

CALIFORNIA HIGHWAYS

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P. O. Box 1103, Sacramento, California.

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CALIFORNIA HIGHWAY DEPARTMENT

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Sacramento, California.

EVERY employee of the highway commission has a direct interest in the improvement of the highway organization's methods and results, both engineering and clerical, office and field. To that end, the State Highway Engineer invites constructive criticism or suggestions from every employee.

Ideas as to the more economical and efficient handling of your job, or suggestions for elimination of waste will be welcomed. Criticism is also desired from persons outside the organization, who are in a position to give facts.

Send only signed communications addressed as follows:
California Highways, P. O. Box 1103, Sacramento, Cal.

FUTURE HIGHWAY BUILDING

To some states that are now just beginning a state road building program, the limited mileage of new construction by the California Highway Commission in 1926 might be taken as a slump in state road construction in California; but the contrary is true. California has had fifteen years of education in scientific road building and the past two years has been a period of transition to a new epoch when state road construction will attain results that will continue to keep us the foremost highway building state in the Union.

Recent legislation, too, shows that financing highway construction has also been perfected. Our law makers have learned that paying as we build is more economical, and that those who use the highways should pay for them.

Contributions Wanted.

State highway building in California has become a vast industry employing many engineers and road experts who daily come in contact with new and interesting features of highway construction. Their problems and how they are met are the things which make CALIFORNIA HIGHWAYS of value to employees of the department and to highway departments of other states and foreign countries. With this in mind every employee of the California Highway Commission should consider it his duty to report to the editor anything that he thinks would be of value to the department.

"Alabama Highways."

The latest addition to the list of state highway department publications is Alabama Highways, published by the Alabama State Highway Department, Montgomery, of which Col. Woolsey Finnell is director, and Henry J. Law and John S. Turner associates. The April issue, which is Vol. I, No. 1, contains 24 pages, with illustrations showing road and bridge work in Alabama.

Thirty-five Millions For New York Roads.

According to Arthur W. Brandt, State Highway Commissioner, New York State during the coming summer and fall will carry out the most extensive highway building program in its history. It will spend on its roads and highway bridges this year \$35,600,000, as compared to \$2,200,000 last year.

Germany Builds Roads.

To make Germany a paradise for motor tourists, and to capture more of the business which comes to Europe from America, 9000 miles of improved highways are to be built, connecting every city of importance.

Of No Interest to Engineers.

The most dangerous curve is the one that outlines a dainty ankle and occupies the driver's attention.

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The Nevada Transcontinental Highways Exposition



CALIFORNIA BUILDING AT RENO.—Interstate cooperation is exemplified in the part California is taking to assist in making the Nevada Transcontinental Highways Exposition a success. This building houses three state department exhibits and many California district and county exhibits.

THE POSSIBILITY of driving a motor car with speed and comfort from the Atlantic to the Pacific over the Overland Trail, made famous in the early days by the covered wagon and the pony express has long been the ambition of the American motorist and is the incentive which prompted the state of Nevada to hold the Nevada Transcontinental Highways Exposition. The highway show opened its doors on June 25 and will run until August 1.

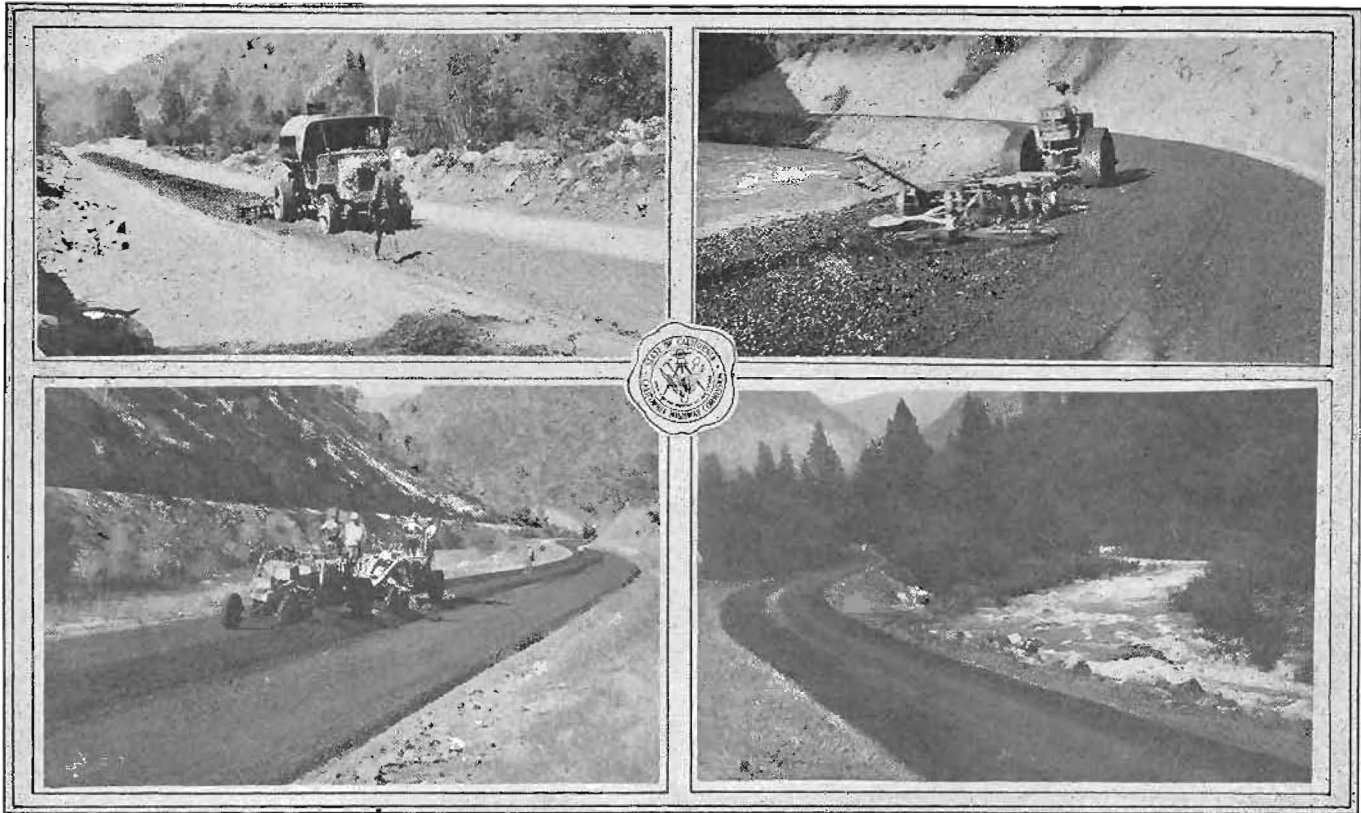
With the coming of motor transportation the Overland Trail has taken the name of the Victory Highway. This transcontinental road strikes California at a point of nearest average distance to most of the state's scenic attractions and area of mineral and agricultural production, entering through the beautiful Truckee River Canyon and over the snow-capped Sierras. Once in California you connect with 6600 miles of state highway and much additional mileage of county roads, joining all principal cities, national parks and resorts. Famous for her highways, California invites the thousands of motorists who will attend the Transcontinental Highway Exposition to tour the Golden State.

Three

Among the exhibits attracting widespread interest in the California Building are those of the California State Highway Commission, Motor Vehicle Department, and Agricultural Department. The largest of these exhibits is a typical California highway landscape, displaying the farm resources of the state. Weaving its way through this vast empire of productive land, presenting the different types of road and bridge construction, is shown California's magnificent system of improved highways. A big relief map, 8 feet in width and 19½ feet long, shows the entire state, its mountains and highway system and different points of interest. New highway construction is shown, making the map one of unusual interest to motorists attending the exposition.

At the information booth is to be found information concerning the California state highway system, the state's vast and varied resources, a tabulation of the motor vehicle registration from 1914 to the present time, showing the growth in the use of motor propelled vehicles in California year by year and the tremendous advance in that line during the past few years.

Excellent Results Obtained in Oiling State Highways



OILING THE MARIPOSA-EL PORTAL HIGHWAY TO YOSEMITE—(1) Applying the hot oil. (2) Initial mixing with disc and rotary harrow. (3) Finishing oiled surface with grader. (4) Section of completed oiled surface.

THE RESULTS being obtained with oiling highways in the state system this year are of such a degree of success that the Highway Commission is now fully satisfied that it is the proper method of treating highways during a preparatory period previous to paving. The low cost, the elimination of dust and the resultant smooth surface, almost equal to paving, are factors which now mark the success of state highway oiling.

Oiling Pioneered by Division I.

To T. A. Bedford, Division Engineer for Division I, belongs the credit of being the pioneer in oiling state highways in California. Previous to his success there had been much oiling of roads in California without satisfactory results and when he proposed to oil the Redwood Highway, the principal trunk line in his division, the Commission looked upon the work with considerable doubt. However, results proved highly satisfactory and oiling of unpaved highways in the state system has become a method of maintenance.



T. A. BEDFORD

In its operations the state uses a lighter oil than is used for oil macadam, having an asphaltic content of from 60 to 70 per cent. Two applications of 0.3 gallons per square yard are made. Between applications dump trucks deposit about an inch of sand and fine gravel, and an abundance of material is kept on

hand at the side of the roadbed to be worked into the surface in case more is necessary. Samples of the surface were recently taken on the Redwood Highway where the oiling was done last year and the oiled layer proved to be two inches thick.

Another, known as the mixing method, is being used very successfully. The crushed rock surface is first oiled, 1½ gallons per square yard, being used. A rotary harrow then thoroughly mixes the oil and gravel, assisting penetration. Graders are then used in a movement of the oiled surface as it packs and hardens. Satisfactory results are being obtained in Division VI, on the Mariposa-El Portal highway into Yosemite Valley with the mixing method.

Success in Division VIII with oiling has attracted a great deal of attention, engineers and highway commissioners from several of the western states visiting the oiled roads of that division to learn of the methods used.

In all, a total of 700 miles will be oiled this year, an appropriation of \$600,000 having been made for that purpose. The maintenance department has organized the work this year in such a manner that inconvenience to the traveling public has been reduced to the minimum.

“Hard surfaced roads stretching from border to border are welding the American people into a solid, coherent nation, abolishing provincialism and sectionalism, destroying dialects and spreading tolerance and understanding everywhere.”

California's Highways Invite Exposition Visitors



California State Highways, like that pictured above, is one of the reasons the Gold State is known as the Motorists' Paradise.

A VISIT TO THE Nevada Transcontinental Highways Exposition will not be complete without a trip into California, and as a few hours' run over a number of scenic routes will land the tourist into the heart of the Golden State, few will return to their homes without having enjoyed the excellent California highways. To assist them in planning this part of their trip, in this issue is described the main routes leading out of Reno, Nevada, into California.

Victory Highway.

One of the popular routes from Reno into California is via Donner Pass or the Victory Highway. Following this route from Reno the California state line is reached with 14 miles of travel, 10 of which is paved, the rest being under construction and about completed. From the state line to Truckee is 19 miles of fine oiled highway. A distance of 14 miles on to Soda Springs Station, rock surfaced, will be oiled during July. The next 12 miles is a dirt road which, with 6 miles of rock surfaced road to Emigrant Gap will also be oiled in July. To

Gold Run, 18 miles, has never been graded by the state, and Gold Run to Auburn is a fine oiled rock road. From Auburn 35 miles of paving will take the tourist to Sacramento. From there San Francisco is reached over 98 miles of paving, the Carquinez bridge at Vallejo being an attraction of the route. From San Francisco, Los Angeles is reached by either the coast route or the San Joaquin Valley route. The complete distance from Reno to Sacramento is 145 miles and to San Francisco, 243 miles.

Lincoln Highway.

Another well known route out of Reno to Sacramento is the Placerville or Lincoln Highway, via Carson City, Lake Tahoe and Echo Summit, a distance of 176 miles. Reno to Carson City, 32.5 miles, is paved with concrete. From there on is untreated dirt road to Lakeside, a distance of 27 miles, where the state line is crossed. Meyers is 9.5 miles and from there to Riverton, 31 miles, will be an oiled earth road. Riverton to Pacific House, 5 miles, is now under construction and will be in fair condition. Placerville, famous in the days of '49,

Motor Vehicle Law Information for Nonresident Motorists

MANY NONRESIDENT motorists will enter California this year, especially after attending the Nevada Transcontinental Highways Exposition and for their information Frank G. Snook, Superintendent of the Division of Motor Vehicles in California, has issued a statement on the regulation concerning the registration of their cars and the obtaining of nonresident permits as follows:

Unless applicants from other states have registered their vehicles in their own state they are not entitled to a California nonresident permit and must apply for California license within ten days after entering the state. If properly registered in their own state they are entitled to a six months nonresident permit.

To register a vehicle after the six months permit expires, certificate of title will be accepted as evidence of ownership from Alabama, Arizona, Colorado, Delaware, Florida, Indiana, Maryland, Michigan, Mississippi, Missouri, Montana, North Carolina. (North Dakota after July 1, 1927),

Oklahoma, Oregon, Pennsylvania, South Dakota, Utah, Virginia and Wisconsin.

From states which do not issue Certificate of Title the following will be accepted as sufficient evidence of ownership:

Certificate of Registration and notarized bill of sale or, Certificate of Registration and original lease contract showing same to have been paid in full or, Certificate of Registration and duplicate lease contract carrying the name of the legal owner and verification by wire of the legal ownership.

Verification of engine number by any State Inspector, State Traffic Officer or other employee of the Division of Motor Vehicles must accompany application in each of the above methods of registration. All papers presented for registration, pertaining to title, must be retained by the division.

Further information on this matter can be secured from any State Traffic Officer.

ARIZONA HIGHWAY PAYS FOR ITSELF

An eighty-two mile section of Maricopa county pavement in Arizona, paid its entire cost in one year, nine months and nineteen days, according to Ira L. Wood, in Arizona Highways.

Mr. Wood uses 2.6 cents a mile as the saving in gas and oil, tires, depreciation and repair bills on the average car, between a paved road and a dirt or gravel road. As authority for this figure he quotes H. G. Borden, former Dean of the College of Engineering, Ohio Northern University.

The Maricopa county road, going east and west from Phoenix, last year carried the equivalent of 816,000 vehicles its entire length. Multiply by 81.9 miles and you get 66,830,400 car miles. At 2.6 cents a mile, the saving to vehicle owners in one year is \$1,737,590.40. The road cost \$2,866,500 and after adding 5 per cent for interest it was found that the highway paid for itself in less than two years.

Cook Talks on Uniform Casting Specifications.

George B. Cook of the Testing and Research Laboratory at the central office, talked before a meeting of 35 representatives of the northern foundry group of the California Development Association in San Francisco, June 13. Mr. Cook discussed the need for uniform specifications for casting in highway construction and outlined ways in which the foundries can render a better service by their adoption.

TESTS MADE OF NON-SLIPPERY ROADS.

A more economical method of road construction to provide highways that will not soften under heat or be made slippery by rain, is claimed for paving invention tested out in Sweden, the Department of Commerce has been advised.

The new paving, which it is claimed will stand a pressure at 19 degrees centigrade, of 6.7 tons and four times that pressure at 50 degrees, the corresponding figure for asphalt being 4.6 tons, has been invented by a Swedish engineer who has been working on the problem for 20 years.

The inventor declares his roads will be cheaper than any kind of pavement at present in use, will not be softened by heat and will not be made slippery by rain. Tests made by the Swedish States Material Testing Institute are said to verify his statements with regard to the pressure the pavement will stand.

A special machine, resembling a locomotive, to compress the material, is used.

BEAUTIFYING STATE ROADS

The Long Beach Press-Telegram prints the following on the California Highway Commission's policy of planting trees on the state highways:

"Since 1920, 56,000 trees have been planted along 685 miles of state highway in California. A greater number of trees, planted in earlier years, including those of natural growth, also are being cared for by the State Highway Department.

"This is a wise policy. Trees add to the attractiveness of the landscape, contribute to the comfort of the traveler, and when planted with thought given to visibility at crossings and other danger points, the benefits will be many and the objections few.

"Especially in the warm valleys of the interior, well shaded roads are inviting to the summer traveler, and on the cooler coastal plains it is possible to relieve a sense of barrenness by well designed planting.

"The cost of setting and maintaining roadside trees is considerable, but it is well worth while. The returns in popular appreciation will be larger, for each dollar expended, than for any other investment that the highway commission can make."

NORTH CAROLINA'S ROAD BONDS

NOW TOTAL SUM OF \$120,000,000

The North Carolina General Assembly has authorized the issuance of \$30,000,000 worth of bonds for continuation of the state's highway program.

This authorization brings the total road bond issues authorized by the North Carolina General Assembly since the state's road building program started to \$115,000,000.

California has issued a total of \$73,000,000 in bonds.

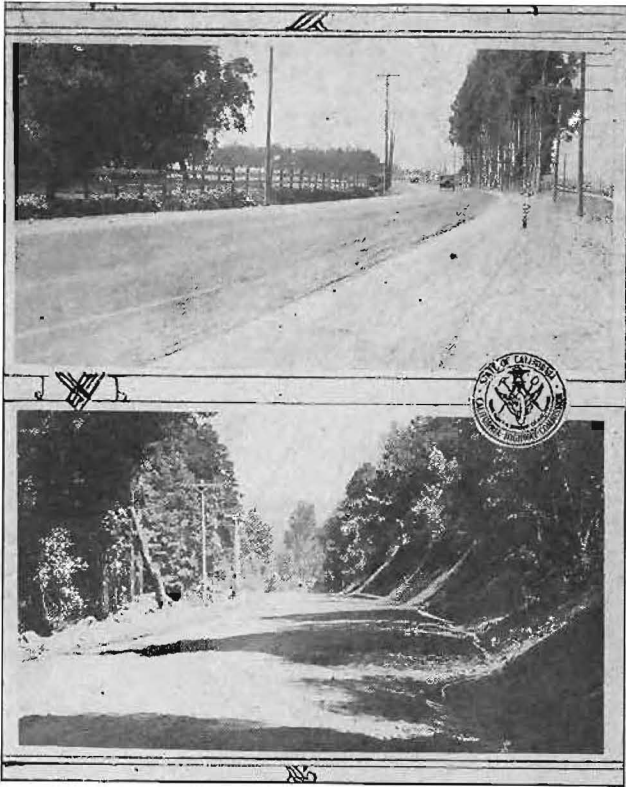
TEXAS CLAIMS NEW PAVING RECORD.

Highway engineers of South Texas claim a new paving record on the La Port road out of Houston. One crew on May 26, in 14 hours and 44 minutes laid 1613 lineal feet of 20-foot, 9-6-9 inch pavement, or 3584.4 square yards, according to a late issue of Western Construction News.

A traveling sunshade, used to protect fresh concrete until covered with earth, is an innovation on this job.

CALIFORNIA HIGHWAYS
INVITE EXPOSITION VISITORS

(Continued from page 5.)



Typical valley and mountain California State Highways.

is reached over 19 miles of oiled rock road, and from there to Sacramento, 53 miles, is paved.

An alternate route is available from Meyers via the west side to Lake Tahoe and Truckee. Meyers to Truckee, 48 miles, is a fair earth road, portions being graded to modern standards. From Meeks Bay to Truckee both grading and surfacing are in progress. At Truckee this road joins the Victory Highway. The distance to Sacramento is 190 miles.

Reno to Red Bluff.

Reno to Red Bluff, 195 miles, can be made in from 6 to 8 hours over a good road, all of which is either constructed state highway or under state maintenance. The California state line is crossed at Purdy's, a few miles northwest of Reno; and after a short distance through lands characteristic of western Nevada, the agricultural lands of Honey Lake Valley are entered and traversed from Doyle to Susanville, all of which is a high speed road. From Susanville in a westerly

direction to Paynes Creek, 80 miles of excellent scenic mountain road, through timber lands, are encountered, all of which has good alignment and easy grades. The last 25 miles to Red Bluff is through foothills and valley.

At Red Bluff the traveler may either turn southward to Sacramento, San Francisco and the southern part of the state, by way of either one of two paved highways, on the east and west sides of the Sacramento River, or he may turn northward over the Pacific Highway through the scenic northern section of the state, to Oregon and Washington. He may also, if he chooses, proceed westward to Eureka, connecting with the Redwood Highway along the Pacific coast, which makes a comfortable day's travel by auto, through the beautiful timbered Coast Range mountains and into the redwood country.

Yuba Pass Route.

Although not a state highway until Downieville is reached, Yuba Pass route receives considerable attention. From Reno to the state line is oiled. State line to Sattley is earth road but beyond that point to Sierra City has been improved by the Bureau of Public Roads. Sierra City to Downieville is county road. Nevada City, over state highway is reached in 47 miles, where pavement is reached. Grass Valley is next visited, and Sacramento is reached with a total mileage of 190 miles from Reno.

Popular Southern Route.

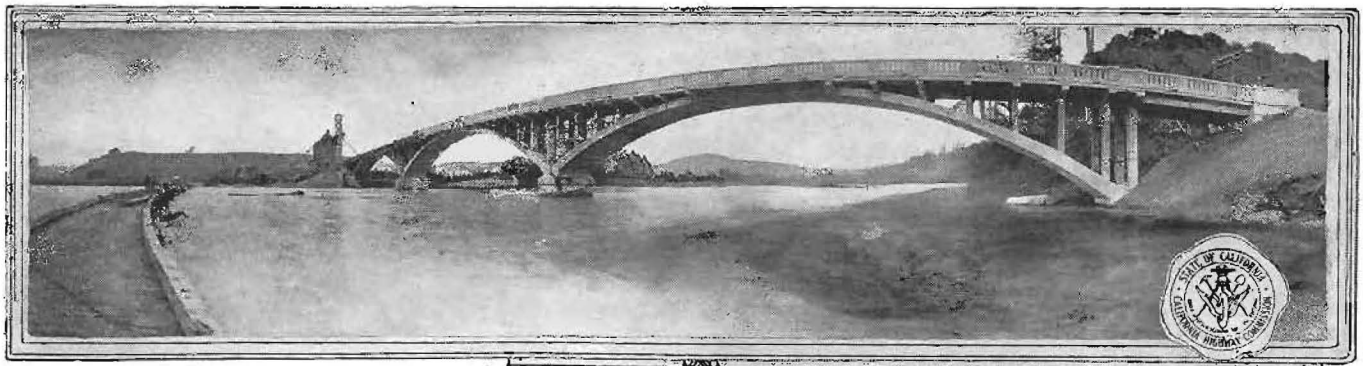
A popular route into southern California, especially in winter, when it is one of the few routes open, is that south over good Nevada state highways to Carson, Goldfield, Beatty, Tonopah and Las Vegas, a distance of 462 miles. Here may be made side trips to St. Thomas, for a view of the "Lost City," to Zion National Park and the Grand Canyon.

The state line is crossed near Jean, the motorist proceeding over a desolate desert region, typical of Death Valley, to Dagget, 150 miles from Las Vegas. Here the Arrowhead Trail is encountered which, to San Bernardino is either paved or good oiled road, a distance of 84 miles. From there to Los Angeles, 65 miles of paved road, lands the motorist in the southern metropolis, the total distance from Reno being 761 miles.

Other Routes.

Access to California may be gained via the Alpine Highway after July 15. Through Nevada to the state line is 56 miles. To Stockton via Woodfords, 7 miles within California boundaries and Jackson is 128, making the total, Reno to Stockton, 191 miles. This route has wonderful scenic features.

Through the Mono National Forest via Bridgeport, Bishop and Mojave is a route that takes the motorist along the Sierra ridge, past Mono and Owens lakes and across the Mojave desert to Los Angeles. The road through Carson City and Minden is taken out of Reno on this route which measures 510 miles to Los Angeles.



Seven

One of the recently built State Highway Bridges in California.

PROVISIONS OF BREED BILL CEMENT STATE UNITY

GETTING ALONG for the past two years with a comparatively small amount of money for construction of new highways has had the beneficial effect of making the people of California realize that unity of thought, purpose and action are necessary for accomplishment. This has been exemplified in the passage of the Breed gas tax bill and its approval by Governor Young. The necessity of the completion of the state highway system brought about the unified action.

The provisions of the bill, introduced by Senator Breed of Oakland, divides the highway system of the state into two classes, primary and secondary. The primary roads include the main trunk lines, interstate connections, county seat laterals and the roads into Yosemite and Sequoia National Park. All other state highways are included in the secondary class. Seventy-five per cent of the gas tax collected in the additional one-cent levy goes to the primary roads and the balance to the secondary.

In signing the bill, Governor Young made the following statement:

"I wish particularly to call attention to the prompt and hearty support of this road-building program on the part of our State Senate and Assembly. I wish also to commend the leadership of our two great automobile clubs in helping to unite all sections of California behind these constructive pieces of legislation. The overwhelming vote by which the bills passed both houses of the Legislature is the best indication of the results their joint efforts have obtained.

"I am especially pleased with the fine spirit of cooperation which has manifested itself in every portion of our state, and which in a few short years will serve to complete a highway system of which we may be justly proud. This cooperation, which made possible the successful passage of these two measures, has given assurance that California will continue to hold its premier position as the motoring paradise of America."

The new tax has no effect whatsoever on the present two-cent tax, half of which goes to the counties and the other half to the state for maintenance and reconstruction work.

The following tabulated statement gives at a glance many interesting facts and figures about the one-cent gas tax:

BREED, S. B. No. 3	Area of State	M. V. Reg.	PRIMARY (75% of Funds)		SECONDARY (25% of Funds)		COMBINED	
			Mileage	Funds	Mileage	Funds	Mileage	Funds
45 Northern Counties.....	52%	42%	2,346	54.7%	1,771	50%	4,116	53.5%
13 Southern Counties..	48%	58%	1,941	45.3%	525	50%	2,466	46.5%
Totals.....	100%	100%	4,286	100.0%	2,296	100%	6,582	100.0%

SOUTHERN COUNTIES—San Diego, Imperial, Orange, Riverside, Los Angeles, San Bernardino, Ventura, Santa Barbara, Kern, San Luis Obispo, Tulare, Mono, Inyo.

NORTHERN COUNTIES—The other 45 counties of the state.

COSTS OF HIGHWAYS IN CANADA.

A total expenditure of approximately \$45,000,000 for highways was made by the Dominion of Canada in 1926, according to advices just received by the Department of Commerce.

STANDING UP FOR A REST.

The street car was crowded. At one stop it took on another passenger. She was young, pretty and wore a trim sport suit. Up jumped a young man and with a polite bow said to the miss, "Won't you have this seat?" "No thank you," replied the young lady, "I have been sitting down all afternoon—I've been skating."

Big Increase of Motor Tourists Seen for 1927.

A check on incoming travel indicates that 20 per cent more cars came into the state during the first three months of this year than entered during a similar period last year. Approximately 4000 more cars were checked, which, considering the weather conditions prevailing on the transcontinental highways, is a likely indication of the tremendous influx of motor tourists for the year.

Dr. Smith—What did you operate for;
 Dr. Jones—Five hundred dollars.
 Dr. Smith—I mean, what did he have?
 Dr. Jones—Five hundred dollars.

HE HURRIED.

A prize yarn they're telling these days is said to be typical of blase Hollywood, and Broadway, New York, will be quick to understand. The yarn is that one chap telephoned another and excitedly told him to "hurry down to Hollywood boulevard, there's a naked woman riding a horse."

"Be right down; it's been a year since I've seen a horse in Hollywood," was the reply.

Local Politics.

Auto Tourist—"I clearly had the right of way when this man ran into me, and yet you say I was to blame."

Local Cop—"You certainly were."

Autoist—"Why?"

Local Cop—"Because his father is Mayor, his brother is Chief of Police, and I go with his sister."—Bison.

Magnificent Distances.

"Well, how was motoring in Manchuria?"

"We had one detour of 2000 miles."

Man (at restaurant): "Waiter, do you serve fish?"
 Waiter: "Yes, we cater to everyone."

New Legislation Affecting the State Highway System

IN MAKING an investigation of the approved bills affecting state highway legislation, the Highway Commission finds that more measures of value to the development of the State Highway System were passed by the Legislature and approved by the Governor in the 1927 session than at any session of recent years.

The measures show that the Legislature desires to safeguard the investment in and insure the development of the State Highway System, as well as to regulate its operation as a transportation system. However, without the broad understanding and encouragement rendered by Governor Young, some of the new legislation might not now be taking its place in the law books of California.

Some of the measures of most importance to the highway system are briefly described

Senate Bill 3. This bill was introduced by Senator Breed of Oakland. It provides an additional one cent tax on gasoline, the proceeds to be used entirely for further construction on the State Highway System. This bill fulfills the aspirations of Highway Commissions since 1921, and carries out the recommendations of the Highway Investigating Committee. It places new highway construction on a permanently financed basis and provides a substantial annual revenue therefor. During the 79th and 80th fiscal years, the new tax should produce about \$15,500,000.

Senate Bill 518 was also introduced by Senator Breed.

This legislation simplifies the Highway Commission's problems in allocating funds by classifying the highways in both northern and southern sections of the state. Long standing disagreements between sections as to the relative amount of highway expenditures are settled as the result of this legislation.

Senate Bills 708 and 709 were introduced by Senator Wagyon of Bakersfield. These measures repeal the gross receipt tax on commercial vehicles and trucks as embodied in former legislation, which tax has proven impractical of collection. They substitute increased registration fees for commercial vehicles in lieu of the tax provisions of the repealed bills.

Senate Bill 864 was introduced by Senator Nelson of Eureka. This bill legalizes the Highway Commission's policy in widening state highways, by fixing a minimum width of 80 feet for state highway right of way. Obtaining wider rights of way has become a difficult part of our problems. The fixing of a legal minimum width of 80 feet will be of incalculable assistance.

Senate Bill 885 was introduced by Senator Fellow of San Francisco. This legislation recognizes the growing public dissatisfaction with the slow transportation afforded by ferries, and the commercial value of toll bridges. It directs the State Highway Commission to investigate the toll bridge situation and report to the next Legislature on a plan for taking over by the public of all toll bridges on the State Highway System. The matter to be investigated is whether such structures should be owned by the public and operated at public expense or whether they should be built by private funds and paid for by the user in tolls which cover interest, repairs, depreciation and profits.

Senate Bill 847 was introduced by Senator Rush of Suisun. This bill recognizes an emergency and appropriates funds in

the amount of \$120,000 for the reconstruction of the Sacramento River bridge at Rio Vista, a lengthy structure, on a Legislative Act Road. Under the emergency appropriation, the bridge will be completed before revenue is available from the new gas tax.

Assembly bills of most interest to the highway organizations are as follows:

Assembly Bill 404 was introduced by Assemblyman Crittenden of Tracy. Its purpose is to clarify responsibility for the maintenance of irrigation structures on public highways.

It provides that those owning, maintaining and operating irrigation ditches requiring structures across the highway, must keep such structures in repair; however, when such structures are built in a permanent manner in accordance with plans approved by the county officials, their maintenance afterwards shall devolve upon the county.

Assembly Bill 1175 was introduced by Assemblyman Noyes of Yuba City. This bill appropriates \$200,000 for the construction of a causeway across the Sutter by-pass. This territory was divided several years ago by reclamation works under the control of the state. The appropriation provides for bridging the by-pass, and probably will be supplemented by Sutter and Yolo counties joining to improve the adjacent highway connections, thereby creating a short cut from Yuba City to Woodland.

Assembly Bill 1284 was introduced by Assemblyman McDonough of San Francisco. This provides \$600,000 from the General Fund for the purpose of paying the wages of convicts employed in road construction camps. Wages of prisoners average about 30 per cent of the total highway construction expense of these camps, and the highway funds are supplemented to that extent.

The bill also provides that convicts, when so employed, shall not come under the provisions of the Workmen's Compensation, Insurance and Safety Act of 1917.

Assembly Bill 1292, introduced by Assemblyman Byrne of Los Angeles, authorizes the transfer of State Prison Board funds to Highway Commission funds in a sum not in excess of \$100,000. This recognizes the justice of claims of the Highway Commission that prison appropriations for maintenance of convicts should be extended to prisoners employed in road camps. Highway funds devoted to prison road construction are supplemented to that extent by the measure.

Another enactment of great importance was Assembly Bill 1119, introduced by Assemblyman Feigenbaum of San Francisco. This bill creates a Department of Public Works, and creates a Highway Commission of five members as a division therein. Its purpose is the centralizing of all public works of the state under the jurisdiction of a director, who will serve as a member of the Governor's cabinet. From the administrative angle of the Governor and the Board of Control, responsibility is centralized under the new arrangement.

The most outstanding feature of the legislative policy was the absence of additions to the State Highway System. During the past few years, those interested in state highway matters have realized more and more that funds provided could never accomplish the completion and adequate maintenance of the state system unless its mileage was limited. An equitable division between the state and the various counties of responsibility for public highway construction and maintenance is necessary if state highway affairs are to be prosecuted in a business-like manner.

REVISED EDITION OF STANDARD SPECIFICATIONS

By L. V. CAMPBELL, Office Engineer.

A REVISED edition of the standard specifications of the California Highway Commission is now on the press and is expected to be available for distribution shortly after the appearance of this issue of the Bulletin.

In furtherance of the general movement for uniformity in specifications, this edition has been made to conform with the form and arrangement approved as standard by the American Association of State Highway Officials. This has made necessary a rearrangement of the order in which the different sections covering the various items appear.

The general provisions, which included the first 38 sections of the 1925 specifications, have been rearranged and enlarged. The former general provisions have been incorporated in the appropriate place in the new arrangement, together with considerable new text. The additional matter includes a more complete definition of terms, and goes into more detail in order to set forth clearly many points which had formerly been omitted.

The revisions of the construction details are more in the nature of bringing the specifications up to date so as to conform with present practice and to incorporate in the standard specifications those details which are at present included in the special provisions.

The principal changes which will appear in the standard specifications are briefly outlined below:

New methods of test for determining the suitability of surfacing materials and aggregate for concrete have been included and are made a requirement for such materials. These particular methods are peculiar to the laboratory of the Commission and were developed as a result of research, to improve on the older methods of test in general use, and to supersede the specification for French Coefficient and the Deval Abrasion tests. These tests are fully described in the issue of April, 1926, of CALIFORNIA HIGHWAYS and are briefly described in the general provisions of the revised specifications.

The work of clearing and grubbing has been separated from the grading specifications and included in a separate section with the view of making clearing and grubbing a separate pay item where that work is of any considerable extent; incidental clearing and grubbing such as encountered on usual reconstruction projects will be included in the grading as has been our previous practice.

The section on grading has been somewhat rearranged and the specifications for structure excavation placed in the grading section; payment for structure excavation, however, will be made as an item separate from the grading as heretofore.

The specifications for rock borders has been revised to conform with our present practice as included in the special provisions for each contract.

The specifications for waterbound macadam base have been separated into two sections, one for type "A" and one for Type "B." The specifications for type "A" macadam have been rewritten to require that stone screenings be used for filler and that they be worked into the voids by rolling and watering. The specifications for type "B" macadam remain the same as formerly with the addition of the Rattler test and Cementing test to determine the suitability of the material.

Only one type of bituminous macadam surface is included in the new edition, this being the type "C" of the 1925 edition.

In general this section remains the same with the addition of the abrasion and toughness requirements heretofore mentioned.

Side forms for asphalt and concrete pavement have been included in a separate section, and the specifications for side forms taken out of the sections covering paving.

The Rattler tests have been substituted for the French Coefficient requirement for broken stone for asphalt concrete base; also broken stone may be made by crushing boulders larger than 8 inches and screened gravel is permitted for that portion of the aggregate smaller than $\frac{3}{4}$ inch. The grading of material for type "A" asphalt concrete surface has been revised to provide for a higher dust content as has been included in some of the latter asphalt surfacing contracts. Also the surface finish specifications have been revised to provide for asphalt coated stone screenings rolled into the hot mixture.

The specifications for Portland Cement Concrete pavement have undergone some changes, and the new edition will provide for paying for one-half of the additional concrete placed on low subgrade at the contract price up to 5 per cent of the theoretical amount required. Also a variation of 2½ per cent of cement either way will be permitted, and any excess or deficiency greater than 2½ per cent variation will be paid for or deducted. Joints in pavements have been revised to conform with our present practice and provide for a longitudinal joint of the weakened plane type to be cut in the pavement; also expansion joints of asphalt and cork composition to be placed at 60 foot intervals with a cut or dummy weakened plane joint at 20 foot intervals. The reinforcement of edges of concrete pavement is included as standard in the revised edition. The time of curing has been reduced to eight days and the time of opening to fourteen days, depending upon the modulus of rupture of the concrete.

The section on reinforced concrete structures has been expanded and foundation treatment for structures included in this section. Also revisions have been made for foundation bearing tests and the specifications for arch rib construction included in this section. Various other minor revisions have been included.

In the section for timber structures, a specification has been included for laminated or strip floors. Other minor revisions have also been incorporated.

The strength requirement for reinforced concrete pipe culverts has been increased and the shell thickness slightly increased in some of the sizes.

The specifications for rip rap have been rewritten to provide for two types; light rip rap and heavy rip rap.

A section has been added for underdrains which includes both tile drains and perforated metal pipe. The specifications for drain tile have been expanded from that in the former edition.

The section for guard rails has been revised to provide for laminated rails in addition to the solid rail.

The following sections not included in the 1925 edition have been added to the 1927 edition: Vitrified clay pipe, waterproofing, drainage system for subways, and fuel oil. Also cuts showing the design for standard structures are included.

The 1927 edition of the standard specifications will be put into use as soon as they are received from the printer and

HIGH HEAD PUMPING ON PAVING JOB

The necessity of securing water for the Mountain Springs paving job in San Diego County probably resulted in the establishment of a new record for the highest head encountered on any paving project in California.

It was necessary to secure water at Jacumba and to pump it over a summit 4.4 miles east, from which point it flowed by gravity to the work. The difference in elevation between Jacumba and the Summit Reservoir was about 417 feet. The amount of water required was estimated at 300 gallons per minute. The total elevation between the summit and the lowest point to which the water was carried for use was 1753 feet.

The pumping to the summit was accomplished by means of a 2½ inch six-stage type MMB horizontal centrifugal pump with bronze impellers. The pump was operated by a 5½-inch by 6½-inch, 4-cylinder Waukesha Industrial Power Unit with twin disc clutch power take-off. A 4-inch welded steel line was used to convey the water to the summit and this line crossed the highway ⅓ of a mile east of the pumping station, with two 45° angles.

In order to insure full discharge, a booster pump was located 2.6 miles from the first pump. This was a 4½ by 5½ Triplex pump, also driven by a Waukesha motor. The piping was so arranged, that the water could be passed through the pump or by-passed around it, which made it possible to operate either only the first pump or use both pumps at the same time.

GRAVEL ROADS PREDOMINATE IN FEDERAL AID SYSTEM

Gravel roads predominate in the 55,903 miles of Federal Aid roads constructed through the country, according to percentages recently published as follows:

	Percent	Mileage
Gravel type	35.5	19,845.56
Graded and drained.....	23.2	12,969.50
Concrete pavement	22.0	12,298.66
Sand clay	8.1	4,528.14
Bituminous macadam	5.6	3,130.57
Bituminous concrete	2.4	1,341.67
Water bound macadam of brick....	3.2	1,788.90
Total	100.0	55,903.00

During the past year there were improvements on 9400 miles of the Federal Aid System, bringing the total improved highways in the system to 55,903 miles.

REVISED EDITION OF STANDARD SPECIFICATIONS

(Continued from page 10.)

distributed. A copy will be sent to each person or firm whose name is on our mailing list to receive copies of notice of contractors of work advertised for bids.

Our present practice will be continued of issuing special provisions for each contract that is advertised; these special provisions will contain data and direction relating to the particular project and such modifications from the provisions of the standard specifications as may be necessary to complete the proposed improvement as contemplated. The special provisions are not complete specifications for a job being supplementary to the standard specifications.

Eleven

PUBLIC APPRECIATE WORK OF COMMISSION THROUGHOUT STATE

That the work of the California Highway Commission is a credit to the administration is reflected in communications coming into the central office from a number of the divisions.

The Coast Auto Lines of Grants Pass, Oregon, appreciatively commend the Division I maintenance work from the state line to Adams Station, Del Norte County, during the winter months.

The city authorities of Larkspur, Marin County, Division IV, have written a letter of praise for the recent improvement in their town. The Chamber of Commerce at Encinitas, Division VII, is thankful for prompt and efficient work in their community, while the Bear Valley Supper Club of Fawnskin, San Bernardino County adopted resolutions commending recent improvements by Division VIII.

REDWOOD HIGHWAY INSPECTION TRIP

During the first week in June the Highway Commissioners made an official inspection trip over the Redwood Highway from Sausalito to the Oregon line. Conferences were held at a number of points where the requests of representative citizens regarding state highway work were heard and present and prospective routes were inspected.

The Commission's party was received with extreme cordiality at all stops and learned of the highway desires of the regions visited. At over-night gatherings and other meetings the Commissioners were able to meet community leaders and much good-will evolved from the exchange of ideas concerning the future of the California highway system. To the Commerce Chambers of Santa Rosa, Upper Lake, Ukiah, Eureka and Yreka, the Commissioners are duly thankful for splendid receptions. They also met Cloverdale, Fort Bragg, Crescent and Montague committees, gathering information concerning many state highway problems.

A conference with the Oregon commissioners, at which interstate connections were discussed and inspection of the Pacific Highway from the Oregon line to Sacramento, completed the trip.

HIGHWAY COMMISSION ATTENDS EXPOSITION OPENING

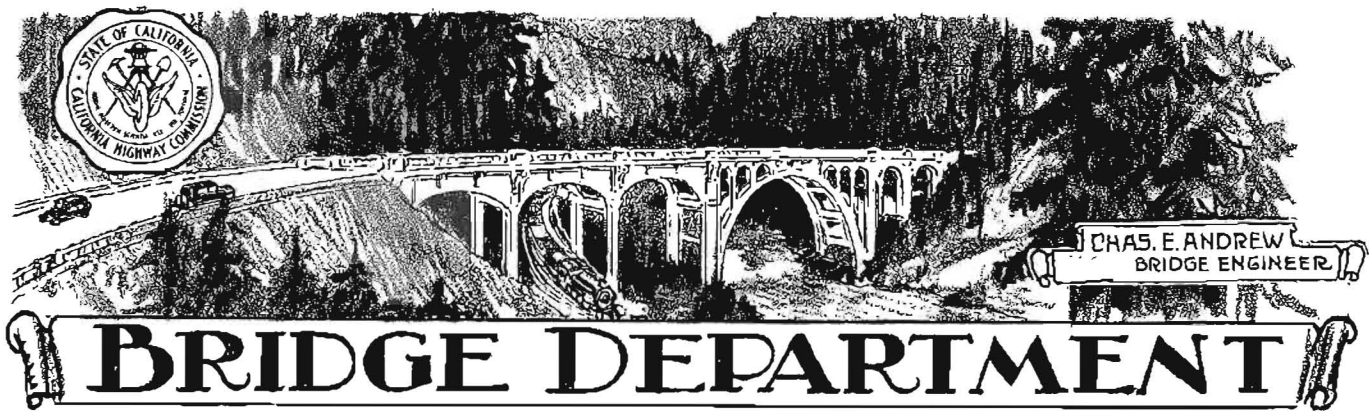
The party composed of California state highway officials attended the official opening of the Nevada Transcontinental Highways Exposition on June 25. They commented very favorably on the affair and were well pleased with the showing being made by California. The California building is a substantial part of the exposition.

The Commissioners spent most of the trip on an inspection of the Auburn-Truckee, Lake Tahoe and Placerville routes of the State Highway System.

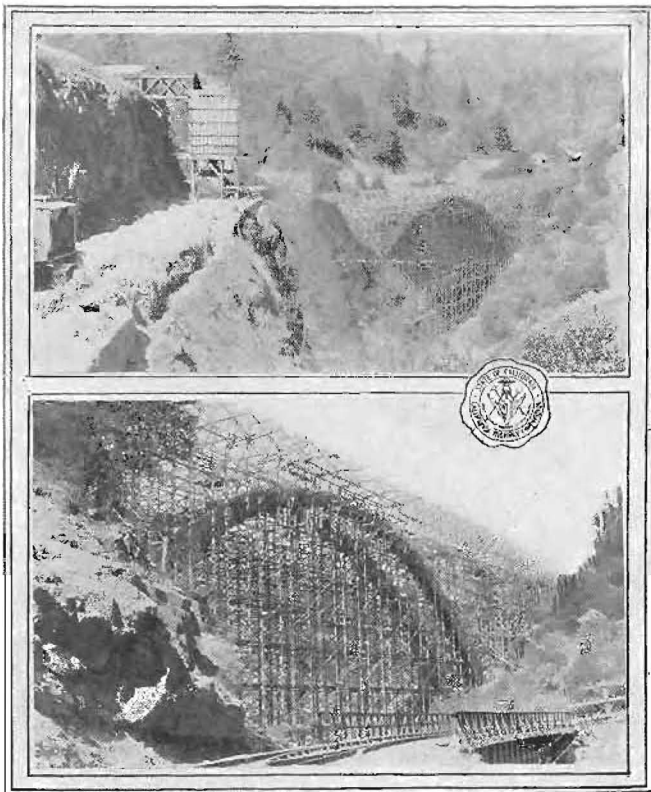
New York City Has Army of Snow Fighters.

New York has 700 pieces of motor-driven equipment and 1500 trucks available for snow removal. The metropolis is planning to keep the streets clear of snow and prevent traffic tieups caused by unfavorable weather in winter.

The final link in the "dustless route" from San Bernardino to Daggett has been completed. Highway commission crews have carried into Daggett the oil-gravel roadway started in Victorville a year ago. Fifty miles of the desert has been spanned with the new highway.



CONSTRUCTION UNDER WAY ON
HARLAN D. MILLER MEMORIAL



Falsework for Harlan D. Miller bridge in the Sacramento River Canyon; view taken from the S. P. tracks.

Above—Plant layout and falsework, Harlan D. Miller bridge.

Timber spider-web in the falsework for the Harlan D. Miller Memorial Bridge, forty miles north of Redding on the Pacific Highway, has been constructed. Footings, arch abutments and arch ribs have now been placed on this contract, which is one of the longest arch spans ever built by the state, being 230 feet on springing line.

Owing to the great length and weight of the ribs, and the very high rise of arch, which tends to cause deformation of falsework during placing, some unusual problems had to be dealt with.

The upper photograph shows the plant layout of Bordwell and Brugge. Aggregate in three sizes is trucked into the bunker, from the present traveled way, and measured into the mixer under bunker through hoppers. The whole plant being at the higher end of the bridge. By this system the proportioning of cement has been of remarkable accuracy, and economy of handling is obtained by the movement of materials being continuously downward to forms.

This is Resident Engineer Johnson's third highly artistic and spectacular bridge on this route. The combination of bridges, the remarkable alignment and finish of work on the new Division II road construction gives an engineering effect probably unsurpassed in the state.

BRIDGE ROADWAY TO BE
140 FEET ABOVE STREAM BED

In addition to the three other bridges noted, a fourth bridge at Pollards Gulch is to be constructed on this route near La Moine, which will consist of a single 200-foot arch span and 200 feet of concrete approach spans, making a total length of 400 feet. This structure is to span Pollards Gulch at a point where the banks are steep and rocky, thus making an ideal site for an arch structure. The bed of the stream will be 140 feet below the grade of the roadway. Pilasters over the arch abutments will have a height of approximately 55 feet. It is anticipated that the construction of this structure will be under way this season.

SUGAR IN CONCRETE.

Recently two cases of failure of concrete to harden in Egypt, where sugar is very plentiful, led to an investigation of the effects which sugar has on the setting of concrete.

After thorough investigation it was found that sugar combines with lime to form saccharates. These destroy the resistance of the concrete in the Le Chateleur tests, and the lowering of the strength is proportional to the amount of sugar present.

Interesting cases of the failure of concrete due to sugar content came to light during the investigation. In one instance, certain portions of a building failed to set and a sugar content of 2 per cent was found in the cement. It was discovered that this sugar came from the bags which had been filled with sugar before being used for cement.—Tech News.

BRIDGE DEPARTMENT NEWS

DELMAR OVERHEAD AWAITS
CONSTRUCTION OF APPROACHES

M. E. Whitney recently completed his work on the Del Mar overhead crossing in San Diego County and is now enjoying a tour through Nevada and Utah. He will be in charge of the Galivan overhead crossing in Orange County.

J. A. Maurer and Sons of Eureka have been awarded the contract for the construction of Slate Creek bridge in Shasta County. This work will be under the supervision of W. H. Johnson. W. H. Carpenter will assist on this project.

W. S. Kingsbury, Jr., is enjoying his vacation in Los Angeles.

W. G. Remington, having recently completed the work on Gaviota Creek bridge in Santa Barbara County, is enjoying a vacation in the Bay district, after which he will have charge of the construction of Wildcat Creek bridge in Contra Costa County.

Frederickson and Brothers of Stockton have been awarded the contract for the bridge across Stockton diverting canal. Guy Mayes, who recently completed the Viejas Creek bridge in San Diego County, will have charge of the work.

E. K. Elder, L. C. Hollister and Lloyd G. Marshall are new employees of the department. Elder and Hollister have been assigned office duties and Marshall will assist W. H. Johnson on the Shasta County bridges.

W. J. Christy, who has been assisting G. W. Thompson on the South San Francisco undergrade crossing, will be assigned to the construction of the three concrete girder bridges across Tassajaro, Alamo and Las Positas creeks in Alameda County.

Leonard T. Isham of Rio Vista has been awarded the contract for constructing the timber trestle across Sacramento River near Rio Vista. W. B. Anderson, who was in charge of the construction of Las Flores creek bridge, has been assigned to this work.

O. P. Dodds will assist Harry Carter in the construction of the Ben Ali undergrade crossing north of Sacramento.

Announcement was received recently of the marriage of Jean P. Winslow and Anna Calvin in San Francisco on June 5.

Because of the illness of his mother, S. Potashnick is leaving the department on July 15, accompanied by his family, for an extended trip to the east.

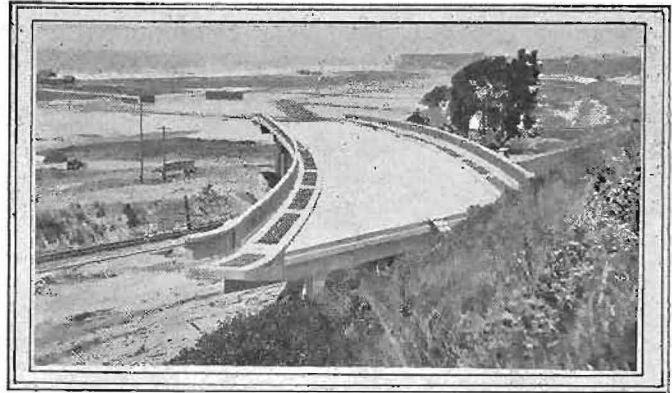
R. W. Van Stan, who was recently transferred from Division VII to the Bridge Department, is assisting A. B. Willett on the Santa Ana overflow bridge.

Trestle Replaces Sand Fill.

A gap in route 60, opened by high flood water, together with an unusually high tide, removed nearly 1000 feet of sand fill and pavement at a slough near Huntington Beach, has been closed and the section again placed in first class condition by the completion of a timber trestle at Santa Ana overflow channel. Since the traffic at this point is about 16,000 cars per day, future widening of this section was anticipated in the design of the bridge, which carries a 34-foot roadway and a 6-foot sidewalk.

Bridges Widened to 40 Feet.

Heavy and rapidly increasing traffic on this route made advisable the widening of three bridges near the Los Angeles-Ventura county line, at Las Virgines Creek, Vejor Creek, and the West Fork of Vejor Creek, to accommodate a 40-foot roadway. Slight repairs were also made to the bridge across Conejo Creek. J. W. Wilson was resident engineer.



Del Mar overhead crossing in San Diego County, just completed and awaiting construction of approaches.

Following the program of grade separations being worked out over the state, an overhead crossing of the A. T. & S. F. Railroad has been recently completed at Del Mar, San Diego County. The design of this bridge follows the girder type of construction. Column bents support 45, 47 and 28 foot spans. M. E. Whitney was in charge.

South Gets Improved Structures.

The Coast road, route 2, from San Francisco to San Diego, has been further improved by the construction of two bridges, an overhead crossing and repairs and widening of four bridges, all of which have been completed this month and with the exception of the overhead crossing, are available for travel.

The most northerly of these structures is at Gaviota Creek, about 30 miles north of Santa Barbara, where a reinforced concrete, four span, girder type bridge replaces an old steel bridge. The new crossing made possible a realignment which increased the radii of three curves. Federal aid was obtained for this project which was built under the direction of W. C. Remington, resident engineer.

WHAT SOME OTHER STATES ARE DOING IN ROAD
IMPROVEMENT.

ILLINOIS—The budget for 1927 of this state is \$36,000,000 for the primary roads and \$70,000,000 for its entire road system. Illinois now has 4500 miles of paving on its primary roads and 1300 miles on secondary roads. In this state there are, too, 5966 miles of completed hard roads in the state's highway system, and 1947 miles of grading completed.

KANSAS—Since June, 1921, more than \$12,000,000 has been spent for bridges on the state and county systems. At least 50 per cent of the county roads, though not graded to standard, have wide and well-kept roadways and are generally in good condition in dry weather.

MARYLAND—Maryland's state road system was designated in 1908, and was the first system to be placed entirely under state control for both construction and maintenance.

NEW JERSEY—A program for improvements of the highways of this state, to cover approximately 1900 miles, extending over a twelve year period at a cost of \$60,000,000, is scheduled for presentation to the Legislature early next year.

VIRGINIA—Virginia will spend nearly \$10,000,000 for good roads this year. The state highway commission has provided for an expenditure of \$8,000,000 to improve the main highways and \$1,250,000 to improve feeder roads.

WEST VIRGINIA—Governor Gore has affixed his signature to the road bill of the 1927 Legislature, making it possible to reissue \$15,000,000 worth of bonds to carry out West Virginia's highway program.

WISCONSIN—The funds of the state highway commission for 1927 are estimated at \$24,566,000 and the plans for the year include 374 miles of paving. Wisconsin has about 2070 miles of pavement.

WHAT THE DIVISIONS ARE DOING



The Grade III and Grade IV Engineers sometime in oral examination encounter questions of highway economics which are new to them. The Examining Boards report that there is too little evidence of outside reading and keeping up with new developments and trend of experiments in highway data.

A very instructive bit of reading is found in the engineering bulletins of the State College at Pullman, Washington. Several progress reports are available on the relation of road surfaces to automobile tire wear, and all publications contain results of actual tests on wear, as well as progress reports on other investigations.

Every highway engineer will profit by the perusal of the third progress report in their engineering bulletin No. 18.

DIVISION I.

HEADQUARTERS, WILLITS.

T. A. BEDFORD, DIVISION ENGINEER.

Counties of Del Norte, Humboldt, Mendocino, and Lake.

It Rains in Del Norte.

As the California Highway Commission is being asked to do highway work in Del Norte county, it might be of interest to the Commission and contractors that for six months of the year it rains enough in any one month to do many parts of California for an entire season. The following is the past season's rainfall record as clipped from the Crescent City American:

September	1 55 inches
October	8 47 inches
November	23 63 inches
December	12 04 inches
January	15 94 inches
February	18 46 inches
March	10 28 inches
April	6 20 inches
May	2 32 inches
Total	98 89 inches

San Diego Bridge Gets Federal Aid.

Las Flores Creek in San Diego County is now crossed by a 150-foot reinforced concrete girder type bridge. The cost of this job was increased considerably by the necessity of a detour trestle and on account of extensions to the apron or concrete mat paving placed in the stream bed at the bridge site. W. B. Anderson was the state's engineer. The total cost of this job, part of which was paid by Federal Aid, will approximate \$30,000.

DIVISION VII.

HEADQUARTERS, LOS ANGELES.

S. V. CORTELYOU, DIVISION ENGINEER.

Counties of Los Angeles, Ventura, Orange, San Diego, and eastern Kern, south of Mojave.

76-Foot Highway for Orange.

A 76-foot pavement will be the result of the work now being done at Laguna, Orange county, on the Oxnard-Capistrano highway. The state has finished and opened its part of the job, 20 feet in width, and the rest is now being done by an improvement district under the supervision of the state. Between Myrtle Street and Cliff Drive, the pavement will be 72 feet wide with curbs. Southerly from Cliff Drive, the pavement will be 56 feet wide between curbs.



Ora-2-C: View of new 56' concrete pavement and curbs near Tustin, Orange County.

Other Paving Jobs Progressing.

On the reconstruction of the Coast Highway westerly from Ventura, good progress is being made. The 20 foot concrete is completed for a distance of 3.4 miles. Back of the concrete seawalls along this stretch the pavement is 30 feet wide.

In addition to the completed pavement over 5 miles of half-width pavement, 10 feet wide, has been laid.

All grading work has been completed on the approaches to the new Carlsbad Overhead Crossing of the Santa Fe tracks in San Diego County, and the placing of the bituminous macadam pavement is nearly completed.

The concrete pavement is now completed and open to traffic on Mt. Springs Grade in San Diego and Imperial counties.

Wedding Bells in Division VII Headquarters.

Miss Marie Carmel, popular member of Division VII's office force, recently gave her friends quite a surprise by coming down to the office one morning with a brand new name. She is now Mrs. H. F. Dahlman.

Also the "spring time influence" was felt at the Lankershim Shops, resulting in the marriage of Carlotta Morgan and Chas. H. Berry, both well known employees at the Lankershim Shops. Mr. and Mrs. Berry are now taking their vacation in Canada.

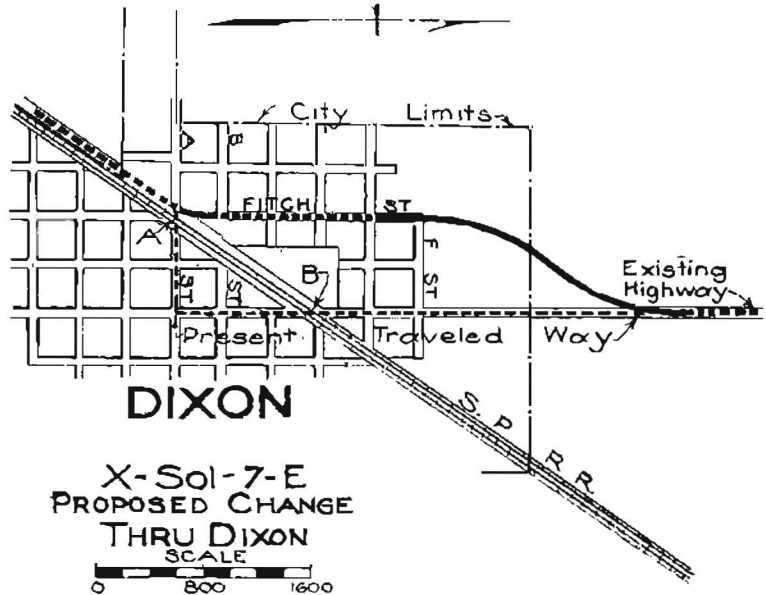
Work on Dixon Rerouting to be Done this Summer

(Reported by R. E. PIERCE, Acting Division Engineer, Division X.)

THE Highway Commission has directed that immediate steps be taken to proceed with the acquiring of the necessary rights of way for the state highway on a new alignment through the town of Dixon, to eliminate two grade crossings with the Southern Pacific railroad inside the town, which have been the cause of several fatal accidents in recent months, one of which resulted in all but one of a stage load of ten people being killed.

Approaching from the south, this line will leave the present route of the highway at "A" Street, thence along Fitch Street to its north end, thence along two easy reverse curves across the private right of way into the present highway about 1000 feet north of the city limits of Dixon.

As soon as the rights of way are acquired, it is planned this year to place the necessary drainage structures and grade and gravel a roadway so as to have a satisfactory foundation for the permanent pavement next year. Some of the property owners are a little extravagant in their ideas of values of their property and it has become necessary to condemn some of these properties.



Solid Line New Construction
 Broken Line Present Pavement
 A & B Grade Crossings.

DIVISION IV.

HEADQUARTERS, SAN FRANCISCO.

JOHN H. SKEGGS, DIVISION ENGINEER.

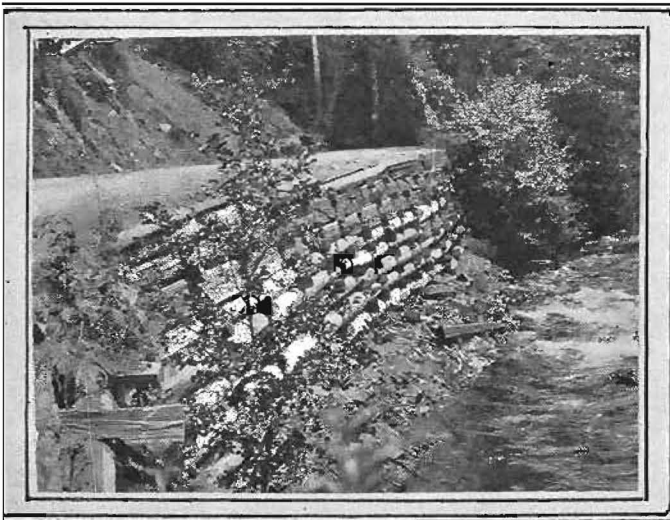
Counties of San Francisco, Marin, Sonoma, Napa, Contra Costa, Alameda, Santa Clara, Santa Cruz, and San Mateo.

DIVISION X.

HEADQUARTERS, SACRAMENTO.

R. E. PIERCE, ACTING DIVISION ENGINEER.

Counties of Amador, Calaveras, Alpine, Tuolumne, Stanislaus, San Joaquin, Solano, and southern Sacramento and Yolo counties.



REDWOOD CRIBBING—On the Big Sur highway south of Carmel; used to repair recent spring storm damage.

MINIMUM AUTO LICENSE \$300.

With all its advancement, Japan sticks to its old-fashioned jinrikisha as a pleasure craft, probably because the cheapest automobile license in that country is \$300. Most of us in the good old U. S. A. kick because we have to pay ten bucks for a license on a machine that will go like—(well, you know, if you own one)—and come back the same way.

Fifteen

Sixty Miles Oiled.

The entire oiling program was completed on June 11, there being 60 miles treated, as follows: San Andreas to Clements, San Andreas, 2½ miles south towards Angels Camp 2½ miles east of Jackson to Clay Station, and from Keystone to Jamestown.

Construction Activities.

Proposals for grading and surfacing with standard road surfacing and crushed rock or stone of that portion of the state highway north of Stockton from the northerly city limits at Wilson Way north to Cherokee Station, a distance of approximately 2½ miles, will be received July 11, 1927.

Construction of the sand fill approaches to the new bridge over the San Joaquin River at Mossdale is progressing rather slowly. However, we expect to have this road ready for traffic at approximately the same time as the bridge is opened.

Right of Way Matters.

The Right of Way Department is experiencing a little difficulty in securing deeds for right of way for a line change through the town of Dixon. As soon as the right of way matters have been settled, this unit will be advertised for construction. The construction proposed consists of grading 40 foot roadbed and placing a 20 foot by 6 inch gravel surface connecting with the present pavement at Fitch Street.

STATE HIGHWAY FUND CONTRACTS (Bond Funds, Including Federal Aid)

Cont. No.	Di- vision	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
COMPLETED AND ACCEPTED SINCE MAY 11, 1927.											
503	VIII	Imperial.....	26	H	Between Brawley and Westmoreland.....	0.46	Grading and Rock Surfacing.....	F. C. Payton.....	\$120,890 26	June 28, 1926	-----
509	VIII	Riverside.....	64	D-E	Between Black Butte and Blythe.....	9.50	Grading and Rock Surfacing.....	S. Y. Faucett.....	87,500 00	July 14, 1926	-----
516	V	San Benito.....	2	E	Across Gaviota Creek near Gaviota.....	-----	Concrete Girder Bridge.....	Oberg Brothers.....	23,411 25	Nov. 16, 1926	-----
520	VIII	Imperial.....	26	F	Adams Ave. to north city limit El Centro.....	0.50	Grading and Rock Surfacing.....	C. E. Pitzer.....	9,053 50	Mar. 28, 1927	-----
AWARDED SINCE MAY 11, 1927.											
525	VII	Los Angeles, Orange.....	60	E-A	Between Naples and Anaheim Bridge.....	1.50	P.C.C. Pavement.....	Matich Brothers.....	59,427 56	June 1, 1927	75
526	II	Plumas.....	29	A	Between Lake Almanor Causeway and Chester Grade.....	0.86	Grading and C.M. Culverts.....	C. B. Clendenning.....	12,024 58	June 1, 1927	75
Total State Highway Fund Contracts Awarded.....						2.36	-----	-----	571,502 12	-----	-----

Note.—Primary construction covered by the above contracts does not include funds obligated on cooperative forest highway projects, prison camp road activities, or day labor jobs not being done under contract.

STATE HIGHWAY MAINTENANCE FUND CONTRACTS (Including Gasoline Tax Fund)

Cont. No.	Di- vision	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
COMPLETED AND ACCEPTED SINCE MAY 11, 1927.											
M-118	II	Shasta.....	3	C	Between Dog Creek and La Moine.....	4.45	Grading and Standard Surfacing.....	George Pollock Co.....	\$316,770 56	April 23, 1926	-----
M-135	VII	San Diego.....	2	A	Over A. T. and S. F. Railway at Del Mar.....	-----	Concrete Girder Bridge.....	John Short.....	31,508 56	July 30, 1926	-----
M-139	VII	Los Angeles, Orange.....	2	D-F	Between Michigan Ave., Whittier and La Mirada St.....	3.77	Grading and P.C. Concrete.....	George Herz and Co.....	205,573 11	Aug. 28, 1926	-----
M-144	IV	Marin.....	1	B	Through Ross and Larkspur.....	2.46	Asph. Conc. Widening and Surfacing.....	Pacific States Const. Co.....	108,190 91	Sept. 14, 1926	-----
M-155	VII	Los Angeles-Ventura.....	2	C-B	Las Virgenes, Vejar and West Fork of Vejar Creek.....	-----	Widening Three Bridges.....	Henry Averbach.....	23,989 78	Oct. 29, 1926	-----
M-156	VII	San Diego.....	2	C	Across Las Flores Creek, near Las Flores.....	-----	Concrete Girder Bridge.....	Sidney Smith.....	28,872 50	Oct. 29, 1926	-----
M-166	II	Tehama.....	29	A	Paynes Creek.....	-----	Maintenance Buildings.....	Martin Construction Co.....	4,607 00	Mar. 28, 1927	-----
AWARDED SINCE MAY 11, 1927.											
M-169	VII	Orange.....	60	A	Santa Ana River.....	-----	Cleaning and Painting Bridge.....	W. M. Ledbetter and Co.....	3,183 75	June 1, 1927	75
M-170	V	San Luis Obispo.....	38	A-B	Paso Robles East.....	-----	Painting Three Bridges.....	D. E. Burgess.....	10,168 18	June 1, 1927	60
911EC1	II	Shasta.....	3	C	Across State Creek at La Moine.....	-----	R.C. Girder Bridge.....	Fred J. Maurer and Son, Inc.....	26,063 44	June 23, 1927	225
92EC1	II	Shasta.....	3	D	Between La Moine and Shotgun Creek.....	6.67	Grading and Rock Surfacing.....	A. Haidlen Co.....	317,109 26	June 23, 1927	250
94EC1	IV	San Mateo.....	2	A	Between Colma and Cypress Lawn Cemetery.....	1.50	P.C.C. Pavement.....	Hanrahan Co.....	203,769 45	June 23, 1927	76
97FC1	VII	San Diego.....	2	A	At Del Mar.....	0.80	P.C.C. Pavement, Crossing Approaches.....	John and Bressi Const. Co., Inc.....	64,795 54	June 28, 1927	150
911EC2	X	San Joaquin.....	4	C	Across Stockton Diverting Canal.....	-----	R.C. Girder Bridge.....	Frederickson Brothers.....	31,408 06	June 23, 1927	125
Total State Highway Maintenance Fund Contracts Awarded.....						8.97	-----	-----	\$856,436 63	-----	-----

Note.—The above obligations charged against the State Highway Maintenance Funds do not include funds from these sources obligated for general maintenance and for specific betterments being done under day labor authorization.

CALIFORNIA STATE PRINTING OFFICE
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CALIFORNIA HIGHWAYS.

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