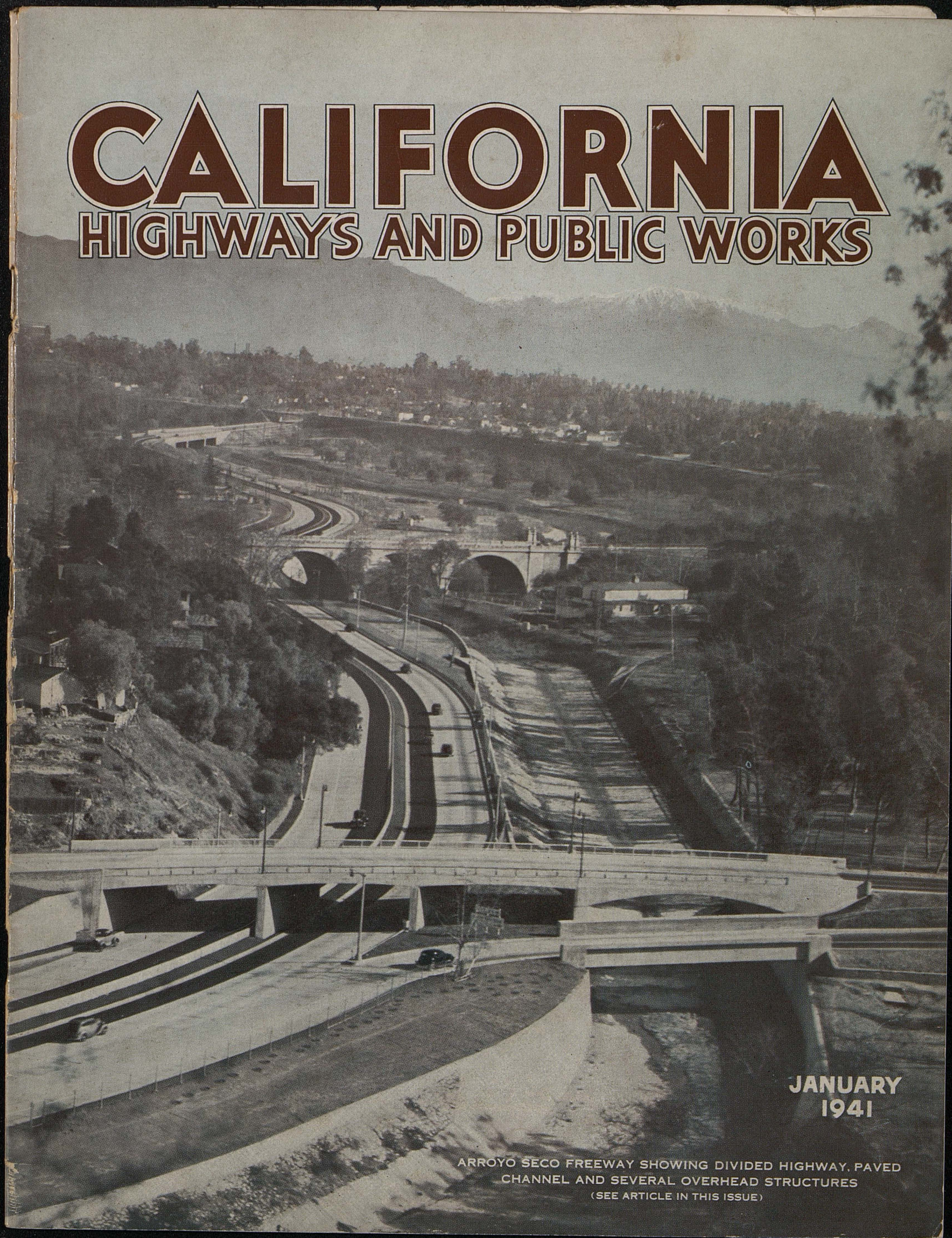
CALIFORNIA
HIGHWAYS AND PUBLIC WORKS



JANUARY
1941

ARROYO SECO FREEWAY SHOWING DIVIDED HIGHWAY, PAVED CHANNEL AND SEVERAL OVERHEAD STRUCTURES
(SEE ARTICLE IN THIS ISSUE)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official Journal of the Division of Highways, Department of Public Works, State of California

FRANK W. CLARK, Director C. H. PURCELL, State Highway Engineer J. W. HOWE, Editor K. C. ADAMS, Associate Editor

Published for information of department members and citizens of California. Editors of newspapers and others are privileged to use matter contained herein Cuts will be gladly loaned upon request. Address communications to California Highways and Public Works, P. O. Box 1499, Sacramento, California

Vol. 19 JANUARY, 1941 No. 1

Table of Contents

$48,615,000 for State Major Project Construction in Highway Biennial Budget

By FRANK W. CLARK, Director of Public Works

RECOMMENDATIONS for allocations to major projects in the biennial State highway budget for the 93d and 94th fiscal years, July 1, 1941, to June 30, 1943, were adopted by the California Highway Commission on December 31, 1940, and have been submitted to Governor Culbert L. Olson.

The amount available for construction and improvement throughout the State, after deduction for administrative expense, for maintenance of the 14,000 miles of State highway, for the one-half cent allocation to incorporated cities, and for joint highway districts, will be $48,615,000.

The sources of revenue for the construction, maintenance and operation of State highways are:

1. The gas tax. 2. One-half the net revenues of motor vehicle fees after providing for the maintenance of the Motor Vehicle Department and the California Highway Patrol. 3. The use fuel tax or Diesel tax available for bridge construction. 4. Regular Federal aid appropriated for the fiscal years 1942 and 1943 by Congress. 5. Caravan fees from the transportation of motor vehicles into the State.

SOURCES OF INCOME

The estimated amounts from these sources accruing to the State Highway Department for the two-year period are:

Gas tax, $73,000,000; motor vehicle fees, $8,474,000; use fuel tax (Diesel), $1,300,000; Federal aid, $7,600,000; caravan fees, $226,000; total, $90,600,000.

These estimated revenues for the 93d and 94th fiscal years must cover all purposes included in the administration of State highways. These are: Administration, Traffic Engineering and Special Investigations, Maintenance, Highway Planning Survey, Capital Investment (including shops, equipment and maintenance stations), one-half cent for incorporated cities, Engineering, both preliminary and construction, Joint Highway District, Rights of Way, Contingency Reserve, Landscaping, maintenance of the San Francisco-Oakland Bay Bridge, and Construction. Allocation of these revenues is made in accordance with the various provisions of legislative enactments requiring distribution to the north and south sections of the State, to primary and secondary highways, to cities, to joint highway districts and other functions mentioned above.

$18,400,000 FOR MAINTENANCE

Administration, cooperative highway planning and special study costs are estimated at $4,435,000. Maintenance of the highways, including maintenance and operation of the newly acquired Carquinez and Antioch bridges, is estimated at $18,400,000. The one-half cent allocation to cities is estimated to amount to $18,250,000.

The total for these three items is $41,085,000, which, with further deductions of $700,000 for capital investments and $200,000 for joint highway districts, leaves a balance for all other functions of $48,615,000.

Distribution of this last amount is made for the various purposes provided by statute to the north and south county groups, to primary and secondary roads, including the necessary engineering, rights of way and contingencies, and is allocated to 547 items or projects.

INADEQUACY OF FUNDS

The greatest problem facing the State in the immediate future will be the improvement of a strategic system of roads for National defense and the construction of access roads to the cantonments, naval and military reservations planned by the Federal authorities within the State.

The results of surveys made in this State for the proposed improvements which would be required for the strategic road system indicate that approximately $150,000,000 will be required in California. In addition to this amount, a sum of about $13,000,000 will be necessary for the construction of access roads.

The appalling inadequacy of funds which are available for highway improvement is clearly seen when these figures are compared with the anticipated Federal aid and gas tax and other revenues shown above.

The State Division of Highways is now engaged, at the request of the Federal Government, in making surveys of various military roads principally those providing access to cantonments, air fields, bombing fields, through military and naval posts, and artillery ranges, etc.

LOST TO CONSTRUCTION FUNDS

The cost of these surveys is defrayed from Federal aid appropriations already made but which must now be withdrawn from construction projects to which these funds were allocated. Authorization for application of Federal aid funds to such work was provided in the recent Federal Aid Act adopted by Congress.

Surveys and plan work are now under way on such projects as the access road from San Luis Obispo to Camp San Luis Obispo, from Monterey to Camp Clayton, from March Field to Riverside and on several roads serving the military and naval establishments in San Diego.

The State proposes that funds for constructing the greatly expanded facilities required for adequate service to the military movements of traffic, be provided by the Federal Government. Unless such additional appropriations are made by Congress

California Highway Commission group—Seated, left to right: Chairman Lawrence Barrett; Director of Public Works Frank W. Clark; Bert L. Vaughn. Standing—Secretary Walter T. Ballou; Iener W. Nielsen; Amerigo Bozzani; L. G. Hitchcock

and if the authorized Federal aid for the ensuing biennium must be applied to these projects, the recommended budget program for State highways will be seriously disrupted and State highway construction reduced.

A number of the highways designated as strategic or access roads by the United States Army authorities are existing units of the State Federal Aid System and therefore eligible to share in expenditures of the regular Federal Aid funds.

OLD BRIDGES A PROBLEM

Old bridges on the State highway system are still one of the major problems in the allocation of funds. In the addition to the State highway system in 1933 of some 6800 miles of county roads, the State took over in excess of 1000 bridges, many of which were built in the early days of road construction and are of light construction inadequate for present day loads.

At the present time 338 of these bridges are posted for limited loads and speeds because they are structurally inadequate to support legal loads safely. Many have reached the stage where reconstruction is imperative to assure safe operation of vehicles. The State is faced with an ultimate expenditure of about $30,000,000 to replace all of these inadequate structures.

Revenues derived from the use fuel tax or the Diesel tax are far from sufficient to reconstruct even those bridges which are in immediate need of improvement to prevent accidents. It has been necessary to allocate a large amount of major project funds for the reconstruction of bridges, and in addition to the budgeted items an amount of $500,000 has been set up for emergency construction, repair or replacement of bridges which have failed or are posted for less than legal loads.

The Federal aid portion of the revenues available for State highway construction is provided by appropriations made by Congress, and are for special and definite purposes to be distributed in accordance with Federal regulations and over which the Federal Government will exercise final approval. The Federal aid funds are therefore limited in their application, but in order to earn this material contribution to State highway construction, allocation of State funds to match such Federal aid is necessary and these funds are subject to the limitations imposed by the Federal regulations which include the possibility of direct application to the military roads previously referred to.

A tabulation of the major projects for the coming biennial period detailing the county, State highway route, location, and the cost of construction, including right of way, engineering and contingencies, follows:

(Continued on page 22)

Governor Olson Dedicates and Opens Arroyo Seco Freeway

By AMERIGO BOZZANI, State Highway Commissioner

CLIMAXING more than 25 years of dreaming and planning by visionaries and engineers, Governor Culbert L. Olson at noon on Monday, December 30, officially dedicated to public service the Arroyo Seco Parkway, the West's first freeway, connecting the cities of Los Angeles, Pasadena and South Pasadena.

Opening of California's most modern highway became a reality when Governor Olson and Sally Stanton, Queen of the 1941 Pasadena Rose Festival, cut a ribbon of roses of beautiful design strung across the parkway.

High dignitaries of the Federal and State governments and of the U. S. Army, together with officials of the County of Los Angeles and the three cities linked together by the parkway participated in the ribbon cutting which had been preceded on Saturday morning, December 28, by a symbolical and highly colorful ceremony staged in the Arroyo Seco. At the ceremony Chief Tahachwee of the Kawie Indians, whose ancestors lived in the Arroyo wilderness hundreds of years before the coming of Father Junipero Serra and his Franciscan mission builders, smoked the pipe of peace with Director of Public Works Frank W. Clark and to the beating of tribal drums relinquished the rights of his people in the Arroyo and formally transferred the property to the State.

FIRST FREEWAY IN WEST

A caravan of more than four hundred automobiles headed by army units and with E. Raymond Cato, Chief of the Highway Patrol, acting as grand marshal traveled over the new highway from the Los Angeles city hall to the site of the dedication ceremonies, where a crowd of more than fifteen hundred persons heard a program of speech making and witnessed the final act in the drama of ultra modern highway construction.

"This," said Governor Olson in his dedicatory address, "is the first freeway in the West. It is only the first. And that is its great promise to the future—the promise of many more freeways to come."

GOVERNOR CULBERT L. OLSON

Built at a cost of approximately five million dollars, the Arroyo Seco Parkway provides a six-mile unit of a direct nine-mile highway link between the business districts of Los Angeles and Pasadena. It also serves Highland Park, Lincoln Heights, South Pasadena, San Marino, and other adjoining areas.

The project admirably exemplifies the spirit of cooperation between the Federal government through the Public Roads Administration, the Works Projects Administration, the Public Works Administration, the State of California and the cities of Los Angeles, Pasadena and South Pasadena, which made possible the completion of this great undertaking and has given California its first modern freeway.

Of the parkway and its significance, Governor Olson said:

My fellow citizens:

> We are gathered here to dedicate a new section of State highway. It is *only* 6 miles long. In average traffic the motorist will travel over it from one end to the other in 7, or 8, or perhaps 9 minutes. But in doing so he will have traveled from the very heart of Los Angeles, through Highland Park and South Pasadena, to the very heart of Pasadena. And he will have done it in easy, nerve-free comfort, and, *above all,* in SAFETY. All this is, to say the least, most extraordinary.
>
> Nevertheless, I suspect that after a few weeks the average motorist using this parkway will have become so used to it that all recollection will soon fade from his memory of how difficult, how tiring, and slow, not to say dangerous, it was to drive between Pasadena and Los Angeles.
>
> Therefore, before we start using this road (and it will surely have heavy use on New Year's Day) it is

Official party at the ribbon cutting ceremony of the Arroyo Seco Freeway dedication—Left to right, Amerigo Bozzani, Highway Commissioner, Chairman of the Celebration Committee; Director of Public Works Frank W. Clark; Sally Stanton, Queen of the 1941 Rose Festival; Governor Culbert L. Olson; Larry Barrett, Chairman, Highway Commission and Ray Cato, Chief, State Highway Patrol

proper and timely, a *very* good thing, in fact, for us to pause a few moments—NOW—to ceremonialize and celebrate an achievement so extraordinary as the completion of this, the Arroyo Seco Parkway.

GREATER THINGS AHEAD

Let us briefly consider what has been done here, and why, and what it means to the community. Let us do this before it fades from memory. Let us do this before we rush headlong into the accomplishment of even greater achievements—for that is exactly what we shall soon be doing, because, in large part, of the knowledge and experience gained here.

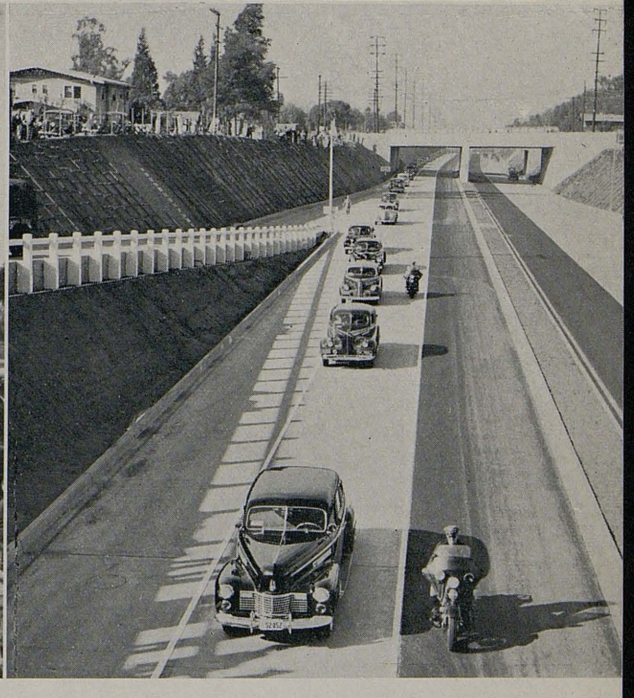
In dedicating this Parkway we do honor to the men and women in whose dream, so long held and so long pursued, it had its inception. The story of that dream is full of interest because it parallels and bears practically the same dates as the story of the automobile. The dream, the idea of an Arroyo Seco highway gathered strength with the years. Its growth paralleled and matched the growth of the use of automobiles.

I wonder what sort of road Mr. T. D. Allen had in mind when he made the first survey for a road through here 45 years ago, when there could scarcely have been more than a hundred automobiles in the entire country. I wonder what report he made, and what recommendations—if any. Did he have in mind a winding, rustic, tree-shaded road, crossing and recrossing the creek bed which was (and is) dry most of the year? Or did he have his mind on more practical matters—such as a road to develop a string of gravel pits to supply sand and gravel to the builders of a greater and still greater Los Angeles?

Forty-five years between the first survey and today's splendid completion. That is a long time.

But perhaps it is just as well that the dream was a long time in its dreaming. Perhaps it is just as well that many obstacles stood in the path to its final realization. Perhaps it is just as well that the dream had to wait, and wait—wait until, under the pressure of sheer necessity, it finally burst out of the confining walls of public indifference, official inertia, selfish opposition, and narrow vision. It is just as well because, while confined, the dream grew and matured. So, when that dream was translated into legislation, that legislation was well conceived and broad visioned. And when the engineers were finally told to go to work, their working plans were BOLD and comprehensive, and they have given us something worth while.

I say BOLD because they were just that. They dealt boldly and realistically and *EFFECTIVELY* with a traffic problem that had become almost terrifying in its urgency of solution. Now that we have it, and it all looks so rather simple, so obviously necessary, so wholly practical, some there will be who will ask, "What is there so wonder-



At top—Part of the throng of people who attended the official dedication of the Arroyo Seco Freeway. Below, at left, automobiles moved to and from the dedication scene in six lanes demonstrating the facilities of the divided parkway for accommodating a heavy flow of traffic. Lower right—Governor Culbert L. Olson's car leads the long procession to the site of the official opening ceremonies on December 30th

View of Arroyo Seco Freeway looking toward Pasadena showing 5 of 26 bridge structures

ful, or so bold about it?'' Oh yes—but it takes courage to do a thing the FIRST time, no matter how necessary, no matter how simple and obvious it may appear AFTER it is done. And *this*, fellow citizens, is the *first* Freeway in the West.

HONOR TO ENGINEERS

In dedicating this Freeway, we do honor to the engineers (civil engineers, safety engineers, landscape architects, and human engineers) whose imagination, knowledge, skill and genius for organization and cooperation were poured into the conception, planning and execution of this great work. They built this freeway, using steel and concrete. But to these materials they added those indispensable ingredients imparted only by the mind; namely, adequacy, safety, economy and sheer beauty.

They built adequacy into this Freeway. It will take good care of the heavy traffic it will have to carry—for many years to come.

They built SAFETY into this Freeway. Safety, but at the same time ease, comfort and great speed, for the thousands of motorists who will pass this way every day. Safety for the children who live and play in the neighborhoods through which the freeway passes. And peace of mind for their parents. This one ingredient, alone, is priceless and would justify the entire cost of the project, because we have only to capitalize the expense, pain, tears and deaths which would result from the accidents which will be avoided by the use of this Freeway.

AN ECONOMICAL UTILITY

They exercised economy in the use and disposition of materials; an economy which has served to keep the cost of the project well below its utility value to the community. This utility value is measured not only by the accidents averted but also by the direct savings realized by the motorists, in terms of time, jangled nerves, gas and oil, and general wear and tear.

Use of the Freeway will free neighborhood streets and boulevards from the congestion of heavy through traffic, with corresponding improvement of the parking problem, greater quiet for the home owner, greater safety for the neighborhood and profit for the local merchant.

And lastly, our engineers and technicians have invested the Arroyo Seco Parkway with *beauty* as well as adequacy, safety and economy. Of course, beauty is only for him who has the eye to behold. But I ask you to look again, and again at the very curves in this roadway. They are designed strictly for functional and utilitarian purposes, and banked for safety. They of course delight the engineer, the safety man, the road builder, the motor car manufacturer and the motorist himself, but they also delight the eye of the artist.

BEAUTIFUL VISTAS PRESERVED

Already we see proof of the careful planning for roadside beautification. Grass, flowers, shrubs and trees will soon cover bare banks and hillsides, line the parkway, and mask the harsh lines of man's so-called improvements to the landscape. When they have grown to maturity, the experience of driving through Arroyo Seco Parkway will be filled with the pleasure of breath-taking scenery, with a new and beautiful vista opening at each curve of the road.

Let us, by all means, preserve those vistas by holding them free from commercial advertising signs. I am happy to know that the WPA has set aside $300,000 for a state-sponsored project for the further beautification of the Arroyo Seco.

I said, a few minutes ago, that this is the first Freeway in the West. It is ONLY the first. And THAT is its great promise to the future—the promise of many more freeways to come.

Very soon, this one will be extended 3 more miles closer to the heart of metropolitan Los Angeles, with direct access to the Civic Center by way of Figueroa Street, and to Sunset Boulevard.

MANY MORE FREEWAYS

Very soon the Cahuenga Freeway will be completed, eliminating the last serious strictures upon fast, safe passage between Hollywood and San Fernando Valley and points north.

Work is going forward rapidly on the great Olympic Boulevard project leading from Los Angeles' commercial center westerly to Santa Monica.

And in the San Francisco Bay district, definite plans are now in preparation to convert the Bay

Arroyo Seco Freeway looking toward Los Angeles. Note paved channel on left

Arroyo Seco in flood period before construction of paved control channel

who introduced and secured passage of the legislation enabling the construction of the Arroyo Seco Parkway. I am proud of my own support of this legislation.

Finally, I wish to say that the people of California are happy and grateful for having a beneficent National Government which paid a major portion of the money cost of this project.

And now, in the name of the people and the State of California, I hereby accept for them the Arroyo Seco Parkway and dedicate it to the general service and safety of the community.

TOO ILL TO APPEAR

It was regrettable that illness prevented the appearance of Dr. L. I. Hewes, Chief of the Western Region of the U. S. Public Roads Administration, without the assistance of which agency the parkway could not have been built. Dr. Hewes was represented by C. H. Sweetser.

With Frank C. Balfour of the Division of Highways acting as master of ceremonies, the program of speeches was opened by an invocation delivered by Rt. Rev. Bertrand Stevens, B. D., Bishop of Los Angeles. Mayor Andrew O. Porter of the City of South Pasadena gave an

(Continued on page 20)

Shore Highway into a Freeway from Palo Alto to San Francisco. And a similar undertaking is planned between San Jose and Oakland.

There is another feature about this Parkway that appeals strongly to me. It is this. Here is a great public work, unquestionably necessary, practical, and beneficial, but of great magnitude and cost. It stands as convincing proof that government can do things, practical and necessary things, and that it can do them in a businesslike and efficient manner.

ASSEMBLYWOMAN MILLER PRAISED

I have seen the printed pamphlet describing this Freeway. On the last inside page tribute is paid to the many men and women and organizations whose direct labors and cooperation spelled out the great and successful work we here dedicate. I wish to add thereto my own tribute.

I wish, also to tender praise to Assemblywoman Eleanor Miller

Director of Public Works Frank W. Clark smoking peace pipe with Kawie Indian Chiefs

Future Freeway Construction Depends Upon People of California

By FRANK W. CLARK, Director of Public Works

FREEWAYS are rapidly becoming an integral and necessary part of any comprehensive highway system. They are a natural and logical step in the gradual evolution of highway development—an evolution that dates back to the first use of the automobile. In retrospect, the speed of early automobiles in comparison with the horse and buggy brought on demands to take the highways out of the mud and ruts. These demands were met by surfacing the old wagon trails. Increased speeds and increased weights of trucks soon demanded straighter and smoother roads. Volumes of traffic increased until it was necessary to construct multi-lane highways.

Highways carrying large traffic volumes were soon recognized as an ideal point of contact between merchant and consumer. As soon as a new road was built "string towns" or "ribbon cities" would "mushroom" over night. Service stations, night clubs, fruit stands, junk yards and other commercial establishments were thrown up with utter disregard for aesthetics or of the purpose for which the road was built. As a result, the modernized highway facility which the motorist had paid for out of gas tax funds, often became little more than an ugly city street serving a few local interests. For the sake of safety, these roads had to be zoned for restricted speeds. In many cases the final result was a facility little better than the one which the new improvement had been built to replace.

Under the then existing laws, the Division of Highways was powerless to do anything about the situation. Now, however, the "Freeway Law" which was passed by the legislature in 1939 and approved by Governor Culbert L. Olson makes it possible to avoid these bottlenecks and places this State among the highway leaders of the nation.

The new law recognizes a freeway as a new type of a highway to which abutting property shall have no right of access or only limited right of access. Under this law, the department is authorized to acquire the necessary rights of way and rights of access from private property to construct and maintain such freeways. The intersection of local county roads or city streets can be regulated or eliminated by agreement with local authorities. New intersections of local streets or highways can not be made without the consent of the California Highway Commission.

FRANK W. CLARK

As a result of this law, projects such as the Arroyo Seco Parkway are now possible. This parkway with its dividing strip to separate opposing traffic throughout its length, with all cross traffic or left turn eliminated by grade separations and with strategically located ramps to permit rapid ingress and egress to and from the highway with a minimum of hazard, is typical of what can and is being accomplished. Where before, cross roads, private entrances, random turning and restricted speed zones often reduced the average speed of travel to 10 or 15 miles per hour, freeways will now permit safe average speeds in excess of 45 miles per hour.

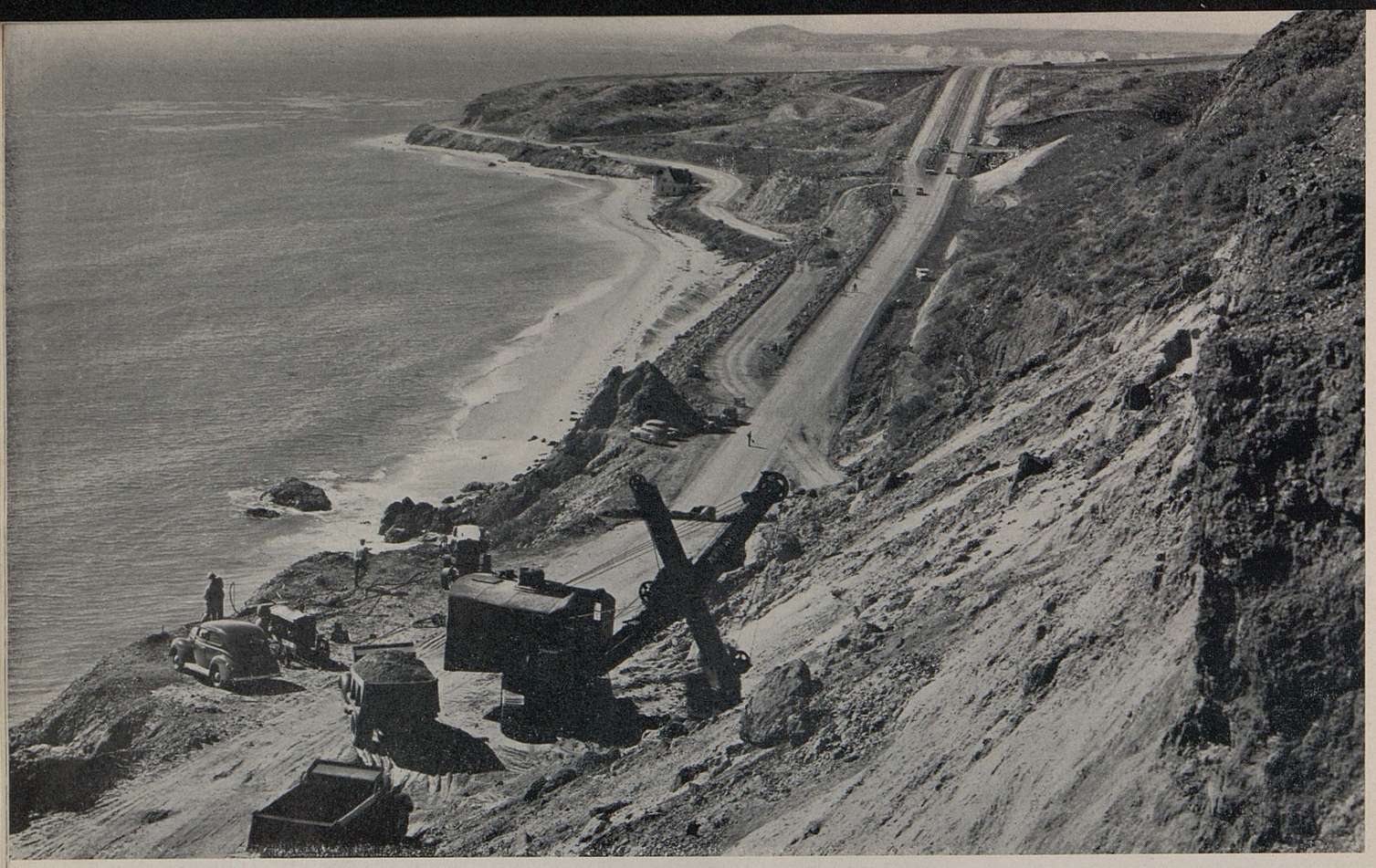
Thus the highway transportation system has developed in gradual stages from the old wagon road to the modern freeway. These stages were all natural developments coming about as a result of popular demand.

While freeways are perhaps a panacea for most traffic ills, for practical reasons their use must be restricted to highways of great importance. Such highways usually occur in or near urban areas where land is subdivided into numerous small parcels which are ordinarily highly developed. The cost of this highly developed land to the widths necessary for freeways will often put the cost of rights of way in excess of that necessary for construction. Where a modern multi-lane highway in an urban area might cost $200,000 per mile, a freeway with its wide right of way, access rights, grade separations, service roads and connecting ramps may run to several times that cost. In rural areas the costs of both types of facility are proportionately lower.

It is only on a small mileage of our entire highway systems that freeways will be economically justified or for that matter will multi-lane highways be justified. The balance of the mileage, however, could absorb more than all available funds just to keep ahead of obsolescence. Thus, unless present highway revenues are markedly increased, expansion of the freeway system is almost certain to lag behind the demand.

To date the California Highway Commission has designated a total of 91.4 miles of highway as freeways.

(Continued on page 14)



Two-yard power shovel removing 50,000 cubic yards deposit of beach sand on a bench 90 feet above coast highway

Eliminating 2-Lane Coast Link

By C. N. AINLEY, Resident Engineer

THE completion of a section of new four lane divided highway, built to modern standards of alignment and grade and replacing one of the bad stretches of the old coast road in Los Angeles County is scheduled for completion in February.

This heavily travelled route, known popularly as the Roosevelt Highway, will have remaining, only three and a half miles of two lane pavement between Santa Monica and Oxnard.

First located in 1921, the original highway was constructed and opened to traffic in 1929. Since that time continually increasing traffic has demanded a faster and safer highway, and as funds were available this route has been reconstructed to meet the demand.

The portion of the old road between Walnut Canyon and Solstice Canyon was narrow and had a number of short radius curves with restricted sight distances. The heavy traffic, with a high percentage of trucks, found this a hazardous stretch of road.

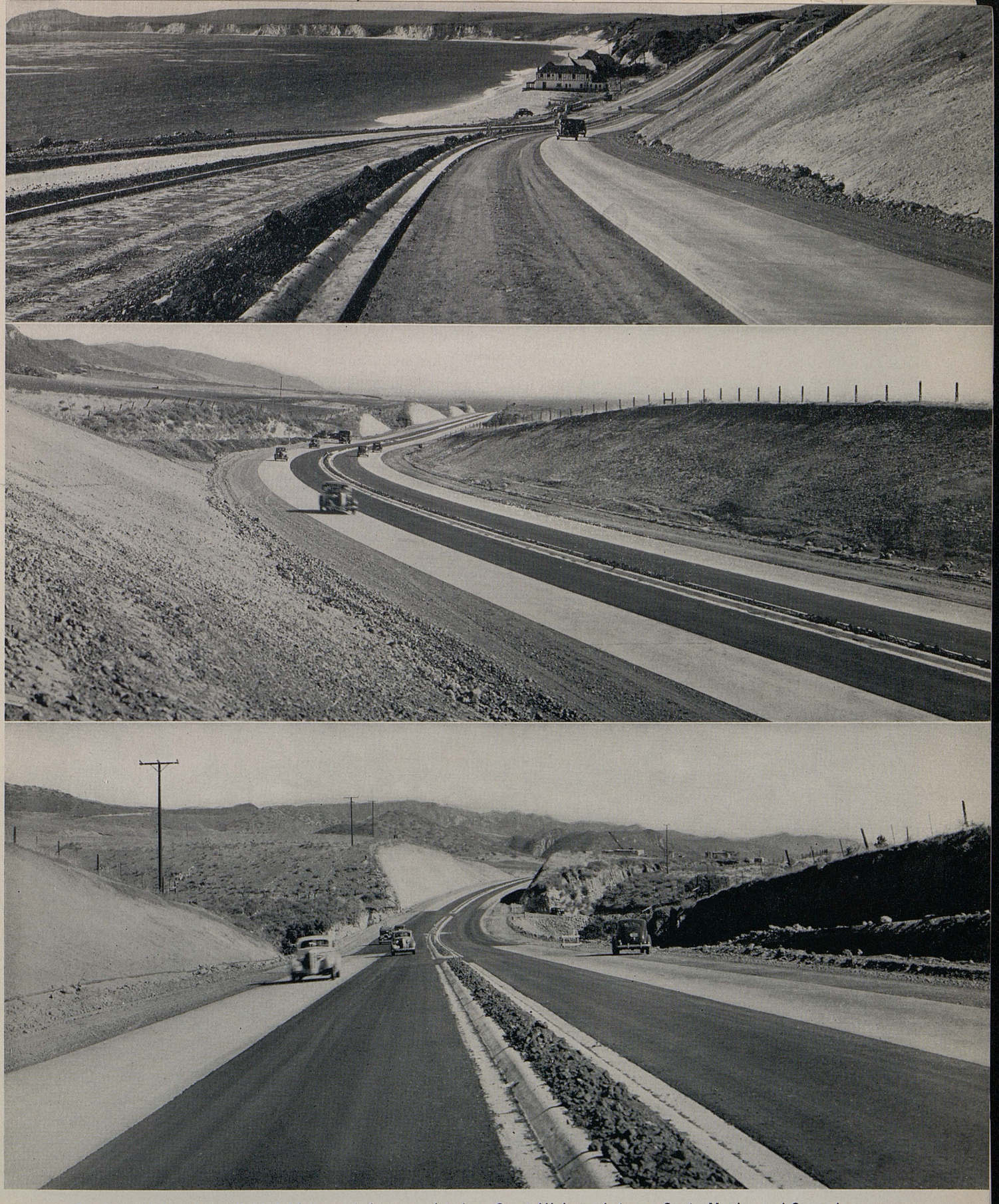
A contract for the relocation and reconstruction of this portion of the highway was awarded in October, 1939, to John Strona of Pomona, and work was started at once. An article by William H. Mohr in the April, 1940, issue of "California Highways and Public Works" magazine covered the salient features of the contract as they had appeared up to that time. Since then developments have caused the extension of the time limit 87 days, indicating the increased work encountered.

Sand pockets were found in a number of cuts and slides occurred in several others, making it necessary to flatten the slopes, and resulted in a large increase in roadway grading quantities. On the whole contract the roadway excavation was increased by 130,000 cubic yards.

When the contractor began operations on the west bluff of Railroad Slide a large deposit of beach sand was discovered on a bench 90 feet above the highway. This sand had a maximum thickness of 80 feet and was overlaid with a 20 foot cap of volcanic breccia. The increase in quantities outside the original one-half to one slope at this location alone amounted to 50,000 cubic yards.

The sand had to be removed before the work on the bluff could proceed. A dragline bucket was used to drag

(Continued on page 21)



Sections of four-lane divided highway being completed on Coast Highway between Santa Monica and Oxnard

Two Olympic Boulevard Units Completed In Los Angeles City

By R. C. MYERS, Assistant District Office Engineer

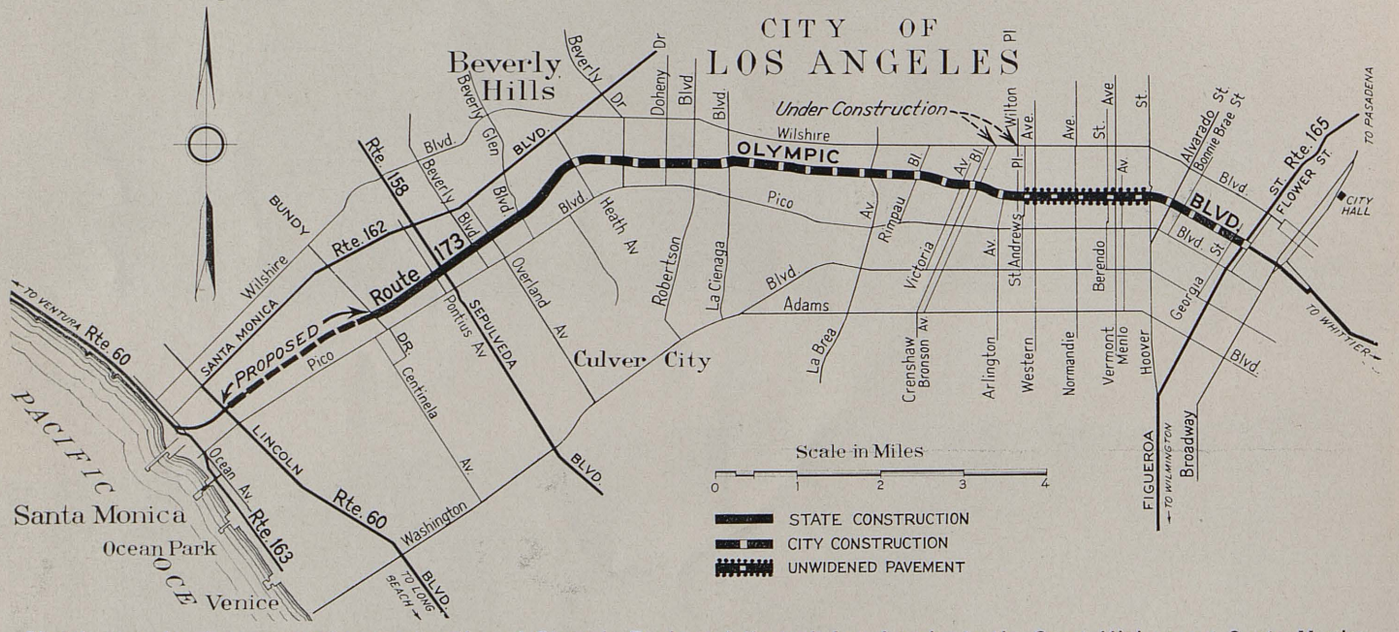
THE recent completion by the State of two contracts on Olympic Boulevard in the City of Los Angeles puts into service about 2½ miles of new modern wide highway and materially advances the progress already made by the City of Los Angeles in opening this new highway arterial from the center of Los Angeles to Santa Monica.

For more than a decade past, three principal streets have carried the great majority of the traffic between downtown Los Angeles and the westerly portion of Los Angeles and the beach city of Santa Monica. These streets, Santa Monica Boulevard, Pico Boulevard, and Wilshire Boulevard, were becoming increasingly more crowded. Street car lines on Pico and Santa Monica Boulevards greatly hampered traffic for some distance westerly of the center of Los Angeles.

Wilshire Boulevard was designed for and has carried a very heavy flow of traffic, but it became evident by about 1928 that the then existing boulevards were inadequate for the extremely heavy traffic between Los Angeles and West Los Angeles including "beach" traffic and that traffic congestion was certain to increase.

It was about that time that a fourth boulevard paralleling the three existing boulevards was proposed. Originally known as "Tenth Street," the name was changed to "Olympic Boulevard" and was taken into the State Highway system in 1933 as a Secondary State Highway.

It is officially described as extending "from Route 60 (Roosevelt Highway) in Santa Monica to the intersection of Ninth and Indiana Streets in Los Angeles via Tenth Street," this latter terminus being at the easterly city limit of Los Angeles.



Sketch map showing progressive construction of Olympic Boulevard through Los Angeles to the Coast Highway at Santa Monica

HEAVY RIGHT OF WAY COSTS

The greater portion of the route was unimproved at that time and the improved portions were too narrow for the heavy traffic such a route would have to carry. There were several jogs in the alignment which required "smoothing out" and practically all of the portions of the route which were open required widening. It was evident from the first that very heavy right of way expenditures would be necessary owing to the highly improved nature of the territory traversed.

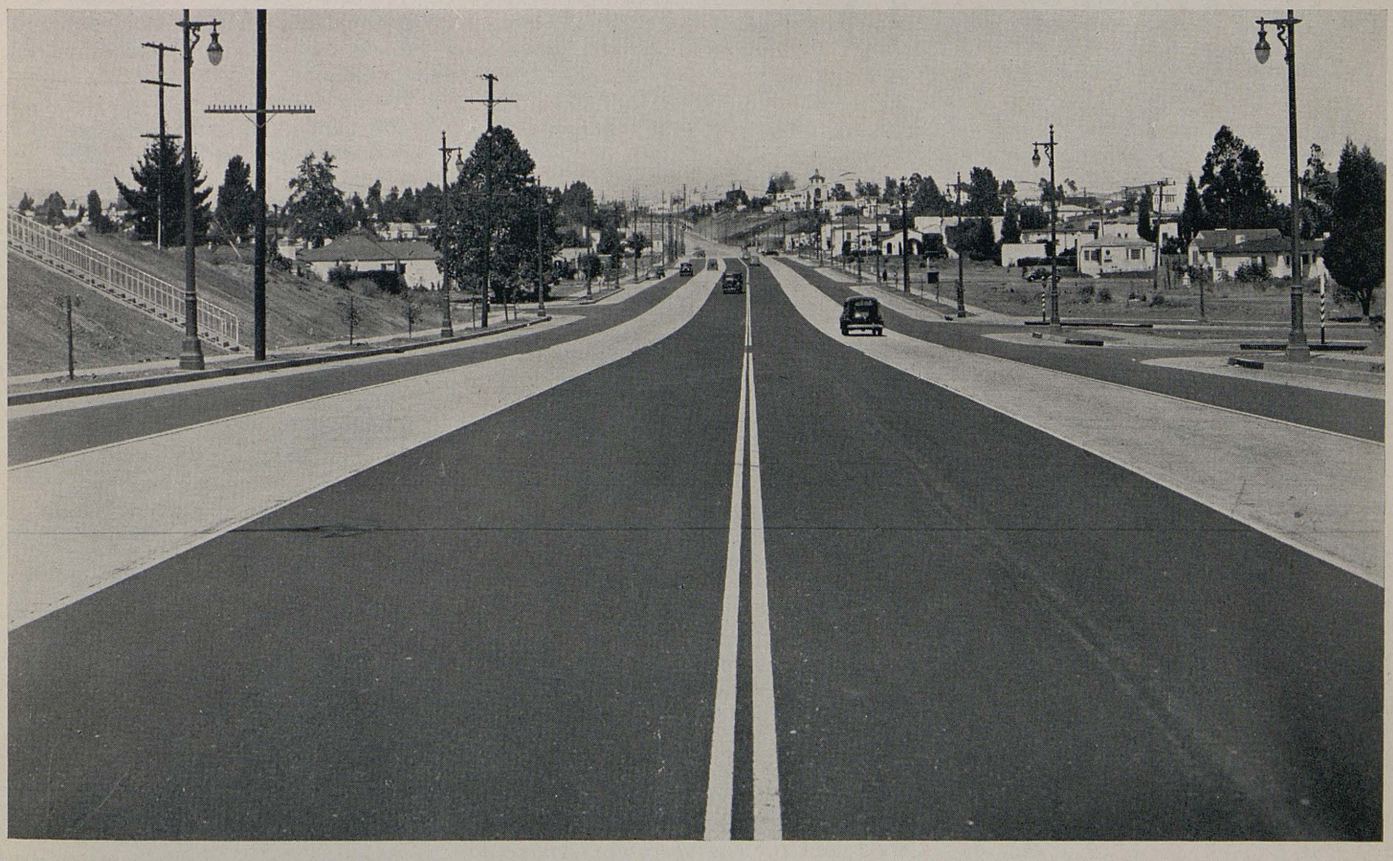
The intent has been to first construct a wide boulevard similar to Wilshire Boulevard, free from car tracks, from the central business district of Los Angeles to Santa Monica to serve a large part of the territory west of the business district of Los Angeles as well as through traffic between Santa Monica and Los Angeles. From progress already made it seems probable that the major part of this enterprise will be an accomplished fact by the end of the biennium 1941-43.

TWO STATE CONTRACTS

The two contracts handled by the State were from Beverly Glen Boulevard to Pontius Street and from Pontius Street to Bundy Drive in West Los Angeles. The lengths are 1.26

(Continued on page 15)

Olympic Boulevard route bisects Twentieth Century-Fox Studio making it necessary to build bridge to connect studio buildings



This Olympic Boulevard unit has 4 twelve-foot lanes of asphaltic concrete, 2 eleven-foot lanes of Portland cement concrete

Tolls Reduced Approximately 20% On Carquinez And Antioch Spans

THE California Toll Bridge Authority, on December 10, authorized reclassification of tolls on the Carquinez and Antioch bridges. The new rates became effective December 16.

The action of the Authority effected a general reduction in truck tolls of approximately twenty per cent and made the rates uniform for various classes of traffic. The new rates are:

Class	Vehicle	Rate Carquinez	Rate Antioch
1	Automobiles, ambulances, hearses, taxis	$0.30	$0.30
2	Trailers drawn by automobiles	.25	.25
3	Buses	1.00	.75
4	Motorcycles	.15	.15
5	Tricars	.20	.20
6	Commutation—For passenger automobiles only. Book to contain from 50 to 54 one-way trip tickets (depending on length of calendar month), good for the calendar month. In addition the book will contain twenty (20) provisional tickets, each good for a one-way trip upon presentation and payment of twenty-five cents (25¢), provided all regular tickets have been used. Additional provisional tickets for the same calendar month will be issued upon surrender of the complete empty cover—front and back—of a $10.75 commutation book of the same month.	10.75	10.75
7	Trucks and truck trailers, including any load: Gross weight up to 4,000 lbs., per ton at	.30	.275
	Additional gross weight from 4,001 lbs. to 8,000 lbs., per ton, at	.25	.225
	Additional gross weight from 8,001 lbs. to 12,000 lbs., per ton, at	.20	.175
	Additional gross weight from 12,001 lbs. to 16,000 lbs., per ton, at	.15	.125
	Additional gross weight from 16,001 lbs. to 20,000 lbs., per ton, at	.10	.075
	Additional gross weight from 20,001 lbs. to 24,000 lbs., per ton, at	.05	.025
	Additional gross weight over 24,000 lbs., per ton, at	.01	.01
	Minimum charge	.45	.45
8	Vehicles requiring special permit. Gross weight per ton	$0.30	$0.275
	Minimum charge	1.00	1.00
	Vehicles exceeding limits of special permit or which, through no fault of the Division of Highways, are not provided with a special permit, gross weight per ton	.45	.45
9	Vehicles not otherwise specified. Gross weight per ton	.30	.275
	Minimum charge	.50	.50

The Authority also extended the lease on the restaurant at the Carquinez bridgehead for a period of one year and gave State Director of Public Works Frank W. Clark authority to terminate leases held on other bridge properties. The properties concerned have to do with fishing wharves on the Carquinez bridge property.

The Authority rejected bids for the lease of property under the Fifth Street approach to the San Francisco-Oakland Bay Bridge and authorized the calling of new bids.

Traffic on Bay Bridge Totaled 1,386,660 Vehicles in December

DECEMBER traffic on the San Francisco-Oakland Bay Bridge held up well in spite of many days of bad weather, showing a total of 1,386,660 vehicles. The heaviest day of the month was Christmas when 60,737 vehicles crossed the bridge.

Truck tolls on the Carquinez and Antioch bridges were adjusted and reduced about 20%, effective on December 16.

Traffic for December on the San Francisco-Oakland Bay Bridge and the Carquinez Bridge is tabulated below:

	San Francisco-Oakland Bay Br.	Carquinez Bridge	Antioch Bridge
Passenger autos and auto trailers	1,277,709	248,847	11,053
Motorcycles and tricars	2,706	376	3
Buses	18,526	4,800	190
Trucks and Truck Trailers	66,874	19,356	1,737
Others	20,845	163	9
Total vehicles	1,386,660	273,542	12,992

Future Freeway Construction

(Continued from page 9)

Only a small portion of this mileage has been completed. A small portion is under construction, a portion is in the planning stage and another portion is ear-marked for future construction as funds become available.

Freeways are here to stay. The California Highway Commission is empowered to declare additional freeways and the engineers are prepared to design and construct them. The progress of ultimate future construction, however, will depend on public reaction. If the travelling public finds freeways to their advantage to such an extent that there is an aroused public demand for such facilities and if necessary funds are provided, the ultimate future of freeways is unlimited.

A railroad agent in Africa had been reprimanded repeatedly for doing things without orders from headquarters and one day his boss received the following telegram:

"Tiger on freight platform eating conductor. Wire instructions."

City of Martinez Takes Over Benicia-Martinez Ferry

ALL THE LEGAL requirements having been fulfilled, including the execution and acceptance of all necessary documents, Director Frank W. Clark of the Department of Public Works announces that the city of Martinez took over ownership and operation of the Benicia-Martinez ferry at 12 midnight December 31.

"It will be recalled," said Director Clark, "that the agreement to transfer this ferry was made a part of the transaction for the purchase by the State of the Carquinez and Antioch bridges from the American Toll Bridge Company. The ferry franchises and properties were owned by the Martinez-Benicia Ferry and Transportation Co., a subsidiary of the Toll Bridge Company.

"By the terms of that purchase, the disposition of the ferry was placed in the hands of the Department of Public Works and the cities of Benicia and Martinez were designated by me to take over ownership and operation of the ferry.

LEGISLATURE EMPOWERED CITIES

"The cities lacked the legal authority to operate a ferry and a bill was accordingly prepared and introduced at the recent extra session of the legislature and passed and approved by Governor Olson on December 5. It gave the cities necessary power to acquire and operate the ferry. All that remained was the sanction of the Railroad Commission.

"Upon the joint application of the American Toll Bridge Company, the Martinez-Benicia Ferry and Transportation Co., and the cities of Benicia and Martinez, the Commission authorized the transfer of the public utility's property.

"The city of Benicia withdrew and officially expressed approval of the transfer to the city of Martinez. Ownership, operation, and maintenance of the ferry system is now vested in the city of Martinez.

"The properties transferred include the steamers Issaquah and Seattle, real estate in both Benicia and Martinez, docks, buildings, shops and other improvements.

"Personal property transferred includes a pile driver, several fuel tanks, the furniture and fixtures of the Benicia office, shop equipment and other machinery, including a forge and blacksmith equipment.

"The Ferry Company also transferred to the city all its right and title to the franchise to keep and take tolls on a public ferry over Carquinez Straits granted by the Board of Supervisors of Contra Costa County. Under the Toll Bridge Authority Act no further franchises may be granted until after the Carquinez Bridge becomes toll-free. The existing ferry, however, may continue to be accepted as a publicly-owned enterprise."

Two Olympic Boulevard Units Completed in Los Angeles

(Continued from page 12)

miles and 1.05 miles respectively and work on the two contracts was carried on concurrently. Both contracts were partially financed from P. W. A. funds and were let by the City of Los Angeles. Preparation of plans, the securing of the right of way, and the construction inspection were handled by the State Division of Highways.

Work on the first of these contracts, from Beverly Glen to Pontius Street, was started January 2, 1940 and was completed June 12, 1940. Work on the second contract, from Pontius Street to Bundy Drive, was started February 28, 1940 and was completed June 15, 1940.

The two contracts cost $226,667 and $151,059 respectively. Both contracts were awarded to Basich Bros., contractors, who were low bidders on each contract. Inspection was under the supervision of State Resident Engineer E. A. Parker.

Both contracts called for construction of 86 feet between curbs, there being 4 twelve-foot lanes of asphaltic concrete, 2 eleven-foot lanes of portland cement concrete pavement, and 2 eight-foot parking strips of portland cement concrete adjacent to the curbs. Right of way for these two contracts was acquired by the State and the City of Los Angeles at a cost of about $230,000, making a total right of way and construction cost of about $608,000 for the 2.31 mile portion constructed by the State.

BISECTS FOX STUDIO

The highway bisects the grounds of the Twentieth Century-Fox Studio, being somewhat below natural ground elevation. It has been necessary to construct a bridge across the highway in these grounds to preserve contact between studio buildings on opposite sides of the highway.

The total distance along Olympic Boulevard from Flower Street in Los Angeles to Lincoln Boulevard (Coast Highway) in Santa Monica is about 14 miles. Of this distance 10.2 miles are improved to ultimate width and standards under the two State contracts above described and under ten separate city of Los Angeles projects.

Another one-half mile section between Arlington Street and St. Andrews Place is under construction as a city sponsored W. P.A. project.

Two other sections (Hoover Street to Vermont Avenue and Berendo Street to St. Andrews Place) aggregating 1.5 miles in length, are in service but have not yet been widened to conform to the rest of the route. When the present city project from Arlington Street to St. Andrews Place is completed, about twelve miles of the route will be in service from Flower Street in Los Angeles to Bundy Drive in West Los Angeles.

(Continued on page 18)

Tiny Glass Beads Used to Make Traffic Lines Brighter at Night

By MARTIN A. O'BRIEN, Maintenance Assistant

EVER since highway departments have been painting traffic lines, methods have been tried or proposed to increase the visibility or effectiveness of the striping during the hours of darkness. One of our neighboring states is making experiments with luminous paint; an electrical engineer has patented tubes of light for inserting in the traffic line—each method to improve the nighttime visibility of the highway centerline.

In keeping with the policy of providing the best possible service to highway traffic, consistent with existing funds, the Division of Highways has tried out various methods to increase the nighttime visibility of traffic lines. A process now developed consists of placing small glass spheres in the traffic lacquer.

REFLECT LIGHT BEAMS

This method has proved successful in making the striping brighter and more effective at night. The glass spheres or beads reflect the head light beams and return the color of the painted line. The beads are, therefore, effective with either white or yellow traffic lacquer.

There is no sparkle to indicate the presence of glass spheres, but the resultant white or yellow line is brighter at night. This feature is particularly desirable on concrete pavements owing to the low visibility of traffic lines after a short period of wear.

The method of application is quite simple. A bead dispensing machine is placed directly behind and approximately eighteen inches away from the spray nozzle of the paint rig. When in motion, the rubber tired wheels of the machine turn a fluted cylinder in a hopper, which by gravity, feeds the glass spheres onto the wet paint. As the lacquer dries, the beads become embedded and firmly locked into place.

Dispensing machines are available for single 4 inch lines and 9 inch double lines. The capillary attraction of the California lacquer closes over the smaller beads and creeps up the sides of the larger sizes, holding them firmly in place. As the line wears down, some of the larger size spheres become loosened and disappear under the action of traffic. The smaller sizes, however, are then uncovered and function.

The glass spheres or beads are graded as to size. They all pass through a No. 80 mesh and are retained on a 150 mesh screen; the average size is about 1/100 of an inch in diameter. The manufacturer of the beads claims their use in traffic lacquer prolongs the life of the painted lines to approximately double the period experienced without their use.

The rate of application followed the manufacturer's recommendation to use 100 pounds of spheres to one mile of 4 inch line, using fifteen or sixteen gallons of lacquer per mile.

CLEANED BY TRAFFIC

It is not necessary to clean traffic lines when painted with beads. Any small accumulation of road dust collected between the spheres is quickly removed by the action of traffic.

Trial applications have been made, or are proposed, for each highway district. The painting has been limited to curves, no passing zones or where a distinctive traffic line is desirable for night travel.

Approximately one mile of 4 inch line was painted with beads on the Redwood Highway, north of Eureka. This section of highway borders the ocean and is in an area of heavy fog. Approximately 20 miles of the Bayshore Highway, between Redwood City and San Francisco, has been painted with an application of beads.

A section on the Ridge Route in Los Angeles County, one-half mile long, at the crest of a 5 mile grade, was also selected for beads. Oil drippings so obliterated the traffic lines that frequent repainting was necessary. Since the beads were applied, a noticeable increase in night visibility is observed, even though the traffic lines were considerably darkened by oil. At night the light rays are reflected by the beads through the film of oil.

The photographs on the opposite page were taken of a double line painted on U. S. 99 E in Sacramento County during March, 1939, which carries approximately 7000 vehicles per day. The line is easily discernible at night, after approximately twenty months of wear. While the paint has flaked off in some spots, the line is still visible and retains beads where the lacquer remains.

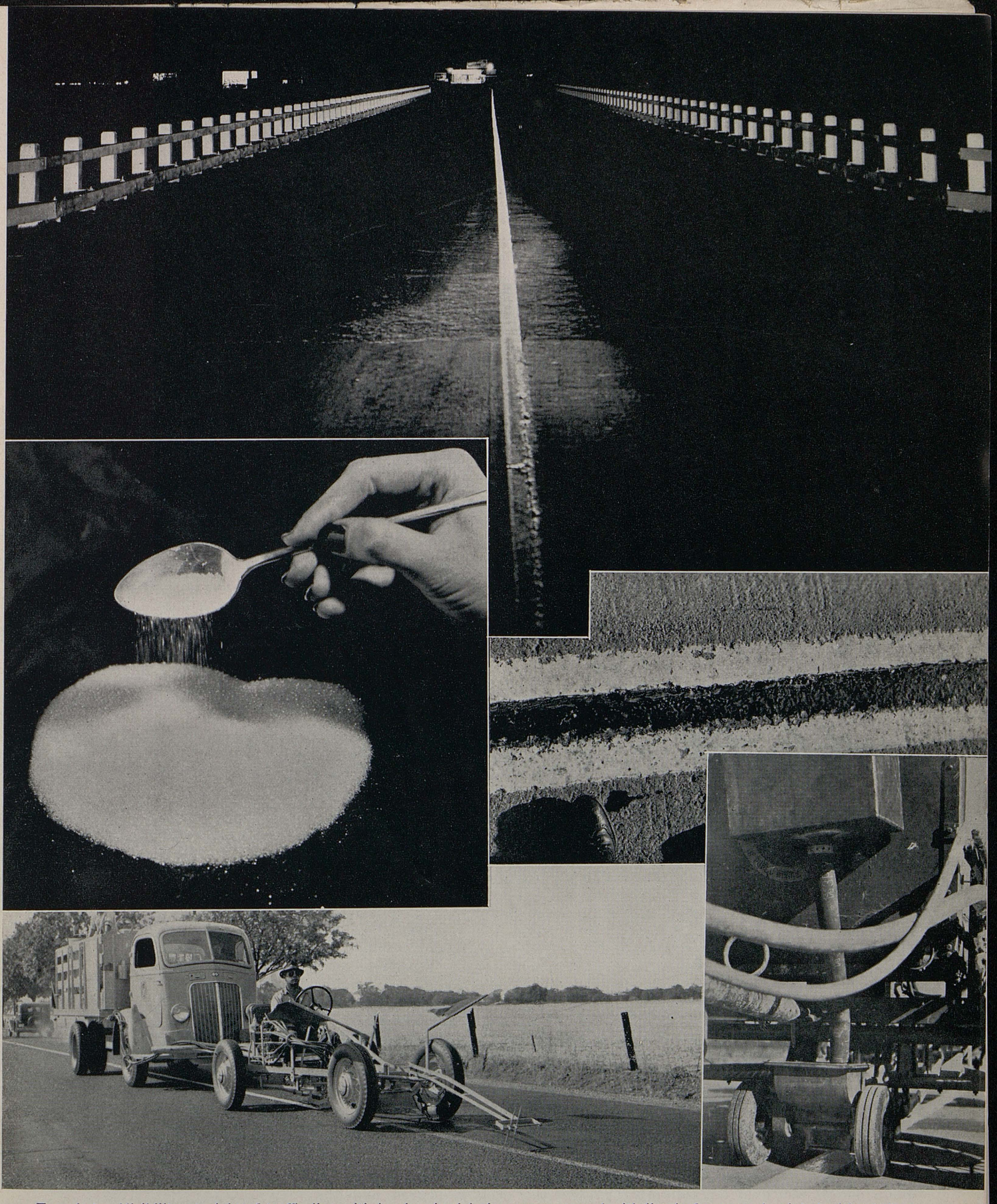
REPAINTING UNNECESSARY

It is not necessary to repaint a line containing the glass spheres or beads until its nighttime visibility reaches a point where it is not effective. An inspection will then disclose that few if any beads remain. Repainting, therefore, will not build up the line with successive layers of beads.

Experiments have been made using glass beads in connection with painting messages on the pavement such as STOP, Pedestrian Crossing, and Railroad Crossing. On the early applications of this type of painting, the beads were applied with a salt shaker. A spray nozzle has now been developed for this purpose.

The use of the glass beads is more or less experimental in California, and our conclusions are based upon observations of a few sample applications. The beads appear to be economically justified on the basis of improved service for selected locations. The cost for labor in painting traffic lines is increased when beads are applied, due to a slowing down of the paint crew with frequent stops to replenish the bead supply.

The high price of the beads, plus added labor, offset the advantage resulting from the prolonged life of the traffic lines. It does not appear desirable, therefore, to make the use of beads a general practice in traffic striping work.



Top photo—Visibility at night of traffic line with beads mixed in lacquer compared with line in foreground painted without them. Left center, beads dropping from spoon are 1/100th of an inch in diameter. Right center—Stripes ragged but bright since 1939. At bottom—striping machine and hopper attachment through which beads are sprayed on the wet paint of stripe

Constructing the Antler Bridge

By CHARLES R. POPPE, Resident Engineer

WORK was started on the Sacramento River crossing at Antler, Shasta County, in March, 1940, and has been progressing at a rapid rate since that time. The structure is now 75% complete.

The Antler Bridge is one of the projects necessitated by the relocation of the Pacific Highway, U. S. 99. Because of the construction of the Shasta Dam, the future flooding of the canyons of the Sacramento, Pit and McCloud Rivers makes it necessary to reconstruct approximately eighteen miles of highway, which is being financed principally by the U. S. Bureau of Reclamation.

State funds are also being used to supplement the Federal funds where improvements in the standards of construction are desired. At the Antler Bridge the State's share is approximately 25%.

STEEL DECK TRUSS TYPE

The Antler Bridge is a steel deck truss bridge 1330 feet in length with concrete piers and abutments. In addition to the two abutments, there are two anchor piers and four main piers. The piers vary in height from 14 feet to 150 feet above ground surface.

The concrete deck will be approximately 210 feet above ground surface at the river. The span lengths are as follows: One at 91.96 feet, one at 188.85 feet, one at 251.82 feet, one at 272.84 feet, one at 251.88 feet, one at 188.93 feet and one at 79.79 feet. The roadway surface will provide a traveled way of 50 feet between curbs with two two-foot-six-inch sidewalks.

Before work on the main piers was started, the contractor made a careful study of several methods of placing the concrete and handling the forms. The method chosen was a crane capable of being moved from pier to pier as necessary. The boom on the crane could be extended as the pier height increased. At the tallest pier, a boom length of 140 feet with a 20-foot jib was required. A one-yard bottom dump bucket was used for handling the concrete. This method proved economical and very satisfactory.

CANTILEVER METHOD USED

Steel erection was started during the month of September, 1940, and is expected to be completed about February 1, 1941. The cantilever method is used in erection with a traveler working form the north end of the bridge to the south. A temporary steel falsework bent is used near the center of each span. In order to erect the 174-foot central suspended span by this method, it was necessary to provide temporary top and bottom chord connections, which will be released when the erection reaches the south anchor pier.

Alignment on the bridge consists of a 5000-foot radius curve compounded to an 850-foot radius curve at the south end of the structure. Pier caps were constructed higher on the west than on the east ends in order to provide for the necessary superelevation required on the roadway. The structure is also on a vertical curve with a +2.5% grade at the south end and a —4.25% grade at the north end.

The steel was fabricated so that the correct vertical curve would be obtained under full dead load. The trusses were fabricated with a horizontal bend at approximately the quarter points of each span in order to provide for the roadway curvature. Due to the horizontal curvature and superelevation, all the diagonal bracing members are of different lengths. No trouble was experienced in the field erection, with all members fitting properly. All main connections were bolted and pinned 100%. Riveting is proceeding as closely as possible behind the erection.

PAINTING RIG DEVISED

The steel is being sandblasted and painted with one coat of paint in the shop. Two field coats will be applied after erection. Field painting at present consists of priming the field rivet heads and such abrasions as can be reached without the use of staging. After the deck is poured and the weather is such as to permit large-scale painting operations, the contractor proposes to construct a rig on the deck with suspended arms. Staging will be supported on these arms in order to provide access to the interior members.

The major contract quantities include the following: 8000 cubic yards structure excavation, 1,270,000 pounds reinforcing steel, 8500 cubic yards reinforced concrete, 468,000 pounds carbon steel, 2,860,000 pounds alloy steel. The cost of the structure is approximately $673,000.

The work is being performed under contract by the United Concrete Pipe Corporation. The Columbia Steel Company is sub-contractor of steel fabrication and erection. It is anticipated that the project will be completed about August, 1941.

Two Olympic Boulevard Units Completed

(Continued from page 15)

This leaves about 2 miles from Bundy Drive to Lincoln Boulevard in Santa Monica which is unimproved. It is expected that this portion of the route will be constructed during the next biennium and that the two present narrow sections will be widened during this same period of time. This will complete the portion of the route from downtown Los Angeles to Santa Monica and will provide an additional thoroughfare similar to Wilshire Boulevard, although on considerably higher standards of alignment.

Funds expended on this route to date for right of way are $2,022,000 —for construction $1,739,000, or a total of $3,761,000.

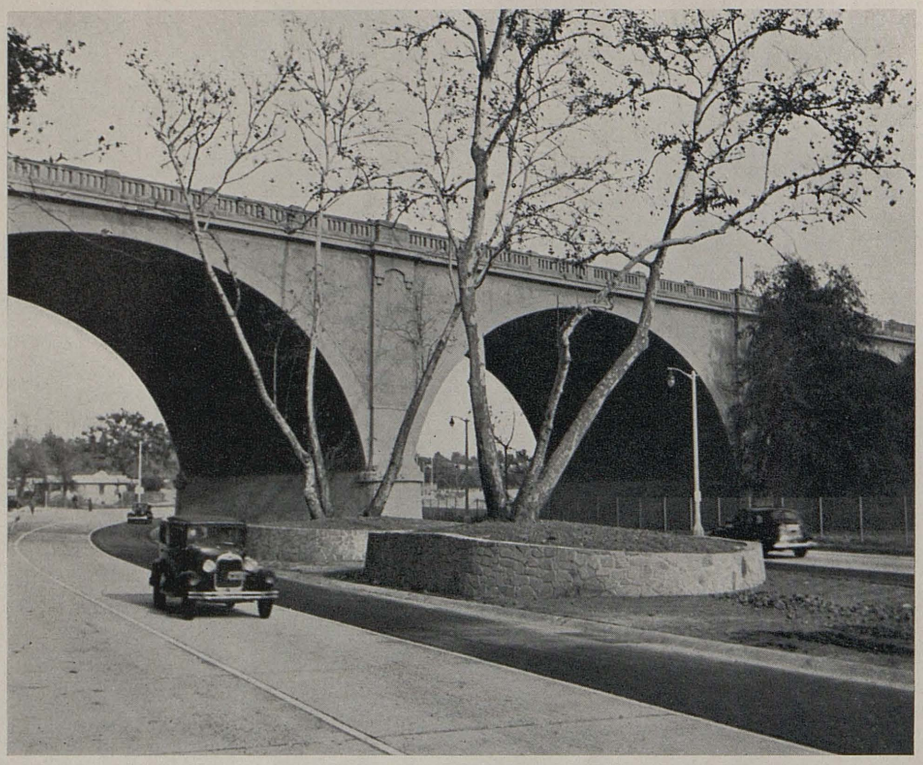
These funds were provided as follows:

¼¢ Gas tax fund for State Highways within cities	$2,268,000
State Highway funds 1½¢ gas tax	836,000
Federal Public Works Administration	542,000
Federal Works Progress Administration	71,000
City of Los Angeles	44,000
	$3,761,000

Highway bridge across Sacramento River at Antler on relocation of U. S. 99 made necessary by construction of Shasta dam. It is a steel deck truss structure 1330 feet long. The concrete deck will be 210 feet above the river

Gov. Olson Dedicates and Opens Arroyo Seco Freeway

(Continued from page 8)



Great care was taken to protect natural sycamores with masonry retaining walls

address of welcome. He was followed by Albert I. Stewart, Vice Chairman of the Board of Directors of the City of Pasadena and by Mayor Fletcher Bowron of the City of Los Angeles.

A narration of the history of the Arroyo Seco dating back to 1769, when Father Juan Crespi, Franciscan padre with the Portola expedition, first came upon the Arroyo, was recited by Balfour.

Short talks were made by Wright L. Felt, representing P.W.A.; Clayton E. Criggs, representing W.P.A.; S. V. Cortelyou, District Highway Engineer of Los Angeles, under whose supervision the parkway was constructed; State Highway Engineer C. H. Purcell; Larry Barrett, Chairman, and L. G. Hitchcock, member, of the California Highway Commission, and Director of Public Works Clark.

Representing the Army on the speakers' stand were Major General Jacob E. Fickel, Commander of the Southwest Air District, Army Air Corps, at March Field; Col. Allen Kimberly, Commander at Fort MacArthur; and Major H. Bunting, representing General E. Calladay, Commander of the anti-aircraft forces in the district embracing Texas, Arizona, New Mexico, California and Nevada.

ARMY PARTICIPATES

"The Army wants good roads," General Fickel said. "Their use would be imperative in times of emergency. This is such a road."

Army participation included a concert on the steps of the Los Angeles city hall prior to the start of the parade by the Third Coast Artillery Band, which headed the caravan, and the raising of the Stars and Stripes at the dedication site by a color guard from this unit. Selections were rendered by the Pasadena Junior College Bulldog Band while the crowd awaited the arrival of the caravan at Fair Oaks Avenue in South Pasadena.

Translated literally, Arroyo Seco means "Dry Wash." For many years before and after the coming of the white man to California, the Arroyo during the rainy season carried flood torrents to the sea. In order to build the parkway, this flood menace had to be controlled, and to this end the Arroyo Seco Flood Control Channel, extending from Devil's Gate Dam in Pasadena to the Los Angeles River in Los Angeles city, a distance of 10.5 miles, was constructed by the W.P.A. at a Federal cost of $7,000,000 plus $880,000 from four sponsors, the State Division of Highways and the cities of Los Angeles, Pasadena and South Pasadena.

WILL CARRRY PEAK FLOOD

The channel is now prepared to carry a peak flow in flood times of 13,500,000 gallons of water per minute to the Los Angeles River, a peak capacity twenty times that of the Metropolitan Water District aqueduct. Millions of yards of earth were excavated from the Arroyo Seco in the building of the channel, which is designed to confine the waters of the drainage area in a lined channel along the parkway.

Public spirited citizens and civic organizations played an important part in bringing about the Arroyo Seco Parkway. In addition to our own Division of Highway engineers, tribute for their untiring efforts in making possible the West's first modern freeway should fittingly be paid to City Engineer Harvey Hincks of Pasadena and his assistants for their co-operation and early plans for the parkway in Pasadena and South Pasadena; to Frank Clough, City Engineer of South Pasadena; to City Engineer Lloyd Aldrich of Los Angeles and his deputies, Merrill Butler, L. E. Arnold, C. J. Shults, L. W. Armstrong, C. L. Bell, and R. W. Stewart for preparation of intricate plans in co-operation with State engineers, and for Engineer Aldrich's efforts in securing large Federal allotments for the Arroyo Channel.

FEDERAL GOVERNMENT AID

To Dr. L. I. Hewes and C. H. Sweetser of the U. S. Public Roads Administration; to Wright L. Felt of the P.W.A. and to R. D. Spencer and Bernard Sewell of the W.P.A., representing the Federal government

without whose aid the parkway never could have been completed.

To the park superintendents and commissioners of the three cities for their aid in beautification and right of way.

To the Santa Fe and Union Pacific Railroads for changing facilities on their private rights of way to fit in with the parkway, thus effecting substantial savings in the parkway construction.

To the spirit of cooperation evidenced by the many contractors and their employees whose willingness to aid enabled the project to advance well ahead of schedule.

THANKS TO ASSISTANTS

It was my honor to act as chairman of the Arroyo Seco Parkway Dedication Committee, which made arrangements for the ceremonies attendant upon the opening of the parkway and I wish to take this opportunity to express my appreciation of the assistance given to me by the following committee chairmen: Caravan and decorations, Stephen W. Cunningham, City Councilman, Los Angeles; Publicity, Harrison R. Baker, Arroyo Seco Parkway Ass'n, Pasadena; Policing, E. Raymond Cato, Chief, California Highway Patrol; Dedication ceremonies, Andrew O. Porter, Mayor of South Pasadena; Dedication luncheon, Edward S. Graham, Chairman, Arroyo Seco Parkway Ass'n, Pasadena; Finance, T. J. Haddock, President, J. E. Haddock Co., Ltd., Pasadena.

No Other Like It

Redding, California

Department of Public Works,
Public Works Building,
Sacramento, California.

Dear Sirs:

I'm writing this note to ask you to please change my mailing address from Lodi, Calif., to the one as given above.

I certainly enjoy getting your magazine and think that there is no other magazine on the market that gives so much information per page. It certainly is informative as to what is going on in the Division of Highways and the Department of Public Works.

Thank you for your service in the past. I hope that it will continue in the future.

Sincerely yours,

James F. Culbertson

Timid Frosh: "I could sit and look at you forever."

Gal Co-ed: "That's what I'm starting to think."

Department History In The Next Issue

The history of the State Department of Public Works together with a comprehensive description of the activities of this largest agency of our State government will be presented in the next issue of this magazine. The work of its three component divisions, namely, the Division of Highways, Division of Water Resources and Division of Architecture touches, very intimately, on numerous occasions during the year, the life and interests of every citizen of California.

The growth of the department from the office of State Engineer with a comparatively few employees in 1878 to its present status with 6,000 employees some of whom are located in every city and county of the State is a striking result of the march of time in California.

Non-Highway Use of Motor Fuel More than 10 per cent

More than one-tenth of the 23,000,000,000 gallons of motor fuel consumed in the United States in 1939 was not used on the highways, but in dozens of other gasoline-motor installations, a report of the Public Roads Administration reveals.

This non-highway use, which includes aviation, agriculture, motor boats, other gasoline engines of all kinds, construction machinery, cleaning, and scores of other uses, as well as the unavoidable losses the petroleum industry suffers from evaporation and handling, amounted to more than 2,000,000,000 in 1939.

Of the nearly 21,000,000,000 gallons used in motor vehicles on the highways, the report shows, private and commercial motorists consume 97.4 per cent, and public use in vehicles of Federal, State, county, and municipal governments, 2.6 per cent.

Eliminating 2-Lane Coast Link

(Continued from page 10)

the sand off the bluff to construct a ramp road on a 20 per cent grade to the top. After the road was completed a two yard power shovel was moved to the bench on the bluff and the removal of the sand was then comparatively easy.

While the sand did not give trouble, the drilling and blasting of the volcanic breccia overburden was difficult. Large charges of powder had to be used to shatter the overburden to prevent it overhanging the shovel. The volcanic breccia when finely shattered made excellent subgrade material.

The portion of the contract on the easterly end, including Railroad Slide, provided for grading only. Of the balance of the contract, substantially all of the paving operations are completed, structures built and dividing curb in place. Shoulders, planting, finishing, etc., and the Railroad Slide area remain.

Completion of the work will bring the Roosevelt Highway another step nearer modern standards.

This work is being financed with Federal Aid and is being carried on under the immediate supervision of C. N. Ainley, Resident Engineer, A. N. George, District Construction Engineer, and S. V. Cortelyou, District Engineer.

A. R. B. A. Convention

"Roads for Defense" will theme note the 1941 Convention of the American Road Builders' Association. Outstanding military authorities and representatives of the U. S. War Department will participate in an open forum on military roads during the four-day conclave in New York City, January 27-30.

Courses for Public Employees

Evening classes of special interest to engineers offered by the Civic Center Division of The University of Southern California School of Government include: Stresses in Framed Structures; Reinforced Concrete; Statically Indeterminate Structures; and Sanitation and Purification of Water, as well as various electrical and mechanical engineering courses.

Detail Of Major Project Allocations Budgeted For C

Continuing the article on the budget from page two, the ensuing pages present tabulations showing the alloca tion of the State Highway System during the ninety-third and ninety-fourth fiscal years of the biennium beginning July 1, 194 lines the amount appears in parentheses for one of the counties, indicating that the two counties share the allocation whi

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Alameda	5	Greenville to Livermore (portions)		$187,350	
Alameda	5	Boehmer Hill and East Slope of Castro Hill	1.5±	94,700	
Alameda	5	Dublin to Livermore	18.7	23,070	
Alameda	5	Hayward to Dublin (portions)	1.1	7,280	
Alameda	69	Ashby Avenue to Bay Bridge Distribution Structure	1.7	36,420	
Alameda	69	Oak Street to High Street	3.3	1,578,350	
Alameda	69	Albany Overhead to Ashby Avenue	2.8	85,000	
Alameda	107	Alameda Creek		101,380	
Alameda	107	Arroyo de Laguna		38,850	
Alameda-San Francisco	68	San Francisco-Oakland Bay Bridge (see San Francisco)		(1,700,000)	$2,152,400
Alpine	23	South of Markleeville		2,430	
Alpine	24	At Woody Gulch		14,570	
Alpine	24	Summit of Pacific Grade to Wolfe Creek Road (portions)		12,100	29,100
Amador-Calaveras	65	Across Mokelumne River		72,850	
Amador	34	Silver Lake to 3 miles east	3.0	12,150	85,000
Butte	3	Biggs Road to Tehama County Line (portions)	3.0	25,500	
Butte	21	Feather River to West Branch	10.4	146,300	
Butte	47	Pine Creek Overflows		50,990	
Butte	87	At Brush Creek	0.4	35,450	
Butte	87	At Grass Draw		6,900	
Butte	45	At Big Butte Creek Overflow		10,760	275,900
Calaveras	24	County Line to Valley Springs (portions)	5.0	30,350	
Calaveras	24	Dorrington to Black Springs (portions)	5.8	18,220	
Calaveras	24	Cabbage Patch to Big Meadows	3.0	9,110	
Calaveras	24	Angels Camp to Murphy's (portions)	2.0	18,220	
Calaveras-Amador	65	Across Mokelumne River (see Amador County)		(72,850)	75,900
Contra Costa	14	Richmond to Carquinez Bridge (portions)	4.8	169,950	
Contra Costa	14	Richmond to Martinez (portions)	17.6	17,000	
Contra Costa	106	Franklin Canyon; Martinez to Route 14 (portions)		546,350	
Contra Costa	106	Hercules to Martinez (portions)		19,400	752,700
Del Norte	1	Richardson Creek northerly (portions)	2.65	17,600	
Del Norte	46	Klamath to Klamath Glenn (portions)		18,820	
Del Norte	71	1.5 miles north of Crescent City		15,180	
Del Norte, Humboldt, Mendocino	1	Various safety items		18,200	69,800
El Dorado	11	2¼ miles east of Clarksville to 1¼ miles west o El Dorado (portions)		349,660	
El Dorado	23	At branches of Big Meadow Creek		2,400	
El Dorado	23	Across Upper Truckee River		3,040	
El Dorado	65	¼ mile north of Cool to Lime Kiln Road (portions)	1±	6,300	361,400
Fresno	4	Malaga to Cherry Avenue	3.8	437,000	
Fresno	10	Warthan Canyon; Parkfield Junction easterly (portions)	1.6	85,700	
Fresno	10	Coalinga to Kings County Line (portions)		12,140	
Fresno	41	White Deer Road to Forest Boundary	3.12	48,570	
Fresno	41	Fowler Switch Canal		8,500	
Fresno	41	Kings Slough and Overflows (12 openings)		125,050	
Fresno	76	Big Dry Creek		14,570	
Fresno	76	Humphreys Creek		3,040	
Fresno	76	Home Creek		18,210	
Fresno	76	Snowslide Creek		5,500	
Fresno	76	Corrall Creek		19,500	
Fresno	76	Pitman Creek		7,300	
Fresno	76	Route 125 to Huntington Lake (portions)		24,280	
Fresno	125	Hub Station to Fresno (portions)		12,140	
Fresno-Madera	125	Fresno to 1.6 miles north San Joaquin River; Canal Bridge (see Madera County)	9.3	(489,300)	821,500

Construction of Highways In 93rd-94th Fiscal Years

tions of highway funds recommended by the State Highway Commission for each proposed major project improvement 1941. The items of proposed expenditure are grouped by counties and in cases where the projects cross county which is only included in the county total column opposite the name of the other county.

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Glenn	45	0.7 mile west to 0.5 mile east of Butte City; Sacramento River	1.7	$526,300	
Glenn	45	At Campbell Slough		17,000	
Glenn	45	Willows to Glenn (portions)	3.0	24,300	$567,600
Humboldt	1	Across Eureka Slough	0.6	327,800	
Humboldt	1	North Scotia Bridge to Rio Dell	1.4	129,300	
Humboldt	1	Weott to 0.6 mile north	0.6	73,450	
Humboldt	1	Freshwater Lagoon to 1 mile south Orick	3.3	355,120	
Humboldt, Mendocino, Del Norte	1	Various safety items (see Del Norte County)		(18,210)	
Humboldt	1	Sinclair's northerly (portions)	1.63	10,620	
Humboldt	1	Avenue of Giants (portions)	0.28	1,800	
Humboldt	1	South Scotia Branch to Fortuna (portions)	5.90	9,100	
Humboldt	1	Loleta to Salmon Creek (portions)	5.90	21,850	
Humboldt	1	Big Lagoon northerly (portions)	2.00	12,800	
Humboldt	1, 56	At Fernbridge Intersection		8,500	
Humboldt	20	Across Mad River	0.5	151,760	
Humboldt	20	At Minor Creek and Glendale Creek		12,500	
Humboldt	46	At Starrit Mine Flumes		1,600	1,116,200
Imperial	12	Mountain Springs to Dixieland (portions)		14,800	
Imperial	26	El Centro to Brawley	11.3	295,750	
Imperial	26	Trifolium Canal to 2 miles north Sandy Beach Road	11.0	371,600	
Imperial	26	Coral Wash to north County line		86,260	
Imperial	26	Kane Springs to Trifolium Canal (portions)		1,800	
Imperial	26	Calexico to El Centro	10.0	43,130	
Imperial	26	Between Calexico and El Centro (portions)		9,860	
Imperial	27	Intersection of Main Street with S. P. R.R. in El Centro		369,700	
Imperial	27	East Highline Canal to Yuma		12,300	
Imperial	187	Niland to north County boundary (portions)		61,600	
Imperial	187	Bonds Corners to Holtville (portions)		9,300	
Imperial	187	Bonds Corners to Holtville (portions)		3,700	
Imperial	198	At San Felipe Creek		7,400	
Imperial	201	North of Calexico to East of Brawley (portions)		3,700	
Imperial	201	Brawley to Calipatria (portions)		12,300	
Imperial	202	Seeley to Bonds Corners (portions)		12,300	
Imperial	202	East Highline Canal Line Changes	0.6	18,500	1,334,000
Inyo	23	Cottonwood Creek to Bartlett (portions)	2.5	85,500	
Inyo	23	At Railroad Crossing Station 528 to Station 533, Section H	0.1	1,200	
Inyo	23	South of Route 127 to Alabama Gate (portions)	1.5	6,630	
Inyo	23	Independence to Fish Springs School (portions)	6.0	16,200	
Inyo	23	Haiwee to Cottonwood Creek and Round Valley Road to Mono County Line (portions)	1.0	3,750	
Inyo	23	Drainage correction on Primary Routes		3,100	
Inyo	63	Near Deep Springs School	0.1	300	
Inyo	76	Laws Junction to Mono County Line	4.6	44,120	
Inyo	76	Near Plant No. 3	0.05	3,400	
Inyo	127	Near Shoshone	0.1	1,030	
Inyo	127	15 miles west of Death Valley to Death Valley (portions)	3.2	1,750	
Inyo		Various drainage correction on Secondary Roads		620	167,600
Kern	4	Fort Tejon to 1.4 mile north of Grapevine Station; Grapevine Creek Bridge	5.9	419,000	
Kern	4	Southern Pacific Railroad Overpass to Shafter Road; Lerdo Canal Bridge	7.5	529,150	
Kern	4	Famoso to Delano (portions)		49,300	
Kern	4	Safety Items on Primary Roads		3,080	
Kern	23	1.8 mile south to 1.1 mile south of Junction Route 57	0.7	39,500	
Kern	23	Mojave to Red Rock Canyon (portions)	14.5	179,700	
Kern	23	Cinco to Ricardo (portions)	1.3	3,700	
Kern	58	Mojave easterly (portions)	8.0	17,800	

DETAIL OF MAJOR PROJECT ALLOCATIONS BUDGETED FOR C

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Kern	58	Marcel easterly; 5 unnamed creeks		$450,000	
Kern	58	5.6, 5.7, 5.9 miles east of Buttonwillow, Equalizers		20,300	
Kern	58	Main Drainage Canal		11,000	
Kern	58	Buena Vista Slough		44,980	
Kern	58	McKittrick to Rosedale (portions)		18,500	
Kern-Tulare	129	Deepwell Ranch to ¼ mile north of county line (see Tulare County)	8.0	(215,650)	
Kern	138	McKittrick to Kings County Line (portions)		36,900	
Kern	140	Hill Creek Cattlepass		4,200	
Kern	142	Southern Pacific Railroad Tracks to Stine Canal	0.66	73,900	
Kern	142	Barren Creek Bridge		8,950	
Kern	142	Poso Creek Bridge		2,500	
Kern		Various Drainage correction on Secondary Roads		6,160	
Kern		Various Safety Items on Secondary Roads		3,080	$1,921,700
Kings	125	5th Standard Parallel to Stratford; Kings River Bridge	4.7	238,000	
Kings	125	Prairie Draws		970	
Kings	134	Corcoran to Tulare County Line (portions)		6,000	
Kings	138	North and south of Junction of Route 125	10.0	54,630	299,600
Lake	15	Laurel Dell Lake to Tule Lake (portions)	1.75	10,300	
Lake	15	Lucerne Northerly		9,700	
Lake, Mendocino	16	Lakeport to Route 1 (portions)		386,700	
Lake	49	Middletown southerly (portions)	3.9	23,000	
Lake	49	Putah Creek to Lower Lake (portions)		93,500	
Lake	89	Lakeport easterly (portions)	0.8	4,700	
Lake	89	Lakeport easterly (portions)	0.8	4,700	
Lake	89	Intersection with Route 16 southerly (portions)	0.9	5,300	
Lake	89	At Kelsey Creek	0.3	140,800	
Lake	89	At Scott Creek	0.3	62,500	
Lake	89	At Middle Creek		28,500	765,000
Lassen	28	Big Valley Mountain	2.5	10,930	
Lassen	29	Susan Route to Susanville (portions)	7.4	6,100	
Lassen, Sierra	29	Constantia to Nevada State Line (portions)		72,850	
Lassen	29	Ravendale to Termo	5.0	20,640	
Lassen	73	Brockmans to Madeline (portions)	3.5	10,930	
Lassen	73	Viewland to Secret Valley (portions)	10.0	30,350	151,800
Los Angeles	2	Ventura Boulevard (portions)	3.1	221,800	
Los Angeles	4	Castaic to Alamos Creek (portions)	16.0	49,300	
Los Angeles	9	Glendora to La Verne (portions)	4.5	14,800	
Los Angeles	26	Right of Way, Ramona Freeway; Los Angeles to Pomona (portions)		406,700	
Los Angeles	26	Garey Avenue to Hamilton Boulevard in Pomona	0.7	43,130	
Los Angeles	26	Valley Boulevard Intersection		3,080	
Los Angeles	60	Latigo Canyon to Winter Canyon	3.5	492,920	
Los Angeles	60	South City Limits to 24th Street in Hermosa Beach	1.2	91,190	
Los Angeles	61	Angelus Crest Highway		591,500	
Los Angeles	156	0.5 mile south of Topanga Post Office		3,080	
Los Angeles	158	Sepulveda Boulevard; Centinella to Jefferson	0.7	88,720	
Los Angeles	158	Sepulveda Boulevard; south of Waterford to Ohio Avenue	0.83	166,360	
Los Angeles	158	Through Sawtelle Military Home	1.0	17,250	
Los Angeles	162	Santa Monica Boulevard, Fairfax to Croft	0.7	49,300	
Los Angeles	164	La Tijera to Sepulveda	1.5	7,400	
Los Angeles	166	Santa Ana Freeway (portions)		985,840	
Los Angeles	168	Rosemead Boulevard, Route 60 to Center Street	3.4	271,100	
Los Angeles	168	Rosemead Boulevard, Siphon Road to Garvey Avenue	2.6	154,040	
Los Angeles	168	Rosemead Boulevard, Glendon Way to Valley Boulevard	0.5	67,780	
Los Angeles	168	Rosemead Boulevard, Las Tunas Boulevard to Longden Avenue	0.7	92,420	
Los Angeles	169	Bellflower Boulevard, Artesia Street to 800 ft. south of South Street		86,260	
Los Angeles	170	Orange County Line to 1 mile north		1,230	
Los Angeles	173	Olympic Boulevard, Centinela to Lincoln in Santa Monica	2.3	542,210	
Los Angeles	174	Downey Avenue to Orange County Line (portions)		24,650	
Los Angeles	179	Route 60 to San Gabriel River	1.4	12,320	
Los Angeles		Various Allocated to cooperative projects in City of Los Angeles (as detailed hereafter):			6,121,820
Los Angeles	2	Cahuenga Pass; 900 ft. north of Barham Boulevard to 1000 ft. north of Lankershim Boulevard *486,000			
Los Angeles	2	Alameda Street to Vermont (portions) *2,500,000			
Los Angeles	2	Aliso Street to Soto Street (portions) *393,200			

CONSTRUCTION OF HIGHWAYS IN 93rd - 94th FISCAL YEARS

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Los Angeles	4	Daley Street; Main Street to Pasadena Avenue *330,000			
Los Angeles	4	San Fernando Road; Ensign to Burbank *35,600			
Los Angeles	4	San Fernando Road; Bransford to Truesdale *47,200			
Los Angeles	4	San Fernando Road; Delay to Verdugo Road *62,000			
Los Angeles	26	Ramona Freeway; Aliso Street to City Limits *500,000			
Los Angeles	60	North of Santa Monica *50,000			
Los Angeles	158	Sepulveda Boulevard, Sunset Avenue to south of Waterford and Ohio Avenue to Pico Place *241,000			
Los Angeles	161	Colorado Street, Townsend Avenue to Eagle Rock Boulevard *92,800			
Los Angeles	161	Moorpark Street Bridge and Approaches, Tujunga Wash *50,000			
Los Angeles	163	Bicknell Street to Windward Avenue (portions) *300,000			
Los Angeles	165	Figueroa Street, Neola to Buena Vista Terrace *112,500			
Los Angeles	165-205	Arroyo Seco Parkway and Figueroa Street, Avenue 22 to Figueroa Terrace *1,300,000			
Los Angeles	173	Olympic Boulevard, Berendo Street, to Western Avenue *310,000			
Los Angeles	173	Olympic Boulevard, Hoover Street to Menlo Avenue *111,000			
Los Angeles	173	Olympic Boulevard, Bundy Drive to Centinella Avenue *46,500			
		* Total cost including cooperative funds; Cooperative Project, City of Los Angeles, ¼c State Highway Fund			$10,606,200
Madera	4	½ mile north of Ash Slough to north County Boundary	1.8	$72,850	
Madera	4	San Joaquin River to Madera	7.5	30,350	
Madera	32	Califa to Merced County Line (portions)		36,420	
Madera, Fresno	125	Fresno to 1.6 miles north of San Joaquin River Bridge; Canal Bridge	9.3	489,300	
Madera	126	Madera to 3 miles east	3.0	104,780	733,700
Marin	1	Ignacio to north County Boundary (portions) Novato Creek		437,080	
Marin	56	At Tomales Bay		4,820	441,900
Mariposa	65	At Maxwell Creek		3,040	
Mariposa	65	At C.C.C. Camp	0.5	7,860	10,900
Mendocino	1	At South Fork Eel River		18,210	
Mendocino	1	¾ mile north of Red Mountain Creek to Piercy	3.6	242,800	
Mendocino	1	Hopland to Crawford Ranch; McNab Creek	6.5	412,800	
Mendocino	1	Northwestern Pacific Railroad to Willits (portions)	1.4	132,940	
Mendocino	1	Elk Creek		3,640	
Mendocino	1	0.5 mile south of Hopland		6,070	
Mendocino, Humboldt, Del Norte	1	Various Safety Items (see Del Norte County)		(18,200)	
Mendocino	1	Ridgewood Hill (portions)	0.92	5,400	
Mendocino	1	Sherwood Road to Rattlesnake Summit (portions)	2.85	17,790	
Mendocino	1	Rosswarnes northerly (portions)	0.66	3,900	
Mendocino	15	Calpella to County Line (portions)	1.90	11,170	
Mendocino	48	Flynn Creek to Navarro	2.3	78,310	
Mendocino	48	Ward Creek—Mile 45.1		1,200	
Mendocino	48	Fairbanks Hill (portions)	1.22	7,830	
Mendocino	56	At Albion River	0.7	327,800	
Mendocino	56	Mile 2.5 northerly		610	
Mendocino	56	Salmon Creek Bridge northerly		5,220	
Mendocino	56	Mile 5.1 Dark Gulch		12,630	
Mendocino	56	Mile 6.6 south of Buckhorn Creek		9,230	
Mendocino	56	At south City Limits Mendocino City		850	
Mendocino	56	Gualala to Point Arena	3.7	19,300	1,317,700
Merced	4	Southerly Boundary to 2.6 miles northerly	2.6	97,130	
Merced	18	East of Merced	0.5	7,300	
Merced	32	West County Boundary to Foot of Grade and San Luis Creek Line Change	4±	163,900	
Merced	32	Pacheco Pass to Junction Route 121 (portions)	1.5	18,220	
Merced	41	Dos Palos Wye to Dos Palos (portions)	4.0	24,280	
Merced	41	Centinella to Los Banos (portions)	10.8	30,350	
Merced, Stanislaus	41	Vernalis to Junction Route 32 (portions) (see Stanislaus County)	5.0	(30,350)	
Merced	122	West of Merced (portions)	4.0	12,140	
Merced	123	End of concrete to Merced River (portions)	3.5	24,280	377,600

DETAIL OF MAJOR PROJECT ALLOCATIONS BUDGETED FOR C

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Modoc	28	Pit River to Canby (portions)	6.0	$6,100	
Modoc	28	Lakeview Junction to Toms Creek (portions)	8.2	14,570	
Modoc	28	Toms Creek to Cedarville (portions)	10.0	12,140	
Modoc	73	Likely northerly	1.0	13,350	
Modoc	73	At New Pine Creek		3,900	
Modoc	73	At Tom Creek, Joseph Creek, and Dry Gulch		16,390	
Modoc	73	Likely to Alturas (portions)	18.6	72,850	$139,300
Mono	13	Vicinity Mile 6.0, Section A	1.5	6,160	
Mono	23	Rock Creek to Casa Diablo (portions)	8.0	98,580	
Mono	23	1 mile north of Bridgeport to Dresslers Corner	1.2	18,480	
Mono	23	Vicinity Mile 12.55 and Mile 14.55, Section J	2.0	22,180	
Mono	23	Station 381, Section J	0.1	920	
Mono	23	Station 116, Section I	0.1	2,160	
Mono	23	Station 543+50 to Station 547+00, Section K	0.1	3,460	
Mono	23	Station 610, Section I		250	
Mono	23	In Leevining		870	
Mono	23	Vicinity Chris' Flat	0.1	4,300	
Mono	23	At Tioga Lodge		12,320	
Mono	23	Casa Diablo Hot Springs to Crestview (portions)	2.7	17,250	
Mono	23	Conway Summit to Bridgeport (portions)	6.0	17,530	
Mono	23	Hot Creek northerly (portions)	8.5	11,460	
Mono	23	Crestview to June Lake Junction	9.7	22,800	
Mono	23	Near Point Ranch		620	
Mono	40	West Boundary to Route 23 (portions)		30,200	
Mono	40	Route 23 to Sand Pit Road	1.5	6,160	
Mono	40	Route 23 to Gas Pipe Springs (portions)	14.3	9,610	
Mono	76	Near Hammil Station	1.0	7,390	
Mono	95	Near Winemuller's, Mile 8.5, Section A	0.4	7,750	
Mono	95	Antelope Valley to State Line (portions)	2.0	5,180	
Mono	111	Grant Lake to Route 23	2.6	37,340	
Mono	111	Station 76 to Station 111+25, Section A	0.6	24,430	367,400
Monterey	2	Salinas to Santa Rita	3.1	361,800	
Monterey	2	Salinas to 2 miles south of Salinas	1.8	152,980	
Monterey	2	At Branstetter Gulch	0.4	38,850	
Monterey	2	At Monroe Gulch	0.3	21,000	
Monterey	2	2 miles south of King City	0.3	28,290	
Monterey	2	King City to Soledad (portions)		26,710	
Monterey, San Benito	2	Santa Rita Mesa to Chittenden Road (portions) (see San Benito County)		(424,900)	
Monterey	2	Bradley to San Ardo (portions)		3,640	
Monterey	2	San Lucas to King City (portions)		18,210	
Monterey	56	Seaside to Castroville		66,780	
Monterey	56	At Salmon Creek		12,140	
Monterey	56	Near Seaside		3,160	
Monterey	56	At Villa, Alder, Willow, Kirk and Lime Creeks and Hot Springs Canyon		12,140	745,700
Napa, Solano	7	Junction of Route 208 to 2½ miles easterly (portion) 2.5		145,690	
Napa	74	Kelly Curves line change		9,710	
Napa, Sonoma	80	Ignacio to Napa (portions)		37,000	192,400
Nevada	17	1.5 miles north Rattlesnake Creek to Grass Valley	4.2	220,950	
Nevada, Yuba	25	Nevada City to Sierra County Line (portions) (see Yuba County)		(123,800)	
Nevada	37	Donner Summit to Donner Lake	2.2	57,650	
Nevada, Sierra	38	1 mile north Farad to 0.7 mile south State Line (see Sierra County)	3.0	(152,370)	278,600
Orange	2	Right of Way; Santa Ana Freeway (portions)		246,460	
Orange	2	Fullerton to Los Angeles County Line (portions)	0.55	5,180	
Orange	43	Santa Ana Canyon Road, Peralto to Olive Cutoff	4.5	295,750	
Orange	43	Santa Ana Canyon Road, through Orange	1.4	24,650	
Orange	43	Santa Ana Canyon Road, Orange to 1st Street, Santa Ana		50,520	
Orange	170	Katella Avenue to Cerritos Avenue		1,110	
Orange	174	Right of way; Santa Ana Freeway (portions)		123,230	
Orange	175	Santa Ana River Bridge		30,800	
Orange	176	Route 62 to Route 2 (portions)		3,700	
Orange	182	Orange to Orange County Park (portions)		860	
Orange	183	At Springdale Ditch		7,390	
Orange	184	Newport Boulevard to Santa Ana	1.3	17,750	
Orange	185	1.2 miles south of Route 2 to Route 2	1.2	4,500	811,900

CONSTRUCTION OF HIGHWAYS IN 93rd-94th FISCAL YEARS

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Placer	3	Lincoln to Yuba County Line (portions)	2.0	$17,000	
Placer	37	2d crossing Nevada County Line to 3d crossing Nevada County Line (portions)	1.0	12,140	
Placer	37	Gold Run to Nevada County Line (portions)	2.0	19,420	
Placer	38	El Dorado County Line to Nevada County Line (portions)		12,140	$60,700
Plumas	21	North Fork to Keddie	21.0	194,300	
Plumas	21	Near Quincy		610	
Plumas	21	Beckwourth to Edes Ranch	9.3	63,130	
Plumas	21	La Porte Road to Western Pacific Subway	4.1	139,620	
Plumas	21	Feather River Inn to Beckwourth (portions)	16.0	6,070	
Plumas	21	Spring Garden to Feather River Inn (portions)	10.0	6,070	
Plumas	21	Spring Garden to Feather River Inn (portions)	12.0	12,140	
Plumas	29	Lost Creek to Route 83	3.0	7,280	
Plumas	83	Greenville to Crescent Mills	4.1	24,280	453,500
Riverside	19	1 mile east Mira Loma to 3 miles west of Riverside	4.3	523,730	
Riverside	43	Riverside to north county boundary	1.3	96,100	
Riverside	64	4 miles west of Blythe to 3 miles west of Blythe	1.1	62,850	
Riverside	64	Route 26 to Black Butte		308,080	
Riverside	64	Indio to junction Route 64-B (portions)		18,480	
Riverside	64	Perris easterly and Hemet easterly		7,640	
Riverside	77	Murietta southerly (portions)		5,240	
Riverside	78	Perris northerly		3,080	
Riverside	78	Elsinore northerly (portions)		860	
Riverside	146	Ripley to junction Route 64 (portions)		9,860	
Riverside	146	Route 64 to north county line (portions)		12,320	
Riverside	187	Between Coachella and Mecca (portions)		4,930	
Riverside-San Bernardino	193	Corona to Route 19 (portions) (see San Bernardino County)	5±	(49,300)	
Riverside	194	San Jacinto northerly (portions)		1,730	1,054,900
Sacramento	3	American River Bridge to North Sacramento	0.7	847,440	
Sacramento	4	Cosumnes River and Overflows		32,800	
Sacramento	4	San Joaquin County Line to Sacramento (portions)		13,360	
Sacramento	11	Sacramento River Bridge at Isleton		31,570	
Sacramento	11	Antioch Bridge to 1 mile east	1.0	60,700	
Sacramento	11	At 3 Mile Slough		19,430	1,005,300
San Benito, Monterey	2	Santa Rita Mesa to Chittenden Road (portions)		424,900	
San Benito	67	Pajaro River Bridge		5,200	
San Benito	119	Cottage Corners to 2 miles north	1.9	119,600	
San Benito	119	At Oat Creek and near Stump Creek		9,100	558,800
San Bernardino	9	Cherry Avenue to San Bernardino	9.4	165,130	
San Bernardino	9	Foothill Boulevard at Station 247, Section A	0.1	2,710	
San Bernardino	19	Through Ontario	2.7	158,040	
San Bernardino	26	Redlands to 3.1 miles east	3.6	44,360	
San Bernardino	26	3.1 miles east of Redlands to Calimesa	2.0	110,910	
San Bernardino	26	State Street to 0.4 mile south of City Reservoir in Redlands	1.7	141,710	
San Bernardino	26	Mission Storm Drain		8,010	
San Bernardino	26	Intersections Monte Vista Avenue and Vernon Street		2,460	
San Bernardino	31	Cajon Pass at Blue Cut Slide, Mile 5.1, Section B		1,480	
San Bernardino	31	Cajon Pass near Keenbrook, Mile 4.0, Section B		980	
San Bernardino	31	Cajon Boulevard at Cable Creek Overflow, Mile 2.5, Section A		740	
San Bernardino	31	Drainage correction; Victorville to Barstow (portions)		2,460	
San Bernardino	43	Victorville to 1 mile east	1.0	79,110	
San Bernardino	43	Near Arrowbear Park		500	
San Bernardino	43	San Bernardino to Route 189 (portions)		8,500	
San Bernardino	43	Running Springs Park to Big Bear Dam (portions)		3,080	
San Bernardino	58	Needles southerly		11,460	
San Bernardino	59	Deer Lodge Park to Mojave Desert	5±	3,080	
San Bernardino	59	At Sheep Creek		620	
San Bernardino	59	Cedar Glen Road to Route 43 (portions)		620	
San Bernardino	189	Squirrel Inn to Lake Arrowhead (portions)		6,160	
San Bernardino	189	Route 43 to Route 59 (portions)		1,230	
San Bernardino	190	Igo to Camp Angelus (portions)		12,300	
San Bernardino	190	San Bernardino to Forest boundary (portions)		16,880	
San Bernardino	191	At north city limits of San Bernardino		1,480	

DETAIL OF MAJOR PROJECT ALLOCATIONS BUDGETED FOR C

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
San Bernardino	192	Route 77 to Ontario	5.85	$36,970	
San Bernardino, Riverside	193	Corona to Route 19 (portions)	5±	49,300	
San Bernardino	207	Junction Route 43		620	$870,900
San Diego	2	Torrey Pines Mesa to Del Mar Overhead	3.3	142,950	
San Diego	2	Bean Street to Barnett Avenue in San Diego	0.9	221,850	
San Diego	2	Wisconsin Street to 8th Street in Oceanside	1.0	36,970	
San Diego	2	San Ysidro to Chula Vista (portions)		7,400	
San Diego	2	Oceanside to Las Flores (portions)		1,850	
San Diego	12	Pine Valley to Casbere Ranch (portions)		9,860	
San Diego	12	Casbere Ranch to Tecate Divide (portions)		3,080	
San Diego	77	Ash Street, San Diego, to ½ mile north of city limits	7.2	739,380	
San Diego	77	Escondido to San Luis Rey River (portions)		661,130	
San Diego	77	Between Vista and Bonsall		12,320	
San Diego	77	At San Luis Rey River		14,790	
San Diego	77	Vista to north county line (portions)		9,250	
San Diego	78	At Canada Verde		6,780	
San Diego	78	At Descanso Creek Bridge		8,630	
San Diego	78	At Coleman Creek		2,470	
San Diego	78	At Acorn Creek Bridge		9,240	
San Diego	78	At Matagual Valley Creek		18,490	
San Diego	78	Cuyamaca to Julian (portions)		9,860	
San Diego	195	At West and East Channels of Live Oak Creek		14,800	
San Diego	195	At Fry Creek		2,460	
San Diego	195	Pump House line change		9,860	
San Diego	195	Bonsall to Pala (portions)		3,080	
San Diego	195	At bridge west of Pala		4,930	
San Diego	195	Oceanside to junction Route 77 (portions)		7,390	
San Diego	196	Carlsbad to Vista (portions)		3,080	
San Diego	198	San Vicente line change		86,260	
San Diego	198	At Sycamore Creek		4,930	
San Diego	198	At Rust Creek Bridge		1,490	
San Diego	198	At Wright Street Creek in El Cajon		18,480	
San Diego	198	Julian to Scissors Crossing (portions)		6,160	
San Diego	198	Ramona to Santa Ysabel (portions)		6,160	
San Diego	198	El Cajon to San Vicente Creek (portions)		6,160	
San Diego	198	Scissors Crossing to Borego Road (portions)		3,700	
San Diego	198	Scissors Crossing to east county line (portions)		3,700	
San Diego	200	San Diego to Engineer's Springs (portions)		18,490	
San Diego		At Borego State Park		1,850	
San Diego		At Cuyamaca State Park		620	2,119,900
San Francisco, Alameda	68	Administration, maintenance, operation and insurance on San Francisco-Oakland Bay Bridge		1,700,000	1,700,000
San Joaquin	4	At Jahant Corner		3,040	
San Joaquin	53	Lodi Lake to railroad crossing	1.0	3,640	
San Joaquin	75	At Morman Slough		6,070	
San Joaquin	75	At Lone Oak Creek		15,780	
San Joaquin	75	At Hunter Creek		1,460	
San Joaquin	75	At Old and Middle Rivers		24,290	
San Joaquin	97	At Calaveras River		1,220	55,500
San Luis Obispo	2	Line change north of motel	0.4	45,600	
San Luis Obispo	2	San Luis Obispo to Santa Margarita (portions)		6,900	
San Luis Obispo	33	At Santa Rosa Creek Bridge		6,160	
San Luis Obispo	33	Paso Robles to Estrella River (portions)		30,800	
San Luis Obispo	56	San Carpojo Creek to northerly county boundary	3.7	9,830	
San Luis Obispo	56	At Arroyo Grande		24,640	
San Luis Obispo	56	Guadalupe to Oceano (portions)		5,920	
San Luis Obispo-Santa Barbara	57	Remove seven bridges		34,500	
San Luis Obispo	57	Route 2 to Cuyama River (portions)		12,320	
San Luis Obispo	58	At Trout Creek		32,040	
San Luis Obispo	125	Salinas River Bridge		6,160	
San Luis Obispo	147	Arroyo Grande to San Luis Obispo (portions)		4,930	219,800
San Mateo	2	South county boundary to Charter Street in Redwood City	3.22	922,720	
San Mateo-Santa Cruz	56	Santa Cruz to Tunitas (portions) cooperative project with Joint Highway District 9 (see Santa Cruz County)		(157,830)	

CONSTRUCTION OF HIGHWAYS IN 93rd-94th FISCAL YEARS

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
San Mateo	56	Tunitas to Half Moon Bay (portions)		$12,100	
San Mateo	68	Redwood City to San Mateo (portions)		7,280	
San Mateo	68	Peninsular Avenue Burlingame to South San Francisco Underpass	6.64	3,520,900	$4,463,000
Santa Barbara	2	Hollister Wye to Goleta Airport	4.4	524,960	
Santa Barbara	2	0.4 mile east of Las Varas Creek to El Capitan Creek	3.2	359,830	
Santa Barbara	2	Olive Mill Road to east city limits Santa Barbara	0.7	33,300	
Santa Barbara	2	Right of way; Rancheria Street from Guiteriez Street to north city limits; Bath Street to Milpas Street		492,920	
Santa Barbara	2	Right of way; Crescent Drive to Hollister Wye	2.0	12,320	
Santa Barbara	2	Zaca to Los Alamos (portions)		2,960	
Santa Barbara	2	Alcatraz to Las Cruces (portions)		6,780	
Santa Barbara	2	El Capitan Creek to Alcatraz (portions)		4,930	
Santa Barbara	2	Junction Route 80 to Stoney Creek (portions)		3,450	
Santa Barbara	2	Gaviota Pass to Buellton		1,730	
Santa Barbara	56	Orcutt to Guadalupe (portions)		4,930	
Santa Barbara	56	Las Cruces to Lompoc (portions)		27,110	
Santa Barbara	57	At Wasioja Creek Bridge		6,160	
Santa Barbara-San Luis Obispo	57	Remove seven bridges (see San Luis Obispo County)		(34,500)	
Santa Barbara	57	At Cottonwood Creek Bridge		6,160	
Santa Barbara	80	At San Jose Creek Bridge		1,230	
Santa Barbara	149	At Alamo Pintado Bridge		4,930	
Santa Barbara	149	Surf to Lompoc (portions)		17,000	1,510,700
Santa Clara	5	Bascome Avenue to Park Avenue (Cooperative Project)	1.2	157,850	
Santa Clara	32	San Felipe to Bells Station (portions)		12,150	170,000
Santa Cruz	32–56	Watsonville to Rob Roy	7.74	461,360	
Santa Cruz	42	Sempervirens Creek		14,600	
Santa Cruz-San Mateo	56	Santa Cruz to Tunitas (portions) Cooperative Project with Joint Highway District 9		157,830	
Santa Cruz	116	San Lorenzo River	0.4±	44,310	678,100
Shasta	3	North of Anderson to Redding Subway	7.5	236,750	
Shasta	3	Redding to 2½ miles north	2.5	60,700	
Shasta	3	La Moine to Siskiyou County Line (portions)	18.5	6,050	
Shasta	20	Near Schilling to Shasta	4±	319,310	
Shasta	28	In Burney Valley (portions)		3,040	
Shasta	209	Summit City to Route 3	2.9	4,860	630,710
Sierra	25	At Goodyear Creek	0.3	45,530	
Sierra-Lassen	29	Constantia to Nevada State Line (portions) (see Lassen County)		(72,850)	
Sierra-Nevada	38	One mile north Farad to 0.7 mile south State Line	3.0	152,370	197,900
Siskiyou	3	North Approach in Dunsmuir	1.5	84,990	
Siskiyou	3	Siskiyou County Line to Dunsmuir	1.5	1,820	
Siskiyou	3	Gazelle to Yreka (portions)	17.0	9,100	
Siskiyou	46	Across Salmon River		78,300	
Siskiyou	46	At Irving, Stanshaw and Sandy Bar Creeks		32,780	
Siskiyou	46	2.5 miles west of Walker Bridge to Hamburg	13.0	97,100	
Siskiyou	72	Edgewood Road to 2½ miles north	2.5	84,990	
Siskiyou	72	Near Macdoel to Dorris (portions)	10.0	10,930	
Siskiyou	72	Four miles north of Weed to Grass Lake (portions)	19.0	10,930	
Siskiyou	82	Fort Jones to Route 3 (portions)	16.0	6,070	
Siskiyou	82	Yreka to McCloud (portions)	6.0	3,640	
Siskiyou	83	Route 3 to McCloud (portions)	9.0	3,640	424,290
Solano	7	North of Vacaville to 2 miles north of Power Station	6.0	495,350	
Solano-Yolo	7, 6	1.3 miles north of Dixon to 1 mile east of Davis	7.5	382,440	
Solano-Napa	7	Junction Route 208 to 2½ miles easterly (portions) (see Napa County)	2.5	(145,690)	
Solano	7	Fairfield to 1 mile north of Vacaville (portions)	5.1	30,350	
Solano	53	Suisun to Denverton (portions)	4.0	24,300	
Solano	90	Route 7 near Richfield Station to 1½ miles north Sweeney Creek		224,610	
Solano	208	At Napa River Bridge		97,150	
Solano-Sonoma	208	Instalment payment and interest Sears Point Toll Road		36,400	1,290,600

DETAIL OF MAJOR PROJECT ALLOCATIONS BUDGETED FOR CONSTRUCTION OF HIGHWAYS IN 93rd-94th FISCAL YEARS

County	Route	Location	Mileage	Proposed expenditure for construction, right of way, engineering and contingencies	County total
Sonoma	1	Sebastopol Avenue to 9th Street in Santa Rosa; Viaduct		$868,080	
Sonoma-Napa	8	Ignacio to Napa (portions) (see Napa County)		37,030	
Sonoma	8	Sonoma County Line to Napa (portions)		4,370	
Sonoma	51	Beltane to Sonoma (portions)		14,600	
Sonoma	56	Timber Cove Tunnel		4,860	
Sonoma	104	Jenner to Guerneville (portions)		19,430	
Sonoma	208	Junction Route 8 to Solano County Line	2.2	19,430	
Sonoma-Solano	208	Installment payment and interest Sears Point Toll Road (see Solano County)		(36,400)	$967,800
Stanislaus-Merced	41	Vernalis to Junction Route 32 (portions)	5.0	30,350	
Stanislaus	109	Modesto to Junction Route 13	4.0	60,750	91,100
Sutter-Yuba	3	Feather River Bridge Foundations		424,950	
Sutter	15	Sacramento River Bridge at Meridian		34,000	
Sutter	15	Meridian Overhead		2,450	
Sutter	87	One mile to 2¾ miles north of Knights Landing	1.8	34,600	496,000
Tehama	3	Cone Lane to Red Bluff	3±	48,560	
Tehama	7	South Boundary to Proberta	19.5	24,280	
Tehama	29	Paynes Creek to Lost Creek (portions)	3.0	7,260	80,100
Trinity	20	Prairie Creek to Valdor (portions)	15.0	24,280	
Trinity	20	Tom Long Gulch to east boundary (portions)	10.7	6,070	
Trinity	20	Douglas City to Vitzhums (portions)	1.0	4,850	
Trinity	29	At Hayfork Creek		18,200	53,400
Tulare	4	Goshen Subway to Kings River (portions)		55,450	
Tulare	4	Quail to Tipton Crossing	5.6	12,300	
Tulare	4–10	Safety items		3,080	
Tulare	10	Right of Way; Route 4 to Mill Creek	4.2	18,480	
Tulare-Kern	129	Deepwell Ranch to ¼ mile north of county line	8.0	215,650	
Tulare	129	Daley's Corner to Woodlake (portions); Yokohl Creek Bridge		49,290	
Tulare	132	Route 134 to Visalia	8.1	30,810	
Tulare		Various Drainage correction on Secondary Roads		6,160	
Tulare		Various Safety items on Secondary Roads		3,080	394,300
Tuolumne	13	2½ miles north of Keystone to south of Jamestown	7.5	91,100	91,100
Ventura	2	Junctions Route 60 and Route 9; and El Rio to Montalvo	1.7	57,920	
Ventura	2	Mandos Curve to Pitas Point	1.5	48,060	
Ventura	2	Drainage protection Montalvo to Ventura (portions)		18,480	
Ventura	9	Victoria Avenue and Saticoy Avenue intersections		11,100	
Ventura	9	Route 2 to Los Angeles County Line (portions)		6,160	
Ventura	9	Saticoy to Los Angeles Avenue	1.6	11,830	
Ventura	60	Point Mugu to Little Sycamore Creek		184,850	
Ventura	60	Fifth Street to 6th Street in Oxnard		49,300	
Ventura	79	Through Santa Paula		38,200	
Ventura	79	Sespe River Bridge		1,850	
Ventura	154	El Rio to Route 9 (portions)	3.6	5,300	
Ventura	155	Triumpho Creek Bridge		1,850	434,900
Yolo	6	Swingle to Yolo Causeway	1.7	109,250	
Yolo, Solano	6, 7	1.3 mile north of Dixon to 1 mile east of Davis (see Solano County)	7.5	(382,440)	
Yolo	6	2½ miles east of Yolo Causeway to Washington Subway	1.3	91,060	
Yolo	50	At Conway Canal 6½ miles east of Woodland	0.3	45,500	
Yolo	50	¾ mile south to ⅓ mile north of Rumsey	1.2	35,210	
Yolo	50	Woodland to Kiesel (portions)	4.5	30,350	
Yolo	87	0.2 mile south to 0.5 mile north of Cache Creek	0.7	23,070	
Yolo	99	Solano County Line to Irrigation Canal (portions)		15,780	
Yolo	99	Irrigation Canal to Route 6 (portions)		24,280	374,500
Yuba, Sutter	3	Feather River Bridge Foundations (see Sutter County)		(424,950)	
Yuba, Nevada	25	Nevada City to Sierra County Line (portions)		123,800	123,800

GENERAL ITEMS, NORTHERN COUNTIES—93rd - 94th FISCAL YEARS

County	Routes	Location	Proposed expenditure for construction, right of way, engineering and contingencies
All Counties Dist. I	Primary	Drainage corrections	$3,040
All Counties Dist. I	Secondary	Install culverts	8,570
All Counties Dist. I	Secondary	State Park Road improvements	5,340
All Counties Dist. II	Secondary	Various safety items	3,640
All Counties Dist. II	Secondary	Improving drainage	4,860
All Counties Dist. II	Secondary	State Park Road improvements	1,090
All Counties Dist. II	Primary	Various safety items	2,430
All Counties Dist. II	Primary	Drainage improvements	8,500
All Counties Dist. III	Primary	Safety items and drainage improvement	4,860
All Counties Dist. III	Secondary	Safety items and drainage improvement	6,070
All Counties Dist. III	Secondary	Install guard rail	2,430
All Counties Dist. III	Secondary	State Park Road improvements	2,790
All Counties Dist. IV	Primary	Drainage correction	6,070
All Counties Dist. IV	Primary	Various safety items	10,800
All Counties Dist. IV	Secondary	Drainage correction	6,070
All Counties Dist. IV	Secondary	Various safety items	10,930
All Counties Dist. IV	Secondary	State Park Road improvements	12,140
All Counties Dist. V	Primary	Safety items and drainage correction	6,680
All Counties Dist. V	Secondary	Safety items and drainage correction	7,280
All Counties Dist. V	Secondary	State Park Road improvements	4,490
All Counties Dist. VI	Primary	Various safety items	6,070
All Counties Dist. VI	Secondary	Drainage correction	12,140
All Counties Dist. VI	Secondary	Various safety items	6,070
All Counties Dist. X	Primary	Drainage correction	3,640
All Counties Dist. X	Primary	Various safety items	2,430
All Counties Dist. X	Secondary	Various safety items	6,070
All Counties Dist. X	Secondary	Drainage correction	6,070
All Northern Districts	Primary	Landscaping and roadside improvement projects	42,500
All Northern Districts	Secondary	Landscaping and roadside improvement projects	24,280
All Northern Districts	Secondary	Emergency construction, repair or replacement of bridges failed and posted for less than legal loads	437,197
		Total General Items Northern Counties	$664,547

GENERAL ITEMS, SOUTHERN COUNTIES—93rd - 94th FISCAL YEARS

County	Routes	Location	Proposed expenditure for construction, right of way, engineering and contingencies
All Counties Dist. V	Primary	Various safety items and drainage improvement	$6,160
All Counties Dist. V	Secondary	Various safety items and drainage improvement	7,400
All Counties Dist. V	Secondary	State Park Road improvements	5,300
All Counties Dist. VII	Primary	Various safety items	12,320
All Counties Dist. VII	Primary	Railroad grade crossing protection	8,630
All Counties Dist. VII	Primary	Small Betterment Projects	18,480
All Counties Dist. VII	Secondary	Various small grading, surfacing and drainage projects	12,320
All Counties Dist. VII	Secondary	Various safety items	18,480
All Counties Dist. VII	Secondary	Various small grading, surfacing and drainage projects	18,480
All Counties Dist. VII	Secondary	State Park Road improvements	5,670
All Counties Dist. IX	Primary	Various safety items	2,460
All Counties Dist. IX	Secondary	Various safety items	620
All Counties Dist. XI	Primary	Various safety items	9,240
All Counties Dist. XI	Secondary	Various safety items	11,700
All Southern Districts	Primary	Landscaping and roadside improvement projects	43,130
All Southern Districts	Secondary	Landscaping and roadside improvement projects	55,450
All Southern Districts	Secondary	Emergency construction, repair or replacement of bridges, failed and posted for less than legal loads	172,513
		Total General Items Southern Counties	$408,353

Highway Bids and Awards for December, 1940

IMPERIAL COUNTY—Between Sandy Beach Road and Truckhaven, about 8.8 miles to be graded, surfaced with plant-mixed surfacing, paved with asphalt concrete, existing bridges to be widened and a bridge to be constructed. District XI, Route 26, Sections C,D. Griffith Co., Los Angeles, $236,715; Oswald Bros., Los Angeles, $245-415; Radich & Brown, Burbank, $247,915; J. E. Haddock, Ltd., Pasadena, $249,800; V. R. Dennis Construction Co., San Diego, $280.205. Contract awarded to Basich Bros., Torrance, $207,577.

KERN COUNTY—Between Fort Tejon & 1.4 miles north of Grapevine Station, about 6 miles, existing roadbed to be widened and Portland cement concrete flumes to be constructed. District VI, Route 4, Section A. Oswald Bros., Los Angeles, $406,706; Macco Construction Co., Clearwater, $409,-506; J. E. Haddock, Ltd., Pasadena, $412,-046; Mittry Bros. Const. Co., Los Angeles, $412,262; Heafey-Moore Co. & Fredrickson & Watson Construction Co., Oakland, $421,-969; A. Teichert & Son, Inc., Sacramento, $430,232; United Concrete Pipe Corp. & Ralph A. Bell, Los Angeles, $462,445; Fredricksen & Westbrook, Sacramento, $473,652; Rhoades Bros., Los Angeles, $486,632; Denni Investment Corp., Wilmington, $536,937. Contract awarded to Griffith Co., Los Angeles, $385,638.

LAKE COUNTY—Fence construction between 3 miles and 5.3 miles northeast of Putah Creek. District I, Route 49, Section B. Willard G. Curtis, Clear Lake Highlands, $4,743; John Burman & Sons, Eureka, $5,710; J. L. Conner & Sons, Calistoga, $5,365; Fred J. Maurer & Son, Eureka, $5,285. Contract awarded to Frank Embleton, Albany, $4,629.

LOS ANGELES COUNTY—On Bellflower Blvd., between Spring St. and South St. about 3.1 mile to be graded and surfaced with plant-mixed surfacing. District VII, Route 169, Section A, Long Beach. Matich Bros., Elsinore, $63,406; Sully-Miller Contracting Co., Long Beach, $63,458; Griffith Co., Los Angeles, $64,195; Oswald Bros., Los Angeles, $64,330; Warren Southwest, Inc., Los Angeles, $76,720. Contract awarded to J. E. Haddock, Ltd., Pasadena, $59,316.

SAN BERNARDINO COUNTY—At Lytle Creek at West city limits of San Bernardino, existing steel and concrete bridge to be widened and about 0.3 mile of approaches to be resurfaced with plant-mixed surfacing. District VIII, Route 9, Section S.Bd.,C. J. E. Haddock, Ltd., Pasadena, $21,809; Byerts & Dunn, Los Angeles, $23,246. Contract awarded to J. S. Metzger & Son, Los Angeles, $21,333.

SANTA CRUZ COUNTY—Between Watsonville and Rob Roy Junction, about 6.2 miles to be graded and surfaced with selected material. Dstrict IV, Routes 32, 56, Section Wat.B.D. Granfield, Farrar & Carlin, San Francisco, $257,793; Macco Construction Co., Clearwater, $257,857; Fredricksen & Westbrook, Sacramento, $271,183; A. Teichert & Son, Inc., Sacramento, $273,-462; Eaton & Smith, San Francisco, $273,-755; Frederickson Bros., Emeryville, $278,-136; Louis Biasotti & Son & Piombo Bros. & Co., San Francisco, $282,174; McNutt Bros., Eugene, Ore., $282,327; Heafey-Moore Co. & Fredrickson & Watson Const. Co., Oakland, $283,437; Earl W. Heple and Parish Bros., San Jose, $292,007; Mittry Brothers Const. Co., Los Angeles, $318,240; Clarence Crow and L. A. & R. S. Crow, Los Angeles, $339,792; Clyde W. Wood, Los Angeles, $346,068; Isbell Construction Co., Reno, Nevada, $351,362. Contract awarded to N. M. Ball Sons, Berkeley, $251,087.

SOLANO COUNTY—At Vallejo Creek near the city of Vallejo, about 0.6 mile north of the junction of Routes 74 and 7, about 0.1 mile to be graded and surfaced with plant-mixed surfacing on crusher run base and a reinforced concrete box culvert to be constructed. District X, Route 7, Section G. Louis Biasotti & Son, Stockton, $5,490; Helwig Construction Co., Sebastopol, $6,715; Albert H. Siemer & John Carcano, San Anselmo, $5,682; Carlton Gildersleeve, Berkeley, $5,999. Contract awarded to Lee J. Immel, Berkeley, $5,268.

Have You Moved?

If you have changed your post office address recently and wish to continue receiving **CALIFORNIA HIGHWAYS AND PUBLIC WORKS** magazine, a penny postal card stating your new address and sent to Post Office Box 1499, Sacramento, will ensure the continuance of your name on our mailing list.

The return of each undelivered magazine by the post office entails an additional charge of two cents upon the State. For that reason when a magazine bearing your name and address is returned, we are obliged to remove your name from the mailing list.

EXTREMELY INTERESTING

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
Columbus

Mr. J. W. Howe, Editor
California Highways
and Public Works,
Sacramento, California.

Dear Sir:

Mr. A. F. Unckrich of the Portland Cement Association furnished us with a copy of a recent issue of "California Highways and Public Works," which we have found to be extremely interesting.

We would very much appreciate being placed on your mailing list so that we may receive this magazine periodically, and would also appreciate a copy of the August, 1940, issue.

Trusting that we may be favored with this request, I am

Very truly yours,
T. J. KAUER,
Engineer of Design.

Plumber: "Why do you want such a big sink?"

Man: "So there'll be plenty of room for the dishes when my wife goes away for a vacation."

Weed Eradication on Highways Cost $102,000 in 1939

SPREADING over orchards and fields, ditch banks, highways and almost every place a plant can grow, weeds annually cost the State sixty million dollars, not only for direct weed control but also in crop and livestock losses as well as increased cost of cultivating and handling agricultural products, according to a report of the State Department of Agriculture.

In 1939 the California Division of Highways spent $102,000 to control weeds and other vegetation along the State highways. That figure includes the cost of equipment and the labor of highway crews in eradication operations which many times result in a restriction of traffic.

TRAFFIC IS PROTECTED

When weeds are being burned along the ditches and fence line of the highway, the equipment necessarily occupies almost half of the road and the smoke makes visibility difficult for drivers. During these operations, flagmen are stationed at the point where the operations are under way to control and otherwise assist traffic to safely pass.

The figure sixty million dollars quoted above is an estimate given by Walter S. Ball of the State Department of Agriculture and Dr. W. W. Robbins of the University of California College of Agriculture in a published study on weed problems in this State.

They estimate that eight per cent of crop cultivation is necessary because of weeds and that in 1939 this cultivation cost the State's farmers nearly $25,000,000.

In 1939 one railroad company spent more than $20,000 to keep weeds off its right of way. Materials alone for controlling weeds on ditch banks during the past three years have cost $43,032, according to the report.

Big Car Increase in L. A. County

A leading reason for traffic difficulties in the Los Angeles area is that the county's motor vehicle registration represents about 41 per cent of the 2,773,698 State total and most of the vehicles are in daily use in the metropolitan region, says the Automobile Club of Southern California.

State of California

CULBERT L. OLSON, Governor

Department of Public Works

Headquarters: Public Works Building, Twelfth and N Streets, Sacramento

FRANK W. CLARK, Director of Public Works

FRANZ R. SACHSE, Assistant Director

MORGAN KEATON, Deputy Director

CALIFORNIA HIGHWAY COMMISSION

LAWRENCE BARRETT, Chairman, San Francisco
IENER W. NIELSEN, Fresno
AMERIGO BOZZANI, Los Angeles
BERT L. VAUGHN, Jacumba
L. G. HITCHCOCK, Santa Rosa
WALTER T. BALLOU, Secretary

DIVISION OF HIGHWAYS

C. H. PURCELL, State Highway Engineer
G. T. McCOY, Assistant State Highway Engineer
J. G. STANDLEY, Principal Assistant Engineer
R. H. WILSON, Office Engineer
T. E. STANTON, Materials and Research Engineer
FRED J. GRUMM, Engineer of Surveys and Plans
R. M. GILLIS, Construction Engineer
T. H. DENNIS, Maintenance Engineer
F. W. PANHORST, Bridge Engineer
L. V. CAMPBELL, Engineer of City and Cooperative projects
R. H. STALNAKER, Equipment Engineer
J. W. VICKREY, Safety Engineer
E. R. HIGGINS, Comptroller

DISTRICT ENGINEERS

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

SAN FRANCISCO-OAKLAND BAY BRIDGE

RALPH A. TUDOR, Principal Bridge Engineer, Maintenance and Operation

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer, Chief of Division
GEORGE T. GUNSTON, Administrative Assistant
HAROLD CONKLING, Deputy in Charge Water Rights
A. D. EDMONSTON, Deputy in Charge Water Resources Investigation
GEORGE W. HAWLEY, Deputy in Charge Dams
SPENCER BURROUGHS, Attorney
GORDON ZANDER, Adjudication, Water Distribution

DIVISION OF ARCHITECTURE

ANSON BOYD, State Architect
W. K. DANIELS, Assistant State Architect
P. T. POAGE, Assistant State Architect

HEADQUARTERS

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

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief
FRANK B. DURKEE, Attorney
C. R. MONTGOMERY, Attorney
ROBERT E. REED, Attorney

printed in CALIFORNIA STATE PRINTING OFFICE
SACRAMENTO, *1941* GEORGE H. MOORE, STATE PRINTER

95033 1-41 23M

California Highways and Public Works
Division of Highways
P. O. Box 1499
Sacramento, California
Return Postage Guaranteed

CALIFORNIA STATE HIGHWAY SYSTEM

SCALE IN MILES
0 50 100

~LEGEND~
Primary Routes
Secondary Routes
Proposed Routes