

CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



*Ocean Boulevard at Santa Barbara,
State Highway - No. 150*

Official Journal of the Department of Public Works
A P R I L 1934

DS50 Illuminant, 2 degree observer

1*	39.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	67.24	82.14	72.05	92.15
2*	13.24	18.11	-4.34	-13.80	9.82	-33.43	34.28	11.81	48.55	-0.40	-0.60	-0.75	-1.06	-1.19	-1.07
3*	15.07	18.72	22.29	22.85	-24.49	-0.35	59.60	46.07	18.51	1.13	0.23	0.21	0.43	0.28	0.19
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Golden Thread

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Highway Speed-up Program Shows 63% of Budget Projects Under Way

17,000 Men Employed, 1157 Miles of Road Built, in Eight Months of the Department's Construction Drive that Began August 25, 1933

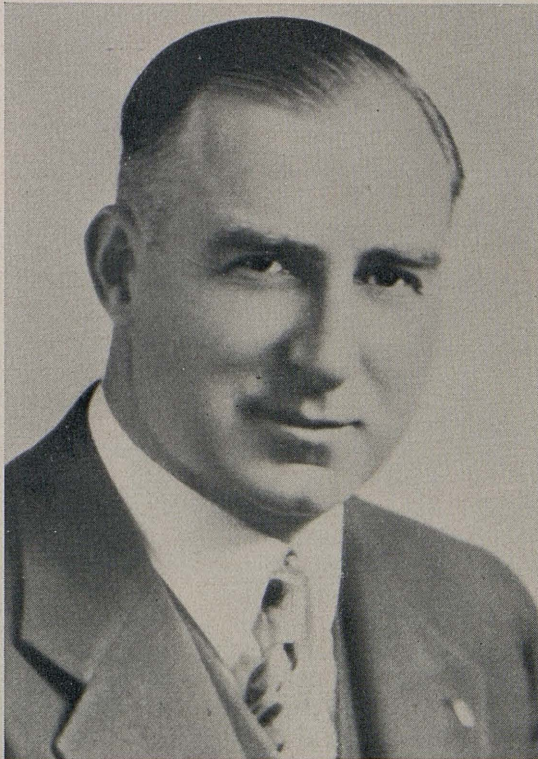
By EARL LEE KELLY, Director of Public Works

THE current biennium, including the 85th and 86th fiscal years of State government in California, was ushered in July 1, 1933, in the midst of the great depression with a challenge to the Department of Public Works, under the urgent mandate of Governor James Rolph, Jr., to advance its construction program with the greatest possible speed in order that work might be furnished to thousands of citizens through this phase of public work.

That this department accepted the challenge and is successfully meeting and conquering the emergency is evidenced by the following facts:

On March 31st, with only 37.5 per cent of the biennium passed, over 63 per cent of the \$34,000,000 construction budget had been placed under way; the projects included in this figure cover the building of more than 1157 miles of highway and the maintenance of the entire State system, at a cost of more than \$27,000,000; only \$2,416,700 of the \$15,607,400 of Federal recovery funds allocated to California remain unobligated; maintenance work in all parts of the State has been completed and authorized totaling nearly

\$6,000,000. And this vast amount of construction is providing continuous work for an average of 8000 to 9000 men, with an estimated total of about 17,000 individuals who will have been given employment by the work inaugurated during these first nine months of the biennium.



EARL LEE KELLY

To gain a proper perspective of this accomplishment requires a brief statement of varied factors which had important bearing upon State highway work in California.

By act of the 1933 Legislature the mileage of the State highway system was increased from 7350 miles to 14,150 miles by the transfer of 6800 miles of county roads to the State system. The Legislature also provided for an allocation to incorporated cities of one-quarter cent of the State's share of gasoline taxes. On June 16th the President signed the National Industrial Recovery Act pro-

viding approximately \$400,000,000 for State highway construction throughout the Nation; of this amount \$15,607,000 was apportioned to California.

These changes in the highway financial situation made necessary a revision of the budget by the California Highway Commission. With

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Sausalito Realignment Cost \$246,000, Saves 460,000 Vehicle Miles Annually

In its 1.55 miles of length the old highway from Waldo Point into Sausalito, carrying Redwood Highway traffic averaging 5000 vehicles a day, had 22 sharp curves equaling 2½ complete circle turns. The new highway just completed, with only 6 long curves and one-quarter mile shorter, will save 460,000 vehicle miles, or 46,000 hours of vehicle time, per year, which means many dollars annually to motorists.

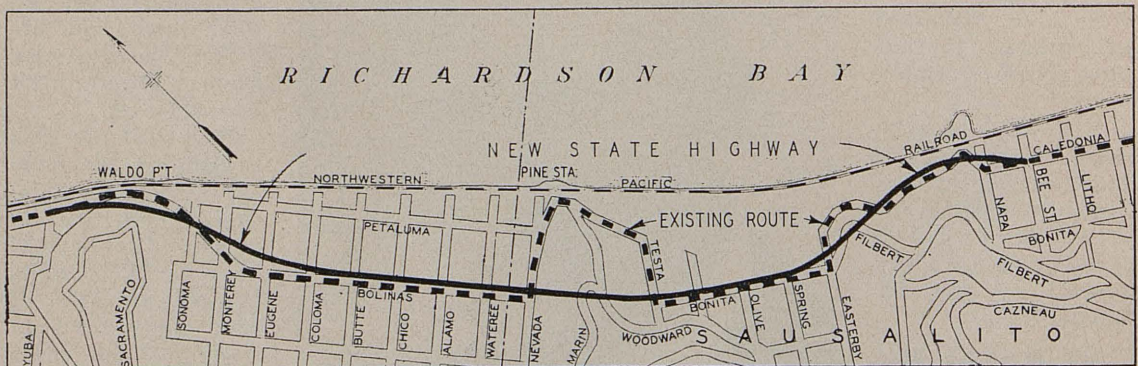
By JNO. H. SKEGGS, District Engineer

THE former highway route in Sausalito from the automobile ferries to the northerly city boundary is now a memory, somewhat comparable to a horizontal pin-wheel for the motorist because there were so many sharp radius corners and curves that the total curvature was usually referred to in terms of complete circles instead of the number of degrees. This reference emphasizes the poor quality of alignment that previously existed over narrow, winding city streets as

in Sausalito were made to obtain the necessary quantity of excavation to construct a heavy embankment across tidal flats in a cove between Waldo Point and Pine Station.

MANY BUILDINGS MOVED

Many buildings, including houses, warehouses, stores, railroad spurs and freight depot were removed from the additional rights of way obtained. Also short sections of local streets were rerouted and reconstructed



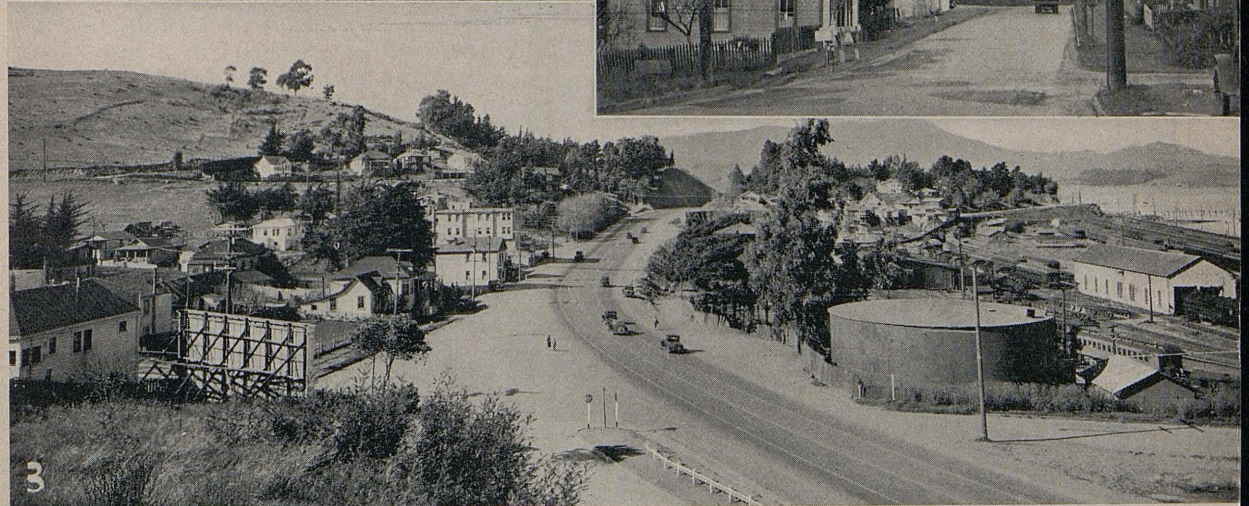
compared with the new broad highway on high standard alignment which has just been completed by the Division of Highways.

Since January, 1932, the State has been very active in a terminal construction for the Redwood Highway from Waldo Street to Water Street in Sausalito. The total work involved two contracts. The first contract began at Waldo Point immediately north of the north boundary of Sausalito and terminated at Napa Street within the city boundary of Sausalito, a total length of approximately 1.3 miles. This first project covered very heavy construction in straightening out the alignment necessary to provide an adequate highway. Heavy cuts in the side hills at Waldo Point and the ridge at Pine Station

entirely in order to provide a new right of way necessary on entering the closely built up hilly section of Sausalito in a manner that would be a credit to State highway construction and at the same time provide ample facilities for handling the heavy traffic to and from the automobile ferries between Sausalito and San Francisco.

Little can be said that would do justice to the work completed in eliminating the circuitous routing of the former highway around the railroad yards of the Northwestern Pacific and around the point at Pine Station and Waldo Point. The completion of this first unit was so favorably received by the general public as to be reflected in the demands of numerous civic organizations and leaders in

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THE SAUSALITO BOTTLENECK terminal of the Redwood highway is just a bad memory. Four-lane modern roadways have replaced narrow winding streets. No. 1—New construction across tidal flats of Richardson Bay near Waldo Point. No. 2—Typical improvement on Bolinas Street. Inset shows former condition. No. 3—Reconstruction at junction of Bonita and Filbert streets. All buildings on left side of road were removed and highway was cut through hills.

State Grading and Oiling 40 Miles of Road on North Shore of Salton Sea

By W. BEUTHEL, Assistant Highway Engineering Draftsman

NOT many people, other than residents of the below-sea level empire that surrounds the Salton Sea, have traveled that most interesting route known as the "North Shore Road."

Those having occasion to drive along the 30-mile stretch of water which occupies the lowest portion of this former desert usually choose the high standard State highway on the other side in preference to the shorter but slower trail through the sand from Niland to Mecca which has but recently become a State secondary highway.

In addition to the difficulty of passing cars on the narrow and sandy roadbed, the North Shore Route had stretches of mud to trap the motorist who attempted it too soon after the occasional desert cloudbursts.

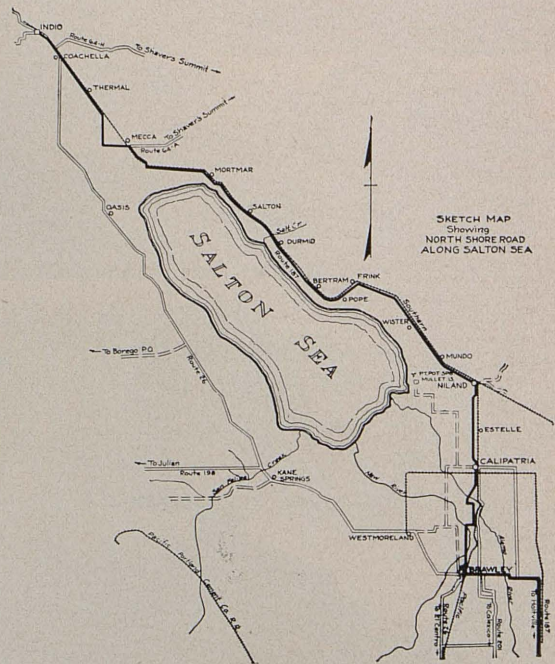
CLOSE TO THE SEA

It will gratify those who recall the interesting and romantic history of the Salton Sea to learn that this road is now being improved so that a safe and comfortable trip can be made by the ordinary driver practically any day in the year. The route passes very close to the Salton Sea and most of the interesting features, such as the gun clubs, resorts, speed-boat course and industries, are along the north shore.

This body of salt water, lying some 250 feet below sea level and having a present area of about 200 square miles and a maximum depth of 50 feet, is of quite recent origin, although the entire valley was at one time a portion of the sea bottom. A very definite ancient beach line is easily traceable at the base of the mountains and minute shells form a considerable portion of the soil in some localities.

The irrigation of Imperial Valley by means of the Colorado River was considered practicable by certain early pioneers of the "49 days." The fact that the soil was a thick layer of silt, that the winter climate was mild and the summer extremely hot, left but one requirement for the early maturing of a variety of crops—a supply of water.

It was known that the river fairly close at hand and flowing at a much higher elevation



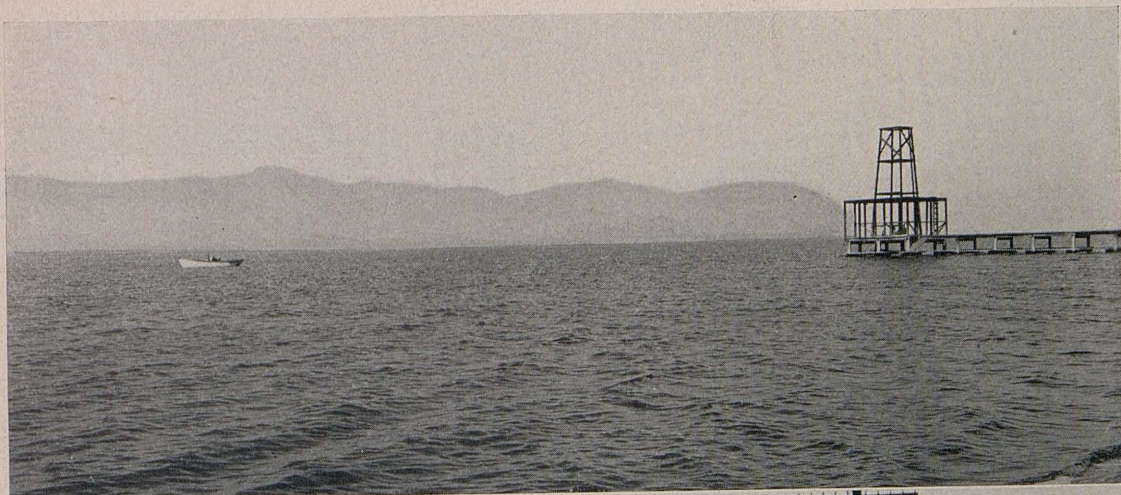
would furnish an ample supply, if it could be distributed by means of existing channels and a system of ditches. However, many years of delay resulted before sufficient engineering and financial support was accumulated, and actual irrigation of the land was not accomplished until 1901.

COLORADO FLOODED VALLEY

Almost at once a fair-sized boom resulted and several towns began a rapid growth. The very early crops proved a most valuable advertisement of the valley's possibilities. Then in 1905 and 1906 came the extraordinary flow of water in the river which finally broke through the irrigation structures and for many weeks poured practically the entire flood down the valley into the ancient lake bed. The sea rose seven inches a day and reached an area of 400 square miles.

The Southern Pacific Railroad, whose main line crossed the ancient sink, was forced to move five times to higher ground. Evidence of the original location is the line of telegraph poles still standing several hundred feet

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SALTON SEA with its vast expanse of blue, wave-capped waters, speedboat courses and fisheries resembles an arm of the sea which it once was. Teams and hand labor are building a forty-mile road along the north shore where only a sand rut trail exists.

Pacheco Pass Project Will Abolish 34 Curves, Widen Road, Reduce Grades

By R. E. PIERCE, District Engineer

OF the several State highways which cross the Coast Range between the Great Central Valley and the coast, the second in importance from a traffic standpoint is the so-called Pacheco Pass Road (Route 32). It extends from Gilroy on Primary Route 2, the Coast Route south of San Francisco, to Califa, in Madera County, on Route 4, the primary highway through the San Joaquin Valley known as the Golden State Highway.

This road is especially noteworthy for the large amount of truck traffic it carries due to the fact that it connects the great San Joaquin Valley and its extensive agricultural resources with the populous Santa Clara Valley and the Monterey-Santa Cruz coastal area.

NARROW ROAD, SHARP CURVES

Owing to the quantity and type of traffic, the low standard alignment, curvature and surfacing on the existing road over the mountains, built some twelve years ago, are a serious handicap to travel.

This project, for which bids were opened on March 21, consists of grading and surfacing on a new alignment following closely the present road and extending from the summit of Pacheco Pass, elevation 1375 feet, easterly for 3.3 miles to the foot of the grade, elevation 407 feet.

The present road, between the above limits, has a roadbed 21 to 24 feet wide, with an indifferent, oil-gravel surface 18 feet wide, and a total of 48 curves, 44 of which have radii of 500 feet or less, one having only a 90-foot radius. These curves have a total angle of 1901 degrees, which means that all travel negotiating this 3.3 miles of road must make over five complete circles. There is 8300 feet of 7 per cent grade on this old location.

THIRTY-FOUR CURVES ELIMINATED

The new alignment contains ten curves, the sharpest having a radius of 570 feet, the balance having radii of 800 feet and over. The total angle of these curves is 411 degrees or slightly over one complete circle. The maximum grade is 6 per cent and the new roadbed will be 30 feet wide.

The grading due to the abrupt character of the terrain will be heavy. Some of the cuts are as deep as 80 feet, and one fill is over 100 feet high. The total estimated excavation is 306,000 cubic yards.

It is planned to make the surfacing 22 feet wide with a 5-inch compacted base of untreated crushed gravel and a 3-inch compacted bituminous crushed gravel surface.

ANCIENT SPANISH GRANT

One rather unusual feature is that the ownership of property along this change and for several miles on either side is under one proprietorship, the original Spanish grant, known as Rancho San Luis Gonzago, having been largely held intact, and this section still belongs to the Pacheco heirs, the family from which the pass takes its name.

A few miles to the east of this project, and on the highway, is the old San Luis adobe ranch house, which, as stated on a tablet placed there in 1931 by the Yosemite Parlor No. 24 N. S. G. W., Merced, was then at least 105 years old.

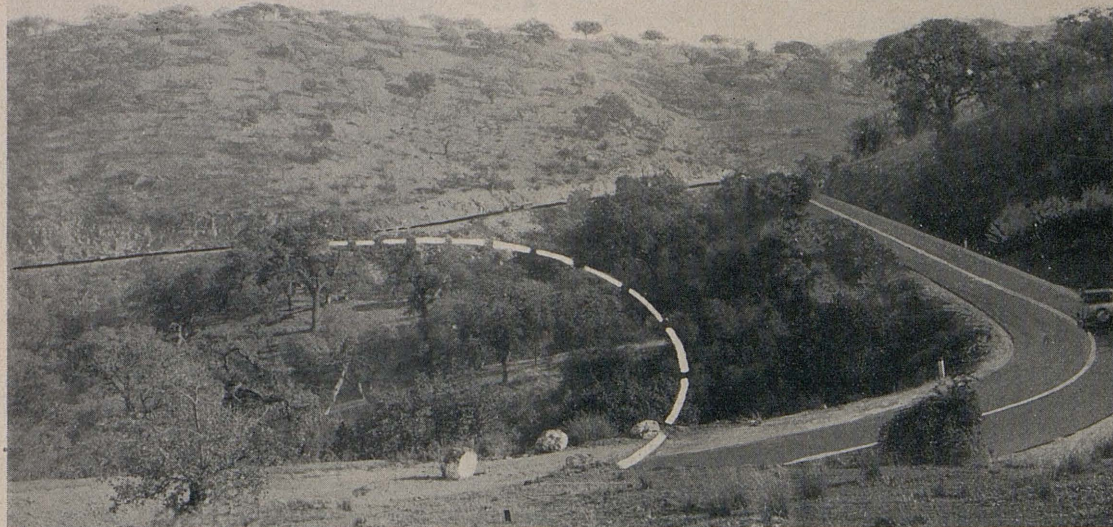
The original walls, about three feet thick, are in an excellent state of preservation and some of the original hand-hewn timbers are still in place inside.

OLD STAGE STATION

The location of this building on the banks of Cottonwood Creek was undoubtedly due to its never-failing supply of water in the creek, which is a branch of San Luis Creek. For a number of years the road over the Pacheco Pass was a toll road and this building was used as a stage station.

The building is now being operated as a restaurant, and fortunately the people running it seem anxious to preserve the building in its original condition. They have quite a collection of interesting relics found in the vicinity.

This improvement, which rebuilds the east approach to Pacheco Pass, should prove of great benefit to the traffic using it, which amounts at peak periods to nearly 2000 vehicles a day.



SOME 48 CURVES, mostly sharp ones, as shown in the top picture, distinguish the 3.3 miles of Pacheco Pass road from the summit easterly to the foot of the grade. New alignment indicated by dotted lines in the lower views will eliminate all short radius turns, widen the roadway and lessen grades. The historic San Luis adobe ranch house, 105 years old is shown at bottom.

Morgan Keaton Made Deputy Director Succeeding Eric Cullenward, Resigned

MORGAN KEATON, Assistant Deputy Director of Public Works, a former Assemblyman from southern California and a former State Adjutant of the American Legion, was appointed Deputy Director of Public Works by Governor Rolph on March 27, 1934, to fill a vacancy created by the resignation of Eric Cullenward.

Mr. Keaton for a number of years was engaged in the real estate and insurance business in Long Beach and Los Angeles where he took a prominent part in the civic affairs of these communities. He was elected a member of the Assembly from the Seventieth District in 1926 and served in the Forty-seventh and Forty-eighth Legislatures, being reelected in 1928.

OFFICER IN WORLD WAR

Born in Virginia, Mr. Keaton attended Roanoke College and then went to Washington and Lee University for a four-year prelegal course, majoring in political science and political economy.

In 1916 he enlisted in the First Minnesota Infantry for service on the Mexican border and in 1917 he entered the first officers' training camp at Fort Snelling, Minn., where he was commissioned a second lieutenant in infantry.

He was assigned to the Eighty-eighth Division and served in France during the World War, being discharged with the rank of captain in the infantry.

Soon after returning to America he came to California and in 1920 established a residence in Sacramento, where he engaged in the general real estate business.

WAS LEGION EXECUTIVE

He was appointed Adjutant of the American Legion, Department of California, in 1921 and served three terms in that office, from 1921 to 1924, with headquarters in San Francisco.

Since November 9, 1932, Mr. Keaton has served as Assistant Deputy Director of Public Works, where he has become thoroughly familiar with the work of the Public Works Department and its various divisions. Following the 1933 session of the Legislature,



MORGAN KEATON

which passed the Outdoor Advertising Act administered by the Department of Public Works, he was appointed chief enforcement officer of this department, where he set in motion all the forms and regulations in connection with the enforcement of the act.

HANDLED UNEMPLOYMENT RELIEF

For the past two winter seasons, Mr. Keaton has also handled the unemployment relief program of the Division of Highways, together with his other duties.

In connection with Mr. Keaton's new office, he will still supervise the work of the outdoor advertising department and the unemployment relief work as carried on by his former assistants. James Call, who is outdoor advertising assistant, will handle the bulk of the work in that department, and Roger Millard, who is unemployment relief assistant, will handle that branch of the work.

"But I don't know what to do," said the wife, learning to drive.

"Just imagine that I'm driving," replied her spouse.

Editorial Sanctum Lured Cullenward From State Office

ERIC CULLENWARD, former Deputy Director of Public Works, resigned that office March 19 to "return to his first love," the newspaper profession, as news editor of the *San Francisco Chronicle*.

Mr. Cullenward had made a brilliant record in his short career in public life and his outstanding ability and talents had won him a host of friends in all parts of the State as well as in official circles, but when the attractive offer of an important editorial position on a large metropolitan daily came to him "out of a clear sky" he found the lure of the "newspaper game" irresistible.

He began his rapid climb to a high post in the State service as secretary of the Highway Commission by appointment of Governor Rolph in June, 1931. Here he gained an intimate knowledge of the work of the Division of Highways and Department of Public Works that proved a valuable asset. He was drafted from this position by Governor Rolph to organize the Bureau of Publications and Documents created by the 1931 Legislature.

When Earl Lee Kelly became Director of Public Works Eric Cullenward was chosen for the deputy directorship and appointed to that office on November 9, 1932, thus having won appointments to three important State offices in seventeen months.

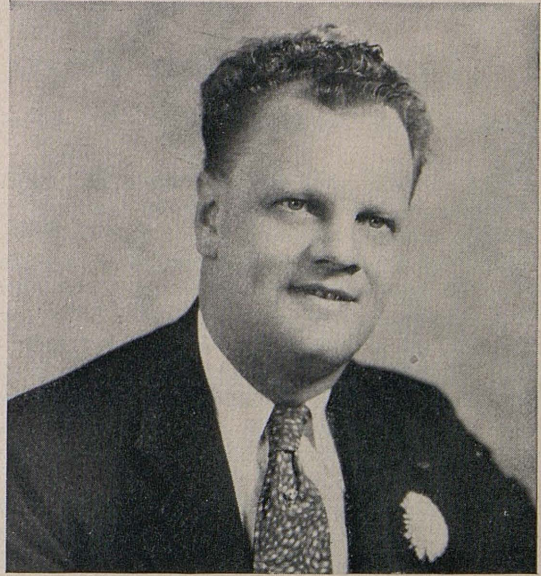
Mr. Cullenward had a long and successful career as a newspaper man before coming into public life. Starting as a young reporter in San Francisco, he rose through all the grades of that exacting profession to the rank of managing editor of the *San Francisco Examiner*.

Transferred to the *Los Angeles Examiner* as day managing editor he remained with that paper throughout the rest of his newspaper career in Los Angeles until his entrance into official life in Sacramento.

His leavetaking was marked by a flattering display of the esteem in which he is held both by fellow workers of the Department of Public Works and the Capitol newspaper contingent.

The Bore—Well, fellows, there I was on that lonely road, miles from nowhere, with a blazing car, no water, no fire extinguisher or anything. What do you imagine I did?

One of the Bored—Took a deep breath and blew the fire out.



ERIC CULLENWARD

Bulletin Discusses Costs of Irrigation

The release is announced by Edward Hyatt, State Engineer, of Bulletin No. 43 of the Division of Water Resources entitled "Value and Cost of Water for Irrigation in Coastal Plain of Southern California." This is one of the bulletins reporting on the various features of South Coastal Basin Investigation being conducted under the supervision of Harold Conkling, Deputy State Engineer.

The bulletin was prepared by Frank Adams and Martin Huberty, Professor and Associate Professor of Irrigation Investigations and Practice in the University of California. Its preparation was through a cooperative agreement between the University and the State Department of Public Works.

The bulletin is the result of an effort to find what the farmer can pay for water for the principal crops of southern California, *i.e.*, citrus and deciduous fruits, walnuts, beets, beans and alfalfa. Many records were consulted and are included in the bulletin. While it is not possible to reach a final and definite conclusion for an industry such as citrus growing with even more variable factors than ordinary agriculture, yet certain broad limits are observable from the data and the discussions and analyses and it will prove a valuable guide in the complex economics of agriculture in southern California.

Work Under Way Totals \$27,739,000

(Continued from page 1)

the adoption of this revised budget, the work of getting projects under way at the earliest possible moment was begun.

Due to the necessity of waiting for the effective date of August 22d, when the new State Contract Law, the California Recovery Act and other acts passed by the last Legislature went into effect, the first real salvo of the attack against the depression was not fired until August 25th. On this date bids were called for fifty contracts on highway construction throughout the State.

The entire staff of the Division labored night and day to put the budgeted work under way as rapidly as possible. Additional engineers and draftsmen were put to work, several of the offices working on double shifts to prepare plans and specifications for this mammoth construction drive.

The program was put under way at top speed and has so continued with the exception of construction delays caused by necessary suspension of work in the mountain areas during the winter months and the necessity of a cessation of advertising for contracts in northern California during part of January and most of February due to a restraining order served on the Department of Public Works in connection with the code of the excavating and dump truck contractors. However, the delay caused by the restraining order was only temporary as the court upheld the judgment of the attorneys for this department and full speed ahead is again the order of the day.

U. S. BUREAU COOPERATED

This commendable achievement of the last nine months in putting approximately \$27,000,000 of road construction under way speaks for the wholehearted spirit of cooperation which has obtained not only within the Division of Highways engineering staff, but in their necessary contacts with the engineering staff of the United States Bureau of Public Works and officials of the National Recovery Administration, whose approval is required on all projects financed with the aid of Federal funds.

In setting in motion this highway program, 228 contracts were awarded between August 25, 1933, and March 31, 1934, totaling \$19,089,300. Of these, 188 were road con-

struction contracts and 40 for bridges and grade separations. Day labor, minor improvements and maintenance work accounted for \$7,164,500 and prison camp road construction for \$1,485,700, making a grand total of \$27,739,300.

Of the total, 143 were financed with the aid of the National Recovery funds, amounting to \$12,293,600.

FEDERAL CONTRIBUTIONS

The importance of the contribution of Federal funds to California's greatest highway construction program can scarcely be overestimated.

The National Industrial Recovery Act provided for the use of funds apportioned to the States on specific classifications of roads, the set-up being that 50 per cent of the amount apportioned was to be expended upon the existing Federal Aid Road System within the State, not less than 25 per cent for improvement to the routes of this system through incorporated municipalities and a maximum of 25 per cent for the improvement of secondary feeder roads off the Federal aid system. California's progress in getting work under way by March 31st on these three classifications is shown below:

	Apportionment awarded	Contracts
Federal Aid System	\$7,803,700	\$7,531,500
Municipalities	3,901,800	2,559,300
Secondary Roads	3,901,800	2,359,500
Total Awarded	-----	\$12,450,300
Projects Advertised	-----	740,300
Totals	-----	\$13,190,600

The Federal funds which were appropriated for apportionment to the States under the authority of the National Industrial Recovery Act carry certain restrictions which insure that a maximum of money expended on construction would go to labor as directly as possible. These restrictions require that labor be limited to thirty hours in any one calendar week and that many types of construction operations be limited to hand labor methods so that the labor required to complete each individual project will require a maximum of man power.

Another restriction which has greatly affected the labor employed on this type of

Working Hours Cut by State but Pay Remains the Same

(Continued from preceding page)

public work is the requirement that all labor shall be selected from lists of available men in the county or political subdivision in which the work is situated; such lists to be furnished by local Federal employment agencies. This provision has insured the spread of wages for highway construction among citizens of the community in which the improvement is made.

STATE REDUCED HOURS

Similar provisions have been included in the specifications for projects which are financed solely by State funds so that identical conditions favoring the relief of unemployment obtain on all contracts for State highway construction.

To further this relief of unemployment the working hours of State highway maintenance forces have been reduced from 48 hours to 40 hours a week with no corresponding reduction in pay. This move increased normal maintenance forces from about 2000 to 2200 men. In addition to this increase, provisions were made for direct unemployment relief by the expansion of regular maintenance crews from October to June, providing half-time work for approximately 4000 men.

It is estimated that the peak of employment of the present construction drive will be reached early this summer with approximately 17,000 men at work on the California State Highway System.

PROUD OF AIDES

On March 31st there were 160 going contracts in force with the Department of Public Works, consisting of 109 road projects and 51 bridges.

The Department of Public Works has done its share in this great battle against depression to give relief to worthy, needy men of family out of work.

I am proud of the fine group of engineers and employees of this great far flung department extending as it does into every corner of every county of California, for it has been through their unselfish work, cooperation and assistance that the greatest construction drive in the history of California has been made possible.

Model of Appian Way Shows Romans Were Extravagant Builders

A DAY on the Appian Way, the most famous road of ancient Rome, is visualized in a large model of the Roman road exhibited at the recent convention of the American Road Builders' Association at Chicago. This model shows both the construction of the road and the traffic on the highway. It was prepared by the Bureau of Public Roads, U. S. Department of Agriculture, after investigation as to the design of this most famous highway in history, typical methods of construction, and the various types of traffic served. The model will be located permanently in the National Museum in Washington.

An article in the *Southwest Builder and Contractor* in describing the road says such roads would be regarded today as wasteful because they would cost six times as much as the wide modern highways.

This road, which endures after twenty centuries, was 16 feet wide with 2-foot curbs 18 inches high on both sides beyond which were 8-foot side roads. The Appian Way was of solid stone and concrete masonry 3 to 4½ feet thick, depending upon the soil on which it was laid. It was very straight, with steep grades and the curves widened as on modern roads.

In building the Appian Way, a bed of sand and gravel, sometimes covered with a thin coat of lime mortar, was used as a foundation for the four layers of masonry. The first masonry layer, from 10 inches to 2 feet thick, was composed of stones that would fit in a man's hand, held together with lime mortar or clay. The second layer of smaller stones mixed with lime mortar was 9 inches thick. The third layer was of concrete made of small stones, sand and hot lime mortar 1½ feet thick in the center and a foot thick on the sides to give crown to the road. The fourth or wearing layer was of polygonal stones about 3 feet in diameter and 6 inches thick laid with close joints. The upper surface of the wearing stones was dressed smooth and the joints fitted so tight as to be scarcely discernible.

The chief difference between the ancient Roman road and the modern highway is that the present-day engineer relies upon the soil to bear the load; the pavement should act as a wearing surface and a roof to protect the supporting subgrade soil. The Romans relied solely on massive construction.

Victory Highway Realignment Cuts Out 42 Curves and Reduces Distance

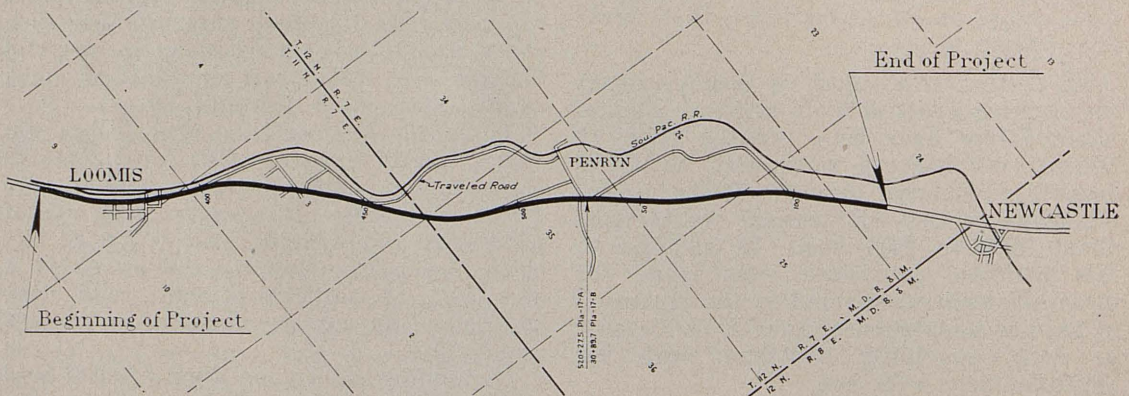
By C. H. WHITMORE, District Engineer

ANOTHER step toward the realization of the desire for a high-speed, shorter and more direct route to the east over the all-year road via Donner Summit will soon be accomplished by the completion of the project in Placer County, between Loomis and Newcastle, now under construction.

Previous construction on this route has eliminated considerable poor alignment and grades with the result that the distance in miles and driving time has been shortened between Newcastle and Auburn. The present

saving of .7 of a mile over the old alignment of 5.9 miles. The old alignment consists of 51 curves having a minimum radius of 150 feet, a maximum radius of 5000 feet, through angles totaling 1305°, and uses a maximum 7 per cent grade with total adverse grade of 231 feet.

The new alignment consists of long tangents with only nine curves, having a minimum radius of 2600 feet and a maximum radius of 5000 feet through angles totaling



SKETCH MAP of route between Loomis and Newcastle on State Highway No. 17, the Victory Highway. The new road now under construction is shown by the heavy black line.

construction is continuous and southerly to the previous construction.

The project lies in the foothills of the Sierra Nevada Mountains and practically the entire length is through beautiful and valuable orchard lands. From these orchards some of the earliest shipments of fruit are made from California to the eastern cities.

PRESENTS MAJOR PROBLEM

Because of the alignment going through these various orchards, replacement of irrigation facilities was a major problem, necessitating several siphons and special drainage features.

The existing State highway was constructed in 1917 and is approximately parallel to the Southern Pacific Railroad from Roseville to Penryn.

This contract is 5.2 miles in length, or a

154° and uses 6 per cent maximum grade with a total adverse grade of 30 feet.

LOOMIS TO NEWCASTLE

The beginning of this project is at the westerly limits of the town of Loomis and extends easterly to about one-half a mile west of the recently constructed Newcastle tunnel.

It is estimated that the construction will cost approximately \$260,500 and will be expended through the major construction items of 160,000 cubic yards excavation, 3850 cubic yards Portland cement concrete pavement, 17,000 tons asphaltic concrete pavement, and the necessary drainage structures, etc., incidental to the completion of a finished roadway.

The January traffic census indicates an average daily traffic of 2100 vehicles.

(Continued on page 22)



ANOTHER STEP in the improvement of U. S. 40, the Victory Highway, is the realignment under way between Loomis and Newcastle on the unit of this State highway, between Sacramento and Donner Summit.

No. 1—Rough grading on new subgrade between Loomis and Penryn. No. 2—Present highway showing old concrete and two of the numerous sharp radius curves that will be eliminated. No. 3—View of completed improvement between Newcastle and Auburn. No. 4—Cutting and filling operations with shovels and trucks at work on a sizeable dirt moving job.

Commission Asks Congress to Grant \$400,000,000 Additional Highway Funds

CALIFORNIA has acted promptly to secure its share of an additional Federal grant of \$400,000,000 if Congress passes one of the several bills recently introduced to secure the appropriation of that amount to continue necessary highway construction in the State and further contribute to unemployment relief.

Under orders of Governor Rolph and upon the recommendation of Director Earl Lee Kelly of the Department of Public Works, Harry A. Hopkins, Chairman of the California Highway Commission, left for Washington, D. C., April 9th, bearing a resolution of the California Highway Commission urging Congress to make the grant of which California's share will approximate \$16,000,000. He will act with highway officials of other States and California congressional representatives in support of the appropriation.

Chairman Hopkins recently attended the conference of the Western Association of State Highway Officials, held March 13th in Salt Lake City, where a resolution was passed urging Congress to make the additional grant.

310,000 JOBS INVOLVED

That resolution stated that 79 per cent of the funds previously allocated to the eleven Western States is under contract and present plans call for the completion of all projects not later than November 1st, when thousands of men will be thrown out of work that private industry will not be able to absorb. This number is placed at 135,000 individuals in the eleven Western States on part-time highway work and 175,000 indirectly employed.

The resolution further states that Federal taxes levied directly upon road users and indirectly through the sales tax during 1933 more than equaled last year's \$400,000,000 appropriation and a further similar appropriation will merely return to the road user his taxes. The major portion of United States public lands lies in the eleven Western States from which those States receive no taxes.

This resolution of the Western Association of State Highway Officials was brought to

the attention of the California Highway Commission at its last meeting on April 6th by Chairman Hopkins, together with Bill H. R. 8781, recently introduced in Congress covering the request made by the conference resolution.

COMMISSION ASKS GRANT

The Commission thereupon passed a resolution urging the appropriation of a sum not less than \$400,000,000, stating that by June 1st all of California's share of the previous \$400,000,000 grant will be under contract and the ensuing curtailment of highway construction will mean the unemployment of thousands of men with dependents.

The resolution, of which a copy was sent to each member of California's congressional delegation, reads as follows:

WHEREAS, There has been brought to the attention of the California Highway Commission in session this sixth day of April, 1934, a bill introduced in the House of Representatives of the United States Congress designated as H. R. 8781, covering an appropriation to provide for emergency construction of public highways and related projects and for other purposes in a sum of not less than \$400,000,000 to be expended by the highway departments of the several States under the provisions of Section 204 of the National Industrial Recovery Act approved June 13, 1933; and

WHEREAS, This Commission, being familiar with the program of construction and relief to the unemployed as provided in the original grant under this emergency measure, realizes the superior effectiveness and does approve of this method of relief not only to unskilled labor but also to skilled labor and indirectly to the so-called "white collar employee"; and

WHEREAS, California's portion of the original grant is 79 per cent under contract and by the first of June all of the appropriation will have been placed under contract; and

WHEREAS, The State of California has not decreased its revenue for highway construction and as far as activities within the control of the California Highway Commission this program will continue; however, the major part of such State funds are necessary to maintain and preserve the large investment already made; and

WHEREAS, A large portion of the highways of the State have not been improved to standards adequate to give a reasonable service and protection to the public as well as the necessity exists of eliminating many thousands of railroad and highway grade crossings; and

Resolution Points to Impending Lack of Work This Summer

(Continued from preceding page)

WHEREAS, The curtailment of highway construction beyond the undertakings possible with State funds will mean the unemployment of thousands of men and the deprivation of the necessities of life to themselves and dependents; and

WHEREAS, It does not appear likely at this time that other industries will be able to absorb this class of employment; and

WHEREAS, Highway construction and allied industries in California, which is also true of the eleven Western States and from all reports is equally true of all States, has demonstrated its suitability as a type of public works to provide the maximum of widespread employment as well as an investment which can be realized upon in the future; and

WHEREAS, California's allocation under the original grant will have provided a total of approximately 10,000,000 man hours exclusive of relief provided to allied industries which will suffer along with highway construction by a reduction in such activities; and

WHEREAS, The major portion of the United States public lands lie in the eleven Western States from which those States receive no revenue from taxation; now, therefore, be it

RESOLVED, By the California Highway Commission, that commendation be made to the U. S. Bureau of Public Roads for its successful handling of the present NIRA program; and be it further

RESOLVED, That the California Highway Commission respectfully requests and urges the Congress of the United States to authorize at the earliest possible date additional funds for the fiscal year 1935 in an amount of not less than \$400,000,000 with such other appropriations for national forest highways, national park roads, Indian reservation roads, etc., by the adoption of a bill containing the provisions of H. R. 8781.

INJURIES TO CHILDREN FROM BLASTING CAPS INCREASED

The year 1933 showed a slight increase in the number of injuries to children from playing with blasting caps. As a result the Institute of Makers of Explosives issues an appeal for prevention, saying:

"As you know, blasting caps are sometimes left by careless workmen following road work, contracting operations, and in and around mines and quarries.

"Sometimes a cap will explode when carried in the pocket and bumped. Other times children throw them in bonfires, strike them with a hammer or rock, ignite by matches, or pick them with pins or sharp instruments. Stamping caps with the feet or "shooting" them against a wall with a sling shot are among the many ways caps are detonated, with disastrous results.

Because of these accidents, many children are now facing the future blind and maimed. Fingers and even hands have been blown off, and many faces and bodies have been severely lacerated and disfigured."

U. S. ROAD BUREAU CHIEF URGES APPROPRIATION TO AVOID EMPLOYMENT SLUMP

In his report to the Legislature under date of February 23, 1934, Thomas H. MacDonald, Chief of the United States Bureau of Public Roads, said concerning a future program:

"The extension of the public works highway program that will hold employment without a precipitous drop during the latter months of the year 1934 and through 1935, merging into employment for the year 1936 comparable with that existing in more normal times through the operations of the regular Federal-aid program plus the State-financed construction and maintenance program, will require an additional grant of around 375 millions now under the public works legislation and provision for 125 millions under the Federal-aid legislation for the fiscal year 1936.

"Since 1916 the Federal government and the States have been engaged in a cooperative relationship which has extended to all the States and to every community in each State. There are two vital reasons why this relationship should be continued. One is the providing and maintaining of essential facilities. The other is the influence of the Federal government in sustaining as extensive employment in this field as is consistent with continuously supportable expenditures.

"It is essential that employment opportunities of dimensions reasonably equal to those existing before the present emergency programs must be offered in the highway improvement and conservation field. This field offers a continuous opportunity for employment in the providing, perfecting and upkeep of facilities which are intimately related to the social and economic life of the whole Nation."

According to the ads in the health magazines, obesity seems to be the mother of invention.—*New Brunswick (Ga.) Pilot.*

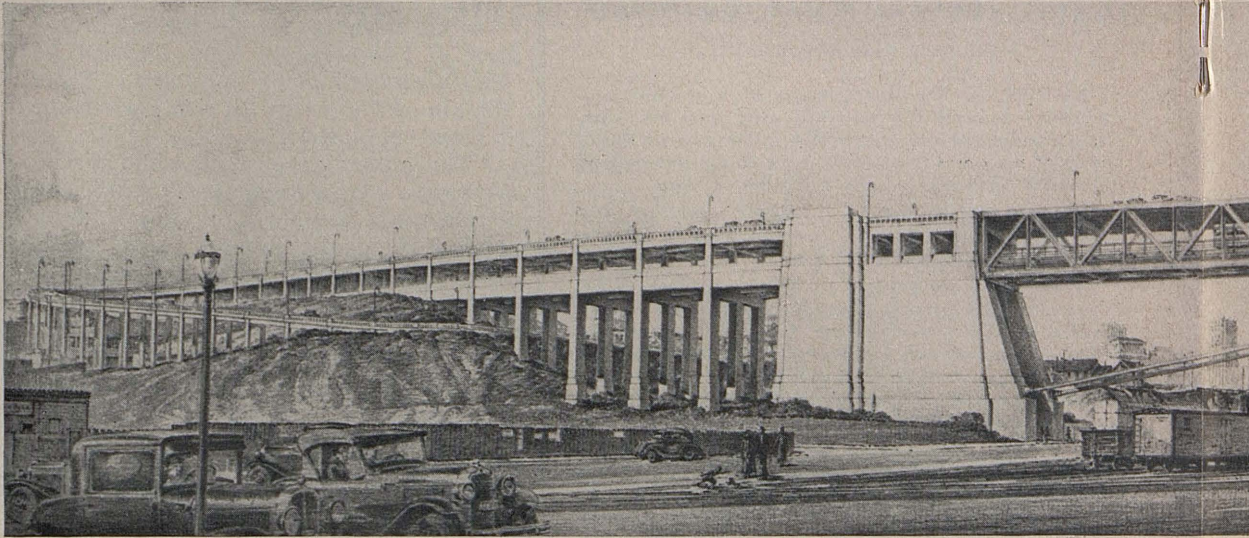
"What's Helen doing?"

"Making a shrimp salad."

"I didn't know we had any shrimps in the house."

"We haven't, but there is one coming to call on her this evening."

How the San Francisco End of the Great B



SAN FRANCISCO, a city of quaint cable cars and surface street railways, will enjoy its first experience in elevated railways, as well as elevated automobile highways, with the coming of the San Francisco Oakland Bay Bridge.

The bridge comes to San Francisco at a height of 175 feet over the famous Embarcadero, that stretches along the harbor from which ships sail to all parts of the world.

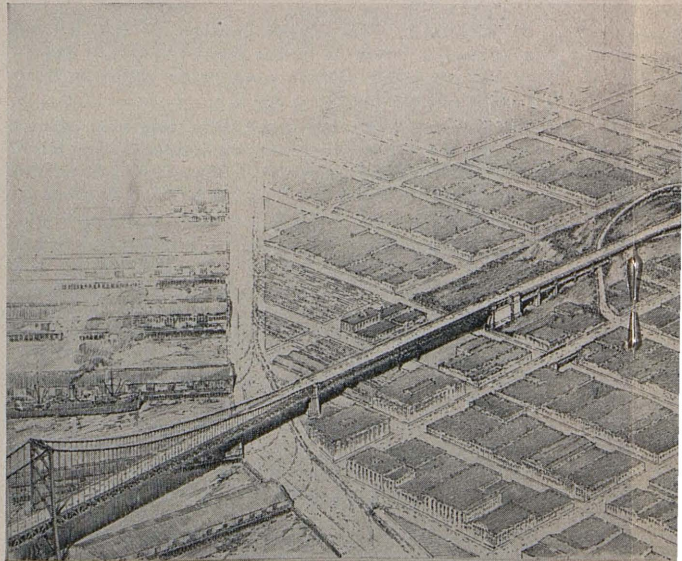
So high is the bridge above the street level, it is pointed out by State Director of Public Works Earl Lee Kelly, that the Palace Hotel of San Francisco could be slipped in under the bridge without even the top of its flag-pole touching the bottom of the lower bridge deck.

SHORT RAMP FOR TRUCKS

The lower deck of the bridge first touches ground on precipitous Rincon Hill, approximately one-quarter of a mile inland from the bay shore. Here the traffic of the lower deck—that is, two interurban car tracks and a heavy truck roadway—branches out to the north on elevated structures.

The truck roadway goes immediately to street level with a ramp only one city block long, but the interurban car elevated trestle will extend probably half a mile off the bridge proper into the heart of San Francisco.

The route of this interurban elevated railway has not yet been selected by Chief Engineer C. H. Purcell and his staff, but it is



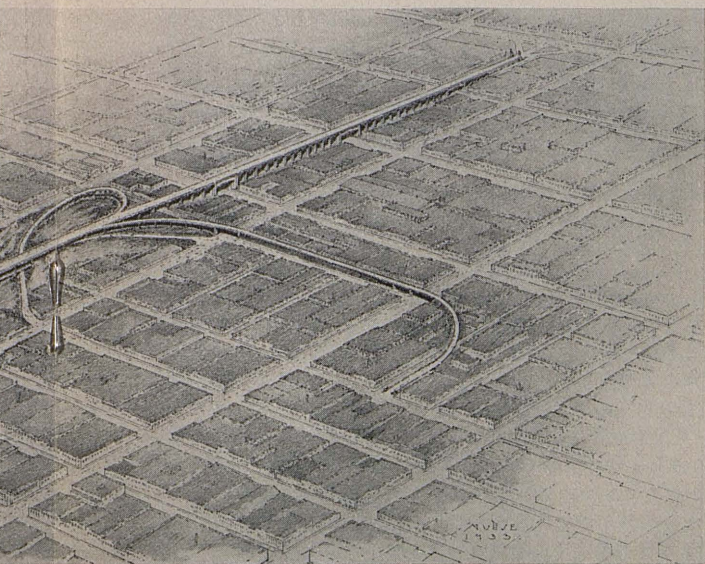
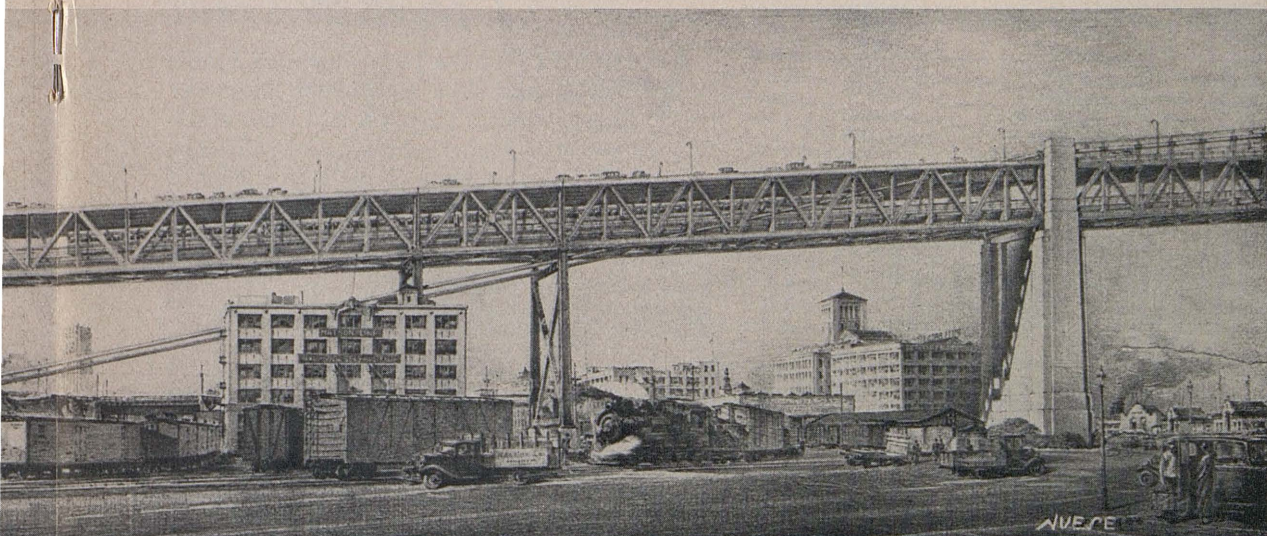
OFF AND ON ramps together with the main entrance and ex Bridge are shown in this picture with the

sure to be an imposing addition to the appearance of San Francisco in the district through which it is routed.

TWO TOP DECK ARTERIES

The upper deck of the bridge will not touch ground until it has proceeded 4200 feet west of the top of Rincon Hill. Here it comes down to level and the bridge ends at Fifth Street between Harrison and Bryant.

Oakland Bay Bridge Will Look When Completed



Entrance and exit in San Francisco of the San Francisco-Oakland Bay Bridge with the exception of the interurban car loop.

However, two more arteries extend off the top deck for those motorists who do not wish to drive a mile west of the San Francisco bay shore in order to cross the bay.

For the eastbound motorists going to Oakland a curved ramp starts on Fremont Street at Harrison, going south, turns west, then north, and then east, joining the bridge on top of Rincon Hill, so that the motorist is on the right-hand side and does not cross the

swiftly moving stream of bridge traffic.

For the San Francisco bound motorist who does not wish to be brought to ground level at Fifth and Harrison streets, a curved ramp takes off the upper deck on Rincon Hill and proceeds along Essex Street to disperse its traffic where Clementina Street comes out on First Street, just south of Market, the main artery of San Francisco.

FIRST ELEVATED HIGHWAYS

These ramps take off the bridge at an elevation more than 100 feet high, which is the height of a 6-story building.

The construction of this remarkable addition to San Francisco's skyline with its first elevated highways is under the jurisdiction of the State Division of Highways of the Department of Public Works and is under the immediate direction of District IV thereof, of which Colonel John H. Skeggs is District Engineer.

Work has not started on this job as yet, although the construction company building the cable anchorage on Rincon Hill is also building the viaduct which will carry the bridge from the cable anchorage to the summit of the hill where the approaches properly begin.

The trestles will be supported on steel and concrete columns carefully considered by the bridge architects—Timothy L. Pflueger, Arthur Brown, Jr., and John J. Donovan—so that they will be of pleasing appearance.

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.

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No. 4

REDUCES THE DANGER

Motorists who have had occasion to do much driving over highways taken over by the State of California in the so-called "6600 mile" bill can not help having noticed that the State's maintenance crews have tackled the job of maintenance in a different manner than it had been attempted before. In almost every instance they are giving more attention to shoulders and the land immediately adjoining the highway than to the pavement itself. Of course they patch the more urgent spots in the pavement, but to judge from the activities of the maintenance crews thus far, there is a lot more to highways than just the pavement.

One of the first acts of the State crews is to paint a white line along the center of the pavement and to keep it in condition to be readily visible, although this act was delayed considerably on the Santa Cruz-Watsonville highway for some reason or other. Almost no other improvement gives so much aid in driving as this white line.

As the summer days arrive, it will probably be found that the practice of widening the highway shoulders and clearing away the growth along the right of way, while helping ordinary driving and increasing the visibility, also serves as an important factor in fire prevention. Many disastrous fires are directly traceable to careless throwing of lighted matches and cigarettes from automobiles. The State is doing its best to make it impossible for fires to start from this cause—along highways under State control.—*Santa Cruz Sentinel.*

Judge: "I can not conceive of a meaner, more cowardly act than yours of deserting your wife. Do you realize that you are a deserter?"

Rastus: "If you knowed dat lady as Ah does, you sho wouldn't call me no deserter. Ah is a refugee—dat's what Ah is."—*Exhaust.*

Authority to Close Grade Crossings is Upheld by Court

AUTHORITY of the Department of Public Works and the California Highway Commission to abandon and close crossings at grade of State highways and railroads, as provided for by Sections 363b and 363o of the Political Code, with the consent and approval of the Railroad Commission of the State of California, as provided for by Section 43b of the Public Utilities Act, has been upheld by Superior Judge J. A. Allen of Tulare County.

In the case of Wills vs. the Department of Public Works et al., a resident of Tulare County obtained a temporary restraining order prohibiting the closing of a crossing which had been superseded by a change in the alignment of a portion of Route 4 of the State highway system in the vicinity of Goshen Junction.

DEMURRER SUSTAINED

The Department of Public Works demurred to the complaint on a number of grounds, particularly on the ground that the matter was without the jurisdiction of the Superior Court and that the complaint did not state facts sufficient to constitute a cause of action.

The department's demurrer was sustained without leave to amend, Judge Allen's order pointing out that the matter of closing grade crossings is within the jurisdiction of the Railroad Commission and its order in the matter reviewable only by the Supreme Court. The decision was rendered after argument of counsel and submission of authorities.

The case is the first court test of the Department's authority in the matter of closing grade crossings and for that reason attracted considerable interest because of widespread public interest in the grade crossing problem.

NO LENIENCY FOR DRUNKS

E. Raymond Cato, Chief of the California Highway Patrol, has issued instructions to all his officers to show no leniency in handling intoxicated drivers picked up on the State highways.

And at the same time he called upon the courts and prosecuting attorneys of the State to see to it that the penalties the law provides for such drivers be imposed alike on the influential as well as the uninfluential offender.

Teacher: Willie, give a definition of home.

Willie: Home is where part of the family waits until the others are through with the car.

Niland-Mecca Road a Relief Project

(Continued from page 4)



WEIRD MUD-POTS, geysers, and fumeroles cover a bubbling, boiling area some twenty acres in extent bordering the Salton Sea that is made accessible by the new highway. The roar of the steam vents can be heard a quarter of a mile away.

out in the sea. The flood channel eroded rapidly, working back from the sea at about one-half mile a day. It was apparent that unless the river could be soon returned to its normal course the channel would soon be cut so deep that the Colorado would permanently flow into Imperial Valley.

Results of the tremendous erosion are shown in the gorge of the New River which for some forty miles is cut to a depth of 50 to 80 feet and a width of 1000 feet. The struggle to turn the river back into the Gulf of California was a most stupendous engineering feat and was finally accomplished by the Southern Pacific Railroad equipment and forces, and the Imperial Valley was saved.

The Salton Sea, which has no outlet, has remained although its level varies somewhat according to the quantity waste and storm water flowing into it. Its shores are the home of many kinds of water fowl.

Another natural phenomenon of the Salton Sea country, which will be made more access-

ible by the new highway, are the geyser and mud-pot fields about six miles west of Niland. Mud, hot water, steam and gas, bubble and blow from the ground over a space of 20 acres in a marsh bordering the sea. The flow of mud is slowly building craters around some of the openings and the roar of steam can be heard a quarter mile distant. The field is accessible by a fair road which leaves the State highway about one mile south of Niland.

A commercial outgrowth of this field is the carbon dioxide wells, of which there are now six in the vicinity. The gas is found at a pressure of 150 pounds and upon further compression is changed into "dry ice," a very efficient refrigerant. The gas is also stored in cylinders for carbonating beverages. The dry ice should find a ready market in the icing of cars for the long haul to market of the valley's vegetables and fruits.

The North Shore Road reconstruction must be considered as a stage improvement rather than a high type accomplishment for the

(Continued on page 32)

Early Opening of Trans-Sierra Roads Effected by New Snow Equipment

By T. W. DENNIS, Maintenance Engineer

STATE highway snow plows are now working their way up the slopes of the Sonora, Ebbitts, Carson and Tioga Passes, the last trans-Sierra roads still snow-bound.

This most unusual early spring condition will be cheering news at least to fishermen, who may now reach their favorite mountain lake or stream on opening day. This situation, however, offers little comfort to water users, who compare the present trace of snow on Donner Summit with last year's 69-inch snow pack.

Contrary to general surmise, the snowfall this season up until January equaled, if not exceeded, that of last winter for the same period. Unfortunately, the usual heavy snowfalls of January and February did not materialize and the season's total was but 70 per cent of that received in 1933 and only 50 per cent of the fall in 1932.

DONNER CLOSED ONE DAY

Snow removal conditions this year were very favorable, as the storms, while heavy and in some instances sustained, occurred far enough apart to allow ample time for removal between storms. As a result, Donner Summit was closed but one day during the winter, and that at the tag end of a 76-inch snowfall. Equally favorable conditions prevailed on the Bridgeport-Bishop road.

Several new types of snow equipment were tried out this season, the more noteworthy being the large vertical fan truck-mounted rotary, the trailer rotary widening unit, and the heavy high speed "V" displacement truck plow with side wings.

The vertical fan rotary, mounted on a two-axle, four-wheel-drive truck, is operated by an independent power plant. The plant, a Liberty aviation motor, is capable of developing 420 horsepower at 1800 r.p.m. The seven-

blade rotor is nine feet six inches in diameter, and is capable of walking through six-foot snow banks of almost ice-like consistency. In operation the unit is backed into the drift, the driver of the truck being guided by a system of bell signals given by the rotor operator.

HANDLES HIGH DRIFTS

The unit, due to its height, is capable of handling high drifts as well as widening. The clean-up is more efficient on deep than shallow banks, since the face of the higher banks forces the carrying of the snow to the side chutes, whereas in shallow cutting the snow has a tendency to fog outward, seriously interfering with the operator's view. This phase has been corrected to some extent by housing the upper portion of the rotor. The great capacity of the plow, its effectiveness on hard packed snow, its vertical reach, all warrant consideration, and it should provide a very competitive unit in the rotor field.

The trailer widening rotary is a comparatively recent development especially adapted to locations where restricted storage impedes removal. The four-foot rotor is trailed on an offset hitch by a truck after the fresh snow has been bladed to the roadsides. It will widen banks up to five feet in height, throwing the snow a considerable distance off the road.

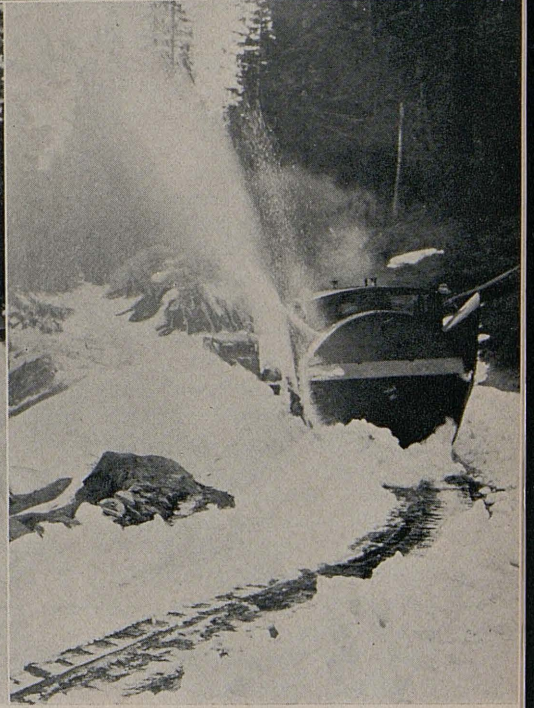
ECONOMY EQUIPMENT

The clean-up however, is somewhat loose, as a small amount of snow either falls back of or is thrown outward into the roadway by the rotor. The power plant consists of a Waukesha motor capable of generating 114 horsepower at 1800 r.p.m. This unit effects a real economy, lessening equipment investment under conditions normally requiring an expensive truck-mounted rotary.

(Continued on page 32)



T. W. DENNIS



SNOW FIGHTING equipment opening Echo Summit on the Placerville-Lake Tahoe highway. Nos. 1 and 2—Railroad type rotary breaking through a four-foot drift. This machine operates backward into the drifts. No. 3—"V" type push plow bucking a drift. No. 4—View of operating end of the big railroad type rotary doing a little cleaning-up work.

New Road Abolishes Tortuous Route to Sausalito Ferries

(Continued from page 2)

the Northbay communities for extension of the same type of improvement on through the city of Sausalito toward the ferries.

NRA FUNDS HELPED

After careful consideration a program was arranged whereby NRA funds became available to the point that the California Highway Commission were able to undertake the additional work of completing the second contract from Napa Street to a terminus at Water Street, a short distance from the automobile ferries, and the northerly terminus of the commercial or business district of down-town Sausalito. This short extension of the improvement is entirely on new rights of way and eliminates all of the dangerous and out-moded types of highway.

Caledonia Street will no longer serve through State highway traffic. The new highway has been continued southerly on a new right of way immediately adjacent to the tracks of the Northwestern Pacific Railroad. The work, as above stated, required the removal of many houses and commercial establishments and has materially changed the picture of Sausalito to the motorist entering it from the north.

Caledonia Street formerly was taxed heavily by local and through traffic in serving the local commercial houses and will continue in the future to only serve the business interests of Sausalito. Work on this latter contract was under construction during the past winter months and is entirely completed and opened to traffic.

The total length of pavement constructed on the second contract was .39 mile. The total cost to the State for grading and paving in the second contract will be approximately \$60,000. The total expenditures involved in the two contracts from Waldo Point to Water Street in Sausalito will be approximately \$246,000, the expenditure of which has permitted the Highway Commission to bring to a terminus the heavy reconstruction work along the Redwood Highway between Santa Rosa and Sausalito.

Conductor (helping stout lady on car): "Yer should try yeast, mother, ter 'elp yer rise better."

Stout Lady: "Take some yourself, lad, and then ye'd be better bred."

Employment Given 100 Men Per Day on this State Job

(Continued from page 12)

This contract is financed through the National Recovery Act and is affording a large amount of unemployment relief for this vicinity. About one hundred men a day are carried on the contractor's pay rolls. With the exception of supervisory positions, all employed are working not more than thirty hours a week, as provided by the statutes of the State of California.

The grading activities on this work have progressed very satisfactorily and except for the great amount of swamp excavation encountered no difficulties have been experienced. A certain amount of swamp excavation had been anticipated in connection with this work, but as construction progressed springs and undersurface water channels were evident in poor ground at several locations that gave no indication of moisture on the surface. It was considered best to remove this unsatisfactory material, install under-drains, and backfill with suitable material. This required the removal of over 22,000 cubic yards of unsatisfactory swamp material and the placing of approximately 4200 lineal feet of perforated drain pipe and backfilling with suitable selected material.

COMPLETED NEXT MONTH

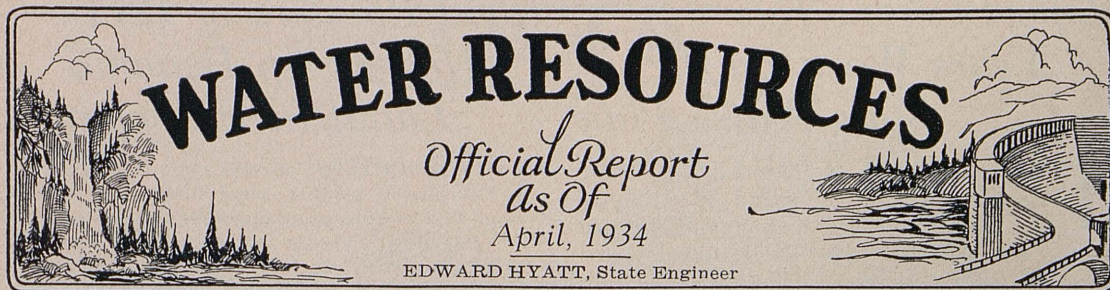
The coarse aggregates for Portland cement and asphalt concrete are being obtained by the contractor from mine dumps in the Ophir District, about five miles easterly from the construction. They are then hauled by motor truck to crushers installed alongside the work about midway from the ends of the project. The fine aggregate is to be obtained from a local creek a short distance from the site of the work.

The contract for this work was awarded September 20, 1933, and is scheduled for completion May 29th this year. The contract progress is satisfactory, and at this time grading and structure installations are practically complete. It is expected that paving will commence about April 15 or 20.

J. D. Greene is resident engineer in charge of construction for the State.

"Dearest," sighed the young man, "couldn't you learn to love me?"

"I might," said the girl, "I learned to eat spinach."



The prospect for another exceptionally dry year remains unchanged through lack of additional heavy rain and snowstorms during the past month. A check of snow and precipitation in the Sacramento-San Joaquin drainage area shows conditions but little better than in 1933 when the seasonal stream flow was only 46 per cent of normal. The outlook is a matter of serious concern for water users according to the monthly report of the State Engineer.

News of the irrigation districts, dam construction, flood control and reclamation work, cooperative topographic mapping and other activities of the division are contained in the report which follows:

IRRIGATION DISTRICTS

Work has consisted of analyzing and tabulating data furnished in reports of irrigation districts for the year 1933, preparatory to the publication of Bulletin No. 21-E, the fifth annual report by the Division on Irrigation Districts in California.

California Districts Securities Commission.

Among the matters before the Districts Securities Commission at its March meeting were the following:

Waterford Irrigation District requested approval of refunding plans for basis of loan from RFC.

Byron-Bethany Irrigation District requested that its recently voted refunding bonds be certified.

La Mesa, Lemon Grove, Spring Valley and Santa Fe Irrigation districts applied for approval of expenditures in connection with their refunding plans.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project.

Under CWA project No. S-502-X-138, clearing in the American River overflow channel has continued during the period with a force varying from 30 to 19 men, and was completed on about March 24th, working a total of 2400 man-hours.

Resubmitted applications have been approved for CWA work in Yolo, Sutter and Yuba counties, but no men have been made available except in Sutter County as mentioned above.

Sacramento Flood Control Project—Bank Protection.

Work under the State-Federal cooperative program for permanent bank protection has continued under the U. S. Engineer Office at Sacramento, in Reclamation District No. 108 and Reclamation District No. 1500.

Resubmitted CWA applications were made by the Reclamation Board and approved as follows:

Yolo County, Project No. YO-SLF-503-X.

Sutter County, Project No. SU-SLF-503-X.

Yuba County, Project No. YU-SLF-503-X.

No work has been done under these projects on account of the inability of the county directors to assign men.

Mokelumne River.

Clearing on the Mokelumne River from New Hope bridge to Woodbridge in San Joaquin County has continued under the direction of this office, CWA Project No. SJ-50-X, with a crew decreasing in size from 60 to 24 men. The work on the left bank has been completed to Woodbridge and a start has been made on clearing the right bank downstream toward Dry Creek.

Under CWA Project No. SAC-1003-X, Sacramento County, work has been proceeding under the direction of this office, in clearing the right bank of the Mokelumne upstream from the New Hope landing bridge along the McCormack-Williamson tract and clearing the Burton Slough By-pass channel between the McCormack-Williamson tract and Reclamation District No. 1002. Assistance has been rendered during the entire period by the U. S. Engineer Office's snagboat "Yuba." Two crews of 30 men each and one crew of 16 men are employed, making a total of 1800 man-hours per week.

Pajaro River.

Under the supervision of this office work commenced on clearing the channel of the Pajaro River under CWA Projects No. 502-MT-X and No. 502-SCR-X, Monterey County furnishing 23 men and Santa Cruz County 12 men. The work so far has been confined to the tidewater section of the river below Watsonville and excellent progress has been made.

WATER RIGHTS

Supervision of Appropriation of Water.

During the month of February, 24 applications to appropriate water were received, 5 were denied and 12 were approved. In the same period 7 permits were revoked and 5 passed to license.

On October 1st progress reports were requested of 1280 permittees and between that date and March 1st

(Continued on page 29)

Report Covers Ten Years Work on the State Water Plan

THE release is announced by State Engineer Edward Hyatt of Bulletin No. 29, of the series of reports issued by the Division of Water Resources, Department of Public Works. This publication is one of the most important volumes presented on the State Water Plan. It represents the results of over ten years intensive study of water problems in the San Joaquin River Basin.

Included in the report are details regarding the available water supply; the area, location and quality of agricultural lands; the history and present status of irrigation, flood control, navigation and hydroelectric power developments; the utilization of surface and ground water supplies; an estimate of the area of lands suitable for irrigation.

TWO PLANS PRESENTED

The major units of an engineering plan for ultimate development, regulation and utilization of water resources of the basin are described as well as a plan for initial development, comprising units immediately required to meet deficiencies in water supply for present developments and needs in the valley.

Because of the dependence of San Joaquin River Basin upon the Sacramento River Basin for supplemental waters to meet its full requirements, the plans for both initial and ultimate development in the two basins are interrelated and interdependent and, therefore, have been considered together as one unified project.

FIRST TO BE BUILT

The units proposed for immediate development of the initial State Water Plan include the Kennett and Friant reservoirs, the San Joaquin River-Kern County Canal, the Madera Canal, Magunden Edison pumping system and the Contra Costa County conduit. This development would furnish adequate water supplies for present needs in the Sacramento Valley, Sacramento-San Joaquin Delta, Upper San Francisco Bay region, and upper San Joaquin Valley.

It would increase the degree of flood protection, improve navigation on the Sacramento River, and incidentally would generate a large block of hydroelectric energy.

Edna—What kind of a driver is Clarence?

Olive—Terrible—All he grasps is the steering wheel.

Road Boosters of 1911 Hooked up Panama Canal in Propaganda

THE ARCHIVES of the California Highway Commission contain some interesting exhibits of road boosting propaganda that were indulged in when the State highway system was in process of organization. One of these exhibits is a 12-page illustrated pamphlet issued in 1911 by the old Placerville and Sacramento Pioneer Road Club presenting an "Appeal for a State Highway along the Old Pioneer Route from Sacramento to Placerville via Folsom, Clarksville, Shingle Springs, El Dorado, and Diamond Springs."

The cover page carries a picture of a fine four-horse stage coach showing gentlemen in top hats and ladies in bonnets and furbelows being whisked at top speed over a dirt road and labeled "The Past, 1849." Contrasting with this early day equipage is a picture of an up-to-date automobile of 1911 vintage without top or windshield, raising a lot of dust as it dashes over a road, the driver and a lady companion protected by goggles, linen dusters, et cetera. This picture is labeled "The Present, 1911"; and the future in the then distant 1915 is pictured by a large question mark.

PANAMA CANAL CONNECTION

In an elaborately worded preamble the boosters hooked up their road as a connection with the Panama Canal in bringing commerce to that section as follows:

"In honor of our Forefathers, the Pioneers, who from pleasant, peaceful homes on the slopes of the Atlantic or the fertile valley of the Mississippi, braved the hardships, toil, suffering, privations and danger in crossing a continent to lay the foundations of this Occidental Commonwealth, we present this preamble in defense of the title of our Organization.

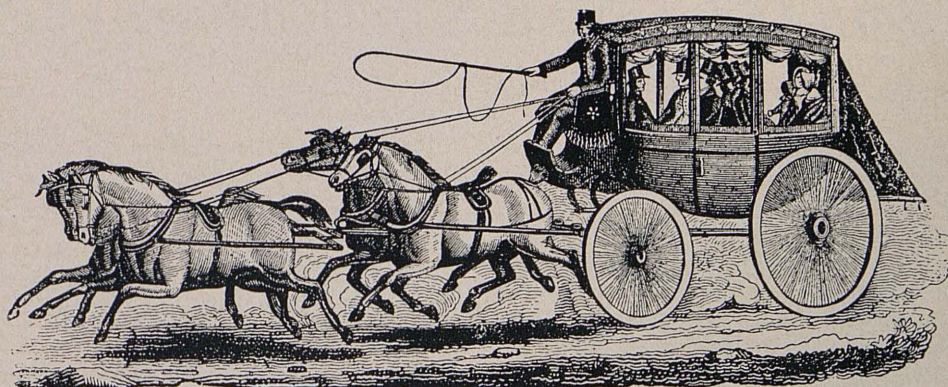
"We contend for recognition of the old landmarks, for the road our forefathers traveled, so wisely located by the old pioneers that this generation can not offer a better route. We contend for the Old Pioneer Trail for those with gray hairs still with us, who can conduct the Honorable Board of State Highway Commissioners or anyone over this grand old trail, afoot, as many of them came, and follow every deviation of this, the only road that has made this section what it is and what it is destined to be upon the completion of that mighty commercial highway—the Panama Canal. It is submitted to this Commission and their consulting engineer whether we are to retain this route as an imperishable monument of utility in honor of its founders, or whether they prefer to consign to the use of posterity a route without a history and in every essential inferior to the time-honored Pioneer Emigrant Road."

ROAD WAS ADOPTED

Their appeal was made for the purpose of having their route taken into the State highway system under the first bond issue of \$18,000,000 enacted by the Legislature in 1909.

The enthusiastic boosters had the satisfaction of seeing their efforts crowned with success. The route they proposed was adopted and became a State highway. With a few minor changes of alignment it is the route known today as State Highway No. 11, extending from Sacramento through Folsom and Placerville to Lake Tahoe.

1849

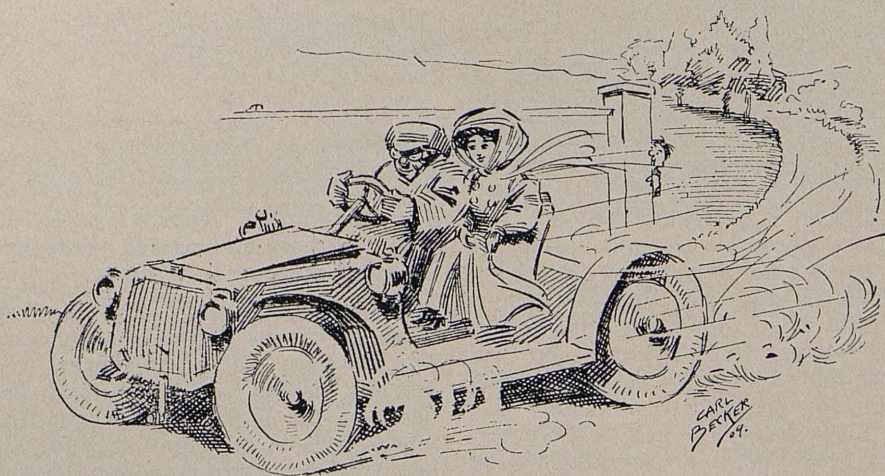


PAST

Appeal for State Highway along the Old Pioneer Route from Sacramento to Placerville via Folsom, Clarksville, Shingle Springs, El Dorado, and Diamond Springs.

OLD PLACERVILLE & SACRAMENTO
PIONEER EMIGRANT ROAD CLUB

1911



PRESENT

OLD ROAD BOOSTER CIRCULAR issued 23 years ago emphasizing pictorially the need of a bigger and better highway between Sacramento and Placerville to meet the advance in transportation facilities from the stage coach of 1849 to the speed demon auto of 1911 and handle the commerce that was coming through the Panama Canal.

New Trans-Sierra Highway Scouted to Join Owens and San Joaquin Valleys

By R. M. GILLIS, Acting District Engineer

ONE of the most interesting roads from a scenic and engineering standpoint, included in the 6800 miles of county roads taken into the State Secondary Highway System by the last Legislature is a route over the high Sierra ridge between Tulare and Inyo counties that will eventually link Death Valley and Mount Whitney, lowest and highest spots in the United States on a new cross-State tour from the Nevada line to the coast.

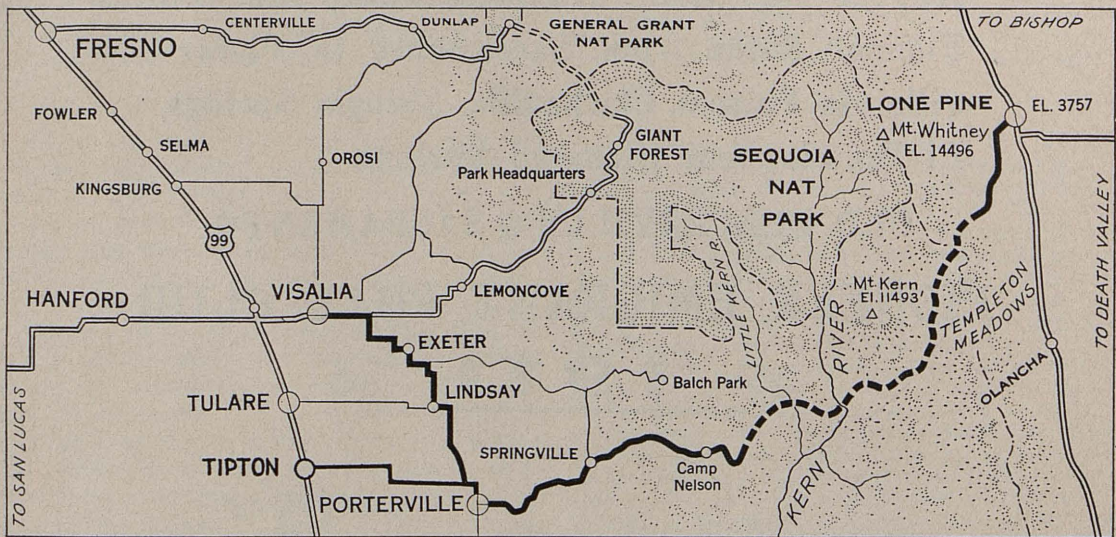
In the legislative enactment, Senate Bill

From Camp Nelson across the Sierras to the Owens Valley, approximately 60 miles, it is a "paper road" that exists only on the map.

LONG NEEDED CROSSING

The route has long been advocated by Tulare and Inyo counties for the following reasons:

I—It will provide a trans-Sierra route that can be used during at least six months of the year and will be intermediate between Tioga Pass on the north and Walker Pass



HEAVY BLACK AND DOTTED LINE shows approximate route of new highway taken by scouting party on horseback trip made over the Sierras last fall.

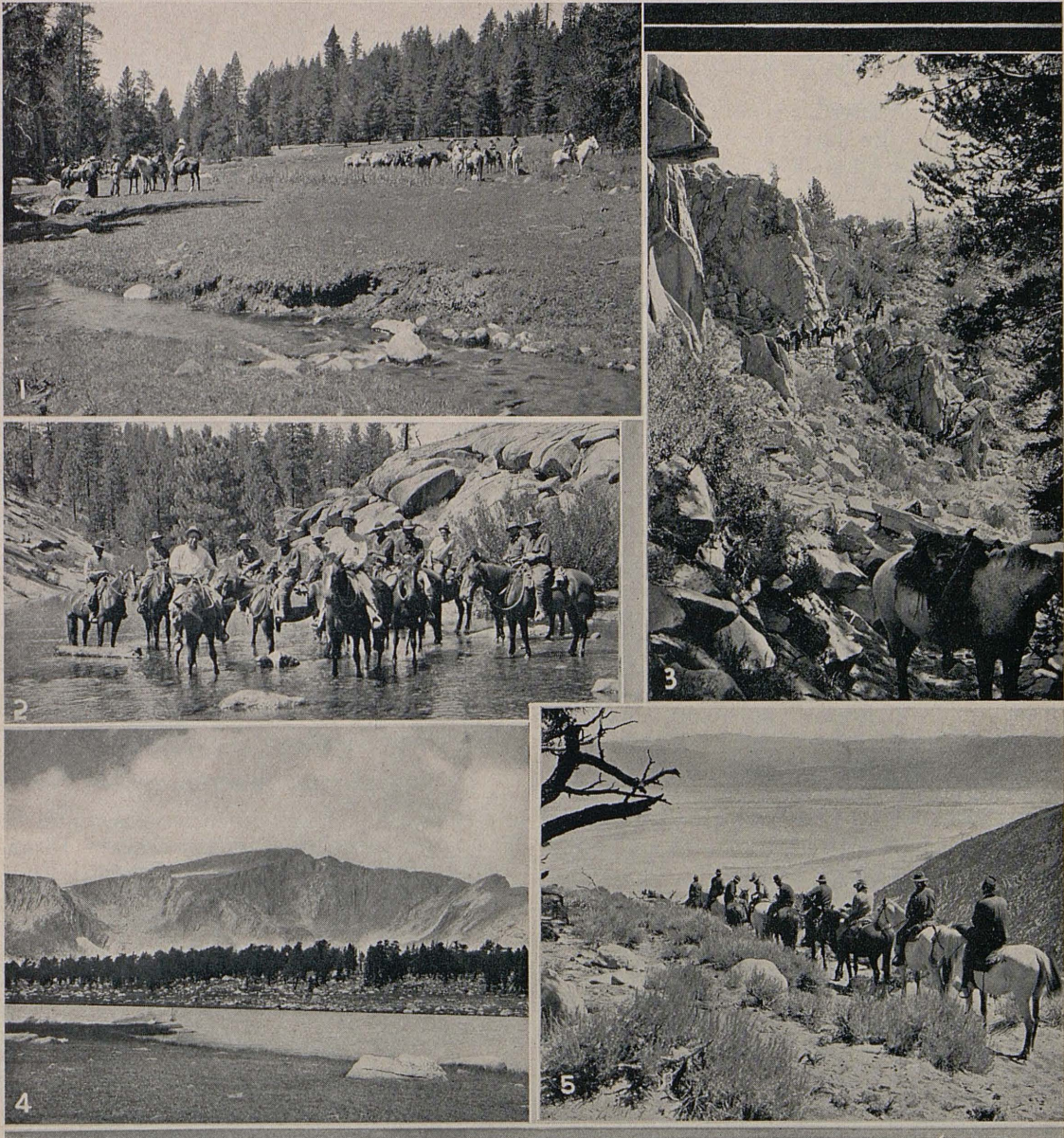
No. 563, this road is designated to run from State Highway Route No. 4 near Tipton via Porterville and Camp Nelson to State Highway Route No. 23 near Lone Pine and is now known as State Route No. 127. Thus it will connect the Golden State Highway through the San Joaquin Valley with the East of the Sierras Highway through Owens Valley.

Existing roads from Tipton to Porterville, 20 miles, and from Porterville to Camp Nelson approximately 36 miles on the west side of the Sierras together with 12 miles of dirt road that zigzags up the eastern slope were taken over for maintenance by the State as traversable roads constituting a part of the route.

on the south. Approximately 175 miles separate these two passes between which no highway crossing now exists.

II—It will furnish a more direct route from the Owens Valley into the center of the San Joaquin Valley and open up a great hunting, fishing and recreational area in the heart of the high Sierra abounding in primeval forests of giant sequoia and pines, beautiful mountain meadows, rushing rivers, golden trout streams and numerous large lakes now only accessible by pack train over horseback trails.

The maximum elevation reached by the road will be about 10,000 feet and it will take the



RUGGED COUNTRY was traversed by the scouting party across the high Sierra section of the proposed State highway route between Lone Pine and Porterville. No. 1—Long Canyon meadows. No. 2—Crossing the Little Kern River. No. 3—In Little Cottonwood Canyon. No. 4—Mt. Langley and one of the Cottonwood lakes. No. 5—Beginning descent into Owens Valley.

motorist to a point within 20 miles of Mt. Whitney, 14,496 feet, where, it is expected, a connecting road will eventually be built to the foot of the peak.

The Sierras, at the proposed crossing of this new route, as at all other points, offer a fairly easy approach from the west but drop very abruptly on the east side. The most difficult problems of location and construction will therefore be encountered in the 6000-foot

drop from the high mountains down to the Owens Valley.

No definite routing of the projected highway can be decided upon until the Division of Highways has made the necessary reconnaissance surveys but a scouting trip was made last fall from Camp Nelson over the proposed route by interested citizens of San Joaquin and Inyo counties and automobile club officials who invited representatives of

(Continued on page 28)

Roads and Trails Cut 1933 Forest Fire Loss

Fewer scenic forest areas in California were desolated by fire last year than for many years of the past, says a report from Regional Forester S. B. Show. California's fire record for 1933 was the best in 10 years, except for 1930 when wind and humidity helped to hold fire hazards in check, it is declared.

Notwithstanding the average hazardous weather conditions of last year, only 75,354 acres were burned over in the State's 18 national forests as compared to the preceding 10-year annual average of 217,990 acres. This represented a cut of more than 80 per cent in fire-fighting costs, or a saving to taxpayers of about \$330,000 in addition to the value of watershed, timber, recreation and grazing land saved from flames.

The C. C. C. was credited by Show as being largely responsible for this saving in fire losses. Through their efforts, 2500 miles of roads and truck trails and 300 miles of firebreaks were constructed and maintained during 1933. It is pointed out that inadequate roads and firebreaks in Santa Barbara National Forest were responsible for more acreage being burned in that one area alone during the past two years than in all the other 17 national forests of the State.

That roads and truck trails are absolutely essential in cutting the time of the initial attack on a fire from hours to minutes is well illustrated in one case where four miles of road in the Angeles National Forest made a difference of 30 minutes instead of two hours in transporting 500 C. C. C. boys to a fire. This enabled the saving of 1000 acres of watershed cover estimated to be worth \$500,000 to Pasadena.

It is confidently believed that by the close of 1934 C. C. C. workers will have advanced the work of forest protection 10 years over the former rate of progress in California.

There are two general classes of trucks operating on the highways—those which are privately owned and operated which constitute about 86 per cent of the total and those which are operated for hire which constitute the other 14 per cent. About 9 per cent are contract haulers—that is, they carry for particular shippers by special contract and about 5 per cent are common carriers.

When Jones showed his wife the fish he caught she said: "Don't try to put that over. Mrs. Smith saw you in the fish shop."

"Sure she did," said Jones. "I caught so many I had to sell some."

PAVEMENTS BUILT BY MAYANS 1500 YEARS AGO IS DISCOVERED

That permanent paved roads were a goal of ancient civilizations has been further shown in a recent discovery by an expedition in Yucatan sponsored by Carnegie Institute.

Roads 30 to 34 feet wide, built of stone and cementing mortar, were found. These roads were built 1500 years ago by the Mayans. There is a resemblance between the construction of these roads and those of the early Romans. They were the crude forerunner of the modern concrete road.

The roadway was excavated to hardpan, then retaining walls 2 to 8 feet high were built of large stone blocks, set in mortar. Between the walls, boulders were laid, weighing hundreds of pounds. Layers of smaller stone were laid on top of the boulders. Over these was spread a layer of finely broken stone, rolled and pounded into a hard, level surface. This was finished with a smooth, hard coat of cementing mortar.—*Concrete Highways and Public Improvements.*

NEW TRANS-SIERRA HIGHWAY TO JOIN OWENS AND SAN JOAQUIN VALLEYS

(Continued from page 27)

the Division of Highways to accompany them. The latter included Assistant Deputy Director of Public Works Morgan Keaton; Fred Grumm, Engineer of Surveys and Plans and R. M. Gillis, Acting District Engineer of District VI. The Automobile Club of Southern California was represented by Field Secretary Carl McStay and Chief Engineer Earnest East.

THREE-DAY TRIP

The party spent three days in the saddle journeying across the mountains by way of Kern Flat, the Little Kern River, Jordan Hot Springs, Templeton Meadows, crossing the headwaters of the South Fork of the Kern to Mulkey Pass, thence to Cottonwood Lakes, Golden Trout Camp and Horseshoe Meadows, there connecting with the road into Owens Valley.

When this new highway over the Sierra is built motorists can travel from the Nevada State line at Beatty, down into and across Death Valley, over the Panamint Mountains to Darwin and Lone Pine in Owens Valley, up over the Sierras within the shadow of Mt. Whitney down into San Joaquin Valley to Tipton and thence to the coast by way of either the Cholame or Coalinga laterals.

Survey Shows Less Snow than in 1933

(Continued from page 23)

reports were received in 1166 cases. These reports have been analyzed and the cases forwarded for appropriate action.

On October 15th reports were requested covering 333 projects under license and on March 1st reports had been received on 260 cases. These reports have likewise been analyzed and various cases forwarded for appropriate action.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

A check of the snow and precipitation in the Sacramento-San Joaquin drainage shows considerably less snow than at this time a year ago but the seasonal precipitation to March 1st was slightly better than a year ago. The seasonal stream flow in 1933 in the Sacramento-San Joaquin drainage was only 46 per cent of normal so that with 1934 following such a dry year and with the precipitation and snow conditions practically no better, the outlook for summer stream flow in 1934 is little better than in the extreme years of 1924 and 1931. With this prospect it is a matter of serious concern that the water users shall subscribe the necessary funds so that the Water Supervisor work can be under way very shortly.

Since the comparatively small peak flow of the Sacramento River at Sacramento in the latter part of February, the river has gradually dropped to a present flow of about 20,000 second-feet.

Salinity tests of samples taken at Bullshead Point, Collinsville and Antioch on March 14, 1934, showed the following results in parts of chlorine per 100,000—Bullshead Point 260, Collinsville 3, Antioch 3.

DAMS

In southern California, work on Pine Canyon dam has been completed; Bouquet Canyon Dam is practically completed, so far as the work of this office is concerned; and the alterations of Mulholland Dam, designed to materially increase the safety of the structure and relieve apprehension from the minds of property owners below, are nearing completion.

Construction of the San Gabriel No. 1 and El Capitan dams is in progress.

THEY BELIEVE IN SIGNS

Law abiding Woodlanders have been stopping religiously at Court and Lincoln streets stop signs where stopping is unnecessary. Consequently these painted stripes were burned off Thursday to prevent too strict adherence to an obsolete law.

Who says the American people only vote for laws to break them? Or perhaps local citizens have a greater sensitiveness for a white painted STOP staring up from the pavement than their fellow Americans.

Application was filed on March 15th for enlargement of the Lake Orinda Dam in Contra Costa County. This structure is an earthfill and the raise proposed will increase the height of the dam 5 feet and the capacity of the reservoir approximately 30 per cent. The raise is to be accomplished by adding material to the upstream slope. The crest width will also be increased. Alterations to the spillway are included in the work.

FEDERAL COOPERATION

Cooperative Topographic Mapping.

Advance sheets of the Huron, Gujarral Hills, El Rico and Chatam Ranch Quadrangles are now available. The Huron and Gujarral Hills Quadrangles cover areas in Fresno County surveyed in 1933 and are on a scale of 1:31,680 with a 5-foot contour interval. The El Rico and Chatam Ranch Quadrangles cover areas in Tulare Lake Bed, Kings County, surveyed in 1932 and 1933. They likewise are on a scale of 1:31,680 with a contour interval of 5 feet.

Final sheets of Venice, Pearland, Littlerock, Little Buttes, Esparanza and Adobe Quadrangles are now available.

This topographic work was done by the Topographic Branch of the U. S. Geological Survey in cooperation with the county of Los Angeles. All sheets except the Venice Quadrangle cover areas in northern Los Angeles County and the field work was done in 1930 and 1931. The sheets are published on a scale of 1:24,000 with a contour interval of 5 feet in the valley areas and 25 feet in the mountainous areas.

WATER RESOURCES

South Coastal Basin Investigation.

Field work on the South Coastal Basin investigation continued along routine lines during the present month.

CWA Surveys—Kennett and San Joaquin Valley.

Work on the survey of Kennett Reservoir and the line through the canyon is being prosecuted by CWA forces. Plans are also under way to start surveys in the San Joaquin Valley with CWA forces on which it is expected to employ approximately fifty men.

At any rate, city street crews were busy Wednesday with blow torches melting off the painted signs and again making Court Street an unmarred boulevard.—*Woodland Democrat.*

"Good morning, Mrs. Kelly," said the doctor, "did you take your husband's temperature, as I told you?"

"Yes, doctor, I borrowed a barometer and placed it on his chest; it said 'very dry,' so I bought him a pint o' beer an' he's gone back to work."—*Boston Transcript.*

Highway Bids and Awards

FOR MARCH

ALAMEDA COUNTY—In Emeryville, at the Parafine Company's Plant, East Bay Approach to San Francisco-Oakland Bay Bridge, consisting of subway with ramps and wing walls, drainage system and pumping equipment. District IV. Bundesen & Lauritzen and Delta Dredging Co., Pittsburg, \$35,211; Fredrickson & Watson Const. Co., and Fredrickson Bros., Oakland, \$38,428; Ben C. Gerwick, Inc., San Francisco, \$42,115; M. B. McGowan, Inc., San Francisco, \$42,485; Barrett & Hilp, San Francisco, \$43,517. Contract awarded to Healy-Tibbitts Const. Co., San Francisco, \$26,433.

BUTTE COUNTY—Approaches to Pine Creek Bridge, about 13 miles north of Chico, to be graded and surfaced with bituminous treated crushed gravel or stone. District III, Route 3, Section D. E. F. Hilliard, Sacramento, \$13,865; Hemstreet & Bell, Marysville, \$14,932. Contract awarded to A. G. Raisch, San Francisco, \$12,441.

KERN COUNTY—Between one mile and two miles south of Delano, about 1.1 mile to be graded and surfaced with bituminous treated crushed gravel. District VI, Route 4, Section F. L. A. Brisco, Arroyo Grande, \$29,158; Griffith Co., Los Angeles, \$31,875; Tiffany Const. Co., San Jose, \$32,030. Contract awarded to Granite Const. Co., Ltd., Watsonville, \$27,339.

LOS ANGELES COUNTY—Eight structures on N Street in City of Los Angeles. District VII, Route 60. Oscar Oberg, Los Angeles, \$66,989; Byerts & Dunn, Los Angeles, \$64,677; Kovacevich & Price, Inc., South Gate, \$63,906; George Hess, Los Angeles, \$61,777; Bannister-Field Co., Ltd., Fred E. Potts Co., Los Angeles, \$60,482; R. R. Bishop, Long Beach, \$60,668; Oswald Bros., Los Angeles, \$67,717; Lynch-Cannon Engineering Co., Los Angeles, \$63,793; Dimmitt and Taylor, Los Angeles, \$66,723. Contract awarded to C. Bongiovanni Const. Co., Los Angeles \$58,888.

LOS ANGELES COUNTY—Overhead crossing in the city of Los Angeles over tracks of Southern Pacific Company spur to Hercules Powder Company. District VII, Route 157. Bannister-Field Co. Ltd., & Fred E. Potts Co., Los Angeles, \$41,939; J. R. Lippincott, Los Angeles, \$49,983; C. Bongiovanni Const. Co., Los Angeles, \$48,923; George Hess, Los Angeles, \$53,883; Dimmitt & Taylor, Los Angeles, \$43,717; Andy Sordal, Long Beach, \$49,017; Theo. A. Beyer Corp., Los Angeles, \$45,716; Sharp and Fellows Contracting Co., Los Angeles, \$46,716; H. M. Baruch Corp., Ltd., Los Angeles, \$49,257; Byerts & Dunn, Los Angeles, \$44,353. Contract awarded to J. L. McClain, Los Angeles, \$41,587.

LOS ANGELES COUNTY—At San Gabriel River Bridge near Whittier, constructing timber pile current deflectors at down stream ends of five bridge piers and clearing channel of obstructions. District VII, Route 2, Section D. Wm. Hess, Los Angeles, \$5,522; Geo. J. Bock & Son, Los Angeles, \$5,722; Creighton, Inc., Los Angeles, \$5,827; R. R. Bishop, Long Beach, \$5,961; Lynch-Cannon Engineering Co., Los Angeles, \$6,330; Gist & Bell, Los Angeles, \$6,340; George Hess, Los Angeles, \$6,860. Contract awarded to E. G. Perham, Los Angeles, \$5,370.

MADERA COUNTY—Between Hawkins School and Oakhurst, about 4.1 miles grading. District VI, Route 125, Section D. Larsen Bros., Sacramento, \$152,730; Fredrickson & Watson Const. Co., Fredrickson Bros., Oakland, \$170,036; Hemstreet & Bell, Marysville, \$159,334. Contract awarded to Yglesias Bros., Inc., San Diego, \$131,357.

MERCED COUNTY—Between westerly boundary and $3\frac{1}{2}$ miles east, about 3.3 miles to be graded and surfaced with bituminous treated crushed gravel or stone (road mixed). District X, Route 32, Section A. George Pollock Co., Sacramento, \$198,096; United Concrete Pipe Corp., Los Angeles, \$250,724; Fredrickson & Watson Const. Co. and Fredrickson Bros., Oakland, \$173,869; Union Paving Co., San Francisco, \$224,463; Peninsula Paving Co., San Francisco, \$197,179. Contract awarded to von der Hellen & Pierson, Castaic, \$153,769.

RIVERSIDE COUNTY—Between Indio and Shavers Summit, about 24.3 miles to be graded and central portion treated with fuel oil. District XI, Route 64, Sections H, I. Macco Const. Co., Clearwater, \$571,048; Griffith Co., Los Angeles, \$615,712; Jahn & Bressi Const. Co., Inc., Los Angeles, \$519,338; United Con-

crete Pipe Corp., Los Angeles, \$534,243; Bechtel Co., San Francisco \$546,286. Contract awarded to Fredrickson & Watson Const. Co., and Fredrickson Bros., Oakland, \$456,436.

SACRAMENTO COUNTY—Widening bridge across American River at 16th Street one mile north of Sacramento and grading and surfacing approaches. District III, Route 3, Section B. Rocca and Caletti, San Rafael, \$160,911; M. B. McGowan, Inc., San Francisco, \$158,434; Bodenhamer Const. Co., Oakland, \$149,776. Contract awarded to Lord and Bishop, Sacramento, \$126,319.

SAN BERNARDINO AND RIVERSIDE COUNTIES—Painting about 608 miles of traffic stripe. District VIII. B. G. Carroll, San Diego, \$5,223. Contract awarded to Edwin Anderson, San Francisco, \$4,894.

SAN DIEGO COUNTY—Three bridges, one across South Sweetwater Channel, one across Otay River and one across North Sweetwater Channel. District XI, Route 2, Section F. Lynch-Cannon Engineering Co., Los Angeles, \$65,713; George Hess, Los Angeles, \$64,690; Walter Trepte, San Diego, \$72,594; Byerts & Dunn, Los Angeles, \$70,108; Sharp and Fellows Contracting Co., Los Angeles, \$66,407; R. R. Bishop, Long Beach, \$66,793; Jerome K. Doolan, Pasadena, \$69,669. Contract awarded to V. R. Dennis Const. Co., San Diego, \$63,903.

SANTA BARBARA COUNTY—Two bridges in the City of Santa Barbara, one across Mission Creek near Figueroa Street consisting of one 38-foot span, the other across Mission Creek near Micheltorena Street consisting of one 40-foot span. District V, Route 2. Bodenhamer Const. Co., Oakland, \$51,498; J. E. Hadcock, Ltd., Pasadena, \$57,186; Weymouth Crowell Co., Los Angeles, \$45,293; George Hess, Los Angeles, \$48,483; Jerome K. Doolan, Pasadena, \$45,694; Theo. A. Beyer Corp., Los Angeles, \$50,712; Oscar Obert, Los Angeles, \$50,519; R. R. Bishop, Long Beach, \$47,919; Sharp and Fellows Contracting Co., Los Angeles, \$47,226; C. Bongiovanni Const. Co., Hollywood, \$51,676. Contract awarded to Lynch-Cannon Engineering Co., Los Angeles, \$44,439.

SANTA CLARA COUNTY—Between San Felipe and Bell Station, about 0.4 mile roadway excavation. District IV, Route 32, Section B. Rocca & Caletti, San Rafael, \$12,000; O. G. Ritchie and W. E. Karstedt, San Jose, \$11,300; W. H. Hauser, Oakland, \$12,000; J. L. Conner, Monterey, \$9,120; Meyer Rosenberg, Inc., San Francisco, \$11,600; Contoules Const. Co., San Francisco, \$11,200; A. J. Raisch, San Francisco, \$11,600; Garcia Const. Co., Irvington, \$12,400; Granite Const. Co., Ltd., Watsonville, \$14,500. Contract awarded to L. C. Karstedt, Watsonville, \$6,800.

SISKIYOU COUNTY—Between Moffett Creek and Forest Home, about 7.5 miles to be graded and surfaced with untreated crushed gravel or stone. District II, Route 82, Section D. Contract awarded to Hemstreet & Bell, Marysville, \$48,361.

STANISLAUS COUNTY—Between one-half mile south and one north of Turlock, about 2.2 miles to be graded and paved with asphalt concrete. District X, Route 4, Section A. Heafey-Moore Co., Oakland, \$93,722; A. Teichert & Son, Inc., Sacramento, \$94,212; United Concrete Pipe Corp., Los Angeles, \$94,401. Contract awarded to Union Paving Co., San Francisco, \$74,555.

TULARE COUNTY—Between Visalia and Merryman, about 8.1 miles to be graded and paved with asphalt concrete. District VI, Route 10, Section C. Southern California Roads Co., Los Angeles, \$299,622; Union Paving Co., San Francisco, \$306,198. Contract awarded to Basich Bros., Torrance, \$265,811.

VENTURA COUNTY—Between Beetox and Santa Clara River, about 3.3 miles to be graded and paved with asphalt concrete. District VII, Route 2, Section C. Griffith Co., Los Angeles, \$56,790; C. O. Sparks, Los Angeles, \$55,581; Basich Bros., Torrance, \$48,790. Contract awarded to Oswald Bros., Los Angeles, \$46,670.

YOLO AND SACRAMENTO COUNTIES—"T" Street Bridge across Sacramento River, widening curves to approximately 22 feet. Lord and Bishop, Sacramento, \$11,950; Campbell Construction Co., Sacramento, \$13,250. Contract awarded to M. A. Jenkins, Sacramento, \$11,850.

H. A. Hopkins Given Appreciation Dinner for Public Service

CHAIRMAN HARRY A. HOPKINS of the California Highway Commission was the recipient of a remarkable testimonial of appreciation for public services rendered by him to his city and the State as an unsalaried official when more than 300 people from all sections of California attended a banquet given in his honor at Taft, March 16th, under the joint auspices of the Taft Chamber of Commerce, Kiwanis and Rotary clubs.

Stanley Abel, Kern County supervisor, was toastmaster and delegations were present from San Francisco, Santa Barbara, Salinas, Tulare, Fresno, Maricopa, Fellows and McKittrick. The speakers included Director Earl Lee Kelly of the Department of Public Works, O. A. Kammers, former president of the Kern County Chamber of Commerce, Highway Commissioner Timothy A. Reardon and other State and civic officials and business associates and friends of the guest of honor.

ARRANGED AS SURPRISE

Mr. Hopkins had just returned from a trip to Salt Lake City where he represented Governor Rolph at a conference of Western States governors and was entirely surprised and greatly moved by the demonstration of esteem, particularly when it climaxed in the presentation to him of a fine watch.

The following editorial comment on the affair appeared in the *Coalinga Daily Record* under the caption "Yardstick of Citizenship":

AN EDITOR'S TRIBUTE

"By their good deeds ye shall know them."

One of the finest tributes that it has ever been our privilege of witnessing paid to a living man—we have heard and seen many paid to the departed—was tendered Harry A. Hopkins at Taft, last Friday evening, when more than three hundred citizens from all over the State assembled at an appreciation dinner in his honor.

The affair was tendered Hopkins in recognition for his service, not only to Kern County, but to the remainder of the State as well, as chairman of the State Highway Commission, for as such the Taftian has recognized the desires and needs of every section of California.

Men from all parts of the valley and State gave verbal expression of their high regard to and for the man who "came from the sagebrush" to become the most popular person ever to have served as chairman of the State commission.

It was a demonstration long to be remembered by every one present and one that will stand out in



H. A. HOPKINS

the hearts and memories of Mr. and Mrs. Hopkins as the most pleasurable occasion of their lives.

Their friends paid tribute to them while they were living and made them realize that after all a service to others is of more value and greater satisfaction than service to one's self.

The lives of Mr. and Mrs. Hopkins have been exemplification of that type of citizenship.

They have been measured by their good deeds.

Three Engineers Win Promotions in Rank

Several promotions in rank of members of the engineering staff of the Division of Highways have occurred in the past month.

James G. Standley, who has been acting as Administrative Assistant Engineer on the headquarters staff, has been made Principal Assistant Engineer.

James W. Vickrey, who has been Acting District Engineer of District 1 at Eureka, has been given the full rank of District Engineer and the same honor has been conferred upon R. M. Gillis, who has been Acting District Engineer at Fresno.

Ever notice what wonderful poker hands you get when you are playing bridge?

Investigation Shows 55% Loss of Water in Santa Ana Canyon

EDWARD Hyatt, State Engineer, announces the release of Bulletin No. 44, dealing with one phase of the work of the Division of Water Resources in the South Coastal Basin Investigation and entitled "Water Losses under Natural Conditions from Wet Areas in Southern California."

Part I of the bulletin deals with "Consumptive Use of Water by Native Plants Growing in Moist Areas of Southern California" and consists of (1) determinations of such use in the valley of Santa Ana River and in the Coastal Plain of Orange County; (2) along the Mojave River near Victorville, and (3) the loss of water in Coldwater Canyon near Arrowhead Springs.

SALVAGING PLANS FEASIBLE

Part II of the bulletin deals with "Ground Water Supply and Natural Loss in the Valley of Santa Ana River between Riverside Narrows and Orange County Line" and consists of a determination of the amount of water lost in that area which might be recoverable in whole or in part.

This bulletin shows definitely the large waste of water now occurring in such areas. It does not point to methods of salvaging the water but in view of the large value of water in southern California there is little doubt that with proper development this water could be saved in large part at a cost which would make it economically feasible. The water in the mountain canyons could be saved by diverting the stream and piping it down the canyon in the same way as the city of San Bernardino now operates in Devil Canyon.

In areas such as that above the Bunker Hill Dike along Santa Ana River the water now wasted could be saved by lowering the water table and the same is true of the area below Riverside Narrows in the Lower Santa Ana Canyon. In this latter area the report shows that there are 4040 acres of land subject to these losses and that in 1931, 17,500 acre-feet was lost in this area while in 1932, 16,300 acre-feet was lost.

LOSS OF FIFTY-FIVE PER CENT

During the period from May to September these losses averaged in the summer of 1931-32, 55 per cent of all the water that entered the valley between Riverside Narrows and Prado, or in other words the aver-

New "V" Type Snow Plow Proves Fast and Effective Equipment

(Continued from page 20)

The "V" type speed plow, having a five-foot vertical height and eleven-foot wing spread, has demonstrated its effectiveness wherever road alignment permits of fast operation. This plow will handle two to three feet of loose snow without pause, and is capable of bucking through drifts four to six feet in height. The side-wing aids materially in furthering the outward disposal of the snow carried upward by the "V."

This unit is particularly valuable at locations where the season's fall does not exceed six feet, though occasional heavy falls and drifts can be expected.

While the present snow season has been comparatively light, its cost has not been lowered commensurately, as much of the labor and equipment required must be held on hand to meet any emergency which might arise.

NILAND-MECCA ROAD A RELIEF PROJECT

(Continued from page 19)

present. The rather modest \$63,000 to be expended over some forty miles of desert rolling trail is expected to widen the roadbed to at least 24 feet, to provide a light gravel layer where most necessary and an oil mix surface 12 feet wide over the entire distance.

The alignment will be greatly improved and guard rail provided on such of the 120 existing small bridges as are usable on the revised alignment. Drainage on new grade will be secured by dips until adequate funds are available for structures.

Under day labor the work was started without delay and is proceeding largely with hand and team methods to conform with its intention as a relief project. It is expected that the construction will be completed by July 1, 1934.

age summer loss was 1640 inches of water and the average loss for the entire two years including the winter also was almost 1200 inches.

The conclusions in both parts of the bulletin are the results of intensive measurements of evaporation and stream flow extending over two or more years.

STATE OF CALIFORNIA
Department of Public Works

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DIVISION OF PORTS



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

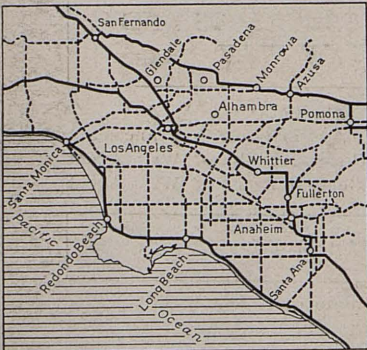
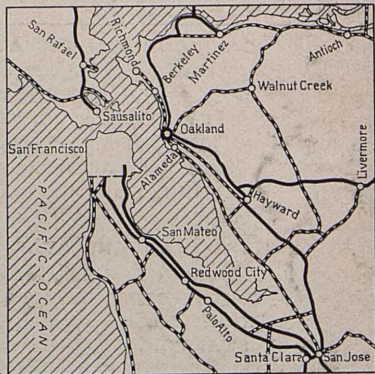
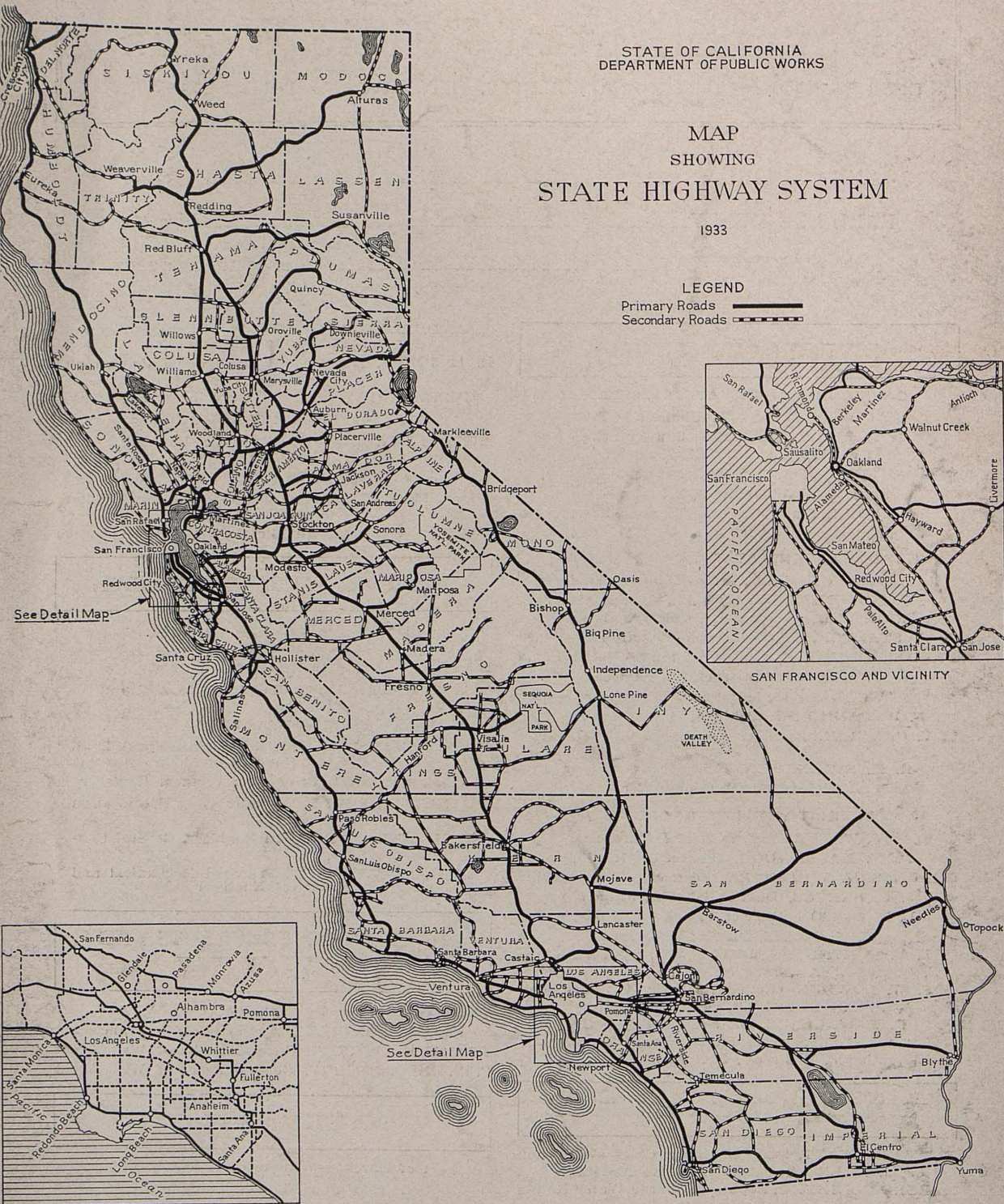
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

MAP
SHOWING
STATE HIGHWAY SYSTEM

1933

LEGEND

Primary Roads 
Secondary Roads 



D50 Illuminant, 2 degree observer

L*	39.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	87.34	82.14	72.05	62.15
a*	13.24	18.11	-4.34	-13.80	9.82	-33.43	34.26	-11.81	-0.40	-0.60	-0.75	-1.06	-1.19	-1.07	-1.07
b*	15.07	18.77	-22.29	22.83	-24.49	-0.35	59.60	-49.07	11.81	0.23	0.21	0.43	0.28	0.19	0.19
Density										0.04	0.09	0.15	0.22	0.36	0.51

Golden Thread

100	49.25	38.62	28.86	16.19	8.29	3.44	31.41	72.46	29.37	54.91	43.96	82.74	52.79	50.87
200	-0.16	-0.18	0.54	-0.05	-0.81	-0.23	20.98	-24.45	16.83	13.06	-38.91	52.00	3.45	50.88
300	0.01	-0.04	0.60	0.73	0.19	0.48	-19.43	53.93	68.80	-89.8	30.77	30.01	-12.72	-28.46
400														
500														
600														
700														
800														
900														
1000														

Colors by Munsell Color Services Lab

Don Williams