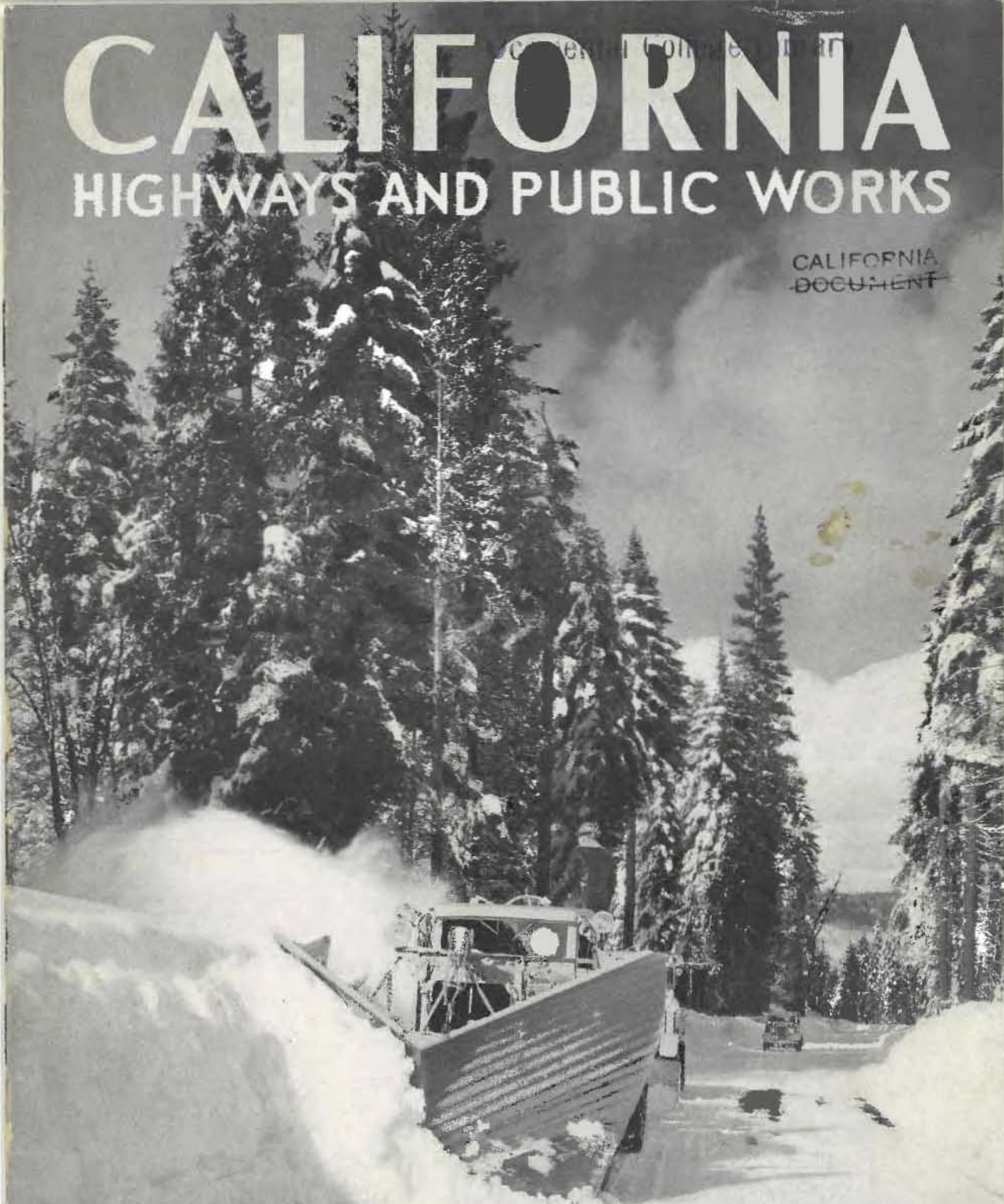


CALIFORNIA

HIGHWAYS AND PUBLIC WORKS

CALIFORNIA
DOCUMENT



Snow Plow Clearing the Tahoe-Ukiah Lateral

Official Journal of the Department of Public Works
FEBRUARY ~ 1935

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2,950 Miles of Highway Improvements in 19 Months is Record of this Biennium

Construction and Maintenance Work put Under Way by February 1st Totalled \$46,816,500 of Federal and State Funds, Completing 78% of Program in 79% of Two Year Period

By **GEORGE T. McCOY**, Assistant State Highway Engineer

THE CURRENT biennium, including the eighty-fifth and eighty-sixth fiscal years of California's statehood, has seen the greatest activity in highway construction in the history of the State. State funds available for road improvement have been augmented by Federal appropriations, with the result that an unprecedented construction program on the State highway system has been possible.

As one of the outstanding methods in the national program for the relief of unemployment, the Federal Government established the policy of intensive public works construction. As a unit in this policy, under the 1933 National Industrial Recovery Act, Congress appropriated \$400,000,000 as Federal aid to the various States for construction on State highway systems, between July, 1933, and July, 1934. Under the Hayden - Cartwright Act an additional \$200,000,000 was appropriated for apportionment to the States to carry the construction program on to June 30, 1935. After this date regular Federal aid apportionments under this act will become available.

Of these two appropriations California was apportioned \$15,607,354 under the NIRA and

\$7,932,206 under the 1935 grant of the Hayden-Cartwright Act.

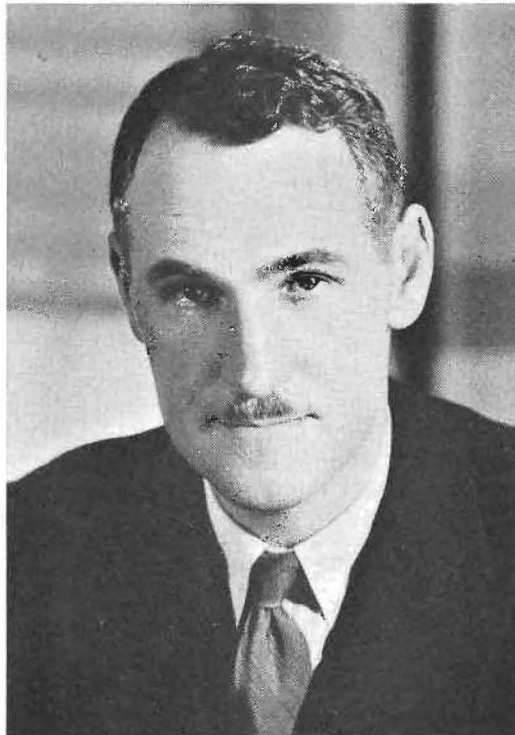
The acts appropriating these amounts contained provisions which required the various States to furnish the necessary rights of way, assume preliminary engineering costs, etc., which will approximate \$3,800,000 of State

highway funds in California in order to make the Federal grants available. Further provisions of the act provided for a wide distribution of the funds.

In selecting projects, cognizance had to be taken of the time element so that right of way negotiations, difficult engineering problems, and other factors involved would not delay the placing of the work under contract.

These two apportionments from the Federal Government, together with \$18,475,000 in State funds, have provided the Division of Highways with a major construction budget totaling \$42,284,600 for the eighty-fifth-eighty-sixth fiscal years (July 1, 1933,

to June 30 1935). With nineteen of the twenty-four months in the biennium past, construction projects in the amount of \$32,873,800 have been put under way or are now advertised for bids. Thus during 79 per cent



GEORGE T. McCOY

(Continued on page 10)

State Crews Keep 4,500 Miles of Roads Open During Worst Storm in 12 Years

By **GEORGE F. HILLESOE** and **NELSON T. BANGERT**, Assistant Maintenance Engineers

AFTER having enjoyed a winter of exceptionally light snowfall last year, the maintenance forces of the State Division of Highways were once again pressed to the limit in keeping snow area routes open to traffic. Exceeding in intensity and area any storm experienced since the department inaugurated the policy of keeping open all important roads, the "season's worst storm" started on January 7, reached its peak between January 13 and 18, and did not subside until January 20.

The range of the storm was exceptional, with four inches of snow falling at Eureka, where a measurable depth is seen only once in a generation, to a maximum fall at "Old Reliable," Donner Summit, where in four days the snow pack was increased by 88 inches. The manner in which the men of the fighting forces responded to the emergency in conquering the "Snow King" is indeed a credit to the organization and must in all sense give them the satisfaction of a job well done.

The following abstract from a district report of the storm amply characterizes the manner in which the employees responded:

"During the storm, superintendents, foremen, and leadingmen lost all track of days and hours. Truck drivers and equipment operators took their equipment out and kept it moving until a round trip was made, or until they were relieved."

WORST IN TWELVE YEARS.

The storm, conceded in places to be the worst in twelve years, was general throughout the State, and deposited snow in measurable depths to the 1200-foot level in the north and to the 4000-foot level in the south. Adding to the fierceness of the storm was the accompanying wind, more particularly in the Sierras and the east of the Sierra region, reaching at times a hurricane velocity of 60 miles an hour. Coupled with temperatures which in places ranged to 30 degrees below zero, the storm, for a time, gave the State more of the arctic touch than is attained in ordinary winters.

Fortified with the best layout of equipment yet available since the advent of snow removal, totalling some 293 pieces, and ranging from

"V" push plow motor graders to large auger-blower type rotaries, the department was able to keep open to traffic 4500 miles of road on which the snow pack reached a foot or more in depth. In addition, many tow graders, tractors, and power graders were pressed into the service of clearing lighter falls.

A CONTINUOUS PERFORMANCE

Equipment was not allowed to stop, operation being continuous in places for as much as 175 hours, with only time out for servicing. A vital help during the emergency was the equipment purchased last fall to replace obsolete units. Broken equipment was repaired and put back into operation with the least possible delay, repairs at times being made at night in a snow bank with only the aid of a flashlight.

As usual, the greatest trouble was experienced at points unprotected by forest or snow fence. Howling winds re-formed drifts on roads almost as rapidly as they were cleared. The value of the drift fence already installed was very evident and demonstrated the necessity of additional installations.

In District I, where ordinarily snow removal is a minor problem, the snowfall reached a maximum of 104 inches on Oregon Mountain, a record fall for that location. In the heavy timbered areas, the weight of snow brought down many large trees which further impeded snow removal operations. Along Willow Creek, 62 trees fell across a two-mile section of highway. Some of these trees were of such size as to necessitate the use of powder in their removal.

SNOWED IN SEVENTEEN DAYS

Except for a small area in Tehama County, snow removal was necessary on all highways in District II. While the snowfall did not in any place reach record depths, the storm was unusual in that snow fell every day from January 3 to January 20. The greatest trouble was experienced in the high-plateau sections east of the mountains, where high winds and resulting drifts were responsible for the blocking of several roads for short periods.

(Continued on page 28)



1



2



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4

SNOW-FIGHTING CREWS AND EQUIPMENT did valorous work in keeping the highways open during the 20-day January storm that attained blizzard proportions in the mountain areas. Nos. 1 and 2—big rotary plow working on State Route 38 near Homewood, Placer County. No. 3—Clearing the Tahoe-Ukiah lateral between Nevada City and Bear Valley. No. 4—Disposing of a 6-foot fall between Dunsmuir and Mt. Shasta City.

Building a Highway Over Santa Ynez Range Via Historic San Marcos Pass

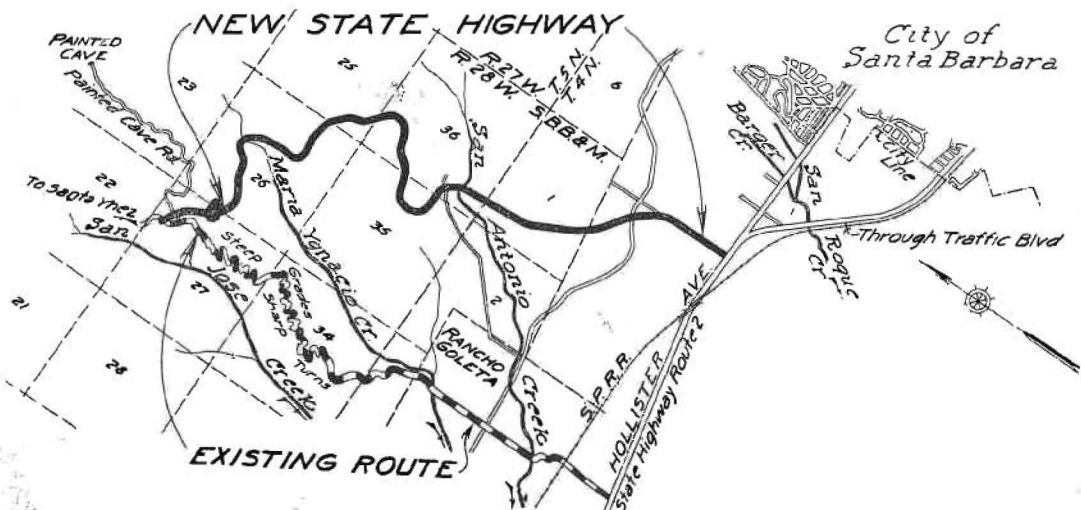
By H. L. COOPER, Acting District Office Engineer

ALONG the rugged, steep slopes of the Santa Ynez mountain range immediately north of the city of Santa Barbara, the historic old San Marcos Pass Road is being reconstructed largely on new alignment. One of the most scenic and interesting secondary routes along the coast the very steep grades and many sharp turns have long discouraged its use as an alternate mountain route to the Coast Highway through the city.

When the improvement now under way is completed, together with the proposed work in the vicinity of Los Olivos and the little mission town of Santa Ynez, the motor-

the top of the range through San Marcos Pass, the road thence follows down the Santa Ynez River Valley and through the small communities of Santa Ynez and Los Olivos, rejoining the Coast Highway at Zaca, about fifty miles north of Santa Barbara.

According to our early California history, it was through this San Marcos Pass and down the southern slope of the mountains that, on Christmas Day, 1846, General Fremont led his small band of soldiers through rain and mud to the capture of Santa Barbara, while the Spanish defenders lay in ambush for him farther westward at Gaviota Pass.



MAP SHOWING ROUTE of San Marcos Pass realignment as compared with present route

ist will have available an alternate route of easy grades and curves, some ten miles shorter than the Coast Highway and replete with beautiful panoramas of mountain and coast scenery.

CROSSES MOUNTAIN RANGE

Known as State Route No. 80, the San Marcos Pass Road was taken into the State system in 1931. It extends northerly from the Coast Highway at a point about two and one-half miles west of Santa Barbara City and follows up a steep ridge on the southern slope of the Santa Ynez Range. Crossing

PANORAMA OF SEA AND CITIES

In addition to affording a mountain shortcut route, this road serves a large and popular vacation and recreational area for the residents of Santa Barbara and vicinity as the near-by canyons contain numerous summer homes and cottages. From points high up on the mountain range, the motorist is afforded delightful views of Santa Barbara and neighboring communities and looking westward, across the ocean, he may behold the distant Santa Barbara Islands.

(Continued on page 15)



SAN MARCOS PASS CONSTRUCTION SCENES. At top a scraper is working on a preliminary fill leading to two 100-foot cuts seen in background. Center picture shows a 100,000 cubic yard fill nearing completion. The bottom view shows three scrapers and a 75 horsepower bulldozer in operation on one of the 100-foot cuts, illustrating the heavy grading work required on many portions of this rugged mountain terrain where a realignment of the existing steep and tortuous highway is now in progress.

Ramona Boulevard a 6-Mile "Airline" Urban Route Without Grade Crossings

By R. C. MYERS, Assistant Engineer, District VII

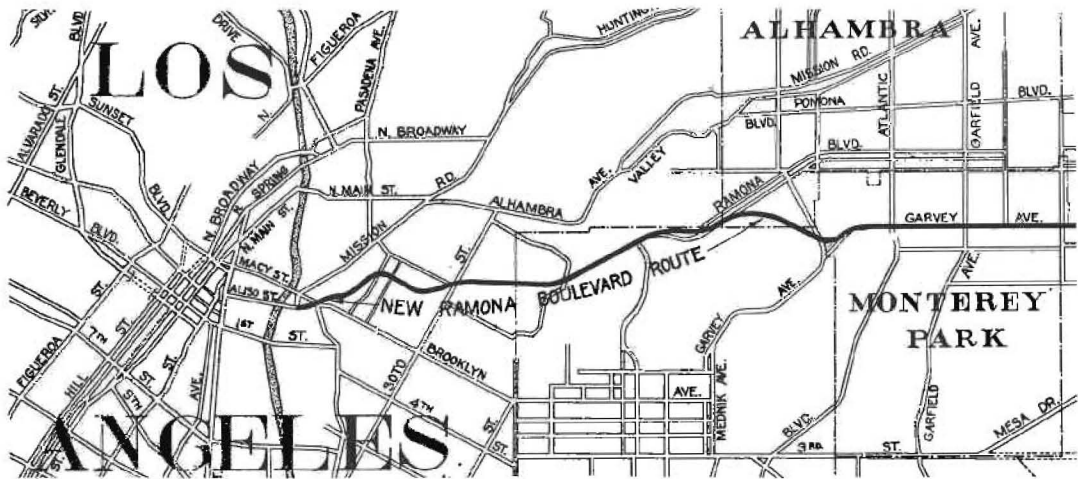
WITHIN the next few weeks the new Ramona Boulevard highway entering Los Angeles from the east will be completed, thus providing traffic with an "airline" entrance from Monterey Park and points east into the Civic Center of Los Angeles.

This project is the final connecting link of the Los Angeles-Pomona route on which construction was begun in 1932 and by which traffic from San Bernardino, Redlands, Riverside and the Imperial Valley aggregating more than 20,000 cars per day, according to

ways and direct connections with only a few relatively unimportant streets. It will be the first highway permitting such an uninterrupted flow of traffic so near the business center of Los Angeles.

All previously existing routes from Los Angeles to Monterey Park were through a maze of heavily traveled intersecting streets and railroad crossings in the industrial district, with the consequent hazard and delay to traffic.

The new route follows along the southerly side of the Pacific Electric Railway Covina



MAP SHOWING ROUTE of new Ramona Boulevard through Los Angeles area.

traffic studies, will be saved \$876,000 annually in operating costs—an amount sufficient to pay the construction cost of the entire route in less than two and a half years.

The Ramona Boulevard link of State highway route 26, as this route is officially known, starts at the intersection of Aliso Street and Mission Road, about three-fourths of a mile east of the Civic Center of Los Angeles, from which intersection connection is made to the Civic Center on Aliso Street.

FREE OF GRADE CROSSINGS

This new boulevard will extend for nearly six miles to Monterey Park having no grade crossings with either railroads or main high-

line to a point outside the city limits of Los Angeles. From this point it cuts across the Midwick Country Club grounds to connect with the westerly end of Garvey Avenue near its intersection with Atlantic Boulevard.

FIVE EXISTING BRIDGES

The advantage of locating the new highway along the Pacific Electric Railway tracks is twofold. In the first place this is by far the best and most direct alignment which can be secured through this section of Los Angeles and in the second place it follows a low canyon where all important cross streets now have bridges over the railroad tracks and yards and new structures can be built to carry

(Continued on page 20)



ALONG THE RAMONA "AIRLINE" HIGHWAY between Monterey Park and Los Angeles. The top view shows a section of the roadway on the grade separation where the new highway crosses Coyote Pass road near Monterey Park. Traffic going southwesterly into Coyote Pass is diverted and passed under the new highway by the road at the left of the picture and thus avoids a right hand turn. The center picture is a view of the long, wide straightaway approaching the concrete bridge that carries Eastern Avenue over the new highway and the Pacific Electric tracks. At bottom is a typical section paralleling the railroad showing the 40-foot pavement, wide oiled shoulders and curbing of this 6-mile stretch of high standard arterial without a grade crossing over which more than 20,000 cars will enter the Los Angeles Civic Center area.

Julien D. Roussel Takes Office as Secretary of Highway Commission

JULIEN D. ROUSSEL, the newly appointed Secretary of the California Highway Commission was born in New York City, descending from a distinguished Huguenot family on his father's side and from early Dutch settlers (the Van Der Veer family) on his mother's side.

His education was secured in the public schools of New York City. He entered the business world early in life, spending his early business years in his home city as secretary to the late James B. Regan, owner of the famous Hotel Knickerbocker, and later with other prominent hotels, including the famous Rector's.

He was active for years in Republican circles in his home State being closely identified with the late George W. Perkins and Col. George Harvey in the celebrated 1916 presidential campaign, during which he was secretary to the candidate, Charles Evans Hughes. Following the campaign, Mr. Roussel assisted in raising the \$5,000,000 endowment fund for the Lincoln Memorial University, for mountain whites, located at Cumberland Gap, Virginia.

DECORATED IN WAR SERVICE

At the outbreak of the war, Mr. Roussel joined the colors and served with distinction in France as a corporal in Company "A," 304th Machine Gun Battalion. For gallantry in action at St. Pierremont, France, he was cited twice in General Orders of his Division and was awarded the Order of the Silver Star, with palm. He also was awarded the Verdun Medal by the French Government, and holds the New York State Honor Medal, together with Victory Medal with three bars.

After his honorable discharge from the Army, he came west to Long Beach, California, which has since been his home and where he has taken a leading part in all civic matters.

After a few years service with the Los Angeles TIMES, he was appointed by the Secretary of State, Charles Evans Hughes, to the United States Foreign Service and assigned to the American Consulate at Smyrna, Turkey, where he served for several



JULIEN D. ROUSSEL

years, being transferred later to the consulate at Prague, Czechoslovakia.

ACTIVE IN CIVIC AFFAIRS

Returning to Long Beach, California, in 1928, Roussel entered the employ of the Union Pacific System and remained there as director of the Travel Bureau until 1932.

Since then he has been active in Republican circles in southern California and is well known to most of the prominent leaders in the State.

He is keenly interested in the development of California's highway system and believes that such development can be furthered by the success of Governor Merriam's highway program.

Mr. Roussel is single and resides at the Sutter Club, Sacramento.

A teacher tells of an excuse which the mother of one of her pupils sent in the other day. The excuse read: "Please excuse Charles. He got wet in the a.m. and was took sick in the p.m."

Supreme Court Decision Greatly Aids Central Valley Water Project

THE State Supreme Court, on January 31st, rendered unanimously an opinion of transcendent importance in the conservation of the waters of the State.

The decision is most timely in clarifying the water law of the State in advance of the commencement of actual work on the great Central Valley water project.

By this opinion, written by Justice Shenk in the case of *Peabody et al. vs. Vallejo*, the Supreme Court declared it to be the policy of this State to conserve its life-giving waters and to put them to beneficial uses.

The court has repudiated the doctrine formerly prevailing and established for over fifty years, which permitted the riparian owner to insist, even though he could not beneficially use the water, that the same must flow past his land, unused and wasted, into the sea.

CONSTITUTIONAL AMENDMENT UPHELD

The decision embodying the new doctrine was made possible by an amendment to the State Constitution passed in 1928, declaring it to be the policy of this State "that the water resources of the State be put to beneficial use to the fullest extent of which they are capable."

In the *Peabody* case, certain riparian owners along Suisun Creek, in Solano County, sought to enjoin the city of Vallejo from impounding the waters of Garden Valley Creek, a tributary of Suisun Creek. The city desired to impound the waters to create a municipal water supply and claimed it could impound such waters without materially injuring the riparian owners.

The riparian owners claimed the right to the full flow of the stream, even while conceding that the larger portion of the waters flowed ultimately into San Francisco Bay. They sought to show that the weight of the full flow of the stream pressed small quantities of water into the strata underlying their lands.

WASTEFUL USE BANNED

Some of the riparian owners claimed the right to the full flow of the stream for the

purpose of flooding their lands and depositing silt thereon. Others desired to use the full flow of the stream to flood their lands to wash out the salt content in the soil. In no uncertain language the court held that such a wasteful use of the water could no longer be countenanced.

The court recognized that the riparian owner is entitled to full protection of his right to use the water for any reasonable beneficial purpose and for any future beneficial use, but unequivocally held that beyond that the right of the riparian to prevent any one else from using the water no longer existed in this State.

The decision culminates the struggle that those who have desired to conserve the waters of the State have waged for many years, but were prevented by legal limitations, which, under the old law, prevented the impairment of the riparian right. In 1926, in accordance with the then existing law, the Supreme Court decision in the *Herminghaus* case, virtually gave to the riparian owners complete control of the waters in the streams of this State.

Largely as a result of that decision the Constitution was amended in 1928 as above indicated. The Supreme Court promptly acted under this new constitutional authority and, in the case of *Gin Chow vs. Santa Barbara*, rendered several years ago, gave the first indication that the constitutional amendment could be interpreted so as to preserve to every water user every legitimate right, but so as to prevent any owner from insisting on the waste of huge quantities of water yearly.

The decision points the way to the manner in which the waters of this State, particularly in the semi-arid regions, may be conserved, and eliminates many of the legal difficulties which would otherwise have arisen in such projects as the Central Valley water project.

In behalf of the State, briefs were filed by Messrs. Spencer Burroughs and Henry Holsinger, attorneys for the Division of Water Resources, as "friends of the court" on behalf of the division, and C. C. Carleton, chief attorney, Department of Public Works.

Biennium Records Outstanding Work

(Continued from page 1)

of the biennium, 78 per cent of the programmed construction has been completed or set in motion.

It is anticipated that with the present speed of the division in advancing projects to bids, the remaining 22 per cent of construction projects will be under way before July 1st.

MAINTENANCE KEEPS PACE

Progress during the biennium on maintenance work has paralleled that of construction, and by February 1, 1935, work orders amounting to approximately \$13,942,700 had been written, leaving only some \$3,779,300 of the \$17,722,000 originally budgeted for maintenance and betterments during the biennium.

The following summations set forth in tabular form the figures given above:

CONSTRUCTION AND MAINTENANCE BUDGET

State funds.....	\$18,745,084
NIRA apportionment.....	15,607,354
Subtotal (Legislative budget).....	\$34,352,438
Hayden-Cartwright Act apportionment	7,932,206
Total construction budget.....	\$42,284,644
Maintenance and betterments—	
(Legislative budget).....	17,722,000
TOTAL	\$60,006,644

CONSTRUCTION AND MAINTENANCE TO FEBRUARY 1, 1935

Construction put under way.....	\$32,590,400
Projects advertised for bids	283,400
	\$32,873,800
Projects to be advertised before July 1.....	9,410,800
TOTAL CONSTRUCTION	\$42,284,600
Maintenance and betterment allotments	\$13,942,700
Remaining for maintenance..	3,779,300
Total maintenance and betterments	\$17,722,000
TOTAL	\$60,006,600

The value of permanent improvement to the State highway system accomplished by the \$32,873,800 allotted for construction may best be judged from the following summary of work put under way and advertised since July 1, 1933:

Type of Improvement	Miles	Amount
Permanent type pavement.....	286.3	\$12,390,400
Bituminous treated crushed rock surfacing	239.8	4,523,500
Untreated crushed rock surfacing	56.6	996,400
Graded roadbed.....	225.8	6,100,100
Oiled roadbed and shoulders.....	2,141.4	1,394,800
Bridges and grade separations.....	(113)	4,847,700
Miscellaneous contracts.....*	(1,495.3)	600,700
Minor improvements.....	---	671,800
Miscellaneous day labor.....	---	1,348,400
Totals	2,949.9	\$32,873,800

* Traffic stripe (not included in mileage total).

To advance this great program has required the persistent and unified effort of the entire State highway organization. Early in the biennium an intensive construction program was put under way with the call for bids on August 25, 1933, for fifty State highway contracts aggregating more than \$4,000,000.

THOUSANDS PUT TO WORK

While the work during the ensuing months did not entail the high pressure which attended the months of August and September, 1933, nevertheless a large number of contracts have been prepared, advertised, and awarded since that time with the result that the great amount of work listed above has been accomplished and the desired result of putting thousands of Californians to work has been attained.

To those outside an organization such as the Division of Highways, it is difficult to realize the vast amount of work necessary to put under way a construction program of the magnitude of the one now nearing completion. Each project, large or small, requires careful planning, consisting of comprehensive surveys in the field; expert design of the proposed work; accurate computation of quantities of materials and work involved; preparation of drawings and plans; writing and assembling of specifications; tests of proposed materials and the settlement of negotiations for the required right of way.

COORDINATED EFFORT REQUIRED

Each of these portions of the work requires time and the labor of men with technical training and experience. The executive staffs in the highway districts and central office organization of the division must schedule

Large Construction Projects Under Way in Southern California

(Continued from preceding page)

and dovetail the work so that the many phases may be consummated in proper order and the preparation of the projects for contract accomplished with a minimum of delay.

That the Division of Highways has put under way so great a volume of work and is advancing down the last few months of the biennial period, assured of accomplishing its task, in itself, speaks for the loyal support and cooperation of the individual members of the organization. The funds supplied by the State and Federal governments for highway construction as a means of relieving unemployment and the efforts extended by the division have made these funds available to the many thousand Californians who have been employed on construction throughout the entire State.

U. S. BUREAU VALUABLE AID

In the administration of the National Industrial Recovery Act and the Hayden-Cartwright bill, the Secretary of Agriculture through the U. S. Bureau of Public Roads was assigned the task of approval of various States' programs, plans and specifications for individual projects, checking of progress estimates payable to contractors and other functions. This Federal agency, through its many years of experience in highway construction, its efficient and well-manned organization, rendered valuable assistance and the closest cooperation to the State in placing the program under way and following the multitude of contracts through to completion.

SOME OUTSTANDING PROJECTS

Some of the larger and more important construction projects which the activity of the division has accomplished for the citizens of California during the biennium may well be listed here.

The Ridge Route alternate, which eliminated the notorious and crooked Ridge Route from the Los Angeles-Sacramento arterial, was completed, as was the construction of the new section of the famous Redwood Highway between Cloverdale and Hopland in Sonoma and Mendocino counties, and an important part of the Redding-Alturas lateral in Lassen and Modoc counties.

In the San Francisco Bay area, construc-

TRUCKMEN JAILED FOR USING HIGHWAY POSTS TO MAKE A CAMP FIRE

Maintenance Superintendent Glenn H. Cheeseman of Saugus reports that as he was proceeding up the Ridge Route Alternate on the morning of November 26, he found that three 8" x 8" x 5/4" highway sight posts had been slashed in two for firewood, just as a tree would be cut down for such a purpose. Looking across the road he discovered a truck with two men sleeping around the remains of a fire. He awakened them and told them they were under arrest and that they would have to go to Newhall with him. He permitted one of the men to stay temporarily to guard the loaded truck but took the other in before Justice of the Peace Kennedy, who listened to the story and assessed a fine of \$25 and 12 1/2 days in jail. The justice sent one of his officers out and brought in the other man who was similarly fined and imprisoned.

The truck driver phoned for bail money and was released. The owners of the truck were billed for the damage.

tion of the approaches to the mammoth Bay Bridge was begun; five miles of San Pablo Avenue in Oakland, Emeryville, Berkeley, Albany and El Cerrito were widened and paved; construction on the Bay Shore Highway was extended southerly and a portion of the crooked route through the Santa Cruz mountains between Los Gatos and Santa Cruz eliminated by the completion of the new road between Inspiration Point and Scotts Valley.

MAJOR COAST IMPROVEMENTS

Along the coast, the Redwood Highway is being improved by drastic realignment involving heavy grading in Del Norte and Humboldt counties, construction on the Carmel-San Simeon Highway in Monterey County has been materially advanced by both road and bridge contracts, reconstruction of the Coast Route has also been started on the realignment of the notorious Nojoqui Grade in Santa Barbara County and on the section in Ventura County between the Ventura River and the Santa Barbara County line.

In Southern California work on State Route 60, locally known as the Roosevelt Highway has been, and still is, in progress on many sections, including Santa Monica, Torrance to Long Beach and along State Street in Long Beach. The construction of the Firestone Boulevard (Manchester Avenue route between Los Angeles and Anaheim) is nearing completion; and improvement of the

(Continued on page 14)

Aerial Wheels Shuttling Across Bay Will Spin Cables For Big Bridge

WITHIN a month a wire rope will be drawn across a mile of water between San Francisco and the concrete center anchorage of the San Francisco-Oakland Bay Bridge midway to Yerba Buena Island. This wire rope will be raised to the tops of Towers W-2 and W-3, and will be the first support of the first of the two catwalks to be built over the bridge tower tops preparatory to spinning the cables of the first of the twin suspension bridges between San Francisco and Yerba Buena Island.

State Director of Public Works Earl Lee Kelly, and perhaps Governor Frank F. Merriam, chairman of the California Toll Bridge Authority, will be with Chief Engineer C. H. Purcell to witness the stretching of the first connection between these two towers of the San Francisco-Oakland Bay Bridge.

This wire rope will be drawn across by a reel barge of the Columbia Steel Company, laid in the water, and then elevated to its place by means of derricks on the tops of the towers.

FOR TEMPORARY CATWALKS

A mesh of steel will be laid between four such cables which, with hand rails, will constitute the temporary catwalk upon which State engineers, inspectors, and workmen will string the 17,464 parallel steel wires which comprise one of the two cables which will eventually support the double-deck San Francisco-Oakland Bay Bridge over the West Bay crossing.

After the construction of this catwalk an endless cable will be erected with two 5-foot diameter spinning wheels attached to it. At this time the contractors will move 16-ton spools of cable, each holding sixty miles of wire, to the Rincon Hill anchorage, San Francisco, and the concrete center anchorage in the midwest bay.

These spinning wheels will be shuttled swiftly (perhaps 600 feet per minute) across the mile course between Rincon Hill and the center anchorage, over the tops of the towers in the same sweeping curves and deflections that will characterize the final cable.

The amount of the deflection, or curve, in the wires thus strung by the shuttling wheels

will be determined by a guide wire set in place and measured carefully. This guide wire will be drawn many feet higher in the sags than the final cable. This is done so that the weight of the cable will cause it to sag into accurate position.

Calculations made in advance by Chief Engineer Purcell's staff foretell the amount of increase in the sag of the completed cable over the first few wires. Accordingly Chief Engineer Purcell expects to be able to spin these wires so that the weight of the final kegsized cable of 17,464 wires will bear it down to the exact height required.

The increased sag of the completed cable will be brought about by the elasticity of the steel wire cable and the bending of the towers, which were built sufficiently out of perpendicular so that this added weight will correct the towers' unloaded positions.

WORKED OUT IN ADVANCE

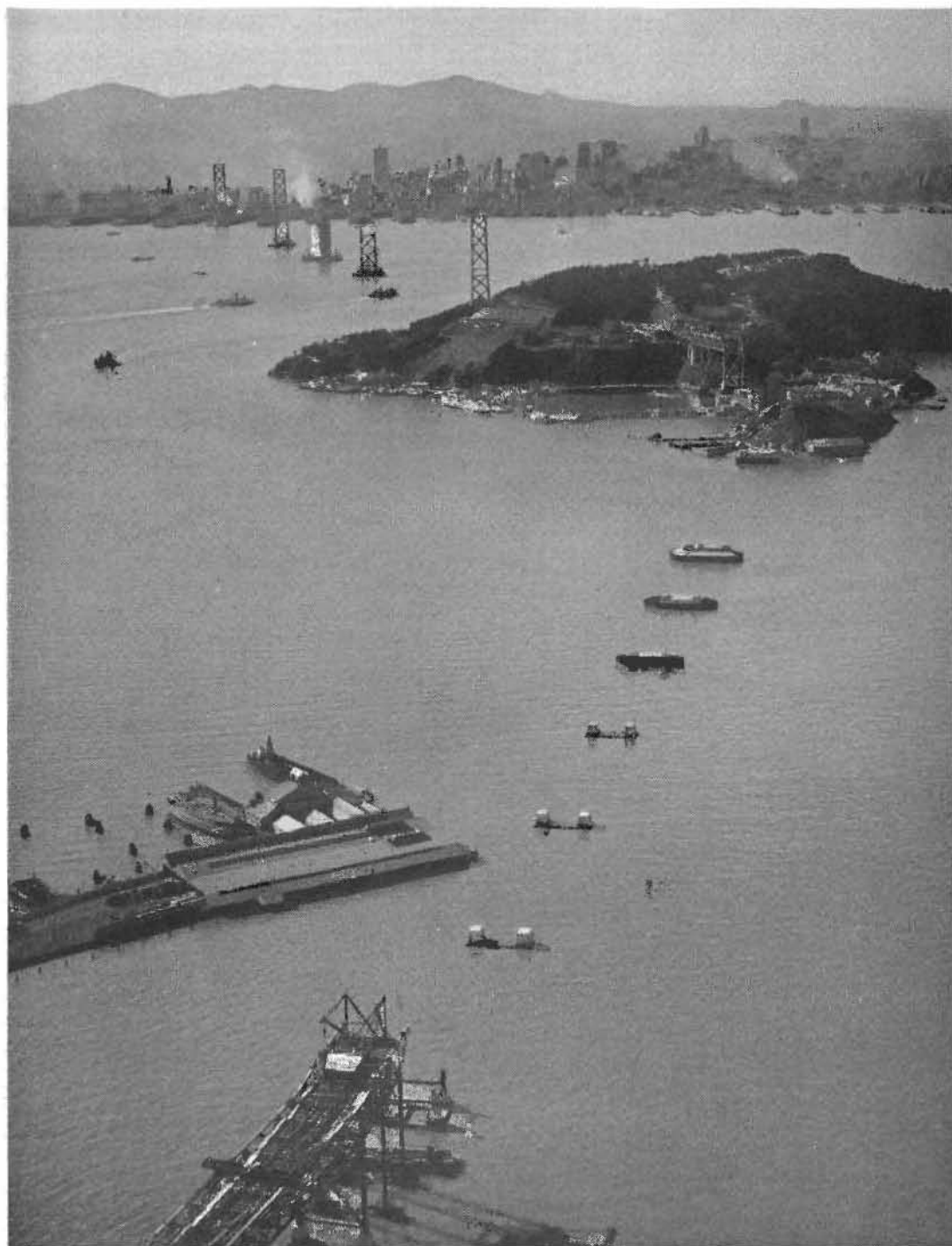
The elasticity of steel, which stretches with less damage to its body than rubber if kept within the limits of its tensile strength, is carefully calculated and accounted for in all these operations. Nothing, Chief Engineer Purcell points out, is left to be worked out on the job, everything being worked out on the blue prints in advance.

And this, the West's first view of major suspension bridge building, will take place during the year 1935 in the West Bay.

In the meantime during this year, the East Bay crossing will be practically completed save for a gap of 576 feet in the center of the 1400-foot cantilever span over the navigable portion of the East Bay waters, just east of Yerba Buena Island.

Fourteen deck-truss spans have already been completed in the East Bay crossing, and the year 1935 will see the five through-truss 500-foot spans erected, together with the four Yerba Buena Island deck-truss spans and the anchor and cantilever arms of the 1400-foot cantilever—in fact, all of the East Bay crossing save the suspended portion in the middle of the cantilever span.

Through Yerba Buena Island a horseshoe-shaped bore will have been completed early



"STEPPING STONES" for the World's greatest bridge. In the foreground are seen the pier foundations for the East Bay crossing extending to Yerba Buena Island with a view of a traveling derrick erecting the last of the 288 foot spans of the Oakland shore superstructure. Erection of span YB-1 on Yerba Buena Island is in progress and beyond the island is seen the entire West Bay Crossing, with Tower W-5 under construction and the city of San Francisco in the background.

3,000 Given Part-time Relief Work

(Continued from page 11)

Ramona Boulevard section of the Los Angeles-Pomona lateral, with its numerous highway grade separations, has been a feature of the biennium.

Reconstruction of the Santa Ana Canyon Road in Orange County, the Jackrabbit Trail in Riverside County and the new viaduct across the yards of a railroad at the entrance of the Foothill Boulevard into San Bernardino are all important improvements.

HEAVY GRADING CONTRACTS

Heavy grading has been undertaken on the Tehachapi lateral in Kern County between Bakersfield and Mojave and on the Fresno-Yosemite route in Madera County.

Two of the most important projects begun during the biennium were the construction of the American Canyon route between the Carquinez Bridge and Cordelia and the massive steel bridge across the Sacramento River at the westerly entrance of the Capitol City. Both of these improvements are on the San Francisco-Sacramento arterial.

Other large projects of the biennium include the construction of a bridge across the Sacramento River at Redding on the new alignment of the Pacific Highway through that city; the beginning of work on the Susanville-Reno road at the State line, and the completion of the easterly connection of the Ukiah-Tahoe lateral with the Sacramento-Truckee road near Emigrant Gap in Nevada County.

MILEAGE ADDED TO SYSTEM

The current biennium has seen many changes which have been of vital import to the people of the State in relation to their State highway system. Laws enacted by the 1933 Legislature affected the extent of the highway system, the use of funds and construction and maintenance procedure.

The addition of approximately 6700 miles of county roads to the State highway system on August 22, 1933, nearly doubled its extent, raising the mileage from 7300 to more than 14,000 miles.

The allocation of one-fourth cent of the State's 2-cent share of the 3-cent gasoline tax to incorporated cities altered the financial set-up of the division.

The greatly increased mileage of the State

system presented the maintenance department with the problem of organization readjustment, which has been ably met with a spreading of territory under the jurisdiction of superintendents, and a minimum outlay for additional equipment.

Maintenance crews were augmented by part time employment providing relief on the basis of a forty hour week, working alternate weeks.

Funds provided for this purpose by the California Highway Commission have been so judiciously expended for employment on part-time crews that approximately 80 cents of every dollar spent on the much needed upkeep of State roads performed by these part-time crews has been paid out in wages to the men. Approximately 3000 men have been kept at work half time for about fifteen of the nineteen months which have passed since the beginning of the biennium.

With this brief panorama of the activities and accomplishments of the Division of Highways in mind, a glance at the position which California holds in respect to the other States of the Union, as shown from statistics compiled in 1934 by the American Association of State Highway Officials, may be of interest.

CALIFORNIA STANDS FIFTH

The cost to the California motorist was only \$5.04 per motor vehicle for license fees and \$17.98 per motor vehicle for gasoline tax. In this regard our State is outstanding, ranking forty-sixth in the lowness of fees and forty-first in low average cost for gas tax. The average motor vehicle fee for the country was \$12.70 and the average cost per motor vehicle for gasoline tax was \$21.80.

The following tabulation shows California's rank in regard to road mileage:

	California Miles	Rank	Total miles in United States
All roads (outside cities)	77,085	18	3,065,254
State highway system	14,019	5	413,268
Miles on State system improved	13,551	4	335,108
Miles pavement on State system	6,665	4	113,564



"HAIRPIN" CURVES ON SAN MARCOS PASS road soon to be abolished by realignment. A beautiful ocean panorama is afforded at this point embracing the Santa Barbara Channel Islands shown by dark line at top of picture.

BUILDING A HIGHWAY OVER SANTA YNEZ RANGE

(Continued from page 4)

With the exception of the lower one and one-half miles, the old road is very crooked with several hairpin turns on grades over 20 per cent and requires second gear travel over certain sections.

The new road now under construction for a length of 5.8 miles is a complete realignment and in general lies about one mile easterly from the old road. The junction with the Coast Highway (Hollister Avenue) is about one and one half miles closer to Santa Barbara than the old intersection, and lies only 1100 feet west of the intersection of the recently completed Santa Barbara through traffic boulevard.

Maximum grade is 6.6 per cent with a general ruling grade in the mountainous stretch of about 5 per cent. The road is of standard 24-foot width with an added two feet each side on fills to accommodate a protective dike

and still afford an effective 24-foot roadbed width.

Wherever practical, daylighting of cuts has been resorted to in order to give greater sight distance and for scenic purposes. Surfacing at the present time will consist of oil mixing the local material and seal coating the surface.

In addition to the heavy grading on the project, 894,000 cubic yards in 5.8 miles, several large drainage structures are being built. Across San Antonio Creek a combination timber and concrete bridge 192 feet long with a 24-foot clear roadway, consisting of eight standard 19-foot timber spans and one 40-foot concrete and steel girder span is being constructed. Also three large reinforced concrete arch culverts under heavy fills are included in the contract, the largest of these giving 102 square feet of opening, is at Maria Ygnacio Creek.

The project is being financed entirely from State funds at a cost of about \$420,000.00 and is scheduled for completion in October, 1935.

International Pacific Highway Means Great Trade Channel For California

By JUSTUS F. CRAEMER, Assistant Director of Public Works

THE International Pacific Highway, which President Roosevelt has stressed as a most important project, extends from Fairbanks, Alaska, along the Pacific slope to Santiago, Chile, and thence across the Andes to Buenos Aires. It will have a length of more than 13,000 miles and will be the longest, continuous motor road in the world.

It is in large part in existence today for of its total length 2300 miles are paved, 879 miles surfaced with lower type material and 2032 miles graded. In addition to the above, there are 5780 miles of trails over which automobiles may be driven in dry weather.

The highway as now completed or projected traverses twelve republics of Latin America, four States of the United States of America, British Columbia and the territories of Yukon and Alaska. The combined area of these political subdivisions served by this highway is 5,107,725 square miles and the population is in excess of 63,000,000.

EXTREMES OF ELEVATION

The highway will reach a minimum elevation of 52 feet below sea level in the Imperial Valley of California and a maximum elevation of more than 14,000 feet in the Andes. More than 50 per cent of the total length will lie at an elevation of over 5000 feet above sea level, yet the climate of the entire region traversed, if the extreme northerly end is excepted, is mild or semitropical and conducive to all year round travel.

The Panama Canal will be crossed on modern power-driven ferries now installed and in operation. Loading and unloading ramps are provided on each side of the canal which rise and fall with the tide.

The writer, less than a year ago, in an interview with the then President of the Republic of Mexico, General Rodriguez, learned that the highway program of the sister republic to our south, provides for the completion of its first international route to the boundaries of the United States this Spring. This all hard surface route will lead from Laredo, Texas, directly to Mexico City, where it joins the West Coast branch of the



JUSTUS F. CRAEMER

International Pacific Highway scouted by the Automobile Club of Southern California several years ago.

The other major highway project of Mexico is that of the West Coast route from Nogales, Ariz., to Mexico City. The improvement of this highway with modern hard surface for its entire length is in process and will require several years more for final completion because of the heavy grade work through the baranca area between Tepic and Guadalajara.

OPENS NEW FRONTIERS

The international Pacific Highway will open up a new frontier for tourist travel and will make accessible by automobile a vast wonderland of historic and scenic attraction. As the motorist proceeds southerly from the United States, he will meet a new and hospitable people. Native costumes and primitive life will add color to the ever-changing

Latin America Seeking Tourist Travel

(Continued from preceding page)

panorama which unfolds before him.

He will find a land of amazing contrasts, Christian temples built upon the ruins of pagan shrines, modern cities built around and upon the ruins of ancient civilizations, active volcanos and mountain peaks reaching elevations of almost 20,000 feet. He will see beautiful lakes and cross many broad and stately rivers. Perforce, his journey will be a leisurely one, for he will be in the land of "mañana."

How much will the international Pacific Highway cost? When will it be open to travel and how will the Latin American countries finance its development, are questions that are asked on every hand. The answers are so fundamentally simple that they leave the questions unanswered for the great majority of people.

COMPLETE IN SIX YEARS

It is impossible to estimate the ultimate cost of the international Pacific Highway although the initial cost to open up the remaining gaps will be suprisingly low. The



THE INTERNATIONAL PACIFIC HIGHWAY crosses the "Rim of the Valley of Mexico at an elevation of more than 10,483 feet.

road will be improved over a period of years and it is expected that the greater part, if not all, will be passable for automobiles within the next five or six years. The cost of the international Pacific Highway will be paid out of tourist revenue.

It is estimated that tourists from the United States spend from \$600,000,000 to \$800,000,000 annually in European travel. Within the past few years, an appreciable part of this annual tourist expenditure has been diverted to Mexico and other Latin American countries. These nations, quick to realize the value of this new source of wealth, are today actively and aggressively reaching out for more and more of this class of travel.

They recognize the necessity for encouraging this class of business by the usual advertising methods and are doing so in a very practical way.

Tourist bureaus have been and are being established in the principal centers of the United States where information concerning



HALL OF THE MONOLITHS, ruins of Mitla on Route of the International Pacific Highway.

(Continued on page 29)

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
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Vol. 13 FEBRUARY, 1935 No. 2

FROM RUTS TO ROADS

Good roads have become so much a part of every day life that little thought of their contribution to our progress and daily comfort is given to them as we drive along over the smooth stretches of gleaming white concrete, or the equally smooth stretches of shiny black asphalt. Only when the opportunity to ride over less satisfactory highways comes to us, is it impressed upon us what "good roads" really mean.

Not long ago it was my privilege to visit one of those sunny and verdant isles in the Caribbean, among the charms of which even moderately good roads are conspicuous by their absence.

A drive out into the country proved to be one of the most hair-raising experiences it has been my questionable privilege to enjoy. After bouncing and jouncing over ruts, stones and bumps in a cloud of dust from the unmaintained dirt road, we left what was quaintly termed "the good road" and proceeded through a series of mud holes, ruts a foot or two deep, down steep embankments and across streams 4 to 6 feet below the road level, the crossing of which was made possible only by the stamina of an American-made car and the efficiency of a native driver whose wizardry at the wheel was close to a miracle.

Between silent but agonized questionings as to the possibility of getting through such an experience alive, or at least intact, my thoughts could not help reverting to the roads of the United States which heretofore had been accepted as a matter of course—not as a cause for general thanksgiving.—By O. E. Potter in *Contractors and Engineers Monthly*.

Southland Routes Being Marked With New State Signs

RAPID progress is being made by signposting crews of the Automobile Club of Southern California on erection of the new-type numbered route signs on main State highways. Seven thoroughfares are now being signed and two more will be posted within the next few weeks.

Consisting of porcelain enamel facing on 18-gauge steel, the new shields have black figures on a white background. This practical method of designating approximately 2000 miles of California highways with some 6000 signs is modeled upon the United States' system of numbering National highways. It was adopted by the State as a means of aiding touring visitors as well as resident motorists and facilitating traffic movement, particularly in metropolitan areas.

At the present time the following routes are being marked in Southern California:

Route 3—Junction of U. S. 101 at Serra Junction of U. S. 101 at El Rio, via Santa Monica.

Route 6—Santa Monica to junction of Route 39 near Fullerton.

Route 10—Junction of Route 3 south of Venice to junction of U. S. 101 at Santa Ana, via Manchester Avenue and Santa Ana Boulevard.

Route 14—Hermosa Beach to junction of Route 18 near Olive, via Artesia Avenue.

Route 15—Long Beach to junction of U. S. 99 near Monterey Park, via Atlantic Boulevard.

Route 19—Junction of Route 3 near Long Beach to junction of U. S. 66 near Lamanda Park.

Route 55—Junction of Route 3 at Newport Beach to junction of Route 18 near Olive.

Southern counties will be posted by the Automobile Club of Southern California, and northern counties by the California State Automobile Association, under existing agreements which provide that the State purchase all materials at its own expense and the automobile clubs pay the costs of labor and transportation of signs and equipment.

MORE RURAL ROADS NEEDED

By encouraging travel for business and pleasure, and the shipment of goods by motor freight, you increase the consumption of gasoline and oil, and you simplify your distribution problems, as well as reduce costs incident thereto. Hundreds of thousands of rural residents want automobiles and trucks, but are delaying the purchase pending the construction of all-weather roads to serve their homes.—*Public Works Magazine*.

Dist. Engineer Gillis Wins Palm for First Road Program Plans

THE DIVISION OF HIGHWAYS program to speed the advertising of construction projects which are financed from the 1935 Federal grant of the Hayden-Cartwright Act has the entire State highway organization keyed to a high pitch in order that all projects shall be under contract by July 1st.

To R. M. Gillis, District Engineer of District VI, with headquarters in Fresno, goes the palm for being the first district engineer to have prepared and submitted to central office complete preliminary reports and plans for his part in this program which is one of the primary factors in the relief of unemployment in California today.

"It is the spirit of determined cooperation which Mr. Gillis and his staff in District VI have exhibited in rapidly advancing the program which justifies the confidence of the Federal government in the sincere desire of the people of California to do all in their power to relieve the unemployment situation," says Assistant State Highway Engineer G. T. McCoy.

"The Division of Highways takes pleasure in acknowledging the splendid efforts of Mr. Gillis and the personnel of District VI under his direction, and in expressing to them the appreciation of the State highway organization for this successful accomplishment."

FEDERAL BOARD RECOMMENDS \$117,531,000 MAPPING PROGRAM

In connection with the Federal cooperative topographic mapping program of the State Division of Water Resources, a recent report of the Federal Board of Surveys and Maps to the National Resources Board indicates that satisfactory maps are available for only 26 per cent of the area of continental United States; that the available maps for an additional 24 per cent are not satisfactory or sufficient and that 50 per cent of the area of continental United States is unmapped.

The Board of Surveys and Maps advised that "a base map of the entire area of the United States is a National need" and reports that after an exhaustive investigation it finds much evidence that the actual loss of money due to the lack of adequate maps is greater than the actual cost of completion of the standard map of the United States. It recommends a ten year plan for the completion of this work as a Federal project at an estimated cost of \$117,531,000.

First Burglar—I need glasses.

Second Ditto—What makes you think so?

First Burglar—Well, I was twirling the knobs on a safe and a dance orchestra began to play.

HIGHWAYS PAY LARGEST DIVIDENDS ON INVESTMENT

It has been definitely proven that a highway properly located and constructed according to traffic needs, pays better dividends than any other investment. It adds to the wealth of the community.

Good roads have done more to aid living conditions in the country than any other agency. The highway is as essential to agriculture and merchants, who sell farming products and supplies, as the railroad and steamboat are to industry.

Facts show that the number of motor vehicles increased 40 per cent in the past 5 years while the amount of road building increased only 13 per cent.

Seventy-five to ninety per cent of the highway dollar finds its way into wages. This percentage is not greatly changed by the turn of the cycle from prosperity to depression and back again.

—Wyoming Highways.

TOURIST CROP SHOWS BIG INCREASE OVER 1933 VISITORS

California's tourist crop for 1934, as represented by the permits issued for non-resident automobiles, showed a gain of 19,138 over 1933. A total of 110,018 nonresident permits were issued for the year for cars coming from every State in the Union and most of the foreign countries.

The total number of nonresident cars entering the State was 154,884 as checked by the border stations of the department. The number of passengers counted was 493,753.

DEADLINE ANNOUNCED FOR ADVERTISING SIGN PERMITS

Outdoor advertising permit plates for 1935 must be in place not later than February 20.

On February 21, the state-wide survey of advertising displays which was temporarily discontinued to allow permittees time to obtain the 1935 plates will be resumed.

In connection with this survey violation citations will be forwarded to the owners of all displays which come within the scope of the Outdoor Advertising Act and do not conform to its provisions. Lack of a permit plate constitutes a violation.

Service of these citations will result in the removal of cited displays in accordance with the terms of the act, unless the owners thereof comply with the law.

AUTO SIZE AND WEIGHT STANDARDS GIVEN APPROVAL

A special committee of the Chamber of Commerce of the United States has placed approval upon uniform motor vehicle size and weight standards adopted by the American Association of State Highway Officials.

A statement issued by the chamber hails this approval as "a further step in efforts looking toward solution of highway transport problems."

Six Mile Boulevard, No Grade Crossing

(Continued from page 6)

these streets over the new highway with a minimum of construction costs and property damage. These existing bridges have carried traffic across the Pacific Electric Railway at Macy Street, Lord Street, State Street, Cornwell Street, Marengo Street and Soto Street inside the city limits of Los Angeles.

Construction of the improvement from Mission Road and Aliso Street in Los Angeles to the intersection of Garvey Avenue and Atlantic Boulevard in Monterey Park, has been done under ten separate contracts. Three of these contracts were for grading and paving the various sections of highway and the other seven contracts were for bridge construction to provide eight grade separations at intersecting streets and roads.

Of these seven bridge contracts, five were for extending or reconstructing existing bridges which already crossed the Pacific Electric Railway at Lord Street, State Street, Cornwell Street, Marengo Street and Soto Street. Another contract was for the reconstruction and extension of the reinforced concrete bridge at Eastern Avenue to carry Ramona Boulevard under said structure.

UNIQUE GRADE SEPARATION

The remaining bridge contract on this section was for the two grade separations to carry Monterey Pass and Coyote Pass roads under the new highway. The highway crosses the Monterey Pass Road on an overhead bridge but a rather unique grade separation is effected on the Coyote Pass Road. This is a partial grade separation by which traffic going southwesterly along Coyote Pass Road will be diverted to the right and passed under the highway instead of making a left-hand turn across traffic.

From the intersection of Mission Road and Aliso Street, the first two highway contracts extend for 1.59 miles along the Pacific Electric tracks to Fickett Street. This portion will be 64 feet wide between curbs with a concrete pavement 40 feet wide and 12-foot oiled shoulders. From Fickett Street to Evergreen Avenue the city of Los Angeles recently completed a pavement 48 feet wide, which is being utilized as a portion of this route.

From Evergreen Avenue to Atlantic Boulevard, a distance of 3.8 miles, the highway

partly follows along new right-of-way and previously existing portions of Ramona Boulevard, Harrison Street and Cotton Avenue and finally cuts across the Midwick Country Club grounds in almost a direct line to connect with the westerly end of Garvey Avenue, a short distance west of Atlantic Boulevard.

DRIVING TIME HALVED

The section from Evergreen Avenue to Atlantic Boulevard has been constructed in one contract and consists of a 40-foot pavement with 20-foot oiled shoulders. This makes a total of 5.39 miles recently constructed by the State and one-half mile by the city, between the westerly end of Garvey Avenue at Monterey Park, and the business district of Los Angeles.

It is difficult to estimate the value of the Ramona Boulevard improvement to both local and through traffic. From Monterey Park to Los Angeles the driving time will be nearly cut in half by avoiding the present congested route via Brooklyn Avenue, by shortening the distance .6 mile, which the new route will do, and by eliminating grade crossings of intersecting streets. By far the greatest benefit, however, will be the increased safety to traffic due to eliminating grade crossings and congested business streets.

Construction work on the Ramona Boulevard route was started in January, 1934, and was scheduled to be completed by the first of this year. However, unusually heavy fall and winter rains have delayed work to a considerable extent so that it will probably not be completed until about the first of March.

ROUTE ADOPTED IN 1931

The Garvey-Holt Avenue route from Pomona to Los Angeles of which the Ramona Boulevard project is the final link was adopted as a State highway route in 1931 and was to extend from the westerly end of Holt Avenue in Pomona in almost a direct line into Los Angeles, utilizing existing pavements on Arroyo Avenue in West Covina and Garvey Avenue through Monterey Park. It was contemplated at that time that additional sections would be constructed on new locations wherever necessary to maintain direct alignment.

(Continued on page 24)

Doctor's Tar Surface Experiments Brought First Road Congress

IT WAS no civil engineer but a doctor who first began experimenting with a tarred surface for eliminating dust from roads. The doctor in question, Ernest Guglielminetti by name, told the story of his discovery to the delegates of the Seventh International Road Congress recently held in Munich, Germany.

Dr. Guglielminetti, who is German Swiss by nationality, is no road expert yet his work as the originator of the tarred roadway has earned him the sobriquet of "Dr. Tar" in civil engineering circles. Dr. Guglielminetti told his hearers that while in Monte Carlo as physician in ordinary to the Prince of Monaco he noticed the extent to which motor drivers suffered from road dust. Knowing from his experience as a military doctor in the tropics that it was the custom to saturate the floor with tar to prevent dust developing he begged from the Prince of Monaco the use of a few yards of roadway to experiment with putting a tarred surface on it.

FIRST ROAD CONGRESS RESULTED

"As soon as my first roads on the Riviera were ready," said Dr. Guglielminetti, "I got countless letters, particularly from German engineers who wanted to see these roads. I arranged the first "road meeting" with them and a German building councilor made the suggestion that a road building congress should be held.

France was enthusiastic for the idea. Germany's support was promised me in 1905 by the Kaiser, who received me at the Gordon Bennett races in the Taunus. And I succeeded also in awakening England's interest. Thus it was that the first international road construction congress came about 25 years ago."

Before the departure of the Congress delegates from Munich to view the new German national roadways under construction a farewell reception was held in their honor in the magnificent halls of the royal castle at Munich by Herr Siebert, Prime Minister of Bavaria.

Boss—"When you called up my wife and told her I would be detained at the office, and would not be home until very late, what did she say?"

Steno—"She said: 'Can I depend on that?'"—*Vancouver Province.*

THE BAY BRIDGE

How many minds and hands are joined to rear

This towered path across the tide-swept bay!
Men pitied Norton,* but the engineer
Has made his dreams reality. Today
Gaunt towers pierce the foggy shroud of night

And flood-lights gleam on blocks of man-made stone

That bind to rock, against the water's might,
An highway, such as gods did never own!
Do they, secure in their place on high,
Cold and undreaming, prideful of their sway,
Feel, as they tread their yet unspoiled domain,

This track we fling across their virgin sky
Is sacrilege? Surely, they too must pray
That this, a madman's dream, we shall attain!

BY PETER W. MOURER, JR.

Junior Construction Engineer
of San Francisco-Oakland Bay Bridge.

* The late "Emperor" Norton of San Francisco.

HUGE WHEELS SHUTTling ACROSS BAY WILL SPIN WIRE CABLES

(Continued from page 12)

in 1935 lined with concrete to form the outer concrete wall of the completed tunnel. The core of rock left within the horseshoe will be excavated by blasting and steam shovel, and will probably be the first time a steam shovel has been used in excavating a tunnel. This is made necessary by the size of this tunnel—58 feet by 76 feet—probably the largest bore tunnel ever undertaken, Chief Engineer Purcell points out.

While these bay operations are in progress contracts will be awarded for the Alameda County and San Francisco approach work, and bridge approach construction within both counties will be more than half completed.

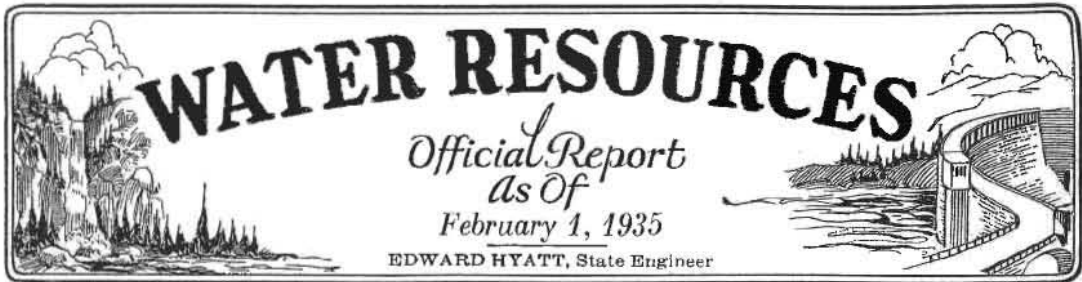
AUTO REGISTRATIONS ON INCREASE

Here's some evidence of better times ahead.

United States registrations of motor vehicles in 1934 increased over the preceding year for the first time since 1930. A preliminary survey records 24,952,007 cars, trucks and buses registered during the year, compared with 23,849,932 in 1933, a gain of 4.5 per cent.

Another indicator is the great increase in interest regarding touring to California on the part of motorists in other sections of the country as evidenced by thousands of requests for detailed data on transcontinental highway conditions and sectional road maps.

That dust pall in the distance is merely Old Man Depression making tracks for where-at-he-came-from.



Increased stream flow in the Sacramento Flood Control area following heavy rains of January made it necessary to operate the Sutter By-pass drainage pumping plants and materially reduced salinity in the Delta region. SERA relief labor engaged in clearing flood channels during the month totalled 38,552 man-hours.

Applications for the construction, repair and approval of dams and appropriation of water, news of flood control and other activities of the division are given in the monthly report as follows:

IRRIGATION DISTRICTS

Bonds in the amount of \$165,000 were voted on January 5th by the South Fork, Modoc County, Irrigation District. The bonds are to be used as security for funds from PWA wherewith to construct the storage works proposed by the district.

The RFC has made available \$1,162,500 to the Oakdale Irrigation District with which to complete the refinancing plans of the district.

DISTRICTS SECURITIES COMMISSION

At the January, 1935, meeting the commission gave approval to requests from irrigation districts in the following matters:

Newport Heights Irrigation District—Calling of an election for refunding bonds to be issued to RFC.

El Dorado Irrigation District—Filing of action under the Federal Bankruptcy Act.

Citrus Heights, West Side and San Dieguito Irrigation Districts—Expenditures from general fund.

Banta-Carbona, Merced, Oakdale, Santa Fe, Fair Oaks, Citrus Heights, San Dieguito, Alpaugh, Big Springs, Carmichael, Corcoran, Jacinto, Lindsay-Strathmore, Thermalito, Oroville-Wyandotte, Naglee-Burk, Tracy-Clover, Waterford, West Side and Montague Irrigation Districts—Modification of assessments for 1934-1935 under section 11 of the Securities Commission Act.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project.

Following the heavy rains which occurred early in January, it was necessary to operate all three of the

Sutter By-pass drainage pumping plants. Included in the routine maintenance for this period was putting all weirs and bridges in shape for the winter.

SERA Relief Work.

The SERA relief projects sponsored by the State Reclamation Board under the direction of this division, continued the work of clearing the flood channels. During the period a total of 38,552 man-hours was expended. Owing to weather conditions, it was not possible to do much work in the Tisdale and Sutter By-passes. On December 31st the Sacramento By-pass clearing was closed down, all the man-hours allotted for this work having been used up. The total man-hours of relief labor worked to date are as follows:

	Man- hours
Federal Transient Service, Upper Sutter By-pass	6,278
Federal Transient Service, Tisdale By-pass	2,989
Federal Transient Service, Lower Sutter By-pass	15,490
SERA Project No. 35-B14-27, American River	49,408
SERA Project No. 58-B14-15, Feather River above Marysville	36,968
SERA Project No. 58-B13-35, Feather River south of Marysville	18,609
SERA Project No. 57-B14-4, Sacramento By-pass	9,472
Total	139,214

Flood Measurements and Gages.

Following the recent storms water spilled over all the weirs of the flood control project with the exception of the Sacramento weir. The water was approximately two feet above the crests of the Tisdale and Colusa weirs and about one foot above the Moulton weir, while at Fremont the maximum head was 0.3 foot at the west end with no water flowing over the east end. The discharges of the Moulton, Colusa and Tisdale weirs were measured by the United States engineers.

The radio gage at Coloma is now operating satisfactorily. One discharge measurement was made at this station. Several discharge measurements were made of the West Intercepting and Wadsworth canals.

DAMS

Certificates of approval for nine dams, including the Morris Dam of the city of Pasadena and the Bouquet Canyon Dam of the city of Los Angeles, have been issued.

City Granted \$1,250,000 Water Power

(Continued from preceding page)

Construction is nearing completion on the Vasona Dam of the Santa Clara Valley Conservation District. Contract has been awarded for the Almaden, Calero and Stevens Creek dams and work is expected to start as soon as the weather clears. Final plans of the proposed Coyote Dam have been received. The exploratory work has been completed and the plans and site are being investigated by this office.

Work on placing the timber facing and additional fill on San Gabriel No. 2 Dam of Los Angeles County Flood Control District is under way. At San Gabriel No. 1 Dam the only progress made during the month has been in the excavation of the cut-off trench.

Inclement weather has slowed down progress on the repairs of the Los Verjels and Antioch dams, as well as the enlargement work at the Williamson and Orinda dams. Work still under way at the El Capitan Dam of the city of San Diego consists of placing the inner lining in the outlet tunnel.

It is expected that the recent rains will fill many of the reservoirs which have not been filled for the past two or three years and give an opportunity for inspection of the dams under conditions of maximum storage.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Maintenance of the Delta tide gages has continued as well as salinity sampling at sixteen permanent stations in the Upper Bays and in the Delta.

Due to the storms of the past month the flow of the Sacramento River at Sacramento increased to 50,000 second-feet on January 10th and has continued at about this figure to date. As shown by the following table, the salinity on January 10th had dropped to 15 parts of chlorine, or lower, per 100,000 at all Delta stations, with a corresponding material reduction at Upper Bay stations.

**Salinity at Upper Bay and Delta Stations on
January 10, 1935**

<i>Station</i>	<i>Salinity in parts of chlorine per 100,000</i>
Bullshead.....	180
Bay Point.....	30
O and A Ferry.....	20
Collinsville.....	2
Emmaton.....	3
Antioch.....	9
Jersey.....	9
Central Landing.....	4
Dutch Slough.....	15
Ridge Pump.....	4
Middle River P. O.....	9

WATER RIGHTS

Supervision of Appropriation of Water.

During December, 17 applications were received; 12 were denied and 13 were approved. In the same period 10 permits were revoked and 2 passed to license.

Among the applications received was one by the city of Ventura seeking to appropriate 9800 acre-feet for municipal purposes from Coyote Creek, a tributary of Ventura River, at an estimated cost of \$532,000.

Among the applications approved were two by the city of Eureka, one of which sought to appropriate 400 second-feet and 90,000 acre-feet from Mad River for power purposes at an estimated cost of \$1,200,000, and the other sought to appropriate 7.74 cubic feet per second and 750 acre-feet per annum from Mad River for municipal purposes at an estimated cost of \$375,000.

In October the Division requested reports from 1355 permittees and 433 licensees and on January 1st reports had been received from 1045 permittees and 356 licensees.

Federal Cooperation—Topographic Mapping.

Office work, proceeded in connection with the Eureka, Bogus and Bartle Quadrangles in Humboldt, Siskiyou and Shasta counties.

The Board of Surveys and Maps advised that "a base map of the entire area of the United States is a National need" and reports that after an exhaustive investigation it finds much evidence that the actual loss of money due to the lack of adequate maps is greater than the actual cost of completion of the standard map of the United States. It recommends a ten year plan for the completion of this work as a Federal project at an estimated cost of \$117,531,000.

WATER RESOURCES

The report on the Mojave River Investigation has been completed and will be available for distribution early in February.

Work on the South Coastal Basin Investigation has continued along routine lines during the present month. Bulletin 45, covering geology and ground water storage capacity of valley fill, South Coastal Basin, is in the print shop and will be ready for release during the early part of February.

The Legislature, upon recommendation of Governor Merriam and the Director of Public Works authorized an appropriation of \$50,000 for immediate use to prosecute efforts to secure early Federal aid and assistance in financing the construction of the Central Valley Project as said project is authorized and defined in the Central Valley Project Act of 1933.

ONE-THIRD MILE MODEL ROAD TO BE BRITISH FAIR EXHIBIT

A model road, built expressly for the purpose of demonstrating the latest developments in roadmaking, will be one of the special exhibits to be featured at the Engineering Section of the British Industries Fair to be held in Birmingham, next spring. Thirty feet wide and one-third of a mile long, it will be divided into seven sections, in each of which one of the following surfacing materials will be used: macadam, concrete, rubber, wood, brick, stone, and iron.

\$876,000 Annual Saving to Motorists

(Continued from page 20)

Construction was commenced in 1932. A 6.06-mile contract was awarded from Pomona westerly on new alignment through the San Jose hills and Kellogg Ranch, to Barranca Street at West Covina. From Barranca Street to the easterly end of Garvey Avenue three other contracts for grading and paving sections of highway have been completed. One of these extends from Barranca Street along Arroyo Drive for 3.78 miles to Orange Avenue and consisted of widening and resurfacing an existing pavement.

From Orange Avenue a 4.31-mile contract was completed in June, 1933, for construction on an entirely new alignment extending across numerous walnut and orange groves, the San Gabriel River and the Southern Pacific Railroad near El Monte. This section connects with the east end of Garvey Avenue at Mountain View Road, a short distance east of El Monte.

NEW BRIDGE BUILT

Since this latter section crosses San Gabriel River on a new location, it was necessary to construct a new bridge and approaches. A reinforced concrete girder and deck type bridge 964 feet in length with 44-foot roadway and two 3-foot sidewalks was constructed under separate contract. Another very important structure on this route is the subway under the main line east of the Southern Pacific Railway near El Monte which was handled under separate contract.

From the intersection of Mountain View Road and Garvey Avenue, the existing pavement on Garvey Avenue has been used through Monterey Park to the beginning of the Ramona Boulevard project at Atlantic Boulevard and Garvey Avenue. Although this old pavement is usable it is quite narrow in places and in other places is in rather poor condition.

A contract has just been let for improvement of Garvey Avenue through the city of Monterey Park. This is to consist of widening the right-of-way to 100 feet and constructing curbs 76 feet apart throughout this entire length wherever they do not already exist in the proper locations, paving the full width between curbs for the five blocks of the central business section of Monterey Park and constructing wide oil and rock shoulders on the balance of Garvey Avenue through Monte-

rey Park. An old timber bridge across Alhambra Wash on Garvey Avenue was washed away by the flood waters of January 1, 1934, and is now being replaced by a larger permanent structure.

For the Ramona Boulevard project proper (from Atlantic Boulevard to Mission Road and Aliso Street) construction costs amount to \$877,000. The wisdom of this improvement can be seen from an analysis of traffic studies which have been carried on at various places along the new route. It is conservatively estimated that the daily volume of traffic on this route near El Monte will be 20,000 cars per day with a very much greater volume largely composed of local traffic on the Ramona Boulevard portion.

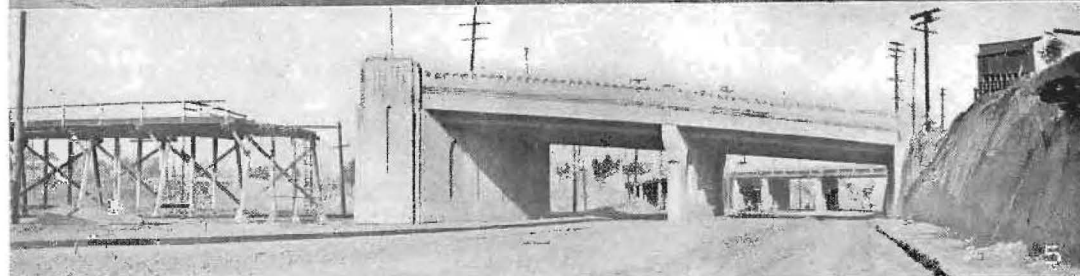
The new route from Pomona to Los Angeles is slightly less than 27 miles in length as compared to slightly more than 30 miles on Valley Boulevard, the shortest alternate route. Assuming an operating cost of 4 cents per mile for all cars including trucks and busses, the saving of three miles in distance will amount to an annual saving of \$876,000, which is sufficient to pay the entire construction cost in less than two and one-half years.

This saving in operating cost, due to shortening the distance, is not so important as increased safety and saving in time. A conservative estimate of the average saving in time per car on the new route from Pomona to Los Angeles is 20 minutes, or an annual saving of 2,400,000 car-hours. As the average car will probably contain more than two people, the annual saving in time would amount to the time of one person for about 5,000,000 hours.

But probably the feature of greatest importance and value in the entire route is the Ramona Boulevard portion which will permit the uninterrupted flow of traffic for six miles through the suburban district from Monterey Park into the Civic Center of Los Angeles.

Employer (to newly hired typist): "Now I hope you thoroughly understand the importance of punctuality?"

Stenographer: "Oh yes indeed. I always get to work on time."



GRADE CROSSINGS ARE ELIMINATED on the new Ramona Boulevard by seven bridges, five of which are shown above. No. 1—Eastern Avenue, a reinforced, concrete girder structure which the State extended with a 39-foot, 6-inch span providing a 60-foot roadway and 2-foot 8-inch sidewalks. No. 2—Coyote Pass grade separation, a 140-foot concrete girder structure providing a 60-foot roadway and 2-foot, 4-inch sidewalks. No. 3—State Street, a concrete girder structure extended by the State with two 44-foot spans providing a 40-foot roadway and two, 2-foot, 5-inch sidewalks. 4—Monterey Pass, an 87-foot concrete girder span providing a 60-foot roadway and two 4-foot sidewalks. This structure permits Monterey Pass traffic to pass under Ramona Boulevard. No. 5—Marengo Street, a 112-foot reinforced concrete girder extension of the existing bridge. Provision is made in the next biennial budget for extending the concrete construction to replace the old section of bridge.

New Type Timber Arch Bridge Spans Dolan Creek Gorge on Coast Highway

By STEWART MITCHELL, Assistant Bridge Engineer

THE Carmel-San Simeon highway in Monterey County, which is now approaching the final stages of construction, has provided numerous and varied problems for the bridge engineer. The gorges which must be spanned are often deep, foundation conditions are uncertain and difficult, and availability of materials and hauling conditions are important factors.

At the northerly end of the road the bridges are of concrete, notably the huge Bixby Creek arch and the smaller but no less attractive arches over the Rocky and Garrapata Creek ravines. Here the proximity to Monterey and other sources of concrete aggregates and the general conditions favored this type of construction. Farther to the south the uncertainty of finding suitable concrete aggregates for large structures, construction difficulties and economic causes favored the use of timber, and a large number of redwood timber trestle and truss structures have been built.

TIMBER SPAN ADVISABLE

At Dolan Creek, owing to the depth of the ravine and the foundation conditions, a long central span was advisable and there arose the question of a suitable and economic type of timber span which could be used.

On the Redwood Highway in Mendocino County there is a framed timber arch over Rock Creek which has given excellent service for some fifteen years and apparently has many features to recommend it. Also, about the time that the construction of Dolan Creek was being considered, information on special types of timber connectors previously used in Europe was compiled and published by the National Committee on Wood Utilization of the Department of Commerce assisted by the Forest Produce Laboratory of the Department of Agriculture, the latter having made numerous tests to determine the best type of connectors adaptable to American Woods and construction methods.

The purpose of these connectors is to increase the efficiency and the service rendered by wood as a construction material which they do largely through the improvement in the strength and dependability of the timber joint, long recognized as the weakest part of

any timber structure. In brief, the connectors consist of metal rings or other shapes which, embedded partly in each member, transmit the load from one wood member to another.

RING CONNECTORS USED

In this structure rings are used most often and are of two types. One type has teeth which are forced into the face of the wood members to be joined. The second type is a plain ring similar to the well known gas engine piston ring and is fitted into precut grooves. Each kind has its advantages in different parts of the structure, but in general the solid rings are used to connect the members of the main trusses which carry the highway. A bolt is run through the center of the connectors to keep the members from spreading apart.

The Dolan Creek Bridge consists of a main central span 180 feet long which is constructed as a framed timber arch and spans a gorge the bottom of which is approximately 150 feet below the surface of the highway. On each side of the main span there are two 38 foot girder spans, the girders being built up of timbers fastened together with these connectors. In addition, there are thirteen ordinary trestle spans each 19 feet long at the north end of the bridge.

It was decided to adopt the type of construction in which the connectors are used for this bridge, one reason being that it permitted the use of smaller-sized timbers in a situation where the handling and hauling of large pieces is a matter of some concern.

PIONEERING CONSTRUCTION

Since the Division of Highways was pioneering in this type of construction it was to be expected that contractors would be somewhat uncertain as to the cost of construction and would allow a certain amount to take care of their lack of experience. It developed that such was the case, although the prices bid were such that the total cost of the structure was not excessive as compared with other types that might have been used in this locality.



DOLAN CREEK TIMBER ARCH—This 180-foot span on Carmel-San Simeon highway involved some pioneering construction for a timber span of such length. Metal ring connectors were used to increase the strength of the timber joints.

The timber for the arches and other built-up members was framed, the grooves cut, etc., in a yard near the dock in Monterey. The arch was completely fitted together while lying on the ground, and then dismantled and hauled to the job.

In order to cut the necessary grooves special tools were designed by the contractor with the assistance of the representatives of the timber interests, and these accomplished the work without difficulty, the framing being carried through without a hitch. It was necessary, under the terms of the contract, to use hand labor as much as possible, which meant that all the boring of bolt holes and smaller grooves had to be done by hand, but the contractor was permitted to use power for cutting the larger grooves as it was found that a satisfactory job could not be obtained otherwise. The contractor chose to erect light falsework upon which to build the arch ribs.

PLACED BY HIGHLINE

The members of the rib were individually carried out into place by a highline, although consideration had been given in the design of the bridge to building up panels on the

ground and carrying them out to place. The contractor's equipment was not rigged up so that this procedure could be carried out but it is the opinion of both the contractor and the engineers of the Bridge Department that it would be the most economical method of construction and that future design should be prepared with this idea in mind.

In addition to this, numerous other features of future designs would be changed to conform to the experience gained from the building of this bridge, and it is believed, that where the conditions are favorable, an economical bridge of pleasing appearance will result. H. L. McCreedy was resident engineer on the bridge construction, assisted by T. K. May, who detailed and drew the plans for the structure.

She (just kissed)—I didn't think you were that kind.

He—I'm even kinder than that.

Mr. Binks was busily engaged with a spade in the mud beside his car when a stranger hailed him.

"Stuck in the mud?" he asked.

"Oh, no!" replied Mr. Binks cheerily. "My engine died here and I'm digging a grave for it."—*Life*.

14 Snow Plows Keep Donner Open

(Continued from page 2)

U. S. Route 40, from Colfax over Donner Summit to the Nevada State line, was the most difficult route in the State to keep open, largely on account of drifting snow. On this section, ten 4-wheel-drive trucks with push-plow attachment, three auger-blower and one railroad type rotary plow were operated.

With this equipment working constantly, the road was kept open, although for five days, on account of restricted width, it was necessary to close the road to trucks and to convoy light traffic over the summit under patrol car control. During this period, it was necessary to allow less important roads in the vicinity to close. These were opened again as soon as equipment could be released from the main route.

SNOW FENCE EFFECTIVE

Almost as difficult as the Donner route was that portion of the "East of the Sierra Highway," Route 23, in District IX. On 140 miles, from the Nevada State line to Bishop, three summits are crossed, ranging up to 8100 feet in elevation. The snow at this altitude is dry and light, and when driven by strong gales necessitates the continuance of snow removal operations long after the actual fall of snow has ceased. Seven truck push-plows and two auger-blower type rotary plows were used to keep this road open to traffic.

In comparison with a season's fall of 138 inches for last year and 96 inches for the year previous, the fall to date at Deadman's Summit has amounted to 164 inches. During the worst of the storm, snow fell at the rate of from 2 to 54 inches a day; the maximum rate of fall being as high as a foot an hour.

Long stretches of snow fence have been installed at points where drifting was extremely serious. To date some nine miles of fence, ranging from four feet to twelve feet in height, protects the highway. Comprehensive surveys indicate that 31 miles of additional fence will be required to adequately control the relentless action of the wind. Past storms in this region indicated the natural slope of snow behind fences to be about 7 to 1. The high winds of this season have caused drift slopes as great as 14 to 1.

At times when blizzards are raging over certain sections of the route, passage by inexperienced motorists would be extremely

hazardous if not impossible. To forestall the possibility of parties becoming snowbound in the area, the flow of traffic is controlled by gates. During the winter season, control stations are established at Crosby's, 16 miles north of Bishop, and at Leevining. Only those engaged in snow removal operations or those familiar with the country are allowed in this area during storm periods. During the recent big storm, conditions dictated the closing of the road to general traffic for a period of five days.

Snow of high moisture content tested the ability of road forces in charge of the highways radiating easterly into the Sierras from Fresno and the Mother Lode country. Two rotary type and nine push plows were used in keeping these roads open. The maximum snowfall occurred on the Calaveras Big Trees route and amounted to 60 inches.

A heavy fall of snow in the Sierra Madre Mountains back of Los Angeles made necessary the use of all available equipment in order to clear the mountain highways for the throngs of snow sport enthusiasts. During the week end of January 19-20, 5000 cars, representing some 20,000 people, wound their way over snow-cleared highways to Los Angeles County's recreational area at Big Pine Park.

Similar conditions prevailed in the San Bernardino Mountains where throngs of valley residents surged to the famous Lake Arrowhead and Big Bear resorts for a day in the snow. Long hours of toil on the part of the highway crews were necessary to insure their safe and carefree journey.

Even in San Diego County at the south end of the State, winter brought its mantle of white to the higher mountain areas. Snow equipment, inactive last year, was assembled and roads cleared without difficulty.

The great influx of motorists into the snow areas again justified the program of snow removal on mountain highways. On the Sunday following the storm, 430 machines traveled over Donner Summit, 487 used Route 15 east of Nevada City, and almost 2000 machines used State highways into the Cuyamaca State Park near San Diego to enjoy the snow sports. None of these highways could have been used were it not for the department's policy of snow removal.

California Can be Trade Center for all South America

(Continued from page 17)

tourist attractions south of the Rio Grande is being disseminated. Railroad and steamship lines are also active in promoting travel to Latin America. This immediate influx of tourist wealth will create the desire and ability to make passable the international Pacific Highway as well as other highways leading to the United States.

The effect of automobile tourist travel upon the economic condition of Latin America is not a matter of speculation. The experience of the United States during the past twenty-five years fully justifies the statement that an era of material development will dawn in Latin America with the influx of automobile tourist travel which will have no parallel in western history.

VAST TRADE POSSIBILITIES

The effect of this development upon the United States of America is beyond human calculation, other than to say, that the greater part of every tourist dollar expended in Latin America will ultimately find its way to the United States through the channels of trade. In this new era Western United States and California, in particular, will benefit immeasurably. With its Spanish heritage and traditions, California can easily become the trade center for all Latin America.

Our merchants and their representatives, and the various chambers of commerce, have not yet sensed the commercial aspect. California holds a natural attraction to our Latin neighbors for several potent reasons. Inured to a warm climate and abhorring the cold, sleet and the snow of the Atlantic seaboard, our climate approximates theirs.

Our historical background, like theirs, is of Spanish origin. We have largely preserved the Spanish nomenclature, and last but not least, we have the largest Spanish population of any State in the United States.

Should we not capitalize these natural advantages, using the International Pacific Highway to cement our friendship, and establish a commercial relationship at the same time? The opportunity exists for Los Angeles and San Francisco to first extend an invitation, and then provide certain facilities now lacking.

PREDICTS WINTER SPORTS DEMAND FOR MORE ROADS

Ski enthusiasts are doubling each year, according to Bestor Robinson, attorney, mountain climber and prominent Sierra Club winter sports devotee.

Speaking before the Rotary Club in Berkeley, Mr. Robinson prophesied that winter sport interest will lead to increased demand for roads in the Sierra timberline areas. The only such region at present easily reached by the motoring public is situated along the Donner Pass road. The popularity of this region is well known. Mr. Robinson comments that in Europe desirable skiing areas are reached in most places by funicular railways. He believes that in California public interest and a motor-minded public will demand that other high mountain roads, as well as the Donner route, be kept open throughout the year. He mentioned possible new roads to reach some of the world's best skiing areas located along the Sierra crest. Mr. Robinson stated that most of this area is at present inaccessible to winter sports enthusiasts.

Other markets of our Union seized and have held a predominance in the handling of certain commodities because these cities embraced the opportunity when it was presented to them, by supplying the facilities required for the particular commodity. For illustration, we have but to mention New Orleans, the cotton market of the world, St. Louis, the fur trade market.

PROVIDE FACILITIES

When St. Louis was an outpost it naturally became the depot for furs. It catered to that trade, provided the facilities, and holds her supremacy to this day. Chicago, because of her strategic geographical situation and with her network of railroads radiating to the grain-growing States, became the grain center of the United States. Chicago provided the facilities, elevators, tracks, etc., otherwise some other enterprising city would have monopolized that staple. New York early provided shipping facilities, and became the greatest port in North America. Detroit catered to the automobile industry, etc.

California can just as surely become the clearing house for the South American trade by furnishing the facilities which will attract the trade and permit it to function comfortably and economically. A suggestion of the facilities which would add much to trade development would be the erection of buildings, or utilization of existing buildings, for display of South American products.

New Type Highway Lights Installed as Experiment at McConnell Subway

IN AN ENDEAVOR to obtain information that will increase safety in vehicular operation at night on State highways at points of possible hazard, the Division of Highways is making a trial installation of a new type of light at McConnell substation, where State Highway Route 4 passes under the Southern Pacific Railroad between Sacramento and Stockton.

The light is of the sodium vapor type, brought out by the manufacturer in an effort to produce units for highway lighting which would be satisfactory from the drivers' standpoint and sufficiently economical as to installation and operating costs as to make highway lighting more general than at present.

GLARE ELIMINATED

Until very recently, at least, the most satisfactory light was that of the incandescent type. In addition to the cost necessary to obtain satisfactory results on the large areas involved, this type of lamp has a light source of very high intensity, offering some difficulty in providing the desired degree of illumination without an accompanying glare which tends to defeat the purpose of the illumination.

A light of the wrong type or improperly installed may be more dangerous on a highway than no lights other than the headlights of vehicles, particularly if glare is present, as it may conceal a vehicle or obstruction behind it from sight of the approaching driver.

SODIUM VAPOR TUBE

The type of light installed is reported by the manufacturer to have marked advantages in these regards. The light is developed by the passage of an electric current through sodium vapor in a tube 3 inches in diameter and 12 inches long. This entire tube glows and gives off its light in a manner similar to the neon tube used for advertising purposes and is of a soft orange color.

The light has the distinction, as compared to daylight or incandescent lamp light, of being monochromatic; that is, of having only one color instead of a fusion of many. This characteristic causes a loss of color differentia-

tion of objects under the light, but it is claimed that this is not necessary for the particular purpose for which developed. The outstanding feature claimed for the lamp is an absence of glare due to the large volume low intensity light source as compared to an incandescent lamp giving off the same amount of light.

TWO LAMPS USED

This type of light was first offered by the manufacturer in the spring of 1934 and the installation referred to is one of two first made in the west. It will be watched with interest to see if it is development worthy of further use.

The installation consists of two 1000-candle power units, mounted on 23-foot ornamental steel standards.

1934 Gas Tax Return Shows Slight Gain

Gasoline tax assessments for the calendar year 1934 amounted to \$39,625,055.32 as compared with \$39,307,352.99 for 1933, an increase of \$317,702.33, or .81 of one per cent.

That the figures for 1934 show an increase over those for 1933 is due largely to the fact that the returns for March, 1934, were for some unaccountable reason abnormally high, being \$794,594.33 in excess of those for March, 1933, and also to the fact that the December, 1934, assessments, contrary to expectations, exceeded those of December, 1933, by \$456,494.06.

Until the December returns were available it appeared that the 1934 revenue would fall slightly below that of 1933, but instead, 1934 is the first year to show an increase since 1931, in which year assessments reached their highest total for a single year, \$41,625,893.24, almost an exact \$2,000,000 greater than the figure for 1934.

"Lady's purse left in my car while parked. Owner can have same by paying for this ad. If she will explain to my wife how the purse got there I will pay for the ad myself. Phone M-123 League City."

↪
 A HIGHWAY
 LIGHTING
 EXPERIMENT
 being tried
 out at
 McConnell
 subway on
 Sacramento-
 Stockton route
 consists of two
 1000-candle
 power sodium
 vapor lamps
 mounted on
 23-foot
 steel
 standards.



Report on Loss of Mojave River Water

The release is announced by State Engineer Edward Hyatt of Bulletin 47 entitled "Mojave River Investigation" issued by the Division of Water Resources. This report goes into the hydrology of the Basin but does not attempt to lay out a specific project.

It is concluded that the average annual water supply is 97,000 acre feet but most of this is lost by evaporation or transpiration and only about 15 or 20 per cent of the water is used beneficially. Occasionally large floods force themselves through the basin and into the dry lakes beyond.

Settlement along the river is small in amount. The problem is not one of deficient water supply as wells can be sunk in the area influenced by Mojave River and in a considerable part water can be readily secured at small depths. If development had taken place the water table would be lower and a much larger amount of water from the river would percolate to the water table than now does.

The native vegetation which now uses so much of the stream with little economic benefit would in large part be killed by lowered water table.

Higgins Elected Head of State Employees

At the close of the annual General Council meeting of the California State Employees Association held in Los Angeles February 9th and 10th, E. Roy Higgins, comptroller of the Department of Public Works, Sacramento, was elected president.

Mr. Higgins is a graduate of the University of California, class of 1919, and has been in the State service since 1922, for the last seven years as comptroller of the Department of Public Works. He has been active in the affairs of the Employees Association since its inception, and for three years has been chairman of the Publicity Committee and Editor of the California State Employee, official magazine of the Association.

A. I. Rivett, Assistant District Maintenance Engineer of the Division of Highways at Stockton was elected chairman of the Publicity Committee.

Man: How far have you and your wife got with your plan to buy a new car?

Neighbor: We got to the point where we don't speak.

Highway Bids and Awards for the Month of January

AMADOR COUNTY—Between Martell and Jackson, about 1.5 miles to be graded and surfaced with bituminous treated crushed gravel or stone (road mixed). District X, Route 34, Section B & Jkn. T. M. Morgan Paving Co., Los Angeles, \$46,508; Fredrickson & Watson Const. Co., Fredrickson Bros., Oakland, \$48,191; Hemstreet & Bell, Marysville, \$66,851; C. W. Calotti & Co., San Rafael, \$51,747; Tiffany Const. Co., San Jose, \$47,669; A. Teichert & Son, Inc., Sacramento, \$49,162. Contract awarded to J. R. Reeves, Sacramento, \$46,450.80.

LOS ANGELES COUNTY—In Monterey Park, between Atlantic Boulevard and New Avenue, 1.5 miles, grade and asphalt concrete pavement. District VII, Route 26, Section Mon. P. Geo. R. Curtis Pave. Co., Los Angeles, \$35,493.20; J. L. McClain, Los Angeles, \$36,132; C. O. Sparks, Los Angeles, \$37,691; Oswald Bros., Los Angeles, \$38,482; L. A. Paving Co., Los Angeles, \$40,813; So. Calif. Roads Co., Los Angeles, \$43,765; P. J. Akmadizich, Los Angeles, \$44,127. Contract awarded to Griffith Company, Los Angeles, \$35,454.50.

LOS ANGELES COUNTY—Between California Ave. and Colorado Ave. in Santa Monica, 0.8 of a mile to be paved with Portland cement concrete. District VII, Route 60, Alternates "A" and "B". Mundo Engineering Co., Los Angeles, "A" \$74,076; Geo. R. Curtis Paving Co., Los Angeles, "A" \$72,412; J. E. Haddock, Ltd., Pasadena, "A" \$66,693, "B" \$71,344; Griffith Co., Los Angeles, "A" \$68,291, "B" \$72,735; Oswald Bros., Los Angeles, "A" \$68,049, "B" \$76,438; Los Angeles Paving, "A" \$75,543, "B" \$79,193; Southwest Paving Co. Los Angeles "A" \$67,505. Contract awarded to J. L. McClain, Los Angeles, "B" \$65,531.70 ("A" \$65,540).

ORANGE COUNTY—Manchester Avenue, between Artesia Avenue, Buena Park, and Lincoln Avenue, Anaheim, 5.2 miles grading and portions paved with asphalt concrete. District VII, Route 174, Section A, Alternates "A" and "B". Oswald Bros., Los Angeles, "A" \$111,666, "B" \$127,326; Griffith Co., Los Angeles, "A" \$124,504, "B" \$136,805; Geo. R. Curtis Paving, Los Angeles, "A" \$128,167, "B" \$141,896; J. E. Haddock, Ltd., Pasadena, "A" \$130,685, "B" \$141,610; V. R. Dennis Const. Co., San Diego, "A" \$132,025; United Concrete Pipe Corp., Los Angeles, "A" \$133,103, "B" \$142,333; Daley Corp., San Diego, "A" \$140,668; L. A. Paving Co., Los Angeles, "A" \$148,117, "B" \$158,053. Contract awarded to C. O. Sparks, Los Angeles, "A" \$111,025.50.

RIVERSIDE COUNTY—Between 4 miles west of Shavers Summit and Shavers Summit. About 4 miles to be graded and surfaced with bituminous treated gravel or stone. District XI, Route 64, Section B. V. R. Dennis Const. Co., San Diego, \$106,748; Geo. Herz Co., San Bernardino, \$109,425; Sharp & Fellows Contr. Co., Los Angeles, \$111,032; Fredrickson & Watson Const. Co. & Fredrickson Bros., Oakland, \$111,356; A. Teichert & Son Inc., Sacramento, \$112,332; Heuser & Garnett, Glendale, \$112,686; Daley Corp., San Diego, \$117,042; Geo. J. Bock & Son, Los Angeles, \$120,794. Contract awarded to Oswald Bros, Los Angeles, \$103,254.76.

SAN BERNARDINO COUNTY—Between San Antonio Avenue and E. city limits about 1.6 miles to be graded and surfaced with asphalt concrete. District VIII, Route 26, Section Ont. Griffith Co., Los Angeles, \$28,051; Southwest Paving Co., Los Angeles, \$26,613; Oswald Bros., Los Angeles, \$31,414; Geo. R. Curtis Paving Co., Los Angeles, \$32,134; E. L. Yeager, San Bernardino, \$35,877; V. R. Dennis Const. Co., San Diego, \$47,002. Contract awarded to C. O. Sparks, Los Angeles, \$23,526.40.

SANTA BARBARA COUNTY—Santa Barbara County, in Montecito, about 0.6 of a mile in length, trees to be removed and disposed of. District V, Route 2, Section J. Geo. E. Rue and Frank Doan, Santa Barbara, \$4,308. Contract awarded to Theo. M. Maine, San Luis Obispo, \$3,595.

SAN FRANCISCO-OAKLAND BAY BRIDGE—San Francisco approaches to San Francisco-Oakland Bay Bridge. Contracts 15 and 15-A. Barrett and Hilt, San Francisco, \$1,498,944; Clinton Const. Co., San Francisco, \$1,221,257; Transbay Const. Co., San Francisco, \$1,319,131; C. W. Calotti & Co., M. B. McGowan,

In Memoriam

STEPHEN ALLEN ROAKE, Supervising Bridge Designing Engineer of the San Francisco-Oakland Bay Bridge, ceased his earthly labors February 3, 1935, at his home in San Mateo after an extended illness.

Steve Roake, as he was affectionately known to his associates, was born August 10, 1874, at Peekskill, N. Y., where he remained until graduating from high school in June, 1891. The engineering profession beckoned to him and early in 1892 he started the long climb up the ladder, some of the rungs being rodman for the city of New York, 1892-1895; draftsman for Elmira Bridge Co., New York; Union Bridge Co., Athens, Pa.; Pittsburg Bridge Co., Lehigh Valley Railroad, 1895-1900; American Bridge Co., 1900-1915; concrete designer for the Celluloid Co. of Newark, 1915-1917; chief draftsman, then assistant consulting engineer in the New York office of the Southern Pacific Co., 1917-1928; and then chief design engineer of the Suisun bridge in the San Francisco office of the Southern Pacific Co.

Upon the completion of the Suisun bridge in December, 1931, Steve Roake entered the office of the San Francisco-Oakland Bay bridge as a supervising design engineer, in which position he remained until ill health caused him to take a leave of absence in August, 1934.

To all these projects he brought splendid ability, untiring energy and a high ideal of duty and responsibility. He leaves behind accomplishments priceless to the Bay area and the State.

In his passing, his widow and his two sons and two daughters have lost a devoted husband and father, the world has lost an outstanding engineer, the State has lost a faithful and conscientious servant, San Mateo has lost a citizen and neighbor and the staff of the Bay Bridge has lost a friend.

Inc., Peninsula Paving Co., San Francisco, \$1,418,326; Bates and Rogers, Const. Co., Oakland \$1,459,627. Contract awarded to Healey Tibbitts Const. Co., San Francisco, \$1,172,622.

SHASTA COUNTY—Overhead crossing over S. P. R.R. at Redding, 1-40' st. girder sp. and 2-30' st. girder sp's on concrete piers and approximately 237' timber trestle approaches. District II, Route 20, Section Rfg. Nelson and Wallace, Escalon, \$32,182; Harry J. Oser, San Francisco, \$34,154; C. W. Calotti & Co., San Rafael, \$30,312; L. C. Seidel, Oakland, \$33,068; Fred J. Maurer & Son, Inc., Eureka, \$30,511; John Carcano and Albert H. Steiner, San Anselmo, \$31,156; B. A. Hawkins & Co., San Francisco, \$32,539; M. B. McGowan, Inc., San Francisco, \$33,487; A. Young, Yreka, \$36,683. Contract awarded to Campbell Const. Co., Sacramento, \$28,979.15.

VENTURA COUNTY—Between Sea Cliff and Benham, about 3.6 miles to be graded and paved with asphalt concrete. District VII, Route 2, Sections F., G. Mundo Engineering Co. and Sander Pearson, Los Angeles, \$241,910; Sharp & Fellows Contracting Co., Los Angeles, \$233,083; Oswald Bros., Los Angeles, \$249,774; Basich Bros., Torrance, \$214,957.60.

A home is a little used building that usually stands on the same lot with a garage.

STATE OF CALIFORNIA
Department of Public Works

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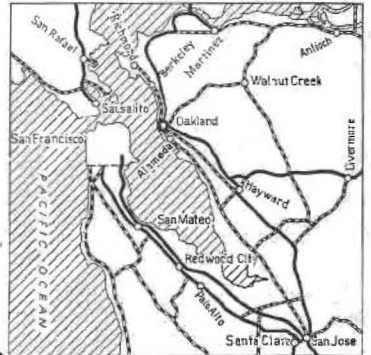
DIVISION OF PORTS

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

LEGEND
Primary Roads ————
Secondary Roads - - - - -

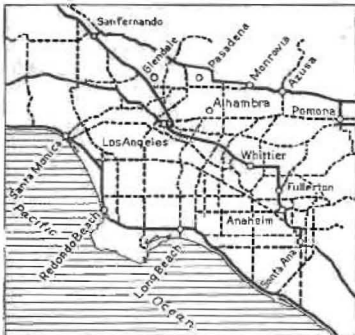


SAN FRANCISCO AND VICINITY



See Detail Map

Sec. Detail Map



LOS ANGELES AND VICINITY