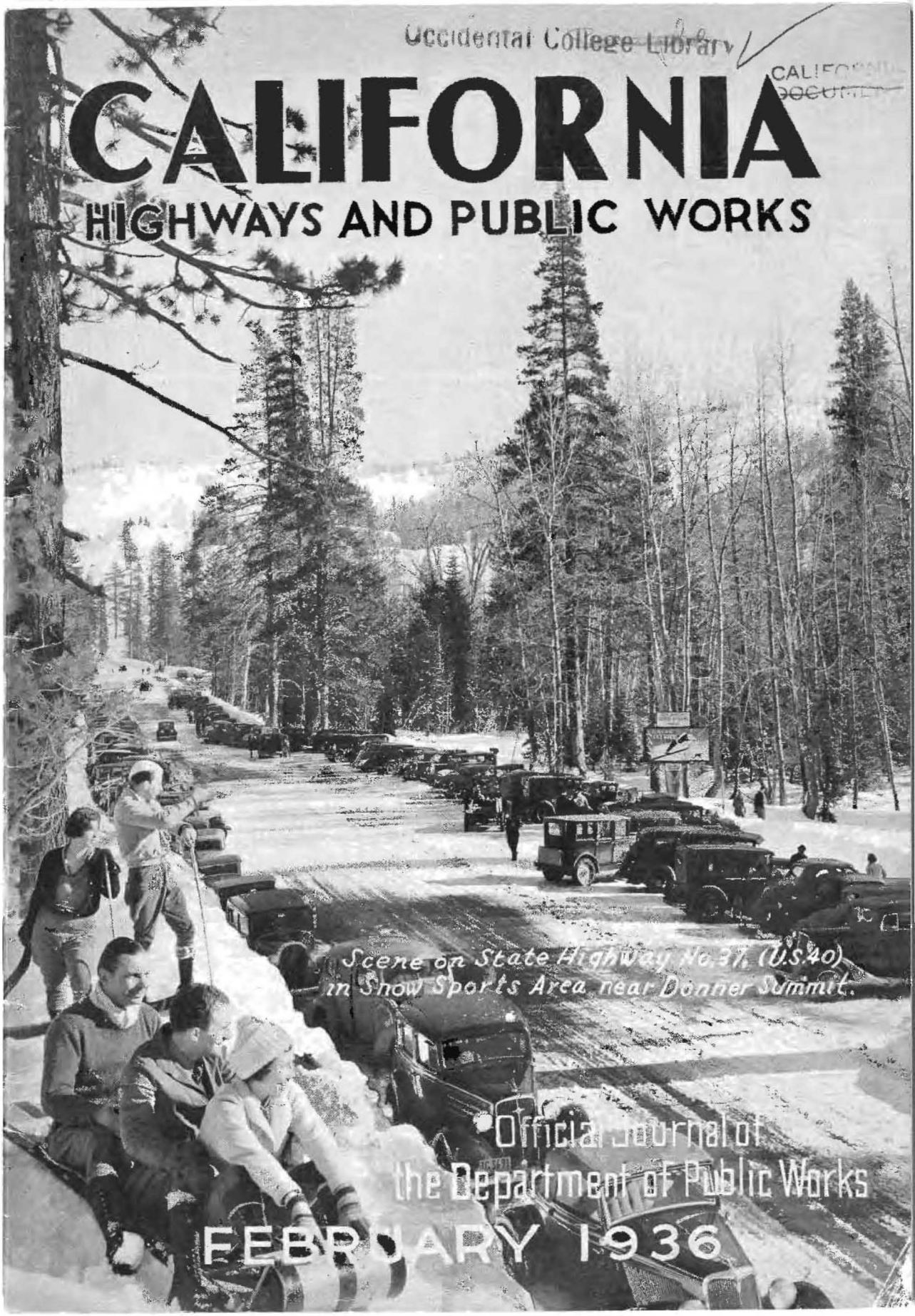
CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



Scene on State Highway No. 37, (U.S.40) in Snow Sports Area near Donner Summit.

Official Journal of the Department of Public Works

FEBRUARY 1936

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State Has Only $15,469,891

from Gas Tax and Motor Vehicle Fees

For Major Highway Construction

During the Current Biennial Period

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

DURING recent months certain interests have sought to develop in the public mind the idea that California is deriving from its gasoline tax revenues many more millions than are needed for the adequate development of its splendid State highway system to keep pace with the ever increasing demands of motorized traffic.

I have encountered this propaganda in various localities throughout our commonwealth when I stated my wish for the New Year was that I could get enough money to give the people of California all the highways they have asked for and urgently need instead of having only some $15,000,000 to satisfy a $100,000,000 demand.

EARL LEE KELLY

Such, however, is the situation that confronts us in the current biennium when out of all available State funds for highway expenditures the counties are getting $31,308,000, the cities $12,187,500, and other State departments are sharing to the extent of $686,000, while the State Division of Highways has only $15,469,891 of actual State revenues for major highway construction projects.

It is well, therefore, at this time to present the following complete statement of our highway revenues and expenditures for the enlightenment of our citizens who may be misled or confused by the extravagant statements of diversion propagandists:

Based on the budgeted amount of revenue from the gas tax the total collections for the current biennium are estimated at $86,700,000. Of this amount approximately 10 per cent or $8,700,000 is divided as follows:

(a) To pay refunds, as authorized, to any purchaser of motor vehicle fuel not used in motor vehicles operated on public highways, estimated at $8,422,000;

(b) To the State Controller for accounting services, estimated at $64,000;

(c) To the State Board of Equalization, the collecting agency, estimated at $214,000.

Deducting the 10 per cent from the $86,700,000 gross total of gas tax collections leaves $78,000,000 available for allocation. Of this amount one-third or $26,000,000 is allocated to the counties. Each county first receives a flat payment of $7,500 each quarter and the balance is distributed in the proportion that the number of motor vehicles in each county bears to the total

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Damage in Sacramento Levee Breaks Confined by Flood Control Project

By **R. L. JONES,** Deputy State Engineer

A FLOOD occurred in January in the Sacramento Valley, as the result of a storm which produced rainfall generally over the entire valley and foothills, with snow in the maintains, commencing on January 9th and ending on January 16th. The rainfall was relatively light on the valley floor and was heaviest on the watershed of the upper Sacramento River.

The resultant runoff caused a medium flood stage in the Sacramento River above its confluence with the Feather River. The runoff from the Feather, Yuba, Bear and American watersheds caused only low flood stages in these streams. The storm was relatively light in the San Joaquin River watershed.

At the latitude of Sacramento the peak quantity of water passing in the Sacramento River and in the Yolo By-pass was 133,000 second feet, or 22 per cent of the 600,000 second feet which the flood control project is designed to carry.

BY-PASS FLOWS MODERATE

The storm was not sufficiently prolonged to produce severe flood conditions. The flow in the American River was comparatively light and it was not necessary to open the Sacramento weir gates. The Little Holland tidal reclamation in the lower Yolo By-pass was flooded. All of the by-passes and the river overflow areas were covered with water to small depths, but the by-passes carried only moderate flows.

The flood was of approximately the same size as that of April, 1935, except that it was more concentrated on the upper Sacramento River than on the Feather, Yuba and American rivers. The snow on the ground at Norden on January 9th was 67 inches and on January 18th was 110 inches.

The rainfall at various points on the Sacramento, American and Feather rivers during the storm is shown in the following tabulation:

RAINFALL—January, 1936

	8	9	10	11	12	13	14	15	16	17
Kennett	0	3.54	1.68	2.68	0	1.80	2.09	2.95	1.02	1.02
Oroville	0	.42	1.82	.82	.30	.42	.68	.06	.12	0
Folsom	.06	1.12	1.04	.88	0	.16	.86	.20	.34	0
Sacramento	.05	.98	.35	.84	T	.19	.32	.05	.01	0

OVERFLOW CHANNELS FILLED

The rivers and overflow channels commenced filling almost immediately and water began flowing over the weirs commencing first at the Tisdale weir. The Moulton weir was last to spill. The Sacramento weir passed water over the gates one foot deep, but the gates were not opened.

The crest heights reached at various stations in the Sacramento flood control project were as follows:

CREST HEIGHTS

Station	Height January, 1936	Height April, 1935	Flood Height
Sacramento River at Red Bluff	24.8	23.7	
Sacramento River at Colusa	26.3	25.1	30.3
Sacramento River at Tisdale Weir	48.8	48.2	53.0
Sacramento River at Knights Landing	30.1	30.2	34.6
Sacramento River at Fremont Weir	36.4	36.6	42.0
Sacramento River at Verona	35.4	35.8	41.8
Sacramento River at Sacramento	26.5	28.6	31.3
American River at Folsom	15.7	18.8	
Yolo By-pass at Lishon	16.7	17.3	26.2

ESTIMATED MAXIMUM DISCHARGES

	January, 1936	April, 1935
Sacramento River at Red Bluff	120,000	110,000
Sacramento River at Verona	63,000	67,000
Sacramento River at Sacramento	75,000	95,000
American River at Fair Oaks	43,000	70,000
Yolo By-pass at Lishon	50,000	58,000

BREAKS IN LOW LEVEES

The only serious condition developed by this flood was in respect to the levees on the Sacramento River above Colusa, on the west side from Wohlfrom's Bend to Princeton, and on the east side from Colusa to Moulton weir. These levees, having a length of about 15 miles, have not been completed to project grade and section and in many places the water reached practically to the tops.

Not only are these levees low and of small section, but they are in poor condition, with many squirrel and gopher holes. Considerable effort was expended in preventing breaks in these levees on January 16th and 17th. Assistance was rendered to the landowners by WPA relief workers, CCC boys and the Division of Water Resources maintenance force.

The principal difficulty encountered in the fight to prevent levee breaks was the great number of leaks caused by squirrel and

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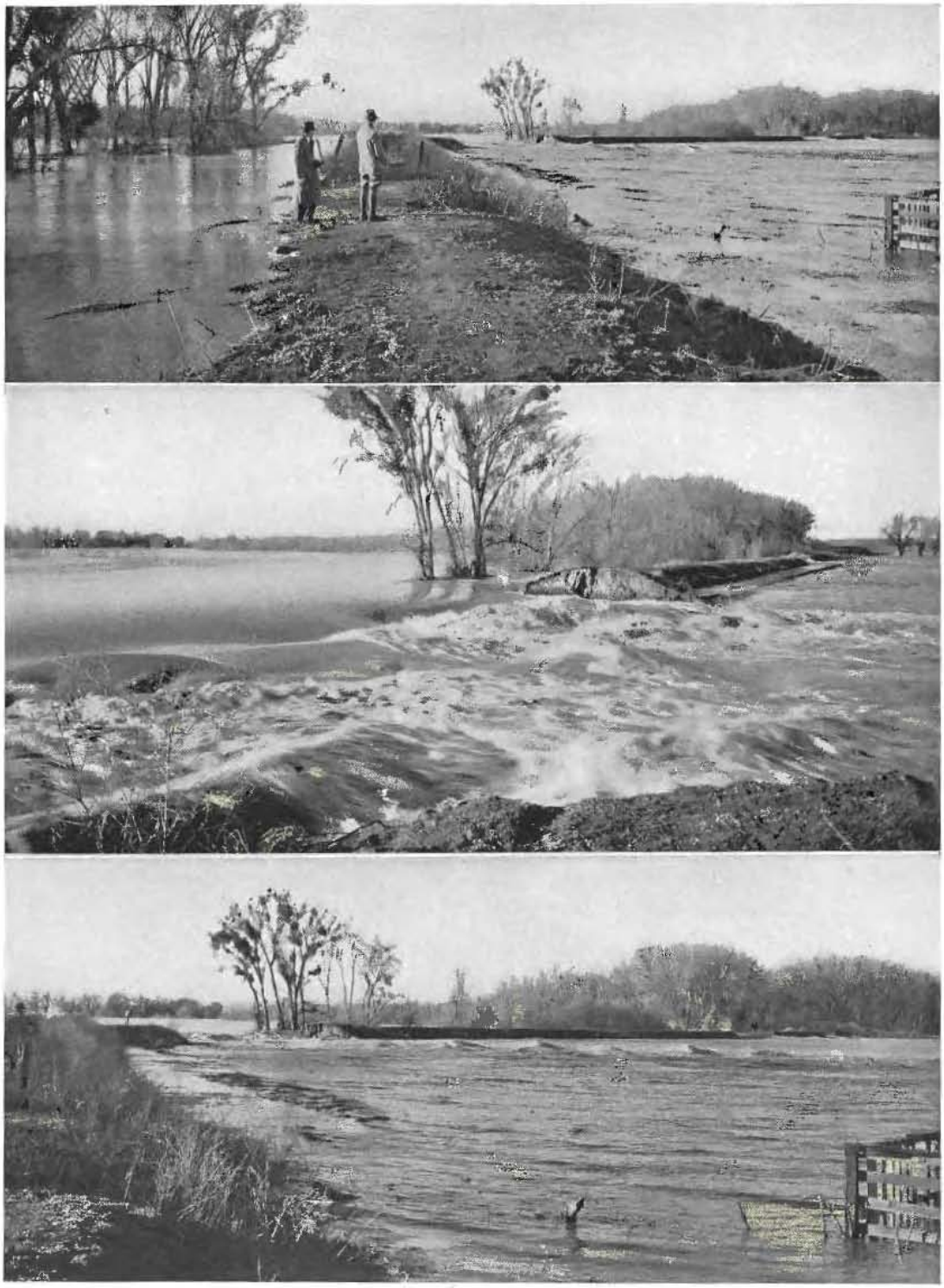


OVER THE TOP of a low levee and through a resulting breach went flood waters of the Sacramento River near Colusa in the January storm. The levee had not been completed to grade and was weakened by rodent holes. In top picture State Engineer Edward Hyatt (left) and Col. A. M. Barton, manager of State Reclamation Board are examining the break, of which different views are shown below.

Realignment Eliminates Two Railroad Crossings and Turns in Redlands City

By **E. Q. SULLIVAN**, District Engineer

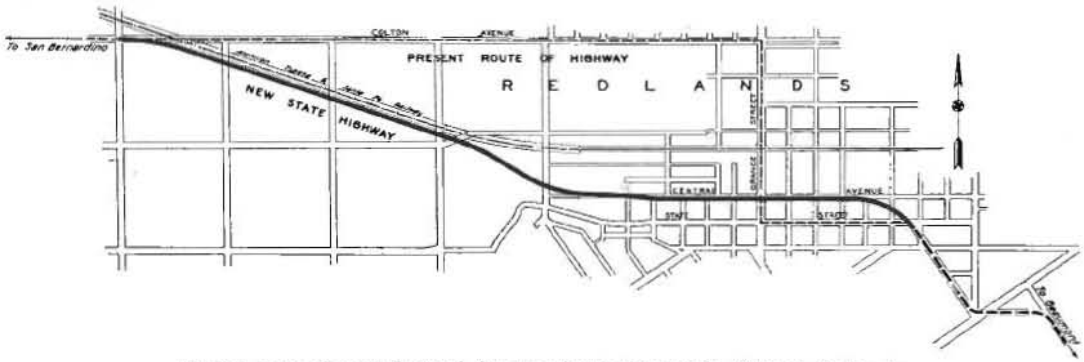
THE city of Redlands in San Bernardino County saw the fulfillment of a long-cherished plan for civic improvement on January 9, last, when the new $400,000 link of highway 99 traversing the city via State Route No. 26 was formally thrown open to traffic.

Two right angle turns and two dangerous railroad crossings on the old route through Redlands are eliminated by the new Central Avenue stretch, which swings off of Colton Avenue entering the city from the north and runs through the center of town, encountering only one major intersection and one major railroad crossing before leading out of the city toward Beaumont, Banning and the Coachella Valley.

"Through the power invested in me by Governor Frank F. Merriam, I hereby declare this highway open to the motorists of California."

Director of Public Works Kelly highly commended Redlands for the civic spirit that made the improvement possible involving as it did the setting back of property in the business district. The $400,000 cost of the undertaking was borne by the state and the city of Redlands, the latter contributing $60,000. The state's share was made up of gas tax and NRA funds. Director Kelly said the new highway, which is 1.9 miles long, is one of the best in California.

The roadway is 76 feet wide and is surfaced with portland cement concrete pavement 20 feet wide flanked by crushed rock shoulders with seal coat surfacing. The shoulders are 6 to 8 feet wide outside of the city and 28 feet wide inside the city limits.



Sketch map of new Central Avenue improvement in City of Redlands.

Ceremonies attended by citizens of Redlands and nearby communities, and state, county and city officials marked the opening of the new link. Director of Public Works Earl Lee Kelly, Harry A. Hopkins, chairman of the California Highway Commission, and C. D. Hamilton of Banning, member of the commission, represented the state.

OFFICIAL OPENING CEREMONY

A program of speech making preceded formal acceptance by the state and Redlands of the project. Opening of the link was signalized when Miss Jessie Reynolds, secretary of the Redlands chamber of commerce, cut a ribbon stretched across the highway, and Chairman Hopkins of the Highway Commission said:

Chairman Hopkins said eternal vigilance in protecting the gas tax fund from interests which seek continually to divert it to other purposes made possible the building of the link.

PRAISE FOR LEGISLATORS

"Highways bring people closer together, create social intercourse and improve education. We should be thankful that we have men in our legislature who are not gas tax diversionists. If the gasoline tax money that the motoring public pays into the state's

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BEFORE AND AFTER views of the new Central Avenue routing of State Highway No. 26 through the City of Redlands reveal what this improvement means from both traffic and aesthetic standpoints. The old routing on this section of U. S. 99 crossed two railroads as it entered town from the north and made two right angle turns from narrow streets in the congested business section. The revised routing cuts directly across the city on new right of way that involved the moving back of property lines and buildings in some places. The upper left photo shows Central Avenue before widening at its intersection with Orange Street, the main business avenue of the city. The large picture just below shows the completed improvement at the intersection. The pictures in the lower group of four are companion views of "eyesore" sections of the city that have been greatly improved and even beautified by the new highway, particularly where it runs through the city dump. At this point the dumping grounds will be further screened by trees and shrubs.

Santa Monica Tunnel Completed and Opened to Traffic at Formal Ceremony

BRAVING wet streets and a continuous drizzling rain, a crowd estimated at 1000 persons gathered about the east portal of the newly constructed Santa Monica tunnel on Saturday afternoon, February 1st, to witness brief ceremonies in which state, county and city officials joined in dedicating the new 400-foot tunnel under Colorado and Ocean avenues in the city of Santa Monica.

The opening to traffic of the tunnel, which joins the Roosevelt Highway with Lincoln boulevard, completes the final link of an extensive program begun by the state in 1932 for improving the coast highway through the great recreational beach area in the vicinity of Santa Monica.

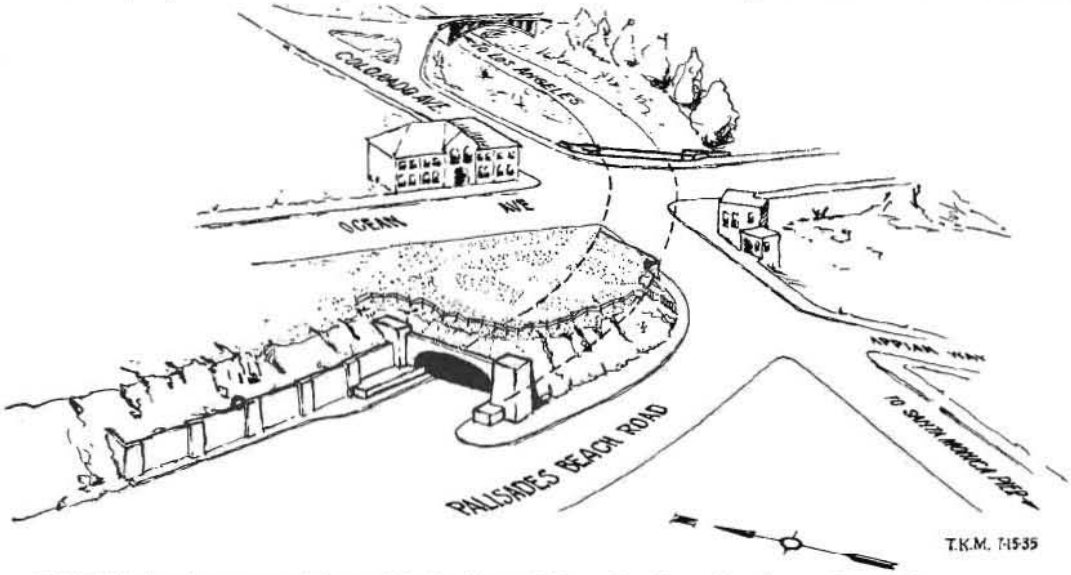
Plans for an elaborate dedicatory ceremony which included a parade and barbecue in the tunnel were called off shortly before the exercises were to commence because of the unfavorable weather conditions.

PARADE THROUGH TUNNEL

Both approaches to the new tunnel were thronged with machines as the traffic barriers at the west portal were removed for the first time, and the cars of the official party paraded through the tunnel to the accompaniment of music by the Santa Monica municipal band. At the east portal of the tunnel the officials left their cars and were escorted to a speaking platform.

Supervisor John R. Quinn of the fourth district of Los Angeles County acted as master of ceremonies, and the first part of the program was limited to the introduction of visiting officials and the engineering staff and contractor responsible for the construction of the tunnel.

Earl Lee Kelly, Director of Public Works, as official representative of Governor Merriam, extended the well wishes of the Governor to all present. He then spoke briefly of the significance of the project as one more unit in the coast highway improvement program designed to eliminate traffic congestion between Santa Monica and Long Beach.



SKETCH showing route of Santa Monica Tunnel from Beach road under park and city avenues.

LINKS CITY WITH COAST

He pointed out that, with the completion of the Olympic boulevard improvement, the tunnel will be an important link in taking traffic directly from the coast highway into

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THROUGH TUNNEL TO COAST at Santa Monica went a cavalcade of autos when the ribbon was cut February 1st. Flat arch construction and four traffic lanes are features. In official group—Police Chief Webb, F. C. Balfour, Dr. J. D. Davenport, City Commissioner Ted Plumer, Assistant State Director of Public Works Justus F. Craemer; City Commissioner Tex Millikan; State Director of Public Works Earl Lee Kelly; Miss Norma Dolan, Mayor W. H. Carter, James C. Dolan, Olympic Boulevard Association; District Engineer S. V. Cortelyou; Supervisor John R. Quinn, Engineer F. J. Grum, Assistant State Highway Engineer G. T. McCoy, Construction Engineer D. R. Warren; Resident Engineer P. R. Watson.

Highway Congress Urges Equitable Fuel Taxes and Continuance of Federal Aid

The recent annual meeting of the American Association of State Highway Officials was attended by Harry A. Hopkins, chairman of the California State Highway Commission. In the following article Mr. Hopkins summarizes the latest information and official opinion on highway statistics and trends as revealed in the convention reports and resolutions, and the relation of these factors to California conditions.

By HARRY A. HOPKINS, Chairman California Highway Commission

THE twenty-first annual meeting of the American Association of State Highway Officials met in Miami, Florida, December 9th to 12th, inclusive, and all the states had officials of their highway departments in attendance with the exception of two. Representing the State of California were C. H. Purcell, State Highway Engineer, and the writer.

The meeting began on the twenty-first anniversary of the association and was attended by a record number of representatives from the several states, there being close to five hundred registered.

In giving a resume of the proceedings and accomplishments of the meeting, space will not permit a lengthy paper. Were one able to review the developments in highway construction in detail for the past twenty-one years it would read like a story of the Arabian Nights. When we know that twenty-one years ago there were a little over 1,700,000 automobiles registered and now there are over 26,000,000 and that the state and county highway mileage in the United States twenty-one years ago only totaled 257,291 miles of surfaced highways compared with a present grand total of 897,181 miles, it is apparent that tremendous strides have been made in providing comfortable transportation facilities for American highway users.

HARRY A. HOPKINS

In 1934 the states surfaced over 24,000 additional miles and while the highway departments were attempting to catch up on this part of highway construction the state legislators added 40,000 miles to the existing state systems.

At the present time six states have their entire highway mileage surfaced and thirty have their state systems 80 per cent surfaced.

NO SURFACING GAIN

The highway systems of the states, counties and townships total 422,582 miles, of which about 13% are on state systems, 44% on county systems and 33% on the township or town systems.

Mileage added to state systems in 1935 did not disclose any percentage in gain for surfaced miles. There are twelve additional states whose state road systems are more than 90% surfaced and twelve more whose state systems are between 80% and 90% surfaced. There are nine states whose state systems are less than 25% dustless or better.

California Ranks 8th in Percentage of Improved Highways

(Continued from preceding page)

Californians are proud of their highway system and its development. In fact, there are times when we like to brag. And while it is true that California has set a record for standardization and high type of construction we find ourselves in the same position as most of the progressive states in that we have a long way to go to catch up with our requirements.

CALIFORNIA'S HIGHWAY RANK

In proof of this statement and to counteract the oftmade statement that California is about built up in highway construction and in testimony of what a tragedy it would be to California if any of our highway funds were used for other than the purpose for which they were intended we offer the following interesting figures:

States that have 10,000 miles or more in their highway systems number fourteen. California with 14,019 miles is seventh among the states. Pennsylvania is first.

There are thirteen states with three thousand miles plus of pavement of all types. California with 5731 miles is fifth. Illinois is first.

Fourteen states have two thousand miles or more of macadam and gravel, low cost mix roads. California with 2885 miles is ninth. Pennsylvania is first.

Twenty-one states have 2400 miles or more of sand, clay, macadam and gravel untreated roads. California makes a good showing here with only 2439 miles and places twentieth. Louisiana has more miles of this type of road than any other.

Nine states with 10,000 miles or more have a larger percentage of their highways improved. California is eighth in this class with 11,065 miles and Pennsylvania first.

20,865 MILES SURFACED

For roads in both county and state systems that are improved on rural free mail delivery routes California is second with 20,865 miles or 91 per cent surfaced. We only have 1249 miles in the state's system that are unimproved in some manner or other.

Since 1925 California has made wonderful strides in constructing bridges. Four hundred fifty-five have been built up to the year 1935, and during the same period 184 grade crossings have been eliminated. In the United States over the same period 37,172 bridges were built and 6604 railroad crossings eliminated. There were in our state, 1149 railroad crossings not eliminated by overhead or underpass on January 1, 1935, and in the United States, 17,879. On county and township systems the number remaining in California is 12,850 and in the United States 120,670.

PUBLIC ENEMY No. 1

In the general sessions of the association many fine papers were offered and considerable discussion was had by different groups on the subject of the tremendous toll in deaths and accidents on the highways of our country. It is very apparent that many drivers of motor vehicles believe they are

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RESOLUTIONS PASSED BY AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS

WHEREAS, The extension of highway facilities and the modernization of existing construction are necessary to adequately provide for the expanding use of motor vehicles; and

WHEREAS, It has been the established policy of the Federal Government for many years to participate with the States in the development and improvement of a limited system of highways essential to the welfare of the nation; and

WHEREAS, In work of a continuing character it is desirable to avoid sporadic efforts which result in bursts of activity followed by periods of inaction; and

WHEREAS, The maintenance of construction programs on an even keel and the avoidance of delays in undertaking such programs may be accomplished only by adequate advance planning based upon a definite knowledge of future availability of funds; now, therefore, be it

RESOLVED, That this association strongly urge upon the Congress of the United States the necessity for providing at this time authorizations for the continuance of regular Federal aid to the States for highway construction for a period of not less than two years (fiscal years 1938 and 1939) in amounts of not less than $125,000,000 for each fiscal year, together with authorizations for each fiscal year for the following purposes in amounts of not less than $12,500,000 for forest highways, roads and trails; $2,500,000 for roads through public lands, nontaxable Indian lands and other Federal reservations, $7,500,000 for roads in national parks, and $4,000,000 for Indian reservation roads, in order that proper plans may be matured for the prompt, efficient and economical usage of such funds.

WHEREAS, It is manifestly unjust to discriminate in the taxation of road users; and

WHEREAS, During the past four years there have been developed motor fuels, other than gasoline, for use in motor vehicles on the public highways, roads and streets of the States; and

WHEREAS, These recently developed motor vehicle fuels are being used in such amounts as to lessen service fees formerly derived by the States; and

WHEREAS, These fuels are used by some classes of motor vehicles to an extent that they are not paying their proportionate share of the cost of construction and maintenance of highways, roads and streets; now, therefore, be it

RESOLVED, That the American Association of State Highway Officials urgently requests that the respective State legislatures take such action as will properly and equitably tax all motor vehicle fuels.

Spraying and Burning Vegetation Along California State Highway Roadsides

By **W. A. SMITH**, Assistant Maintenance Engineer

CALIFORNIA, in common with other western states having an arid summer season, has a special problem in the reduction of fire hazards to property and watershed cover along her roadsides.

The spraying and burning of roadside vegetation for the 1936 season is now under way. This work, which involves protective measures along 1100 miles of State highways at an annual expense of some $80,000, has been a regular part of the Division of Highways maintenance program since 1929. Prior to that time, control measures were undertaken only at locations where owners of adjoining property or local organizations cooperated in the work.

The purpose of this roadside spraying and burning is to provide a firebreak between the highway and adjoining property. Its justification lies in the protection afforded the property owner or public interests against the increased hazard due to volume of motor traffic which improved highways bring, as well as in prevention of erosion damage to highways at locations where natural cover may be destroyed by fire, and also in the fact that insurance rates on grain lands are thereby kept to a lower level.

MAXIMUM RESULTS POLICY

The State highway program has been planned on the basis of maximum results in fire hazard reduction for the amount expended, rather than attempting 100 per cent clearing as advocated in some sections. A definite policy covering the selection of areas to be so treated is being followed.

In general, no spraying is done opposite locations where a natural or artificial firebreak already exists, either adjacent to or within a reasonable distance of the right of way. It is considered that the clearing of vegetation from locations adjacent to orchards, vineyards, plowed land, railroad rights of way, or streams which parallel the highway is not justified, as reasonable protection already exists.

Likewise, bare cut slopes five feet or more in height present a natural obstruction against fires being started by passing traffic.

Spraying and burning can only be carried on, to advantage, over grassy areas. Where brush abounds, clearing is the only effective measure and, when that is done at considerable expense, the area is exposed to the growth of grass and a more hazardous condition is thus created.

DEVELOPED BY EXPERIMENTS

The spray material adopted and methods followed, as well as the equipment used in making the application, were developed as the result of considerable experiment. Likewise, problems have arisen in the matter of burning the sprayed areas which required standardization.

Under conditions encountered in California, where the vegetation drys up rapidly with the coming of the first hot days of the season, it is necessary to spray a strip to either kill or dry out the grass sufficiently so that it may be burned while adjacent areas are still too green to present a hazard. This strip is ordinarily 9 feet in width, immediately adjacent to the fence lines and was adopted as being the maximum which can be handled by means of the spray bar equipment.

The location adjacent the fence lines includes the area of heaviest vegetation and also permits burning of the section between the shoulder and sprayed area later, if that seems desirable.

STERILIZATION NOT DESIRED

It must be borne in mind that efforts are directed simply to creating a firebreak. It is not desired to sterilize the soil, since at many locations it may not be necessary to spray another season. On account of the appearance, there are many individuals and some organizations who roundly criticize the work.

For most effective and economical results, the spray material should be applied when the vegetation is about two inches high. At that time the area can be uniformly covered; the growth is tender and practically a perfect kill is assured. There is the further advantage at this stage that no burning is required, although it may be necessary later to go over certain low areas where moisture starts a new growth.

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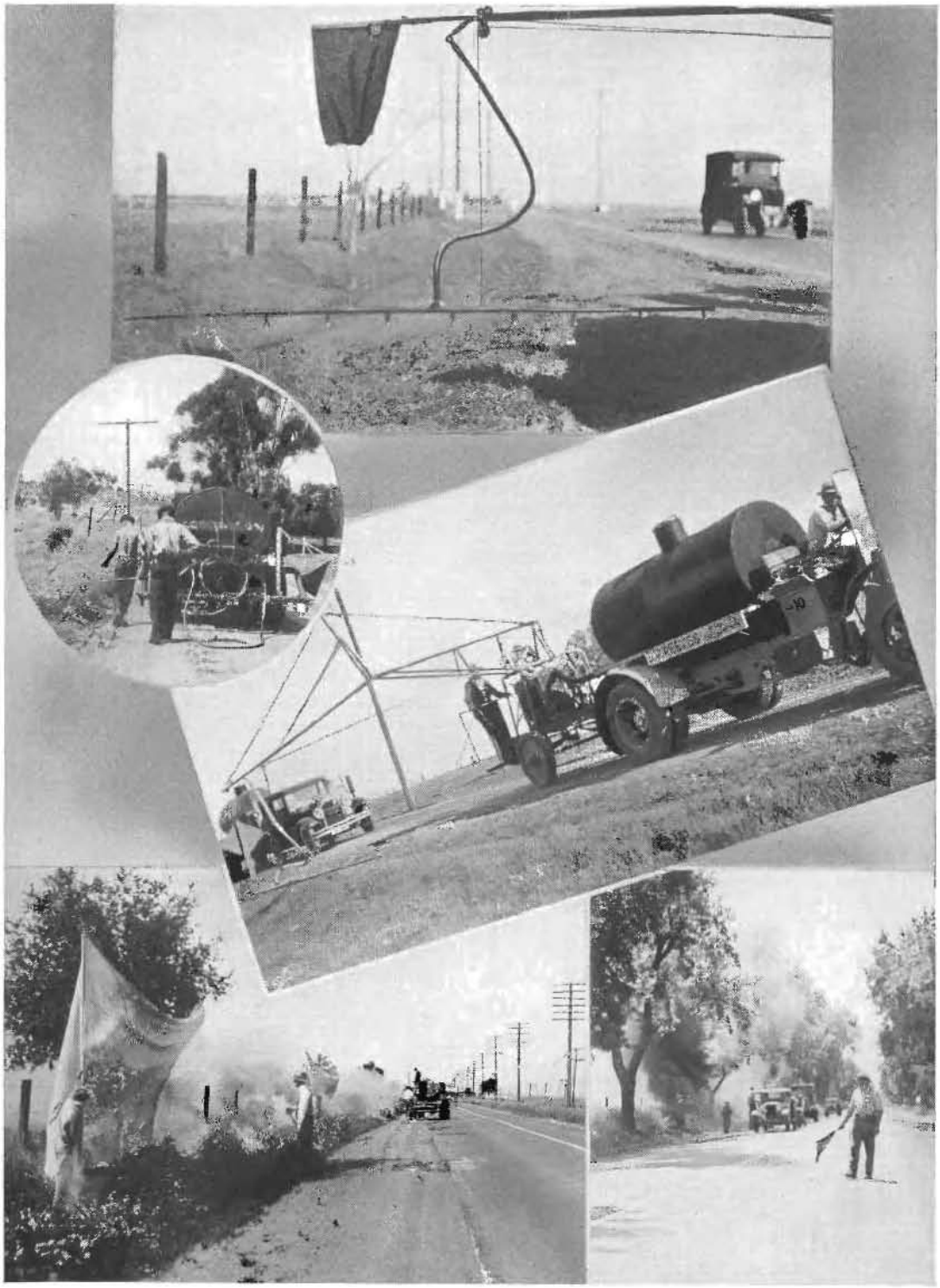
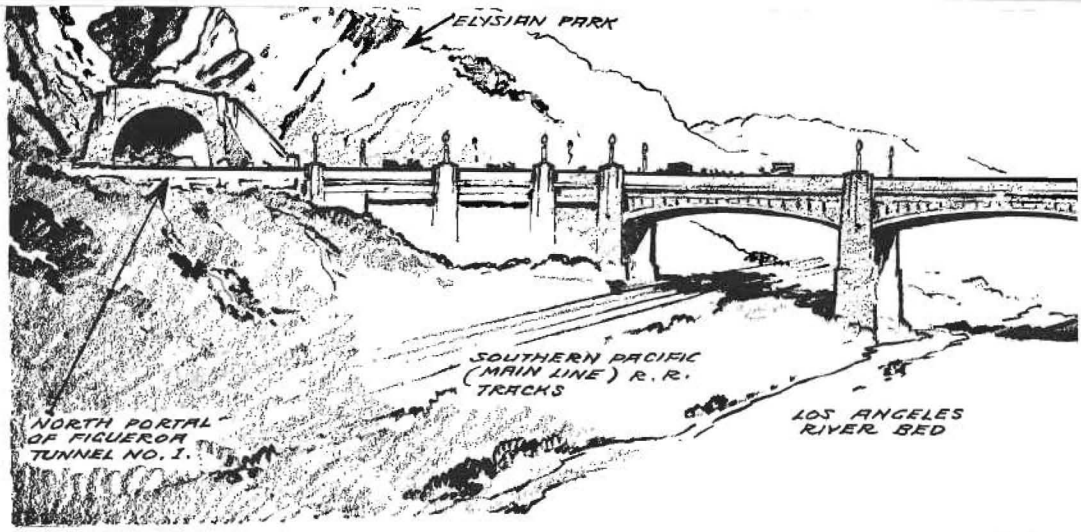


SPRING CLEANING STARTS in Winter on State Highway roadsides and the annual spraying and burning operations are under way along an 1100 mile front. At top, a 10-foot spray bar of a Diesel oil spraying unit. Center, a weed spraying outrigger on oil spreader trailer. Inset shows hand-spraying method. At bottom, burning operations with protection for trees and motorists.



OVER RIVER, RAILROADS, AND BOULEVARDS, a wide 1100-foot viaduct will carry the highway extension link of Figueroa Street from Tunnel No. 1 of the chain of three tunnels built through Elysian Park in Los Angeles to join North Figueroa Street on the other side of the river valley. The main river span will be 200 feet long. This sketch by Charles Owens is reproduced by courtesy of the Los Angeles Times.

State Building $650,000 Figueroa Street Viaduct in Los Angeles City

By **CHARLES WEST JONES,** Senior Field Construction Engineer, Bridge Department

FOR years the mountains and the Los Angeles River have been a barrier to through traffic on Figueroa Street, one of the main north and south traffic arteries in the city of Los Angeles. This traffic in the past has been forced to take a long circuitous path around the mountain, through the congested business section of the city.

At last, due to the combined efforts of the city, the state, and the federal government, the engineering dream of breaking through the barrier to secure a direct route for Figueroa Street traffic is about to be realized. The complete program includes a chain of four tunnels, three of which have already been bored through the mountain, and the fourth is under construction.

As part of this program, the state has recently awarded a half million dollar contract for the construction of a 1000-foot viaduct link starting at the northerly tunnel portal in Elysian Park.

JOINS NORTH FIGUEROA STREET

The viaduct will cross above the various tracks of the Southern Pacific Railroad, the tracks of the Los Angeles Railway, the Los Angeles River, and San Fernando Road to join North Figueroa Street, and will also make direct connection with the proposed Arroyo Seco Parkway to South Pasadena and Pasadena, a new route added to the State Highway System by act of the legislature of 1935.

The engineering forces of the state and city of Los Angeles cooperated in designing the viaduct. It will be an imposing structure with a main river span 200 feet long crossing the river at an elevation of some 70 feet above the stream bed. Long spans will cross the railroad tracks on each side of the river. The vehicular roadway will be 44 feet in width and, in addition there will be sidewalks on each side of the roadway.

This project, which will give employment to many persons, will be financed from federal funds made available under the 1935 apportionment of Emergency Relief funds. The work will be done under the direct supervision of the state.

CONSTRUCTION PROBLEMS

Viewing the project from a construction standpoint, some of the major problems will be the building of deep river piers adjacent to the railroad tracks without endangering or interfering with railroad service and the spanning of San Fernando Road without interrupting street car and vehicular traffic. It is proposed to construct the main river pier on the north bank of the Los Angeles River around and over the large Glendale outfall sewer without injuring that structure.

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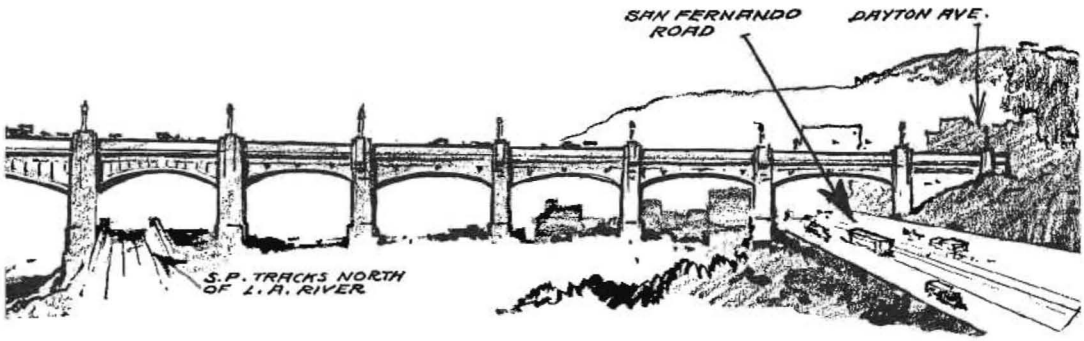
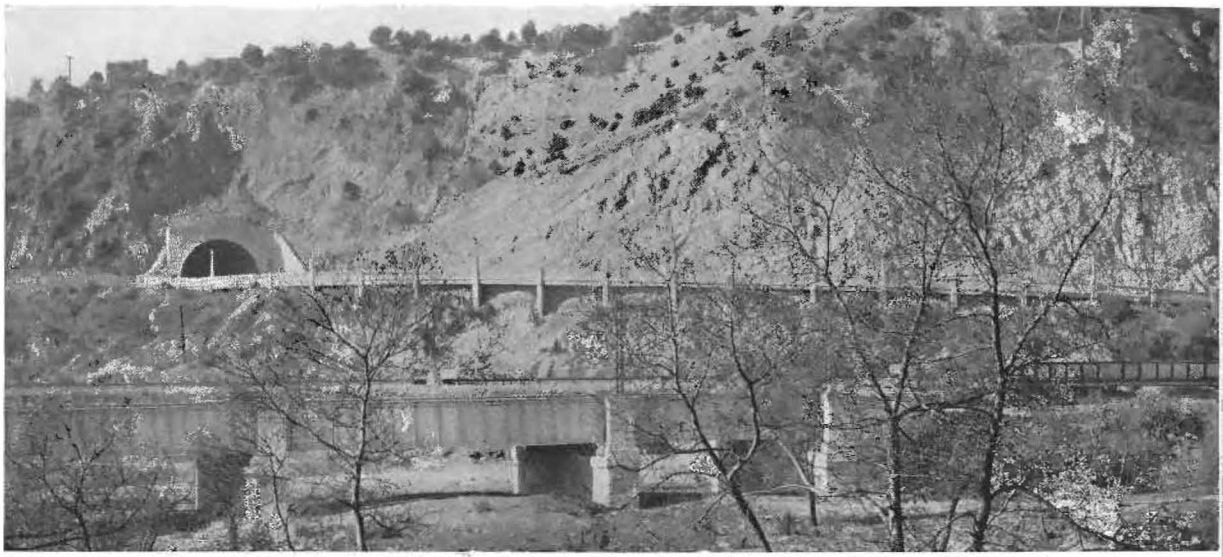




Tunnel Portal at Elysian Park and Riverside Drive where viaduct will connect.

Tunnel Vista showing three completed Figueroa Street bores through park.

Cities and Counties Get $43,495,500

(Continued from page 1)

registration in the State. Deducting the counties' apportionment from the total leaves $52,000,000 available for the State highway fund.

A tabulation of distribution to this point is as follows:

Total estimated revenue		$86,700,000
Deduct approximately 10% as follows:		
(a) Refunds	$8,422,000	
(b) State Controller	64,000	
(c) Board of Equalization	214,000	8,700,000
Balance		$78,000,000
Deduct 1/3 for counties		26,000,000
Balance for State highway fund		$52,000,000

To the above there is added a portion of the Motor Vehicle Fund made up of transfer fees, chauffeurs' license fees, headlight testing fees, and the motor vehicle fees. All of this money, except the motor vehicle fees, goes to the Department of Motor Vehicles plus not to exceed 35 per cent of the motor vehicle fees. This leaves 65 per cent of the motor vehicle fees for distribution, one-half to the counties and one-half to the State Highway Fund. The payment to counties is based on the motor vehicle registration as above stated.

A summary of the above figures is as follows:

Estimated motor vehicles fees	$16,332,308
35% for Division of Motor Vehicles	5,716,308
Balance	$10,616,000
1/2 to counties	5,308,000
Balance to State Highway Fund	$5,308,000

A third source of revenue for highway use is the regular Federal Aid contribution of the National Government estimated at $9,513,919 for the current biennium.

A Federal aid appropriation has been regularly made by the Federal Government to the State since 1921 and, for the first time, the appropriation has not been made for both fiscal years of the biennium.

The total revenue for State highways is, therefore, as follows:

Gas tax (2 cents per gallon)	$52,000,000
Motor vehicle fees	5,308,000
Federal aid	9,513,919
Total	$66,821,919

From the $52,000,000 of gas tax revenue must be deducted the shares allotted to the cities by action of the State legislature as follows:

HOW CITIES PARTICIPATE

For city streets of major importance, 1/4 cent or 7/8 of 1/4 cent as only 7 apportionments are available in this biennium	$5,678,500
For State highways within cities 1/4 cent	6,500,000
Total	$12,187,500

This brings a reduced balance for State Highway uses as follows:

Total State highway revenues from gas tax, motor vehicle fees, and Federal aid	$66,821,919
Deduct allocations to cities	12,187,500
Balance	$54,634,419

The allocations made from this total State Highway balance through the Division of Highways are shown in the following tabulation:

Administration (which includes approximately $408,000 to the Controller, Department of Finance, State Treasurer, Attorney General, etc.	$2,558,919
Maintenance	15,215,500
Construction and improvement	36,860,000
Total	$54,634,419

The distributions made from the $36,860,000 allocation for construction and improvement are as follows:

Item	Amount	Per cent of total budget
Preliminary engineering	$1,198,395	1.8%
Construction engineering	2,043,390	3.1%
Rights of way	2,725,850	4.1%
Betterments and minor improvements	4,350,000	6.5%
Joint highway districts	225,000	0.3%
Contingencies	1,333,555	2.0%
Major projects	24,983,810	37.4%
Total	$36,860,000	55.2%

It will be noted in the above distribution that $24,986,000 is allotted for major construction projects. That figure, as already stated, includes $9,513,919 of Federal aid funds.

Deducting this Federal money, leaves the sum of $15,469,891 as the actual amount of

(Continued on page 15)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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

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

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

Vol. 14 FEBRUARY, 1936 No. 2

BUILT FOR SAFETY

As Exhibit "A" of Highways Built for Safety, the Automobile Club of Southern California presents the Los Angeles-Bakersfield route.

Excepting the paving to be laid over grade now being finished for about five miles from Kern County line to Fort Tejon, it is now three-laned throughout from Los Angeles to the floor of San Joaquin Valley due to elimination of the last "bottleneck" by a new bridge at Tujunga Wash on San Fernando Road.

Adding another traffic lane from the foot of Grapevine Grade to the northern boundary of Kern County is the last job required to make this route safer and entirely modern. It is expected that the 1937-39 state budget will provide funds for this.

Does widening the road add to safety?

While this organization believes that a highway should be widened only as traffic requires it, it offers the following answer to the safety question as taken from state accident records:

On a 27-mile section of modern THREE-LANE highway on this route from Castaic School to Gorman there were only seven traffic accident fatalities during 1934.

On the 27-mile adjacent section of old TWO-LANE highway from Kern County line below Grapevine Grade north to the road angle point south of Bakersfield, there were 25 accident deaths during 1934.

Both sections of the same highway carry equivalent traffic loads, approximately 4000 vehicles per day, according to the club.

Seven fatalities against twenty-five indicate that traffic safety can be engineered into highway construction.

—Automobile Club of Southern California.

Budget Faces Loss of $4,756,960 From Federal Aid Funds

(Continued from page 14)

the State's own revenues that the Division of Highways can absolutely count on as available for new highway construction:

Major project allocation	$24,983,810
Estimated Federal aid revenue	9,513,919
Actual State revenue available for construction projects	$15,469,891

The significance of the reference to this $15,469,891 as "Actual State revenue" is made apparent by the fact that only one-half of the $9,513,919 Federal aid has been appropriated to the State up to date and President Roosevelt has recommended to congress that the other one-half be deferred until 1938.

If this second appropriation is not received the allocation for major projects would be reduced by $4,756,960, leaving available in the current biennium the sum of $20,226,850 for major construction projects derived from both State and Federal aid funds.

MEANS FEWER PROJECTS

The loss of $4,756,960 Federal aid would necessarily mean a revision of the Division of Highways budget for the current biennium and the withdrawal of proposed projects that will cost approximately the amount of the Federal aid reduction. The deferment of these long needed improvements or additions to many parts of the State highway system would be a keen disappointment to localities that would be affected and in some cases might prove a real hardship.

The American Association of State Highway Officials at its recent annual meeting passed resolutions urging Congress and the Federal Government to continue this Federal aid, and citizens' committees in California and other states are sending petitions to Washington in support of the resolutions.

Salesman: "These stockings are the very latest patterns, fast colors, holeproof, won't shrink, priced far lower than elsewhere, and a very good yarn."

Co-ed: "Yes, and you tell it well, too."

Tommie had always been much afraid of dogs. One day, after a struggle to get him to pass a large dog which stood on the corner, his mother scolded him for his unnecessary fear.

"Well," was the reply, "you'd be afraid of dogs if you were as low down as I am."—*Parent's Magazine.*

State Completes Extensive Surfacing Project on Death Valley Highways

By **S. W. LOWDEN**, Acting District Engineer

IN THE budget allocations for secondary roads within the State Highway System for the 87th-88th fiscal year were included a number of projects for the improvement of Route 127 extending from a junction with Route 23, the Los Angeles-Reno Highway, in the vicinity of Lone Pine, Inyo County, to the San Bernardino County line at Ibex Pass, a distance of 179 miles.

This route is rapidly becoming known as the Mount Whitney-Death Valley Highway, and will, in future years, become one of the most scenic drives within the state borders. Its importance is indicated by the increased number of travelers into this desolate region, traffic records indicating that visitors have doubled in number for each of the past three years. The winter season of 1934–1935 allowed 45,000 persons to view the unique scenic features contained within the boundaries of the Death Valley National Monument, and enjoy the weird natural wonders amid the eerie solitude and stillness of this peculiar historic area.

LARGE TRAFFIC INCREASE

Traffic counts being maintained by the monument authorities indicate that up to February 1, 1936, the volume of travel this season has substantially increased over that of preceding years, and it is anticipated that by May 1st of this year the increase in the number of visitors will largely reward the judgment of the Department of Public Works in allocating sufficient funds for this important route to provide the many betterments recently completed.

As the main entrance to the Death Valley area, these improvements were needed to overcome the dust and rough condition of the roads which, prior to the installation of a hard surface, were typical of roads to be found in isolated desert regions, and could not be traversed with the speed and comfort of present day demands.

The construction of bituminous treated surfacing involving 3450 tons of asphaltic road oil, placed at a cost of $93,000 obtained from the state gas tax revenues, was completed on December 20, 1935, and that work accomplished the conversion of dusty, graveled roadbeds into fine specimens of wide, smooth highways.

FURTHER CONSTRUCTION PLANNED

Second in importance to the surface treatments in the State's program of improvement is the proposed construction from the westerly end of the toll road recently acquired by the State, westerly toward Lone Pine. This construction contemplates an improvement which will eliminate the hazards now encountered by traffic through Darwin Wash and over Zinc Hill.

Surveys for this portion of the improvement have been completed recently which will eliminate the steep grades, precipitous slopes and insecure formations encountered throughout the course of the existing road.

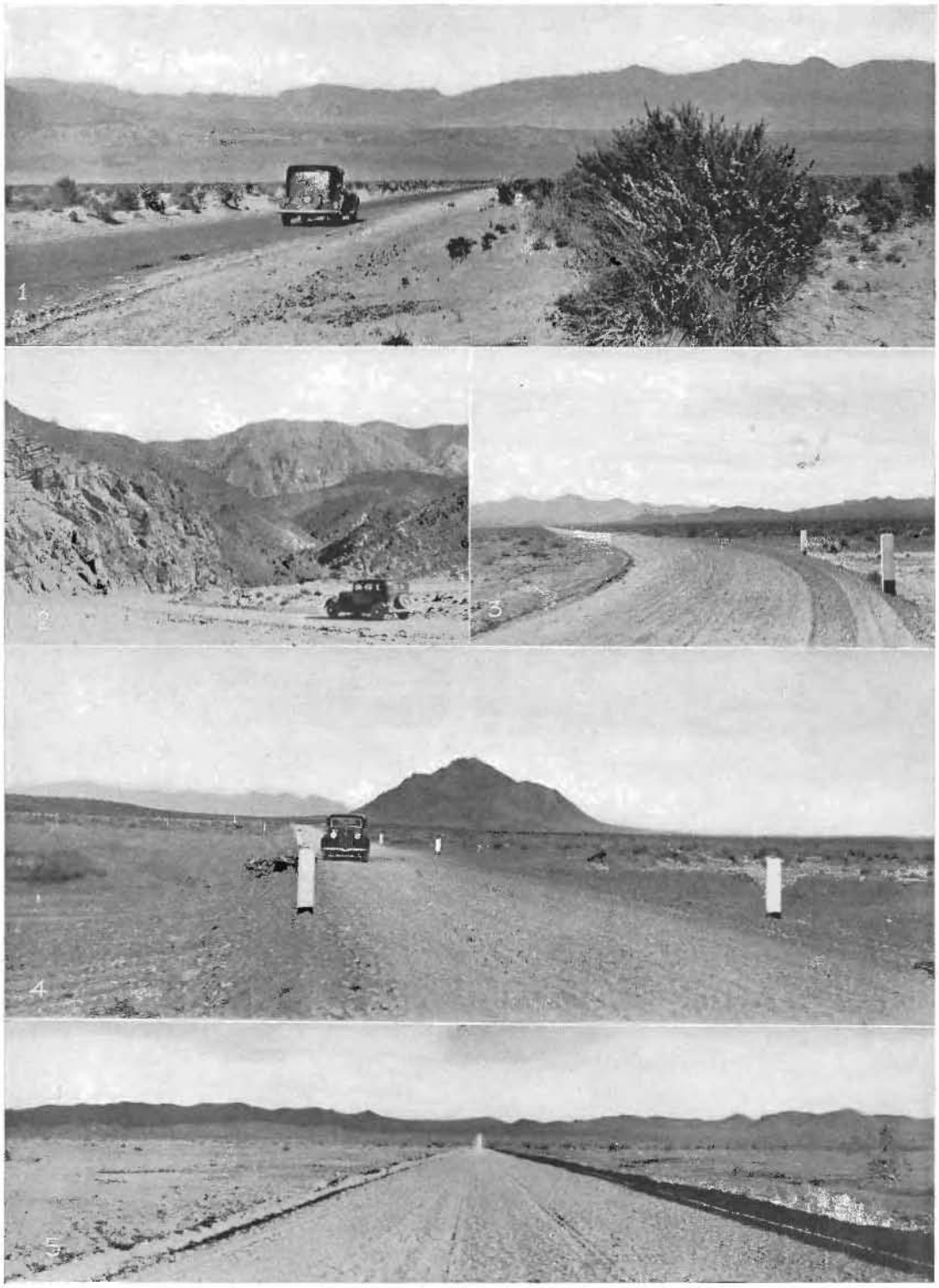
The improved road will permit travel through inspiring open spaces along easy slopes, with the utmost safety and convenience, at the same time preserving and making more impressive the aesthetic values of the Panamint Valley and surrounding mountain ranges which spread as a mosaic before the eyes of the traveler.

DARWIN-KEELER IMPROVEMENT

A further improvement that will be thoroughly appreciated by the motoring public is the proposed elimination of the existing one-way road between the old mining camps of Darwin and Keeler. The latter town borders the extensive dry bed of Owens Lake, which until a few years ago comprised one of the major bodies of water lying east of the Sierras, but which has been dried up by the collection of the waters of Owens Valley in the aqueduct of the city of Los Angeles.

Still another improvement contemplated in the near future is the construction of a three-mile unit adjacent to Townsend Pass. This improvement lying on the westerly side of the Panamint range of mountains winds through a canyon of rugged cliffs of kaleidoscopic coloring. Ultimately a point is reached where there is presented to view over the miles of wasteland, the snow-clad summits of numerous peaks of the Sierra Nevada range, that reach an elevation in excess of 14,000 feet. Chief

(Continued on page 27)



SURFACED ROADS FOR DEATH VALLEY—Through "Devil's Corn Patch," four miles east of Stove Pipe Wells. No. 2—In Darwin Wash, Zinc Hill in background. No. 3—Section south of Death Valley Junction. No. 4—Amargosa River crossing between the Junction and Shoshone. Eagle Mountain in distance. No. 5—Between Shoshone and Ibex Pass.

Sacramento Levee Break Caused But Little Crop Damage

(Continued from page 2)

gopher holes. Had these not existed, there would have been less difficulty in protecting the levees, although they were not of sufficient height to withstand a further rise of water.

BREAKS TOTAL 500 FEET

The levee on the east side of the Sacramento River broke in three places a short distance south of the Moulton weir during the night of January 16th and early morning of the 17th. These breaks were practically together and the levees were opened to a total length of approximately 500 feet. A considerable quantity of water was released through these breaks, which almost immediately began to reduce the water heights which were threatening the levees to the south on both sides of the river. By noon of January 18th no further danger of levee breaks existed.

The damage occasioned by the break on the east side near the Moulton weir was confined to erosion on the Johnston ranch. After water passed through the breaks it flowed directly eastward into the Butte basin overflow, and in passing removed the newly plowed top soil from an area of approximately 100 acres.

These levees are scheduled for completion to full grade and section by the California Debris Commission during 1936, in time to care for the floods in the winter of 1936–37.

Except for limited damage done by erosion at the break near Moulton, this flood caused no damage to lands protected by the Sacramento Flood Control Project works. As usual, a small amount of damage was occasioned to improvements and crops in the overflow areas and by-passes.

These areas are intended primarily for the passage of flood waters, and a certain amount of damage is inevitable at each small flood when the lands are used for other purposes. In reporting on the flood, the daily press emphasized these occurrences, indicating that a damaging flood was in progress, whereas the entire flood control project system in its completed parts was functioning perfectly.

30 Million Commuters Per Year Will Use the Bay Bridge Terminal

THE San Francisco-Oakland bay bridge terminal to be built between First and Fremont streets and facing Mission street in the city of San Francisco is designed to accommodate one of the world's largest annual pedestrian movements representing 30,000,000 commuter trips a year.

The total number of persons to pass through this building the first year is expected to equal one-fourth the population of the United States. Most of them, of course, will be commuters, 50,000 of whom will pass through this building each morning and evening.

The building was designed by engineers of the staff of Chief Engineer C. H. Purcell, with architectural treatment by Timothy L. Pflueger, Arthur Brown, Jr., and John L. Donovan. It will be 65 feet high, 800 feet long and faced with terra cotta of granite texture.

ENCLOSED RAMP SYSTEM

The loading platforms enclosed in the terminal will be 700 feet long. The building is really an enclosed system of ramps and stairways connecting the street and street car concourse to the four loading platforms for the six tracks of the East Bay trains.

The Market Street Railway and Municipal Railway cars of San Francisco will swing south off Market street down First and on to a ramp at the front of the terminal building. Three tracks will be provided on this elevated street car ramp at the front of the terminal.

In the basement of the terminal a huge garage space for 755 cars will be provided.

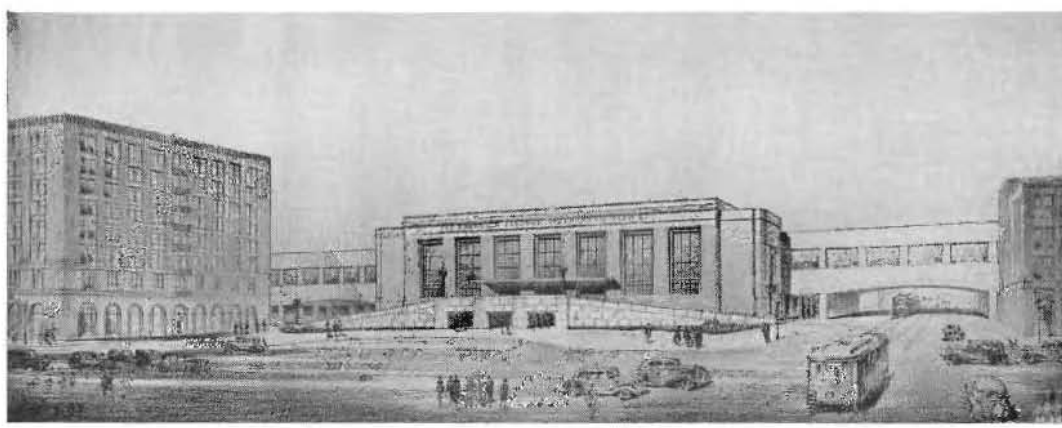
INTERURBAN RAILWAY LOOP

The building will be open at both ends for the six tracks of the interurban railway loop, but the tracks for the loop are under roof.

Beneath the interurban railway loading platforms is a seating space for commuters in a waiting room 135 feet wide by 220 feet long. Here will be located the usual newsstands and concessions for the convenience of the traveling public.

This terminal is part of the $15,000,000 interurban railway project that is part of the San Francisco-Oakland Bay Bridge which is being built for the California Toll Bridge Authority of which Governor Frank F. Merriam is chairman, by the State Department of Public Works, of which Earl Lee Kelly is director.

SAN FRANCISCO TERMINAL of Bay Bridge as it will appear when completed is indicated by white arrow. The building will accommodate six tracks of the interurban railway loop.



FRONT OF TERMINAL showing elevated ramp for three tracks of street cars. The building provides a waiting room 135 feet wide by 220 feet long.

The long-awaited contracts, necessary to obtain an additional $10,000,000 from the RFC for the construction of the terminal and the addition of interurban railway facilities, have been completed.

These contracts now must pass the scrutiny of the California Toll Bridge Authority, the State Railroad Commission, and the Reconstruction Finance Corporation.

The Reconstruction Finance Corporation by resolution has already committed itself to advancing an additional $10,000,000 which, with $5,000,000 saved out of the original $61,400,000 loan, will provide the $15,000,000 necessary to construct the bridge railway, terminal building, and viaducts. This additional advance was contingent upon State legislation since enacted.

In compliance with RFC requirements, the contracts provide for discontinuance of all interurban passenger ferry service, and for operation over the bridge railway of the Key and Southern Pacific east bay trains, these facilities to be operated by the existing carriers.

Newport Beach Grade Separation Plan Includes Two Bridges and Ramps

By **A. D. GRIFFIN**, District Office Engineer, District VII

FOURTEEN years ago the Southern Pacific Railroad grade separation was constructed to pass the Coast Highway under the railroad at Newport Beach and thus eliminate the hazard of collisions between vehicles and trains. As years passed traffic on the Coast Highway between Long Beach and San Diego, and the cross traffic on the intersecting county highway between Santa Ana and Newport Beach increased tremendously, and traffic congestion on Sundays and holidays became unbearable.

Frequently cars on both the State highway and the county road were held up an hour or more in negotiating this intersection, and serious accidents were frequent.

COOPERATION PROPOSED

And so it hapuened that eight years ago City Engineer R. L. (Pat) Patterson of Newport Beach, and Orange County Engineer N. H. (Nat) Neff, proposed to join with the State in a three-way cooperative project for construction of a highway grade separation that would lift the county road up to the level of the railroad viaduct and carry it over the State highway.

Since that time these two capable engineers have worked long and hard on the proposition. Subsequently, the Newport Beach-Santa Ana county road was made a State highway and taken out of county jurisdiction, but nevertheless Nat Neff's best efforts have always been available to the State in furthering plan work on the project.

Another man who was most helpful was R. C. (Bob) Mize, an old timer in Orange County who is the attorney for most of the property owners in the vicinity of the Newport Beach grade separation, but F. M. Strobridge, formerly of Newport Beach, now of Los Angeles, is without question the "granddaddy" of the Newport Beach grade separation.

"CONVERSATION ENGINEER"

So frequent and regular have been his visits to the district office in the effort to expedite an undertaking close to his heart that we look on him as a part of the State highway organization. Mr. Strobridge is exceptionally well posted upon engineering subjects, so much so that upon one occasion he was asked if he was a civil engineer. His reply was, "I have the degree of C. E. but in my case it means "Conversation Engineer."

The "conversation stage" for the Newport Beach grade separation project was a long one because there were so many points that had to be settled before plan work could be consummated. We not only had Mr. Strobridge's services as a "conversation engineer," but the record further shows that he most generously donated to the State for right of way large areas of land from his own property in Newport Beach that were needed for the proposed construction work.

Other generous donations of right of way made this project possible. Great credit is due George Machris and his brother, Alfred Machris, who control the Wilshire Oil Company, for the donation to the State of large areas of land also needed for right of way. These men also gave the State certain so-called "borrow rights."

"BORROW RIGHTS" DEFINED

Now, the term "borrow rights" is a misnomer. It would be more proper to call them "take rights." What is meant by "borrow rights" is that the State can excavate and remove earth material from a location on private property outside of the right of way, and transport it to construct roadway embankments on the right of way.

As plans for this project began to take form and were presented to the Southern Pacific Railroad Company, we encountered a curious situation. The railroad officials were not even lukewarm about the project, it might even be said they were icy-cold. While years ago the railroad line to the city of Newport brought them in considerable profit with the then young city developing commercially and industrially, their business had dropped to almost nothing as the city of Newport Beach, including the Balboa peninsula and Balboa Island, became a recreational resort due to the splendid land-locked bay now world famous for the water sports it affords.

Statement was made by one of the railroad officials that they wished they could give up

GRADE SEPARATION SITE of Newport Beach project. The Coast Highway passes building in foreground and extends southerly around Newport Bay. Santa Ana road crosses just beyond railroad overhead.

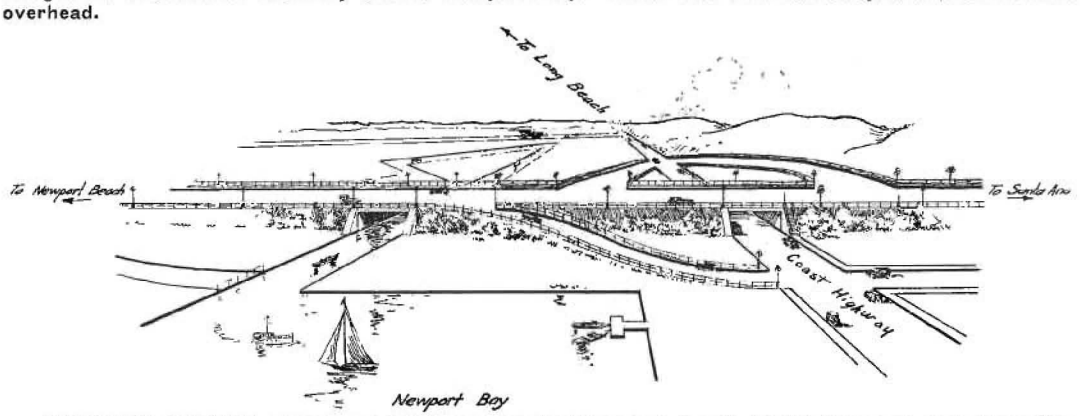


DIAGRAM SKETCH shows overhead crossing for Newport Beach-Santa Ana road and connecting ramps from the Coast Highway.

the Newport Beach line. Now, the abandonment of a long length of railroad (approximately eight miles) can not be accomplished in a day just by deciding it should be done. While local officials were agreeable to this suggestion from the start, the railroad company's board of directors, sitting back in New York City, had to be won over.

This was a most difficult task because the portion of the railroad right of way desired by the State was covered by a bonded indebtedness in excess of the amount the State offered for the right of way. Also, the matter had to be referred to the "Great White Father" in Washington through the Interstate Commerce Commission, because the Southern Pacific Railroad operates between States and the cutting off of a branch railroad from the main system might seriously affect interstate conditions. And so the working out of this proposition required many, many months of negotiation, before a successful agreement was reached so that the Newport-Santa Ana road could be moved over and occupy the railroad right of way.

There were also many other problems to be solved. Along the highway had been installed a large high-pressure water main carrying the water supply for the city of Newport Beach, the city of Laguna Beach, and other Orange County coast communities. There is also in the right of way a large high-pressure gas main which transports gas from the Ventura field to San Diego. Taking care of these important public utilities had to be worked out so that highway construction would not interfere or interrupt these most essential services.

(Continued on page 30)

Federal Aid Urged for Next Biennium

(Continued from page 9)

using the highways through special concession. A license to drive is but a privilege permit to operate on an asset owned by all the people.

Our highways are not built for individuals to use as they choose. Society in general and government retains the right to dictate the manner of use of the asset that is built by everyone. The 23,100 deaths on our rural highways and the 12,900 on our urban highways last year resulted from many causes. Of course, we want to know the cause to help find the remedy. But whether it be collision with pedestrians, collision with other motor vehicles, collision with railroad trains, with fixed objects, noncollision or any other cause, the American people should not view it with the apathy that seems to be public enemy number one.

Our highways may be the cause of some of these accidents but the engineer can not be shouldered with the responsibility. He is building the best highway and to the extent that revenue will permit, the engineer is doing his part in designing and building for safety by widening of curves, increasing sight distances, constructing extra lanes, installing signs and signals, putting down visible striping and many other things that science is devising in the interest of the highway user.

Now comes the responsibility of Mr. Citizen. If someone entered his home and murdered one of his family the greatest of interest would be manifested immediately. Mr. Citizen can cooperate with the constituted authorities through due observance of the laws if nothing else.

We have motor vehicles using our highways that are unfit for use and should be eliminated and a continuance of the practice now instituted in California of taking cognizance of those that have caused numerous accidents, even if they are minor, is going to be effective.

A strong resolution was passed by the association on this subject asking President Roosevelt and the governors of the several states to use their executive authority and to appoint advisory groups and direct existing official agencies to effect the cooperative action necessary to accomplish the desired results.

MORE FEDERAL AID URGED

California, like many of the states, wrote into its present biennium budget the full amount of the Federal Aid authorization as a part of the necessary funds to carry on the continuing process of highway construction within our boundaries. A strong resolution was passed by the association asking Congress to appropriate for highway construction for the fiscal years of 1938 and 1939 not less than $125,000,000 for each fiscal year, as well as other sums for the same period for forest highways, roads and trails, roads through public lands, nontaxable Indian lands, and other federal reservations; roads in national parks and for Indian reservation roads. In California authorizations and appropriations for these purposes are very necessary for a well connected highway system. May we hope that the members of Congress will be as highway-minded as they have been through making these appropriations in the past.

The unemployment situation in the United States has affected highway programs in all the states to a greater or less extent. Without the Federal Emergency appropriations many of the states would not have been able to make any showing to any extent during the past two years. The different states have worked with the greatest speed possible in a most efficient manner in the use of the Federal Emergency money for highway construction and railroad grade crossing eliminations. This has not only brought improvement years ahead of what would normally be possible but it has offered a channel providing profitable employment while constructing public improvements of a permanent character. All of this of course, has added to the civic and social values of the country.

EQUITABLE FUEL TAXES

The association offered a strong resolution pledging its continued support and assistance in the directing and expending of future Federal funds in an endeavor to meet the unemployment situation.

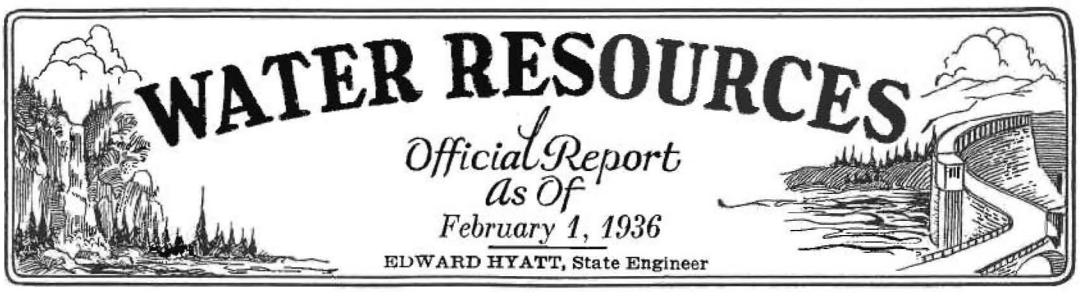
Another very important resolution that had wide discussion and was passed unanimously was a recommendation to the respective state legislatures that they take action to properly and equitably tax all motor vehicle fuels. Papers were offered and talks made on the new types of motors and the new development of motor fuels, other than gasoline, now being used in motor vehicles on our public highways. It was shown by many states that their revenue had decreased because of these fuels do not carry a tax and for that reason many users of our highways are not paying their proportionate share of the cost of construction and maintenance of our highways, roads and streets.

SAN FRANCISCO SEEKS CONVENTION

The association meeting was opened with a welcoming address by Governor Dave Sholtz of Florida in which he stressed the beauties and climate and other assets of his wonderful state. The representatives from California were particularly impressed with the Governor's reference to our own fair state. Realizing we were guests of the State of Florida and recipients of her very fine hospitality we listened with appreciation to the Governor's remarks and in true American sportsmanship and with due realization of how generous nature has been to our fair state we entered into the spirit of the occasion and did our part to make the convention one that will be known for specific accomplishments.

However, we felt California is ideally situated to entertain the representatives of the states in as wonderful a manner as Florida. San Francisco had asked us to present an invitation to the association to hold its 1936 convention in the city by the Golden Gate. This was done and we were not surprised when 90 per cent of those attending wanted to come to California.

If the executive committee in June officially accepts this invitation, Californians interested in highway matters will have an opportunity to meet, see and listen to the outstanding men of the United States working to move the people and trade on rubber wheels over paved highways.



Plans are being rapidly formulated for construction of the Central Valley water project by the U. S. Bureau of Reclamation. Both the Denver and local offices of the bureau are making every effort to get construction started at the earliest possible date, that the program may be carried out in accordance with the approval by the President in which he authorized an initial allocation of $15,000,000 for the construction of the project.

The tentative program adopted under the direction of Mr. Walker Young, engineer in charge of the project, contemplates construction being started on Kennett Dam on Sacramento River and the necessary relocation of the Southern Pacific railroad to replace several miles of the present line which will be flooded by the reservoir; the Contra Costa Conduit to serve industrial, urban and agricultural areas in Contra Costa County; Friant Dam on the San Joaquin River and the Madera and Friant-Kern canals which will divert water from the Friant reservoir to the lands in southern San Joaquin Valley.

The State Department of Public Works is cooperating in every possible way with the Bureau of Reclamation in speeding work on the project, and Governor Merriam has indicated his approval of $20,000 from the emergency fund to the Water Project Authority that it may effectively cooperate with the U. S. Bureau of Reclamation in furtherance of the project.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project.

Routine maintenance was continued during this period, consisting of the removal of debris from bridges and structures, operation of pumping plants, levee patrol, minor repairs to structures, and filling cracks and gopher holes in levees.

During the small flood that began on January 13th, emergency work was done to hold the west levee of the Sacramento River above Colusa on the Clara Packer ranch. This work was done on January 16, 17 and 18 in cooperation with landowners, U. S. War Department, and WPA. Several of our WPA crews from other projects were transferred here during the emergency. The high water almost reached the levee top in places, but the chief trouble was occasioned by numerous gopher and squirrel hole leaks. The levee was safely held after a period of 48 hours of continuous work.

Relief Labor Work.

During this period aproximately 290 men were engaged on six WPA relief labor projects, clearing and improving the flood channels, principally in Sutter and Yuba counties. During the storm of early January much of the area on which these men were working was covered with water, but the crews continued to work on nearby levees. Some time was lost on account of rain.

Sacramento Flood Control Project.

Work has continued in preparing the right of way for the south levee of the American River near Perkins, the present work consisting mostly of installing irrigation pipes and removing hop support poles.

Work on the three new drainage pumping plants on the Sutter By-pass has been continued under contract with the California Debris Commission. Several of the new units have been installed and are ready for operation.

Several inspection trips were made with the U. S. Army Engineers on the Sacramento River between Colusa and Rio Vista, by boat, chiefly in the examination of the condition of caving banks.

Flood Measurements and Gages.

During the January storm flood measurements were taken at Coloma on the south fork of the American River, at Fair Oaks on the American River, and on the Bear River at Wheatland. The stages reached on the other streams were not sufficiently high to warrant measurement.

Automatic radio sending sets have been installed at gaging stations at Coloma on the south fork of the American River, at Rattlesnake Bridge on the north fork of the American River, and at Verona on the Sacramento River. These stations automatically transmit the river stages at fixed intervals and are located at the key stations which would largely determine the question as to whether or not the Sacramento weir gates should be opened.

DAMS

Application was filed January 15, 1936, for enlargement of the Sheffield Dam of the city of Santa Barbara. This is a small earth fill structure impounding water for municipal use, which is to be raised

(Continued on page 24)

First Snow Survey Data Completed

(Continued from page 23)

approximately 12 feet and will store an additional 140 acre-feet. The estimated cost of the work is $95,000.

An amended application for repair of the Littlerock Dam located on Littlerock Creek and owned by the Littlerock and Palmdale Irrigation Districts, Los Angeles County, was filed December 23, 1935. The work contemplated covers alterations in the construction of temporary spillway works. This application was approved January 3, 1936.

Application for enlargement of La Patera Dam in Santa Barbara County was approved Janury 7, 1936.

Authorizations to use the Calero, Guadalupe, Vasona Percolating and Stevens Creek dams of the Santa Clara Valley Water Conservation District were issued December 21, 1935. Work on Coyote and Almaden dams has been considerably delayed because of the rains.

Work on Cajalco Dam of the Metropolitan Water District is progressing satisfactorily as is that at San Gabriel No. 1 of the Los Angeles County Flood Control District.

An order authorzing the use of San Gabriel No. 2 under certain restrictions as to storage was issued December 21, 1935.

Enlargement of the O'Shaughnessy Dam of the city of San Francisco is proceeding.

Repairs and alterations on the American River Head Dam and Lake Francis Dam, both belonging to the Pacific Gas and Electric Company, have been satisfactorily completed.

Repairs on St. Helena Lower Dam have been delayed on account of heavy rains in the vicinity.

The PWA has available, funds for the repair of Lake Hodges Dam of the city of San Diego and the state has been assured the work will be commenced shortly.

The usual maintenance and operation inspections have been carried on in addition to the inspections of repair and construction work.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Work has continued during the past month on compilation of the 1935 Report covering diversions, stream flow, and return flow in the Sacramento-San Joaquin territory and salinity in the Delta.

In the field, the tide gages and salinity sampling at permanent stations in the Delta have been maintained.

From a flow in the Sacramento River at Sacramento of about 9500 second feet in the latter part of December, the recent storms brought the flow to a maximum on January 16th of about 75,000 second feet plus the additional flow in Yolo Bypass.

The increased stream flow is reflected in a marked recession of salinity which had dropped to 6 parts of chlorine per 100,000 at Collinsville and Antioch on January 14th.

CALIFORNIA COOPERATIVE SNOW SURVEYS

Work during the past month has been in the office in bringing up to date the computation of normals for both precipitation stations and snow courses and in compiling natural stream flow records for correlating the past snow survey data.

The first snow surveys for the season were made at key courses at the end of January and the data of these surveys together with precipitation records to date will be published in the first monthly bulletin to be ready on February 10th.

WATER RIGHTS

Supervision of Appropriation of Water.

Twenty applications were received during December to appropriate water; 13 were denied and 11 were approved. In the same period 12 permits were revoked and 7 passed to license.

A total of 1479 reports were filed between October 15th and January 1st covering developments under permits and licenses issued by the Division. These reports are under study with a view to determining what extensions should be allowed, what inspections should be made and what abandonments have occurred.

Water Distribution.

Reports covering distribution of water in the following districts for the 1935 season are being prepared: Hat Creek, Burney Creek and Cow Creek Water Master Districts (Shasta County), Owl, Soldier, Emerson, Cedar, Deep and Mill Creek Water Master Districts (in Surprise Valley, Modoc County); New Pine, Davis and Franklin Creek Water Master District (in Goose Lake Valley, Modoc County); Shasta River Water Master District (Siskiyou County).

Reports covering the distribution of water in the following districts for the 1935 season have been completed: South Fork Pit River, Pine Creek, and Hot Springs Valley Water Master Districts (Modoc County); and Big Valley Water Master District (Modoc and Lassen counties).

FEDERAL COOPERATION—TOPOGRAPHIC MAPPING

Final sheets of the Hoaglin Quadrangle are now available. This covers an area in southern Tehama County. The sheet is published on a scale of 1:125,000 with a contour of 100 feet. Final sheets are also available of Woody Quadrangle in Kern County. This is published on a scale of 1:62,500 with a contour interval of 50 feet.

REDLANDS DEDICATION GROUP—In the official party (left to right) State Highway Commissioner C. D. Hamilton, Mayor William Fowler, Secretary Horace Williamson, Chamber of Commerce; Chairman Harry A. Hopkins of Highway Commission, District Engineer E. Q. Sullivan, Miss Jessie Reynolds, Director of Public Works Earl Lee Kelly, Mayor Harford of Colton; Mayor Funk of Beaumont, Mayor Johnson of San Bernardino.

Highway Sponsor Sees Dream Realized

(Continued from page 4)

coffers had been diverted, this modern highway, a milestone in the development of Redlands, could not have been possible. We of the state are thankful that the highway could be completed at so early a date."

The new highway runs through the heart of the municipal dump. E. Q. Sullivan, district engineer, who supervised construction with the cooperation of City Engineer George Hinckley, said that plans have been made to beautify the route with trees, shrubbery and flowers where it passes through the dump thus providing an attractive entrance to Redlands.

Among those on the speakers' platform to whom the improvement meant a lot was Isaac Ford of the city planning commission. Ford is credited with having conceived the new highway and sponsored the movement for it.

"I am glad my dream has come true," he said.

Mayor Will Fowler of Redlands opened the dedication ceremonies and told of the city's efforts over a period of years to bring about the improvement.

Highway Commissioner Hamilton praised Redlands for its united work in pushing the work of the highway link to completion.

As president of the Redlands chamber of commerce, Horace S. Williamson give a full measure of credit to the state for the construction of the project.

THREE VISITING MAYORS PRESENT

Officials of neighboring cities joined with Redlands in celebrating the opening of the new road. Mayor E. F. Harford of Colton headed a delegation which included H. W. Roller, city councilman; John Cook, chamber of commerce president; and Otto B. Kessler, secretary of the chamber.

Mayor Johnson of San Bernardino, Mayor J. D. Funk of Beaumont and Mayor Harris of Banning represented their cities at the ceremonies.

A civic Rotary Club luncheon preceded the dedication.

Troop 21, Redlands Boy Scouts, took part in the opening.

Clearing 1100 Miles of Roadsides

(Continued from page 10)

Due to the rapid growth and uncertainty as to weather, careful planning is necessary and it is possible, at best, to cover only a portion of the areas at the ideal time.

Experiments have been carried on—in one case extending over several years—to determine the most effective nonpoisonous material. Various proprietary chemicals were included in these tests. Nothing was discovered, however, that was more effective or as economical as Diesel oil having the following specifications to insure a uniform material of adequate toxic effect:

Specific gravity (A. P. I.) at 60°F_____
_____not less than 27°Be
Flash point (Penskey-Martin closed cup)____
_____not less than 150°F
Viscosity (Saybolt Universal) 100°F_____
_____not more than 50 seconds
Distillation—90% point_____not over 680°F
Water and sediment_____not more than a trace

The Diesel oil is applied at the average rate of one-tenth gallon per square yard of area to be treated by means of tank truck outfit equipped with pressure pump and spray bar. The spray bar is fitted with orchard type spray nozzles designed to give a uniform spread.

To insure such a spread, it is necessary that the position of the spray bar be adjustable so that it may be readily raised or lowered and reach out to varying distances from the roadway. Various designs have been used to serve the purpose. The pictures on page 11 illustrate the general idea.

WORKERS HELD RESPONSIBLE

After the oil is applied, it is allowed to penetrate and act on the vegetation, which gradually turns brown. Burning operations, if required, are then started.

Under existing legal restrictions, any damage which results through negligence of an individual in the State service is a direct responsibility of that individual. Special care is taken, therefore, to see that adjoining property, fence posts, trees, etc., are properly safeguarded, as well as provision made for the protection of traffic. Knapsack type pumps or fire trucks are provided for each crew, and flagmen warn and direct traffic.

The cost of spraying averages from $50 to $60 per road mile of two 9-foot strips, and burning operations cost about $20 per road mile, or a total of $75 to $80.

In addition to the areas where spraying is necessary, a considerable mileage is also protected during the regular maintenance operations by blading, disking, or mowing. Protection by this means is considerably cheaper in first cost, averaging about $6 per road mile for a reasonable width.

SERIOUS FIRE ABATED

Any grading operation, however, has the disadvantage of disturbing the road section and loosening the soil to wind and water erosion so that the ultimate cost, considering damage done and discomfort due to dust nuisance, may well exceed the cost under the spraying method. There are many locations, also, where it is not possible to work equipment, and such areas must be sprayed.

There is no question as to the beneficial results of this work. Prior to the initiation of this protective measure, a number of serious fires could be anticipated each season. Last year not a single fire of any magnitude was reported as having started along the State highway.

$650,000 VIADUCT IN LOS ANGELES

(Continued from page 12)

The erection of the unusually long steel plate girder spans, which will span the tracks and the Los Angeles River will also be an interesting construction problem.

The contract for the viaduct has been awarded to the low bidder on a bid price of $578,420. However, supplemental work to be accomplished by the Southern Pacific Company, in addition to a contingency item, will bring the cost of this project to approximately $678,000. The contract provides for 300 working days in which to complete the viaduct.

The North Figueroa Street road, tunnel and viaduct projects will provide a continuous through artery for traffic to and from the rapidly developing areas across the river at the north, northwest, and northeast of Los Angeles.

Highest and Lowest Spots in U. S. Linked Closer by Highway

(Continued from page 16)

among these peaks is Mount Whitney, the highest peak in the United States proper.

At this spectacular viewpoint the casual visitor does not realize that a few miles distant in Death Valley, reached in an hour's comfortable drive by way of the recently improved highways, lies Bad Water, the lowest spot in the continental United States with an elevation of 279.8 feet below sea level.

SCENE OF PIONEER TRAGEDY

Bad Water is of particular interest as it is the termination of the Amargosa River, the disappearing stream of Death Valley, and the spot where a number of early immigrants trapped in the floor of the valley rushed to partake of the crystal clear water only to die in agony a few hours later, because this water is abnormally charged with salts and minerals.

Probably in no section of the state has the improvement of the Secondary Highway System brought more prompt and beneficial results to the scattered inhabitants of the region, to the people of California, and to visitors from states beyond our borders, than the work done by the Department of Public Works in this area and by the National Park Service within the borders of the Death Valley National Monument.

Many thousands of motorists who had deferred a trip through this picturesque yet awesome wonderland until such time as the highways were in a condition to be traveled with comfort and safety have been able to enjoy a new and exotic touring experience.

AUTOS COVER 16 BILLION MILES

The nation's 25,000,000 motor vehicles rolled up an aggregate mileage last year that reached the astronomical proportions of nearly two hundred billion miles, according to figures reported in a nation-wide study. In California the estimated total of motor vehicle mileage in 1934 was 16,111,000,000 miles, the second highest among the states. New York was first with about twenty billion miles.

California made a gain of 5.66 per cent in motor vehicle registrations in the first nine months of last year in comparison with the same period of 1934.

New Tunnel Provides Traffic Outlet From Crowded Beach Area

(Continued from page 6)

the heart of Los Angeles providing a direct outlet for city-bound traffic from the beach.

Mr. Kelly then, as Director of Public Works for the State of California, without further ceremony declared the tunnel open for traffic.

Mayor Carter of the city of Santa Monica expressed regrets over the necessity of canceling the festivities due to the inclement weather and emphasized the benefits which Santa Monica would enjoy from the completion of the tunnel.

Expressions of appreciation were extended to the officials for their splendid cooperation and in conclusion the mayor commanded Chief of Police Webb of the city of Santa Monica to have the final barricade removed and allow traffic to use the tunnel.

The municipal band played the national anthem and at its conclusion, cars were allowed to pass through.

Previous to the outdoor ceremony, the state and county officials met with Santa Monica heads and civic and business leaders at a luncheon in the Del Mar Club held under the auspices of the Olympic Boulevard Improvement Association.

With Supervisor Quinn acting as toastmaster, the luncheon program included brief speeches by Director Earl Lee Kelly, District Engineer S. V. Cortelyou, Justus F. Craemer, Assistant Director of Public Works; D. W. Pontius, president of the Pacific Electric Railway; G. T. McCoy, Assistant Highway Engineer, and Fred Grumm, Engineer of Plans and Surveys.

Mr. Pontius in his remarks stated that: "This is the greatest highway project completed in the entire state in several years and it means more to the Santa Monica Bay district than anything else that could be accomplished."

First Angler: "I caught a fish so big that my friends wouldn't let me pull it aboard for fear the boat would be swamped."

Second Angler: "I quite believe you. I once had a similar experience aboard the Mauretania."

Wife—Did you notice the wonderful coat the woman had on who was sitting in front of us in church this morning?

Husband—No; I'm afraid I was dozing.

Wife—It does a lot of good to take you to church, doesn't it?

State Exhibit at San Diego Fair to Show Highway Safety Features

THE DIVISION of Highways of the Department of Public Works, will contribute its share toward the success of the 1936 edition of the California Pacific International Exposition at San Diego by continuing an exhibit depicting some of the more interesting phases of its many activities and services to the motoring public of California. During the 1935 Exposition, over 1,700,000 persons viewed the Highway Exhibit in the State Building.

Among the many interesting features in this exhibit is the one showing side by side sectional models of the famous Appian Way of ancient Rome and of a modern highway. Colored lights and explanatory captions present interesting and informatory comparisons between the methods and processes of the ancient highway builders of Appius Claudius and the modern practices used in the construction of California's unexcelled highway system.

WORK REQUIRED 280 YEARS

Here are presented the historical facts of that first and justly famous effort of government to provide for its citizens an artery of commerce and a life line of protection in time of war, for its far-flung empire.

The Appian Way was begun by the Censor Appius Claudius in 312 B.C. and for over 280 years, this far-sighted emperor and his successors labored toward its completion. When completed it extended from Rome to Brundusium, a distance of 350 miles. Massive in plan, and constructed to endure for ages, the effort appears feeble indeed when compared to California's highway system extending over 13,605 miles, of which there is hardly a mile that is not incomparably better than this ancient road.

Especially does the comparison appear invidious when it is realized that less than one-tenth of the time required to construct the 350 miles comprising the Appian Way has been utilized in the construction of the mighty modern road system which is justly California's pride.

Among the many interesting facts obtained from visitors to the highway exhibit during the 1935 exposition was the universal impression made by California's road system upon visiting motorists from other states and territories. Few indeed failed to pause and remark to the exhibit attendants upon the lasting impression our fine roads had made upon them.

The exhibit planned for this year's fair is to be expanded by the addition of an informational and interesting exhibit of the standard system of highway signing which has been developed for the safety, information, and direction of the motoring public.

In conjunction with and supplementing the sign exhibit, it is planned to present a complete pictorial exposition of the multitude of safety refinements developed by California's road builders in the design, construction and maintenance of our highways.

SAN MATEO COUNTY CLUB EXPRESSES APPRECIATION FOR ROAD IMPROVEMENT

Sky L'Onda Improvement Club
San Mateo County, January 27, 1936.

Division of Highways,
Department of Public Works,
Sacramento, California.

Gentlemen:

The officers and members of the club take this opportunity to thank your department for the wonderful work you have done on the stretch of road from Redwood City to the Sky Line Boulevard.

The amount of improvement noted in the short length of time since your department took charge, is phenomenal, and your Mr. Grosser, who we understand is directly in charge of this work, is to be commended for his foresight in improving the worst spots before our winter weather set in.

This work was carried on entirely without interruption or hindrance to travel, due to wise planning and handling of equipment, which is quite a task on a road as narrow as this one.

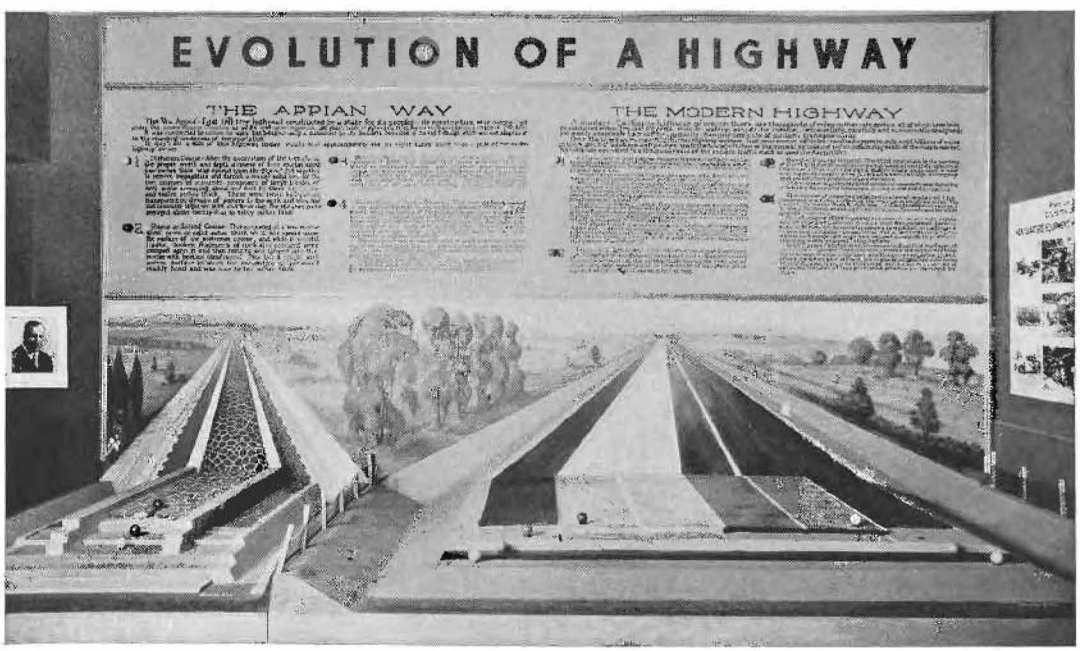
Please believe us when we say that people of Sky L'Onda are very grateful to your department.

Very truly yours,

(Signed) A. J. TURNER, President

E.F.Mc.

SAN DIEGO EXPOSITION EXHIBITS—The old, much dreaded plank road over the desert to Yuma is realistically reproduced, affording visitors a comparison with the wide, modern, surfaced highway that the State has built, providing safe traffic through the ceaselessly shifting sand dunes.



ANCIENT AND MODERN HIGHWAYS are compared in this exhibit of the Appian Way built by the old Roman engineers and a standard present day arterial as California engineers build it. The models show every step from foundation up to top layer surfacing.

Grade Separation at Newport Beach Now Under Construction

(Continued from page 21)

As the project developed many improvements were added to the original scheme. A system of side road ramp connections was worked out so that there will be a free flow of traffic in all directions whatever the destination may be of vehicles coming into the grade separation.

LIGHTING SYSTEM ADDED

As the plan work neared completion Pat Patterson brought into the district office a design for an electric lighting system, which he advocated be constructed for the city of Newport Beach as a part of the State contract. This was the last addition to the plans, and now decorative electroliers will be evenly spaced, so that the entire project will be well illuminated and safe for night driving.

The accompanying perspective drawing is an attempt to show the completed structure. Like all plans of the Newport Beach grade separation, it has been subjected to many changes since first drawn for Mr. Strobridge by Will Sharpe, an Alhambra artist.

And so the Newport Beach grade separation project has passed out of the "conversation stage," and is now under construction. The estimated cost, including the channel bridge, the highway overhead bridge, all ramp connections, and incidental work to complete the project, is approximately $170,000. The work is scheduled for completion in September, 1936. When completed, this structure will stand as a monument to effective and wholehearted cooperation.

The traveling public journeying in the vicinity of Newport Beach find a traffic facility that will greatly add to their comfort, convenience and safety, and save them many wearisome and nerve-racking delays. During the long planning period every advantage was taken of new developments and of experiences gained by traffic flow studies at that location and elsewhere, and many most desirable additions and refinements have been carried into the plans which could not possibly have been worked out if the project had been forced-drafted to maturity more quickly.

One Wife: "When you and your husband quarrel, do you threaten to go home to your mother?"

Another: "No, indeed, I threaten to have mother come here."

State Highways Used Most in Both Rural and Municipal Areas

THE preponderant use which traffic makes of the state highways is not confined to either the urban or rural areas. It is outstanding in both, according to data on road transportation in California gathered for Director of Public Works Earl Lee Kelly.

Where one car is found on a mile of county road, fifteen are found on the rural state highway; and in the cities, six times as many cars will travel over the urban portion of the state highway as will be found on an equal mileage of the other municipal thoroughfares.

MOST VEHICLE MILEAGE

The aggregate population and road mileage of the five counties of Alameda, Los Angeles, San Diego, San Francisco and San Mateo are 63.5 per cent and 20.9 per cent of the state totals for these respective items.

The aggregate vehicle miles occurring in these counties are 58.6 per cent of the state total; in fact, in Los Angeles County alone is 42.2 per cent of the combined state vehicle mileage.

Of the large proportion of traffic in this group of five counties, 30.6 per cent of the vehicle mileage is on state highways, 8.2 per cent on county, and 61.2 per cent on municipal thoroughfares.

Truck Owners Must Pay Bridge Damages

The fact has now been legally reaffirmed that law violators are responsible for damages to State highways and that the duty of the Department of Public Works to care for and protect State highways is not limited to physical maintenance by the Department. Such duty, the court recognizes, also includes the collection of the costs of making repairs made necessary by the illegal operation of vehicles on the State highways.

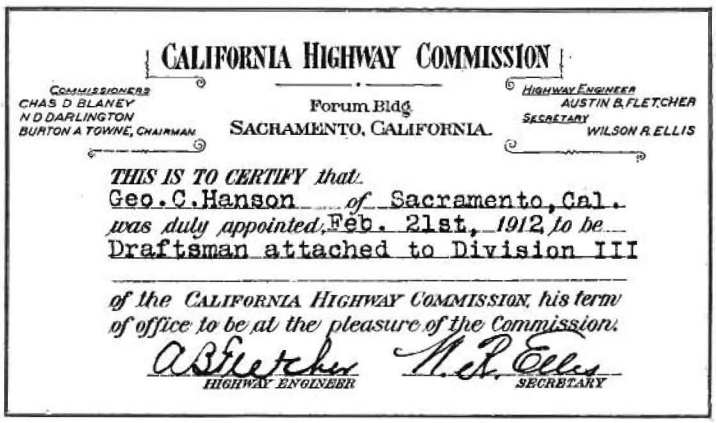
In recent months the department has recovered judgments against two truck operators for damages to bridges, one in Shasta County and one in Monterey County. In the latter case an over-height load was driven onto a bridge across the Salinas River at Soledad with such force as to require reconstruction of one-half of the entire bridge.

Old Timer, Do You Hold a Card to Beat This?

ANOTHER applicant for membership in the Old Timers' Club of the State Division of Highways holding an identification card dated way back in February, 1912, reported in this month.

He is George C. Hanson of Sacramento. While a close runner-up for the honor of head man of the club, Mr. Hanson did not displace George Mattis of Emeryville, who last month submitted credentials showing that he was appointed Chief Assistant of the old Division V of the Highway Commission on February 1, 1912. Mr. Hanson went to work as a draftsman for the commission on February 21st of the same year.

While he did not win the post of oldest member in point of years elapsed since his original appointment, Mr. Hanson has a distinction of his own. He has a record of 24 years of uninterrupted service with the Division of Highways.



CALIFORNIA HIGHWAY COMMISSION

COMMISSIONERS
CHAS D BLANEY
N D DARLINGTON
BURTON A TOWNE, CHAIRMAN

Forum Bldg
SACRAMENTO, CALIFORNIA

HIGHWAY ENGINEER
AUSTIN B. FLETCHER
SECRETARY
WILSON R. ELLIS

THIS IS TO CERTIFY that
Geo. C. Hanson of Sacramento, Cal.
was duly appointed Feb. 21st, 1912 to be
Draftsman attached to Division III

of the CALIFORNIA HIGHWAY COMMISSION, his term of office to be at the pleasure of the Commission.

A B Fletcher
HIGHWAY ENGINEER

W. R. Ellis
SECRETARY

TWENTY-FOUR YEARS' SERVICE began for George C. Hanson when he received this card and went to work for the State March 1, 1912.

WORKED IN OLD OFFICE

The only requirement for membership in the Old Timers' Club is possession of one of the identification cards issued by the old Highway Commission in 1912 and thereafter to every man appointed on the staff of a division engineer. Mr. Hanson sent in his card and with it a photograph of himself taken when the commission had offices for the employees of District III in the California Fruit Building in Sacramento.

In applying for membership, Mr. Hanson wrote:

"I have been much interested in the articles in California Highways and Public Works about the Old Timers' Club and the contest for the oldest certification card.

"While mine probably is not as ancient as some others, its date of February 21, 1912, should at least attain honorable mention.

"I actually went to work as a Draftsman in Central Office on March 1, 1912. I have been employed by the Division of Highways for close to 24 years of continuous service."

ON THE JOB, twenty-four years ago. George C. Hanson (left) and H. C. Stover, now designing engineer of bridges, then starting as a draftsman.

Highway Bids and Awards

for January, 1936

KINGS COUNTY—Between 2 miles south of Lemoore and 1⅛ miles east of Stratford. About 6.3 miles in length, shoulders to be graded. District VI, Lemoore Road. L. A. Brisco, Arroyo Grande, $18,365; Claude C. Wood, Stockton, $19,165; Stewart & Nuss, Inc., & John Jurkovich, Fresno, $19,465; Earl W. Heple, San Jose, $19,644; M. J. B. Construction Co., Stockton, $22,679; Rexroth & Rexroth, Bakersfield, $23,032; Oilfield Trucking Co., Bakersfield, $23,344. Contract awarded to Leo F. Piazza, San Jose, $18,127.75.

LOS ANGELES COUNTY—Undergrade crossing under Union Pacific R. R. at Soto St. in Los Angeles, about 0.22 mi. roadway to be graded and paved with P. C. concrete. District VII, Route Feeder, Section L.A. H. M. Baruch Corp., Ltd., Los Angeles, $172,109; Basich Bros., Torrance, $159,634; Griffith Co., Los Angeles, $156,284; R. E. Campbell, Los Angeles, $193,-311; Merritt Chapman & Scott Corp., San Pedro, $179,164; Carlo Bonglovanni Const. Co., Hollywood, $189,990; T. A. Allen Const. Co., Los Angeles, $156,-691. Contract awarded to Oscar Oberg, Los Angeles, $154,942.70.

LOS ANGELES COUNTY—In San Gabriel Canyon between Camp Bonita and Follows Camp. About 2.2 mi, graded and A St. string br. to be constructed. District VII, route feeder, Section San Gabriel Canyon. Granfield, Farrar & Carlin, San Francisco, $368,394; Basich Bros., Torrance, $399,094; Oswald Bros., Los Angeles, $442,219. Contract awarded to Guy F. Atkinson Co., San Francisco, $355,762.

LOS ANGELES COUNTY—Los Angeles Railway and Southern Pacific R. R. overhead crossing at Figueroa Street and about 0.23 mi. roadway to be graded and paved with A. C. pavement. District VII, Route 165, Section L.A. Bent Bros., Inc., Los Angeles, $620,547; C. W. Calletti & Co., San Rafael, $632,860; Griffith Company, Los Angeles, $646,061; Mittry Bros. Const. Co., Los Angeles, $627,253. Contract awarded to Clinton Const. Co. of Calif., Los Angeles, $578,420.

LOS ANGELES COUNTY—Overhead crossing over Valley Boulevard and Southern Pacific R. R. at Soto St. and approx. 0.62 mi. to be graded and paved with A. C. District VII, Route Feeder, Section L.A. Heuser & Garnett, Glendale, $126,445; Bent Bros., Inc., Los Angeles, $133,911; Merritt-Chapman-Scott, Corp., San Pedro, $127,021; Robert E. McKee, Los Angeles, $135,-330; Byerts & Dunn, Los Angeles, $132,224; Lynch-Cannon Eng. Co., Los Angeles, $128,863; Atlas Construction Co.-C. F. Robbins, Pasadena, $136,863. Contract awarded to Griffith Co., Los Angeles, $116,864.70.

LOS ANGELES COUNTY—Undergrade crossing under Pacific Electric Ry. at Mission Road in Los Angeles. District VII, Route Feeder, Section L.A. Bodenhamer Constr. Co., Oakland, $273,900; Mittry Bros. Constr. Co., Los Angeles, $324,072; J. E. Haddock, Ltd., Pasadena, $245,917; R. E. Campbell, Los Angeles, $264,976. Contract awarded to L. E. Dixon Co., Los Angeles, $241,661.

MENDOCINO COUNTY—Near Lane's Flat. Widen, surface with river run gravel and place C. M. P. and D. I. a length of 0.2 mile. District I, Route 1, Section J. C. W. Caletti & Co., San Rafael, $8,556; John Burman & Son, Eureka, $7,901. Contract awarded to Helwig Const. Co., Sebastopol, $5,688.

NAPA COUNTY—Construct maintenance station buildings, at yard, about ½ mile north of Napa. District IV, Route 49, Section B. Theo. Johanns, Yuba City, $8,290; A. H. Siemer, San Anselmo, $7,263. Contract awarded to C. G. Langum, Napa, $7,194.

NAPA COUNTY—Between St. Helena and Larkmead Station 6.3 miles, grade and bridge. District IV, Silverado Trail. Pacific States Construction Co., San Francisco, $82,723; Bodenhamer Const. Co., Oakland, $86,867; Heafey-Moore Co., Oakland, $88,313; Granfield-Farrar and Carlin, San Francisco, $89,444; J. A. Casson, Hayward, $89,794. Contract awarded to Union Paving Co., San Francisco, $67,523.50.

ORANGE COUNTY—South Main Street between Delhi Road and Fairview Avenue, 1.3 mi. grade and P. C. C. pavement. District VII, Route 184, Section S.A. Basich Bros., Torrance, $45,753. Contract awarded to C. F. Robbins, Los Angeles, $42,487.

RIVERSIDE COUNTY—Between 10 miles west of Indio and Indio. About 10.9 miles in length to be graded and treated with liquid asphalt and a timber pile trestle to be constructed. District XI, Route 64, Section Q & Indio. Basich Bros., Torrance, $146,795; J. E. Haddock, Ltd., Pasadena, $154,223; Dimmitt & Taylor, Los Angeles, $150,868; V. R. Dennis Const. Co., San Diego, $138,132; Gibbons & Reed Co., Burbank, $155,330; Griffith Co., Los Angeles, $198,247; Geo. Herz & Co., San Bernardino, $146,830; Matich Bros., Elsinore, $143,235; Granfield, Farrar, & Carlin, San Francisco, $185,410; Oswald Bros., Los Angeles, $141,640. Contract awarded to Sharp & Fellows Cont. Co., Los Angeles, $129,848.90.

SAN BENITO COUNTY—Between Bear Valley and 1 mile of Willow Creek, 3.1 mile, grade, Sel. Mtl. Base, Rdmix Surf. and Tim. Br. District V, Route 119, Section C. Gibbons & Reed Co., Burbank, $101,295; Chas. Harlowe, Jr., Oakland, $108,436; Hemstreet & Bell, Marysville, $91,925; A. Teichert & Son, Inc., Sacramento, $84,102; C. F. Fredericksen & Sons, Lower Lake, $92,034; Heafey-Moore Co., Oakland, $100,272; J. L. Conner, Monterey, $85,950; Peninsula Paving Company, San Francisco, $94,500; Young & Son Company, Ltd., Berkeley, $88,391; M. J. B. Construction Co., Stockton, $93,725. Contract awarded to Union Paving Co., San Francisco, $85,187.50.

SANTA CLARA COUNTY—In Santa Clara undergrade crossing, Southern Pacific R. R. District IV, Lafayette Street undergrade crossing. Macdonald Kahn Co., Ltd., San Francisco, $168,127; A. J. Raisch and A. G. Raisch, San Francisco, $159,114; Eaton & Smith, San Francisco, $168,945. Contract awarded to Barrett & Hilp, San Francisco, $152,897.10.

SHASTA COUNTY—Borings at site of bridge over Pit River. District II, Route 3, Section B. Diamond Drilling Co., San Francisco, $4,240; Chicago Pneumatic Tool Co., San Francisco, $4,131; Milton A. Purdy, Oakland, $4,647; Cannon Brothers, Compton, $3,945. Contract awarded to Daniel G. Longtin, San Francisco, $3,301.40.

SUTTER COUNTY—In Yuba City, Plumas Street between Bridge Street and Scott Street, about 0.1 mile to be graded and paved. Curbs and gutters constructed. District III, Route 3, Yuba City. C. R. Fesler, Yuba City, $3,331; Louis C. Siedel, Sacramento, $3,236. Contract awarded to Leo F. Piazza, San Jose, $2,589.34.

TEHAMA COUNTY—One-half mile south of Red Bluff undergrade crossing, Southern Pacific R. R. 2 R. C. Abuts. Steel Sup. Str. 0.45 mi. P. C. C. Pav. District II, Route 7, Section B. C. W. Calletti & Co., San Rafael, $93,203; Paul J. Tyler & Lord & Bishop, Sacramento, $93,516; A. Teichert & Son, Inc., Sacramento, $102,695; McDonald Kahn Co., Ltd., San Francisco, $112,550. Contract awarded to N. M. Ball Sons, Berkeley, $91,790.

Excited Young Father: "Quick! Tell me! Is it a boy?"

Nurse: "Well, the one in the middle is."

—Daughters of America Magazine

Husband (after the theater): "But, dear, what did you object to?"

Wife: "Why, the idea of you bellowing 'Author! Author!' at a Shakespearean drama!"

—The Christian Science Monitor

Theysitlikethisuponaseat,
And now and then they kiss;
Then she says some darn fool thing,
And then they sit
Like----------this.

STATE OF CALIFORNIA

Department of Public Works

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

FRANK F. MERRIAM.....Governor

EARL LEE KELLY.....Director

JUSTUS F. CRAEMER.....Assistant Director

EDWARD J. NERON.....Deputy Director

DIVISION OF HIGHWAYS

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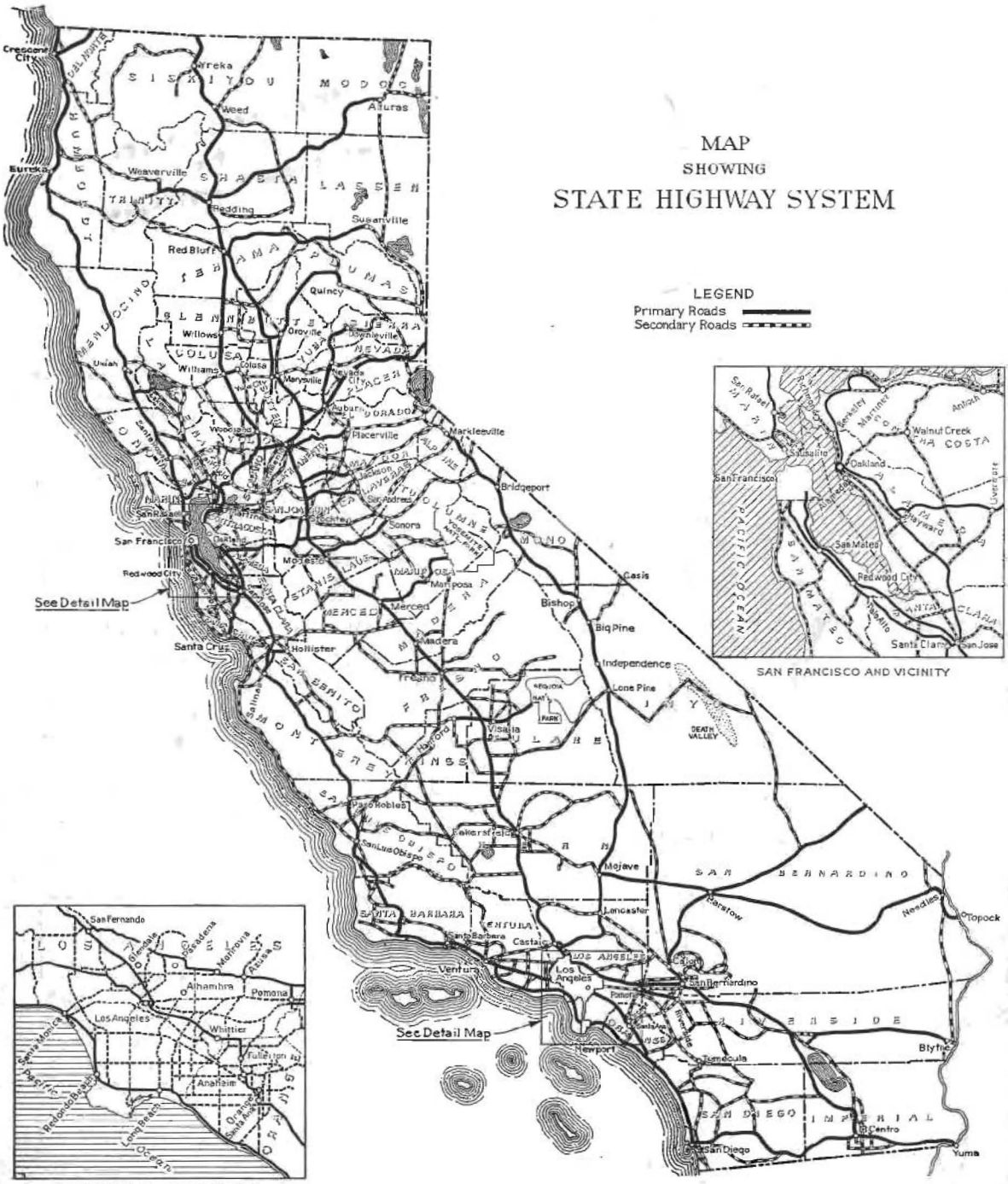
MAP
SHOWING
STATE HIGHWAY SYSTEM
LEGEND
Primary Roads
Secondary Roads
See Detail Map
See Detail Map
SAN FRANCISCO AND VICINITY
LOS ANGELES AND VICINITY
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