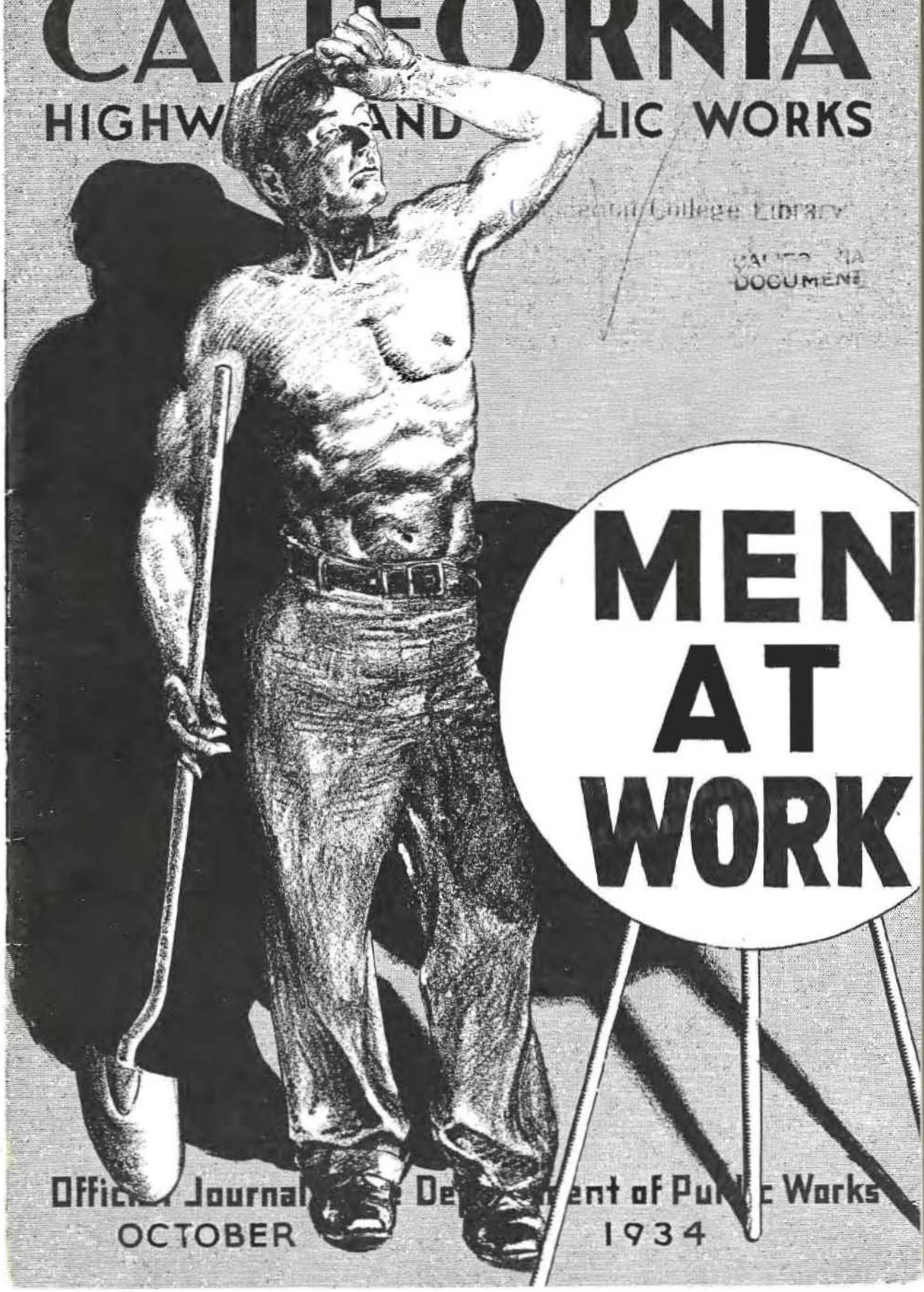
CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



Official Journal of the Department of Public Works
OCTOBER 1934

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12,900,000 Man Days Work

Assured on State Highways

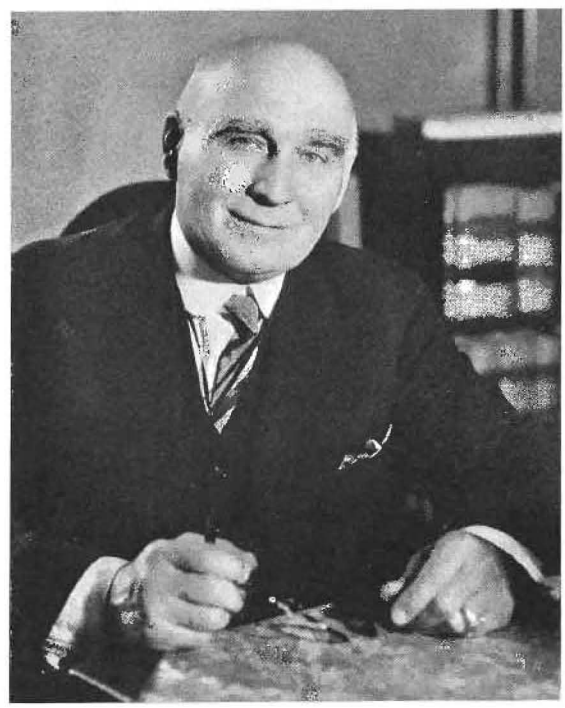
By Governor Merriam

During Next Three Years

By **FRANK F. MERRIAM**, Governor of California

REMUNERATIVE work for the largest possible number of citizens of California on the highways of this State for the next three years without an extra cent of cost to the taxpayer is the program of this administration, which, I am happy to announce, is already well under way.

In recent conferences with the members of the California Highway Commission and with Director Earl Lee Kelly of the Department of Public Works, I have stressed the necessity for quick action to achieve this goal, and they have nobly responded. On September 7th the Highway Commission allocated $1,000,000 to keep at work on maintenance crews through the winter 3200 heads of families with some 12,000 dependents who would otherwise have been thrown back upon the charity rolls of their various communities. The money for this fund comes from accrued savings on contracts during the past two years.



FRANK F. MERRIAM

The commission now informs me that it has allocated funds in the sum of $2,012,000 for 12 projects representing 25 per cent of the highway improvements to be financed from the $7,932,206 Federal apportionment to California under the Hayden-Cartwright bill passed by the last Congress.

All projects selected for construction with these Federal funds in California must be submitted to the U. S. Bureau of Public Roads for approval. On the list appended to this article are the projects that have received such approval. Accordingly they are being advertised for bids, and contracts will be awarded and men put to work on these projects within a few weeks.

The number of man-days work that will be afforded to citizens of California by this first 25 per cent of recommended projects is estimated at 81,000 representing workers at jobsites, that is, men directly employed in work on the highways. In addition to these, workers in related industries share in the employment provided by these funds, such as men engaged in the manufacturing of highway building materials and supplies, in transportation of such materials and the operation of equipment. The ratio of this class of labor is approximately 2 to 1, making a total of 242,900 man-days work that will be provided by the first 25 per cent of these available funds.

Contracts will be awarded for the remaining 75 per cent as fast as the projects are approved by the U. S. Bureau of Public Roads so that it is fairly estimated that 1,065,600

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State Completes New "Feeder-Road" Link of Junipero Serra Boulevard

By **JNO. H. SKEGGS,** District Engineer

JUNIPERO SERRA BOULEVARD is an arterial serving a large and rapidly growing traffic between San Francisco and points south, especially in San Mateo County. Traffic census for the boulevard taken in January, March and July of this year shows average counts of 10,129, with peak counts as high as 18,256 vehicles per day.

Junipero Serra Boulevard is the natural development resulting from the need of a common outlet for traffic converging in "the circle" which is made by a major intersection of West Portal Avenue, St. Francis Boulevard, Sloat Boulevard and Portola Drive.

From "the circle" southward to the county line the boulevard is part of the system of city streets. Near the county line Alemany Boulevard, another city arterial of high standard design, joins Junipero Serra. About one-half mile north of the Alemany intersection Junipero Serra is joined by the Nineteenth Avenue Extension, likewise of high standard construction as far north as the intersection with Sloat Boulevard.

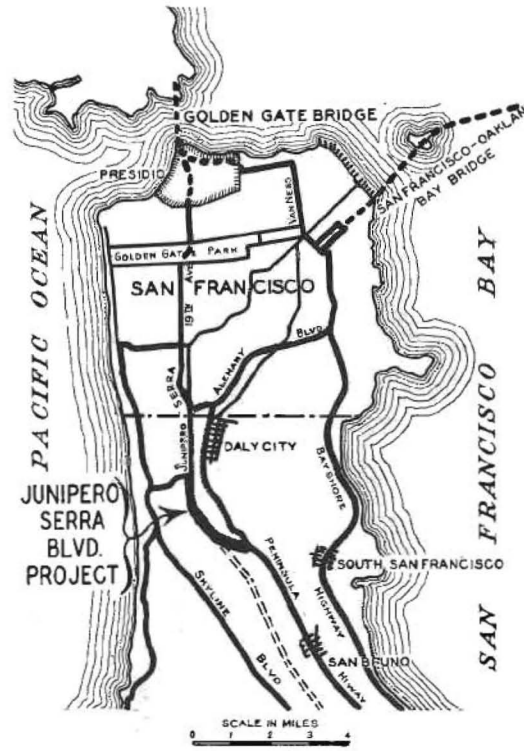
FEEDER ROAD LINK

From the county line southward Junipero Serra Boulevard is under jurisdiction of Joint Highway District No. 10 and stands in the relation of a "feeder" road to the State highways.

This great highway is in process of stage construction and now reaches southward more than two miles beyond Daly City, the last extension being a link 1.97 miles in length constructed by the State Division of Highways.

Outstanding features of Junipero Serra Boulevard are that it originates in the westerly borders of San Francisco's residential district and is in the natural line of a traffic outlet for a vast section of the city population. Likewise it is the natural routing for through traffic between the Redwood Highway of north bay counties and the highways of the peninsula of the bay via the Golden Gate Bridge.

As feeders to the boulevard are extended northerly, especially the major extension to reach the Golden Gate Bridge via Nineteenth and Funston avenues, traffic will be greatly increased.



TRAFFIC HAS INCREASED

Numerous other tributary streets feed this arterial, and central city areas contribute large volumes of passenger traffic via such important connections as Portola Drive and Alemany Boulevard, which, by reason of recent improvements, has nearly doubled its traffic.

For several years past this traffic has had no alternative but the connection to Route 2 (El Camino Real) via School Street in Daly City, thereby being forced to combat a dangerous railroad crossing, two right angle turns and the congestion of business districts.

Junipero Serra Boulevard throughout has a right of way 125 feet or more in width. Its location and general setting are most favorable to continuance of a minimum number of intersections, and to the preservation of conditions essential to an arterial highway.

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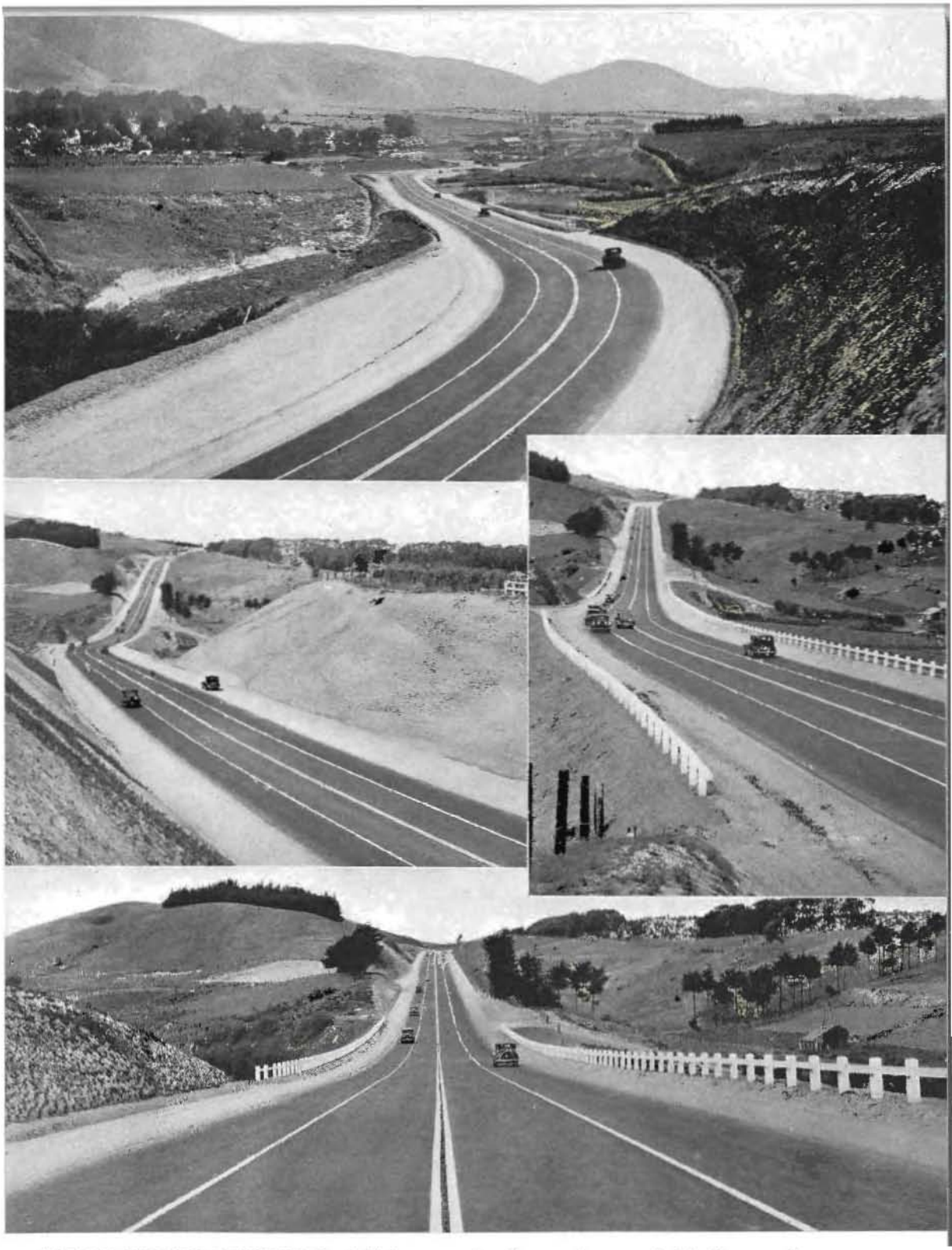

LATEST MODERN STANDARDS of highway construction are incorporated in the recently completed extension of Junipero Serra Boulevard, one of San Francisco's main arterials down the Peninsula. The new unit, 1.67 miles long, is graded to a width of 65 feet including a small berm on hills. The 40-foot pavement is 6-inch asphalt concrete on 4-inch crusher run base. The shoulders of 4-inch crusher run base have an oil bound surface and shoulder treatment is extended to adjacent gutters. Maximum grade is 5 per cent. Double striping marks the center of the four traffic lanes.

Director Kelly Pays Tribute to Fine Achievements of District Engineers

By **EARL LEE KELLY**, Director of Public Works

DURING the past year the Division of Highways organization has conducted the largest highway construction program ever inaugurated in California. With the opening, in the summer of 1933, of the national program for intensive State highway construction as a means towards recovery, California stepped to the front and on August 25th issued a call for bids on fifty contracts, which were estimated to cost over $4,000,000 and which covered work on 470 miles of State highways.

The intensive construction program thus begun, was continued throughout the year with the result that between August 25, 1933, and October 1, 1934, 332 contracts for construction on the State highway system were awarded by the Department of Public Works. These contracts involved the expenditure of some $26,700,000 on improvement to approximately 2850 miles of State roads and construction of 105 bridges.

DISTRICTS PREPARED WORK

This mammoth construction program was accomplished only by the unified effort and cooperation of the entire organization of the Division of Highways. One of the most important factors in making possible the achievement was the concentrated work of preparation, performed in each of the eleven districts of the Division under the direction of the District Engineers.

It was the "will to do" which these executives threw into the work of the districts so that in phenomenally short periods projects were prepared from preliminary surveys to completed plans. It was the enthusiastic spirit with which they tackled the job and which was transmitted to their assistants that made possible the beginning of the contracts which brought relief to thousands of unemployed throughout the State.

That the highway construction achievement during the past year as California's part in the national program of recovery has been so successfully accomplished, is indisputable evidence of the ability of the district engineers of the Division of Highways.

Because of the outstanding performance of these engineers in the conduct of the affairs of their several districts, it is with great pleasure that I here acknowledge the debt of the administration to them and express the deep appreciation which is felt by California for their splendid service to the State.

The district engineers of the Division of Highways' eleven districts who have so ably acquitted themselves are:

DISTRICT I.

J. W. VICKREY, with headquarters at Eureka.

Mr. Vickrey entered the service of the Division of Highways as a transitman in April, 1917, assigned to the district of which he is now the chief executive. In 1920 he resigned, but returned to State highway work a year later as construction engineer for District III. 1926 saw him promoted to District Maintenance Engineer, and in 1929 he was chosen to fill the vacancy in District IX caused by the retirement of District Engineer F. G. Somner. On September 1, 1933, he was transferred from Bishop to his present position as the head of District I. Mr. Vickrey came to California from the staff of the Los Angeles County Surveyor.

DISTRICT II.

F. W. HASELWOOD, with headquarters at Redding.

Mr. Haselwood is one of the old time employees of the Division and entered the highway service February 19, 1912, after completing important hydraulic power investigations for the State Board of Control. He began his highway career as a chief-of-party in District I and was almost immediately promoted to the position of Assistant Engineer for the district, which title he held for eleven years. After a year in headquarters office he was appointed District Engineer of District III. In 1929, Mr. Haselwood was transferred to the same post in District I and on the first of February, 1932, he assumed his present duty as administrator of the affairs of District II.

DISTRICT III.

C. H. WHITMORE, with headquarters at Marysville.

Mr. Whitmore left his duties as Assistant State Highway Engineer for the State of Oregon to become the Assistant District Engineer of District IV in San Francisco on September 15, 1923. In 1928, he was made District Engineer of District I and on June 1, 1929, he was transferred to the post he now holds as District Engineer of District III.

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State Highway District Engineers

Firestone Boulevard Bottleneck in Graham Widened and Open to Traffic

By **S. V. CORTELYOU,** District Engineer

FIRESTONE BOULEVARD, sometimes known as Manchester Avenue, which was taken into the State highway system August 21, 1933, will be one of the principal traffic arteries connecting the Coast Highway, the southerly portion of Los Angeles and contiguous territory with Anaheim, Orange and Santa Ana when contracts and contemplated improvements on this route are completed.

Prior to its inclusion in the State highway system, Manchester Avenue, as the western part of this route is known, was improved for its full width with permanent pavement, curbs, and gutters, and for the major portion with sidewalks and street lights, from Inglewood east to Central Avenue.

From Central Avenue to Alameda Street, in the unincorporated community of Graham, a bottleneck existed which greatly restricted through traffic on this route.

OLD SURFACING TOO THIN

For the first 600 feet east of Alameda Street past the Firestone Tire and Rubber Company plant the old highway was wide enough to accommodate present traffic, but the surfacing was only a thin bituminous mixture, too light for the heavy traffic of the boulevard.

From the end of this portion which had the light surfacing to Santa Fe Avenue and from Atlantic Boulevard to Downey there was a full width improvement. From Downey to Artesia, in Orange County, there was no direct route, travel following existing county roads, which in general run either in a north and south or east and west direction.

With the adoption of the route from "Route 60 (Coast Highway) to Main Street, Santa Ana, via Manchester Avenue and Santa Ana Boulevard" as a State highway, it was apparent that the first step in its logical development was the elimination of the bottleneck condition in the community of Graham, between Central Avenue and Alameda Street.

This section, which is 1.49 miles in length, was already graded to a roadway width of 70 feet with curbs at variable distances from the center line along the westerly portion between Central Avenue and Compton Avenue; on the easterly portion, from Compton Avenue to Alameda street, there was an old concrete pavement 40 feet wide, which was too narrow for the heavy traffic of this route, and was in a very rough condition.

Plans for the improvement of this section were prepared by the Los Angeles County surveyor and road department. The State Division of Highways opened bids in December, 1933. Work was started under a State contract in January, 1934, and completed August 11, 1934.

Work under this contract included construction of concrete curbs with concrete gutters six feet wide on each side. Concrete sidewalks were constructed wherever necessary to fill in gaps in previously existing sidewalks, which sidewalks were paid for by Los Angeles County. Asphaltic concrete pavement six inches thick was placed the full width between gutters on all portions not previously paved, and the old concrete pavement was resurfaced with asphalt concrete a minimum thickness of two inches to eliminate irregularities in the existing pavement and make the crown conform to present State highway standards. The width of roadway between curbs was increased to 74 feet.

COUNTY CONTRIBUTES $119,000

The county of Los Angeles contributed toward this project to the extent of securing additional land to make a 100-foot width of right of way and also paid the cost of relocating sewer connections, constructing sidewalks under this contract, and changing the lighting system. The county contribution toward the cost of construction was $19,000, and about $100,000 for the right of way. The State's share amounted to $120,000, or a total cost of construction for the portion from Central Avenue to Alameda Street of $239,000.

The increased traffic, resulting from the widening of Firestone Boulevard from Central Avenue to Alameda Street, with the further increases which may be expected when improvements are completed on other sections

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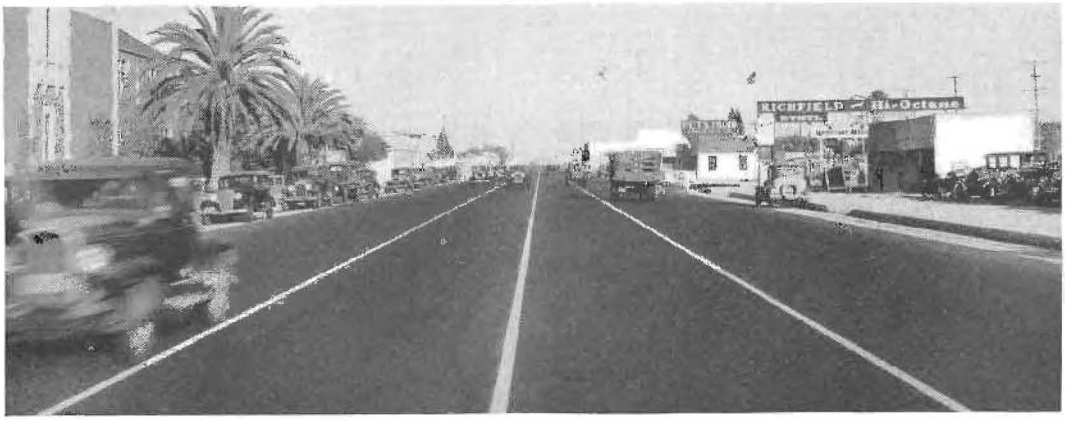
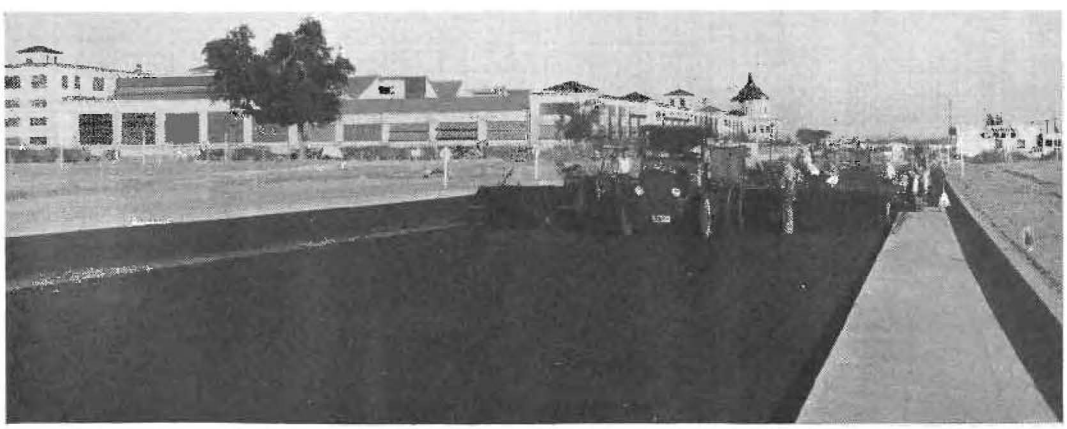


TRAFFIC CONGESTION is eliminated on Firestone Boulevard in the community of Graham, Los Angeles County, by the completion of a fine, four-lane highway, 74 feet wide between curbs.

OLD BOTTLENECK CONDITION as it existed before the improvement is shown above. The old pavement was only 40 feet wide, much too narrow for the heavy traffic on this route. The section recently completed is 1.49 miles in length and has a right of way with 100 feet for the entire distance.



EXTENDING THE IMPROVEMENT for 600 feet east of Alameda street the original thin bituminous mixture surfacing, too light for the increased heavy traffic, is being paved to bring it up to the standards of pavement on either side of that short section.

Budget Projects Will Add More Jobs

(Continued from page 1)

man-days additional work will be under way within the next few months that will carry employment well over into next spring.

In the meantime the Highway Commission will be finishing the preparation of its next biennial budget for highway construction and maintenance during the 1935–1937 period.

From the present outlook the available revenues during the next biennium for State highway construction and maintenance from the gasoline tax, motor vehicle fees and Federal aid will provide approximately 11,592,000 man-days work.

From these two sources it will be seen that a total of 12,900,000 man-days work in connection with State highway construction and maintenance is well assured for the next three years.

It should be gratefully remembered that Harry A. Hopkins, chairman of the Highway Commission, Director Earl Lee Kelly and the California delegation in Congress, as well as many civic bodies throughout the State, worked hard to secure the Federal money for California highways.

FEDERAL GRANTS OPPOSED

Several bills had been introduced in Congress last March, all requesting federal appropriations for the continuation of needed highway construction throughout the Union to provide and maintain essential transportation facilities and further contribute to unemployment relief. Much opposition developed.

This opposition was called to the attention of the California Highway Commission at its meeting on April 6th. The commission thereupon passed a resolution urging Congress to make the grant and thereby prevent the unemployment of thousands of men in California with dependents. So serious did the situation appear that Chairman Hopkins and Director Kelly were immediately dispatched to Washington.

COMBINED EFFORTS SUCCEED.

The resolution of the Highway Commission urging Congress to pass the measure was immediately endorsed by numerous chambers of commerce and boards of supervisors throughout the State who rushed their indorsements to Washington, where Chairman Hopkins and Director Earl Lee Kelly were appearing before Congressional committees and government engineering boards, explaining and urging the needs of the appropriation for California. These combined efforts finally resulted in the passing of the Hayden-Cartwright bill for which every member of the California Congressional delegation voted.

The projects for which allocations have been made by the Highway Commission following approval by the U. S. Bureau of Public Roads, all conform with the restrictions imposed by the Federal government in making the grant. These conditions provide that 50 per cent of the funds must be used on roads in the Federal aid system; 25 per cent for roads on the Federal aid system within municipalities and 25 per cent on feeder or secondary roads not in the Federal aid system. The list of projects thus far approved is as follows:

STATE HIGHWAY EXECUTIVES CONGRATULATED ON LOW COSTS

LOS ANGELES CHAMBER OF COMMERCE

Los Angeles, California,
October 8, 1934.

State Highway Commission,
Public Works Building,
Sacramento, California.

Gentlemen: Our attention has been called to the cost of administration of the various highway districts in the State highway system, and we wish to congratulate your honorable body upon the low costs that you are able to maintain and, particularly, wish to congratulate S. V. Cortelyou, District Engineer of District 7, which includes this territory, for having the honor of maintaining the lowest ratio cost in the entire State.

Once again we wish to express our appreciation of Mr. Cortelyou's whole-hearted cooperation with us at all times and feel that the interests of our highway needs in the county of Los Angeles are in particularly good hands.

Very truly yours,

LOS ANGELES CHAMBER OF COMMERCE.

(Signed) A. G. ARNOLL,
Secretary and General Manager.

Federal Budget Projects Approved

ROADS ON FEDERAL AID HIGHWAY SYSTEM OUTSIDE OF CITIES

County	Road	Description	Miles
Fresno	VI-Fre-4-A	Selma to Fowler Switch Canal Grading and paving	1.0
Plumas	II-Plu-21-A	Rock Creek to Storrie, grading North Fork Feather River Bridges at Tobin, Storrie and Rock Creek	2.5
Shasta	II-Sha-3-B	N. approach Sacramento River Bridge at Redding Grading and paving	
Santa Barbara	V-SB-2-E-D	Nojoqui Grade, Grading and paving	3.7
Los Angeles	VII-LA-4-E	Oak Glen to Saugus Grading, bridge and paving	4.4

ROADS ON FEDERAL AID HIGHWAY SYSTEM WITHIN CITIES

County	City and State Route	Description	
Alameda	Oakland 5	Moss Ave.-Webster to Santa Clara and Harrison Grading and paving	
San Mateo	Daly City 2	Daly City to Colma (Mission St. to Junction San Jose and Mission) Grading and paving	1.2
Shasta	Redding 3	S. Approach Sacramento River Bridge Grading and paving	
Los Angeles	Long Beach 60	Loma Ave. to Hathaway Ave. (State St.) Grading and paving	0.5
San Bernardino	Colton 26	I Street, Grading and paving	1.4

SECONDARY OR FEEDER ROADS NOT ON FEDERAL AID HIGHWAY SYSTEM

	Secondary State Highways	Description	
San Mateo	IV-SM-105-A	Skyline Blvd. to Half Moon Bay, Grading and surfacing	2.7
Orange	VII-Ora-174-A	Manchester Ave.-Buena Park to Anaheim, Grading and paving	5.2

Methods of Preserving Roadside Trees in Cooperation with Public Utilities

By **E. S. WHITAKER**, Assistant State Arboriculturist

TO SAVE or to destroy? To balance or to butcher? To create or to allow nature to take its course? These three questions are linked inexorably with the beautification problems that daily confront the designers and maintainers of the roadside beauty of the highways of the State of California.

Existing trees are a problem when new alignments are being located. Existing trees are a problem when clearance of any kind is obstructed by their growth. New plantings may not be as easily located as is believed at first glance, for there are always the wires of public utility companies to be reckoned with.

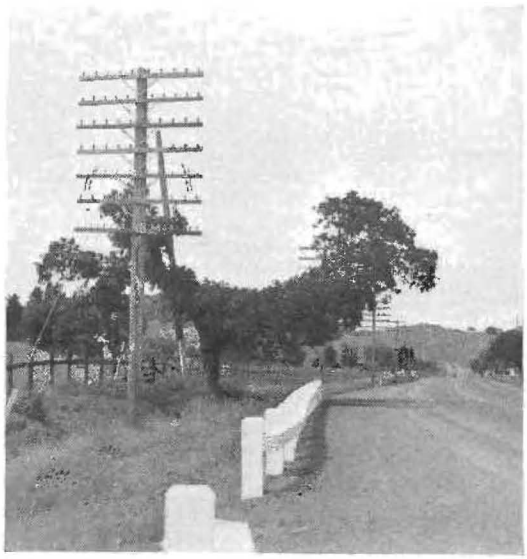
Should a tree make way, either by removal or crown trimming to a line of wires, or should beautiful natural or planted trees have the right of way at the expense of the utility company?

Forester G. D. Blair, of the Consumers Power Company of Jackson, Michigan, presented a paper before the 1934 annual meeting of the Michigan Association of Municipal, County and Public Utility Foresters, dealing with this subject as seen through the eyes of the public utility company. Mr. Blair has very fairly met these questions and acknowledgment is made to his article, parts of which have been used verbatim herewith.

MAINTENANCE COSTS AFFECTED

It may be interesting to know that 25 per cent of all public utility customers, according to Mr. Blair, are at one time or another directly affected by trees through the lack of proper trimming for wire clearance. Also, that 15 per cent of all annual overhead line maintenance costs and 10 per cent of all line construction costs are directly accountable to trees. A broken limb or a wet leaf may hinder the reception of a message which has otherwise traveled thousands of miles successfully.

Overhead lines are a very important pulse of the nation, and to keep them open is to greatly further the welfare of the people. On the other hand, trees are the saviors of our hot valley regions, making livable a condition



THE "CRADLE TREE," a masterpiece of tree butchery. Here the foliage has been repeatedly cut away to make a path of noninterference for seven rows of wires.

AT CLOSE QUARTERS, with wires above tree growth, poles must be raised.

Tree Butchery by Linemen Prevented

(Continued from preceding page)

that is only existible without them. Then, too, they are appealing to the senses, attracting through their beauty tourists and visitors to side trips and extra days of vacationing.

The public wants more and better trees; the public utility companies want less expensive construction and maintenance costs on their overhead lines. Each of these interests may satisfactorily be served if the problem be given the proper attention at its origination. Each side should recognize and appreciate the involved interests of the other in the construction of lines and the planting of trees.

TREE BUTCHERY OBSOLETE

At the time of construction, it will probably be found much less expensive to fit the poles to the trees than to fit the trees to the poles and wires. The oldtime method of tree butchery, employed by construction gangs when placing wires, is no longer recognized.

Elements taken into consideration when placing wires are tree form, width of right of way, and the importance of the lines, before the wires are placed over, to one side, or under the trees. Of course, the utopian of all types of wire construction, so far as trees are concerned, is the laying of underground cables. This, however, is quite expensive in initial cost, and also is not used except when absolutely necessary because of the high wire maintenance cost in case of breakage.

Underground cables are not practical except in densely populated areas, in near urban districts or contiguous to some beautiful specimen or row of trees. Heavily insulated tree cable is ofttimes used to minimize trimming cost and to retain the natural shape of the tree crown.

TRIMMING REQUIRES EXPERTS

Wires placed directly over trees are in the least desirable location, for it is in the tops of trees that the greatest annual growth occurs. This necessitates a yearly trimming cycle which causes maintenance costs to be unnecessarily high and is detrimental to the natural form of the tree.

If it is necessary, in order to have proper clearance for a line, to remove growth from trees each successive year, it is evident that the line is not properly placed in reference to the trees and should be raised for more economical maintenance

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LEFT MISSHAPEN by the butchers this tree shows the effect of continual trimming for overhead clearance. Note the size of its crown in relation to the trunk.

AN IDEAL example of the ultimate desirable condition of tree and wire location is shown by this fine specimen—a thing of grace and beauty adorning the roadside.

Los Gatos-Santa Cruz Cut-off Dedicated at Inspiration Point

BRINGING the scenic and recreational resources of Santa Cruz County closer to San Francisco Bay and to all of northern California, the new Inspiration Point cut-off on the Los Gatos-Santa Cruz Highway was officially dedicated on Saturday, September 22.

A colorful ceremony attended by over 1000 people marked the opening of the new high-standard route. A begonia-studded barrier of redwood leaves, representing Santa Cruz County's flowers and forests, was held by a group of bathing beauties, typifying the county's ocean beaches. Director of Public Works Earl Lee Kelly severed the strand at 2 p.m., and led the caravan of State officials and civic leaders out over the new route.

Chairman Harry A. Hopkins of the California Highway Commission and Commissioners Timothy A. Reardon, Philip A. Stanton and Frank A. Tetley were speakers at the dedication ceremonies and participated in the opening, as did Col. John H. Skeggs, District Engineer.

The State officials were guests at a luncheon at the Hotel Palomar in Santa Cruz, where the caravan formed to journey to Inspiration Point over the old road, escorted by Capt. Jack Payton of the California Highway Patrol and County Farm Advisor Henry Washburn.

At Inspiration Point, Mayor Roy Hammond of Santa Cruz gave a short address of welcome, and Fred McPherson, Jr., served as master of ceremonies.

Many civic and official bodies were represented at the ceremony, including the California State Chamber of Commerce, the California State Automobile Association, the Chambers of Commerce of San Jose, Santa Clara, San Benito County, Pajaro Valley, San Lorenzo Valley, Soquel, Highland and Salinas.

Senator Bert B. Snyder of Santa Cruz,

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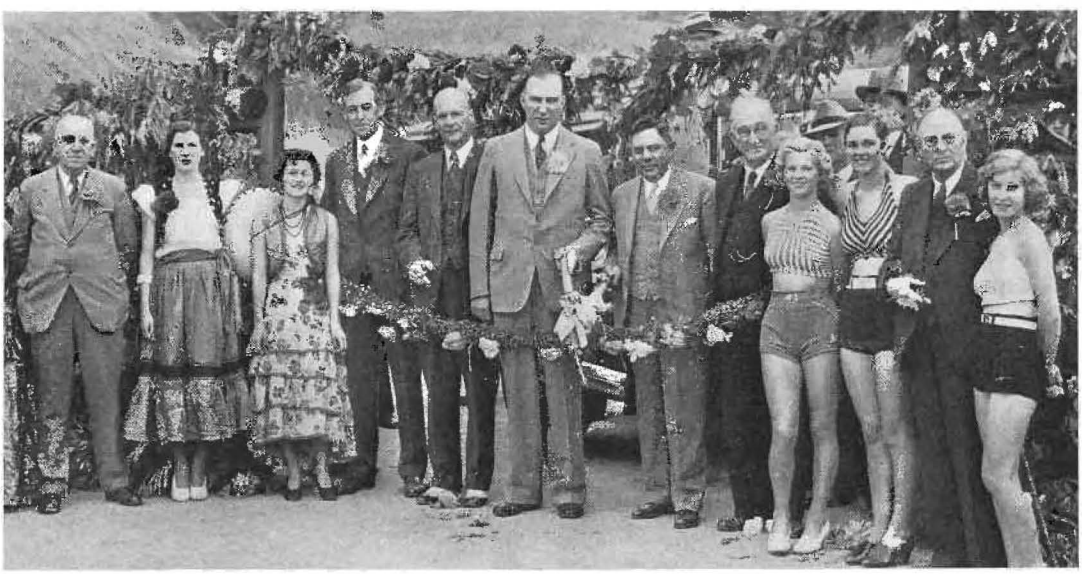
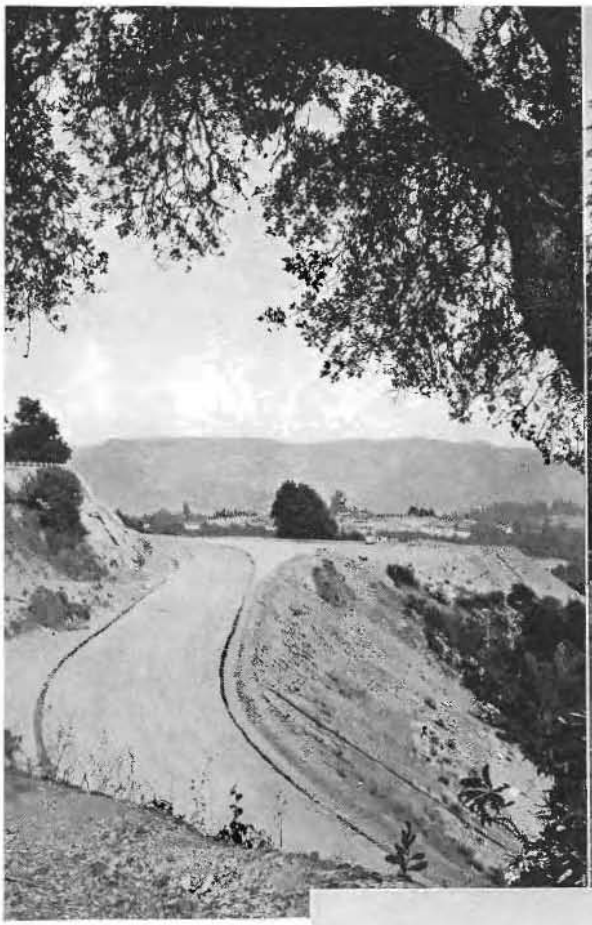


SHEARS IN HAND and flanked by officials, bathing beauties and Birthday Party girls Director Earl Lee Kelly is about to cut the ribbon officially opening the Inspiration Point cutoff. Left to right the officials are Highway Commissioner T. A. Reardon, District Engineer J. H. Skeggs, Mayor Roy Hammond, Chairman Hopkins of Highway Commission and Commissioners F. A. Tetley and P. A. Stanton.



INSPIRATION POINT CUT-OFF

a 6.67 mile relocation of the mountain section of the Los Gatos-Santa Cruz highway officially dedicated September 22d, replaces 8 miles of narrow winding road of 15-foot pavement. The new section strikes boldly through the mountains with huge cuts and fills. It is 46 feet wide through the mountains, 36 in the valley and surfaced with bituminous macadam.

Research Laboratory Forced to Build Extensions to Handle Increased Work

By **T. E. STANTON,** Materials and Research Engineer

THE 1922 Biennial Report of the California Division of Highways recited that in order to properly house and centralize the testing and research work, the California Highway Commission had erected a building to be known as the testing and research laboratory. This structure was a Class "A" building of brick, one story in height, with a spacious basement covering an area approximately 33 feet in width by 105 feet in length.

Current annual expenditures for highway construction and maintenance are more than double the expenditures of 1922, and more rigid control of construction and maintenance operations requires that the department handle more work in one year than in all the ten years preceding that time. The San Francisco-Oakland Bay Bridge has served to still further increase the work of the department.

FORCED TO ENLARGE

By the end of 1933 it had become exceedingly difficult to efficiently handle the work and it was found essential to enlarge the building facilities. This enlargement consists in extending the building by additions to both the east and west ends; the floor space in the additions approximating 5000 square feet.

The first floor of the easterly wing will be occupied by the aggregate and soils department.

The value of soil and foundation tests, which now occupy a prominent position in the work of the department, has received considerable recognition during recent years. The Materials and Research Department of the Division of Highways has kept abreast of the times not only in the performance of tests but also in the development of new equipment for the purpose.

CONCRETE TESTS INCREASE.

The basement of the east wing will house the concrete department, the work of which has been very materially expanded, not only on account of the increased volume of routine testing but also in the investigation and testing of the large number of special brands of cement which have been developed during recent years and are still in the process of development for special uses.

Less than ten years ago but one brand of cement, known as standard Portland cement, was used in concrete construction. We are today using considerable quantities of at least four grades, including standard Portland; high early strength; special sea water such as that used in portions of the Bay Bridge construction; and the high silica or blended type of cement.

The chemical department will occupy the first floor of the westerly extension, thereby enabling that department to better handle the increased volume of work, including the many additional chemical tests and analyses which have been developed in recent years to control the quality of materials entering into highway and bridge construction.

ASPHALTS AND ROAD OILS

The basement of the west extension will house the asphaltic concrete and road oil department.

The rapid development of the road oil, asphaltic cutback and asphaltic emulsion low-cost road construction has multiplied the work of this department several fold to insure that the best available material is used and the construction operations are properly carried out to the end that the greatest value of service may be secured for the expenditures made.

The work of the Materials and Research Department of the Division of Highways has received favorable attention not only throughout the United States but also internationally, as frequent requests are received for information from as far off as England, Germany, India and Australia.

MORE RIGID CONTROL

The tendency of recent years nationally and internationally has been toward the more rigid control of construction materials and operations through the materials and research departments. Along with the routine control and tests of materials has gone an extensive research program to develop new and improved methods to the end that more value

GROWING WINGS the Testing and Research Laboratory of the Division of Highways at 34th and Serra Way is expanding to take care of increased work. The wings add 5000 square feet of floor space.

of road service will be had for each dollar expended.

The cost of operating the Materials and Research Department, including all preliminary investigations, control tests of materials during construction, and research work of all kinds amounts to considerably less than 1 per cent of the total State expenditures for highway purposes. For this relatively small expenditure the Division of Highways is assured that only the best quality of materials enter into the construction of its State highways.

HUMBLE BEGINNINGS—The wooden shack housed the first laboratory in 1912. The concrete building was a later addition.

TWO BRIDGES BEING BUILT ON SAN MARCOS PASS ROUTE

On the San Marcos Pass Route in Santa Barbara County between the Santa Ynez River and Santa Ynez, a distance of 2½ miles, the road has been reconstructed with a 28-foot graded roadbed with an oil treated gravel surface 20 feet in width under the provisions of the NIRA.

Within the limits of the above project two bridges are under construction under the supervision of the Bridge Department, one across the Santa Ynez River, a reinforced concrete bridge having a total length of 765 feet with a 24-foot clear roadway; and one across Santa Agueda Creek, being a reinforced concrete bridge having a total length of 128 feet with a 24-foot clear roadway. It is anticipated that these bridges will be completed in November.

REAL EXPANSION came with this substantial brick building in 1922, now found inadequate.

Traffic Able to Avoid City Congestion

(Continued from page 2)

Tentative plans for extending the boulevard southward are ready when joint highway district funds for further construction become available.

STATE BUILDS EXTENSION

During the past summer the work of extending Junipero Serra Boulevard southward from junction with School Street in Daly City to Edgemar Road (a distance of 0.63 mile) was completed by Joint Highway District No. 10 at a cost of about $9,600, which cost included a concrete structure separating Washington Street from the boulevard.

At the same time the State has been constructing the "feeder" road extension southward from Edgemar Road, including a connecting link eastward to join El Camino Real (State Highway Route 2, U. S. Highway 101). This unit is a total of 1.97 miles in length, of which 1.6 miles is the boulevard and 0.37 mile is the connection to Route 2. The connection, however, is of the same high type construction as in the boulevard itself, and the finished project is one outstanding in attractiveness and serviceability.

TRAFFIC AVOIDS CONGESTION

Traffic is now able to avoid all conditions of city congestion and delay all the way from Sloat Boulevard and Portola Drive to the open road of Route 2 and its connections to the bay shore.

Construction of the section described in this article was commenced early in the spring of this year and completed in September. Location is all in open country over a terrain of low hills. Excavation, however, was wholly in soil consisting of sand tightly bound with an ideal admixture of clay, so that the resulting roadbed is compact and stable.

Curvature is light and 5 per cent grade is the maximum. The roadway was graded to a width of 65 feet, including side ditches and a small berm on hills.

Pavement consists of 6 inches of crusher run base 40 feet wide surfaced to the same width with asphalt concrete 6 inches thick.

The shoulders have a surfacing of crusher run base compacted to a thickness of 4 inches constructed as an oil bound surface by applying emulsified asphalt in three coats, three-quarters gallon per square yard total. The shoulder treatment is extended to cover adjacent gutters.

Cut slopes are uniformly 1:1 and rounded at the top.

In keeping with our policy of roadside beautification, and as a measure to prevent wind erosion of the cut slopes, the cut faces have been beautified with plant growth. Ice plant was used for the purpose and with complete success. Cost of the protection was about $0.05 per square yard of surface planted. This treatment results in beautifying as well as protecting the slopes.

BUILT WITH FEDERAL FUNDS

Roadway excavation amounted to about 280,000 cubic yards, all of which was required to build the embankments. The work was done with heavy crawler type tractors and wheeled scrapers of 12 cubic yards capacity. Average haul was about 1000 feet.

The contractor's price for earthwork was $0.13 per cubic yard, a remarkably low figure for the present high standard requirements in earthwork.

Total construction cost, including engineering, for this new section of the boulevard was less than $208,000 and the project was financed entirely from Federal government funds.

The heavy volume of traffic now using this connection to the city is sufficient testimonial to the fitness of the improvement.

PROJECTS UNDER WAY ON MORRO-FRESNO SECONDARY

Between Atascadero and Morro in San Luis Obispo County, from 6 miles east of Morro to the Atascadero Summit, a distance of about 3.2 miles, the road is being constructed with a 20-foot selected material surface on a 28-foot graded roadbed.

This project comes under the provisions of the NIRA. Plans are complete for the construction of a portion of this road within the limits of the Santa Barbara National Forest, a distance of about 4 miles.

These projects are a portion of the route between Morro Bay and Fresno, which was included in the secondary roads taken over from the county by the act of the Legislature.

Friend: "Why have you given the general such a peculiar pose?"

Sculptor: "You see, it was started as an equestrian statue and then the committee found they couldn't afford the horse."—*Brantford Expositor.*

Group Planting Assures Tree Growth

(Continued from page 11)

or placed under the tree, if the height of the lower branches permits.

In any case, the trimming should be done in such a manner as to disturb the natural growth of the tree as little as possible, consistent with adequate clearance. This trimming work, of course, should be done only by trained men with proper tools and the fundamentals of proper tree surgery should be followed in all cases.

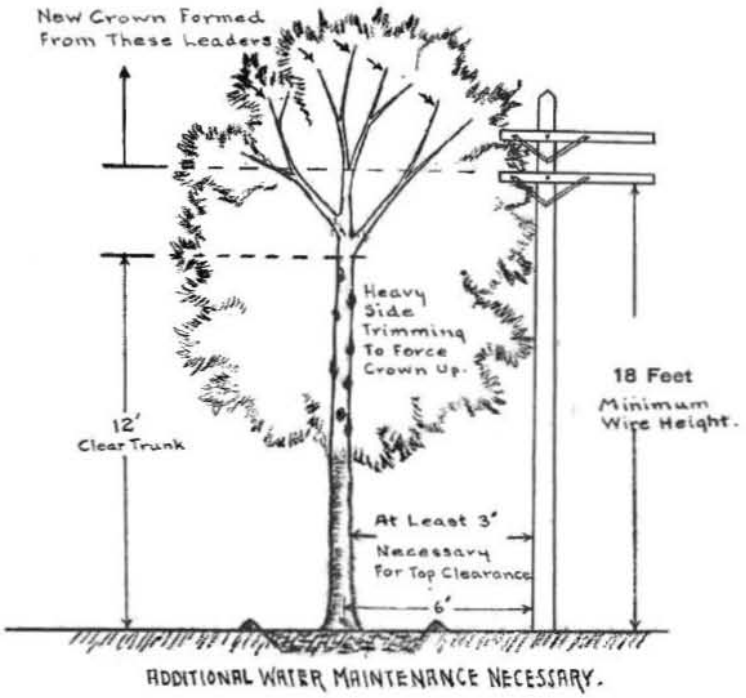
A possibility in solving the problem in rural communities and the country areas lies in the acquisition of extra right of way for the use of the pole line. This would cause tree interference to be practically nil, and would lessen the cost of wire maintenance through the use of lower wires. An extra width easement could nearly always be obtained from private parties if the use of this piece of land were explained to them.

The Maintenance Department of the Division of Highways, in coping with problems of tree and wire relationship, has grouped the work into three general classes in accordance to the trees to be worked on. These are: First, the large or matured trees; secondly, the young growing trees; and most important, the proposed plantings.

Under the first class is found the most usual type of wire clearance. Trees that are of large size are usually the ones that show the marks of tree butchery as practiced by linemen not so long ago. Wherever trees have reached the full height of the poles and have to be severely topped each year to maintain clearance, if possible, instead of raising the wires and so only prolonging an unescapable condition, the wires are lowered to the 18-foot minimum. At this level is usually found only clean trunks and lower branches; so that occasional water sprout growth is the only trimming maintenance needed.

Trees are sometimes found that have formed a semicircle of growth around the wires, caused by severe trimming of the growth under the wires with no effort made to shape up the tree as a whole by trimming any growth other than the branches or twigs that cause the interference. The result is a cradle-like hollow in which the wires rest, with growth on each side that in some cases has formed a full sized tree with a hole through the crown.

PROPOSED PLAN SHOWING THE TRIMMING WORK ON YOUNG TREES FOR WIRE CLEARANCE.



ADDITIONAL WATER MAINTENANCE NECESSARY.

STATE REGULATIONS require 12 feet clearance between trunk of tree and the highway. Railroad Commission demands 18 feet minimum clearance between wires and ground. Pole is set 6 feet from trunk with 3-foot clearance for side-arms.

WIRES MUST BE RAISED

In a case of this kind, the first operation is the raising of the wires to allow a 40-foot minimum clearance. This height has been agreed upon as a minimum by the Division of Highways and the utility companies over trees. Heavy trimming of the side growth is then undertaken, leaving only the strongest and most upright branches. In the hollow where the wires formerly were, new growth will sprout, that in three or four seasons will fill this hollow.

The strongest of these are selected, the rest trimmed out, and the growth that remains is trimmed up to eventually form a new central framework for a new tree crown. In proper time the wires may be lowered to 18 feet, the minimum height for overhead wires to allow continued unrestricted growth of the new crown. This form of work is the most complete type of tree crown rehabilitation attempted in an effort to establish wire clearance because the

(Continued on page 21)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

EARL LEE KELLY ..... Director
JOHN W. HOWE ..... Editor

Address communications to California Highways and Public Works, P. O. Box 1499, Sacramento, California.

Vol. 12 OCTOBER, 1934 No. 10

As Seen by an Editor

I wonder if many people beside myself have noticed as they drive over the county roads, recently taken into the State highway system as secondary highways, what the maintenance department of the Highway Commission has done to those roads to make them safer and more comfortable for motorists. * * *

In the first place, the life saving white line in the center of the highway attracts the eye. Then they have made safer many turns by widening the shoulders and they have smoothed the rough spots. * * *

Dangerous culvert edges have been marked with white posts, trees near the highway have been painted white and numerous stout barriers have been installed at danger points where they have long been needed.

It is very evident that they closely watch the highways and lose no time in doing all in their power to make the roads safer and some of the work done by them during the short time they have been in charge has been needed for a long period. They are always doing something to improve conditions and the roads taken over in many respects approach the main highway in condition and upkeep.

Numerous warning signs have been installed by the maintenance crews and if there is need for anything to be done to add to the safety of the motorists they do not overlook it. They are on the job all the time despite the vast district they must cover and only a perfect system could accomplish such results.—Art S. Newburgh in *Petaluma Argus-Courier.*

3400 Miles of Road to Link State and U. S. Forest Systems

OVER 3400 miles of roads in the National forests of California will eventually link the State highway systems to the mountain recreational areas, according to a report just made to the Department of Agriculture, Washington, D. C., by the U. S. Forest Service, Bureau of Public Roads and the State Highway Engineer.

Part of this proposed cooperative system consists of the Sierra Way, a high mountain road, already partly completed, paralleling the summit of the Sierra Nevada from Siskiyou County to Kern County. This highway links many of the outstanding scenic features of the State, such as Mt. Shasta, Mt. Lassen, Tahoe, the early mining country, giant trees and National parks.

The total estimated cost of the National forest highway system in California will be $127,383,700 of which $88,257,700 has been expended or allocated. Of this total the State share is approximately $50,000,000, the Federal government's $23,000,000 and the counties' $15,000,000.

Future expenditures of over $39,000,000 will be 55 per cent Federal, 35 per cent State and 10 per cent county funds.

AVERAGE SPEED ON MARYLAND HIGHWAYS 35.5 MILES AN HOUR

During the summer of 1933 the Maryland State Roads Commission carried on a highway traffic speed survey to obtain comprehensive knowledge of the way traffic actually uses the State highways. The speed of traffic was observed at about 50 of the regular traffic census stations which the State Roads Commission has used for many years. The results of the survey were reported by Dean A. N. Johnson of the University of Maryland at the 13th annual meeting of the Highway Research Board.

The average speed as observed from 41,000 vehicles was 35.5 miles per hour, with 87 per cent of all traffic within 45 miles per hour and 99 per cent within 55 miles per hour and only an occasional vehicle moving over 65 miles per hour.

The percentage of various rate of speeds is shown in the following table:

8 per cent between 15-25 miles per hour.
36 per cent between 25-35 miles per hour.
43 per cent between 35-45 miles per hour.
12 per cent between 45-55 miles per hour.
1 per cent between 55-65 miles per hour.

Farmer: "No, I wouldn't think o' chargin' ye for the cider. That'd be bootleggin'—an' praise the Lord, I ain't come t' that yit. The peck o' potatoes'll be five dollars."

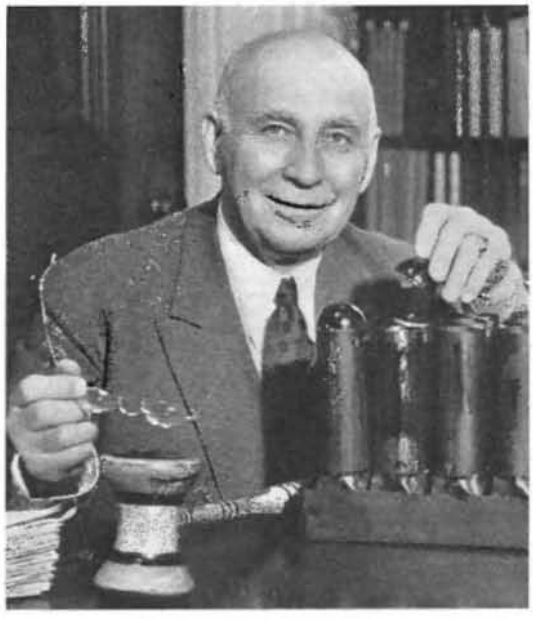
Governor Praises Bay Bridge Chiefs on Completion of Deep Water Structures

COMPLETION of the twelve and one-half million dollar substructure of the San Francisco-Oakland Bay Bridge was celebrated with a great luncheon meeting of Oakland business men in the Hotel Oakland on Tuesday noon, October 16th, when Governor Frank F. Merriam gave public praise to State Director of Public Works Earl Lee Kelly and Chief Engineer C. H. Purcell, and their staffs, for conquering the deep waters of San Francisco Bay.

The luncheon was sponsored and managed by the Oakland Junior Chamber of Commerce, aided by the State Department of Public Works. Floyd J. Day was chairman of the Bridge Day for the Oakland Junior Chamber.

GREATEST IN WORLD

Governor Merriam pointed out that the underwater or unseen portions of the San Francisco-Oakland Bay Bridge alone, without considering its superstructure, made it the world's greatest bridge.



GOVERNOR MERRIAM examining model of flotation cylinder presented to him at luncheon given by the Oakland Junior Chamber of Commerce.

Fifty-one concrete piers, involving many different types of engineering design, one of which is original to this bridge, and which will be the State of California's contribution to subaqueous engineering, are now in the last stages of completion, with the deep water work all done.

Director of Public Works Kelly cited the faith which the contractors had in the designs of Chief Engineer Purcell and his staff, and pointed out that these great engineering and contracting firms and their bondsmen risked $12,500,000 on the judgment of the State of California's engineers.

SUBMARINE WORK FINISHED

Chief Engineer Purcell spoke briefly; thanked the contractors for their cooperation, and expressed pleasure that the deep water portion of the work was all done, and that the loss of life had been held to a record minimum of five men on the substructure work, one casualty having occurred on the substructure.

Consulting Engineer Charles Derleth, Jr., Dean of the University of California College of Engineering, offered his compliments to the State of California for the successful negotiation of the deep waters of the great San Francisco Bay.

Other speakers were: Floyd J. Day, general chairman; Lorenzo Buckley, chairman of speakers; Ed. H. Siems, vice chairman; W. J. McCracken, mayor of Oakland; Wm. Hamilton, chairman, board of supervisors.

The committee in charge of the event were: Floyd J. Day, Ed. H. Siems and Lorenzo Buckley.

Speaking at the luncheon, Chief Engineer C. H. Purcell assured football fans that they can count on crossing the great new bridge for the 1936 "big game."

Mr. Purcell announced that every department of the bridge construction is now well ahead of schedule and unless some unforeseen event transpired to hold up the work he estimated that the bridge will be completed sometime between the dates of August 15 and October 31, 1936.

"Say, why do you nickname your girl Appendix?"
"Because it costs so much to take her out."

155 Snowplows Ready to Keep State Highways Open Through Winter

By **T. H. DENNIS**, Maintenance Engineer

THE SNOWSTORM of September 23 was an early reminder to the public that the winter season is on the way. Many hunters and vacationists were marooned temporarily and were released by the Division of Highways' forces and snow removal equipment. The equipment was in operation a few hours after the start of the storm on Donner and Echo summits and around Lake Tahoe.

The Carson Pass, Ebbetts Pass, Luther Pass, Sonora Pass and Tioga Pass roads were closed for a day or so, but were opened easily as soon as equipment was available. The snowfall varied from 4 inches to 18 inches at various locations.

The Maintenance and Equipment departments had started the program for the 1934-1935 winter season long before. Detailed information as to equipment requirements had been collected and submitted for executive approval as early as July 27. Each season there are certain units of equipment which must be replaced either because of obsolescence or poor mechanical condition, and this year was no exception.

EQUIPMENT REPLACEMENTS

The new equipment and replacements are as follows:

New Equipment:
- 17 trucks from 2½ to 5-ton capacity
- 1 Auger type rotary
- 16 Speed type straight blade push plows
- 4 "V" type push plows

Units Retired:
- 14 trucks
- 4 30-h.p. tractors
- 4 tractor plows
- 2 tractor rotary plows
- 1 shovel type rotary plow
- 10 straight blade, "V" and speed type plows

While the new equipment represents an investment of about $100,000, there is an increase in inventory value of less than $4,000 due to the retirement of the old units.

Expenditures for snow removal work during the 1933-1934 season were $150,491.23 on about 2000 miles of road. The expenditure for the previous season was $304,259.18 on about 3300 miles of road.

Each community and individual feels that they are entitled to consideration in the snow removal program and, when the winter season starts in earnest, requests and petitions are received asking that particular sections of road be kept open. Usually such sections are in isolated areas of heavy snowfall and with very limited winter traffic at best. Naturally, the expense of keeping an open road is almost as great for a few as for a large number of machines, as a one-way road seldom will serve the purpose and drifts fill the road faster than when a two-way passage is provided.

PUBLIC MISUNDERSTANDS

It would be of some public benefit if all roads could be kept open the year around, but in many cases the extent of use would not justify the expense. Instances are on record where sections of road were opened with considerable difficulty in the spring, as a result of public importunity, on which the snow would have melted in the natural course of events in almost the same time and with very little aid from highway forces.

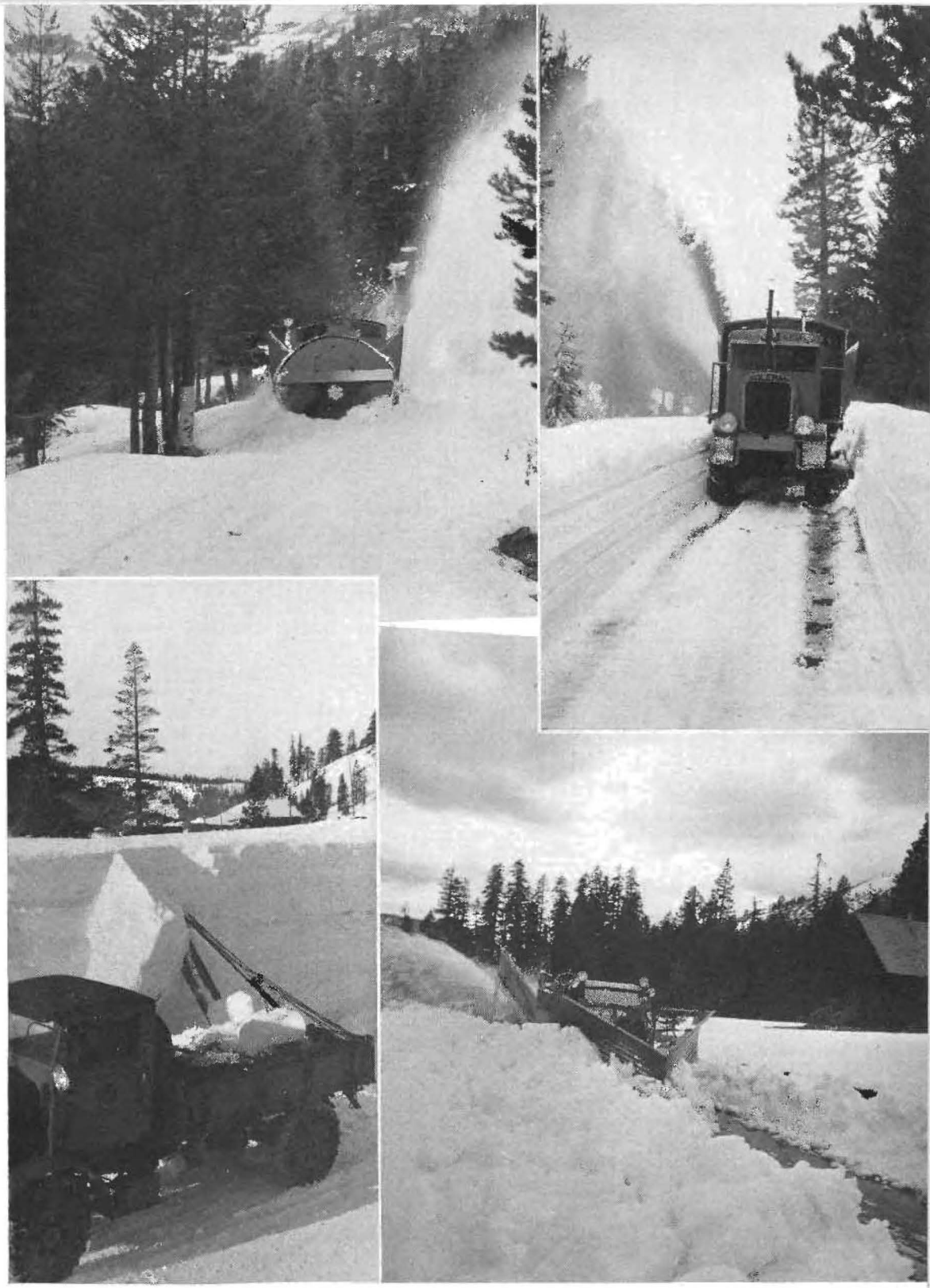
The public is slow to understand why the work of opening the mountain roads is delayed as long as possible each spring. After a certain time in the spring, the action of sun and wind with minimum assistance from highway forces will open up a road much faster and more economically than can be done earlier by strenuous efforts with heavy equipment.

There will be no particular increase in the sections of State highways for which snow removal work is planned for the coming winter over that carried out during the past two years. Last season, the light snowfall made it feasible to maintain an open road where that had not been possible before. Naturally, with a normal winter season it will not be practical to equal that situation entirely during 1934-1935 with the equipment and funds available.

THIRTEEN PERMANENT STATIONS

The snow removal work is now on a permanent, well organized basis. Permanent quarters designed for the needs of the work have been provided east of Emigrant Gap and at the Summit on the Donner Pass route; at

(Continued on page 27)



HIGHWAY SNOW FIGHTERS in action—The top pictures show front and rear views of one of the large railroad type rotary plows. The operating end is at the rear of the machine which backs into the drifts. Lower left is a slice bar mounted on a truck. At right is a V-plow with side wing.

District Chiefs Men of Proven Ability

(Continued from page 4)

DISTRICT IV.

JNO. H. SKEGGS, with headquarters in San Francisco.

Just one month after his discharge from the army, where he had served in the Engineer's Corps with the rank of Lieutenant Colonel, on August 25, 1919, Colonel Skeggs was appointed to the position of Assistant District Engineer in District IV. Two years later, on the first of October, 1921, he received his appointment as District Engineer and has served the Division as chief executive of the San Francisco office for the past thirteen years.

DISTRICT V.

L. H. GIBSON, with headquarters at San Luis Obispo.

Mr. Gibson was helping to construct State roads in California before there was a Division of Highways. He was a "Road Engineer" with the old California State Engineering Department and was inducted into the Division on May 26, 1913, as Assistant Highway Engineer attached to the headquarters office. On the first of December, 1918, Mr. Gibson was appointed to his present position as District Engineer of District V.

DISTRICT VI.

R. M. GILLIS, with headquarters at Fresno.

Mr. Gillis is the youngest of District Engineers in the time of service to California, but his experience in highway construction has been broad and varied. Before coming to California as District Construction Engineer for District X in April, 1929, Mr. Gillis had served the Highway Department of the State of Washington on various phases of work, holding the position of District Engineer at the time he left that Department. Because of his wide experience he was made Assistant Construction Engineer for the California Division in August of 1929, supervising grading work over the State. On September 1, 1933, Mr. Gillis was promoted to District Engineer of District VI at Fresno.

DISTRICT VII.

S. V. CORTELYOU, with headquarters at Los Angeles.

Mr. Cortelyou, the dean of California's District Highway Enginers, with twenty-three years of service in the Division of Highways, is in charge of the most difficult District in the State. In his able administration of the affairs of his district he has justly earned the respect and esteem of not only his own community but of the entire State.

On February 1, 1912, Mr. Cortelyou was appointed to the position of Assistant District Engineer for District VII which post he held for nearly twelve years. On January 1, 1924, he was promoted to his present position. Mr. Cortelyou came to the State service from the office of the Los Angeles County Surveyor where he held the title of Office Engineer.

DISTRICT VIII.

E. Q. SULLIVAN, with headquarters at San Bernardino.

Mr. Sullivan began working for the Division of Highways as an Assistant Resident Engineer in District II in August, 1914, and served in that capacity and as a Resident Engineer until October, 1923, when he was appointed to his present position of District Engineer of District VIII. Prior to his State service, Mr. Sullivan was employed in Los Angeles as an inspector on construction for private consulting engineers.

DISTRICT IX.

S. W. LOWDEN, with headquarters at Bishop.

In April, 1912, Mr. Lowden joined the California highway organization as rodman on a survey party in District II, coming to the State service from the position of mine surveyor for the U. S. Government. Since that time he has climbed steadily in the organization having been a Resident Engineer, Superintendent of Construction, Maintenance Superintendent, and District Maintenance Engineer. On September 8, 1933, he was appointed to his present position as Acting District Engineer of District IX.

DISTRICT X.

R. E. PIERCE, with headquarters at Stockton.

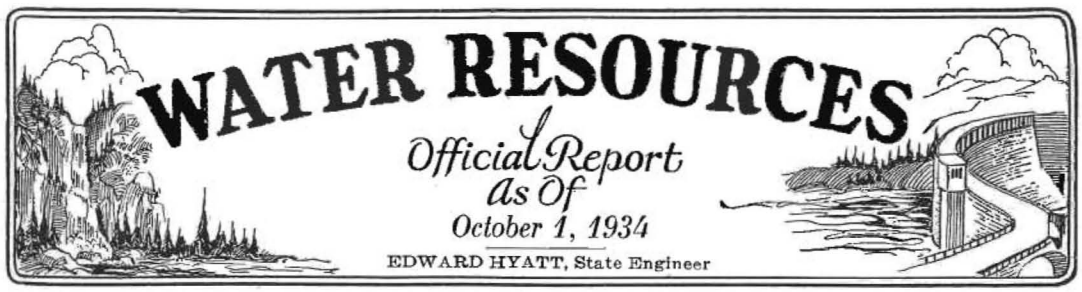
Mr. Pierce left the employ of the West Side Railroad Company as a Resident Engineer at Dixon to enter the Division of Highways organization as a draftsman in District III in June, 1915. A year and a half later he was made Office Engineer. In November, 1918, he took a leave for military service and returned a year later as Construction Engineer for the same District. With the formation of District X in 1924, Mr. Pierce was appointed to the position of Assistant District Engineer and on March 8, 1926, was appointed as District Engineer.

DISTRICT XI.

E. E. WALLACE, with headquarters at San Diego.

This District is the latest development in the growth of the Division of Highways and with its formation a year ago Mr. Wallace was entrusted with the organization, being transferred from his post as District Engineer of District VI, where he had been for over seven years. Mr. Wallace entered State employ as a draftsman in District V in 1913 where, in six years he climbed to the position of Assistant District Engineer, from which post he was transferred to District VI.

These are the men who labor devotedly for the development of the State highway system in the many sections of California and whose records of achievement will live long in the annals of road construction on the Pacific coast and of whose unselfish service all Californians should be justly proud.



A renewal of activities by irrigation districts for improvement of dwindling water supplies is reported by the California Districts Securities Commission. Applications for refinancing loans from RFC by a total of 26 districts up to October 1 had been approved by the Federal authorities.

Flood control and reclamation projects on the Sacramento, American, Feather and Mokelumne rivers are providing 56,316 man hours work. Flow of the Sacramento River at Sacramento has increased causing a recession of salinity at upper Delta stations.

Dam applications, topographic mapping and other activities of the division are covered in the monthly report of the State Engineer which follows:

IRRIGATION DISTRICTS

The State Engineer has been notified that the Hollister Irrigation District, San Benito County, which has been dormant since 1925, is reviving its organization, with the purpose of carrying out the necessary plans for developing a much needed water supply. The district contains highly developed orchard areas which are dependent on a rapidly diminishing underground water supply. An effective method of replenishing and augmenting this supply in time to prevent loss to much of the orchard area is the problem which demands the immediate attention of the district.

The South San Joaquin and Byron-Bethany Irrigation Districts in San Joaquin County have been notified that their applications for refinancing loans from RFC have been approved by the Federal authorities. The amounts involved in the loans are: South San Joaquin district, $2,652,500; and Byron-Bethany district, $372,500. The total number of California irrigation district applications to RFC for loans approved is 26.

FLOOD CONTROL AND RECLAMATION

a. Maintenance of Sacramento Flood Control Project.

During this period routine maintenance work has been carried on with a small force on the units of the flood control project.

b. Sacramento Flood Control Project.

The work of moving the Packer warehouse from the new levee right-of-way eight miles above Colusa has been commenced. This work is being done for the Reclamation Board, the estimated cost of which is $4,272. The new levee will be constructed by the California Debris Commission with State and Federal funds.

During this period this office has been directing the activities of several SERA projects sponsored by the State Reclamation Board. The work consists of clearing timber and brush from certain flood channels, and in most cases the lands are being grubbed so they may be farmed. In all cases tools and transportation are being furnished. The projects and the man-hours worked to date are as follows:

Federal Transient Service—Upper Sutter By-pass	4,530 man-hours
Federal Transient Service—Tisdale By-pass	564 man-hours
Federal Transient Service—Lower Sutter By-pass	6,060 man-hours
SERA Project No. 35-B14-27—American River	11,792 man-hours

Work was commenced on September 19th on SERA Project No. 58-B14-15, on the Feather River channel above Marysville, with a crew of 40 men. It is expected that this number will be gradually increased, the project including 29,000 man-hours. This office is providing tools and supervision, the men furnishing their own transportation.

Mokelumne River.

Work was commenced September 20th on SERA Project No. 35-B14-40, clearing and grubbing the by-pass channel between Reclamation District No 1002 and the McCormack-Williamson tract. The work started with a crew of 40 men, this office furnishing supervision and tools. There are included in the project 4370 man-hours.

WATER RIGHTS

Supervision of Appropriation of Water.

During the month of August, 41 applications were received, 17 were denied and 14 were approved. In the same period 3 permits were revoked and 3 passed to license.

Among the more important applications received were two by South Fork Irrigation District proposing appropriations from Mill Creek and Clear Lake, tributary to South Fork of Pit River, for irrigation and power uses in Modoc County.

Projects under permit were inspected preparatory to issuance of license in Nevada, Sierra, Butte, Yuba, Sutter, Yolo, Sacramento, San Joaquin and Contra Costa counties.

(Continued on page 30)

Planning to Protect Highway Trees from Methods of Butchers

(Continued from page 17)

whole crown shape is changed over a short period of from six to ten years, which calls for careful continued attentive work on the part of the trimmer.

There have been a few special instances that deserve mention, wherein private owners of trees although allowing a right of way have reserved the rights to care for the trees on the right of way. Usually these rights of ways are not the full 100 feet in width, and space is at a premium.

AN ALTERNATIVE LOCATION

If the property owner refuses the utility company the right to place poles upon land off the strip occupied by the highway and the trees, and if there is not sufficient room between the tree row and the property line for the pole line, then the poles and wires are placed between the shoulder edge and the tree row.

In some cases the poles have been leaned out away from the trees to afford more clearance. This type of pole placement is not encouraged if for no other reason than that the poles and wires rather than being obstructed by the tree row, tend to detract from the beauty of the trees by heir obviousness to the passing traveler.

There are a considerable number of trees along the highways that are now at the stage where the first trimming for wire clearance is necessary. If it is possible, and whenever the wires are at a reasonable or feasible distance from the trees, side trimming is resorted to in an effort to force the central leader growth up and to form a crown above the level of the wires. This will eventually give the same effect as that established on the large trees by the lowering of the wires to or under the crown growth.

SIDE-ARM PLAN

If the wires are not at a sufficient distance to one side to allow this trimming, a plan is under way wherein the wires may be side-armed on the poles until the crown is forced above the minimum wire height, at which time they may be replaced to their original position on the poles, with the same effect as produced on the trees as treated above.

There are existing rows of trees that have been planted directly underneath a line of wires, an evidence of very poor judgment in roadside designing. The only solution in such cases is to raise the wires to a maximum height and continually trim or move the poles a few feet in and side-arm if right of way width permits.

When planting new trees, the locations of poles and wires are now considered so that if trees can be well placed with regard to a beautiful effect and still not cause interference they are so planted.

GROUP PLANTING METHOD

More plantings of the group type are being made which does away with the long rows of trees in which every tree offers a problem of clearance, both to wires and to tree maintenance forces. These group plantings break up the monotonous view of poles and wires as effectively as a row planting would do, with none of the regimented stiffness afforded by the latter.

(Continued on page 26)

Grade Separation of Sunset and Glendale Avenues Completed

A NEW concrete viaduct carrying Sunset Boulevard across Glendale Boulevard in the heart of the city of Los Angeles was completed on October 1. This concrete structure has a 90-foot clear span across Glendale Boulevard and replaces a three-span timber trestle which had carried traffic for the past 29 years at this important grade separation.

Both Sunset and Glendale boulevards carry a tremendous volume of vehicular traffic and the Pacific Electric Railway has a double line of car tracks on both boulevards.

This is one of the projects financed from Federal highway funds set up for use within municipalities in 1933. The structure was designed in the office of the city engineer of Los Angeles. The contract was advertised and the construction supervised by the Bridge Department of the State highways.

TOTAL COST $142,000

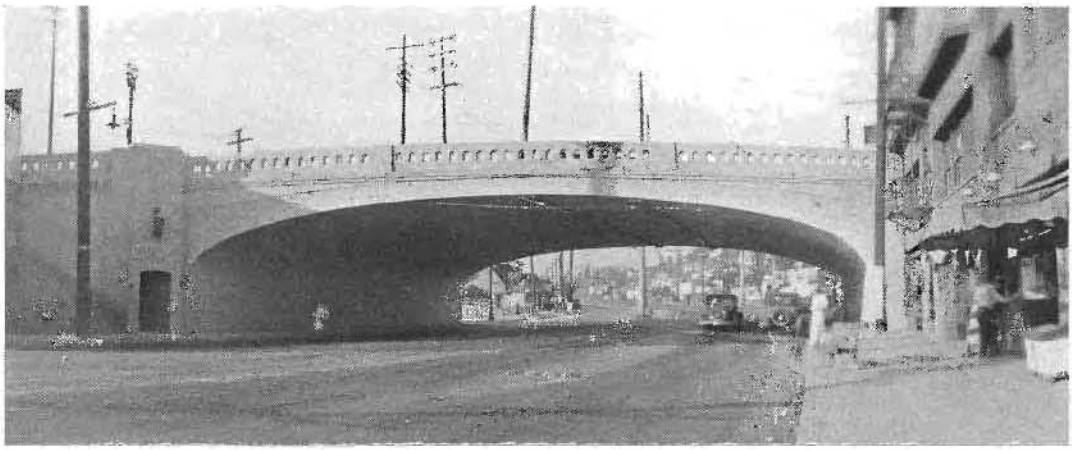
The contract was awarded in the amount of $130,000 on January 9, 1934. In addition to the contract work it was necessary for the Pacific Electric to build falsework and do necessary track work in connection with taking care of the railroad during the construction of the grade separation. The work done by the railroad amounted to approximately $12,000, and this work was also financed with Federal highway funds.

The new structure provides a minimum 72-foot width of highway on Sunset Boulevard plus wide sidewalks. The width of roadway flares out over the structure to take care of the intersection with Reservoir Street at the northwest corner of the intersection.

FOUR-WAY INTERSECTION

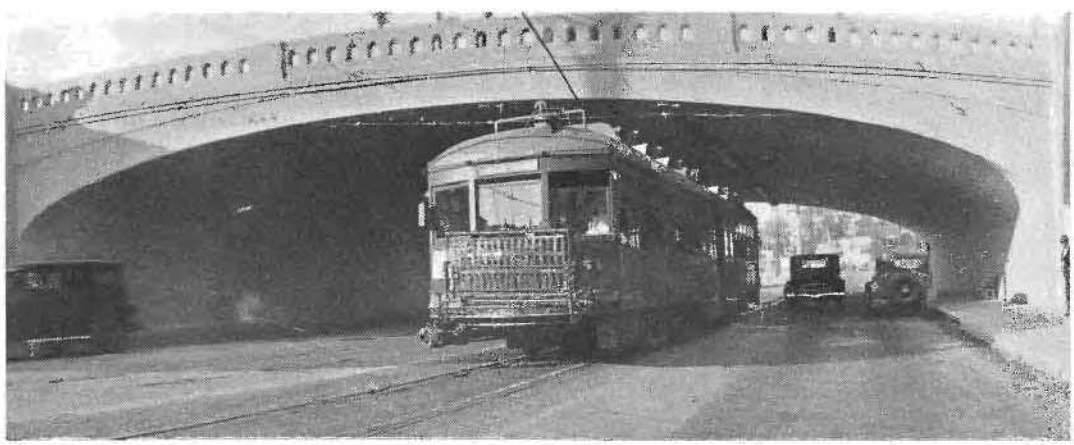
Just north of the structure Lakeshore Avenue comes into Glendale Boulevard so that there are four different streets which come together at this intersection, which complicated both planning and construction.

It was found necessary to reroute the vehicular traffic but the project was carried to completion without interrupting the railway traffic, one line over the structure and the other on the street level under it. This was accomplished by constructing the arch one-half width at a time, building temporary trestle work and making three separate shifts of railway tracks and trolleys.



CARRYING THE HEAVY TRAFFIC of Sunset Boulevard over Glendale Boulevard in the city of Los Angeles this grade separation structure was recently completed. In addition to the large vehicular traffic two railway lines are accommodated, one running over the structure and the other beneath it.

RELIC OF EARLY CONSTRUCTION standards this old timber bridge has been replaced by the new concrete and steel viaduct. Besides being inadequate to carry the load of present day traffic, its heavy wooden supports obstructing the roadway were a menace to vehicles.



TRAFFIC AREA INCREASED by the single arch structure, there is now room for two lanes of traffic on either side of the railway tracks.

Realignment Eliminates 130 Curves

(Continued from page 12)

Assemblyman Clifford R. Kallam of Watsonville, former Mayor Fred W. Swanton, Postmaster Fred Hale, former Postmaster Fred R. Howe of Santa Cruz, Councilman Irving E. Mabie of Los Gatos, Sheriff A. T. Dresser, Supervisors George N. Ley and Rose Rostron, County Surveyor Lloyd Bowman and Resident Engineer F. C. Walsh, in charge of the project, also participated in the ceremonies.

Director Earl Lee Kelly in his dedicatory address pointed out that this nearly completed section of the Los Gatos-Santa Cruz highway serves only a part of the traffic problem through the Santa Cruz Mountains, and that several more similar projects will be required to bring the entire road to modern standard. If these needed projects are to be made possible, he stated, the highway funds of the State must be kept intact and preserved for highway uses.

The project dedicated is a section of State Highway Route No. 5 known as the Stockton-Oakland-Santa Cruz Highway. The Inspiration Point cut-off leaves the old road at a point nearly a mile east of Inspiration Point and with 6.67 miles of new construction, replaces eight miles of the most dangerous and difficult part of the old road, terminating at Scott's Valley.

The number of curves has been reduced by 130, to a total of only 22; 6101 degrees of curvature, or nearly the equivalent of 17 complete circles, have been eliminated. The minimum radius of curve is 500 feet as against 80 feet on the old road. The width of new road is a minimum of 46 feet through the mountainous section and 36 feet in the valley, or about 100 per cent greater than that of the old.

In relation to the present traffic, savings in operating costs alone derived from reduced travel distance, represent a profit of about 25 per cent as the yearly dividend on the money invested in the improvement.

If only a fourth of the motorists using this highway are concerned with distance saved the investment would still be justified on the mileage saving basis.

The traffic count has steadily mounted, being well sustained, even during these depression years, and often reaches peaks in excess of 12,000 cars per day.

The saving in travel distance is accompanied by a saving of from fifteen to twenty minutes in driving time. The increased driving comfort resulting from the elimination of curves will be a boon to the thousands of travelers who come not only from the nearby bay area, but from the Sacramento and San Joaquin valleys and other interior points to Santa Cruz beaches and mountain resorts.

In addition to the Inspiration Point cut-off, the section from Ocean Street in Santa Cruz for a distance of two miles toward Los Gatos has been completed. "Ultimately the entire 25-mile section between Los Gatos and Santa Cruz will have come under the reconstruction plan already well formulated, and in considerable measure brought to realization," Colonel Skeggs stated in a recent article.

On the evening preceding the dedication ceremonies, the State officials were guests of the Pajaro Valley Chamber of Commerce and after a brief inspection tour of the highway setup in that vicinity were entertained at a dinner in the Resetar Hotel at Watsonville. The local committee of arrangements included J. A. Harvey, chairman of the Monterey Bay Highway Commission, President W. W. Bendell of the Pajaro Valley Chamber of Commerce, F. L. Selleck, chairman of the chamber highway committee, and Secretary M. C. Hall.

PLANNING TO PROTECT HIGHWAY TREES FROM BUTCHERS

(Continued from page 24)

The policy of the Division of Highways is to secure whenever possible a 100-foot wide right of way. With this in mind no permits are issued to private parties to plant on less than an 80-foot right of way and the State planting program is governed by the same restriction.

Although the pole lines will be given preference under normal conditions, the time is coming when, if an issue of importance arises the wires and poles will come second to a well designed roadside. When necessary, the wires will cross the road through an underground conduit, to save a beautiful roadside vista, or when it is impossible to pass near a tree without spoiling the effect created by that tree.

While more intelligent handling of the problems as they arise has taken the place of the slipshod methods which were detrimental to all concerned, as time goes on these problems will cease to be considered as such and will become a part of the well accomplished routine of every day work.

Snow Removal Work Reduced by Drift Control Measures

(Continued from page 20)

Mineral and Lost Creek on the Susanville lateral; at Crestview, Conway Summit and Sonora Junction on the route between Bishop and Reno; and at five locations on the Crest route between San Bernardino and Big Bear Lake. At other locations, the regular maintenance stations are adequate to serve the purpose.

The equipment consists of some 155 snowplows ranging from the light motor grader "V" plows; straight blade plows for 2½ to 5-ton trucks; several "V" type plows attached to 5-ton 4-wheel drive trucks equipped with side wings and capable of bucking hard compacted drifts four feet in depth; auger type and railroad type rotaries with digger arms and back sloping blades, as well as rotary widening units.

The operations and equipment are varied to suit local conditions. On the Pacific Highway (U. S. 99) the snowfall is not heavy but there is considerable drifting. On the Susanville lateral the snowfall is fairly heavy but drifting is limited as the road is more protected from prevailing winds by the heavy stand of timber. On the road north of Bishop the snowfall is not extreme; however, there is a considerable mileage of road at an elevation of 8000 feet, where the snow is dry and drifts badly.

CONTROLLING THE DRIFTS

The snow removal work is reduced at certain points by drift control measures. In many cases, during construction provision is made to raise the grade of the road so that the fill portions will be kept clear by wind action. Likewise, the ditch sections and cuts are widened and the slopes flattened to provide storage space for snow.

In open areas, snow fence made up of lath pickets is installed on the windward side at a sufficient distance from the road to provide a windbreak and insure storing the snow before it reaches the road. There is now some 80,000 lineal feet of snow fence in place.

A safety measure carried out by highway forces is the sanding of icy sections of pavement to increase traction for equipment. Prior to the beginning of winter, sand mixed with salt is stockpiled in shelters at convenient locations and is applied with power spreaders as the need requires during the winter season. During the 1933-1934 season $14,780 was allocated for this purpose and about 1500 miles of road were so treated during the season.

HIGHWAY STRIPING BROUGHT TO HIGH DEGREE OF PERFECTION

Marching along beside the motorist on dark nights or in rainy or foggy weather when the best of headlights can pierce the murk only a few feet, those white traffic stripes on the highway win the heartfelt appreciation of anxious drivers. Modern practice in the striping of highways has resulted in making these safeguards one of the most indispensable features of safe motor travel.

State highway authorities in California can be credited with having brought highway striping to a high degree of perfection, constantly testing materials and methods to obtain the best and most lasting results. The distinctive center striping recently applied to the Bayshore Highway along the westerly side of San Francisco Bay was a further evidence of this policy.

On such heavily traveled four-lane highways, emphasizing the center line helps to prevent dangerous third lane driving, whether intentional or due to uncertainty as to location on the part of the driver.

Considerable attention is also being given to the value of striping the outer edges of highways in areas along the coast and other localities where dense fogs frequently reduce visibility almost to zero. Truly the motorist's friend, these reassuring white guide lines.—*Motorland.*

THREE MORE MILES GRADED ON SAN SIMEON-CARMEL COAST

Rapid progress is being made on projects along the Carmel-San Simeon highway in Monterey County.

Between Big Sur and 1.6 miles south of Molera's ranch, a distance of 3.1 miles, the highway has been constructed with a 24-foot graded roadbed. This project is through a very scenic portion of the Big Sur country; large redwood trees bordering the sides of the highway.

Between Monterey and the Seaside Road, a distance of 2.6 miles, fuel oil has been applied to the existing roadway shoulders; also on the road between Salinas and Castroville, a distance of 7.6 miles, and between Castroville and Watsonville, a distance of 11.3 miles.

Across Hot Springs Creek, 48 miles south of Monterey, a timber bridge, having a 24-foot roadway is under construction under the supervision of the Bridge Department and will be completed about the first of October.

County, State Share in Cost of $239,000 Short Cut Highway

(Continued from page 6)

of the route, would undoubtedly be too great for the thin oil surfacing which extends from Alameda Street easterly for 600 feet.

In order to bring this short section up to the standards of the pavement on either side, an extension has been made to the contract from Central Avenue to Alameda Street to include this portion and construct it to the same standards as the original contract. This extension to the contract is estimated to cost about $7,000, of which the county has agreed to contribute $3,000. Construction of this portion will be completed in October, 1934.

This will form a continuous full width improvement from Inglewood to Santa Fe Avenue at the west city limits of South Gate.

At present, the city of South Gate is improving Firestone Boulevard from Santa Fe Avenue to Atlantic Boulevard from the ¼ cent city gas tax fund, the State highway cooperative fund, and using SERA labor.

HIGH SPEED SHORT CUT

There is at present a wide pavement on this route from Atlantic Boulevard to Downey, and recently another State contract was awarded for 7.78 miles of new construction on a diagonal line along the Southern Pacific railroad from Downey to Buena Park in Orange County. This contract from Downey to Buena Park will be completed next spring, and eventually this highway will be extended to Miraflores to connect with the existing wide boulevard from that point to Santa Ana. The project as a whole will fill a need which has existed for many years for a high speed short cut from the territory along the southerly edge of Los Angeles into the heart of Orange County.

SURVEY BEING MADE ON THE COTTONWOOD PASS ROAD

A survey is under way for the reconstruction of the Cottonwood Pass Road from the Cholame lateral, near Cholame, to the San Luis Obispo County boundary, a distance of about 5½ miles. This is a portion of the route between Morro Bay and Fresno, which was included in the secondary roads taken over from the county on August 21, 1933, under an act of the Legislature.

Rattlesnake Creek Bridge a Structure of Unusual Design

THE new bridge across Rattlesnake Creek on the Redwood Highway in Mendocino County, forty miles north of Willits, recently completed and opened to traffic has some features of construction design that are new to this State.

The bridge is a unit of an improvement project by which the highway was given a much better grade and alignment.

The old section of road dropped down into a "V" shaped gorge and crossed the creek on a low, narrow bridge built about 1915. The road climbed out of the gorge on a vertical curve.

The new bridge has a 24-foot roadway, crosses the gorge 75 feet above the streambed and with its approaches makes the total project approximately three-quarters of a mile long. The 108-foot central span of the bridge is a three-hinged, framed arch of unusual design.

METAL RINGS USED

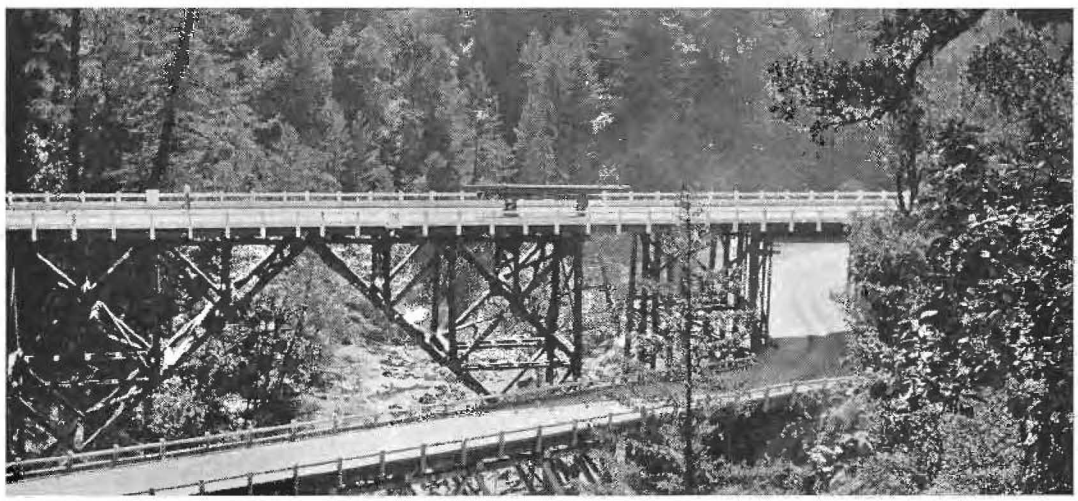
The ordinary framed structure of this kind would usually consist of large timbers butting against cast iron angle or bearing blocks, or by dapping the timbers when the member is in compression, and would have cumbersome bolted splices to take care of tension.

In this structure use is made of metal rings between several timbers composing the truss member which cause them all to act together and through these connectors the stresses are transferred from one member to another without the need of angle blocks, dapping or bolted splices. The rings are of two kinds—a split ring set into grooves which are cut into the adjacent timbers, and toothed rings which may be pressed into the timber.

The former are heavier and are used in the more important members. They have an advantage in permitting the use of smaller sized timbers, which are cheaper and less wasteful of our lumber resources for the reason that in cutting heavy timbers a large amount of smaller sticks must be cut which overstock the yards.

In erecting this structure, the contractor used a highline. One-half of a truss span was framed completely lying flat on the ground and then it was lifted into place by the highline.

NOVEL BRIDGE DESIGN is incorporated in this structure over Rattlesnake Creek on the Redwood Highway in Mendocino Coutny. Metal ring connectors are used in the center span. Truss spans were framed on the ground and lifted into place by a high-line.



THE NEW AND OLD bridges are shown in this picture. The new crosses the creek 75 feet above stream-bed carrying the highway on a better grade and alignment and eliminating a vertical curve where the old road climbed out of the gorge.

CONSTRUCTION UNDER WAY ON THE COALINGA LATERAL

On the Coalinga lateral between the Mustang Ridge and Priest Valley in Monterey County, a distance of about 3.3 miles, the road is being constructed with a 24-foot graded roadbed and a 20-foot selected material surface. It is anticipated that this work will be completed in February of next year. This project is financed under the National Industrial Recovery Act.

One of the freshmen up at Ames can't understand why he has to take courses in husbandry in order to get his bachelor's degree.—*Earth Mover.*

Salinity Less at High Delta Stations

(Continued from page 23)

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Although during the past month the flow of the Sacramento River at Red Bluff has remained at the lowest summer levels, the flow at Sacramento has increased from 1000 to about 1500 second feet due to reduced irrigation diversions and increased return flow and rice drainage. There has been little increase in the flow of the San Joaquin River near Vernalis, the present flow being about 500 second feet.

The increased flow of the river at Sacramento has caused a recession in the salinity at the highest Sacramento Delta stations but at the lower stations and in the San Joaquin Delta there has been no recession and in many instances there has occurred a continued encroachment. The following tabulation compares the salinity at Bay and Delta stations on September 10, 1924, 1931, and 1934.

Comparison of Salinity at Bay and Delta Stations on September 1924, 1931 and 1934

	Salinity in parts of chlorine per 100,000		
Station	*1924*	*1931*	*1934*
Point Orient	----	1780	1760
Bullshead Point	----	1580	1640
Collinsville	1035	1180	1060
Emmaton	696	955	720
Rio Vista Bridge	402	640	490
Liberty Ferry	108	400	152
Isleton Bridge	30	440	35
Sutter Slough	7	12	8
Walnut Grove	8	10	8
Antioch	1065	1100	960
Jersey	604	800	620
Central Landing	164	250	78
Southwest Point	----	340	90
Ward Landing	----	330	190
King Island Pump	136	----	88
Rindge Pump	93	180	62
Orwood Bridge	----	230	84
Middle River P.O.	142	250	100
Clifton Court Ferry	60	100	34
Whitehall	----	23	9

DAMS

Applications were filed by the Santa Clara Valley Water Conservation District on August 20, 1934, for the construction of the following dams:

Coyote Dam, Santa Clara County on Coyote River; rockfill, 100 feet in height, storing 30,000 acre feet of water and to cost $340,000.

Calero Dam, Santa Clara County on Calero Creek; earthfill, 82 feet in height, storing 9000 acre feet of water and to cost $290,000.

Almaden Dam, Santa Clara County on Almaden Creek; rockfill, 100 feet in height, storing 2500 acre feet of water and to cost $210,000.

Guadalupe Dam, Santa Clara County on Gaudalupe Creek; rockfill, 115 feet in height, storing 3500 acre feet of water and to cost $260,000.

Vasona Percolating Dam, Santa Clara County on Los Gatos Creek; earthfill with Ambursen spillway section; 21 feet in height with a storage capacity of 660 acre feet and to cost $89,000.

Stevens Creek Dam, located on Stevens Creek; earthfill, 110 feet in height, storing 4000 acre feet of water and to cost $320,000.

Of the above dams the application for the Vasona Percolating Dam was approved on September 13, 1934.

Application for repair of the Antioch Dam in Contra Costa County was filed on September 11, 1934. This is a dam storing water for municipal purposes for the city of Antioch.

Application for repair of Quail Lake Dam was received on September 11, 1934. This dam is located on Quail Lake near Lake Tahoe and is used for domestic, irrigation and power purposes.

FEDERAL COOPERATION—TOPOGRAPHIC MAPPING

Topographic surveys are in progress on the Paynes Creek Quadrangle in Tehama County and the final sheets of Etna Quadrangle are now available. The latter quadrangle involves areas in Trinity and Siskiyou counties. It is mapped on a scale of 1:125,000 with a contour interval of 100 feet.

The final sheets of Joshua Quadrangle are now available. This area was mapped by the Geological Survey in cooperation with the county of Los Angeles. The scale is 1:24,000 and the contour interval is 5 feet.

WATER RESOURCES

a. South Coastal Basin Investigation

The principal activities this month in connection with South Coastal Basin investigation have been the completion of the report on geology.

b. Mojave River Investigation.

Field work on Mojave River investigation was begun in 1929 with funds appropriated by the Legislature of that year and continued during the biennium. In 1931 no appropriation for this work was made but by an agreement with agencies of the Federal government stream measurements and measurements of water levels at wells were continued together with work on loss of water from native vegetation and moist areas. Field work in this way on the stream measurements and well measurements has continued to the present date. During the month work was begun in the Los Angeles office on getting the report ready.

c. Central Valley Project.

Work on the Central Valley project has continued throughout the present month and additional data has been presented to the Federal Public Works Administration in connection with the application made by the Water Project Authority of California for a loan and grant for the construction of the project

First New State Route Number Sign Installed With Ceremony at Carmel

IN THE presence of a large gathering of State and local officials, civic and business leaders, and representatives of the California State Automobile Association, the first of the new State route number signs was installed on the afternoon of September 10 at Carmel.

Bearing the numeral 1, the sign was set in place at the junction of the Monterey, Pacific Grove and Carmel highways, a point on State Route No. 1.

This route, so designated in the new route numbering program, has the distinction of being one of the longest of the numbered highways, extending from Las Cruces north along the coast to Fortuna.

Under the initial program, two thousand miles of main traveled State highways will be posted with the new markers, requiring a total of more than six thousand signs, or an average of three to a mile.

In northern and central California the signs will be installed by the Automobile Association and in the south by the Automobile Club of Southern California under a cooperative arrangement with the Division of Highways. The work will be accelerated with completion. of surveys.

Courtesy of Motorland.

FIRST IN THE FIELD of the new State route number signs, a number 1 marker was appropriately erected on State Route No. 1 at Carmel on September 10th with a gala ceremony attended by State and civic officials. Left to right in the above group are: Colonel Ralph Parker, commandant of the Monterey Presidio; Russell Bevans, State Registrar of Motor Vehicles; State Senator E. H. Tickle of Carmel; Supervisor Harry Abbott of Salinas and Percy E. Towne, a director of the California State Automobile Association.

Speakers at the Carmel installation ceremony stressed the magnitude of the plan and the high value of the new route number signs for visiting motor tourists or resident motorists traveling unfamiliar roads.

Percy E. Towne of San Francisco, a director and former president of the Automobile Association, reviewed the growth of California's official road signs and told of the difficulties that lack of dependable signs caused early motorists. Developed by the Automobile Association and Automobile Club of Southern California as official agencies and with the cooperation of State and local authorities, the sign system is recognized as a model by the Nation, Mr. Towne said.

The installation program was jointly arranged by the Monterey Chamber of Commerce, Pacific Grove Chamber of Commerce, Carmel Business Men's Association, and Monterey Peninsula Junior Chamber of Commerce.

Supervisor A. B. Jacobson of Monterey County was chairman of the arrangements committee. State Senator E. H. Tickle of Carmel officiated as master of ceremonies. Other members of the committee were E. J. Zanetta of Monterey; Sheldon Gilmer of Pacific Grove; E. A. H. Watson of Carmel; and K. Y. Sapero of Monterey.

Giving a gala touch to the ceremony, music was provided by the Monterey fire department orchestra in Spanish costumes, and the

(Continued on page 32)

Highway Bids and Contract Awards Made in September

BUTTE-PLUMAS COUNTIES—Oiling in various locations. Dist. II, Rt. 21, Secs. B-C-A-B. Tiffany Const. Co., San Jose, $4,368; C. F. Frederickson & Sons, Lower Lake, $4,418; Tieslau Bros., Berkeley, $4,519. Contract awarded to Hayward Building Material Co., Hayward, $3,864.

KERN COUNTY—Between westerly boundary and 2.4 miles south of Maricopa, 9.3 miles surfacing with bituminous material. Dist VI, Rt. 57, Sec. A. Western Motor Transfer Co., Santa Barbara, $51,160; L. A. Brisco, Arroyo Grande, $47,992; Hanrahan-Wilcox Corp., San Francisco, $49,575; Giffith Co., Los Angeles, $47,624; Stewart & Nuss, and John Jurkovich, Fresno, $45,854; Granite Const., Co., Ltd., Watsonville, $59,-458; Tiffany Const. Co., San Jose, $46,465. Contract awarded to C. W. Wood, Stockton, $42,579.

KERN COUNTY—Across Whiterock Creek at Monolith, a timber bridge of three 15-ft. spans. Dist VI, Rt. 58, Sec. F. Claude C. Wood, Stockton, $3,018; D. O. C. Const. Co., Santa Barbara, $3,199. Contract awarded to Rexroth & Rexroth, Bakersfield, $2,702.

KERN COUNTY—In Maricopa, 0.7 of a mile to be graded and surfaced with bituminous treated stone, Klipstein, Poso, California and Merced Streets. Dist. VI, Rts. 57 and 138. L. A. Brisco, Arroyo Grande, $14,962; John Jurkovich, Fresno, $12,463; Granite Const. Co., Watsonville, $13,081. Contract awarded to C. W. Wood, Stockton, $10,228.30.

LOS ANGELES COUNTY—Approaches to Alhambra Wash bridges about 0.3 of a mile long, to be graded and paved with asphalt concrete and two bridges to be constructed. Dist. VII, Rts. 26 and 168, Sections A, B. R. R. Bishop, Long Beach, $58,446; Griffith Co., Los Angeles, $59,389; Byerts & Dunn, Los Angeles, $61,417; Bannister Field Co., Ltd., and Fred E. Potts Co., Los Angeles, $63,710. Contract awarded to Kovacevich & Price, South Gate, $48,281.80.

MARIN COUNTY—Const. pile protection on bridge across Corte Madera Creek, at Greenbrae. Dist. IV, Rt. 1, Sec. C. M. B. McGowan, Inc., San Francisco, $10,500; Theodor Johannns, San Francisco, $7,490; Albert H. Seimer, San Anselmo, $8,246. Contract awarded to Healy-Tibbitts Const. Co., San Francisco, $6,832.

MERCED COUNTY—Across Santa Rita Slough, 0.5 of a mile graded, surfaced bituminous treated gravel, and a timber bridge. Dist. X, Rt. 32, Sec. C. Hanrahan-Wilcox Corp., San Francisco, $28,697; Poulos & McEwen, Sacramento, $30,285; C. W. Wood, Stockton, $21,641; Union Paving Co., San Francisco, $24,223; John S. Heilmann, San Francisco, $26,270; John Jurkovich, Fresno, $32,340. Contract awarded to Valley Paving & Const. Co., Fresno, $20,981.80.

MONO COUNTY—Grading, Drainage, and Surfacing with fuel oil 1.2 miles between Whiskey Canyon and Yerby's. Dist IX, Rt. 23, Sec. C. D. C. Follis, Glendale, $7,946; Basich Bros., Torrance, $7,230. Contract awarded to Hemstreet & Bell, Marysville, $6,862.

RIVERSIDE COUNTY—Between 1½ miles north of Moreno and 2½ miles west of Beaumont about 6.8 miles to be graded, surfaced oil treated crushed gravel. Dist. VIII, Rt. 19, Sec. D. Griffith Co., Los Angeles, $364,-469; Sharp & Fellows Const. Co., Los Angeles, $372,-772; Granfield, Farrar and Carlin, San Francisco, $380,627; J. F. Knapp, Oakland, $419,604; Hanrahan-Wilcox Corp., San Francisco, $479,705; United Concrete Pipe Corp., Los Angeles, $443,983; Daley Corp., San Diego, $447,090; C. O. Sparks, Sander Pearson & Mundo Engr. Co., Los Angeles, $478,998; Jahn & Bressi, Los Angeles, $389,418; Oswald Bros., Los Angeles, $389,430; C. W. Wood, Stockton, $390,220; Basich Bros., Torrance, $474,739. Contract awarded to Mittry Bros. Const. Co., Los Angeles, $360,809.90.

SAN BERNARDINO COUNTY—Through Bloomington, about 0.4 mile to be graded, paved with Portland cement concrete. Dist. VIII, Rt. 26, Sec. D. C. O. Sparks, Los Angeles, $25,614; B. G. Carroll, San Diego, $27,973; Matich Bros., Elsinore, $29,108; George Herz & Co., San Bernardino, $31,565. Contract awarded to Griffith Co., Los Angeles, $24,954.20.

SAN DIEGO COUNTY—In San Diego, between Market St. and Broadway, 0.3 of a mile grading and paving with asphalt concrete. Dist. XI, Rt. 2, Sec. SD. Griffith Co., Los Angeles, $24,114; V. R. Dennis Const. Co., San Diego, $23,933. Contract awarded to Daley Corp., San Diego, $23,415.70.

SANTA BARBARA COUNTY—Between Hollister Ave. and Painted Cave Road, 5.8 miles to be oil treated and a bridge to be constructed across San Antonio Creek. Dist. V, Rt. 80, Sec. C. Sharp & Fellows Contracting Co., Los Angeles, $494,555; C. W. Wood, Stockton, $412,363; Jahn & Bressi Const. Co., Los Angeles, $374,482; Peninsula Paving Co., San Francisco, $493,009; A. Teichert & Son, Sacramento, $444,-219. Contract awarded to Granfield, Farrar & Carlin, San Francisco, $368,268.35.

$50,000 LEFT TO BEAUTIFY ROADS PROVES WIDOW'S MITE

Six years ago Mrs. Mary Hyland, a widow, of San Francisco had accumulated a fortune estimated at about $50,000 by traveling about California selling pencils. In her daily pilgrimages she often sought in vain for a shady place to rest so she bequeathed her fortune to the State in a trust to extend over a period of fifty years "for the purpose of beautifying the highways by planting trees and constructing benches at a distance of about a mile apart, such trees to be fruit trees whenever deemed advisable."

But misfortune came and under date of September 18, the State was informed by the Wells Fargo Bank and Union Trust Company, executor and trustee, that Mrs. Hyland had died leaving a balance of 69 cents to her account and $42 found in her purse.

STATE ROUTE NUMBER SIGN INSTALLED AT CARMEL

(Continued from page 31)

Eleventh Cavalry Band from the Monterey Presidio.

The preliminary work of logging the roads and making surveys of intersections to determine the number and location of signs for each of the 198 selected routes, is proceeding with all possible speed.

It is estimated that from three to five signs per mile will be necessary. On this basis it is planned to have approximately ten thousand signs erected by the first of next year. In the meantime additional signs and material for their erection will be secured.

The number of signs needed at intersections varies with the number of roads or streets leading into an intersection and with traffic conditions.

A study of all principal intersections is being made by the engineers of the State Maintenance Department to collect the necessary data for locating the signs. This study is being conducted first in the large metropolitan areas.

STATE OF CALIFORNIA

Department of Public Works

Headquarters: Public Works Building, Eleventh and P Sts., Sacramento

FRANK F. MERRIAM.....Governor

EARL LEE KELLY.....Director

EDWARD J. NERON.....Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

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PHILIP A. STANTON, Anaheim
FRANK A. TETLEY, Riverside
DR. W. W. BARHAM, Yreka
C. H. PURCELL, State Highway Engineer, Sacramento
JOHN W. HOWE, Secretary

HEADQUARTERS STAFF, SACRAMENTO

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J. G. STANDLEY, Principal Assistant Engineer
R. H. WILSON, Office Engineer
T. E. STANTON, Materials and Research Engineer
FRED J. GRUMM, Engineer of Surveys and Plans
C. S. POPE, Construction Engineer
T. H. DENNIS, Maintenance Engineer
F. W. PANHORST (Acting), Bridge Engineer
L. V. CAMPBELL, Engineer of City and Cooperative Projects
R. H. STALNAKER, Equipment Engineer
E. C. HIGGINS, Comptroller

DISTRICT ENGINEERS

J. W. VICKREY, District I, Eureka
F. W. HASELWOOD, District II, Redding
CHARLES H. WHITMORE, District III, Marysville
J. H. SKEGGS, District IV, San Francisco
L. H. GIBSON, District V, San Luis Obispo
R. M. GILLIS, District VI, Fresno
S. V. CORTELYOU, District VII, Los Angeles
E. Q. SULLIVAN, District VIII, San Bernardino
S. W. LOWDEN (Acting), District IX, Bishop
R. E. PIERCE, District X, Stockton
E. E. WALLACE, District XI, San Diego

General Headquarters, Public Works Building, Eleventh and P Streets, Sacramento, California

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer, Chief of Division
J. J. HALEY, Jr., Administrative Assistant
HAROLD CONKLING, Deputy in Charge Water Rights
A. D. EDMONSTON, Deputy in Charge Water Resources Investigation
R. L. JONES, Deputy in Charge Flood Control and Reclamation
GEORGE W. HAWLEY, Deputy in Charge Dams
SPENCER BURROUGHS, Attorney
EVERETT N. BRYAN, Hydraulic Engineer, Water Rights
A. N. BURCH, Irrigation Investigations
H. M. STAFFORD, Sacramento-San Joaquin Water Supervisor
GORDON ZANDER, Adjudication, Water Distribution

DIVISION OF ARCHITECTURE

GEO. B. McDOUGALL, State Architect, Chief of Division
P. T. POAGE, Assistant Chief
W. K. DANIELS, Administrative Assistant

HEADQUARTERS

H. W. DEHAVEN, Supervising Architectural Draftsman
C. H. KROMER, Principal Structural Engineer
CARLETON PIERSON, Supervising Specification Writer
J. W. DUTTON, Principal Engineer, General Construction
W. H. ROCKINGHAM, Principal Mechanical and Electrical Engineer

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief
HUGH K. McKEVITT, Attorney, San Francisco
FRANK B. DURKEE, General Right of Way Agent
C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor
Port of San Jose—Not appointed

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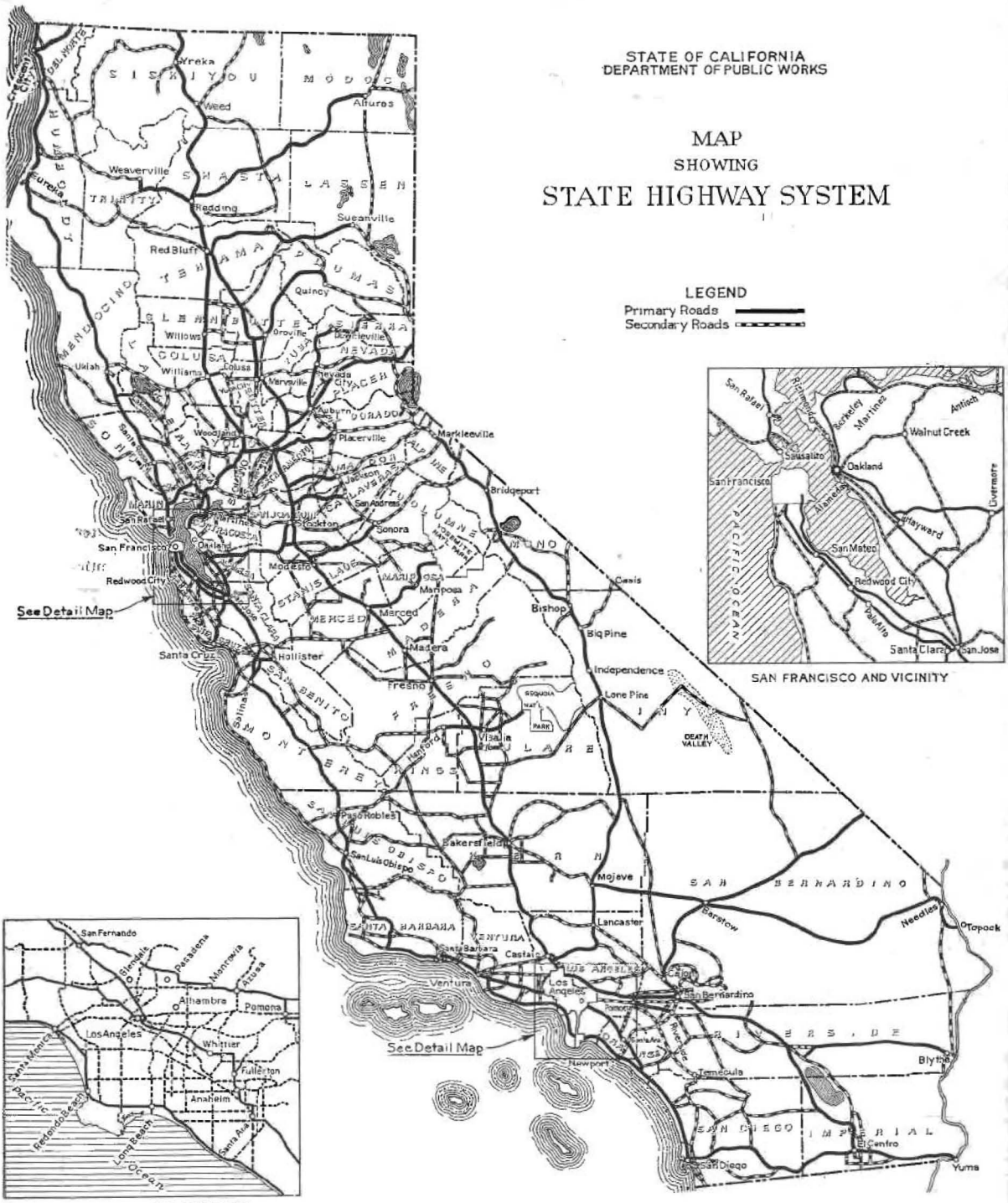
SACRAMENTO, 1934

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

MAP
SHOWING
STATE HIGHWAY SYSTEM

LEGEND
Primary Roads
Secondary Roads



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