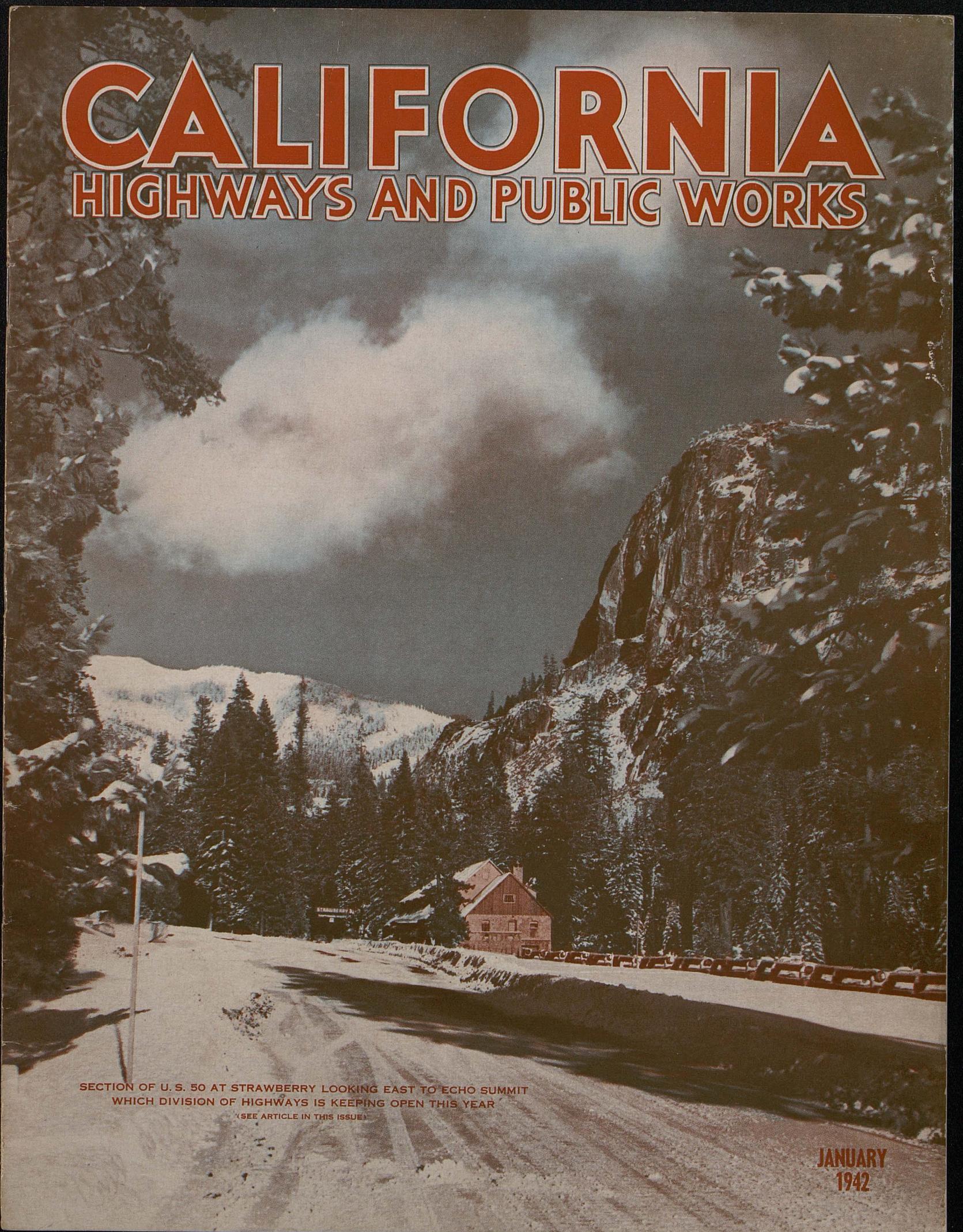


CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



SECTION OF U. S. 50 AT STRAWBERRY LOOKING EAST TO ECHO SUMMIT
WHICH DIVISION OF HIGHWAYS IS KEEPING OPEN THIS YEAR

(SEE ARTICLE IN THIS ISSUE)

JANUARY
1942

inches

D50 Illuminant, 2 degree observer

1	38.12	65.43	49.87	4.34	44.26	55.56	70.82	63.51	38.92	52.24	97.06	92.02	87.34	82.14	72.06	62.15
2	13.24	18.11	-4.34	-15.80	9.82	-33.43	34.29	11.81	11.81	48.55	-0.40	-0.60	-0.75	-1.05	-1.19	-1.07
3	15.07	18.72	-22.29	22.85	-24.49	-0.35	59.60	-46.07	18.51	18.51	1.13	0.23	0.21	0.43	0.28	0.19
4																
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Density

Golden Thread

16 (0.01)	17	18 (0.1)	19	20	21	22	23	24	25	26	27	28	29	30
49.25	38.62	28.86	15.19	8.29	3.44	31.41	72.46	72.95	28.37	54.91	43.96	62.74	62.79	50.87
-0.16	-0.18	0.54	-0.05	-0.81	-0.23	20.98	-24.45	16.83	13.05	-38.91	32.00	3.45	50.88	27.17
0.01	0.04	0.60	0.73	0.19	0.49	-19.43	55.93	68.80	48.49	30.77	30.01	81.29	12.72	-29.46
0.75	0.98	1.24	1.67	2.04	2.42									

centimeters

Colors by Munsell Color Services Lab

Don Williams

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. 20

JANUARY, 1942

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Normal Activities of Department of Public Works Subordinated by Defense Highway Construction

By FRANK W. CLARK, Director of Public Works
Vice Chairman State Council of Defense

WAR defense work will subordinate normal activities of all divisions of the State Department of Public Works during 1942.

While the heaviest burden of defense efforts which will be undertaken by the department will be borne by the Division of Highways, the Division of Architecture and Division of Water Resources will assume increasing responsibilities made necessary by the war.

California, with nearly 1,000 miles of coast line, three of the largest ports of supply for the Pacific, some of the greatest ship building and repair facilities, enormous air craft manufacturing centers, and numerous Army, Navy, and Marine establishments, is confronted with a defense problem of magnitudinous proportions.

The California Division of Highways in cooperation with the United States Public Roads Administration, has been engaged since October, 1940, in the study and development of detailed plans for access roads and structures required by military and naval establishments and defense industry. The extent of this undertaking was evident from a study of the appended tabulation which sets forth access road projects, the estimated construction cost of which, including rights of way, is in excess of \$45,000,000.

The war begun by Japan against the United States has changed the entire aspect of the strategic and access road plans as tentatively prepared for this State and will necessitate a greatly enlarged program of defense highway construction.

At a recent meeting in my office attended by Colonel Arthur Wilson of the General Staff of the United States Army and officials of the

Public Roads Administration, the importance of speed in the highway program mapped out for us by the Federal Government was emphasized. A list of the proposed strategic and access roads in California was checked over by Colonel Wilson. He suggested that certain additional roads that had not been contemplated would be necessary.

The California Highway Commission, of which Larry Barrett of San Francisco is chairman, is giving complete cooperation to this department and to State Highway Engineer C. H. Purcell in carrying out the plans of the Army and the Navy.

The highway projects now under consideration were initiated as the result of conferences held in accordance with instructions issued by the Army and the Navy authorities.

Both instructions provided that all conferences be called by the commanding officers of the posts, the conferences to be attended by representatives of the Corps Area Commander for Army projects or the Commandant of the Naval District for Navy projects, by representatives of the Public Roads Administration, the Division of Highways, Work Projects Administration, county or city officials as the case might be. Subsequently, the responsibility of constructing access roads to exempted stations, consisting in the main of air fields, was transferred from the Corps Area Commander's office to the United States Corps of Engineers. Consequently, representatives of this latter Federal agency were in attendance at recent conferences on exempted stations.

The purpose of these conferences was to determine the access road needs of each particular post, to determine the kind and amount of

assistance which the Public Roads Administration, the State Highway Department, Work Projects Administration and the city or county were prepared to give.

Generally, the State and local agencies were able to provide little financial assistance as most of the designated access roads are not on the State Highway System and gas tax funds could not be used on them.

Early construction of these projects was limited to those undertaken by the Work Projects Administration. At one time it was thought that many of the access roads would be constructed by the Work Projects Administration but the quick upswing of defense activities so depleted the available WPA labor that many projects had to be dropped from their program.

The great bulk of the projects remained therefore to be built by other agencies. The only means of financing such an enormous program of access roads is by Congressional appropriation. The first bill embodying appropriations for this character of work was passed by Congress on July 24, 1941, and later vetoed by the President.

Subsequent legislation was introduced and finally passed by Congress and signed by the President on November 19, 1941. The final terms of the bill as passed and as approved by the President provides \$150,000,000 for access roads for the entire United States, \$25,000,000 to be apportioned to the States for the improvement of the strategic network to be allocated under the regular Federal Aid formula, \$25,000,000 to be allocated directly by the President and \$10,000,000 for flight strips. The allocation of these flight strips is to be determined by the Army air

authorities and their purpose is to provide supplemental landing fields parallel to strips of highway at various locations in the United States. Ten million dollars was appropriated for surveys and plans making a total of \$220,000,000.

The total of the projects as listed approximates \$45,000,000. Several of these projects are under way at the present time under Work Projects Administration allocations but some of the projects listed probably will not be included in the list of priorities of projects as prepared by the War authorities.

The Army and Navy authorities have been working diligently in preparing a list of projects in order of priority so that funds as they become available will be applied to those projects considered by the Military authorities of highest importance.

The tabulation of projects attached does not include cost of certain designated access roads for which preliminary engineering is being performed by the Public Roads Administration nor the cost of designated access roads to certain defense industries.

As a result of the various post conferences held since October, 1940, and at intervals throughout the entire year of 1941, the State has been authorized by the Public Roads Administration to prepare access road plans. The cost of this preliminary engineering has been financed entirely with Federal funds which had previously been apportioned to California as Federal aid on normal construction programs.

Plans and specifications have been completed on many of these projects and the State is prepared to advertise more than \$18,000,000 worth of projects, pending of course, the securing of rights of way. The cost of rights of way may or may not be included in the allocation of funds for a particular project.

One of the important duties of the Division of Highways in the present war emergency is the guarding of approximately 150 highway bridges of military value. This function is performed by the Maintenance Department of the Division. These structures, including the San Francisco-Oakland Bay Bridge which is being patrolled by the State Guard, are under 24-hour protection. In addition, the Maintenance Department through arrangements with Pacific

Telephone Company, maintains a direct connection with 21 swing drawbridges operating on 21 navigable streams in Sacramento, San Joaquin, Napa and Sonoma counties.

Immediately following an alert warning or orders for a blackout, the bridge tenders on these spans are notified by telephone to douse all lights. A special crew stationed in an office of the Maintenance Department in the Plaza Building in Sacramento performs this work. The Maintenance Department also is guarding numerous powder houses on various highways throughout the State and has made available to the Army its maintenance shops for use in connection with the repair of Army transport vehicles. Certain highway construction equipment required by the Army has been provided by the Division of Highways.

In connection with the guarding of the San Francisco-Oakland Bay Bridge and the State-owned Carquinez and Antioch bridges, I wish to compliment very highly The Adjutant General's department for the rapidity with which armed guards were made available. In the case of the San Francisco-Oakland Bay Bridge, armed guards took over from the maintenance men by 2 o'clock on the morning of December 8th, or within 14 or 15 hours after the actual outbreak of hostilities. In the case of the Carquinez and Antioch bridges, State guardsmen took over at about 2 o'clock on the morning of December 9th.

The Division of Water Resources in cooperating with the Reclamation

Board and the United States Army engineers has completed a comprehensive survey of the entire levee system in the Sacramento-San Joaquin Valley and delta with the view to providing adequate patrols against sabotage in high water areas at points of particular importance from a military standpoint.

The Division of Architecture is engaged in preparation of uniform plans for sirens, safety features for public buildings, particularly schools, and provision of standby or emergency utility services to State institutions.

At the present time, more than 155 employees of the Department of Public Works are on military leave. The Division of Highways alone has given 136 employees to the armed forces of the United States and already 16 employees of the Division of Architecture are in service.

I want every citizen of California to know that the entire staff of this department has placed itself in the service of the military authorities and the authorities charged with the civil defense of California. As a result certain delays in completion of plans and specifications on budgeted highway projects may well occur as there can be no question but our engineering services must be first made available to those essential strategic or access road projects that are requested by the military and naval authorities.

(Table of Designated Military and Access Highways on pages 18-20.)

Daughter of Engineer Tilton Assistant to Winant in London

To fly to Europe is an exceptional experience, especially when the destination is at the hub of World War activities. Such has been the role of Edith Tilton Denhardt, daughter of Assistant Construction Engineer G. A. Tilton, Jr., of the State Division of Highways.

Mrs. Denhardt was appointed special economic assistant to United States Ambassador Winant at London, England, and recently flew there on the Atlantic Clipper to take up duties in the United States diplomatic service.

Mrs. Denhardt is a graduate of the University of California in Economics and was prominent as a member of the debating team for four years, becoming forensic commissioner in her last year.

Victory Book Campaign

Sponsored by the USO, Red Cross and American Library Association, the Victory Book Campaign opened Nation-wide January 12th to continue for one month. The goal is 10,000,000 books for our armed forces. Take your gift books to your nearest public library. Magazines are not desired at this time. The need is very urgent. Mabel R. Gillis, California State Librarian, is State Director. There is a local director in each locality where there is a public library. Books needing repairs will be repaired. Our American defenders are particularly eager for up to date technical material to help with their problems, as well as books on current affairs and plenty of good fiction. Give a man a book he can read.

Highway Tree Maintenance Improved by Trained Crews

By E. S. WHITAKER, Assistant Landscape Engineer

IN THE 10 years from 1929-30 to 1939-40 there has been a marked change in highway tree maintenance work as performed by crews of the Maintenance Department of the Division of Highways on State right of way. The change in this relatively short period has been the direct result of a betterment in the methods of operation due to the work having been consigned to crews composed of men selected for their ability to properly care for trees and landscaping.

Expenditures for tree maintenance during the year 1929-30 amounted to \$84,320.05. Work consisted mainly in the care of planted trees, as there were few intensively developed landscaped portions of roadsides, and little corrective attention was given native growth on the right of way. In that year the State highway personnel included two highway tree trimmers and one tree foreman, operating in three of the then 10 highway districts.

During 1939-40, expenditures for this same kind of work amounted to

\$203,690.49. In this year there were 24 tree crews composed of 17 tree foremen, 33 tree trimmers, and 62 groundsmen, equipment operators, and laborers, operating full time on tree maintenance in 10 of the 11 highway districts. Their work consisted of the care of all planted and native growth on the right of way with a considerable amount of this being composed of highly developed landscaped areas.

While the increase in expenditures during this 10 years has been the natural result of a steady development of our roadside landscaping program, this increase would have resulted regardless of the manner in which the necessary maintenance work was done. The increase in personnel, however, has been the result of the following conditions:

MEN TRAINED FOR JOBS

1. Even before the exceptional increase in landscaping, it was realized that tree planting and maintenance could not be done practically by regular maintenance crews. Not only

were these crews unable to properly handle the work, but there was a decided conflict in desirable times for accomplishment of roadway maintenance and tree maintenance. By establishing tree crews of men trained in tree maintenance work, and in recognizing that timely tree maintenance is necessary to prevent a partial or even a total loss of the original planting investment, the greatest possible advancement toward economic tree maintenance resulted. Costs of the work would be far in excess of the present figures, were this work done by crews not trained in tree and landscaping maintenance.

2. In 1933 the State Highway System was practically doubled by the inclusion of 6045.18 miles of county roads. In general a large amount of work was immediately necessary to bring conditions affecting roadside growth on these roads up to the standard set by the division for sight and restriction clearance, and for other tree reconditioning work. Tree crews were increased in personnel to



Clearance restricted roadside and private property trees and view from same point after tree trimming



Showing palm trees lining highway before and after trimming

care for this semiemergency and, due to events that followed, were not subsequently reduced.

FEDERAL AID GIVEN

3. The year 1934 saw the first allocations of Federal Aid funds for roadside landscaping, that resulted in the establishment of extensive and highly developed roadside landscaped areas and caused an immediate increase in the amount of necessary tree and landscaping maintenance. A further yearly increase in the total area of landscaped roadsides has necessitated additions in personnel to the tree crews.

The growing conditions affecting plant life in practically all portions of the State served by the highway system are of such extremes considering climate and soil, that the maintenance of large plantings of trees and shrubbery, even under what might be considered as normal conditions, continues to be necessary even when plant maturity is reached.

Best example of this type of work is the summer watering program in which 24 tank trucks of from 1,000 to 2,000 gallon capacity, work from May to October to water trees and shrubs. While the greater proportion of this work is done in the central valleys and elsewhere away from the coastal

fog belt, it is generally necessary to water all new tree plantings through

at least their first two summers to obtain good growth.

PEST CONTROL WORK

In the lower San Joaquin Valley in a semidesert area trees are still being watered throughout the entire summer that were planted in 1925. There is no reason to believe that this work can be discontinued so long as it is desired to keep these trees alive.

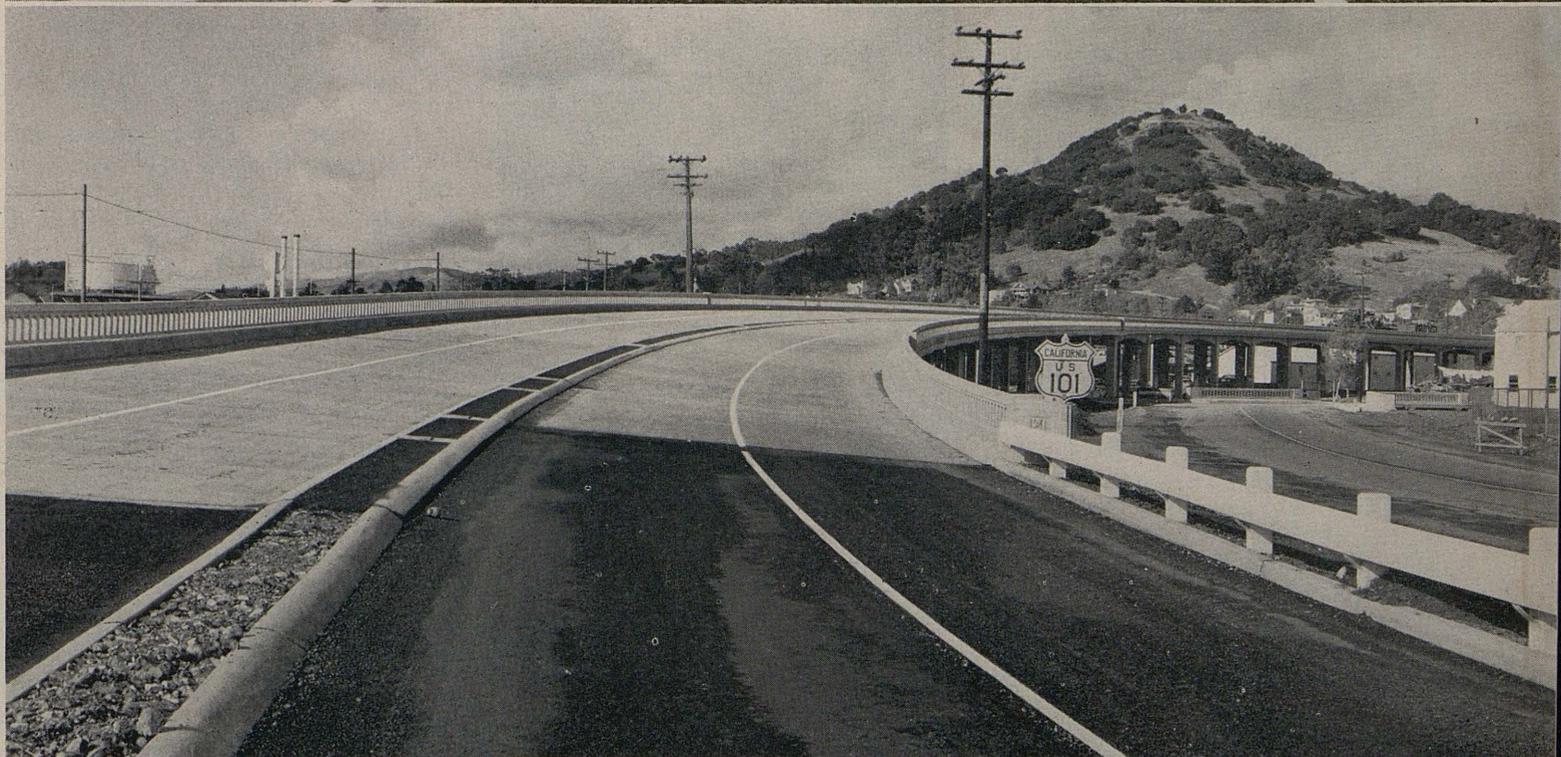
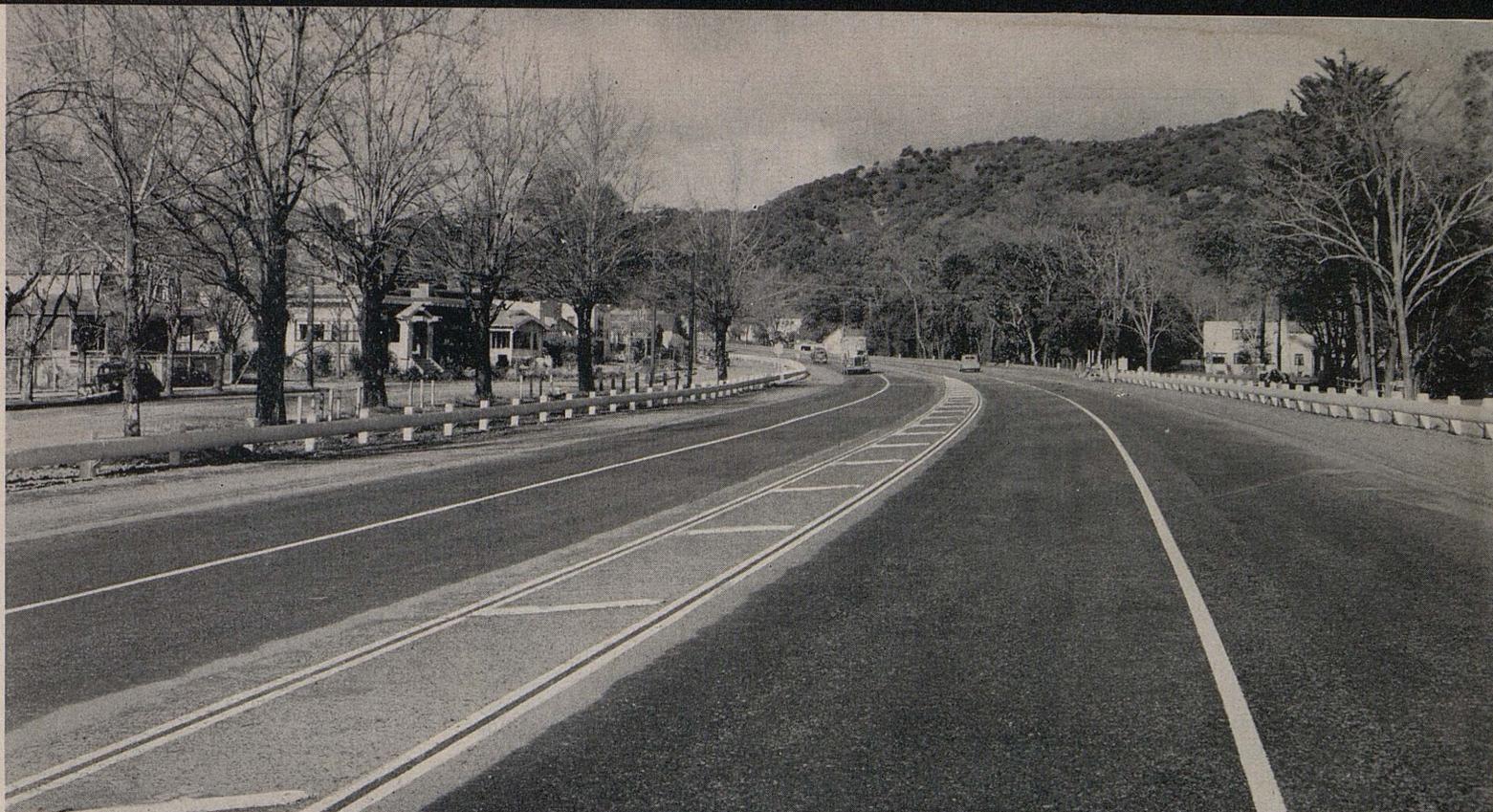
Insect, pest, and rodent control is another portion of each year's tree maintenance program regardless of the age of the plants. In bad years costs have aggregated \$6,000 for this work alone. In districts where a yearly recurrence of infestations is certain, tree crews operate State-owned tree spraying equipment and there are now available, when needed, five high pressure spray rigs in as many districts. Elsewhere, when infestations are sporadic or small, the work is done under service agreement by local commercial operators.

There is also the problem of securing the public's appreciation and proper treatment of roadside developments. Trees damaged or destroyed by traffic are a common occurrence as is also the loss of young planted stock

(Continued on page 28)



Eucalyptus trees on highway before and after top work



THE new \$675,000 San Rafael Viaduct, which breaks a serious traffic bottleneck in the heart of the City of San Rafael, is now entirely completed. The viaduct provides a four-lane divided highway over approximately five city blocks of residential and industrial property in San Rafael, providing five grade separations which will speed up traffic through the city and eliminate dangerous congestion.

The structure occupies the channel of Irwin Creek, a stream which carries the run-off from practically all the streets in the eastern portion of San Rafael. It has a total of 67 spans, varying in length from 17 feet to 57 feet 6 inches. It is 2,207 feet 6 inches in length.

The viaduct structure itself cost \$402,000; the roadway work \$153,000, and the Linden Lane Underpass, which carries traffic beneath the viaduct, \$120,000.

The upper picture shows the northern approach to the viaduct and the lower is of the deck of the structure.

Motor Transport of Tomorrow Will Be Big Post-war Problem

At the meeting of the American Association of State Highway officials in Detroit, Mr. Paul G. Hoffman, president of the Studebaker Corporation and vice president of the Automobile Manufacturers Association, delivered an instructive address on the problems of highway motor transport which will have to be met after the war. His remarks follow:

THERE'S an old saying that history repeats itself. I have proof of that in a bulletin issued by the National Automobile Chamber of Commerce to its members under date of August 1, 1917.

The bulletin contained a list of "Don'ts."

The first one said: "Don't call it a pleasure car. Call it a passenger car or automobile."

Down at the bottom of the page, the last one said: "Don't take too seriously the talk about failure of the supply of gasoline."

Despite that solemn resolution of 1917 against the expression "pleasure" car, I saw it recently in two New York newspapers. I have heard it used repeatedly during the last few months by Government officials in Washington.

And as for the gasoline shortage, well, perhaps you have read something lately about that yourselves. I don't know who is right, but I do say that it is a matter of "horse sense" that we all ought to do all we can to conserve fuel.

ABRUPT ABOUT-FACE

It wasn't altogether strange that the automobile manufacturers found it necessary in 1917 to suggest a shift of phrasing from "pleasure" to "passenger" car. It was an abrupt about-face. They had spent the previous twenty years trying to convince a doubting public that there was any pleasure in driving the contraptions they were building during that period. Furthermore, the idea that the 5,000,000 motor vehicles in operation in 1917 might play an important part in the transportation picture was just beginning to take hold not only with the public but with the manufacturers themselves.

It is startlingly strange today, however, that a single person out of our



PAUL G. HOFFMAN

130 million Americans would fail to recognize the position which motor vehicles now occupy in the transportation field.

The 5,000,000 motor vehicles of 1917—and there were less than 2,000,000 when the World War started—have been multiplied into 32,000,000 today. These cars and trucks pile up in a year nearly 500 billion passenger miles of travel, more than six times as much as the total travel of all other forms of transportation in the country combined. Four-fifths of this mileage is by automobile.

Moreover, the road use surveys which were made by your organization, in cooperation with the Public Roads Administration, show that well over half of the passenger car travel, on a mileage basis, and three-fourths of it, measured by the number of trips, are for driving to work, to market, and in the other necessary trans-

portation jobs which are linked with day-to-day economics of American life.

GAS SHORTAGE PROBLEM

As for talk in 1941 of gasoline shortages, we already have seen fuel rationing, of sorts. There has been mention of "gasless Sundays." But no one in the United States has yet proposed a "gasless Monday." That would be something for Mr. Hitler's gestapo agents to promote. "Gasless Mondays" would close our schools, curtail our food supply, cripple industry and business, and plunge our economic and social activities into chaos and inefficiency.

If we face a shortage of gasoline, then we should meet it by a sensible rationing plan which will permit uninterrupted essential uses of any or all motor vehicles. After all, millions of defense workers depend every day on their private cars to get them back and forth from home to office or factory.

Recent surveys show that 82 per cent of all workers in a Youngstown, Ohio, steel center use their own automobiles or ride with fellow workers to and from their jobs. At an aircraft center in Glendale, California, the percentage was 87. In Midland, Michigan, the figure is 92 per cent. Nine thousand employees at an airplane plant near Seattle arrive daily in 3,000 passenger cars from distances as great as 40 miles away. The same picture prevails in defense centers everywhere, from coast to coast.

Whether we measure its use statistically, or whether we examine its effect upon the life and habits of the individual, the motor vehicle emerges clearly today as an essential factor of major importance to both our civilian and defense economy.

HIGHWAY BUILDING PROGRAM

All this has happened since the turn of the century. A revolution has occurred in the American way of life;

a transition in which the manufacturers of motor vehicles have taken a part. Yet all we do is supply the rolling stock. We have built and sold in 41 years approximately 81,000,000 cars and trucks. These vehicles would have no place to go—in fact, most of them would not have been manufactured at all—if you gentlemen and your profession had not accomplished during this same period the most gigantic road building program in the history of the world.

The enormous usefulness of motor transport to America's civilian economy, and the vital contribution which it is making to the defense program, are, therefore, tributes to the administrative leadership and the technical skills which your profession has given to the country during this period.

The year 1941 marks two important anniversaries in the history of motor transportation in the United States. It was in 1901, 40 years ago, that the good roads movement was put under way by groups of citizens interested in coordinating what formerly had been haphazard and piece-meal road planning and building.

ROUTES FOR DEFENSE

In 1921, just 20 years ago, the existing Federal Aid Highway Act was passed by Congress and approved by the President, largely as a result of the continuing good roads movement. Many of you present this evening were active in that movement.

In many ways, the 1921 law marked the beginning of the development of National highway transportation in this country within the framework of the American political system, for it established the broad principle of Federal aid, under which the Federal Government, in granting funds for road work, gives necessary direction to highway activities but permits direct responsibility for highway projects to be retained by the States.

Under this policy, we have succeeded in building a great public road system which surpasses anything the world has ever seen. More than 3,000,000 miles of streets and roads, including approximately 80,000 miles of highways selected in cooperation with the War Department and approved by the Secretary of War as a strategic network of routes for the National defense, bind the Nation together in a vast transportation network.

Since the Federal Aid Act was passed, we have made an investment

UP TO AMERICAN PEOPLE

If you stopped a thousand people at random on the street, I doubt whether half a dozen of them could tell you anything at all about the history of our road movement, about the meaning of Federal Aid to the States, or about the master plan as a peacetime charter for future highway development. The public simply doesn't know. Clearly we must focus attention now on this big problem. We must promote a wider and clearer public understanding of the important issues involved.

I have abiding faith in the judgment and sanity of the American people. Once they have the facts, they will act on them intelligently. Once they learn the glorious record of highway development in this country; once they are acquainted with your great plans for the reshaping of highway transportation, you will have their full support. With that support, I can visualize a development within the next 20 years that will not only make America a better country in which to travel but also a better place in which to live.

(Excerpt from address of Paul G. Hoffman to State Highway officials in Detroit.)

in public roads estimated at 21½ billions of dollars. We have created as a result of this policy great new industries. More than 200,000 persons were employed last year on State and Federal roads alone. Motor transport as a whole provided the pay checks for one-seventh of all the gainfully employed in the Nation.

ADDITIONAL TRAFFIC BURDEN

As we face the National emergency which has come in 1941, we can well be thankful for the development of this great enterprise. Perhaps we should also be regretful that so much of our highway tax revenue has been diverted to other purposes. During the six years 1935-1940, nearly one billion dollars of highway tax revenues, or one-eighth of the total collected, were diverted.

You gentlemen know too well that you could have used that billion and

perhaps 10 more, because the demands on our highway system even in normal times far outstripped our building and modernization program.

Today highway transportation faces not only a normal burden but billions of miles of additional travel superimposed by the defense program. I wish I could say that highway transportation is prepared fully to take on this additional burden and to handle the assignment safely and efficiently.

But I do not believe this to be true. Through no fault of yours, our highway system is inadequate. Through no fault of ours, a substantial percentage of the rolling stock is obsolete. During the depression years, from 1931 through 1934, not enough new cars were built to take care of the ordinary replacement demands.

Let us first take a square look at our transportation pool of approximately 27,500,000 passenger cars. That is an impressive total, but today one car out of every five you see in service is over 10 years old. That percentage is abnormally high. In 1935, for example, only one car out of 15 cars registered was that old. It is a great tribute to the motor car that millions of Americans depend every day upon these venerable jalopies to provide them with indispensable transportation.

Whether highways and rolling stock are as efficient as we would like them to be, they are faced with a tremendous transportation job, in which all of us are directly interested.

TWO PHASES OF QUESTION

In so far as highway facilities are concerned, the easy way would be to undertake at once large-scale building and modernization programs. But that method also is out due to the priorities which have been created by the stresses of the emergency.

From the standpoint of highway facilities, therefore, the immediate problem appears to have two phases:

1. To increase sharply the safety and efficiency of the existing system of roads and city streets.

2. To alleviate by modernization and a minimum amount of new construction the acute problems in critical defense areas.

Both angles of the problem present difficulties.

In the field of safety, there is little or no public recognition of the extent to which accelerating defense activities have increased traffic accidents.

(Continued on page 26)

Joint Legislative Committee Tours State Holding Hearings on Water Problems



Starting at Redding, December 1st, the Joint Legislative Interim Committee on Water Problems, inspected Sacramento Valley units of the Central Valley Project, the State Water Plan and the Sacramento River Flood Control District. Members on the committee on the tour shown above are, right to left, first row, Frank Reed, executive secretary of the committee, Senator Charles H. Deuel, Chico; Senator Bradford S. Crittenden, Stockton, committee chairman; Senator Robert W. Kenny, Los Angeles; Assemblyman Clyde Watson, Orange; Assemblyman Rodney L. Turner, Delano, vice chairman. Back row, left to right, Senator R. R. Cunningham, Hanford; Assemblyman Seth Millington, Gridley; and Assemblyman Gordon Garland, Woodlake.

DURING the first week in December the members of the Joint Legislative Interim Committee on Water Problems toured the Sacramento Valley on the first of a series of inspection trips which will take them to all parts of the State on a study of water problems.

The committee was authorized and its work outlined in Senate Concurrent Resolution No. 11, Chapter 130, Statutes of 1941. Committee members are: Senator Bradford S. Crittenden, Stockton, chairman; Senator R. R. Cunningham, Hanford; Senator Charles H. Deuel, Chico; Senator Robert W. Kenny, Los Angeles; Senator Ed Fletcher, San Diego; Assemblyman Rodney L. Turner, Delano, vice chairman; Assemblyman Gordon

Garland, Woodlake; Assemblyman Gardiner Johnson, Berkeley; Assemblyman Seth Millington, Gridley; Assemblyman Harold F. Sawallisch, Richmond; and Assemblyman Clyde Watson, Orange.

The committee spent a day inspecting Shasta Dam and power plant, highway and railroad relocation works, and the afterbay dam and power plant at Keswick. On succeeding days they viewed areas damaged by Sacramento River floods; the levee and by-pass system of the Sacramento River Flood Control Project; sites of proposed units of the State Water Plan on the Sacramento, Feather, American and Cosumnes River; the Delta Cross Channel and the Contra Costa Canal units of the Central Valley Project and the Stockton Deep Water Channel.

Public meetings were held in Redding, Red Bluff, Chico, Willows, Colusa, Marysville, Sacramento, Auburn, Pittsburg and Stockton. At these meetings local representatives laid before the committee their problems, ranging from requests for reservation of storage space in Shasta reservoir for the future development of lands in the Sacramento Valley, through pleas for additional river control, drainage and seepage relief, the development of additional units of the State Water Plan and that power developed by the Central Valley Project be made available for various public agencies.

"I'd like to get married and settle down," said the young chap, "but I guess I have to stay single and settle up."

Reckless Drivers Make Life of Highway Surveyor Dangerous

By B. VAN DALSEM, Senior Engineer

A SURVEY party is working along the center line of one of our busy highways. Warning signs have been placed several hundred feet each side of these men. Flagmen have been stationed between these signs and the surveyors. Here we have the setting of a drama which occurs almost daily somewhere along our highway system.

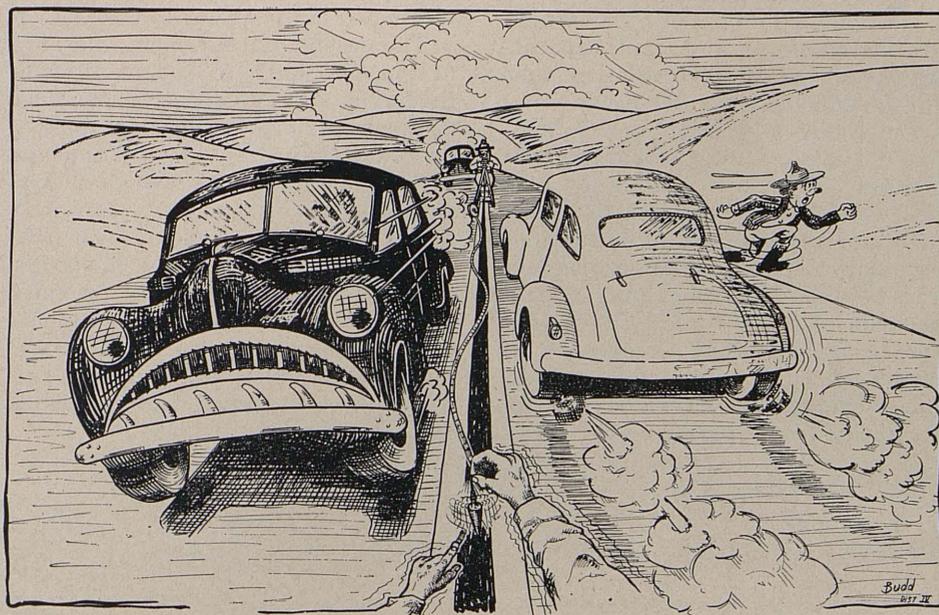
This survey party has avoided working on the pavement as much as possible, but this is one of those occasions when it is impossible to do otherwise. The men are nervous and there is no reason why they shouldn't be, for they have had to perform this type of work many times before. They are fully aware of some of the events which are to follow.

The transitman now has his instrument in adjustment and the two chainmen have stretched their tape down the center stripe. Cars are streaming past this group continuously.

RECKLESS DRIVERS

The transitman glances quickly into his note book for information. His eyes fly from the book to an approaching motor car and back to the book again. The two chainmen are astride the traffic stripe, facing each other. Each is watching the traffic approaching him to his left. Now the transitman is ready. The chainmen crouch down. The head chainman straddles the stripe, but the rear chainman must move to the left of the division strip, that the instrument man may see past him. They are now busily engaged in setting a point.

The transitman shouts his instructions to the men, for he knows from experience that it is best to make as few motions as possible, lest he confuse a passing motorist. The point is set and the men move ahead to another. Once more they squat. Suddenly the rear chainman rises to his feet. This is a signal to the other



Cartoonist's conception of hazards encountered by highway surveyors

man that all is not well behind him. He, too, is on his feet.

An automobile is hugging the stripe. The head chainman motions him over, glancing over his shoulder, making certain there is room for him to step back if he is forced to do so. The car swerves back into the center of its lane, and as he reaches the rear chainman, the driver shouts something which is unintelligible to the worker, but which, he is certain, is not taught in Sunday School.

DANGEROUS WORK

Most of the motorists give the workmen a wide berth, as they continue to set their survey points, but the majority of them do not slacken their speed. Oh! Oh!—here comes a car at a terrific rate of speed. The flagman motions the driver to slow down, but he still comes at the same speed. He misses the leg of the transit tripod by a matter of inches! He's too close to the center line! Both chainmen are on their feet. Now what will he do?

Why, he blows his horn of course, and misses them by inches also.

By now the chainmen are too far away from the transitman to hear his instructions. The only course left to make his men know where their point should be set is to signal with his arms. He tries to wave his arms as little as possible, but at that, a motorist has mistaken these motions as a signal for him to pass on the left. The instrumentman must now do his best to get the car back in its proper lane. He succeeds in doing so, but receives a "dog eye" from the driver as he passes by.

What is that noise behind him? It is the screeching of brakes. A courteous motorist has slowed down for the flagman. But why all the noise? That car behind him was traveling too fast and had to cut out in order to avoid a crash. All is well!

The chainmen are nearing the flagman farthest away from the transitman, and as he glances through his

(Continued on page 21)

Third Niles Canyon Improvement Is Rapidly Nearing Completion

By J. E. BURKE, Resident Engineer

NESTLED among the hills of southern Alameda County, is the little town of Sunol which now has a subway and traffic separating layout nearing completion that will adequately serve her needs.

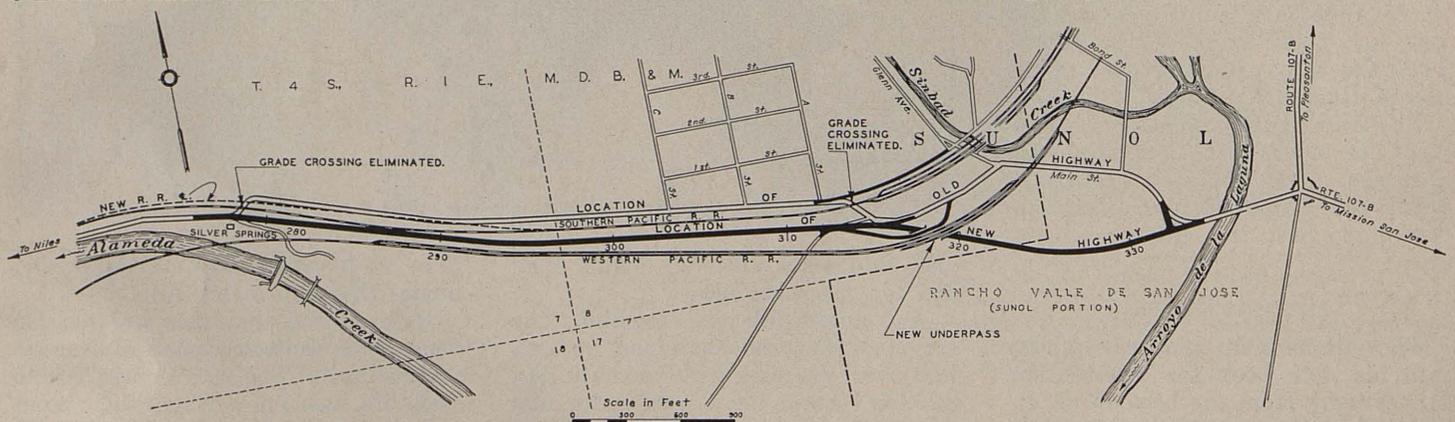
The Sunol separation is the third major improvement to that portion of Route 107, Section A, known as the Niles Canyon Road. At the time this route was accepted into the State's Secondary Highway System, the six miles between Niles and Sunol crossed Alameda Creek three times and Arroyo de la Laguna Creek once on narrow through truss steel or light timber bridges and crossed the Southern Pacific tracks twice and the West-

constructed over five reinforced concrete piers on spread footings. It was completed in the fall of 1939.

The second improvement consisted of a major change in alignment of the first mile of Route 107 from its junction with Route 5 (Sign Route 17). In order to realign this portion and thereby eliminate two more old steel through truss bridges, it was necessary to construct a new channel for Alameda Creek for almost the entire distance of the contract. This provided room for the new highway between the creek and the Southern Pacific tracks on the north wall of the canyon. This highway construction was completed in the late summer of 1940.

essary for the new highway to be constructed between the two railroads. Before that could be done, one of the railroad tracks had to be moved to provide the required room for the highway. It was finally decided because Southern Pacific was almost entirely in cut section and Western Pacific entirely on fill section, the Southern Pacific could be more easily shifted.

Approximately 24,500 cubic yards of earth had to be moved to allow shifting of 3,300 lineal feet of track a maximum of 65 feet. Another 2,500 yards were moved to provide a detour for the existing Route 107 as the new location of the railroad coincided with the existing highway location.



SUNOL SEPARATION

ern Pacific once at grade. These three grade crossings were extremely dangerous to highway traffic due to short approach curves and limited sight distances.

NEW MODERN BRIDGE

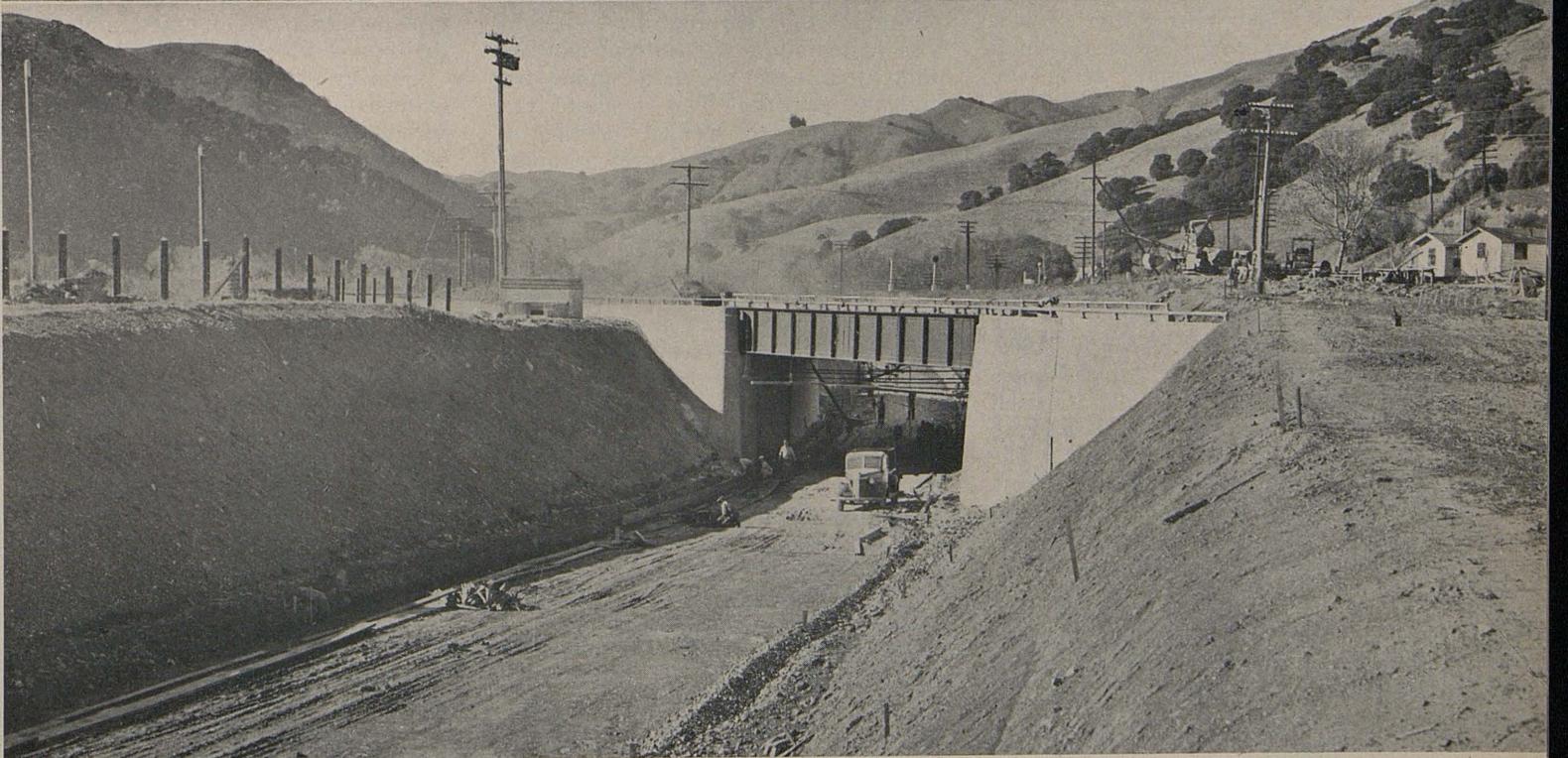
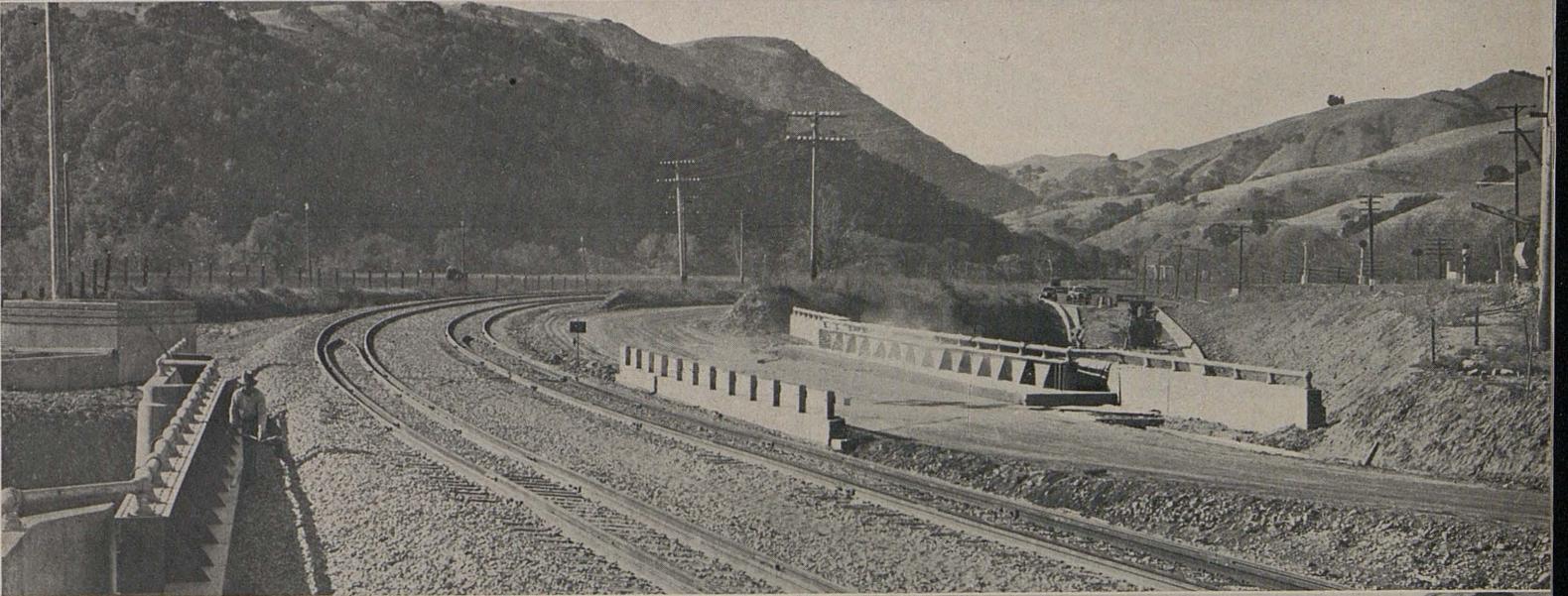
The first improvement on this route was replacing of the old and narrow steel through truss bridge over Arroyo de la Laguna Creek with a modern reinforced concrete structure of the continuous girder type. The old bridge consisted of two 120-foot spans; the easterly half being erected in the 1880's and the westerly half in the spring of 1904 after extremely high water had washed out the timber bents originally constructed there. The new structure with 26-foot clear roadway width and two 4-foot sidewalks is

The Sunol separation, which includes a mile and a tenth of relocated highway with the separation structure, eliminates the three grade crossings and bypasses through traffic from the town of Sunol, leaving only one antiquated bridge yet to be modernized.

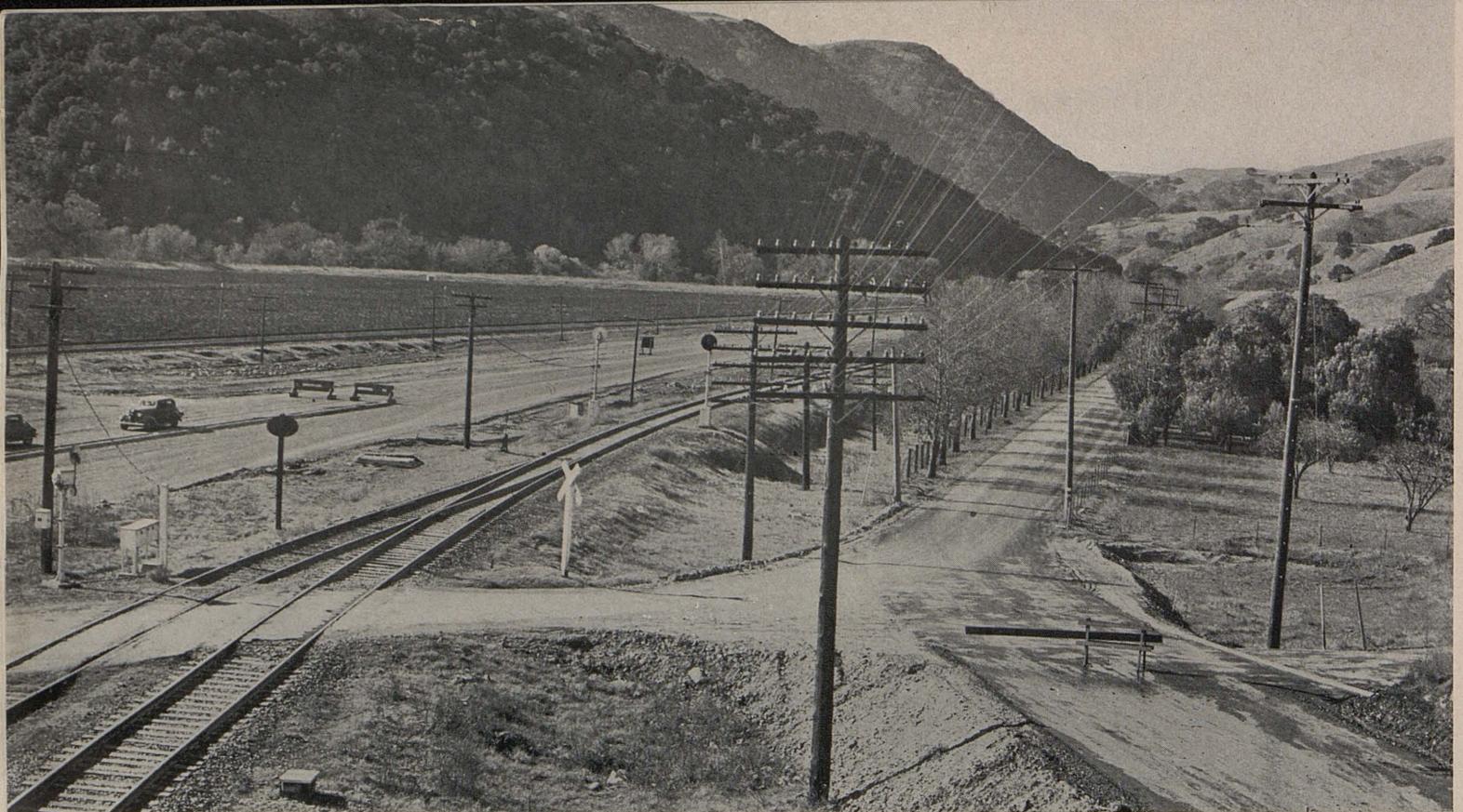
Beginning approximately a mile west of Sunol and opposite the Silver Springs Dam, the new highway runs eastward between the Southern Pacific and Western Pacific tracks to the west edge of Sunol where it crosses under the Western Pacific, skirts the south side of Sunol and ties in with the west end of the new Arroyo de la Laguna Creek bridge. In order to eliminate the two Southern Pacific grade crossings it was nec-

After the grade had been prepared for the railroad by the State's contractor, the tracks were shifted by means of a tractor which dragged the rails and ties by a cable sling as far as the slack in the rails would allow.

A new connection between track and tractor was then made and another pull taken. After about 1,000 feet had been moved, sharp kinks in the rail were bulldozed out by the tractor and the track then lined up for grade and alignment by the railroad's extra and section gangs. Three days were required to roughly relocate the 3,300 feet of track and it could have been done in less time than that had it not been necessary to keep the track open to allow the passage of regularly scheduled trains. Trains traveled



Upper—View of newly completed highway directly west of Sunol, looking toward Niles Canyon. Center—New Sunol underpass. Lower—Underpass at Sunol under construction



Old grade crossing west of Sunol, showing new highway on left beyond railroad crossing. Project eliminates three grade crossings

the track during relocation over double "S" reverse curves at six miles an hour without mishap. The objectionable feature to this method of relocating track was the large number of ties which were either broken in two by becoming skewed or which were split at the spikes from the same cause.

After all relocation work was completed, ballast was hauled in and dumped and the track raised to its ultimate grade. The relocation work, including contract work of excavation for both detour and railroad, surfacing detour and extending culverts and constructing new headwalls for the railroad, cost approximately \$15,500.

The Western Pacific Railroad operated on shoofly track along the east side of the structure during the construction of the separation. The structure is of reinforced concrete abutments and wing walls on spread footings without foundation piling. The abutments are constructed sufficiently far apart on the skew to the railroad to provide a 26-foot clear roadway and two sidewalks each four feet wide. The front faces of the abutments and wings are battered and fluted to provide a very pleasing modern design.

The structure carries the Western Pacific's main line and Sunol pass-

ing track and a 24-foot highway on a system of two 6-foot girders connected by 24, 27 and 30-inch wide flange steel beams. The beams are stiffened by 18-inch channel diaphragms and covered by wrought iron plates under the railroad portion and by a concrete deck under the highway portion. The wrought iron ballast plates are welded together at the joints after being riveted to the upper beam flanges.

All other structural steel connections were riveted, and all steel was erected by the contractor's gas shovel with a crane boom. In order to raise the 20-ton girders it was necessary to counterweight the back of the shovel with sand bags. However all raising operations were completed without danger. The wrought iron ballast plates were waterproofed after welding and riveting were completed with a mopping of hot bitumastic enamel and a 1½-inch compacted thickness of plant mixed surfacing.

The railroad and highway sections of the structure are separated by a 12-inch high and 2-foot 6-inch wide concrete curb topped by a laminated timber guard rail with the posts embedded in the curb. An 18-inch walkway is provided along the east side of the structure for the convenience of trainmen and a 36-inch sidewalk along

the west side for pedestrians. Both are of checkered plate. The steel girders, along the outside of the walkways, protrude above the walkways about 30 inches and are topped by pipe handrails which extend out along the tops of the wing walls.

Subway drainage is provided by an extensive system of perforated and corrugated metal pipes and by catch basins which transport the storm waters to a sump constructed near the end of the southeast wing. From the sump it is pumped by one of two 10-horsepower motors through a 12-inch welded steel pipe to a paved ditch along the south side of the new highway, ultimately emptying, through a 30-inch pipe, into Alameda Creek at a point about a mile west of the pump house.

The highway section of the structure carries the Sunol approach road. This service road diverges from the main highway about 300 feet west of the west subway approach cut, flanks the subway on the south side to the structure and then crosses over the main highway, providing a method for traffic traveling from Niles to Sunol to drive into town without crossing opposing traffic.

COST TO STATE \$152,500

For traffic traveling west from town, another service road has been con-

(Continued on page 21)

Proposed State Water Plan Units Would Develop Two Great Valleys

THE Water Project Authority of California, meeting in Sacramento, on November 25th, directed its Executive Officer, State Engineer Edward Hyatt, to confer with Federal authorities and submit various units of the State Water Plan for an extension of the Central Valley Project.

For several months United States Bureau of Reclamation engineers have been investigating the feasibility of developing American River and other units proposed in State Water Plan.

The plan, originated after 10 years of studies by the State Engineer's office. It contemplates the construction for the Great Central Valley basin of 24 major storage reservoirs with an aggregate capacity of 17,817,000 acre-feet of water and six major conveyance units to distribute surplus water developed. Increased capacities at Shasta and Friant dams have boosted the aggregate storage to 19,497,000 acre-feet.

The State Engineer told the Authority that the ultimate plan is designed to furnish adequate supplemental water supplies to care for all domestic, municipal and industrial uses and for the ultimate irrigation of nearly 10,000,000 acres of irrigable land in the Sacramento and San Joaquin valleys and foothill regions. At present only approximately 3,000,000 acres of valley lands are under irrigation. Other primary objectives of the plan comprise restoration and maintenance of commercial navigation on the Sacramento and San Joaquin rivers, control of floods by storage regulation, and the prevention of salt water invasion from San Francisco Bay into the delta of the Sacramento and San Joaquin rivers.

HYDROELECTRIC POWER

In addition to its other purposes, the State Water Plan provides for the development of hydroelectric power at 10 of the proposed storage dams, at five afterbay dams and in connection with the diversion of Trinity River water into Sacramento River basin.

An aggregate installation of 1,640,000 kilovolt amperes in hydroelectric plants is proposed. The estimated average annual output of these plants would be 6,800,000,000 kilowatt hours. The cost, excluding units of the Central Valley Project, based on 1929 estimates, would be \$455,400,000.

The units of the plan, in addition to those now under construction in the Central Valley Project, are as follows:

AMERICAN RIVER UNIT

The American River unit comprises three storage reservoirs, designated as Auburn, Coloma and Folsom, and three dams for afterbay regulation, together with six hydroelectric plants. This unit provides for combined gross storage capacity of 1,952,000 acre-feet and power plant installation of 295,000 kilovolt amperes capacity. Operated primarily for irrigation the development would provide a total irrigation yield of 1,790,000 acre-feet, of which 1,656,000 acre-feet would be new water. The average annual electric energy output would be 898,800,000 kilowatt hours.

The Trinity River diversion provides for a storage reservoir at Fairview on the Trinity River with gross capacity of 1,436,000 acre-feet. Four power plants with an installed capacity of 193,000 kilovolt amperes would utilize a drop of 1,800 feet to the Sacramento River watershed. Under the ultimate plan of operation the diversion would provide 440,000 acre-feet of water annually for irrigation of lands on the west side of the Sacramento Valley and develop an average annual energy output of 855,000,000 kilowatt hours.

FEATHER RIVER DAM

The Feather River development provides for a dam and storage reservoir on the Feather River above Oroville with a capacity of 1,705,000 acre-feet and an afterbay dam several miles downstream. Power plants operated in connection with the dams would have an installed capacity of 324,000 kilovolt amperes. Operated primarily for irrigation and flood con-

trol the unit would provide a total seasonal irrigation yield of 2,610,000 acre-feet, of which 2,040,000 acre-feet would be new water. With slight modification the irrigation yield would remain practically the same and the average annual electric output would be 1,172,200,000 kilowatt hours.

The Narrows reservoir on the Yuba River would have a gross storage capacity of 853,000 acre-feet. It would be operated for irrigation, flood control and power development. Installed capacity of the power plant would be 160,000 kilovolt amperes. Operated primarily for irrigation with flood control and incidental power development the reservoir would develop a total seasonal irrigation yield of 975,000 acre-feet, of which 869,000 acre-feet would be new water. The electric energy output would be 528,100,000 kilowatt-hours annually.

Camp Far West reservoir on Bear River is designed for irrigation and flood control. The reservoir would have a storage capacity of 151,000 acre-feet and develop a total seasonal yield of 192,000 acre-feet of water.

NUMEROUS RESERVOIRS

Millsite reservoir on Stony Creek, 10 miles downstream from Stony Gorge, would have a storage capacity of 115,000 acre-feet and would provide a total seasonal irrigation yield of 92,000 acre-feet of water.

Capay reservoir on lower Cache Creek would have a storage capacity of 378,000 acre-feet. The total seasonal irrigation yield would be 155,000 acre-feet of water.

Monticello reservoir on Putah Creek west of Winters would have a storage capacity of 130,000 acre-feet and develop a total seasonal irrigation yield of 96,000 acre-feet of water.

Nashville reservoir on the Cosumnes River north of Plymouth would have a storage capacity of 281,000 acre-feet. It would be operated for irrigation and flood control providing a total seasonal irrigation yield of 163,000 acre-feet of water.

(Continued on page 25)

Improvements in the Gilroy Area

By H. S. PAYSON, Resident Engineer

THE Division of Highways has recently completed a general improvement to the highway system on Route 2, the San Francisco-Los Angeles Coast Highway, in the vicinity of Gilroy, in Santa Clara and San Benito counties.

Three contracts were let by the Department of Public Works to effect the improvements. Two of these contracts were planned and administered by District IV, Division of Highways, Jno. H. Skeggs, District Engineer, and the third by the Bridge Department under F. W. Panhorst, Bridge Engineer. A previous article in the "California Highways and Public Works," August 1941, issue, described some phases of this work.

SOUTH OF GILROY

Two concurrent projects south of Gilroy were executed, extending from the Sargent Overhead over the main line of the Southern Pacific to the

Prunedale Junction in San Benito County. These projects consisted of a relocation and improvement to the highway and the construction of a new bridge over the Pajaro River. This local improvement constitutes a much needed realignment to the old, winding roadway that crossed the Pajaro River on sharp alignment at Sargent Station, 6 miles south of Gilroy. The completed improvement provides four lanes of divided highway and bridge on high standards at a most opportune time for use in the strategic network of highways for the National defense.

The total length of this project is 2.6 miles.

HISTORY OF NEW LOCATION

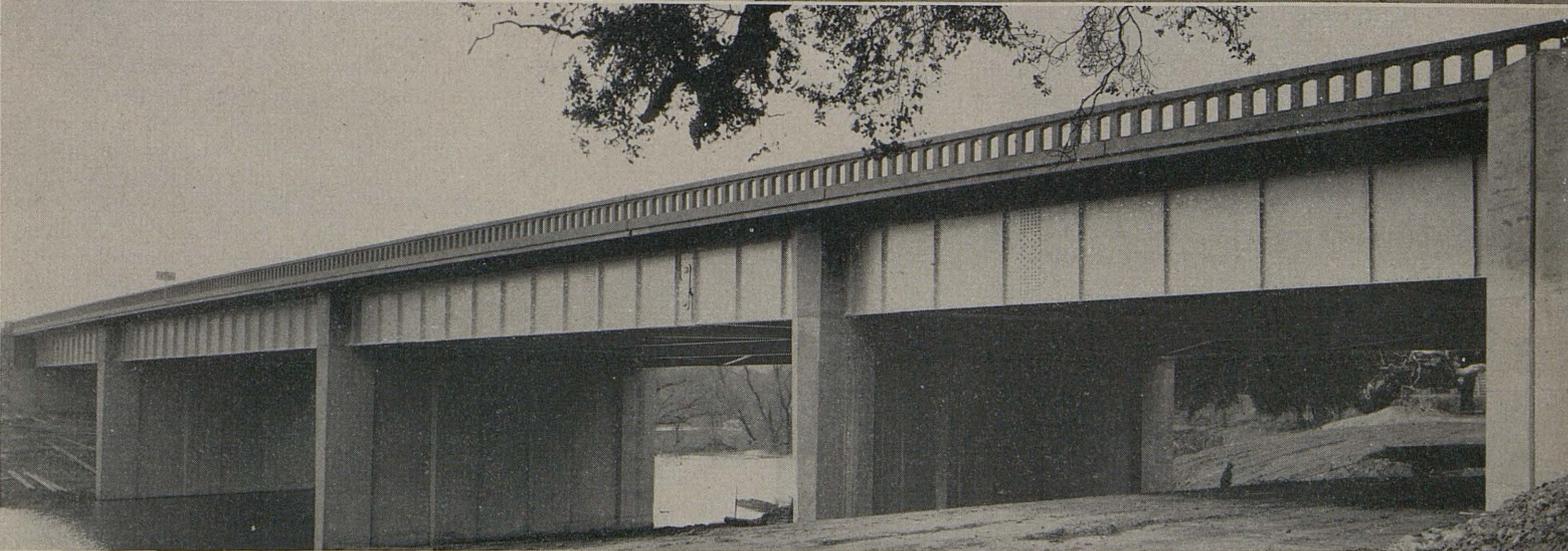
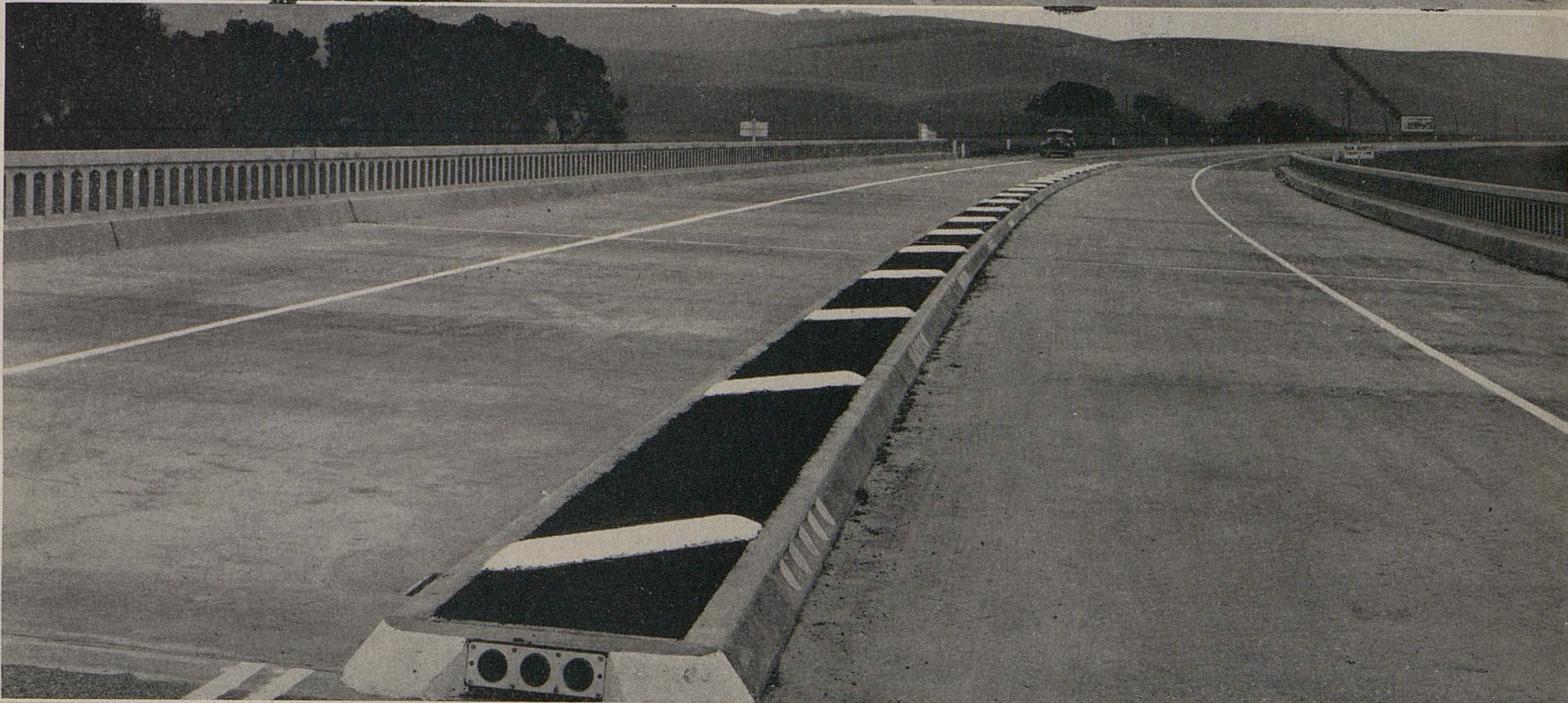
The importance of this section of highway and its natural value of location has been demonstrated repeatedly since the earliest history of transportation in California. Early

Mission travel followed this location extensively, while early American travelers followed the Spanish and Californian. This traffic found the location convenient and useful, crossing the Pajaro River and the San Benito River on horseback without bridges. As the flow of traffic increased and the transportation of heavier shipments assumed greater importance it became necessary to provide better highway and bridge facilities.

A ferry was operated for many years across the Pajaro River below the mouth of the San Benito River during periods of flow in the former. Old residents of the area still recall stories of the difficulties, dangers and occasional drownings that followed in the use of the ferry. During dry periods the travel ordinarily reverted to a location some three miles upstream from the ferry, at the location of the present highway. Heavy



Typical new roadway on U. S. 101 north of Pajaro River in Santa Clara County near Sargent



Upper—Antiquated bridge across Pajaro River at Sargent which has been replaced by new structure shown in lower photograph
Center—Raised division strip on deck of new bridge contrasting with narrow roadway on old span



View of stretch of new divided highway on U. S. 101 at Sargent in Santa Clara County

horse-drawn stages were unable to use the ferry, and elected to ford the river near the new bridge site, often being delayed or mired down for days in wet weather.

It appears that a small timber bridge was built, crossing the Pajaro River near the present crossing, about 1860, operated as a private toll bridge for many years. It is said the revenue from the tolls was used to maintain both the bridge and keeper, and a sporting club and bar at the north bridgehead for the pleasure of local residents and travelers.

LONG STUDIES MADE

About 1871 this bridge was replaced with a timber structure having three timber truss spans on pile bents with short approach spans to a gravelled roadway. This bridge remained in place until the high water of 1937-38, long after its use was abandoned.

In 1914 a 200-ft. steel truss span bridge was built by the counties about 600 feet downstream from the timber bridges described. This structure served as a unit of the new concrete pavement constructed by the newly formed State Highway Department. This bridge and highway have been used by the public until the completion of the new highway projects described by this article.

Studies for the location of the improvement of the route were made over a period of several years, and developed two principal alternates. The first struck boldly over the rolling hills of the old Sargent Ranch to

a new crossing of the river downstream from the steel bridge, and contained a new overhead over the railroad, a short, high embankment approach to the river crossing, and crossed a long, marshy area. This location would have required new right of way, extensive sidehill excavation in wet, unstable ground, and many undesirable features from a maintenance standpoint. The other alternate, the adopted alignment, followed a portion of the old roadway, utilized a portion of the existing overhead over the railroad, and permitted easier construction in fairly stable material, while adding but little length to the first location studied.

CONSTRUCTION DETAILS

The new highway construction provided a graded roadway width of 66 feet; two 23-foot roadways separated by a 6-foot median area, and having 7-foot shoulders. Transition areas from this section to existing pavement were provided at either end of the project. The surfaced area was composed of 10 inches of select material, 5 inches of imported borrow, and 3 inches of plant-mixed surfacing. The shoulders were surfaced with road-mixed surfacing.

The full section alignment permits observed operating speeds up to 75 miles per hour without difficulty.

The new bridge crossing the Pajaro River is located approximately halfway between the old steel truss bridge and the location of the former timber structures. The four bridges used to cross the river at this location have

all been located within a space of some 600 feet, showing the nature of the terrain.

UNUSUAL CONSTRUCTION FEATURES

The newly completed structure is composed of two high concrete abutments and three concrete piers, founded on piles or hard foundation strata. The superstructure is formed by four lines of continuous steel plate girders, restrained for dead and live loads by the piers. A reinforced concrete deck provided two 25-foot roadways divided by a 4-foot curbing. Wide outer curbs are provided with concrete railings.

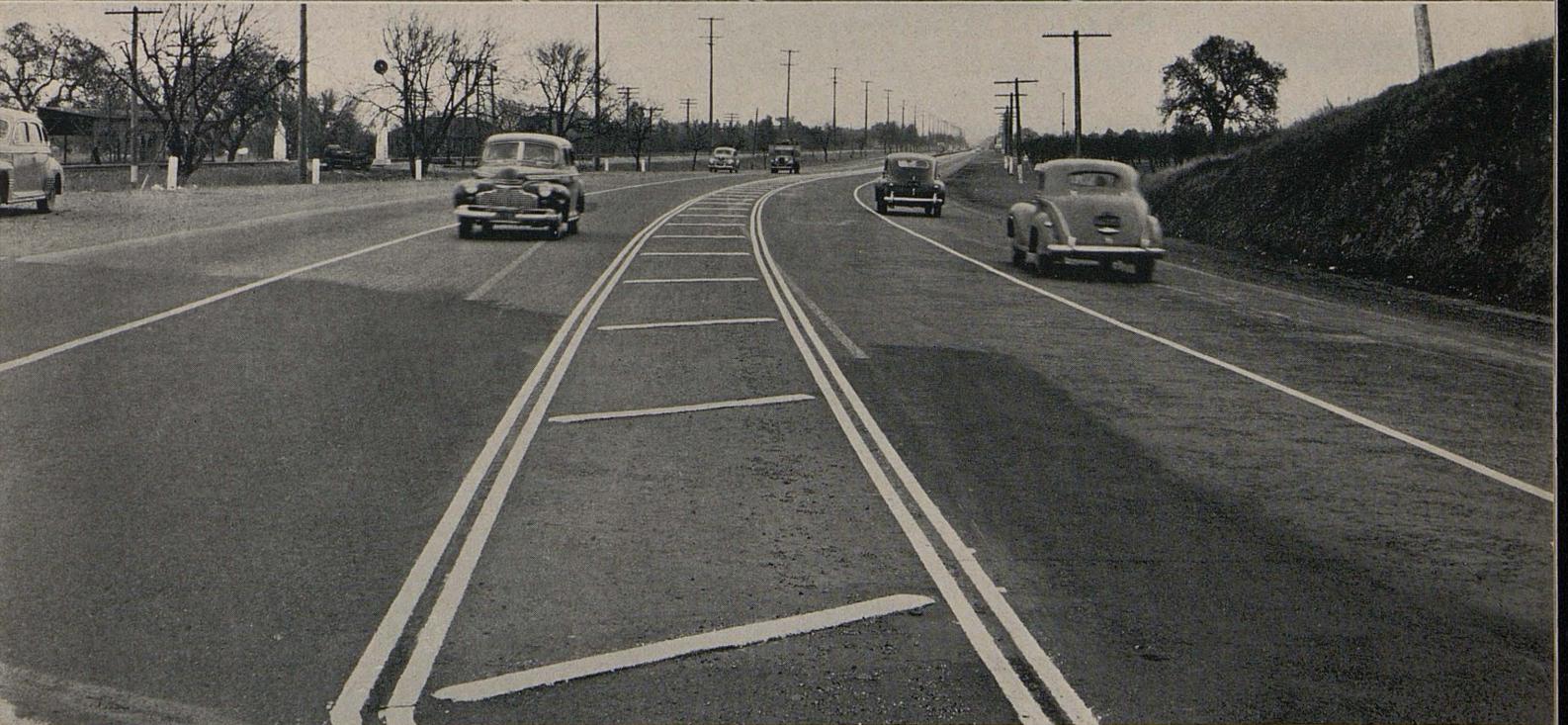
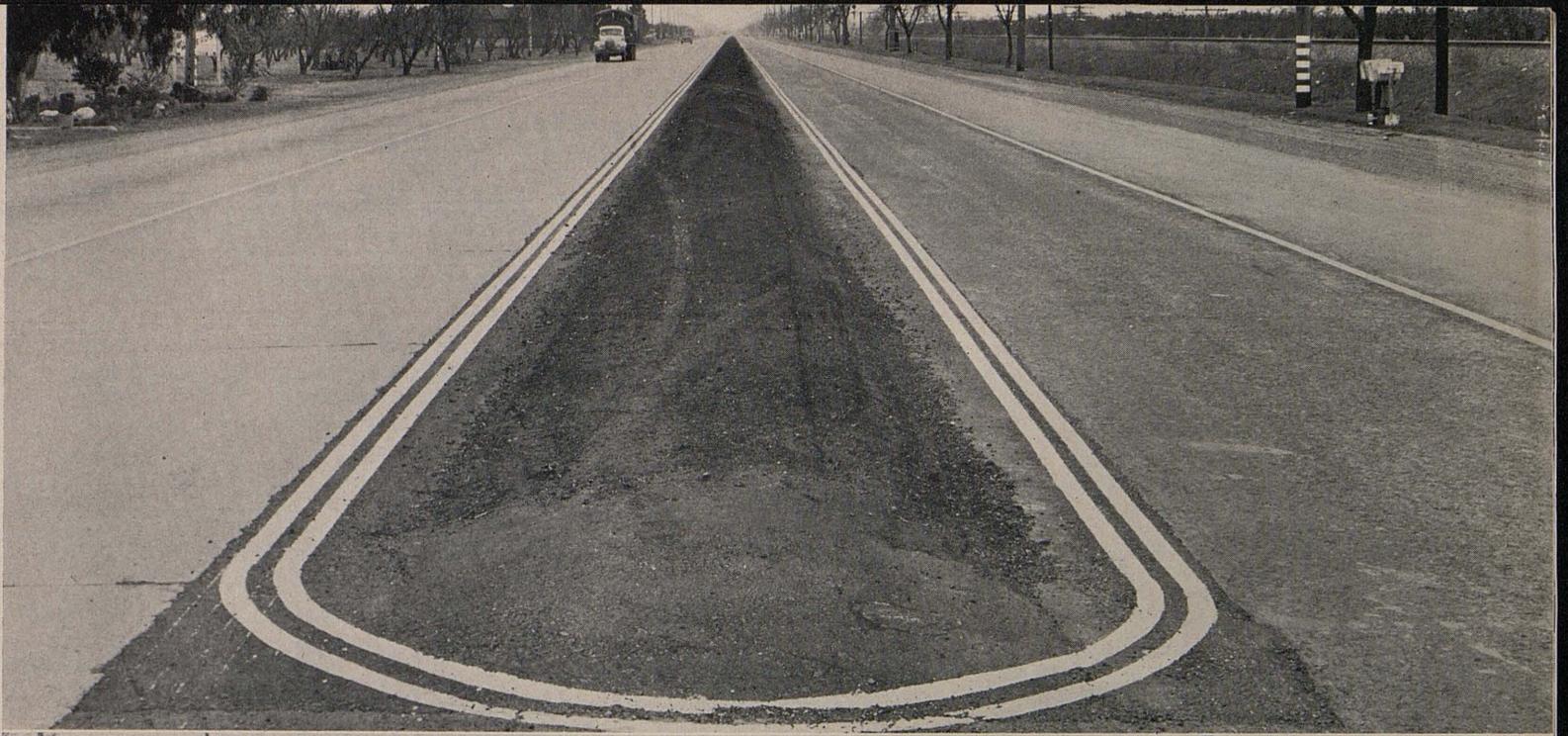
Many unusual construction features were used to construct this bridge, owing to lack of heavy equipment and select crews, both in demand on defense work. Probably the most unusual on a bridge of this size was that of erecting the steel over the river, shown in the August issue of this magazine, wherein that portion is shown being handled from rafts floating the heavy members on the water.

The construction of these two projects occupied a full year from November 1940.

The old two-lane pavement north of Gilroy to the existing three-lane pavement at Llagas Creek, a distance of 5.64 miles, was improved under another contract during this same period.

A new roadway was graded on alignment west of and paralleling the existing pavement, separated from the old roadway by a raised median area 10 feet wide. The new roadway

(Continued on page 21)



These photographs show types of divided highway construction on new improvement on U. S. 101, north of Gilroy

DESIGNATED MILITARY AND NAVAL ACCESS ROADS FOR THE STATE OR PUBLIC

Post	County-Route-Section	Location	Length	Total cost (including construction, engineering and right of way)	Status of plans
District I Eureka Section Base	I-Humboldt-Feeder	Rte. 1 near Arcata to Eureka Section Base	12.6	\$500,000	County preparing plans
District III McClellan Field (Sacto. Air Depot)	III-Sacramento-Feeder	Ben Ali to S.P. Underpass	3.0	160,000	County preparing plans
	III-Sacramento-Feeder	Along northerly boundary	1.5		Cost estimate not available
Mather Field	III-Sacramento-Feeder	Mather Field to Mills	1.3	55,000	County preparing plans
District IV Hamilton Field	IV-Marin-1-A	Channelization at Entrance			Cost estimate not available
	IV-Marin-Feeder	Various Roads in Reservation	3.3	90,000	Plans completed
Alameda Air Base	IV-Alameda-Feeder	Estuary Tube	1.1	6,730,000	Design suspended pending financing of construction
Moffett Field	IV-Santa Clara-68-A	Pedestrian Underpass at Moffett Blvd.		19,300	Design completed
	IV-Santa Clara-Feeder	Improvement Moffett Blvd.	0.2	8,900	Construction completed by WPA except for sidewalk
Camp McQuaide	IV-Santa Cruz-Feeder	Beach Road from Watsonville to San Andres Road	2.5	85,000	Construction completed by WPA
	IV-Santa Cruz-Feeder	San Andres Road from Beach Road to San Andres School	3.3	144,200	Plans complete. WPA to construct
Camp McQuaide	IV-Santa Cruz-Feeder	San Andres Road from San Andres School to Aptos	5.2	37,800	Plans nearly complete
	IV-Santa Cruz-Feeder	San Andres Road to New State Route 56	1.5	255,000	Survey deferred
	IV-Monterey-Santa Cruz-56-D, J	Watsonville Airport to Beach Rd.	2.0	448,700	Survey in progress
		Pajaro River Bridge		123,200	
Moore Dry Dock & Defense Plant Corp.	IV-Alameda-Feeder	Adeline St. Separation		277,000	Plans completed. Contract awarded by Navy
Richmond & Todd-Calif. Shipyards (Richmond)	IV-Contra Costa-Feeder	Pullman and Panhandle Blvds.	1.5	247,000	All estimates by PRA. No surveys at present
		14th St.	0.8	105,000	
		Herman Ave.	0.5	104,000	
		R.R. Separation Cutting and Pullman Approach Road from Bay Bridge	0.6	533,000	
Treasure Island San Francisco Harbor Defense		Various Roads		227,500	Plans by PRA
District V Fort Ord	V-Monterey-Feeder	East Garrison to Rte. 118	4.6	863,000	Survey not completed
		Salinas River Bridge		754,000	Plans completed
	V-Monterey-Feeder	Rte. 118 to Rte. 2 North of Salinas	2.5		Cost estimate not available.
	V-Monterey-Feeder	Grade Separation at Rte. 118 and Railroad			Surveys deferred at request of Army authorities
	V-Monterey-Feeder	Stub Connection to Railroad	0.9		
	V-Monterey-Feeder	Rte. 117 to Ft. Ord near Laguna Seca	1.54	74,800	Plans turned over to Army April 24, 1941
	V-Monterey-Feeder	Del Monte Ave., from Monterey to Seaside Junction	2.8	450,000	Surveys being deferred pending development of project
	V-Monterey-Feeder	East Garrison-Route 118 Road to Route 2 South of Salinas	3.4	397,500	Survey complete
	V-Monterey-Feeder	Rte. 2 South of Salinas to Salinas Airport	1.40	167,500	Survey complete
	V-Monterey-56-I	Rte. 117 to Seaside Junction	2.9	502,000	Plans completed
		Seaside Junction to Marina	6.3	824,000	Plans completed
		Fort Ord Pedestrian Overcrossing		38,500	Plans completed
		Fort Ord Pedestrian Undercrossing		49,500	
		Marina to Castroville	5.3	580,000	Plans completed
		Neponset Bridge		424,000	Plans completed
		Lapis Underpass		198,000	Design nearly complete
		Tembladero Slough		22,000	Plans completed

WHICH SURVEYS AND PLANS ARE BEING SUPERVISED BY ROADS ADMINISTRATION

Post	County-Route-Section	Location	Length	Total cost (including construction, engineering and right of way)	Status of plans
District V—Continued					
Fort Ord—Continued	V-Monterey-22-A	Castroville to Rte. 2	5.2	\$528,000	Plans completed
		Castroville Overhead		61,500	Plans completed
Camp Hunter Liggett	V-Monterey-Feeder	King City to North Reservation Boundary	13.0	722,500	Plans nearly complete
		Pine Creek Bridge		38,500	
	V-Monterey-Feeder	North Reservation Boundary to Jolon	5.5	269,500	WPA construction. Work started July 14, 1941
	V-Monterey-Feeder	Jolon to East Reservation Boundary	3.5	176,000	WPA construction. Work started May 7, 1941
		Jolon Creek Bridge		33,800	Plans completed
	V-Monterey-Feeder	East Reservation Boundary to Hames Valley School	13.1	652,000	Plans completed
	V-Monterey-Feeder	Hames Valley School to Hames Creek Bridge	5.9	343,300	Plans completed
	V-Monterey-Feeder	Jolon to Rte. 56	28.6	2,414,600	Design complete 11.2 miles. Balance deferred until construction assured. Plans by PRA
Camp San Luis Obispo	V-San Luis Obispo-56-D	San Luis Obispo to 0.5 mile West of Pennington Creek	6.4	1,757,000	WPA started construction April 8, 1941
		Chorro Creek Overhead		315,000	
Camp Cooke (Santa Maria-Lompoc)		Various Roads			Cost estimate not available. Plans by PRA
District VI					
Lemoore Basic Flying School	VI-Kings-10-B, C	Improvement of State Rte. 10 from Lemoore to West Boundary Flying School			Degree of improvement not yet determined
District VII					
Terminal Island (Los Angeles Harbor)	VII-Los Angeles-Feeder	Seaside Blvd. to Willow St.	3.0	1,546,000	Plans nearly complete
		Grade		510,000	
	VII-Los Angeles-Feeder	Pave		266,000	Plans completed
		U. P. R.R. Separation Seaside Blvd.		3,950,000	Plans completed
		Cerritos Channel Bridge		1,211,000	Plans completed
		Anaheim St. Overhead			
		State St. Overhead			
District VIII					
March Field and Camp Haan	VIII-Riverside-19-B, C	Riverside to East End Box Springs Overhead	3.8	563,700	Plans completed
		Box Springs OH Widening		23,100	Plans completed
	VIII-Riverside-19, 78-C, D	East End Box Springs Overhead to Dracaea Ave. (includes Separation Rtes. 19 and 78)	1.0	165,000	Plans completed
	VIII-Riverside-78-D	3 miles South of March Field to Dracaea Ave.	4.9	626,600	Plans completed
	VIII-Riverside-Feeder	Iowa Ave. from Rte. 19 to Rte. 43	3.1	243,800	Plans completed
District IX					
Muroc Bombing Range	IX-Kern, San Bernardino-Feeder	Rte. 145 South of Kramer to West Cantonment Area near Muroc	23.8	475,500	Deferred at Army request when Preliminary Engineering nearly completed. Access road may be required on different routing
District X					
Benicia Arsenal	X-Solano-74-B	0.5 mile East of Vallejo (Rte. 7) to Benicia Arsenal	7.0	665,000	Plans completed
	X-Solano-74-C	Benicia to 3.2 miles Northerly. (Includes Sulphur Springs Valley Creek Bridge)	3.9	308,300	Plans completed

DESIGNATED MILITARY AND NAVAL ACCESS HIGHWAYS—Continued

Post	County-Route-Section	Location	Length	Total cost (including construction, engineering and right of way)	Status of plans
District X—Continued Mare Island Navy Yard	X-Solano-Feeder	Extension Ryder St. in Vallejo			Cost estimate not available pending further data from Navy
Stockton Air Base	X-Solano-Feeder	Extension Railroad Ave. on Mare Island	0.8	\$69,300	Plans completed
	X-San Joaquin-Feeder	Sharps Lane, from Stockton Air Base to Charter Way			Cost estimate not available. County preparing plans
District XI San Diego Area	XI-San Diego-2-S.D.	Market St. to Coutts St.	2.8	449,000	Plans completed
	XI-San Diego-2-S.D.	Coutts St. to Enterprise St. (including Barnett and Witherby Separations)	0.4	945,000	Plans completed
	XI-San Diego-2-S.D.	Enterprise St. to Mission Bay Park	2.0	364,500	Plans completed
Camp Callan	XI-San Diego-2-S.D.	Widen Bridges across San Diego River, Tecolote and Cudahy Creeks		176,000	Plans completed
		Grade Separation and Approaches at North Entrance	0.55	77,000	Plans completed
San Diego Area	XI-San Diego-12-S.D.	Lytton St. and Barnett Ave. from Rosecrans St. to Rte. 2	1.0	218,200	Plans completed
	XI-San Diego-77-S.D.	"A" St. to Mission Valley Rd.	3.0	1,695,000	Plans completed
	XI-San Diego-77-S.D., A	Grade Separation Structures at Date St.		88,000	Plans nearly complete
		Quince St.		71,500	Plans nearly complete
		Richmond St.		60,500	Plans nearly complete
		Upas St. (Equestrian and Pedestrian)		27,500	Plans nearly complete
		University Ave.		240,000	Plans completed
		Pascoe St.		55,000	Plans nearly complete
		Sixth St.		93,500	Plans nearly complete
		Mission Valley Rd. to 0.5 mile North of City Limits	4.0	968,000	Plans completed
		San Diego River Bridge		364,000	Plans completed
		Friars Rd. Separation		22,000	Plans completed
		Kearney Mesa Housing Separation		25,000	Plans completed
		Rosecrans St. to Lytton St. to Rte. 2		272,500	Survey in progress
		Highway and Railroad Separation at Rte. 2		590,000	Design in progress
		Mission Valley Rd., Rte. 2 to Rte. 77		390,000	Survey in progress
Fallbrook Naval Arsenal	XI-San Diego-Feeder	Harbor Drive, 8th St. in National City to Civic Center	5.2	605,000	Plans completed
		Harbor Drive, Approaches to Housing Project	0.5	15,400	
		Schley St. Separation		630,000	
		Switzer Canyon Separation		630,000	
		7th St. Channel Br.		49,500	
		Chollas Cr. Br.		99,000	
		Harbor Drive, Civic Center to Talbot	4.3	680,000	
		Small Boat Channel Bridge		320,000	
		Fallbrook Arsenal to Rte. 77	1.0	49,000	
		Rte. 2 to Jct. Rte. 77 and Arsenal Road (portions)	4.56	400,000	
North Island Naval Air Station	XI-San Diego-199-A	North Island Naval Air Station to Rte. 2	13.3	611,000	Preliminary engineering deferred pending construction funds becoming available
Fort Rosecrans	XI-San Diego-Feeder	In Fort Rosecrans, from Ballast Point to Upper Cantonment	2.37	272,269	Army contract. Work started July 25, 1941
Camp Lockett	XI-San Diego-200-D	Campo Creek, Bridge and Approaches		17,600	Design in progress

VISITORS RESTRICTED AT SHASTA DAM BY WAR

United States Bureau of Reclamation announced certain construction areas of Central Valley Project are closed to the public, but that visitors are permitted at vista houses at Shasta

and Friant dams. No passes of any sort are required to view the spectacular construction work from these special vantage points which attracted more than half a million visitors to these dams last year.

Since the outbreak of war addi-

tional armed guards have been employed on all divisions of the project, and extra precautions are being taken in the hiring of new employees and in maintaining close surveillance of every phase of work on the huge water and power project.

Reckless Drivers Make Life of Highway Surveyor Dangerous

(Continued from page 9)

telescope he notices that a car has stopped beside this flagman. He is probably asking whether or not this is the road to Oshkosh. Another motorist is forced to the opposite lane. He sees, for the first time, the men working on the pavement, but it is too late. Another car is approaching him, and he must return to his own lane. He passes to the left of the head chainman, but the other car does not slacken its speed. He must cut in between the two men, and does. Snap! The tape is broken and the men move off the pavement to make repairs.

Does this story sound fantastic? Well, it isn't. These things are happening continuously. Why there aren't more serious accidents is an unanswered question. These workmen must constantly be alert. One of the wisest comments to be made by one of these men to a newcomer is: "Get used to traffic? You mustn't get used to it, for if you do, you'll be killed."

It is probably safe to say that the majority of the motorists are not intentional offenders. Most certainly there are many, many car drivers who are very courteous. It is that small group of drivers who have utter disregard for the safety of others who must be taken to task.

THOUGHTLESS DRIVERS

These beings have the attitude of a small boy with a chip on his shoulder. He figures he has paid his portion for the use of the highways through gasoline tax and he is thereby privileged to do as he pleases. "I'm the guy who pays your wages," he thinks. "Make way for the master! If you don't like it, what are you going to do about it?"

Little does this man realize that these false motions of the workmen, forced upon them by others like himself, are actually costing the motoring public money which might be placed into more highways. This is particularly true in cases where maintenance crews are working on pavement. The sooner he learns that a flagman is there for his protection alone, and not to create a nuisance, the better for everybody.

Another great contributing factor in this case is ignorance and thoughtlessness. Many motorists do not realize the danger to which these workmen are daily subjected. They do not realize that there might not be any room for a man to move away, if he should find an automobile too close for safety. They seem to forget that there are other motorists on whose account these men must be alert.

Above all, they should realize that signs are placed upon the highways for a reason. The "Men and Equipment Working" signs are painted on a yellow background, and yellow means "Caution." The situation ahead of these signs might not always be dangerous, but it doesn't pay to take a chance. A dead man or a broken piece of equipment is useless on highway work.

Niles Canyon Improvement Nearing Completion

(Continued from page 12)

structed on the north side of main highway. It is more or less a tangent extension of the old route from the point where it formerly curved to cross Southern Pacific tracks to a point opposite the beginning of service road into Sunol. These two service roads and the main highway, at intersection point, are divided by a traffic island two feet wide and 200 feet long. At east end of Sunol, the existing approach constructed as part of Arroyo de la Laguna Creek Bridge Contract was revamped to care for traffic entering or leaving town from that side.

All main highways, except for the subway and the service roads, are surfaced with plant mixed surfacing. The main highway surfacing is 22 feet wide with 7-foot shoulders treated with penetration oil.

The \$135,000 contract for this work was let by the State under authority of the Public Roads Administration to Earl W. Heple of San Jose. The total cost to the State of the project, including all railroad work, will be approximately \$152,500.

Improvements in the Gilroy Area

(Continued from page 16)

was paved 23 feet wide, of standard Class "B" concrete pavement, for the exclusive use of southbound traffic. The westerly half of the old pavement was surfaced with a 10-foot wedge of asphaltic pavement to eliminate the old roadway crown, and now provides two 10-foot traffic lanes for north bound traffic.

Plant-mixed surface borders were placed on each side of the new pavement and on the west side of the old roadway, while the raised area between was treated with penetration oil treatment. Road connections were provided between the roadways at county road connections, paved with asphaltic concrete. The connections at the Gilroy city limits and at the Llagas Creek Bridge provide transitions to existing pavement with suitable dividing areas and median bars.

A supplemental contract was let by the City of Gilroy to provide better connection with their streets and the widened State highway. The completed project is of a high character and relieves an intolerable situation between Gilroy and San Jose. The completed roadway provides fast, smooth surfacing for traffic.

The completion of these three projects has eliminated two dangerous portions of roadway and provides a much needed improvement of high quality and standards. The remaining portion between Gilroy and the Sargent Overhead, approximately 5 miles in distance, was originally scheduled for early reconstruction, but may have to be postponed because of the national emergency. The three projects were constructed by:

Contract	Contractor	Amount
24TC7—N. M. Ball Sons (North Gilroy)	-----	\$184,000
24TC9—Heafey-Moore Co. & Fredrickson & Watson Const. Co. (South of Gilroy)	-----	135,000
214TC17—C. W. Coletti & Co. (Bridge)	-----	127,000
Total contract cost-----		\$446,000

The writer served as Resident Engineer for the two roadway contracts, while I. T. Johnson was Resident Engineer for the new bridge over Pajaro River.



Scene on Echo Summit after snow removal operations. Depth of snow pack is clearly shown in this picture

Snow Removal on Echo Summit

By N. R. BANGERT, Assistant Maintenance Engineer

THE first heavy snowfall of the season came to the high Sierra region, east of Sacramento, during the Christmas and New Year holiday period. This storm served to christen the new snow removal station of the Division of Highways located at Echo Summit on U. S. Highway 50 and the new snow removal equipment obtained especially for this work.

Prior to this season only push plow equipment was assigned to snow removal work on this road and the road generally closed shortly after the first heavy storm each winter. On August 29th of this year the California Highway Commission voted funds for the purpose of keeping the Echo Summit road open throughout the winter. This authorization provided for the purchase of the necessary additional snow removal equipment, and housing facilities for both men and equipment.

Orders were placed at once for equipment which included, in addition to push plows and light trucks, two large auger type snowplows. Clearing operations at the new maintenance station site were started on September 3d and the first construction materials arrived on the job September 5th. As rapidly as materials were received workmen were assigned to the project to carry out the erection of the station buildings, which included a 40-foot by 107-foot truck shed, a gasoline and oil storage house, a bunk house capable of housing about 30 men, and a boiler house for supplying steam heat to both the truck shed and the living quarters. During the peak period of construction about 40 carpenters, electricians, steam fitters, painters, and others were employed. It was necessary to dig a well and develop a suitable water supply, also to place various large fuel storage tanks underground,

and to construct a sewage disposal system. The installation of an electric generating plant was required as no commercial power was available in the vicinity.

All major buildings were sufficiently complete by the end of November to permit their use and finishing touches on the interiors of the buildings were completed by about December 20th.

In view of the difficulties experienced in obtaining materials and the isolated location of the work, an exceptional job was done by the personnel of District III and Headquarters Shop.

Judging from experience during the heavy storms of the holiday period, the equipment assigned to this station and the facilities provided appear ample to handle the snow removal work on this trans-Sierra highway. Recent storms have also indicated that the snowfall on the



Echo Summit road will be equal to, if not greater than that on the Donner Summit highway.

The following figures represent the snow pack at the two summits during the recent storm period:

	Echo Summit Inches	Donner Summit Inches
December 17, 1941	20	10
December 18, 1941	20	24
December 19, 1941	16	14
December 21, 1941	21	18
December 23, 1941	22	26
December 24, 1941	29	24
December 26, 1941	28	26
December 29, 1941	51	49
December 30, 1941	73	53
December 31, 1941	85	80
January 2, 1942	73	70

NOTHING IRREGULAR

In the wild and wooly West a poker game was in progress. A tenderfoot, looking on, saw one of the players deal himself four aces from the bottom of the deck. The tenderfoot whispered indignantly to another onlooker. "Did you see that?"

"What?"

"That swindler dealt himself four aces."

"Wall, it was his deal, wasn't it?"

"Aren't your neighbors honest, Uncle John?"

"Oh yes, all of them."

"Then why do you keep that loaded shotgun near your henhouse?"

"That's to keep 'em honest."



Upper—New maintenance station of Division of Highways on Echo Summit
Lower—View on U. S. 50 west of summit



Looking north over completed portion of Ducor Cutoff. Bridge in background is over Poso Creek



View looking south over section of highway built by State from point a half mile south of Poso Creek

Another Link Under Way On Ducor Cutoff

WORK has been commenced on another link of the Ducor Cutoff. The contract calls for grading the roadway and a light penetration oil treatment, from Deepwell Ranch to one quarter mile north of the Kern-Tulare County Line, a distance of about eight miles.

Due to an advance in prices, the work contemplated under the original budget item could not be accomplished. As a result several thousand cubic yards of imported borrow material and an adequate road surface will have to be provided at some future time, to complete this 8-mile stretch of highway.

The recently completed 5.6-mile stretch of the new Ducor Cutoff extending southerly from Deepwell Ranch to the Famoso-Woody Road was completed to modern standards, including the surfacing.

To date the Ducor Cutoff has been a road of "links." The first link, built by the State extending southerly from Ducor to Thermal School in Tulare County, provided for grading and the construction of a bridge at White River. This link has yet to be provided with surfacing before it can be considered complete.

The next link, a 1.2-mile stretch of highway, involving heavy excavation, the grading for which was completed by Tulare County and the State provided an oil treated surface to the roadway.

Kern County provided still another link when Supervisor W. R. Woollores graded and oiled 3½ miles of highway between Poso Creek and the Famoso-Woody Road. Then the State, by another contract, extended the cutoff from Poso Creek to a point 3.3 miles further to the south, this latter stretch being graded and surfaced to modern standards.

With the completion of the present Louis Biasotti & Son contract, it will then be possible, weather permitting, to drive from Bakersfield via Oildale to Ducor, over the cutoff. The highway along this route, however, will still be far from complete. There will still remain a 3.6-mile link, now a narrow rolling Tulare County road without oil, to be completed.

Water Plan Development Will Aid Two Great Valleys

(Continued from page 13)

Ione reservoir on Dry Creek would have a storage capacity of 610,000 acre-feet. It would be operated for irrigation and flood control developing a total seasonal irrigation yield of 150,000 acre-feet.

Pardee reservoir on the Mokelumne River four miles north of Valley Springs, a part of the State Water Plan, is already developed by the East Bay Municipal Utility District. It is operated for municipal water supply and power development.

IN SAN JOAQUIN VALLEY AREA

Valley Springs reservoir on Calaveras River three miles south of Valley Springs would supplant the present development of the City of Shasta and have a storage capacity of 325,000 acre-feet for flood control and irrigation. It would develop a total seasonal irrigation yield of 98,000 acre-feet of water.

Melones reservoir on the Stanislaus River six miles west of Jamestown would supplant the present development of the South San Joaquin and Oakdale Irrigation Districts. The proposed reservoir would have a storage capacity of 1,090,000 acre-feet. It would be operated for irrigation, flood control and power development. Installed capacity of power plant would be 68,000 kilovolt amperes. Operated primarily for irrigation and flood control with incidental power development the total seasonal irrigation yield would be 887,000 acre-feet. Average annual output in electric energy would be 240,000,000 kilowatt hours.

DON PEDRO RESERVOIR

Don Pedro reservoir on the Tuolumne River five miles northeast of La Grange would have a storage capacity of 1,000,000 acre-feet and would replace the present dam and reservoir of the Modesto and Turlock Irrigation Districts. The reservoir would be operated for irrigation, flood control and power development. Installed capacity of the power plant would be 120,000 kilovolt amperes. Operated primarily for irrigation and

flood control with incidental power development the reservoir would provide a total seasonal irrigation yield of 1,303,000 acre-feet and develop an estimated annual output of electric energy of 365,000,000 kilowatt hours.

Exchequer reservoir on the Merced River, located seven miles above Merced Falls, is already developed by the Merced Irrigation District. It has a storage capacity of 279,000 acre-feet and is operated for irrigation, flood control and power development.

Buchanan reservoir on the Chowchilla River west of Raymond would have a storage capacity of 84,000 acre-feet operated for irrigation and flood control. The total seasonal irrigation yield would be 53,000 acre-feet.

Windy Gap reservoir on Fresno River 32 miles northeast of Madera would have a storage capacity of 62,000 acre-feet. It would be operated for irrigation and flood control. It would develop a total seasonal irrigation yield of 45,000 acre-feet.

Pine Flat reservoir on the Kings River 26 miles east of Fresno would have a storage capacity of 400,000 acre-feet. The reservoir would be operated for irrigation, flood control and power development. Installed capacity of the power plant would be 40,000 kilovolt amperes. Operated primarily for irrigation and flood control with incidental power development the reservoir would produce a total seasonal irrigation yield of 1,764,000 acre-feet and an estimated annual output of electric energy of 100,500,000 kilowatt hours.

Pleasant Valley reservoir on the Tula River nine miles east of Porterville would have a storage capacity of 39,000 acre-feet, operated for irrigation and flood control. It would develop a total seasonal irrigation yield of 128,000 acre-feet.

Isabella reservoir on the Kern River, 35 miles northeast of Bakersfield, would have a storage capacity of 338,000 acre-feet, operated for irrigation and flood control. It would develop a total seasonal irrigation yield of 670,000 acre-feet.

Motor Transport of Tomorrow Will Be Big Post-war Problem

(Continued from page 7)

There is no mystery, of course, in highway accident reduction. The time-proven formula of education, enforcement and engineering is just as effective and just as certain of results today as it ever was. But the task of applying the formula is more difficult.

FIELD OF EDUCATION

In the field of education, for example, the public has become less receptive because psychologically we are facing an eat-drink-and-be-merry attitude on the part of millions of Americans who are enjoying substantial increases in income.

In addition, war news is crowding safety news off the front pages and off the air waves. Europe's shooting war is more dramatic than a war on accidents. There is less room in headlines and broadcasts for news about saving lives while lives are being snuffed out in battles on land and sea and in the air.

There are also difficulties in the enforcement program. The State officials charged with the duty of enforcing traffic regulations have lost large numbers of their most competent men to the armed services. High wages being paid by industry act as magnets to draw away from the enforcement agencies the capable recruits who might otherwise become replacements.

Large expenditures required for defense purposes have also made difficult the procurement of appropriations necessary for increasing the volume of enforcement activity to match the increased volume of traffic and the consequent increased accident exposure.

ENGINEERING SIDE

On the engineering side of the safety picture, I don't need to tell you gentlemen of the inroads which the defense effort has made in your own personnel. The demand for competent traffic engineers far exceeds the supply.

Nor do I need to tell you that the funds necessary for highway construction and maintenance are in many cases hard to obtain. It will be no easy task to provide even the stop-gap facilities urgently needed in the defense areas. Complete utilization of all funds available for construc-

tion and maintenance will be called for.

Yet despite all of these obstacles—and because of them—the agencies promoting the cause of highway safety have redoubled their efforts. The President in a proclamation has called upon the National Safety Council, and all citizens and other interested organizations, for a concerted and intensified campaign against accidents. The President pointed out that accidents, by taking a huge toll in life and property, definitely hinder the country's national defense effort.

Speaking for all of the agencies with which the Automotive Safety Foundation is working, I can assure you gentlemen that there is a clear recognition of the problem on their part, and a determination to intensify their activities.

IMMEDIATE JOB

We face one more immediate job. And that is planning for the post-defense period.

No well-informed person can question the fact that a huge road-building program is in prospect. If the emergency had not intervened, that program would now be under way, for even the peace-time demands in motor transportation revealed in glaring manner the inadequacies of our present highway system. Highway construction is almost automatically No. 1 on the list of post-defense projects, as the President has recognized in the creation of a National Highway Planning Board, headed by Mr. MacDonald and comprising, among others, engineers who are here tonight.

The prospect is further supported by general recognition that there will be need for substantial public works to take up the slack in employment when defense activities are ended.

In planning for that period, we must strip from our legal processes all of those long-enduring and costly delays in procurement of rights-of-way which, left to the post-defense period, would confront us inevitably with dangerous barriers to a great forward reemployment program on needed public roads.

ACTION NEEDED NOW

We also must evolve policies of finance which will not cripple the

individual or the Nation as a whole, but which instead will enable us to carry forward this great program without undue hardship or sacrifice. Wise use of the large sums of special taxes now paid by motorists will largely accomplish that purpose.

Both problems, legal and financial, call for action—NOW. They pose many difficult and complicated issues, which must be resolved if we are to be ready, when war production suddenly ends, to move swiftly and effectively into the kind of large-scale program which the Nation has a right to expect from its great corps of highway engineers.

Yet even if both of these phases of the planning job are carried through successfully, there will remain three fundamental questions of policy. These, too, are of immediate concern.

First. Will full use be made of the surveys by the 48 States which produced the master plan for highway development?

MASTER PLAN

The "master plan" is a coordination on a National scale, by State and Federal authorities, of 48 State "master plans," each based on surveys of present and future traffic needs, and providing an orderly program for meeting those needs to the maximum degree possible.

As the expression of far-seeing men, the master plan is an accomplishment that pays tribute to the great leadership of Thomas H. MacDonald, of the Public Roads Administration, and of other Federal and State highway authorities. It stands as a symbol of intelligent, cooperative effort between State and Federal agencies in the development of long-range plans for projects in which both agencies have direct and important interests.

What are the actual traffic needs today? What does the evidence indicate the expanded needs of the future will be? How can we meet these needs, getting maximum returns from every dollar spent, and doing first things first? These are the basic questions that have been asked and answered in this magnificent record of long-range planning. The master plan in its final analysis can best be described, it seems to me, as being

essentially the application of good common sense to a big job.

Question No. 2. Will the program be carried on by the Federal Government alone, or will the traditional Federal Aid system be continued?

FEDERAL AID

As Patrick Henry said of our political history, there is no way of judging the future except by the past. Before the advent of the motor vehicle, road building in America was a local and largely disorganized operation. Movement was limited.

With the development of flexible, personal highway travel, the narrowly limited horizons of millions of families were lifted. It was learned that the motor vehicle recognizes no boundary in its movement, township, county or State. Through its use, distance was eliminated. The old toll concept of road construction had to be discarded in order to make possible the development of coordinated thoroughfares adequate to meet the revolutionary potentialities of a great new form of transportation.

All of this experience is back of the Federal Aid principle. Supporting it also is the proven leadership of men like Senator Hayden and Representative Cartwright, acknowledged highway authorities in Congress, whose wise counsel and able generalship made possible much of the progress of the good roads movement.

By trial and error, the hard way, we came through the years to a recognition that on the basis of use, roads divide themselves into broad categories, affecting in turn the National, State and local interest. It was learned that the size of the task required that the several units of Government each have its own administrative sphere of activity. We discovered the wisdom of carefully balancing the responsibilities among the States and the Federal Government in accordance with a policy which has demonstrated itself to be desirable, effective and of public benefit.

MOTOR TRANSPORT OF FUTURE

It was a long step from the pick-and-shovel type of road program of 1900 to the development in recent years of the master plan for a network of highways which envisions the tremendous potentialities of motor transport of tomorrow.

To abandon the Federal Aid principle, which was the outgrowth of the

War Has Slight Effect on Traffic on Three State-owned Toll Bridges

IN SPITE of the state of war which was forced upon the Nation early in December, the traffic on the three State-owned toll bridges held up well throughout the month. The records indicate a decrease below the traffic volume of the previous month but nevertheless showed a marked gain over December, 1940.

On the San Francisco-Oakland Bay Bridge, the daily average for December, 1941, was 52,901 vehicles, representing a decrease of 3,714 vehicles per day as compared with November, 1941, and an increase of 18 per cent over December, 1940. The Carquinez

Bridge with an average of 13,221 vehicles per day showed an increase of nearly 50 per cent above the record of December, 1940. The daily average for November, 1941, was 14,265 vehicles. During December, 1941, an average of 625 vehicles daily used the Antioch Bridge, representing an increase of 49 per cent over December, 1940, and a decrease of 206 vehicles per day when compared with November, 1941.

The vehicular traffic on the San Francisco-Oakland Bay Bridge and the Carquinez and Antioch bridges for the month of December, 1941, is tabulated below.

	San Francisco-Oakland Bay Bridge	Carquinez Bridge	Antioch Bridge
Passenger autos and auto trailers	1,432,931	367,807	14,840
Motorcycles and tricars	3,061	619	7
Buses	46,692	6,259	198
Trucks and truck trailers	85,444	30,367	3,526
Others	71,795	4,803	803
Total vehicles	1,639,923	409,855	19,374

experience, would be another long step—backwards.

Finally, Question No. 3. Will the program be carried forward on a sound business basis, with competitive bidding by private contractors, or will it become a gigantic relief project?

Many years ago the costs of highway construction became a major factor in the fiscal economy of the several States. While the job was a public responsibility, it became clear that only by preserving the competitive system in bidding and letting out the jobs on contract under Government specifications could we get the full return from every dollar spent.

Certainly, we have an obligation of the highest order to carry on these projects in the most efficient way possible, else the burden will be terrific.

WHEN WAR ENDS

There would not seem to be any question as to how we should answer the three questions I have raised.

And yet it is my reasoned guess at the moment that if all those who are interested in sound highway policy

should stand idly by, the master plan for orderly road development will be ignored; the policy of Federal Aid will be superseded by a centralized Federal control, and road building will fall into the category of relief. We will slip back 40 years to the status of our pick-and-shovel road-building days before the motor vehicle.

This opinion is not the result of the belief that there are iniquitous forces at work, deliberately planning such an outcome. Not at all. Rather, it is based on considerations evoked from the outlook for the post-defense period.

"Here, Tommy," said Mrs. Jones to her neighbor's little boy, "run along and put this parcel on the bus."

"Which bus?" asked the lad.

"Any bus," replied Mrs. Jones, "It's me husband's lunch, and he works in the lost property office."

Said the artist: "I'll give you five dollars if you let me paint you."

The old mountaineer shifted his tobacco from one cheek to the other and back again.

"It's easy money," said the artist.

"Thair hain't no question 'bout that," the mountaineer replied. "I wuz just a-wonderin' how I'd get the paint off afterwards."

Bids and Awards For December, 1941

ALAMEDA COUNTY—A storm drain to be constructed across State Route 5 and through the town of Niles. District IV, Route 5, Section C. Robert B. McNair, Oakland, \$31,567; Dan Caputo, San Jose, \$32,519; Lee J. Immel, Berkeley, \$36,620. Contract awarded to McQuire & Hester, Oakland, \$29,129.

HUMBOLDT COUNTY—Between Weott and 0.5 mile north, about 0.5 mile to be graded and surfaced with roadmix surfacing. District I, Route 1, Section C. Guerin Bros., So. San Francisco, \$49,100; Mercer, Fraser Co., Eureka, \$52,366. Contract awarded to J. L. Conner & Sons, Ukiah, \$47,379.

KINGS COUNTY—Across Kings River, 1.0 mile west of Stratford, a reinforced concrete slab bridge to be constructed. District VI, Route 125, Section D. Dan Caputo, San Jose, \$31,967; F. Fredenburg & G. Moriconi, So. San Francisco, \$34,637; L. D. Tonn, Lodi, \$34,945; Trewhitt-Shields & Fisher, Fresno, \$37,361; Louis Biasotti & Son, Stockton, \$38,819; F. Kaus, Stockton, \$39,140. Contract awarded to Kiss Crane Service, Berkeley, \$30,866.

LOS ANGELES COUNTY—Installation of traffic signal system at the intersection of Lakewood Blvd. and Carson St. District VII, Routes 168 and 178, Sections A,A. Pacific Union Marbleite Co., Los Angeles, \$8,521. Contract awarded to Econolite Corp., Los Angeles, \$8,344.

LOS ANGELES COUNTY—Between Macy Street and Indiana Street, about 2 miles in length, existing roadbed to be widened, portland cement concrete pavement and base to be constructed, asphalt concrete surfacing to be placed over existing pavement and new portland cement concrete base and plantmixed surfacing to be placed on road connections. District VII, Route 26, Section L.A.D. J. E. Haddock, Ltd., Pasadena, \$270,508; Griffith Co., Los Angeles, \$299,686; United Concrete Pipe Co., Los Angeles, \$333,417; Radich & Brown, Burbank, \$379,853. Contract awarded to Nick Persecallo, Los Angeles, \$225,745.

LOS ANGELES COUNTY—At Long Beach Traffic Circle, about 0.3 mile, portions of the roadway to be graded and paved with portland cement concrete, portions to be surfaced with portland cement concrete base and asphalt concrete pavement and portions to be surfaced with asphalt concrete. District VII, Route 60, Section L.Bch.F. J. E. Haddock, Ltd., Pasadena, \$31,180; Anso Construction Co., Inc., Long Beach, \$31,507; Sully Miller Contracting Co., Long Beach, \$32,850; Griffith Co., Los Angeles, \$38,437. Contract awarded to Vido Kovacevich, South Gate, \$30,524.

LOS ANGELES COUNTY—About 0.4 mile of grading between Centinela Avenue and Slauson Avenue, District VII, Route 158, Section B. Vido Kovacevich, South Gate, \$12,960; Griffith Co., Los Angeles, \$12,978; Roland T. Reynolds, Anaheim, \$13,610. Contract awarded to Oswald Bros., Los Angeles, \$12,542.

SOLANO COUNTY—Between 1.3 miles north of Dixon and South Fork of Putah Creek, about 4.2 miles in length, to be graded and paved with portland cement concrete. District X, Routes 7 and 6, Sections EI, A. Heafey-Moore Co. & Fredrickson & Watson Construction Co., Oakland, \$369,593; A. Teichert & Son, Inc., Sacramento, \$370,227; Fredericksen & Westbrook, Sacramento, \$392,457; Claude C. Wood and M. J. B. Construction Co., Stockton, \$416,943. Contract awarded to N. M. Ball Sons, Berkeley, \$359,902.

Highway Tree Maintenance Work



Sample of tree trimming which increases vision on highway curve

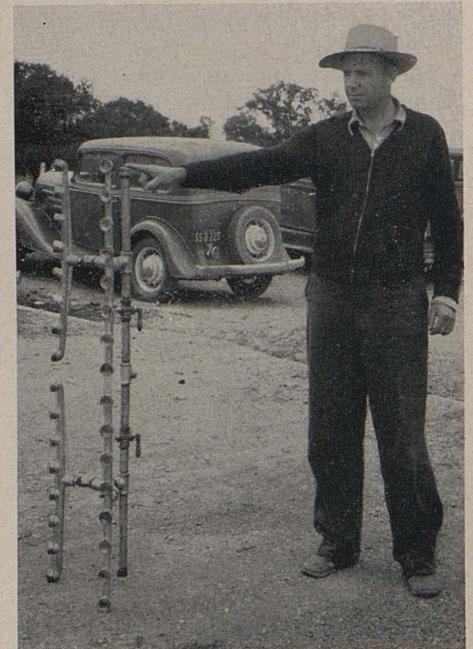
(Continued from page 4)

through theft or mistreatment. The average annual loss of trees and shrubs that have died, been destroyed, or stolen, for the last eight years is in excess of 1,500 plants. In several districts a goodly portion of the tree crew's time is spent in removal and replanting work.

Another bad condition exists at locations where there is easy access from the traveled way to the landscaped areas. At many of these locations the bill for the cleanup of refuse is as large as that for the actual maintenance of the plantings. Particularly is this true at roadside developments such as parking areas and drinking fountains.

During the year 1939-40 two of the districts placed the responsibility for supervision and performance of their fire hazard and noxious weed control work under district tree foremen. Excellent results were obtained. The yearly program for fire hazard and noxious weed control aggregates \$160,000 in costs, with the work extending to some portion of each highway district.

Conflict in the correct times of performance of this and regular highway maintenance work necessitates having the growth control work done by a separate crew. Under a planned program of control or eradication, the time element is of utmost importance for effective results in noxious weed work. In many instances, control must be obtained during as short a period as ten days to warrant the



Evans spraybar used in eliminating roadside vegetation alongside State highways

expenditure. It is important that control crews are aware of and prepared for that critical time. In a lesser extent this necessity of proper time of performance is also true with the fire hazard control work.

By a more definite programming, particularly of the noxious weed control work, it will be possible to increase in number the tree foremen who can be given this added responsibility.

State of California
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Department of Public Works

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

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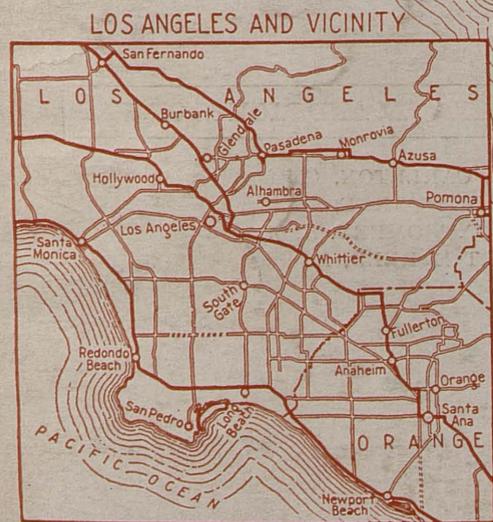
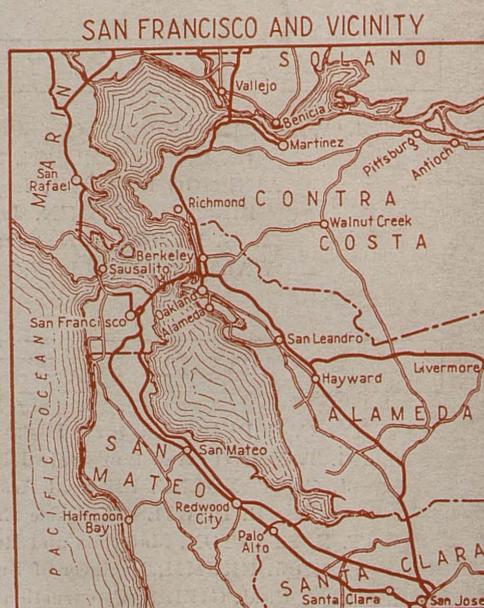
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CALIFORNIA STATE HIGHWAY SYSTEM

SCALE IN MILES



~ LEGEND ~
 Primary Routes ———
 Secondary Routes ———
 Proposed Routes - - - - -



D50 Illuminant, 2 degree observer

L*	39.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	67.24	62.14	72.05	62.15
a*	13.07	18.72	-22.29	22.85	-24.49	11.81	59.60	-48.07	18.55	1.15	0.23	0.21	0.43	0.28	0.19
b*	15.07	18.72	-22.29	22.85	-24.49	11.81	59.60	-48.07	18.55	1.15	0.23	0.21	0.43	0.28	0.19
Density										0.04	0.09	0.15	0.22	0.36	0.51

Golden Thread

Colors by Munsell Color Services Lab

Don Williams