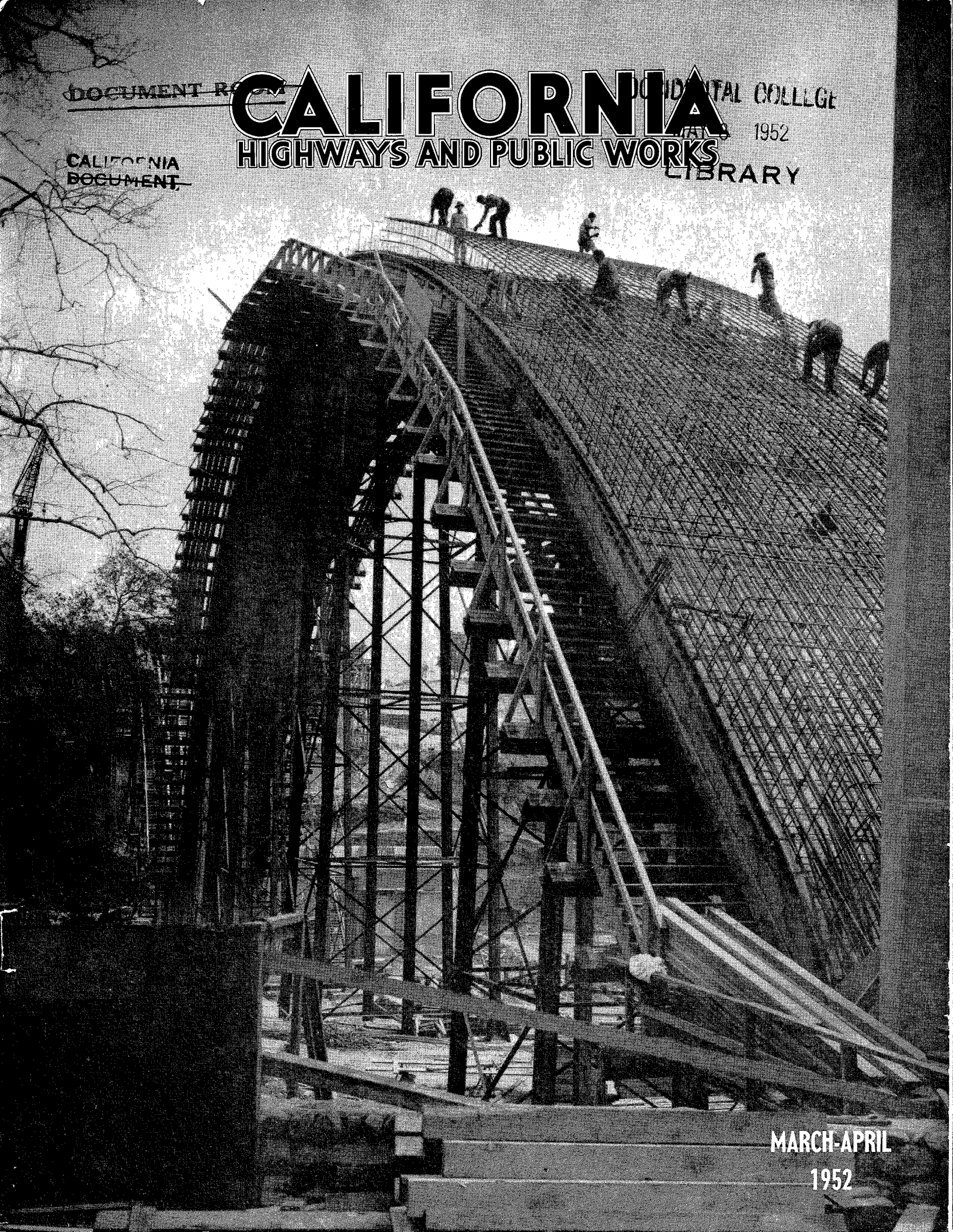
CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



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California Highways and Public Works

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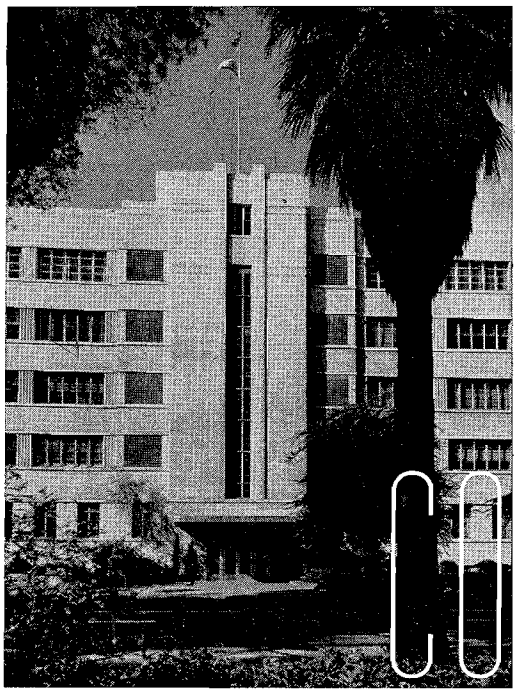

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Big Job

Role of Division of Highways in Development of the Freeway System for the Los Angeles Metropolitan Area

By P. O. HARDING, Assistant State Highway Engineer

In 1912 when California first started to construct a State Highway System the problem was one of getting out of the mud in the rural areas. Generally speaking, the cities had some surfaced streets permitting the very light vehicular traffic of that day to traverse the incorporated areas much more easily than the undeveloped roads of rural territory. The State Highway System was thus initiated as a rural system with official routes stopping at the boundaries of incorporated cities.

Difficulties of small incorporated towns to provide suitable surfaced arterial routes were recognized by legislation in 1925, permitting the extension and improvement of a highway route through a municipality with a population of not more than 2,500. The increasing vehicular traffic and the generally unsatisfactory condition of city streets as connecting links in a through arterial system brought increasing consciousness of this city problem. In 1932 there were 457 miles of city streets in the 202 California cities which were connecting links to state routes. The over-all rural State Highway System at that time was approximately 7,000 miles. The gasoline tax was 3 cents with 1 cent going to the counties for other rural roads and 2 cents reserved for the maintenance and improvement of the State Highway System.

Policy of Cooperation

In recognition of the city problem, by legislative authority, Statutes of 1931, a policy of cooperation in construction was inaugurated for those portions of the highway routings within the cities, and in 1932 several miles within cities were improved by state and local cooperation. In further recognition of this problem Chapter 767, Statutes of 1933, provided that the Department of Public Works would annually expend from the State Highway Fund an amount equal to the net proceeds of one-fourth of one cent per gallon tax of motor vehicle fuel upon

P. O. HARDING

state highway routes within incorporated municipalities. Still further recognition of this problem was given by the Legislature in 1935 which provided an additional one-fourth cent of the gasoline tax for maintenance, rights of way, construction or improvement on streets of major importance within the cities, off the State Highway System.

System Expanded

Both the 1933 one-fourth cent and 1935 one-fourth cent were taken from the state highway two cents of gas tax, thus reducing the expenditures upon the state rural system to 1½ cents. Coincident with the legislation reallocating these gas tax funds, the Legislature in 1933 and 1935 added some 6,800 miles of rural county roads to the state system, which, with the extended routes through the cities, resulted in a total State Highway System of approximately 14,000 miles. Both the county road additions and the city sections were generally deficient in standards of grades, alignment and major bridge structures to handle state highway traffic and these routes were generally designated as traversable routes taken over by the State for maintenance until such time as they could be improved to carry the legal loads and the prevailing volumes of traffic at the speeds expected for a State Highway System.

Lack of Funds

The responsibilities thus delegated to the State were far greater than the funds available to meet them, and at each successive biennial session of the Legislature the department tried to properly portray this problem in the interest of obtaining additional funds. These efforts were without success, although it was pointed out that we were losing ground in the fight to adequately take care of the rapidly increasing traffic throughout the entire State.

In December, 1941, this Country was precipitated into a world war and all construction work upon the State Highway System, as such, was stopped until its conclusion in late 1945. By this time the tremendous growth of the State, due to its strategic military location with relation to the vast war operations in the Pacific, had produced a traffic situation, the full impact of which was not realized until the removal of gasoline rationing and other wartime controls.

Collier Committee Goes to Work

Governor Warren recognized this problem and the particularly acute situation within the cities and urged the passage of legislation to provide the additional funds necessary for modernizing our State Highway System. The 1945 Legislature felt that this situation required comprehensive study before the enactment of definite legislation and accordingly appointed a joint Senate-Assembly committee headed by Senator Randolph Collier of Yreka, which was to report back to the 1947 Legislature with recommendations. This committee in the interim period solicited

information from the State Division of Highways, from each of the 300-odd incorporated cities, and each of the 58 counties in the State. It visited all sections of the State to receive all the factual data available on the street, highway and road problems from these three levels of government.

Los Angeles Problem Acute

The transportation problem in Los Angeles has become particularly acute due to the generally decentralized development over this large metropolitan area. The incorporated area within the city limits of Los Angeles is 453.47 square miles but the 45 other incorporated cities within Los Angeles County and the tributary cities in Orange, Riverside and San Bernardino Counties to the south and east and Ventura County to the north and west make the actual boundaries of the metropolitan area most difficult to define. The population of Los Angeles County alone, according to the 1950 Federal Census, was 4,151,687, with the population of Los Angeles City 1,970,358.

The latest figure on vehicular registration in Los Angeles County as of the end of 1951 is 2,133,641. Los Angeles, as a city with nearly half the population and the worst congestion of the county, has been a natural leader in studies of vehicular transportation facilities in this metropolitan area. It has been assisted, and its studies expanded since the 20's by the county and by various governmental, civic, and private organizations, showing the widespread recognition of the seriousness of the transportation problem.

Years of Planning

It can thus be seen that the Los Angeles Metropolitan Freeway System planned for this area did not develop overnight. It has matured through the years through the cooperation of governmental units, civic organizations and public-spirited citizens, and tribute must be given to all. Individuals and organizations now accept it as a transportation system evolved for the benefit of the people as a whole, through the functioning of democratic processes.

It would be impossible to list all the people and organizations who have had a part in these coordinated studies. Some of these organizations have published comprehensive reports, others have issued and distributed reports which were not published. Still others have taken an active part in meetings and discussions in informal manner in furtherance of the cooperative spirit and attitude of this comprehensive undertaking.

Freeway Network Laid Out

It is believed that the general consensus of these organizations is expressed in the report of the Los Angeles Metropolitan Parkway Engineering Committee to the Collier Joint Fact-Finding Committee on Highways, Streets and Bridges of the California Legislature, dated March 30, 1946. This report was signed by the Mayor of Los Angeles, the Chairman of the Los Angeles County Board of Supervisors and a representative of the Los Angeles County Section of the League of California Cities. It points out that the com-

mittee was originally composed in 1944 of city and planning engineers of the City of Los Angeles, the county and the cities immediately adjoining Los Angeles, but was later expanded in 1946 to include engineering representatives of all cities within Los Angeles County.

This committee laid out a network of freeways totaling some 613 miles in the most congested portions of the metropolitan area, which was unanimously approved by the expanded committee. There is reproduced herewith the central portion of the Los Angeles County Regional Planning Commission map included in this report.

Including the arterial routes added by the Legislature in 1947, about one-fourth of the total mileage of the committee's freeway network is a part of the State Highway System. The Collier-Burns Act provided additional funds for the cities to improve their major street systems, for the counties to maintain and improve county roads both inside and outside incorporated areas, and for the State to improve its system both inside and outside the cities.

Counties and Cities Help

These additional funds, however, quickly proved insufficient to solve the modern traffic problem, which had been further aggravated by the postwar increase both in population and vehicles, and by the steady rise in highway construction costs.

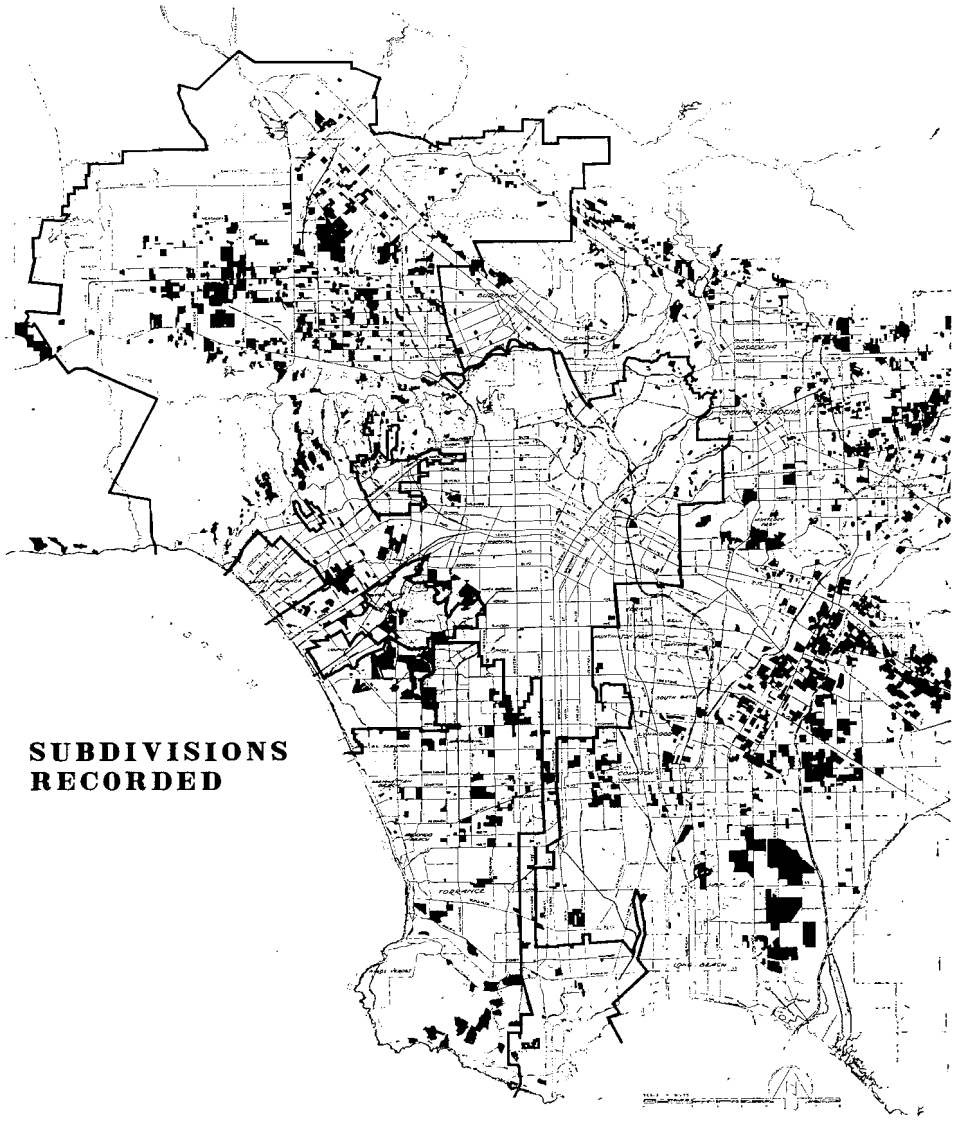
Faced with these conditions it has been impossible for the cities to do very much toward solving their share of the freeway problem. Both the cities and the counties through their planning commissions and engineering departments have been most helpful in planning subdivision developments in conformity with projected freeway lines for which there are no present funds to purchase rights of way. The State, in order to establish a freeway, must acquire the property access rights along the freeway route, but the State, as such, does not have the detailed power necessary to control local zoning setbacks and land use development, this being vested in the city and county legislative units of government. The planning commissions of these local agencies are doing notable work in protection of future freeway routes both for their own sections of freeway and for those on the state highway routes.

Looking to Future

The inadequacy of funds for the State to progress as rapidly as desired

Years	In the city of Los Angeles		Outside city of Los Angeles	
	Number of Subdivisions	Number of lots	Number of subdivisions	Number of lots
1945 to 1950 inc.	1,136	55,593	1,622	108,784
1951	255	7,866	248	17,144
1945 to 1951 inc.	1,391	63,459	1,870	125,928

Grand Total
3,261 Subdivisions
189,387 Lots



CITY PLANNING COMMISSION
LOS ANGELES

SUBDIVISIONS RECORDED

has been accentuated by the extreme residential and industrial subdivision which has occurred in the Los Angeles Metropolitan Area since the war. It has been impossible for the local planning bodies to completely control subdivisions to protect rights of way for those freeways for which financing does not appear to be available in the foreseeable future. In such cases, however, they have in many instances been able to arrange the subdivision so as to minimize the number of improvement units involved and best fit the future freeway into the actual pattern of the subdivision.

The accompanying map, showing new subdivisions in the postwar period 1945 to 1951 inclusive, is indicative of the tremendous growth of the area. Subdivision activity reached a peak in the first quarter of 1950, at which time there were some 18,000 lots recorded. The largest subdivision in one unit has been that within the unincorporated territory in the Lakewood area north of Long Beach where some 17,500 homes are planned, more than half of which have been completed at the present time. This subdivision includes street layouts with separate frontage roads, and complete shopping, recreational, school and other civic facilities. It is truly a well planned and well executed community development.

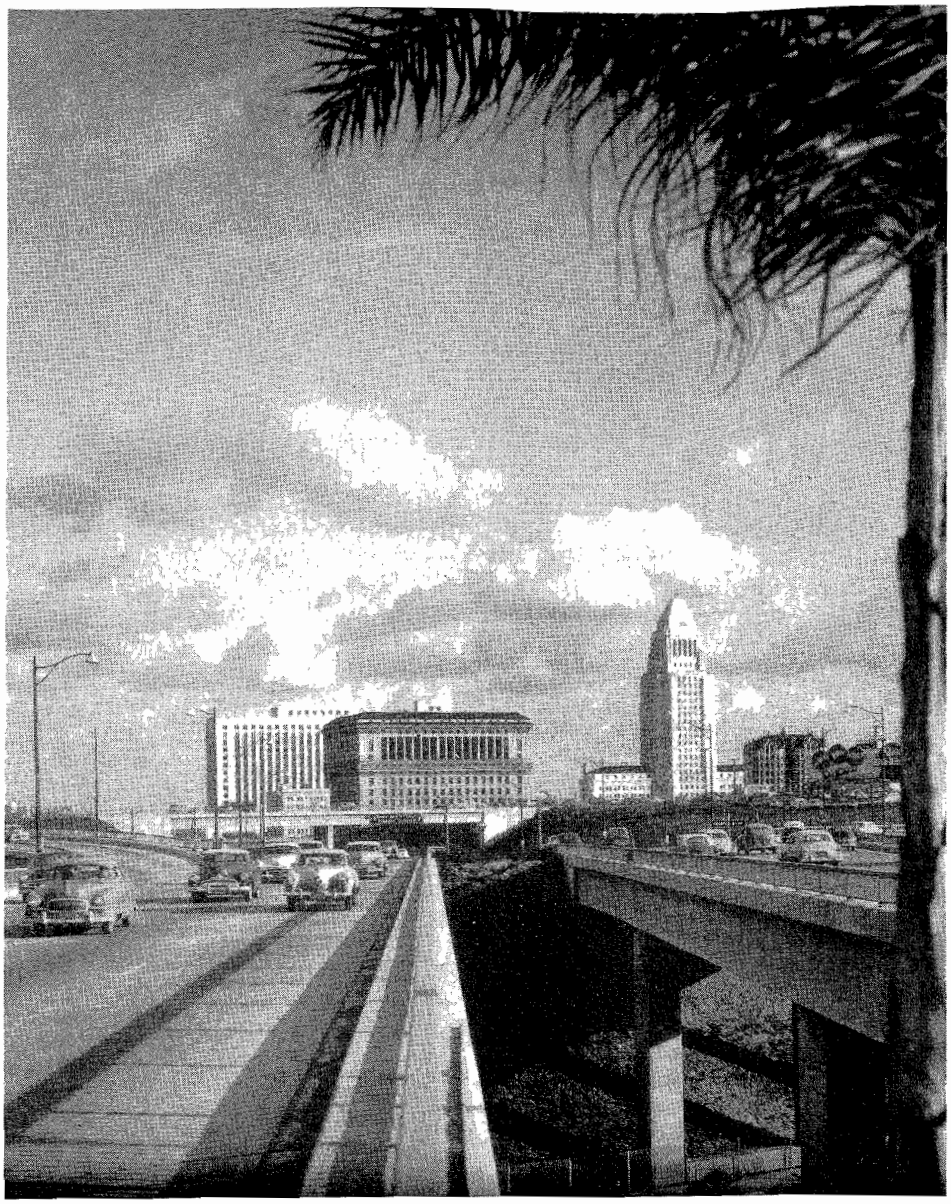
New Subdivisions

As can be seen from the map, however, subdivisions have been springing up everywhere that vacant land is available for such purposes. In prewar subdivisions building of residences usually progressed in a kind of hit or miss manner extending over a period of several years. A notable difference in this postwar subdivision effort, due to the extreme house shortage which developed during the war, has been the immediate building of residences upon every available lot within the new subdivision and the almost immediate sale and occupancy of those residences within a very short period of time after their construction.

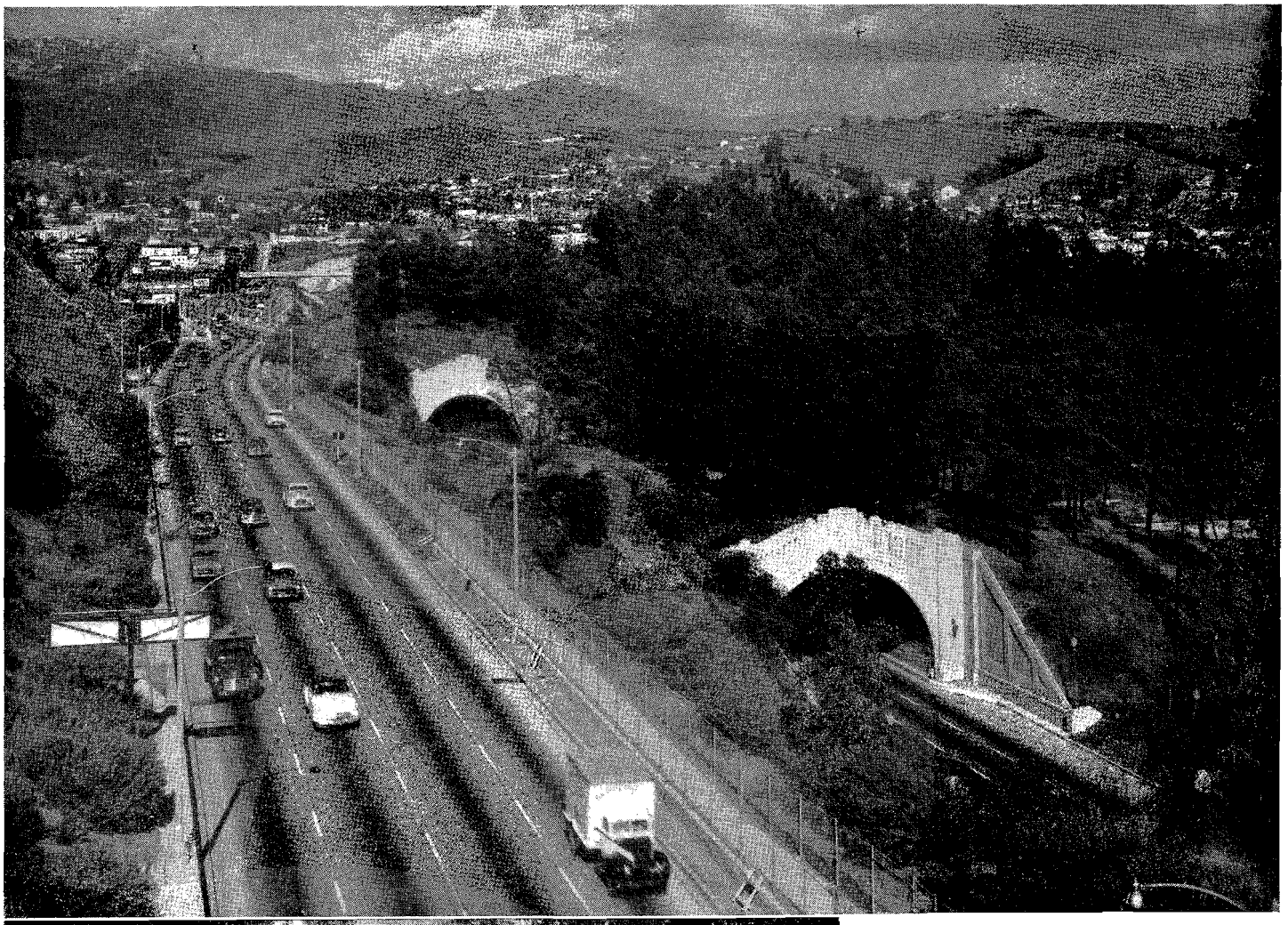
Active Real Estate Market

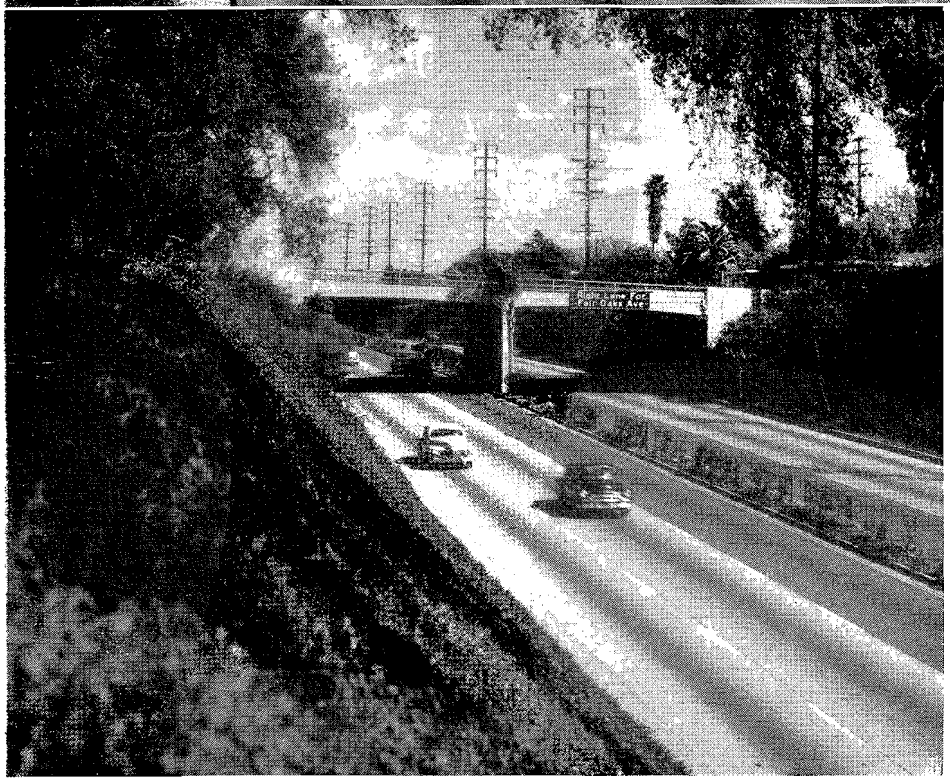
It is felt that such freeways as we have been able to program funds for right of way acquisition and construction have themselves been a factor in the surge of subdivision activity within the traversed territory and beyond. This very active real estate market, combined with the general inflationary trend in all prices, has materially affected the costs of both right of way acquisition and construction out of all proportion to the more or less fixed revenues of the increased motor vehicle registration. Furthermore, each new resident and each new motor vehicle has accentuated the traffic problem so that we are confronting new critical deficiencies at a more rapid rate than we are able to overcome the old deficiencies.

This condition, of course, confronts both the city and county governments with respect to all public services including water supply, sanitary sewers and sewage disposal, flood control and storm drains, garbage and rubbish collection, schools, parks, playgrounds, public buildings, police, fire and health protection. The demands on the tax dollar of every level of government within the State have been stretched to the limit to provide for the over-all expanding economy of the State.



View looking easterly along Hollywood Freeway from above Figueroa Street, showing Hollywood-bound traffic on left and Los Angeles Civic Center-bound traffic on right. In the center background are the Los Angeles Civic Center buildings, the one in the center being the Hall of Justice, the large building to the left and rear being the Federal Building, and the City Hall, with its tower, to the right.

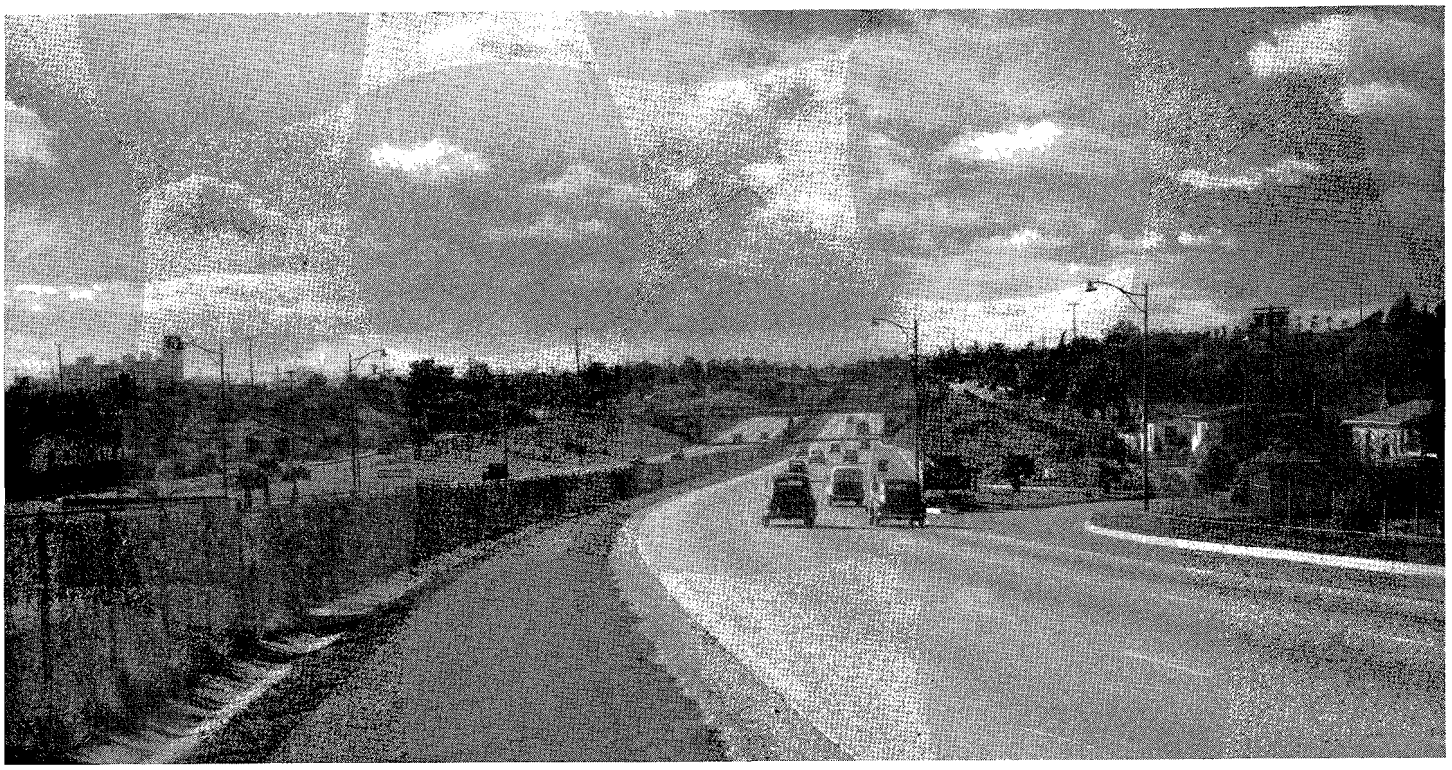




Cost of Freeways

The cost of metropolitan freeways will vary from block to block. The trend of cost, however, per mile depends upon the percentage of property that has been improved together with the land values, values of improvements, and the design of the freeway itself. If the freeway can be laid out to parallel existing streets, it usually requires some 212 average 50-foot lots per mile without any expansion for interchanges. The actual number required depends upon the spacing of the

UPPER—Looking northerly from Elysian Park along Arroyo Seco Parkway, the four-lane, high-level road to the left carrying traffic into the Los Angeles Civic Center and the lower roadway to the right through the tunnels carrying outbound traffic. The junction with Riverside Drive is at center left of photograph. It is this section of the Arroyo Seco Parkway, between the Riverside Drive junction and the Castelar Street junction, where recent counts show traffic in excess of 100,000 vehicles for a 24-hour period. LOWER—View along Arroyo Seco Parkway in the South Pasadena area.



Looking westerly along Santa Ana Freeway from east city limits of Los Angeles near Indiana Street

interchanges and to a large extent upon the design of those interchanges. If the freeway cannot be located parallel to existing streets, the number of properties affected per mile will normally be increased upward 25 or 30 percent, for the design must include, in addition to the freeway proper, rearrangement of the street pattern outside the freeway right of way for the proper circulation of local travel.

If the freeway traverses long cross blocks and calls for the inclusion of parallel frontage roads on each side of the freeway, there may be a further increase in the number of lots affected per mile. As soon as a lot has been improved, the combined value of the improvement and lot may reach 10 times the value of the vacant lot. There is some salvage to the improvements when the right of way is ultimately cleared for construction so that the improved value will generally bear relationship of from six to eight times the value of the unimproved property. Thus the cost of the right of way for a metropolitan freeway may vary within rather wide limits, depending upon the percentage of improvement of the property in the area traversed.

Future Trend Anticipated

The construction cost of the freeway will similarly vary with the percentage of improvement of the property. If the freeway can be constructed before there is any appreciable development, it can be established as the guide for the future trend of development in the area. It can oftentimes be constructed at ground level with provision for future grade separations, if and when needed at cross streets, to be elevated over or depressed below the freeway and the right of way for these facilities should be acquired in the initial right of way program.

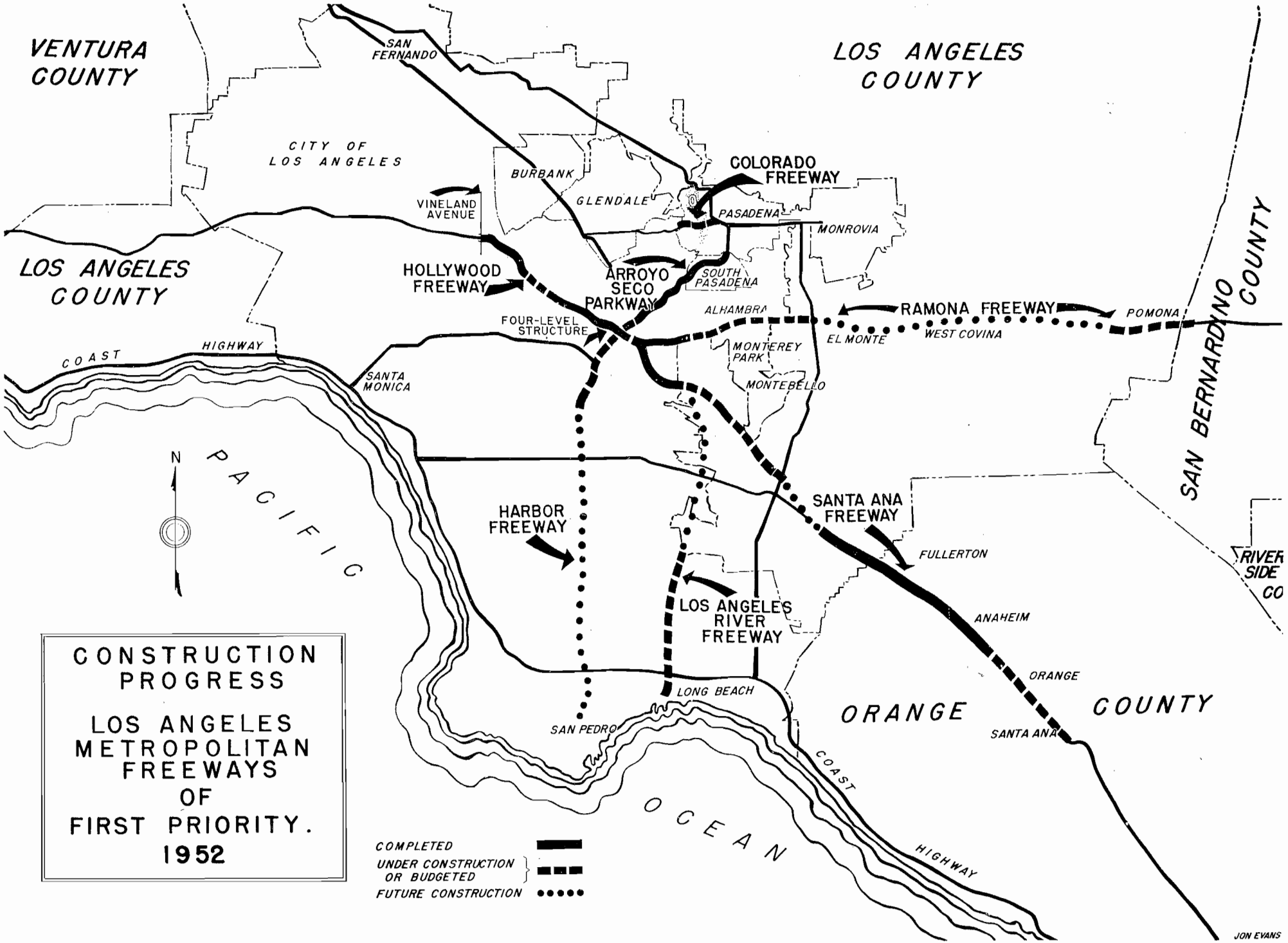
On the other hand, if the freeway is traversing a fully improved section of the city, the design of the freeway itself has to meet the established street pattern which will call for additional grade separations and interchanges. It will generally mean that the freeway has to be completely elevated or depressed to avoid the far-reaching property damages upon cross arterials in attempting to elevate or depress well developed streets at frequent intervals across the freeway.

The cost pattern in itself presents a problem in determining whether the freeway program should progess inward from the outlying, relatively undeveloped areas where the traffic has not yet reached acute stages, or whether they should progress outward from the costly developed areas where traffic congestion has assumed alarming proportions.

Under the first procedure the overall freeway program could be realized much more quickly and at appreciably less cost than under the latter. Under the second procedure the development proceeding ahead of the right of way acquisition and construction will increase the cost and time of realization of completing the program but will provide traffic relief most quickly and where most needed. This presents a situation something like the argument as to which comes first, the chicken or the egg. Should the freeway come first, or the development? In many cases we have no choice—the development is already here.

Justification

The major justification for the metropolitan freeway is to relieve the creeping paralysis of traffic congestion which has been taking place upon the existing street arterials. The benefit of the freeway is therefore direct in the


VENTURA COUNTY
LOS ANGELES COUNTY
SAN FERNANDO
CITY OF LOS ANGELES
BURBANK
GLENDALE
PASADENA
MONROVIA
COLORADO FREEWAY
VINELAND AVENUE
HOLLYWOOD FREEWAY
ARROYO SECO PARKWAY
SOUTH PASADENA
ALHAMBRA
FOUR-LEVEL STRUCTURE
RAMONA FREEWAY
POMONA
WEST COVINA
EL MONTE
MONTEREY PARK
MONTEBELLO
SAN BERNARDINO COUNTY
COAST HIGHWAY
SANTA MONICA
N
PACIFIC
HARBOR FREEWAY
SANTA ANA FREEWAY
FULLERTON
RIVERSIDE CO
LOS ANGELES RIVER FREEWAY
ANAHEIM
ORANGE
LONG BEACH
ORANGE COUNTY
SAN PEDRO
SANTA ANA
COAST HIGHWAY
OCEAN
CONSTRUCTION PROGRESS
LOS ANGELES METROPOLITAN FREEWAYS OF FIRST PRIORITY.
1952
COMPLETED
UNDER CONSTRUCTION OR BUDGETED
FUTURE CONSTRUCTION
JON EVANS

time savings afforded to those users of the freeway who have been diverted to same from the existing city streets. A second and indirect benefit, however, occurs in speeding up all the remaining local travel through the relief of congestion provided to those city streets. These are far reaching benefits.

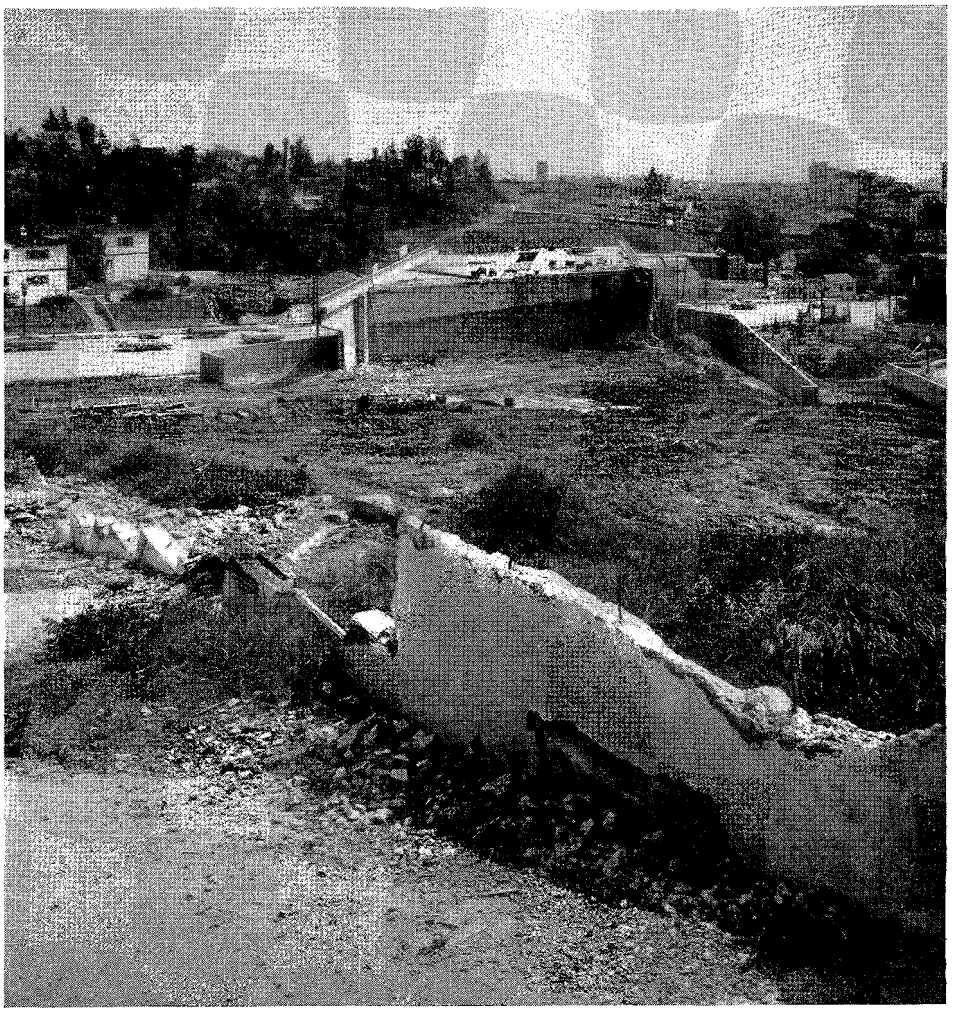
Traffic upon rural freeways is that previously established upon an existing route and subject only to the normal trend of increase occasioned by the over-all economic growth of the area which it traverses. In contrast to this, the traffic of a metropolitan freeway represents the cumulative diversion from more or less parallel arterials within rather wide limits on either side of the freeway insuring a full traffic load upon the freeway as soon as it is fully opened to properly serve the over-all traffic of the area. For example, a 2½ mile section of the Hollywood Freeway was opened to traffic December 27, 1950. It immediately carried 32,000 vehicles per day. Within three months this had increased to 38,000 and in another four months to 44,000.

Increasing Traffic

The opening in September, 1951, of an additional 2½ miles increased the volume of the first section to some 70,000 vehicles per day. On December 20, 1951, we opened the civic center section of the Hollywood-Santa Ana Freeway and traffic upon this former section jumped to in excess of 91,000 vehicles per day. More recent reports show that this has now increased to over 99,000 vehicles per day. This traffic has all originated from the previously overcrowded parallel arterials of the vicinity.

In spite of the many problems confronting us and the inadequate financing of progress as rapidly as we feel we should, notable progress has been made upon the major arterial freeways of the Los Angeles metropolitan area. Since the war, the State Division of Highways has spent or obligated $150,000,000 and has budgeted for the 1952-53 Fiscal Year an additional $28,000,000 on these freeways.

The Division of Highways has been assisted in this program by the construction industry and its many fine contractors who, under our system of free enterprise and under the keenest competition, have provided us with the most economical results possible under the restrictions of controlled materials and other numerous obstacles.



View from Whitley Heights looking easterly along construction in progress on Hollywood Freeway. In the foreground is concrete foundation of building that has been moved to clear right of way; in the middle foreground is the Cahuenga Boulevard Undercrossing nearing completion; and in the background is the spire of the Hollywood Presbyterian Church.

Hollywood Freeway Financed

The Hollywood Freeway is now completely financed, the last major construction unit to connect with the existing freeway in Cahuenga Pass being placed under contract February 14, 1952. All of the required rights of way have been secured and all but minor right of way clearing completed. In the 6¾ miles between Spring Street in the civic center and Cahuenga Pass a total of 1,709 buildings have been removed and 87 have been demolished. These have been of various types, including many multiple unit residential dwellings and this program has been accomplished without a single legal eviction of any of these tenants involved.

In this connection it is interesting to note that many of the homes relocated as a result of freeway development now present a better appearance in their new and more pleasant surroundings.

The Cahuenga Pass section of 1.3 miles was originally constructed by the city with state and federal financial cooperation. The 1.8 mile section beyond the Cahuenga Pass to Vineland in the San Fernando Valley was opened to traffic in January, 1949. By the end of 1952 there will be 5½ miles from the civic center to Hollywood Boulevard under traffic. There should be completed prior to the end of 1953 the entire 10.1 miles from the civic center to Vineland at an estimated total cost of about $55,000,000.

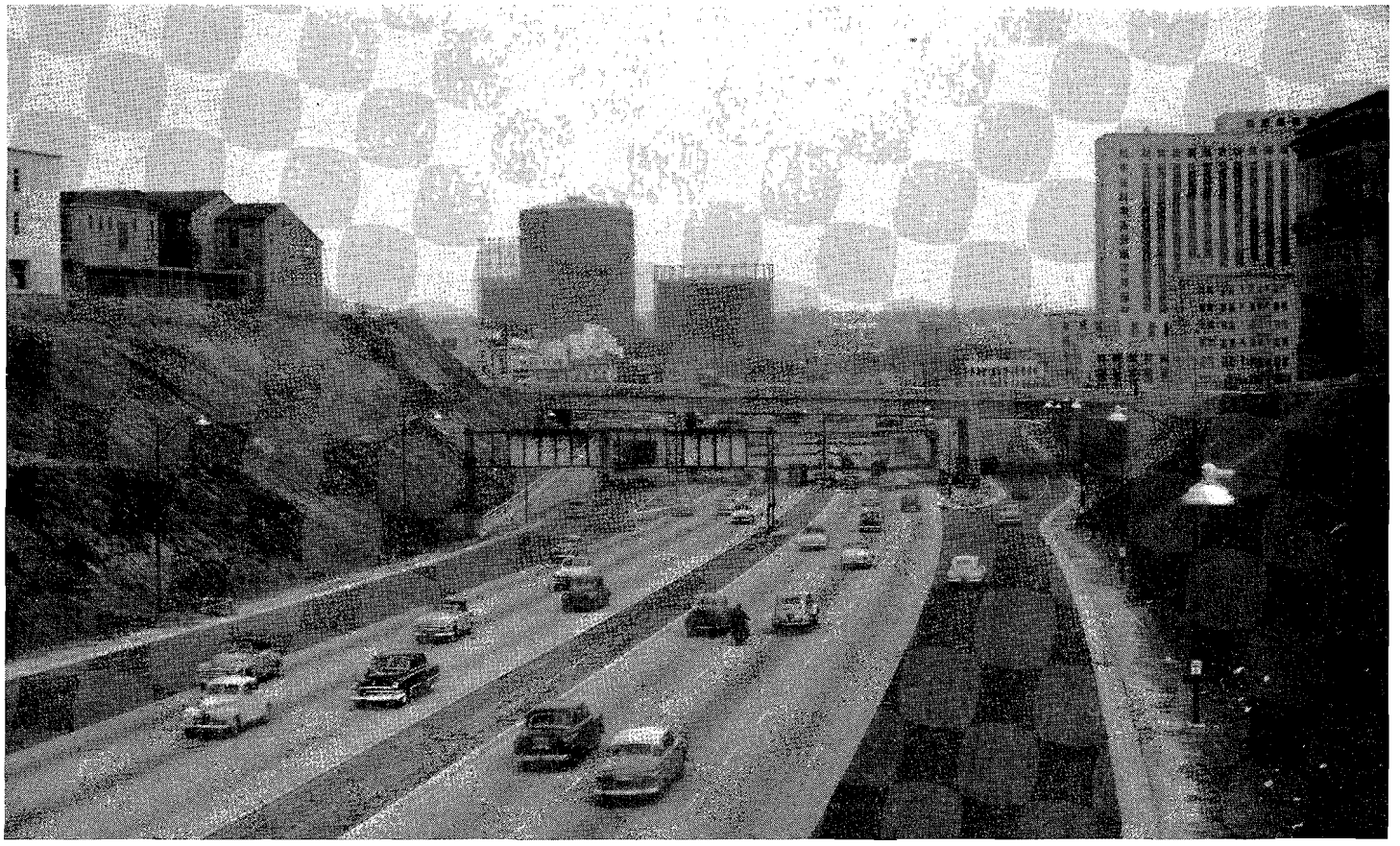
Arroyo Seco First

The Arroyo Seco Parkway was the first freeway of appreciable length constructed in this area. It was opened to traffic for a six-mile length between Avenue 22 in Los Angeles and Glenarm Street in Pasadena December 30, 1940. It was later extended to connect with Castelar Street and Figueroa Street to serve the downtown area. We have yet to pull the plug, as we call it, in making a connection between Figueroa Street and the four-level interchange structure that will throw this freeway into the system. It is expected that this will be advertised for contract within a month's time now that additional outlets from the system have been provided for the downtown area. The Arroyo Seco Parkway, lying largely through park lands of Los Angeles and South Pasadena, was not subject to the excessive right of way costs of today. It was largely constructed at a time when construction costs were approximately 40 percent of those of 1952 although it involved in its eight-mile length a total of 43 contracts. The total cost is estimated to be approximately $10,000,000.

Harbor Freeway

The Harbor Freeway from the four-level interchange to Battery Street in San Pedro involves a total length of 22.8 miles. By mid-1952 that section from the four-level interchange one-half mile in length to Third Street will have been completed and opened to traffic. Work was started in 1951 and will be continued during 1952 on construction contracts to extend this freeway from Third Street as far south as Olympic Boulevard. This 1.6-mile section will act as the distributor to and from the central business district of Los Angeles. It involves a comprehensive system of collector roads to provide a reservoir of storage to permit the gradual absorption of off-bound traffic into the congested downtown area. Right-of-way acquisition beyond Olympic Boulevard is now under way as far southerly as Santa Barbara Avenue adjacent to the Coliseum and University of Southern California. Right-of-way acquisition in the San Pedro district at the southerly end of this freeway is expected to start in the near future. In the clearing of rights of way to date there have been 315 buildings

Looking northwesterly along portion of Hollywood Freeway through Cahuenga Pass from Pilgrimage Bridge. The oncoming traffic is inbound, with the two lanes to right headed for Cahuenga Boulevard and the two lanes to left headed for Highland Avenue. Traffic is over 105,000 vehicles per 24 hours.



Looking easterly from the Grand Avenue Bridge along portion of Hollywood Freeway through the Los Angeles Civic Center. The bridge in the middle foreground is recently completed Hill Street Overcrossing; the buildings to the left are the Los Angeles Board of Education administration buildings; and the buildings to the right are the Federal Building and the Hall of Justice.

of all types and descriptions removed and 89 demolished. The Division of Highways has awarded 10 major construction contracts to date. Total expenditures for rights of way and construction to date is approximately $24,000,000.

Figueroa Street

Present Figueroa Street, State Highway Route 165, which will ultimately be superseded by the Harbor Freeway, involves 62 sets of traffic signals between Temple Street adjacent to the four-level interchange and Battery Street in San Pedro. Within this distance there is a total of some 200 cross streets which has slowed traffic for the over-all distance to speeds varying between 25 and 35 miles per hour, and requiring a total travel time of approximately 55 minutes in off-peak periods and more than one hour during peak periods. It has been estimated that upon completion of this freeway the entire trip can be made in 27 minutes.

Santa Ana Freeway

On the Santa Ana Freeway by the end of 1952 construction should be completed for the entire 10 miles between Aliso Street east of the Los Angeles River and Lakewood Boulevard. During 1952 construction will also be under way on the important downtown one-third-mile section on Aliso Street between Los Angeles Street and Lyon Street. Construction on the 2½-mile section through the City of Santa Ana at the extreme southeasterly end of this freeway is approximately 40 percent completed to date. Much of the right of way on the Santa Ana Freeway within and just outside the City of Los Angeles was purchased prior to the full impact of the present real estate inflationary trend. In clearing the right of way a total of 744 buildings have been removed and 39 have been demolished to date. The State Division of Highways has awarded 57 construction contracts in the over-all 32-mile length between the Civic Center in Los Angeles through Santa Ana, of which some 22 miles have been completed. The total expenditures for rights of way and construction to date is $37,000,000.

Ramona Freeway

The Ramona Freeway was originally constructed in 1935 as a conventional highway for the two-mile section from Aliso Street east of the Los Angeles River to the city limits at Indiana Street. It was converted to a freeway immediately after the war, this being accomplished in 1946. The 1.8 miles just beyond the Los Angeles city limits to Helen Drive was completed and opened to traffic in April, 1951.

A grade separation at Rosemead Boulevard adjacent to El Monte was completed and opened to traffic on Rosemead in September, 1951. Between Helen Drive and Rosemead there are seven major contracts under way, all of which should be completed

by the fall of 1953, thus opening to traffic the full 10-mile length from Aliso Street to Rosemead Boulevard. Right-of-way acquisition has been under way on the easterly end of this freeway for the past two years in the Pomona-Claremont area and construction is expected to start within two months of the present date. Much of the heavily improved right of way of this freeway was also acquired prior to the period of heaviest inflation. To date 256 buildings have been removed and 19 demolished in clearing the rights of way. A total of 26 construction contracts has been awarded by the Division of Highways in the overall total 30-mile length of this freeway within Los Angeles County between Aliso Street and the San Bernardino county line. Total expenditure to date for rights of way and construction is approximately $17,000,000.

Los Angeles River Freeway

The Los Angeles River Freeway is under construction and approximately one-third completed for the 2½ miles in Long Beach between the Pacific Coast Highway, State Route 60, and 223d Street. It is expected that contracts will be advertised for bids in April for the construction of several bridge structures between 223d Street and Atlantic Avenue in Compton. In clearing the right of way to date 189 buildings have been removed and one demolished. Total expenditure to date is approximately $4,000,000 for rights of way and construction.

The Los Angeles River Freeway was put into the State Highway System by the Legislature in 1947. For a number of years prior thereto, however, under the general guidance of the Los Angeles County Regional Planning Commission, this general route was laid out and protected. The City of Long Beach was instrumental within its city limits in reserving all of the vacant lands for this future freeway. Both the city and county assumed responsibility for reserving freeway space in several major structures constructed by them across the route of the freeway.

The present southerly terminus of the state highway portion of this freeway is at the Pacific Coast Highway. The southerly extension of the Los Angeles River Freeway, from the Pacific Coast Highway to the Long Beach Harbor area, requires special mention because the construction work now in progress by the City of Long Beach is the only instance since World War II of another governmental agency carrying out the construction and financing of a complete unit on the Los Angeles Metropolitan Freeway System. This part of the Los Angeles River Freeway is not on the State Highway System and the State has no responsibility with respect to it except in the review of plans for approval as a major city street project eligible for gas tax funds. Over a period of several years the City of Long Beach has been designing and acquiring rights of way on this 1.6 miles of freeway.

Grade Separation

Nearing completion is the Guy F. Atkinson $2,000,000 contract for a full interchange grade separation structure at Anaheim Street, with completion scheduled for September, 1952. All rights of way have been secured by the City of Long Beach and it is

View looking westerly along Hollywood Freeway showing in foreground Belmont Avenue pedestrian overcrossing. Heavy traffic on both roadways of the freeway will be noted. Over 99,000 vehicles per 24 hours have been counted.


TRIGGS STREET UNDERCROSSING
ANAHEIM
SANTA FE SPRINGS
SANTA ANA FREEWAY
ATLANTIC BLVD.
SOUTH GATE
MAYWOOD
BELL
TRIGGS ST.
LYNWOOD
COMPTON
WASHINGTON BOULEVARD INTERCHANGE
LOS ANGELES RIVER BRIDGE
ARTESIA AVENUE INTERCHANGE
THE LOS ANGELES RIVER FREEWAY
FROM OLYMPIC BOULEVARD TO ARTESIA AVENUE
VII-LA-167 - LBch. A, Com. Sgt. B.
Bridge Department


LONG BEACH
DOMINGUEZ STREET UNDERPASS
ANAHEIM ST.
PACIFIC COAST HWY.
WILLOW ST.
CHERRY AVE.
LONG BEACH BLVD.
ORANGE AVE.
ATLANTIC AVE.
PROPOSED CONNECTION TO TERMINAL ISLAND FREEWAY
UNDER CONSTRUCTION
SECTION A
SECTION B
SECTION C
SECTION D
SECTION E
SECTION F
SECTION G
SECTION H
SECTION I
SECTION J
SECTION K
SECTION L
SECTION M
SECTION N
SECTION O
SECTION P
SECTION Q
SECTION R
SECTION S
SECTION T
SECTION U
SECTION V
SECTION W
SECTION X
SECTION Y
SECTION Z
SECTION AA
SECTION BB
SECTION CC
SECTION DD
SECTION EE
SECTION FF
SECTION GG
SECTION HH
SECTION II
SECTION JJ
SECTION KK
SECTION LL
SECTION MM
SECTION NN
SECTION OO
SECTION PP
SECTION QQ
SECTION RR
SECTION SS
SECTION TT
SECTION UU
SECTION VV
SECTION WW
SECTION XX
SECTION YY
SECTION ZZ
BELHART ST.
CARSON ST.
COMPTON CREEK BRIDGE
DOMINGUEZ ST.
DEL AMO BLVD.
ALAMEDA ST.
COMPTON CREEK BRIDGE
(CONTRACT AWARDED JAN 1962)
ARTESIA AVE.
LONG BEACH BLVD. INTERCHANGE
RAILING DETAIL
PACIFIC COAST HIGHWAY INTERCHANGE
(UNDER CONSTRUCTION)
THE LOS ANGELES RIVER FREEWAY
FROM ARTESIA AVENUE TO PACIFIC COAST HIGHWAY
VII-LA-167 - LBch. A, Com. Sgt. B.
Bridge Department

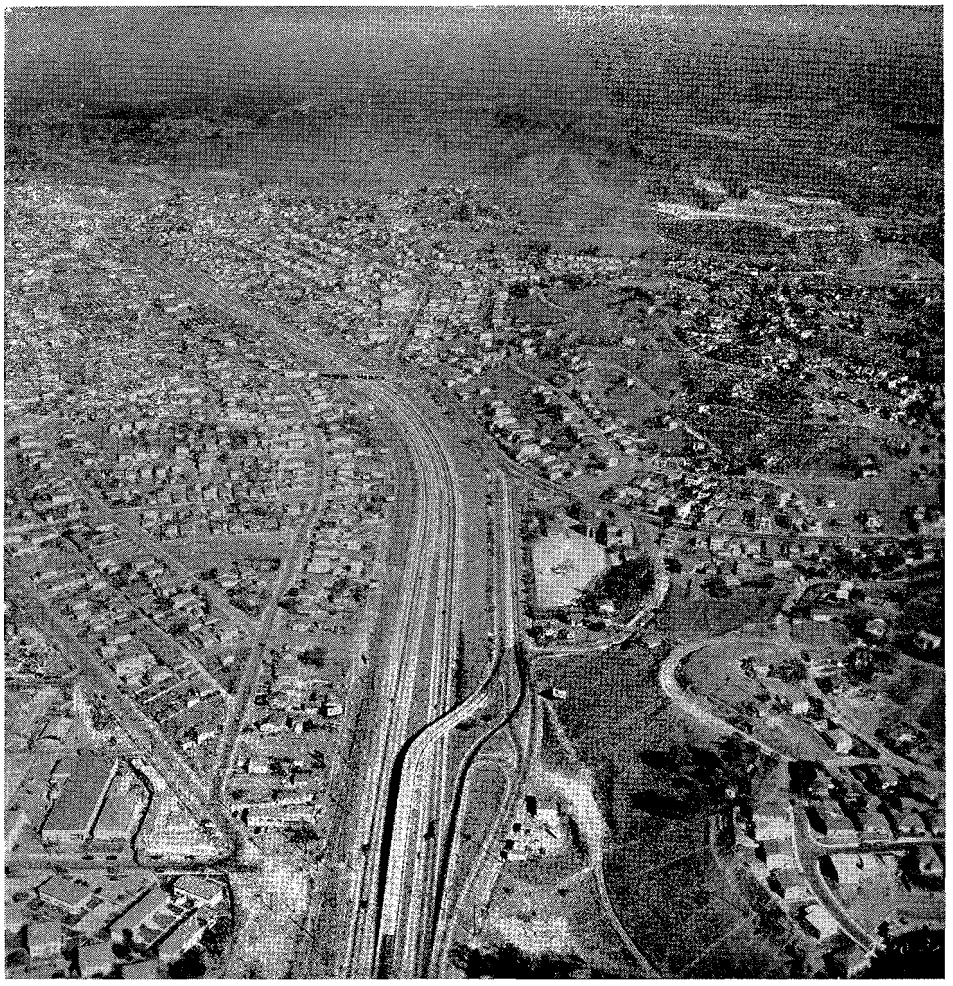
expected that a city contract will be advertised and awarded in April, 1952, for building the freeway southerly from the Pacific Coast Highway to Anaheim Street. From Anaheim Street southerly into the Harbor area, design is under way by the City of Long Beach for grade separation structures and bridges across the Los Angeles River at Ninth Street and other streets with full traffic interchange facilities. It is expected that this freeway, for which the City of Long Beach has accepted responsibility for design, construction and financing, will be completed and opened to traffic within about two years' time, with the total estimated cost being in the neighborhood of $10,000,000, all financed from other than state highway funds.

Colorado Freeway Bridge

The Colorado Freeway bridge over the Arroyo Seco, which was awarded to the Guy F. Atkinson Company at a cost of $3,389,650, is the largest single contract ever awarded by the State Division of Highways. Active construction of this bridge joining Pasadena and the Eagle Rock section of Los Angeles was officially started on May 3, 1951, and ground-breaking ceremonies were held on the site of the work. In clearing the right of way 10 buildings were removed and two demolished. In spite of difficulties in obtaining steel the contractor has made exceptional progress, and this project with a completion date estimated for July, 1953, is approximately 35 percent completed at the present time.

Sepulveda Freeway

The Sepulveda Freeway from Ventura Boulevard in San Fernando Valley to the Los Angeles River Freeway near 223d Street is 33 miles. Construction of this freeway has not been started but right-of-way acquisition has been in progress since the end of the war. No concerted effort has been made to clear up right of way for any specific section of this freeway. Right-of-way acquisition activities have been confined to "distress" cases and to special instances where it has been necessary to acquire vacant land ahead of contemplated private development that would have greatly increased the later right-of-way acquisition costs.



View looking easterly along Ramona Freeway from above the east city limits of Los Angeles, showing the City Terrace area. The bridge in the foreground is the overhead structure for inbound traffic from the City Terrace area. In the center left is shown the Herbert Street Overcrossing and in the left background is shown the Eastern Avenue Overcrossing.

To date $3,000,000 has been spent for right-of-way acquisition on the Sepulveda Freeway.

Allesandro Freeway

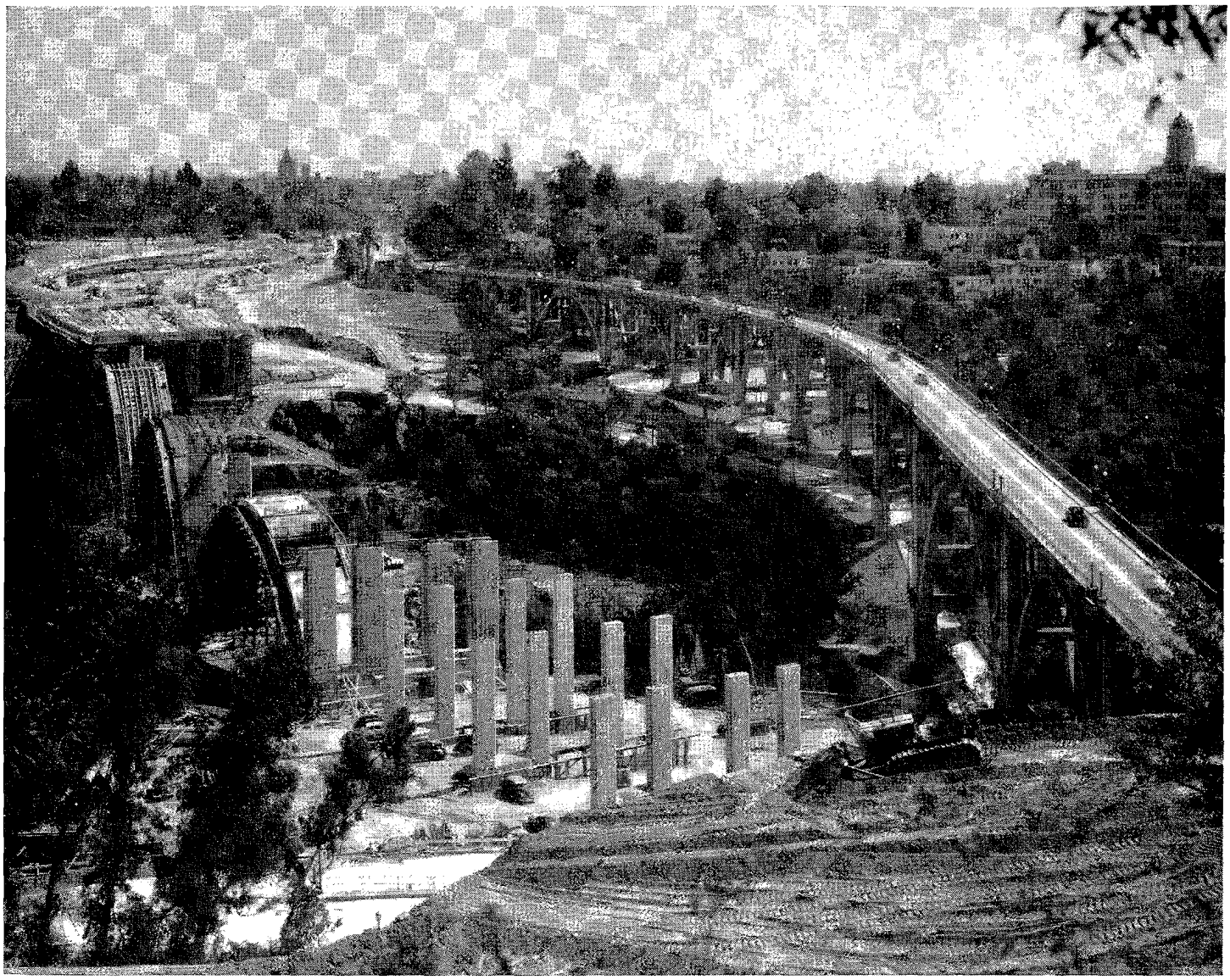
Construction of the Allesandro Freeway has not been started but right-of-way acquisition is under way. The total length of this freeway that has been covered by a freeway agreement with the City of Los Angeles is 1.4 miles. This is a very important section of freeway, extending from Fletcher Drive to Avenue 36 near Eagle Rock Boulevard, because it will provide a badly needed railroad grade separation with the Southern Pacific Railroad, and also a highway grade separation with San Fernando Road. The total expenditure to date for right-of-way acquisition is approximately $1,500,000.

Terminal Island Freeway

The Terminal Island Freeway, 3.1 miles in length, extending from Seaside Boulevard on Terminal Island to Willow Street, was constructed by the State Division of Highways at the request of the Navy as a federal access road for the Navy. This freeway, while on the Los Angeles Metropolitan Freeway System, is not on the State Highway System, and no state money was utilized either in its design, right-of-way acquisition, or construction. This freeway was financed by federal funds and Navy funds, the total expense being about $14,000,000.

Ridge Route

The Ridge Route, while not on the Metropolitan Freeway System, as such, is U. S. Highway 99, a very important



Looking easterly across Arroyo Seco, showing old Colorado Street Bridge on right and new construction in progress on left for the Colorado Freeway Bridge. Buildings in business district and civic center of Pasadena show in background.

north-south arterial connecting the Los Angeles metropolitan district with the fertile and productive San Joaquin Valley and is deserving of brief mention. The conversion of this three-lane highway into an expressway (a limited access freeway) was started after the war and by May of 1952 the 45.2 miles from the north city limits to the Kern county line and the five-mile section from the Los Angeles county line to Fort Tejon in Kern County will have been completed and placed under full traffic load. The cost of the portion within Los Angeles County for rights of way and construction is approximately $12,000,000.

Ventura Boulevard

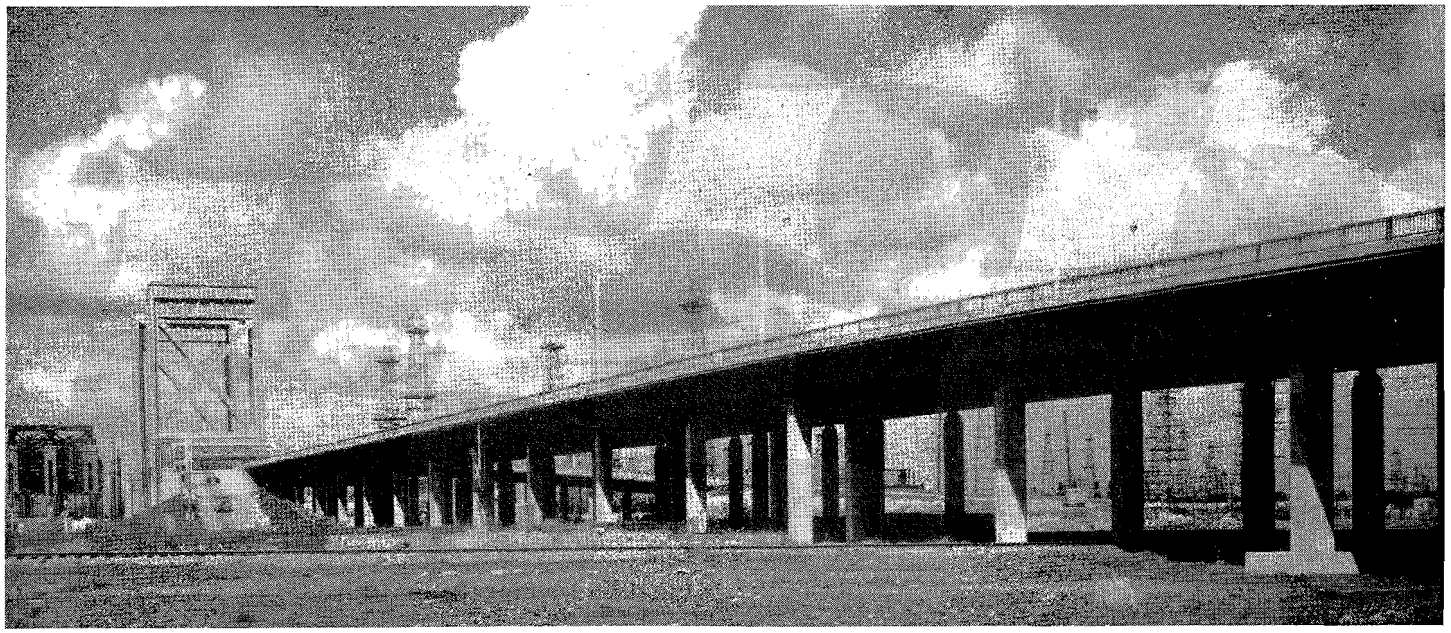
The Ventura Boulevard expressway, in the same general category as the Ridge Route, is not on the Metropolitan Freeway System, but is an important state highway route, U. S. 101, acting as a feeder to the Hollywood Freeway and connecting north coastal cities with the Los Angeles metropolitan area. The total length of Ventura Boulevard from Vineland Avenue in the City of Los Angeles extending through Ventura County to the Santa Barbara county line is 61 miles. Of this total mileage 21.6 miles have been converted since the war to a four-lane limited access freeway at a total cost for right of way and construction of $7,500,000.

Looking to the future of the Los Angeles Metropolitan Freeway System, it is estimated there will be required some $500,000,000 to $600,000,000 additional financing to complete the main state highway arterial routes necessary as the basic or backbone network of the overall system. The time required to complete this with the present funds available is a matter of simple arithmetic.

Traffic and Population

The pressing need for freeways is evidenced by the traffic upon those short sections already completed and opened to traffic. Recent counts upon

UPPER—Looking easterly along Fletcher Drive at grade crossing with Southern Pacific Railroad showing vehicles held up by freight train. The proposed Allesandro Freeway, located to the right just off limits of photograph, will provide grade separation with the Southern Pacific Railroad as well as with San Fernando Road and eliminate traffic delays that are now common occurrences. LOWER—View northerly along viaduct on Terminal Island Freeway leading to Commodore Schuyler F. Heim lift span bridge that was designed by State Division of Highways. Low level bascule bridge shown at extreme left.



the Hollywood Freeway have been cited. On the Arroyo Seco Parkway between the Castelar junction and Riverside Drive junction our counts show traffic in excess of 100,000 vehicles for a 24-hour period. Both state and city checks of traffic on the Cahuenga Pass section of the Hollywood Freeway show this to be carrying in excess of 105,000 vehicles in 24 hours. Imagine the congestion that would result on the city street system if any of these sections of freeway were closed to traffic.

The population of the City of Los Angeles increased from 1,504,277 to 1,907,358 in the decade from 1940 to 1950. In this same period the assessed valuation of the city increased from $1,281,632,625 to $2,428,594,985, an increase of nearly 90 percent. The

assessed valuation of the city today is in excess of $2,480,000,000 and that of the county approximately $5,350,000,000.

For an area which lives on rubber-tired vehicles, there can be no question that freeways are an indispensable economic lifeline. The economy of the Los Angeles metropolitan area could not be maintained at its present level without them, and its future prosperity depends in large measure on the realization of the long-range freeway plans. The cost of building the Los Angeles freeway network may appear high; but the cost of not building it would be infinitely higher.

LETTER FROM ARGENTINA

BUENOS AIRES

MR. KENNETH C. ADAMS, *Editor*
California Highways and Public Works
Sacramento, California

DEAR SIR: I have received your courteous letter dated December 20, 1951, in which you inform me I have been placed on the mailing list to receive *California Highways and Public Works.*

Thank you very much. It will be for me a pleasure to receive your magazine which holds one of the first places among those publications which keep us up to date on the most important highways works, especially in your State.

Very truly yours,

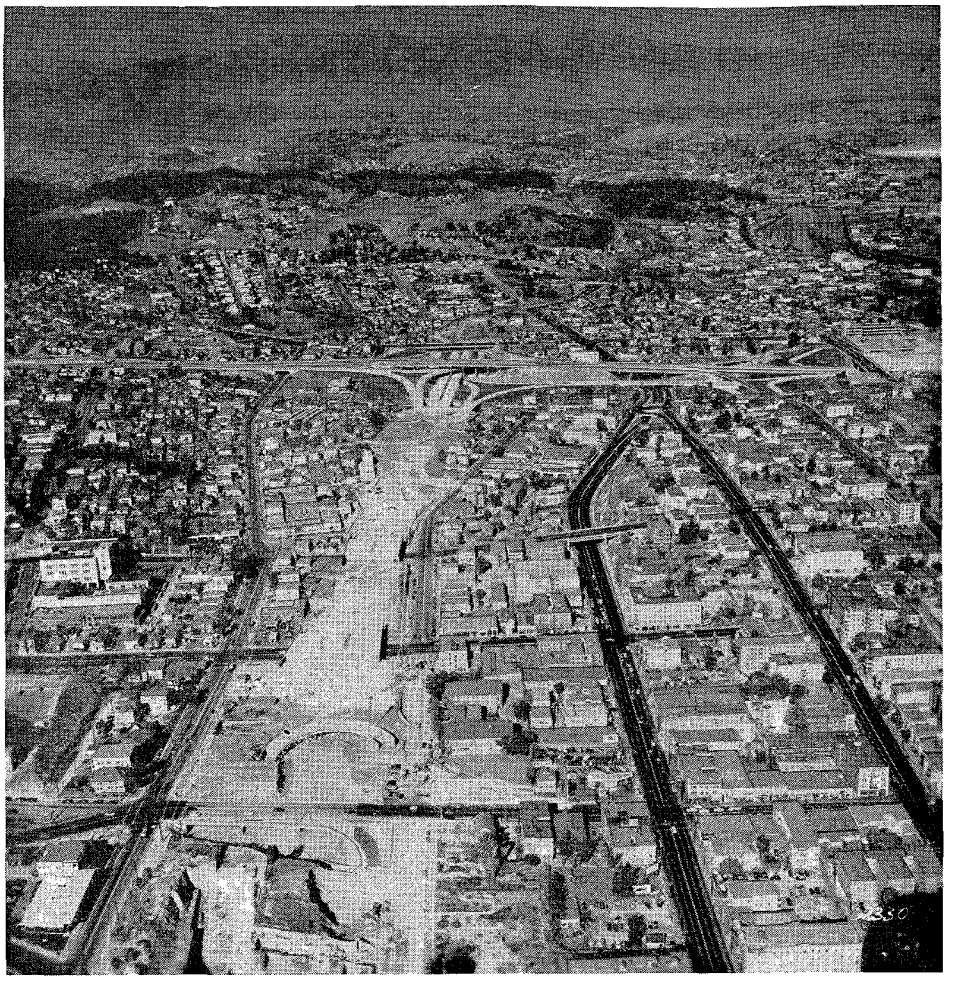
CARLOS NOYA SCHOO
Ingeniero de Conservación
Administración General de
Vialidad Nacional, Argentina

STAY ON SLOW SIDE

Knowing that you should always drive at a safe speed is one thing. Knowing what that safe speed should be is often quite another. The wise motorist always plays it safe by underestimating the speed at which he should drive. The wise motorist stays on the slow side, and keeps himself safe.

RATON PASS

Raton Pass, which lies on the main route from Colorado down into New Mexico, is reported by the National Automobile Club to have been named for the many pack rats that live in the area.



Looking northerly along Harbor Freeway construction between Beaudry Avenue on the left and Figueroa Street on the right. The four-level grade separation structure and the Hollywood Freeway appear in the central part of the photograph with Pasadena in the background. The completed construction in the foreground is the Third Street Overcrossing.

AUTO CLUB URGES MOTORISTS, PEDESTRIANS TO CUT TRAFFIC FATALITIES

Southland motorists and pedestrians have been called on by the Auto Club of Southern California to assume full responsibility for traffic safety as auto fatalities continued to increase during the first three months of this year.

Auto accidents killed 466 persons in 12 Southern California counties during the first quarter. This is a 4 percent increase over last year and nearly 47 percent above the same three-month period of 1950.

The Indians of New Mexico have no written language. Their myths have been passed orally from generation to generation and they are among the most interesting to be found in the world.

FROM LONDON

"SHELL" REFINING AND MARKETING COMPANY LIMITED

25 Bagley's Lane, Fulham, London, S. W. 6

THE EDITOR
California Highways and Public Works

DEAR SIR: In advising you of my change of address, I should like to take the opportunity of saying how much I appreciate receiving a copy of *California Highways and Public Works.* You have been sending me your journal since I visited California in 1946 and I find it of great interest, both for its technical content and the references to men I met during my visit. I look forward to receiving it in the future.

Yours truly,

J. F. T. BLOTT

County Roads

Humboldt Commissioner Discusses Increasing Problems of His Job

By JOHN DAVIS, Humboldt County Road Commissioner

FOR MANY years a popular subject of complaint has been the condition of county roads, not alone in Humboldt, but in many other counties in this State and others. We in Humboldt, along with Del Norte and Mendocino Counties, have problems which are quite similar in nature. First, our principal industry, logging; our mountainous terrain and climatic conditions involving a long rainy season.

Before condemning county officials responsible for maintenance of the road system, perhaps we should stop and consider some of the factors causing a deterioration of these roads, also the public demand for improved road alignment.

Many existing county roads are a product of a "Topsy grew" situation. Years ago, old trails were widened to accommodate the horse and wagon. As construction equipment was strictly limited to hand shovels, wheelbarrows and horse-drawn scrapers, it was not feasible nor economically justifiable to move large quantities of earth. Therefore, the least amount of earthwork moved governed the alignment and grade of the road. This naturally resulted in very crooked alignment in mountainous areas.

Early Travel Limited

With the advent of the motor car, these roads were further widened and a gravel or rock base added. Prior to 1940, traffic was limited mainly to light passenger cars, and with this relatively low traffic count, no serious problems arose except for the usual storm damage which occurred each winter.

The logging industry, prior to 1940, depended mainly upon their own railroads to move logs from the woods to sawmills, and very little use was made by them of the county road system. During the war period and the postwar era, there was an ever-increasing demand for lumber. It was to be expected that timber in the back areas would become profitable to cut if an economical means could be found to bring the logs in.

This transportation factor could only be met by hauling over existing roads with the new type of logging trucks developed during that period. The nation-wide demand for lumber and the many thousands of acres of timber in Humboldt County led to a healthy development. The population increased from 46,000 in 1940 to 77,000 in 1951.

Car Traffic Doubled

With an increase in wealth as well as population the number of passenger cars almost doubled from 16,000 to approximately 30,000. Trucks made a phenominal gain in that same period also; from a count of 1,756 to over 6,000. The ratio of passenger cars to trucks decreased from 9.3 to 1 to the present ratio of 4 to 1. This means that there is one truck for every five vehicles on the road today.

In light of these growth factors let us stop and think what effect this tremendous increase in traffic does to our lightly-surfaced, narrow road system. We all know that a heavily traveled road is subjected to a much greater wear and tear than one having a few cars a day. As a consequence many county roads experienced failures in the surfacing whether it be paved or graveled. Poor drainage, and continuous traffic during the rainy season wreaks havoc, causing pavement failures and resulting in numerous and deep chuck holes.

Road Funds Static

Unfortunately, during this growth in traffic, road funds did not increase in the same proportion. For instance in 1940, the road budget was $243,902, and in 1950, $573,888. From a first inspection one would say it appears that the money spent in 1950 was more than double 1940. However, let us consider that the 1940 dollar purchased 76 percent more goods than the 1950 dollars.

Let us multiply $240,200 by 1.76 which would equal $422,753 1950 dollars. This being the case, a simple arithmetic division would then give a very comparative figure.

Money spent per vehicle—1940, $422,753—18,039 vehicles, $23 each.

1950, $573,888—31,989 vehicles, $18 each.

Limited Road Funds

One can readily see that 10 years ago we had a higher amount to spend per vehicle than now. On these same roads, we have doubled the number of passenger cars and quadrupled the number of trucks with an increase in the number of miles of county road to maintain.

Owing to our limited road budget and with increasing costs in wages and materials, it has been necessary to reduce the number of men maintaining the road system during this 10-year period. This is directly opposite to what should have been done. In keeping with progress our manpower should have been doubled.

Let us consider our administration problems. Up until 1947 the county road system was divided into five districts with a supervisor in charge of each district having several foremen under his immediate supervision.

Following the enactment of the Collier-Burns Act in that same year road districts were consolidated under one department head, namely a road commissioner appointed by the board of supervisors; the board to determine policy and approve budget items, the commissioner to administer.

Need Two Assistants

In a county the size of Humboldt it is essential for good organization to have at least two assistants or general

foremen to properly supervise or coordinate the work. This is a reduction of two in administrative personnel compared to the old district organization.

With regard to road funds, the income to Humboldt County is obtained primarily from two sources. The first is from a proration of 1⅜ cents out of a total of 6½ cents gas tax among 58 counties. This proration is made upon a basis of the number of vehicles in Humboldt County compared with the State as a whole. A logging truck is given the same weight as a motor scooter when prorating the funds.

No provision is made for the fact that roads in Humboldt County are more expensive to construct owing to the terrain or to maintain owing to the long rainy season.

A breakdown of the 6½-cent gas tax shows the following: counties, 1⅜ cents; cities ⅛ cents; state highway, 2½ cents; Federal Government, 2 cents.

Forty-cent Limit

From property taxes there is a 40-cent statutory limitation placed upon the amount allocated for road funds. This amount cannot be increased without a change in the state statutes as local control cannot make this change. This means that the road department is limited to 5½ cents to 7 cents out of each county tax dollar collected.

When one considers the low assessed valuation of Humboldt County as compared to its real present-day value it is apparent that this source would not supply very much in the way of funds. Let us compare this average of 6 percent with the figure of 40 percent to 50 percent now going for school funds, 12 percent to 13 percent for the county hospital, and approximately 9 percent for relief. One can easily realize that a very small portion of county taxes are being used for road purposes.

Surfacing Costly

Paving costs, exclusive of grading and widening, amount to approximately $6,000 per mile for a six-inch base with seal coat, and approximately $11,000 per mile for a plant-mixed bituminous surfacing.

From these figures, one may readily observe that with a limited budget it is impossible to show any great improvement in alignment, widening or surfacing.

As traffic continues to grow and costs spiral higher with inflation, the amount of actual road maintenance will perhaps decrease. This condition will naturally present a very difficult problem for those in charge of the road department and the board of supervisors.

What steps then might be taken to alleviate this condition? We might consider a possible revision of the Collier-Burns formula giving consideration to the type of traffic, the mountainous terrain and the long rainy season or we might do what other states and counties have done in solving similar problems.

Revise Tax Limit?

This could be done by a possible revision in the 40-cent limitation on property taxes allowing an increase in percentage for road funds or a severance tax or special license fee for those using the roads for commercial purposes based on the number of ton-miles hauled.

. . . Continued on page 51

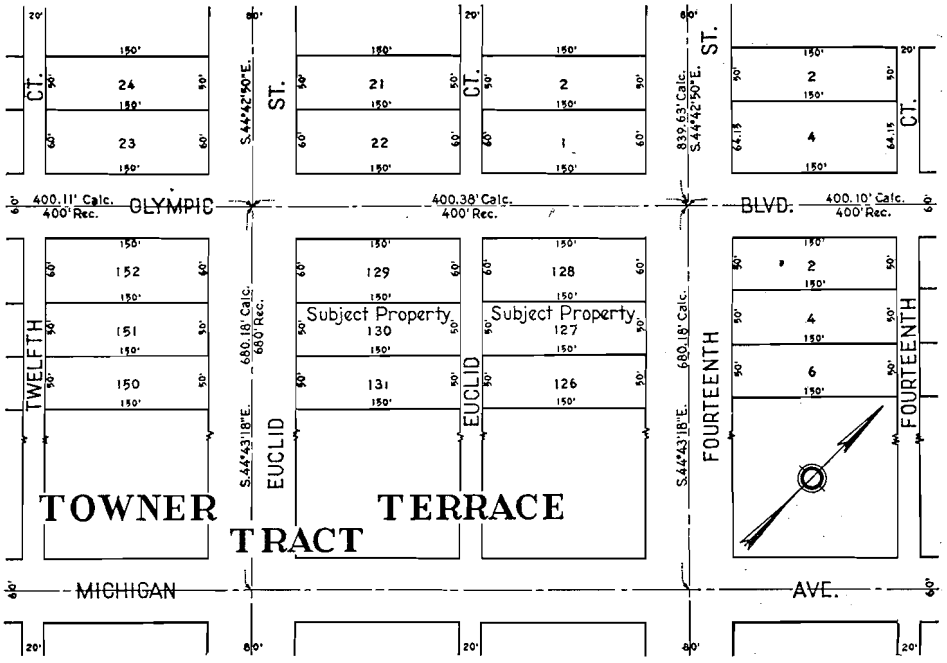
This is type of logging traffic to which Mr. Davis refers

State Victory

Supreme Court Decision Landmark In Litigation Involving Freeways

THE CASE of *Schnider* v. *State of California*, 38 A. C. 492, decided by the California Supreme Court on February 21, 1952, should be of interest to all those concerned with the law applicable to freeways. This case holds specifically that the mere construction of a freeway pursuant to a resolution of the California Highway Commission authorizing the reconstruction of a portion of a highway as a freeway does not create new rights of access in favor of land which did not abut on the highway as it formerly existed.

In the *Schnider* case, plaintiffs brought an inverse condemnation proceeding against the State of California to recover damages for the taking of a claimed right of access to Olympic Boulevard, State Highway Route 173, in the City of Santa Monica. In 1945, the California Highway Commission adopted a resolution authorizing the reconstruction of a portion of Olympic Boulevard as a limited freeway. The location of plaintiffs' property in relation to the surrounding area as it appeared prior to the reconstruction of Olympic Boulevard is shown by the accompanying map.



Case of Plaintiffs

In 1947, plaintiffs purchased Lots 127 and 130 which did not abut on Olympic Boulevard until it was subsequently widened for use as a freeway. Prior to that time, Lots 128 and 129, which were acquired by the State from other persons for highway purposes, intervened between plaintiffs' property and Olympic Boulevard. The construction of the freeway was commenced by March 1, 1948, and sometime thereafter the State erected a fence along the common boundary line between plaintiffs' property and the freeway, thereby barring direct access from one to the other.

Plaintiffs obtained a judgment for damages due to a change of grade but the trial court refused to allow plaintiffs compensation for the loss of asserted right of direct access to Olympic Boulevard. From this latter portion of the judgment the plaintiffs appealed.

The sole issue before the court was whether the plaintiffs acquired a right of direct access as a result of the construction of the freeway.

Findings of Court

At the outset of its opinion, the court finds that it is clear from the record that there was no right of direct access to Olympic Boulevard from plaintiffs' Lots 127 and 130 when the resolution of the California Highway Commission was adopted and that such a right did not arise upon the acquisition of the intervening property by the State for highway purposes.

The court finds, in Sections 100.1, 100.2 and 100.3 of the Streets and Highways Code, ample authorization for the construction of a freeway on land where none had existed before without creating rights of direct access in favor of other property which, prior to the new construction, had no such rights of access. In particular, the court points out that the provision of Section 100.3 of the Streets and Highways Code that a declaration creating a freeway "shall not affect private property rights of access, and any such rights taken or damaged within the meaning of Article I, Section 14, of the State Constitution * * * shall be acquired in a manner provided by law," plainly refers to rights of access which exist prior to the establishment of the freeway and not to claimed rights which have no previous existence and which could come into being, if at all, only by virtue of the new construction.

Highway Commission Upheld

As the court states in this regard:

"Where a property owner has no right of direct access to a highway before it is converted into a freeway abutting upon his property, nothing is taken from him by the failure to give him such a right when the conversion takes place. The allowance of compensation in such a case would amount to a gift rather than payment for the destruction of a right."

The court finds that the resolution adopted by the California Highway Commission in 1945 fully complied with the applicable provisions of the Streets and Highways Code and effectively designated Olympic Boulevard

. . . Continued on page 60

Edwin L. Carty New President Safety Council

Edwin L. Carty was elected President of the California Safety Council at the 17th annual state-wide meeting of the accident prevention group in Los Angeles, which saw more than 60 civic and industrial leaders from all areas of the State installed as officers and directors.

"Accidents affect everybody's pocketbook," Carty warned, "since hospitalization of thousands of traffic casualties, increased law enforcement, and higher insurance rates to offset property damage, nick the dollar of the farmer as well as the city man and the salary man as well as the wage earner."

Carty recommended (1) a sharply increased highway construction program to meet California motorists' accelerating demands for more adequate highways and freeways in which all frills may be eliminated; (2) an expanded highway patrol to control traffic flow and properly enforce existing motor vehicle regulations, and (3) widespread training of high school students in the rudiments of skillful driving.

Vice presidents named to serve with Carty for the coming year are Harry Conklin, Vice President, Loyalty Group Insurance; Superior Judge Daniel R. Shoemaker, and Attorney Henry Robinson, all of San Francisco; Dr. Robert Gordon Sproul, President University of California, Berkeley; O. L. Gray, Manager, Santa Fe Railway; Henry L. Gogerty, Architect; Robert A. Moffitt, Attorney; George Worster, Yellow Cab Company President; and Charles C. Reed, inheritance tax appraiser; and of Los Angeles; George A. Scott, San Diego department store executive; and J. D. Grant, Stockton Iron Works.

Re-elected as general counsel was Bernard C. Brennan, a former safety council president. Aaron Riche, also of Los Angeles, was renamed secretary-treasurer. Forty-five directors were also installed at the safety council meeting.

In Memoriam

MICHAEL G. GLEN

Members of the Materials Laboratories at Headquarters and employees of District VIII, were saddened by the death of Michael Gabriel Glen, who passed away in San Bernardino, January 13, 1952, after an illness of seven weeks.

"Mike," as he was affectionately called, was head of District VIII Materials Laboratory, a very competent man in the field of materials research and an interesting and patient teacher of those under his direction.

He was born in Rostov-on-Don, Russia, on September 30, 1899. He received his elementary and high school education at the Tomsk Institute of Technology, Tomsk, Siberia, but was forced to flee to Harbin, China, by the Russian Revolution. In 1923 he came to California with a group of White Russian students. He won scholarships to the Redlands and Pomona Colleges and later transferred to the University of California in order to major in engineering. He graduated in May, 1927.

His first engineering job was on the San Mateo Bay Bridge. In November, 1928, upon completion of the bridge, he went to work for the California Division of Highways, in District VIII, where he served until his death. He became very interested in the materials and research phase of highway engineering early in his career, and organized and set up the testing laboratory for District VIII.

He is survived by his mother, Mrs. Agrippina Gollandskova, and an aunt in Harbin, China; his wife, Florence; and two children, Barbara and Michael.

HIGHWAY DANGER SPOTS

Stay in your own lane on hills and curves and observe the markings on the highway. That's *protective driving*, and it means you'll help avoid a collision with oncoming cars by watching for the danger spots and observing the highway markings that are placed there for your protection.

W. A. S. H. O. Will Meet in June in Seattle

W. A. Bugge, Director of Highways for the State of Washington and President of the Western Association of State Highway Officials, has announced that the Thirty-First Annual Conference of the Western Association of State Highway Officials will be held in Seattle, Washington, at the Olympic Hotel, on June 5, 6, and 7, 1952.

The conference headquarters will be at the Olympic Hotel in Seattle. A sufficient number of rooms have been reserved at the headquarters hotel, and other hotels close to the Olympic have assured us that they will have rooms available for those not desiring to stay at the headquarters hotel. There are four Western Hotels in Seattle for those desiring to utilize their credit cards.

Detailed plans indicate that a most beneficial and enjoyable three days will accrue to the conferees which will include a yacht trip through Lakes Washington and Union, the canal and government locks, Agate Pass Bridge, Puget Sound Naval Shipyard and the Narrows Bridge, ending in a grand smorgasbord at a unique waterfront club in Tacoma.

The formal prereservation plans will be sent delegates the latter part of April W. C. Pedersen, General Chairman, has sent this notice to W. A. S. H. O. members:

"The City of Seattle is celebrating its centennial, and many special events are planned for that week. Whether your hobby be fishing, swimming, mountain climbing—come equipped, for you will find the recreation of your choice in this exhilarating Puget Sound area.

"A special program of interest to the ladies is now being arranged, so make your plans—warn the wife and bring the kids! We are looking forward to entertaining you and making you a part of our third largest industry —tourism."

Of the 4,000 miles of California state highway from which snow is removed each year, only 550 are kept open primarily for recreational traffic.

Concrete Paving

Calcium Chloride Admixture Expedites Opening Pavement to Traffic

By CARL ALZUETA, Assistant Engineer, Construction Department

A SECTION of portland cement concrete pavement was recently treated with calcium chloride on Contract 1-10TC62-F, Sol-7, 8-H,B,A, to accelerate the early strength. From results obtained it appears that this admixture will, in many cases, expedite the opening of the pavement to traffic and is adaptable to the California method of finishing pavement concrete.

Our current specifications and instructions provide that high early strength concrete be obtained by adding two extra sacks of cement to the regular five-sack pavement concrete. Occasionally, because of improper balancing of the ratio of water to cement in the richer mixes, the desired early strength was not obtained. Through the use of small percentages * of calcium chloride, comparable strengths to that obtained from properly designed seven-sack concrete are possible at about one-fifth the additional cost. In addition, the concrete treated with calcium chloride will exhibit lower shrinkage than that characteristic of the richer mixtures.

* 1 to 2 percent by weight of the cement.

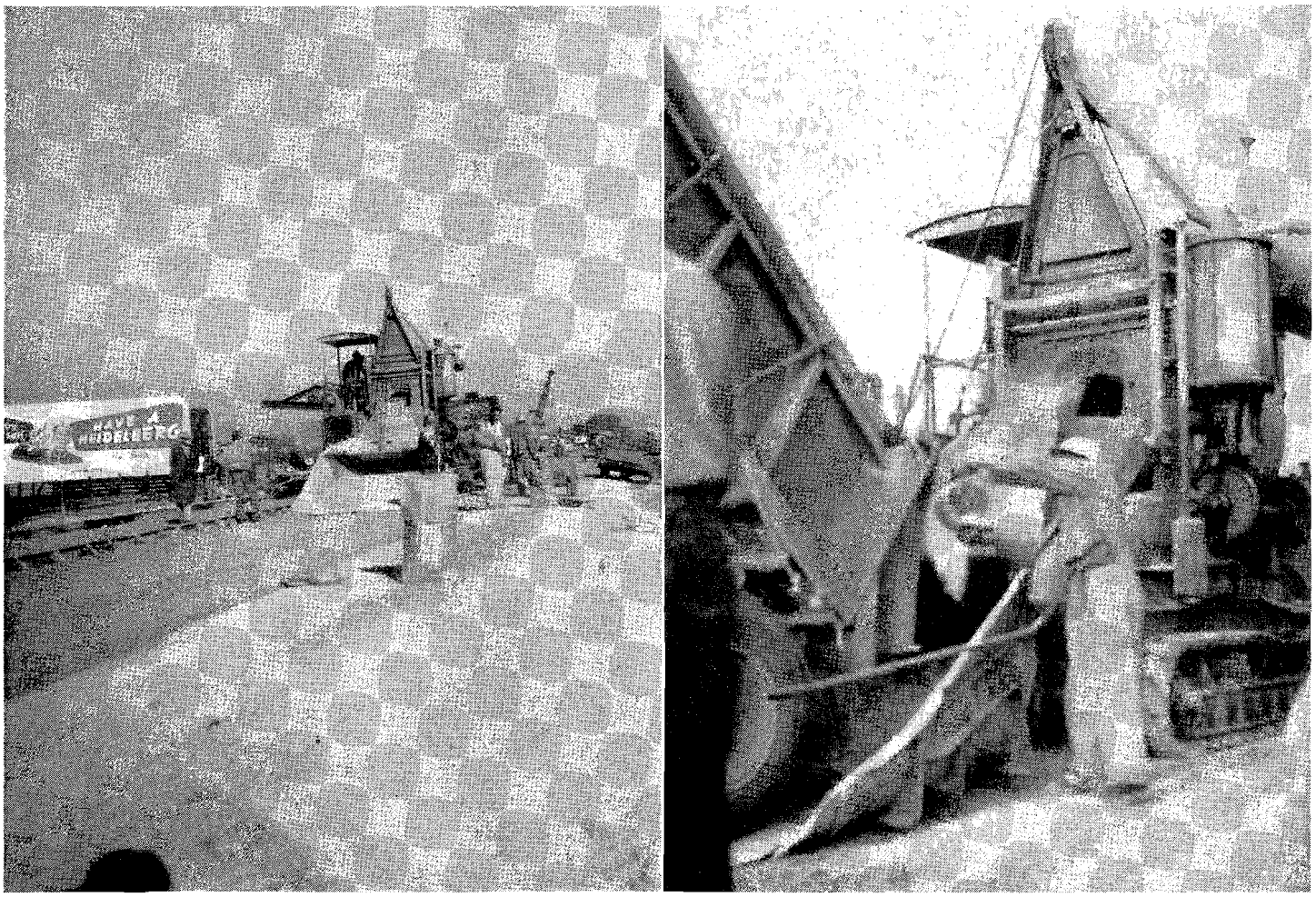
Construction Procedure

Flaked calcium chloride was delivered to the job in 100-pound moisture-proof sacks, and spotted at regular intervals on the grade. The admixture was proportioned by filling calibrated containers and added to each batch at the skip. No adjustment in the mixing water was necessary to maintain equal workability.

Since the chemical is an effective accelerator, several minor adjustments may be necessary at times in the normal

. . . Continued on page 32

LEFT—Bags of flaked calcium chloride spotted on the grade. RIGHT—Adding flaked calcium chloride to the mix.



Great Builder

John Hunt Skeggs Leaves Many Monuments Upon Retirement

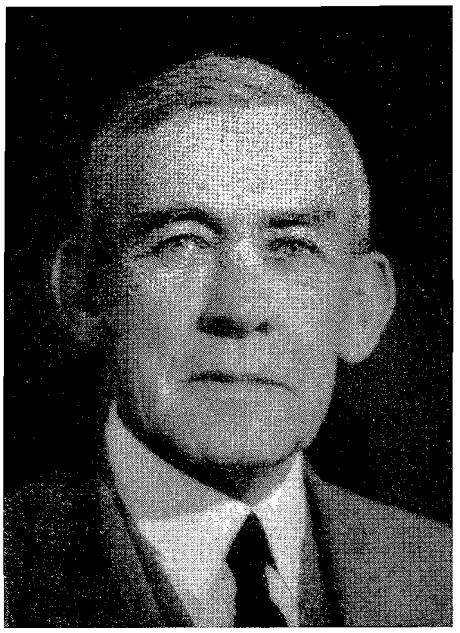
In the fitting surroundings of old and substantial San Francisco, the friends and associates of Colonel Jno. H. Skeggs gathered at the Fairmont Hotel on March 29, 1952, to render full and richly deserved honors on the occasion of his retirement from state service. Among the several hundred who paid tribute to his career of leadership and achievement were government officials, civic leaders, outstanding builders of public works, and those with whom he was associated in the creation of the California Highway System.

Colonel Skeggs' state career in highway engineering began in 1919 when he accepted an appointment as assistant Division Engineer, Division IV, the predecessor of the present District IV. After being assigned as Acting Division Engineer on July 15, 1921, he succeeded W. Lewis Clark as Division Engineer on the first day of October in the same year. From that date and until the present he has guided the district through the full scope of its labors and accomplishments. While his titles have changed through the classifications of principal highway engineer and metropolitan area highway engineer he has remained for 31 years at the helm of highway development and progress in the vital areas of Central-Coastal California.

Born in Alabama

John Hunt Skeggs was born in Sommerville, Morgan County, Alabama, on March 16, 1882, one of six children in the family of William E. and Celia E. (Bean) Skeggs. The families on both sides were early settlers of the colonies, being among those agriculturists who seasonally drove their livestock from Virginia and the Carolinas to the more favorable forage of the far south. As the gulf lands were thus opened the families settled in the vicinity of the present Huntsville, Alabama, named in honor of one of his forebears.

With such antecedents it followed that Judge Skeggs' children were



COL. JNO. H. SKEGGS

reared in the traditions of the old south. To this day John Skeggs' early training is quite visible except for his departure from the soft southern manner of speech. The seeds of his pre-eminent devotion to honor and integrity were sown in this land of his early youth.

Takes Up Engineering

After completing his primary education in the public schools of Decatur, Alabama, he entered Alabama Polytechnic Institute, probably better known in California as Auburn. In the language of our more familiar pattern of higher education, Auburn administrates the Colleges of Agriculture and Mechanics while the Liberal Arts and allied colleges are centered in Tuscaloosa.

Since there was no background of engineering in his family, one wonders at the colonel's selection of the civil course. He recalls that in his younger days he was committed to the responsibility of managing his own future and, enjoying the out-of-doors, the activities of a civil engineer appealed to him. Moreover, having stumbled over the many survey stakes which dotted the campus, he decided to leave a few monuments to his own residence.

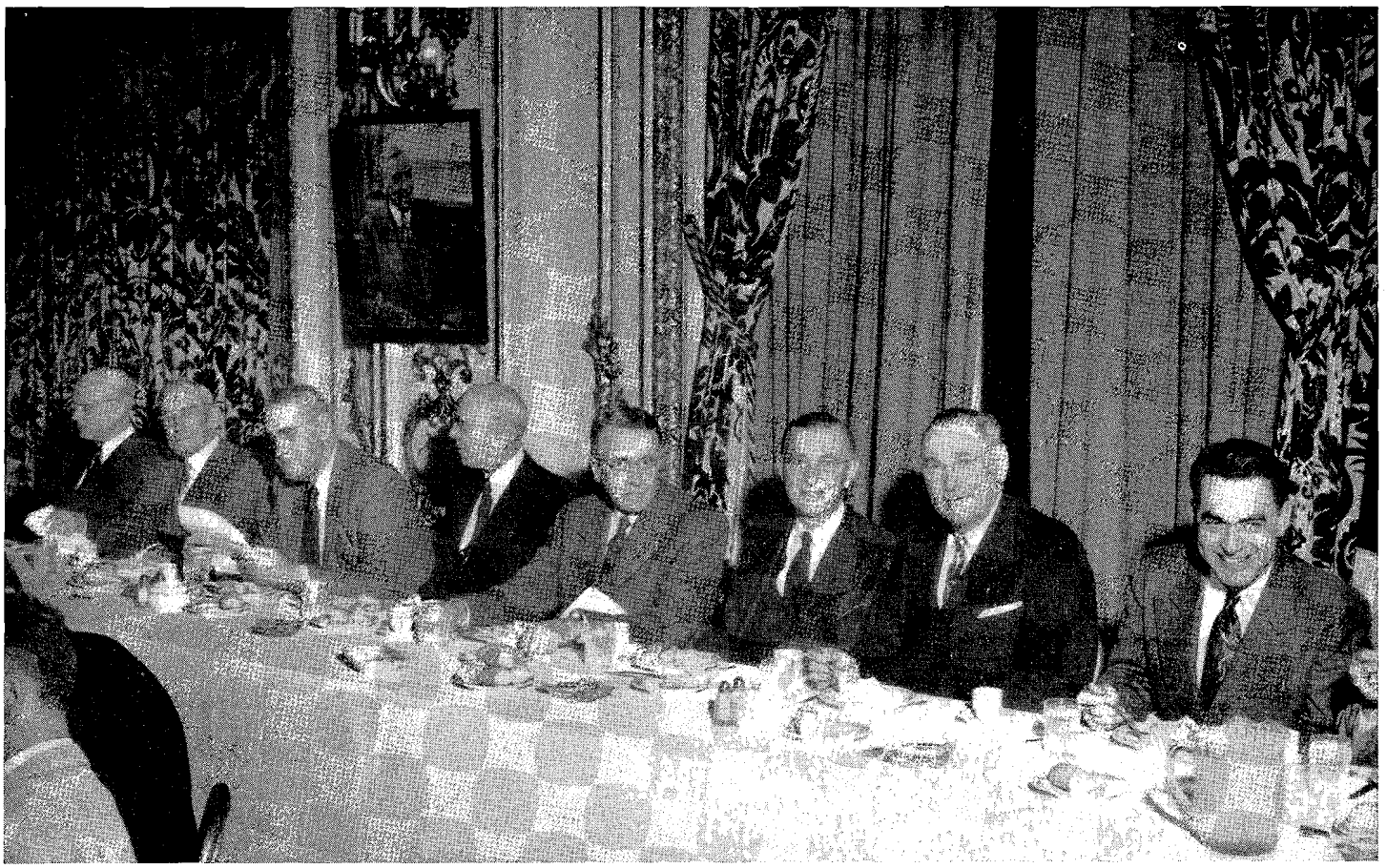
As a student, his athletic interest lay in football. John Skeggs is unique in that he submits no claim to All-American selection, preferring to recall that the varsities of the nineties were expected to be students as well as athletes, and it is pleasant to note that he graduated with honors. He still follows the fortunes of the Orange and Blue, quite actively too, for he was largely responsible for the Santa Clara-Auburn game of 1936.

After graduation he joined the Alabama Railway forces as a topographer on preliminary and location surveys. Leaving this work he became a tax expert with the Alabama Title Guarantee Company, the only interlude in his long career of civil engineering.

On Los Angeles Aqueduct

The year 1903 found him returned to engineering and far from his native Alabama. For five long years he mounted the slow steps to chief-of-party with the Pacific Electric Company of Los Angeles. After a brief period of titular splendor as City Engineer of Covina, opportunities came in the building of the Los Angeles Aqueduct through Inyo and Kern Counties. Of all his early experience this task seems to have afforded him his greatest opportunity for young adventure. While it may be that the hardships of this pioneer endeavor have grown in stature through the years, Colonel Skeggs can always trump any leisure hour story of early engineering by reciting one of his own adventures on the aqueduct.

At the conclusion of this project, in 1909, he assumed the duties of Deputy County Surveyor of Los Angeles County, and for five years remained in charge of field work on road and bridge location as well as construction. In this assignment he met many of his future associates, notably Spencer V.



Speakers' table at dinner tendered Col. Skeggs. LEFT TO RIGHT—Director of Public Works Frank B. Durkee, Col. Skeggs, State Highway Engineer Geo. T. McCoy, Assistant State Highway Engineer B. W. Booker, Deputy State Highway Engineer R. M. Gillis, Fred Grumm, retired deputy state highway engineer, Ray Duffy, assistant district engineer, District Highway Engineer L. A. Weymouth.

Cortelyou, whose career with the Division of Highways closely paralleled his own in its magnitude and responsibility.

Goes to War

His next position was with the Los Angeles County Road Department where he doubled as Construction Engineer and Maintenance Engineer. A brief interlude with the U. S. Bureau of Public Roads brings his career to 1917, the year of the first World War. Colonel Skeggs immediately entered the military service as a Captain in the Corps of Engineers, U. S. Army. Through the rank of major and later lieutenant-colonel he participated in the memorable Saint-Mihiel and Meuse-Argonne offensives.

Returning to civil life at the conclusion of the war, John Skeggs entered the service of the State of California, beginning a career which was to leave its provident marks on the face of California in the form of highways, developed and constructed in a manner which has brought to him the highest honors of his profession.

Notable Achievements

To record the eminent achievements of Colonel Skeggs during the 31 years of his administration would be to recite the history of the district. The projects conceived and executed have materially affected the life and activity of the metropolitan area surrounding San Francisco Bay. Lines of communication which he created have determined many of the present centers of population, and have opened new horizons of better and more comfortable living to countless thousands.

Confronting him in his first years of responsibility was the lack of approach from the only land connection to the city of San Francisco. The old two-lane El Camino Real, which followed the route of the early Spanish explorers, had become saturated with the growing automobile traffic. Surveys had started on the present Route 55, the Skyline Boulevard, in 1919, and he immediately devoted his energies toward its completion. By 1928 it had carved its way on the face of the ridge running southerly and parallel to the coast, to the point known as Saratoga Gap. The colonel's interest in this job and his vigorous leadership towards its early and successful completion are pleasingly commemorated in the naming of Skeggs Point, a beautiful turnout which presents a full panorama of the land which the Skyline serves.

Birth of Freeways

To further relieve the situation, Route 68, the Bayshore Highway, was conceived, and is now becoming one of the foremost freeways in the country. Realignment and widening of El Camino Real came into being, and it is interesting and significant to note that the section near Colma foretold the

coming era of divided highways. In all his early building Colonel Skeggs, with the then limited means at hand, sought to control access to his creations. While the word "freeway" was unknown his foresight in restricting entry became the essence of modern freeway construction.

One of the most noteworthy of his engineering accomplishments was the treatment of the Valona Slide. This seemingly uncontrollable movement harried the southern approach to the Carquinez Bridge, at the same time interfering with the mainline railroad at its base. The problem called for original thinking, and in cooperation with the railroad engineers a complex system of subterranean drainage was evolved. He devised the huge surface of interlocked and independently anchored concrete slabs which cover the face of the huge cliff above, diverting the lubricant which actuated the slide. The cliff is now reminiscent of the watersheds of old Gibraltar supporting that waterless and isolated peninsula.

Some of His Projects

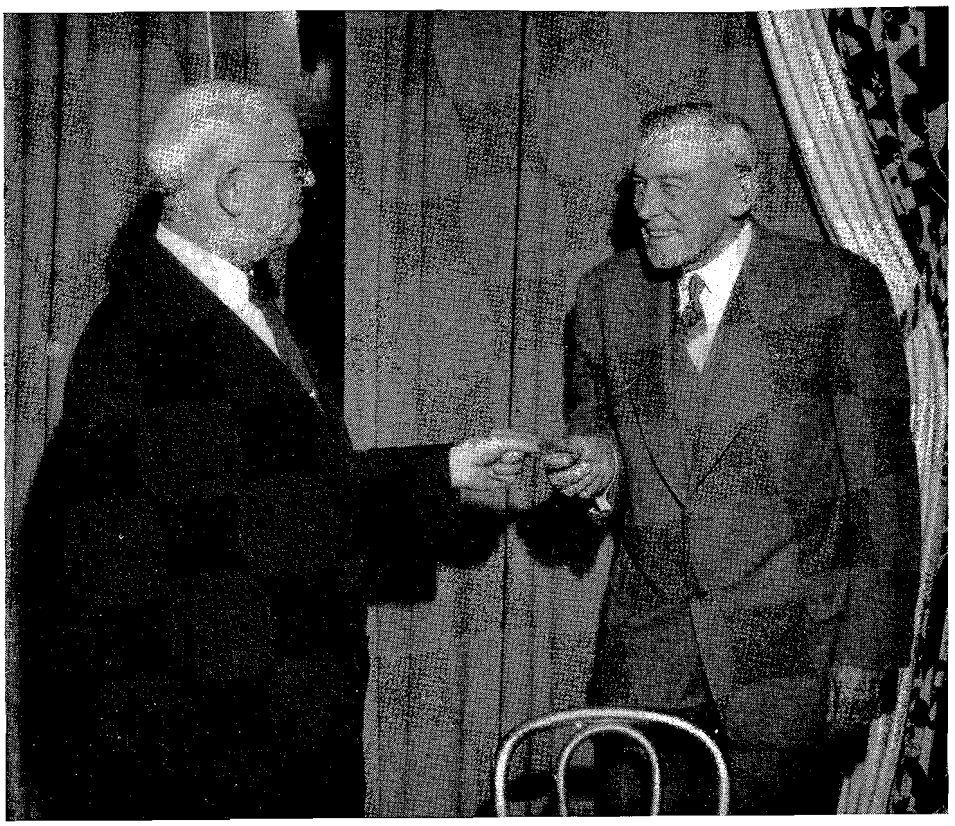
Noteworthy also in his achievements were the replacing of the Pacheco Pass wagon trails, and the Altamont realignment, opening the way for the coming flood of wheels from and to the South and East. Here John Skeggs conceived and developed the process of dust oiling, adding immeasurably to the comfort of drivers and roadside inhabitants.

Perhaps one of the most pleasant accomplishments in the minds of thousands who yearly visit the vacation area of Santa Cruz, was the rebuilding of the Los Gatos-Santa Cruz Highway. Those who followed the old bumper to bumper trail through Holy City many times have had occasion to thank those who brought it into being. In more recent years and close to this area, Colonel Skeggs was first able to put teeth into his plan of controlled access on the Watsonville-Rob Roy section of Coast Route 1.

Monuments to Col. Skeggs

It would be difficult to select any one of his accomplishments to serve as a lasting monument to his generation of outstanding engineering achievements. Each one had its own importance, varying only in the purpose which it served. However, with respect to magnitude and endurance, and to its impact upon the manifest destiny of this Bay area, the location and construction of the approaches to the San Francisco-Oakland Bay Bridge and the Golden Gate Bridge, linked as they are to the Eastshore Freeway, Waldo and 19th Avenue, will make forever memorable the career of John H. Skeggs. The results of his work are countless and endless. Opening the Lake County recreation area with the road from Calistoga north, the Russian River realignment from Cloverdale to Hopland, McDonald to the Sea, the elimination of the Corte Madera grade, are but a few of the projects which have left their imprint on transportation in this area.

One might summarize the lasting contributions he has made to highway engineering by recalling (1) the three major tunnels in the district, Broadway Low Level, Waldo, and Funston; (2) his pioneering in the field of divided highways and center-striping; (3) his unending and successful battle to control access rights and, (4) the 1,300 miles of outstanding state highways in this district, all of which were built or rebuilt under his direction.



Col. Skeggs, right, receives from his successor, B. W. Booker, keys to auto presented to him as parting gift

In completing his tasks with the Division of Highways it must be a source of pleasant satisfaction for him to recall the division office in its few small rooms in the Rialto Building, and its growth through the phases of the Flood Building, the State Building, the Headquarters at Van Ness and Jackson, and finally the present building, planned to meet the needs of an operations and design force of 750 men and women. Colonel Skeggs gave careful attention to its functional design and construction, determined that these quarters would reflect the wisdom of so many years of administration. The building now stands as a beautiful landmark representing progress in the field of transportation during this first half of the century.

USING THE HAND BRAKE

In freezing wet weather the use of the emergency brake is not advisable when parking because it may freeze and then cannot be released. Use the car's gears as a parking brake and turn the wheels into the curb on hills.

B. W. Booker

APPOINTMENT of B. W. Booker as Assistant State Highway Engineer in charge of the District IV office of the Division of Highways in San Francisco was announced by State Highway Engineer George T. McCoy, effective on the retirement of Jno. H. Skeggs on April 1, 1952.

The last 10 years of Mr. Booker's 30 years of service with the Division of Highways have been spent in the San Francisco office, as Assistant District Engineer and, beginning October 3, 1947, as District Engineer.

A native of Topeka, Kansas, Mr. Booker moved to San Francisco as a boy and took his civil engineering studies at the University of California. After several years of varied experience with the Southern Pacific, the San Francisco Harbor Commission and the Interstate Commerce Commission, he joined the State Highway organization in October, 1921, as a draftsman. His first assignment was to a survey party in Lake County.

He served as office engineer, locating engineer and construction engineer in four different districts of Northern and Central California before his assignment to District IV in 1942.

During his career with the Division of Highways, Mr. Booker has had responsibility for surveys, design, construction, maintenance and administration in many different areas of the State. In particular, he has had considerable experience in slide and slip-out correction work in heavy construction areas.

He has been responsible for much of the planning of metropolitan freeways and bridge approaches in the San Francisco Bay Area. He was responsible for the compilation of the Preliminary Traffic Report on Proposed San Francisco Bay Crossings and the San Francisco Metropolitan Bay Area Traffic Report.

The snow-removal season on California state highways runs from October until the opening of the higher mountain passes in June.

B. W. BOOKER

JOSEPH P. SINCLAIR

SHOWING OFF

The next time you feel the urge to show off when behind the wheel of a car, warns the National Automobile Club, remember that it takes but a split second, but a panic-stricken moment of confusion, to switch from spectacular driving to spectacular death.

Joseph P. Sinclair

JOSEPH P. SINCLAIR was born January 23, 1920, in Minneapolis, Minnesota, and received his schooling in the Los Angeles area. He graduated in 1932 from the University of Southern California, receiving a Bachelor of Science Degree in Civil Engineering.

Mr. Sinclair entered state service in July, 1932, as a Junior Engineering Field Aid with District VII at Los Angeles, and was assigned to surveys in the San Diego area.

In April of 1933, Mr. Sinclair left state service to accept employment with the Los Angeles Metropolitan Water District, with headquarters at Banning, California, where he was employed on construction of the Los Angeles aqueduct.

In October of 1933, two months after District XI was formed with headquarters in San Diego, Mr. Sinclair returned to state service and remained with that district until January 1, 1950. During that period he received wide experience in design, city and county cooperative projects, laboratory, maintenance, project reports, and budget fields. In the last 10 years with District XI, Mr. Sinclair served as Assistant District Maintenance Engineer, Project and Budget Engineer, and Design Engineer.

From 1943 until the end of 1945, Mr. Sinclair was an officer in the U. S. Navy, serving with a naval construction battalion as executive officer in charge of construction of bases in the western Pacific. He was released from active duty with the rank of Lieutenant Commander in December, 1945.

In January, 1950, Mr. Sinclair was promoted to Assistant District Engineer—Design-in District VII, and he has served in that capacity until named to succeed Mr. Booker in District IV. This assignment has included supervision of freeway design in the Los Angeles Metropolitan Area, as well as varied types of construction in the Ventura County section.

Montgomery

Continued from page 27 . . .

In December of 1912, Monty was assigned to Construction as Assistant Resident Engineer. He was promoted in 1917 to Resident Engineer and stationed at Pine Valley in San Diego County. Monty served as Resident Engineer with the Construction Department until 1947, when he was made Field Supervisor over many Resident Engineers. In this capacity he patiently passed on to young engineers the benefit of his many years of highway engineering exerience.

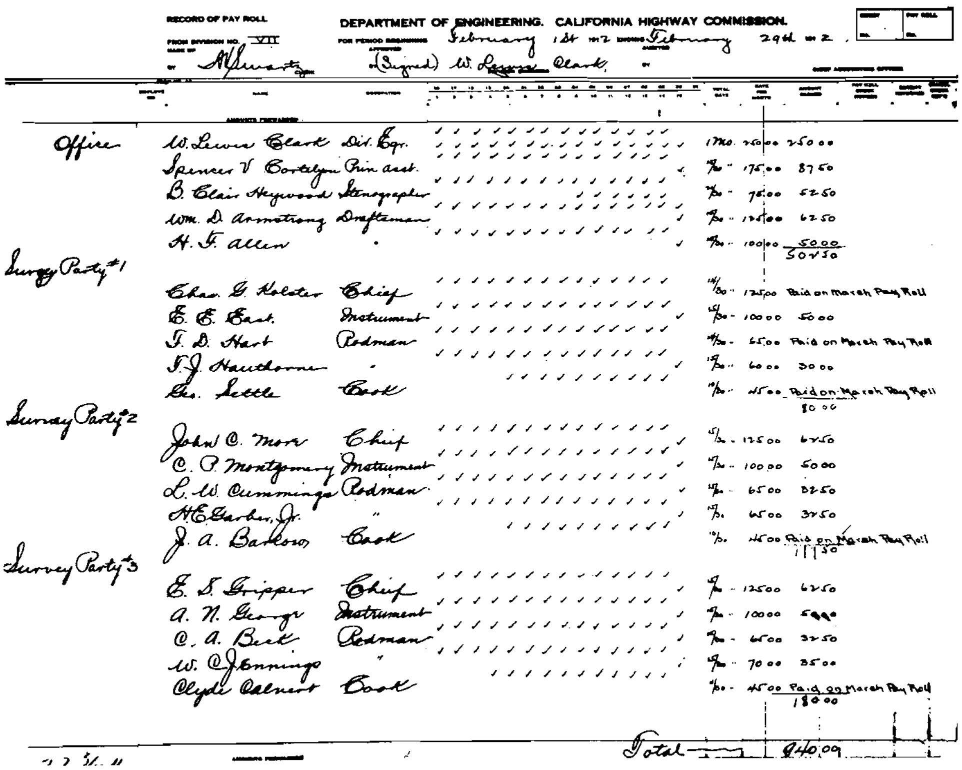
Truly, Monty and District VII have "grown up" together. They saw two-lane highways in Southern California expand into the vast network of multimillion dollar freeways which are described in this issue by P. O. Harding.

Peterson

Continued from page 27 . . .

Pete served as Assistant Resident Engineer and Resident Engineer on state highway paving contracts. His long experience in highway construction work made him one of the State's foremost asphalt paving hot plant experts. Although the 10 years preceding his retirement were largely spent in the district office, he frequently was called on to aid in getting asphalt concrete paving jobs under way.

In the 23 years Pete has been in District VII, most of the time in the Construction Department, his friendly disposition and dry wit have made him a host of friends who hope his retirement will be a long and pleasant one.



RECORD OF PAY ROLL — DEPARTMENT OF ENGINEERING. CALIFORNIA HIGHWAY COMMISSION.

From Division No. VII — For period beginning February 1st 1912 ending February 29th 1912.

(Signed) W. Lewis Clark

	Name	Occupation		Rate	Amount
Office	W. Lewis Clark	Dist. Engr.	1 Mo.	250 00	250 00
	Spencer V Cortelyou	Prin asst.	15/30	175 00	87 50
	B. Clair Heywood	Stenographer	15/30	75 00	52 50
	Wm. D. Armstrong	Draftsman	15/30	125 00	62 50
	H. F. Allen	"	15/30	100 00	50 00
					502 50
Survey Party #1	Chas. G. Kolster	Chief	14/30	125 00	Paid on March Pay Roll
	E. E. East.	Instrument	15/30	100 00	50 00
	F. D. Hart	Rodman	14/30	65 00	Paid on March Pay Roll
	T. J. Hawthorne	"	15/30	60 00	30 00
	Geo. Settle	Cook	10/30	45 00	Paid on March Pay Roll
					80 00
Survey Party #2	John C. More	Chief	15/30	125 00	62 50
	C. P. Montgomery	Instrument	15/30	100 00	50 00
	L. W. Cummings	Rodman	15/30	65 00	32 50
	H. E. Garber, Jr.	"	15/30	65 00	32 50
	J. A. Barlow	Cook	10/30	45 00	Paid on March Pay Roll
					177 50
Survey Party #3	E. S. Gripper	Chief	15/30	125 00	62 50
	A. N. George	Instrument	15/30	100 00	50 00
	C. A. Best	Rodman	15/30	65 00	32 50
	W. C. Jennings	"	15/30	70 00	35 00
	Clyde Calvert	Cook	10/30	45 00	Paid on March Pay Roll
					180 00
			Total		940 00

Seitz

Continued from page 27 . . .

in asphaltic surfacing. For some time Slim's bump marker was standard equipment on most asphaltic concrete paving jobs in the district.

Slim's interest in mechanics and gadgets promises to keep him pleasantly and actively employed during his retirement.

GREAT ENGINEERING EXHIBIT TO MARK CENTENNIAL EVENT

With the American Society of Civil Engineers spearheading the plans, it is anticipated that 25,000 engineers of all branches, representing 51 American and foreign engineering societies, will meet at the 11-day Centennial of Engineering in Chicago, September 3 to 13, 1952.

Charles E. Thorp

CHARLES E. THORP, Purchasing and Requisition Clerk, of the Division of Highways, Service and Supply Department, retired on April 1 after 34 years of state service, 32 of which have been with the Division of Highways.

CHARLES E. THORP

Mr. Thorp was born in Lancashire, England, and was induced to visit California by his uncle, who was then President of Weinstock, Lubin and Company in Sacramento. Mr. Thorp was properly initiated to California by being in San Francisco at the time of the big earthquake in 1906.

He first started work as a draftsman with the Department of Engineering, but in 1920 transferred to the Purchasing Department of the California Highway Commission, which was then in the Forum Building, Sacramento.

Mr. Thorp soon became Purchasing Agent Grade III and General Buyer Grade 4, and was appointed Assistant Purchasing Agent, under Lowell R. Smith, of the California Highway Commission. Mr. Austin B. Fletcher was at that time the State Highway Engineer. Prior to 1927, the Division of Highways was purchasing $2,000,000 worth of materials annually as compared with $5,500,000 purchased for the entire State, not including highways.

In 1926, all state purchasing was centralized under the Department of Finance, and Mr. Thorp was reclassified as a Purchasing and Requisition Clerk for the Division of Highways, and has held that title since 1927.

After retirement, Mr. Thorp plans some extensive gardening, taking care of his many camelias and azaleas as well as his beautiful rose garden.

He and Mrs. Thorp plan to do some traveling and hope to go to Yellowstone Park, and points east, west, north and south.

Thomas J. Whalen

On January 1, 1952, Thomas Joseph Whalen retired after thirty years of faithful service with the Division of Highways, Maintenance Department in District V. He was born in Castroville, California, November 1, 1891, where he received his formal education. Between 1908 and 1915 he was employed on ranches near Castroville, Monterey and Gonzales, and from 1915 to 1918 was a hotel proprietor at San Lucas. He served with the A. E. F. in France during World War I. He began work with the Division of Highways in 1919 as laborer-teamster in the Maintenance Department in Monterey County. In 1920 he was promoted to sub-foreman and later the same year to foreman which position he held until retirement.

THOMAS J. WHALEN

Mr. Whalen was employed continuously in the Maintenance Department in District V with the exception of two years in 1943 to 1945 when illness prevented his working. From 1945 to date of retirement, he was located in the Cuyama area in Santa Barbara County.

Mr. Whalen was especially popular with the men under his supervision. He was very methodical and neat in all of his work and maintained warehouses and yards under his supervision in a very orderly manner. He was very expert in placing emulsion patches and seal coats, being considered one of the best men in the State on this work.

Mr. Whalen has two married daughters. One lives at King City and one at Soledad. Mr. Whalen and his wife, Mrs. Edith M. Whalen, are making their home at King City.

During an ordinary winter, the California Division of Highways clears snow from some 4,000 miles of state highway at an average cost of $1,500,000.

Lloyd A. Batham

On February 29, 1952, Lloyd A. Batham, Associate Highway Engineer with the Division of Highways, District IV, retired after 38 years of State service.

Mr. Batham started his engineering career in 1905 as chainman for the City of Chico. After leaving the city position in 1909, he was an engineer for the Richvale Land Company and the Sierra Electric Power Company, and in 1910 returned to Chico as Assistant City Engineer. Working until 1912 in that position, he accepted employment with the Northern Electric Railroad Company as Assistant Engineer. After two years in railroading, he went to work for the California Highway Commission in 1914, the Division of Highways not being in existence at that time.

LLOYD A. BATHAM

His first assignment was in Headquarters Office as a draftsman, at which position he worked until 1918, when he transferred to Division IV office in San Francisco. After a short time, he was appointed chief draftsman, working under the direction of W. Lewis Clark, Division Engineer, who was succeeded in 1921 by Jno. H. Skeggs, later District Engineer and Assistant State Highway Engineer. Mr. Batham served as chief draftsman for 24 years and in 1942 was appointed Assistant District Planning Engineer, a position he held until his retirement on February 29, 1952.

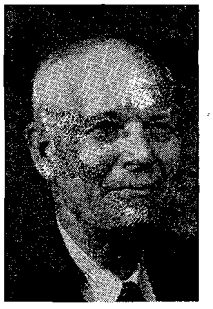
On the night of February 21, 1952, over 100 co-workers gathered at the Montclair Restaurant to honor Lloyd on the occasion of his retirement. R. P. Duffy, Assistant District Engineer, acted as master of ceremonies and a shotgun was presented to Lloyd by Colonel Skeggs on behalf of his friends. Among the speakers was Paul O. Harding, Assistant State Highway Engineer, District VII, who flew from Los Angeles to be with his good friend and former co-worker.

Lloyd plans to do a lot of fishing and hunting during his retirement. His son, Lloyd Batham, Jr., is an Assistant Highway Engineer in District III, and they expect to have many trips together in the Sierras.

Roy C. Teel, Sr.

Roy C. Teel, Sr., veteran state highway right-of-way agent in District V, San Luis Obispo, has announced his retirement from public service effective April 1, 1952.

Formerly in the real estate business in Los Angeles, Mr. Teel joined the Division of Highways on February 21, 1931, as a construction camp clerk and transferred to right-of-way work in San Francisco November 1, 1935. In 1944 his duties took him to San Luis Obispo where a year later he was designated district right-of-way agent.



ROY C. TEEL, SR.

Illness in the summer of 1948 necessitated his relinquishing this post but he remained actively engaged in right-of-way work as administrative assistant. He was particularly instrumental in the training of new agents, many of whom gathered to honor him at luncheon January 31st and again, along with other district employees, at a testimonial banquet at the Anderson Hotel, San Luis Obispo, on February 8, 1952.

Mr. Teel plans to return to the Los Angeles area and make his future home in Whittier, where he admits he will probably again engage in some phase of real estate activity.

Following in his father's footsteps is Roy C. Teel, Jr., an assistant right-of-way agent in the Los Angeles office of the Division of Highways.

Charles H. Ryon

APRIL 1, 1952, saw the close of a long career in public service and the beginning of a well-earned retirement for Charles H. Ryon, chief clerk, Equipment Department, Division of Highways, Sacramento.

Thirty-eight years ago, on September 11, 1914, Charles embarked on a career which has been at once satisfying, interesting and richly filled with lasting friendships made along the way.

He was born in the town of Marysville, on September 19, 1886; the son of Edwin Ryon, an expert cabinet maker, and Georgia Carey Ryon.

Shortly after Charlie's birth, the family moved to Chico, where his father became Bridge and Building Superintendent for the Sacramento Northern Railroad. There Charlie received his education and planned his life. He graduated from high school and took a post-graduate course in stenography and commercial law.

At Chico Normal

Charlie's first position, which he held while still in his last year of school, was that of secretary to Dr. Van Liew, then President of Chico State Normal School and also President of the California State Teachers' Association at that time.

In 1911, he left Chico and moved to Sacramento to live, where he was secretary to Mr. Gustave York, President of Hall, Luhrs and Co., wholesale grocers of that time. It is said that Charlie established a record in the selling of hams that has never been equaled.

In 1914, he took the first and only examination for "chief clerk" given by the State of California and on September 11, 1914, he entered the service of the newly formed Division of Highways, it being only two years old at that time. He was appointed to the position of clerk under Lowell R. Smith, Chief Clerk of District III with offices in the Forum Building. The late Wm. S. Caruthers was at that time the Division Engineer of District III.

The personnel of the office in the Forum Building consisted of only three or four, including the Chief Clerk, and many were the extra hours of hard labor that Charles Ryon and Lowell Smith were called upon to give to the cause.

CHARLES H. RYON

On June 30, 1917, Charlie married Ethel Katherine Doyle, the daughter of the publisher of the Marysville *Democrat*. Mrs. Ryon has shared 35 of Charlie's 38 years of service to the people of California. Mrs. Ryon is now a retired schoolteacher.

Goes to District IV

In 1918 he was transferred to District IV as clerk and stenographer to the late James Moriarity, Chief Clerk. Lewis G. Clark was then District Engineer, preceding Col. Jno. H. Skeggs.

Ryon returned to District III Office at Sacramento in 1919 and in 1920, he was appointed Chief Clerk, Lowell Smith having left the district some time before, later becoming Purchasing Agent with the Department of Finance.

Among those whose highway career began with District III was Tom H. Dennis, then a Resident Engineer and later Highway Engineer, Clyde Rust, once office boy and now Maintenance Superintendent, John Stillwell and Walter Riechel, now Superintendents of Equipment, Tom Mendenhall, now Headquarters Shop Truck Department Foreman, and many others.

In 1922, Ryon went to Central Office for six months under Herman Weaver, and on August 13th, he was appointed Chief Clerk of the newly-formed Equipment Department under R. H. Stalnaker.

He served under Mr. Stalnaker, saw him retire, and Mr. Earl Sorenson assume charge of the department. He has never faltered in his efforts to continually improve the effectiveness of his organization.

Frank L. Holt

AFTER 34 years of service with the Division of Highways, Frank L. Holt has retired. He had a varied career driving stage out of Truckee to Independence Lake and Sierraville Valley, driving logging teams, largest of which were 14 head in one string—10 horses and 4 oxen; and working for Southern Pacific at Gold Run as Station Engineer Fireman. He started to work for the Division of Highways in 1917 in District I Engineering Department.

The District Engineer was Mr. Somner, Assistant Engineer Haselwood, Survey Party Chief Fred Bolles, and Field Boss, J. W. Vickrey. In 1925 he went to Carnelian Bay, Lake Tahoe, in District III, under Superintendent C. H. Weeks. In April of that year he drove over Echo Summit over four feet of frozen snow in a Dodge screenside truck.

In 1926 he transferred to Maintenance and worked throughout the district, spending 15 years in the Truckee territory, most of the time as leadingman. He transferred to Marysville in 1944 and retired on February 29, 1952.

FROM CAL TECH

MR. GEORGE T. MCCOY
State Highway Engineer
Sacramento 4, California

DEAR SIR: I ran across a copy of *California Highways and Public Works* in our civil engineering library here at Cal Tech recently. I was quite interested in the magazine, as it keeps well abreast of the times and brings to me, an undergraduate civil engineer, a look into what we can expect to be doing when we graduate. It also shows that what we are learning can be useful on the outside.

Sincerely yours,

PHILIP K. BATES, JR.
Pasadena, California

In Memoriam

CLYDE F. LANGWORTHY

Previously unreported in *California Highways and Public Works* was the loss of Clyde F. Langworthy, who died suddenly last year while serving as resident engineer for the now completed relocation of State Sign Route 150 in the vicinity of the Cachuma Reservoir in Santa Barbara County. At the time of his death, he had served the State of California for nearly 20 years.

Born in San Antonio, Texas, on February 23, 1900, Mr. Langworthy studied civil engineering while in the military service during and shortly after World War I, and later attended the University of Texas. After working as a draftsman with various private concerns and then the City of Burbank, he first joined the Division of Highways staff in September, 1927, at Redding. He subsequently worked in District III (with its headquarters then in Sacramento) and District I, moving in 1941 to District V, where he remained until his death.

He is survived by his widow, Mrs. Odette Langworthy, whom he married in 1936, and by seven daughters and a son.

HIGHWAY WORKERS DESERVE PRAISE

It's a good thing to note when an official agency does a good job, and the State Division of Highways has done just that in keeping roads open after the recent snowstorms in the hills.

It has been a gigantic task, but the Division of Highways has kept traffic moving despite terrific snow problems. Some of the highway crews were moving snow 24 hours at a clip during the worst falls in the mountain areas, and they managed to keep the main roads passable most of the time.

Taxpayers got their money's worth and more from the efficient and loyal service of the highway personnel during the recent emergency. Good work.—*Los Angeles Mirror*, March 13, 1952.

In Memoriam

BURTON W. HUBBARD

Burton W. Hubbard, a member of the staff of District VII, Division of Highways, for almost 24 years, died March 2, 1952, at the Queen of the Angels Hospital in Los Angeles after a short period of illness.

Hub, as he was known to his many friends, was born December 23, 1905, at Belmond, Iowa, attended grammar and high schools at Durango, Colo., and later majored in geology at the University of Colorado at Boulder. He entered the employ of District VII June 25, 1928, as a chairman on survey party, after having worked for the Colorado Highway Commission and for the County of Los Angeles.

For a few months during 1933 and 1934 Hub worked for District V at San Luis Obispo and for the San Francisco-Oakland Bay Bridge. Except for these short periods, his military leave for naval service in 1942, and for the winter of 1947 when he was Resident Engineer under the United States War Department on the project of rehabilitating war-damaged highways in Greece, his engineering career with the Division of Highways has been in District VII.

Hub had a very well-rounded experience in highway engineering, having served in all survey party positions and acted as survey party chief. He also served as assistant resident engineer on construction and as squad leader in drafting room design. This broad experience made him very valuable in the position which he held from April, 1948, to the date of his death. As assistant district office engineer he handled, among other duties, the contacts with the public in connection with state highway activities and the extensive freeway developments in the Los Angeles area.

Hub's immediate family consists of his widow, Margaret, who resides in Santa Ana, and his son, Lee, who graduated with honors from Santa Ana High School, winning a scholarship to the University of Chicago. He is now attending this university, majoring in anthropology.

Hub's passing is a loss to the State Division of Highways and a cause of sorrow to his host of friends.

In Memoriam

JOHN O. MILLER

John O. Miller is dead. His memory will long be revered in the State Department of Public Works.

Mr. Miller was a supervising hydraulic engineer of the Division of Water Resources at the time of his sudden death in Sacramento from a heart attack on March 7, 1952. He entered state service in April, 1938, as an associate hydraulic engineer. He advanced to senior hydraulic engineer on July 1, 1946, and on August 1, 1950, was promoted to his latest post.

A graduate from Stanford University in 1912, with a C. E. degree, Mr. Miller engaged in varied engineering practice until 1917 when he entered the Army and was commissioned second lieutenant, U. S. Army Engineers, serving for two years during World War I.

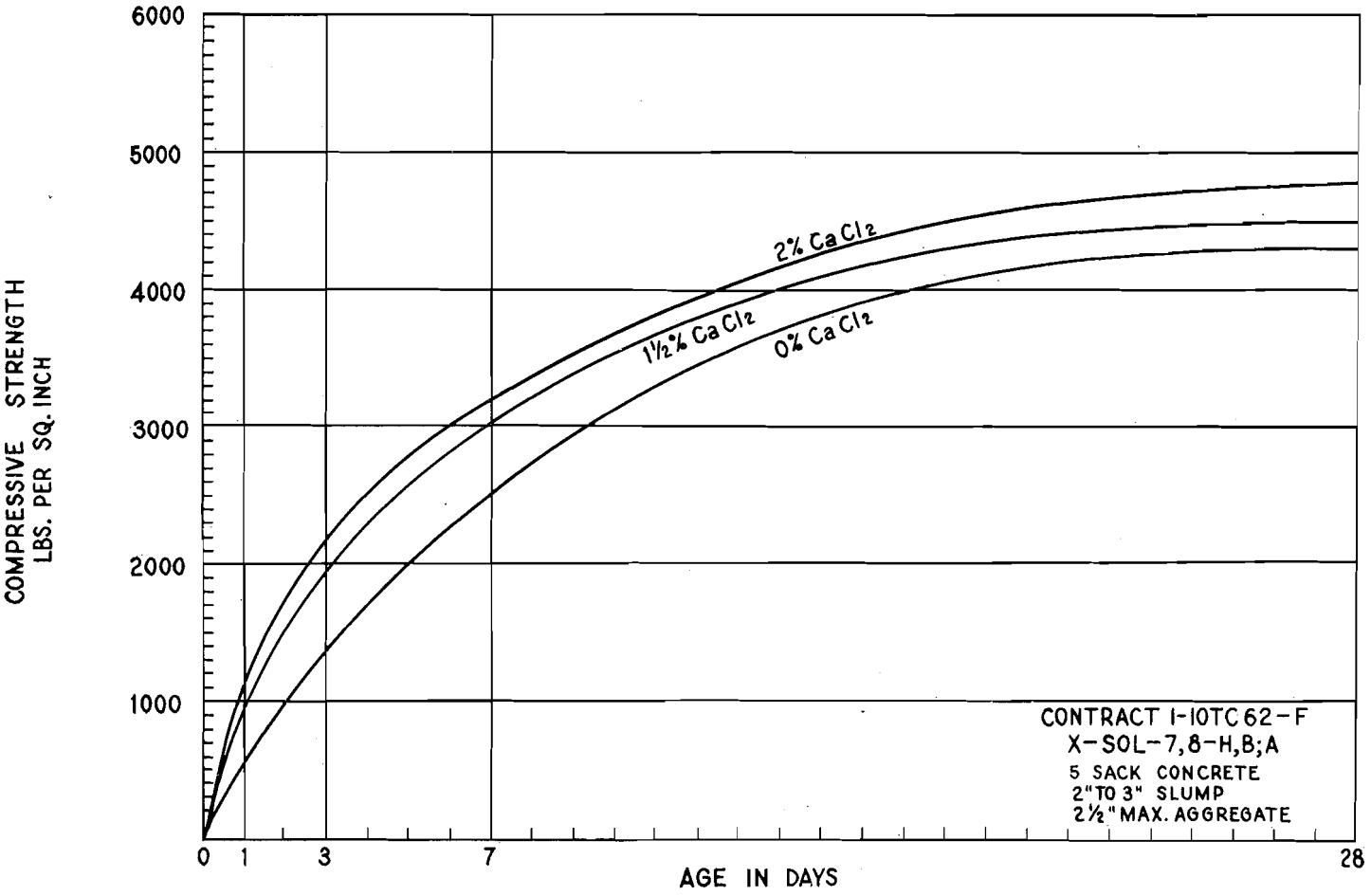
From 1919 to 1928 he practiced his profession in Virginia and New England states. Returning to California, he engaged in storm and sanitary sewer design and construction for the Cities of Richmond and Woodland. From 1931 to 1934 he was in private practice. From 1934 to 1938 he held various administrative positions with CWA, SERA and WPA.

John Miller is, and always will be, a tradition at Stanford. His phenomenal performances on the track and on football fields are still recalled whenever and wherever college grads gather. He excelled in the 440-yard dash, the half-mile and in relay races. In track events and in football he was called the "Bakersfield Jackrabbit."

Mr. Miller was born in Bakersfield on August 19, 1886. He was educated in the public schools of that city and went on to Stanford to win honors in collegiate sports that made him internationally known.

He was a member of various Masonic orders including Ben Ali Temple Mystic Shrine. He was Past Commander of Yolo Post No. 77, American Legion.

Mr. Miller is survived by his widow, Alene, Sacramento; two brothers, Harry, of Las Vegas, Nev., and Tom, of Glendale, and a sister, Mary Ashe Miller of Las Vegas.



Concrete Paving

Continued from page 21 . . .

finishing operation and in the quantity of calcium chloride used:

1. Finishing of concrete pavement as specified in the California method is designed to prolong the final finish by intermittent surface manipulation until the maximum subsidence has taken place. This method results in improved riding qualities and in a nonskid surface texture. On very warm days the addition of a full 2 percent of calcium chloride may not result in the maximum subsidence desired. On such days smaller quantities are advisable; however, the higher curing temperature will result in higher early strengths and offset the loss occasioned by the use of lower percentages of the accelerator.

2. The treated concrete hardens rapidly after the final passes of the drag finisher and the effective period available for the steel cut float used in the final finish is reduced.

3. Calcium chloride should not be added to any section shorter than the average effective run of the self-propelled drag finisher (175 to 250 feet). The finishing characteristics of the treated and untreated pavement within one pass of the finisher may be such as to make this operation difficult and unsatisfactory.

Results Obtained

The principal increase in compressive strength of the treated over the untreated concrete results in the first seven days. After this period there is little significant benefit in the treated concrete. At the end of one and three days, 2 percent of calcium chloride will almost double the compressive strength of normal concrete. At seven days, treated concrete was 30 percent higher, but at 28 days there was little difference in the compressive strengths.

While larger proportions of the admixture will increase the early strengths of the concrete, the addition of not over 2 percent is advisable. Higher percentages may have deleterious effects on the quality of the concrete as well as complicate the normal finishing operation.*

Benefits possible from the addition of calcium chloride to pavement concrete:

(1) Expedite the opening of the pavement to traffic or to the contractor's equipment.
(2) Decrease the number of pavement crossing devices necessary.
(3) Slight decrease in setting time will be helpful in winter paving.
(4) Decrease protection time necessary in maintenance patches, etc.

The test section was placed with the cooperation of Parish Bros., Contractor, Ed Craun and Kenneth Hatch, Resident Engineers, and Lou Kovanda, Associate Materials and Research Engineer.

* Recent studies indicate that the addition of calcium chloride may increase the expansion caused by the alkali-aggregate reaction.

A good driver obeys the traffic rules and is quick enough to dodge those who don't.

Some Gadget

Bridge Department Uses One of Largest All-welded Steel Beams

By RALPH H. KIPP, Assistant Steel Inspector, Materials and Research Department

ONE OF THE largest all-welded steel beams ever manufactured on the Pacific Coast was recently placed in position on the State Highway System. The beam, 53 inches deep and 106 feet long, is part of the Route 69-228 Separation Structure on the Eastshore Freeway, State Sign Route 17. This structure is located about one-fourth mile northwest of San Lorenzo near Oakland at the junction of State Highway 228 with the Eastshore Freeway.

The location and controlling features at this grade separation structure sound like a bridge designer's nightmare. There is a combination of limited headroom, high skew, and the structure is on a curve. The location at the same time represents a culmination of a highway designer's dream, in that it produces roadway interchange to give traffic greater safety and freedom of movement.

Problem Met

The Bridge Department of the Division of Highways, which has the responsibility for structural design, found the most economical solution to the problem to be the use of solid wall reinforced concrete abutments built along the curve and skew of Route 228. Then to support the Eastshore Freeway roadway slab steel stringers were placed perpendicular to the abutments. This necessitated facia beams to support one end of the stringers along each side of the upper roadway. Because of the combination skew and curve these two beams are of different lengths. The span of the south edge member is 100 feet, whereas, that of the north edge is but 65 feet. The south edge beam is not only heavier than the north, but also takes advantage of composite action with the concrete curb by the use of shear lugs along its top flange. It is the construction of the longer of these two all-welded members of the steel structure that is described in the following article and shown in *Photo 1.*

Ambitious Product

When this ambitious structural product of the highway and bridge designer arrived in the fabricating yard of Judson-Pacific-Murphy Corporation it then became an interesting inspection problem for the Materials and Research Department. The production of these beams as weldments was necessary because the largest standard rolled beam is 36 inches deep (which is considerably short of the designed 53 inches depth) and does not have the strength required. Structural steel plates were used as a fabricating material.

A cross section through the beam is shown in *Figure I.* The top and bottom flanges are 3 inches thick. The web was manufactured from $\frac{7}{8}$-inch x 48-inch plate. The flanges were made in three segments each. The top flange segments were 23, 37 and 46 feet long and the bottom flange segments were 26, 37 and 45 feet long. Each flange required two butt welds, as shown in *Figure II.* The ends of the flange plates to be welded were prepared by gas burning or cutting to 30 degree angles and then grinding the flame-cut surfaces. The welds were made with a semiautomatic welding machine using $\frac{5}{64}$-inch wire, 420 amperes and 30 volts.

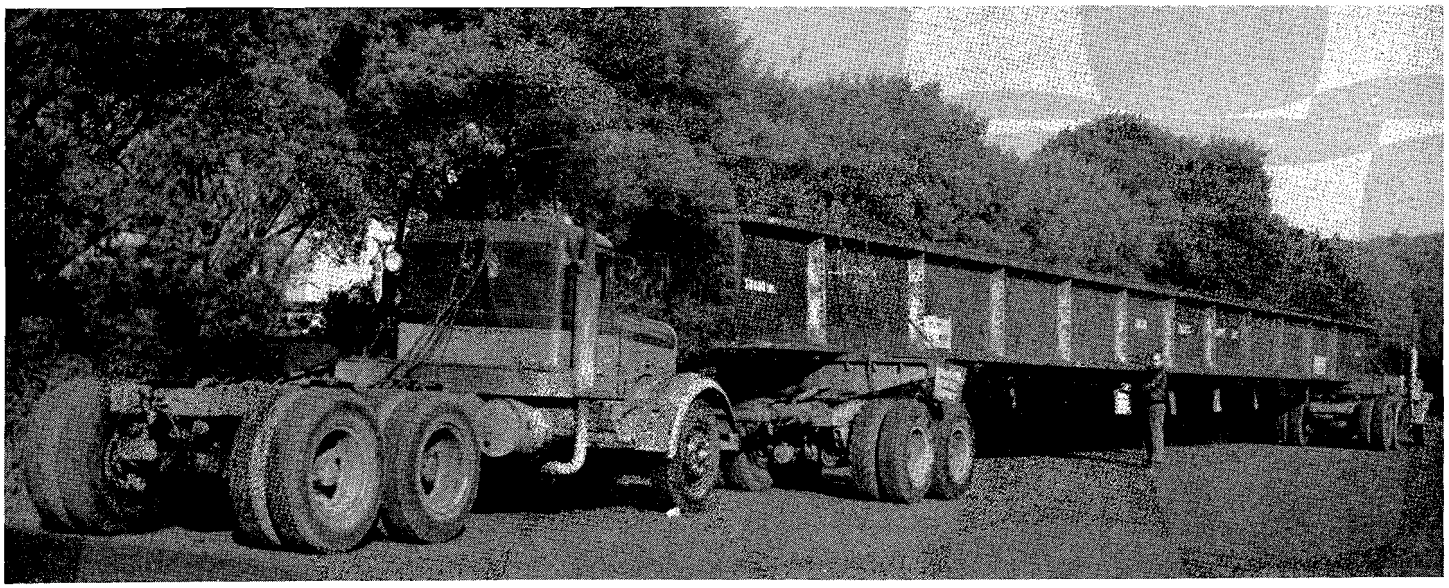


PHOTO 1

Welding Process

An average of 14 passes were required to weld each side. After completing the welding of one side, the plates were turned over so as to complete the construction. The second side

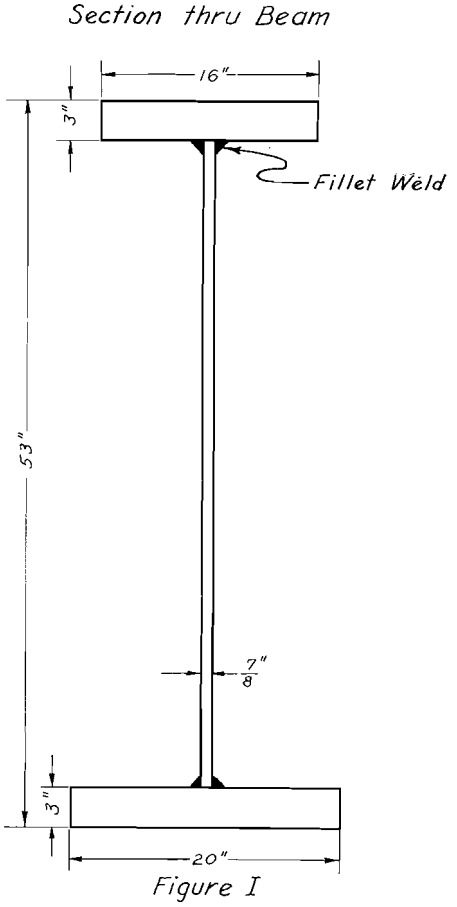
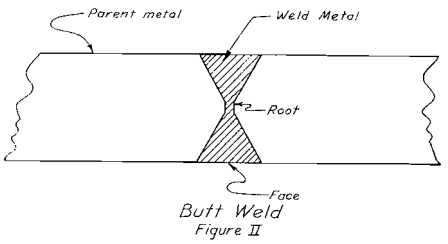


Figure I

was chipped down to clean metal before placing the weld. In order to have full welds on the three-inch face, small structural steel angles were tack welded to the edges of the flange plates. This formed a table on which the welding machine could operate so as to start and end the weld outside the edge of the flange. These extensions were later burned off and ground smooth resulting in a full-width sound weld. The butt welding of each flange took approximately two and one-half hours for each side. The plates were preheated to a minimum metal temperature of 300 degrees F. and the metal kept up to temperature by two gas torches and one large kerosene torch.



Butt Weld
Figure II

One of Major Problems

The web plate was fabricated from two sections 37 and 70 feet in length, respectively. These plates were beveled to 30 degrees and welded with a Unionmelt automatic welding machine. Oxyweld Number 36, $\frac{3}{16}$-inch wire was used in the automatic machine working at 800 amperes and 30 volts. Before starting this weld, a small "sealer" pass was welded in by hand.

As steel plates are invariably warped or distorted by heating local areas, straightening of the plates both before and after welding was one of the major problems throughout this complete fabrication. This was especially true of the three-inch flange plates. Straightening had to be accomplished before and after each complete weld and then the completed web sections and flange section were straightened again before final assembly. Straightening was accomplished by the application of heat and pressure.

Final assembly of the plates into a structural beam was undertaken on a skid especially constructed for the job. *(Figure III.)*

Supporting Framework

The "skid" or supporting framework consisted of 36-inch beams placed flat and end to end for the entire length. On the top sides of the 36-inch beams, 12-inch wide flange heavy section beams were placed transversely and evenly spaced along the entire length. This assembly was leveled and straightened and then welded together. Uprights were then bolted to the 12-inch transverse members. The uprights were bolted solidly in place along one side, while those on the opposite side were movable. Space was left between the uprights for the 53-inch beam. Hydraulic jacks were placed as shown in *Figure III* so as to apply pressure through the slotted uprights. The entire assembly acted as a huge vise to apply pressure to the complete beam in order to bring the webs in contact with the edges of the flange plates.

Before final fitting-up was started, the web plate was trimmed to a width of 47 inches and the areas where it would contact each flange were cleaned by grinding. Fitting was started at the center of the beam and simultaneously worked toward each end. One movable vise was needed on top in order to correct lateral variations in the beam.

Eight-ton Jacks

It was first thought that five-ton jacks would be adequate for this process. However, it was found necessary to use eight-ton equipment so as to bring the three-inch flanges into the desired contact. Preliminary assembly was fixed by tack welding the web to the flanges. Tack welds slightly longer than those used under normal fabricating conditions were applied. This was done so as to hold the members squarely in contact and also to provide a better base for the automatic welding

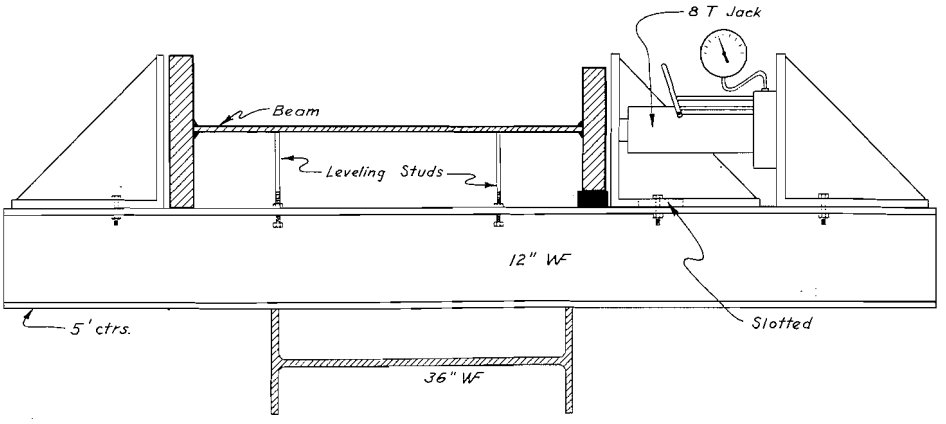


Figure III

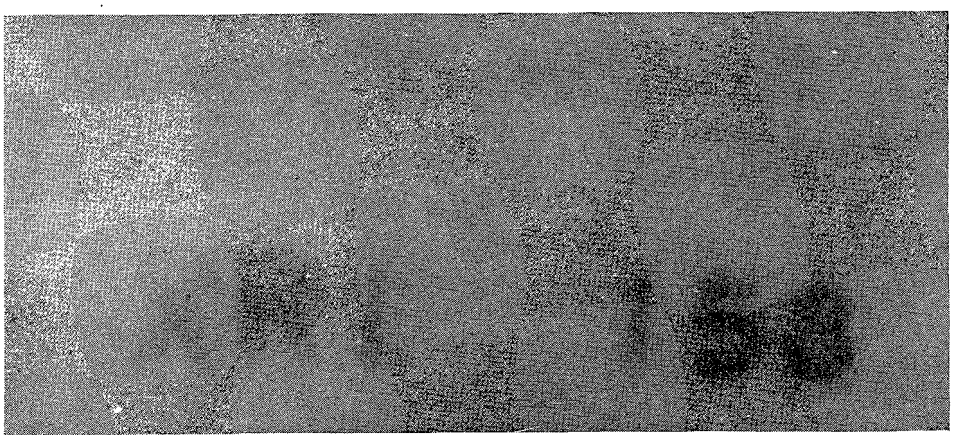


PHOTO 2

machine during the fillet welding operation. Before starting the fillet welding, the surfaces were cleaned with power-driven brushes and all interfering tack welds were chipped out and replaced. It was necessary that this cleaning operation be done very carefully in order to secure proper penetration and to limit surface defects.

Fillet Welding

The fillet welding also was performed on metal preheated to 300 degrees minimum. This heat was maintained ahead of the welding machine by a large kerosene torch and four gas torches. The temperature was controlled by using 300-degree "Tempilstiks." Temperature control was also checked by using an Alnor portable pyrometer. A Tempilstik is a temperature indicator manufactured from material which will melt at the desired temperature. The fillet welding was done by the Unionmelt process using one-fourth inch Number 36 Oxyweld wire with an amperage of 1,015 to 1,100 and a voltage of 27 to 30. Four hours were required for the welding machine to travel the 106 feet in making one fillet weld. This consumed about 75 pounds of welding wire for each 106 feet of one-half inch fillet.

Beams at 35-degree Angle

In order to secure equal penetration of the web and flange during the welding operation and still have the welding machine in a controllable position, the beams were placed at an angle of 35 degrees with the horizontal. The welds were started and finished outside the beam by the use of an end platform. The beams were supported on skids during the complete welding operation. A camber of about two and one-half inches was produced in the 106-foot beam during each heating and welding sequence. The cooling after each welding operation was inhibited by augmenting the insulating qualities of the slag by six-inch strips of asbestos board. Cooling required from eight to ten hours and the various temperature readings were as follows:

At 1 hour after welding—
flange 210 degrees, web 180 degrees
At 2½ hours after welding—
flange 148 degrees, web 128 degrees
At 4 hours after welding—
flange 128 degrees, web 98 degrees

Temperature readings were taken of the steel six inches from the weld. The average lengthwise expansion following each weld operation amounted to about one-eighth inch in the over-all length of the beam. Following the completion of all welding and cooling, the beam came within all tolerances required of a roll section. It also returned to its original straightness losing the camber resulting from the heat.

Radium Used for Photos

Inspection of the welding was performed by the writer who was present during all welding operations. This visual inspection was supplemented by nondestructive testing. Complete gamma ray pictures were taken of the butt welds and of a reasonable portion of the fillet welds. The gamma ray inspection pictures were taken of each butt weld by raising the flange three feet from the floor. The gamma ray pellet was then placed between the floor and the plate, about 24 inches from the weld. The gamma rays were generated by a 100-gram capsule of radium. The negatives were placed over the weld and for this three-inch material were exposed about eight hours. The exposures for the fillet welds were made by placing the negative on the outside face of the flange with the beam in an upright position. The capsule was then placed at an angle of 20 degrees from the web and about 24 inches from the weld. *Photo 2* shows a picture through a butt weld and *Photo 3* shows a fillet weld.

The "X-ray" (gamma ray) pictures taken during the inspection period were made by the Pittsburg Testing Laboratory. It may be of interest to note that the radium capsule used by them is valued at approximately $50,000.

The beam was manufactured for the contractor, Fredrickson and Watson Construction Company, by Judson-Pacific-Murphy Corporation of Oakland, California. Fabrication inspection was performed by the writer. The Resident Engineer is J. N. Perry of the Bridge Department.

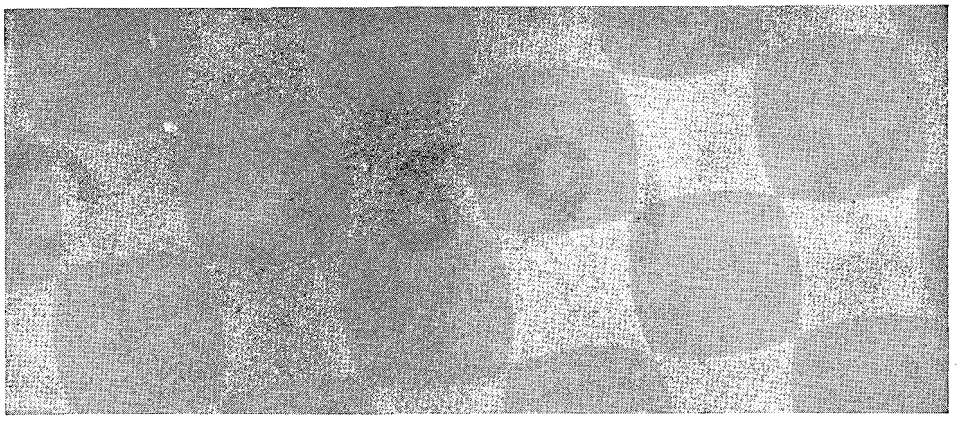


PHOTO 3

Antiskid

New Method of Roughening Slick Seal Coated Pavement Surfaces

By N. R. BANGERT, Assistant Maintenance Engineer, Division of Highways

DURING the past two years, several of the northern districts of the Division of Highways have had under development a new method of roughening slick seal coated pavement surfaces. This treatment consists of softening the binder by means of heat and grooving the seal coat course with a rake-type drag.

Experiments along this line were first carried out late in the fall of 1950 by the maintenance personnel of District II. To date, the operation has been confined to—and appears to be particularly adapted to—the treatment of newly laid seal coats where a slick condition has resulted from the flushing of the binder to the surface of the screenings course. In such cases, the submerged screenings are literally turned over and road-mixed by the passage of the drag tines. As the amount of heat applied is only sufficient to soften the binder of the seal coat, the underlying mix is not disturbed or injured by the operation; also, as the binder chills rapidly behind the drag, only a small amount of the seal coat aggregate is whipped off by traffic.

Effective Seal

The effectiveness of the seal as a means of preventing the penetration of moisture into the underlying surface course is less impaired by this treatment than by the scoring and gouging resulting from the use of disc scarifiers.

The pavement is heated by means of the flame generating equipment assigned to some districts for the purpose of killing roadside weeds during the spring months. These burners are trailer-mounted and develop intense heat by burning a light fuel oil in a draft created by a blower powered by a small air-cooled engine. The flame is

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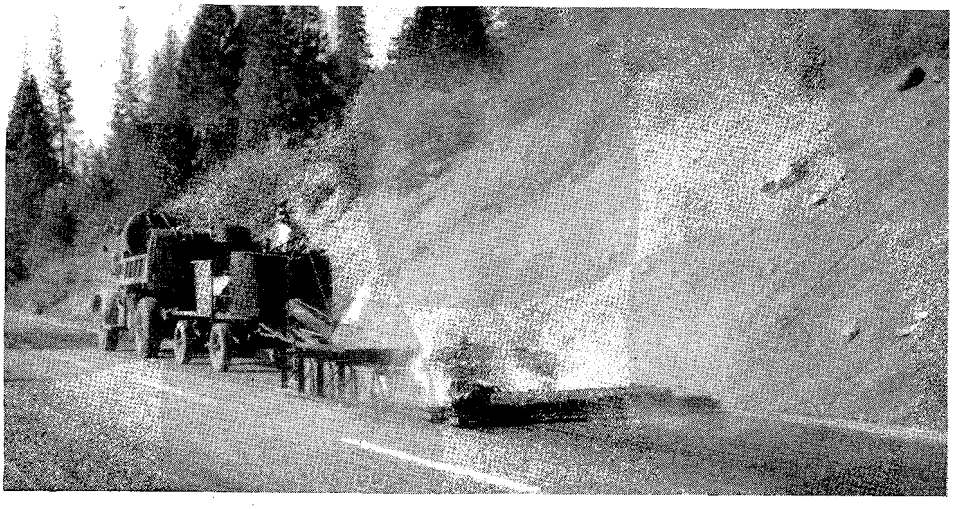
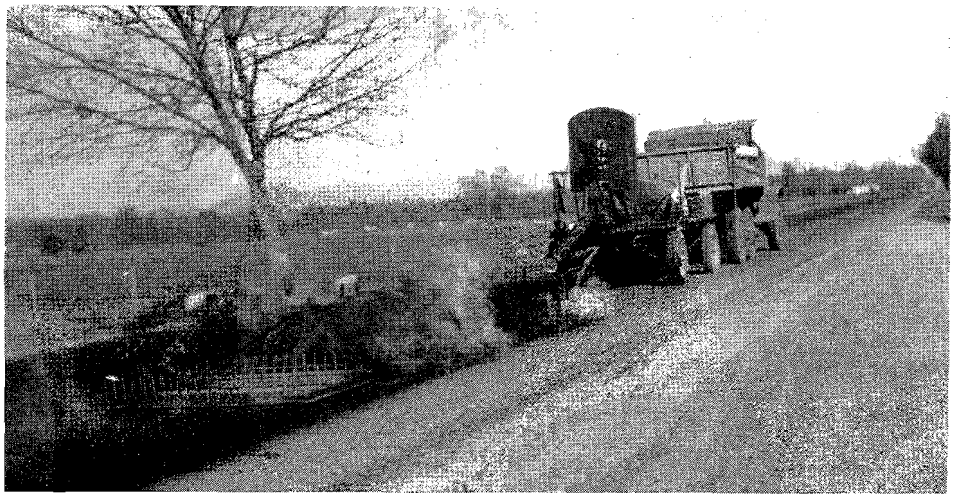
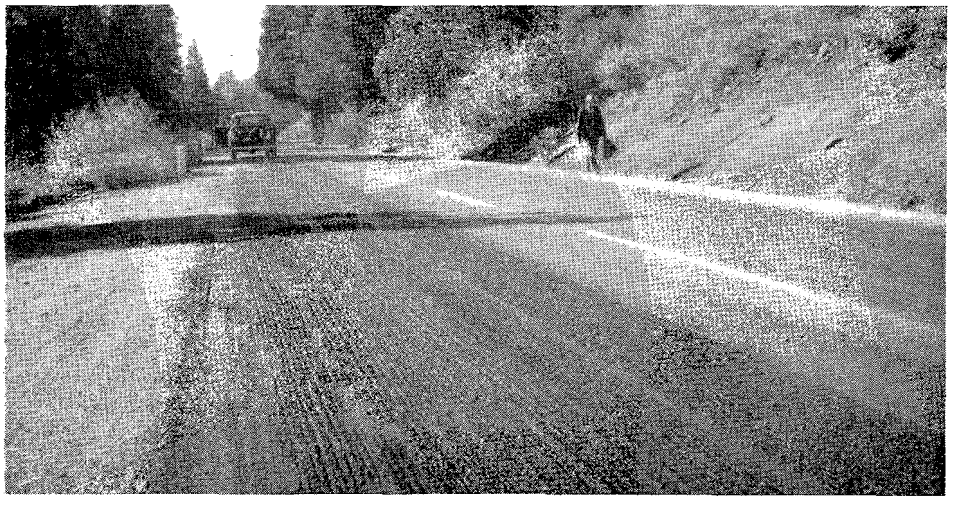






UPPER—Heating and raking equipment used on U. S. 40 in District III. CENTER—Top of burner and spike drag used in District II. LOWER—Portion of U. S. 40 treated by heating and raking.

Conference

Engineers Discuss Street and Highway Problems on Broad Level

SUBJECTS as general as the national long-range highway outlook and as specific as road surfacing methods were analyzed and discussed at the Fourth Annual Street and Highway Conference, held on the campus of the University of California at Los Angeles February 6th-8th.

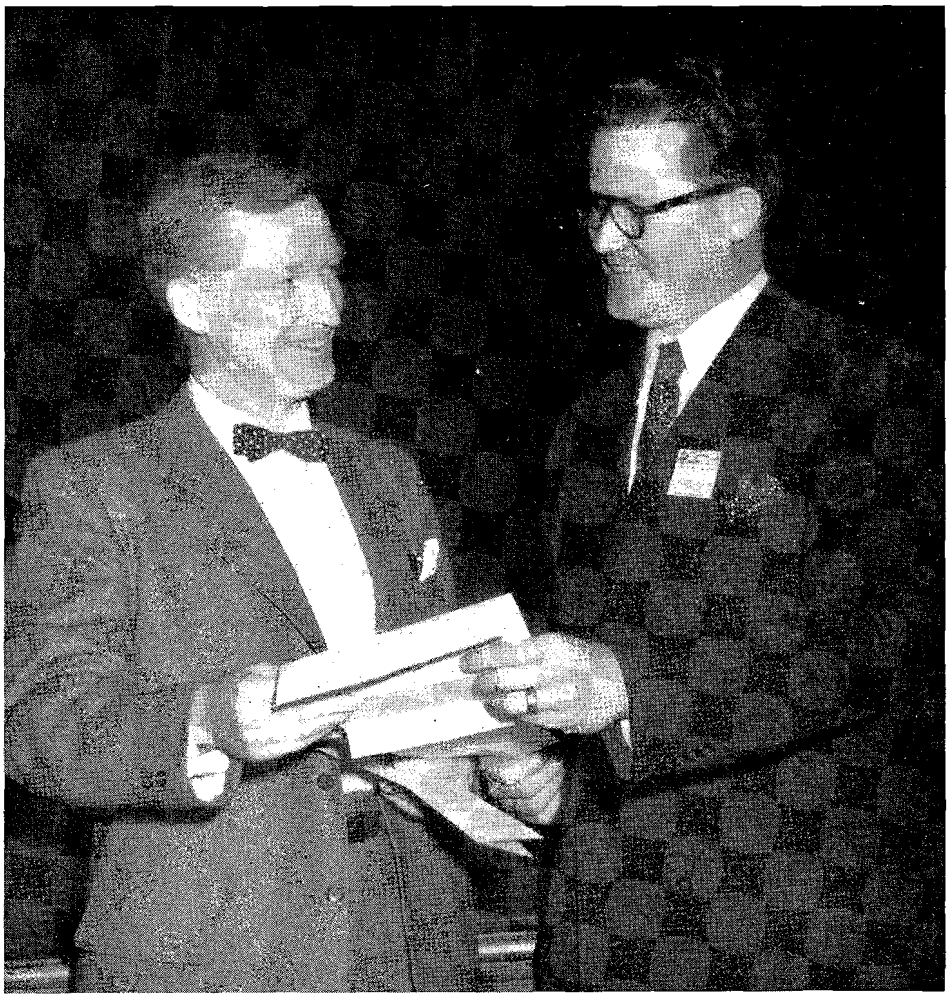
More than 400 engineers and officials representing federal, state, city and county governments participated in the conference, along with representatives of the materials and transportation industries.

The conference was conducted by the Institute of Transportation and Traffic Engineering of the University of California, of which Harmer E. Davis is director. Deputy State Highway Engineer R. M. Gillis is a member of the institute's advisory committee. Representatives of the Division of Highways serving on the program committee for the conference were F. N. Hveem, Materials and Research Engineer, and H. B. LaForge, Engineer of Federal Secondary Roads.

Many Subjects Covered

Among the subjects covered in the three days of general and group sessions were: planning, construction, maintenance, administration, personnel, financing, public relations, and research in numerous fields ranging from road test sections to safety belts in motor vehicles.

Following the opening of the conference in Royce Hall by Chairman Joseph E. Havenner, manager of the public safety department of the Automobile Club of Southern California, and a welcome by Dean Paul A. Dodd of U.C.L.A., the initial general session took up the broader aspects of highway development trends. The statewide deficiency problem was sketched by State Senator Randolph Collier, and the needs of Los Angeles County by Chairman Roger W. Jessup of that county's board of supervisors.



Roy Jorgensen, Engineering Counsel, National Highway Users Conference, left, and Joseph E. Havenner, Automobile Club of Southern California, Chairman of Conference

One potential answer to the problem on a nation-wide scale was then outlined by Roy Jorgensen, engineering counsel of the National Highway Users Conference, who reported that a co-ordinated attack on highway deficiencies was being prepared by the principal commercial and industrial groups with a stake in adequate roads, under the banner of PAR—Project, Adequate Roads.

After a report on the strategic materials situation by Assistant State Highway Engineer Richard H. Wilson, the conferees adjourned to section meetings of their choice.

Maryland Road Test

One group first received a verbal and pictorial report on the Maryland road test section and a preview of the forthcoming Idaho road test sponsored by the Western Association of State Highway Officials; and then took part in a discussion of road mix methods led by Raymond Harsch of the Shell Oil Company.

Another group heard a broad-gauge review of the urban transportation situation by Director Davis of the I.T.T.E. and Dean L. M. K. Boelter of the U.C.L.A. College of Engineering. This was followed by a review of

truck traffic problems led by Wade Sherrard, manager of the Motor Truck Association of California, and Dan M. Finch, testing director for the California Highway Patrol.

At the general session on the second day the conferees were given an educator's view of the engineering personnel problem by Dean George W. Gleeson of the School of Engineering of Oregon State College. The next speaker was A. Allan Bates of Chicago, vice president of the Portland Cement Association. He described the Illinois tests which produced the unexpected discovery that a small amount of air whipped up into concrete mixtures apparently retarded deterioration.

Group Sessions

After a tour of the campus engineering facilities, the conferees met again in group sessions.

One series of group meetings took up skid resistance studies specifications for light-traffic roads and streets, and priority ratings for improvement projects. The discussion leaders included: R. A. Moyer of the I.T.T.E., Assistant State Highway Engineer Earl Withycombe, Road Commissioner E. H. Hanna of San Benito County, Supervisor C. F. Peterson of Humboldt County, and Norman Kennedy of the I.T.T.E.

Another group first considered employee morale, as discussed by City Administrator F. R. Coop of Inglewood; and then heard a talk on "Preventive Maintenance, a Must Today" by Harold F. Hess, executive vice president of the Construction Industry Manufacturers Association, Chicago.

Traffic Trouble Spots

The third series began with a session on "Fixing Traffic Trouble Spots," led by Assistant Traffic Engineer R. J. Israel of the Division of Highways and Arthur Philpott, traffic analyst for the City of San Jose. Then J. R. Paulson, editor of the Palo Alto Times, spoke on "Getting Support for Traffic Improvements."

The remaining group session was devoted to summaries of typical I.T.T.E. research projects. These projects were described by the graduate students who conducted them. They covered such fields as: safety belts for front-seat automobile passengers; comparative delays at four-way stop versus semitraffic-actuated signal control intersections; and sampling techniques in estimating traffic volume.

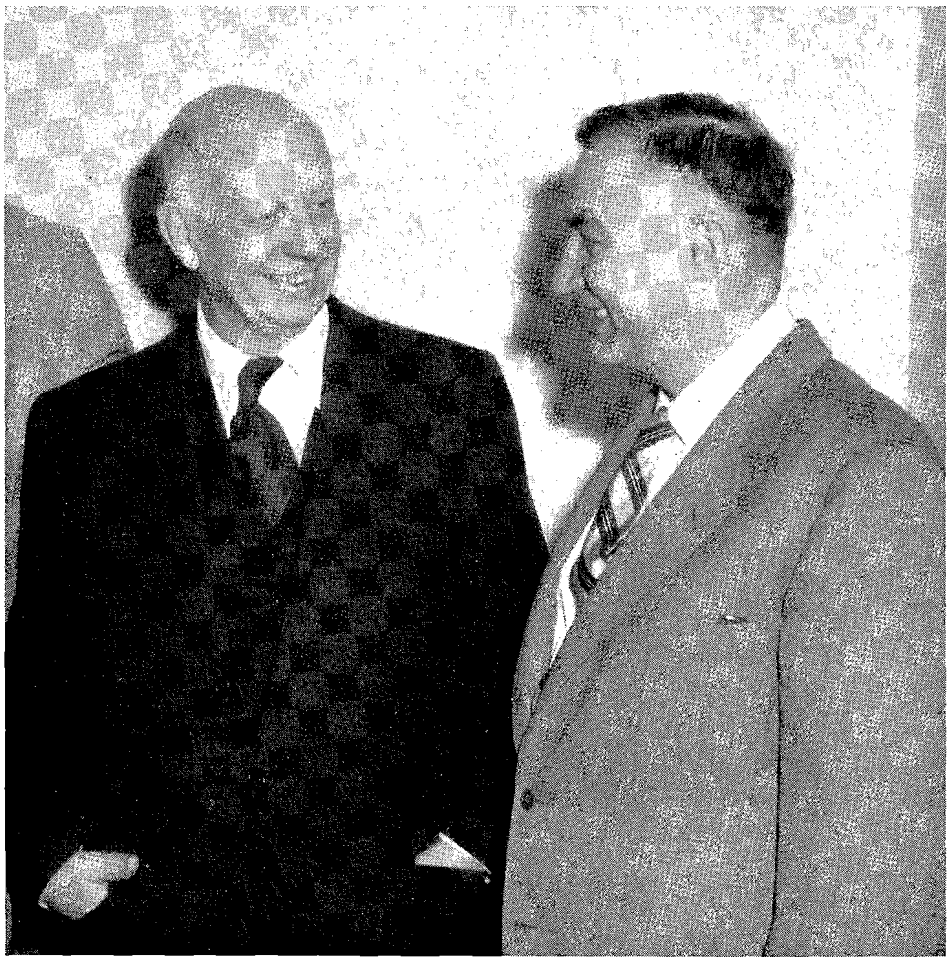
The final general session opened with a summary by W. R. MacDougall, general manager of the County Supervisors Association, of "Changing Legislative Concepts of California County Road Administration." This was followed by California Highway Commissioner Harrison R. Baker's talk on "Coordinating State-wide with Local Interests in Highway Problems" (summarized in this issue of *California Highways and Public Works*). Edwin S. Moore of the California State Automobile Association spoke on "Public Relations."

Lively Panel

A lively panel discussion on "Responsibility for Traffic Safety" was conducted by Professor Amos E. Neyhart of Pennsylvania State College. Many questions from the audience were answered by the following panel members, each of whom represented a specialized point of view: Earl Campbell, Director of Field Organization for the National Safety Council; J. Allan Davis, General Counsel of the Automobile Club of Southern California; J. C. Young, Traffic Engineer, Division of Highways; Russell Emmett, inspector for the California Highway Patrol; and Wade Sherrard, general manager of the Motor Truck Association of California.

At the luncheon meeting which concluded the conference the principal speaker was Pyke Johnson, President of the Automotive Safety Foundation. His subject was "Zero Hour for Highway Safety."

Pyke Johnson, President of Automotive Safety Foundation, left, and Dean L. M. K. Boelter, College of Engineering, U. C. L. A.



CONFERENCE HIGHLIGHTS

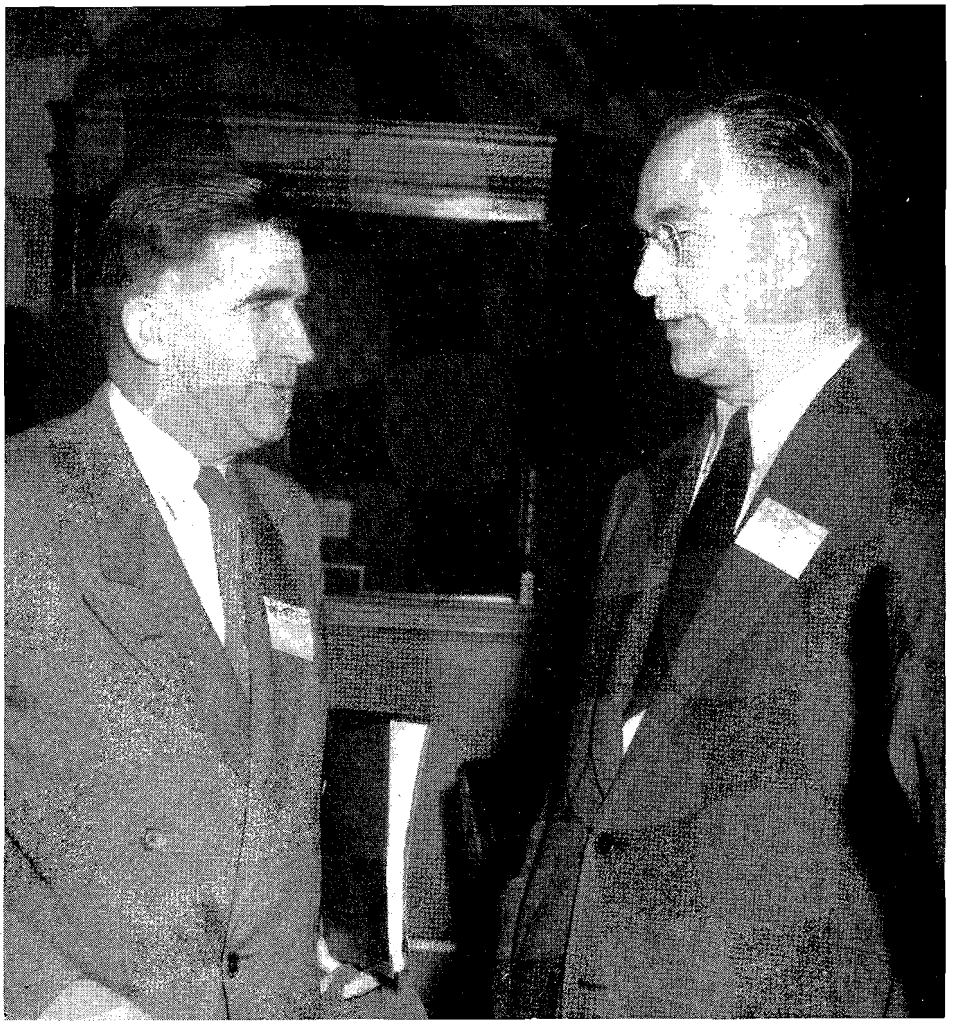
SOME OF THE points emphasized by speakers at the Fourth Annual Street and Highway Conference held at the University of California at Los Angeles in February:

State Senator Randolph Collier: "The Division of Highways' deficiency report is only an inventory. It is not the blueprint of a program. Many people seem to think that the deficiency report calls upon us to write out a blank check for three billion dollars. They seem to forget that highway problems are dynamic and that the Legislature meets every year and can modify them. * * * I've asked many people who have examined the deficiency report if they could tell us of any project that ought to be taken out of the inventory. We haven't received a single suggestion to take out a project; on the contrary, we have been told that the report fails to include some urgently needed improvements."

Pyke Johnson, President, Automotive Safety Foundation: "The Nation is paying far more in blood and dollars year after year than it would cost to provide the requisite capacity and safety. The National Safety Council estimates that accidents cost us about 3½ billion dollars annually —more than the amount spent on road and street construction. In addition, deficient roads cost us at least as much again in higher insurance rates and transportation charges."

Roy E. Jorgensen, Engineering Counsel, National Highway Users Conference: "At what city can you point and say, there the job is done? Even in the rural areas where the problem is much simpler, the main routes between the major cities are largely obsolete. Fortunately, the limited mileage of completed modern facilities set a pattern. We know the great benefits that will be derived from congestion relief and reduced hazard. What we need now is full recognition of the magnitude of the job to be done and coordination of all efforts toward its accomplishment. A new good roads movement, geared to the problem of the fifties, can provide the impetus now just as did its predecessor in the twenties. So we have the need for PAR—Project: Adequate Roads."

Dean George W. Gleeson, Oregon State College: "Easier courses or lower aptitude requirements will not produce the high-grade engineering talent which is now more necessary than ever. If more engineering freshmen are to be obtained, they should rather be obtained through proper high school guidance. High school students should be encouraged to take more mathematics courses rather than be discouraged from taking them, as is now a far too prevalent practice."



R. A. Moyer, Research Engineer, I. T. T. E., University of California, left, Earl Withycombe, Assistant State Highway Engineer, California Division of Highways

William R. MacDougall, General Manager, County Supervisors Association of California: "It is true that under the Collier-Burns Act and its 1951 amendments the individual, personal, detailed duties of each supervisor as an operating road superintendent in his district are gone. In contrast, the power and authority of the five-man board is emphasized and reaffirmed. The Legislature has given us, and we are now operating, a county road system under complete local control, but yet with proper engineering and administrative techniques guaranteed as a basic part of each county's system. The State is sharing its centrally collected highway users revenues with the counties. Where necessary, special local taxes are being levied to supplement these funds. Policy control remains what it should be—a challenging local responsibility."

J. R. Paulson, Editor, Palo Alto Times: "Every investigation concerning improvements or changes should be complete, then presented honestly to the people. Projects should be submitted to the people in public meetings, through the newspapers, and on radio and television. The whole story should be told, not just part of it. If this is done, 99 percent of your worthy projects will go through smoothly and easily."

Supervisor Roger W. Jessup: "During the postwar years, hundreds of miles of Los Angeles County highways have become strangled by the mushroom growth of subdivisions, shopping centers and industrial areas. What was yesterday a through, modern highway is today a bottleneck of traffic congestion. Yet, at the same time, the demand for more new highway facilities has increased out of all proportion to our ability to provide them."

Coordinating State-wide and Local Highway Problems

By HARRISON R. BAKER, Member, California Highway Commission

ONE OF THE problems frequently dealt with by the California Highway Commission is the problem of relations with individual communities where state-wide and local interests *appear*—I italicize "appear"—to be in conflict. To be perfectly frank, it is one of the toughest public relations problems which confronts not only the Highway Commission, but any governmental board or agency which must base its decisions and actions on the general welfare.

This problem may arise on a gigantic scale—as, for example, when a Federal Government atomic energy project displaces half a county in South Carolina. It may arise on a very small scale—as, for example, when a city lot is to be rezoned. The local-interest problems of the California Highway Commission are sometimes large, sometimes small—but I assure you they are certainly frequent.

Not Unnatural Situation

There is nothing unnatural about this situation. Whenever any individual, or group of individuals, believes that he or they are called on to sacrifice something, you have a problem. If it's an individual, you might call it a sales problem. If it's a community, one usually terms it a public-relations problem. It boils down to this: if, through open discussion, you can show the individual or the community that the proposed sacrifice is

(1) not so serious as it looks, in fact, maybe not a sacrifice at all;

(2) something that will serve a worthy purpose; and

(3) one which contains sound, objective, logical reasons why that one person, neighborhood, or community should have been singled out—then you have the problem pretty well solved.

If, in addition, you can start to present your case early enough—before misunderstandings arise—you will be able to keep the discussion on an unemotional, friendly basis; and the individual, neighborhood, or community will be taking an objective view as well as yourself.

HARRISON R. BAKER

Case of John Doe

Let's consider John Doe, citizen and businessman of Anytown, California. How does he regard highway problems?

The answer is that John Doe is more than one person. He regards highway problems in the light of what use he is making of what particular road for what particular purpose and at what particular time.

When John Doe is earning his living at his place of business, he thinks of highways in terms of their effect, or apparent effect, on his personal income. If he thinks he benefits directly or indirectly from the through traffic which proceeds along the streets of Anytown, he will instinctively resist any suggestion which may interfere with the existing pattern.

This John Doe becomes alarmed at the first rumor of a highway survey crew or right-of-way inquiry. He gets his chamber of commerce secretary on the phone, contacts his city councilmen and county supervisors, writes his legislators, and urges the local newspaper editor to verbalize his protest against any proposal to upset Anytown's good old status quo.

The Point of View

Of course, when John Doe has to go out of town on a business trip, or when he packs his family into the car to see faraway scenes and places, he becomes quite a different John Doe. He studies his road maps to see how best to bypass cities on his route. He chafes audibly at every stop-light; his blood pressure goes up every time he has to fall in behind a truck on a narrow road curving up a steep hillside. He particularly resents slowing down for business developments which have mushroomed along the highway and considers a 35-mile speed zone as a personal affront.

When he gets back home, weary from battling congested traffic, John Doe writes to his legislator, to his newspaper editor, and very likely to the Governor about the plague of bottlenecks on our highways, which shorten a man's vacation or rob him of valuable business time. Why, he says, do you have to fight local traffic and stop-lights every time you hit the smallest village? Why on earth don't we build highways so that they'll do their primary job of carrying through traffic expeditiously and safely? And, keen business man that he is, John Doe points out in his letter that in addition to all the other benefits we would enjoy if every town were by-passed and there were no dangerous intersections, it's obviously cheaper to build highways in a straight line out in the open country than to route them through busy towns.

Different at Home

Then, back in his Anytown routine, John goes off to attend a committee

meeting to map the strategy for a campaign to keep traffic routed close to the business district as it passes through town, regardless of traffic convenience, even if it does cost a few hundred thousand dollars more for construction and rights of way than the route proposed by the engineers.

Thus, our public-relations problem involving local communities is to merge these two John Does into one person. John isn't realy the unreasonable fellow I have just pictured. He is capable of listening to and comprehending an explanation of state-wide highway problems, and of changing his point of view when all the facts are presented. Also, he often is able to contribute additional information on community traffic needs and pending local industrial or other expansion. Given the data pertinent to the problem, John Doe is capable of becoming the foremost ally of the highway planner.

Benefits From By-Passing

The most striking example of John Doe's receptivity to facts is in the economic effects of by-passing business districts. A few years ago communities were keeping their big guns loaded for the first indication that through traffic was going to be routed around their downtown areas. Merchants envisioned deserted main streets and imminent bankruptcy if and when the stream of vehicles was diverted from their front doors. We all know that in general the reverse is true. We are acquainted with the several studies of typical communities. Through these studies merchants as well as the general public in North Sacramento, in Escondido, in Temecula, and in Auburn have been made aware that economic gains, not losses, have resulted from the freeways by-passing their business districts.

It should be acknowledged that to some extent, at least, we of the Highway Commission, and the highway engineers, must shoulder the blame for some of the misunderstandings. In past years the policy was to divulge as little as possible of our plans for highway location, partly to prevent complications in the acquisition of rights of way, and partly to prevent hardship and uncertainty which often occur during the interval between route determination and actual construction. This latter condition pertains to some degree regardless of public announcement of highway intentions.

New Freeway Policy

Thus, formerly, the first word a community received of a proposed highway improvement often was the announcement of formal adoption of a route by the Highway Commission, with no indication whatever that local needs and problems had even been taken into consideration. They had been, of course, but the townspeople could not be blamed for not realizing it. And quite possibly we did not have the full benefit of information concerning pending local expansion or developments.

An important step in highway public relations was taken on July 15, 1948, when the commission adopted a resolution setting forth its present policy with respect to determination of freeway routes.

(*Editor's note:* At this point Mr. Baker went into details of the resolution, which provides for adequate public notice to the citizens of any locality where freeway construction is under consideration, and for the offer of a public hearing by the commission in advance of adoption of a freeway route.)

Copies of this resolution, which might be termed the Communities' Highway Bill of Rights, were sent to the city councils of the more than 300 incorporated cities and all 58 county boards of supervisors in California. It put them on notice that henceforth the location or relocation of freeways would be treated as public business from its inception, and that whatever final decision was made would be based on "open covenants openly arrived at."

Full Information

This full-discussion policy has since been implemented to the hilt by the State Highway Engineer and his staff. Not only have meetings been held by the district engineers with local officials; they have also been held with business groups, neighborhood clubs, and any other interested segment of the community. Maps have been made available for posting and for publication, at various stages of planning, up to and including the final declaration of intention by the Highway Commission to adopt the route. Letters have been sent to local governmental bodies advising them of the various steps being taken. The district engineer and members of his staff, and sometimes members of the Highway Commission, have spoken before service clubs and have made particular effort to furnish full information to the press.

As a result, the people of the various communities concerned have "sat in" on the important discussions leading up to the determination of the highway route, and know that they have "sat in." Even those who are still not satisfied with the final choice—and there is no community without its dissenters—are aware that they have had their say, and that their views have been given full and courteous consideration.

The development of public understanding of the state highway program involves, of course, a good deal more than full notice and discussion of proposed route adoptions. It requires a constant attention to the public-relations possibilities in every contact, in every piece of correspondence, and, at many other stages, in the process of planning, financing, building, and maintaining highways.

Most of the regular meetings of the commission are held in Sacramento. Every effort is made, however, to hold meetings in other parts of the State when feasible. Such a practice permits more groups and individuals to appear and be heard before the commission without the expenditure of too much of their own time and money in travel. During the latter half of 1951, the commission held one meeting in San Francisco and one in Los Angeles, and the meeting in January, 1952, took place in San Diego.

Hearings Welcomed

Wherever the meeting is held, individual and group appearances are solicited. When possible, appearances should be arranged in advance. This gives the commission secretary an opportunity to schedule the group for a definite hour, geared as closely as possible to the distance it must travel to the meeting site and to the amount of time required for the presentation.

More often than most people realize, the commission goes to the public. Not

all at once, of course; but individual members make as many appearances as possible before local groups. To an even greater extent, members of the Division of Highways staff have made themselves available for talks, showing of slides, and other public presentations of highway matters.

Highways are always news. Therefore, a steady stream of news releases has been maintained for years by the commission and the Department of Public Works. These releases cover both routine and special activities incident to the highway program, keeping the public informed not only on commission actions but also on calls for bids, award of contracts, completion dates of projects, and so forth.

In addition, there has been a healthy and growing trend toward issuance of more information to news media from the various district offices of the Division of Highways. Our engineers are encouraged to cooperate with newspapers as fully as possible, with emphasis on prompt and full response to questions by reporters.

Good Relations Essential

You are familiar, I know, with the bimonthly magazine, *California Highways and Public Works*. This publication serves several purposes. It not only provides information to those in California who are interested in highway development; it also serves as a medium of technical information for the far-flung staff of the Division of Highways and as a means of interchange of highway ideas among engineers and governmental agencies throughout California, the United States, and many foreign countries. Newspapers and other general publications make frequent use of the articles and illustrations contained in the magazine.

We have reason to believe that progress is being made in establishing and maintaining good relations between the state agency and the local community with respect to state highways. The consideration given to local problems in selecting routes is becoming generally known, and there have been a number of well-publicized instances of changes made at the instigation of community interests. Sometimes these changes have even been made against the better judgment of the commission and the engineers.

Santa Maria Example

One of the finest examples of state-community relations at their best is the advance thinking, planning, and public discussion with regard to the proposed freeway which will by-pass Santa Maria. Although funds for construction of this project are not yet available, and the people there have been repeatedly so informed, there has been ample foundation laid for the eventual choice of route. The District Engineer has explained in general terms the various alternative routes which may be considered. He also has outlined the factors which weigh more or less heavily in the final determination of routes by the commission, including the factor of local desires. The local newspaper carried full advance and follow-up accounts of a recent public forum on the subject; a few days before the forum it printed an editorial outlining the basic facts, for use by those planning to participate in the session. Thus, when all the engineering data are finally available to the commission, the choice of a route carrying traffic through or around Santa Maria will be made with all the cards and opinions on the table; and if further discussion is needed, it can be held in an atmosphere cleared in advance by mutual understanding of the essential elements involved.

Buellton Story

You probably know of examples of completed freeways which follow routes different from those recommended by our engineers on the basis of traffic service and economics. The Buellton story is one of the earliest and best-publicized of these; it was a case of enlightened civic leadership which met the engineers half-way and enabled us to work out a compromise which served both the economy of the town and the needs of through traffic, with some sacrifice on both sides. A still more recent story is that of Placerville. The route best serving traffic and the only route economically feasible through town involved displacement of some important buildings. Our engineers and particularly our right-of-way agents worked everything out, aided in large measure by the initiative and cooperation of the community; construction of the first unit of the Placerville Freeway is scheduled to start this year.

San Rafael Story

At a public meeting in San Francisco about a year ago, the city managers of three cities located north of the Golden Gate Bridge on Highway 101 were called on to discuss freeways and expressways.

First, San Rafael. The 2-mile freeway through San Rafael by-passes the business district by means of an overhead structure which crosses the four major streets of the city. When the plan for the overhead was broached, many merchants objected strenuously. But the proponents, headed by the city council, urged that the overhead recommended by the engineers be constructed, and it was. This is what the city manager had to say a year ago: "We in San Rafael are definitely of a single mind that the construction of the state highway through our community was the most desirable single project that we have ever had accomplished in recent years for the safety and welfare of our citizens as well as the motoring public."

Petaluma Story

Second, Petaluma. After thorough local discussion a freeway routing which would by-pass the city and yet be satisfactory to the people of the area was agreed upon. The existing routing of the Redwood Highway through the heart of the business district has led to noise, congestion, accidents, and other undesirable results. The city manager summarized 10 beneficial effects of the proposed by-pass, including: increased local business activity, increased property values, increased safety and convenience for both pedestrians and local motor traffic, reduced noise and hazard from through traffic (particularly trucks), and better parking facilities and control of local traffic.

Santa Rosa Story

Now, Santa Rosa, and the other side of the picture. The recommendation of the State Highway Engineer was for a route somewhat to the west of the City, at a cost of less than $1,000,000. But local interests became aroused. When the smoke had cleared, the commission had acceded to local insistence and adopted a route close to the business district and only a little to the west. A compromise proposal of the state engineers for a five-block viaduct over some of the main intersecting streets likewise had been rejected by organized local groups.

Many of you know the rest of the story. The so-called freeway at ground level through Santa Rosa has been the scene of congestion, increased accidents, and finally a 35-mile speed limit through the city. Says the city manager:

"The present construction after two years, if we are willing to face the facts, can no longer be considered a freeway; it is only a widened highway running through a heavily traveled 3-mile stretch with dangerous cross traffic.

Speaking as a member of the commission, I might add that the situation which occurred in Santa Rosa is not likely to occur again, for a number of reasons. One reason, of course, is that we know a good deal more about freeways and their local effects than we did a few years ago. Another reason is that the local communities themselves are more aware of the benefits of efficiently planned by-passes, as just illustrated by the experience of San Rafael and the attitude of Petaluma.

Many New Freeways

Since the new procedure on route adoptions was laid down by the commission three and a half years ago, we have adopted nearly 600 miles of freeway. In 41 instances, the new routing involved areas in which there had been some appreciable degree of development. As stated in the procedural resolution, the commission offered in each of the 41 cases to hold hearings. The number of hearings actually requested and held was eight. Five of these eight hearings were held during the first year under the new procedure. One of the cases was actually a pleasant misunderstanding. The city council of a northern California city informed us that they wanted a hearing held. A majority of the commission turned up as scheduled, sat down with the local leaders, and then discovered that the community had no objection whatever to the proposed route. It seems that they had felt that to decline the offer of a hearing would be discourteous to the commission.

This is not to say that all is sweetness and light in the matter of route adoptions. There are still differences of opinion, sometimes vehemently expressed. But I should like to point out again that the discussion of facts and viewpoints, even in the knottier problem cases, is a matter of public knowledge and public participation, and I am more confident of happy solutions in all cases because the basis for the solution will have been threshed out in full public view.

Room for Improvement

It is obvious that room exists for still more improvement in our relations with communities. Misconceptions are still far too widespread to permit us to relax our efforts to interest and inform John Doe on the subject of highways.

In the face of all I have just related, we still hear remarks like: "They'll put the highway where they want to, regardless of what we say." People who make such misstatements constitute a definite public-relations challenge.

Then we hear people in some parts of the state saying: "The big cities get all the money for fancy freeways while they leave us cow counties in the mud." And in other parts of the State we hear this: "Why don't they relieve our traffic congestion instead of building roads in cow counties for one-tenth as many cars?" Here is a public-relations problem of the greatest magnitude: How shall we explain to both groups of people that under law and under commission policy the needs of both are being met as equitably as possible, and as rapidly as the present system of financing will permit?

Many Misconceptions

There are many more misconceptions, some within the province of the engineer rather than the Highway Commission, but all of them demanding correction as part of an over-all program to make John Doe better informed on highway matters. "Those new lanes are all paved; why can't we use them right now?" I know you are familiar with that one. How do you get across to the motorist bottled up on a congested two-lane stretch of highway parallel to a nearly completed additional two lanes, the facts about necessary completion of shoulders, concrete pavement curing, seal-coating, installation of signs and lights, and so forth? How are you going to cope with the incessant demand for traffic signals at every intersection of a state highway with a city street, and explain the distinction between traffic control and traffic safety?

One way to approach these problems is to insist that they be considered in their proper perspective; that is, as part of a state-wide problem, not an isolated issue. If this view through the right end of the telescope can be taken and maintained on a large scale, the solution to many of our highway deficiency headaches is in sight.

Position of Commissioners

The members of the California Highway Commission are themselves drawn from different sections of the State, each of which has its serious highway problems. Fortunately, we have had the benefit of the state-wide view through repeatedly seeing the fundamental similarity and the interrelationship of these apparently local situations. We do possess individually a special familiarity with the needs of the section of the State from which we hail; but we are in no sense "the Highway Commissioner from" this or that area. The only instruction I have ever received from Governor Warren since he appointed me to the commission in 1943 was: "You are a highway commissioner for all of California." I am sure my colleagues received the same marching order; it is in that spirit that we endeavor to act, and it is that spirit which we must somehow convey to John Doe.

The complexity and scope of the job to be done are tremendous. By the same token, they constitute a tremendous

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Record Snowfall

Pack on Donner Summit Was 314 Inches on March 20th

A RECORD-BREAKING snow pack of 314 inches was recorded at Donner Summit on U. S. 40 on March 20, 1952. This is the greatest depth of snow reported for this location since accurate observations were first made in 1897. Also on March 20th, the total snowfall at Donner Summit for the current winter reached 776 inches, equaling the fall for the entire winter of 1889-90, which was exceptionally heavy in comparison with the years to follow, and coming within seven inches of the total for the winter of 1879-80. Snowfall during the spring months should push this season's total to a new high.

Exceptional depths of snow were experienced elsewhere throughout the Sierra Nevada Range, as evidenced by the following table:

SNOW PACK

Location	Depth, inches	Date
Mineral Summit (State Sign Route 36)	211	(3-19-52)
Yuba Pass (State Sign Route 49)	245	(3-22-52)
Echo Summit (U. S. 50)	313	(3-20-52)
Peddler Hill (Carson Pass Road) (State Sign Route 88)	263	(3-20-52)

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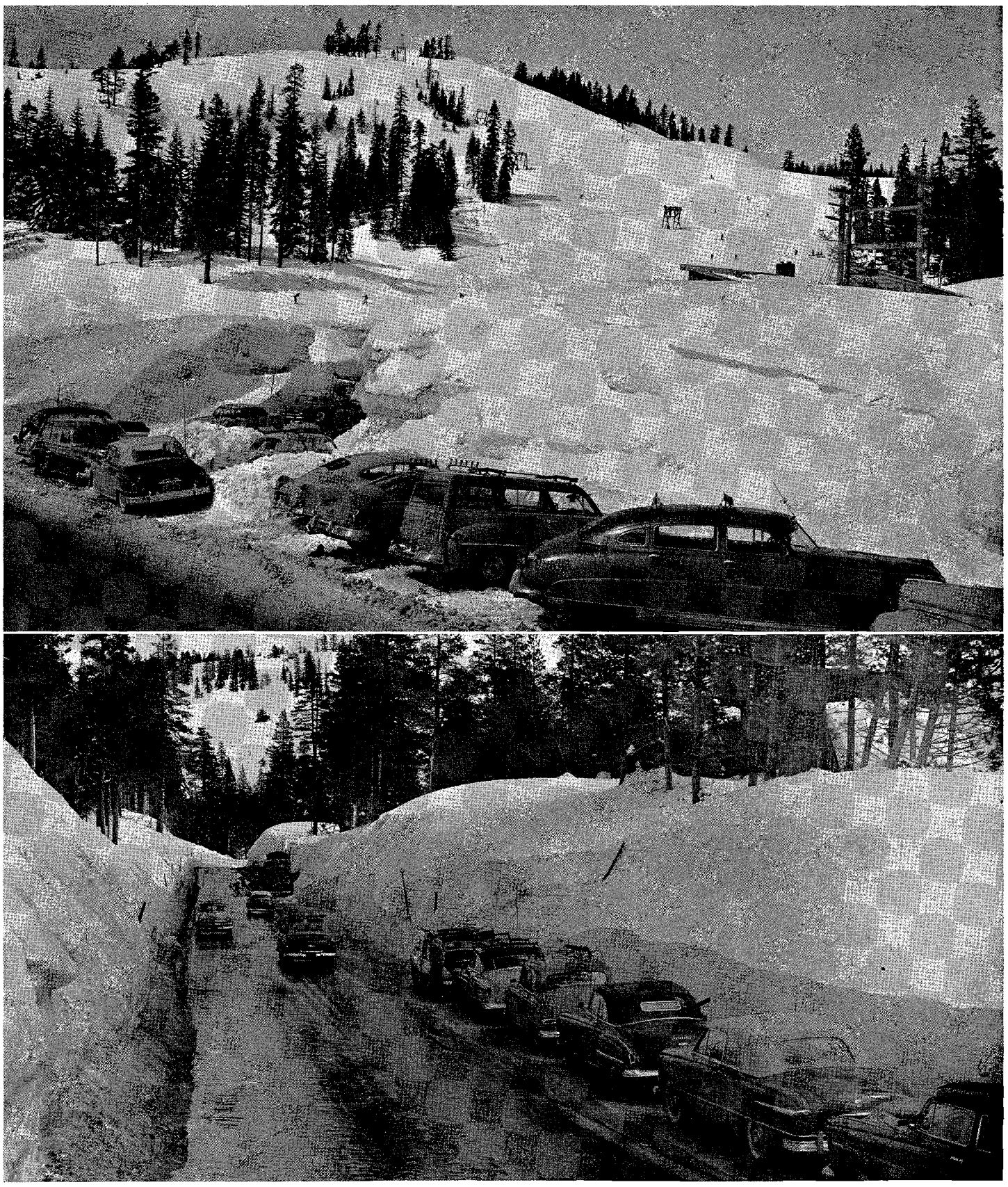
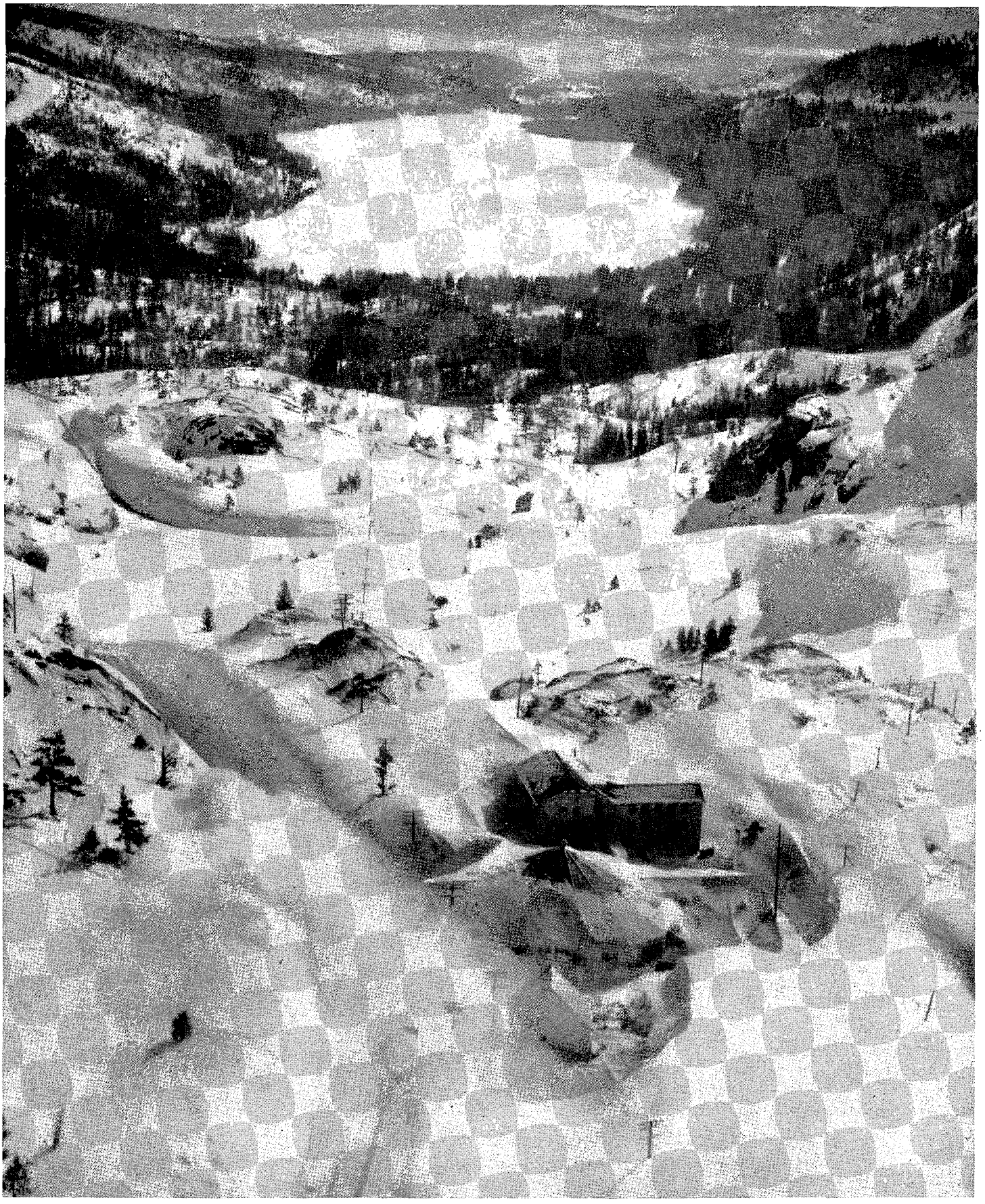
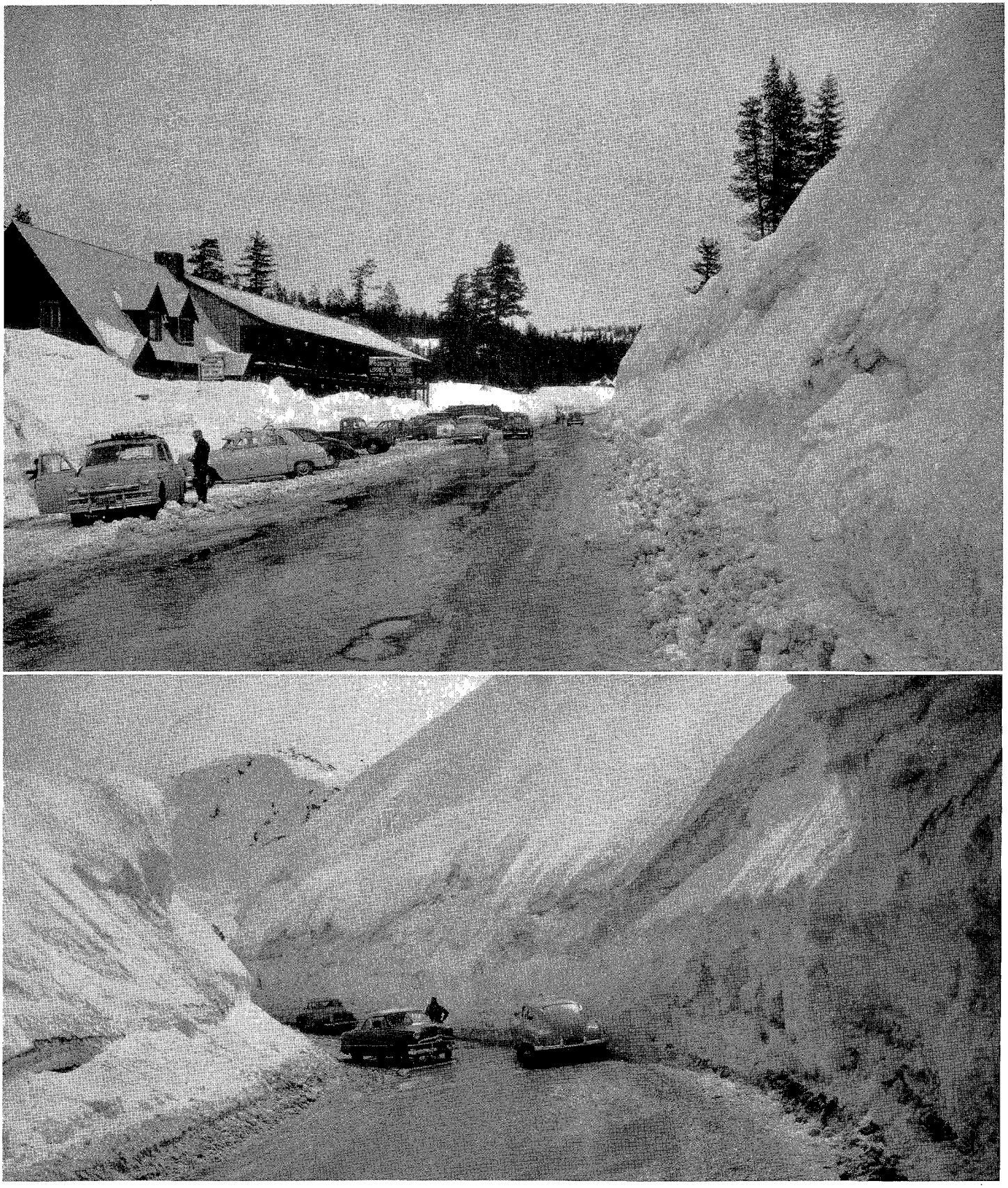
This photo shows height of snow wall opposite ski resort on U. S. 40 in the Donner Summit area late in March



UPPER—Roadside parking at ski resort showing ski lift in background. LOWER—Regulated parking near Soda Springs on U. S. 40.



This striking aerial photo taken by Robert Handsaker of the Sacramento Bee shows maintenance station of Division of Highways on Donner Summit



UPPER—Snow conditions at end of March in resort area west of Donner Summit on U. S. 40. LOWER—Canyon of snow on Donner Grade, U. S. 40.

Record Snowfall

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Camp Connell (Ebbetts Pass Road) (State Sign Route 4)	144	(3-20-52)
Big Stump (Entrance to General Grant Grove) (State Sign Route 180)	180	(3-21-52)
Shaver Lake (Huntington Lake Road) (State Sign Route 168)	120	(3-17-52)
Deadman Summit (near Crestview) (U. S. 395)	154	(3-15-52)

Additional Storms

Storms during the middle of February and the first three weeks of March continued to add snow along the routes affected by the big January storm. Roads across the Sierra became relatively narrow paths between towering walls of hard-packed snow. These high walls not only complicated the problem of snow disposal but increased the threat of closure by trapping even the slightest drift from surrounding areas.

United States Routes 40 and 50 were closed several times by blizzard conditions or slides of freshly fallen snow, the longest closure for each route being a four-day period in mid-March.

During the same March storm the Feather River Road, State Sign Route 24, was closed for a day between Blairsden and Chilcoot Pass by high wind and drifts.

Points along U. S. 395 in Mono County received an exceptionally heavy fall of snow from the storm starting on March 14th. Eighty-four inches of snow fell in one 24-hour period at Deadman Summit near Crestview. A snowslide near McGee Creek filled a 300-foot long highway cut with 18 feet of snow. A series of snow slides along State Route 111 also hampered the opening of this road between U. S. 395 and the town of June Lake.

CEMENT AND CONCRETE

Publication of a Comprehensive Bibliography on Cement and Concrete is announced by Purdue University. The bibliography covers the 23-year period of the literature, 1925-1947, inclusive and has both a subject and an author index. It contains 40,000 or more references.

State-wide Summary of Water Conditions

CALIFORNIA'S 1952 snow-melt runoff will be the greatest since the initiation of the state-wide snow survey program in 1930.

Seasonal precipitation to date over the entire State averages about 150 percent of normal with variations from a minimum of 100 percent to a maximum of 200 percent of normal. Areas of greatest percentages of normal are in the vicinities of Bishop in Inyo County and Portola in Plumas County. A heavy March storm brought generous amounts of rain to the general area of recently critical water shortage along the coastal plains between Santa Barbara and San Diego.

Although the Sierra snowpack as a whole contains a volume of water exceeding any heretofore measured on April 1st, the volume on the watershed above Shasta Dam is less than that of April 1, 1938. On watersheds of the Feather, Yuba, and American Rivers, runoff during the April-July period is expected to be the greatest since 1890. It is anticipated that Sierra streams tributary to the northern San Joaquin Valley will produce flows of sufficient magnitude to overflow low lying agricultural lands in the vicinities of their respective confluences with the San Joaquin River. The runoff from Sierra streams tributary to the southern San Joaquin Valley will probably result in depths and extent of submergence in the Buena Vista and Tulare Lake areas approaching those of 1938.

Although appreciable space in major Sierra reservoirs has been evacuated for the purpose of regulating flood flows, it is anticipated that all will fill and some will spill before the end of the period of snow-melt runoff. Only in the south coastal area has the runoff been of insufficient magnitude to insure filling of all reservoirs.

The abundant rainfall and runoff of the past season has resulted in substantial replenishment to most ground water basins of the State. Ground water levels measured about April 1, 1952, were higher in nearly all areas than those of April 1, 1951. Ground water elevations in the San Francisco Bay region were all higher than those of last spring, except in the San Lorenzo area in southern Alameda County where no appreciable change was noted. Water levels in the central coastal area were similarly higher. In the Central Valley, water levels were generally higher than those of a year ago. Increases in water elevations have been noted in most of the unconfined ground water zones of the south coastal area.

Runoff from the major streams of the State have averaged above normal for the six-month period October 1st to April 1st.

Stream Flow

The April-July runoff from snow-fed streams in the Sierra Nevada will be the greatest in many years. The runoff forecasts range from 250 percent of the 62-year normal expectancy on the Kern River Basin to 150 percent on the watershed of the Sacramento River above Shasta Dam. On the latter area the anticipated April-July runoff was exceeded in 1938. On the watersheds of the Feather, Yuba and American Rivers runoff during the April-July period is expected to be the greatest since 1890. On the remainder of the Sierra Nevada south from the American River Watershed the April-July snow-melt runoff will be the greatest since 1906 or 1907 with the exception of the Kern River where greater runoff occurred in 1916. *All the forecasts of total snow-melt runoff contained herein are predicated upon the prevalence of normal weather conditions during the period of runoff.* Forecasted runoff amounts in acre-feet, and in percentage of the 62-year normal, for major Sierra streams are set forth in the tabulation following:

STREAM FLOW FORECASTS—APRIL 1, 1952

Stream	Gaging station	Estimated 1952 flow April-July Acre-feet	Percent normal
Sacramento	Shasta Dam	2,800,000	150%
Feather	Oroville	4,900,000	222%
Yuba	Smartville	2,400,000	199%
American	Fair Oaks	3,150,000	206%
Mokelumne	Mokelumne Hill	1,050,000	198%
Stanislaus	Melones	1,650,000	200%
Tuolumne	La Grange	2,400,000	179%
Merced	Exchequer	1,300,000	185%
San Joaquin	Friant	2,600,000	192%
Kings	Piedra	2,450,000	184%
Kaweah	Three Rivers	600,000	204%
Kern	Bakersfield	1,150,000	253%

CENTRAL VALLEY AREA

The most recent year of comparable snowpack and similar general conditions for estimating maximum daily rates of flow during May and June was 1938. Temperatures during those two months averaged about five degrees above normal. Based on the assumption of a temperature pattern similar to 1938, it is anticipated that the following conditions will prevail in the Central Valley.

SACRAMENTO RIVER BASIN

Stream channels and by-passes in the Sacramento Valley have ample capacity to carry anticipated snow-melt runoff through the reclaimed areas. Minor flooding may be expected in some mountain valleys the Pit and Feather River Watersheds. Within the Sacramento River Flood Control Project water will probably flow over Colusa, Tisdale and Fremont Weirs until about June 1st. Seepage conditions on lands bordering the Sacramento and Feather Rivers will be severe until water in the river channels drops to elevations below natural ground surface.

Some flooding may be expected in a relatively small unprotected area north of the City of North Sacramento from backwater from the Sacramento and American Rivers.

Estimated peak stages and discharges in the Sacramento River Basin during May, 1952, are as follows:

Gaging station	Gage height in feet	Discharge in second-feet
Sacramento River near Red Bluff (Iron Canyon)	8	26,000
Sacramento River at Hamilton City	136	35,000
Sacramento River at Ord Ferry	105	35,000
Sacramento River at Colusa	61	31,000
Feather River, five miles east of Oroville	40	40,000
Yuba River at Marysville	64	——
Sacramento River at Verona	35	50,000
American River at Folsom	15	36,000
American River at "H" Street	35	35,000
Sacramento River at "I" Street	27	85,000

KERN RIVER BASIN

Flows on Kern River passing the City of Bakersfield will probably be in the order of 6,000 to 8,000 second-feet which will cause some overflow into Goose Lake Slough and inundate a narrow strip of agricultural land extending northerly to Sand Ridge at the south end of Tulare Lake. The portion of the Kern River flow remaining in the channel downstream from Goose Lake Slough will be discharged into Buena Vista Lake until the latter is completely filled and will then discharge into Buena Vista Slough to join other Kern floodwaters impounded behind Sand Ridge.

TULARE LAKE BASIN

The Kings and Kaweah Rivers will discharge large volumes of water into the Tulare Lake Sump. Advice has been received from the Corps of Engineers, U. S. Department of the Army, that the partially completed Pine Flat Reservoir will be operated for flood control during the snow-melt period. It is understood that as much as 300,000 acre-feet of flood control space may be available in that reservoir.

SAN JOAQUIN RIVER BASIN

Along the San Joaquin, Merced, Tuolumne and Stanislaus Rivers east of the valley trough there will be minor flooding of river bottom lands on which some agricultural development has taken place.

The operation of Friant Dam has materially altered the regimen of flow of San Joaquin River from that which existed in 1938. Reservoir operation and diversion of about 3,000 second-feet through the canals of the Central Valley Project will materially reduce the quantity of water reaching the Mendota Pool. An additional 2,300 second-feet can be diverted through the canals heading at Mendota Pool. However, some overflow on eastside grasslands is anticipated.

Subject to Inundation

Along that portion of the San Joaquin River traversing the trough of the valley between the Stanislaus and Merced Rivers relatively narrow strips of land along either or both banks of the river are unreclaimed or inadequately protected and will be subject to inundation.

Reclaimed lands along both banks of San Joaquin River downstream from the Stanislaus River to the Banta Carbona Irrigation District intake will probably be inundated when stages at the Vernalis gaging station exceed 26 feet, corresponding to a discharge of about 35,000 second-feet, as is anticipated.

The levees on the left bank of San Joaquin River between Banta Carbona Irrigation District intake and Mossdale Bridge and on both banks of Paradise Cut, although recently improved, should be carefully watched. Failure in this area would disrupt major lines of transportation and cause appreciable damage.

In the Sacramento-San Joaquin Delta the high tides and winds will be of more cause for concern than any rise that might result from snow-melt runoff.

The East Bay Municipal Utility District has advised that Pardee Reservoir on Mokelumne River will be operated to control releases to 5,000 second-feet insofar as is possible. That flow would cause only minor inundation of bottom lands adjacent to the river and of unreclaimed lands at the junction of the Mokelumne and Cosumnes Rivers.

LAHONTAN AREA

The water surface elevation of Lake Tahoe on April 1st was 6227.18. Assuming normal precipitation and temperature conditions for the balance of the season it is estimated by the Truckee Basin Water Committee, which regularly forecasts Lake Tahoe stages, that the lake will rise, with discharges regulated in accordance with the federal court decree, to elevation 6229.1. The maximum elevation should be reached on or about July 31st.

Releases have been made from Lake Tahoe during January, February and March under provisions of the Truckee River Decree and as authorized by the federal court in the amount of 214,000 acre-feet. It is anticipated that additional releases will be made under that authorization during the months April to July, inclusive, in the amount of 350,000 acre-feet. If subnormal or abnormal precipitation conditions prevail the release will be revised accordingly.

. . . Continued on page 56

ANCIENT PICTURES ON ROCKS POSE QUESTIONS

By LAURA ADAMS ARMER *

WHY DID primitive people peck designs on rocks?

A modern artist may answer: "Because they needed to express the beauty they felt. Archeologists surmise that the animal pictures on rocks were magical formulas to bring good hunting. Geographers see maps in some of them. The most beautiful of all pictographs were painted on the walls of caves in Spain and Southern France. Bison, cows, the ibex and prehistoric ponies are recorded by Stone Age artists.

In California and the Southwest, rocks and caves hold the secrets of early Indians who have left spirals, circles, stars, suns, mountain sheep, lizards, frogs, serpents, zigzag lines, dots and dashes hewn in the rocks with stone tools, or painted with color. Savants do not fathom their meaning. Indians know very little about them.

Through copying sand-paintings of the Navaho Indians in Arizona, I am able to interpret a few signs. The medicine men with whom I worked told me what they know. Knowledge that has been handed down from cliff dwelling times. A spiral, if it turns counter-clockwise, represents an evil wind which destroys. A square painted on the back of a reptile represents the house he lives in. Triangles are hoofprints of deer. The summer and winter moons border the house and deer tracks.

On a boulder high in the Southern California Sierra, in Kern County, I found the petroglyphs which were photographed with myself in the foreground. They resemble Owens Valley and Southern Nevada patterns. I should say the zigzag lines portray two rivers which bound some particular location known to the artist. Zigzags mean water in many parts of the world. In the Geographic Magazine for December, 1948, is an article entitled: "Sinai Throws A New Light On the

. . . Continued on page 56

* Internationally known artist and writer now residing in Fortuna, Humboldt County, California.

Walker Pass Road, State Sign Route 178, is a historic route. The western outlet of the pass is situated about 60 miles from the City of Bakersfield. These ancient Indian petroglyphs are to be found near Walker Pass in Kern County. It was through Walker Pass that the famous Bidwell-Bartleson Party (1841) and later emigrant parties made their way across the Sierra Nevada into California. Mrs. Armer views petroglyphs.

PILE DRIVING ON BAYSHORE FREEWAY IS SPECTACULAR

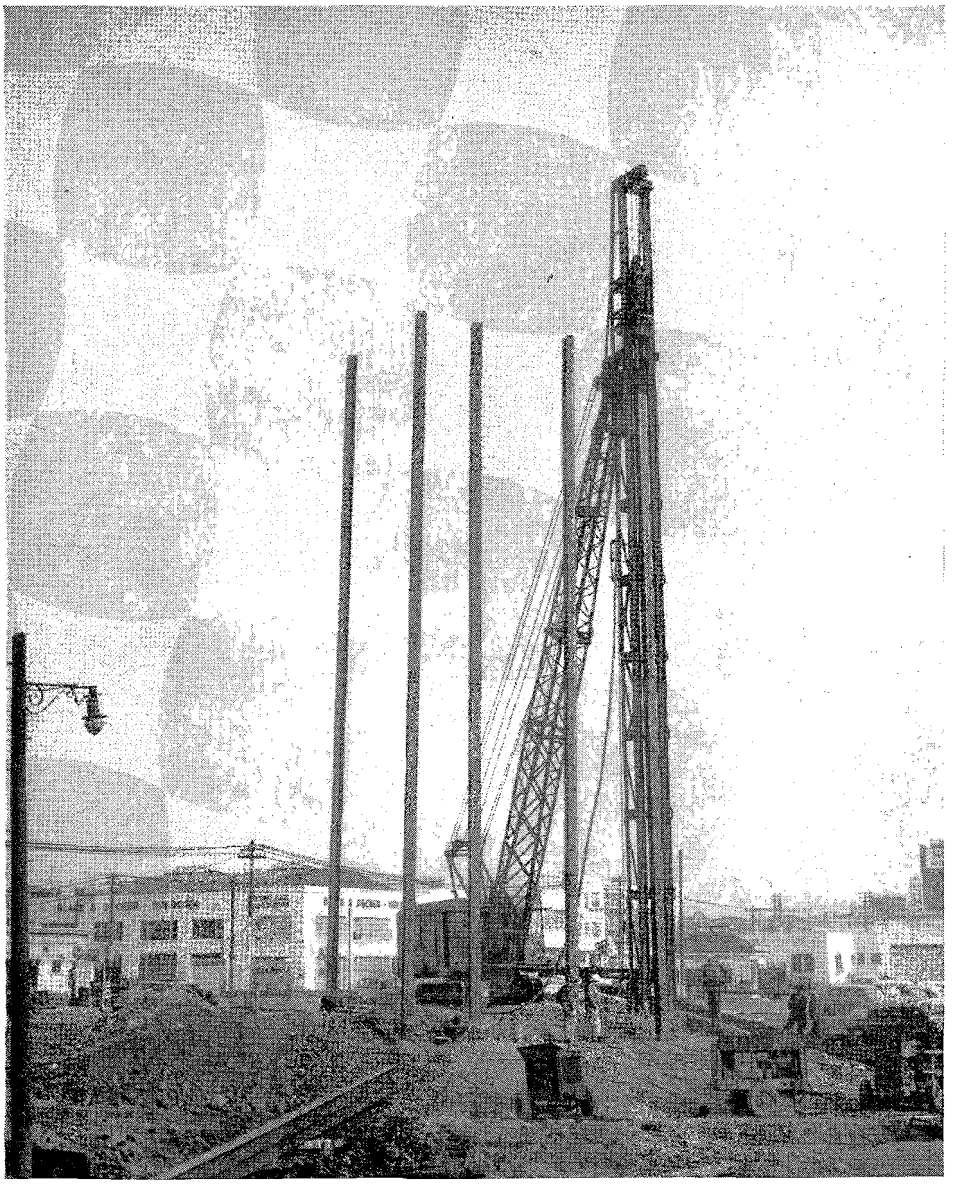
THE PILE DRIVER shown here at Ninth and Bryant Streets in San Francisco is driving one of approximately 550 Bethlehem Pacific steel H-piles that are being used in the abutment and pier foundations for the new $3,500,000 18th Street to Bryant Street Overpass project which is part of the Bayshore Freeway.

All told, approximately 670 tons of H-piles, 40 and 50 feet long are being driven for this section which is expected to be completed in February of next year.

At the Ninth and Bryant Street location, piles have to be driven to a depth of approximately 150 feet because of the softness of the earth down to that level. This is the old Mission Fill which at one time was part of the bay. Fifty-foot lengths of piles are spliced together by means of welding in order to reach firm foundation material.

This nine-tenths of a mile section of the new freeway, which will be an eight-lane divided highway, has connections at Ninth and Tenth Streets, with a one-way off-ramp at Ninth to San Francisco, and a one-way on-ramp at 10th for cars leaving San Francisco.

The whole project is under the supervision of F. W. Panhorst, Assistant State Highway Engineer in charge of bridges, for the Division of Highways.



County Roads

Continued from page 18 . . .

To bring our inadequate surfacing condition up to standards, we could also consider a road bond issue, to be repaid by any of the above means or a special improvement tax.

If the public really desires an immediate improvement in the county road system, serious thought should be given to the above means of financing, otherwise, they should be content with conditions as they now exist and accept them without complaint to those who are charged with the administration. To date Humboldt County has its fourth road commissioner since 1947. The removal of the old road commissioner and hiring a new one each year will not in itself correct road conditions as they now exist; in fact it will act in the reverse, as the road crew morale will be lowered owing to instability of the administration and lack of faith in the board of supervisors.

Let us all work together for one common cause of better roads with constructive criticism rather than destructive. Good roads are the key to continued increasing prosperity of Humboldt County.

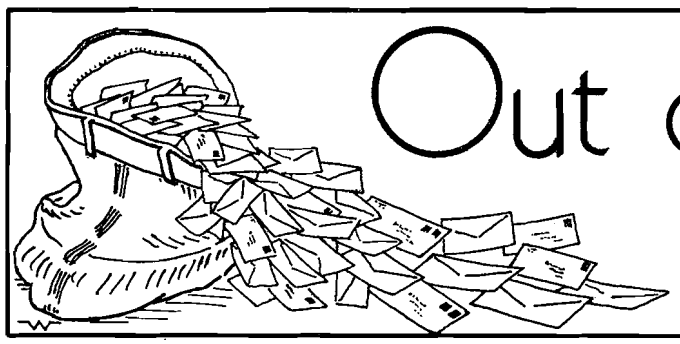
FROM DOWN UNDER

CHAMPIONS LIMITED
113-119 Currie Street, Adelaide

DEAR SIR: I wish to express my appreciation of your monthly publication, *California Highways and Public Works.*

This magazine is read by a number of clients who are road constructors and they have gained considerable knowledge from the reading of this publication.

E. O. JANSEN, *Sales Director*



Out of the Mail Bag

RECALLS BOYHOOD DAYS

OFFICE OF
COUNTY ASSESSOR
OF SACRAMENTO COUNTY
COURTHOUSE
Sacramento 14, California

MR. KENNETH C. ADAMS, Editor
California Highways and Public Works
Sacramento, California

DEAR SIR: I have been very much interested in your November-December issue of *California Highways and Public Works.* The section entitled "Photogrammetry" was especially interesting as the pictures show where I was born and lived for about 17 years. I can spot the location of the old house of my grandmother, the schoolhouse where I attended grammar school—we thought we were going to have many happy days when the schoolhouse burned down, but of course they found other places for us to go until a new school was built. The hill shown in the northeast corner of the map was used for flying kites when I was a youngster. The remains of the old Pacific Coast railroad right of way still shows very distinctly. I was a locomotive fireman on that road when I was 18 years old.

In addition the section entitled Shell Beach Study was very interesting as I, as a boy, helped harvest beans in the area where the town site is located. The ranch house of the former owner of this property shows very plainly in the photograph. In those days we did not think the abalones, which were very plentiful there, were good for eating, the shells being the only useful part.

Yours very truly,

HARRY M. WOOD,
County Assessor

BALANCING ROCK

W. W. MAULE
Minden, Nevada

KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: In your November-December Vol. 30, Mr. Munroe's cover page "Balancing Rock" brings back memories of 1924 while I was forest supervisor of the Mono National Forest and the year that I had supervision of building what was designated the "Reversed Creek Road," a six-mile link from June Lake Junction to S. S. power house at Silver Lake.

Portions of the road roughly followed a cowpath and the structure we emplaced has held mainly to the present link. The huge cost to the Forest Service was $6,000. A team Fresno moved the grade material and certain hard rock work was blasted by hand drills.

The perched boulder shown was brought into place by a post-glacial glacier which Israel C. Russell describes in "Quarternary History of Mono Valley in Eighth Annual Report of U. S. G. S.—1886-87." That glacier corked up a small stream by moraine north of the boulder and caused it to return into Rush Creek.

Very truly yours,

WILLIAM M. MAULE

GOOD ROADS

MR. GEORGE T. McCOY
State Highway Engineer

I have been driving over California highways since 1909. The great improvements one sees are almost unbelievable. Of course, every state recognizes California's leadership in building good roads.

JOHN J. LYNCH
Oakland, California

PLUMB BOB POINTS

SUVERKROP INSTRUMENTS
P. O. Box 436, Bakersfield, California

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: The November-December issue of your fine magazine, with the article on Standard Plumb Bob Points, has just been brought to my attention. This is a very important contribution to a very worthwhile effort, and especially so in view of both the circulation of your magazine among people concerned and the fact that it is an altogether independent write-up.

Mr. McGinnis is certainly to be congratulated for the clarity and engaging style of his writing. His article will go a long way in these final stages of making this plumb bob point universally accepted as the national standard.

In writing you thus I think I am only expressing the feelings of all plumb bob users and directors of work in which plumb bobs are used, as well as those of the numerous distributors and manufacturers who have pioneered the standard point. Sincere thanks from all of us.

LEW SUVERKROP,
Engineer

HOW TRUE

EDITOR

The Nov.-Dec. issue carries a sad commentary on adult delinquency. Beautiful scenery is marred with the debris tossed from cars by selfish slovenly men and women who must be admonished by the Highway Department to be more thoughtful, as though they were overgrown children.

Sad commentary, indeed.

JOSEPH KINSEL
4988 Mt. Royal Drive
Los Angeles, Calif.

COMPLIMENT FOR ENGINEERS

COLONEL GEORGE RUHLEN
2244 Plum Street
San Diego 6, California

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: Thanks very much for placing may name on the mailing list of California Highways and Public Works.

The articles on up-to-date engineering practices indicate our highway authorities are keeping close touch with the best modern theories and the results are evident to anyone traveling California highways. This confirms my previous high regard for the highway engineers with whom I have had pleasant associations in the past.

In addition to matters of local interest in the current issue, especially the new Oceanside-Carlsbad Freeway, the historical references which frequently appear in your publication are also interesting to one afflicted with an historical avocation, as is your correspondent.

Very truly yours,

GEORGE RUHLEN

LIKES MAGAZINE

THE UNION METAL MANUFACTURING CO.
Canton, Ohio

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: I want to thank you for the copies of the fine publication that reaches my desk. It is read with great interest by me as well as others in our organization.

This magazine keeps me abreast with the excellent program that the Highway Department is continuously carrying on—a program that gives the kind of roads to your citizens and visitors that makes your highways an example to many other states. Also, many of the articles are written by friends of mine in the Highway Department whom I do not get to see very often except at AASHO meetings.

Our company is proud to be the supplier of some of the poles and piling for your modern projects.

We wish you all a happy and successful 1952.

Sincerely yours,

W. A. PORTERFIELD
Vice President

FROM LONDON

LONDON

January 23, 1952

KENNETH C. ADAMS ESQ.,
California Highways and Public Works,

Dear Mr. ADAMS, we here in London all look forward to receiving your excellent magazine and would take the opportunity of thanking you for continuing to mail it to us.

We take the liberty of sending round our copy throughout the group of companies and, thereafter, it finds a place in the Royal Automobile Club in London where it is read by many interested people.

Fortunately, I am a frequent visitor to California and to Sacramento and am therefore able to see the many magnificent achievements carried out by the California Highways Department but, for the rest of us your magazine is the only medium to show our people the wonderful job of work which is being carried out in the most beautiful state in America.

Our most sincere good wishes for 1952 and beyond,

A. J. F. ANDREWS
Managing Director.

LIKES MAIL BAG

2610 W. 60th Street
Los Angeles 43, California

MR. KENNETH C. ADAMS, *Editor*

DEAR SIR: I have received several issues of your magazine and being employed by the City of Los Angeles in the Public Works Department causes me to read your magazine with keen interest, as new asphalt construction is our business.

Your magazine is the best in its field and it would be difficult to estimate its value to your readers. Such a magazine is an integral part of our California highway progress.

I read with interest that part of California Highways Public Works, "Out of the Mail Bag" and you must be immensely pleased to receive such letters. It must be a pleasure for you to pass along these letters of fine expression to those that help make the California Highways and Public Works a wonderful magazine.

Very Sincerely yours,

CHAS. L. DORSEY

FOR CLEAN HIGHWAYS

P. O. Box 18-A
Buellton, California

California Highways and Public Works
Sacramento, California

DEAR SIRS: I thought you would be interested in knowing that the Solvang Women's Club is very much interested in a roadside clean-up in the Santa Ynez Valley. They have appointed a committee of which I am chairman. Many motorists using the highways are very thoughtless and throw bottles, beer cans, and other rubbish by the wayside. This increasing carelessness should be brought to public attention. Possibly some means could be found to end this practice.

In our own valley we have approached the Division of Highways engineer, and the supervisors. We hope once these departments have the opportunity to "rake" up, we may be of help with an educational program through the schools. It is hoped to cover this ground by Easter.

Very truly,

TLITA DE LA CUESTA

FROM CANADA

ONTARIO
DEPARTMENT OF HIGHWAYS

TORONTO, CANADA
February 4th, 1952

MR. KENNETH C. ADAMS, *Editor,*
California Highways and Public Works,
Sacramento, California

DEAR MR. ADAMS: I have been receiving copies of your very fine publication, *California Highways and Public Works* and wish to take this opportunity to express my appreciation.

Your magazine is most interesting, well illustrated and of the highest standard.

Thanking you, very truly yours

THOMAS E. MAHONY
Traffic Division

HISTORY OF UNITED STATES NUMBERED HIGHWAYS

By M. A. O'BRIEN, Highway Signing Supervisor

To THE MANY historical events credited to San Francisco we find, upon investigation, that our present system of U. S. numbered highways may be added as it also had its origin in that city. While the idea was previously conceived and discussed by the officials of the Bureau of Public Roads and many state highway officials, the first step leading to the development of an interstate highway system was brought forth at the annual meeting of the American Association of State Highway Officials held in San Francisco during November, 1924.

There was a definite need for the marking of interstate highways and routes of travel which was partially satisfied by the various trail associations. Many individuals sought to capitalize on the popular demand for interstate and cross-country routes by organizing trail associations, collecting large sums of money from our citizens, and giving practically no service in return. This action discredited the many reputable trail associations which had heretofore rendered a distinct public service by stimulating highway improvement.

Haphazard Naming

Some of these organizations proposed routes through cities and towns that had contributed to their cause even though the route selected and identified would not be the most direct and best way for through travel. The old method of giving names to various highways prevented any uniform system of marking since highway names frequently were not continued into adjoining states and in several instances the same major highway would have two or more names in one state. Civic-minded groups vied with each other in naming various highways. Roads were named as the result of political pressure more often than for historical reasons. Too frequently local names were assigned a highway without markers of any kind being placed to identify the route. Local groups in one section often disagreed with other areas on the choice of a name. It frequently happened that this difference of opinion between neighboring groups was a source of considerable embarrassment to highway officials who now universally accept the system of highway numbering. Mr. Herbert Hoover, when Secretary of Commerce, is credited with making the original suggestion to establish a system of U. S. numbered highways.

A. A. S. H. O. Takes Action

The American Association of State Highway Officials in the San Francisco meeting of 1924, heard a paper on the subject of Interstate Highways presented by E. W. James, Chief of the Division of Design for the Bureau of Public Roads. This original report by Mr. James was approved and the state highway officials, on November 20, 1924, adopted the following resolution:

"This association hereby requests the Secretary of Agriculture, in cooperation with the several states, to undertake immediately the selection and designation of a comprehensive system of through interstate routes and to devise a comprehensive and uniform scheme for designating such routes in such a manner as to give them a conspicuous place among the highways of the Country as roads of interstate and national significance.

"To more satisfactorily carry out these suggestions and obtain speedy and satisfactory results, this association requests the Secretary of Agriculture to appoint a board to be composed of members of the Bureau of Public Roads and of the state highway departments to cooperate in formulating and promulgating a system of numbering and marking highways of interstate character."

Board Appointed

This resolution was presented to the Secretary of Agriculture. He concurred, and on March 2, 1925, appointed a board to make a study and submit recommendations. Thomas H. MacDonald, Chief of the Bureau of Public Roads, was named as Chairman; E. W. James, Chief of the Division of Design, Bureau of Public Roads, was named as Secretary; the other members were highway officials nominated from 21 states.

The various state representatives were divided into six regional groups, which acted on highways within the states embraced in their respective geographical areas. The 11 western states were named the "Western Group" and were represented by Robert M. Morton, State Highway Engineer for California; Roy Klein, State Highway Engineer for Oregon; Preston G. Peterson, Chairman, State Road Commission for Utah; James A. French, State Highway Engineer for New Mexico.

Similar groups were formed for other sections of the Nation as follows: Mississippi Valley Group representing 11 states; Lakes Group representing six states; Southern Group representing nine states; North Atlantic Group representing five states; and the New England Group representing six states. These groups had their meetings and reported to a Joint Board on Interstate Highways.

First Joint Board Meeting

The first full meeting of the joint board was held in Washington, D. C., on April 20, 1925. Resolutions were adopted which formed the basis for designation of the system of United States highways. The board recommended the immediate selection of transcontinental and interstate routes from the Federal Aid Road System and that these routes be continuously designated by means of a standard highway marking sign. It voted, also, that a system be established and marked to satisfy the demand for marked routes on the part of transcontinental and interstate traffic. This marking was to meet a need which in the past had been partially satisfied by the marked trails,

established by various trails associations. It was further voted to allow the several states to continue the marking of existing trails and memorial highways pending the establishing of the proposed marking system unless such action would conflict with the marking systems and policies now in force in the several states. A resolution "that no trail association be permitted to establish further routes on state or federal-aid routes" was adopted.

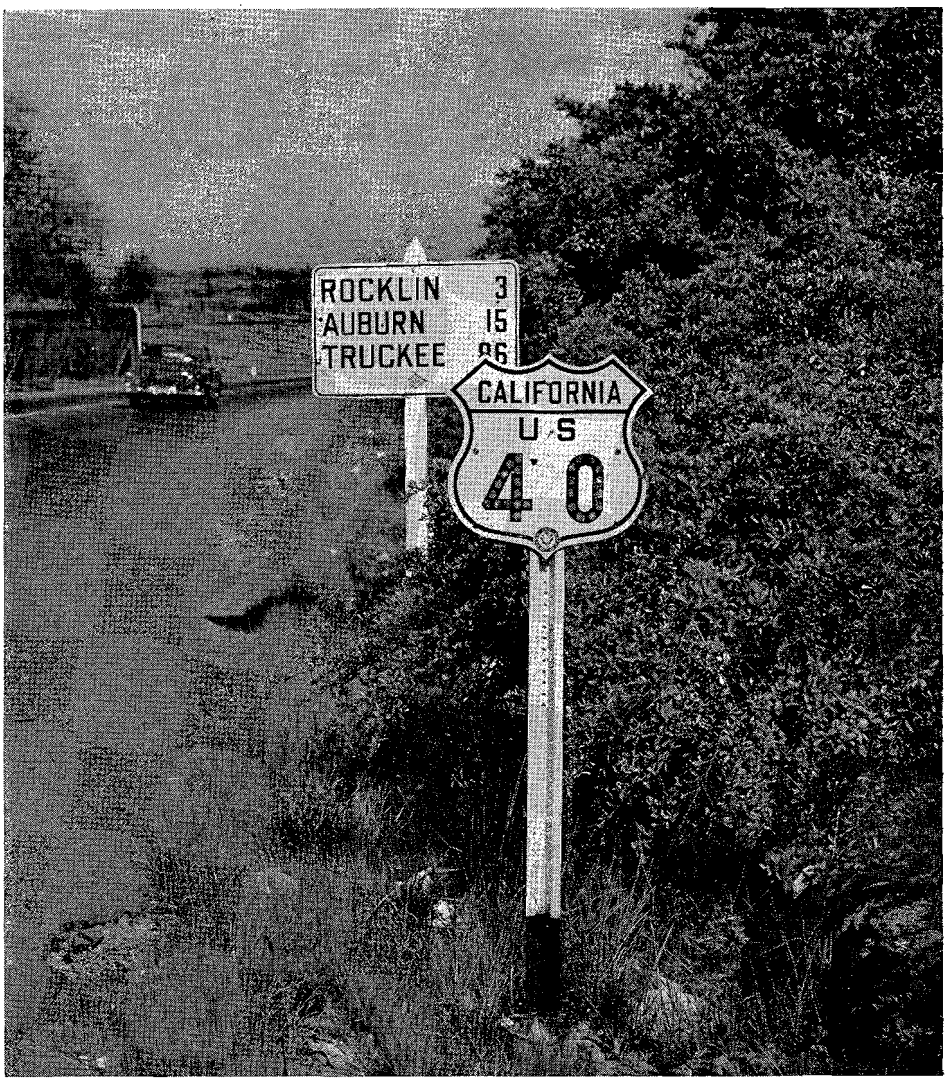
Signs Adopted

A second meeting of the joint board was held in Washington, D. C., on August 3, 1925, which adopted the reports and recommendations of the six territorial groups. The numbering system was adopted at this meeting. Our present standard U. S. shield with a white background and black lettering and a system of uniform warning, regulatory, and directional signs were also adopted for installation on these interstate highways.

As a basis for selecting the highway routes for the various states, it was decided that the mileage of these U. S. highways be confined to not more than 3 percent of the total certified rural miles within a state. At that time, the federal-aid system consisted of interstate and intercounty roads and was limited to 7 percent of the total mileage of rural roads then existing. The certified miles of rural highways in California in 1925 totaled 70,000 miles. The Western Group, in its meeting, had designated 2,599 miles in California as U. S. highways which was 3.7 percent of the certified miles. However, the joint board which met in Washington, D. C., in August, 1925, reduced this group selection to 2,220, or 3.1 percent of the certified miles to be the U. S. Highway System in California.

Routes Selected

The findings and report of the joint board was presented to the American Association of State Highway Officials at its annual meeting held in Washington, D. C., in November, 1926. A resolution was adopted at that time to proceed with the program as submitted by the joint board.



Even numbered U. S. routes run east and west. This shows sign on U. S. 40

The committee assigned all odd numbers for highways which run in a north and south direction and assigned even numbers for highways which run east and west. The lowest east and west numbers parallel the Canadian border.

The routes and numbers selected were referred to the various state highway departments for review as to the extent and general location of the U. S. routes to be marked. It was felt that each state highway department should select the best available routes and locate U. S. highways over roads where proposed improvements and realignments would be made.

In California

The original selection consisted of 76 primary highway routes throughout the United States. U. S. Highway 1 was to follow the Atlantic Coast, and U. S. Highway 101 to follow the western coast of California. It was found necessary and advantageous to have some U. S. highways as connecting laterals between other major routes. Where this has been done, the number of the major route is retained and the lateral route has the addition of a third digit. One example of this system in California is applied to U. S. Highway 99, the main north and south route which passes through the central part of California. The number "99" has been retained to mark three of the laterals; we therefore have U. S. Highway 199, U. S. 299, and U. S. 399, all of which connect U. S. 99 with some other U. S. highway.

(To be continued)

Ancient Pictures

Continued from page 50 . . .

Bible," Prof. W. F. Albright of Johns Hopkins University in a table of signs based on his studies, says that Sinaitic writing on the rocks is the oldest in our alphabet. He calls the zigzag, water. Also the square is house in old Sinai.

When I was writing and painting in the Black Mountain section of the Navaho reservation, I made the acquaintance of an up-to-date chiseler of the sandstone cliffs not far from my house. This man was a lover of horses. He had drawn several life-size portraits of his pony on the walls of the canyon and finished his mural with a mountain lion, the soft-footed chief of Navaho medicine men. I know that the Indian carved those animals on the rocks because of his admiration for their forms. If, a thousand years from now they still exist, I wonder what archeologists will say about them. I shall have my say now.

They are the expressions of the artist's emotional delight in the creatures of the good Mother Earth.

Summary of Water Conditions

Continued from page 49 . . .

The Los Angeles Department of Water and Power has forecast runoff for the hydrographic year in the Owens River Watershed to amount to 170 percent of their long-term mean; the Mono Basin Watershed excluding Mill Creek to amount to 180 percent of the long-term mean; and the average runoff from the Inyo-Mono area to average 172 percent of the long-term mean.

COLORADO DESERT AREA

According to advice received from the Office of River Control, U. S. Bureau of Reclamation, Boulder City, Nevada, snow survey and precipitation data available on April 1st indicated an anticipated runoff at the Grand Canyon gaging station of from 13,400,000 acre-feet to 16,200,000 acre-feet. That agency further advised that it believed the flood control requirements below Lake Mead would be met.

Sign Language

THE MOTORIST who doesn't believe in signs is inviting trouble when he heads his car into California snow country.

The State Division of Highways has a special "sign language" for the 4,000 miles of state-maintained highway on which snow and ice are a constant or a recurring hazard every winter, and most of the signs move up and down the mountain slopes along with the snowline.

There is sound basis in state law, experience and common sense behind these signs which tell the motorist where to put on chains and where to park while doing so.

Reaching suitable winter sports areas often requires driving over miles of icy mountain road. This means the use of skid chains.

First Warning

The first specific warning a motorist will encounter in snow country is a rectangular sign with reflectorized black letters on a yellow background reading "CHAINS REQUIRED 1 MILE AHEAD."

The Division of Highways tries, whenever possible, to place these signs near roadside developments such as garages or service stations where chains either can be rented or the motor vehicle driver can put on his own and not have to park on the traveled way to do so.

Farther along, at the actual chain-control point, there is a sign reading "STOP – VEHICLES WITHOUT CHAINS ON REAR WHEELS PROHIBITED." This rectangular sign is of reflectorized porcelain enamel with a white STOP on a red background. The remaining letters are black on white.

This sign (following the former wording of the statute in the Vehicle Code) in the past read simply "VEHICLES WITHOUT CHAINS PROHIBITED." However, this had to be changed when wiseacres, after being accosted, would exhibit chains neatly stored away under the seats of their cars and claim compliance with the law on the grounds that it mentioned nothing about having the chains actually on the wheels of the car.

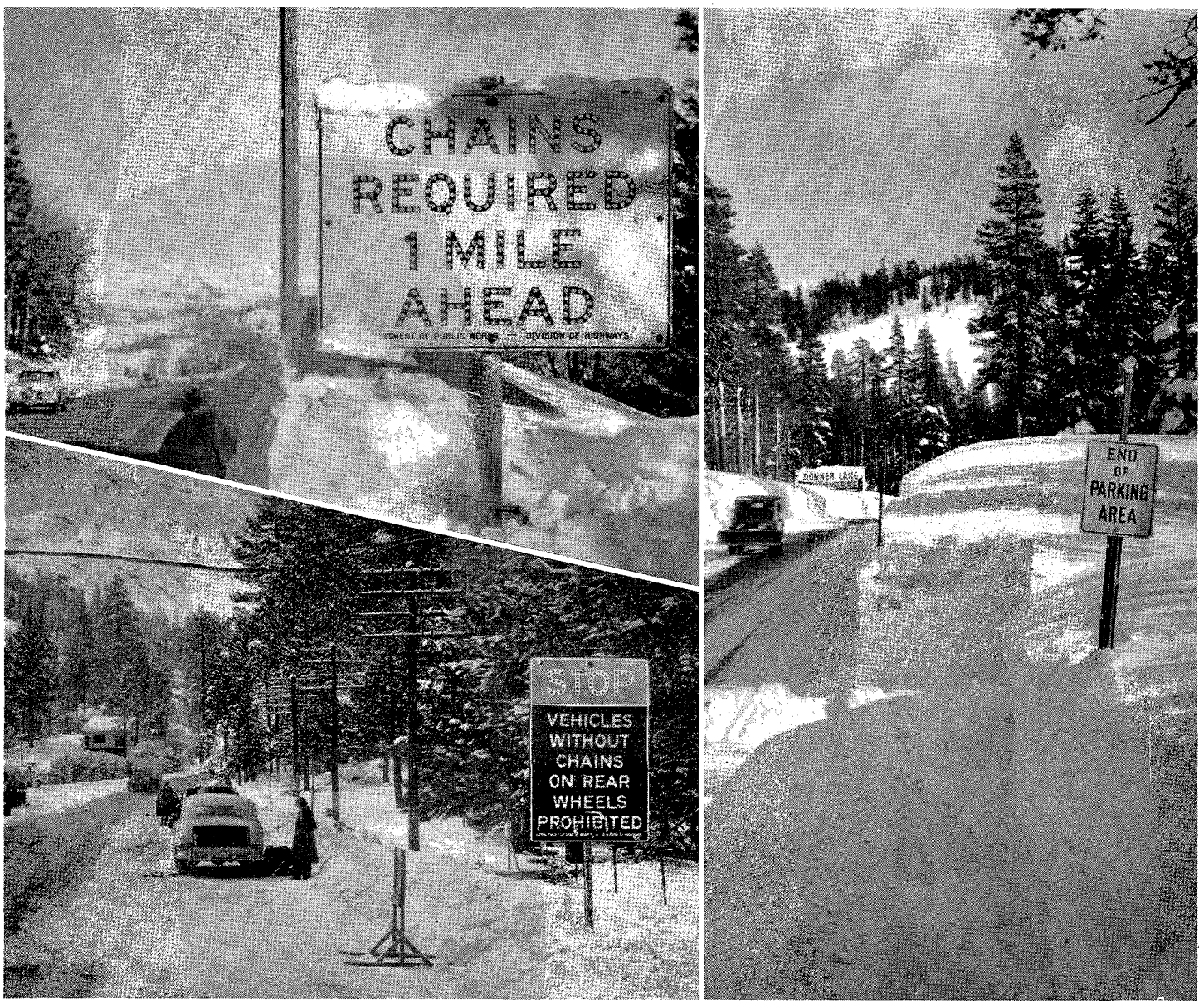
Highway maintenance men and officers of the California Highway Patrol who have seen fatal smashups caused by failure to use chains along ice-covered pavements have been understandingly slow to see the humor in this attempt to evade the spirit of the law. To avoid trouble, however, the law, and consequently the signs, were made more specific by adding three words: "ON REAR WHEELS."

Quite frequently, the division posts a black-on-yellow reflectorized sign reading "CHAINS ADVISABLE." Highway engineers point out that this sign is a warning to all drivers not thoroughly familiar with snow conditions. If you're a newcomer to the snow areas better play it safe and put on your chains, even though the only law behind the "advisable" sign is the unwritten law of self-preservation.

Motorists entering snow sports areas will come across locations where the snow has been removed from the shoulder of the road for a sufficient distance to permit parking. These spots are identified by rectangular black-on-white signs reading "PARK OFF PAVEMENT."

In places where the narrowness of the road makes it impossible to park clear of the pavement, the Division of Highways places red-on-white "NO PARKING" or "NO PARKING AT ANY TIME" signs, usually with an arrow underneath the letters to indicate the limit of the NO PARKING section.

Cars left parked, unattended and locked on the traveled way cause some of the biggest headaches which plague highway workers—and other motorists. They not only create a hazard but often make it impossible for other traffic, particularly the all-important snow-plow, to get through. During the



Winter brings a special "sign language" to the California mountain routes maintained by the State Division of Highways. By heeding these and other official roadside admonitions, tourists, winter sports fans and other motorists can enhance their driving pleasure and especially their safety, and also prevent serious traffic tieups.

recent pre-New Years storm, a few thoughtless motorists who parked and locked their cars on the pavement on U.S. Highway 40 bottled up hundreds of other vehicles for long periods and actually were responsible for closing the route for 36 hours.

Where large spaces at the side of the road have been leveled and cleared for parking, the Division of Highways places portable black-on-white signs stating "BEGINNING OF PARKING AREA" and "END OF PARKING AREA."

When leaving the chain-control areas motorists are notified by a black-on-yellow sign reading "END OF CHAIN CONTROL." This means that chains can be removed. This sign is posted at the first safe location below the danger area so that the motorist will not have to drive for any great distance over dry pavement with the resulting wear on both chains and tires.

Routes not kept open during the winter months are marked at control intersections or other advance points by rectangular black-on-white signs stating that the route or pass is closed by snow beyond a certain point.

For example, a driver heading east along State Sign Route 108 will encounter signs reading "SONORA PASS CLOSED BY SNOW BEYOND PINECREST." The word PINECREST may be on a detachable plate, so that it can be replaced by the name of some other point as snow conditions change.

California's experienced snow-removal crews and the California Highway Patrol are unanimous in one thing: When it comes to driving through ice and snow, warning signs are a motorist's best friend. Treat them with respect. Take what they say seriously. It could add years to your life.

STANDARD HIGHWAY DEFINITIONS FOR ALL STATES

Freeway—An expressway with full control of access.

Parkway—An arterial highway for non-commercial traffic, with full or partial control of access, and usually located within a park or a ribbon of parklike development.

Expressway—A divided arterial highway for through traffic with full or partial control of access and generally with grade separations at intersections.

These are three of many highway definitions recommended by the special committee on nomenclature of the American Association of State Highway Officials and approved as a policy of the association. Other definitions are:

Highway, Street or *Road*—A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

(*Recommended usage:*
in urban areas—highway or street
in rural areas—highway or road)

Arterial Highway—A general term denoting a highway primarily for through traffic, usually on a continuous route.

Control of Access—The condition where the right of owners or occupants of abutting land or other persons to access, light, air, or view in connection with a highway is fully or partially controlled by public authority.

Full control of access means that the authority to control access is exercised to give preference to through traffic by providing access connections with selected public roads only and by prohibiting crossings at grade or direct private driveway connections.

Partial control of access means that the authority to control access is exercised to give preference to through traffic to a degree that, in addition to access connections with selected public roads, there may be some crossings at grade and some private driveway connections.

Major Street or *Major Highway*—An arterial highway with intersections at grade and direct access to abutting property and on which geometric design and traffic control measures are used to expedite the safe movement of through traffic.

Through Street or *Through Highway*—Every highway or portion thereof at the entrance to which vehicular traffic from intersecting highways is required by law to stop before entering or crossing the same and when stop signs are erected. (Uniform Vehicle Code, Act V)

Local Street or *Local Road*—A street or road primarily for access to residence, business, or other abutting property.

Divided Highway—A highway with separated roadways for traffic in opposite directions.

Belt Highway—An arterial highway for carrying traffic partially or entirely around an urban area or portion thereof. (Also called circumferential highway.)

Radial Highway—An arterial highway leading to or from an urban center.

Frontage Street or *Road*—A local street or road auxiliary to and located on the side of an arterial highway for service to abutting property and adjacent areas and for control of access.

Toll Road, Bridge, or *Tunnel*—A highway, bridge, or tunnel open to traffic only upon payment of a direct toll or fee.

Cul-de-sac Street—A local street open at one end only and with special provision for turning around.

Dead-end Street—A local street open at one end only without special provision for turning around.

ELEMENTS OF THE CROSS SECTION

Roadway — (General) The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

(In construction specifications) The portion of a highway within limits of construction.

Roadbed—The graded portion of a highway, usually considered as the area between the intersections of top and side slopes, upon which the base course, surface course, shoulders, and median are constructed.

Subgrade—The portion of the roadbed prepared as a foundation for the base or surface course.

Median—The portion of a divided highway separating the traveled ways for traffic in opposite directions.

Traveled Way—The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

Shoulder—The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Roadside—A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside.

Traffic Lane—The portion of the traveled way for the movement of a single line of vehicles.

Auxiliary Lane—The portion of the roadway adjoining the traveled way for parking, speed-change, or for other purposes supplementary to through traffic movement.

Parking Lane—An auxiliary lane primarily for the parking of vehicles.

Speed-change Lane—An auxiliary lane, including tapered areas, primarily for the acceleration or deceleration of vehicles entering or leaving the through traffic lanes.

Median Lane—A speed-change lane within the median to accommodate left-turning vehicles.

Outer Separation—The portion of an arterial highway between the traveled ways of a roadway for through traffic and a frontage street or road.

TRAFFIC TERMS

Passenger Car—A motor vehicle designed for the transportation of not

more than eight persons. The term includes taxicabs, limousines, and station wagons.

Bus—A self-propelled motor vehicle designed for the transportation of more than eight persons.

Trolley Coach—A motor vehicle, designed for the transportation of persons, which is propelled by electric power from overhead trolley wires but not operated upon rails.

Streetcar—A vehicle designed for the transportation of persons and operated upon rails principally in municipalities.

Truck—A general term denoting a motor vehicle designed for transportation of property. The term includes single unit trucks and truck combinations.

Truck Combination—A truck tractor and a semitrailer, either with or without a full trailer, or a truck with one or more full trailers.

Light Delivery Truck—A single unit truck, such as a panel or pick-up truck, with size and operating characteristics similar to those of a passenger car and commonly used for short-haul light delivery service.

Parked Vehicle—A vehicle stopped for temporary storage.

Standing Vehicle—A vehicle stopped for a brief interval as when loading or unloading.

Curb Loading Zone—Roadway space adjacent to a curb and reserved for exclusive use of vehicles during loading or unloading of passengers or property.

Traffic Control Device—Any sign, signal, marking, or installation placed or erected under public authority, for the purpose of regulating, warning, or guiding traffic.

Traffic Sign—A traffic control device mounted on a support above the level of the roadway that conveys a specific message by means of unchanging words or symbols.

Traffic Marking—A traffic control device consisting of lines, patterns or colors on the pavement, curbs, or other objects within or adjacent to the roadway, or words or symbols on the pavement.

Traffic Signal—A power-operated traffic control device by which traffic is regulated, warned, or alternately directed to take specific actions.

Traffic Control Signal—A traffic signal by which traffic is alternately directed to stop and to proceed.

Delay—The time lost while traffic is impeded by some element over which the driver has no control.

Operational Delay—Delay caused by interference between components of traffic.

Fixed Delay—Delay caused by traffic controls.

Speed—The rate of movement of a vehicle, generally expressed in miles per hour.

Average Spot Speed—The arithmetic mean of the speeds of all traffic, or component thereof, at a specified point.

Over-all Travel Time—The time of travel, including stops and delays except those off the traveled way.

Running Time—The time the vehicle is in motion.

Over-all Travel Speed—The speed over a specified section of highway, being the distance divided by over-all travel time. The average for all traffic, or component thereof, is the summation of distances divided by the summation of over-all travel times.

Running Speed—The speed over a specified section of highway, being the distance divided by running time. The average for all traffic, or component thereof, is the summation of distances divided by the summation of running times.

Design Speed—A speed determined for design and correlation of the physical features of a highway that influence vehicle operation. It is the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern.

Merging—The converging of separate streams of traffic into a single stream.

Diverging—The dividing of a single stream of traffic into separate streams.

Weaving—The crossing of traffic streams moving in the same general direction accomplished by merging and diverging.

Volume—The number of vehicles passing a given point during a specified period of time.

Density—The number of vehicles per mile on the traveled way at a given instant.

Headway—The time interval between passages of consecutive vehicles moving in the same direction by a given point.

Spacing—The distance between consecutive vehicles measured front to front.

Design Volume—A volume determined for use in design, representing traffic expected to use the highway. Unless otherwise stated, it is an hourly volume.

Average Daily Traffic—The average 24-hour volume, being the total volume during a stated period divided by the number of days in that period. Unless otherwise stated, the period is a year. The term is commonly abbreviated as ADT.

Thirtieth Highest Hourly Volume—The hourly volume that is exceeded by 29 hourly volumes during a designated year. (Corresponding definitions apply to any other ordinal highest hourly volume, as tenth, twentieth, etc.)

Basic Capacity—The maximum number of passenger cars that can pass a given point on a lane or roadway during one hour under the most nearly ideal roadway and traffic conditions that can be attained.

*Possible Capacity**—The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions regardless of their effect in delaying drivers and restricting their freedom to maneuver.

Practical Capacity – The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions, without unreasonable delay or restriction to the drivers' freedom to maneuver.

Design Capacity—The practical capacity or lesser value determined for use in designing the highway to accommodate the design volume.

NAVY APPRECIATION

U.S.S. LOS ANGELES CA-135
c/o Fleet Post Office

VALLEJO, CALIFORNIA,
14 February, 1952

California Highway Commission
Los Angeles, California

GENTLEMEN: This is by way of a compliment to the people responsible, for their comprehensive traffic analysis and placement of easily read and understood traffic signals and directives.

Realizing the difficulties involved due to the large number of autos and limited space in Los Angeles streets (and being out-of-state drivers), we anticipated a certain amount of difficulty in driving in Los Angeles County, because of the immense volume of motor vehicles and our unfamiliarity with streets and directions.

However, such was not the case. Due to the excellent freeways, signals and fast-flowing traffic, we were able to maneuver with as much ease as if we had been driving in this area for years.

Our thanks go also to the courteous, efficient and helpful police officers, both in the city and on the highways. Their handling of traffic during the rush hours is especially gratifying.

Sincerely,

W. H. OMER, USN
Houston, Texas
J. V. CALDERSON, USN
Del Rio, Texas
F. J. TUK, USN
Latrobe, Penna.

State Auto Influx Up 10 Percent In First Quarter

AN ALL-TIME high of 277,240 out-of-state cars entered California during the first three months of this year, bringing 704,828 persons into the State.

The car influx is a 10 percent increase over the previous high of 251,074 set last year, the Touring Bureau of the Automobile Club of Southern California announces.

The number of passengers to enter California in out-of-state cars during the first quarter is also the highest in history, topping the 1951 record year of 634,649 by nearly 17 percent.

Southern California border stations checked through 185,087 of the total number of cars and 479,420 of the passengers.

The three-month breakdown showed the following totals of out-of-state vehicles entering California in 1952: January, 89,578; February, 92,287; March, 95,375. Each represented new monthly highs.

State Victory

Continued from page 19 . . .

as a freeway within the meaning of Section 23.5 of the Streets and Highways Code defining a freeway.

Speaking of the freeway declaration the court continues:

"The construction of the freeway pursuant to the resolution did not create new rights of access in favor of land which did not abut upon the highway as it formerly existed. Where an ordinary or conventional road is built, there may be an intent to serve abutting owners but when a freeway is established the intent is just the opposite, and a resolution creating a freeway gives adequate notice that no new rights will arise unless they are specifically granted."

Landmark in Litigation

In its opinion in the *Schnider* case, the court is careful to point out two specific situations which were not involved therein. The court stated it was not concerned with a situation in which the owner of property abutting upon a conventional highway is deprived of direct access when it is rebuilt as a freeway, and also that the *Schnider* case did not involve the question of what rights of access plaintiffs would have acquired if the boulevard had been widened and rebuilt as a conventional highway.

While the decision in the *Schnider* case merely confirmed the department's long standing interpretation of the law, it does stand as a landmark in litigation relating to freeways, since it is the first case in the United States which squarely decides the point involved.

DEMISE OF A COYOTE

It has been a hard winter, men. Even a coyote froze to death. Well, maybe he didn't freeze. Maybe his restricted quarters interfered with his normal diet of mice, jackrabbits and ranchers' chickens. Might be that a few snootfulls of invigorating Modoc winter air would have kept his tuneful presence among us. But anyhow he's dead. His untimely demise was discovered this-a-way:

Last year Prison Camp No. 39 north of Alturas put a 60-inch culvert in the new road at Dry Creek. This is about eight miles north of the Cedarville junction. The first snow and wind this winter plugged it shut and every storm increased the drifts. This was observed by Bill Stout, the camp superintendent. However, he was busy fighting snow to keep the road open, pulling out stalled trucks and hauling surfacing material to bolster the surface on sections of highway not completed last year. Furthermore, he had no great hope that it was ever going to quit snowing or warm up. Blocked culverts wouldn't make any difference anyway.

Finally, there came a day. It didn't snow. A flock of wild geese flew over. Bill consulted the calendar and refreshed his memory. Very skeptically, he decided it might be a good idea to open that Dry Creek culvert. Just an off chance you understand, that some day the snow might melt. He sent a crew down to shovel the snow out of both ends. There in the middle of the pipe they found Don Coyote.—*Contributed by District II, Division of Highways.*

The California Division of Highways operates 220 pieces of special snow removal equipment, in addition to 190 sanders and other devices for reducing accident hazards on icy highways.

HIGHWAY BIDS AND AWARDS

December, 1951

ALAMEDA AND CONTRA COSTA COUNTIES —At Broadway Low Level Tunnel, portions of tunnel ventilating and illuminating equipment to be cleaned and painted. District IV, Route 75, Section Oak, A. M. Williams & Sons, Inc., Oakland, $25,280; Deemer & Deemer, San Francisco, $27,600; J. S. Morris Co., Berkeley, $33,300. Contract awarded to R. W. Reade & Co., Berkeley, $14,604.

FRESNO COUNTY—On Blackstone Avenue between Olive Avenue and ¼ mile north of Shields Avenue in Fresno, about 1.8 miles to be graded and surfaced with plant-mix surfacing on untreated rock base and drainage pumping system to be installed. District VI, Route 125, Section Fre, C. Baun Construction Co., Fresno, $427,568; Guy F. Atkinson Co., South San Francisco, $463,875; M. J. B. Construction Co., Stockton, $475,739; Leo F. Piazza Paving Co., San Jose, $480,537; M. J. Ruddy & Son, Modesto, $528,096. Contract awarded to Gene Richards, Fresno, $411,957.46.

KERN COUNTY—Between McFarland and Delano Underpass, about 5.5 miles to be graded and paved with Portland cement concrete on cement treated subgrade, existing pavement to be surfaced with plant-mix surfacing over untreated rock base and drainage structures to be constructed. District VI, Route 4, Section F. Peter Kiewit Sons' Co., Arcadia, $908,216; J. E. Haddock, Ltd., Pasadena, $954,242; Fredrickson & Watson Construction Co., Oakland, $1,016,473; Rice Bros. Inc., Marysville, $1,020,867; Gordon H. Ball & San Ramon Valley Land Co. & Ball & Simpson, Berkeley, $1,028,367; M. J. B. Construction Co., Stockton, $1,054,575; United Concrete Pipe Corp., Baldwin Park, $1,087,358. Contract awarded to Griffith Company, Los Angeles, $817,166.

LOS ANGELES COUNTY—On Hollywood Freeway in the City of Los Angeles between Hollywood Boulevard and Western Avenue, about 0.7 mile to be graded and surfaced with Portland cement concrete on cement treated subgrade. District VII, Route 2. J. E. Haddock, Ltd., Pasadena, $1,376,104; Bressi & Bevanda Constructors, Inc., North Hollywood, $1,476,937; United Concrete Pipe Corp., Baldwin Park, $1,496,967; Winston Bros. Co., Monrovia, $1,510,341; Bongiovanni Construction Co., Hollywood, $1,532,060; Griffith Company, Los Angeles, $1,583,463; C. G. Willis & Sons, Inc., Los Angeles, $1,602,490; Clyde W. Wood & Sons, Inc., North Hollywood, $1,612,666; A. Teichert & Son, Inc., Sacramento, $1,688,137; Guy F. Atkinson Co., Long Beach, $1,789,070. Contract awarded to Webb & White, Los Angeles, $1,370,545.30.

LOS ANGELES COUNTY—At the intersection of Figueroa Street with Sepulveda Boulevard and the intersection of Lakewood Boulevard with Gardendale Street, full traffic-actuated signal systems and highway lighting at two intersections to be furnished and installed. District VII, Routes 165,168, Sections A,A. Westates Electrical Construction Co., Los Angeles, $24,858; Electric & Machinery Service, Inc., South Gate, $26,413; C. D. Draucker, Inc., Los Angeles, $26,559. Contract awarded to Fischbach & Moore, Inc., Los Angeles, $24,581.

MERCED AND STANISLAUS COUNTIES—At intersections of Route 4 with El Capitan Way, Johnson Street and Golf Road, traffic signal system with highway lighting at one intersection and highway lighting at two intersections to be furnished and installed. District X, Route 4, Sections D,A. R. Goold & Son, Stockton, $22,371; Underground Electric Construction Co., Oakland, $24,242; Main Electric Service, Stockton, $24,947; Howard Electric Co., Gilroy; $26,424. Contract awarded to L. H. Leonardi Electric Construction Co., San Rafael, $21,750.

SAN BERNARDINO COUNTY—In the City of San Bernardino at the intersections of Fifth Street with F Street, G Street, and H Street, traffic signal systems and highway lighting to be furnished and installed. District VIII, Route 9. Electric & Machinery Service, Inc., South Gate, $11,265; Fischbach & Moore, Inc., Los Angeles, $12,422; Westates Electrical Construction Co., Los Angeles, $12,918; C. D. Draucker, Inc., Los Angeles, $13,210; Paul R. Gardner, Ontario, $14,436. Contract awarded to Trico Company, Burbank, $11,140.

SANTA CLARA COUNTY—At the intersections of Bayshore Highway with Moffett Boulevard and at Moffett Field South Gate, traffic signal system and highway lighting to be modified at one intersection, traffic signal system and highway lighting to be furnished and installed at one intersection, and channelization to be constructed. District IV, Route 68, Section A. R. Flatland, San Francisco, $42,596; Edward Keeble, San Jose, $44,472; John B. Paroline, Morgan Hill, $44,977; A. J. Raisch Paving Co., San Jose, $46,775; L. C. Smith Co., Building Products Inc., Con Car Ranch & Enterprises, Inc., San Mateo, $47,590; J. Henry Harris, Berkeley, $48,690; Bragato Paving Co., Belmont, $49,562; Peter Sorensen, Redwood City, $56,500. Contract awarded to J. C. Bateman, Inc., San Jose, $41,687.60.

SANTA CLARA COUNTY—On Eastshore Freeway between 0.9 mile north of Route 68 and 0.2 mile north of Trimble Road, about 1.8 miles to be graded and paved with Portland cement concrete and plant-mix surfacing and highway separation structures to be constructed. District IV, Route 69, Section A. Dan Caputo & Edward Keeble, San Jose, $1,278,630; Fredrickson Bros. & Lew Jones Construction Co., Emeryville, $1,310,988; Carl N. Swenson Co. Inc. & Ball and Simpson, Berkeley, $1,317,010; United Concrete Pipe Corp., Baldwin Park, $1,388,154; Guy F. Atkinson Co., South San Francisco, $1,413,033; Granite Construction Co., Watsonville, $1,418,001. Contract awarded to Fredrickson & Watson Construction Co. & M & K Corp., Oakland, $1,260,449.16.

January, 1952

CONTRA COSTA COUNTY—Between Railroad Avenue in Pittsburg and A Street in Antioch, about five miles to be graded and paved with Portland cement concrete and plant-mixed surfacing and six grade separation structures to be constructed. District IV, Route 75. Ball and Simpson & H. Earl Parker, Inc., Berkeley, $2,527,742; Frederickson & Watson Construction Co. and M & K Corp., Oakland, $2,529,581; Eaton & Smith, San Francisco, $2,584,636; Guy F. Atkinson Co., South San Francisco, $2,590,657; A. Teichert & Son, Inc., Sacramento, $2,627,925; Parish Bros., Benicia, $2,681,210; Granite Construction Co., Watsonville, $2,708,374; United Concrete Pipe Corp., Baldwin Park, $2,718,949; Lord & Bishop and M. J. B. Construction Co., Sacramento, $2,743,741; Chas. L. Harney, Inc., San Francisco, $2,888,868. Contract awarded to Peter Kiewit Sons Co., Arcadia, $2,516,564.70.

KERN COUNTY—At the intersection of State Route 4 with Sherwood Avenue, Kern Avenue, and Perkins Avenue in McFarland, full traffic actuated signal system with highway lighting to be furnished and installed at one intersection and highway lighting to be furnished and installed at two intersections. District VI, Route 4, Section F. L. H. Leonardi Electric Construction Co., San Rafael, $23,691; Hall Sloat Electric Co., Inc., Oakland, $23,899; A-C Electric Co., Bakersfield, $24,619; Electric and Machinery Service, Inc., South Gate, $26,048; R. Gould & Son, Stockton, $26,508; R. Flatland, San Francisco, $26,650; C. D. Draucker, Inc., Los Angeles, $27,871; Fischbach & Moore, Inc., Los Angeles, $28,016. Contract awarded to Howard Electric Co., Gilroy, $23,581.

LASSEN COUNTY—Between 4.5 miles and 6.5 miles north of Secret Valley, about 2.1 miles to be graded and surfaced with road-mixed surfacing on untreated rock base. District II, Route 73, Section D. Harms Bros., Sacramento, $329,640; O'Connor Bros., Red Bluff, $329,987; Eaton & Smith, San Francisco, $359,888; J. Henry Harris, Berkeley, $387,438; United Concrete Pipe Corp., Baldwin Park, $389,226. Contract awarded to A. Teichert & Son, Inc., Sacramento, $310,780.

LOS ANGELES COUNTY—On Hollywood Freeway, between Hollywood Boulevard and Western Avenue, highway lighting and illuminated sign systems to be furnished and installed. District VII, Route 2. C. D. Draucker, Inc., Los Angeles, $59,660; Electric & Machinery Service, Inc., South Gate, $61,037; Fischbach & Moore, Inc., Los Angeles, $62,852. Contract awarded to Westates Electrical Construction Co., Los Angeles, $58,891.

LOS ANGELES COUNTY—On Ramona Freeway between 0.1 mile east of Jackson Avenue and Rosemead Boulevard, about 1.7 miles to be graded and paved with Portland cement concrete on cement-treated subgrade and with plant-mixed surfacing on imported base material and six bridges to be constructed to provide a six-lane divided highway with frontage roads. District VII, Route 26, Section E. Vido Kovacevich Co., South Gate, $2,421,609; J. E. Haddock, Ltd., Pasadena, $2,422,648; Guy F. Atkinson Co., Long Beach, $2,439,070; United Concrete Pipe Corp., Baldwin Park, $2,445,295; A. Teichert & Son, Inc., Sacramento, $2,508,736; Bressi & Bevanda Constructors, Inc., North Hollywood, $2,654,627; Peter Kiewit Sons' Co., Arcadia, $2,663,233. Contract awarded to Griffith Co., Los Angeles, $2,307,503.40.

LOS ANGELES COUNTY—Over Ramona Freeway and tracks of the Pacific Electric Railway at Evergreen Avenue, a structural steel and reinforced concrete bridge for a pedestrian overcrossing to be constructed. District VII, Route 26. O. B. Pierson, Bellflower, $72,765; Byerts & Sons and Geo. K. Thatcher, Los Angeles, $79,584. Contract awarded to J. E. Haddock, Ltd., Pasadena, $72,047.75.

LOS ANGELES COUNTY—In the city of Monrovia, on Huntington Drive between Shamrock Avenue and Mountain Avenue, about 0.3 mile to be graded and surfaced with plant-mixed surfacing on untreated rock base and on the existing pavement and widening an existing reinforced concrete slab bridge across Sawpit Wash. District VII, Route 161. Vido Kovacevich Co., South Gate, $40,444; J. E. Haddock, Ltd., Pasadena, $41,531; Jesse S. Smith and Service Construction Co.. of Southern California, Burbank, $47,231; Dimmitt & Taylor, Monrovia, $48,532; Walter Kaucher, Los Angeles, $49,395; Stuckey & Carroll Construction Co., San Gabriel, $66,129. Contract awarded to Warren Southwest, Inc., Torrance, $39,028.76.

LOS ANGELES COUNTY—On Los Angeles River Freeway across Del Amo Boulevard and across Compton Creek about 0.2 mile west of the city limits of Long Beach, two reinforced concrete bridges to be constructed and approach embankments for the bridge across Compton Creek to be graded. District VII, Route 167, Section A. J. E. Haddock, Ltd., Pasadena, $531,011; K. B. Nicholas, Ontario, $537,519; Oberg & Cook, Gardena, $543,242; Guy F. Atkinson Co., Long Beach, $552,219; C. B. Tuttle Co., Long Beach, $559,841; Bongiovanni Construction Co., Los Angeles, $561,595; Byerts & Sons and Geo. K. Thatcher, Los Angeles, $574,456. Contract awarded to R. M. Price Co., Altadena, $508,656.

LOS ANGELES COUNTY—At the intersections of Lakewood Boulevard with Candlewood Street, Hardwick Street, and Del Amo Boulevard, traffic signal systems and highway lighting at three intersections to be furnished and installed. District VII, Route 168, Section A. Westates Electrical Construction Co., Los Angeles, $43,645; Electric & Machinery Service, Inc., South Gate, $45,118; C. D. Draucker, Inc., Los Angeles, $46,160. Contract awarded to Fischbach & Moore, Inc., Los Angeles, $43,274.

ORANGE COUNTY—On Laguna Canyon Road, between Forest Avenue in Laguna Beach and 0.2 mile north of Canyon Acres Drive, about 0.9 mile of roadway to be graded, untreated rock base to be placed and surfaced with plant-mixed surfacing. District VII, Route 185. Dimmitt & Taylor, Monrovia, $269,114; Cox Bros. Consruction Co., Stanton, $282,073; Flickinger-Welker, Inc., Los Angeles, $286,280; E. C. Young, San Fernando, $292,332; Sully-Miller Contracting Co., Long Beach, $299,472; Clifford C. Bong & Co., Arcadia, $331,643; A. Teichert & Son, Inc., Sacramento, $333,021; Tomei Construction Co., Van Nuys, $371,663. Contract awarded to Nappe Construction Co., Inc., North Hollywood, $265,790.55.

ORANGE COUNTY—At the intersection of Newport Avenue with MacArthur Boulevard-Main Street in the City of Fullerton, at the intersection of Spadra Road with Brea Boulevard, and in the City of Anaheim at the intersection of Center Street with Olive Street, full traffic actuated signal systems with highway lighting at two intersections and fixed-time traffic signal system with modification to existing lighting at one intersection to be furnished and intsalled. District VII, Routes 43, 184, 2, 19, 178. Fischback & Moore, Inc., Los Angeles, $34,708; Westates Electrical Constructoin Co., Los Angeles, $35,073; C. D. Draucker, Inc., Los Angeles, $36,039. Contract awarded to Electric & Machinery Service, Inc., South Gate, $34,103.

SAN DIEGO COUNTY—Between 0.4 mile and 6.1 miles east of Julian, portions, about four miles in length to be graded and bituminous surface treatment applied. District XI, Route 198, Section E. Ralph B. Slaughter, Julian, $159,928; Clifford C. Bong & Co., Arcadia, $172,438; Einer Bros., Inc., Escondido, $178,594; Dimmitt & Taylor, Monrovia, $190,829; Ralph A. Bell, Monrovia, $212,812; L. S. Hawley, Montebello, $214,284; Walter H. Barber, La Mesa, $221,796; Cox Bros. Construction Co., Stanton, $342,366. Contract awarded to E. C. Young, San Fernando, $130,773.70.

SAN MATEO COUNTY—Between south city limits of San Francisco and 0.6 mile south, about 0.5 mile to be graded. District IV, Route 68, Section E. Piombo Construction Co., San Francisco, $172,320; Eaton & Smith, San Francisco, $227,634; United Concrete Pipe Corp., Baldwin Park, $229,160; Guy F. Atkinson Co., South San Francisco, $307,810; L. A. & R. S. Crow, El Monte, $301,300; C. G. Willis & Sons, Inc., Los Angeles, $242,732; Charles L. Harney, Inc., San Francisco, $254,180; L. C. Smith Co., San Mateo, $267,545; S. A. E. Co., Redwood City, $280,000; Ball & Simpson, Berkeley, $289,950; Charles J. Rounds, Los Angeles, $341,370; Frederickson & Watson Construction Co.-M & K Corp., Oakland, $350,000; Frederickson Bros., Emeryville, $360,460; H. Earl Parker, Inc., Marysville, $373,600; C. V. Kenworthy, Stockton, $394,000. Contract awarded to Edward Keeble, San Jose, $136,260.

SOLANO COUNTY—In and adjacent to the City of Vallejo, at the intersection of State Route 7 with Magazine Street, full traffic-actuated signal system and highway lighting to be furnished and installed and channelization and drainage facilities to be constructed. District X, Route 7, Section F, Val. Parish Bros., Benicia, $21,363; J. Henry Harris, Berkeley, $22,664. Contract awarded to R. Flatland, San Francisco, $20,579.

SONOMA COUNTY—Installation of highway signals and lighting at intersections of Main Street with Santa Rosa Avenue-Bodega Avenue in City of Sebastopol and at junction of Redwood Highway with Gravenstein Highway near Cotati. District IV, Routes 1, 104, 51. R. Flatland, San Francisco, $12,551; Arthur B. Siri, Inc., Santa Rosa, $12,665; Helwig Construction Co., Sebastopol, $12,923. Contract awarded to J. Henry Harris, Berkeley, $12,445.40.

SAN LUIS OBISPO COUNTY—In San Luis Obispo, between Marsh Street and Morro Street, about 0.5 miles, three reinforced concrete bridegs to be constructed and one existing bridge to be widened and roadways to be graded and paved with plant-mixed surfacing on cement treated base. District V, Route 2. C. K. Moseman, Redwood City, $428,963; Trewhitt, Shields & Fisher, Fresno, $430,792; Madonna Construction Co., San Luis Obispo, $433,910; Granite Construction Co., Watsonville, $438,177; Thomas Construction Co. and H. Earl Parker, Inc., Fresno, $454,369; J. E. Haddock, Ltd., Pasadena, $489,444. Contract awarded to C. B. Tuttle Co., Long Beach, $412,863.

February, 1952

KERN COUNTY—On Allen Road and Santa Fe Way, between Rosedale Avenue and State Route 139, about 10.3 miles to be graded and surfaced with road-mixed surfacing and bituminous treated surfacing on imported base material cement treated. District VI, Routes 1161, 575. Rice Bros., Inc., Marysville, $354,712; Baun Construction Co., Fresno, $375,979; Volpa Bros., Fresno, $377,634; Griffith Co., Los Angeles, $386,600; Peter Kiewit Sons' Co., Arcadia, $388,044; M. J. B. Construction Co., Stockton, $389,748; Oilfields Trucking Co. and Phoenix Construction Co., Inc., Bakersfield, $390,772; Dimmit & Taylor, Monrovia, $416,237; Granite Construction Co., Watsonville, $422,446; Ball & Simpson, Berkeley, $422,692; Claude C. Wood Co., Lodi, $423,642; Dicco, Inc., Bakersfield, $433,099; Close Building Supply, Inc., Hayward, $433,685; Louis Biasotti & Son, Stockton, $433,737; Harms Bros., Sacramento, $460,701; Clyde W. Wood & Son, Inc., North Hollywood, $493,575; Osborn Company, Pasadena, $557,491. Contract awarded to Maddona Construction Co., San Luis Obispo, $343,308.

LOS ANGELES COUNTY—On Hollywood Freeway in the City of Los Angeles, between Mulholland Drive and Cahuenga Boulevard and between Gower Street and Hollywood Boulevard, three bridges, one pedestrian undercrossing, extensions to two existing pedestrian undercrossings and 11 retaining walls to be constructed and about 1.4 miles to be graded and surfaced with Portland cement concrete pavement on cement treated subgrade to provide a six-lane divided highway. District VII, Route 2. A. Teichert & Son, Sacramento, $2,312,771; Bressi & Bevanda Constructors, Inc., North Hollywood, $2,317,836; R. J. Daum Construction Co. and Webb and White, George W. Peterson, Jack W. Baker, Los Angeles, $2,318,260; J. E. Haddock, Ltd., Pasadena, $2,335,498; Winston Brothers Co., Monrovia, $2,348,801; Guy F. Atkinson Co., Long Beach, $2,444,379. Contract awarded to Bongiovanni Construction Co., Los Angeles, $2,274,366.30.

LOS ANGELES COUNTY—In the City of Los Angeles, at the intersections of Franklin Avenue with Vine Street and with Argyle Avenue, furnishing and installing highway lighting. District VII, Route 2. Ets-Hokin & Galvan, Inc., Wilmington, $3,752; Westates Electrical Construction Co., Los Angeles, $4,623; Electric and Machinery Service, Inc., South Gate, $4,896; Fischbach and Moore, Inc., Los Angeles, $5,132. Contract awarded to Ed. Seymour, Long Beach, $3,348.

LOS ANGELES COUNTY—On Hollywood Freeway between Mulholland Drive and Cahuenga Boulevard and between Gower Street and Hollywood Boulevard, highway lighting and illuminated sign systems to be furnished and installed and electroliers to be installed. District VII, Route 2. Fischbach & Moore, Inc., Los Angeles, $153,992; C. D. Draucker, Inc., Los Angeles, $156,056; Westates Electrical Construction Co., Los Angeles, $158,927. Contract awarded to Electric & Machinery Service, Inc., South Gate, $141,552.

SACRAMENTO COUNTY—Across the Sacramento River at Paintersville, one mile south of Courtland, a bridge to be repaired. District III, Route 11-E. James H. McFarland, San Francisco, $41,519; Lord & Bishop, Sacramento, $42,665; B. S. McElderry, Berkeley, $46,485; R. E. Hertel, Sacramento, $49,592; R. G. Clifford and C. O. Bodenhamer, Berkeley, $57,274; George Pollock, Sacramento, $69,200. Contract awarded to Barton Construction Company, Oakland, $39,930.52.

SAN DIEGO COUNTY—Between Palm Avenue in Palm City and G Street in Chula Vista, full traffic actuated signal system with highway lighting at one intersection, and highway lighting at five intersections to be furnished and installed. District XI, Route 2-G, Ch. V. California Electric Works, San Diego, $43,751. Contract awarded to Ets.-Hokin & Galvan, San Diego, $42,321.

SAN DIEGO COUNTY—At the intersection of Pacific Highway with Miramar Road, in the City of San Diego, full traffic actuated signal system and highway lighting to be furnished and installed and channelization to be constructed. District XI, Route 2-S.D. R. E. Hazard Contracting Company, San Diego, $41,984; Daley Corporation, San Diego, $46,357; V. R. Dennis Construction Company, San Diego, $47,026; Griffith Company, Los Angeles, $47,712. Contract awarded to Cox Bros. Construction Company, Stanton, $41,576.80.

SAN DIEGO COUNTY—Between Oceanside and Bonsall, portions about five miles in net length to be graded and surfaced with road-mixed surfacing. District XI, Route 195-A.F. Slaughter & Young, Julian, $199,673; Einer Bros. Inc., Escondido, $204,207; Sharp and Fellow Contracting Company, Los Angeles, $205,386; George Herz and Company, San Bernardino, $209,449; Cox Bros. Construction Company, Stanton, $227,113; Clifford C. Bong and Company, Arcadia, $228,115; R. A. Erwin, Colton, $241,930; Osborn Company, Pasadena, $253,929; Dimmitt and Taylor, Monrovia, $259,707. Contract awarded to C. G. Willis and Sons, Inc., Los Angeles, $197,923.55.

SAN DIEGO COUNTY—Portions between Seventh Street in National City and 32d Street in San Diego, about eight-tenths mile in net length, 36 inch chain link fence and median lanes to be constructed. District XI, Route 2-Nat. C.S.D. United States Steel Company, Cyclone Fence Department, San Diego, $6,460; Atlas Iron and Wire Works, San Diego, $6,783. Contract awarded to Pacific Fence Company, Los Angeles, $6,439.80.

SAN FRANCISCO COUNTY—On 13th Street between Mission Street and Route 68, the foundations for a portion of a bridge and miscellaneous road work to be constructed. District IV, Route 2-SF. Piombo Construction Company, San Francisco, $464,101; Healy-Tibbitts Construction Company, San Francisco, $493,046; Eaton and Smith, San Francisco, $501,500; Fredrickson and Watson Construction Company, M and K Corporation, Oakland, $540,327; Guy F. Atkinson Company, South San Francisco, $545,332; Duncanson-Harrelson Company, Richmond, $595,941. Contract awarded to Charles L. Harney, Inc., San Francisco, $458,072.35.

SAN JOAQUIN COUNTY—Furnishing and installing lavatory building and fixtures at District X Office, Stockton, District X. Craft Mill and Supply Company, Stockton, $2,170; E. R. Stark, Stockton, $2,249; Nomellini Construction Company, Stockton, $2,480; Shepherd & Green, Stockton, $2,621; V. A. Nelson, Stockton, $3,286. Contract awarded to Don Clark, Inc., Stockton, $2,119.

SAN MATEO—Portola Road and Alpine Road, about three miles south of Woodside, about four miles in length, to be graded and imported subbase material to be placed. District IV, Route 1048. Edward Keeble, San Jose, $99,762; M. J. Ruddy & Son, Modesto, $109,617; Cecil L. Moore, San Leandro, $114,498; Eaton and Smith, San Francisco, $115,586; Granite Construction Company, Watsonville, $118,714; M. Malfitano & Son, Inc., Pittsburg, $128,202; L. C. Smith Company, San Mateo, $131,851; S. A. E. Co., Redwood City, $134,015; Huntington Bros., Napa, $141,493; Fredrickson Bros., Emeryville, $149,753. Contract awarded to John Delphia, Patterson, $97,419.30.

ALAMEDA COUNTY—At and adjacent to the intersection of Hesperian Boulevard with Lewelling Boulevard, traffic signal system and highway lighting to be furnished and installed, plant-mixed surfacing to be placed on existing roadway and curbed islands to be constructed. District IV, Routes 69 and 228, Sections B,A. O. C. Jones & Sons, Berkeley, $15,078; Frank Electric Co., Hayward, $15,541; Manning & Whitaker, Inc., San Francisco, $15,771; R. Gould & Son, Stockton, $15,883; R. Flatland, San Francisco, $16,004; J. Henry Harris, Berkeley, $16,062. Contract awarded to Underground Electric Construction Co., Oakland, $14,923.50.

LOS ANGELES COUNTY—On Santa Ana Freeway, between Los Angeles Street and Lyon Street, a combination railroad underpass and highway separation structure, a railroad underpass, a pumphouse, a drainage storage box, reinforced concrete retaining

walls to be constructed and approximately 0.34 mile to be graded and portions to be surfaced with Portland cement concrete pavement on cement treated subgrade and asphalt concrete on imported base material; acceleration and deceleration lanes, frontage roads and streets to be surfaced with plant-mixed surfacing on imported base material; to provide a freeway with six-lane divided roadbed. District VII, Route 2. W. J. Disteli, Los Angeles, $1,290,209; Guy F. Atkinson Co., Long Beach, $1,307,721; Bressi & Bevanda Constructors, Inc., North Hollywood, $1,324,199; Webb & White, Los Angeles, $1,333,333; Vido Kovacevich Co., South Gate, $1,336,586; J. E. Haddock, Ltd., Pasadena, $1,337,419; MacDonald and Kruse, Sun Valley, $1,446,961. Contract awarded to George W. Peterson and Jack W. Baker, Los Angeles, $1,222,895.

LOS ANGELES COUNTY—On Hollywood Freeway between Mulholland Drive and Cahuenga Boulevard and between Gower Street and Hollywood Boulevard, highway lighting and illuminated sign systems to be furnished and installed and electroliers to be installed. District VII, Route 2. Fischbach & Moore, Inc., Los Angeles, $153,992; C. D. Draucker, Inc., Los Angeles, $156,056; Westates Electrical Construction Co., Los Angeles, $158,927. Contract awarded to Electric & Machinery Service, Inc., South Gate, $141,552.

NAPA COUNTY—Across Napa River on Lincoln Avenue in Calistoga, a reinforced concrete bridge and approaches to be widened. District IV, Route 49. D. M. Sandling, San Pablo, $64,896; R. G. Clifford & C. O. Bodenhamer, Berkeley, $67,938; Ted Schwartz, Grass Valley, $68,890; Bos Construction Co., Oakland, $69,864; Chas. S. Moore and Robert R. Murdoch, Oakland, $70,549; Stanley H. Koller Construction, Crockett, $72,937; Al Erickson & Co., Napa, $73,301; Pike & Hill, Corey Bros. & Bailey, San Rafael, $81,608; James H. McFarland, San Francisco, $90,816; R. E. Hertel, Sacramento, $96,857; Tumblin Co., Bakersfield, $102,699; H. H. Anderson and John B. Paroline, San Leandro, $1,552,722. Contract awarded to E. H. Peterson & Son, San Pablo, $62,813.

PLACER COUNTY—Between 1.7 miles and 2.3 miles north of Auburn, about 0.3 mile of roadbed to be widened, imported subbase material, untreated rock base and plant-mixed surfacing to be placed. District III, Route 17, Section C. M. J. Ruddy & Son, Modesto, $22,096. Contract awarded to Joe Chevreaux, Auburn, $18,246.

RIVERSIDE COUNTY—At the intersection of Mission Boulevard with Bloomington Boulevard-Nakoma Avenue, traffic signal system and highway lighting to be furnished and installed and channelization to be constructed. District VIII, Route 19, Section A. Fischbach & Moore, Inc., Los Angeles, $17,803; Electric and Machinery Service, Inc., South Gate, $18,430; Westates Electrical Construction Co., Los Angeles, $18,983. Contract awarded to Paul R. Gardner, Ontario, $16,642.35.

SACRAMENTO COUNTY—At the intersection of North Sacramento Freeway with El Camino Avenue, for constructing storage building and chain link fence. District III, Route 3, Section B. Sutter Supply Co., Sacramento, $4,774; Lawrence Construction Co., Sacramento, $4,941; "B" and "B" Construction Co., Sacramento, $4,999; Robert Bardell, Oakland, $5,557; Affiliated Engineering Contractors, Inc., Sacramento, $5,740. Contract awarded to Taylor and Mullen, North Sacramento, $4,525.

SAN BERNARDINO COUNTY—On Highland Avenue at Del Rosa Channel, a reinforced concrete box culvert to be constructed. District VIII, Route 190, Section C. Morgan-Weiser, Inglewood, $12,437; Matich Brothers and Matich Brothers Paving Co., Colton, $13,102; A. A. Edmondson, San Fernando, $13,463; Thomas Construction Co., Fresno, $14,667; O. B. Pierson, Bellflower, $15,090; N. M. Saliba Co., Los Angeles, $17,775; E. L. Yeager Co., Riverside, $18,923. Contract awarded to George Herz and Co., San Bernardino, $12,177.

SAN FRANCISCO CITY AND COUNTY—Between Army Street and 17th Street about 1.3 miles to be graded and paved with Portland cement concrete on cement treated subgrade and plant-mixed surfacing on cement treated base; a grade separation structure and three pedestrian overcrossings to be constructed and highway lighting and traffic signals to be furnished and installed. District IV, Route 68. Chas. L. Harney, Inc., San Francisco, $1,394,870; Ball & Simpson, Berkeley, $1,431,203; Judson Pacific-Murphy Corp., Emeryville, $1,472,042; Eaton & Smith, San Francisco, $1,577,262. Contract awarded to Fredrickson & Watson Construction Co., M & K Corp., Oakland, $1,386,336.12.

SAN DIEGO COUNTY—At intersections of El Cajon Blvd. with Oregon Street, Euclid Avenue, 54th Street and 70th Street, in San Diego, pedestrian signals to be furnished and installed. District XI, Route 12. California Electric Works, San Diego, $3,098. Contract awarded to Ets-Hokin & Galvan, San Diego, $2,891.

SAN DIEGO COUNTY—Between Oceanside and Bonsall, portions, about 5 miles in net length, to be graded and surfaced with road-mixed surfacing. District XI, Route 195, Sections A,F. Slaughter & Young, Julian, $199,673; Einer Bros., Inc., Escondido, $204,207; Sharp & Fellow Contracting Co., Los Angeles, $205,386; George Herz & Co., San Bernardino, $209,449; Cox Bros. Construction Co., Stanton, $227,113; Clifford C. Bong & Co., Arcadia, $228,115; R. A. Erwin, Colton, $241,930; Osborn Company, Pasadena, $253,929; Dimmitt & Taylor, Monrovia, $259,707. Contract awarded to C. G. Willis & Sons, Inc., Los Angeles, $197,923.55.

SONOMA COUNTY—Between ¼ mile west of Monte Rio and Northwood (portions), a net length of 0.8 mile, to be graded and surfaced with plant-mixed surfacing on imported base material. District IV, Route 104, Section A. Arthur B. Siri, Inc., Santa Rosa, $88,504; Huntington Bros., Napa, $94,335; J. Henry Harris, Berkeley, $135,680. Contract awarded to Eaton and Smith, San Francisco, $79,487.10.

SUTTER COUNTY—At 13 locations between one mile east of Meridian and 3 miles west of Yuba City, culverts and drainage structures to be extended and roadway to be widened. District III, Route 15, Sections A,B. Laredon Construction Co., Los Angeles, $18,688; Rice Brothers, Inc., Marysville, $18,984; Charles S. Moore & Robert R. Murdoch, Oakland, $19,303; Ted Schwartz, Grass Valley, $24,264; O'Connor Bros., Red Bluff, $26,156; H. Earl Parker, Inc., Marysville, $37,234. Contract awarded to Commercial Construction Co., Marysville, $16,075.50.

VENTURA COUNTY—At the intersection of Ventura Boulevard with Saviers Road-Vineyard Avenue, traffic signal system and highway lighting to be furnished and installed. District VII, Routes 2,154; Sections, C,A. Fischbach & Moore, Inc., Los Angeles, $12,328; Electric Machinery Service, Inc., South Gate, $12,569; Westates Electrical Construction Co., Los Angeles, $12,771. Contract awarded to C. D. Draucker, Inc., Los Angeles, $11,996.

VENTURA COUNTY—Between Oxnard Boulevard and east city limits of Oxnard, about 0.6 mile to be graded and surfaced with plant-mixed surfacing on untreated rock base. District VII, Route 153. C. W. Peterson, North Hollywood, $80,117; Griffith Company, Los Angeles, $81,350. Contract awarded to Baker & Pollock, Ventura, $74,197.70.

F. A. S. County Routes

TULARE COUNTY—On Poplar Road, between 6 miles south of Poplar and Poplar, about 6 miles to be graded and surfaced with road-mixed surfacing on cement treated base. District VI, FAS Route 1130. Valley Paving & Construction Co., Inc., Pismo Beach, $166,947; Volpa Bros., Fresno, $167,935; Rice Bros., Inc., Marysville, $168,024; M. J. B. Construction Co., Stockton, $170,656; Oilfields Trucking Co. and Phoenix Construction Co., Inc., Bakersfield, $179,590; Flickinger-Welker, Inc., Los Angeles, $176,186; Griffith Co., Los Angeles, $183,307; Close Building Supply, Inc., Hayward, $186,650; Thomas Construction Co., Fresno, $194,159; United Concrete Pipe Corp., Baldwin Park, $198,610; Claude C. Wood Co., Lodi, $204,461; M. J. Ruddy & Son, Modesto, $213,156; W. H. O'Hair Co., Colusa, $222,210; Dicco, Inc., Bakersfield, $223,568. Contract awarded to Baun Construction Co., Fresno, $161,302.

Antiskid

Continued from page 36 . . .

directed into a long rectangular metal hood mounted on broad steel runners. This hood is towed behind the flame generator and serves to concentrate the heat on the pavement surface.

Design of Drag

The metal scratch drag, which is towed behind the hood, is constructed in two sections, each containing two rows of 80-penny spikes. Holes on three-inch centers in the base plate of each section serve to space the spikes. The holes of one line are staggered with respect to those of the other line in order to give an effective spacing of 1½ inches. The spikes are held in a vertical position by two angle irons bolted together between the spikes. The leg of one angle is welded to the base plate. Spikes are set to protrude about one inch below the base place and can be driven down as necessary to compensate for wear. During the past year, in order to more thoroughly scratch distorted areas of surfacing on some of the work, the front section of the drag has been divided into two units and the rear section divided into three or more units. These units are held together by chains and extra weight is added if needed.

The surface treatment, like discing, is most effective if undertaken after the weather has cooled to the extent that excess asphalt will not again be flushed to the surface of the seal coat. The rough texture thus developed will generally remain until the following summer.

The hood and drag as first constructed in District II had an effective width of five feet. Similar equipment made up in District III for work during the fall of 1951 was about seven feet wide.

Cost of treatment has ranged from about $300 to $500 per mile of two-lane pavement.

The State Division of Highways uses two-way FM radio in directing its snow removal operations and keeping motorists informed of winter road conditions.

Highway Problems

Continued from page 43 . . .

challenge. John Doe will not have begun to understand how his highways are built and maintained until he understands something about a financing structure which is anything but simple. He must be told in plain but accurate terms where highway money comes from and how it is distributed.

In the same terms, he must be told about its inadequacy. We have a statewide highway deficiency which is estimated at 3 billion dollars in terms of today's traffic and today's construction costs.

Financial Problem

Although it is not within the province of the Highway Commission to say how much money should be provided for highways or in what manner the funds should be raised, it is certainly a duty of the commission, and other highway officials, to inform the public that the demands and needs of highway users cannot be met with the funds presently available. Any actual move toward changing the extent or methods of highway financing is a matter for determination by the people and the Legislature, after they are satisfied that the most effective use of available moneys is now being made.

The highway committees of the local chambers of commerce and the State Chamber of Commerce have been very effective and helpful in determining traffic needs and at the same time obtaining thorough public discussion of controversial issues. I know I speak for the entire Highway Commission in expressing our appreciation for the yeoman service performed by the chamber of commerce at both the state and local level not only in interpreting local conditions and situations to the commission, but also in interpreting highway problems to the people of their communities.

The least that the engineer and highway official can do for such committees is to give them the benefit of their knowledge and experience. They can make technical data available for committee study, preferably in not overly technical form. In advance of committee sessions they can prepare maps and sketches which will bring the situation to life and make explanations easier.

The same principles of public relations apply to city and county street and road problems as to state highways. The basic solution lies in increased public understanding. This understanding depends on an intelligent public interest, and the maintaining of public interest depends on leadership. While the Highway Commission and highway engineers are not the appropriate persons to supply that particular leadership, we can and should equip the leaders with whatever special knowledge we have acquired through experience. The problem of remedying our highway deficiencies is so acute that we cannot lay claim to doing our assigned job if we fail to do everything reasonable to supply the public with the available facts.

In Memoriam

KYLE TRUESDALE

Kyle Truesdale, 51, Maintenance Leading Man with 27 years of service in the Division of Highways, died on March 20th from injuries received when he was struck down by a car.

The accident, which took place on March 11th, happened while he was engaged in highway repair work about 17 miles west of Santa Barbara on U. S. 101.

Mr. Truesdale was born June 16, 1900, in Shandon and received his schooling there. He began his career with District V of the Division of Highways in 1924, serving in the Monterey, San Luis Obispo and Santa Barbara areas. For the past 16 years he has lived in Santa Barbara.

Mr. Truesdale was past president of Santa Barbara Chapter 25, California State Employees Association, of which he was a charter member. He was also a member of the Magnolia Lodge No. 242, F. and A. M., and of the Royal Arch Masons and the Knights Templar.

He is survived by his widow, Beatrice; his mother, Mrs. Hollis Truesdale; a sister, Mrs. Edna Gibson; and three brothers, Ralph, Everett and Hugh.

In Memoriam

RAY E. RALEY

Assistant Highway Engineer Ray E. Raley died at his home in San Bernardino on February 14, 1952, following a brief illness. He had many friends in and out of state service, since his 29 years with the Division of Highways had included assignments in many different areas of California.

Mr. Raley was born in Hanoverton, Ohio, June 28, 1890. He went to work for the State of Oregon in 1917 as a rodman on highway location, and moved to California in 1922 as a draftsman in the District V office in San Luis Obispo. After working in several different districts and on the San Francisco - Oakland Bay Bridge, Mr. Raley was transferred to District VIII in February, 1948. He was in the design department of that district at the time of his death.

He was educated at Mount Union College and at Carnegie Institute of Technology and later pursued engineering studies in California universities. He was a registered civil engineer, and was particularly active in Masonic circles. For three years he served as secretary of the 49ers Chapter of the Western Mining Council.

Mr. Raley is survived by his widow, Alice; by a son, Ray E. Raley, Jr., of Bakersfield; and by five brothers and two grandchildren.

In Memoriam

PAUL F. FRATESSA

Many friends of Paul F. Fratessa in the Department of Public Works are mourning his passing in San Francisco on March 4th, last.

From March 1, 1923, to February 28, 1927, Mr. Fratessa was attorney for the California Highway Commission. He served in that capacity during the administration of Governor Friend W. Richardson.

An outstanding member of the bar in San Francisco, Mr. Fratessa is remembered in Sacramento for his interest in highway matters and the zeal he displayed while in state service.

EARL WARREN
Governor of California

•

FRANK B. DURKEE
Director of Public Works

•

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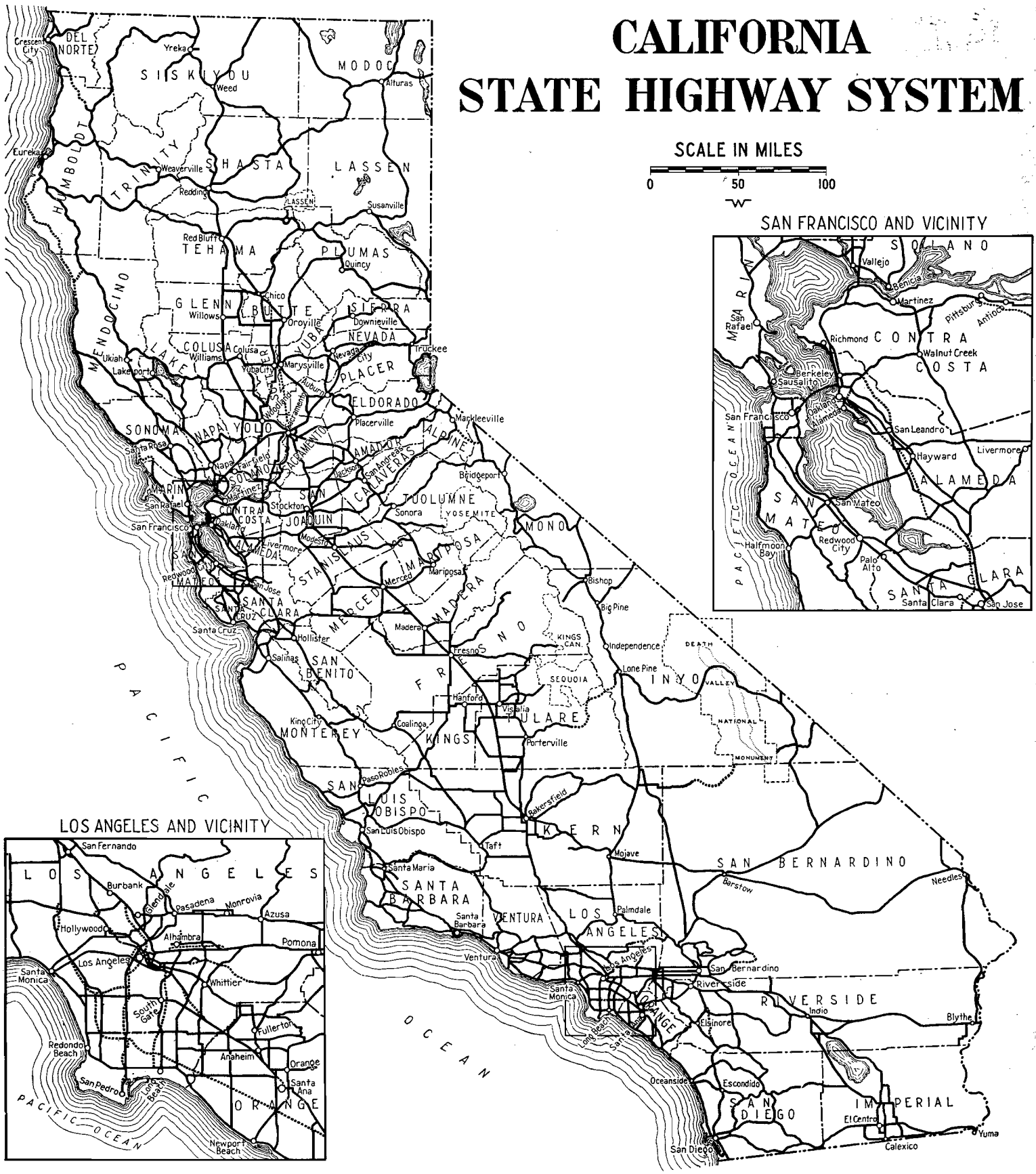

Sept. 1951