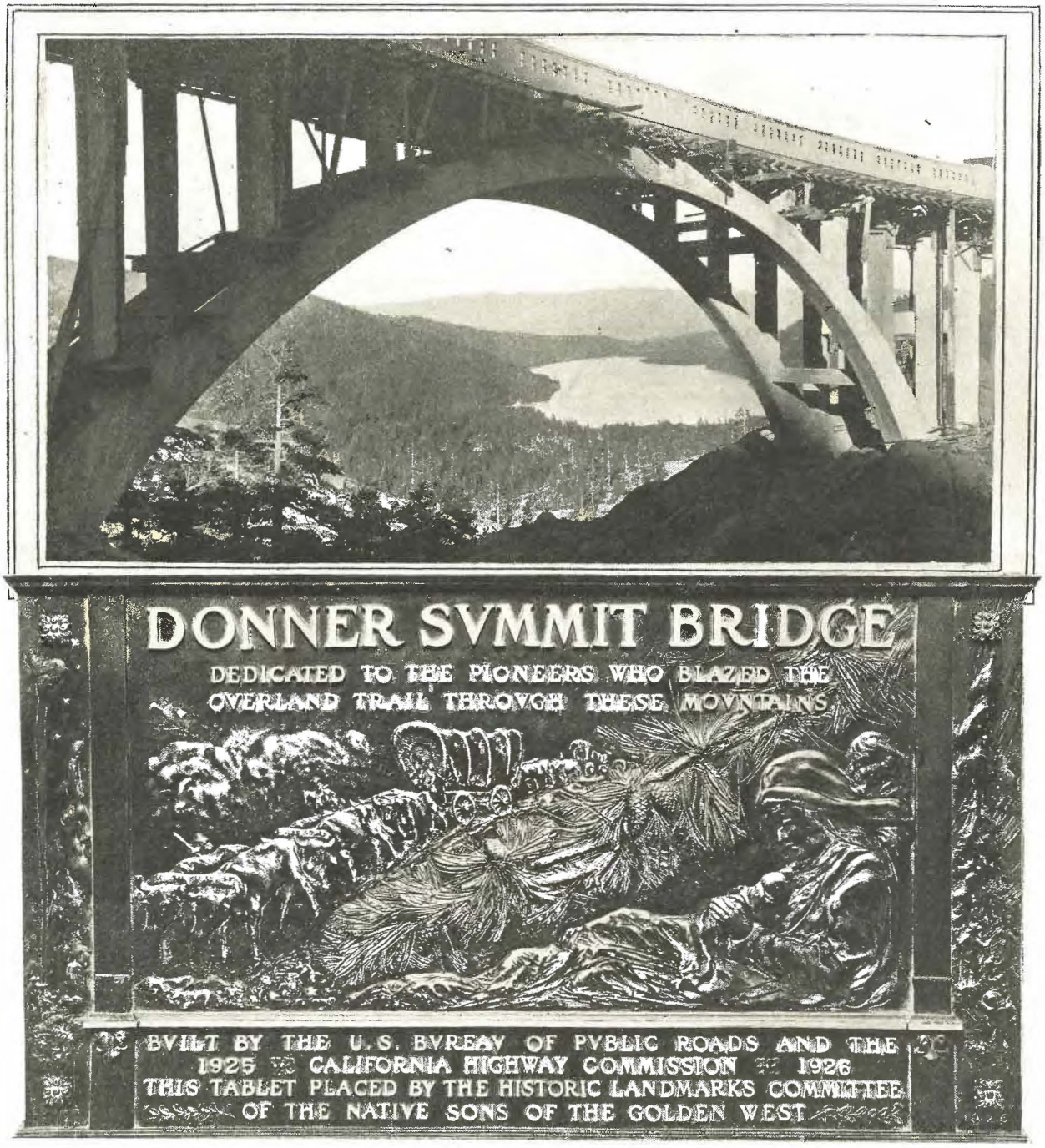
CALIFORNIA HIGHWAYS

A BULLETIN ISSUED BY THE CALIFORNIA HIGHWAY COMMISSION FOR THE INFORMATION OF ITS EMPLOYEES AND THE PUBLIC

Vol. 3 SEPTEMBER, 1926 No. 9



CALIFORNIA HIGHWAYS

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FRANK B. DURKEE - - - Editor

P. O. Box 1103, Sacramento, California.

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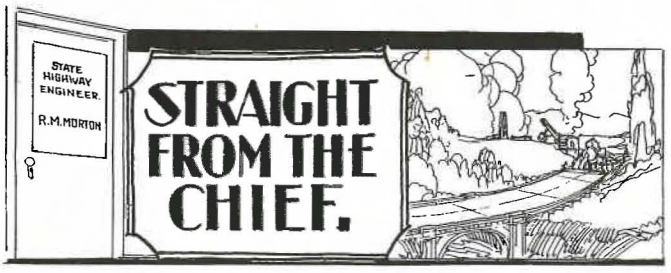

ADJACENT to the cities, more intensive settlement of land seems to follow construction of State highways. This evolution in ownership and in usage brings up an interesting study in psychology of ownership which should be thoughtfully considered by all of the engineering employes.

It is almost axiomatic that when land is used for farming, the attitude of the property owner is against setting aside for the use of the public any more than the minimum width of right of way. Many bitter disputes have arisen over the obtaining of widths of 60 feet, which was the former standard, and it is still more difficult to induce owners of farming land to dedicate the present standard of 80 feet. There are, of course, exceptions.

Subdivision Changes Attitude.

This attitude often changes when the character of the land changes from agricultural to subdivisional. Immediately the owner appreciates that all possible advantages of location and frontage should be developed by him to interest prospective purchasers. We find quite generally a desire on the part of

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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.

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Donner Summit Bridge Marks Evolution of Overland Trail

MARKING forcefully by its very boldness the evolution of the emigrant road of the pioneers into the great transcontinental highway of the present, Donner Summit bridge, near the crest of the Sierra in Nevada County, has been completed and opened to traffic. It is dedicated, "To the Pioneers who blazed the Overland Trail through these mountains." Descendants of survivors of the Donner party, the terrible tragedy the scene of which the bridge overlooks, joined with Native Sons of the Golden West and state and federal highway officials on August 22d in the formal unveiling of a memorial tablet on the spectacular structure.

High up amid the granite crags of the Sierra, Donner Summit bridge, a forest highway project, is one of the most unique structures on the state highway system of California. It spans a rocky chasm at an elevation of nearly 7,000 feet and was built to make possible a grade of not to exceed 7 per cent from Donner Lake to the Summit; eliminating for all time the 18 and 20 per cent grades of the old road, first projected in early days, and for years the most difficult section of the most important interstate connection to the East in northern California. The new state highway is the third road to be built up this rocky precipice.

Unusual Engineering Features.

Unusual engineering features of the bridge make it a distinctive structure. It has a handsome arch 110 feet in length with a depth of 70 feet, yet it is built on a compound curve and on a grade of 7 per cent. Its clear roadway width is twenty-four feet and its total length, including approaches, is 241 feet.

As a part of the lower approach span, there has been constructed an elevated observation platform twenty-five feet in length and seven feet wide, on a pedestal of which the memorial tablet of the Native Sons was placed. Here the motorist may enjoy, safely guarded from passing traffic, the marvelous view of the high Sierra and the Donner Lake basin which unfolds below. It was near this spot that the Donner party turned back in October, 1846, balked by snow in its attempt to cross the summit. Because of the historical significance of the spot, the observation platform was deemed appropriate. A wide parking place for automobiles also has been provided near by.

Donner Summit bridge was built by the United States Bureau of Public Roads in accordance with plans furnished by the bridge department of the California Highway Commission. Funds came from federal appropriations for roads within the national forests. C. C. Gildersleeve was the contractor and C. S. Bruning resident engineer for the bureau. Cost of the bridge, including the features added after the contract was awarded, was approximately $40,000.

Bridge Part of Larger Improvement.

The bridge, destined to become a well known stopping place on the Victory highway, is the outstanding feature of a larger improvement which includes the grading and surfacing of 6.9 miles of the state highway from Soda Springs to Donner Lake. This new section is now open to traffic, eliminating three dangerous grade crossings of the Southern Pacific railroad.

The section from the lake to the Summit, 3.2 miles, was graded by the California Highway Commission at a cost, including engineering, of $212,500. It involved difficult construction largely through solid granite. The section from the summit to Soda Springs, 3.7 miles, was graded by the Bureau of Public Roads as a forest highway project at an approximate cost of $120,000. Surfacing of both sections, 6.9 miles, was another forest project in charge of the bureau, the work costing approximately $75,000; making a total expenditure for the improvement of the seven miles, including Donner bridge, of nearly a half million dollars.

The entire section has been built on high standards of alignment and grade and is of ample width to care for a heavy traffic. Besides eliminating three grade crossings and the steep and winding grades of the old road, the superior location of the new highway should permit opening of the route to traffic several weeks earlier in the spring.

Many Attend Dedication.

Harvey M. Toy, chairman of the California Highway Commission, presided at the dedicatory ceremonies, which were attended by a large gathering. Among those taking part were:

NUMBERS 4 AND 8 ARE HIGHWAY FINANCING MEASURES ON NOVEMBER BALLOT

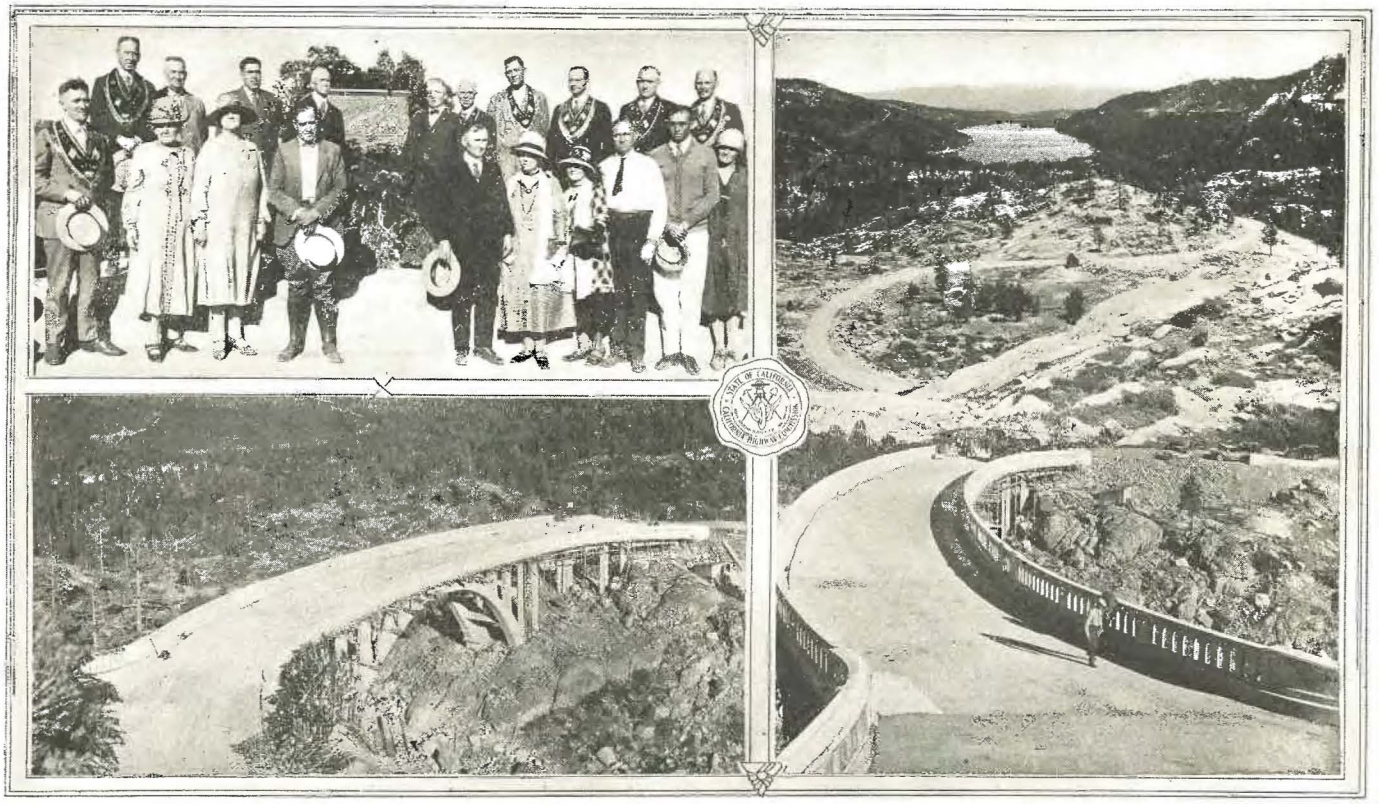
TWO HIGHWAY FINANCING MEASURES, both submitted directly to The People by initiative petition, will appear upon the ballot at the general election on Tuesday, November 2d. They will be propositions Numbers 4 and 8. The financing of future state highway construction in California, a matter of state-wide discussion for the past three years, is now directly before the electorate for decision.

This is as it should be, for The People now have opportunity to pass upon this vital question and to remove it from the field of controversy.

The texts of the two measures submitted to the referendum are set forth in full, together with arguments for and against, in the official pamphlet which is distributed by the Secretary of State, prior to the election, to each registered voter.

The California Highway Commission and the State Highway Engineer, mindful of the importance to the state of the completion of the state highway system, commend a careful study of the two proposed financing measures, Numbers 4 and 8, by the electors of California.

SPECTACULAR BRIDGE DEDICATED TO MEMORY OF PIONEERS



TRAIL BLAZERS REMEMBERED—*Upper left,* group of state officials, officers of Native Sons and Daughters, and descendants of Donner party survivors taking part in dedication of structure on August 22d; *Below,* view of bridge; *Right,* bridge and new state highway descending by easy grades to Donner Lake in background. (Southern Pacific snow sheds at upper right of view.)

Hilliard E. Welch, of Lodi, grand president of the Native Sons of the Golden West; Dr. Eva Rasmussen, of Sacramento, past grand president of the Native Daughters; Fletcher A. Cutler, past grand president of the Native Sons; C. F. McGlashan, of Truckee, author of the History of the Donner Party; George G. Radcliff, chairman of the State Board of Control; John T. Skelton, of Sacramento, who read letters from two of the living survivors of the Donner party; and Lewis F. Byington, of San Francisco, past grand president of the Native Sons, who delivered the dedicatory address; Native Sons and Daughters of Truckee and W. B. Gelatt of Donner Lake.

Descendants of survivors of the Donner party present were: James Fraser Lewis; Martha Jane Lewis, and Susan A. Lewis, of Santa Cruz, son and daughters of Martha Jane ("Little Pattie") Reed-Lewis, deceased; and Ernest H. Murphy, of Marysville, son of William G. Murphy.

The memorial tablet reads as follows:

> "Donner Summit Bridge; dedicated to the pioneers who blazed the Overland Trail through these mountains; Built by the U. S. Bureau of Public Roads and the California Highway Commission, 1925-1926. This tablet placed by the Historic Landmarks Committee of the Native Sons of the Golden West."

AID OF PUBLIC IN PUNCTURE VINE FIGHT IS WELCOMED

THE motoring public can materially aid in the campaign of the Highway Commission and the various counties for the eradication of puncture vine along the highway right of way and such aid will be welcomed, it is announced by State Highway Engineer R. M. Morton.

Maintenance forces are continually cooperating with county horticultural commissioners and considerable amounts have been expended in an effort to rid the highways of the pest, the spread of which is fraught with so much danger to agriculture.

Motorists who observe patches of the weed growing along the highway are urged to give the information to the local maintenance foreman, who has instructions to destroy the pest wherever found. The name and address of the foreman will be found on maintenance section markers posted along the highway at boundaries of the sections. The information also may be forwarded through the automobile clubs or chambers of commerce. The location should be described as specifically as possible.

PRIZES OFFERED FOR ESSAY

CALIFORNIA engineers who have entered the essay contest of the American Road Builders' Association have until October 10th to get their manuscripts in the hands of Chas. M. Upham, business director of the association, P. O. Box 1270, Raleigh, North Carolina, it is announced.

The essays must not exceed 1500 words in length, but the subject is limited only to methods, materials, equipment, maintenance or operation of highways. Any engineer of the rank of inspector or rodman of above, excepting State Highway Engineers, is eligible to compete.

The first prize is a free trip to Chicago to attend the annual convention of the American Road Builders' Association which takes place during Good Roads Week, January 10th to 15th. In addition, there are several cash prizes.

PAVEMENT RECONSTRUCTION STUDIES AS CONDUCTED BY THE CONSTRUCTION DEPARTMENT

By C. S. Pope, Construction Engineer.

THE studies necessary for a proper investigation of pavements which it is proposed to reconstruct have been given attention by the Construction Department and some of the features entering into the problem are presented herewith:

1. *GRADE AND ALIGNMENT SURVEY.*

It is usually desirable, though not always necessary, that a grade and alignment survey with the necessary cross sections should be made. If grade and alignment surveys show that an extensive destruction of old pavement will result or if the original line will be deviated from seriously the economic comparison of pavement types may be extensively modified; as may also the condition survey hereinafter mentioned.

Surveys should give grades and cross sections of the old pavement with sufficient accuracy to determine the amount of surface material in tons or cubic yards which will be required.

Curves which do not conform to present standards for either horizontal or vertical curvature should be studied and reconstructed where necessary.

Superelevation needs to be provided for in most cases as a considerable amount of former work is lacking in proper superelevation.

Grade in excess of three or four per cent of excessive curvature is usually considered a condition adverse to asphaltic types of surfacing, though recent developments in pavements of this type should make a change in sentiment in this regard.

2. *CONDITION SURVEY.*

Before deciding upon a pavement type for reconstruction over old paving a condition survey of the old pavement should be made.

In the case of an old stone or macadam or bituminous macadam road, if the same is on the proper grade, an accurate determination of the thickness of road metal available should be made by digging through the road metal at intervals of not over two hundred feet.

Cuts should be made through the crown and at each quarter point and the thickness recorded.

If old concrete is to be resurfaced it should be examined and classified at suitable intervals in accordance with the Bureau of Public Roads classifications which are as follows:

Class A—Normal number of transverse cracks but no longitudinal cracks.

Class B—More than normal number of transverse cracks and some corner breaks.

Class C—Similar to A and B but with longitudinal crack and a considerable number of corner breaks.

Class D—Tranverse and longitudinal cracks so numerous as to break pavement into slabs less in area than Class C but not less than 50 square feet.

Class E—Cracks so numerous as to break pavement into slabs less than 50 square feet in area but no general disintegration.

Class F—Badly broken and with disintegrated paving.

If the old concrete has been surfaced, the surface should be removed at intervals for a width of one foot across the entire width of the pavement in order to properly examine the base.

It is generally assumed that a concrete pavement in Class C condition or better, may be successfully surfaced with asphaltic concrete from 1½ to 2½ inches minimum thickness.

Paving in Class D or Class E condition may sometimes be saved with asphalt concrete surfacing from 2½ to 4 inches in thickness, although additional concrete base construction is considered better practice, except on the best foundation soils.

Paving in Class F condition usually requires complete reconstruction, though sometimes it may be saved by use of second story concrete.

3. *ECONOMIC TRAFFIC STUDY.*

An economic study of pavement types is impossible without a proper traffic census, a knowledge of the first cost of various types of pavement and accurate information as to the cost of maintenance of each type. Formerly this information was not available, but under our present methods of recording information, the various factors required for a proper solution of this problem will be available with increasing accuracy each year.

If we are able to establish accurately certain factors the economic trend of the problem of comparison of types is quite simple, and may be reduced to mathematical solution.

4. *SOIL SURVEY.*

It is now common practice to make a soil survey even for reconstruction work.

Both alkali and adobe soils have been found adverse to concrete pavements and require treatment before such pavements are laid. Sandy soil is particularly favorable to concrete pavements.

Asphaltic concrete and macadam are not affected by alkali, but require special base construction to be entirely satisfactory on adobe soils.

Among other matters which should be given consideration, in addition to the above mentioned matters of major importance, are the following:

Make a survey of road building materials available and establish availability of material and plant suitable for different types of construction.

Report prevailing weather conditions and usual amount of wet weather which might be unfavorable to any particular type of paving.

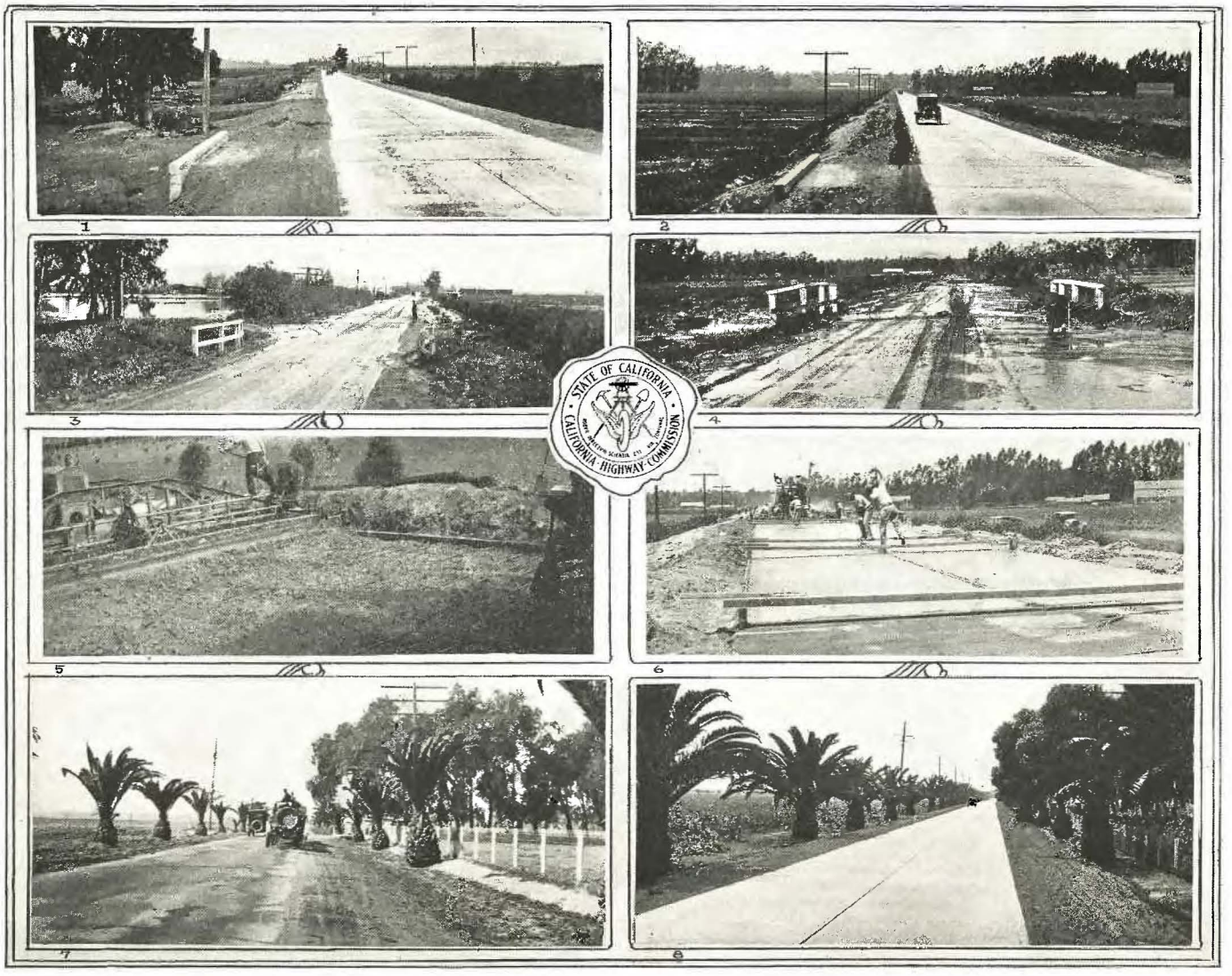
Consider and compare following constructions:

(a) Flush shoulders of concrete.
(b) Asphalt Macadam surface and shoulder.
(c) Asphalt Concrete surface and shoulder.
(d) b and c with Portland Cement Concrete shoulders.
(e) Sheet Asphalt in combination d.
(f) Second story concrete.

Compare the consistency of recommended construction with that used in other parts of the State under similar conditions.

FROM THE ABOVE BRIEF OUTLINE IT SHOULD BE APPARENT THAT SOUND PRACTICE DICTATES THAT CONCLUSIONS AND RECOMMENDATIONS FOR THE TYPE OF CONSTRUCTION TO BE USED SHOULD BE REPORTED WITHOUT REGARD TO PERSONAL PREFERENCE AND OPINION BUT IN ACCORDANCE WITH AN ECONOMIC AND ENGINEERING ANALYSIS BASED ON DESTRUCTIVE TRAFFIC TO BE CARRIED BY THE PARTICULAR ROAD UNDER INVESTIGATION.

SOME INTERESTING PROBLEMS SOLVED ON VENTURA COUNTY RECONSTRUCTION PROJECT



BEFORE AND AFTER VIEWS ON COAST ROUTE—1 and 2, views of new 20-foot concrete pavement placed on raised grade in the vicinity of Beetox, on Camarillo-Ventura reconstruction project, Ventura County; 3 and 4, views at same location following flood prior to reconstruction. The old pavement at this point was lower than level of land on the upper side, with result that it was flooded each winter. New pavement, with numerous large culverts, is expected to correct this condition. 5 and 6, construction views; and 7 and 8, *before* and *after* views not far from Camarillo. (Photos by Division VIII.)

By A. D. GRIFFIN, Resident Engineer, Division VII.

WITH the completion on August 14th of the H. H. Peterson reconstruction contract, another heavily traveled section of the Coast Highway in Ventura County, 13.2 miles in length, was made adequate for present day traffic. All embankments were widened to 30 feet, all culverts and bridges extended accordingly, and three miles of flush cement concrete shoulders, to give five feet of added width to the existing pavement, were placed, together with 10.2 miles of "second-story" cement concrete pavement, 20 feet in width.

The original pavement, which was 15 feet wide and four inches thick, was placed in 1917 by the Modern Construction Company. Because of ideal, sandy subgrade conditions, three miles of this pavement was still in good condition and required widening only, by flush shoulder construction. These shoulders were constructed six inches thick.

The pavement on the balance of the section had about outlived its usefulness as a safe and comfortable riding surface. A "second-story" pavement was laid with a minimum thickness of five inches at the center, which was increased to seven inches over the edge of the old slab, and to nine inches at the edge of the new pavement. At grade changes, all new pavement was placed seven inches thick, increasing, beginning at points two feet from the center and edges, to a thickness of nine inches. All full width pavement was marked with the V center line groove as previously described in the *Bulletin*. Curves were flattened to a radius of 1,000 feet or less and given standard superelevation.

Earth at a Premium.

The roadway on this section is almost entirely on embankment and there was little chance to secure material for widening from within the right of way, since deep, dangerous, and un-

REBUILDING OF CAMARILLO-VENTURA SECTION COMPLETED

sightly side ditches are no longer tolerated on State highways. In a fertile valley planted to beans, beets, walnuts and lemons, and provided with irrigating systems, no farmer will countenance borrow pits in his land to supply earth for the highway, regardless of compensation. This made it necessary to thoroughly inspect the surrounding country to locate spaces where earth could be secured, and if possible good done instead of harm.

One farmer was found who had a layer of clay top soil, a foot or so thick, which he wished skimmed from his bean field to make available the richer soil underneath. This yielded 10,000 cubic yards without cost for the dirt, itself. Another had a knoll the removal of which netted another 10,000 cubic yards and improved the tract for irrigation. A school yard was leveled to yield 2000 yards.

State Builds Reservoir.

Near Montalvo, a mutual water company contemplated the building, in the future, of a reservoir with a capacity of six acre feet on a site a half mile from the highway. Plans called for a balance of cut against fill. Discussion of the matter with the stockholders resulted in the building of the reservoir by the State entirely in cut in return for the material excavated. Thus 8,000 cubic yards were made available for use on the highway.

In the vicinity of Beetox, for a mile and a half, farmers had erected along the property line barriers to the flow of storm water to cause a deposit of fertile silt on their bean fields. With the passage of years, the level of the land adjoining the highway on the upper side was raised until it averaged two feet higher than the existing pavement. This caused culverts to fill with silt with the result that the flood waters passed over the pavement along the entire stretch, depositing slippery clay silt which was the cause of numerous serious accidents. To overcome this it was necessary to raise the grade, in some places as much as three and one-half feet, so that the new pavement would be above the level of storm waters; new culverts, and more of them, were constructed at a higher level.

Property Owners Cooperate.

Property owners, realizing the necessity for raising the grade of the highway, in a fine spirit of cooperation, permitted the State's contractor to make a deep ditch up to fifty feet in width just beyond the right-of-way line, from which 32,000 cubic yards of earth were removed for embankments. Although crops were lost from about eight acres, no damages were asked of the State as it is probable that during the first heavy storm the silt-burdened flood waters will replace all "borrowed" material.

To guard against the linear shrinkage of the clay fill at Beetox, a protective sand blanket a foot in thickness was placed immediately prior to paving operations.

Aggregates for Concrete.

Rock and sand for concrete were supplied by the Saticoy Rock Company which provided special storage bins for specification rock and sand in order to create a reserve supply. Sand was stockpiled for twenty-four hours to drain off excess water. Proportioned batches were delivered to the contractor, the sand being weighed and the rock measured.

To secure rock grading in accordance with the specifications, a long conveyor belt was run under spouts which tapped commercial bins. By regulating gates in each size, the required grading was uniformly secured and it was possible to use a rock, close to the coarse limits of the specifications, without danger of sacrificing workability because of grading fluctuations. A stronger concrete was thus obtained.

The superintendent for the contractor, Mr. S. T. Corfield, formerly assistant division engineer in Division VI, handled the job efficiently, to the end that the entire project was opened to travel several days ahead of the expiration of the time limit of the contract.

ENGINEER DECLARES CALIFORNIA LEADS IN QUALITY OF ROADS

AFTER an automobile trip extending over 10,000 miles from California to the Atlantic coast and return, including in its itinerary twenty-four states, E. E. East, chief engineer for the Automobile Club of Southern California, has returned convinced that California is still leading the Nation in road building. This is particularly true, Mr. East emphasizes in his report, as regards riding qualities of pavements and the safety features which are now being embodied in the design and construction of State highways.

East said he was surprised to find on some of the principal transcontinental roads in the East grades that required second gear over long distances; sharp blind curves and innumerable sharp, vertical curves which completely obstructed the view of approaching vehicles—construction which would not be countenanced in California.

Bridge construction in many states, he says, is far below the standards of this state. Only on grade separations are the eastern states apparently making faster progress than is California, which, of course, is due here largely to the lack of funds.

Quality, in recent years, has been the watchword of construction in California; standards of alignment and grade have been increased far beyond the plans of engineers a few years back; new pavements have a minimum width of twenty feet and vary in thickness from six to nine inches at the edges, with special reinforcing where necessary. Width and strength of bridges also have been increased with the increasing standards of other features of the highway.

OILED SHOULDER EXPERIMENT

Sand shoulders, particularly those adjacent to river crossings, have caused considerable trouble on the Valley route in Division VI. An oil treatment has been tried adjacent to the Merced River which promises satisfactory results.

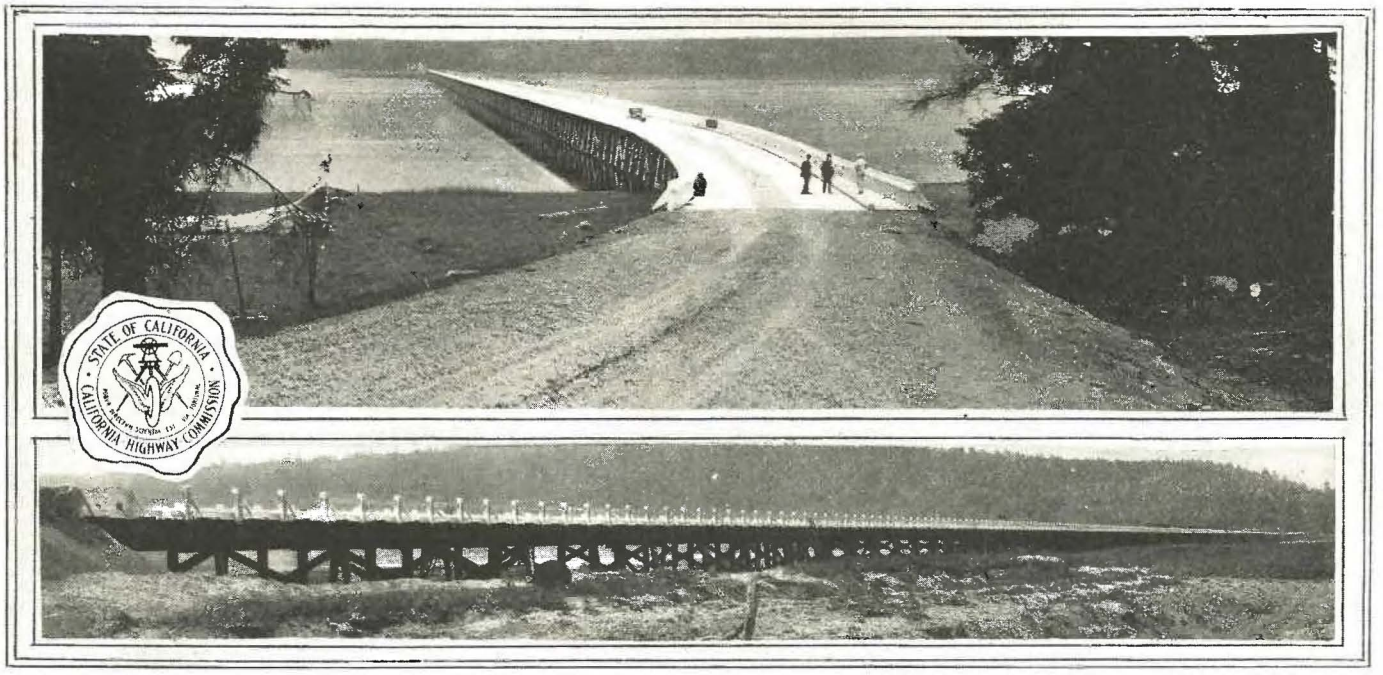
Previously, one-half gallon per square yard of 45 per cent oil was harrowed into the sand about four inches deep and six feet wide. This, however, did not bind satisfactorily, especially in the light blow sand. Recently, one-half gallon per square yard of 65 per cent oil was worked in and indications are that the trouble at this particular point is over.

Equipment Department.

Machinery having been installed, the new shop building at the Lankershim yard is now in use. The building, modern in design, is 60 feet wide and 140 feet long, with a blacksmith shop adjacent. The new machine shop is well lighted and ventilated and fully equipped.

Staying up all night may make you as wise as an owl, but owls have no sense during the day.

BIG LAGOON TRESTLE CUTS DISTANCE ON REDWOOD ROUTE



BIG LAGOON TRESTLE—Views of new 4000-foot structure recently completed on Redwood highway, in Humboldt County. Upper view shows pedestrian walk separated by curb from traveled portion of bridge. (Photos courtesy Redwood Highway Association.)

CONSTRUCTED, with the exception of the piling and the asphalt surfacing of the floor, of "ever living" native redwood, the trestle across Big Lagoon, Humboldt County, the latest improvement on the Redwood Highway, has been completed and opened to traffic. The trestle is approximately 4000 feet long and, together with its approaches, represents an improvement on standard alignment 1.4 miles in length. It takes the place of more than three miles of narrow, crooked and dangerous county road.

Cedar was used for the piling, but the entire superstructure was built of redwood timber, of which approximately 1,385,000 feet were used. The floor has a wearing surface of asphalt concrete. It is the largest structure using native wood on the state highway system.

A feature of the structure is the safety walk for pedestrians, which is protected from the traveled portion of the bridge by a heavy timber curb. This walk was added, when it was realized that completion of the bridge would be followed immediately by its use by fishermen. Because it is adjacent to the ocean, tourists also will desire to stop to take photographs and to view the surrounding country. A walk seemed necessary to make the long trestle safe, and it was therefore added to the plans shortly after the contract was awarded. The walk has a width of four feet, while the clear roadway width of the trestle is twenty-one feet.

The Mercer Fraser Company of Eureka was awarded the contract for both the trestle and the grading of the approaches on a bid of $140,251. Construction proceeded so rapidly it was possible to open the structure to traffic more than a month ahead of the contract time.

C. M. Butts represented the bridge department as resident engineer. Grading of approaches was also in charge of Mr. Butts.

CITIES URGE THROUGH TRAFFIC ROUTE OFF MAIN STREETS

IN THE early days of construction every community in the state wanted the State highway routed down its Main street. Business which was to be thus gained and other advantages to be secured were regarded of inestimable value.

Times are changing. The great increase in motor vehicle registration has resulted in a traffic which chokes the highways. Through traffic no longer needs to stop for repairs or gasoline at every community center along the route; great distances often are covered without a single stop and the through driver is irritated by delays incident to passing through cities and towns.

There is evidence that leaders of urban communities, unless they are located at convenient stopping places along the great arteries of travel, are beginning to realize that the through motorist is not the asset he was once believed to be. At a recent meeting a large delegation of citizens from Ontario and Pomona, in San Bernardino and Los Angeles counties, appeared before the highway commission to urge the establishment of a new State highway route between the two communities, which would eliminate several grade crossings and *TAKE THE THROUGH TRAFFIC AWAY FROM THE BUSINESS DISTRICTS OF THE TWO CITIES.*

Route Opposed in Beginning.

When asked why the route, so obviously the proper one, was not adopted when the highway was originally laid out a decade ago, the delegation replied that both communities had insisted that the highway pass through their business districts, even though it was necessary to cross several railroad lines to do so. The counties interested have agreed to take over the existing highway as a county road, if the new section is built. Upon this showing, the commission directed the State Highway Engineer to investigate and report upon the proposed route.

There is evidence that other communities are coming to the same conclusion as Ontario and Pomona. Through traffic jams business districts and makes it more difficult for local residents and nearby farmers, the real supporters of community progress, to do their shopping and transact their business. The day is coming when centers of population will not oppose locations for arterial routes that will take the highway as far as possible away from business centers.

WHAT COUNTIES' INCOME FOR ROADS FROM STATE SOURCES MEANS IN TERMS OF LOCAL TAX RATES

MANY people in California fail to appreciate the fact that one-half of the state's net income from the present two-cent gasoline tax is divided among the counties; and that, likewise, one-half the income from motor vehicle license fees, less the cost of motor traffic police, is also divided among the counties in proportion to motor vehicle registrations.

The combined income of the fifty-eight counties for road work during 1925 from these two state sources exceeded ten and a half millions.

For those who delve into statistics the accompanying table will prove interesting. It gives the assessed valuation of each county upon which local taxes are levied, the amounts apportioned to each from the state fuel fund and license fees, and the rate necessary in each county to raise a like sum by local taxation.

The importance to the counties of this income is evident from the fact that in twenty-seven a tax in excess of 20 cents per $100 of assessed valuation would be necessary, while in seven a rate of 30 cents or above would be required to raise an amount equal to the state's contribution. The average for the state is .183. The tabulation follows:

Counties	*Total valuation county assessed nonoperative property, 1925*	*Apportioned to counties* *Motor vehicle fees, 1925*	*Fuel tax 1925*	*Total*	*Tax rate per $100 valuation necessary to provide equal revenue*
Alameda	$353,955,912	$243,589 74	$501,982 67	$745,572 41	$0.211
Alpine	714,521	76 33	155 69	232 02	.032
Amador	6,758,127	4,020 45	8,297 55	12,318 00	.182
Butte	36,480,949	26,790 97	55,062 05	81,853 02	.224
Calaveras	7,032,275	3,998 69	8,210 70	12,209 39	.174
Colusa	22,071,355	9,497 28	19,686 97	29,184 25	.132
Contra Costa	88,605,475	38,970 36	82,431 42	121,401 78	.137
Del Norte	10,283,747	2,912 78	5,721 37	8,634 15	.084
El Dorado	10,337,340	5,129 36	10,786 11	15,915 47	.154
Fresno	165,714,637	120,092 14	251,700 12	371,792 26	.224
Glenn	22,894,726	9,784 75	19,524 60	29,309 35	.128
Humboldt	52,406,168	28,230 39	57,336 68	85,567 07	.163
Imperial	42,567,499	41,363 02	86,772 48	128,135 50	.301
Inyo	11,390,515	5,581 79	11,672 72	17,254 51	.152
Kern	180,120,547	71,007 40	149,135 94	220,143 34	.122
Kings	25,088,599	18,760 06	39,128 16	57,888 22	.231
Lake	7,336,840	5,208 28	10,723 45	15,931 73	.217
Lassen	13,400,500	8,043 88	15,251 21	23,295 09	.174
Los Angeles	2,525,067,035	1,375,395 17	2,919,898 75	4,295,293 92	.170
Madera	22,909,600	11,544 05	24,129 67	35,673 72	.156
Marin	25,497,930	18,112 37	36,879 47	54,991 84	.216
Mariposa	4,713,177	1,971 61	4,068 38	6,039 99	.128
Mendocino	25,898,504	14,323 68	29,484 57	43,808 25	.169
Merced	32,612,022	22,733 75	47,926 00	70,659 75	.217
Modoc	7,670,374	3,563 73	7,128 53	10,692 26	.139
Mono	3,084,630	625 60	1,322 23	1,947 83	.063
Monterey	40,182,545	25,638 60	54,193 18	79,831 78	.199
Napa	22,079,343	13,989 06	28,767 58	42,756 64	.194
Nevada	7,065,905	5,611 80	11,125 48	16,737 28	.237
Orange	146,732,680	83,495 06	174,081 82	257,576 88	.176
Placer	15,678,205	16,950 70	34,832 06	51,782 76	.330
Plumas	12,624,992	3,669 77	6,695 83	10,365 60	.082
Riverside	46,121,230	48,970 43	102,768 22	151,738 65	.329
Sacramento	128,361,002	87,955 13	180,493 47	268,448 60	.209
San Benito	13,308,600	8,431 64	17,184 89	25,616 53	.192
San Bernardino	69,033,745	74,785 05	154,653 40	229,438 45	.332
San Diego	100,963,361	121,578 58	258,725 51	380,204 09	.377
San Francisco	733,693,760	267,846 93	557,795 89	825,642 82	.113
San Joaquin	104,620,310	72,649 24	150,728 59	223,377 83	.214
San Luis Obispo	34,464,953	18,687 69	37,850 55	56,538 24	.164
San Mateo	42,062,670	34,422 04	72,106 08	106,528 12	.253
Santa Barbara	60,567,709	41,809 46	89,077 27	130,886 73	.216
Santa Clara	107,985,290	94,934 45	197,431 08	292,365 53	.271
Santa Cruz	22,442,480	26,118 57	53,749 91	79,868 48	.356
Shasta	16,940,710	11,620 51	23,701 79	35,322 30	.209
Sierra	2,892,010	1,397 21	2,699 33	4,096 54	.142
Siskiyou	21,072,870	16,256 90	32,281 65	48,538 55	.230
Solano	30,787,420	23,663 65	48,317 38	71,981 03	.234
Sonoma	43,514,670	48,297 64	98,885 67	147,183 31	.338
Stanislaus	53,830,075	47,647 54	98,233 53	145,881 07	.271
Sutter	17,853,325	10,693 00	21,783 76	32,476 76	.182
Tehama	17,165,960	10,507 54	21,574 21	32,081 75	.187
Trinity	3,395,927	1,063 50	2,012 74	3,076 24	.091
Tulare	67,763,250	57,282 05	120,351 87	177,633 92	.262
Tuolumne	8,850,745	6,634 93	14,063 37	20,698 30	.234
Ventura	54,556,749	31,298 07	66,796 88	98,094 95	.179
Yolo	26,966,854	17,864 32	37,267 45	55,131 77	.204
Yuba	16,578,575	9,512 29	19,503 61	29,015 90	.175
Totals	$5,794,770,924	$3,432,610 98	$7,194,051 54	$10,626,662 52	*$0.183

*Average per County.

TRAFFIC ON CALIFORNIA HIGHWAYS CONTINUES TO INCREASE

SUMMER COUNTS FOR INTERSTATE ROUTES TABULATED

COUNTS of traffic taken periodically by the maintenance department of the state highway organization are studied as a guide to the allotment of money for maintenance purposes. Data thus gathered also are available for the use of the other departments in planning the design and construction of highways that will be adequate for probable future traffic.

The first comprehensive study of traffic throughout the state was made in 1920 by the United States Bureau of Public Roads and the California Highway Commission with the cooperation of a number of the counties. This wark continued in 1922 and, in 1924, was taken over by the commission. Since that time counts have been made at regular intervals.

The practice has been, generally, to take counts from 6 a.m. to 10 p.m., for two-day periods. The last count made was on July 18th and 19th of this year, at some 430 strategic points throughout the state. The count is generally taken on Sunday and Monday, which are, on most roads, the high and law days for the week. The sixteen hour period has been found to cover more than 90 per cent of the traffic.

A comparison of totals indicates that the rate of increase for 1926 is somewhat lower than for preceding years. The drop recorded at some points may be partially accounted for by the fact that construction work was in progress nearby, or because improvement of adjacent roads has provided additional traffic arteries. Some of the increases over the 1925 count between various terminii are as follows:

Red Bluff to Woodland Wye.....12 per cent
Fairfield to Benicia..... 9 per-cent
Sacramento to Woodland Wye.....10 per cent
San Francisco to San Jose..... 8 per cent
Santa Monica to Seal Beach..... 9 per cent
San Bernardino to El Centro.....28 per cent

Taking the 1924 figures as a base, it is found that, in 1925, traffic increased throughout the state by 17 per cent over the previous year. The 1926 totals show an increase of 22 per cent over the 1924 count.

Interstate Traffic.

Much has been conjectured about interstate traffic in California. A table below gives the figures for 1924 and 1926 at the nine most important border stations. These counts show the Pacific Highway and the Borderland route carrying the heaviest interstate traffic. The larges number of foreign cars (cars with other than California license) crossing the border of the state was at Yuma on Sunday, July 18th. A count over a long period might show different averages than here indicated, but the figures generally will give the trend of traffic at the peak of the summer season.

CALIFORNIA HIGHWAY COMMISSION

TRAFFIC COUNT—IMPORTANT BORDER STATIONS—16 HOURS—1924 AND 1926

ROUTE AND LOCATION OF CHECKING STATION	1924						1926					
	Thursday, July 17.			Friday, July 18th.			Sunday, July 18th.			Monday, July 19th.		
	All vehicles	Trucks and busses	Foreign cars	All vehicles	Trucks and busses	Foreign cars	All vehicles	Trucks and busses	Foreign cars	All vehicles	Trucks and busses	Foreign cars†
Roosevelt Highway—Route 71 At Oregon line	No Count			No Count			279	16	48	227	26	47
Redwood Highway—Route 1 At Oregon line	No Count			No Count			369	20	168	424	98	173
Pacific Highway—Route 3 At Oregon line	1,076	11	331	897	13	275	1,434	41	312	1,178	40	308
Susanville-Reno highway Route 29—At Doyle	101	8	32	96	4	19	213	10	47	134	15	31
*Victory Highway (Truckee River route) Route 38 At Nevada line	363	4	227	151	2	52	928	8	633	555	4	324
Arrowhead Trail (Silver Lake Cut Off) Route 31 At Nevada line	No Count			No Count			106	20	46	109	20	45
National Old Trails (Needles Route) Route 58 Near Arizona Border	90	....	41	160	....	45	220	8	101	244	13	112
Mecca-Blythe Highway—Route 64 At Arizona line	No Count			No Count			116	2	....	101	....	....
Borderland Highway—Route 27 Colorado River opposite Yuma	No Count			No Count			1,415	124	749	1,282	156	562

*This count does not include traffic at Nevada line on Dog Valley grade, or traffic on state routes touching Nevada line on north and south shores of Lake Tahoe, a part of which is interstate.

†Foreign cars are all vehicles other than those carrying California license.

Motor Vehicle Registration For 1926 Shows Gain; Fees Apportioned to State and Counties

MOTOR vehicle registrations and the income from license fees for the first six months of 1926, as recently announced by the California Division of Motor Vehicles, indicate that the total for the year will reach the estimates of the Highway Investigating Committee, as set forth in its report. Actual registrations to June 30th reached a total of 1,549,093 vehicles, while the committee's estimate for the year is 1,610,000. It is even probable that this figure may be exceeded by December 30th next.

The last legislature changed the registration year to make it coincident with the calendar year. The total registration on June 30th this year was 166,272 in excess of the registration on July 31st of 1925.

Statement of total number of fee paid registrations of automobiles, trucks, motorcycles, and trailers for January 1, 1926, to June 30, 1926:

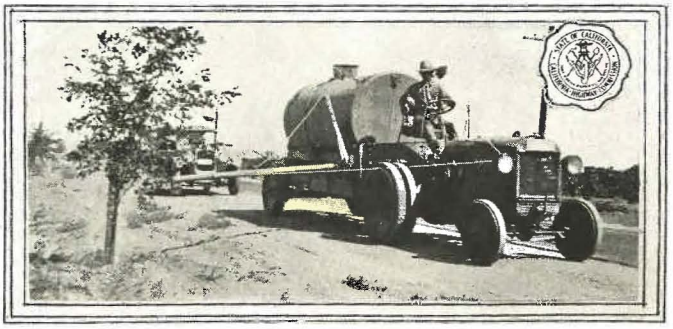
County	Autos	Solid Trucks	Pneumatic Trucks	Motorcycles	Trailers
Alameda	95,442	2,821	10,425	887	980
Alpine	36	----	3	1	1
Amador	1,478	50	240	2	7
Butte	9,687	241	1,343	59	364
Calaveras	1,453	65	256	7	35
Colusa	3,311	104	480	13	145
Contra Costa	15,386	424	1,743	215	189
Del Norte	918	41	223	3	16
El Dorado	1,713	70	350	14	10
Fresno	41,324	1,477	5,011	288	2,026
Glenn	3,405	107	423	25	304
Humboldt	10,340	334	1,346	54	73
Imperial	14,797	342	2,849	39	338
Inyo	2,025	37	265	5	33
Kern	25,312	750	3,382	163	962
Kings	6,499	192	803	34	574
Lake	1,935	101	304	2	27
Lassen	2,994	41	352	16	21
Los Angeles	511,295	14,723	54,297	2,730	6,691
Madera	4,119	120	584	22	161
Marin	6,868	238	1,168	49	28
Mariposa	715	32	162	3	10
Mendocino	5,094	231	880	23	37
Merced	8,016	240	1,241	63	412
Modoc	1,311	19	155	3	7
Mono	258	3	32	----	----
Monterey	9,520	339	1,535	71	251
Napa	5,188	243	733	57	91
Nevada	2,089	62	381	7	13
Orange	30,830	597	3,293	221	1,309
Placer	5,921	189	1,133	41	93
Plumas	1,347	49	239	3	16
Riverside	18,297	310	2,688	129	915
Sacramento	30,743	1,131	4,774	292	711
San Benito	3,061	97	414	28	68
San Bernardino	27,997	578	3,830	220	849
San Diego	46,406	996	5,784	619	558
San Francisco	96,720	4,990	13,393	858	466
San Joaquin	24,914	816	3,919	232	1,073
San Luis Obispo	6,983	171	1,094	37	149
San Mateo	13,268	598	1,877	104	165
Santa Barbara	15,164	369	2,225	124	216
Santa Clara	34,995	1,332	4,453	407	1,315
Santa Cruz	9,692	364	1,425	114	141
Shasta	3,625	173	636	13	78
Sierra	516	14	102	1	3
Siskiyou	6,030	128	748	20	30
Solano	8,525	284	1,176	76	136
Sonoma	17,002	686	3,540	142	248
Stanislaus	16,690	375	2,203	159	1,267
Sutter	3,780	212	733	15	126
Tehama	3,597	88	532	21	219
Trinity	390	9	62	----	2
Tulare	20,284	625	2,716	115	1,527
Tuolumne	2,268	59	317	13	19
Ventura	11,690	264	1,578	58	516
Yolo	6,314	245	1,005	43	261
Yuba	3,284	94	584	8	71
TOTALS	1,262,841	39,290	157,439	8,968	26,353
City County and State	10,931	Exempt from Fees		303	691
Public Service	7,785	Exempt from Fees		45	1,453
United States	1,067	Exempt from Fees		12	30
Dealers' Plates	11,756			148	68
Nonresidents	19,913				

Total Number of Vehicles--1,549,093.

Apportionment of Motor Vehicle fees to counties for period beginning January 1, 1926, and ending June 30, 1926:

County	County Share	Traffic Officers Salaries Paid for First One-half Year	Traffic Officers Salaries Reserved for Second One-half Year	Net Apportionment to County
Alameda	$213,734 17	$10,017 16	$10,380 00	$193,337 01
Alpine	79 32	----------	----------	79 32
Amador	3,435 53	----------	----------	3,435 53
Butte	22,601 77	4,125 00	4,500 00	13,976 77
Calaveras	3,512 92	----------	----------	3,512 92
Colusa	7,838 27	1,500 00	1,500 00	4,838 27
Contra Costa	34,713 18	6,985 32	7,560 00	20,167 86
Del Norte	2,321 32	1,570 17	751 15	----------
El Dorado	4,164 81	1,137 50	1,350 00	1,677 31
Fresno	96,918 36	10,467 89	13,860 00	72,590 47
Glenn	8,248 37	1,950 00	1,950 00	4,348 37
Humboldt	23,485 81	6,390 00	6,390 00	10,705 81
Imperial	35,492 76	11,001 24	12,270 00	12,221 52
Inyo	4,574 90	----------	----------	4,574 90
Kern	59,042 40	12,451 73	14,130 00	32,460 67
Kings	15,655 27	2,773 38	3,090 00	9,791 89
Lake	4,580 71	1,920 00	1,920 00	740 71
Lassen	6,619 59	1,983 34	3,300 00	1,336 25
Los Angeles	1,140,132 26	----------	----------	1,140,132 26
Madera	9,670 17	1,650 00	1,650 00	6,370 17
Marin	16,152 41	5,386 87	5,460 00	5,305 54
Mariposa	1,783 54	374 20	1,200 00	209 34
Mendocino	12,107 54	6,270 00	4,500 00	1,337 54
Merced	19,270 70	5,877 48	7,200 00	6,193 22
Modoc	2,891 96	----------	----------	2,891 96
Mono	566 78	----------	----------	566 78
Monterey	22,646 26	6,525 00	6,900 00	9,221 26
Napa	12,206 20	1,913 23	2,250 00	8,042 97
Nevada	4,930 84	1,800 00	1,800 00	1,330 84
Orange	70,070 53	12,060 59	16,050 00	41,959 94
Placer	14,262 48	4,200 00	4,200 00	5,862 48
Plumas	3,197 60	----------	----------	3,197 60
Riverside	43,185 95	8,741 57	9,150 00	25,294 38
Sacramento	72,745 84	5,850 00	5,850 00	61,045 84
San Benito	7,091 59	3,110 00	3,750 00	231 59
San Bernardino	64,717 99	----------	----------	64,717 99
San Diego	105,118 37	22,207 50	22,770 00	60,140 87
San Francisco	225,106 64	----------	----------	225,106 64
San Joaquin	59,821 97	7,255 44	8,070 00	44,496 53
San Luis Obispo	16,303 30	5,400 00	5,400 00	5,503 30
San Mateo	30,962 34	8,604 83	9,600 00	12,757 51
Santa Barbara	34,989 80	8,250 00	8,250 00	18,489 80
Santa Clara	82,174 20	12,430 00	12,000 00	57,744 20
Santa Cruz	22,686 89	----------	----------	22,686 89
Shasta	8,743 58	2,900 00	3,150 00	2,693 58
Sierra	1,230 29	----------	----------	1,230 29
Siskiyou	13,444 22	4,161 86	4,350 00	4,932 36
Solano	19,713 68	4,350 00	4,350 00	11,013 68
Sonoma	41,800 90	5,250 00	5,400 00	31,150 90
Stanislaus	39,999 96	4,954 84	5,700 00	29,345 12
Sutter	9,405 15	3,900 00	3,900 00	1,605 15
Tehama	8,613 98	4,500 00	4,113 98	----------
Trinity	893 70	----------	----------	893 70
Tulare	48,838 33	7,660 93	10,680 00	30,497 40
Tuolumne	5,176 51	1,200 00	1,200 00	2,776 51
Ventura	27,267 60	5,495 91	5,580 00	16,191 69
Yolo	15,212 29	2,700 00	2,700 00	9,812 29
Yuba	7,817 00	2,100 00	2,100 00	3,617 00
TOTALS	$2,889,970 80	$251,352 98	$272,225 13	$2,366,392 69

Net amount to Highway Commission first half, 1926, $2,889,970.80.



One man tree watering outfit in operation in Division VI. Tractor tank arrangement is development of the division. Pipe for carrying water to trees is operated from driver's seat.

Teacher—"Use the right verb in this sentence—'The toast was drank in silence.'"

Pupil—"The toast was ate in silence."—Exchange.

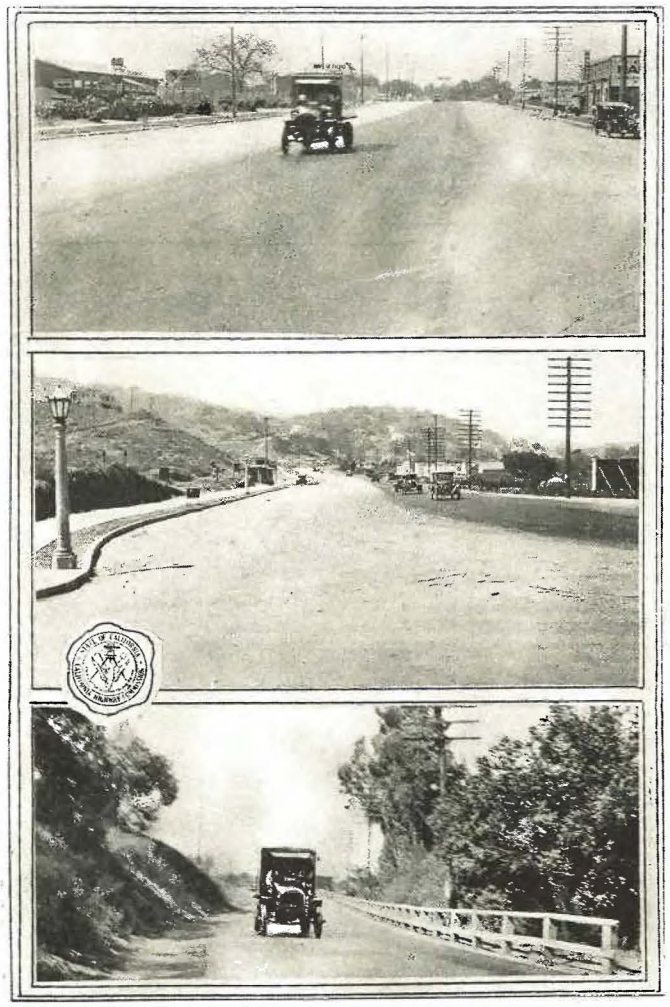
STRAIGHT FROM THE CHIEF

(Continued from page 2.)

owners to convert the State highway into a main boulevard, with sufficient width to accommodate the multitudinous traffic supposed to react to increase frontage values. In planning the subdivision, property owners willingly establish set back lines so as to provide for a wide boulevard, and the width of the highway is increased from 60 to 80, 100 or even 120 feet, depending on the magnitude of the vision which the owner has for the future of his property.

In several locations where the widths originally established were seriously cramping the expansion of the road to take care of increased traffic, subdividers have cooperated with the Division Engineers in dedicating more width for the State highway. Notable examples of this exist on Route 2 between San Mateo and San Jose. Several subdividers have set back their lines on one side to give 40 feet as a half width for the street eventually to be built.

Between Hollywood and Calabasas, in Los Angeles County, the evolution of the old, narrow country road to a modern city



Cooperation by subdividers. *Above,* Ventura boulevard north of Los Angeles, 90 feet between curbs; *Center,* subdivision line set back on south side of original right of way, present pavement at right; *Below,* view on highway in same locality where subdivision has not yet taken place. More room needed.

street is very apparent. For long distances, subdividers have voluntarily increased the width of the State highway, and have thereby added greatly to the attractiveness of their properties, and have provided as well for future heavy traffic by setting aside width enough to permit wide street and sidewalk construction.

Engineers Should Watch Changes.

Our organization should be alive to the possibilities presented by the psychology of the situation. Land is usually subdivided into lots adjacent to the cities, and the resultant settlement causes an increase in local traffic which the former State highway width does not provide for. Through cooperation of subdividers, much can be accomplished to obtain the increased width now known to be necessary for our State highways. Many county boards of supervisors also have agreed to cooperate by not accepting maps of subdivisions fronting on the highway until they have the approval of the State highway authorities.

Our engineering organization, constantly traveling back and forth over the roads, should be alive to subdivision projects, and should diligently follow up the surveys in an effort to demonstrate to property owners the desirability of setting aside the increased width necessary for the future.

ARIZONA BANKER TELLS OF FAITHFUL WORK AT SAND HILLS

THE FAITHFULNESS of a California highway engineer and the untiring efforts of the contractors who had charge of the Sand Hills paving project, in Imperial County, moved Emil C. Eger, Yuma, Arizona, banker, to voice his commendations in a letter to State Highway Engineer R. M. Morton. Because of the heat of the desert the work progressed under extremely trying conditions, as pointed out by Mr. Eger. His letter follows:

> With reference to the paving on the Sand Hills near Yuma, the writer is moved to call attention to the efficient manner in which this work has been handled and the untiring labors of the engineer in charge, Mr. Baker, as well as of the contractors Schmidt and Hitchcock. Under conditions trying in the extreme, with the thermometer around 125 degrees, there being no shade, the results are truly remarkable.
>
> The writer has had occasion to know that Mr. Baker left for the work morning after morning shortly after daylight, returning at dusk. This in itself may not be unusual, but at this season of the year, in Yuma, it is.
>
> The execution of the work—no less important than the fine ability displayed in its planning—leaves a monument, of which the California Highway Commission may well be proud; and work well performed should not go without praise, lest the fine incentive displayed be taken as a matter of course.

Yuma Chamber Comments.

The Yuma Chamber of Commerce has added its comments upon the new Sand Hills highway. L. W. Alexander, secretary, writes to Chairman Harvey M. Toy as follows:

> I have been directed by the Yuma Chamber of Commerce to write to you and your able staff and submit their compliments covering the paving and completion of the highway through the Sand Hills which are located between Yuma and Holtville. This stretch of road was overcome by the California Highway Department when engineers said it was impossible.
>
> It is a most excellent piece of work and a wonderful road which will make it possible for tourists and all travelers who use our highways to enter your beautiful state with a degree of comfort, which in the past has been a dread and somewhat of a hardship, and at the same time view one of the wonders of the world in this vast expanse of sand located in the State of California.
>
> We also feel that the completion of this road is of great importance to Yuma and a great asset and I have also been directed to extend to you the sincere thanks of the entire community for your consideration in making it possible for this work to be advanced and this road completed.

DIVISION IV TELLS OF BATTLES WITH DUST PROBLEM

By R. P. Duffy, Maintenance Engineer, Division IV.

EXTENSIVE experiments have been carried on in Division IV over a considerable period in an effort to find an economical means of combating the dust nuisance on unpaved roads, of which there are approximately 140 miles in the Division. The Skyline Boulevard, leading south along the coast from San Francisco, for example, has a crushed rock surface and is graded to widths of 30 and 40 feet. Counts of traffic on this road over a sixteen hour period on Sunday, July 18th, 1926, showed a total of 11,992 vehicles passing Station 55-1, and 5,707 at Station 55-2-A.

To handle such traffic over unpaved roads without controlling dust is a serious problem. As early as 1922 Division IV began experiments with calcium chloride as a dust preventive, when it was tried on two miles of graveled road on Route 8, in Sonoma County, and on a mile on Route 14 in Contra Costa County. The following season calcium chloride was applied to heavier traveled gravel and crushed rock roads with varying success. In locations where humidity was low, the results were far from satisfactory, and studies were begun in an effort to find a more satisfactory and economical method.

Further Experiments Tried.

In June, 1924, a section of the Pacheco Pass road, Route 32, between Stations 140 and 146, was treated with fuel oil for a width of 21 feet, at the rate of 1/9 gallon per square yard of surface; and, in August, the adjoining section between Stations 130 and 140 was treated with magnesium chloride, which was furnished for the experiment without cost by the Leslie Salt Works of Redwood City.

Observation of both palliatives indicated that, under the conditions encountered, the fuel oil was the more effective. This influenced a decision to try fuel oil during the 1925 season.

After considerable thought and study, it was decided to apply to the mulch surface of the road a fuel oil of low asphaltic content at the rate of 1/3 gallon per square yard, per season, in three applications of 1/9 gallon each. The first application was made in May. Subsequent applications were made as the roads became dusty.

Preceding each application of oil the mulch was evenly distributed over the road surface, which was again dragged immediately after the oiling to thoroughly mix the mulch with the oil. This treatment gave traffic a practically dustless road during the time the oil was active. The period between applications varied with climatic conditions but was generally from five to seven weeks.

Method of Applying Oil.

Oil was applied under pressure by an asphaltic oil truck distributor, which cavered from five to twelve miles of 21-foot roadway daily, depending upon the necessary length of haul of the oil.

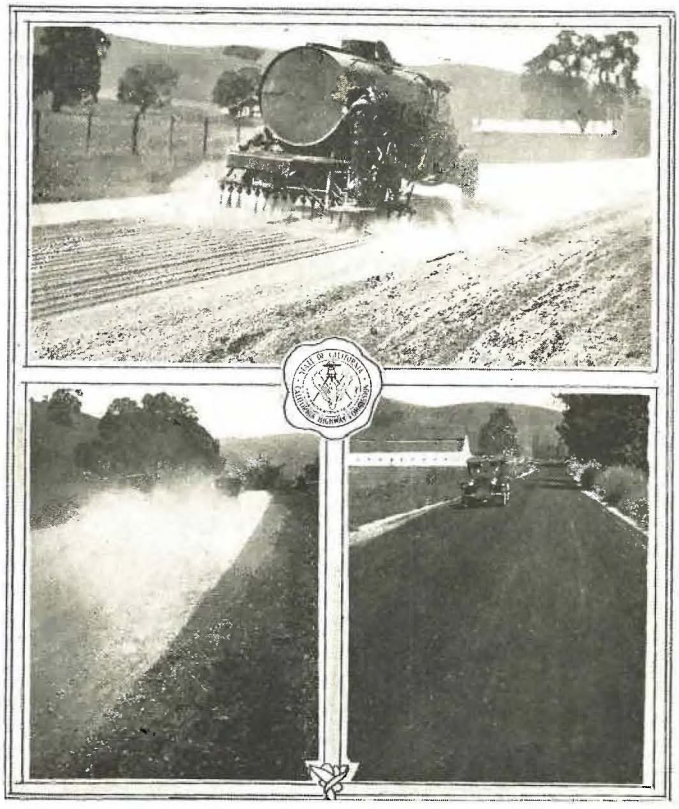
The cost of this type of work varied with the market price of oil and the freight rate to the various destinations. A fair average for Division IV would be approximately $100 per mile for an application of 1/9 gallon per square yard, or about $300 per mile per season.

The 1925 fuel oil experiments were so successful it was decided to follow the same plan during the 1926 season.

Plan Followed During 1926.

In order to obtain a more lasting effect, we have, this season, made heavier applications of fuel oil containing a high percentage of asphalt. On 5.5 miles of the Skyline Boulevard ½ gallon per square yard was applied in two equal applications of ¼ gallon each.

Applications of asphaltic road oils also have been made to the broomed base of graveled or crushed rock roads. One ¾ mile stretch on Route 22, in Santa Clara County, wa streated in June, 1925, with Gilmore 90-95 road oil at the rate of 0.40 gallons per square yard, and about one mile on Route 14, in Contra Costa



OILING OPERATIONS, DIVISION IV—*Above,* placing application of oil on section of Pacheco Pass lateral. *Below, left,* dust prior to oiling; *Right,* car traveling at rapid rate few days after work completed; no dust. (Photos by Division IV.)

County, just south of Rodeo, was treated with Grade E asphalt of 200 to 250 penetration at the rate of 0.45 gallons per square yard.

Both of these sections now have the appearance of an oil macadam pavement, and since their treatment little maintenance has been necessary on the traveled highway .

Participation in World Road Congress Authorized by Senate.

A joint resolution to authorize the Secretary of Agriculture to accept membership for the United States in the Permanent Association of the International Road Congresses was adopted by the House of Representatives early in the summer.

This is seen to be one of the moves which will help road development throughout the world, a movement which will assure the United States a continuation of its leadership in highway building influence as well as in motor car manufacturing.

"Now that you've see my son and heir," said the proud young father, "which side of the house do you think he resembles?"

"Well," said his astonished bachelor friend, "his full beauty isn't developed yet, but surely you don't suggest that he—er—looks like the side of a house, do you?"—Exchange.

WHAT THE DIVISIONS ARE DOING

DIVISION III.

HEADQUARTERS, SACRAMENTO.

F. W. HASELWOOD, DIVISION ENGINEER.

Counties of Butte, Colusa, El Dorado, Glenn, Nevada, Placer, southern Plumas, Sierra, Sutter, Yuba, and northern Sacramento and Yolo.

ON SEPTEMBER 18th, Clark and Henery completed the 1.14 miles of asphaltic concrete pavement on Del Paso boulevard in North Sacramento. This boulevard is 100 feet wide. Sidewalks are 12 feet wide, leaving 76 feet for roadway. Early this summer curbs, gutters and sidewalks were completed by the city of North Sacramento. The central 30 feet was paved by the state and the side strips by the municipality, both jobs being done by Clark and Henery.

The new pavement connects with the 30-foot concrete pavement placed last winter from the American River bridge to the city limits of North Sacramento, and together with it constitutes one of the most notable improvements on the entrances to Sacramento. The cost of the completed pavement was approximately $85,000, of which the state paid approximately $29,000 and the city $56,000. Clyde W. Rust was resident engineer for the entire project.

Oiling Brings Improvement.

The road between Donner Lake and Truckee has been improved with a surfacing of crushed rock bound with asphaltic oil. Through the town of Truckee this surfacing is 40 feet wide and has the appearance of an asphalt pavement.

Similar surfacing has been completed on the Ukiah-Tahoe route from Marysville easterly for five miles. Yuba County cooperated with the state on this latter project.

Work for the season of 1926 has been completed on the construction of 3.5 miles of new grade leading from Nevada City to the top of Harmony ridge. This work is being financed jointly by Nevada County and the state.

DIVISION VI.

HEADQUARTERS, FRESNO.

E. E. WALLACE, ACTING DIVISION ENGINEER.

Counties of Fresno, Madera, Merced, Mariposa, Kings, Tulare, and Kern, north of the Tehachapi.

THE California Road and Street Improvement Company has been awarded the contract for widening with asphaltic concrete, a section of Route 4 between Church and Cherry avenues, Fresno.

The Allied Contractors, Incorporated, of Colorado were awarded the contract for concrete shoulders, asphaltic concrete top and rock borders on Route 4, in Merced County, between Chowchilla River and Merced.

Division VI has been using a Killifer disc on rough asphalt pavements. A vialog reading on a seventeen-mile section showed 18.5 inches per mile of roughness, which compares favorably with many new pavements. A two-ton caterpillar tractor equipped with a rubber track provided the motive power for operating the disc.

South of Bakersfield, the maintenance forces of the Division have been using a Wheeler planer to reduce the ridge which formed against the concrete shoulder by reason of the excess of high-penetration asphalt used in the old asphalt surfacing and seal coat. The material removed is deposited outside the concrete shoulder where it forms an oil shoulder from one to two feet in width.

A tractor and "A" frame have been used for unloading crushed rock for shoulder work at Kingsburg. The maintenance department reports the unloading has been done for 12 cents a ton.

DIVISION VII.

HEADQUARTERS, LOS ANGELES.

S. V. CORTELYOU, DIVISION ENGINEER.

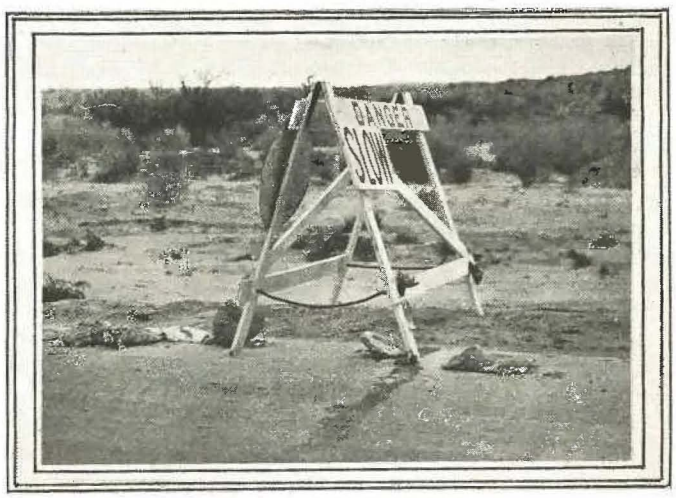
Counties of Los Angeles, Ventura, Orange, San Diego, and eastern Kern, south of Mojave.

ON THE Coast highway, north of Ventura, work of removing the "Long Causeway", 4,448 feet in length, has been completed by maintenance forces. Work is now in progress on the removal of the westerly Causeway, the Rincon seawalls having been completed. It has been necessary to cut this trestle longitudinally, removing half at a time, the traffic being carried on the southerly part under a one-way control.

Work has commenced on the contract for the construction of five miles of highway to be graded and paved with concrete between Oxnard and Hueneme Road, on the ocean front route. Along the coast, easterly from Oxnard, in the vicinity of Point Mugu, a maintenance crew, equipped with two power shovels and dump trucks, is removing slides and quarrying and placing rip-rap rock to protect the highway from wave action.

Coast Route Section Open.

The new Coast highway between Newport and Laguna is now completed except for the construction of rock shoulders, which work is now well under way. Traffic has been using the new road for several weeks.



Collapsible warning sign in use in several of the divisions. It works on hinges and, if struck by a passing vehicle, is easily knocked down. There is little danger of damage such as sometimes results when more rigid signs are used.

The dangerous grade crossing just north of Oceanside, San Diego County, is a thing of the past. Traffic is now using the new underpass under the tracks of the Santa Fe railroad. The new line also eliminates several bad curves. This work is a part of the recently completed John and Bressi contract for widening and thickening the Coast highway between Oceanside and San Onofre.

DIVISION IX.

HEADQUARTERS, BISHOP.

F. G. SOMNER, DIVISION ENGINEER.

Counties of Inyo, Mono, and eastern Kern County, north of Mojave.

SURFACING work between Red Rock Canyon and Little Lake, under contract to Harry Wilson and Gallaway and Vozz, has been completed.

A crushing plant is being installed on the four-mile section of road recently graded between Manzanar and Lone Pine, Inyo County. The city of Los Angeles is erecting a steel structure at the crossing of the aqueduct on this section.

Work has been started by state forces on the relocation project in Long Valley between McGee Creek and Convict Creek, Mono County.

Oiling of thirty miles of road in Owens Valley including the main streets of Bishop, Big Pine, Independence, and Lone Pine is about completed.

Surveys have been completed on the relocation between Dogtown and Point Ranch, in Mono County, and construction by state forces will soon be commenced.

A contract has been awarded Grant T. Johnson for the construction of a shop building and garage at the Bishop maintenance yard. The contract also includes truck sheds, pumping plant and oil house, and a general remodeling of the plant.

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.

EXCELLENT progress is being made on the laying of asphalt concrete surfacing on the Modesto-Stanislaus River reconstruction project. This job is being done by the Valley Paving and Construction Company of Visalia. J. W. Cole is resident engineer, who has A. K. Nulty and J. D. Greene as assistants.

H. Brown, contractor, has started work on the 30 foot concrete pavement through the new subway to the M Street bridge at West Sacramento. C. A. Potter is resident engineer and G. C. Harden, assistant.

The survey, financed by Solano and Napa counties of the proposed new highway through the American canyon from the Carquinez Straits bridge to Cordelia, is nearly completed. H. F. Balsz is acting chief of party in charge.

Oiling Operations Under Way.

Division X has commenced oiling roads (Oregon type) in Amador County at a point about three miles west of Ione. Continuation of the work from this point to Jackson is planned. H. S. Clark, maintenance foreman, is in charge. The oil being used is a 65 per cent asphalt content product obtained from the Gilmore Oil Company of Los Angeles.

HIGHWAY NEWS NOTES

CHAIRMAN Harvey M. Toy of the commission has returned to his home in San Francisco from Hawaii where he enjoyed a vacation of several weeks.

Commissioner Louis Everding recently returned from a motor trip to Yellowstone National Park.

W. A. Smith of Division III has been appointed assistant to Acting Maintenance Engineer T. H. Dennis, succeeding C. H. Blood, resigned.

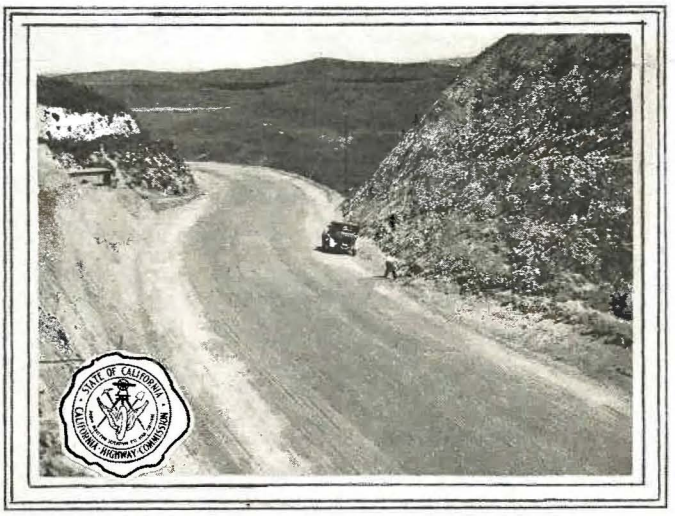
E. K. Guion, formerly assistant in the Department of Surveys and Plans, has succeeded Mr. Smith as office engineer of Division III.

Miss Ruth Miles has returned to her former position of Chief Stenographer, Division X, after an extended leave of absence during which she visited England and the continental countries.

Miss Charlotte Barnes of the Purchasing Department has announced her engagement to Mr. Henry Mahoney of the Accounting Department, headquarters. The wedding will be an event of the near future. The headquarters staff recently presented the couple with a beautiful silver set.

R. A. Westbrook, assistant resident engineer, Division VI, has been transferred to Division V.

A. N. George, well known member of the Division VII staff, is the proud father of A. N. George, Jr., his first son.



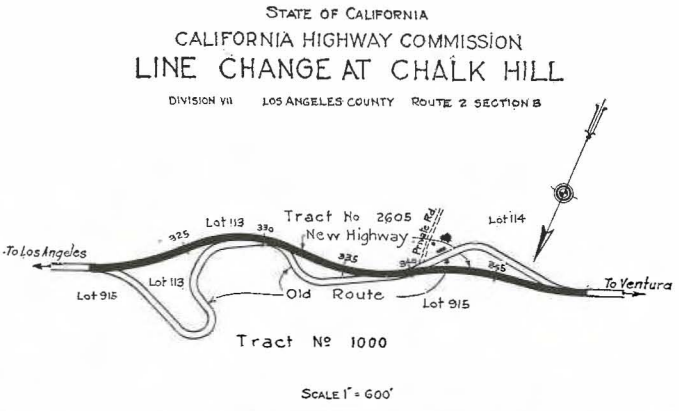
New highway on new alignment and grade over Chalk Hill, Coast route, Los Angeles County. Portion of old grade may be seen in upper left of view. (Photo by Div. VII.)

CHALK HILL BARRIER NO MORE

CHALK HILL, the last barrier to fast traffic out of Los Angeles over the Ventura boulevard (Coast State highway), has been removed with the opening to travel of the new line and grade over this elevation, recently completed under the direction of Division VII. Grades have been considerably reduced by a heavy cut at the summit and several dangerous curves have been removed, as shown by the map of the improvement.

Along the new route a roadway, 40 feet wide, was graded and a 24-foot bituminous macadam pavement constructed. The cost of the line change, seven-tenths of a mile in length, was approximately $45,000.

H. A. McCray of Los Angeles was the contractor. R. D. Kinsey, assistant resident engineer, supervised construction for the state.



News from Division III.

Miss Lucille Steers has returned to work after a prolonged illness.

Clyde W. Rust is temporarily in charge of the grading and surfacing between Sportsman's Hall and Riverton in the place of J. L. Piper, who is ill.

R. K. Forrest, formerly superintendent of maintenance and construction work in Division III, has been transferred to the Maintenance Department.

C. H. Weeks, chief of party, has taken over the maintenance work on the Placerville road formerly directed by Mr. Forrest.

Since the transfer of Mr. Dennis to the central office, the duties of Maintenance Engineer in Division III have been carried on by J. W. Vickrey, in addition to his duties as assistant on construction and location.

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

Cont. No.	Division	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
					COMPLETED AND ACCEPTED SINCE AUG. 16, 1926.						
468	III	Nevada	38	B	Across Truckee River, near Hinton		Concrete Girder Bridge	McKay Engr. Co.	$37,902 15	June 3, 1925	
495	VI	Mariposa	18	E, F	Across Slate Gulch and Sweetwater Creek		Two Earth-filled Arch Span Bridges	Noble Bros.	23,046 75	Mar. 17, 1926	
					AWARDED SINCE AUGUST 16, 1926—NONE.						
					PENDING AWARD—NONE.						

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.	Division	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
					COMPLETED AND ACCEPTED SINCE AUG. 16, 1926.						
M-90	IV	Sonoma	1	B	Healdsburg to Santa Rosa	14.16	P. C. Concrete Pavement	J. V. Galbraith	585,146 17	June 17, 1925	
M-106	VII	Ventura	2	B, C	Camarillo to Ventura	13.19	P. C. Concrete Pavement	H. H. Peterson	447,947 59	Nov. 13, 1925	
					AWARDED SINCE AUGUST 16, 1926.						
M-138	V	Monterey	2	D	Across Salinas River, 1 mile south of Soledad		Refloor, Clean, and Paint Steel Bridge	Atlas Construction Co.	$47,319 63	Aug. 28, 1926	150
M-139	VII	Los Angeles	2	D	Btw. Michigan Ave., Whittier and Southerly Boundary	3.22	P. C. Concrete Pavement	George Herz and Co.	204,068 87	Aug. 28, 1926	150
M-140	VI	Fresno	4	B	Btw. Church Ave. and Cherry Ave.	0.60	Asph. Conc. Surface and Widening	Calif. Road and St. Imp. Co.	20,975 47	Aug. 28, 1926	75
M-141	VI	Merced	4	A	Btw. Merced and the southerly boundary	14.33	P. C. C. Widening and Asph. Conc. Surface	Allied Contractors, Inc.	185,909 84	Aug. 28, 1926	200
M-142	V	Santa Barbara	2	H, J	Btw. Carpinteria and Summerland	4.5	P. C. Concrete Pavement	Sam Hunter	284,201 66	Sept. 14, 1926	200
M-143	II	Shasta	3	C	Across Dog Creek, about 1 mile south of Delta		Concrete Girder Bridge	E. M. Bordwell and G. E. Brugge	123,890 63	Sept. 14, 1926	225
M-144	IV	Marin	1	B	Through Ross and Larkspur	2.46	Asph. Conc. Surface and Widening	Pacific States Construction Co.	87,938 01	Sept. 14, 1926	90
M-145	VI	Mariposa	18	E	Across Bear Creek, about 3 miles south of Briceburg		Concrete Girder Bridge	Noble Brothers	11,123 44	Sept. 14, 1926	100
M-146	II	Tehama	3	D	Sacramento River Bridge		Refloor and Paint Bridge	D. E. Burgess	6,390 00	Sept. 14, 1926	100
					Sub-total	25.11			$965,427 55		
					PENDING AWARD.						
	IV	San Mateo	2	A	Colma to Cypress Lawn Cemetery	1.51	Grading		$128,262 24		
	IV	Contra Costa	14	B	Btw. El Ciervo and Valona	1.8	Grading and Standard Surfacing		211,522 77		
	II	Shasta			Boulder Creek Maintenance Station		Foreman's Cottage, Bunk House, etc.		9,104 19		
	II	Trinity			Douglas City, Maintenance Station		Foreman's Cottage, Truckshed, etc.		8,545 33		
					Total State Highway Maintenance Fund Contracts Awarded and Pending Award	28.42			$1,320,252 08		

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.

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