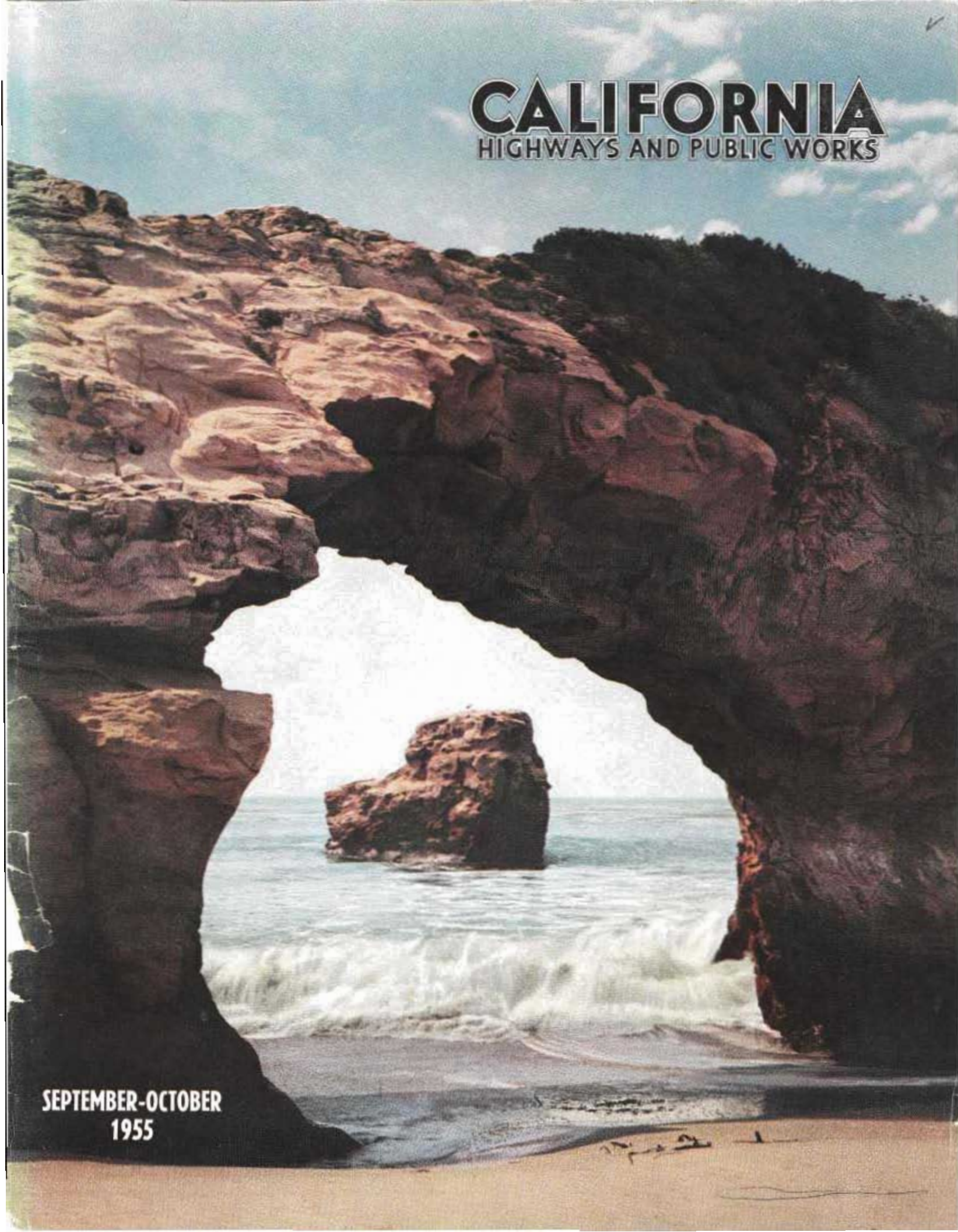
CALIFORNIA
HIGHWAYS AND PUBLIC WORKS



SEPTEMBER-OCTOBER
1955

Santa Ana Freeway *Has Induced Industrial and Recreational Development*

By W. L. FAHEY, District Engineer, District VII

THE SANTA ANA Freeway is one of the most important traffic arteries on the system of freeways being constructed by the State Division of Highways to serve Southern California. This freeway extends from the easterly terminus of the Hollywood Freeway at Spring Street in the Los Angeles Civic Center in a generally southeasterly direction for a total length of 42.8 miles through the Cities of Buena Park, Anaheim, Santa Ana, and Tustin to a junction with the San Diego Freeway near the Town of El Toro. This freeway, following as it does a northwesterly-southeasterly direction generally paralleling the Pacific Ocean coastline, makes it of great strategic value because so many of the other important traffic arteries in this part of the State have been established in a generally northerly-southerly or easterly-westerly direction.

Benefits Two Counties

Measured in travel time, the Santa Ana Freeway brings Orange County closer to the Los Angeles metropolitan area, and this is proving of immense benefit to both areas. The development of critically needed housing projects and large industrial manufacturing plants along the route of the Santa Ana Freeway is an indication of the economic value of this freeway. Since the last issue of *California Highways and Public Works*, three important events have occurred that affect the Santa Ana Freeway.

Winston Brothers Construction Company of Monrovia completed its $2,000,000 construction contract and opened the 2.5-mile southerly extension of the Santa Ana Freeway from First Street in the City of Santa Ana, through the City of Tustin and southerly to Browning Boulevard. Winston Brothers are not newcomers in the freeway construction field. They have successfully carried out prior construction on the Santa Ana Freeway,

W. L. FAHEY

the Hollywood Freeway, and now have in progress two adjoining contracts on the San Bernardino Freeway that will complete 9.4 miles of this freeway between West Covina and Pomona at a cost of $5,500,000.

The second event was the completion of four undercrossing bridges to carry county road traffic arterials over the Santa Ana Freeway between the Town of Norwalk and the City of Buena Park by the contractors, Ukropina, Polich, Kral, and Ukropina of San Gabriel. This contracting organization has on the Santa Ana Freeway completed seven previous contracts of freeway construction for which the contract allotments total $10,923,000. This important construction, recently completed between Norwalk and Buena Park at an estimated cost of $1,050,000, made it possible for the first time to eliminate all existing traffic crossings at grade and take out the traffic signals that were a serious impediment to the free flow of traffic on this portion of the Santa Ana Freeway that had been previously built to expressway standards.

Longest Full Freeway

With the completion of these grade separation bridges, the Santa Ana Freeway became a full freeway for the entire 18.8 miles in Los Angeles County. Combining this mileage with the 10 miles of the completed Hollywood Freeway, which in effect is a northwesterly extension of the Santa Ana Freeway, motorists traveling between the San Fernando Valley in Los Angeles and Buena Park in Orange County have available a total length of 28.8 miles. This is the longest stretch of full freeway in Southern California.

The third event that created considerable impact traffic-wise on the Santa Ana Freeway was the opening of Disneyland. Disneyland is located in Orange County just westerly of the Santa Ana Freeway intersection with Harbor Boulevard. It is reported that 27,742 visitors were attracted to Disneyland on Monday, July 18, 1955, when the park officially opened its gates to the general public. Some 25,000 invited guests were present the day before at the official dedication ceremonies. California Governor Goodwin J. Knight was present and play a prominent role in the dedication.

Governor Pays Tribute

In his message commemorating the opening, Governor Knight said:

"We in California are proud of Disneyland and of our fellow Californian, Walt Disney. For a quarter of a century, he has consistently and tirelessly worked to provide fine, wholesome entertainment to millions of American families. Many of the characters he has created have become universal symbols of laughter and happiness to young and old alike. Disneyland is a monument to humanity's desire for happiness and enjoyment of life's blessings."

Since location in this unique park was of prime importance, Walt Disney retained the Stanford Research Institute in June, 1953, to make an extensive site and location study. The Stanford project was under the direction of C. B. Wood, Jr. The institute is a nonprofit corporation affiliated with Stanford University. It conducts extensive research for government and private industry.

The considerations in selection of the site were of more than passing interest to the Division of Highways. Aside from the traffic effect on state highways serving the area, it constitutes an outstanding example of the benefit of freeways. The evaluation process, similar in some respects to those of other major industries and developments adjacent to freeways, is concrete evidence of the economic importance of the growing freeway system.

Selection of the site from among many possible sites was made after a year's study in location analysis and a complete search of land records. Among other qualifications, utility conditions, accessibility, topography and envionmental characteristics were considered. Even annual rainfall figures helped in making the final decision. During this period Stanford Research Institute conducted a complete economic feasibility study of the entire Disneyland project. This included a thorough survey of attendance patterns for amusement areas and the projection of an annual rate of operation for Disneyland.

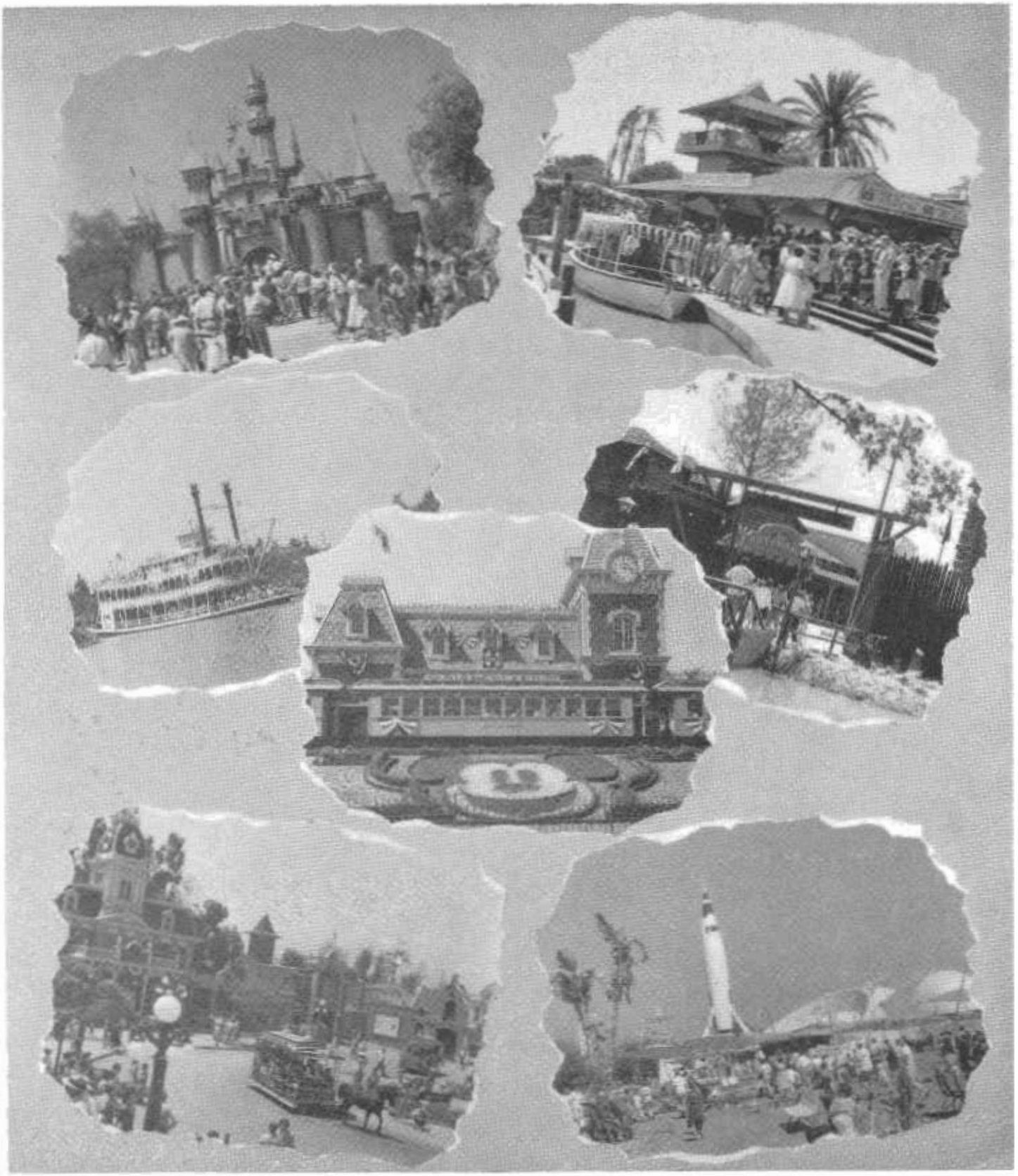
Report Cites Benefit of Freeway

In carrying out the comprehensive investigation for the Walt Disney productions that resulted in the selection of the present site for Disneyland, the Stanford Research Institute on August 28, 1953, submitted a report entitled, "An Analysis of Location Factors for Disneyland." The advantages and disadvantages of many possible sites over a wide-spread area were considered and analyzed. This report placed great emphasis upon the traffic carrying potentialities of the Santa Ana Freeway, and in the analysis of all of the possible sites that were considered in the Orange County area, the proximity of the Santa Ana Freeway was noted and considered in detail. The fact that the site for Disneyland as finally selected and developed lies close to the Santa Ana Freeway and its intersection with Harbor Boulevard is an indication of the value which the investigators placed upon the Santa Ana Freeway for providing adequate vehicular ingress and egress.

An interesting phase of the problem that developed from the Stanford research investigations was the analysis that was worked out from a consideration of "A Theoretical Peak Day At Disneyland." At the start of this particular problem, statement was made: "On the theoretical peak day the admissions will be primarily limited by the ability of one lane of the Santa Ana Freeway to deliver cars to Disneyland. Additional admissions arriving over routes other than the Santa Ana Freeway will be roughly proportional to the population densities in the areas feeding these other routes."

It was concluded that coming from the northwest into Disneyland the

Looking southeasterly showing new homes built within last three years adjoining Dollison Drive between Florence Avenue from which this photograph was taken and the Southern Pacific Railroad over which grade separation bridge on Santa Ana Freeway is shown in background, left



UPPER—Medieval castle with moat and drawbridge that provide the entrance to "Fantasyland." Dock in "Adventureland" with boat about to take on new load of passengers to make tour of the rivers of the world. CENTER—Steamboat coming around the bend. The "Mark Twain" Frontierland's 105-foot paddle-wheeling river boat about to make a landing. Main entrance to Disneyland showing in foreground Mickey Mouse reproduced in flowers and Santa Fe and Disneyland Railroad passenger train. Entrance into "Frontierland." LOWER—Main Street Plaza, U. S. A., showing Disneyland City Hall and horse-car transportation system in operation. A glimpse of "Tomorrowland." Transportation and communication as they may be many years hence are shown.

Santa Ana Freeway would carry 62 percent of the total traffic into Disneyland, whereas coming from the southeast into Disneyland via Katella Street, the Santa Ana Freeway would bring in 13 percent of the Disneyland traffic. Thus the Santa Ana Freeway can be expected to handle 75 percent of the traffic to Disneyland. In this manner, the importance of the Santa Ana Freeway as a traffic carrying facility to Disneyland was conclusively established by the Stanford Research Institute.

The Santa Ana Freeway exerts a great influence on the industrial and residential growth within its sphere of influence. It is a strong factor in the huge industrial expansion that is occurring easterly and southeasterly of Los Angeles. John F. Kelly and Edward P. Riley, Right of Way Agents for the Division of Highways, writing in the July-August, 1954, issue of *California Highways and Public Works*, have presented in detail the advantages that the Santa Ana Freeway offers to the development of industrial business. They presented the views of representatives of many companies operating industries along the Santa Ana Freeway and summarized their findings as follows:

"1. The freeway is distinctly a property appreciation factor to adjoining property.
"2. The freeway is an asset from an advertising standpoint to business located on a frontage road.
"3. Moving to an industrial location near the freeway has made it possible to retain customers discouraged by traffic congestion.
"4. The freeway contributes immeasurably as a convenience factor to employees and business associates.
"5. Industrial location on frontage road along the freeway accounts for additional business per month which is attributable entirely to prospective customers using the freeway.
"6. The freeway facilitates distribution of goods. Crosstown delivery from south to north has been reduced to one-third the former time.
"7. The freeway is advantageous in directing customers to the plant without their getting lost on unknown industrial streets.

Enhanced Land Values

"The enhanced land values and the enthusiastic endorsement by the property owners conducting business along these

Looking northwesterly toward Santa Ana-San Bernardino interchange with widening construction in progress on Los Angeles River bridge shown center left

LEFT—Looking southeasterly along Santa Ana Freeway showing overpass bridges for Florence Avenue and traffic interchange roadways. It is interesting to note that substantially all of the homes shown in this photograph were constructed within the last five years, for the most part during the period when the Santa Ana Freeway was under construction. RIGHT—Looking southeasterly showing Lever Brothers Manufacturing Company's $15,000,000 plant adjacent to Santa Ana Freeway.

frontage roads is conclusive evidence that when industrial improvement represents the highest and best use for land, the location of an industrial site in close proximity to a freeway is a definite advantage."

While this study of Messrs. Riley and Kelley did not include the part of the Santa Ana Freeway in Orange County it is a foregone conclusion that substantially the same findings would have resulted because new industries are continually springing up along this freeway in the Orange County area.

On this same general subject Harry E. Bergh, Planning Director for Orange County, in commenting recently on the Santa Ana Freeway, said:

"For a period of about 20 years prior to actual commencement of the program to convert Manchester Avenue to a freeway the Orange County Planning Commission has recognized the great importance of this route as an arterial connection between central Orange County and the Los Angeles metropolitan area.

"The commission through its recommendations to the board of supervisors in the adoption of zoning regulations included special set-back lines to protect the route for future widening. These regulations were zealously adhered to by the commission in its administration of the constant demand for special zoning permits to the end that when the time came to proceed with conversion of the old two- and three-lane route into a modern freeway great costs were saved in removal of buildings which would undoubtedly have been erected as close as possible to the former narrow roadway.

"Furthermore, when the outward reach of industrial development began to evidence itself in demand for large factory sites in Orange County and it was especially desirable for the manufacturer to have a 'front-window' on this great arterial the commission saw, and grasped, the opportunity to further protect this route by its recommendation for development of these sites with adequate off-the-highway parking and coordination of egress and ingress for the sites with the State Division of Highways.

"This procedure of the planning function in government thus added great taxable value to the county; it gave the industrialists sites which are especially valuable to their needs, and, since the plants occupy large acreages, it removed thousands of feet of frontage on the freeway from the threat of 'shoestring' or fringe type roadside business development."

Orange County Benefited

William Gallienne, Executive Secretary of the Associated Chambers of Commerce of Orange County, recently in discussing the Santa Ana Freeway, said:

"The effect of the Santa Ana Freeway on industrial growth and residential development is an interesting study. There is no doubt, of course, that the Santa Ana Freeway played a potent part in bringing industry to Anaheim and Fullerton; likewise, the Santa Ana Freeway has materially helped the residential development from Buena Park through Anaheim and Fullerton and on to Santa Ana and Orange.

"It could be said that the Garden Grove home development which is probably the greatest in Orange County stems from the fact that people can travel via Highway 39 and hit the Santa Ana Freeway, and be in Los Angeles in almost 30 minutes.

"Our predicted population for Orange County in 1960 is 500,600 people. However, at the rate we are going with almost 400,000 people now, we will probably have approximately 600,000 or 650,000 in 1960."

One of Early Freeways

In point of time the Santa Ana Freeway ranks as one of the earliest freeways initiated for the Los Angeles area. It may be considered as starting in 1933 when Lloyd Aldrich, City Engineer for the City of Los Angeles, who recently retired from city service, was instructed by the Los Angeles City Council to investigate and prepare preliminary plans for the construction of a new viaduct for Aliso Street. The then existing steel girder bridge at this location had proved inadequate to serve vehicular traffic and the double tracks of the Pacific Electric Railway Company. Grade crossings over the tracks of the Santa Fe Railway Company and the Union Pacific Railroad Company were the cause of much traffic delay. It was apparent that the proposed improvement would do much to correct the intolerable traffic situation that had developed even as early as 1933.

This important construction project was started on November 6, 1939, by the City of Los Angeles as a cooperatively financed Federal Works Prog-

ress Administration project. In addition to the funds supplied by the Federal Government, contributions toward financing the project were made by the State, the county, the city and the railroad companies. At the conclusion of the WPA work, a city contract was let to the Contracting Engineers Company to finish incomplete portions of the project. It was finally completed and opened to the public by appropriate ceremonies on August 14, 1944. This unit of construction by the City of Los Angeles at the junction of the Santa Ana Freeway and the Ramona Freeway, as it was then called, became an essential part of these two freeways.

Earl Warren Comments

Earl Warren, now Chief Justice of the U. S. Supreme Court, who was then the Governor of California, said:

"On the occasion of the dedication of the Aliso Street Viaduct, it is a pleasure to extend greetings and congratulations to the City of Los Angeles and to the County of Los Angeles.

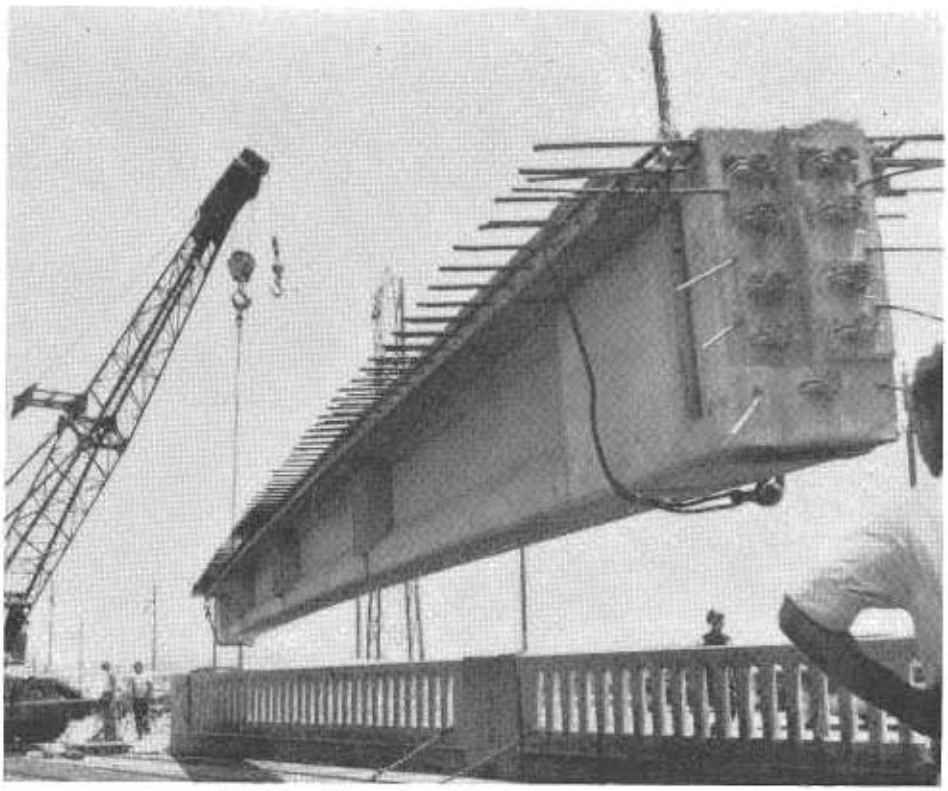
"This $5,000,000 project is an excellent example of what cooperation between the State and local political subdivisions can accomplish in the development of our great California Highway System. The Arroyo Seco Parkway is another outstanding monument to this sort of cooperative effort. The State is justifiably proud of its contribution of $746,123 to this undertaking.

"The Aliso Street grade separation is another long step forward in solving vehicular traffic congestion in the downtown area of Los Angeles. Over the viaduct will flow a huge volume of such traffic from the proposed Ramona Parkway and the Santa Ana and Hollywood Parkways, both of which are on the postwar program adopted by the California Highway Commission.

"Recognizing the future needs for freeways in large metropolitan centers, the Highway Commission is giving much study to this type of highway development and the Aliso Street Viaduct is a component part of its planning in this direction."

New Traffic Facility

This construction by the City of Los Angeles that was completed on August 14, 1944, was hailed by all as an outstanding engineering achievement and rightly so. On that day there was no thought that vehicular traffic would so increase in the short span of 10 years that major reconstruction at this location in the amount of $2,850,000 would be necessary, but such has proven to be the case.



Photograph by Assistant Resident Engineer Tom Chew, showing prestressed precast reinforced concrete girder 80 feet long, weighing 24 tons, being swung into place to widen Santa Ana Freeway bridge over Los Angeles River.

On January 14, 1954, a contract amounting to $513,400 was awarded to Charles MacClosky of San Francisco for the construction of a new interchange bridge to carry westbound traffic on the San Bernardino (Ramona) Freeway southbound on the Santa Ana Freeway. With the completion of this high level bridge on July 12, 1955, westbound motorists on the San Bernardino Freeway who desire to travel south on the Santa Ana Freeway make the interchange directly and easily. They no longer have to pull off at Mission Road and make two very difficult left turns in order to get onto the Santa Ana Freeway.

This new traffic facility is also proving of great advantage to inbound motorists on the San Bernardino Freeway who desire to go to the easterly section of downtown Los Angeles business district because they can now take the new high level bridge, proceed southerly on the Santa Ana Freeway, and utilize whichever exits are most convenient for them at First Street, Fourth Street, and Seventh.

Starting on page 30 of the March-April, 1955, issue of *California Highways and Public Works* resident engineer Warren B. James' story entitled, "Prestressed Girders," described this construction. He also explained how the use of prestressed precast reinforced concrete girders in the portions of the new bridge that spanned the freeway traffic lanes greatly expedited the completion of this structure and caused much less interference with public traffic.

Aliso Street Widened

On July 16, 1954, a contract was awarded Oberg Brothers Construction Company of Inglewood that provided for widening the Aliso Street viaduct a minimum amount of 41 feet so that it could be converted into an eight-lane freeway. The contract allotment for this project was $2,034,500. This contract is now substantially completed.

Motorists in the Los Angeles area have had occasion during the past year to become familiar with this construction work easterly of the Los Angeles Civic Center, across the Los Angeles

River and at the junction between the San Bernardino and Santa Ana Freeways. There is no location in Southern California where reconstruction of existing highway facilities to convert to modern freeway standards have been carried out under such severe conditions of vehicular traffic movements.

There are some 129,000 vehicles per day utilizing this section of freeway. The State's contractors were able to make no move whatsoever in going forward with their construction work without first considering the effect on public traffic. They must assure themselves that whatever operations they started could be carried out with safety for their own employees and also with safety for the passing motorists. The fact that so much work has been accomplished since reconstruction work was first started in this area early in 1954 without there having been serious accidents resulting from construction operations certainly indicates very commendable and careful management on the part of the State's contractors.

Public traffic has been discommoded by construction work in progress. This has been evident every day as one saw long lines of vehicles moving through construction operations at reduced speed. The Los Angeles City police officers of the Traffic Division under Deputy Chief Harold Sullivan are to be complimented for their efficiency in handling and directing traffic through construction. Many serious traffic snarls have been avoided due to their efforts, and the construction schedule has been speeded up.

Project Speeded Up

Questions have been asked us as to why this construction has taken so long and why haven't more efforts been made to speed things up. Everything possible to speed up operations has been done.

In designing this extensive reconstruction project and in preparing the contract specifications the State Division of Highways has done many things to expedite the work and to shorten the period of construction. The shortest possible time limits were established for doing the required construction. In order to keep traffic moving smoothly in six lanes during the construction period, a temporary timber trestle 10 feet wide and 200 feet in length was designed and constructed over Center Street so as to widen the bridge sufficiently to provide the six lanes. Another item to expedite the work was the utilization of prestressed precast reinforced concrete girders 80 feet long, weighing 24 tons each, to be placed as the bridge deck over the Santa Fe Railway on the west bank of the Los Angeles River and over the Union Pacific and Southern Pacific Railroads on the east bank of the Los Angeles River. By this efficient method, the customary placing of falsework on railroad right of way that would have greatly interfered with the railroad traffic was avoided, construction operations were speeded up, and the time of construction was greatly reduced since these girders could be fabricated at the same time other work was in progress.

Construction Time Saved

Another item of design that is speeding up the work is the carrying out of the plan for utilizing most of the old girders over Mission Road. The utilization of this portion of the existing bridge structure by remodeling as necessary to fit it in with the new highway grade system was a great time saver. Another feature of the design which made it possible for the contractor to save construction time was the determination of span

Looking easterly from Santa Ana Freeway showing industrial development along frontage road in East Los Angeles area

Looking northeasterly showing toward background the section of the Santa Ana Freeway and Harbor Boulevard with Disneyland in foreground

lengths to permit maximum reuse of contractor's forms and falsework.

Speeding up of construction work has been accomplished by good planning on the part of the contractors. Methods for extensive multiple use of forms have been worked out, and methods for moving large units of falsework intact have been frequently utilized. The forms and falsework for the north half of the Center Street undercrossing were moved on rollers as a unit into place for building the south half of the separation. The 242-foot Los Angeles River arch rib falsework was moved intact from the south rib to the north rib. This included the soffit forms for the rib. Most of the falsework bents on the west approach spans were moved intact from span to span. In this manner much time was saved.

It is anticipated at this time that all contract work in this area will be entirely completed and ready for final acceptance during October, 1955.

The pressing need for a new highway arterial between the Los Angeles central business district southeasterly through the industrial area and extending into Orange County was quite generally recognized some 20 years ago. To list by name all the civic-minded individuals who have had an important part in the development of the Santa Ana Freeway would be an impossible task because so many of the important contributions by some individuals would be certain to go unnoted. The same can almost be said even of an attempt to list the various organizations which had an important part in developing the Santa Ana Freeway.

Early Reports on Freeways

Turning to the earlier reports that were first published that served to focus public attention on the great traffic need for freeways was the publication by the Engineering Department of the Automobile Club of Southern California of a report dated April 16, 1937, entitled, "Traffic Sur-

vey, Los Angeles Metropolitan Area." In this report routings were shown for new "motorways" radiating in all directions from the downtown Los Angeles area. Later, under date of December 7, 1939, a comprehensive report was made by the City of Los Angeles Transportation Engineering Board, the Citizens Transportation Survey Committee, and the Works Progress Administration, in which a new proposed highway arterial between the Los Angeles downtown area extending in a general southeasterly direction toward Orange County was advocated. These arterials were called "parkways," and portions of those routes designated on the map accompanying this report that are labeled "Ramona Parkway," "Long Beach Parkway Extension," "Olympic Parkway," and the "Santa Ana Parkway" approximate quite closely the present routing of the Santa Ana Freeway. In this report credit is given to other cooperating agencies as follows: Los Angeles Traffic Association, Central Business District Association, Los Angeles County Regional Planning Commission, and the Automobile Club of Southern California.

Future Routes Protected

The Los Angeles County Planning Commission and its counterpart in Orange County, the Orange County Planning Commission, through their control of subdivisions have been instrumental in protecting future freeway routes from encroachments by proposed subdivisions, housing projects, and industrial developments that would have otherwise increased the later costs of right-of-way acquisition. Another important publication which gave further support to the Santa Ana Freeway development was the report by the Los Angeles Metropolitan Parkway Engineering Committee dated March 30, 1946, entitled, "Interregional, Regional, Metropolitan Parkways." This report gave valuable information to the Joint Fact-finding Committee on Highways, Streets and Bridges of the California Legislature in its deliberations prior to the adoption of the Collier-Burns Highway Act of 1947, the passage of which greatly increased state highway funds available for freeway construction.

The Collier-Burns Act discontinued as such the one-fourth cent of gas tax previously allocated to state highway routes through cities. In the over-all additional financing which it provided, it passed the complete responsibility to the State of California for constructing and maintaining all state highways through all cities within the State.

First Contract

The first contract awarded by the State Division of Highways on the Santa Ana Freeway was for the section from Kearney Street to Soto Street. This was awarded January 16, 1946, and completed December 11, 1947. Since that time a total of 68 major contracts have been completed, having a total value of $34,000,000. At the present time four major construction contracts are now in progress, totaling $10,000,000. All of these are now in final stages of completion, having already been opened to public traffic.

Other contractors who have completed construction contracts on the Santa Ana Freeway and who have not been previously mentioned in this story are the following:

Peter Kiewit Sons' Co., Byerts & Dunn, Mike Radich & Co., J. E. Haddock, Ltd.,

Looking southeasterly along the Santa Ana Freeway showing in foreground recently completed Shoemaker Avenue Overpass Bridge. The other three recently completed bridges at Carmenita Road, Alondra Boulevard, and Valley View Avenue are shown in background.

W. J. Distelli, Spencer-Webb Co., Jannoch Nurseries, Vido Kovacevich Co., Electric and Machinery Service Inc., Huettig, Schromm, & Bennett, Econolite Corp., Sully-Miller Contracting Co., Ralph A. Bell and United Concrete Pipe Co., Ets, Hokin and Galvan Inc., C. O. Drauker, Inc., Westates Electrical Construction Co., Clinton Electric Corp., Henry C. Soto Corp., Webb and White, Fischbach and Moore Inc., George W. Peterson and Jack W. Baker, Newbery Electric Corp., Justice-Dunn Co., A. S. Schulman Electric Co., C. O. Sparks and Mundo Engineering Co., D. & M. Sprinkler Co., K. E. C. Company, Ed Seymour, Wulfert Co. Inc., Contracting Engineers Co.

Right-of-Way Acquisition

Right-of-way acquisition on the Santa Ana Freeway has progressed in an orderly manner with a minimum number of condemnation proceedings being required. To date there has been expended for rights of way a total of slightly more than $16,000,000. Thus completed construction, construction in progress, and rights of way now represent a total investment of $60,000,000.

There have been many interesting features in connection with the development of the Santa Ana Freeway that have been previously reported in *California Highways and Public Works*.

In the November-December, 1953, issue, J. W. Greene of the Bridge Department reported construction difficulties at the Simons Underpass where there was built a structural steel through girder-type bridge carrying the two main line tracks and two lead tracks of the Santa Fe Railroad across the Santa Ana Freeway. It consists of two spans each, approximately 104 feet long, supported on reinfrced concrete abutments and a center pier of structural steel columns. There are four structural steel girders connected by 21-inch and 30-inch floor beams, with a total weight of 1,250 tons. The interior girders are over 11 feet in depth and weigh 192 tons each. They were fabricated in three parts, the largest weighing 76 tons. These interior girders weigh over one ton per foot, being possibly the heaviest per foot that the Bridge Department has yet designed. The two interior steel columns weigh 23 tons each. There are about 3,000 cubic yards of concrete in the abutments, wingwalls and center pier footings. The Simons Underpass was completed and opened to the full load of railroad traffic on October 6, 1952.

Looking southeasterly along the Santa Ana Freeway showing grade separation with Santa Fe Railroad and Lincoln Street Overcrossing. On the right side of the freeway are shown new subdivisions and homes that were built during and since the freeway construction.

Projects Described

Also in the November-December, 1952, issue is a story entitled, "Norwalk Diagonal," by M. E. Cessna, district engineer, retired. This important link in the Santa Ana Freeway, extending from Rosemead Boulevard northerly of the Town of Downey to Rosecrans Avenue southerly of the Town of Norwalk, was approximately five miles long. This area has been the scene of intensive residential development. A few years ago the land passed through was almost exclusively agricultural, being largely in orange groves, while today thousands of new homes are visible on both sides of the freeway and very little acreage is left for future housing, industrial, or business development.

In the January-February, 1953, issue of *California Highways and Public Works*, J. M. Curran, associate bridge engineer, described the unusual construction on the bridge to carry the Santa Ana Freeway over the Rio Hondo, which is located southeasterly of the City of Los Angeles. The bridge is a steel girder structure 635 feet long consisting of seven 83-foot spans and one 52-foot span. A bridge roadway 88 feet wide provides two 40-foot wide roadways, and an 8-foot median or dividing strip, to carry the six traffic lanes of the freeway. Since pedestrians are not allowed on freeways there are no public sidewalks on this bridge, although there are two 1-foot 9-inch walkways for maintenance workers.

Pile Driving Difficult

The seven piers and two abutments are founded on cast-in-place concrete pile-supported footings. Piles were driven to an average penetration of 40 feet below the river bed to insure against scour in the fine sandy channel bottom formation. Due to this fine sand formation the driving of piles was very difficult and jetting of piles

Looking northerly along Santa Ana Freeway in East Los Angeles area from above Sixth Street, showing Fourth Street Overcrossing in center

Looking easterly showing, center left, new Broadway-Anaheim Shopping Center under construction in City of Anaheim, with extensive parking space provided for shoppers adjoining the Santa Ana Freeway. In foreground is shown manufacturing plant of Robertshaw Fulton Controls Company, with adequate parking space provided convenient to buildings.

was required for almost their entire penetration.

The designers of the bridge specified unusual welding methods to meet the design requirements of the 83-foot long spans by using transformed rolled steel beams rather than by using conventional fabricated steel plate girders. These usual methods are described in detail by Mr. Curran.

Starting on page 51 of the July-August, 1955, issue of *California Highways and Public Works* is a story by resident engineer James L. Needham describing the Winston Brothers contract on the Santa Ana Freeway between Browning Avenue and First Street. The newly completed pavement was opened to public traffic during September and final completion of this contract is scheduled during October, 1955.

Important Orange County Contracts

Another important Santa Ana Freeway contract scheduled for completion in October, 1955, is the construction at Harbor Boulevard in Orange County between Santa Ana and Anaheim. This contract, being carried out by J. A. Thompson & Son of Inglewood, provides a bridge to carry Harbor Boulevard, an important Orange County arterial, over the freeway, and the necessary traffic interchange roadways. The contract allotment is $403,000. Completion of this contract will remove another set of traffic signals from the freeway that have been a frequent cause of delay to the free flow of traffic in this area.

A very important unit of the Santa Ana Freeway from Broadway in Santa Ana extending northerly 2.6 miles to Lewis Street was awarded February 3, 1955, to the Griffith Company of Los Angeles. The contract allotment is $4,385,700. The contract is now reported as 20 percent complete, and the estimated date for final completion is December, 1956. Due to very complicated traffic movement in the vicinity of Orange County Hospital where the Santa Ana Freeway crosses Chapman Avenue and the further problems introduced by proximity of the Southern Pacific Railroad, the grade separation structures and the system of traffic interchange roadways that were necessary at this location necessitated one of the most intricate and extensive interchange systems that have yet been designed and constructed.

Later on this fall it is expected that advertising will be placed for the major portion of the last remaining unit of construction on the Santa Ana Freeway between the City of Santa Ana and the City of Los Angeles to convert the existing expressway to a full freeway extending from Ball Road just northwesterly of Harbor Boulevard to Coyote Creek. This includes line changes for the new freeway through the City of Anaheim and the City of Buena Park. The project is 6.5 miles in length and is to be financed from the 1955-56 budget which provides $5,502,000.

Early next spring it is anticipated that a contract will be let for the short section of the Santa Ana Freeway that involves grade separation structures at Orangethorpe Avenue and Magnolia Avenue between the Cities of Anaheim and Buena Park that cannot be included in the construction that will be advertised this fall.

Thus it appears that by midyear 1957 about 35 miles of the Santa Ana Freeway will be completed to full freeway standards to Browning Avenue south of Tustin.

Plans are now in progress to extend the construction of this freeway southerly from Browning Avenue 7.8 miles to its southerly terminus at junction with the San Diego Freeway near El Toro. This future construction necessary to complete the Santa Ana Freeway will be financed from subsequent fiscal year construction budgets as the California Highway Commission determines that funds are available for this purpose.

As the population of Los Angeles County and Orange County has grown there has been a corresponding increase of motor vehicles using the Santa Ana Freeway. Following is a summary of our annual 16-hour July counts for the last six years southeasterly of Buena Park. These illustrate the growth of traffic on the Santa Ana Freeway largely as a result of land development in Orange County:

	16-hour July count, Sunday	*6 a.m.-10 p.m., Monday*
1950	18,322	12,449
1951	24,914	16,684
1952	28,379	20,281
1953	29,477	22,243
1954	37,182	31,437
1955	45,056	45,618

The increase in traffic has been so great that in the not too far distant future it is certain that all sections that have been constructed as a four-lane freeway will require widening to six lanes. This contingency was foreseen years ago during the planning of the Santa Ana Freeway and all rights of way that have been obtained are ample to convert the four-lane sections of this freeway to six lanes. Provisions have also been made for this contemplated widening in the design of bridge structures and the roadbed section. The future widening can be carried out, whenever funds can be made available for this additional construction by the Highway Commission, with a minimum of additional cost and little inconvenience to public traffic.

The Santa Ana Freeway stands as a symbol of what can be done when there is wholehearted cooperation on the part of county, city and state officials, and public spirited organizations and individuals. Its successful progress is in no small measure due to the high type of leadership provided District VII by S. V. Cortelyou, Assistant State Highway Engineer who retired in 1949, and his successor, Paul O. Harding. Assisting in the work of administering and supervising the activities of the district are District Engineer E. T. Telford in charge of planning and design, and the writer in charge of construction and maintenance.

WALNUT CREEK PROJECT

The Division of Highways opened bids September 21 on a $3,000,000 freeway project in Contra Costa County in Walnut Creek for a length of 2.8 miles between Oakland Boulevard and 0.3 mile north of Monument.

The job calls for the construction of two 37-foot roadbeds with a 30-foot median to provide a four-lane divided freeway with frontage roads, ramps, and interchange lanes. There will be overcrossings at Waldon Road, Contra Costa Canal, Geary Road, Oak Park Boulevard and Hookston.

The low bidder was Stolte, Inc., and Gallagher & Burk, Inc., Oakland, with a proposal of $2,638,616.50.

Looking southeasterly along construction in progress on Santa Ana Freeway with the site of the Chapman Avenue Traffic Interchange System shown in center. Orange County Hospital buildings are shown center right.

Freeway Ramps

Proper Spacing Important In Preventing Accidents

By GEORGE M. WEBB, Traffic Engineer, and
R. J. ISRAEL, Assistant Traffic Engineer

To properly locate a modern freeway and to establish its basic engineering features requires the careful consideration of many elements. A major factor is the over-all traffic service that any proposed freeway route will provide. In this connection, there is a direct relationship between the traffic service and the traffic interchange locations. Properly spaced points of ingress and egress must be carefully selected in order that the freeway will function with maximum efficiency and safety.

Traffic must be able to enter and leave the freeway at ramp connections smoothly and with as little friction as possible. To that end, ramp location and design must be coordinated to allow easy, unhurried merging and weaving maneuvers to take place. Experience has shown that certain minimum distances are needed between ramps if this is to be achieved.

Spacing Ramp Connections

Often local officials and groups ask that additional points of ingress or egress be created. In many cases, if this were to be done, the ramps would be too close together and the very purpose of the freeway—safe and efficient movement of traffic—would be seriously impaired. The same is true of similar requests by individuals who own or operate roadside business and who also ask for an off-ramp which would give direct access to their establishment.

The spacing of ramp connections cannot be based on an inflexible set of rules because of the complexity and the number of elements involved in the engineering decision at each location. The Division of Highways is constantly re-examining its planning and design practices for the purpose of evaluating and improving its present standards. Traffic studies so far completed point to the following general conclusions concerning ramp spacing in freeway design:

The Arden Way Off-ramp on the new Elvas Freeway near Sacramento effectively handles substantial volumes of traffic. One illuminated overhead sign and dual reflectorized advance signs precede the gore sign shown.

Ramps which serve a substantial volume of traffic without undue circuity of travel should be included if such ramps are sufficiently spaced to accommodate adequate geometric designs and to allow adequate advance signing. Ramps not justified from a traffic service standpoint should be omitted for the following reasons:

1. Ramp connections on high-volume freeways are the source of a substantial portion of total freeway accidents, and studies on such freeways show off-ramps to be three times as hazardous as on-ramps.

2. Studies show that "shopping from the freeway" is an accident generator.

3. Off-ramps must be sufficiently spaced to allow distance for adequate geometric design and advance signing. (Geometric design involves the length and curvature of interchange lanes, acceleration and deceleration lanes and adequate weaving distance between ramps.)

4. Traffic studies show that fewer accidents will result when minor intersections are eliminated and the movements combined at one location. Logic would indicate that this relation applies also to ramps.

1. ACCIDENTS AT RAMP CONNECTIONS

Accompanying *Table I* represents the summary of a two-year study of accidents on the heaviest traveled portions of the Pasadena (Route 165 portion) and the Hollywood Freeways. It shows that ramp accidents, which include the off and on movements, represent 33 percent and 25 percent, respectively, of the total accidents on these lengths of freeway. It also shows that off-ramp accidents are approximately three times as numerous as on-ramp accidents, while off-ramp fatal and injury accidents are nearly four times those involving on-ramps.

The summary also shows that ramp accidents are predominantly of the single-vehicle and two-car overtaking types. Basic causes are excessive speed, improper turning, and unsafe lane changes.

Table II shows the relation of ramp accidents to total accidents for a number of rural freeways. These rural freeways all show a significantly lower percentage of ramp accidents than do urban freeways. One factor is undoubtedly the wider spacing of ramp connections. The other factor is, of course, the traffic volumes. The table shows that the percentage of ramp accidents increases generally in

TABLE I

ACCIDENT STUDY ON THE PASADENA AND HOLLYWOOD FREEWAYS
LA-165-LA and LA-2-LA

	Pasadena Freeway				Hollywood Freeway			
	1952 and 1953 4-level structure to Riverside Drive				1952 and 1953 Coronado Terrace to Spring Street			
	On ramp	Off ramp	Main frwy.	Total	On ramp	Off ramp	Main frwy.	Total
Total number of								
Accidents	17	44	123	184	17	46	183	246
Fatal accidents	0	1	2	3	0	1	2	3
Non-fatal accidents	5	21	48	74	6	19	89	114
Property damage	12	22	73	107	11	26	92	129
Fatalities	0	1	2	3	0	1	5	6
Persons injured	5	34	70	111	9	33	164	206
Daylight	8	14	44	66	10	19	114	143
Darkness	8	26	65	99	7	21	63	91
Clear (including cloudy)	14	34	100	148	15	39	171	225
Raining	2	5	6	13	1	0	7	8
Single vehicle accident	5	17	38	60	6	25	11	42
Two or more vehicle accident	12	27	85	124	11	20	172	203
Accidents involving trucks	0	0	9	9	1	4	20	25
Approaching	1	2	4	7	0	0	11	11
Overtaking	11	23	81	115	10	19	161	190
Intersection	0	2	0	2	1	1	0	2
Had been drinking	5	7	16	28	2	7	17	26
Sleepy (or apparently so)	0	1	3	4	0	1	4	5
Speed	3	15	21	39	5	18	11	34
Following too closely	2	3	32	37	3	5	81	89
Improper turning	2	17	1	20	1	0	1	2
Improper passing	5	0	8	13	4	3	11	18
Improper parking	1	1	4	6	0	0	8	8
Improper signaling	0	0	2	2	0	0	0	0
Wrong lane (not passing)	1	2	2	5	0	0	8	8
Skidding	0	0	0	0	0	0	3	3
Improper lane changes	1	6	39	46	3	14	52	69
Defective brakes	0	1	3	4	0	2	3	5
Tire trouble	1	1	5	7	0	1	4	5
Mechanical failure and out of gas	0	0	1	1	0	2	4	6

TABLE II

RAMP ACCIDENTS ON RURAL FREEWAYS

1/1/54 to 7/1/55	Tulare Tul-4-B, F	Sacramento Sac-3-B No. of North Sacramento connections	Bayshore SM-68-F	Eastshore Ala-69-C, D	Santa Ana LA-166-A Pioneer to to Atlantic	Totals
Accidents on						
On-ramp	1	2	4	16	10	33
Off-ramp	1	2	7	18	25	53
Entering on off-ramp					1	1
Leaving on on-ramp		1				1
Total ramp accidents	2	5	11	34	36	88
Total accidents on main freeway	34	44	61	167	224	530
Percent ramp accidents of all accidents	5.6	10.2	15.2	16.8	13.8	14.2
Number of traffic lanes	4	4	6	4	4	
1954 average daily traffic	10,000	30,000	51,000	38,000	60,500	
ADT per traffic lane	2,500	7,500	8,500	9,500	15,100	

proportion to the total volume of traffic on the freeway.

The table also shows there is no significant difference between the number of on-ramp and off-ramp accidents at the lower traffic volumes, but off-ramps become increasingly more hazardous as volumes increase. It is obvious that the problem of disengaging from a fast moving traffic stream becomes increasingly difficult as the density of traffic on the freeway increases.

2. SHOPPING FROM THE FREEWAY

Not too many years ago it was considered proper for the state highway to be located on the main business street, particularly through the moderate-sized and smaller communities. Businessmen were generally committed to the theory that the through traffic represented an essential business potential. Actually, mixing of the local shoppers with the faster moving through traffic invariably resulted in an extremely high accident rate for these lengths of highway.

In order to cure this accident situation and to expedite the flow of traffic, freeways were conceived and constructed. Accident-wise, the results have exceeded the most optimistic of expectations. Results, so far, generally show that in spite of the over-all increase in traffic induced by the new facility and the availability on Main Street for increased shoppers, the freeway and Main Street combined have less than half as many accidents as previously occurred on Main Street alone.

Business will naturally develop along the frontage roads which adjoin the freeway, and "roadside business" signs at the normal connections will direct traffic to the frontage road where the motorist can select restaurants, motels, or gas stations without the pressure of high-speed traffic. However, if off-ramps are constructed to directly serve specific business establishments, we are reverting to the old idea, and, to some extent, to the increased accidents attendant thereto.

So far there are no such conditions on full freeways, but direct connections to private businesses exist at many locations on our expressways. Studies at these access locations show that the condition which we have termed "shopping from the freeway" is a source of accidents. Accidents due to this condition involve sudden changed decisions on the part of one driver and appear as two-car accidents due to sudden slowing or sudden turning, including turns from the wrong lane.

3. REQUIRED SPACING FOR ADEQUATE GEOMETRIC DESIGN AND ADVANCE SIGNING

Present standards call for one-half to one mile advance signing on freeway turn-offs. There may be some doubt that this distance provides sufficient advance warning at present speeds. The eastern toll roads with wider spaced connections use far greater distances for advance signing. With the present trend of increasing speeds, it may be necessary to extend advance signing distance in the future. This advance warning is necessary to allow safe and orderly lane changes on the part of high-speed traffic.

Advance signing, as discussed above, is in addition to the length needed for the deceleration lane. The length of speed change lanes vary with the design speed of the freeway and the safe speed of exit as controlled by the ramp curvature. Maximum lengths under present design standards, including length of taper, are 300 feet for the deceleration lane and 1,050 feet for the acceleration lane. The length required for safe weaving, where an off-ramp follows an on-ramp, varies with the speed of traffic and the weaving volumes. The subject is too complex to state numerically in this article; however, a very considerable weaving length may be required for heavy volumes. Under normal conditions weaving length can be accommodated within required signing distance.

Although closer spacing will be required in cities to satisfactorily distribute the heavy volumes and to avoid circuity of travel, certainly off-ramps less than one mile apart on rural freeways will not allow room for required speed change lanes and adequate signing.

4. GREATER SPACING OF CONNECTIONS SHOULD REDUCE ACCIDENTS

Studies of intersections, both signalized and nonsignalized, show that intersections with low volume cross movements have more than their share of the accidents. That is, with a given number of cross movements, more accidents would be expected to occur if they were divided into two or more locations, than would occur if these movements were combined at a single intersection.

The Division of Highways has not yet made studies which would directly relate turning volumes to accidents at freeway ramps. One factor to support the hypothesis that ramp connections bear a relation to intersections is the lower percentage of ramp accidents on rural freeways. This is undoubtedly due, in some measure, to the wider spaced connections. There is also the factor that each additional off-ramp produces a grade intersection with the frontage road or the county road to which it connects. These low traffic intersections will generally develop more accidents than would the adding of these exit vehicles at the next major connection.

The department is manifestly justified in constructing major turn-offs to the highest standards, and in providing illumination and the most advanced signing, including bridge signs across the roadway. Such treatment is not economically justified at turn-offs to accommodate only a few vehicles per day, particularly in the matter of acquiring sufficient right of way to provide an adequate radius of curvature on the ramp.

California's full freeways are the safest system of highways in the world. It is necessary to be doubly vigilant to maintain this record with the extension of freeways for long rural distances. The department certainly cannot afford to introduce additional hazards in our design which studies so far indicate would be the net result of permitting intermediate connections which are not warranted from the traffic service standpoint.

Camarillo Study

Greatest Economic Gains Along Old Highway Route

By JOHN F. KELLY, Headquarters Right of Way Agent

ONE AND a half years ago, US Highway 101 through Camarillo served a dual purpose as California's famous coast highway route extending from San Diego to San Francisco and as the main street of Camarillo. In addition to this conflicting mixture of fast moving through highway traffic and local shoppers, there was also the intersection at grade of State Highway Route 153 and a grade crossing of the main line of the Southern Pacific Railroad. The result was a highly dangerous traffic situation for everyone.

On March 24, 1954, this traffic tangle came to an abrupt end. Amid colorful civic ceremonies, Adolfo Camarillo, head of the family for whom the Town of Camarillo was named, cut the ribbon to officially open the new freeway through Camarillo.

This eventful day undoubtedly gave Don Adolfo Camarillo a great deal to think about. He would remember years ago when the town began with a few stores along US Highway 101 near the Southern Pacific Railroad main line crossing. He would be proud of the prosperous community which exists today and the part that he and other civic-minded citizens had played in making this town such a desirable place to live.

Aerial view showing freeway and old highway through center of Camarillo. Row of palm trees left of freeway indicates central portion of business district along old highway route.

SYNOPSIS

CAMARILLO		NEW FREEWAY		ECONOMIC STUDY	
Location	50 miles northwest of Los Angeles on US Highway 101 in Ventura County	Location	Near center of town	Purpose	Obtain factual evidence on the economic status of the community affected by freeway
Population	Estimated 5,000 (unincorporated)	Completed	March 24, 1954	Factual data	1. Property values 2. New building construction 3. Retail business condition 4. Community growth factors
Primary income	Agriculture	Design	Freeway with cross streets separated from through lanes Four-lane divided expressway permitting grade entrance at westerly end of town	Time of study	One year before and after freeway opened
Growth influence	Nearby government installations. Attractive residential sites	Property directly affected	Business district		

UPPER—Before freeway—Traffic on old highway route in business district. Congestion caused by railroad crossing
LOWER—After freeway—Traffic congestion relieved. Old highway route through business district being used for local traffic

Looking to the future on this day, Mr. Camarillo's thoughts were probably the same as all other citizens in the community in that he was certain the new freeway would relieve the hazardous traffic situation; but what would it do to the present economy and future growth of Camarillo?

Questions Involved

Resolving these doubts into specific questions, and then proceeding to obtain answers through the use of factual data was the problem posed for this study. Like many communities faced with the same group of doubts, the basic questions can be summarized as follows:

1. Would the relocation of US Highway 101 to another location decrease the value of property along the old highway route?

2. Would the rerouting of highway traffic to the new freeway put an end

to the new commercial building activity in the business district along the old highway?

3. Would the removal of highway traffic from the business district cause business losses which would affect the economy of the entire town?

4. Would the location of the freeway through the center of town divide the community, making the existing business district inaccessible to serve the entire town?

5. Would the freeway be a deterrent to future growth of the community and discourage prospective investors from choosing Camarillo as a location for a new home or business?

It then follows that if these questions can be answered, not by opinion, but by the application of known economic reaction of both land values and business activity to the freeway influence, the people of Camarillo can be certain of their future growth and economy.

Factual Study

One of the first considerations in a study such as this is the determination of the length of time required to obtain a reasonable degree of accuracy. Generally the longest periods of time available for a study will give the highest degree of accuracy. In some communities the adjustment to the freeway mode of transportation is slow. In these cases, studies would not be warranted under two or three years after the freeway is in operation. Despite the fact that a relatively short time has elapsed since the completion of the freeway, ample evidence was found through a preliminary survey to indicate that Camarillo was not undergoing a long transition period in adjusting to the removal of through traffic from its business district. With adequate factual data available there was no reason to delay making an economic study just one year after the freeway opened. The Land Economic Section of the California Division of Highways, because of this almost immediate acceptance, proceeded to make a thorough investigation of all phases of the economy of Camarillo. The following material is the result of an analysis of the facts accumulated in this investigation and

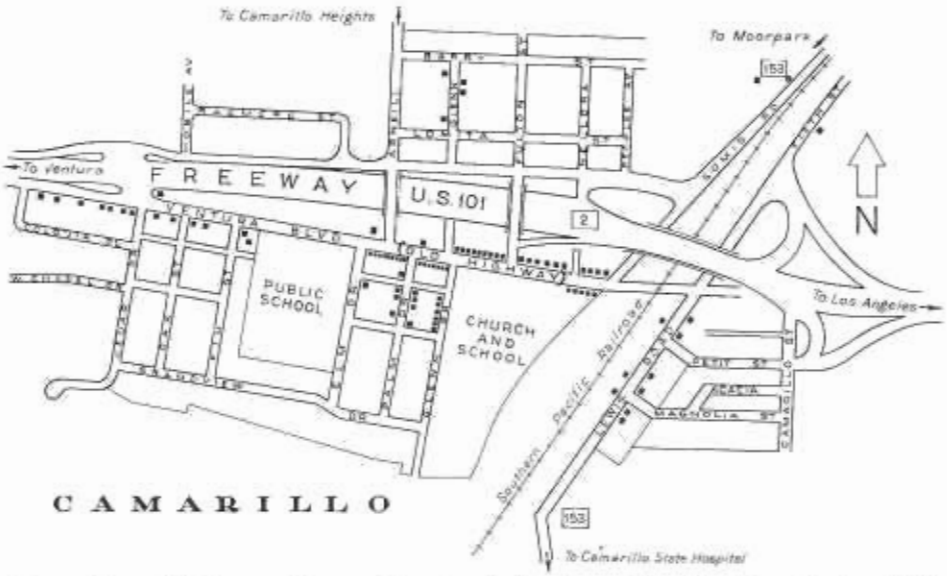


Diagram shows old highway and freeway through central portion of Camarillo. Note railroad and State Highway 153 crossing old highway route. The black squares indicate location of commercial buildings in the community.

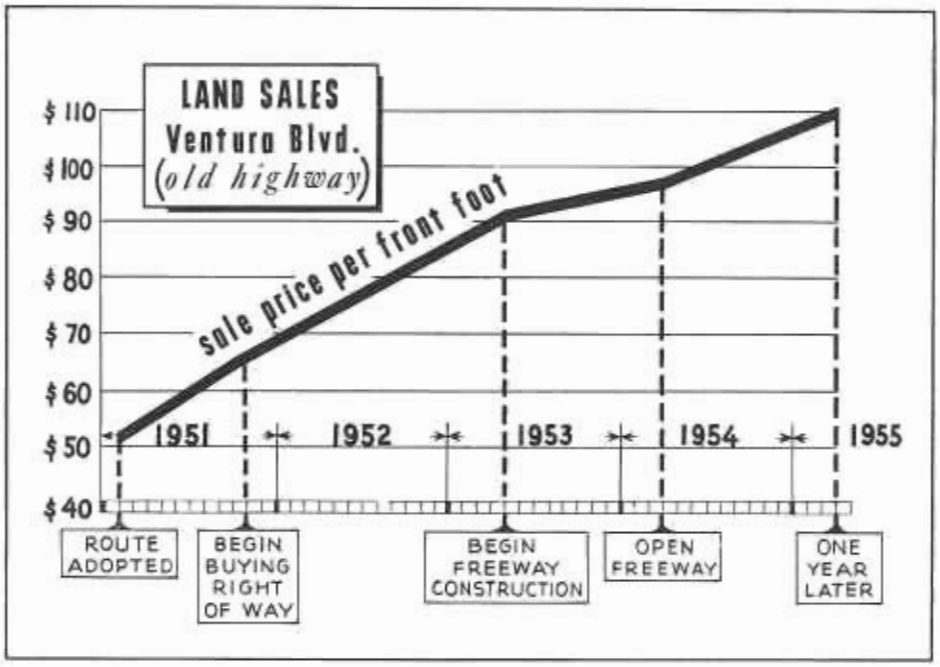
shows the present economic status of the community one year after the freeway was opened as compared with the previous year when the business district was along the highway route.

PROPERTY VALUES

One positive indicator of the freeway effect upon the economy of the community is the trend in property values, particularly the sale prices of those properties fronting on the superseded highway route. It is not always possible to have this data in an economic study because of an insufficient number of property sales in the community to definitely indicate a price trend before and after the construction of the freeway. Fortunately, there has been sufficient real estate activity along the old highway route in Camarillo so that this study will have the advantage of this vital information.

There are two methods of approach in utilizing the record of land sales.

Trend in land prices along old highway route during various stages in the development of the freeway



The first requires the use of all property sales and appraising the improvements included in the sale so that they can be subtracted from the entire sale price. The final result is the change in value attributable to the land only. The second method utilizes only the sales of unimproved properties, and thereby eliminates any question as to the amount of change in value to be assigned to the land. This method is obviously preferable and is the one used in this study.

Two fields of investigation were established for comparative purposes: first, the sales of property throughout Camarillo not directly affected by the freeway construction to establish the rate of change that could normally be expected; and secondly, those properties along the old highway where property was directly affected by the rerouting of traffic to the new freeway. All recorded sales or resales from 1946 to mid-1955 were investigated.

Trend on Old Highway

In general, it can be stated that all sales with frontage along the old highway maintained or exceeded the normal percentage of appreciation that could be anticipated, taking into account that the value increase in a growing community for commercial properties generally is at a more rapid rate than other types of land sales.

The accompanying chart shows the average land value of property along the old highway since 1946. The valuation of land at various stages during the development of the new freeway and during the year following its completion are indicated.

The trend in land sales prices from $36 to $110 per front foot, and particularly the increase that has taken place since the route for the freeway was adopted in 1951 would positively indicate that the freeway did not decrease the value of property fronting along the old highway.

Prior to 1945 commercial improvement along US Highway 101 in Camarillo was confined to approximately 25 building sites within a two-block area near the Southern Pacific Railroad crossing. The remainder of highway frontage through Camarillo comprised part of sizable land holdings and was not available for commercial building.

The accompanying diagram of Camarillo shows the location of the retail business district along the old highway.

In 1945 a subdivision with 18 commercial lots fronting on the highway between Glenn and Elm Streets was placed on the market. Two additional subdivisions west of Elm Street were opened in 1947 and 1949, making a combined total of 35 more lots along the highway for commercial improvement.

On March 24, 1954, when the freeway opened, there were 26 vacant subdivided lots fronting on the old highway zoned for commercial improvement. Fourteen of those lots, with frontage varying from 25 feet to 60 feet, have sold since the day through traffic was diverted from the old highway to the freeway. The sales prices of these 14 lots ranged from $95 to $214 per front foot or an average unit price of $110.

The sale of commercial frontage on side streets perpendicular to the old highway has been small in comparison with sales activity along the highway. The sales prices of these vacant properties have not shown as high a rate of price increase as was found for commercial lots fronting on the old highway after the completion of the freeway.

Taxation

The change in total taxation is a further indication of the increased property valuation and new building construction that has taken place in Camarillo since the freeway route was adopted.

The county taxes levied in Camarillo during the four-year period from 1951 to 1955 have increased from $63,684.37 to $103,078.08 per year, representing a 61.86 percent change.

The tabulation of county taxes was confined to the central area of Camarillo, as shown on the accompanying diagram. The Camarillo Heights District was excluded because it is not directly affected by the freeway.

NEW BUILDING CONSTRUCTION

The active real estate market along the old highway and particularly the upward trend in sale prices is indicative of the confidence many people have in the superseded highway route as a safe and desirable location to make an investment. This confidence is further emphasized by the fact that the majority of new commercial construction in the community has taken place along the old highway route. Since January, 1951, when it became definitely known that highway traffic would be rerouted to the freeway, 22 of the 29 new commercial structures in Camarillo were built along the route to be superseded.

The accompanying chart shows the number of new commercial structures along the old highway as compared with the number started on all of the streets of the town since January, 1951.

Building activity along the old highway route has not been confined to permits for new structures. Business growth has required expansion of a number of buildings, and permits have been issued for seven additions to existing structures since 1951.

The location of the school and church properties along the old highway route have caused the commercial improvements to be extended for some distance with wide separations between groups of retail outlets. The side streets of the three subdivisions opened in 1945, 1947 and 1949 provide the only opportunity to concentrate any sizable group of retail outlets in one specific area. This has been the principal incentive for building activity in that area. Regardless of the advantage of this centralized location, the commercial building trend and increase in land prices have been more spectacular along the old highway than on the side streets.

The reference to all other streets in Camarillo is not restricted to the three subdivisions. There are several other districts in the community which could have been developed into a new commercial area had there been any fear that frontage on the superseded highway would not remain the most desirable commercial site after the removal of highway traffic.

RETAIL BUSINESS

The factual data used for the retail business section of this study consisted of the gross retail sales reported by each retail outlet in Camarillo to the State Board of Equalization for the purpose of paying state sales tax. This

source of information provided a reliable basis for making a comparison of business gains or losses before and after the freeway opened.

To ascertain whether the businesses in Camarillo were in line with the normal trend in business conditions, a comparison was made with all retail outlets in Ventura County during the same period of time.

This study is based upon a comparison of the gross retail sales in Camarillo and Ventura County during one year *before* and *after* March 24, 1954, the date the Camarillo Freeway opened. All of the retail outlets have been segregated into groups in order to distinguish between those businesses in the community most frequently patronized by highway motorists; such as service stations, eating and drinking places, and all other retail outlets which are dependent upon local patronage.

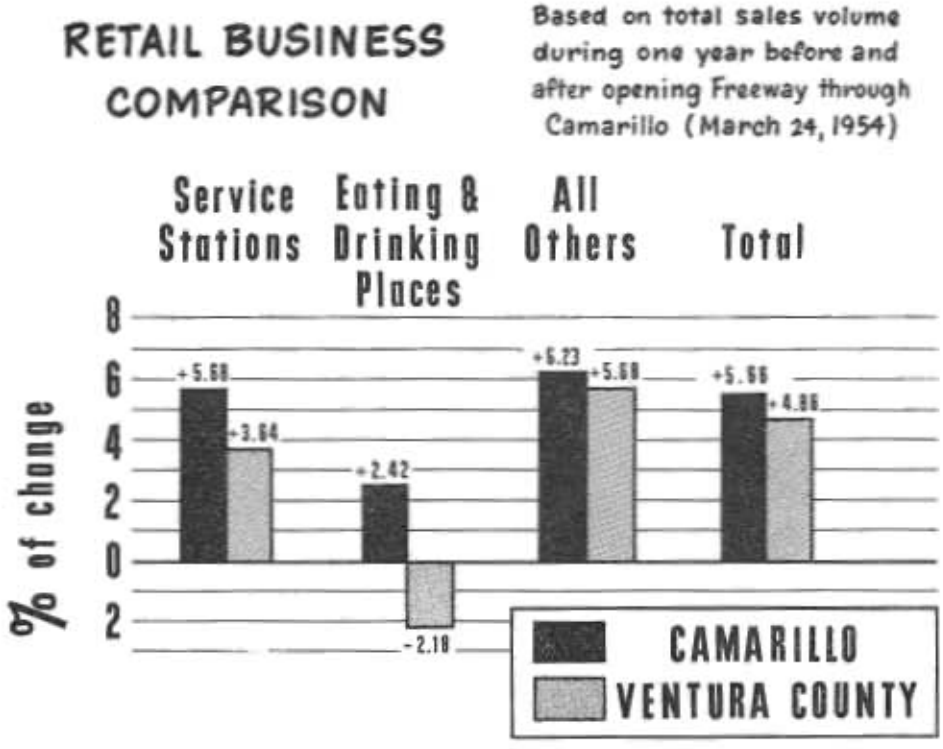
The graphic illustration in the accompanying chart shows the gains and losses by each group of businesses in Camarillo as compared with Ventura County before and after the completion of the freeway.

The dollars and cents figures in the tabulation of sales tax reports have been converted to percentages so that actual business volume of individual retail outlets would not be exposed.

According to the reports submitted to the State Board of Equalization, four new businesses were started in Camarillo during the year before the freeway opened. One of these new businesses was in the group catering to highway motorists; whereas, the other three were in the group unlikely to benefit from highway traffic in the business district.

During the year "after" the records show 10 new businesses started in Camarillo. Five of these were in the category of service stations and eating and drinking places. Their location along the old highway route is an indication the investors did not feel that highway traffic at the front door was a requirement for success.

During the "before" period the records do not show any businesses closing out without a successor; whereas, during the year "after" there were two retail outlets in this category. Both of these businesses would be



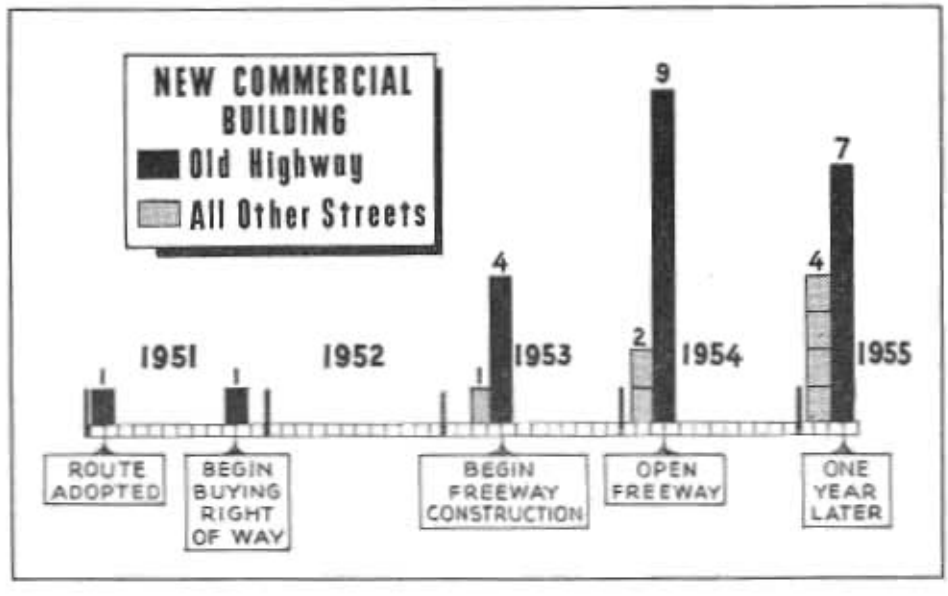
Graph illustrating percentage increase or decrease in volume of retail sales in Camarillo as compared with Ventura County during a similar period of time

classified as a type dependent upon local patronage.

The total gross retail sales in Camarillo were 5.66 percent greater during the year after the freeway opened as compared with the year before. Total retail sales throughout Ventura County during this same period increased 4.86 percent. In other words, the economic condition of Camarillo from the standpoint of retail business was slightly higher than the increase required to attain equal status with the normal trend in business conditions in this general area.

The majority of retail outlets in Ventura County were subject to the same general economic influences and

A comparison of commercial building activity along old highway route and all other streets in Camarillo. Twenty-two of twenty-nine new commercial buildings constructed in community since 1951 have been along the old highway.



therefore had a relatively equal opportunity to succeed during the overall two-year time period covered by this study. In Camarillo the rerouting of the highway away from the business district represented a radical change from the traffic pattern to which the community had become accustomed. The merchants in Camarillo were required to adjust to this change in addition to the normal changes affecting business in other communities. Whatever adjustments may have been required to overcome this change were successfully accomplished within one year.

Service Stations

Service stations are one of the groups of businesses most likely to derive some benefit from highway traffic through the business district. The gross sales reports after the rerouting of highway traffic in Camarillo indicate that total service station business in the community was not deriving appreciable benefits from through highway traffic. The increase of 5.68 percent as compared with a 3.64 percent increase shown by all service stations throughout Ventura County reflects a substantial gain after the removal of highway traffic from the business district.

The community increase for service station receipts does not necessarily mean that each service station automatically shared in the community business increase. A tabulation of the gross retail sales of the individual service stations revealed that some of the stations suffered a business decrease during the year "after" while others enjoyed an increase in gross sales. The reason some of the stations suffered losses during a period when total sales in the community were increasing was due to local competition. Within two months after the freeway was completed two new major brand service stations opened on the old highway route in Camarillo. The volume of buisness they performed reduced the proportionate share of total business in the town for the existing stations.

Three of the existing major brand service stations located near the Southern Pacific Railroad depot in the older portion of the business district along the old highway route acquired new sites near the center of the business area (along the old highway route). Modern service station improvements were constructed on the new sites in order to compete for buisness increases taking place in the community.

Gasoline Sales

The total number of gallons of gasoline sold by all service stations in Camarillo during the period covered by this study has been obtained from the records of the oil companies and the State Board of Equalization. These figures reveal that after the freeway in Camarillo opened the total number of gallons of gasoline sold increased 4.73 percent over the previous year. This gain follows the state trend of 4.30 percent increase in gallonage sales in 1954-55 as compared with 1953-54.

During the "after" period the two new stations in Camarillo had a similar effect upon gallonage sales as upon the gross retail sales of the individual service stations. Despite the losses in gallonage sales among some of the service stations, the gain in total gallons sold in the community is further evidence that the rerouting of through traffic was not damaging to this type of business.

Eating and Drinking Places

The retail outlets selling food with nonalcoholic drinks, beer and wine, or all types of liquor, comprise the group of businesses referred to as eating and drinking places. Like service stations, these retail outlets are the types of businesses in the community that highway motorists are most likely to patronize.

The factual reports indicate that eating and drinking places in Camarillo were not relying very much on highway traffic for their success. The 2.42 percent *increase* for the year after the freeway opened compared with the 2.18 percent *decrease* for the same type of retail outlets throughout Ventura County shows the benefit of the freeway to this business group.

If the owners of these businesses had elected to cater primarily to the passing motorist rather than building up a good repeat business among local customers, the effect of rerouting highway traffic from the business district to the freeway would have undoubtedly reflected a different trend in gross sales.

Where income is primarily dependent upon the merits of good business management as evidenced by service, quality merchandise, etc., the removal of through traffic and congestion is a district benefit. The gains made by eating and drinking places during the year after the freeway opened in Camarillo discredits any assumption that the removal of highway traffic from a business district is ruinous to this particular type of business.

All Other Business

The majority of the retail outlets in Camarillo, such as grocery, hardware, clothing stores, etc., comprise the "all other" group. The tabulation of gross retail sales shows a 6.23 percent increase for this group after the freeway opened as compared with the year before. The same type of businesses throughout Ventura County gained 5.68 percent during the same comparative period. The gains made by the "all other" group of businesses in Camarillo were not as spectacular as those made by service stations and eating and drinking places, but were well above the normal expectancy during this period.

TRAFFIC

Before the freeway was completed, a total of 8,250 vehicles per day used the old highway route through the business district of Camarillo. Local traffic comprised only 1,210 of these vehicles.

The removal of approximately 7,050 through highway travelers from the main street of Camarillo made the retail outlets along the highway more desirable to the local shoppers because of better parking facilities and safer traffic conditions for motorists and pedestrians.

COMMUNITY GROWTH FACTORS

This study has shown the effect of the new freeway upon the economy of Camarillo through such positive indicators as property values, new building construction and business conditions in the community. The primary purpose of this study has been to determine the freeway effect upon the economy of the community; however, an economic analysis of Camarillo

View of business district along old highway route. Many of the commercial structures visible have been built since freeway route adopted.

would not be complete without consideration being given to all of the factors influencing its economy.

Government Installations

The geographic, climatic, and physical conditions of the area surrounding Camarillo have made it a popular place for the construction of various government installations. The close proximity of Camarillo to these government facilities with their large pay rolls and job opportunities has had a marked effect upon the growth of the community in recent years.

The oldest and best know of these government installations is the Camarillo State Hospital, located less than five miles from town. This large mental institution opened in 1936 and at the present time has approximately 1,600 employees. Approximately 200 of the employees live in the Camarillo area. The expenditures made in Camarillo from the $5,500,000 annual pay roll, plus the money spent in the community by visitors to the hospital, have a substantial effect upon the economy.

The Oxnard Air Force Base located approximately two miles west of Camarillo is the government installation situated closest to the town. At the present time, there is a total of approximately 1,950 civilian employees and military personnel at this air force base. According to latest reports from the air force base, an additional squadron and other manpower increases are anticipated in the near future. Approximately 316 of the present personnel live off the base and an indefinite number of these people are residing in Camarillo.

The U. S. Naval Air Missile Test Center at Point Mugu near Highway 101 alternate contributes additional pay roll expenditures in the Camarillo area. At the present time, there are an estimated 4,500 military personnel and civilian employees at this installation. An estimated 450 people live in the Camarillo area.

The U. S. Naval Advanced Base depot at Port Hueneme is located approximately 11 miles from Camarillo. An estimated 228 of the 3,800 civilian and military personnel at the depot live in Camarillo.

Attractive Residential Sites

The climatic conditions and country living atmosphere at Camarillo have attracted a number of residents, particularly in the Camarillo Heights area. Camarillo enjoys a convenient location, being situated approximately half way between Los Angeles and Santa Barbara, and a relatively short distance from Oxnard and Ventura. Completion of the freeway through Camarillo links the community by a modern highway system with these urban centers. The reduction in driving time is expected to make Camarillo more popular than ever as a residential community.

At the time this study is being written, a subdivision of 78 homes ranging from $12,000 to $15,000 is planned for construction adjacent to the frontage road south of the freeway and west of the business district. Other plans for residential and commercial building in the community indicate that Camarillo will grow considerably in the near future.

CONCLUSIONS

In summarizing this economic study, these conclusions can be made:

1. The relocation of US Highway 101 to another location did not decrease the value of property along the old highway route. This property frontage increased at a higher rate than similar property elsewhere in the community.

2. The rerouting of highway traffic to the freeway did not put an end to new commercial building along the old highway. New construction on the superseded highway has had all the characteristics of a building boom.

3. The freeway benefited retail business to the extent that every type of business in the community showed a substantial increase after the removal

. . . Continued on page 30

Burns Freeway

Second Unit of Project Is Dedicated by Governor Knight

By ALAN S. HART, District Engineer

THE MEMORY of Assemblyman Michael "Mike" J. Burns coauthor of the 1947 Collier-Burns Act will be perpetuated and a long-felt need of his home area fulfilled with the completion and dedication of the second unit of the Burns Freeway. The Burns Freeway is the portion of US Route 101 between the northerly city limits of Eureka and north city limits of Arcata and officially designated the Michael J. Burns Memorial Freeway by House Resolution No. 230 passed on June 15, 1949. The first unit, completed in 1954 and dedicated on July 20, 1954, extended from Gannon Slough just south of Arcata through Arcata and to a point just north of north city limits of Arcata, a distance of approximately 2.9 miles.

This second unit, known as the Eureka Slough-Gannon Slough project, extends from Eureka Slough at northerly city limits of Eureka to Gannon Slough for a length of approximately five miles.

The project is a unit of planned highway development from south city limits of Eureka to the US 101-299 intersection north of Arcata, and was first contemplated in 1944 when placed on the planning program as a high-priority project, but execution was dependent upon availability of funds to finance.

The completion of the freeway fulfills a long-felt need in the matter of highway improvement in the Humboldt Bay area wherein traffic volumes, continually increasing from year to year, overtaxed the old two-lane facility with resultant severe traffic congestion and delays. The sector of highway gains in importance wherein it serves as the major artery in the Humboldt Bay metropolitan area, the most densely populated area in extreme Northwestern California. It is a prime example of a section of highway that is not only a portion of a main route carrying long-distance through traffic, but is also of vital importance to the local transportation needs, especially a "Main Street" between the Cities of Eureka and Arcata, which are closely related in the daily activities of the area.

This improved highway facility supersedes the old two-lane highway, which was paralleled by new northbound lanes, and the old two-lane road was reconstructed to accommodate southbound lanes. The old highway was originally graded in 1918, gravel surfaced in 1921 and provided with a concrete pavement in 1925.

Work on this second and final unit of the Burns Freeway was accomplished under two contracts, with work starting on May 1, 1954. The first contract included grading and structures, including new bridges across Jacoby Creek and Gannon Slough and widening of the old structures across these waterways. Work under the first contract was done as a joint venture contract by Macco, Morrison-Knudsen, and River Construction Company at an approximate cost of $868,000. The second contract provided final surfacing and lighting at intersections with work done by the Mercer, Fraser Company of Eureka at an approximate cost of $633,200. Costs of rights of way will approximate $306,000. Total construction cost is approximately $1,807,200.

The completion of the project provides a four-lane limited-access freeway with channelized intersections at the two county road intersections, the connection serving the Humboldt County Airport, and a frontage road serving an industrial area.

The project traverses the westerly edge of a reclaimed tidal flat adjoining Humboldt Bay with the only promontory being a finger of the foothills extending to the bay where the highway and adjoining Northwestern Pacific Railroad pass through a cut, which came to be known as Brainard Cut.

On the west side and southerly side of the freeway as it curves around the northerly reaches of Humboldt Bay the highway is paralleled by the Northwestern Pacific Railroad. The tidal flat is therefore protected from inundation by the railroad and highway embankments supplemented by reclamation dikes and drainage ditches.

The alignment of the old highway was utilized which met all the required design standards, being generally long tangents connected by long-radius curves. Terrain allowed provision of flat grade but broken grades were utilized to provide proper drainage.

The typical roadway section is a four-lane divided highway with 37-foot-wide all-paved roadways separated by a 70-foot-wide median strip. The all-paved roadways provide two 12-foot driving lanes with 5-foot inside shoulders and 8-foot outside shoulders.

The structural features of the section on the northbound lanes on the new grade consist of 0.33-foot Class "C" cement treatment (4 percent cement) of the subgrade material overlain by 0.50-foot of Class "A" cement-treated base. The cement-treated base is 25 feet wide with untreated base shoulders.

The southbound lanes (the old two-lane concrete pavement) were reconstructed to provide a minimum of 0.33 feet of untreated base and existing shoulders were widened and reinforced with a minimum depth of 1 foot of imported borrow.

On both roadways the wearing surface consists of full-width 0.2-foot depth of dense graded plant-mixed surfacing with 0.05-foot open graded plant-mixed surfacing on the traffic lanes and a fog seal on the shoulder areas.

The project includes approximately 4,100 feet of frontage road serving industrial development just northerly of

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Memory of Late Michael J. Burns Honored by Knight

Several hundred people from Eureka, Arcata, and the surrounding country joined together in a ceremony opening the M. J. Burns Memorial Freeway on Thursday, July 22, 1955. Mrs. Michael J. Burns, assisted by Senator Randolph Collier, snipped the blue and gold ribbons which permitted the flow of traffic between the two Humboldt cities.

Humboldt County turned out generously to greet Goodwin J. Knight, the first Governor to visit them in years. The Governor's gracious wife, Mrs. Virginia Knight, was an instant "hit" with both the women and the men of the area.

No longer now will the motorists move bumper to bumper on the strip between Eureka and Arcata. Caught as they often were behind huge logging trucks, the tourists moved with a snail-like pace. The new freeway now voids this unpleasantness.

The dedication and official opening of the freeway was a joint venture of the Eureka and Humboldt County Chambers of Commerce.

UPPER—Governor Goodwin J. Knight, left, and Senator Randolph Collier hold sign which was installed on new freeway. In center—Mrs. Michael J. Burns, left, and Mrs. Knight, right. LOWER—Photo taken at scene of ribbon cutting.

Guests of Honor

Master of ceremonies, A. J. Gosselin, Chairman of the Eureka Chamber of Commerce Streets and Highway Committee, presented the visiting guests upon the speakers' stand. They included: Frank B. Durkee, Director of Public Works and Chairman of the California State Highway Commission; F. Walter Sandelin, Ukiah Commissioner; Chester H. Warlow, Fresno Commissioner; James A. Guthrie, Vice Chairman, San Bernardino Commissioner; Chelso Maghetti, Secretary, Davis; F. W. Panhorst, Assistant State Highway Engineer; Milton Harris, Construction Engineer; Mayor A. B. C. Davis, Arcata; Mayor George C. Jacobs, Eureka; Sam B. Merryman, Jr., District No. 5, representing Humboldt County Board of Supervisors; contractors: Ralph Brown, Mercer Fraser Company, Eureka; Macco Corporation, M & K Company, River Construction Co.; Senator Arthur W. Way, Third District; Assemblyman Frank P. Belotti, First District; A. S. Hart, First District Highway Engineer; George J. Cole, Chairman, Humboldt County Chamber of Commerce; Lloyd Height, President, Arcata Chamber of Commerce; Cliff Dumm, President, Eureka Chamber of Commerce; Mrs. Michael J. Burns, widow of the late Senator Mike Burns; Sena-

tor Randolph Collier, Second District, Yreka; and Mrs. Goodwin J. Knight.

Eight Miles of Modern Highway

The address of the afternoon was made by Governor Knight. He said in part:

"The project that we are dedicating here today is a unit of the Burns Memorial Freeway, more than five miles in length, and costing more than $2,000,000. Together with the first unit, which was completed in July last year through Arcata, it will create eight miles of ultramodern highway, built at a cost of more than $5,000,000.

"New highways such as the one we are dedicating today mean much to our travelers, not only in faster movement and greater comfort, but in added safety.

"Expressways and freeways seem to be today's answer to the terrible toll that is being exacted on our highways. The records show that freeways are about four times as safe as travel on two-lane highways. Expressways are next in the safety category, with three-lane highways almost as dangerous as the two-lane roads.

"As costly as they are, we must continue to build bigger and better expressways and freeways for our people. This Burns Memorial Freeway is a fine example of what the State is endeavoring to do in the way of providing the most modern forms of highways for the people of California."

Tribute to Michael Burns

"It is particularly fitting for this project to be named the Burns Memorial Freeway. Senator Michael J. Burns, co-author of the Collier-Burns Highway Act for the development of an expanded state system of roads and highways, truly can be said to be one of the fathers of California's modern network of fine highways. Senator Burns died in 1947, after 17 years of notable service to the people of California in our State Assembly and our State Senate. No more suitable memorial could have been devised for this sunny son of Ireland who contributed so much to California's progress. He truly was a man independent in spirit, constant in his concern for the public welfare, and a man who strictly adhered to the principles that have made our Country great. His name will live long in the memory of those with whom he worked for so many years in our State Capitol in Sacramento, and in the hearts of the people here among whom he lived."

Following the ceremonies, the Governor, members of the Highway Commission and prominent officials of Humboldt County were guests at the beach home of Mr. R. W. Mathews.

Preceding the events of the afternoon the visitors were guests for lunch in the famous Carson Mansion, an outstanding structure in architecture.

In the evening, under the auspices of the Eureka Chamber of Commerce, the Governor addressed one of the largest dinner groups ever assembled in the Eureka Inn.

C. A. Maghetti, Secretary
State Highway Commission

BURNS FREEWAY

Continued from page 24 . . .

Eureka Slough. This road was constructed to a 40-foot width between curbs with a plant-mixed surfacing on a 0.3-foot depth of Class "A" cement-treated base. To fence off the frontage road from the freeway a 72-inch link fence was placed.

Major structure work involved bridges over Jacoby Creek and Gannon Slough. At Jacoby Creek the old bridge was widened to 37 feet and a new parallel bridge of the same width was constructed. At Gannon Slough the old bridge, 360 feet in length, was widened to 28 feet and a new parallel bridge 77 feet in length and 37 feet wide was provided. Two large box culverts in drainage ditches were reconstructed and extended and new floodgates provided.

"Borrow Job"

The prevalence of the unsuitable material composing the marshland adjacent to the new bridges made it impossible to recompact and necessitated surcharge of the approach embankments prior to bridge construction to obtain maximum possible consolidation of the underlying marsh muck.

The project traversing the flat marshland, with no appreciable satisfactory material developed in excavation, was a "borrow job." The knoll at Brainard Cut was almost leveled to provide the material for embankments, and approximately one-half million yards were removed and utilized.

To maintain the drainage of the tidal flat, the existing drainage plan had to be perpetuated. The old drainage ditch paralleling the old highway was reconstructed to the right of the new northbound lanes, and the material excavated, which was unsuitable for embankments, was used to fill the old ditch and form the freeway median strip. This material will eventually subside and compact and the width of the median then provides for construction of possible future necessary driving lanes.

Under right-of-way agreements the State is obligated to maintain drainage ditches, and such maintenance in the past proved to be somewhat of a problem by reason of the growth of tules, cattails, etc., which seriously decreased the discharge capacity of the ditches. To alleviate this problem and keep future maintenance costs down, modern chemistry was utilized on this project. The surfacing contract included an item of weed control treatment. The ditch areas were sprayed with a solution of 80 percent 3-(3,4 dichlorophenyl)-1-1-dimethylurea. It is anticipated that this treatment will control weed growth with another lesser application of same material in about a year, with a similar application every two or three years thereafter.

Highway lighting at the two main county road intersections, namely, Indianola Road and Bayside Cutoff, consists of the newly developed fluorescent highway lighting fixtures, first installation of which was made on the previously constructed Arcata portion of the Burns Freeway, have proven to be very satisfactory.

Harold "Hod" W. Benedict was resident engineer on both the grading and surfacing projects under the general direction of Alan S. Hart, District Engineer. The Bridge Department was represented on the project by Alton Kay, who handled the major structure work.

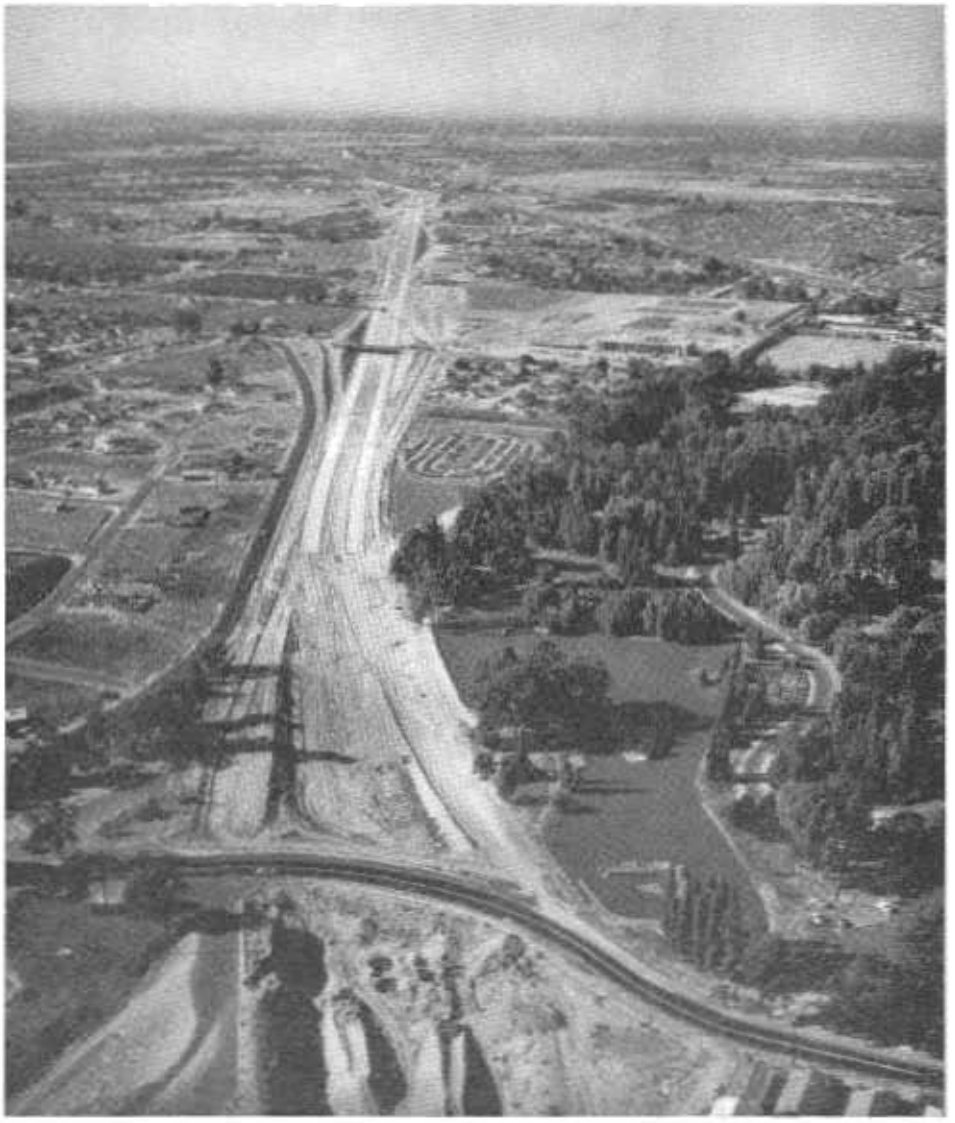
Fresno Freeway

Will Provide Many Benefits To Through and Local Traffic

By EARL T. SCOTT, District Engineer, District VI

FRESNO CITY'S first full freeway now under construction is fast taking form. Comprising a section of US 99, mostly on new location and having a length of six miles, the freeway will extend from Church Avenue, the south city limits, northwesterly through the city and on to Princeton Avenue. The new section of US 99 will parallel to some extent the existing highway but will follow a route through Fresno along the westerly side of the Southern Pacific Railroad tracks.

The first major contract was awarded to Guy F. Atkinson Company, South San Francisco, in August, 1954, and is now just about complete. The job was 2.4 miles long extending from Tielman Avenue to Princeton Avenue and cost $1,510,000, not including the cost of right of way. A second contract 1.8 miles in length and extending southerly from Tielman Avenue to San Joaquin Street was awarded to Gene Richards, Incorporated, and D. M. Underdown and Gene Richards of Fresno, and has been under way since July of 1955. The cost of this most recent job will be about $1,545,000. The final contract to be let to complete the freeway through Fresno will be advertised early in 1956.



Looking north on Fresno Freeway, showing construction

Eleven Structures

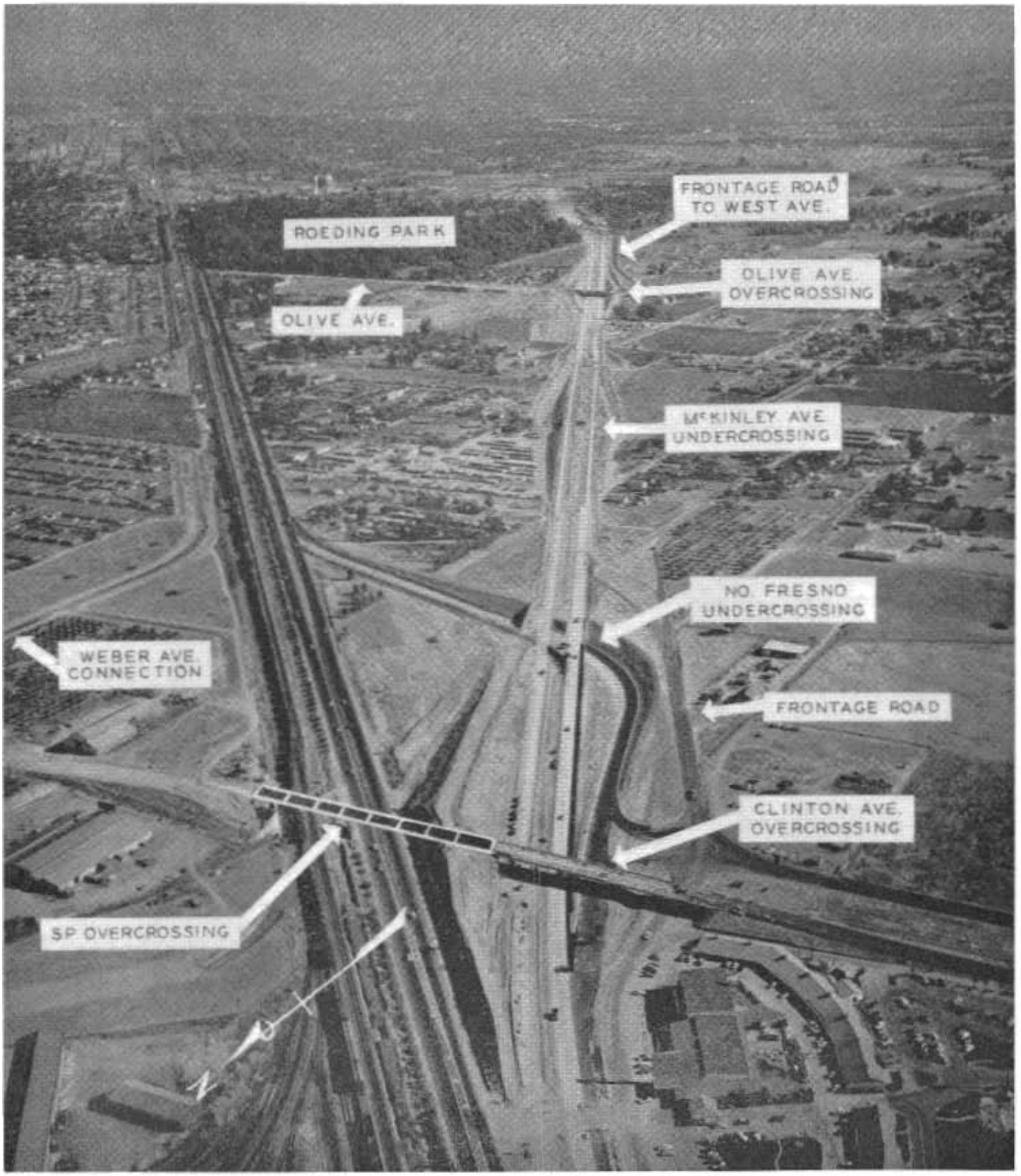
Contracts now under way provide for the construction of an underpass at the Kerman Branch of the Southern Pacific Railroad and an overhead crossing of the Southern Pacific main line tracks at Clinton Avenue, as well as nine undercrossing or overcrossing structures at intersecting streets or roads. The work on these structures together with grading and paving operations is confined to a section of freeway of about 3¾ miles in length. With two contractors at work an with their equipment everywhere, many people observe the progress being made. They are fast becoming freeway conscious and are looking forward to the completion of the job.

Present Route Inadequate

Present US 99 through Fresno has little to recommend it as a satisfactory route. The 5¾-mile section, to be superseded by the freeway, contains almost every possible factor to endanger and impede the flow of its 21,000 to 30,000 daily users.

It has four abrupt changes in direction at busy intersections where drivers often lose their way. The 15 traffic signals contribute to our excessive number of rear-end accidents and often delay traffic.

It traverses over a mile of downtown shopping area, with many turning movements, swarms of pedestrians and heavy parking, and an additional two miles of fringe area business



This aerial view of the Fresno Freeway shows the progress made to date on the new route which will bypass Fresno. The photograph is looking south from a point over Princeton Avenue.

district and roadside development. Nearly five miles has restricted speed zoning, much of it at 25 miles per hour. A section of three-lane pavement still remains.

An accident rate several times the state average has long persisted, the current rate on one long section being 26 accidents per million vehicle miles.

When the freeway is completed, 7,000 through vehicles a day and additional thousands of local users will benefit markedly from its greater safety, increased mobility and more comfortable qualities.

The time needed to drive through Fresno will be cut in half. The accident rate should drop to approximately 1.4, the average for all California freeways. Driving strain and discomfort will be at a minimum.

But its benefits will not be confined to those who use it. The reduction in traffic on the present route will aid the thousands of local drivers who continue to use that facility. Further, due to an inevitable readjustment of traffic in the downtown area, not only Broadway but at least four other streets parallel and adjacent to it will feel the effect of lessened congestion.

Thus, the Fresno Freeway and the three pairs of one-way streets soon to be put into use on two other state highways, will provide Fresnans with a rapid and safe network of state highways for traffic to pass through, around, or into the central business district, as well as important side effects on many other city arterials.

FROM MANILA

The Editor Sta. Ana, Manila

SIR: I have been receiving regularly issues of your *California Highways and Public Works* magazine for the last four years, but I never did have the occasion to thank you for the privilege of being included on your mailing list. I am now taking the opportunity to do so.

I have found all the issues very interesting and very helpful to our work in the City Engineer's Office of Manila. The change in cover to color made it more attractive and more worth keeping.

Sincerely yours,

M. C. GOMEZ

FREEWAYS DELICATELY ATTUNED

The Nation's giant freeways are proving something that few foresaw when these marvels of speed, interchange and confusion were conceived.

What they are proving is that freeways are among the engineer's most delicately adjusted devices.

They well might be compared to a highly jeweled watch, a fine internal combustion engine or a television instrument.

Each is the result of ingenuity expended over a long period of years.

Each is composed of an infinite number of parts, many of them so tiny as to appear unnecessary.

But they all are necessary. If there be any doubt, just bend a minute cog on a watch sprocket or remove a screw from a carburetor.

Freeways first are images in the minds of men.

These images are transferred to the draftman's sketches.

Distances are calculated to a fraction of an inch.

Designs estimate the speed cars may travel with safety. They include the number of cars expected to use specific sections of the freeway, and of the cars which will leave or enter the freeway lanes by way of ramps.

Where possible, as on San Diego's fine Cabrillo Freeway, the effects of natural beauty upon the motorist are considered.

And the results of all this planning are magnificent. They speed traffic smoothly and without irritation. They do until * * * some motorist does something that could not have been foreseen.

Something like entering the freeway without caution. Or something like changing lanes without proper signals, or speeding, or going too slowly.

Then there is a crash, and within seconds the fine freeway becomes an infernal trap which backs up fuming motorists for miles.

In a manner of speaking, a cog got bent or a screw became lost in this fine mechanism.

Freeways can be no better than the drivers who use them, but they can be just as good, or just as bad.—*Editorial from San Diego Evening Tribune.*

CONSTRUCTION PROJECTS IN LOUISIANA

By NORMAN C. RAAB, Projects Engineer, Division of San Francisco Bay Toll Crossings

Recently it was the privilege of the writer to make a trip to New Orleans, Louisiana, for the purpose of inspecting the construction of two major projects in that area. These projects are the offshore oil drilling developments in the Gulf of Mexico and the 24-mile prestressed concrete highway bridge over Lake Pontchartrain.

Certain aspects of the construction of the above two projects are similar in detail to those used in the planning for the approach to the Richmond-San Rafael Bridge on the Marin County side and for the greater part of the transbay structure of the Southern Crossing of San Francisco, as they have required the precasting of concrete elements used in the structure, then transporting and erecting these parts in rough water.

The construction of the Lake Pontchartrain Bridge consists of the prefabrication of hollow poststressed concrete piles, which are 54 inches in diameter, driven and jetted into accurate position along the line of construction; the positioning of a precast concrete cap on the tops of the two pile bents; and the placing, by waterborne equipment, of the 180-ton prefabricated and pretensioned roadway section on the newly constructed bents. The roadway is 28 feet in width and provides two lanes, each 14 feet wide, permitting two-way traffic past a stalled vehicle.

John Dahlquist

John Dahlquist, senior construction supervisor for the Division of Architecture retired from state service recently and was honored by fellow employees at a retirement dinner held at the Turf Club in Rivera on August 17, 1955.

Dahlquist was born in Stockholm, Sweden, on October 12, 1885. He was a graduate of the Higher Technical College of Stockholm in civil and structural engineering. Following his graduation he worked in many of the construction trades as well as for his father who was a contractor. For a period of time, he acted as foreman and superintendent of construction for several contractors, but in 1919 strike conditions forced him to leave Sweden and he came to the United States where two brothers and a sister were living.

He arrived in New York in 1920 and first went to Chicago. He later went to Minneapolis where he accepted a job as construction supervisor with Engstrom and Lingwall Construction Company supervising the construction of a housing project. In 1921 he went to Seattle and then to San Francisco. In San Francisco he was employed for a time as superintendent for the Walmark Construction Company. The next year he opened a structural engineers office in the Wright and Collander Building in Los Angeles and for over a year practiced his profession of engineering. In 1923 he joined the Pozzo Construction Company as general superintendent. He married Helene Hendrickson at Santa Ana in Orange County on August 27, 1926.

For the next 20 years Dahlquist worked for different contracting firms, the City of Los Angeles and for himself as general contractor. In 1948 he joined the forces of the Division of Architecture as a senior construction supervisor and was placed in charge of direct construction work at the Department of Agriculture Poultry Laboratory in San Gabriel. For several years he was construction supervisor of several National Guard armory projects in Southern California, and from December, 1953, until the date of his retirement was in charge of construction at the Long Beach State College.

Employees Receive Twenty-five-year Awards

Employees of the Division of Highways who became eligible for 25-year awards during August and September, 1955, are:

Name	Total service Yrs.	Mos.	Days
ELIGIBLE ON JULY 31, 1955			
District VII			
Jones, Edward P.	25	0	29
ELIGIBLE ON AUGUST 31, 1955			
District II			
Nett, Walter M.	25	0	9
District IV			
Brown, Elmer	25	0	21
District V			
Holman, Herbert J.	25	0	22
Lovell, Mabel A.	25	0	9
District VII			
Dewing, Earle H.	25	0	24
District VIII			
Gaylord, C. Worth	25	0	8
McCurry, Richard C.	25	0	25
District XI			
Gray, George A.	25	0	25
Central Office			
Fulton, Rex H.	25	0	19
Bridge Department			
Gillenwaters, Franklin G.	25	0	22
Shop 1			
Tharp, Charles H., Jr.	25	0	2

Name	Total service Yrs.	Mos.	Days
ELIGIBLE ON SEPTEMBER 30, 1955			
District II			
Dooley, Ambrose J.	25	0	22
Eugene, Joseph K.	25	0	27
District III			
Ambler, Arthur N.	25	0	21
District IV			
Miller, Lawrence V.	25	0	16
Wise, M. S.	25	0	21
District V			
Chittenden, Carroll S.	25	0	16
District VI			
Landen, Joseph T.	25	0	28
District VII			
Curtis, Cyril W.	25	0	16
Leidel, Walter L.	25	0	28
District VIII			
Taylor, Cleveland C.	25	0	0
District XI			
Hopkins, A. E.	25	0	22
Central Office			
Ferron, Harold L.	25	0	18
Bridge Department			
Brownell, Clarence J.	25	0	12
Materials & Research			
Scholefield, Howard L.	25	0	15
Shop 6			
Kent, Charles	25	0	20

CAMARILLO STUDY

Continued from page 23 . . .

of highway traffic from the business district.

4. The location of the freeway through the center of town did not divide the community or make the existing business district inaccessible to any particular area. The spectacular growth in the existing business district supplies the answer to this question.

5. The freeway has not discouraged new investments in the community. Building activity since the completion of the freeway and proposed construction indicates that Camarillo is just beginning to grow.

CARRIAGE MEN DISBAND

The four surviving members of the Carriage Wagon Woodstock Implement Association have decided that, after 75 years, the organization might just as well disband, reports the National Automobile Club.

"We're gone—we've just got to face the truth," said F. F. Stice of Fayetteville, Arkansas, as he proposed the deactivation.

"We're down to four. Besides the gas engine, now we've got this stuff about flying saucers, jets, and the atomic and hydrogen age. No, boys, we're on the way out."

D. B. Campbell of Tullahoma, Tennessee; C. B. Marquis of Fort Smith, Arkansas; and J. R. Tubb III, of Sparta, Tennessee, listened to the dismal truth and agreed that the carriage trade was gone—real gone.

First Classified Scenic Area Is Established By Forest Service

Clare Hendee, acting under his authority as regional forester of the U. S. Forest Service in California, has established, with the concurrence of the Chief of the Forest Service, a special area dedicated to scenic recreation in Tuolumne County to be known as the Calaveras Memorial Scenic Area. This is the first such dedication of national forest lands in California to be administered for the exclusive purpose of preserving scenic recreational values.

This memorial scenic area consists of 378.7 acres of the finest stand of veteran sugar pines remaining in the State. Intermingled are the associated pines, firs, and cedars and a few giant sequoias that make up the typical virgin forest in this part of the Sierra. This area adjacent to the Calaveras South Grove Big Tree State Park will greately enhance the recreational values and attractions of the whole area.

Under forest service administration this area will be maintained in an undisturbed condition, no commodity sales will be made and the only development permitted will be a minimum of foot trails to enable the public to reach and enjoy all parts of the area. Only in case of a disastrous fire or uncontrollable epidemic insect attack will the removal or salvage of the killed trees be authorized.

PASSENGER CAR-TRAILER ACCIDENTS

Passenger car-trailer combinations were involved in 828 California traffic accidents during 1954, reports the National Automobile Club.

HIGHWAYS BENEFIT

Prior to construction of the Eastshore Freeway connecting Oakland and San Jose, average land values in the area were about $500 an acre. Today, according to the National Automobile Club, the property in that same vicinity is valued at $21,000 an acre and $40,000 an acre valuation for land fronting the highway.

NOTHING FAZES A FISHERMAN

BAKERSFIELD, CALIFORNIA
September 10, 1955

California Highways and Public Works

GENTLEMEN: I have just reviewed a copy of your magazine of July-August and note, with regret, the announcement of the passing of Robert C. McFarland, construction superintendent.

Immediately this took me back some 20 years when the road into King's Canyon was being built. A fishing buddy of mine and I had been in the habit of going into this country, on foot, for a long time. When we arrived that year we found the road was under construction with this area closed to the public on account of a job of blasting. Having traveled a long distance, we were naturally highly disappointed and with the fisherman's usual ingenuity, when his sport is being denied, I spoke up and said: "Well, it's too bad; my brother, who is in charge here, is at the other end of the road or I am sure he would let us through."

After looking at my driver's license, the hard-boiled guard softened and said: "Oh, all right fellows, we'll tell McFarland he missed you—go on through, but be careful." Later we met up with McFarland and he showed a fine sense of humor saying that he wanted to see the "bird" who was his brother. He even gave my pal a lift since he had given out coming over the hill. This incident occurred in the vicinity of Horseshoe Bend.

Yours very truly,

A. H. MCFARLAND

THE RIGHT SIDE

Who's a pedestrian? You are the moment you step from your car. Always leave your car from the curb side, says the California State Automobile Association, never from the street side.

SAFETY MARGIN

It's the driver, not the car or the condition of the road, who causes most of the accidents. A good driver allows an adequate margin of safety between his car and the others.

CLARE HENDEE NAMED ASSISTANT CHIEF OF FOREST SERVICE

Regional Forester Clare Hendee, who has been in charge of the California region since 1951, has been named an assistant chief of the forest service by its chief, Richard E. McArdle, the U. S. Department of Agriculture announced. Hendee succeeds E. W. Loveridge, who has retired from the forest service to accept an assignment as agricultural attache with the American embassy in Bogotá, Colombia.

In assuming his new position Hendee will head up the administrative management and information activities of the forest service. Hendee will direct and coordinate administrative operations, personnel, organization, financial management, defense, business management and public information and education activities.

During his 25-year career with the forest service, Hendee has been continuously engaged in the administration of forest resources. As regional forester in California he was responsible for the management of soil, water, timber, forage, recreation and wildlife resources on 17 national forests; and their protection from fire, insects, and diseases. He also was forest service head of state and federal cooperative forestry programs in California.

Chief McArdle announced further that Charles A. Connoughton, regional forester of the southern region of the forest service with headquarters at Atlanta, Georgia, succeeds Mr. Hendee as regional forester of the California region.

NEW BOOKLET TELLS ABOUT KERN CITIES

Want to know when Wasco was founded? The elevation of Tehachapi? Ridgecrest's population? Type of soil, or the weather in Mojave? Perhaps you're interested in the number of retail and wholesale outlets in Delano?

The answers to all these and scores of other questions conerning Kern County communities may be found in "*Community Information*," a new publication being developed by the Kern County Board of Trade.

Cow Palace

New Freeways Will Speed Traffic to Grand National Show and Rodeo

EXTENSIVE recent freeway construction again this year will add materially to the comfort and convenience of thousands of visitors who annually travel by automobile to the Grand National Livestock Exposition, Horse Show and Rodeo, it was announced by Nye Wilson, Secretary-manager of the huge Cow Palace, where the 1955 show will be held October 28th to November 6th.

Local traffic from San Francisco and the East Bay, as well as traffic from points south, will especially benefit, according to a report which Wilson received from R. P. Duffy, Assistant District Engineer, District IV, Division of Highways, comprising the nine Bay area counties.

In the spring of this year the section of the Bay Shore Highway between Alemany Boulevard and Hester Street, just south of the Third Street intersection, was completed, bringing the Cow Palace within 12½ minutes' drive of San Francisco's Civic Center.

Completion of final sections in downtown San Francisco, making connections to the San Francisco-Oakland Bay Bridge and providing ramp connections to the surface streets at Fourth, Eighth, and Mission Streets, have added also to the ease with which the Cow Palace can be reached.

Traffic Expedited

On the East Bay side of the bridge, portions of the third level of the distribution structure at the approaches have been opened since the last Grand National and sections of the Eastshore Freeway in Berkeley and Oakland have been completed to an eight-lane divided section. Traffic from the south will benefit in great measure from completion of the Bayshore Freeway to a six-lane divided section between San Mateo and San Carlos.

While construction work is still continuing on the Waldo Grade north of the Golden Gate Bridge, converting this section from a four-lane undivided highway to a six-lane divided freeway, no delay in traffic is anticipated. Traffic will be shifted between the existing road and the new lanes to meet construction needs but traffic service will be equal to that previously rendered during the construction period.

Members of the "Riders of the Andes," internationally famous Chilean Army equestrian team, are shown practicing one of their amazing feats of horsemanship

The Cow Palace, with its vast paved and lighted parking areas capable of accommodating 4,000 cars, is particularly well equipped for automobile traffic, Wilson pointed out. He said preparations are being made to handle record crowds in view of the great international attraction which will headline this year's arena show.

Riders of the Andes

Several months ago Wilson flew to Chile, where he made arrangements for the appearance of the "Riders of the Andes," the famous Chilean Army equestrian team from the School for Carabineros, on the outskirts of Santiago, which is the pride of all South America.

On his return he announced that the group, consisting of 30 men and 30 beautifully matched bay horses, has lived up to its reputation in every way, and the members, in his opinion, the world's most fearless and daredevil riders.

They have been in the saddle in rough mountainous country of the far-flung provinces since they were four, or five, years old, only the best being chosen for the "Cuadro Verde," or "Green Squadron."

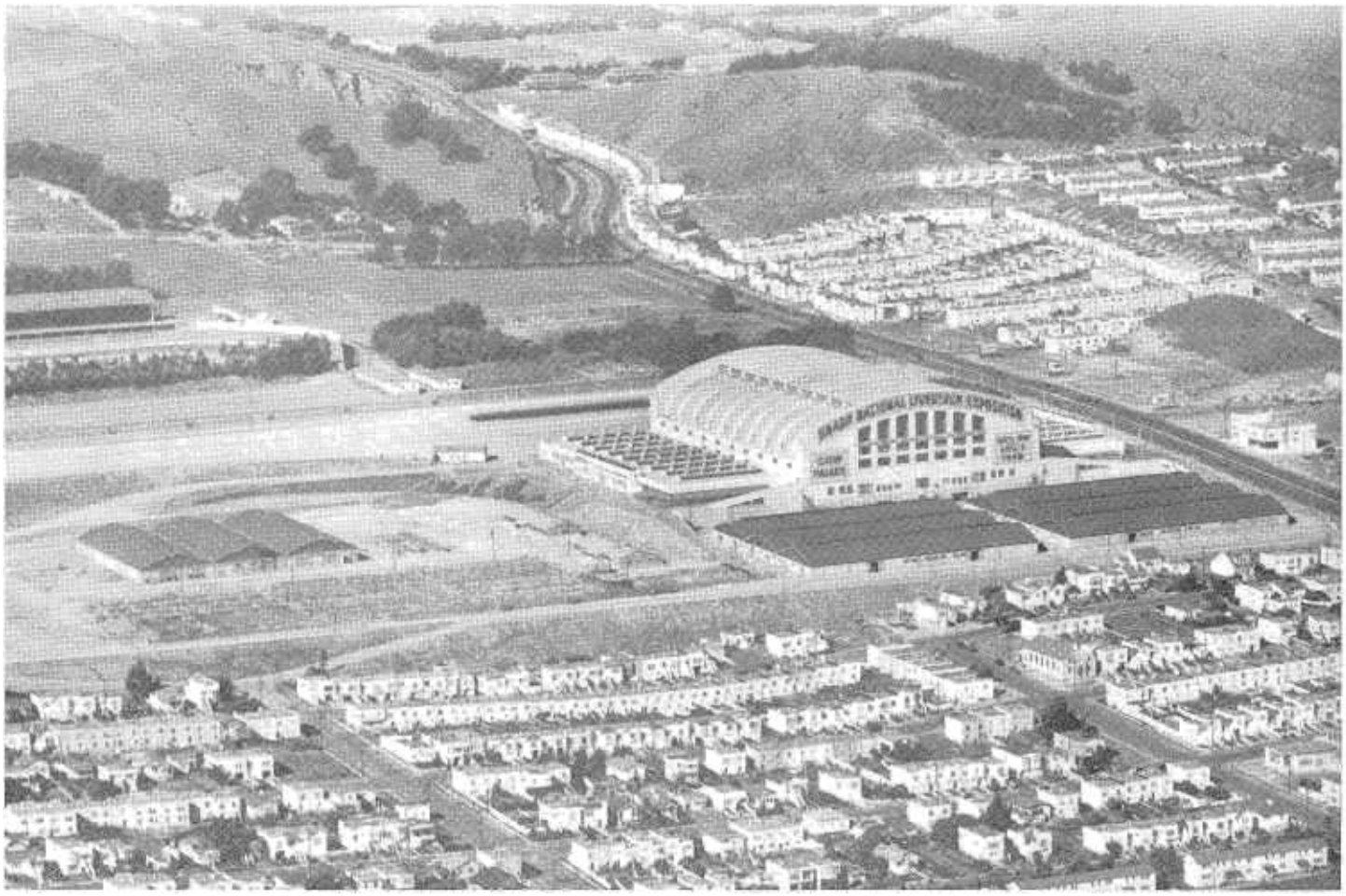
Working with flat Army cavalry saddles without special equipment of any kind, they perform amazing feats of horsemanship—including four abreast pyramids—while traveling at top speed. No comparable attraction has been seen at the Cow Palace since 1952 when the Royal Canadian Mounties were featured and brought an all-time record attendance of more than 170,000 persons.

Back again this year by popular demand will be Capt. William Heyer and his famous dancing horse, "Starless Night."

National Horse Show

Also of special interest to horse lovers will be the full division National Horse Show which will again this year include the National and Pacific Coast Cutting Horse Contest Finals. New classes have been added to the horse show and there will be a special children's matinee on Friday, November 4, for children's equitation and the finals of the A. H. S. A. Stock Saddle Seat competition for juniors.

International Rodeo Association champions in saddle and bareback bronc riding, steer wrestling, calf roping and bull riding will be decided during the Grand National, which, as the last big rodeo of the year, is an important factor also in the world



This is an aerial view of Cow Palace in San Francisco where, as in the past, the Grand National Livestock Exposition, Horse Show and Rodeo will be held October 28 to November 6

championship competition of the Rodeo Cowboys Association.

Three of the Nation's leading stock contractors will pool their strings of broncs, bulls, steers and calves to add to the excitement of the rodeo contests.

In the Livestock Division, where premiums of $88,235 are being offered, national attention will be focused on the National Hereford Show. This show is the only Register of Merit Show for Herefords in California and marks the second time that the national show is to be held at the Cow Palace, the other occasion in 1951.

Ticket prices for the Grand National arena show are $1.25, $2, $2.50, $3, and, for box chairs, $3.50. Parking is 50 cents. Seats may be purchased at the Cow Palace and J. C. Penney Co., in San Francisco; in Oakland at Ina Thrams Box Office, Sherman Clay & Co., and Breuner's, Broadway at 22d; in Berkeley at Breuner's, 2128 Center Street, and in Sacramento at the Civic Theater Box Office. Outside the Bay area, tickets may be reserved at Pacific Greyhound ticket agencies.

The Grand Nationals are sponsored and produced by No. 1-A District Agricultural Association, a State of California agency whose board of directors serves without pay. Directors are: Porter Sesnon, President; Wilson Meyer, First Vice President; Roland Tognazzini, Second Vice President; Louis G. Conlan, Lawrence Draper, Jr., J. W. Mailliard III, George M. Mann and Fred D. Parr.

CLOSE TO HOME—AND DANGER

When you're driving close to home, you're still close to danger. Before turning into that driveway, take a good look about you and make the proper arm signals in a clear and unmistakable way.

ARTICLE APPRECIATED

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Oakland, California

California Highways and Public Works

GENTLEMEN: I want to express my thanks to the authors of the article "Automation" in your July-August issue. As head of the Right-of-Way Engineering and Survey Branch of the of the Alameda County Flood Control and Water Conservation District, I found the article very interesting and meriting additional study for possible application to our work.

Yours truly,

ROBERT E. ELLIS
171 Via Dolorosa
San Lorenzo, California

Concrete Pipe Jacking

Project at Kellogg Hill Is Completed

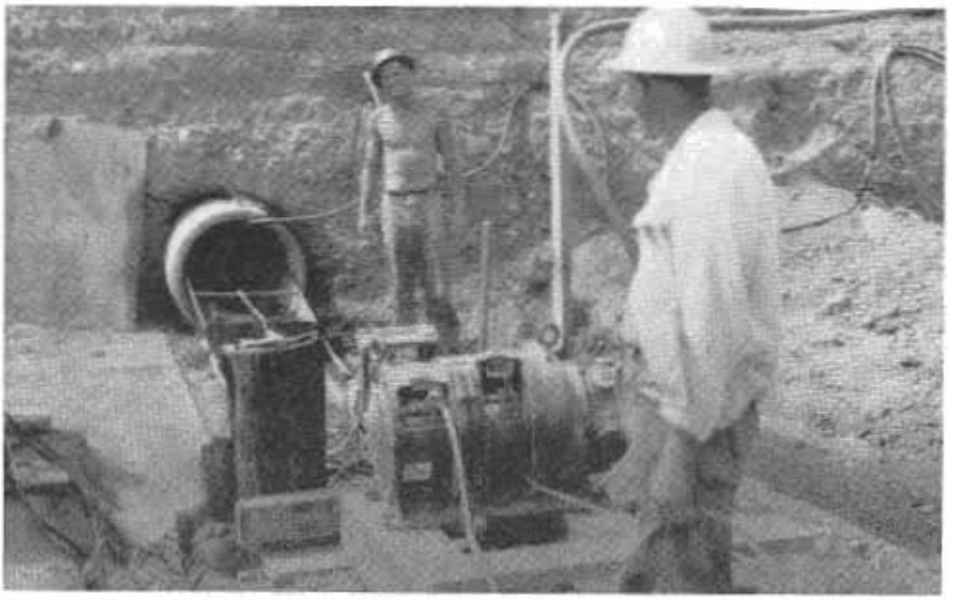
By ROBERT M. INNIS, Resident Engineer

WORK WAS STARTED this spring on the last section of the San Bernardino Freeway in District VII. This 5.21-mile contract, awarded to Winston Bros. Company, extends from West Covina over Kellogg Hill and connects to the completed freeway through the City of Pomona. The alignment of the new freeway is essentially the same as the existing route, Garvey Avenue, with the grade some three to four feet higher.

Since the terrain is mountainous and has many cross canyons and high fills on the existing route, the problem of drainage was quite interesting. Should we replace the existing drainage with new installations or extend the existing culverts? Since the culverts had been in place since 1932, and the grade differentials between the ends of the existing culverts and the proposed toe of slope in the canyons prevented any pipe extensions without an objectionable sharp grade break, it was decided to install new culvert pipe throughout. To replace this cross drainage by open cut method was obviously prohibitive—first, because the height of the existing fills was so great, and secondly, because public traffic had to be maintained on the existing Garvey Avenue. Therefore, the contract provided for jacking approximately 2,000 feet of reinforced concrete pipe ranging in diameter from 24 inches to 54 inches.

Contractor's Option

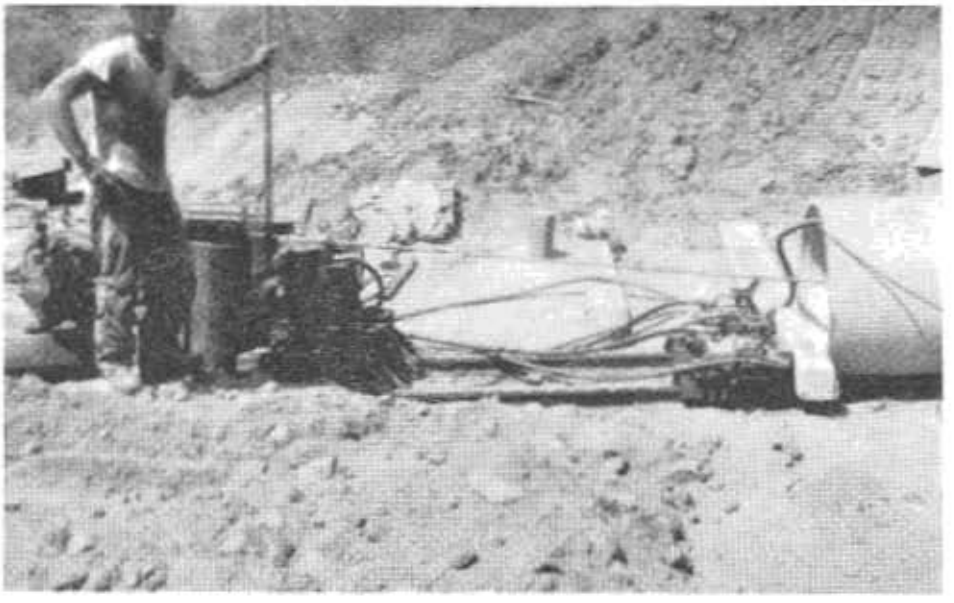
The contractor had the option of using 30-inch pipe in lieu of the 24-inch and 27-inch sizes to provide more working room. Consequently, 30-inch pipe was used at all locations where smaller pipe was specified. All pipe to be jacked was specified to have a 2,000-D load factor. The jacking pit was usually set up at the downstream end of the line and the pipe was jacked up grade. This was done to prevent any water from staying in the pipe heading.



Sled and trigger winch used in removing excavated material

The lengths of the lines to be jacked varied from 160 feet to approximately 330 feet and these were all jacked from one jacking pit at each location. The setting up or installation of the jacks, rails, and backstops called for very close accuracy for line and grade as the specified tolerance allowed only 3 inches per 100 feet variance in line and grade. The complete jacking operation at each location was performed by two men: one inside the pipe with

Excavated material about to be removed

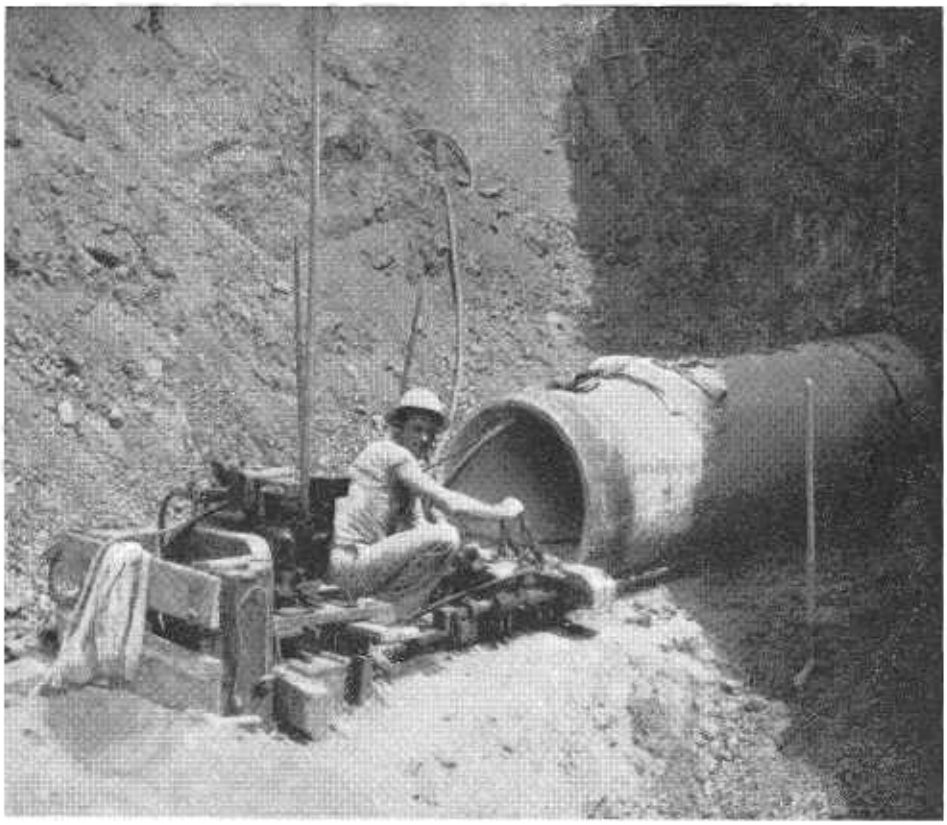


a short hand pneumatic clay spade and shovel and the other man operating the air tugger winch which pulled the dirt sled in and out. The man working in the pipe would excavate approximately two feet ahead of the pipe and then it would be jacked up snug against the dirt heading. Line and grade control was the sole responsibility of the man working in the pipe and was done by neat grading for the perimeter of the pipe up to approximately 18 inches above the flow line. However, at the time of the actual jacking the lead pipe section would deflect due to soil variations. In hard soil conditions the lead pipe would rise and in wet excavation the pipe would deflect downward.

Field Checks

At frequent intervals, field checks for line and grade were made with instruments and the variation from the theoretical line and grade was determined. The crew would then try to work back to the theoretical line. Although the end pipe would hole through within 6 to 10 inches of the theoretical location, the pipelines as laid, especially those over 150 feet in length, would be a series of small deflections. The average day's work would run between 8 and 10 feet of pipe jacked in a 10-hour shift. Each section of pipe was coated with Bentonite rotary mud for lubrication and was butted against the adjacent section of pipe with a one-half inch mortar pad for bearing. The new pipe sections were usually placed at the end of each shift so the mortar could set up during the night. Two 75-ton hydraulic jacks were used on the 30-inch diameter pipes and two 200-ton jacks were used on the 54-inch line.

The key to successfully jacking the long lengths of R. C. P. on this contract was the soil condition. The old fills were well compacted and no large boulders or rock were encountered. The material was such that it would tunnel and hold its shape—the result being there was no overhead displacement or load on the pipeline being jacked. Any vertical load would have made jacking impossible. The pipe seemed to jack smoothly up to around 200 feet of length but from then on considerable stress was evident, with small chips spalling out at the joints. However, and luckily, there developed no complete pipe failure or serious cracking.



Jacking operation at Kellogg Hill

The pipe jacking work on this contract has been completed, with a total of 1,815 feet of pipe being jacked. The work of jacking the reinforced concrete pipe was performed by the J. S. Barrett Co., subcontractor for Winston Bros.

View of equipment and two-man crew used in jacking operations

NEW UNIT OF EASTSHORE FREEWAY IS OPENED TO TRAFFIC

LEFT—New unit of Eastshore Freeway extending from 11th and Cypress Street to Market Street in Oakland. RIGHT—Construction has started on a major project along Cypress Street that includes a double-deck viaduct from the Distribution Structure of the Bay Bridge southerly to 16th Street.

A new unit of the Eastshore Freeway in Oakland which extends from 11th and Cypress Streets to Market Street was opened to traffic Friday, September 2, 1955, at 11 a.m.

This 0.7-mile project consists of a short section of an elevated freeway structure together with approach ramps which will later serve as on and off ramps for local traffic when the adjoining units of the facility will be completed. In addition to eliminating conflicts at a number of cross streets, traffic will no longer be subjected to the delay occasioned by the jog in the route from Seventh and Eighth Streets to Fifth and Sixth Streets.

As this completed section initially constitutes only a short link on this freeway route, motorists should exercise caution and be prepared to reduce speed as dictated by traffic conditions. This is especially important because traffic on adjoining street sections is subject to control by traffic signals and at certain periods, particularly during peak hours, congestions may extend back onto the freeway.

Cost $1,762,000

Work on the contract for this unit was performed by Fredrickson & Watson Construction Company and M & K Corporation, at a cost of $1,762,000.

Work has also just been started on a major project along Cypress Street that includes a double-deck viaduct from the distribution structure southerly to 16th Street. Plans are being completed for subsequent projects to fill the gap between the completed freeway unit and 16th Street to the north, and in a southerly direction to Oak Street.

Freeway Routing

The California Highway Commission has adopted a freeway routing for 11.8 miles of State Sign Route 198 (Hanford-Visalia Highway) between Ninth Ave., one mile east of Hanford, Kings County, and U. S. Highway 99.

Since the freeway route follows the existing highway a public hearing by the commisison was not considered necessary.

State Highway Engineer G. T. McCoy told the Commission that although construction might be some time in the future adoption of a freeway routing at this time was desirable to make known the State's plans for ultimate development and to protect needed rights of way.

Plans of the Division of Highways call for the eventual construction of a four-lane expressway over this section at a cost of approximately $1,770,000.

Slurry Seal Coat

Division of Highways Conducting Experiments

By MERLE L. NELSON, Highway Engineering Associate

THE PROBLEM of maintaining our highway surfaces in a smooth-riding and presentable condition has long been a thorn in the side of the Maintenance Department of the Division of Highways. One of the most costly and time-consuming maintenance operations is crack sealing. A good many of our bituminous pavements which exhibit severe cracking and spalling could be restored to give several additional years of satisfactory service by a suitable method of filling and sealing the cracks and spalls. The conventional type of seal coat has not provided a satisfactory treatment in all respects.

Headquarters Maintenance Department recently requested that the Materials and Research Department investigate and report on a new type of surface treatment called Slurry or Squeegee Seal Coat which had been developed and used quite extensively by the City and County of Los Angeles for sealing old bituminous pavements.

The slurry seal consists of mixing a fine sand or crusher dust or a combination of both with mixing type emulsion and water to form a very wet slurry.

A typical batch mixed in an ordinary transit mix truck would consist of the following composition.

For each ton of aggregates (dry weight) add

25 gallons of water
47 gallons of emulsion

The water can be varied to obtain the desired consistency to suit certain conditions.

The emulsion being used at present is mixing type emulsion (65-85 pen. base); also (150-200 pen.) has been used to some extent as the base asphalt.

Satisfactory Gradation

The aggregates should conform reasonably close to the following gradation which has been considered to be satisfactory.

Sieve sizes	*Percent passing*
No. 20	100
No. 30	91
No. 50	54
No. 100	20
No. 200	3

The emulsion and water are added to the mixing drum and the aggregates are then added slowly to prevent balling. Approximately five minutes is required to add the aggregates. The surface to be treated is sprinkled with water, normally about 0.10 gallon per square yard.

The slurry is then poured from the transit-mix truck onto the pavement inside a specially constructed spreader box which consists of a rectangular

Watering the pavement

Slurry train in action

frame the width of one lane. The "box" is equipped with a squeegee strike-off rubber which forces the slurry into all cracks and depressions in the pavement as the spreader is towed along the pavement behind the truck. The result is a very uniform and rejuvenated appearing pavement.

Under normal weather conditions traffic can use the treated surface in from 1½ to 3 hours after application and in certain instances in less time.

Conclusions

The following conclusions were arrived at after representatives of this department made an inspection of the slurry projects placed by Los Angeles County forces and a few experimental projects placed by our maintenance forces in District VII:

1. It is our opinion that the slurry seal, while not a cure-all, has a very definite place in maintenance work.
2. The treatment appears to do an excellent job of crack sealing and provides what appears to be a very satisfactory nonskid surface, especially when sand is used as the aggregate.
3. The mixture is cheap and can be applied at an amazingly fast rate.
4. Depending upon weather conditions, the slurry seal will set up sufficiently hard in some two to three hours so that it will not be marred by traffic.
5. The treatment is unsurpassed for use in city streets and residential areas where other types of surface treatments have always presented problems.
6. The mixture should not be considered as a substantial wearing surface and no attempt should be made to apply it in thicknesses greater than one-fourth inch and preferably one-eighth inch. This will permit faster set up and is important particularly on two-lane roads where traffic controls are to be enforced.
7. If a somewhat thicker layer is desired it is recommended that it be placed in two thin layers with proper time intervals for complete drying and setting up.
8. In addition to filling all cracks and holes in old surfaces the treatment improves the appearance of old pavements 100 percent.
9. The mixture sticks tenaciously to the old pavement, providing a tight seal.
10. District VII maintenance personnel and maintenance men of the County of Los Angeles are completely enthusiastic about the treatment.
11. We have recommended that maintenance forces place some experimental sections of this treatment in the vicinity of Sacramento for observation.

Spreading slurry

Completed slurry in right lane

McCoy Reports on Button Canyon Project

It would cost approximately $600,000 to construct an adequate two-lane road on a six-mile stretch of Sign Route 36 in Tehama County through the Button Canyon section, according to State Highway Engineer G. T. McCoy.

The Highway Commission asked McCoy for a report on the section between Tedoc Road and Dry Creek after a delegation from Tehama County and the City of Red Bluff had appeared at the commission's meeting in August requesting improvement of the existing road. Contributions of $25,000 each toward the project were offered by Tehama County and the Smith Lumber Company.

The road at present follows a narrow tortuous canyon, and an interim-type improvement is not feasible, McCoy said; any reconstruction should be on the basis of providing an adequate facility on permanent alignment.

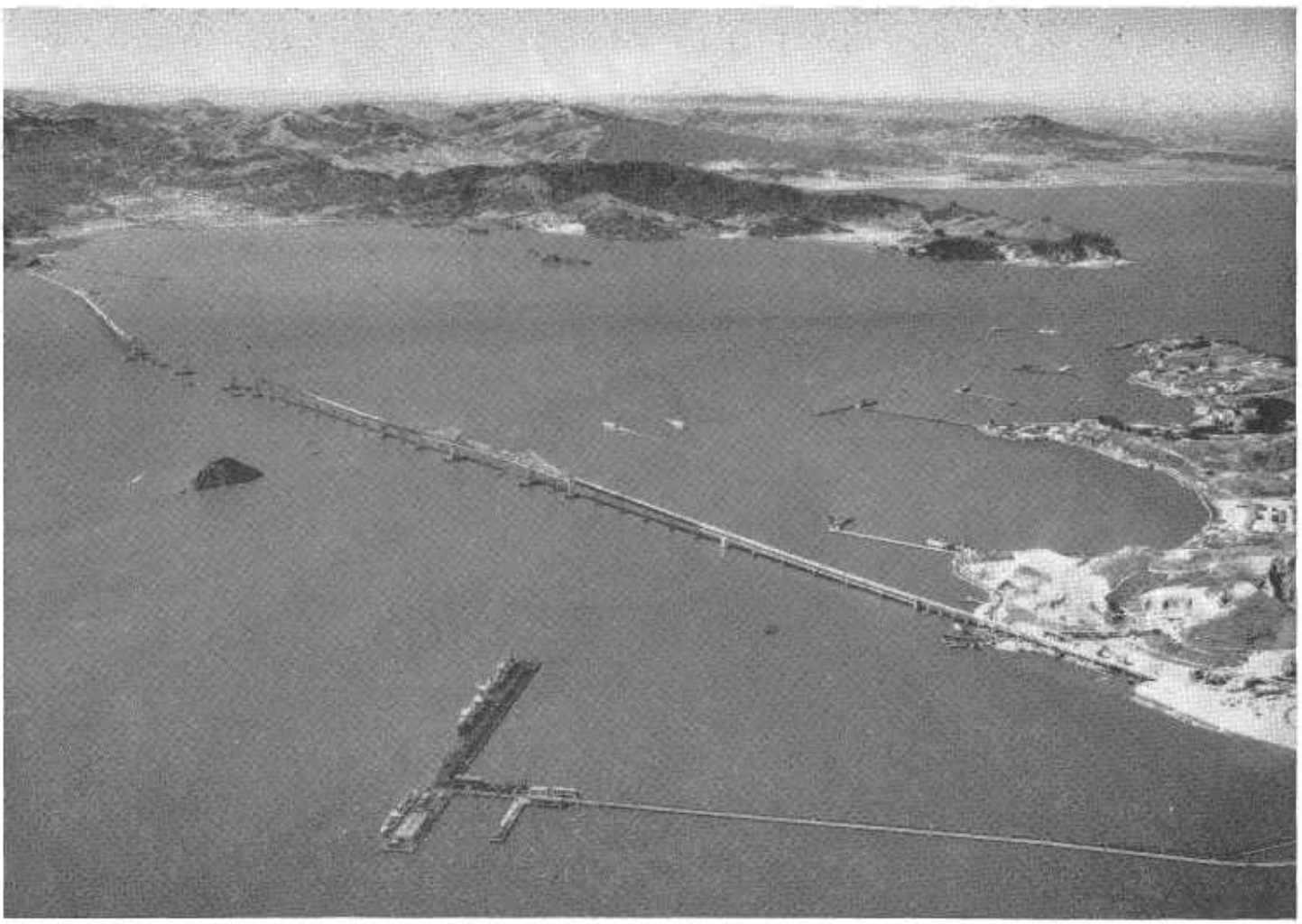
Rapid Progress

Richmond-San Rafael Bridge Is More Than 80 Percent Completed

On WEDNESDAY, September 14, 1955, workmen for the Murphy-Kiewit superstructure contract of the Richmond-San Rafael Bridge, now nearing completion in the northern part of San Francisco Bay, slipped the 12-inch pins into position connecting the lower chords of the east cantilever span.

At the same time the last of the 36 289-foot truss spans are being completed. Of the 18,500 feet of steel spanning the Bay, only the 2,140-foot cantilever structure over the west navigation channel remains for completion. Already workmen have erected the two main steel towers and are now progressing out on each side of bridge is being constructed, said the project now is more than 80 percent completed.

The newly completed span is over the secondary navigation channel paralleling the Richmond pierhead line. The two cantilevers are of identical design, each having a main span of 1,070 feet with 535-foot anchor arms.



This aerial photo shows the gap in the east cantilever span of the Richmond-San Rafael Bridge which was closed on September 14. The progress on the project, now more than 80 percent completed, is graphically shown.

This operation, together with the subsequent placing and riveting of several other truss members, closed the gap of the first of the two cantilever spans over the main navigation channels.

one of the towers with the intricate and delicate balancing of the steel truss members.

Norman C. Raab, Chief, Division of San Francisco Bay Toll Crossings, under whose personal supervision the

The vertical clearance for shipping over this channel is 135 feet while a clearance of 185 feet will be provided over the main channel.

. . . Continued on page 41

Foothill Freeway

Narrow Devil's Gate Roadway Is Eliminated

By C. J. VERNER, Resident Engineer

ON NEW YEAR'S Day, 1956, the spectators who attend the annual Tournament of Roses and the Rose Bowl football game in Pasadena will find motoring to and from these events less time consuming. A 1¾-mile section of the Foothill Freeway between Hampton Road in La Canada and Montana Street in Pasadena will have been completed in the autumn of 1955.

The section of State Sign Route 118 on which the improvement to full freeway standards has been provided by action of the State Highway Commission voting funds on July 24, 1953, for construction, eliminates the old narrow roadway across the Devil's Gate Dam as well as a sharp curve and grade intersection with State Sign Route 11 at the westerly end of the dam.

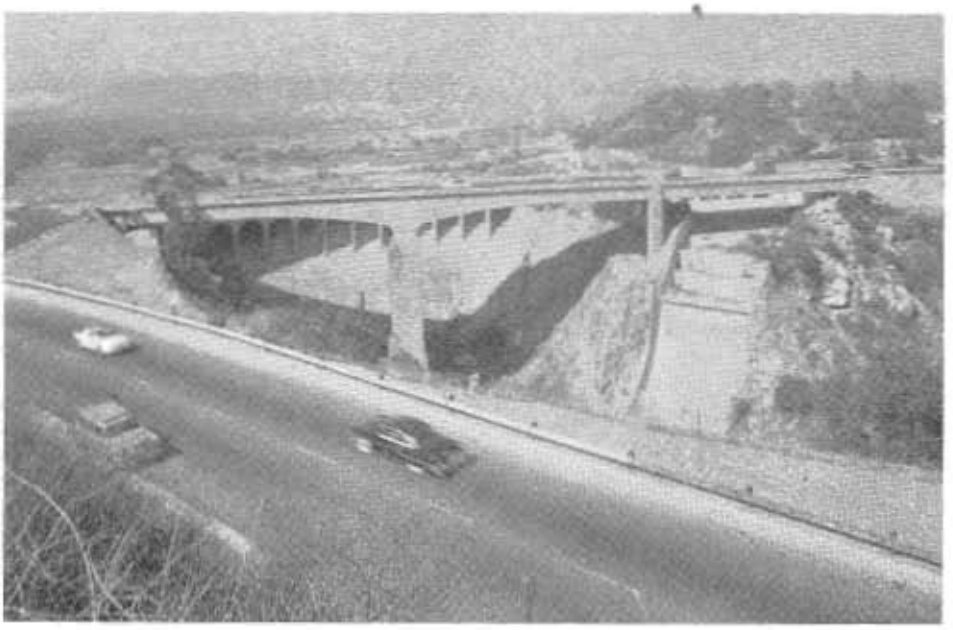
The portion of Route 118 between San Fernando and Pasadena traverses the foothill area of the towering San Gabriel Mountains immediately to the north, which provide areas for summer outings and winter sports to the public.

Excellent Cooperation

Among the 17 bids submitted, joint venturers George W. Peterson, Jack W. Baker and Dragline Rentals Company submitted the low bid of $1,831,070 which was approved as a contract by the Attorney General of the State on March 17, 1954.

The excellent cooperation received during the construction from the various agencies involved and the diligent prosecution of the work under the supervision of George W. Peterson as project manager enabled the contractor to complete the project approximately three months prior to the expiration of the allowable time specified for this contract.

The new alignment and the existing roadway conflicted at numerous locations. Five stages of varying amounts of detouring were required for public traffic during construction. As each successive stage came into play, traffic was allowed more of the new roadway for its use. Fortunately each successive stage partially alleviated the congestion existing prior to construction, so that the full improvement of traffic flow came gradually to the motoring public as the job progressed. The close proximity of existing roadway and new construction in several instances necessitated opening portions of structures to traffic before the remaining portions of these structures could be completed.



This new Devil's Gate Dam bridge eliminates old, narrow roadway as well as a sharp curve and grade intersection with Sign Route 11 at westerly end of dam

Seven Structures on Freeway

Seven structures are required in the length of the project to provide full freeway standards. These structures range in size from an equestrian trail undercrossing to the unique bridge across the Arroyo Seco and spillway of Devil's Gate Dam.

Driving easterly from Hampton Road on the new four-lane freeway which is composed of two 28-foot roadways surfaced with four inches of plant mix on eight inches of untreated select material, the motorist will pass under or cross over structures in the following order.

The Meadow Grove Street Overcrossing is a reinforced concrete box girder bridge about 157 feet long.

The Berkshire Place Undercrossing is a reinforced concrete slab bridge about 45 feet long.

The Route 165/9 Separation is a reinforced concrete box girder bridge about 344 feet long which connects the west bound traffic lanes of the freeway with State Sign Route 11, spans over Flint Canyon Wash as well as the freeway. The roadway of the bridge across the wash which parallels the freeway at this location is supported on single multifaced column bents which rise 50 feet above the

wash presenting a graceful appearance.

Series of Bridges

The Flint Canyon Wash Bridge is a reinforced concrete slab and box girder about 348 feet long. The existing timber structure adjacent to the new bridge will remain in service to be used for access to Oak Grove Park.

The distance to the next bridge is 400 feet. The roadway excavation prism in this distance yielded over 100,000 cubic yards for use as roadway embankment or select material as base for the plant mix surfacing.

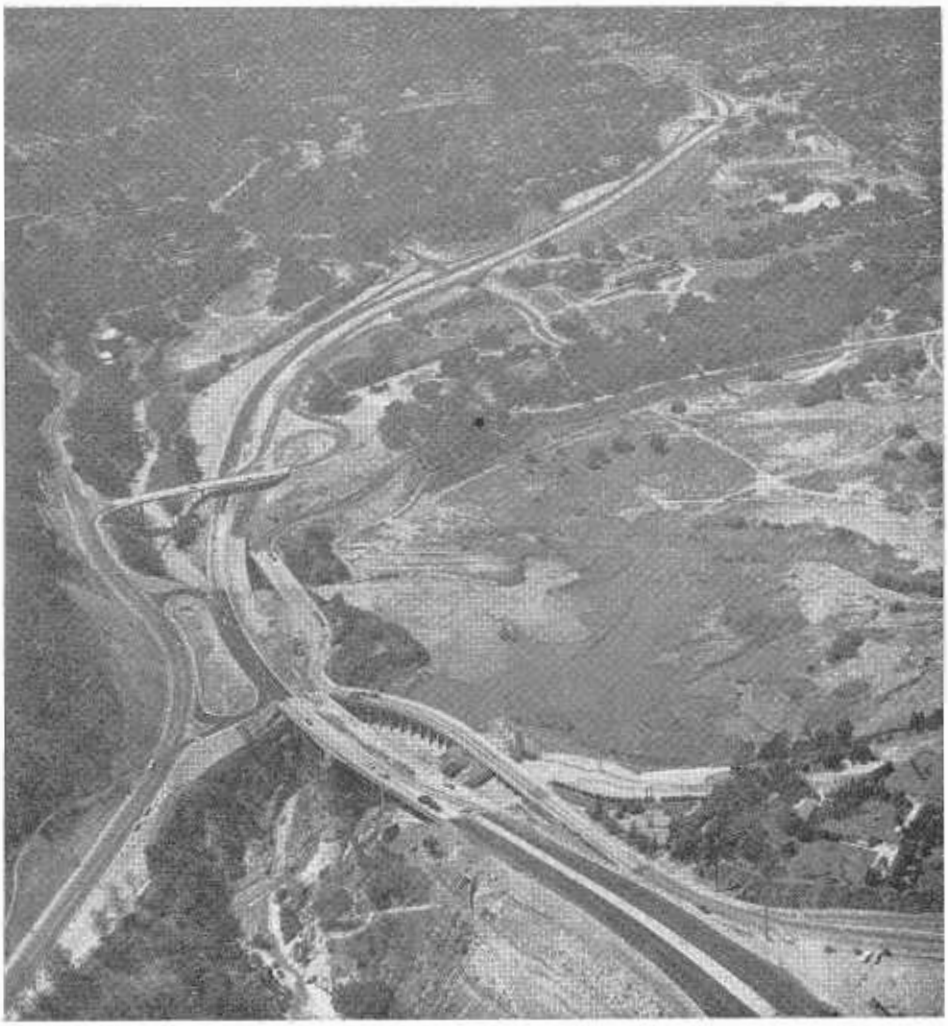
We are now at the brink of the Arroyo Seco across which the Los Angeles Flood Control District constructed Devil's Gate Dam in 1920 to restrain the destructive flood waters that were periodically carried by the Arroyo Seco.

The Arroyo Seco Bridge is a reinforced concrete box girder about 418 feet long, adjacent to the downstream face of Devil's Gate Dam. Two spans each 136 feet long are required to cross the arroyo, and one span 119 feet long is required to cross the dam spillway. The pier which acts as the common support for the two 136-foot spans is rigidly connected to the superstructure, while all other supports are simple connections. To obtain the required rigidity the eight-foot depth box girder gracefully increases to 14 feet at the pier beginning 65 feet each side of the pier. The pier which is cellular with outside faces rusticated to provide appearance of masonry blocks reaches upward 85 feet above the arroyo bottom to support the superstructure, and extends downward 20 feet below the arroyo bottom for adequate support on rock.

The Arroyo Seco Equestrian Tunnel is a reinforced concrete box eight feet wide, 10 feet 6 inches high and about 118 feet long. The tunnel provides grade separation for the equestrian trail existing in this location prior to construction.

The Arroyo Boulevard Overcrossing is a reinforced concrete box girder bridge about 107 feet long.

The contract work is being administered by the Bridge Department. L. E. Steele represents District VII on the project.



Aerial view of Foothill Boulevard looking westerly across Devil's Gate Dam, showing portion of old highway alignment on left

RAPID PROGRESS

Continued from page 39 . . .

Paving of the roadway has kept pace with the steel erection, and of the four miles of overwater crossing 1½ miles of the upper deck have been completed on the west end of the bridge and one mile on the east or Richmond end.

Of the 15 contracts required to complete the project for upper deck traffic, five have been completed; nine are under construction; leaving one, for the signing and striping of the roadways, to be advertised in time for the opening of the bridge to traffic by October of 1956.

One of the five contracts for the completion of the lower deck for an ultimate six lanes of traffic is now being advertised with the remainder to follow as needed. This second phase of construction should be completed by October of 1957.

Revenue bonds in the amount of $62,000,000 were sold to finance the first phase construction while a state loan of $6,000,000 will be used to complete the second phase giving a total cost of $68,000,000 for the 5½-mile project.

OAKLAND TO TRACY FREEWAY

Completion of the freeway on U. S. 50 from Oakland through Castro Valley to Tracy in San Joaquin County is in sight. Director of Public Works Frank B. Durkee awarded a contract for $4,275,510.70 to Peter Kiewit Sons Co. for grading and paving 5.4 miles between 2.3 miles west of Dublin and 0.3 mile west of Center Street in Oakland.

Retirements *from* Service

E. E. Wallace

E. E. Wallace, district engineer of District XI of the Division of Highways, retired on September 1, 1955, bringing to an end a career of 42 years of important contributions to the development of California's Highway System.

He has been in charge of District XI since the district was established in 1933, with headquarters at San Diego. It comprises San Diego and Imperial Counties and the eastern half of Riverside County, with a total of 1,100 miles of state highways ranging from major metropolitan freeways to long stretches of desert road.

Wallace came to work for the State in 1913 in the District V Office in San Luis Obispo. By 1919 he had become assistant district engineer there. One of his assignments was the location of SSR 1, the Carmel-San Simeon Highway.

To Fresno in 1926

In 1926 he was appointed district engineer of District VI, with headquarters in Fresno, and remained there until the formation of District XI in San Diego seven years later. His accomplishments during this period included construction of the Grapevine Grade Section of US 99 south of Bakersfield and reconnaissance for the mountain highway which now carries traffic into Kings Canyon.

Starting as the first district engineer of District XI, his administration in San Diego has spanned the period of that area's tremendous growth in population and traffic, particularly during and since World War II.

During the wartime period Wallace was responsible for planning and construction of important access roads developed by the State for the Federal Government to serve aircraft plants, shipyards and military establishments. Shortly after the war the Cabrillo Freeway was completed as one of California's earliest full freeways. Subsequent major projects planned and completed under Wallace's direction include the Oceanside-Carlsbad Freeway and the Montgomery Freeway between National City and the Mexican border, both on US 101.

Freeways Accelerated

Planning for other freeway sections of US 101 and for US 80 in the San Diego metropolitan area has been accelerated in the last few years under the expanded state highway program.

In the meantime, over the last 22 years, Wallace directed the continuous improvement of state highways in the desert areas of District XI, with emphasis on widening of both the traveled way and the numerous bridges, as well as resurfacing and, in recent years, reconstruction.

Wallace was born in Harlan, Iowa, and received his early education there and in Alabama and Tennessee. He graduated from the University of Alabama where he studied civil engineering.

His first engineering job was as a civilian employee with the U. S. Corps of Engineers in 1908 on lock and dam construction in Alabama. The following year he went to work for the Southern Pacific Railroad in Los Angeles and Bakersfield.

Frank C. Balfour introduces Mrs. Janet W. Adams and Rev. Donald Wallace, daughter and son of Mr. and Mrs. Wallace, seated on his left

From 1911 to 1913 he was employed in the engineering department of the Associated Oil Company in Bakersfield.

Wallace lives at 3245 Elliott Street in San Diego. He is married and has a son, Donald, of Syracuse, New York, and a daughter, Janet W. Adams, of Pasco, Washington.

Wallace Tendered Farewell Dinner By Many Friends

San Diego went all out to show its appreciation of E. E. Wallace upon the occasion of his retirement. Under the auspices of the San Diego Chamber of Commerce a dinner in honor of Mr. and Mrs. Wallace was tendered in the El Cortez Hotel on Friday night, August 26th. Friends and associates of Wallace numbering 562 were in attendance.

In addition to engineers and other employees of the Division of Highways from many sections of the State, there were present members of the California Highway Commission, state legislators, mayors of incorporated cities and county supervisors in San Diego, Imperial, Riverside, and San Bernardino Counties, comprising District XI of the Division of Highways.

Introductory remarks on behalf of the San Diego Chamber of Commerce were made by Robert M. Golden, president, who introduced Frank C. Balfour, Chief Right of Way Agent of the Division of Highways, as master of ceremonies. Balfour presented Dr. William B. Livingstone, Pastor of the First Presbyterian Church, who delivered an invocation.

Among those at the head table with Mr. and Mrs. Wallace were Highway Commissioner James A. Guthrie, San Bernardino; Commissioner and Mrs. Fred W. Speers, Escondido; Mrs.

Janet Adams, daughter, and Rev. Donald Wallace, son of Mr. and Mrs. Wallace; Mr. and Mrs. Golden, Mrs. Frank C. Balfour, Vice Mayor Clair W. Burgener, San Diego; Chairman Frank A. Gibson of the San Diego Board of Supervisors and Mrs. Gibson; Assistant State Highway Engineer Charles E. Waite, Sacramento, representing State Highway Engineer George T. McCoy; T. Fred Bradshaw, Assistant Director of Public Works, Sacramento, representing Director of Public Works Frank B. Durkee; and R. B. Luckenbach, Assistant District Engineer of District XI.

Mrs. Adams and Reverend Wallace surprised their father by coming from Washington and New York to attend the farewell party.

Vice Mayor Burgener spoke for all the incorporated cities and Supervisor Gibson spoke on behalf of the counties represented. All the speakers highly praised Mr. Wallace for his unselfish service with the Division of Highways for 42 years.

Numerous gifts from friends and associates of Mr. Wallace were presented to the guest of honor by Luckenbach.

Assistant State Highway Engineer C. E. Waite

Mr. Wallace shows Mrs. Wallace handsome wrist watch presented to him by his associates

CALIFORNIA IS APPORTIONED $47 MILLION FOR HIGHWAYS

California has received an apportionment of $47 million in Federal Aid funds for highways during the fiscal year beginning in 1956.

Of this amount, $14½ million is for the primary highway system, $7½ million for secondary or feeder roads, $15 million for urban highways, and almost $10 million for that portion of the Interstate Highway System which is in the State.

The apportionment is the second and last under the provisions of the Federal Aid Highway Act of 1954. The act authorized $1,750,000,000 in grants to the states and other federal highway projects for the two fiscal years beginning July 1, 1955 and 1956.

HOBART MILLS JOB

The California Highway Commission has adopted a route for a proposed relocation of approximately 4½ miles of State Sign Route 89 (Truckee-Quincy Highway) in the vicinity of Hobart Mills, Nevada County. The adopted route extends from 0.7 mile south of Prosser Creek to 1.6 miles north of Hobart Mills. For the most part it runs to the northeast of the present highway on a generally parallel course.

DRIVER'S LICENSE

Every motorist should have his driver's license with him at all times when he is driving.

The California State Automobile Association reminds you that failure to have it in your possession while driving may result in a fine.

Edmonston, Waddell And Jones Retiring From State Service

An employee of the State of California since September, 1924, A. D. Edmonston, State Engineer, Chief of the Division of Water Resources, notified Director of Public Works Frank B. Durkee of his intention to retire on November 1, 1955.

After about 14 years of employment as an engineer in connection with design and construction of hydraulic structures on various irrigation, hydroelectric and municipal water projects in California, Edmonston entered service as an engineer in charge of investigations and preparation of reports on the water resources of California. Formulation of the State Water Plan, as reported to the Legislature of 1931, including plans for the Central Valley Project, were under his direct charge.

A. D. EDMONSTON

Succeeds Edward Hyatt

In 1945 he became Assistant State Engineer and in February, 1950, he was appointed State Engineer of California, succeeding the late Edward Hyatt and in this capacity, Edmonston is in direct charge of all state functions dealing with water rights, appropriation of water, adjudication of water rights, watermaster service, safety of dams, supervision of use of water of Sacramento and San Joaquin Rivers, maintenance and operation of Sacramento River Flood Control Project, investigations of surface and underground waters and water quality and pollution. He is also in charge of the division's cooperative programs with the Federal Government involving stream gaging, snow surveys, topographic mapping, irrigation investigations, ground, surface and water quality investigations, beach erosion and the Sacramento River trial distribution program.

As State Engineer, Edmonston is Engineer and Secretary of the State Water Resources Board under which he is conducting the investigations for the California Water Plan, the initial unit of which—the Feather River Project—was authorized for state construction in 1951.

THOMAS B. WADDELL

Holds Important Jobs

The State Engineer is Executive Officer of the Water Project Authority of California, which was created by the Central Valley Project Act of 1933. Acting for the authority, Edmonston has prepared the reports on Feasibility of State Acquisition of the Central Valley Project, Central Valley Project Management, and is conducting the trial distribution studies on the Sacramento River under contract between the authority and the U. S. Bureau of Reclamation. He is in charge of the San Francisco Bay Salinity Control Barrier Investigation, the report on which will be made to the water Project Authority.

The State Engineer also serves as a member of the Districts Securities Commission, State Water Pollution Control Board, the State Soil Conservation Commission, the California Colorado River Boundary Commission, the California-Nevada Water Compact Commission and the California Klamath River Commission. He is a Director and Past President of the Association of Western State Engineers.

Edmonston is a member, American Society of Civil Engineers, and also belongs to the American Geophysical Union, American Water Works Association, Commonwealth Club, and Tau Beta Pi, National Engineering Honor Society.

GERALD H. JONES

The post of State Engineer is subject to civil service law and the Personnel Board will be requested to hold an examination to fill the position.

Waddell Also to Retire

After 38½ years of state service Thomas B. Waddell, Assistant State Engineer, notified Director of Public Works Frank B. Durkee that he will retire on November 2d. Waddell is retiring at the age of 65 years. His retirement will follow by one day

. . . Continued on page 47

Raymond P. Duffy

Raymond P. Duffy, assistant district engineer in charge of construction for District IV retired on October 1st, culminating a 41-year career with the State, 34 years of it with the Division of Highways in San Francisco. Duffy came to work for the division in 1921 as a construction inspector.


RAYMOND P. DUFFY

Prior to that time he worked for six years with the State Harbor Commission in San Francisco which included an assignment as transit man on the construction of the tunnel underneath Fort Mason between Van Ness Avenue and the Army Transport Docks.

After five years on construction and maintenance work with the Division of Highways, Duffy was promoted to maintenance engineer for District IV in 1926. In 1939 he became district construction engineer and in 1947, when the division was reorganized and expanded following passage of the Collier-Burns Highway Act, he was promoted to assistant district engineer—construction, the post he held at the time of his retirement.

As assistant district engineer Duffy has had direct supervision over all construction work on state freeways and other highways in San Francisco, San Mateo, Santa Clara, Santa Cruz, Alameda, Contra Costa, Solano, Napa, Sonoma and Marin Counties.

Born in San Pablo, Duffy attended schools in Marin County and received his engineering education at the Vander Naillen School of Engineering in Oakland.

His first engineering job was with the U. S. Department of the Interior working on various projects in Nevada and Arizona during 1911 and 1912.

Duffy and his wife live at 239 C Street in San Rafael.

Walter J. Long

Walter J. Long, senior structural engineer in the State Division of Architecture, began his retirement career on September 1st. Long has worked for the division under four state architects and six chief structural engineers during a period of over 44 years since he first started working with the division in 1911. He has had continuous service with the architect division except for a seven-year interval in the mid-1920's when he worked as principal engineer for the late R. A. Harold, Sacramento architect, and for the architectural firm of Dean and Dean of Sacramento.


WALTER J. LONG

The late Maury I. Diggs, State Architect, first put Long to work as an architectural draftsman. Long progressed successively in other classifications as structural draftsman, superintendent of construction, estimator, structural engineering designer, and senior structural engineer. He has held the latter position since 1933.

Long is the son of a general contractor and a native of Denver, Colorado, where he attended the public schools. Following high school he worked five years for different architects in Denver before coming to California. He has an architect's license and a structural engineer's certificate in California and belongs to the Structural Engineers' Association of Central California.

He is married to Luella A. Martin, daughter of the late Dr. and Mrs. James J. Martin, a well known Sacramento family. They have two children, a son and a daughter. Long plans to spend his retirement in travel and in pursuing various activities for which he's had little time during his professional career.

James H. Goodwin

After 36 years of service with the Division of Highways, James H. Goodwin, Highway Mechanic Foreman, Shop 9, Bishop, retired in August.


JAMES H. GOODWIN

Jim was born in Independence, Missouri, November 17, 1895. His family moved to California in 1903 and settled in Oakland in 1906, where he was educated in the public schools. He served his apprenticeship as machinist, mechanic and blacksmith in Stockton, and was then employed by the Holt Caterpillar Manufacturing Co.

In 1917, he enlisted in the Army and served 18 months overseas, as automatic rifleman, Co. B, 128 Infantry, 32d Red Arrow Division. He was wounded in action at Chateau Thierry.

After his discharge from the Army and return to California in 1919, he secured a position at Headquarters Shop, Sacramento, on July 23, 1919. He was later assigned to District III where he remained until 1923 when he transferred to District VI. In July, 1925, he was appointed highway mechanic foreman of Shop 9, and has held that position since that time.

Jim has been a member of the American Legion for 35 years and is a member of 40 and 8 and D. A. V. He is a Past Commander of Post 118 and the 27th District, Past Adjutant Post 118 and 27th District of the American Legion.

He is a member of F. & A. M., Royal Arch, 32d Degree Scottish Rite Masons, Shrine, and Order of Eastern Star.

He is a charter member of Fresno Chapter No. 11, C. S. E. A., later transferring to High Sierra Chapter No. 12.

Jim's principal hobbies are activities in veteran, civic, and fraternal affairs and he expects to be well occupied with these and other activities now that he is retired.

CEREMONY MARKS COMPLETION OF NEW FREEWAY

One of the major accomplishments of Ed Wallace as district engineer in San Diego was the construction of the Montgomery Freeway.

Ceremonies marking completion of the freeway, a $7,000,000, 11.1-mile span between National City and the Mexican border, were held June 17th with United States and Mexican officials participating. The program was arranged by the San Diego Chamber of Commerce. Supervisor David Bird was chairman.

Shown on the platform, left to right, are Fred Speers, Escondido member of the State Highway Commission who represented Gov. Knight; Moreno Henriquez, lieutenant governor of Baja California; Supervisor Dave Bird, toastmaster; Mrs. C. G. Buehrer, San Ysidro parade marshal; Reyna V. Swedd, "Miss Mexico" for the ceremony, and Sammy Payne, who represented Uncle Sam.

Horsemen from the United States and charos from Baja California met in front of a platform alongside the freeway about a half mile north of the border in an impressive friendship gesture. Scrolls signed by Governor Knight of California and Governor Braulio Maldonado of Baja California were read and exchanged.

Moreno Henriquez, Lieutenant Governor of the new Mexican state, headed a large delegation from south of the border. He referred to the freeway as "another strong tie which binds us together."

Fred Speers, Escondido member of the California Highway Commission, represented Governor Knight, reading a message from the Governor and speaking briefly.

An impressive parade arranged by civic workers of San Ysidro preceded the platform ceremony.

National anthems of the United States and Mexico were played by the Naval Training Center Band of San Diego. Rev. Seraphin Muller of San Luis Rey Mission pronounced the invocation.

The new freeway links Highway 101 with principal highways of Baja California.

By Governor Knight *

A warm greeting on the success of the completion of the John J. Montgomery Freeway which unites the peoples of two great states, Baja California, and Alta California.

I congratulate Mr. Braulio Maldonado and other authorities of Lower California for the great steps they have taken to face the problems imposed upon the state for reasons of its rapid growth. Their acknowledgment of the value of this new freeway that will bring the two areas closer indicates to us that it is a progressive administration.

The Montgomery Freeway is a route of significance for various reasons: From the standpoint of economy it will promote the continuous commercial and industrial development between Mexico and the United States.

For the tourists of both states there will be a facilitation of transit between the tourist areas.

Commercially there will be easy distribution of materials accessible to both countries.

I trust that this route that so closely follows the path traced by Father Junipero Serra, will, in time, be the strongest link that will extend from the capital of Mexico to the capital of California, Sacramento.

GOODWIN J. KNIGHT, Governor
State of California

** Free translation of Governor Knight's message which was in Spanish.*

By Governor Maldonado

Commemorating the dedication of San Diego County's and California's great Montgomery Freeway, which has become a link in the highway system of Baja California, I, Governor Braulio Maldonado of Baja California, Mexico, do extend my heartfelt felicitations to the Honorable Goodwin Jess Knight, Governor of California, U. S. A.;

And express to him the sincere appreciation of the people of Baja California, Mexico, for the great highway program his State has undertaken.

Improvement of the economic well-being of the people on both sides of the border will result from highway construction programs in the two Californias. Montgomery Freeway will become an important link in our circle highway from Tijuana to Ensenada and inland return by way of Tecate, the latter part of which will be completed this year.

May the dedication of the new Montgomery Freeway always remain as a symbol of the sincere friendship of the peoples of the United States and Mexico. May this token of gratitude always remain as a constant reminder of accomplishments of neighbors dedicated to democratic principles.

BRAULIO MALDONADO, Governor
State of Baja California, Mexico

EDMONSTON RETIRING

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those of State Engineer A. D. Edmonston and Assistant State Engineer Gerald H. Jones.

Waddell graduated as a civil engineer from the University of California in 1912. For one year he was in private employment and in August, 1913, accepted appointment as assistant flood control engineer of the old State Department of Engineering in charge of plans for a flood control system for the Sacramento and San Joaquin Valleys. In January, 1918, he was named principal assistant engineer for the State Reclamation Board, a position he held until March, 1923, when he entered private employment for a period of two years. He returned to state service in August, 1925, as hydraulic engineer for the old Division of Engineering and Irrigation.

From August, 1929, to August, 1931, he was hydraulic engineer for the Division of Water Resources in charge of Sacramento Valley studies for the State Water Plans. From July, 1931, to September, 1946, he was supervising hydraulic engineer for the division in charge of Central Valley Project studies and flood control and conservation investigations. From September, 1946, to November 1, 1951, he was principal hydraulic engineer of the Division of Water Resources, from which post he was elevated to Assistant State Engineer.

Waddell is a member of the American Society of Civil Engineers. He is a resident of Sacramento.

Jones Is Retiring

The Division of Water Resources will lose another of its top executives through retirement. Gerald H. Jones, Assistant State Engineer, will also retire on November 1st after more than 31 years of state service.

Jones, with headquarters in Sacramento, has over-all supervision of the safety of dams, the operation and maintenance of the Sacramento River Flood Control Project, flood damage repair programs, state hydraulic construction projects, snow surveys, the Sacramento-San Joaquin water supervision program, and beach erosion control.

He has been engaged in engineering work, both private and public, since 1911. About 31½ years have been spent in the service of the State of California. Other engineering work included 3½ years with East Bay Water Company on construction of San Pablo Dam and tunnels; two years with the City of Napa on Milliken Canyon Dam; two years as Chief Engineer and Manager of East Contra Costa Irrigation District; and six years on miscellaneous irrigation, water works and power developments, including Salmon Creek Dam in Alaska.

Jones is a native of California with San Francisco as his birthplace. He is a member and Past President of Sacramento Section, American Society of Civil Engineers.

W. A. Douglass

Walter A. Douglass, senior highway engineer with the Division of Highways Bridge Department in Sacramento, retired on August 25, 1955, culminating a 31-year career with the State.

At the time he retired Douglass was engaged in advance planning work for the Bridge Department. His job included maintaining close liaison with the 11 highway districts throughout the State. He had a responsible part in the preparation of the special report to the Legislature which culminated in the authorization of the Carquinez Bridge Toll Project.

Born in Iowa, Douglass attended school in Waterloo and Mt. Vernon. He studied engineering at Iowa University and Colorado Agricultural College.

He came to California in 1916 and went to work for the Division of Highways in 1921. He resigned in 1923 to enter private employment which included an assignment as assistant city engineer for the City of Eureka from 1924 to 1925. He returned to work for the division as a resident engineer on bridge construction in 1926. He was assistant bridge construction engineer from 1932 to 1937, later was assigned to administrative duties and finally in 1950 to advance planning.

Douglass is a member of the American Society of Civil Engineers and is also active in the Masonic Lodge and the Rotary Club. He has served on the State Olive Advisory Board and is Past President of the Fair Oaks Irrigation District.

Douglass and his wife live at 5648 Hazel Avenue in Fair Oaks.

Ralph Veach

On August 17, 1955, Ralph Veach, Division of Architecture Construction Supervisor, was honored at a retirement dinner in Los Angeles by fellow members of the division's Area III construction force. Mr. Veach retired after 21 years of service as a state employee.

Veach was born on October 21, 1885, in Terra Haute, Indiana. He attended Terra Haute public schools and studied civil engineering at Rose Polytechnic Institute. His first job was with the Overland automobile factory in 1903 during summer vacations.

Following his graduation, Veach ranched for himself in the Province of Saskatchewan, Canada. In 1910 he married Margaret McCloud of Winnipeg, Canada. They now have five children and 13 grandchildren, including two married granddaughters.

In 1915 Veach went to Los Angeles where he was associated with his brother in the contracting business. Later he was an inspector with the Los Angeles Board of Education. In 1934 he joined the staff of the Division of Architecture and for over two decades has served the State in the capacity of construction supervisor.

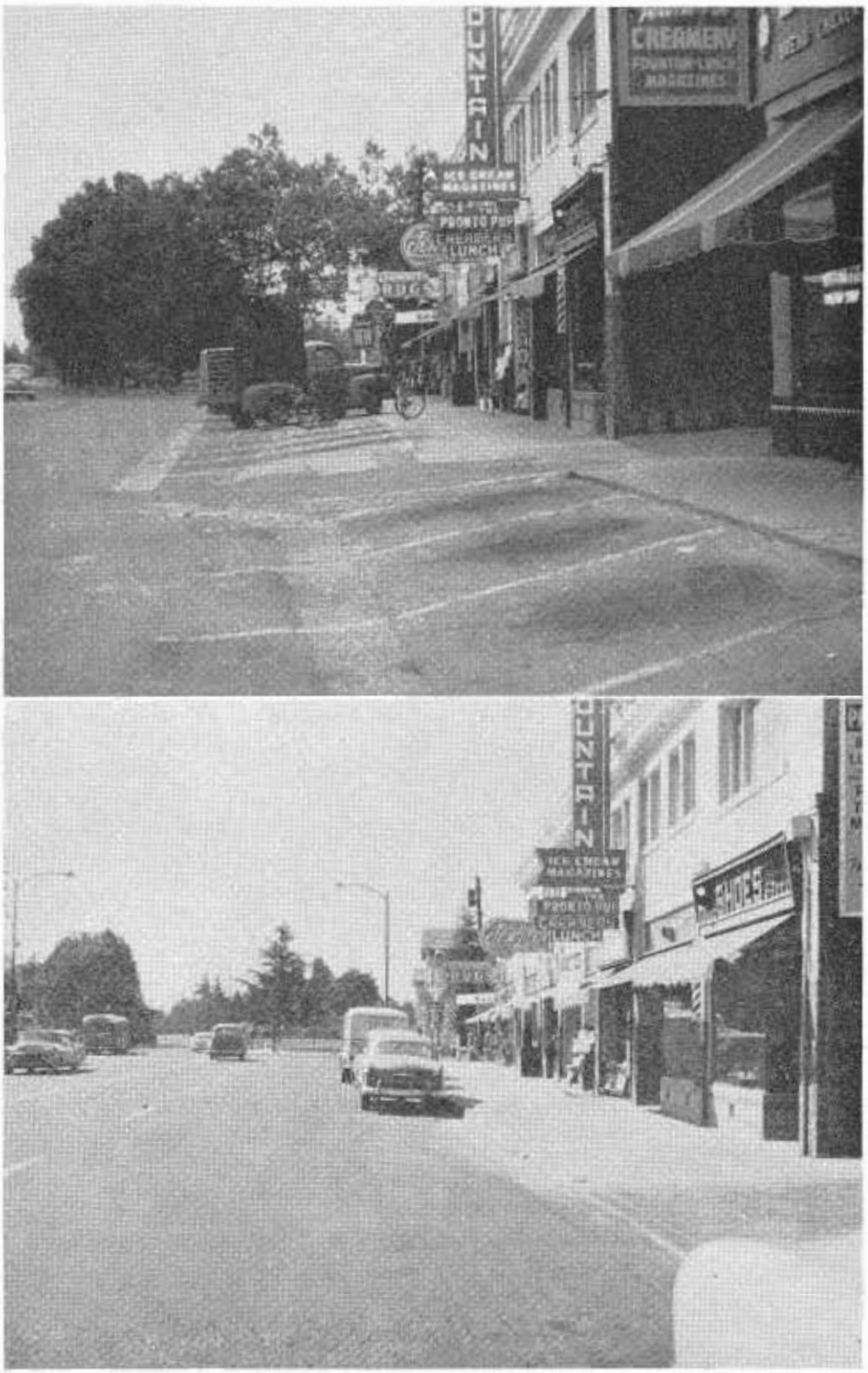
During World War II, Veach left the Division of Architecture, but returned later to supervise construction at the Pacific and Patton State Hospitals. In 1950 he was a roving inspector specializing in the supervision of construction of medium size construction projects, such as armories and Department of Employment branch office buildings. In 1953 he was assigned to assist with the supervision of construction of the new Fairview State Hospital near Costa Mesa, where he remained until he officially retired earlier this year.

San Jose Job

Lincoln Avenue Widening
Major City Street Project

By HAROLD J. FLANNERY, City Engineer, City of San Jose

LIKE ALL California cities, San Jose has felt the impact of greatly accelerated growth in population with an accompanying increase in automobile traffic. This tremendous growth has created many complicated traffic problems. In an effort to alleviate these conditions, San Jose has undertaken a series of street openings and street widening projects. One of the most recent and important projects was the widening of Lincoln Avenue, a street in the Major City Street System, between Minnesota and Coe Avenues in the Willow Glen District. The improvement involved acquisition of rights of way by the city, and the widening and lighting contract financed by assessment proceedings and an allocation of gas tax funds. Various public utilities were participants also to the extent of revising and improving their facilities in conjunction with street widening. As a result, the city has added to its street system a modern thoroughfare with adequate lighting and a four-lane roadway with capacity to accommodate present and future traffic needs in a rapidly growing business district.



UPPER—Looking south from Lincoln and Coe Avenues before improvement.
LOWER—Same location after improvement.

History

The City of Willow Glen consolidated with the City of San Jose in 1936. In October, 1949, a group of progressive businessmen submitted a petition for the widening, lighting and placing of all public utilities underground. Subsequently, in August, 1950, two similar petitions were submitted for the entire Willow Glen business district of Lincoln Avenue, for a distance of approximately one mile in length. The city realizing the importance of Lincoln Avenue as a main artery agreed to share part of the widening cost by the allocating of a portion of its gas tax money for the paving of the widened roadway; the property owners to assume the cost of the relocation of sidewalks, curbs, gutters and the lighting facilities. Also,

the cost of acquisition of right of way was to be borne by abutting property owners. The public utilities agreed to cooperate in the undertaking by assuming the cost of placing of all their facilities underground. Thus in 1952 assessment proceedings were commenced to acquire the necessary property; and in April, 1954, a contract was let to the A. J. Raisch Paving Company for the improvement of Lincoln Avenue by widening and lighting.

Details of Widening

The existing right of way was widened to provide for a 60-foot roadway with 10-foot marginal sidewalks.

Mercury-vapor luminaires were erected at 32-foot mounting heights and spaced on approximately 120-foot centers. Opposite spacings were employed to provide a method of decorating streets so as to avoid the need of anchors on the abutting buildings. Although staggered spacings would have produced a more evenly distributed light pattern, the maximum to minimum intensity of five to one in the roadway area is still within a reasonable amount to give excellent illumination. The average maintained illumination is 1.3 f.c.

Cost and Statistics

The cost of land acquisition to the property owners was $111,000. Contract and engineering costs totaled $137,500, of which the city contributed $55,700 from its gas tax funds. Relocation and underground work by the various utilities totalled approximately $200,000.

On October 5, 1954, the job was completed, and the lights turned on. Formal dedication was made on October 30, 1954, attended by state officials, city officials, and members of the Willow Glen Businessmen's Association.

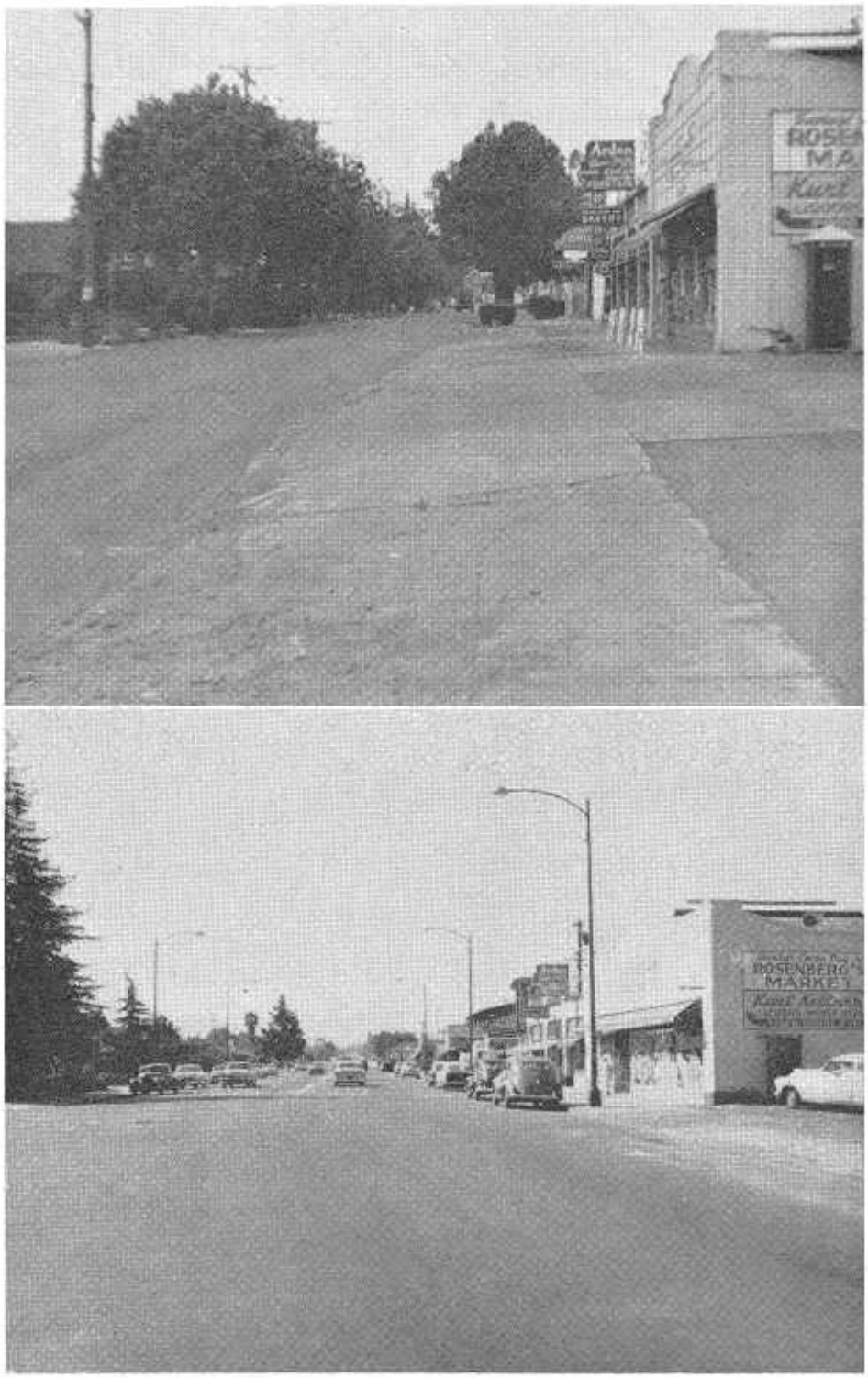
The traffic count in June, 1953, was 9,000 A. D. T. After the opening, it increased to 14,000 A. D. T. as of July, 1955.

Plans were prepared under the supervision of Harry V. Miller, associate civil engineer, and the resident engineer was William Arthur Crane.

Normal business operations were carried on during the entire construction period, and this was only accomplished by excellent cooperation between contractors, engineers, and business men.

Property owners are extremely pleased since the cost of the project to them has been more than offset by the increased value of their property.

Summing up the project it is an excellent example of the benefit that can be derived from the use of state gasoline gas tax funds to supplement local funds in the accomplishment of city street improvement.



UPPER—Lincoln Avenue between Brace and Minnesota, looking south, before improvement.
LOWER—Same location after improvement.

SAN FRANCISCO CHAMBER OF COMMERCE URGES FREEWAY PROJECTS

Officials of the San Francisco Chamber of Commerce on August 17th submitted to the California State Highway Commission recommendations for highway improvement in the City and County of San Francisco which reflect the coordinated thinking of the Departments of Planning and of Public Works of the City and County of San Francisco, of major civic organizations, and of the Street, Highway and Bridge Section of the Civic Development Committee of the San Francisco Chamber of Commerce.

Recommended for construction and right-of-way allocation in the 1956-57 budget are the following projects with estimates of cost:

Bayshore Freeway, Third Street to south city limits, $560,000; Bayshore Freeway, south city limits to connection with existing Bayshore Freeway, near South San Francisco, $870,000; Embarcadero Freeway, completion from the San Francisco-Oakland Bay Bridge via the Embarcadero to Broadway at Battery and Sansome Streets, $5,400,000; 13th Street lateral, extension across Market Street from Mission Street to Turk and Golden Gate and Franklin and Gough Streets (included in this project are connections to Oak and Fell Streets), $7,900,000; Golden Gate Bridge approach, two additional lanes on US 101 from Richardson Avenue wye to junction with Sign Route 1 at Park Presidio interchange, $4,000,000.

With Leonard S. Mosias presiding, officials of the San Francisco Chamber of Commerce entertained the highway commissioners and engineers of the Division of Highways at a luncheon at the Sutter Club in Sacramento following their appearance before the commission.

Pictured at the luncheon are: AT SPEAKER'S TABLE, *right to left*—Highway Commissioners Walter Sandelin, Ukiah; Fred Speers, Escondido; H. Stephen Chase, Sacramento; G. L. Fox, General Manager, San Francisco Chamber of Commerce; Leonard S. Mosias, Chairman, Street, Highway and Bridge Section, San Francisco Chamber of Commerce; Frank B. Durkee, Director of Public Works and Chairman of the Commission; Commissioners Chester H. Warlow, Fresno; Robert L. McClure, Santa Monica; James A. Guthrie, San Bernardino, and State Highway Engineer, George T. McCoy. AT END TABLE, *right to left*—Ralph Wadsworth, City Engineer of San Francisco; J. W. Vickrey, Assistant State Highway Engineer; Charles E. Waite, Assistant State Highway Engineer; H. Irving Rhine, San Francisco Chamber of Commerce; Harold V. Starr, Manager, Civic Development Department of the Chamber. FRONT ROW, *left to right*—J. C. Womack, Planning Engineer, Division of Highways; Arthur C. Jenkins, Chamber of Commerce; Milt Harris, Construction Engineer, Division of Highways; C. A. Maghetti, Secretary, Highway Commission. MIDDLE TABLE, *left to right*—C. M. Gillis, Assistant Deputy Director, Public Works Department; F. W. Panhorst, Assistant State Highway Engineer; Frank C. Balfour, Chief Right of Way Agent; J. E. Jellick, Chamber of commerce; A. J. Schlichtmann, General Petroleum; R. H. Wilson, Assistant State Highway Engineer; Robert E. Reed, Chief Counsel, Department of Public Works, and John P. Murphy, Public Relations Section, Division of Highways.

Jacob Dekema In New Post

Appointment of Jacob Dekema of San Bernardino as district engineer of District XI, State Division of Highways, succeeding E. E. Wallace, who retired August 31st, was announced by State Highway Engineer G. T. McCoy.

District XI, with headquarters in San Diego, comprises San Diego and Imperial Counties and the eastern half of Riverside County. For the past three years Dekema has been assistant district engineer of District VIII, with headquarters in San Bernardino.

JACOB DEKEMA

Dekema is a graduate of Los Angeles High School and of the University of Southern California, where he received his bachelor of science degree in engineering in 1937.

In 1938 he went to work for the Division of Highways and rose steadily through the ranks to become, successively, district construction engineer in District IX (Bishop), assistant construction engineer working out of division headquarters in Sacramento, and assistant district engineer (administration) of District VIII.

During World War II Dekema spent 2½ years on active Navy duty, specializing in aviation ordnance.

He is a member of the American Society of Civil Engineers and of the Elks and Mason Lodges. He and Mrs. Dekema have two children, Pamela, seven, and Douglas, three.

Max Gilliss Is New Deputy of Public Works

Director of Public Works Frank B. Durkee has elevated C. M. (Max) Gilliss, Assistant Deputy Director of the Department of Public Works, to a newly created position of deputy director. Gilliss' appointment under civil service laws is a temporary one, subject to a competitive civil service examination scheduled for October 15, 1955. Durkee said that expanding work in the department necessitated the creation of the new deputy position to assist in the development and coordination of administrative activities. In recognition of this need, the position was approved by the State Personnel Board and the Department of Finance.

Gilliss assumed the duties of special representative of the Department of Public Works on December 1, 1952. In August, 1953, he was named assistant deputy director.

Born and reared in Oklahoma, he took his college training at Riverside College, University of California at Los Angeles, and Oklahoma A. & M. at Stillwater, Oklahoma. In 1942 and 1945 he attended engineering and sales schools with International Business Machines Corporation, Endicott, New York. He is a licensed public accountant in California.

Gilliss went to work in 1937 at Riverside for a private corporation as operator and chief operator of its IBM accounting systems. In November, 1946, he first entered public service as a systems expert for Riverside County and chief of its central IBM accounting section.

With the advent of the Collier-Burns Act of 1947, he was named administrative assistant and attached to the Riverside Road and Survey Department. He represented Riverside County officials and the county board of supervisors before local and state agencies, taxpayer groups, state and local chambers of commerce, conventions, and legislative hearings.

Visiting Engineers Study Highways In California

Twenty-five engineering instructors from colleges and universities in 20 states of the Union and two foreign countries, spent six weeks in California this summer in advanced study in the highway engineering field.

DR. T. E. H. WILLIAMS

Most of the visitors' time was spent in an intensive course at the Institute of Transportation and Traffic Engineering at the University of California. Field trips covered the freeway and other highway developments in the San Francisco Bay area and the Los Angeles metropolitan area.

Another field trip included a tour of the Division of Highways Headquarters Office at Sacramento.

One of the visiting instructors, Dr. T. E. H. Williams of Newcastle Upon Tyne, England, returned to Sacramento for more detailed study before leaving in mid-August for eastern metropolitan centers and subsequently for his home. He is head of the highway engineering and traffic studies section of the Department of Civil Engineering at King's College of the University of Durham.

In addition to attending the I. T. T. E. course, Dr. Williams has been making a special study of urban freeways in the United States at the request of the British Road Federation and the Rees Jeffreys Road Fund. He was interested in all aspects of California's freeway program.

Beer Joins District VIII

Charles G. Beer has been assigned as assistant district engineer-administration in District VII, succeeding Jacob Dekema who was transferred to District XI as district engineer.

Beer went to San Bernardino from the Los Angeles office where he served as traffic engineer for a number of years.

Southern Tour

Highway Commission Visits Five Southland Counties

By C. A. MAGHETTI, Secretary, Highway Commission

FOLLOWING a custom of several years standing, the California Highway Commission recently completed a business session in Los Angeles and a tour of several southland counties for the purpose of viewing highways and to hear presentations from various civic organizations for highway improvements during the 1956 period.

The task of maintaining and improving California's thousands of miles of highways is gigantic and continuous. With automobile registrations mounting at an accelerated rate, never-ending problems seem to multiply faster than the cure and although millions of dollars are expended annually, the dollars are still insufficient to cover the needs.

With the purpose in mind to bring the Highway Commission in closer contact with these problems in the thickly populated southland, the California State Chamber of Commerce and the Southern California Highway Committee joined forces to prepare a tour of inspection interspersed with luncheon and dinner meetings at which it was possible for civic groups to report directly to the commissioners the pressing problems of their particular area.

Five Counties Visited

The commissioners, busy men in their own vocations, set aside the week of July 18-22, 1955, to conduct the regular monthly business meeting and the inspection tour. During this period visits were made to the Counties of Ventura, Los Angeles, Orange, Riverside and San Diego. In every section, it was observed new homes were being constructed with mushroom rapidity.

As each home meant that a new family would occupy it, and as the average family of today owns at least one automobile, the ultimate result serves to create a greater strain and stress on existing highways.

To see all of this once again, the commission set forth from the district office in Los Angeles on July 18, 1955, to travel the Hollywood Freeway through the San Fernando Valley to the Golden State Freeway Project and thence over Route 79 to Ventura and Oxnard where luncheon was served by the joint Ventura and Santa Barbara County interests. Here the first presentation of highway needs for 1956 were heard by the commission.

Following luncheon the tour continued on to Santa Monica for dinner and the reception of proposed highway projects by the Santa Monica Chamber of Commerce.

Back to Los Angeles on Tuesday. The regular monthly business session of the commission was held that day with Wednesday set aside to hear presentations by various groups.

All Commissioners Present

Those present included Frank B. Durkee, Director of Public Works and ex officio Chairman of the California Highway Commisison; and Commissioners Chester H. Warlow, Fresno; James A. Guthrie, San Bernardino; H. Stephen Chase, Sacramento; Robert McClure, Santa Monica; Walter Sandelin, Ukiah; Fred W. Speers, Escondido; and Chelso A. Maghetti, Commission Secretary.

From the Division of Highways present were: F. W. Panhorst, Assistant State Highway Engineer; J. W. Vickrey, Assistant State Highway Engineer; R. H. Wilson, Assistant State Highway Engineer; C. E. Bovey, Engineer of City Projects; J. C. Womack, Planning Engineer; J. P. Murphy, Principal Highway Engineer; Frank C. Balfour, Chief Right of Way Agent; E. F. Wagner, Deputy Chief Right of Way Agent; and members of the Los Angeles District Office.

In the evening, members of the commission and staff and the Division of Highways were dinner guests at the University Club hosted by the Los Angeles Chamber of Commerce Downtown Business Men's Association, and the Metropolitan Transportation Engineering Board. The dinner concluded with a hearing of the needs of the busy Los Angeles area.

Wednesday the commissioners devoted the morning to public hearings when interested persons appeared and presented their roadway problems. At the end the commisison met to consider one of the presentations and to render a decision.

A buffet luncheon at noon in the patio of the Los Angeles office of the State Chamber of Commerce was thoroughly enjoyed.

Business and pleasure followed in the afternoon. With the completion of fabulous Disneyland, new traffic problems in the area presented them-

(1) Dinner meeting at Escondido, home town of Commissioner Fred Speers. Left to right—C. A. Maghetti, Secretary; Frank B. Durkee, Director of Public Works and Chairman of the Commission; Commissioners James Guthrie, San Bernardino; Fred Speers, Escondido; Robert McClure, Santa Monica; Edward Wallace, District Engineer, San Diego; and Commissioner H. Stephen Chase, Sacramento.

(2) The stop at Corona where members of the tour were met by city officials and served cooling lemonade.

(3) Listening to the presentation of highway needs at Anaheim by Kenneth Kendrick, Vice Chairman of the California State Chamber of Commerce Highway Committee.

(4) Director Durkee addressing the meeting at Anaheim. Among those seated at the head table are Robert McClure and on the other side of the speaker Commissioners Chase and Speers.

(5) The meeting at Los Angeles. The main dining room of the University Club was filled to capacity.

(6) Just before the meeting in Riverside. Conversing in the patio of the famous Riverside Inn may be seen in the central distance, Commissioner Guthrie. In the right foreground are Kenneth Kendrick and Commissioners Speers and Chase.

(7) Inspecting the overpass in the City of Colton. Left to right, two city officials and Director Durkee, Commissioners Speers, Guthrie, Chase and Chester Warlow.

(8) A look at the highway. At the extreme left Commissioner Speers, with right side showing; Commissioner Guthrie; back to camera, Chester Warlow. Facing camera, Stephen Chase, Carl Fennema, Downtown Business Men's Association, Los Angeles, and C. A. Maghetti, secretary.

(9) Another highway inspection stop. On the Santa Ana Freeway looking towards Disneyland in the far distance.

selves. The commissioners viewed the situation and were later guests of the management for a tour of that wonderland.

In the evening the Associated Chambers of Commerce of Orange County presented the 1956 projects at the dinner meeting in Anaheim. The night was spent at the Balboa Bay Club.

Thursday morning the schedule read "Leave Orange County via Brea Canyon to inspect the proposed Brea Canyon Freeway, thence to Pomona and over the new freeway to Colton and south to Riverside." Hosts at the luncheon in the famous Riverside Inn were the Riverside County Board of Trade and San Bernardino civic interests. Pressing problems of the area were presented.

Dinner at Escondido

A stop was made at Corona where the mayor and other officials favored the commission with refreshing lemonade in the city park, after which the tour continued on to Escondido via State Route 71 and US 395.

At Escondido, the chamber of commerce in cooperation with northern San Diego civic organizations hosted the dinner and presented their 1956 requirements.

The tour came to an official end following the luncheon at the Hotel El Cortez, which was sponsored by the San Diego Chamber of Commerce, the San Diego Downtown Association, and the Highway Development Association.

In retrospect, the tour which followed the business sessions of the commisison, was a decided success. Its value was further magnified because it provided the opportunity for the commission members to see at first hand, not only work which was completed, but also that which is on the drawing boards and under future consideration.

Furthermore, it emphasizes that much is yet to be done even though California undoubtedly leads the Nation with its 14,000 miles of highway.

The need for bigger, wider, and better highways is readily recognized by the commission. Its greatest task is to distribute the funds it has wisely and for the greatest good to the greatest number.

State Chamber Recommends Highway Projects

SPEAKERS AT STATE CHAMBER LUNCHEON. LEFT—F. W. Tarr, Chico, Vice Chairman of State-wide Highway Committee. CENTER—Director of Public Works Frank B. Durkee. RIGHT—James Musatti, General Manager of State Chamber.

Recommendations for 492 highway improvements in all parts of California were submitted to the Highway Commission for consideration in the preparation of its 1956-57 budget by the California State Chamber of Commerce on August 18th.

One of the continuing activities of the state chamber has to do with the coordinating efforts which result each year in compilation of highway construction project recommendations.

The chamber's 500 state-wide and regional highway committeemen, local governmental officials, local chamber of commerce executives, civic associations and a multitude of interested individuals participated in assembling those projects that merit early consideration by the commission.

Following presentation of its recommendations officials of the State Chamber of Commerce tendered a luncheon to the highway commissioners and engineers of the Division of Highways at the Sutter Club in Sacramento.

Los Angeles Makes Recommendations

Spearheaded by Matt English of the Los Angeles Chamber of Commerce and Robert M. Shillito, General Manager of Downtown Business Men's Association, representatives of those two organizations and other civic groups, submitted to the California Highway Commission on September 22d a list of freeway projects in the Los Angeles metropolitan area which they urged be recognized in the 1956-57 budget for additional allocation to finance extensions.

The recommendations were signed by: Carl P. Miller, President, Los Angeles Chamber of Commerce; Burton C. Rawlins, President, Downtown Business Men's Association; Robert Mitchell, President, Los Angeles Metropolitan Traffic Association; Charles Bennett, Chairman, Metropolitan Engineering Board; Lloyd Aldrich, City Engineer, City of Los Angeles; Ernest E. East, Chief Engineer, Automobile Club of Southern California; J. T. Blalock, President, Los Angeles Chapter, National Safety Council; William B. Cleves, Chairman, Los Angeles Traffic Advisory Board.

Projects on which acquisition and construction should be completed which were recommended by the delegation are:

	Miles
(1) *Olympic Freeway*—State Route 173 Santa Ana Freeway to Hoover Street	4.4
(2) *Long Beach Freeway*—State Route 167 Atlantic Boulevard (North Jct) to Compton Boulevard	7.3
(3) *Harbor Freeway*—State Route 165 92d Street to Pacific Coast Highway	11.4

	Miles
(4) *Ventura Freeway*—State Route 2	
Hollywood Freeway to Los Angeles city boundary near Calabasas	14.8
(5) *Golden State Freeway*—State Route 4	
From Santa Ana Freeway to Hollywood Freeway	19.4
(6) *Hollywood Freeway*—State Route 159	
Lankershim Boulevard to Golden State Freeway	6.8
(7) *San Diego Freeway*—State Route 158	
Burbank Boulevard to Venice Boulevard	12.0
Harbor Freeway to Long Beach Freeway	5.0
(8) *Allesandro-Glendale Freeway*—State Routes 162 and 61	
Colorado Freeway to Glendale Boulevard	4.9
Total	86.0

"The projects," a spokesman for the delegation said, "are not listed in any order of priority, however, it has been unanimously agreed by us that the most important link at this writing is the section of the Olympic Freeway from the Santa Ana Freeway to the connection with the Harbor Freeway. We respectfully urge that all other projects be undertaken as rapidly as possible."

SEATED AT LUNCHEON, LEFT TO RIGHT: A. S. Koch, Orange County Road Commissioner; Supervisor Heinz Kaiser, Orange County; H. B. LaForge, J. C. Young, Division of Highways; C. A. Maghetti, Secretary, Highway Commission; Frank C. Balfour, Division of Highways; Commissioner James A. Guthrie; Lew A. Arnold, Deputy City Engineer of Los Angeles; Robert E. Reed, Division of Contracts and Rights of Way; E. E. East, Automobile Club of Southern California; State Highway Engineer George T. McCoy; Public Works Director Frank B. Durkee; James Munroe, Los Angeles Chamber of Commerce; Commissioner Robert E. McClure; John S. Ward, Downtown Business Men's Association; Commissioner H. Stephen Chase; Sam Kennedy, Los Angeles County Road Commissioner; Commissioners Chester H. Warlow and Walter Sandelin; George N. Cook, Assistant Secretary, Highway Commission; William Cleves, Chairman, Los Angeles Traffic Advisory Board; Walter Linderswith, Los Angeles Metropolitan Traffic Association; J. C. Womack, Planning Engineer, and Assistant State Highway Engineer F. W. Panhorst. STANDING, LEFT TO RIGHT—Robert M. Shillito, General Manager, Downtown Business Men's Association; Deputy Public Works Director Max Gilliss; Douglas McKenzie, City Engineer, Pasadena; Lloyd Braff, General Manager, Los Angeles Traffic Department; Matt English, Los Angeles Chamber of Commerce.

Dirt-moving Job

A large dirt-moving highway project in Northern California this year is the three-mile realignment of U. S. 299 from the Trinity River easterly up a 6 percent grade toward Redding, 30 miles away.

Earl L. McNutt Company of Eugene, Oregon, outbid 11 other contractors, including three other Oregon firms and one Los Angeles outfit, to land the $586,134 contract.

McNutt's bid for 780,000 cubic yards of roadway excavation was 26½ cents per cubic yard—a price which requires a highball operation.

The existing road has 82 curves, 30 of them reversing. The new alignment will cut the mileage from 4.5 miles to 3.02 miles. Because of the large amount of logging and lumber truck traffic, the road has a high traffic index.

The new 32-foot roadway parallels the existing road for nearly two miles, then through two deep cuts eliminates two large loops in the existing roadway. There will be more than 15,000 cubic yards of excess excavation.

Oregon Caves National Monument

On an August day in 1874 Elijah Davidson was out after bear in the Siskiyou Mountains of Southern Oregon. After some beating around in the bush he managed to spot a bear and wounded it. The wounded bear, however, disappeared into an opening in the rocks and Elijah, armed with a torch and his rifle, followed after it. He thus became, according to the National Automobile Club, the first white man to happen across the natural wonder that has since come to be known as the Oregon Caves National Monument.

The story of these vast caves is one that starts far back in the ages. It starts back at a time when some ancient ocean that then covered the land was depositing great layers of lime, which later hardened into limestone. Under terrific heat and pressure generated within the earth this limestone was turned to marble and the whole area was thrust up above the surface of the sea and formed into what is now known as the Siskiyou Mountains. Rain fell and mixed with decaying vegetation to form carbonic and other acids, and this acid ran through the fractures formed in the marble during the period of upheaval to carve out the great tunnels that became the Oregon Caves.

As the acid water ate away the marble in one place it would deposit it in another. As the water dripped slowly from the ceiling it would evaporate slightly before falling and leave some of the lime it was carrying as a deposit. And as it struck the floor and evaporated it would deposit more lime there. In this way the fantastic stalactites and stalagmites were formed, hanging icicle-like from the ceiling, rising cone-like from the floor. Often these stalactites and stalagmites would join together to form strange natural columns in the underground caves.

CABLE CARS

The first successful test of cable cars in San Francisco was made on Clay Street in August, 1873, according to the National Automobile Club.

Large Allocation For Sherwin Hill

The California Highway Commission has voted an allocation of $1,515,000 to relocate a 12-mile section of U. S. Highway 395 (Three Flags Highway) north of Bishop, Inyo County, to eliminate the steep pitches and sharp curves in the vicinity of Sherwin Hill and Rock Creek Grade.

Plans of the Division of Highways call for the construction of a modern, two-lane highway over this section. The allocation is the largest ever made for a single state highway project in Inyo and Mono Counties.

The commission adopted a routing for the relocation in September, 1954. The route extends from Birchim Canyon, about 12 miles north of Bishop, to Whiskey Canyon, south of Tom's Place in Mono County. Tom's Place is approximately 65 miles south of Bridgeport, Mono County.

The new route runs easterly of the existing highway on a generally parallel course. For most of its length it follows the east mesa between Rock Creek and the Owens River.

The allocation was made as an addition to the state highway budget for 1955-56.

BARNEY OLDFIELD DRIVES FOR HENRY FORD

Few scenes in the history of the American motor car are quite so memorable as the one that took place near Salt Lake City around the beginning of this century, points out the National Automobile Club.

Mechanics and helpers rolled out on the sands the giant "999," a racing car that Henry Ford and his friends had built to beat all comers. Barney Oldfield took his place behind the wheel, Henry stepped to the front of the car and cranked it while Barney waggled the choke, the car started with a roar, the earth shook, and the race car was about to get under way.

"This chariot may kill me," the one-time champion bicycle racer was reported to have said as he chewed on his dead cigar, "but they will say afterward that I was going like Hell when it took me over the bank!"

The old "999" never took Barney over the bank. He won by half a mile.

Future Freeway Is Given Name Of Glendale

The California Highway Commission has named a future freeway in the Los Angeles-Glendale area the Glendale Freeway.

The route of the proposed freeway, formerly unofficially referred to as the Allesandro Freeway, extends from the Hollywood Freeway in the vicinity of Vermont Avenue to Foothill Boulevard in the vicinity of La Canada and Montrose.

A new routing has been adopted for only one mile of the ultimate 10-mile freeway. This is the portion between the Los Angeles River near Fletcher Drive and Avenue 36 near Eagle Rock Boulevard. The new route runs several hundred feet south of and generally parallel to Fletcher Drive.

The Glendale Freeway, when its entire location is eventually determined, will include portions of State Highway Route 162 and Sign Route. These routes now follow Hyperion Avenue, Rowena Avenue, Fletcher Drive, Verdugo Road and Canada Boulevard.

The commission said its action in naming the Glendale Freeway was taken at this time to forestall confusion in future public announcements and discussions concerning the freeway routing. The commission assigns names to freeways on the State Highway System for the purpose of providing directional information to the traveling public.

NEW NAPA RIVER BRIDGE

Division of Highways has applied for the Army Department's approval of plans for construction of a new four-lane highway bridge across Napa River.

The structure would replace the existing highway bridge at Vallejo and would be a high-level fixed-span reinforced concrete structure supported on a series of concrete column bents with the channel span supported on concrete piers and footings.

The main channel span would have a horizontal clearance of 140 feet between fenders and vertical clearances of 100 feet above mean higher high water and 106 feet above mean lower low water.

Hatchet Mountain Job

Improvement of US 299 between Redding and Alturas this year includes two major realignment projects—(1) the Montgomery Creek Double Loop project, and (2) five miles from Debs Place to the summit of Hatchet Mountain.

Fredrickson & Watson Construction Company of Oakland was awarded the Hatchet Mountain job on its bid of $555,355.55.

The 8,000 feet on the west of the Little Hatchet Creek bridge followed the existing roadway and the work consisted largely of making the grade more uniform although for one short section a four-lane roadway was built to permit passing.

At Little Hatchet Creek the existing bridge is being replaced with a reinforced concrete box culvert 62 feet long. The channel is also being changed.

After crossing Little Hatchet Creek the new alignment crosses the existing way several times up a continuously rising grade varying from 1.3 percent to 5 percent. Approximately 85 percent of the roadway excavation is in this section.

MOTOR VEHICLE REGISTRATIONS

According to an estimate of the Bureau of Public Roads, motor vehicle registrations in the United States are expected to reach 61,301,000 in 1955. The estimate, based on reports of state registration agencies, indicates a gain of 4.6 percent compared with 1954 motor vehicle registrations.

Passenger cars are expected to total 50,954,000, a 5.1 percent increase compared with 1954. Trucks and busses will total 10,347,000, a gain of 2.8 percent. Florida leads the states in expected total increase in registrations with 10 percent, and Texas is second with an expected gain of 7.1 percent. The total of motor vehicles is expected to reach 81,000,000 by 1965.

MOTOR TRUCKS AND BUSSES

United States factories produced 700 motor trucks and busses in 1904, according to the National Automobile Club.

BY-PRODUCTS OF THE FREEWAYS

The primary objective of freeways is to expedite the flow of large volumes of traffic as safely as possible. Beyond that freeways are producing some beneficial by-products and it is with these that Paul O. Harding, Assistant State Highway Engineer, has concerned himself in an article in *California Highways and Public Works.*

Developed Areas

Freeways, Mr. Harding says, have played a conspicuous part in the development of areas which they traverse. They have improved park areas, he says; they have helped to beautify the city, particularly in older sections where decrepit buildings have been moved from their paths, and they are assisting in erosion control through the State Division of Highways protective planting program.

Some persons are bound to take issue with the claim for park improvement: the long contention over routing the Golden State Freeway through Griffith Park exhibits the disagreement. But Mr. Harding insists that existing parks will finally be benefited by freeway development rather than damaged.

Additional Park

The Hollywood Freeway location between Bellevue Avenue and Temple Street is cited. This had to pass through a part of Echo Park, but under an agreement between the State and the city, additional park land was acquired to compensate for the land required by the freeway.

In addition the State assumed the job of reconstructing playground facilities which had been in the path of the freeway, replacing, among other things, a baseball diamond. The new one has bleachers and night lighting. In other cases, too, restored facilities were improvements over the originals.

In the Eagle Rock playground area where land was required for the Colorado Freeway, another agreement between city and State produced advantages for both parties. The agreement required the State to assist in building up low levels of parkland with earth from freeway excavations. So far, 65,000 cubic yards of material have been used on this project which will eventually be the scene of tennis courts and other playground facilities.

Arroyo Seco Parkway is one of the best examples of the erosion control program through multipurpose planting. Originally the route was a boulder-strewn river bottom. The planting of a decade and more has transformed the highway to a pleasing park. And there is the added insurance against disastrous floods given by the thick cover that clings to the hills on both sides.

Beauty Is By-product

At the Atlantic Boulevard interchange on the Santa Ana Freeway, the ice plant that greens the slopes is not primarily for esthetic purposes. Beauty is a by-product; what the ice plant actually does is save many thousands of dollars that would have to be spent on maintenance.

Freeway development has met and will continue to meet opposition, even though it is generally agreed that it is the best solution for our critical traffic problems.

Mr. Harding recognizes this. He says: "Freeway development has a terrific impact on the communities passed through. Literally thousands of people have their homes, their businesses, and their institutions torn up by the roots. Money payments to owners based on fair market values for property taken cannot always compensate some individuals for sentimental attachments. The freeway program goes forward on the premise that there is accomplished 'a greater good for a greater number.'"—Editorial in Los Angeles Times.

TWO DANGER POINTS

More serious traffic accidents result from two causes than from all others, says the California State Automobile Association. These are improper passing and driving too fast for conditions. Be sure there's a margin of safety when you pass another car, and use good judgment in regulating your driving speed.

Highway Division Engineer Elected Director of ASCE

R. Robinson Rowe, supervising bridge engineer for the State Division of Highways, will be installed as an American Society of Civil Engineers director at the organization's convention in New York City October 24-28.

New president of the ASCE will be Enoch R. Needles, New York, senior partner of Howard, Needles, Tammen & Bergendoff.

The installation of officers will take place October 26 during a morning business meeting.

Rowe was born in 1896, graduated from Harvard University in 1916, took a B.S. in engineering in 1918 and another B.S. that same year from the Massachusetts Institute of Technology.

Following college, he worked for a time with the United States Geological Survey and Southlands Corp. In 1926, he was a construction engineer in the firm of Allan & Rowe, San Diego. He was an associate engineer on the San Francisco-Oakland Bay Bridge project in the mid-1930's.

Since 1938, Rowe has been the division's supervising bridge engineer. He is well known in the ASCE for his numerous technical articles and served as president of the organization's Sacramento Section at one time.

At the same business session the Rudolph Hering Award will be presented to W. F. Langelier, professor of sanitary engineering, University of California, Berkeley; Russell G. Ludwig, consulting engineer, El Monte, and to Harvey F. Ludwig, Washington, D. C., sanitary engineer.

Other Californians will receive awards. The Arthur M. Wellington Prize will go to R. J. Ivy, bridge engineer, State Division of Highways, Sacramento; T. Y. Lin, professor of civil engineering, University of California, Berkeley; Stewart Mitchell, consulting engineer, Sacramento; N. C. Raab, project engineer, San Francisco Bay Toll Crossings, Berkeley; Vernon J. Richey, senior bridge engineer, Bay Toll Crossings, Berkeley; C. F. Scheffey, department of civil engineering, University of California.

RETIREMENT OF BAY BRIDGE BONDS BENEFITS HIGHWAY FUND

With Governor Goodwin J. Knight presiding as chairman, the California Toll Bridge Authority on October 4th took action which will authorize the retiring of all of the presently outstanding bonds of the San Francisco-Oakland Bay Bridge and which will also effect by June 30, 1957, reimbursement to the State Highway Fund of the moneys advanced for operation and maintenance of the bridge since its inception as now provided by law.

There are sufficient funds on hand from bridge income so that by reducing the reserve fund of the bridge from $25,000,000 to $15,000,000, as is permitted by the existing bond resolution, retirement of all outstanding San Franciso-Oakland Bay Toll Bridge Revenue Bonds and repayment to the highway fund can be acomplished.

Highway Fund Benefits

"The State Highway Fund, particularly the portion by law allocated to the 45 northern counties," the Governor said, "will benefit immediately by our action by the addition of approximately $6,000,000 to the budget for the 1955-56 Fiscal Year and $11,000,000 to the budget for the 1956-57 Fiscal Year and will also be relieved of expenditures for the maintenance of the bridge now being paid from the State Highway Fund amounting to approximately $1,000,000 a year.

"This will enable the State Highway Commission to consider allocating in its current and 1956-57 budgets approximately $17,000,000 to be spent in the 45 northern counties of the State from whose share of the funds maintenance, insurance and operation costs have been paid in the past. Projects in the 1956-57 budget, under new legislation, can be let to contract beginning January 1, 1956."

Repayment to Highway Fund

Redemption of the outstanding bonds now will eliminate them as one of the major obligations that must be met in financing a Southern Crossing. By reason of legislation adopted at the 1955 session of the Legislature, tolls must be continued on the bridge at rates substantially equivalent to those in effect on January 1, 1955, for the purpose of accumulating funds to reimburse the State Highway Fund for expenditures heretofore made for maintenance and operation of the bridge and to build up a reserve for the construction of the Southern Crossing, which will be aided by the authority action due to the savings in interest on the bonds which will be effected, the Governor pointed out.

Repayment to the Highway Fund is required by the Southern Crossing legislation enacted in 1953, so that no delay in construction of the Southern Crossing is involved.

Existing law enacted in 1953 requires that at the time the Southern Crossing financing takes place sufficient bonds be issued to retire all of the presently outstanding bonds and to pay off the Highway Fund in cash. The effect of the present retirement of the bonds, and commencement of the repayment to the State Highway Fund, will reduce the amount of bonds that will have to be issued for the Southern Crossing.

The action of the authority will result in advancing the construction dates of a number of badly needed highway projects at least a year.

Parallel Carquinez Bridge

The authority also adopted a bond resolution authorizing the issuance of up to $80,000,000 of revenue bonds to finance the construction of a new parallel Carquinez Bridge, a Benicia-Martinez Bridge, improvements to the existing Carquinez Bridge, and extensive approaches to both of the new bridges.

The resolution provides for an initial issue of $46,000,000 to finance the new Carquinez Bridge and an approach on the southerly end of the bridge to Hercules. The action contemplates a second series of up to the remaining $34,000,000 approximately a year from now to provide funds to build the Benicia-Martinez Bridge, improve the existing bridge, and to complete the approaches, particularly through the City of Vallejo, to the Carquinez Bridge.

Calls for bids on the construction contracts of the new Carquinez Bridge, its toll plaza, and the southerly approach to Hercules will be published in the near future. It is contemplated that bids will be opened about the first of December on this construction work and the bonds sold pursuant to competitive bidding about December 13th.

Richmond-San Rafael Bridge

Pursuant to Chapter 159, Statutes of 1955, the authority approved and authorized the execution of an agreement between the Department of Public Works and the Department of Finance, whereby funds up to $6,000,000 necessary to complete the lower deck and the connecting approaches to the Richmond-San Rafael Bridge will be borrowed from the State School Land Fund.

When the Richmond-San Rafael Bridge was originally financed it was contemplated that the lower deck would not be commenced until several years after the bridge was opened to traffic. However, due to anticipated greater traffic and the economies that can be effected in construction, it was deemed desirable to proceed with the construction of the lower deck at this time. It is estimated it will be completed about a year after the upper deck is opened to traffic in the fall of 1956.

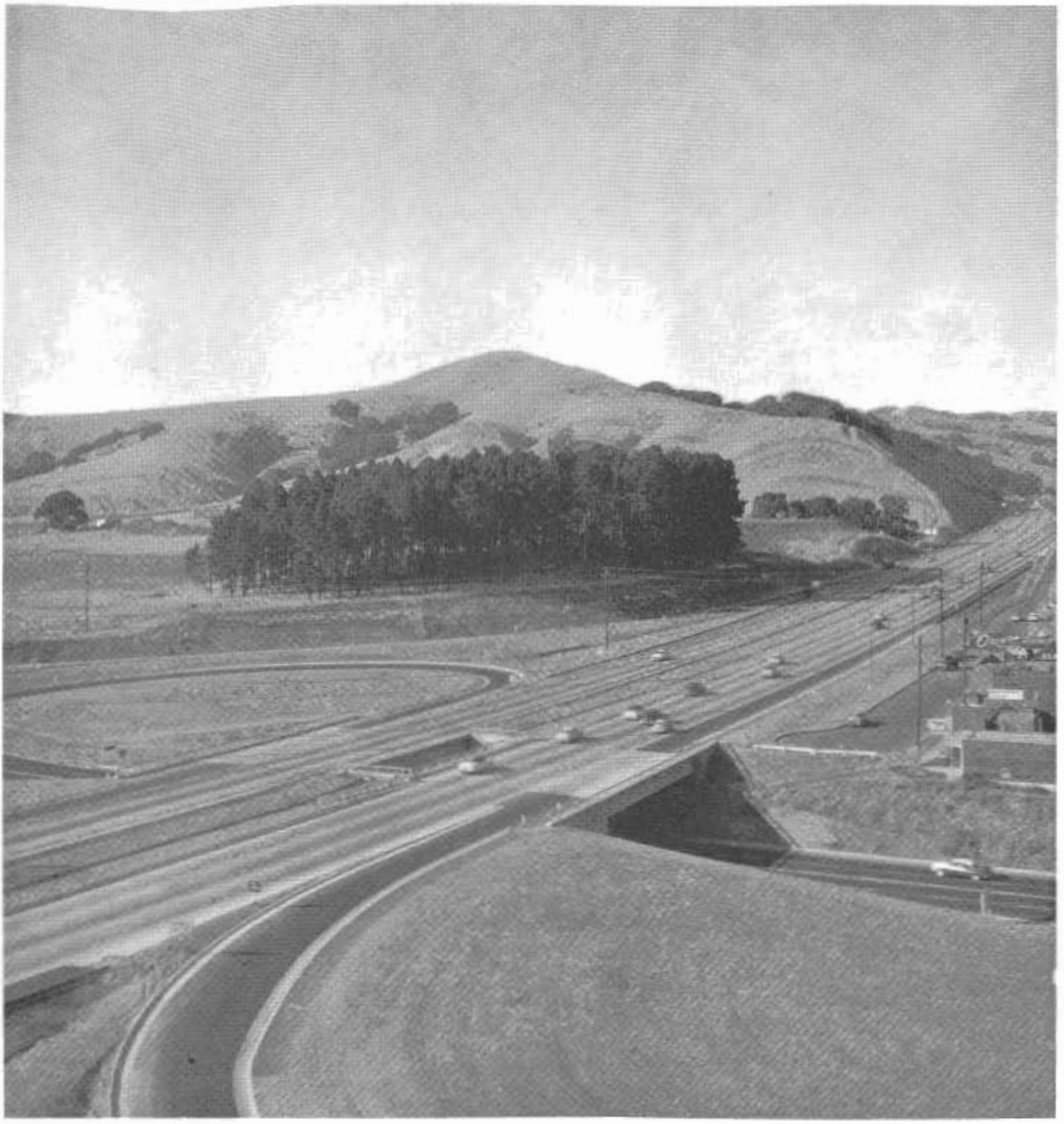
The borrowed funds will be repaid with interest out of any new or refunding bond issues on the bridge that may be issued or, if no bonds are issued, from tolls after the presently outstanding bonds are retired.

Carquinez Bridge Engineer

Leonard C. Hollister of Sacramento, Principal Bridge Engineer for the State Division of Highways, has been named coordinator for the parallel Carquinez Bridge and approaches project.

The engineer will work under G. T. McCoy, state highway engineer, and his assistants, F. W. Panhorst and V. W. Vickery.

PHOTOGRAPHIC SECTION KEEPS PICTORIAL RECORD OF HIGHWAY PROGRESS



This is the new Orinda Interchange on Sign Route 24 in Contra Costa County

Recent aerial view of new Waldo approach to Golden Gate Bridge looking toward San Francisco. Picture graphically shows size of cuts. On September 28 both north and south bound traffic was routed through new east Waldo tunnel pending remodeling of the old bore which will require about three months.

Construction operations on Bayshore Freeway from Third Street Interchange in foreground. Looking southerly along open water fill toward Sierra Point. The Division of Highways is advertising for bids on a project which will complete all rough grading and structures required to close the overwater gap on the freeway.

State Highway Contracts Awarded

JULY, 1955

Lake, Mendocino, Humboldt, and Trinity Counties—At various locations, apply seal coats, 69.0 miles. Contract awarded to Arthur B. Siri, Inc., Santa Rosa, $76,350.

Modoc County—US 395—Between Pit River Bridge and Route US 299, on Main Street. Construct new curbs and gutters, and revise street intersections and drainage facilities, 8,000 lineal feet. Contract awarded to Marion V. Allen, Redding, $42,481.02.

Plumas and Tehama Counties—At various locations, apply seal coats, 10.3 miles. Contract awarded to I. J. Ely Co., Larkspur, $14,580.

Siskiyou County—US 99 and US 97—At various locations, apply seal coats, 18.1 miles. Contract awarded to I. J. Ely Co., Larkspur, $17,075.45.

Siskiyou County—SR 96—Across Klamath River, about 16 miles east of Hamburg. Construct steel towers and anchorages for a pipeline suspension bridge. Contract awarded to Trinity Construction Co., Redding, $5,927.30.

Siskiyou County—SR 82—Between Fort Jones and Moffet Creek. Grade, place cement treated base and surface with plant-mixed surfacing, partially on new alignment, and construct a reinforced concrete bridge, 5.6 miles. Contract awarded to Clements Const. Co. and Ronald D. Coats, Centerville, $469,529.95.

Colusa County—FAS 758—Between 10 miles north of Colusa and Butte county line. Place imported base material and apply a prime and double-seal coat, 7.1 miles. Contract awarded to D. Gerald Bing, Carmichael, $93,230.

El Dorado County—FAS 1187—Between Weber Creek Bridge and Four Corners, and between Lotus and Mother Lode Highway. Construct a graded roadbed, 2.9 miles. Contract awarded to C. V. Kenworthy, Stockton, $107,484.

Glenn County—FAS 761 and 1119—Between Colusa county line and SR 45, and between County Road P and SR 45. Construct a graded roadbed with imported subbase material and place plant-mixed surfacing on untreated base at one location and place imported base material at second location, constructing road approaches. Contract awarded to Harms Bros., Sacramento, $164,381.

Nevada County—FAS 1220—Across Deer Creek, on Mooney Flat Road, about 1.5 miles north of SR 20. Construct a welded steel bridge. Contract awarded to E. H. Thomas Co., Sacramento, $37,949.

Sacramento, Yolo, El Dorado, Placer, Colusa, Sutter, Yuba, Nevada, and Glenn Counties—At various locations. Apply seal coat to the existing surfacing, 50.0 miles. Contract awarded to A. Teichert & Son, Inc., Sacramento, $54,602.50.

Alameda County—Between 10th Street and the distribution structure, on Eastshore Freeway. Construct a portion of a double deck, reinforced concrete bridge, construct a graded roadbed, place pavement and surfacing, place plant-mixed surfacing on the detour bridge, place light weight plant-mixed surfacing on a portion of the existing structure, construct channelization connections and approaches, construct a detour bridge and construct traffic control facilities. Contract awarded to Grove Shepard, Wilson & Kruge of Calif., Inc., Seattle, $5,878,249.

Santa Clara County—US 101 Bypass—At Agnew Underpass. Reconstruct pump plant. Contract awarded to Lew Jones Const. Co., San Jose, $4,216.

San Mateo County—US 101—Between Victoria Avenue and Rosedale Avenue, grade and pave with plant-mixed surfacing on cement treated base and existing pavement, completion of which provides a six-lane divided highway with traffic signal and highway lighting systems, 0.9 mile. Contract awarded to L. C. Smith Co., San Mateo, $253,958.50.

San Mateo County—SR 5—Between 3.5 miles north of Alpine Road and 1.8 miles south of La Honda Road. Place untreated base over the existing traveled way and shoulders, surface with plant-mixed surfacing and apply seal coats, 1.3 miles. Contract awarded to O. C. Jones and Sons, Berkeley, $44,688.

San Mateo County—US 101 Bypass—Between San Francisco Airport Interchange and 0.4 mile north of Broadway Interchange. Grade an off-ramp and two detours and surface with plant-mixed surfacing on untreated base, construct two reinforced concrete box culverts, relocate existing electroliers and modify the existing sign lighting, 0.7 mile. Contract awarded to O. C. Jones & Sons, Berkeley, $135,854.80.

Sonoma County—SR 1—Between Jenner and Mendocino county line. Furnish and install new drainage facilities. Contract awarded to Thomas Const. Co., Fresno, $52,907.

Fresno County—Between Broadway and P Street, on Stanislaus and Tuolumne Streets; and between Divisadero Street and Ventura Street, on O and P Streets. Construct a graded roadbed, place plant-mixed surfacing on cement treated base and on the existing pavement and apply seal coats, 1.4 miles. Contract awarded to Gene Richards, Inc., D. M. Underdown & Gene Richards, Fresno, $147,000.

Kern County—US 99 and US 399—Between Bakersfield and Lerdo and between SR 139 and Greenfield. Apply seal coats, 17.5 miles. Contract awarded to Howard B. Folsom, Westwood, $15,525.50.

Kern County—FAS 887—Between main canal and China Grade loop, on Manor Street. Construct a graded roadbed, surface with plant-mixed surfacing on cement treated base and construct a steel bridge at Beardsley Canal and a reinforced concrete bridge at main canal, 1.8 miles. Contract awarded to Griffith Co., Los Angeles, $215,882.40.

Tulare County—SR 65—Between 1.5 miles north of Deer Creek and Linda Vista Avenue, near Porterville. Construct graded roadbeds, place plant-mixed surfacing on cement treated base and existing pavement and install a highway lighting system, 7.7 miles. Contract awarded to Stewart & Nuss, Inc., Fresno, $455,537.

Tulare County—FAS 1130—Between Avenue 48 and Avenue 96 on Road 192, about five miles west of Terra Bella. Construct a graded roadbed and surface with plant-mixed surfacing on imported base, 5.9 miles. Contract awarded to Stewart & Nuss, Inc., Fresno, $172,107.

Los Angeles County—At the intersections of Foothill Freeway-Canada Avenue with Montana Street and of Canada Avenue with Lincoln Avenue. Install complete in place, traffic signal systems and highway lighting. Contract awarded to Electric and Machinery Service, Inc., South Gate, $19,938.

Los Angeles County—SR 2—Between Glendale Avenue and Towne Street. Widen the existing roadbed and place plant-mixed surfacing on cement treated base and over portions of the existing pavement and install traffic signal and lighting systems, 0.8 mile. Contract awarded to Griffith Co., Los Angeles, $193,734.40.

Los Angeles County—Between 92d Street and Gage Avenue, on Harbor Freeway. Grade, place concrete pavement on cement treated subgrade, and place plant-mixed surfacing on cement treated base and untreated base, and construct 20 major structures, completion of which provides an eight-lane divided freeway together with ramps and frontage roads at 88th Place Undercrossing, 87th Place Pedestrian Undercrossing, Route 165/174 Separation, Manchester Avenue East Pedestrian Undercrossing, Manchester Avenue West Pedestrian Undercrossing, 84th Street Pedestrian Undercrossing, 83d Street Undercrossing, 81st Street Pedestrian Undercrossing, 79th Street Undercrossing, 78th Street Pedestrian Undercrossing, 76th Street Undercrossing, 74th Street Undercrossing, Florence Avenue Undercrossing, 69th Street Pedestrian Undercrossing, 67th Street Undercrossing, 65th Street Pedestrian Undercrossing, and four concrete retaining walls, 1.8 miles. Contract awarded to Guy F. Atkinson Co., Long Beach, $4,087,411.50.

Los Angeles County—In the vicinity of Clark Avenue, on Lakewood Boulevard. Widen the existing traveled way by grading, placing imported subbase material, place plant-mixed surfacing on untreated base, and construct concrete curbs, completion of which provides a left-turn median lane, 0.3 mile. Contract awarded to G. G. Fisher Paving Co., South Gate, $15,775.

Los Angeles County—At the intersection of Norwalk Boulevard with Florence Avenue, near Santa Fe Springs. Install a full traffic actuated signal system and highway lighting system. Contract awarded to Electric & Machinery Serv., Inc., South Gate, $7,941.

Ventura County—SR 126—About one mile east of the City of Ventura. Construct drainage facilities and a detour. Contract awarded to Charles M. Major & Kings Plumbing, Ojai, $11,842.

Riverside County—SR 79—Between SR 71 and 3.5 miles north of Sage (portions). Grade and surface with road-mixed surfacing, 13.6 miles. Contract awarded to A. S. Hubbs, Colton, $65,323.

Sacramento County—SR 24—Between Ideton and Paintersville Bridge. Construct untreated base borders and apply penetration treatment, 4.5 miles. Contract awarded to Rice Brothers, Inc., Lodi, $16,493.

San Joaquin County—FAS 907—3.5 miles north of Tracy, at Old River. Construct a graded roadbed, place plant-mixed surfacing on untreated base and construct a reinforced concrete girder bridge, 0.5 miles. Contract awarded to Lord & Bishop, Inc., Sacramento, $124,535.50.

San Joaquin, Tuolumne, Mariposa, Calaveras, Stanislaus, and Amador Counties—At various locations, apply seal coat to the existing surfacing, 33.5 miles. Contract awarded to Delta Const. Co., Rio Vista, $41,412.

Solano County—SR 12—Between Fairfield and Travis Air Force Base. Construct a graded roadbed and surface with plant-mixed surfacing on untreated base and existing pavement and widen the existing bridge, 4.4 miles. Contract awarded to Parish Bros. & Harms Bros., Sacramento, $303,768.70.

Stanislaus County—SR 132—Across Tuolumne River at Basses Ferry. Repair the existing reinforced concrete bridge. Contract awarded to H. Sykes, Patterson, $2,905.

San Diego County—US 80—At Jackson Boulevard Undercrossing. Widen a portion of the existing roadway, grade and surface with plant-mixed surfacing on untreated base, completion of which provides a four-lane detour roadway, and construct a reinforced concrete bridge, 0.4 mile. Contract awarded to Griffith Co., Los Angeles, $141,045.75.

AUGUST, 1955

Mendocino County—US 299—Across Powers Creek, near the community of Blue Lake. Widen one approach to bridge, place untreated base on the widened section, place plant-mixed surfacing on both approaches and modify the connection of one road approach. Contract awarded to J. J. Tracey, Eureka, $9,585.

Mendocino County—FAS 982—Between 5.3 miles west of Willits and Willits. Construct a graded roadbed, connections and approaches and install drainage facilities, 5.3 miles. Contract awarded to W. H. Darrough & Sons, Yuba City, $209,457.50.

Siskiyou County—Sign Route 96—Across Irving Creek, about 10 miles north of Somes Bar. Reconstruct the existing bridge with a new timber superstructure and reinforced concrete deck, and regrade approaches at the bridge ends. Contract awarded to Osborne Const. Co., Crescent City, $22,719.

Lassen County—On Antelope Peak, about 7.5 miles northeast of Susanville. Construct a steel

building. Contract awarded to Thomas W. Lisota, Redding, $6,997.

Modoc County—US 299—Between Adin and Rush Creek, and between one mile east of Canby and Chambers Ranch. Apply medium seal coat, 11.3 miles. Contract awarded to H. B. Folsom, Westwood, $21,083.

Modoc and Siskiyou Counties—Sign Route 139—Between 2.0 miles north of Stronghold and Oregon State line. Apply fine seal coat, 7.2 miles. Contract awarded to Howard B. Folsom, Westwood, $14,555.

Plumas County—Sign Route 89—At Greenville. Reconstruct and widen the existing roadbed by grading, placing road-mixed surfacing on imported subbase and on cement treated base and applying seal coat, 0.5 miles. Contract awarded to Pyramid Const. Co., Reno, Nev., $37,850.

Shasta and Tehama Counties—US 99, Sign Route 36—At various locations. Apply medium fine and medium seal coats, 33.4 miles. Contract awarded to Howard B. Folsom, Westwood, $53,460.

Siskiyou County,—US 99 and US 97—At three locations. Apply medium seal coat to the existing surfacing, 22.6 miles. Contract awarded to Morgan Const. Co., Redding, $48,915.

Siskiyou County—FAS 1089—Across Scott River, about two miles east of Etna. Construct a reinforced concrete bridge. Contract awarded to R. M. Skamnes-Skamnes-Bird-Wiggs Co., Inc. Sacramento, $61,225.

Trinity County—FAS 1089—Across Rush Creek, at Costa Ranch, about eight miles north of Weaverville. Construct a steel bridge across Rush Creek. Contract awarded to Barton Const. Co., Oakland, $30,988.80.

Butte County—Sign Route 32—Across Pine Creek Lagoon, about seven miles northwest of Chico. Repair the existing reinforced concrete bridge. Contract awarded to John R. Stephens, Manteca, $3,801.

Butte County—FAS 1169—Between State Highway Route 87 and Oroville-Quincy Highway, in and near Oroville. Place plant-mixed surfacing over the existing base, construct a graded roadbed, place imported subbase material, untreated base and plant-mixed surfacing and apply a penetration treatment and seal coat to shoulders, 1.9 miles. Contract awarded to Baun Const. Co., Inc., Fresno, $83,563.50.

El Dorado, Nevada, Yuba, Sierra and Sacramento Counties—At various locations. Apply fine seal coat to the existing surfacing, 28.0 miles. Contract awarded to A. Teichert & Son, Inc., Sacramento, $47,051.50.

Nevada County—FAS 1203—Between State Highway Route 17, near Town Talk and State Highway Route 25, on Brunswick Road. Construct a graded roadbed and drainage facilities, 3.3 miles. Contract awarded to H. Earl Parker, Inc., Marysville, $115,048.30.

Placer County—US 40 and State Route 91—At the junction of Routes 17 and 91 near Newcastle Grade. Place plant-mixed surfacing on untreated base and install highway lighting, completion of which provides a channelized intersection, 0.2 miles. Contract awarded to Granite Const. Co., Watsonville, $35,296.

Sacramento County—US 50—On the "I" Street Bridge at the intersection of Jibboom Street and "I" Street Ramps. Install signal and illuminated sign systems. Contract awarded to Sacramento Electric Works, Sacramento, $1,330.

Sacramento County—FAS 932—Approaches to American River Bridge, at Fair Oaks. Construct a graded roadbed, place imported subbase material, untreated base and plant-mixed surfacing, install traffic bars and highway lighting systems, 0.8 mile. Contract awarded to Brighton Sand and Gravel Co., Perkins, $132,307.20.

Yolo County—Sign Route 16—Across Yolo Bypass. Construct a graded roadbed and pave with portland cement concrete on cement treated subgrade, 1.5 miles. Contract awarded to A. Teichert & Son, Inc., Sacramento, $123,539.50.

Yuba County—Sign Route 20—About 4.3 miles east of Marysville, at Woodruff Lane. Construct a graded roadbed and surface with plant-mixed surfacing on untreated base, 0.3 mile. Contract awarded to Baldwin Contracting Co., Inc., Marysville, $28,795.50.

Alameda County—US 50—In the vicinity of the San Francisco-Oakland Bay Bridge Toll Plaza. Construct or reconstruct portions of the North Toll Plaza and bridge approach roadways and reconstruct the westbound leg of the Port of Oakland Overcrossing and construct the Toll Plaza Outfall Sewer. Contract awarded to Chas. L. Harney, Inc., San Francisco, $1,744,213.50.

Alameda County—State Route 226—Between 0.3 mile and 0.7 mile south of Bay Farm Island Bridge. Place plant-mixed surfacing on imported subbase material on existing surfacing and cement treat the top portion of the imported subbase material, apply seal coat and screenings, 0.3 mile. Contract awarded to Independent Const. Co., Oakland, $29,697.25.

Alameda County—FAS 1025—Between Decoto Road and Thornton Avenue, on Lincoln Road and Dairy Avenue. Construct a graded roadbed and surface with plant-mixed surfacing on untreated base, 2.0 miles. Contract awarded to Clements Const. Co. & Ronald D. Coats, Centerville, $178,491.95.

Contra Costa County—At the intersection of Potrero Avenue with Hoffman Boulevard. Install drainage facilities. Contract awarded to O. C. Jones & Sons, Berkeley, $17,465.80.

Marin County—State Route 52—At Trestle Glen Drive, on Tiburon Boulevard. Shape the existing roadway shoulder on the left, surface the intersection with plant-mixed surfacing and install metal plate guard railing. Contract awarded to Brown-Ely Co. Contractors, Corte Madera, $8,154.75.

Marin, Sonoma, Napa, Alameda, Contra Costa, San Mateo, Santa Clara, and Santa Cruz Counties—At various locations. Apply fine seal coat, 40.7 miles. Contract awarded to Granite Const. Co., Watsonville, $62,437.50.

Napa County—At the Napa Wye about five miles south of Napa, at the intersection of Route 8 with Route 74. Install complete in place highway lighting system and three-way flashing beacon. Contract awarded to Ed. Pierce Electric Co., Inc., Vallejo, $3,696.

Napa County—State Route 102—At Soda Creek about 14 miles east of Rutherford. Extend the existing bridge with field assembled plate pipe arch culvert, and widen and surface the existing roadway. Contract awarded to Slinsen Const. Co., Napa, $4,309.

Santa Cruz County—Sign Route 1—Between Sign Route 17 and Mission Street. Construct graded roadbeds and surface with plant-mixed surfacing on untreated base and construct three reinforced concrete bridges and one pedestrian overcrossing at: San Lorenzo River Bridge; Grant Undercrossing; Ocean Street Undercrossing; and High Street Pedestrian Overcrossing, completion of which provides a four-lane divided highway together with frontage roads, ramps and connections, 1.6 miles. Contract awarded to Granite Const. Co., Watsonville, $962,632.

San Francisco—At the intersections of Harrison Street with Seventh Street and Bryant Street with 10th Street. Install two neon sign systems. Contract awarded to Cascade Products, San Francisco, $2,247.

San Mateo County—State Route 107—Between Sign Route 5 and Portola Road (portions). Construct widened roadbed areas, place untreated base material and surface with plant-mixed surfacing, 0.3 mile. Contract awarded to The Fay Improvement Co., San Francisco, $19,780.

San Mateo and Alameda Counties—State Route 107—Between Palo Alto and Newark, across San Francisco Bay. Repair the Dumbarton Bridge. Contract awarded to Payne Const. Co., Oakland, $110,760.

Sonoma County—Sign Route 12—At Pocket Canyon about 1.5 miles west of Forestville. Widen the existing channel, place sacked concrete riprap, extend an existing corrugated metal pipe culvert, 0.1 mile. Contract awarded to Don Dowd Co., Sebastopol, $2,330.

Monterey County—State Route 117—Between Camino El Estero and Del Monte Junction. Construct a graded roadbed together with frontage roads, road connections, crossovers and intersecting roads, surface with plant-mixed surfacing on untreated base and apply seal coats, install traffic signal systems and highway lighting, completion of which provides a four-lane divided highway, 1.2 miles. Contract awarded to Granite Const. Co., Watsonville, $447,722.48.

Santa Barbara, San Luis Obispo, and Monterey Counties—At various locations. Apply fine seal coat, 54.6 miles. Contract awarded to Valley Paving & Const. Co., Inc., Fresno Beach, $76,613.10.

San Luis Obispo County—US 101—At French Road Intersection, near the City of San Luis Obispo. Grade, place imported borrow, imported subbase material and untreated base and surface with plant-mixed surfacing, install highway lighting system, completion of which provides channelization, three speed change lanes and widened roadway, 0.2 mile. Contract awarded to A. J. Diano Const. Co., Santa Maria, $23,587.50.

Fresno, Kings, Tulare, and Kern Counties—At various locations. Apply seal coat, 32.9 miles. Contract awarded to Rand Const. Co., Bakersfield, $33,798.

Kern County—US 99—Between Taylor Avenue and Elmo Highway. Prepare roadside areas, install watering system and plant trees, 1.5 miles. Contract awarded to Oliver's Flower Shop & Nursery, Fresno, $14,938.80.

Kern County—Sign Route 178—Between 2 miles west of Bena and 0.8 mile east of Arvin Road. Install reflectorized guide posts and reflectorize the existing guide posts. Contract awarded to Wulfert Company, Inc., San Leandro, $3,392.95.

Kings County—Sign Route 41—Across South Fork of Kings River about 2.6 miles south of Fresno County line. Grade bridge approaches and surface with plant-mixed surfacing on untreated base, grade and surface a detour with road-mixed surfacing and construct a reinforced concrete bridge, 0.25 mile. Contract awarded to Thomas Const. Co., Fresno, $66,665.

Mariposa County—FAS 811—Between 3.5 miles and 6.5 miles east of Firebaugh and between 9 miles southwest and 6 miles west of Madera, on Madera-Firebaugh Road. Grade roadbeds and place plant-mixed surfacing on cement treated base and install drainage facilities, 5.1 miles. Contract awarded to M. J. Ruddy & Son, Modesto, $138,047.

Tulare County—FAS 579—At Elbow Creek and Cottonwood Creek, about seven miles south of Dinuba. Widen two concrete bridges. Contract awarded to Kaweah Const. Co., Visalia, $23,626.58.

Los Angeles County—US 101—Between Grand Avenue and Lyon Street, on the Hollywood and Santa Ana Freeways. Alter an existing freeway on-ramp, grade and pave a collector road, join an existing on and off-ramp, install highway lighting and illuminated sign systems, and prepare and plant roadside areas, 0.8 mile. Contract awarded to J. E. Haddock, Ltd., Pasadena, $149,237.30.

Los Angeles County—US 99—Between Wolfskill Street and Workman Street, on San Fernando Road and on Truman Street. Install complete in place pre-timed traffic signal system and highway lighting and modify existing traffic signal systems. Contract awarded to C. D. Draucker, Inc., Los Angeles, $14,998.

Los Angeles County—At various locations. Apply seal coat to existing surfacing, 26.5 miles. Contract awarded to Contractors Specialty Const. Co., Inc., Laguna Beach, $30,380.

Los Angeles County—US 6—Between 1.7 miles north of Lancaster and Kern County line, at four locations. Replace four existing corrugated metal pipes. Contract awarded to C. E. Wooster, Bakersfield, $3,472.82.

Los Angeles County—On the Golden State Freeway, at Los Feliz Boulevard. Construct a graded roadbed, place asphalt concrete on selected material and untreated base and construct two bridges, completion of which provides new city street together with two reinforced concrete bridges at Los Feliz Boulevard Overcrossing and at Los Feliz Boulevard On-Ramp Overcrossing, 0.4 mile. Contract awarded to Vinnell Co., Inc., and Vinnell Const., Alhambra, $683,568.

Los Angeles County—Between 0.3 mile south of Imperial Highway and 0.3 mile south of Southern Avenue, on the Long Beach Freeway. Construct a graded roadbed and surface with plant-mixed surfacing on cement treated base and untreated base and construct a reinforced concrete bridge, at the Imperial Highway Overcrossing, 1.1 miles. Contract awarded to Oberg Brothers Const., Inglewood, $797,763.

Los Angeles County—At Crenshaw Boulevard and at Casimir Avenue, on 174th Street and at Crenshaw Boulevard on Pacific Coast Highway. Install or modify traffic signal systems, highway lighting and channelization. Contract awarded to Ed Seymour, Long Beach, $20,995.

Orange County—Sign Route 18—At the intersection of Santa Ana Canyon Road with Orange-Olive Road, about one mile east of Olive. Construct a deceleration lane adjacent to the southbound roadway with plant-mixed surfacing on untreated base. Contract awarded to Cox Brothers Const. Co., Stanton, $4,078.

Ventura, Los Angeles, and Orange Counties—At various locations. Apply seal coats to the existing surfacing, 24.1 miles. Contract awarded to Baker & Pollock, Ventura, $57,800.

Ventura County—Alt. 101—At the intersection of Oxnard Boulevard with Gonzales Road, near the City of Oxnard; and at the intersections of Main Street with Eighth Street and 10th Street in Santa Paula. Install traffic signal systems and construct channelization. Contract awarded to Westates Electrical Const. Co., Los Angeles, $15,826.

Los Angeles, San Bernardino and Riverside Counties—At various locations. Apply seal coats, 48.5 miles. Contract awarded to George E. Hickey, Van Nuys, $81,702.

San Bernardino and Riverside Counties—At various locations. Place seal coat on traveled way, 66.0 miles. Contract awarded to Einer Bros. Inc., Escondido, $69,332.40.

San Bernardino and Riverside Counties—US 70-99—Between Live Oak Canyon and Beaumont. Place two applications of medium seal coat on the traveled way, 9.2 miles. Contract awarded to Contractors Specialty Const. Co., Inc., Laguna Beach, $39,075.

San Bernardino County—At the intersection of US 70-99 with Euclid Avenue, in Upland and Ontario. Prepare and plant roadside areas with lawn and ground cover, 300 feet. Contract awarded to Armstrong Nurseries, Inc., Ontario, $3,491.23.

San Bernardino County—Sign Routes 138 and 30—Between 6.1 miles northwest of Cahon and Cahon and between Haven Avenue and Willow Avenue. Surface shoulders with road-mixed surfacing over the existing and imported material, 15.8 miles. Contract awarded to George Herz & Co., San Bernardino, $46,955.20.

San Bernardino County—Sign Route 2—Across Big Pines Creek, about 38 miles east of Los Angeles County line. Redeck the existing bridge and resurface the approaches. Contract awarded to E. S. & N. S. Johnson, Fullerton, $5,990.

San Bernardino County—Sign Route 30—Between 0.25 mile west of Riverside Avenue and Western Avenue in San Bernardino. Grade, place surfacing and base; construct channelization, connections and approaches and install traffic control facilities, a portion of which, when completed provides four-lane divided highway, 3.2 miles. Contract awarded to A. S. Hubbs, Colton, $244,315.

San Bernardino County—Sign Routes 18-30—At Running Springs. Construct a graded roadbed and place plant-mixed surfacing and selected material, 0.2 mile. Contract awarded to Matich Bros., Colton, $18,554.

Inyo County—FAS 1183—Between 8.5 miles west of Independence and Forest Boundary, on Onion Valley Road. Grade and surface with road-mixed surfacing on imported base material, completion of which provides a two-lane roadway, part of which is on new alignment, 4.2 miles. Contract awarded to I. L. Croft & Son, Inc., Saugus, $195,740.48.

Kern, Inyo, and Mono Counties—At various locations. Apply seal coats, 56.4 miles. Contract awarded to Granite Const. Co., Watsonville, $69,210.

Merced County—Sign Route 140—At Eastside Canal, 12.8 miles east of Gustine. Grade approaches, place imported subbase material, untreated base and plant-mixed surfacing, and construct a reinforced concrete slab bridge, 0.6 mile. Contract awarded to Chas. L. Harney Inc., San Francisco, $68,713.60.

San Joaquin County—Sign Route 12—Between Terminus and 3.7 miles easterly. Cement treat the existing base, surface with plant-mixed surfacing on the cement treated base, apply seal coat and place imported borrow on the shoulder areas, 3.7 miles. Contract awarded to Rice Brothers Inc., Lodi, $69,432.50.

Solano County—US 40—Between Admiral Callahan Lane and extension of Route 208. Grade, place plant-mixed surfacing on untreated base, completion of which provides a new frontage road, 1.2 miles. Contract awarded to Parish Brothers Inc., Benicia, $47,891.50.

Solano County—FAS 1108—Between Vacaville and Elmira. Construct a graded roadbed, place imported subbase material, untreated base, surface with plant-mixed surfacing and double seal coat and widen the existing bridge, 1.9 miles. Contract awarded to Fredrickson Bros., Emeryville, $91,757.

Stanislaus County—Sign Route 120—In the City of Riverbank. Surface with plant-mixed surfacing and pave between curbs and existing pavement with plant-mixed surfacing on untreated base, 0.6 mile. Contract awarded to Standard Materials, Inc., Modesto, $24,245.

Stanislaus, Solano, Tuolumne, Mariposa, Amador, Calaveras, San Joaquin and Merced Counties—At various locations. Apply medium fine seal coat, 36.1 miles. Contract awarded to George Reed, Modesto, $49,962.65.

Tuolumne County—FAS 919—Between State Highway Route 13 and Stanislaus County line, on Keystone-La Grange Road. Place plant-mixed surfacing on existing base, 12.6 miles. Contract awarded to M. J. Ruddy & Son, Modesto, $75,675.

San Diego County—US 395—Between A Street and Date Street. Grade and widen traffic lanes, surface with plant-mixed surfacing on concrete base and over existing pavement and install highway lighting and signal systems, 0.3 mile. Contract awarded to Griffith Co., Los Angeles, $57,897.70.

San Diego County—Sign Route 76—About 1.8 miles and 4.3 miles east of Rincon (at two locations). Install metal plate guard railing, 538 linear feet. Contract awarded to Roy C. Ek, San Diego, $1,689.32.

MANY THANKS, JIM

NATIONAL AUTOMOBILE CLUB
San Francisco 4, California

August 24, 1955

Mr. Kenneth C. Adams, Editor

Dear Mr. Adams: Congratulations to you and your staff for putting out a most interesting and informative magazine. Text and pictures all serve admirably to keep us abreast of the very latest developments in the California Highway System and many of our department heads read each issue eagerly when it comes in the mail.

Again, congratulations and many thanks!

Cordially yours,

National Motorist
Jim Donaldson, Editor

In Memoriam

LEO J. McCARTHY, SR.

A recently retired member of the District VII Right of Way Department, Division of Highways, Leo J. McCarthy, Sr., died at St. Vincent's Hospital, September 9th, after a prolonged illness. Rosary for Mr. McCarthy was recited the following Sunday evening at the Cathedral Chapel Church in Los Angeles and Requiem Mass was celebrated the next day.

The last three years of Leo's long service with the Division of Highways was as property disposal agent and auctioneer for the Excess Land Section of District VII in Los Angeles.

Leo was born in San Francisco April 14, 1885. He was graduated from St. Mary's College in Oakland in 1906 and prior to the beginning of his career with the State of California was Superintendent of Streets of the City of Oakland; Secretary and Managing Director of the National Catholic Welfare Council; and Field Secretary to Most Rev. Edward J. Hanna, D. D. Archbishop of San Francisco.

In addition to his widow, Mrs. Loretta Marie McCarthy, he leaves four sons, Leo J., Jr., Paul R., Justin W. and Peter York; a daughter, Mrs. Patricia Marie McGarry, and 10 grandchildren.

Leo will be greatly missed by his many friends and associates both within and without the Division of Highways and they extend their deep sympathy to his family.

VALUE OF HIGHWAY CONTRACTS

The value of 371 highway contracts under way on September 1, 1955, was $234,917,800, which compares with the previous all-time high of $238,031,500 on June 30, 1955, when 381 contracts were under way, according to State Highway Engineer George T. McCoy.

Up to September 1, 1955, construction included 1,662 miles of freeways, expressways and multilane divided highways on the State Highway System completed or put under way.

GOODWIN J. KNIGHT
Governor of California

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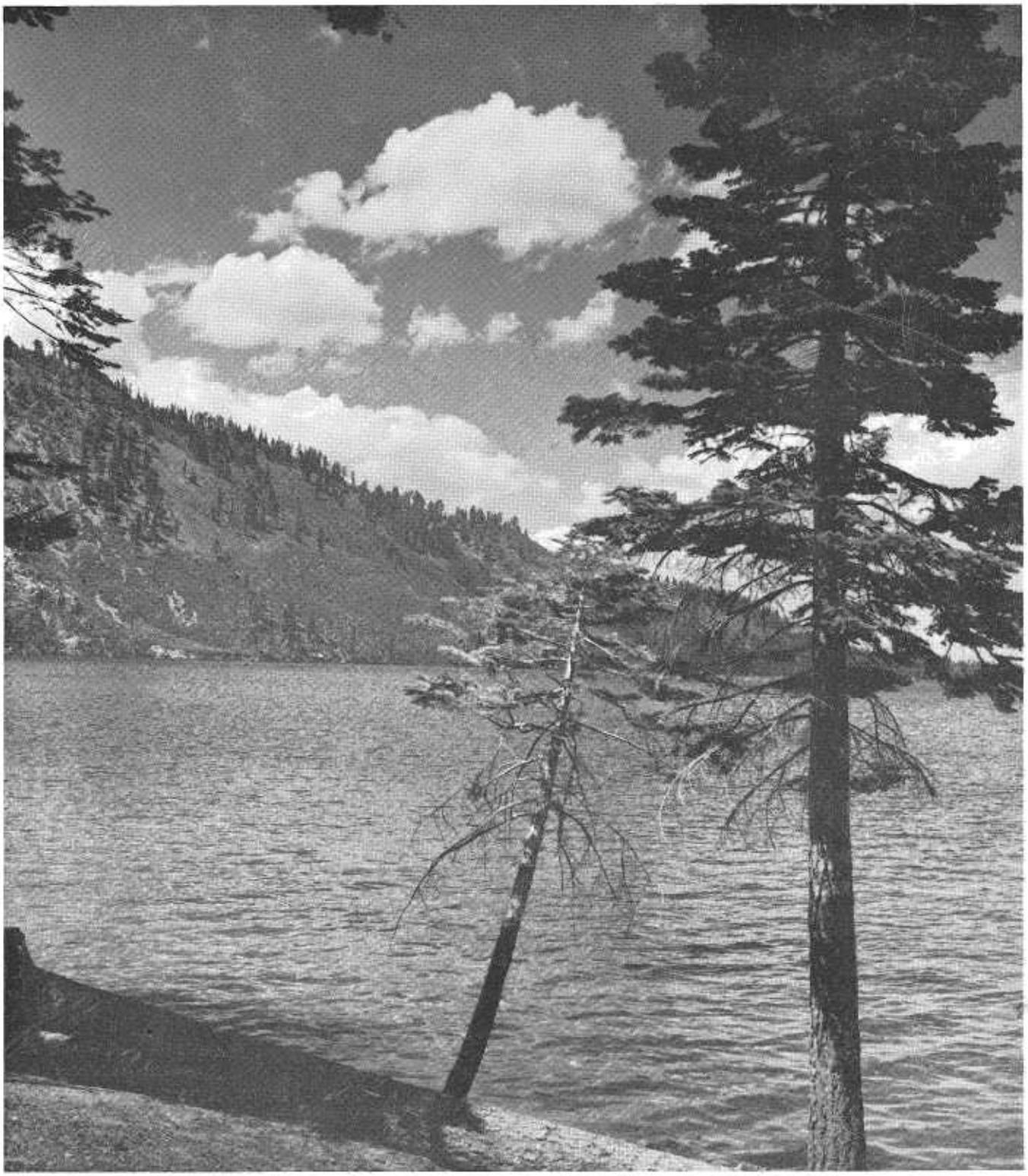

Fallen Leaf Lake near Lake Tahoe as seen from State Route 94. Photo by Robert J. Rose, Photographic Section, Department of Public Works.