Road, about 14 miles west of Placerville.

A total of \$1,700,000 is available for the project.

## Division Announces Latest Retired List

### District I

Lloyd Gullick, highway maintenance man II, 15 years; Lawrence G. Hitchcock, highway maintenance man II, 32 years; Robert C. Hunt, highway maintenance man II, 42 years; Earl F. Mayeau, janitor, 6 years.

### District II

Carl Burger, highway foreman, 28 years; Alfred T. Moore, highway engineering associate, 43 years; Bessie E. Peterson, bookkeeping machine operator II, 33 years; John W. Stone, highway foreman, 27 years.

### District III

George W. Reed, assistant highway engineer, 9 years.

### District IV

Joe Garabini, laborer, 20 years; Carl R. Goetz, assistant highway engineer, 16 years; H. Glover Hughes, associate highway engineer, 44 years.

### District V

Carl A. Kaler, highway maintenance man III, 34 years; Bessie O. Ladd, highway field office assistant, 12 years.

### District VII

Kathleen C. Busse, senior clerk, 15 years; Joe B. Hileman, highway maintenance man II, 31 years; Ruby M. Parsons, intermediate stenographer, 17 years; Allen Preston, associate highway engineer, 34 years; Mark Stan, groundsman, 5 years; James W. Sutton, senior highway foreman, 25 years.

### District VIII

Almon B. Ruggles, associate right-of-way agent, 30 years; C. Clarke Waterman, accounting officer III, 25 years.

### District IX

Fred McKenzie, highway maintenance man II, 17 years.

### District X

Frank T. Lavagnino, highway maintenance man III, 30 years.

## Joseph A. Caffrey

Joseph A. Caffrey, supervising right of way agent for California Division of Highways, died suddenly of a heart attack on August 11, while vacationing in Santa Cruz.

Caffrey had been appointed to service with the division's Right of Way Department in Marysville in 1947, and transferred to Headquarters in Sacramento in 1953. He had held his supervisory position since October of 1960, having had charge of approving right-of-way contracts pertinent to highway construction, and making final audits of title on transactions. He also worked on special studies for the right of way program.

Born in Sugar Notch, Pennsylvania, December 30, 1904, Caffrey attended schools in that state before going on to Fordham University in New York and then to Dickinson School of Law in Carlisle, Pennsylvania, where he received his degree in 1931. From then until 1937 he practiced law in Luzerne County, Pennsylvania, coming to California in 1938. He was successively employed by the City of Sacramento McClellan Air Force Base, and by the State Department of Motor Vehicles, before joining the Division of Highways.

He was a member of the American Right of Way Association.

Surviving Caffrey are his wife Mary, and four children—John, Antoinette, David, and Teresa.

### District XI

Morgan Bryce, highway foreman, 36 years; John W. Stone, highway foreman, 27 years.

### Headquarters

Esther M. Cecil, accounting technician II, 29 years.

### Materials and Research

Eldridge D. Drew, associate engineering geologist, 32 years; William W. Holtzclaw, skilled laborer, 18 years; James E. Kreiss, assistant physical testing engineer, 28 years.

## Chief Draftsman Walt Landers Leaves

Senior Highway Engineer Walter Landers, chief draftsman for the State Division of Highways in Sacramento, retired August 31.

A native of Leigh, England, Landers attended school there and in Australia. He came to the United States in 1921.

From 1924 to 1928 he was a cartographer for Rand McNally & Company in San Francisco.

He started work for the Division of Highways as a draftsman in the Redding district office in 1928, advancing in subsequent years through drafting and engineering ranks. He transferred to Sacramento headquarters in 1938 and became chief draftsman in 1942.

In addition to his responsibilities for compiling division maps and maintaining records of maps and plans Landers has had the responsibility of assembling maps and plans prepared in other offices of the division for the letting of major construction contracts.

Landers is a member of the American Society of Civil Engineers. He is also a Mason and a member of the Shrine.

He and his wife, Agnes, have a son, Leslie, and a daughter, Barbara.



WALTER LANDERS

### Headquarters Shop

Frank T. Myers, heavy equipment mechanic, 29 years.

### Shop 6

Herbert L. Carroll, highway mechanic foreman, 27 years.

### Shop 8

Sidney J. Smith, mechanic's helper, 15 years.

### Shop 11

Thomas F. Walsh, fusion welder, 17 years.



# STATE OF CALIFORNIA

EDMUND G. BROWN, Governor

## HIGHWAY TRANSPORTATION AGENCY

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### DEPARTMENT OF PUBLIC WORKS . . . JOHN ERRECA, Director

RUSSELL J. COONEY . . . Deputy Director (Management)  
HARRY D. FREEMAN . . . Deputy Director (Planning)  
FRANK A. CHAMBERS . . . Chief Deputy Director  
T. F. BAGSHAW . . . Assistant Director  
C. RAY VARLEY . . . Assistant Director  
JUSTIN DuCRAY . . . Departmental Management Analyst  
S. ALAN WHITE . . . Departmental Personnel Officer

### DIVISION OF HIGHWAYS

J. C. WOMACK . . . State Highway Engineer, Chief of Division

J. P. MURPHY . . . Deputy State Highway Engineer  
J. A. LEGARRA . . . Deputy State Highway Engineer  
GEO. LANGSNER . . . Deputy State Highway Engineer  
LYMAN R. GILLIS . . . Assistant State Highway Engineer  
J. E. McMAHON . . . Assistant State Highway Engineer  
FRANK E. BAXTER . . . Assistant State Highway Engineer  
GEORGE A. HILL . . . Assistant State Highway Engineer  
J. C. BURRILL . . . Comptroller  
NEAL E. ANDERSEN . . . Equipment Engineer  
JOHN L. BEATON . . . Materials and Research Engineer  
C. G. BEER . . . Urban Planner  
A. N. DUNHAM . . . Computer Systems Engineer  
ALVORD C. ESTEP . . . Engineer of Design  
J. F. JORGENSEN . . . Construction Engineer  
SCOTT H. LATHROP . . . Personnel and Public Information  
C. T. LEDDEN . . . City and County Projects Engineer  
H. C. McCARTY . . . Office Engineer  
JACK E. PEDDY . . . Project Control Engineer  
DANA G. PENGILLY . . . Planning Engineer  
E. J. L. PETERSON . . . Program and Budget Engineer  
R. V. POTTER . . . Systems Research Engineer  
E. L. TINNEY . . . Maintenance Engineer  
DONALD P. VAN RIPER . . . Principal Landscape Architect  
J. E. WILSON . . . Traffic Engineer  
A. L. ELLIOTT . . . Bridge Engineer—Planning  
R. J. IVY . . . Bridge Engineer—Special Projects  
I. O. JAHLSTROM . . . Bridge Engineer—Operations  
DALE DOWNING . . . Bridge Engineer—Southern Area

#### Right of Way

RUDOLF HESS . . . Chief Right of Way Agent  
HARRY L. KAGAN . . . Assistant Chief  
DEXTER D. MacBRIDE . . . Assistant Chief  
R. S. J. PIANEZZI . . . Assistant Chief

#### District 1, Eureka

SAM HELWER . . . District Engineer

#### District 2, Redding

H. S. MILES . . . District Engineer

#### District 3, Marysville

W. L. WARREN . . . District Engineer

#### District 4, San Francisco

ALAN S. HART . . . District Engineer  
R. A. HAYLER . . . Deputy District Engineer  
HAIG AYANIAN . . . Deputy District Engineer  
C. F. GREENE . . . Deputy District Engineer

#### District 5, San Luis Obispo

R. J. DATEL . . . District Engineer

#### District 6, Fresno

W. L. WELCH . . . District Engineer

#### District 7, Los Angeles

E. T. TELFORD . . . District Engineer  
A. L. HIMELHOCH . . . Deputy District Engineer  
A. C. BIRNIE . . . Deputy District Engineer  
A. W. HOY . . . Deputy District Engineer  
R. E. DEFFEBACH . . . Deputy District Engineer

### CALIFORNIA HIGHWAY COMMISSION

ROBERT B. BRADFORD . . . Chairman and  
Administrator, Highway  
Transportation Agency  
ABRAHAM KOFMAN . . . Vice Chairman  
Alameda  
JAMES A. GUTHRIE . . . San Bernardino  
ROGER S. WOOLLEY . . . San Diego  
FRANKLIN S. PAYNE . . . Los Angeles  
WILLIAM S. WHITEHURST . . . Fresno  
ALFRED E. HELLER . . . Nevada City

JOHN ERRECA . . . Administrative Officer  
and Director of Public Works  
JACK COOPER, Secretary . . . Sacramento

#### District 8, San Bernardino

C. V. KANE . . . District Engineer

#### District 9, Bishop

C. A. SHERVINGTON . . . District Engineer

#### District 10, Stockton

JOHN G. MEYER . . . District Engineer

#### District 11, San Diego

JACOB DEKEMA . . . District Engineer

### DIVISION OF CONTRACTS AND RIGHTS OF WAY

HARRY S. FENTON . . . Chief Counsel

EMERSON RHYNER . . . Deputy Chief (Sacramento)  
HOLLOWAY JONES . . . Deputy Chief (San Francisco)  
REGINALD B. PEGRAM . . . Deputy Chief (Los Angeles)

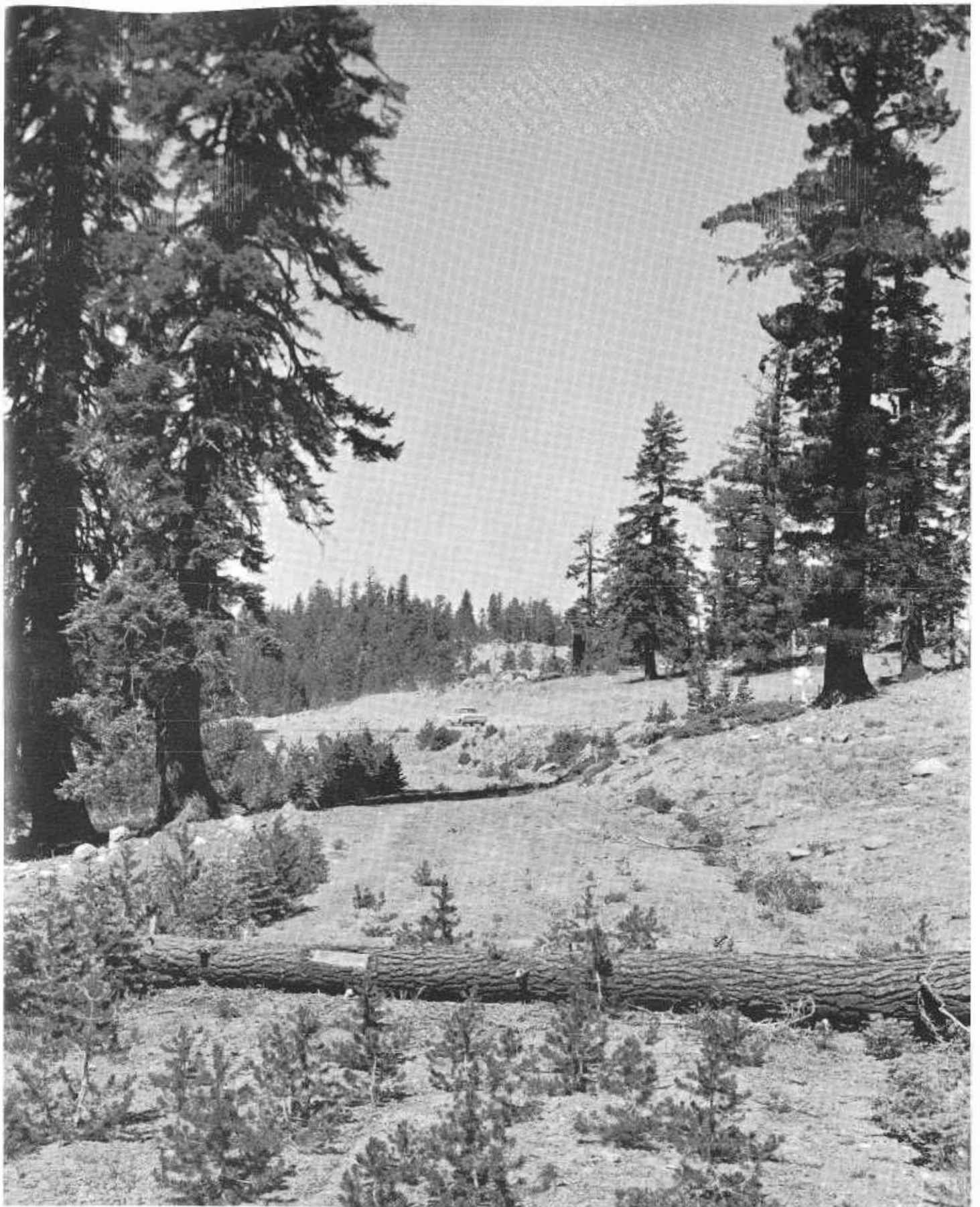
### DIVISION OF BAY TOLL CROSSINGS

E. R. FOLEY . . . Chief Engineer

BEN BALALA . . . Planning and Construction  
CHARLES L. SWEET . . . Operations

### DIVISION OF AERONAUTICS

CLYDE P. BARNETT . . . Director, Chief of Division



*Remains of the old emigrant road (foreground) are still visible from this section of Highway 88 between Peddler Hill and Tragedy Springs. (See "Highway 88" article beginning on Page 2)*



