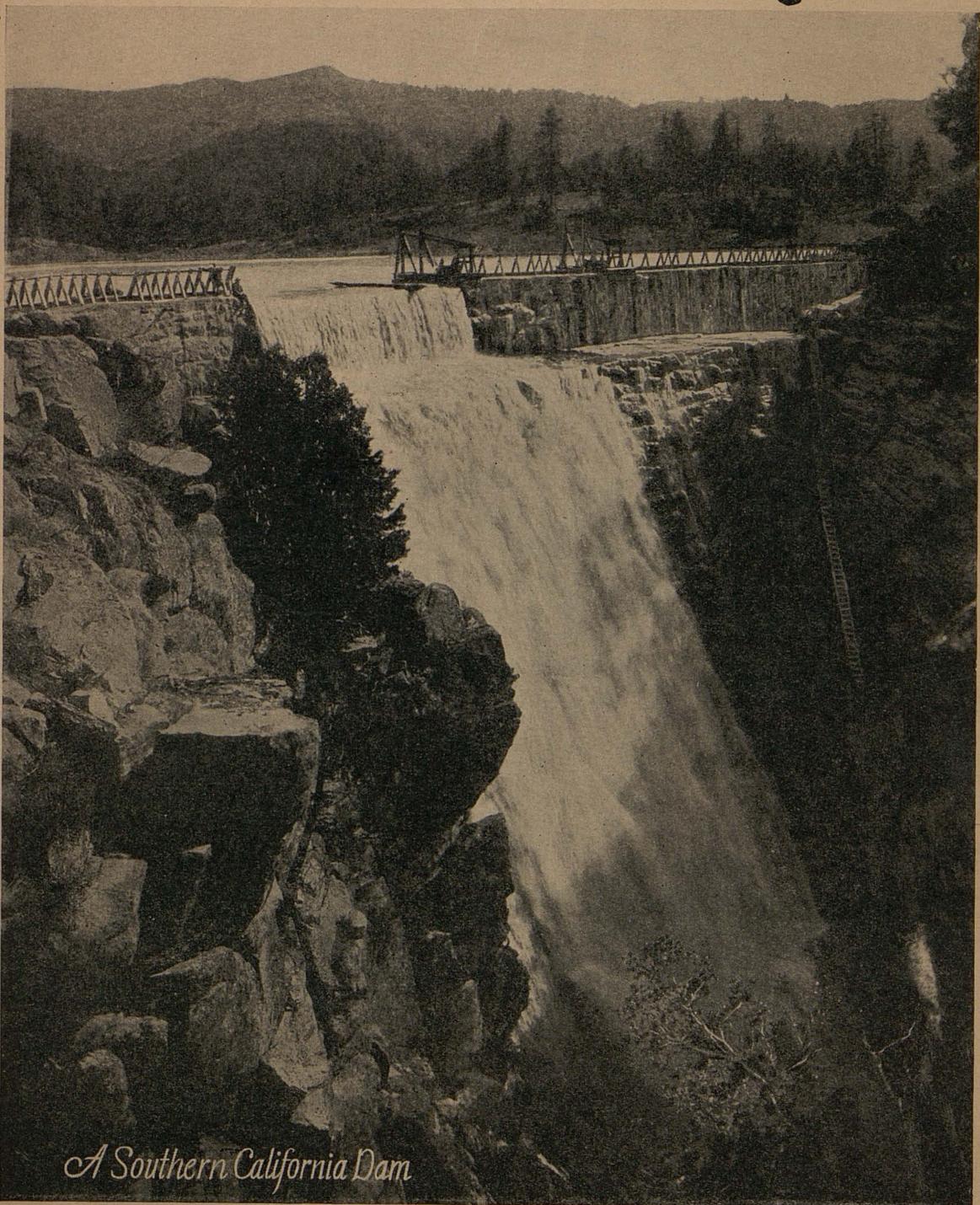


*C. A. Ryan*

# California Highways and Public Works



*A Southern California Dam*

Official Journal of the Department of Public Works  
AUGUST State of California 1932

inches

4 3 2 1 0

centimeters

10 9 8 7 6 5 4 3 2 1 0

D50 Illuminant, 2 degree observer

L*	39.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	87.34	82.14	72.06	62.15
a*	13.07	18.72	-22.29	22.85	-24.49	-0.35	59.60	-48.07	18.51	1.13	0.23	0.27	0.43	0.28	0.19
b*	15.07	18.72	-22.29	22.85	-24.49	-0.35	59.60	-48.07	18.51	1.13	0.23	0.27	0.43	0.28	0.19
Density										0.04	0.09	0.15	0.22	0.36	0.51

Golden Thread

16 (M)	49.25	38.62	28.86	16.19	8.29	3.44	31.41	72.46	72.85	23.57	54.91	43.96	82.74	62.79	50.87
17	0.01	-0.04	0.60	0.73	0.19	0.49	-19.43	55.93	68.80	-49.49	30.77	30.01	81.29	-12.72	-29.46
18 (B)															
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Colors by Munsell Color Services Lab

Don Williams



## Table of Contents

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	PAGE
\$31,904,000 Dam Building Program in Southern California..... <i>By Edward Hyatt, State Engineer</i>	1
Prunedale Cut-off Opened with Ceremony..... <i>By G. H. Tilton, Jr., District Construction Engineer</i>	2
Scenes at Official Opening of Prunedale Cut-off.....	3
Gold Run to Airport Relocation Abolishes Grade Crossings..... <i>By C. H. Whitmore, District Engineer</i>	4
Construction Views of Gold Run—Airport Improvement.....	5
Eliminating Coachella Valley Dips and Washes—Illustrated..... <i>By E. Q. Sullivan, District Engineer</i>	6
Thirteen Major Projects Scheduled for Advertising.....	8
Projects Offered for Bids in August Tabulated.....	9
Illustrations of Southern California Dams.....	11
Cajon Pass Realignment Develops “Magnetic Hill”.....	12
Illustrations of Cajon Pass Highway Improvement.....	13
Six Ice Cakes Lower Sixty Ton Bridge..... <i>By Gordon L. Long, Resident Engineer</i>	16
How Ice Cakes Were Used as Jacks—Illustrated.....	17
Official Water Resources Report for August.....	19
Commissioner Stanton’s “Official Car” Wrecked—Illustrated.....	19
Water Applications and Permits.....	23
Statistics on Dam Construction.....	27
Highway Bids and Awards for July.....	29
July Traffic Count Shows Decrease.....	30
Traffic Count Tabulation.....	31-40



# \$31,904,000 Dam Building Program Under Way in Southern California

Department of Public Works Approves and Supervises Great Conservation and Flood Control Projects Giving Employment to Thousands of Workers

By EDWARD HYATT, State Engineer

**T**HE Department of Public Works, through the State Engineer, has been charged since 1929 with the responsibility of approval of plans and supervision of construction and maintenance of all dams in California above a minimum size. At the present time and during the last year the main activity in the building of new dams has been in Southern California.

Including dams which will soon be started, dams under construction and dams recently completed, there will be added to the water storage in southern California about 387,000 acre-feet at an approximate cost of \$31,904,000.

Before construction of a dam can be started, plans and specifications must be approved by the State Engineer, who also supervises construction from start to finish, and when the structure is completed issues a certificate of approval, certifying that the dam is safe. The tendency in dam building is to design higher structures of greater storage capacity, which results in greater potential menace than was the case a decade ago when smaller dams were the rule.

#### GREAT RESPONSIBILITY

The responsibility resting upon the State office in approving the design and supervising construction of new dams as well as

passing upon those already built is very great, as it may result in increasing the cost to the owners in large amounts, and may even cause abandonment of a dam on which much money has been expended; but more important it means that the State office must undertake the grave duty of assuring people living below a dam and the public generally that all reasonable safeguards have been observed in its construction and that lives and property will not be jeopardized thereby.



EDWARD HYATT

ers to clear the way for construction at the earliest date possible in order to reach the unemployment problem quickly and effectively.

#### VITAL PROBLEM

Water is the first consideration in the economic development and continued prosperity

(Continued on page 10)

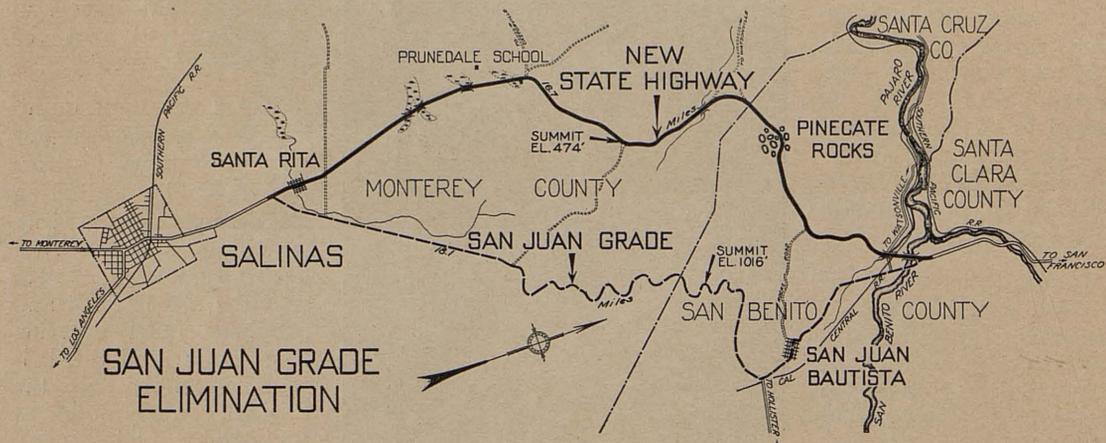
# Prunedale "Cut-off," Bypassing Old San Juan Grade, Opened With Ceremony

By G. A. TILTON, JR., District Construction Engineer

STATE HIGHWAY progress was again recorded when the "Prunedale Cut-off," eliminating the old San Juan Grade in Monterey and San Benito Counties, was opened to traffic on July 20, 1932. Automobile travelers bound to the Olympiad at Los Angeles, who selected the Coast Highway (U. S. Route 101) from San Francisco to Los Angeles were greeted with a new highway unit 16.7 miles in length, safe, fast, and comfortably convenient, contrasting the narrow, twisting, dangerous San Juan Grade, obsolete after seventeen years of service.

Amid the picturesque surroundings of the beautiful "Pinecate Rocks" of bandit lore, 300 people gathered to witness the formal

events leading up to the final construction of the "Prunedale Cut-Off" and elimination of the San Juan Grade. Other speakers and participating officials were: Charles H. Purcell, State Highway Engineer; Timothy A. Rearson, State Highway Commissioner; Harry A. Hopkins, State Highway Commissioner; Lester H. Gibson, State Highway District Engineer; John W. Howe, Secretary State Highway Commission; Robert Sterling, Monterey County Supervisor; George Dudley, Chairman Monterey County Supervisors; A. A. Caruthers, Monterey County Supervisor; Howard Cozzens, Monterey County Engineer, and A. G. Turner, Chairman San Benito County Supervisors.



opening, attended by prominent State and county officials.

Ceremonies were conducted under the auspices of the California State Chamber of Commerce, presided over by A. E. Roth, Regional Director of that body. Governor James Rolph, Jr., was unable to attend because of the serious illness of his brother, and conveyed his regrets through his spokesmen, Colonel Walter E. Garrison, Director of the Department of Public Works, and Earl Lee Kelly, Chairman of the State Highway Commission.

#### RELATED HISTORY

George Gould, President of the Salinas Chamber of Commerce, related the history of

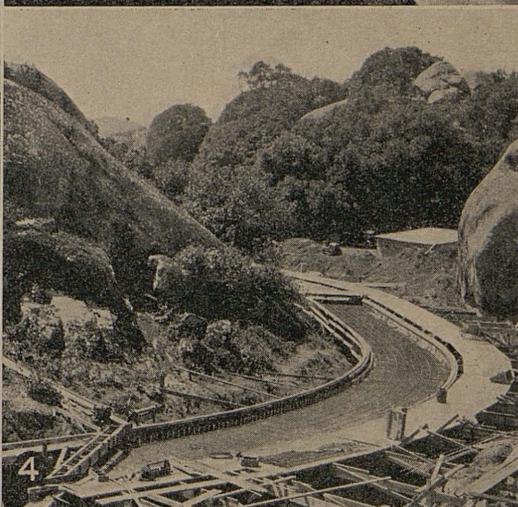
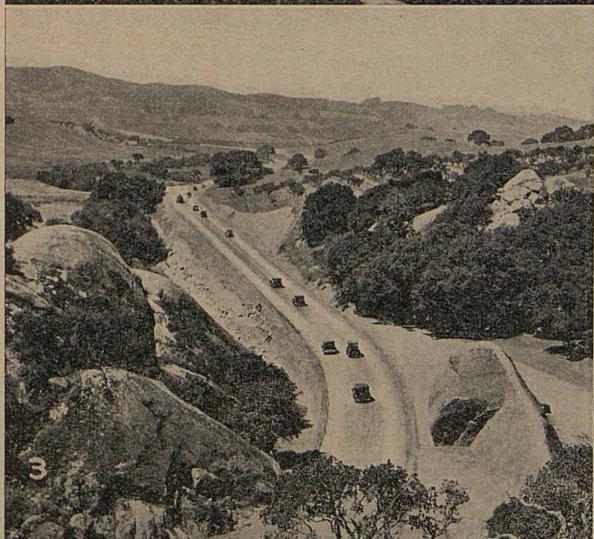
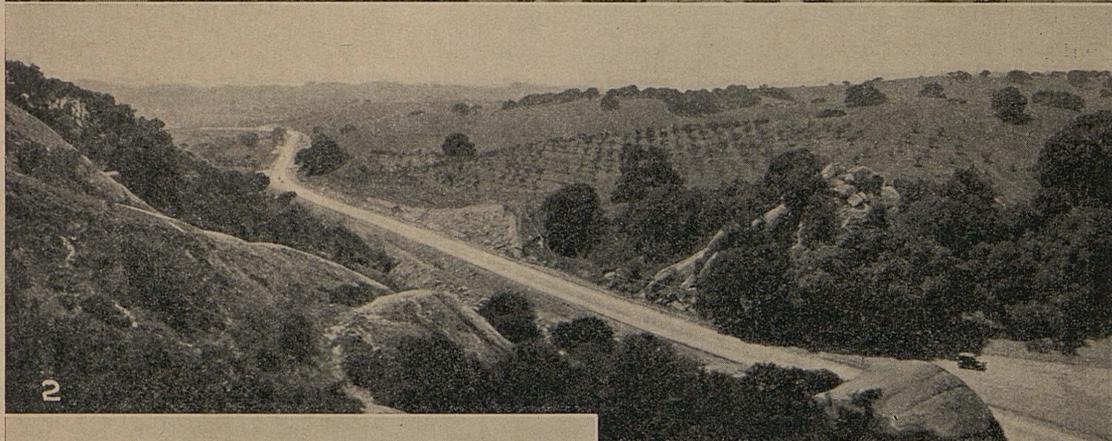
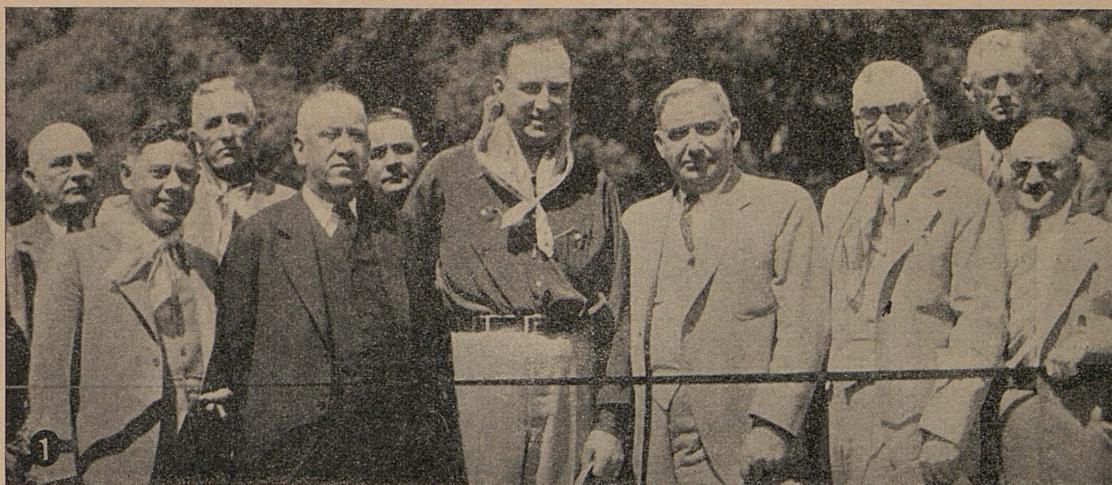
Completion of this most important unit of the Coast Highway culminates six years of engineering studies, surveys, public meetings, and conferences of State and county officials.

Only by rushing construction activities with day and night shifts was it possible to successfully overcome unexpected delays caused by heavy winter rains and complete the new highway in time to throw it open to Olympiad traffic as well as for the opening day of the popular Salinas Rodeo.

#### UNUSUAL PROBLEMS INVOLVED

The newly constructed unit leaves the existing highway two miles north of Salinas and passes over rolling mesas and winds through scenic valleys, joining the existing highway

(Continued on page 22)



**BREASTING THE TAPE** at the Prunedale Cut-off dedication ceremony in picture No. 1, left to right in the front row, are the following Highway officials: Commissioner Harry A. Hopkins, Commissioner Timothy A. Reardon, Commission Chairman Earl Lee Kelly, Colonel Walter E. Garrison, Director of Public Works; C. H. Purcell, State Highway Engineer, and John W. Howe, Commission Secretary. No. 2 shows the wide, safe, fast new highway that runs for 16.7 miles through scenic valleys and over rolling mesas, eliminating the narrow, steep, tortuous old San Juan Grade. No. 3 shows the highway at the Pinacate Rocks, famed as an ancient bandit lair, and in picture No. 4 is seen the 8-foot by 10-foot culvert under construction that carries a creek channel under the pavement.

# Gold Run-Airport Project Abolishes Three Grade Crossings on U. S. 40

By CHARLES H. WHITMORE, District Engineer

**I**N THE early part of 1933, should prescribed work adhere to schedule, that portion of State Highway Route 37 between Auburn and Truckee will consist entirely of high speed, modern highway.

The last section of what only a short time as a decade ago was merely a wagon trail is now being replaced by a \$400,000 grading and preliminary surfacing project, of ample width, easy grades and alignment. The final section is located between Gold Run and Airport and, in spite of the work of removing the last vestige of the old type of road transportation, the old order is linked nevertheless with the new by the vernacular of the termini.

**Gold Run**, as the name implies, was settled during the historical gold rush days of California, while **Airport**, equally descriptive of modern times, was established by the Airways Division of the U. S. Department of Commerce as an emergency landing field for airplanes flying between Sacramento and Reno—one of the most dangerous air routes in the country on account of the heavily timbered, precipitous, and lofty Sierra Mountain range that is crossed.

## NARROW AND STEEP

The road to be replaced is typical of mountain wagon roads. The tortuous alignment, narrow width, and steep grades have been improved to some extent by State maintenance forces, but the present road is still far short of the needs for present day volume and speed of traffic.

As evidence of the betterment which will be obtained for traffic, a comparison between the two routes reveals the following:

	Length miles	Width feet	Per cent maxi- mum grade	Minimum curve ft.
Present road.....	12.971	16	12±	50±
Proposed road.....	11.483	30	6	500

Furthermore, two crossings of the main lines of the Sacramento-Reno division of the Southern Pacific Railroad and one crossing of a branch line—all at grade—will be eliminated by the new construction. The revised location involves, however, near

Towle, one interception of the railroad and highway, distant one-third from the beginning of the project, at which location the highway will be underpassed through a new concrete structure now being speeded to completion.

The new construction, on the basis of the contract bid, will cost per mile, \$22,000 for grading, \$10,000 for miscellaneous structures and \$3,000 for surfacing, or an aggregate cost of \$35,000 a mile for the entire project.

## TWO HUNDRED MEN EMPLOYED

The contractor, employing five power shovels and complementary equipment of tractors, scrapers, and dump trucks, and a labor force of nearly 200 men, is moving the earthwork at the rate of 7000 cubic yards daily from designated cuts to fills, in some cases hauling the material one-half a mile to placement. Several cuts and fills of 80 to 100 feet in depth, are being made so that finished construction of line and grade will be commensurate with the present day requirement for this class of highway.

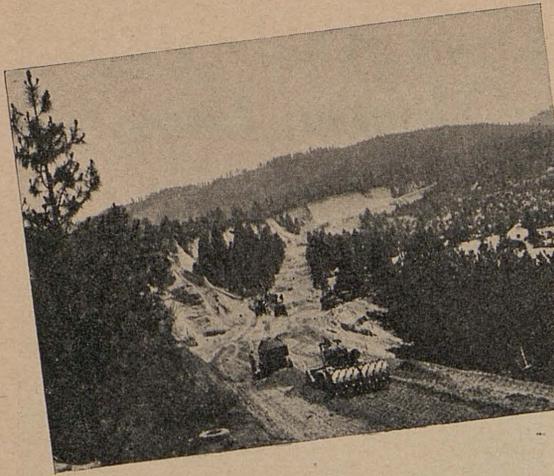
An example of the large masses of earthwork to be moved can be gleaned from the fact that one Engineer's Station alone (representing 100 longitudinal feet of highway center line) 1,000,000 cubic feet of earthwork is to be embanked at some locations.

The road between Auburn and Truckee, of which the portion of highway under discussion is part, while to a large extent catering to pleasure traffic bound to and from the Lake Tahoe region and the El Dorado National Forest, yet also is an integral part of a transcontinental vehicular route identified as U. S. Route 40 (the Victory Highway). As such, it will become, in ever increasing importance, the main transportation means for motorized commercial units plying between northern California and points to the East.

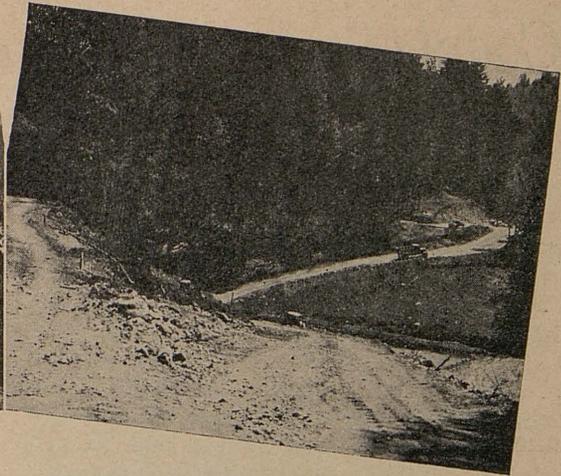
## NEAR HYDRAULIC DIGGINGS

Except for the first two and a half and the last mile of the project the route traverses, in a northeasterly direction, a canyon through which flows a tributary of the North Fork of the American River, known as Can-

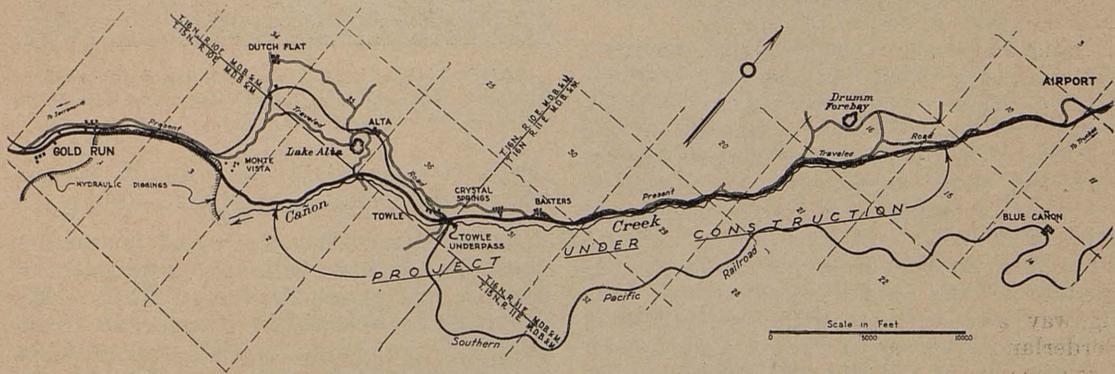
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**SPEEDY WORK** being done in moving vast quantities of earth on highway relocation near Gold Run hydraulic diggings.



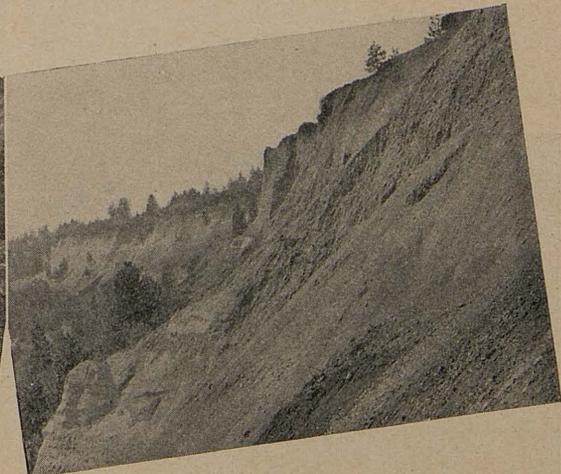
**IN TALL TIMBER**, this part of new mountain route involves long hauls from cuts to fills.



Sketch Map of Gold Run-Airport Improvement



**PIONEERING A ROAD** along steep cliffs with steam shovel and trucks. Completed embankment is shown in foreground.



**ALONG CENTER LINE** before construction near Gold Run. 1,000,000 cubic yards moved in 100 longitudinal feet.

## Coachella Valley Dips and Washouts to be Eliminated by Modern Pavement

By E. Q. SULLIVAN, District Engineer

**T**HE reconstruction of fourteen miles of State highway in the Coachella Valley, in Riverside County, on the road to the Imperial Valley sees a pavement of old standard giving way to the demands of modern traffic. The old pavement was built many years ago, 15 feet wide, 4 inches thick, and with shoulders of sand. It has held up well through the years, but pavements laid in the horse and buggy day prove utterly inadequate for modern traffic. The new highway will be 20 feet wide and from 9 to 6 inches thick, with a 12-inch sub-base and hard gravelled shoulders to add to the safety.

Night and day a stream of vehicles follows this highway. Many persons prefer night driving in the desert areas and the truck traffic also starts in the evening from the Imperial Valley gardens for the Los Angeles markets. Great trucks with huge trailers, are used extensively to carry grapefruit, dairy products, hay, watermelons, lettuce, and the endless varieties of garden products, coming into bearing the whole year round. This highway also connects with the Inter-state Borderland Highway at El Centro and therefore also carries a stream of tourists.

### ONCE BELOW SEA

To the casual traveler, the route might seem an endless desert waste flanked on the horizon by the shimmering colorful mountains. In reality, the region abounds in



**TRAVERTINE ROCK**, an Indian profile monolith bearing tribal writings covered with shells, indicating it was once submerged in an ancient sea.



**SAND SHOULDERS** along the old fifteen-foot highway through Coachella Valley and dip being replaced by modern pavement.

things of interest that astonish the layman and in some instances puzzle the scientist.

As one leaves the green and prosperous Coachella Valley with its multitude of ranches, one passes Travertine Rock. This landmark bears Indian writings, some so old that they are encrusted with shell growths, proving that they have stood beneath the waters of an ancient sea. The beach lines of this ancient sea are plainly marked along the rocky cliffs and sandy slopes. The ancient beach sands are filled with polished shells, and other remnants of sea life, another evidence of geologic changes.

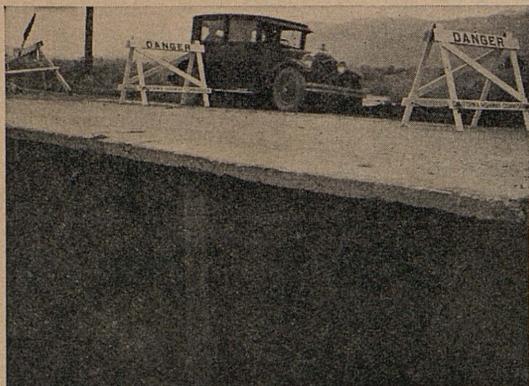
The waters of the present Salton Sea, some 30 miles long and 7 miles wide, gleam to the east a topaz blue, its possibilities as a winter playground hardly touched. Travelers have often compared the Salton Sea to the Sea of Galilee of the Holy Land.

The present Salton Sea was formed during the break in the Colorado River in 1905 to 1907, but geologists generally agree that for a period of probably from 400 years to 500 years, the Colorado River has discharged uninterruptedly into the Gulf of California, except for the brief period in 1905 to 1907. However, there were times in the olden days, confirmed by Indian traditions, when the Colorado River delivered its waters into the Salton Basin for long periods of time instead

## Whole Valley Once Great Inland Sea

(Continued from preceding page)

of into the Gulf of California and the whole Coachella Valley was a vast inland sea.



ONLY A CRUST of old pavement was left by a great summer flood of water that crossed this dip.

### ANCIENT BEACH LINE

This Salton Basin was then an inland sea with a surface of nearly 2000 square miles, embracing all of what is now known as Imperial and Coachella Valleys. The greatest depth of the sea was about 320 feet. Its margin is the well marked beach line. The present beautiful Salton Sea is but a small portion of what was once this great inland sea.

Fish Springs situated half way between the highway and Salton Sea was once a true oasis with its unfailling water for the pioneer immigrants. The modern autoists turns up his nose at the smell and taste of the alkaline water but pauses to marvel at the flow coming out of the parched ground. A 60-foot plumb bob can not touch the bottom of the flow; tiny pop-eyed fish emerge from the mysterious depths.

The water is clear and limpid; strangely enough, some underground rock barrier divides the underground waters near Travertine Rock in such a way that, just to the north, gush forth from artesian wells waters as sweet as mountain streams, while just to the south in the vicinity of Fish Springs the artesian wells are alkaline.

### 117 DIPS ELIMINATED

The new highway provides for bridges or culverts to replace all of the 117 rough riding dips of the old highway. This is the land of

sudden and torrential summer cloudbursts with enormous concentration of precipitation. They happen several times each summer. A cloud rapidly ascending from the horizon within an hour or two sometimes brings torrents of rain which may within a period of fifteen minutes cause floods of water to race down the gullies.

It has not been uncommon for an inexperienced motorist to attempt a crossing and have his car washed from the pavement. In another thirty minutes the brilliant desert sun may be shining again and the land steaming in the summer heat with only a trickle of water in the channels.

Such floods often leave the highway impassable unless it is liberally supplied with bridges and culverts. The accompanying pictures show the result of floods at dips during past summers on the old highway.

Though many people prefer to take summer trips on the desert at night, others taking long trips enjoy driving in the daytime; the dry air and the breeze created by driving keep the traveler reasonably comfortable and he will then have the cooler nights for sleep. The weather on the desert in the winter is usually delightful.

The fascination of the desert increases with each succeeding trip. Moonlight on the desert is of such radiance that mountains and distant views stand out clearly. Perhaps the fascination of the desert lies in its variety. Each trip brings new beauties and experiences.



UNDERMINING of the old thin pavement at dip by flood waters. One hundred seventeen of these dips are to be replaced by culverts.

## *Eight Road Projects, Nine Bridges on Month's Advertising Program*

**C**OLONEL WALTER E. GARRISON, Director of the Department of Public Works, announced that during the month of August, State Highway Engineer C. H. Purcell of the Division of Highways, planned to advertise 13 major projects for construction on State highways at an estimated cost of \$2,224,400.

These projects include eight road jobs and five bridge jobs. The road projects cover work on approximately 56 miles of State highway and amount to an estimated cost of some \$1,564,000. The five proposed bridge projects will involve the construction of nine bridges, estimated to cost approximately \$660,000. The work is distributed well over the State and involves jobs in ten counties.

The following summary and detailed list of projects planned for August advertising show the scope of the proposed work which will carry forward the 1932 State highway construction program:

### EXTENDING IMPROVEMENT

In Los Angeles County the second section of construction is to be made on the new Los Angeles-Pomona lateral. A contract has already been awarded and work is about to begin on the easterly portion of the route between Barranca Street and Pomona. The work comprises a graded roadbed 50 feet wide and Portland cement concrete pavement 30 feet wide. At its westerly end this project will connect with the existing concrete pavement on Garvey Avenue at Mountain View Road, and at its easterly end it will connect with the oiled macadam of Arroyo Avenue at Orange Avenue.

Two major structures are planned for construction in connection with this improvement, one, a grade separation with the main line of the S. P. near the beginning of the project, and the other a bridge across the San Gabriel wash. The completion of this new lateral will give to southern California motorists a modern State highway between Los Angeles and Pomona three miles shorter than the present route.

In Fresno County where the Golden State

Highway enters the city of Fresno on the south, it is planned to reconstruct the highway from Fancher Creek to the south city limits of Fresno, a distance of 2.7 miles. This project will carry forward the improvement completed last year on the 7.5 miles between the Fowler Switch Canal and Fancher Creek. The new construction will follow the existing alignment but will provide a heavy 30-foot asphalt concrete pavement on a 46-foot roadbed to replace the existing rough 20-foot concrete pavement.

### CURVES ELIMINATED

Major improvement to the Santa Cruz-Stockton lateral in Santa Cruz County is planned for the section of the route in the Santa Cruz Mountains between Inspiration Point and Scott's Valley. The project involves improved alignment and the construction of a 46-foot roadbed.

**The existing road has 152 curves with total curvature amounting to more than 20 complete circles, while on the new road there will be only 22 curves, with a total curvature of less than four complete circles. The minimum radius on the existing road is 80 feet and on the proposed alignment 500 feet. There will be a saving in distance of two miles.**

This route has become one of the most important recreational highways in the central coast country of California as it connects the Santa Clara Valley and the bay section with the many resorts in the Santa Cruz Mountains and the beaches along the north shore of Monterey Bay. The improvement has become a necessity if adequate facilities are to be provided for the large volume of travel using this highway.

### RELIEVES CONGESTION

In Santa Clara County the broad ribbon of the Bayshore Highway is to be carried 8.2 miles further towards San Jose. The new construction will connect with the southeasterly end of the section just completed between Redwood City and Oregon Avenue in Palo Alto and will carry the road by the Sunnyvale Naval Air Base to Lawrence Sta-

(Continued on page 18)

## Work Prepared for Bids in August

The following State highway improvement projects with an estimated total cost of approximately \$2,224,000 were planned to be advertised for bids prior to September 1. The road jobs cover approximately fifty-six miles of highway and five bridge projects involving construction of nine bridges. The work is distributed over the State in ten counties as follows:

### DETAILED LIST OF PROJECTS

County	Location	Miles	Type of Surface
Los Angeles	Between El Monte and Covina	4.3	Port. Cem. Con. Pave.
Fresno	Fancher Creek to Fresno	2.7	Asphalt Con. Pave.
Tulare	Lemon Cove to Three Rivers	4.5	Bit. Treat Crush. Rock
Santa Clara	Oregon Ave. to Lawrence Sta. Rd.	8.2	Bit. Treat Crush. Rock
Marin	Alto to Belvedere Crossing	3.1	Bit. Treat Crush. Rock
Monterey	San Remo Divide to Carmel River	3.7	Graded Roadbed
Santa Cruz	Inspiration Point to Scott's Valley	4.8	Graded Roadbed
San Bernardino	Westerly Bdry. to San Bernardino and San Bernardino to Anderson St.	24.7	Oiling Shoulders
Los Angeles	Across Piru Creek	----	4 Reinf. Conc. Bridges
Shasta	Across Fall River at Fall River Mills	----	Steel Stringer Bridge
Monterey	Across Wild Cat Ceek	----	Reinf. Con. Arch Bridge
Shasta	Across Hat Creek and Pit River	----	2 Steel Stringer Bridges
Kern	Across Kern River at Bakersfield	----	Stl. Str. & Tim. Trestle

### SUMMARY

Type	Miles	Amount
Portland Cement Concrete Pavement.....	4.3	\$190,700
Asphalt Concrete Pavement .....	2.7	168,000
Bituminous Treated Crushed Rock Surfacing	15.8	700,700
Graded Roadbed .....	8.5	483,200
Oil Treatment to Shoulders.....	24.7	21,800
Bridges .....	(9)	660,000
Totals .....	56.0	\$2,224,400

## 20 Dams Under Construction in 1932

(Continued from page 1)

of southern California. This section of the State with a population of two and one-quarter million people, comprises ten per cent of the irrigable area of the entire State and fifty per cent of the State's population. The water resources of southern California are only 1.4 per cent of the total resources of the State and if wholly conserved are insufficient to fully meet future requirements without development of water from other sources. The control and conservation of the surface flow of southern California streams are imperative to meet the ever increasing demands for municipal purposes, irrigation uses and to afford protection against recurring devastating floods.

The urban communities are vitally interested and concerned in being assured of sufficient water to meet their domestic and industrial uses. The rural communities must obtain a sufficient supply, economically developed, to permit of irrigation uses in increasing amounts. Both interests have uppermost in their minds protection against the loss of life and damage to property that has and will continue to result from the recurring torrential floods common to this section of the State.

#### FOUR COMPLETED

Four major dams have been completed in southern California within the last year, and applications for six have been recently approved and construction is either under way or is expected to start soon. Several are for the dual purpose of flood control and conservation; others are primarily for conservation with small flood control value. The following table lists the larger dams under construction in southern California in 1932

MAJOR DAMS IN SOUTHERN CALIFORNIA UNDER CONSTRUCTION IN 1932

Name	Type	Height foundation to crest of dam	Storage acre-feet	Approximate total cost
Big Tujunga No. 1.....	Concrete-arch.....	180	6,250	\$980,000
San Gabriel No. 1.....	Rockfill.....	360	68,000	10,000,000
San Gabriel No. 2.....	Rockfill.....	270	14,000	3,000,000
Pine Canyon .....	Concrete-gravity..	325	40,000	7,500,000
Bouquet Canyon .....	Earthfill.....	215	36,200	4,000,000
Chatsworth enlargement .....	Earthfill.....	40	10,500	860,000
El Capitan .....	Hydraulic fill.....	240	118,000	4,000,000
Juncal .....	Concrete-arch.....	160	7,000	337,000
Santiago .....	Earthfill.....	160	25,000	900,000
Irvine .....	Earthfill.....	46	17,000	155,000
10 small dams.....			45,000	172,000
<b>Totals .....</b>			<b>386,950</b>	<b>31,904,000</b>

The three dams of the Los Angeles County Flood Control District are designed for both flood control and conservation. Big Tujunga No. 1, recently completed under State supervision, is situated on Big Tujunga Creek, above the San Fernando Valley. It is a concrete arch dam of the "variable radius" type in which the radius of the arc increases from lowest point to crest, thereby affecting a saving in amount of materials used and conforming to the contours of the canyon, without sacrificing the safety of the structure. This dam has already been of service in regulating last winter's floods, which otherwise might have caused damage.

Groundbreaking ceremonies were held at the site of the Los Angeles County Flood Control District's San Gabriel No. 2 dam on April 15, 1932, following approval of the plans by the State Engineer and construction is now actively under way. This dam is located on the west fork San Gabriel River, about seven miles upstream from the Forks, and is one of the structures to be built in lieu of the proposed Forks dam on the San Gabriel River.

#### LARGEST IN WORLD

Plans for San Gabriel No. 1 dam have just been approved. This is the largest dam to be built by the Los Angeles County Flood Control District, and is located in San Gabriel Canyon about two miles below the Forks. It will cost about ten million dollars and be the largest rockfill dam in the world, containing about five million cubic yards of rock. (The largest rockfill dam at present is also in California—the Salt Springs dam of the Pacific Gas and Electric Company.)

San Gabriel Nos. 1 and 2 dams of the Los Angeles County Flood Control District, together with Pine Canyon dam now under construction by the city of Pasadena, will provide for the complete conservation and utilization of the waters of San Gabriel River, and also afford flood protection to San Gabriel Valley.

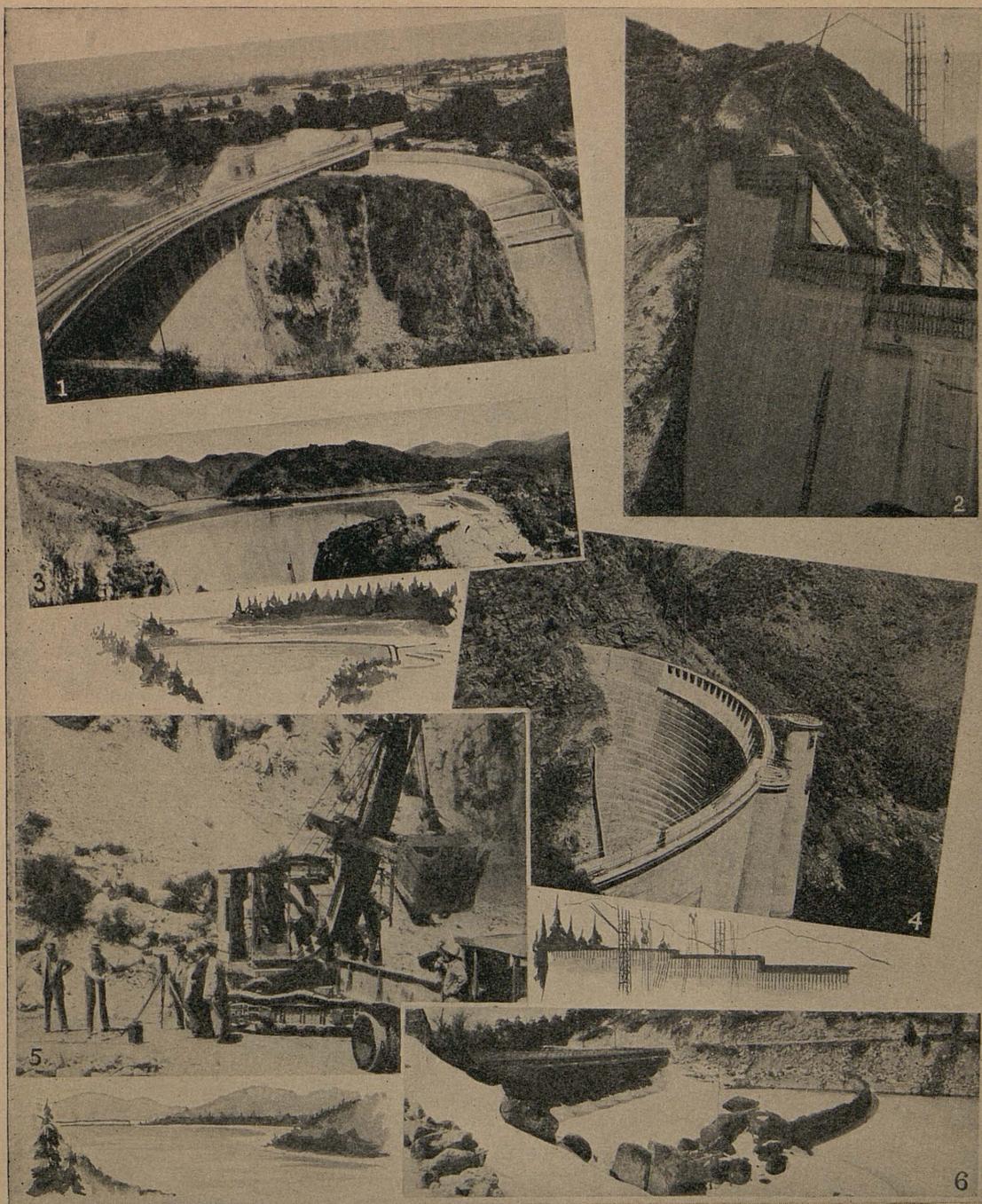
The two dams under construction by the Flood Control District will replace the storage which it was contemplated could be developed by the construction of a masonry dam of unprecedented magnitude at the Forks site on San Gabriel River. When the law governing supervision of dams became effective in

August, 1929, construction had been under way on the Forks dam for about two years, and several million dollars had been spent but a slide had occurred, raising questions as to the safety of the site.

#### SANCTION REFUSED

An application for approval of the site and plans was made to the State Engineer, who at once initiated a critical examination. Being situated immediately above the populous San Gabriel Valley it was essential that any dam built here should be safe by the best engineering standards. To review the whole situation properly the State Engineer was assisted by

(Continued on page 14)



**SOUTHERN CALIFORNIA DAMS** will number 170 when the present construction program now under way is completed and the total cost will approximate \$70,000,000, providing a water storage of 1,300,000 acre-feet. Some of the structures already built or building shown in the above group are: No. 1, Devils Gate Dam in the Arroyo Seco near Pasadena; No. 2, Big Tujunga Dam, 180 feet high, a concrete arch type; No. 3, Gibraltar Dam on the Santa Ynez River, built for the city of Santa Barbara water supply system; No. 4, Juncal Dam, built by the Montecito Water District, Santa Barbara County; No. 5, Ground breaking scene at San Gabriel Dam No. 2, being built by the Los Angeles County Flood Control District in San Gabriel Canyon, and No. 6, the original Big Bear Dam, located 150 feet upstream from the site selected for a new dam.

## Cajon Pass Realignment Completed Develops a "Magnetic Hill" Curiosity

**T**HE CAJON PASS Highway is now complete and traffic is moving over it. As can be seen by the accompanying illustrations, Cajon Creek has been moved over to the left of the new highway and the highway occupies the old creek channel. One of the heaviest floods in many years descended last winter during the construction of this road. The new channel had been finished and carried the flood safely through with no injury to the new road under construction.

The old road had ninety-one curves which have been reduced to thirty-two on the new highway. The old curves could not safely be negotiated at speeds exceeding thirty miles per hour. Traffic at forty-five miles per hour on the new curves gives a feeling of such safety and security that it is evident should the legal speed limit ever be increased that travel can securely use this road at still higher speed with perfect safety.

### COUNTY CAMP MOVED

Camp Cajon lies near the center of this project. It is a campground operated by the county of San Bernardino to welcome tourists coming in from eastern States, and offers a delightful, shady, convenient first night stop in California. The old road was restricted in passing through Camp Cajon by a masonry wall on the one side and rocky cliffs on the other.

Clustered on the rocky cliffs are a number of interesting stone buildings erected by various organizations, and it was impossible to cut back the cliffs without destroying them.

On the other side the ground being level, it was possible to move back the masonry walls and rearrange the monuments, masonry seats, barbecue pits, picnic tables, and other facilities, characteristically inscribed, which have been donated through the years. Care was exercised by the masons and laborers to preserve the original appearance of the masonry in moving back and rebuilding such that no scars are in evidence.

Above Camp Cajon the road branches off to Big Pines, the Los Angeles County Park.

For many years there has been distressing traffic congestion at this junction following heavy snows when pleasure seekers crowded up to the snow sports from the Los Angeles metropolitan area. At this junction when there is snow, vehicles must stop to put on chains. Here two and one-half acres have been leveled to make a large parking space which it is expected will eliminate the congestion.

An unexpected curiosity has developed in the construction of this road. A "magnetic hill" has been discovered. In going north, and passing through the railroad grade separation, the traveler appears to be descending a hill, but if he stops he will find his car will rapidly back up the hill in the most uncanny fashion, suggesting that he is being drawn backwards up hill by some magnetic force. There is actually an ascending grade of one per cent, though the eye is completely deceived and this ascending grade appears to be a descending grade.

The old road, in descending out of the Cajon Pass followed Cajon Wash and was hemmed in by gravel banks. The new highway is up on the mesa and the tourist in entering California will now be greeted by spectacular views of Mount San Jacinto and Mount San Bernardino rising snow capped as a background for the lovely dark green orange groves of California.

### ENTER THE COMFORT CONTRACTOR

Exit the heating contractor! Enter the comfort contractor!

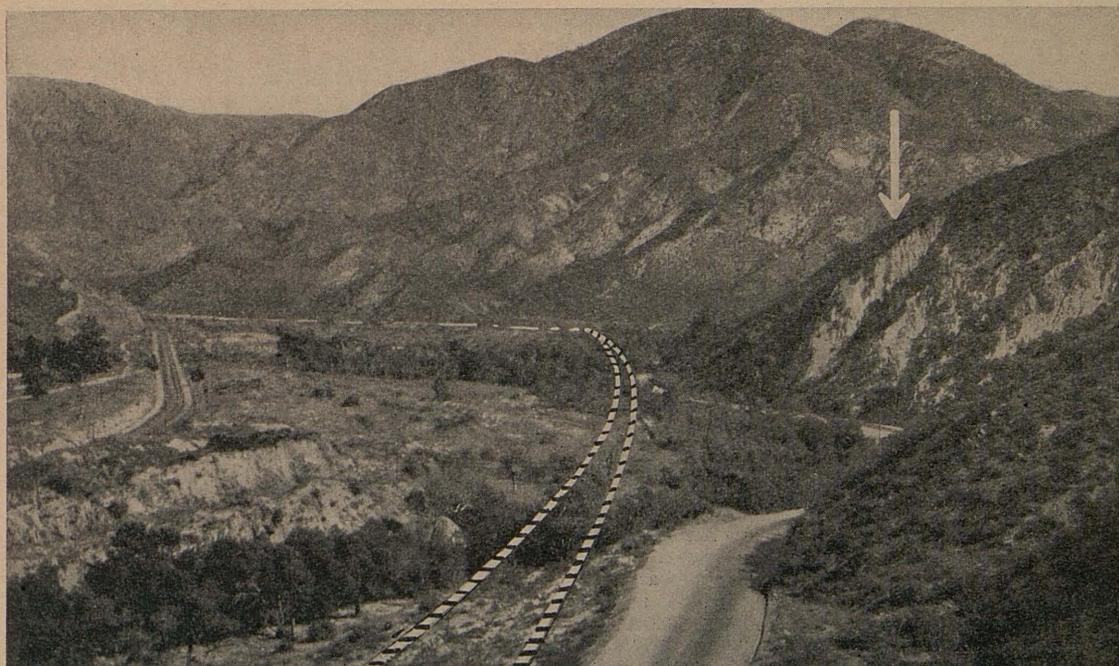
The new name for the dual function was introduced at the annual convention of the Heating and Piping Contractors National Association in Detroit. The suggestion was made by a New York consulting engineer.

"As comfort is the slogan of the heating, ventilating and refrigerating manufacturer today, the heating and piping contractor should become a comfort contractor, for by so doing he can embrace in one work all of the things that he is trying to accomplish or sell for all seasons of the year," said the proponent.—*Portland Journal of Commerce*.

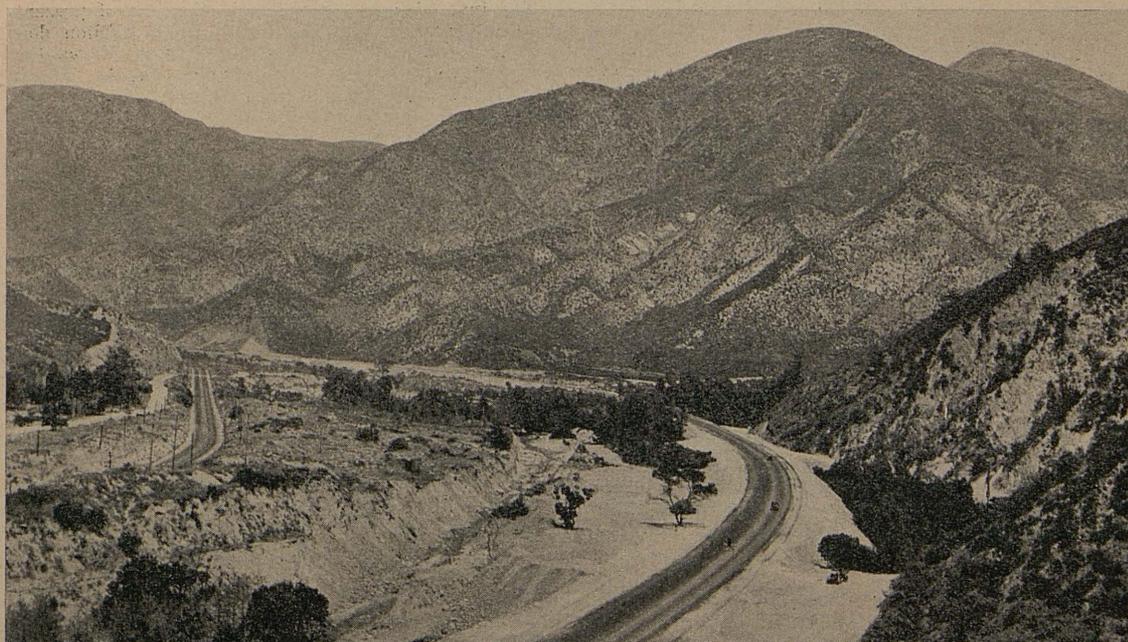
### An Untaxable Income

Friend: "What's your son's average income?"

Father: "From two to two-thirty a.m."—*Exchange*.



**BEFORE MAJOR OPERATIONS** by State engineers on the recently completed realignment project, the highway through Cajon Pass, famous transcontinental traffic gateway to southern California, had ninety-one curves, steep grades and the Blue Cut slide, indicated by arrow, that blocked the road with tons of dirt at every rain. One operation involved changing the creek channel to permit moving the road away from the slide.



**MINUS 59 CURVES**, the Cajon Pass highway is shown after completion of the recent realignment operations. The channel of Cajon Creek has been changed, permitting a new route for the highway sufficiently removed from the hill slopes to prevent further blockades by the Blue Cut slide.

## Protection Given 37 Cities and Towns

(Continued from page 10)

a consulting board of outstanding geologists and engineers of national reputation, preeminently qualified to advise upon the safety features.

After thorough consideration the application was disapproved on the grounds that the dam if built would be a menace. The Flood Control District thereupon made intensive studies of other dam and reservoir sites on the San Gabriel River, resulting in the selection of San Gabriel dam sites numbers 1 and 2, plans and specifications for both of which have now been approved.

The city of Pasadena has started construction on its Pine Canyon Dam, located on the main San Gabriel River, about five miles above Azusa and about three miles downstream from San Gabriel No. 1. Groundbreaking ceremonies were held on April 26th last. Plans were approved in June, 1931. This structure will contain about 480,000 cubic yards of concrete and three million pounds of reinforcing steel. The 40,000 acre-feet of storage capacity will make possible the use for domestic consumption in Pasadena of a large amount of water which would otherwise be wasted into the ocean.

Nowhere in the State is there a better example of the necessity for building dams for water conservation, nor of the responsibility devolving upon the State office in approving such dams, than on the San Gabriel River. There will be three great dams on this river, storing a total of 122,000 acre-feet, costing about \$20,500,000.

### GREAT VALUES INVOLVED

Downstream lies the San Gabriel Valley, in which are situated 37 cities and towns and a great suburban and agricultural development. The total population of the valley is 750,000, and the assessed valuation \$1,000,000,000, the probable real value being between two and a half and three billion dollars. The dangers inherent in the construction of these dams are apparent. The failure of an upper dam might easily destroy those down stream. In the event of the failure of any one, a catastrophe might be the result.

State supervision of dam building on San Gabriel River has resulted in the abandonment of the proposed Forks dam on the ground that it would have been a menace if built, and in the requirement of increased safety factors on the three dams which are already or soon will be under construction on the river. These actions constitute an assurance to the people of San Gabriel Valley that the water which is absolutely necessary for their use will be made available for them under the consideration that protection of life and property is paramount.

### REPLACES DAM THAT FAILED

The city of Los Angeles has started construction of Bouquet Canyon Dam under approved plans. This is located near the upper end of Bouquet Canyon, and will replace the storage capacity which was lost with the failure of the San Francisquito dam. Bouquet Canyon dam will be an earthen structure of very generous proportions, and will be safe by all modern engineering standards. The city has recently com-

pleted the enlargement of Chatsworth Reservoir, which will now store 10,500 acre-feet.

The city of San Diego is building a very large dam of a combination hydraulic fill and rock embankment type, to be known as El Capitan, on the San Diego River. It will supply domestic water for the city of San Diego and also be useful in flood control. The dam is located about twenty-five miles northeast of the city of San Diego.

The Montecito County Water District, adjoining the city of Santa Barbara on the south, completed a few months ago its Juncal dam on the Santa Ynez River, which combines three different types of structures. The main dam across the Santa Ynez River is a variable radius arch, and there is an auxiliary dam in a saddle, one section of which is gravity type and the other multiple arch.

### IRRIGATION STORAGE

Several irrigation enterprises have also built large storage dams. A notable example is the recently completed Santiago dam in Orange County, jointly owned by the Carpenter and Serrano Irrigation districts and the Irvine Company. This dam is located on Santiago Creek, about nine miles northeast of the city of Santa Ana, and while intended primarily for irrigation will probably be used for flood control as well.

The application of the Irvine Company of Orange County for the construction of a dam near Newport Bay, which will conserve about 17,000 acre-feet when completed, has been approved.

The investment at this time in the face of present financial difficulties of more than thirty million dollars in these dams for storage of water shows the faith which southern California has in its future, and also demonstrates clearly that water development must go ahead if the State is to progress or even maintain its present position. Continued development of water and water storage under proper regulation is vital.

### WIDE FIELD OF DUTY

In addition to supervising construction of new dams, it is the duty of the State Engineer, under the law, to inspect, analyze and report upon all existing dams in the State over the minimum height. While the dams built in earlier years are in general not as large nor of as great technical difficulty as those now contemplated, the problem of obtaining adequate information upon which to approve them as built or upon which to direct repairs, is not easy because in many cases there are no records available to indicate the character of the foundation upon which the dam was built nor the methods or quality of construction.

Under these conditions special investigations or explorations are often necessary to obtain sufficient information upon which to determine what repairs, if any, are necessary.

There are in southern California at the present time or soon will be about 170 dams, with a storage capacity of 1,300,000 acre-feet, which represent a cost of dams alone, exclusive of reservoir lands, water rights, rights of way, appurtenant structures, etc., of about seventy million dollars. The State Engineer exercises supervision over all of these dams, which may be segregated as follows, according to ownership:

## 170 Dams in South Will Involve Total Cost of \$70,000,000

(Continued from preceding page)

	No.	Acre-foot storage capacity
Municipally owned .....	49	460,000
Water and flood control districts.....	19	130,000
Irrigation districts .....	12	50,000
Power companies .....	3	-----
Individual owners and water com- panies .....	87	660,000
	170	1,300,000

The city of Los Angeles leads the list as to number of dams, having 27, while the Los Angeles County Flood Control District comes next with 17. The city of San Diego has eight.

### SAFETY ASSURED

The number, magnitude and strategic location of these dams in this populous and intensively developed, high-valued section, indicate the necessity of State supervision of these structures in the interest of safety.

This requisite, accentuated by the fact that southern California has within recent years experienced two disasters resulting from dam failures, is the principal reason that the Legislature of the State placed all dams under centralized State authority with power to exercise vigorous supervision from the standpoint of safety and to direct work necessary to render each and all of them safe in conformity with modern engineering knowledge and standards. This function is entrusted to the State Engineer and is one of the most important activities of that office.

The very best cooperation has been received from owners of dams, who in general are favorable both to the law and its administration. It is believed that the dam act has been impartially and competently administered, and it is unequivocally stated that a large number of dams, both new and old, in California are much safer at the present time, or will be when repairs or construction have been completed, than they would have been had the law not been enacted by the Legislature.

This assurance to the people of the State is of much importance in the program of water development which is going on in all parts of California and which must continue in the future if the State is to maintain its present position of leadership.

### CALIFORNIA CITY LEADS

The density of motor vehicle registration in Los Angeles is greater than that of any other city in the country, there being 2.4 persons for every motor vehicle registered in the city. This compares with 7.7 persons in New York, 9.2 persons in Chicago, and 11.1 persons in Philadelphia.—*The American City*.

"What is your daughter working for at college—  
an M. A.?"

"No, an M-R-S."—*Buffalo Courier-Express*.

## HIGHWAY CREW STOPS FOREST FIRE SPREAD

State of California  
Division of Forestry  
Middletown, July 6, 1932

C. H. Whitmore,  
Division Engineer,  
Sacramento, Calif.

Dear Mr. Whitmore:

I wish to speak a word of praise in behalf of the following members of the Hi-way crew stationed at the "Clear Lake Oaks," Lake County, Calif.

C. C. McFadden	C. E. Hichock
W. H. Beard	C. Canham
F. H. Holmes	G. F. Baylard

These men were coming home from work when they saw a fire starting from a camp fire that some negligent person had left burning along the road. They immediately proceeded to put a line around the fire and were successful in holding it to a very small area. McFadden then notified me of the fire and I went up there and made an investigation. It pleases me greatly to receive such cooperation from your division. Mr. Beard was with me on a number of fires in the Fair Play district of El Dorado County last year, and I always found him to be a very capable and conscientious man.

Wishing your division the best of success for the future, I remain,

Yours respectfully,

HUGO LINDBLOM,  
Asst. Ranger.

## ARCHITECTURAL AWARDS For the Month of July

WHITTIER STATE SCHOOL—Steel water storage tanks. Contract awarded to Chicago Bridge and Iron Works, \$6,335.

MENDOCINO STATE HOSPITAL—Drilling and testing water well. Contract awarded to R. L. Norris, Sacramento, \$3,961.

STOCKTON STATE HOSPITAL—Surfacing roads. Contract awarded to C. W. Wood, Stockton, \$5,017.

BORDER STATION AT YERMO—Addition to building. Contract awarded to W. W. Clark, Barstow, \$296.12.

### MUST PLAN IN ADVANCE

The tremendous increase in traffic congestion; the efforts of local governments to meet it in the authorization and construction of highways and bridges; the unparalleled rapid extension of urban and suburban conditions into rural areas—all force upon the attention of the citizen, singly and in groups, the fact that advance planning is essential to the proper and economic development of an adequate future highway transportation system.—*The County Highway System*.

## *Six Cakes of Ice Used to Lower 60-Ton Steel Bridge Span Into Place*

By GORDON L. LONG, Resident Bridge Engineer

THE MODERN highway contractor distributes the greater part of his contract monies among a long list of commodities and crafts to which one construction company recently added the wares of the iceman when they made use of six 400-pound cakes of the common or household variety of ice in lowering the sixty-one-ton steel span of the Russian River Bridge on the Tahoe-Ukiah cut-off.

The steel trusses, in three separate pieces, were connected together by transverse floor beams on the approach roadway and moved on rollers over the completed trestle spans to their position above the river channel where they were supported by a temporary pile falsework structure.

Rolling the trusses out over the trestle spans brought them to a position about three and one-half feet higher than their final resting place on the piers.

### NO ROOM FOR JACKS

The sections of the trusses were riveted together while supported on the falsework, after which timber cribbing was placed on the concrete piers under the two end floor beams. The falsework was then removed leaving the steel supported at the piers but three and one-half feet above final grade.

The bridge was then lowered with jacks to within six inches of its final height when it was discovered that there would not be sufficient clearance between the bottom of the steel beams and the concrete piers to permit of further use of the jacks.

An order was phoned to the local ice company for the delivery of six 400-pound cakes of ice to the bridge site at 6.30 a.m. the following day.

These ice cakes measured about 10½ inches by 21 inches by 56 inches. Three cakes were placed flatwise on each of the two concrete piers, directly beneath the end floor beams. In order to distribute the load from the relatively narrow bottom flanges of the steel beams over a larger area of the ice, timber planking was placed between the ice and the beams. The jacks were then removed, allowing the entire weight of the span to come onto the ice.

It required twenty-five hours for the ice to melt sufficiently to lower the truss the necessary six inches, but this was no disadvantage as sufficient time was given the workmen to place the steel masonry pedestals and rockers and drive the 5-inch steel pins.

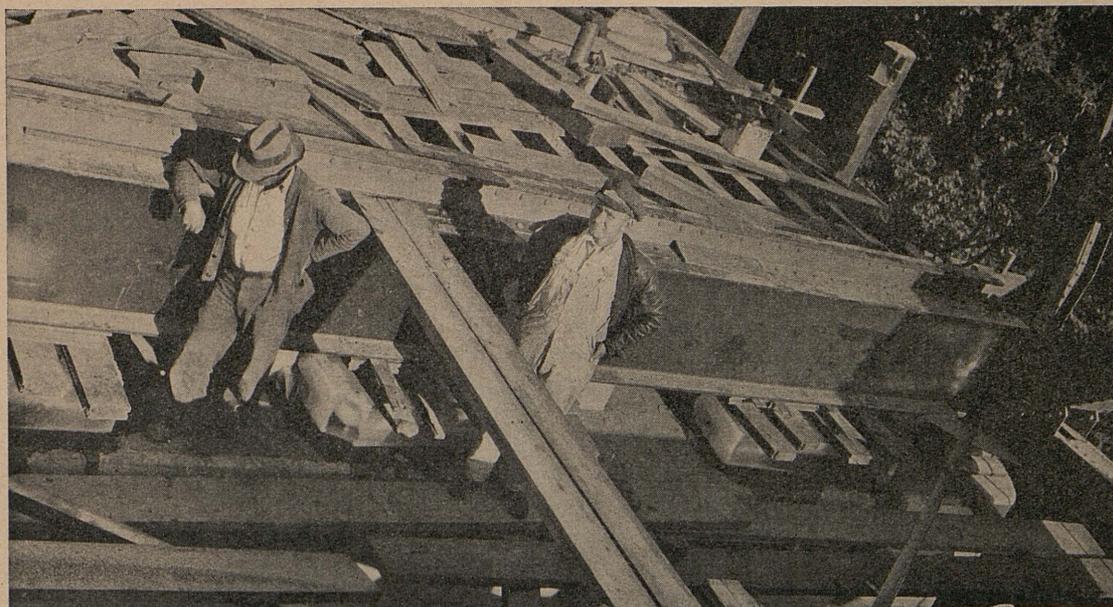
The comparative decrease in the three dimensions of the cakes appeared to be in about direct proportion to the areas of the respective surfaces limiting the dimensions. From this it is deduced that to lower a weight through a much greater distance by this method would demand that attention be given to the decrease in the supporting area of the ice.

Each 400-pound cake of ice supported fifty times its weight, or about twenty thousand pounds. From observation it was roughly estimated that this load could be safely increased by fifty per cent but tests on eight-inch cubes in the Division of Highway's laboratory show that the ultimate compressive strength of the ordinary commercial ice is about 220 pounds per square inch. These tests would indicate that the total safe load, allowing a safety factor of two, permissible on the large surface of one ice cake, would be about 130,000 pounds.

The use of natural ice by builders is not of uncommon occurrence. In the northern latitudes instances of the erection of comparatively heavy bridge spans, supported on the frozen surface of the water during construction, are recorded and in northern Canada, winter construction of a railroad by placing the ballast directly on the frozen swamps and adding more material as the ice thawed in the spring, solved a difficult and otherwise very expensive problem.

In the above instances only a static mechanical property of the ice was utilized and it is believed that the employment of the combined mechanical, physical and thermal qualities of the substance in moving a comparatively large weight as described above.

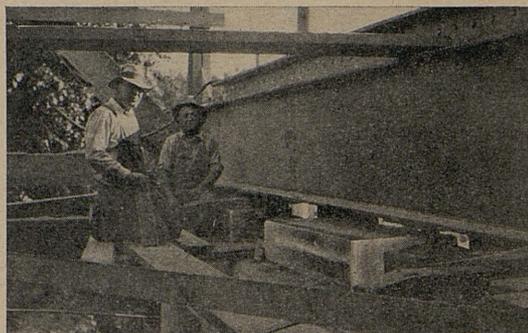
It might be added that convincing the order clerk at the ice company that he was not on the receiving end of a practical joke was the only difficulty encountered in this novel operation.



**A MELTING SCENE**—Here's the iceman helping the engineer watch six cakes of ice do the work of jacks in lowering bridge truss.



**THE ICEMAN'S BRIDGE** over the Russian River on Tahoe-Ukiah cut-off after being properly iced into place.



**TRUSSES ON ICE** was a new dish for the steel men but they found it did the trick.

## GOLD RUN-AIRPORT PROJECT ABOLISHES THREE GRADE CROSSINGS ON U. S. 40

(Continued from page 4)

yon Creek. For the first half of the project the terrain is much more rugged than is the remaining half.

The controls of the route align the new road through a varied topography of bench section on a steep sidehill, where it is projected near the rim of hydraulic diggings at the Gold Run end of the work and on the hillside of the canyon farther along, of moderate cuts and fills where ridges are followed

and of massive cuts and fills where ridges are crossed.

Based on current progress the contractor will finish the construction of this project within the prescribed time limit, having at the present time completed, after slow progress for the first three months of operations, more than one-third of the work, with the time allotment about one-half expended.

"What's happened, George?" she asked her husband, who had got out of the car to investigate.

"Puncture," he said briefly.

"You ought to have been on the lookout for this," was the helpful remark. "You remember the guide warned you there was a fork in the road."—*Tit-Bits*.

## 13 Major Projects Offered to Bidders on August Schedule

(Continued from page 8)

tion Road. The new section will be a 50-foot roadbed surfaced with bituminous treated crushed gravel or stone 42 feet wide.

This new route down the peninsula from San Francisco has already mitigated the traffic congestion on the Coast Route, although it has only been completed to Palo Alto and its completion into San Jose will provide adequate highway accommodations down the peninsula.

On the new alignment of the Redding-Alturas lateral between Burney and Fall River Mills in Shasta County, bids will be asked for the construction of three bridges. One contract is for a steel stringer bridge across Fall River at the town of Fall River Mills and a second will be awarded for steel stringer bridges across Hat Creek and Pit River.

Road construction on the 19 miles between Canyon Creek, just west of Burney and Fall River Mills is well under way and a contract has recently been awarded for the construction of the westerly ten-mile section.

### LARGE BRIDGE PLANNED

As a unit in the construction of a new northerly approach of the Valley Route into Bakersfield, the State plans to construct a new bridge across the Kern River. This major structure will be placed on the new alignment of the State highway to be constructed cooperatively by the State, the city of Bakersfield and Kern County as a revised routing of the Los Angeles-Sacramento arterial through Bakersfield.

The new bridge will be 2295 feet long and will consist of steel stringer spans, timber trestle, and deck of concrete to provide a clear roadway 40 feet wide with two 4-foot sidewalks. This new crossing will eliminate from the State highway the existing narrow concrete arch bridge built 19 years ago by the county.

"How do you determine the horsepower of a car?"  
"By the number of horses it takes to haul it back to town."—*National Forest*.

A scientist says a mosquito can fly fourteen hours without alighting. But it seldom does.—*Florence Herald*.

## Song of the Bridge

OH WE sing of the clatter and clamor and clang,  
As the rising ribs rear high,  
Of the breath taking shout of the men far out  
Silhouetted against the sky.

And we sing of the churn of the great machine  
As it rolls out the mixture below,  
Of the swift intake as the columns make  
And the bucket swings to and fro.

Oh, high overhead, from yellow and red  
The smoke of the donkey turns blue,  
With the strain and snap, as the cables slap  
And the lines to the sheaves run true.

And we plan for the strength of the structure  
As the time stream ebbs and flows  
And we plan for the weight of a loading  
'Gainst Stress the King of our Foes.

Oh, ye people, who travel the highways  
From the uttermost ends of the earth,  
To you we sing of this animated thing  
That has toiled from the day of its birth.

To the poets and peasants and princes  
Who speed cross the rivers and creeks  
Hark, to the murmur beneath you!  
Hark, while the structure speaks:

"I was born in the vales with primitive man  
As he clung to the tree that was home.  
I stood with the brave Horatius  
By the foam-splashed towers of Rome.

I gave, when the Time was upon me,  
As I plunged in the hell-stream's tide,  
I gave the all-that-was-in-me,  
I gave—but I never died!

I spanned, in the days of Richard,  
The moat that guarded the gate,  
And armored men with their ladies  
Knew that I guarded their fate.

Over the rushing torrents,  
Is the place that I pause for rest,  
Over the rock-strewn chasm  
Is the home that I love the best.

Now rich with years and knowledge,  
As the Stream of the World passes by,  
I know that I live forever,  
I live—and I can not die."

ALFRED C. NORTH,  
*Assistant Bridge Construction Engineer.*

### A SAFETY RECORD

Without a single traffic accident death to a child of school age, from 6 to 15 years, in all Los Angeles County during the month, June was the first in 86 months over a period of seven years in which such a record had been scored.

## "Official Car" Meets Tragic Fate—Stanton Escapes With Injuries

A tragic fate overtook Commissioner Philip A. Stanton's "official car" on July 9th when it figured in a highway crash that left it a crumpled wreck by the roadside while, to the great joy of his many friends, the veteran California Highway Commissioner escaped with minor injuries.

The "official car" ensemble—Stanton, his ancient flivver, his still more ancient dog and his cigar—a combination, always the same, that has been a familiar sight for years to Orange County folks was proceeding along the Coast Highway near Seal Beach. While turning into Bay Boulevard a speeding machine crashed into them with terrific impact. The "official car" turned several somersaults and came to rest, a crushed, distorted thing minus two legs.

### ENSEMBLE EMERGES

Out of the mass of twisted steel and broken glass, Commissioner Stanton emerged bleeding, dragging the unconscious dog Foxie after him and still gripping the cigar between his teeth.

"We thought you were surely killed, Phil," exclaimed a breathless friend who ran to his aid.

"God is in his temple and the government at Sacramento still lives," exclaimed the Commissioner as he calmly took stock of his injuries.

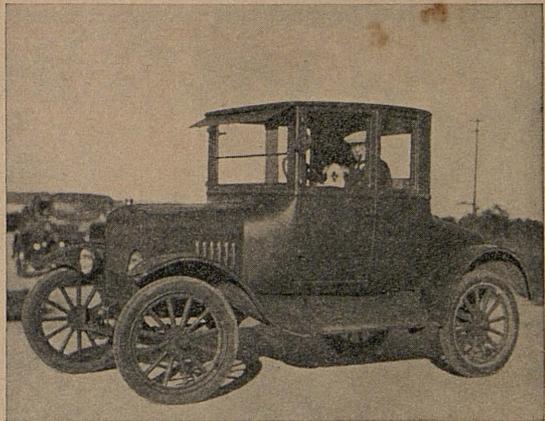
A bad cut on one hand required six stitches, both knees were cut and swollen and numerous contusions were distributed over his body. Foxie was stunned and had a deep cut over one eye. The cigar was mushroomed.

Commissioner Stanton was taken home and put to bed where he remained for one week with many protests against the doctor's orders. He missed one meeting of the Highway Commission but turned up at the next in Sacramento looking well and fit as ever.

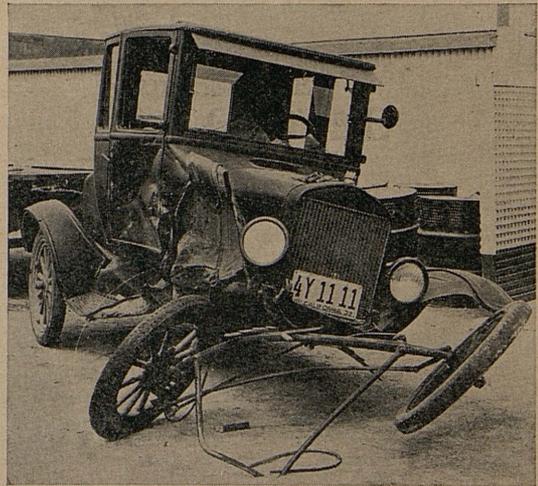
Despite the fact that he is independently wealthy, owns a beautiful estate at Anaheim and an expensive family car which Mrs. Stanton drives, the Commissioner has persistently stuck to his old flivver for his personal use. It was his first love, automotively speaking, and he never learned to drive any other.

Hungry Tourist—Waiter, two eggs, please. Boil 'em four minutes.

Waiter—Yes, sir, be ready in a second, sir.



Commissioner Stanton in his "Official Car."

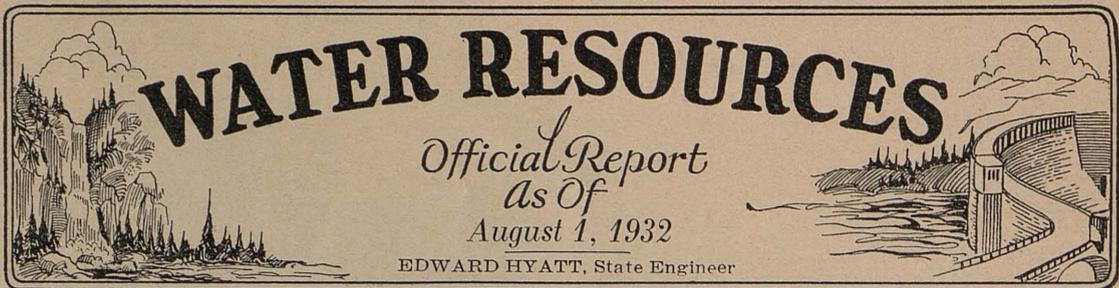


"Official Car" as it looked after crash.

## Highway Builders to Gather in Congress

A joint meeting of more than ten national organizations representing every phase of highway and building activities will be incorporated in the Highway and Building Congress to be held in Detroit during the week of January 16, 1933. It is estimated that this gathering will attract 40,000 people, consisting of highway officials and engineers, contractors, manufacturers, architects, bonding companies, bankers and civic organizations, from all sections of the United States and many foreign countries.

The purpose of the Congress is to devise a coordinated program of future activities that will lead to the immediate improvement in national economic affairs as related to highways and building.



A marked improvement in the agricultural outlook due to better water supply conditions exists throughout the State, according to the report of State Engineer Edward Hyatt, covering the activities of the Division of Water Resources for July. Field inspections covering practically all sections of the State indicate that irrigation enterprises generally are well supplied with water for the current season and that crop yields, particularly in irrigated grain and forage are unusually large. As a result of these conditions, regardless of extremely low prices for farm products, there is a tendency to optimism which did not prevail earlier in the season. Details of dam projects, snow surveys, and river flow investigations are included in the report which follows:

Visits to irrigation districts in the San Joaquin Valley, during the month of July, indicated that crops generally were above the average in yield, and in all cases where irrigation water was obtained from wells a rise in the ground water was reported. In the southern part of the valley this rise was from 5 to 22 feet, and the decreased pumping lift will result in a material saving in power costs. The additional amount of gravity water made available from this season's increased snowfall, will also greatly reduce power costs to those districts which supplement their supply from underground sources.

In the Consolidated Irrigation District, Fresno County, it was estimated that the supply of gravity water this year would save the land owners \$400,000 in pumping costs over those of the previous year. The Alta Irrigation District estimated a saving of \$250,000 and the Fresno district a like amount. Proportionate savings in power costs in the other irrigation districts located in the southern part of the valley would bring the total for the season to approximately \$1,250,000.

### DAMS

To date 812 applications have been received for approval of dams built prior to August, 1929; 94 for approval of plans for construction or enlargement and 304 for approval of plans for repair or alteration.

*a. Applications received for approval of plans for repair or alteration.*

Thirty-five of these applications have been received during this period. These applications are largely in response to suggestions from this department which is

endeavoring to have all dams in shape for approval by August 14, 1932; the date set by law for completing investigations of all dams built prior to August 14, 1929.

b. Plans for the construction of the Cherry Flat Dam on the East Fork of Penitencia Creek in Santa Clara County were approved by the State Engineer this month. This is to be an earthfill dam 50 feet high with a storage capacity of 500 acre-feet. It will be built by the City of San Jose for recreational use.

*c. Plans for repair or alteration approved.*

Twenty-five such applications have been approved this month.

### FLOOD CONTROL AND RECLAMATION

*a. Maintenance of Sacramento flood control project.*

The four small pumping plants for the irrigation of willows along the east levee of the Sutter By-pass are being operated and the planting of additional willows along the west side of the borrow pit has been continued. A small crew has been engaged in cutting star thistles on the east levee, along the entire 21 miles. When this work is completed this levee will be practically free of obnoxious weeds. Thistles have been cut on both levees of the Sacramento By-pass.

The revetment along the south side of the by-pass has been protected by placing a mat of cobbles where the current has a tendency to cut and undermine the concrete protection.

The irrigation dam placed in Butte Slough by a group of farmers, to divert Butte Creek water into the Sutter By-pass, partially failed on July 11th and our equipment and force is being used to make repairs in cooperation with the farmers. Additional sheet piles are being driven, and the structure strengthened and back-filled with rock. It is expected to complete the work by July 25th.

At the present time approximately 1200 goats owned by A. F. Johnston are pasturing in the cut-over land in the lower Sutter By-pass under contract. These goats are performing excellent work in keeping down the young willow growth, and are reducing the maintenance cost considerably.

*b. Sacramento Flood Control Project.*

Reports have been rendered on several applications before the Reclamation Board, and work done under several applications has been inspected.

Two contracts are under way for clearing by-pass and overflow land, the Johnston contract in the lower Sutter By-pass and the Ewell contract in the Feather River bottoms near Marysville.

*c. Russian River jetty.*

Work on the jetty has continued during this period with a crew of 11 men. The track and equipment are in satisfactory condition and rock has been placed in the jetty continuously. A fair percentage of the rock is in pieces of eight tons and larger, which is being placed on the south side. At the present time the material available in the quarry contains approximately 50 per cent waste. A portion of this is being dumped along side the quarry in the ocean, from a side track, the balance being used along the railroad track and a small portion in the jetty for filler. The river channel through the bar has been kept open.

*d. Emergency flood protection and rectification of rivers.*

During this period inspection was made of our bank protection work constructed during the past year on

# Snow Run-off Was Well Sustained

(Continued from preceding page)

the Sacramento and San Joaquin River systems. Most of the work is in excellent shape, only minor repairs being needed in certain places, particularly on the paved revetment near the cannery at Isleton.

*e. Flood measurements and gages.*

Two measurements were made on the San Joaquin River at Mossdale bridge and Vernalis at a low flood stage.

## WATER RIGHTS

*a. Applications to appropriate.*

Thirty-four applications to appropriate water were received during the month of June; 11 were denied and 23 were approved. In the same period 17 permits were revoked or passed for license. The essential data concerning each of the applications received or approved during the month will be found elsewhere in this publication.

Field investigations of completed projects are in progress in San Bernardino, Inyo and Mono counties.

*b. Adjudications and water distribution.*

Material progress has been made in adjudication and water distribution work in the northern part of the State during the present month.

## SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The regular field work comprising the measurements of all diversions, return flow, use of water, salinity, etc., throughout the Sacramento-San Joaquin territory, has continued during the past month. In the San Joaquin Valley the snow run-off has been well sustained and it is only within the last few days that the streams have begun to drop rapidly to summer levels. The recorders will be reinstalled and the measurements of return water will be resumed shortly. From June 28th to July 15th the flow of the Sacramento River at Sacramento has dropped from about 11,000 to 4000 second-feet. A continued falling off in the flow may be expected throughout July but no serious irrigation difficulties are anticipated during this season.

Sampling at permanent salinity stations in the Upper Bay and Delta region and operation of the tide gages have been maintained. The following comparison of recent salinity tests with those at the corresponding time in 1931 shows the extent to which the recent stream flow has retarded the seasonal encroachment of salinity. At present its advancement through Suisun Bay has just commenced.

Comparison of Salinity on July 10, 1931 and 1932 Upper Bay and Sacramento-San Joaquin Delta Area

Station—	<i>Salinity in parts of chlorine per 100,000 parts of water</i>	
	<i>July 10, 1931</i>	<i>July 10, 1932</i>
Point Orient -----	1780	1280
Point Davis -----	1660	700
Bullhead -----	1390	300
O. and A. Ferry -----	980	14
Collinsville -----	660	1
Antioch -----	510	2
Emmaton -----	470	1
Jersey -----	270	1
Central Landing -----	40	1
Middle River P. O. -----	18	1

## CALIFORNIA COOPERATIVE SNOW SURVEYS

Routine field and office work has continued under this project during the past month. Field trips have

been made for the purpose of checking or gathering in equipment and supplies used during the past season, to complete arrangements with various cooperating agencies for the 1933 surveys, and to make some changes and map certain of the snow courses.

Office work has included the computations and maintenance to date of stream flow and precipitation tabulations, etc., and a special study of the modifying effect on April first forecasts of April-July precipitation.

## WATER RESOURCES

*a. Pit River investigation (Modoc and Lassen counties).*

Work on the report covering the three years investigation of the Pit River was continued during the month.

*b. Napa Valley investigation.*

Stream gagings were made on Rector and Dry creeks during the month of June and field work in connection with the investigation was closed on June 30th. Assembly of the data in preparation for a report is now in progress.

*c. Santa Clara investigation.*

All streams entering the valley which continued to flow during the month were under observation and the stages noted from time to time. On June 30th Campbell Creek was the only one of the minor streams continuing to flow and this had diminished to approximately 25 gallons per minute at Saratoga.

Computations for the various streams which were gaged during the winter and spring months are now in progress and the data with respect to percolation on the various streams are being assembled. The agreement with Santa Clara Valley Water Conservation District has been renewed looking toward a continuance of this investigation during the fiscal year 1932-1933.

*d. South coastal, Ventura, Salinas Valley and Mojave River investigations.*

Good progress is being made and work is proceeding along routine lines in the South Coastal Basin, Ventura County, Salinas Valley and Mojave River investigations.

## STATE WATER PLAN

At the invitation of Governor Rolph, 250 representatives from all parts of the State gathered at Hotel Oakland, Oakland, on July 11, 1932, to consider the reports of the California Water Resources Commission and the California Joint Legislative Water Committee, and to consider the advisability of calling a special session of the Legislature.

A resolution introduced by John L. McNab of San Francisco and seconded by former Governor Stephens, Assemblyman Robert P. Easley and Thomas M. Carlson recommending that the Governor convene the Legislature in special session to consider the reports of the Joint Legislative Water Committee and the California Water Resources Commission and to propose for adoption a constitutional amendment on the basis suggested in these reports and that the call for such special session be limited to consideration of water legislation was adopted by the assemblage at the close of the meeting.

### 100 Per Cent Correct

Teacher: "Tommy, is trousers singular or plural?"  
Tommy (after much thought): "Singular at the top and plural at the bottom."

## Peat Swamp and Big Sand Boils Impeded Work on Cut-off

(Continued from page 2)

at the San Benito River, three miles north of San Juan Bautista. It is 1.4 miles shorter, and rises to an elevation of 473 feet above sea level in comparison to the 1016 foot summit of the old San Juan Grade across the Gabilan Range of mountains.

Although the road passes through seemingly easy country, several unusual engineering problems were encountered. In order to secure the best alignment consistent with modern standards of State highway location, it was necessary to traverse 1.3 miles of heavily watered peat swamps.

Upon removal of the peat, several geyser-like sand boils approximately 50 feet in diameter were encountered under the center of the proposed embankment and pavement; too low to be drained. These unstable areas presented a unique and difficult problem that was overcome only by dumping crushed rock into them until a state of equilibrium was produced, thus portions of the new highway are virtually built upon floating mats of rock.

To preserve the beautiful oaks and odd shaped monoliths at "Pinecate Rocks," it was necessary to construct the pavement over the creek channel. A 10-foot by 8-foot concrete culvert, large enough to drive an automobile through, was built under the pavement for the full length of the channel in the "Gorge." Fourteen acres of this romantically interesting spot was acquired by the State to preclude for all time commercial exploitation and further damage by seekers of treasure supposedly cached somewhere in this area.

During construction 720,000 cubic yards of earth and rock was excavated. Pavement and structures required placing of 47,000 cubic yards of concrete. To provide against a minimum of settlement, all embankments of earth and rock were compacted by watering and rolling in eight inch layers.

The roadbed is constructed to a graded width of 40 feet in cuts and 38 feet on fills. The concrete pavement is 20 feet wide, laid in two 10-foot strips, 7 inches thick in the center and 9 inches on the edges, reinforced along the edges to prevent corner cracking. Oil treated shoulders are constructed on each side of the pavement.

## In Memoriam

ERNEST L. P. LEA, aged 61, foreman, connected with District X of the State Division of Highways met his death on June 21, 1932, while in the performance of his duties.

Mr. Lea was spreading rock on a traffic strip north of Lodi in San Joaquin County, being protected by a work car traveling slowly behind him. A heavy truck attempting to pass struck the car, throwing it against Foreman Lea, and injuring him fatally.

Mr. Lea was born in England in 1871, coming to this country when a boy. His first employment on the coast was with a steamship company as boatswain between San Francisco and San Diego. Later he was engaged by a lighterage company that furnished supplies to the "sour doughs" who entered the Nome territory during the spectacular gold rush of that period.

Following his Alaska experience, Mr. Lea was employed by a granite company as derrick man and stone setter during which employment he was engaged upon the setting of stone in the University of California Campanile, the D. O. Mills Bank at Sacramento, the City Hall in Oakland, and other public buildings.

Mr. Lea came to the California Highway Commission in 1921 and was a faithful and conscientious worker during the eleven years of his service. He was a well-known resident of Rio Vista for ten years and a past master of the Rio Vista Lodge of Masons.

Besides his widow, Hattie Lea, he is survived by a daughter, Mrs. Margaret Marshall, of Sacramento, and three sons, Percy V., Ernest E., and Henry V. Lea.

Mr. Lea's son-in-law, Geo. E. Marshall, is a maintenance superintendent connected with District X, with his headquarters at Sacramento.

"It's very hard to drive a bargain nowadays," said the fellow who bought an old flivver for \$10.—*Princeton Tiger*.

Cop—Who was driving when you hit that car?  
Drunk (triumphantly)—None of us; we was all in the back seat.

Census Taker: "Would you mind telling me if there is any insanity in your family, lady?"

Young Resident Engineer's Wife: "Well, no, not exactly. Only my husband thinks he's boss here at home."—*South Dakota Highway Magazine*.

Seven timber and concrete bridges, the largest of which is 710 feet long, over the San Benito River, are included in the project.

The total cost of the "Prunedale Cut-Off," including bridges, is approximately \$1,000,000, a cost of \$60,000 per mile.

# July Water Applications and Permits

## APPLICATIONS FILED

Applications for permit to appropriate water, filed with the State Department of Public Works, Division of Water Resources, During the Month of July, 1932.

**MARIPOSA COUNTY**—Application 7309. Mutual Mining Company, 1723 Webster Street, Oakland, for 3 cubic feet per second from Whitlock Creek, tributary to Sherlock Creek, thence to Merced River. To be diverted in Sec. 29, T. 4 S., R. 18 E., M. D. B. and M. For mining and domestic purposes. Estimated cost \$500.

**PLUMAS COUNTY**—Application 7310. E. G. Lindsey and Geo. H. Lindsey, c/o Geo. H. Lindsey, Quincy, for 0.25 cubic foot per second from spring tributary to Nelson Creek, thence Middle Fork Feather River. To be diverted in Sec. 15, T. 23 N., R. 10 E., M. D. B. and M. For mining and domestic purposes. Estimated cost \$500.

**PLACER COUNTY**—Application 7311. F. M. Chrisman, 1023 Russ Bldg., San Francisco, for 250 cubic feet per second and 200,000 acre-feet per annum from Middle Fork of American River, tributary to Sacramento River. To be diverted in Sec. 36, T. 15 N., R. 13 E., M. D. B. and M. For power purposes (119,000 t.h.p. to be developed). Estimated cost \$18,000,000.

**PLACER COUNTY**—Application 7312. F. M. Chrisman, 1023 Russ Bldg., San Francisco, for 250 cubic feet per second and 200,000 acre-feet per annum from Middle Fork of American River, tributary to Sacramento River. To be diverted in Sec. 36, T. 15 N., R. 13 E., M. D. B. and M. For municipal purposes. Estimated cost \$15,000,000.

**SISKIYOU COUNTY**—Application 7313. Gearhart Mining Company, c/o Sam Sargent, Happy Camp, Cal., for 3 cubic feet per second from Coon Creek, tributary to South Fork Indian Creek. To be diverted in Sec. 4, T. 17 N., R. 6 E., H. B. and M. For mining purposes.

**SIERRA COUNTY**—Application 7314. Oregon Creek Company, c/o B. R. Dunwoody, Camptonville, for 50 cubic feet per second from Oregon Creek, tributary to Middle Fork of Yuba River. To be diverted in Sec. 34, T. 19 N., R. 9 E., M. D. B. and M.

**EL DORADO COUNTY**—Application 7315. B. W. Stone, 161 Ellis St., San Francisco, for 500 cubic feet per second and 125,000 acre-feet per annum from (1) Rubicon River, (2) Pilot Creek, (3) Gerle Creek, (4) Loon Lake, (5) Buck Island Lake, (6) Rock Bound Lake, (7) Little South Fork Rubicon River, tributary to American River Drainage Area. To be diverted in Sec. 9, T. 13 N., R. 16 E., Sec. 11, T. 12 N., R. 12 E., Sec. 24, T. 13 N., R. 13 E., Secs. 11, 31, and 34, T. 14 N., R. 14 E., Sec. 4, T. 13 N., R. 15 E., and Sec. 2, T. 13 N., R. 14 E., M. D. B. and M. For municipal purposes.

**EL DORADO COUNTY**—Application 7316. C. L. Biedenbach, 40 Hillcrest Road, Berkeley, for 200 gallons per day from unnamed stream, tributary to South Fork American River. To be diverted in Sec. 19, T. 11 N., R. 17 E., M. D. B. and M. For domestic purposes. Estimated cost \$150.

**EL DORADO COUNTY**—Application 7317. C. M. Carter, R. D. Nicol and W. P. Austin, c/o C. M. Carter, 2325 Valley St., Oakland, for 614,000 acre-feet per annum from South Fork American River, tributary to American River. To be diverted in Sec. 21, T. 11 N., R. 9 E., M. D. B. and M. For irrigation purposes (450,000 acres). Estimated cost \$9,000,000.

**EL DORADO COUNTY**—Application 7318. C. M. Carter, R. D. Nicol and W. P. Austin, c/o C. M. Carter, 2325 Valley St., Oakland, for 100,000 acre-feet per annum, from South Fork American River, tributary to American River. To be diverted in Sec. 21, T. 11 N., R. 9 E., M. D. B. and M. For municipal purposes. Estimated cost \$9,000,000.

**LOS ANGELES COUNTY**—Application 7319. Malcolm R. Savage, c/o Chas. F. Plumber, Architect, W. P. Story Bldg., Los Angeles, for 200 acre-feet per annum from unnamed canyon, tributary to Triunfo Canyon, thence Malibu Creek. To be diverted in Sec. 2, T. 1 S., R. 18 W., S. B. B. and M. For irrigation purposes (100 acres).

**ORANGE COUNTY**—Application 7320. H. E. Davis, General Delivery, San Juan Capistrano, for 0.025 cubic foot per second from unnamed spring, tributary

to San Juan Creek. To be diverted in Sec. 15, T. 7 S., R. 6 W., S. B. B. and M., for domestic purposes. Estimated cost \$500.

**EL DORADO COUNTY**—Application 7321. L. E. Finch, 2750 Castro Way, Sacramento, for 200 gallons per day from unnamed stream, tributary to South Fork American River. To be diverted in Sec. 19, T. 11 N., R. 17 E., M. D. B. and M. For domestic purposes. Estimated cost \$150.

**PLACER COUNTY**—Application 7322. Aura Noonchester, c/o Murle C. Shreck, Attorney, Capital National Bank Bldg., Sacramento, for 3 cubic feet per second from McKinney Creek, tributary to Lake Tahoe. To be diverted in Sec. 13, T. 14 N., R. 16 E., M. D. B. and M. For mining and domestic purposes. Estimated cost \$1,000.

**HUMBOLDT COUNTY**—Application 7323. Harry B. Waterman, Willow Creek, for 0.19 cubic foot per second from Friday Creek, tributary to Trinity River. To be diverted in Sec. 23, T. 7 N., R. 5 E., H. B. and M. For irrigation and domestic purposes (15 acres). Estimated cost \$600.

**MONTEREY COUNTY**—Application 7324. Louise Matter, Box 528, North San Diego, for 0.025 cubic foot per second from unnamed spring, tributary to San Clemente Creek. To be diverted in Sec. 30, T. 17 S., R. 2 E., M. D. B. and M. For domestic purposes.

**EL DORADO COUNTY**—Application 7325. Kenneth S. Cairns, Oscar O. Reeg and A. W. Blair, c/o Oscar O. Reeg, Box 514, Placerville, for 600 gallons per day from unnamed spring tributary to Echo Lake. To be diverted in Sec. 35, T. 12 N., R. 17 E., M. D. B. and M. For domestic purposes. Estimated cost \$250.

**ALPINE COUNTY**—Application 7326. R. Franklin Weber, c/o Sorensens Resort, P. O. Box 10, Gardnerville, Nevada, for 3 cubic feet per second from unnamed stream, tributary to West Carson River. To be diverted in Sec. 1, T. 10 N., R. 18 E., M. D. B. and M. For mining and domestic purposes. Estimated cost \$10,000.

**ALPINE COUNTY**—Application 7327. R. Franklin Weber, c/o Sorensens Resort, P. O. Box 10, Gardnerville, Nevada, for 3 cubic feet per second from unnamed stream tributary to West Carson River. To be diverted in Sec. 1, T. 10 N., R. 18 E., M. D. B. and M. For power and domestic purposes, 51 hp. to be developed. Estimated cost \$10,000.

**DEL NORTE COUNTY**—Application 7328. A. L. Bailey, Agnes Bailey and W. S. Bailey and John J. Dann and H. A. Schell, O'Brien, Oregon, for 75 cubic feet per second (37.5 cubic feet per second from each of sources 1 and 2) from (1) North Fork Elk Creek and (2) South Fork Elk Creek, tributary to Elk Creek, thence Illinois River. To be diverted in Sec. 12, T. 13 N., R. 4 E., H. B. and M. For mining and domestic purposes. Estimated cost \$12,000.

**PLACER COUNTY**—Application 7329. George Chapman, Tahoe Vista, for 400 gallons per day from unnamed spring, tributary to Lake Tahoe. To be diverted in Sec. 12, T. 16 N., R. 17 E., M. D. B. and M. For domestic purposes. Estimated cost \$500.

**MENDOCINO COUNTY**—Application 7330. Geo. C. Bauer, 1899 Jackson St., Oakland, for 0.15 cubic foot per second from Hazeldell Creek, tributary to Robinson Creek, thence Russian River. To be diverted in Sec. 10, T. 14 N., R. 13 W., M. D. B. and M. For irrigation purposes (10.2 acres). Estimated cost \$500.

**SISKIYOU COUNTY**—Application 7331. George E. Dickson, 1313 S. Florence Avenue, Dunsmuir, for 0.025 cubic foot per second from Yew Creek, tributary to Sacramento River, to be diverted in Sec. 25, T. 39 N., R. 4 W., M. D. B. and M. For irrigation purposes (2 acres). Estimated cost \$100.

**SIERRA COUNTY**—Application 7332. Taber Development Company, 228 Bank of America Bldg., Stockton, for (1) 15 cubic feet per second and (2) 35 cubic feet per second, total 50 cubic feet per second from (1) Dean's Ravine, (2) South Fork Canyon Creek, tributary to Canyon Creek and Yuba River, to be diverted in (1) Sec. 7, T. 21 N., R. 11 E., (2) Sec. 12, T. 21 N., R. 10 E., M. D. B. and M. For mining purposes.

**SISKIYOU COUNTY**—Application 7333. William A. Paxton, 955 Edgeware Road, Los Angeles, for 2 cubic

(Continued on page 24)

## Water Applications and Permits

(Continued from page 23)

feet per second from Deadwood Creek, tributary to McAdams Creek, to be diverted in Sec. 20, T. 45 N., R. 3 W., M. D. B. and M. For power and domestic purposes. Estimated cost \$100.

PLACER COUNTY—Application 7334. United States, Tahoe National Forest, c/o R. L. P. Bigelow, Supervisor, Nevada City, for 0.1 cubic foot per second from Brockway Tract Springs, tributary to Lake Tahoe, to be diverted in Sec. 12, T. 16 N., R. 17 E., M. D. B. and M. For domestic purposes (80 lots). Estimated cost \$750.

### PERMITS ISSUED

Permits to appropriate water, issued by the Department of Public Works, Division of Water Resources, during the month of July, 1932.

INYO COUNTY—Permit 3930, Application 7168. Issued to Ingle Carpenter, suite 820, Detwiler Bldg., Los Angeles, July 6, 1932, for 200 gallons per day from Rock Creek, tributary to Owens River in Sec. 6, T. 6 S., R. 30 E., M. D. B. and M. For use for domestic purposes. Estimated cost \$400.

EL DORADO COUNTY—Permit 3931, Application 7241. Issued to U. S. El Dorado National Forest, Placerville, July 6, 1932, for 1600 gallons per day from Dartmouth Cove Creek, tributary to Upper Echo Lake in Sec. 2, T. 11 N., R. 17 E., M. D. B. and M. For domestic purposes. Estimated cost \$250.

SUTTER COUNTY—Permit 3932, Application 7085. Issued to Fred H. Heiken, Yuba City, July 9, 1932, for 6.35 cubic feet per second from West Dredger Cut of Sutter By-pass, tributary to Sacramento River in Sec. 11, T. 13 N., R. 2 E., M. D. B. and M. For irrigation of 254,135 acres. Estimated cost \$3,500.

MENDOCINO COUNTY—Permit 3933, Application 7238. Issued to Curtis T. Orwick, Cummings, July 11, 1932, for 0.2 cubic foot per second from Squaw Creek in Sec. 20, T. 23 N., R. 16 W., M. D. B. and M. For domestic and recreational purposes. Estimated cost \$200.

MONO COUNTY—Permit 3934, Application 6913. Issued to A. J. Warrington, Bridgeport, July 13, 1932, for 3 cubic feet per second from Virginia Creek in Sec. 2, T. 3 N., R. 25 E., M. D. B. and M. For placer mining purposes in said Sec. 2. Estimated cost \$50.

MONO COUNTY—Permit 3935, Application 6914. Issued to A. J. Warrington, Bridgeport, July 13, 1932, for 3 cubic feet per second from Dog Creek, in Sec. 16, T. 3 N., R. 25 E., M. D. B. and M. For placer mining purposes in Secs. 11 and 14 of said township. Estimated cost \$1,500.

TEHAMA COUNTY—Permit 3936, Application 7155. Issued to First National Bank Trust Department, c/o W. W. Hoy, agent, Santa Ana, July 20, 1932, for 15-acre-feet per annum from tributary of South Fork of Battle Creek, thence Sacramento River, in Sec. 9, T. 29 N., R. 4 E., M. D. B. and M. For recreational purposes.

MENDOCINO COUNTY—Permit 3937, Application 7249. Issued to Eugene Provost, Dos Rios, July 20, 1932, for 0.025 cubic foot per second from unnamed creek, tributary to Eel River in Sec. 24, T. 22 N., R. 14 W., M. D. B. and M. For recreational and domestic purposes. Estimated cost \$300.

TUOLUMNE COUNTY—Permit 3938, Application 7133. Issued to Russell C. Grigsby, Hotel Terry, Stockton, July 21, 1932, for 0.05 cubic foot per second from Eagle Creek in Sec. 8, T. 3 N., R. 16 E., M. D. B. and M. For recreational and domestic purposes. Estimated cost \$3,000.

MONTEREY COUNTY—Permit 3939, Application 7270. Issued to Division of Highways, Department of Public Works, State of California, Sacramento, July 22, 1932, for 520 gallons per day from Little Soda Springs Creek in Sec. 25, T. 24 S., R. 5 E., M. D. B. and M. For recreational purposes. Estimated cost \$235.

MONTEREY COUNTY—Permit 3940, Application 7271. Issued to Division of Highways, Department of Public Works, State of California, of Sacramento, July 22, 1932, for 520 gallons per day from Redwood Creek in Sec. 23, T. 24 S., R. 5 E., M. D. B. and M. For recreational purposes. Estimated cost \$250.

MONTEREY COUNTY—Permit 3941, Application 7272. Issued to Division of Highways, Department of

## GOOD ROADS AND MOTOR VEHICLES NOW NECESSITIES OF LIFE

Good roads and motor vehicles, the one useless without the other, are both necessities to modern life just as are electric lights and bath tubs.

There was a time when bath tubs and electric lights were luxuries. A decade ago motor vehicles were luxuries; now they are necessities to all.

Consider the school teacher and the mechanic who live in the country and drive many miles to work. Bear in mind the congestion in cities that has been relieved due to the development of automobile transportation permitting people to live comfortably in localities otherwise inaccessible. The motor bus and truck offer new transportation facilities that have added value to real estate in many new localities.

—Georgia Highways.

Public Works, State of California, Sacramento, July 22, 1932, for 520 gallons per day from Spruce Creek in Sec. 4, T. 24 S., R. 5 E., M. D. B. and M. For recreational purposes. Estimated cost \$250.

SAN BERNARDINO COUNTY—Permit 3942, Application 7127. Issued to H. C. Zech, 116 E. 31st St., Los Angeles, July 23, 1932, for 0.025 cubic foot per second from unnamed spring in Sec. 31, T. 2 N., R. 2 E., S. B. B. and M. For domestic purposes. Estimated cost \$2,500.

EL DORADO COUNTY—Permit 3943, Application 7077. Issued to (1) R. G. Sproul and (2) S. B. Freeborn, (1) Berkeley, (2) Davis, July 28, 1932, for 400 gallons per day from unnamed stream tributary to Upper Echo Lake, in Sec. 34, T. 12 N., R. 17 E., M. D. B. and M. For domestic purposes.

EL DORADO COUNTY—Permit 3944, Application 6891. Issued to N. L. Apollonio, Camino, July 28, 1932, for 0.025 cubic foot per second from unnamed small creek, tributary to Brush Creek, thence South Fork American River in Sec. 4, T. 10 N., R. 12 E., M. D. B. and M. For domestic purposes. Estimated cost \$400.

MONO COUNTY—Permit 3945, Application 7066. Issued to Cy Williams, Bishop, July 28, 1932, for 200 gallons per day from Rock Creek tributary to Owens River in Sec. 32, T. 4 S., R. 30 E., M. D. B. and M. For domestic purposes.

DEL NORTE COUNTY—Permit 3946, Application 7094. Issued to Hawkins & Brown, Crescent City, July 29, 1932, for 3 cubic feet per second from Diamond Ravine, tributary to North Fork Smith River in Sec. 11, T. 18 N., R. 2 E., H. B. and M. For mining and domestic purposes. Estimated cost \$20.

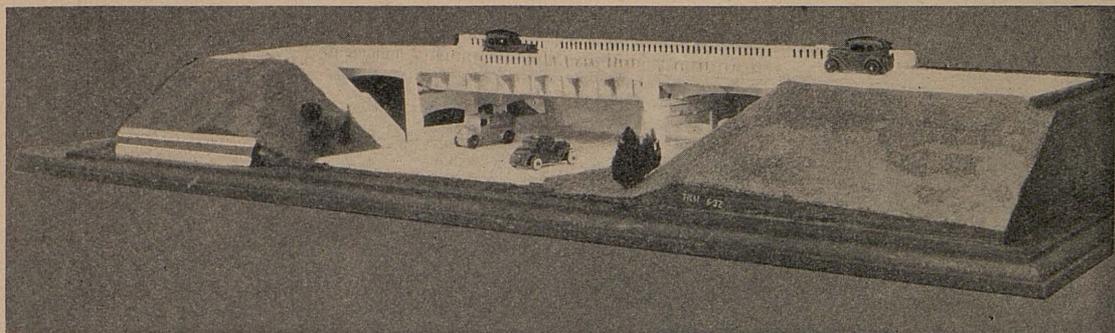
MONO COUNTY—Permit 3947, Application 7171. Issued to Charles O. Perkins, 1143 Vergue Avenue, Pasadena, July 29, 1932, for 200 gallons per day, from Rock Creek, tributary to Owens River in Sec. 33, T. 4 S., R. 30 E., M. D. B. and M. For domestic purposes. Estimated cost \$25.

SAN FRANCISCO COUNTY—Permit 3948, Application 7181. Issued to Spanish Mining Company and San Francisco Commercial Company, San Francisco, July 29, 1932, for \$1.50 cubic feet per second from Devils Canyon Creek, tributary to Poormans Creek and Yuba River in Sec. 19, T. 18 N., R. 11 E., M. D. B. and M. For mining, milling, including incidental domestic and fire protection. Estimated cost \$6,000.

NEVADA COUNTY—Permit 3949, Application 7182. Issued to Spanish Mining Co., and San Francisco Commercial Company, San Francisco, July 29, 1932, for 3 cubic feet per second from Poormans Creek, tributary to South Fork of Yuba River in Sec. 31, T. 18 N., R. 11 E., M. D. B. and M. For mining and milling, including incidental domestic and fire protection. Estimated cost \$11,000.

Parent—"My son has so many original ideas."  
Teacher—"Yes, especially in arithmetic."—*Lustige Blatter.*

## Value of Bridge Models Proven



MODELS PAY in ideas for the time and money they cost. That is the verdict of Bridge Department engineers as the result of building this first experimental model of an overhead structure that will carry Culver Boulevard and a railroad over the new Lincoln Boulevard near Playa del Rey.

By F. W. PANHORST, Acting Bridge Engineer

THE ABOVE picture is of a model of the proposed Culver Boulevard crossing, built to a scale of one-eighth inch to the foot or one-ninety-sixth of its actual size. The model is about two and one-half feet in length. An artist's sketch of this same crossing was shown in the January issue of this magazine.

On Route 60, the Lincoln Boulevard section of the Roosevelt Highway is being built as a new road crossing Culver Boulevard, a few miles west of Culver City near Los Angeles. At this location Lincoln Boulevard, a six-lane road, will pass underneath Culver Boulevard and the Pacific Electric Railroad. The present Culver Boulevard and the Pacific Electric are now at approximately the same elevation as the new highway. They will be raised and taken over the bridge as shown in the model.

### COST IS SMALL

The model is made of plaster of paris and cardboard with a couple of sponges to represent trees. Between \$3 and \$4 worth of material and but a few days of time was necessary to construct this model. Offhand one might say that the Bridge Department was entering into the kindergarten business, but there really is a distinct advantage in making such a model. The reason is to bring out points in appearance not shown on the plans and often hard to discover until the bridge is actually built. Very frequently we see a bridge or building that is an eyesore, which, if a model had first been constructed, would have been built otherwise than planned.

The primary object of a bridge is to carry traffic over a stream, highway or some depression. When a location is in a sparsely populated district and on a tangent where no one will see the side of the bridge or the general appearance of the bridge, economy is paramount. The bridge should be built as cheaply as possible to carry the specified load and no additional cost for appearance sake is justified, but when a bridge is built in such a position that thousands of people daily pass beneath it or alongside of it, a certain amount of consideration should be given to the artistic appearance of the structure.

### DEPENDS ON LOCATION

In other words, the amount of time, effort and money spent on the appearance of a bridge should depend entirely on its location, not an equal amount of all given to each structure. Some should be given less and some more.

As an example of this, on bridges across the Los Angeles River in Los Angeles, similar to the Sixth Street Bridge now under construction, thousands of dollars are being spent for appearance sake and this expenditure is justified inasmuch as thousands of people daily pass over, beneath and all around the structure.

As a contrast to the bridges mentioned in Los Angeles, we build some bridges in the desert and in remote mountain sections where the bridge is not seen as a feature of the landscape, in which cases we waste no money on aesthetics but merely build the cheapest bridge to carry the required load, taking into consideration, of course, the life of the structure.

This model is the first made by the department and was made primarily as an experiment to see if the time and effort were justified. We have found that time and money were well spent inasmuch as we have made a number of changes due to certain features appearing in the model which could not be visualized from the plan.

### Completely Electrified

An automobile electrical worker was charged with assault and battery, and brought before the judge.

Judge (to prisoner)—What is your name, occupation, and what are you charged with?

Prisoner—My name is Sparks. I am an electrician, and I am charged with battery.

Judge (after recovering his equilibrium)—Officer, put this guy in a dry cell.—*Motor Land.*

Storekeeper: "Shall I draw the chicken for you, madam?"

Young Bride: "No, thank you, your description is quite sufficient."—*Motor Trader.*

## CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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

COLONEL WALTER E. GARRISON.....Director  
JOHN W. HOWE.....Editor

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Vol. 10                      AUGUST, 1932                      No. 8

### EVERY CENT FOR LABOR

Every dollar that is spent for construction today goes in full amount into labor, and every cent of each dollar that is to be used for construction under the relief bill now in Congress will go into wages, whether of the shirtsleeve or the white-collar worker. This fact needs emphasis not only because many people believe that a large part of the money will leak away in waste, but also because a flood of false assertions on the subject has been spread over the land.

The facts are simple. Roughly, half of the construction dollar goes to labor on the job. Most of the remainder goes to pay for material, tools and fuel, whose cost in turn is due to labor, as the intrinsic value of the ultimate raw materials in the ground is too small to count. The residue goes to pay for supervision, planning, surveys, insurance—all of them again representing wage payments. Profit is non-existent under present day business conditions, for everyone is bidding at or below cost. Even capital investment is disregarded, as is shown by the accounts of numerous corporations, whose plant investment has shown no earnings for months past. The price of steel, for example, is wholly made up of labor wages, in mine or on railroad or at the mill.

Beyond this, however, the same dollar works more than once to create employment, since the wage payments are promptly turned over for food, clothing and shelter, and in this process give new employment to mill hands, store clerks and transportation men, whose wage earnings again put others to work supplying their needs.—Engineering News-Record.

## Reduced Auto Usage Reflected in State Highway Revenues

**M**OTORISTS are now paying a huge share of the cost of general government expenses unrelated to roads. The Federal gasoline tax of one cent a gallon is expected to bring in \$130,000,000 from motorists. Federal taxes on motor vehicle sales, accessories and parts, lubricating oil, tires and tubes, will cost motorists another \$100,000,000.

The increased cost of motoring, therefore, is \$230,000,000 a year.

In return the Federal Government is giving the road users \$125,000,000 through Federal Aid for highways. This is \$105,000,000 short of the motorists' contributions to the Federal Government.

Highway authorities in general are of the opinion that the new Federal taxes will reduce the volume of motor usage. This will mean that the highway incomes of many states, particularly those with gasoline tax rates of four, five, six and seven cents a gallon, will suffer reductions in income. The American Automobile Association estimates there will be 1,500,000 fewer cars in use in 1933 than now, largely because of high taxes. There were 730,000 less motor vehicles in 1931 than in 1930.

In the face of reduced income, many highway builders maintain it would be folly for States to use motorists' money for any other purposes than road construction. Roads are inadequate for present traffic demands. Properly built roads lessen travel costs and extend motoring. More money is needed for roads, for economy's sake, not less. It is further claimed: faith must be kept with motorists; that for the best interests of the country, motoring must be stimulated, not thwarted.

—*Georgia Highways.*

### AN ENORMOUS INVESTMENT

According to the best available information, about two billion dollars' worth of highways were built between 1923 and 1930, and it is reasonable to suppose that these roads are still in existence. The enormous public investment represented by these roads can be very seriously depreciated if highway maintenance is neglected.

About the only tangible thing most of us get out of our taxes is the satisfaction and profit that come from a system of good highways, and it certainly is good governmental, as well as good financial, policy for those in public office to maintain these highways in the best of shape.—*Public Works.*

# Vital Statistics on Dam Construction

## APPLICATIONS FILED

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources, during the month of July, 1932.

**SAN DIEGO COUNTY**—Lily Pond Dam No. 838-2. Cuyamaca Water Company, San Diego, owner; earth, 17½ feet above streambed with a storage capacity of 10 acre-feet. Situated on Alvarado Creek, tributary to San Diego River, in Sec. 16, T. 16 S., R. 1 W., S. B. B. and M.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources, during the month of July, 1932.

**CONTRA COSTA COUNTY**—St. Mary's Dam No. 584. St. Mary's College, St. Mary's College, Cal., owner; rolled earth fill, situated on Las Trampas Creek tributary to Walnut Creek, in Sec. 17, T. 1 S., R. 2 W., M. D. B. and M.

**CONTRA COSTA COUNTY**—Lafayette Dam No. 31-2. East Bay Municipal Utility Corp., Oakland, owner; earth, situated on unnamed creek, tributary to Lafayette Creek, in Sec. 26, T. 1 N., R. 3 W., M. D. B. and M.

**PLACER COUNTY**—Alta Forebay Dam No. 97-10. Pacific Gas and Electric Company, San Francisco, owner; earth, nine feet above streambed with a storage capacity of 65 acre-feet, situated on no stream, in Sec. 30, T. 16 N., R. 11 E., M. D. B. and M. For regulation purposes for power use. (Removal.)

**PLACER COUNTY**—Bonnie Nook Dam No. 97-13. Pacific Gas and Electric Company, San Francisco, owner; earth, 18½ feet above streambed with a storage capacity of 11 acre-feet, situated on no stream, in Sec. 36, T. 16 N., R. 10 E., M. D. B. and M. For regulation purposes for water supply use. (Removal.)

**MODOC COUNTY**—Spicer Dam No. 146-3. Modoc Meat Company, Alturas, owner; buttress and flashboards, situated on Pit River, tributary to Sacramento River, in Sec. 9, T. 42 N., R. 10 E., M. D. B. and M.

**LASSEN COUNTY**—Watson Dam No. 160-2. Peter Gerig, et al., Bieber, owner; lumber, earth and rock dam, situated on Pit River, tributary to Sacramento River, in T. 38 N., R. 7 E., M. D. B. and M.

**RIVERSIDE COUNTY**—Hole Dam No. 813. W. J. Hole, Arlington, owner; earth, situated on Arroyo tributary to Santa Ana River, in Sec. 36, T. 2 S., R. 6 W., S. B. B. and M.

**LASSEN COUNTY**—Laxalt Dam No. 248. Peter Laxalt, Madeline, owner; earth, situated on McDonald Creek, tributary to Madeline Plains, in Sec. 3, T. 36 N., R. 13 E., M. D. B. and M.

**MODOC COUNTY**—Little Juniper Dam No. 136. G. M. and J. E. Clark, Alturas, owner; earth, situated on Little Juniper Gulch, tributary to Pit River, in Sec. 4, T. 40 N., R. 13 E., M. D. B. and M.

**SAN DIEGO COUNTY**—Corte Madera Dam No. 837. Corte Madera Corporation, San Diego, owner; earth, situated on Corte Madera Valley, tributary to Pine Creek, in Sec. 16, T. 16 S., R. 4 E., S. B. B. and M.

**SHASTA COUNTY**—False Lake Dam No. 223. O. Merlo, Redding, owner; earth dam, situated on North Fork Jenny Creek, tributary to Sacramento River, in SE¼ of NW¼ and SW¼ of NE¼ Sec. 4, T. 31 N., R. 5 W., M. D. B. and M.

**NEVADA COUNTY**—Bowman Rockfill Dam No. 61-2. Nevada Irrigation District, Grass Valley, owner; rockfill, situated on Canyon Creek, tributary to South Yuba River, in Sec. 5, T. 18 N., R. 12 E., M. D. B. and M.

**NEVADA COUNTY**—French Lake Dam No. 61-6. Nevada Irrigation District, Grass Valley, owner; rockfill, situated on Canyon Creek, tributary to South Yuba River, in Sec. 17, T. 18 N., R. 13 E., M. D. B. and M.

**PLACER AND NEVADA COUNTIES**—Combie Dam No. 61-9. Nevada Irrigation District, Grass Valley, owner; arch, situated on Bear River, tributary to Yuba River, in Sec. 2, T. 13 N., R. 8 E., M. D. B. and M.

**NEVADA COUNTY**—Sawmill Flat Dam No. 61-10. Nevada Irrigation District, Grass Valley, owner; situated on Canyon Creek, tributary to South Yuba River,

in Sec. 11, T. 18 N., R. 12 E., M. D. B. and M. Rockfill dam.

**NEVADA COUNTY**—Island Lake Dam No. 61-12. Nevada Irrigation District, Grass Valley, owner; rock and earth, situated on Canyon Creek, tributary to South Yuba River, in Sec. 27, T. 18 N., R. 12 E., M. D. B. and M.

**NEVADA COUNTY**—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earth, situated on South Fork Canyon Creek, tributary to South Yuba River, in Secs. 22 and 23, T. 18 N., R. 12 E., M. D. B. and M.

**SAN BERNARDINO COUNTY**—Running Springs Park Dam No. 806. Bank of America N. T. and S. A., San Francisco, owner; gravity, situated on Deep Creek, in Secs. 5 and 6, T. 1 N., R. 2 W., S. B. B. and M.

**PLUMAS COUNTY**—Butt Valley Dam No. 93. Great Western Power Company, San Francisco, owner; hydraulic fill, situated on Butt Creek, tributary to North Fork Feather River, in Sec. 13, T. 26 N., R. 7 E., M. D. B. and M.

**PLUMAS COUNTY**—Lake Almanor Dam No. 93-3. Great Western Power Company, San Francisco, owner; hydraulic fill, situated on North Fork Feather River, tributary to Sacramento River, in Sec. 28, T. 27 N., R. 8 E., M. D. B. and M.

**PLACER COUNTY**—Lake Valley Dam No. 97-32. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on North Fork, tributary to American River, in Sec. 35, T. 17 N., R. 12 E., M. D. B. and M.

**MENDOCINO COUNTY**—Van Arsdale Dam No. 97-102. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on South Fork, tributary to Eel River, in Sec. 30, T. 18 N., R. 11 W., M. D. B. and M.

**LASSEN COUNTY**—Wards Lower Dam No. 227-2. B. F. Gibson, Litchfield, owner; earth, situated on unnamed drainage, tributary to Willow Creek, in Sec. 5, T. 29 N., R. 14 E., M. D. B. and M.

**MONO COUNTY**—Bridgeport Dam No. 70-2. Walker River Irrigation District, Yerington, Nevada, owner; earth, situated on E. Walker River, tributary to Walker River, in Sec. 34, T. 6 N., R. 25 E., M. D. B. and M.

**LASSEN COUNTY**—Fulcher Dam No. 156-3. G. L. Kramer, Bieber, owner; buttress and flashboards, situated on Pit River, tributary to Sacramento River.

**LASSEN COUNTY**—Bieber Dam No. 154. Bieber Dam Association, Bieber, owner; buttress and flashboards, situated on Pit River, tributary to Sacramento River.

**LAKE COUNTY**—Scott Dam No. 97-101. Pacific Gas and Electric Company, San Francisco, owner; concrete gravity, situated on South Fork Eel River, tributary to Eel River, in Sec. 14, T. 18 N., R. 10 W., M. D. B. and M.

**SAN MATEO COUNTY**—Dianda Dam No. 615. Dante Dianda, Halfmoon Bay, owner; concrete and earth, situated on Denison Creek.

**RIVERSIDE COUNTY**—Lake Hemet Dam No. 817. Lake Hemet Water Company, owner; arch, situated on South Fork Valley, tributary to San Jacinto River in Sec. 7, T. 6 S., R. 3 E., S. B. B. and M.

## PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of July, 1932.

**SANTA CLARA COUNTY**—Cherry Flat Dam No. 24. City of San Jose, San Jose, owner; earth, 50 feet above streambed with a storage capacity of 500 acre-feet, situated on East Fort Penetencia Creek, tributary to Penetencia Creek, in Sec. 21, T. 6 S., R. 2 E., M. D. B. and M. For storage purposes for recreation use.

**LOS ANGELES COUNTY**—Alta San Rafael Dam No. 780. Alta San Rafael Company, Pasadena, owner; gravity, 11½ feet above streambed with a storage capacity of 13 acre-feet, situated on Arroyo Seco, tributary to Los Angeles River, in lots 18 and 22, tract No. 8001, in Pasadena. For storage purposes for irrigation use.

# Plans Approved for Changes in July

(Continued from page 27)

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of July, 1932.

**CALAVERAS COUNTY**—Ross Dam No. 99-3. Emma Rose and Hobart Estate, San Francisco, owner; arch, situated on San Domingo Creek, tributary to Calaveras River, in Sec. 14, T. 3 N., R. 13 E., M. D. B. and M.

**LASSEN COUNTY**—Biscar Dam No. 251. Peter Biscar Karlo, owner; earth, situated on Snow Storm Creek tributary to Secret Valley in Sec. 18, T. 31 N. R. 15 E., M. D. B. and M.

**MONTEREY COUNTY**—Pacific Grove Dam No. 642-3. Central California Water Supply Company, Pacific Grove, owner; earth, located in Punta Pinos Rancho.

**FRESNO COUNTY**—Meadows Lakes Dam No. 695. Alva E. Snow, Fresno, owner; earth, located in Sec. 11, T. 10 S., R. 23 E., M. D. B. and M.

**LASSEN COUNTY**—Red Rock No. 1 dam No. 230. August Anderson and Dodge Bros., Ravendale, owner; earth, situated on Red Rock Creek, tributary to Madeline Plains, in Sec. 22, T. 36 N., R. 16 E., M. D. B. and M.

**LASSEN COUNTY**—Red Rock No. 2 dam No. 230-2. August Anderson and Dodge Bros., Ravendale, owners, earth, situated on Red Rock Creek in Sec. 3, T. 35 N., R. 16 E., M. D. B. and M.

**LASSEN COUNTY**—Red Rock No. 3 dam No. 230-3. August Anderson and Dodge Bros., Ravendale, owners; earth, located in Sec. 4, T. 35 N., R. 16 E., M. D. B. and M.

**LASSEN COUNTY**—Meadow Brook Dam No. 229. L. R. Cady and Frank Coffin, Susanville, owners; masonry, situated on Baxter Creek, tributary to Honey Lake, in Sec. 26, T. 29 N., R. 12 E., M. D. B. and M.

**CALAVERAS COUNTY**—Salt Springs Valley Reservoir No. 496. The California Company, Stockton, owner; rock, situated on Rock Creek, tributary to Littlejohn Creek, in Sec. 16, T. 2 N., R. 11 E., M. D. B. and M.

**LOS ANGELES COUNTY**—Twin Lakes Park Dam No. 774-2. Twin Lakes Park Company, Los Angeles, owner; gravity, situated on De Los Aliso Canyon, tributary to Brown's Canyon, in T. 2 N., R. 16 W., S. B. B. and M.

**MODOC COUNTY**—Mud Lake Dam No. 129-5. Thomas Est., C. A. & Iva S. Raker, Alturas, owner; earth and rock, situated on unnamed stream, tributary to North Fork Pit River, in Sec. 20, T. 43 N., R. 13 E., M. D. B. and M.

**PLACER COUNTY**—Clover Valley Dam No. 97-16. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Antelope Creek, tributary to Sacramento River, in Sec. 28, T. 12 N., R. 7 E., M. D. B. and M.

**AMADOR COUNTY**—Henderson Forebay Dam No. 1-11. Preston School of Industry, Waterman, owner; earth, tributary to Sutter Creek, in Sec. 18, T. 6 N., R. 10 E., M. D. B. and M.

**SAN BERNARDINO COUNTY**—Chino Ranch No. 1 Dam No. 801. Wm. Rowland Estate and Scott Investment Company, Los Angeles, owners; earth, situated on Brea Canyon, tributary to San Gabriel River in Sec. 14, T. 2 S., R. 9 W., S. B. B. and M.

**SAN BERNARDINO COUNTY**—Chino Ranch No. 2 dam No. 801-2. Wm. Rowland Estate and Scott Investment Company, Los Angeles, owners; earth, situated on Brea Canyon, tributary to San Gabriel River, in Sec. 24, T. 2 S., R. 9 W., S. B. B. and M.

**SAN BERNARDINO COUNTY**—Chino Ranch No. 3 dam No. 801-3. Wm. Rowland Estate and Scott Investment Company, Los Angeles, owners; multiple arch, situated on Brea Canyon, tributary to San Gabriel River, in Sec. 23, T. 2 S., R. 9 W., S. B. B. and M.

**CONTRA COSTA COUNTY**—St. Mary's Dam No. 584. St. Mary's College, St. Mary's College, Cal., owner; earth, situated on Las Trampas Creek, tributary to Walnut Creek, in Sec. 17, T. 1 S., R. 2 W., M. D. B. and M.

**MODOC COUNTY**—Spicer Dam No. 146-3. Modoc Meat Company, Alturas, owner; buttress and flashboards, situated on Pit River, tributary to Sacramento River, in Sec. 9, T. 42 N., R. 10 E., M. D. B. and M.

**PLACER COUNTY**—Bonnie Nook Dam No. 97-13. Pacific Gas and Electric Company, San Francisco, owner; earth, 18.2 feet above streambed with a storage capacity of 10.8 acre-feet, located in Sec. 36, T. 16 N., R. 10 E., M. D. B. and M.

**MODOC COUNTY**—Rye Grass Swale Dam No. 150. W. B. Graves, Alturas, owner; earth, situated on Rye Grass Swale, tributary to Pit River, in Sec. 25, T. 41 N., R. 11 E., M. D. B. and M.

**LOS ANGELES COUNTY**—Sawpit Dam No. 32-12. Los Angeles County Flood Control District, Los Angeles, owner; arch, situated on Sawpit Creek, tributary to San Gabriel River, in Sec. 13, T. 1 N., R. 11 W., S. B. B. and M.

**LASSEN COUNTY**—Watson Dam No. 160-2. Peter Gerig, et al., Bieber, owner; timber, situated on Pit River, tributary to Sacramento River, in T. 38 N., R. 7 E., M. D. B. and M.

**LASSEN COUNTY**—Laxalt Dam No. 248. Peter Laxalt, Madeline, owner; earth, situated on McDonald Creek, tributary to Madeline Plains, in Sec. 3, T. 36 N., R. 13 E., M. D. B. and M.

**MODOC COUNTY**—Little Juniper Dam No. 136. G. M. and J. E. Clark, Alturas, owners; earth, situated on Little Juniper Gulch, tributary to Pit River, in Sec. 4, T. 40 N., R. 13 E., M. D. B. and M.

**LASSEN COUNTY**—Coon Dam No. 249. W. W. Long, Susanville, owner; earth, situated on Coon Creek, tributary to Horse Lake, in Sec. 22, T. 33 N., R. 13 E., M. D. B. and M.

**SHASTA COUNTY**—False Lake Dam No. 223. O. Merlo, Redding, owner; earth, situated on North Fork Jenny Creek, tributary to Sacramento River, in SE  $\frac{1}{4}$  of NW  $\frac{1}{4}$  and SW  $\frac{1}{4}$  of NE  $\frac{1}{4}$  Sec. 4, T. 31 N., R. 5 W., M. D. B. and M.

**LASSEN COUNTY**—Branham Flat Dam No. 249-3. W. W. Long, Susanville, owner; earth, situated on tributary to Horse Lake, in Sec. 20, T. 33 N., R. 13 E., M. D. B. and M.

**NEVADA COUNTY**—Bowman Rockfill Dam No. 61-2. Nevada Irrigation District, Grass Valley, owner; rockfill, situated on Canyon Creek, tributary to South Yuba River, in Sec. 5, T. 18 N., R. 12 E., M. D. B. and M.

**NEVADA AND PLACER COUNTIES**—Combie Dam No. 61-9. Nevada Irrigation District, Grass Valley, owner; arch, situated on Bear River, tributary to Yuba River, in Sec. 2, T. 13 N., R. 8 E., M. D. B. and M.

**NEVADA COUNTY**—Sawmill Flat Dam No. 61-10. Nevada Irrigation District, Grass Valley, owner; rockfill, situated on Canyon Creek, tributary to South Yuba River, in Sec. 11, T. 18 N., R. 12 E., M. D. B. and M.

**NEVADA COUNTY**—Island Lake Dam No. 61-12. Nevada Irrigation District, Grass Valley, owner; rock and earth, situated on South Fork Canyon Creek, tributary to South Yuba, in Sec. 27, T. 18 N., R. 12 E., M. D. B. and M.

**NEVADA COUNTY**—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earth, situated on South Fork Canyon Creek, tributary to South Yuba, in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M.

**SIERRA COUNTY**—Mose Emery Dam No. 331-3. Loftus Blue Lead Mines, Los Angeles, owner; earth, situated on a gulch tributary to Cedar Grove Ravine, in Sec. 12, T. 21 N., R. 9 E., M. D. B. and M.

**SAN BERNARDINO COUNTY**—Running Springs Park Dam No. 806. Bank of America, San Francisco, owner; concrete gravity, situated on Deep Creek, in Sec. 32, T. 1 N., R. 2 W., S. B. B. and M.

**SAN BERNARDINO COUNTY**—Arrow Bear Dam No. 807. Arrow Bear Lake Corporation, Los Angeles, owner; earthfill, situated on South Fork Deep Creek, tributary to Deep Creek, in Sec. 34, T. 2 N., R. 2 W., S. B. B. and M.

**LASSEN COUNTY**—Lower Ward Lake Dam No. 227-2. B. F. Gibson, Litchfield, owner; earth, situated on unnamed drainage, tributary to Willow Creek.

**LOS ANGELES COUNTY**—Johnston's Lake Dam No. 192. City of Pasadena et al., Pasadena, owners; earthfill, situated on a draw, tributary to Arroyo Seco.

## Highway Bids and Awards for July

**COLUSA COUNTY**—District III, Route 7, at Arbuckle, about 0.25 mile to be graded and surfaced with bituminous treated crushed gravel or stone. Hemstreet & Bell, Marysville, \$6,546.25. Contract awarded to A. Teichert & Son, Inc., Sacramento, \$5,919.70.

**LASSEN COUNTY**—District II, Route 29. Erection and completion of an addition to the superintendent's cottage at Susanville. T. H. Johanns, San Francisco, \$1,998; Andrew Siri, Dunsmuir, \$912, irregular. Contract awarded to R. B. McKenzie, Red Bluff, \$1,900.

**LOS ANGELES COUNTY**—District VII, Route 26, between Barranca St. and Pomona, about 6 miles to be graded and paved with P. C. concrete. M. J. Bevanda, Stockton, \$337,327.50; Fredrickson & Watson Construction Co., Fredrickson Bros., Oakland, \$319,342; Gibbons & Reed Co., Burbank, \$357,665; Jahn & Bressi Construction Co., Inc., Los Angeles, \$297,811; Sander Pearson, Santa Monica, \$352,380; Sharp & Fellows Contracting Co., Los Angeles, \$351,845; Hall-Johnson Co. and M. S. Ross, Los Angeles, \$372,742; J. L. McClain, Los Angeles, \$324,178.50; Peninsula Paving Co. and J. P. Holland, Inc., San Francisco, \$302,332.70; Van der Hellen & Pierson, Castaic, \$354,841.50; Clyde W. Wood, Stockton, \$352,985; J. E. Haddock, Ltd. and Gist & Bell, Pasadena, \$339,391; United Concrete Pipe Corp., Los Angeles, \$348,698; T. M. Morgan Paving Co., Los Angeles, \$314,831.50. Contract awarded to Griffith Company, Los Angeles, \$290,932.80.

**MENDOCINO COUNTY**—District I, Route 1, construction of a concrete retaining wall in the town of Willits. Mercer-Fraser Co., Eureka, Cal., \$1,635; F. Maurer & Son, Inc., Eureka, Cal., \$1,930; E. B. Bishop, Sacramento, Cal., \$1,572.50; Whited & Whited, Santa Rosa, Cal., \$1,615.40; Chas. Whited, Willits, Cal., \$1,525; H. Sneed, Berkeley, Cal., \$1,563.50; O. A. Lightford, Willits, Cal., \$1,572.50; Sam Sciarrino, San Jose, Cal., \$1,700; R. E. Shaw, Eureka, Cal., \$1,765. Contract awarded to A. T. Howe, Santa Rosa, Cal., \$1,305.

**PLACER COUNTY**—District III, Route 17, between Wise Power House and Auburn 1.4 miles Bit. surface treatment to exist. borders. E. F. Hilliard, Sacramento, \$923. Contract awarded to Fredrickson & Watson Construction Co., Fredrickson Bros., Oakland, \$873.

**SAN DIEGO COUNTY**—District VII, Route 2, between Rose Canyon and Torrey Pines Reservoir, about 2.1 miles to be paved with A. C. Daley Corporation, San Diego, \$37,115; V. R. Dennis Const. Co., San Diego, \$37,108.50. Contract awarded to Griffith Company, Los Angeles, \$35,638.

**SAN DIEGO COUNTY**—District VII, Route 2, between Rose Canyon and Sorrento Creek, about 4.4 miles to be paved with P. C. Concrete. Walter Trepte, San Diego, Cal., \$90,264.40; Jahn & Bressi Const. Co., Inc., Los Angeles, Cal., \$95,375.50; Kovacevich & Price, Inc., South Gate, Cal., \$91,568.20; Share & Fellows Contracting Co., Los Angeles, Cal., \$99,826.10; Griffith Co., Los Angeles, Cal., \$87,007.10; R. E. Hazard Cont. Co., San Diego, Cal., \$94,462.50; E. Paul Ford, San Diego, Cal., \$93,028; United Conc. Pipe Corp., Los Angeles, Cal., \$94,777. Contract awarded to B. G. Carroll, San Diego, Cal., \$83,899.85.

**SAN DIEGO COUNTY**—District VII, Route 2, reinforced concrete girder bridge over A. T. & S. F. Railway about two miles south of Del Mar, two 58-foot spans, two 43-foot 4-inch spans, nine 40-foot spans on concrete bents. M. H. Golden, San Diego, \$108,250.50; Jarboe Construction Co., San Diego, \$139,828.50; B. O. Larsen, San Diego, \$108,418; Heuser & Garnett, Glendale, \$143,631; Weymouth Crowell Co., Los Angeles, \$126,135.80; W. E. Kier Construction Co., San Diego, \$125,356.50; Frank Doran, San Diego, \$117,352; Gist & Bell, Arcadia, \$121,393; Sharp & Fellows Contracting Co., Los Angeles, \$116,846; Obert Bros., Los Angeles, \$114,447.50; Bodenhamer Construction Co., Oakland, \$118,020; Fredrickson & Watson Construction Co. and Fredrickson Bros., Oakland, \$126,019. Contract awarded to Byerts & Dunn, Los Angeles, \$107,652.50.

**SAN MATEO COUNTY**—District IV, Route 68, between Sierra Point and South San Francisco, about 0.6 mile to be paved with concrete. S. M. McGaw, Stockton, \$29,382.25; Eaton & Smith, San Francisco, \$26,638.50; C. W. Wood, Stockton, \$26,817. Contract awarded to Hanrahan Co., San Francisco, \$22,978.50.

**SANTA BARBARA COUNTY**—District V, Route 22, painting 259 miles traffic stripe at various locations in

District V. B. G. Carroll, San Diego, Cal., \$1,629.11; Essick Machinery Co., Los Angeles, Cal., \$1,383.06. Contract awarded to Edwin Anderson, San Francisco, Cal., \$1,295.

**SANTA CLARA COUNTY**—District IV, Route 2, planing existing asphalt concrete surface between Morgan Hill and Sargent Overhead about 10.9 miles. Contract awarded to Standard Road Planing Co., San Luis Obispo, \$5,497.60.

**SHASTA COUNTY**—District II, Route 28, Mt. Shasta Maintenance Station buildings. J. W. Anderson, Mt. Shasta, \$8,390; M. G. Still, Mt. Shasta, \$8,475; L. H. Selvester, Glenburn, \$9,133; Rolla Arbuckle, Anderson, \$8,294; Luiai Cosentino, P. O. Box 366, Dunsmuir, \$7,700; R. B. McKenzie, Box 190, Red Bluff, \$9,000; Andrew Siri, 300 Wood St., Dunsmuir, bid item not filled in; Theodore Johanns, 2020 15th St., San Francisco, \$8,000; Oliver S. Almie, 60 Sussex St., San Francisco, \$8,167; J. P. Brennan, Redding, \$8,711; J. V. Whiteley, Mt. Shasta, \$7,997.40. Contract awarded to Liston Ehorn, Red Bluff, \$7,637.

**SHASTA COUNTY**—District II, Route 28, between Canyon Creek and Hat Creek Summit, about 10.2 miles to be graded and surfaced with crushed run base and bituminous treated crushed gravel or stone surface, plant mixed. Isbell Construction Co., Carson City, Nevada, \$404,371; S. H. Palmer & J. P. Holland, Inc., San Francisco, \$301,353.50; Meyer Rosenberg, San Francisco, \$259,052.50; The Utah Construction Co., San Francisco, \$329,604.40; Hemstreet & Bell, Marysville, \$333,037.50; Kern & Kibbe, Portland, Oregon, \$305,647.30; C. T. Malcolm and A. Teichert & Son, Inc., Sacramento, \$319,005.75; California Construction Co., San Francisco, \$294,676.20; Hanrahan Company-Young & Son Company, Ltd., Berkeley, \$324,227.50; E. C. Coats, Sacramento, \$282,635; Fredrickson & Watson Construction Co., Fredrickson Bros., Jones & King, Oakland, \$277,748.60. Contract awarded to T. M. Morgan Paving Co., Los Angeles, \$255,248.25.

**VENTURA COUNTY**—District VII, Route 2, near Ventura, 2 R. C. girder bridges to be constructed and 814 feet of road to be graded and paved with P. C. concrete. Byerts & Dunn, Los Angeles, \$229,122; Mittry Bros. Const. Co., Los Angeles, \$195,901.20; Carl N. Swenson Co., San Jose, \$216,866.95; Sharp & Fellows Contracting Co., Los Angeles, \$220,624.12; Rocca & Caletti, San Rafael, Cal., \$206,266.50; Pacific Bridge Co., San Francisco, \$228,876; Macco Construction Co., Clearwater, \$222,127.50; Clinton Construction Co. of California, San Francisco, \$222,127.50; Mercer-Fraser Co., Eureka, \$242,506.25; Obert Bros., Los Angeles, \$207,186; M. B. McGowan, Inc., San Francisco, Gist & Bell, Arcadia, \$222,034.50; Herbert M. Baruch Corp., Ltd., Los Angeles, \$199,805.32; Fredrickson & Watson Const. Co., Fredrickson Bros., Oakland, \$209,267.50; The Utah Construction Co., San Francisco, \$222,473.50. Contract awarded to M. B. McGowan, Inc., San Francisco, \$169,247.

### SAFETY COUNCIL OFFERS PROGRAM

The need for thorough research, based on a modern, scientific technique, is emphasized in the "balanced program" which the National Safety Council offers as a definite plan for reducing traffic accidents.

"Traffic engineering studies are needed," says the report, "to determine more accurately the relation between accident occurrence and the various features of street and highway design, construction and maintenance—such as widths, grade, curvature, divided roadways, intersection design, surface, guard-rails, illumination, etc."

Also, if we are to reduce accidents, studies must be made of the effect of various driving practices and regulations relating to speed, to methods of turning, parking, signals, signs and safety zones. Experiences of cities should be studied and compared in order to segregate the good and bad methods and thus set up standards.

Studies should also be made of the habits and abilities of drivers who have had accidents.

# July Traffic Count Shows General Decrease in State Highway Travel

By T. H. DENNIS, Maintenance Engineer

**A** COMPARISON of this and last year's annual July traffic count shows an average decrease this year in both Sunday and Monday traffic; the loss averaging 9.4 per cent on Sunday and 8.3 per cent on Monday.

The count taken on July 10th and 11th, between the hours of 6 a.m. and 10 p.m. covered the traffic on all State highway routes, the vehicles being segregated by hourly periods under the following classifications: California automobiles, light trucks, (under 2 tons), heavy trucks, trailers, buses and horse drawn vehicles.

The main north and south routes, carrying 50 per cent of all State highway travel, show the greatest loss for both days there being only one gain recorded on Sunday for Route 23 between Saugus and Mojave.

### SMALL GAIN IN SOUTH

Totals for the main laterals also show a corresponding loss, with a slight gain on a few secondary routes.

Several of the interstate connections show a considerable loss with a small gain for some of the southern entrances, particularly Route 31, which is the main outlet from Boulder Dam and an important route into Los Angeles and the Olympic Games. However, Route 27, the Yuma entrance to California, suffered a heavy loss, more than offsetting the gains made in other routes.

Only the recreational routes held their own in the general traffic slump, losing but 0.5 per cent and 0.4 per cent on Sunday and Monday respectively. These routes, however, represent only 15 per cent of the total State travel and do not greatly affect the State average.

Several of these routes, notably the Sky-line boulevard, Lake Tahoe roads, All Year road into Yosemite and the Crest route to Big Bear Lake show a substantial gain over 1931, these gains were more than offset by the loss in Route 60, El Rio to Serra. Portions of this route are under construction which affects the traffic to some extent.

Traffic counts were also made on the new secondary roads taken into the State High-

way System in August of 1931. No comparison is possible on these routes as comparable figures for 1931 are not available. However, the July count shows an appreciable gain over similar figures taken in 1929, indicating an increased use of these roads since their inclusion in the State system.

The comparative loss this year for the four major route classifications expressed as a percentage of the 1931 count is as follows:

	Per cent loss		Per cent of total traffic
	Sunday	Monday	
Main north and south routes	12.3	11.0	50
Laterals between inland and coast	10.1	8.7	25
Interstate connections	4.5	0.5	10
Recreational routes	0.5	0.4	15

Gain or loss in traffic volume expressed as a percentage of the July, 1931, count for all State highway routes, is as follows:

Route	Termini	1932			
		Per cent gain or loss			
		Sunday		Monday	
1. Sausalito-Oregon Line	.....	Gain	Loss	Gain	Loss
2. San Francisco-Mexico Line	.....	14.7	.....	14.7	14.3
3. Sacramento-Oregon Line	.....	11.5	.....	11.5	12.4
4. Sacramento-Los Angeles	.....	8.6	.....	8.6	11.1
5. Stockton-Santa Cruz	.....	13.8	.....	13.8	8.9
6. Sacramento-Woodland Junction	.....	4.2	.....	4.2	5.4
7. Benicia-Tehama Junction	.....	10.7	.....	10.7	10.4
8. Ignacio-Cordella	.....	16.6	.....	16.6	3.3
9. San Fernando-San Bernardino	.....	2.3	.....	2.3	7.2
10. San Lucas-Sequoia National Park	.....	8.4	.....	8.4	13.3
11. Sacramento-Nevada Line, Echo Pass	.....	2.4	.....	2.4	2.2
12. San Diego-El Centro	.....	2.5	.....	2.5	5.9
13. Salida-Route 23, Sonora Pass	.....	.....	7.4	.....	8.8
14. Albany-Martinez	.....	.....	13.1	.....	13.5
15. Ukiah-Emigrant Gap	.....	.....	11.1	.....	20.4
16. Hopland-Lakeport	.....	.....	9.0	.....	8.2
17. Roseville-Nevada City	.....	8.3	.....	8.3	0.9
18. Merced-Yosemite National Park	.....	14.0	.....	14.0	5.9
19. Route 9 W. of Claremont-Riverside	.....	6.6	.....	6.6	3.2
20. Redding-Route 1, near Arcata	.....	.....	8.3	.....	11.7
21. Richvale Wye-Route 29	.....	.....	4.3	.....	4.3
22. San Juan Bautista-Route 32	.....	.....	14.4	.....	17.3
23. Saugus-Alpine Junction	.....	5.5	.....	5.5	6.0
24. Lodi-Route 23, Ebbetts Pass	.....	.....	3.2	.....	7.5
25. Nevada City-Downieville	.....	3.5	.....	3.5	17.3
26. Los Angeles-Mexico Line	.....	.....	5.1	.....	0.5
27. El Centro-Yuma, Ariz.	.....	.....	35.6	.....	19.4
28. Redding-Nevada Line	.....	.....	9.8	.....	6.2
29. Red Bluff-Nevada Line	.....	.....	18.4	.....	6.7
31. San Bernardino-Nevada Line, Jean	.....	7.9	.....	7.9	7.6
32. Gilroy-Route 4, Califa	.....	0.7	.....	0.7	3.0
33. Paso Robles-Famosa	.....	.....	9.5	.....	4.7
34. Twin Cities-Route 23, Carson Pass	.....	45.4	.....	45.4	72.0
35. Peanut-Kuntz	.....	.....	6.9	.....	17.9
37. Auburn-Truckee, Donner Pass	.....	.....	15.0	.....	13.4
38. Meyers-Nevada Line, Truckee River	.....	30.8	.....	30.8	43.4
39. Tahoe City-Nevada Line	.....	65.3	.....	65.3	58.8
40. Route 13-Route 23, Tioga Pass	.....	8.0	.....	8.0	18.4
41. General Grant National Park	.....	.....	31.9	.....	17.3
42. Route 55-California Redwood Park	.....	122.4	.....	122.4	373.9
43. San Bernardino-Big Bear Lake	.....	39.6	.....	39.6	21.2
44. Boulder Creek-Calif. Redwood Park	.....	.....	20.8	.....	21.3
45. Willows-Route 3, Biggs	.....	.....	12.3	.....	26.0
46. Klamath River Road	.....	0.6	.....	0.6	20.0
47. Orland-Chico	.....	.....	13.0	.....	40.2
48. McDonalds-Navarro R. Road	.....	.....	16.5	.....	39.5
49. Calistoga-Route 15, Stubbs	.....	.....	17.4	.....	16.6
51. Santa Rosa-Schellville	.....	.....	12.8	.....	5.2
52. Alto-Tiburon	.....	.....	9.0	.....	17.5
53. Fairfield-Lodi	.....	.....	11.4	.....	14.7
54. Michigan Bar, Central House	.....	60.4	.....	60.4	16.8
55. San Francisco-Route 5, Glenwood	.....	37.5	.....	37.5	40.7
56. Carmel-San Luis Obispo	.....	.....	18.8	.....	5.9

Route	Termini	1932				July, 1931		July, 1932	
		Per cent gain or loss				Sun.	Mon.	Sun.	Mon.
		Sunday		Monday		12	13	10	11
57.	Santa Maria-Freeman and Walker Pass	.....	14.6	.....	14.7	4,464	3,576	3,709	3,001
58.	Bakersfield-Arizona Line, Topock	.....	4.6	.....	20.3	3,889	2,650	3,452	2,148
59.	Lancaster-Balleys	.....	13.5	.....	11.0	1,611	799	1,349	819
60.	El Rio-San Juan Capistrano	.....	20.5	.....	18.0	2,601	1,899	2,108	1,325
61.	La Canada-Mt. Wilson Road	.....	.....	.....	3.7	.....	.....	.....	.....
63.	Big Pine-Nevada Line, Oasis	.....	56.5	.....	63.2	2,145	1,452	1,591	1,015
64.	Indio-Arizona Line, Blythe	.....	43.6	.....	127.8	447	311	268	154
65.	Auburn-Sonora	.....	57.5	.....	57.4	1,206	1,471	1,445	947
66.	Mossdale-Manteca	.....	.....	.....	13.9	.....	.....	.....	.....
67.	Route 2-Pajaro River	.....	.....	.....	45.3	.....	.....	.....	.....
68.	San Francisco-San Jose Bayshore	.....	.....	.....	7.9	.....	.....	.....	.....
69.	San Rafael-San Quentin	.....	.....	.....	20.7	1,121	1,051	942	854
70.	Ukiah-State Hospital, Talmage	.....	6.7	.....	27.3	41	38	75	66
71.	Crescent City-Oregon Line	.....	27.7	.....	27.5	1,150	1,085	868	832

A comparison of traffic census for July, 1931, and July, 1932, for Sunday and Monday from 6 a.m. to 10 p.m., shows the following figures:

Route 1. Sausalito to Oregon Line (District IV)				
Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Sausalito to Ferry Building	89	92	38	35
Sausalito-Hyde Street Ferry	11,827	5,350	9,669	4,558
Hyde Street-Berkeley	5,095	3,280	3,785	2,477
Alto Jc. at Jc. Rt. 52	11,748	6,433	9,239	5,028
S. on 1	.....	.....	.....	.....
E. on 52	1,350	811	1,229	669
W. on 52	.....	.....	2,121	1,390
N. on 1	11,466	6,186	10,702	6,147
Calif. Park Y Jc. Rt. 69	13,252	7,606	8,934	5,183
S. on 1	13,520	7,658	11,701	6,767
N. on 1	4,465	2,315	3,527	1,779
E. on 69	12,790	6,103	11,322	6,121
San Rafael N. of Cy. at Hill Top	12,909	5,346	11,026	6,121
Ignacio, Jc. Rt. 1 and 8	3,631	1,151	3,149	1,398
S. on 1	8,633	4,230	8,577	4,811
E. on 8	.....	.....	.....	.....
N. on 1	6,833	4,230	8,577	4,811
Petaluma S. of City Limits at Maint. Yard	9,683	5,601	7,536	4,042
Petaluma N. of Cy.	9,941	7,016	8,770	6,469
Cotati at Jc. C. R. to Sebastopol	8,141	4,674	6,508	3,750
S. on 1	4,346	1,720	3,082	1,343
W. on C. R.	3,612	3,188	3,753	2,767
N. on 1	.....	.....	.....	.....
Santa Rosa S. of Cy. at Triangle Service Station	5,706	4,167	5,179	4,084
Santa Rosa N. of Cy. at S. P. R.	6,849	5,256	5,319	4,772
R. Xing	.....	.....	.....	.....
Healdsburg S. of Cy. at N. W. P. R. R.	5,113	3,721	3,726	3,045
Lytton, Jc. C. R. to Calistoga	3,393	2,780	2,309	1,885
S. on 1	993	721	878	686
E. on C. R.	2,627	2,195	2,939	2,406
N. on 1	2,514	2,047	2,206	1,633
Asti	.....	.....	.....	.....
McDonald at Jc. Rt. 48 to Booneville	2,203	1,901	1,743	1,360
S. on 1	430	344	313	254
W. on 48	1,791	1,557	1,468	1,124
N. on 1	.....	.....	.....	.....
Hopland at Jc. Rt. 16 to Lakeport	1,993	1,898	1,954	1,579
S. on 1	722	751	696	676
E. on 16	2,714	2,622	2,448	2,193
N. on 1	.....	.....	.....	.....
Ukiah S. of Cy. Lts. Jc. with Rt. 70	2,306	2,117	2,098	1,895
S. on 1	992	1,271	1,058	924
E. on 70	2,969	3,090	2,858	2,575
N. on 1	.....	.....	.....	.....
Ukiah N. of Cy. Lts. Jc. Rt. 15 to Colusa	3,087	2,983	2,346	1,961
S. on 1	1,037	877	862	660
E. on 15	2,345	2,284	1,734	1,480
N. on 1	.....	.....	.....	.....

District I				
Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Willits N. of Cy. at Jc. C. R. to Sherwood	1,881	1,778	1,484	1,312
S. on 1	85	85	59	74
W. on C. R.	1,837	1,697	1,421	1,249
N. on 1	1,342	1,300	1,179	976
Mendocino-Hum. Co. Line	2,048	1,913	1,715	1,502
Garberville Jc. C. R. to Briceland	377	291	390	303
S. on 1	2,057	1,964	1,883	1,667
N. on 1	.....	.....	.....	.....
Dyerville at Jc. C. R. to South Fork	2,225	1,720	1,906	1,426
S. on 1	340	334	219	256
E. on C. R.	2,247	1,624	1,870	1,363
N. on 1	223	176	230	162
W. on C. R.	.....	.....	.....	.....
Alton, Jc. C. R. to Red Bluff	2,749	2,021	2,449	1,642
S. on 1	679	383	785	429
E. on C. R.	2,979	2,170	2,795	1,826
N. on 1	.....	.....	.....	.....
Fernbridge at Jc. C. R. to Ferndale	3,684	2,509	3,529	2,113
S. on 1	1,178	977	1,177	1,007
W. on C. R.	3,796	2,623	3,592	2,207
N. on 1	4,676	4,587	4,046	3,184
Eureka S. of Cy. Lts.	.....	.....	.....	.....

Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Eureka N. at Eureka Slough Brg.	4,464	3,576	3,709	3,001
Arcata N. of Cy. at Jc. Rt. 20 to Weaverville	3,889	2,650	3,452	2,148
S. on 1	1,611	799	1,349	819
E. on 20	2,601	1,899	2,108	1,325
N. on 1	.....	.....	.....	.....
Clam Beach, Jc. C. R. to Crannell	2,145	1,452	1,591	1,015
S. on 1	447	311	268	154
E. on C. R.	1,206	1,471	1,445	947
N. on 1	.....	.....	.....	.....
Orcut Jc. Rt. 1 and C. R. to Weitchpec	1,121	1,051	942	854
S. on 1	41	38	75	66
E. on C. R.	1,150	1,085	868	832
N. on 1	.....	.....	.....	.....
Klamath, Jc. Rt. 46 to Klamath Glen	906	847	1,364	1,354
S. on 1	188	147	421	412
E. on 46	852	919	1,163	1,088
N. on 1	.....	.....	.....	.....
Crescent Cy. S. E. of Cy. at Jc. Rd. to Crescent Cy.	1,938	1,973	.....	.....
S. on 1	2,534	2,434	.....	.....
E. on 1	1,755	1,674	.....	.....
N. on 1	.....	.....	.....	.....
Crescent Cy. N. Jc. Rt. 71	.....	.....	1,617	1,677
S. on 1	.....	.....	841	819
N. on 71	.....	.....	790	868
E. on 1	.....	.....	.....	.....
Houchl Bridge, C. R. to Smith River	.....	.....	830	663
S. on 1	.....	.....	166	117
W. on C. R.	.....	.....	882	650
N. on 1	855	826	556	599

Route 2. San Francisco to Mexico "Coast Route." (District IV)				
Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Colma Jc. C. R. to S. San Fran.	26,567	10,069	23,510	9,153
N. on 2	3,558	2,280	4,052	1,856
E. on C. R.	23,009	7,789	19,458	7,297
S. on 2	.....	.....	.....	.....
San Bruno Jc. with Bay Shore Rd. to S. San Francisco	21,718	8,244	19,146	7,467
N. W. on 2	2,641	2,364	2,264	2,224
N. E. on C. R.	24,359	10,708	21,514	8,591
S. on 2	20,960	10,733	17,895	9,964
San Mateo S. of Cy. at 16th Ave. Redwood City N. of Cy. Lts.	18,390	9,141	17,855	9,112
Palo Alto at Federal Telegraph Station	20,162	11,285	14,142	8,642
Mt. View, at School	.....	.....	16,944	9,847
Sunnyvale, Jc. C. R. to Saratoga	11,968	8,311	16,241	11,457
S. on 2	5,670	3,091	5,099	2,961
W. on C. R.	15,155	8,911	10,167	7,389
S. on 2	13,696	10,901	11,816	9,503
5 mi. N. of San Jose	12,972	11,907	11,103	9,824
4 mi. N. of San Jose	.....	.....	.....	.....
San Jose N. of Cy. Lts. at Lumber Yard	22,217	25,064	17,059	19,529
San Jose S. of Cy. Lts.	11,248	9,405	8,965	8,076
5 mi. S. of San Jose	9,174	6,456	6,800	4,916
15 mi. S. of San Jose	8,342	5,877	6,807	4,864
Gilroy N. of Cy. at Jc. with Mt. Madonna Rd. to Watsonville	8,193	6,736	5,970	5,437
N. on 2	1,303	982	1,327	924
W. on C. R.	8,134	6,790	6,176	5,510
S. on 2	5,672	3,595	3,573	2,622
Gilroy, 3 mi. south of city	.....	.....	.....	.....

District V				
Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
San Juan Bautista N. of Cy. at Jc. with Rt. 67 Chittenden Rd.	5,617	3,775	3,679	2,947
N. on 2	3,811	1,740	2,084	1,458
W. on 67	5,062	3,436	3,792	2,780
S. on 2	.....	.....	.....	.....
San Juan Bautista S. of Cy. at Jc. with Rt. 22 to Hollister	4,961	3,624	3,930	3,140
N. on 2	3,100	2,145	2,095	1,384
E. on 22	4,263	3,081	2,902	2,334
S. on 2	4,058	2,875	2,812	2,276
S. Bt.-Mon. Co. Line	.....	.....	.....	.....
Salinas, 2 mi. N. Jc. Prunedale Cutoff	.....	.....	2,886	2,254
N. on Mon. 2-A	.....	.....	1,749	1,432
N. on Mon. 2-J Cutoff	.....	.....	4,543	3,595
S. on Mon. 2-A	7,567	6,614	6,172	5,502
Salinas N. of Cy. Lts.	4,922	5,100	4,614	4,859
Salinas S. of Cy. Lts.	3,802	3,490	3,179	2,873
Gonzales, 3 mi. N. of Town	3,583	3,140	2,819	2,518
E. End of King City Bridge	.....	.....	.....	.....
San Lucas S. of Cy. at Jc. R. 10 Coalinga and C. R. to Jolon	2,666	2,252	2,238	1,947
N. on 2	108	108	123	142
E. on 10	85	91	114	130
W. on C. R.	2,602	2,225	2,119	1,885
S. on 2	3,346	2,981	2,425	2,007
Paso Robles N. of Cy. Lts.	4,464	3,539	3,403	2,622
San Luis Obispo N. of Cy. Lts.	3,955	3,147	3,226	2,583
San Luis Obispo S. of Cy. Lts. at R. R. Xing	6,768	4,867	5,161	3,986
N. of Pismo, Jc. Rt. 2 and Terrace Ave.	6,565	4,444	4,010	3,326
N. on 2	2,014	884	1,464	749
W. on C. R.	4,599	3,566	3,409	2,904
S. on 2	.....	.....	.....	.....
San Maria N. of Cy. at Jc. B.	4,700	3,326	3,646	2,849
57 to Bakersfield	283	146	199	135
N. on 2	4,736	3,371	3,708	2,876
E. on 57	.....	.....	.....	.....
S. on 2	.....	.....	.....	.....

Station location	July, 1931		July, 1932		Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.		Sun.	Mon.	Sun.	Mon.
Harrison Sta. Jc. Rt. 2 and C. R. to Lompoc.	12	13	10	11	Yuba Cy. N. of Cy. at Jc. Rt. 15.	12	13	10	11
W. on 2.....	3,385	2,983	2,680	2,202	S. on 3.....	3,862	4,388	3,326	3,785
S. on C. R.....	430	404	480	314	W. on 15.....	2,106	2,392	1,818	1,968
E. on 2.....	2,998	2,696	2,333	2,004	N. on 3.....	2,364	2,751	2,103	2,387
1 mi. S. of Zaca Jc. Los Olivos Rd.					Gridley, Jc. C. R. to Oroville.				
N. on 2.....	2,790	2,351	2,326	1,895	S. on 3.....	1,649	1,872	1,628	1,723
E. on 80.....	187	149	308	116	E. on C. R.....	1,003	1,136	862	1,001
S. on 2.....	2,716	2,283	2,271	1,874	N. on 3.....	1,856	1,945	1,714	1,678
Buellton at Intersection with Co. Rds. W. to Lompoc and Easterly.					Richvale Wye, Jc. Rt. 21 to Oroville.				
N. on 2.....	3,061	2,601	2,538	2,096	S. on 3.....	1,286	1,092	1,081	917
E. on C. R.....	683	578	601	499	E. on 21.....	439	384	411	334
W. on C. R.....	587	431	498	367	W. on 3.....	1,166	1,034	1,000	856
S. on 2.....	3,494	2,826	2,879	2,309	Chico at Jc. C. R. east to De Sabla.				
Las Cruces, Jc. Lompoc Rd.					S. on 3.....	3,167	2,832	1,435	1,299
N. on 2.....			2,613	2,112	E. on C. R.....	325	419	292	350
W. on C. R.....			235	91	N. on 3.....	3,343	3,124	1,504	1,494
S. on 2.....			2,804	2,195	Chico N. of Cy. at Jc. C. R. Ea.				
Gaviota W. of Rd. to Gaviota Sta. Stony Cr. 3 mi. N. of Goleta.....	3,209	2,633	2,773	2,124	S. on 3.....	1,889	1,691	912	890
Santa Barbara W. of Cy. at Jc. San Marcos Rd.	4,612	3,706	4,197	3,099	E. on C. R.....	237	139	185	149
N. on 2.....	5,891	4,833	9,209	4,291	N. on 3.....	1,786	1,632	997	940
On San Marcos Rd.....	1,040	582	711	391	Chico, 8 MI. N. Jc. C. R. to Cana.				
S. on 2.....	6,502	5,179	9,678	4,461	S. on 3.....	1,036	899	501	396
Santa Barbara W. of Cy. Lts. on 2 Santa Barbara 300 Ft. E. of Cy. Lts.	12,000	9,867	9,605	8,960	W. on C. R.....	56	73	39	82
Carpinteria, Jc. Rt. 2 and Casitas Pass Road.					N. on 3.....	982	827	483	424
W. on 2.....	8,666	5,724	6,667	5,041					
N. on C. R.....	411	468	433	517	District II				
E. on 2.....	8,539	5,645	6,458	4,675	Butte-Tehama Co. Line				
					Red Bluff at Jc. with Rt. 29 to Susanville.				
District VII					S. on 3.....	1,567	1,274	1,443	1,417
Ventura W. of Cy. at Bridge.....	9,494	5,838	7,627	4,984	E. on 29.....	976	725	982	753
Ventura, E. of Cy., Jc. Telegraph Rd.					N. on 3.....	1,943	1,813	1,796	1,715
E. on 2.....	9,815	7,034	8,047	6,573	Cottonwood S. of Town at Tehama Shasta Co. Line.....	2,084	2,102		
W. on 2.....	12,649	9,397	7,622	5,696	Redding S. of Cy. at Jc. Rt. 28 to Alturas.				
N. on 79.....	3,074	2,554	2,786	2,197	S. on 3.....	2,278	2,527	2,089	2,361
El Rio Intersection.					E. on 23.....	736	803	810	824
W. on 2.....	8,697	5,994	7,061	5,370	N. on 3.....	2,006	2,856	2,712	3,005
N. to Saticoy.....	1,637	1,161	1,287	1,035	Redding 3 MI. N. at Jc. with C. R. to Kennett.				
S. on 60.....	7,277	5,036	6,112	4,950	S. on 3.....	1,336	1,035		
E. on 2.....	4,233	2,893	3,172	2,244	W. on C. R.....	34	42		
Ventura-Los Angeles Co. line.	4,904	2,267	3,801	2,099	N. on 3.....	1,336	1,028		
Calabasas, Jc. Mulholland Dr.					Gibson-Hulder Creek Maint. Yard				
E. on 2.....	6,737	3,295			N. on 3.....	1,334	1,021	1,006	814
W. on 2.....	6,722	3,284			Dunsmuir 1.5 MI. S.....	2,119	1,578		
S. on C. R.....	342	202			Dunsmuir N. Cy. Lts. at Br.....	3,821	3,247		
W. of Hollywood-Ventura Blvd. at Sepulveda St.	10,319	6,146	10,257	5,750	Dunsmuir 4 MI. N. at Mott.....	2,330	1,628	1,842	1,588
L. A. E. at Indiana St.	14,262	14,510	12,348	13,256	Gazelle 1 MI. N. at Montague Rd., N. of Gazelle, Jc. Montague Rd., S. on 3.....	1,600	1,281		
Whittier at Jc. with Hadley St.					N. on 3.....			868	832
W. on 2.....	18,824	13,073	15,669	12,789	N. on C. R.....			851	767
N. on Hadley.....	3,460	3,258	3,362	3,493	N. on C. R.....			94	56
E. on 2.....	14,319	10,599	13,411	10,844	Yreka, S. Cy. Lts. Jc. with Rt. 46 S. of Hornbrook.	2,153	2,075		
La Habra E. Cy. Lts. at Jc. Rds. to La Habra and Brea.					S. on 3.....	1,504	1,286	1,203	1,069
N. on 2.....	8,371	4,719	8,034	4,846	W. on 46.....	273	221	255	297
W. to La Habra.....	4,089	3,423	2,511	2,131	N. on 3.....	1,436	1,190	1,137	1,037
E. to Brea.....	2,935	2,038	2,752	1,733	Oregon Line.....	1,465	1,138		
S. on 2.....	10,393	5,494	8,318	5,378					
Anaheim N. of Cy. Lts. N. of Jc. Santa Ana Blvd. and Chapman	14,003	10,483	12,038	9,830	Route 4. Sacramento to Los Angeles (District X)				
Santa Ana N. of Cy. Lts. at Jc. C. R. to Orange.					Sacramento S. of City Lts.....	7,644	7,466	7,104	7,221
N. on 2.....	5,695	4,118	5,071	3,883	7 MI. House at Intersection Florin Rd.,				
E. on C. R.....	8,250	6,825	8,560	6,915	N. on 4.....	4,549	3,926	3,444	4,531
S. on 2.....	6,438	5,313	5,105	4,430	E. on C. R.....	783	653	822	677
Tustin W. of Cy.	8,267	6,224	8,280	6,543	W. on C. R.....	91	112	152	127
Serra Jc. Rt. 60.					N. on 4.....	4,139	3,605	3,239	4,343
N. on 2.....	4,649	2,309	4,718	2,959	Old Elk Grove at Intersection Franklin-Elk Grove Rd.				
W. on 60.....	7,273	3,636	4,730	3,079	N. on 4.....	3,747	3,138	3,754	3,031
S. on 2.....	10,138	5,110	7,407	4,502	E. on C. R.....	703	754	665	737
Oceanside Nr. S. Cy. Lts.	10,183	5,769	7,975	5,630	W. on C. R.....	477	403	531	361
Delmar at S. P. R. R. King.	8,924	4,931	7,006	4,437	S. on 4.....	3,324	2,695	3,267	2,639
La Jolla, N. End Rose Canyon.					Twin Cities Jc. Rt. 34 to Jackson.				
N. on 2.....			6,840	4,049	N. on 4.....	3,535	2,679	3,580	2,739
W. to La Jolla.....			2,217	1,253	E. on 34.....	404	355	443	366
S. on 2.....			4,629	2,802	S. on 4.....	3,559	2,730	3,643	2,775
San Ysidro, Jc. N. of Border.					Jc. S. H. and C. R. to Stockton, Forest Lake.				
N. on 2.....			4,255	2,011	N. on 4.....	3,392	2,558	3,190	2,686
N. W. to Nestor.....			5,415	3,859	S. on 4.....	2,670	2,091	2,675	2,318
S. on 2.....			9,583	5,871	S. W. on C. R.....	692	496	651	406
					Lodi Jc. Rt. 24 to San Andreas.				
Route 3. Sacramento to Oregon Line (District III)					N. on 4.....	3,605	3,334	3,943	3,344
Sacramento N. at Jc. Garden Highway.					E. on 24.....	1,311	1,251	1,450	1,255
W. on 3.....	13,995	14,593	13,753	14,492	S. on 4.....	*	*	*	*
N. on Garden Highway.....	1,051	827	636	638	Cherokee Station.				
E. on 3.....	13,148	13,959	13,263	13,798	N. on 4.....	3,464	3,061	4,507	3,793
Ben Ah Xing Jc. C. R.					E. on C. R.....	3,465*	3,009*	307	214
W. on 3.....	7,080	5,237	7,082	5,030	S. on 4.....	*	*	*	*
N. on C. R.....	722	502	706	394	Stockton S. of Cy. Jc. of Mariposa Rd.				
S. on C. R.....	1,125	890	1,006	921	W. on 4.....			Under construction	3,375
E. on 3.....	6,843	4,967	6,714	4,511	E. on C. R.....			Under construction	1,070
Jc. C. R. to Folsom N. of 12 MI. House.					S. on 4.....			Under construction	
S. on 3.....	6,436	4,591	5,892	4,020	Turner's Sta. Intersection of Rt. 4 and C. R.,				
E. on C. R.....	755	390	661	464	N. on 4.....			Under construction	
N. on 3.....	5,753	4,221	5,416	3,641	S. on 4.....			Under construction	1,788
Roseville, S. of Cy. Lts.	6,493	5,348	6,377	4,613	E. on C. R.....			Under construction	476
Roseville, N. of Cy. Lts.	1,641	1,527	1,551	1,265	W. on C. R.....				315
Lincoln, S. of City.	1,731	1,619	1,393	1,241	Ripon N. of City.	5,170	4,599	4,771	3,996
Marysville, S. of Cy. at Jc. Hammon Rd.					Salida Jc. Rt. 13 to Sonora.				
S. on 3.....	1,946	1,826	1,671	1,620	N. on 4.....	5,348	4,667	4,097	3,762
Hm. Rd.	983	930	771	836	E. on 13.....	369	552	285	295
W. on C. R.....	781	938	467	461	S. on 4.....	5,547	5,021	4,166	3,772
N. on 3.....	3,251	3,263	2,535	2,620	Modesto N. of City.	7,602	7,312	6,042	5,744

\* Under construction.

Station location	July, 1931		July, 1932		Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.		Sun.	Mon.	Sun.	Mon.
Modesto S. of Cy. Jc. Crows Landing Rd.					N. W. on C. R.	5,054	4,047	410	462
N. on 4	10,505	10,285	9,369	8,544	S. E. on C. R.	877	778	725	748
S. on 4	9,666	9,252	7,967	7,601	Mossdale Jc. Rt. 66 to Manteca				
W. on C. R.	3,088	3,513	2,422	2,690	N. on 5	4,125	2,801	3,439	2,824
Turlock, N. Jc. C. R.					E. on 66	3,821	2,847	3,288	2,508
N. on 4			3,566	3,453	S. on 5	7,837	5,664	6,684	5,210
W. on C. R.			1,337	1,322	Tracy, E. of Cy. Jc. C. R. to Banta				
S. on 4			2,735	2,927	E. on 5			6,148	4,887
Turlock, S. Jc. C. R.					N. on C. R.			1,483	1,119
N. on 4			2,190	1,985	W. on 5			5,021	3,915
E. on C. R.			2,013	1,882	Tracy W. of Cy. at Jc. C. R. to Byron				
S. on 4			3,972	3,723	E. on 5	7,713	5,086	6,504	4,573
					N. on C. R.	656	544	669	512
					W. on 5	7,119	4,585	5,747	4,083
<b>Route 4. (District VI)</b>					<b>District IV</b>				
Stanislaus-Mer. Co. Line	3,965	4,109	3,492	3,140	Altamont at R. R. Sta.	7,389	4,646	6,242	4,143
Atwater N. of Cy.	4,052	3,949	3,627	3,192	Livermore E. of Cy. at Jc. C. R. to Livermore				
Merced N. of Cy. Lts. at Bridge	5,634	5,433	4,633	4,626	E. on 5	7,753	5,246	6,936	4,859
Merced S. Cy. Lts. at Bridge	3,862	4,077	3,963	3,932	S. on C. R.	3,048	2,079	2,464	1,837
Merced-Madera Co. Line	2,567	2,331	2,401	2,015	W. on 5	5,024	3,108	4,487	3,039
Califa Jc. Rt. 32 to Gilroy					Santa Rita Inn Jc. C. R. to Pleasanton				
N. on 4	2,748	2,451	2,514	2,229	E. on 5	6,549	4,004	5,684	3,781
W. on 32	906	762	842	721	S. on C. R.	743	418	667	494
S. on 4	3,557	3,061	3,316	2,897	W. on 5	6,931	4,112	5,833	3,813
Madera N. of City	4,199	3,641	3,915	3,386	Dublin Jc. C. R. to Martinez				
Madera-Fresno Co. Line	4,235	4,158	3,908	3,351	E. on 5	7,160	4,221	6,406	4,029
Muscate	5,530	4,388	4,159	3,582	E. on 5	2,202	849	1,863	808
Fresno N. of Cy. W. of S. P. R. R. Xing at Jc. Olive Ave.					W. on 5	7,758	4,410	6,991	4,155
N. on 4	6,441	5,779	5,201	4,870	Dublin Jc. C. R. to Niles				
E. on Olive	2,429	1,268	3,194	5,762	E. on 5	7,836	4,507	6,703	3,999
S. on 4	5,726	5,373	2,242	1,523	S. on C. R.	1,543	616	1,325	553
W. on Olive	2,029	985	3,790	1,549	W. on 5	8,142	4,490	7,318	4,200
Fresno, S. of Cy. at Jc. Church Ave. on 4	7,861	8,640	7,476	7,598	Hayward Jc. with Castro Valley Road				
Malaga, S. of R. R. Sta.	6,349	6,511	5,888	5,608	E. on 5	10,738	5,392	8,719	5,257
Fowler S. of City	4,439	4,428	4,354	4,158	S. W. on C. R.	2,546	1,809	2,006	1,695
Selma S. of City	3,868	3,583	3,991	3,538	W. on 5	8,229	3,601	6,713	3,558
Kingsburg S. of City N. Kings River Bridge	3,636	3,192	3,578	2,932	At Alameda Co. Hospital on Ala-5-D				
Goshen Jc. Rt. 10 to Hanford and Visalia					N. on 5	9,171	4,113	12,396	5,944
N. on 4	2,994	2,745	3,004	2,723	Hayward, S. of Cy. Lts.	10,668	4,017	9,837	5,204
W. on 10	1,235	1,137	1,145	850	Niles N. at Hotel Bellevue	9,063	3,646	8,158	3,698
E. on 4	1,698	1,616	1,507	1,396	Niles at Jc. Niles Canyon Road				
S. on 4	2,812	2,529	2,655	2,339	N. on 5	8,349	4,563	7,541	4,274
Visalia Wye, Jc. Rt. 10 to Visalia					E. on C. R.	2,874	1,456	2,201	1,137
W. on 4	2,512	2,525	2,254	2,240	S. on 5	7,558	4,454	7,182	4,121
S. on C. R.	2,126	1,612	1,779	1,486	Niles S. of Cy. at Jc. C. R. to Centerville				
E. on 10	4,190	3,933	3,502	3,485	N. on 5	7,362	4,266	7,232	4,038
Tulare S. of Cy. Lts.					W. on C. R.	2,294	1,908	2,202	1,887
E. on C. R.	3,223	3,208	2,951	2,963	S. on 5	5,553	2,756	5,593	2,711
W. on C. R.	310	436	295	425	Mission San Jose Jc. C. R. to Livermore				
S. on 4	3,284	3,039	2,873	2,814	N. on 5	5,168	2,187	4,901	2,062
Tipton at Intersection C. R. to Porterville					E. on C. R.	2,588	1,598	2,329	1,246
N. on 4	2,962	2,642	2,533	2,459	S. on 5	7,307	3,496	7,156	3,225
E. on C. R.	278	247	257	205	Warm Springs Jc. C. R. to Centerville				
S. on 4	2,929	2,608	2,532	2,442	N. on 5	7,380	3,316	6,229	2,592
Between Earlhart and Delano	2,940	2,732	2,785	2,717	N. W. on C. R.	6,557	2,676	5,190	2,412
Delano Intersection C. R. to Porterville					S. on 5	14,032	5,986	11,411	4,968
N. on 4	3,736	3,302	3,253	3,092	5 Mi. N. of San Jose	15,669	7,394	13,189	6,550
E. on C. R.	547	464	373	358	San Jose N. of Cy. at Jc. with Gish Road				
S. on 4	3,363	3,149	3,180	3,030	N. on 5	10,789	6,503	7,889	4,943
Famosa Jc. Rt. 33 to Paso Robles					W. on C. R.			2,405	1,425
N. on 4	2,908	2,659	2,656	2,585	S. on 5			5,569	3,737
W. on 33	576	584	483	515	San Jose W. of Cy. at Sanitarium	15,001	11,819	9,962	9,205
S. on 4	2,908	2,784	2,704	2,651	Los Gatos N. E. of City	6,591	3,221	5,523	2,941
Saco at Saco Garage	3,359	3,399	3,035	3,079	Los Gatos S. W. of City Lts.	12,160	4,639	8,909	3,357
Bakersfield N. of Cy. at Jc. C. R. to Oil Center					Santa Clara-Santa Cruz Co. Line	12,200	3,772	7,275	2,338
W. on 4	5,321	6,965	3,926	4,171	Santa Cruz N. of City	8,571	3,494	7,054	2,973
N. on C. R.	4,422	6,068	4,276	4,643					
S. on 4	9,426	10,049	7,408	8,151					
Intersection Brundage Lane and Rt. 4									
N. on 4	4,185	4,179	4,194	3,961	<b>Route 6. Sacramento to Woodland Junction (District X)</b>				
W. on B. L.	827	865	812	797	W. of Sacramento, W. of Underpass	5,356	4,448	5,031	4,602
S. on 4	4,613	4,230	4,202	3,956	Davis E. of Cy. Underpass	4,286	3,338	4,091	3,158
Bakersfield 6 Mi. S. at Jc. C. R. to Taft					Woodland Wye Jc. Rt. 7 W. to Benicia and N. to Woodland				
N. on 4	3,929	3,774	2,989	2,777	E. on 6	4,337	3,527	4,144	3,090
W. on C. R.	1,025	696	557	491	W. on 7	4,348	3,359	4,485	3,160
S. on 4	3,784	3,488	3,108	2,859	N. on 7	1,976	1,722	1,702	1,505
20 Mi. S. of Bakersfield at Jc. Rt. 57, Maricopa Rd.					<b>Route 7. Tehama Junction to Benicia (District X)</b>				
N. on 4	2,615	2,139	2,359	2,159	Benicia, W. on Benicia-Vallejo Rd.			1,152	989
W. on 57	919	947	370	213	Benicia N. of City	749	398	605	304
S. on 4	2,737	2,505	2,576	2,332	Cordella Jc. Rt. 8 to Napa				
Lebec N. of Station	3,061	2,409	2,641	2,317	S. on 7	407	268	276	242
					W. on 8	4,752	3,072	3,276	2,491
					E. on 7	4,998	3,294	3,529	2,739
					West of Cordella, Old Jc. Rts. 7 and 8				
					S. on 7	713	432	484	324
					E. on C. R.	596	412	485	389
					N. on 7	452	295	306	245
					Fairfield E. of City	5,131	3,644	4,465	3,945
					Dixon S. of City	4,265	3,121	4,187	3,108
					Woodland Wye Jc. Rt. 6				
					E. on 6	4,348	3,359	4,485	3,160
					E. on 6	4,337	3,527	4,144	3,090
					N. on 7	1,976	1,722	1,702	1,505
					<b>Route 7. (District III)</b>				
					Woodland S. of City	2,329	2,178	2,143	2,035
					Woodland N. of City at Browns Corner				
					E. on 7	3,041	2,904	2,743	2,503
					S. on C. R.	314	319	295	284
					W. on C. R.	1,203	1,139	1,165	1,093
					N. on 7	1,788	1,723	1,868	1,595
<b>Route 5. Stockton to Santa Cruz via Oakland (District X)</b>									
Jc. Old Rt. 4 N. of French Camp R. R. Xing									
N. on 5	Under construction		4,549	3,889					
S. on 5	4,370	3,355	4,200	3,551					

Station location	July, 1931		July, 1932		Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.		Sun.	Mon.	Sun.	Mon.
Williams S. of City.....	1,369	1,424	1,325	1,199	N. on C. R.....	230	129	172	92
Williams N. of City.....	1,232	1,454	1,138	1,234	E. on 10.....	1,288	628	1,175	629
Willows S. of City.....	1,390	1,472	1,498	1,453	<b>Route 11. Sacramento to Nevada Line via Placerville (District III)</b>				
Willows N. of Cy. at Maint. Sta.	1,581	1,840	1,586	1,618	Sacramento E. of Cy. Lts.....	5,034	3,865	4,907	3,324
Orland N. of City.....	1,586	1,606	1,569	1,492	Perkins Jc. with C. R. to Plymouth,				
<b>Route 7. (District II)</b>					W. on 11.....	4,896	3,012	4,675	3,072
Red Bluff, S. of town at Reed					S. E. on C. R.....	1,436	966	1,507	1,076
Cr. Br.....	1,530	1,587	1,478	1,452	E. on 11.....	3,460	2,071	3,214	2,071
<b>Route 8. Ignacio to Cordelia via Napa (District IV)</b>					Folsom W. of Cy. Jc. Pratt Rd.,				
Ignacio, Jc. Rt. 1 and 8.....	3,631	1,151	3,149	1,398	S. W. on 11.....	2,341	1,420	2,259	1,437
Petaluma Creek Bridge.....	3,548	1,132	2,967	1,351	E. on C. R.....	794	423	825	413
Schellville Jc. Rt. 51 to Santa Rosa,					N. E. on 11.....	2,011	1,221	1,574	1,122
S. W. on 8.....	3,656	1,281	3,109	1,359	Folsom E. of Cy. at High School,				
N. on 51.....	2,314	992	1,664	789	N. on 11.....	1,384	783	1,051	669
N. E. on 8.....	2,793	1,122	2,209	1,050	W. on C. R.....	692	400	711	296
Jc. C. R. to Vineburg,					E. on 11.....	1,926	1,063	1,695	909
W. on 8.....	4,199	1,772	2,183	960	El Dorado Jc. Rt. 65,				
N. on C. R.....	1,787	793	1,878	853	W. on 11.....	2,229	1,179	2,307	1,311
E. on 8.....	2,498	1,035	3,529	1,857	S. on 65.....	330	258	429	417
Napa Wye Jc. 74 to Vallejo,					E. on 11.....	2,179	1,199	2,352	1,349
N. on 8.....	6,551	3,144	5,592	3,237	Placerville W. of Cy.	3,071	2,200	2,276	1,589
S. on 74.....	8,260	4,566	7,066	4,230	Placerville E. of Cy.	2,488	1,574	2,397	1,549
E. on 8.....	4,869	3,291	4,115	3,015	Headquarters Camp	1,863	886	1,733	777
<b>District X</b>					E. on Huntington.....	1,597	623	1,494	636
Cordelia Jc. Rt. 7.....	4,752	3,072	3,276	2,491	Strawberry Jc.....	1,411	616	1,269	579
On American Canyon Rd.....			40	28	Alpine Jc., Jct. Rt. 23,				
<b>Route 9. San Fernando to San Bernardino (District VII)</b>					W. on 11.....	673	337	1,039	578
Tujunga W. of Sunset Blvd.....	5,774	3,443	6,977	3,529	S. on 23.....	150	100	297	193
La Crescenta W. of Penn. Ave.....	6,955	4,238	6,917	3,573	E. on 11.....	625	322	1,168	699
La Canada at School St.....	6,682	3,772	6,126	4,095	Mays, Jc. Rt. 38,				
Pasadena E. of Cy. Lts.....	6,747	5,118	6,331	5,692	E. on 11.....	856	494	1,432	1,042
Jc. Huntington Dr. and Colorado St. Extension,					Lakeside, State Line.....	1,443	946	1,449	893
W. on Colorado.....			9,549	5,921	<b>Route 12. San Diego to El Centro (District VII)</b>				
S. on Huntington.....			6,323	4,684	San Diego E. of City Euclid Ave.				
E. on Huntington.....			15,801	10,674	at Cajon Ave.....	8,213	5,231	8,724	5,159
Azusa W. of City Limits.....	13,278	7,014	14,104	8,125	El Cajon W. of Cy. Lts.....	5,814	4,464	7,021	5,132
<b>District VIII</b>					At Sweetwater Bridge.....	2,103	1,029	2,257	1,053
S. Bd-LA Co. Line.....	7,446	3,315	9,369	4,715	Descanso, Jc. C. R. to Warners Spr.				
Uplands E. of Cy. at Jc. C. R. to Uplands,					W. on 12.....			1,735	874
W. on 9.....			Under construction	7,141	N. on C. R.....			287	126
S. W. on C. R.....			Under construction	1,755	E. on 12.....			1,723	903
E. on 9.....			Under construction	8,622	Jacumba at Jc. C. R. El Campo,				
Uplands at Euclid Ave. Intersection,					W. on 12.....	1,611	69*	1,403	808
W. on 9.....	7,114	4,205	8,876	4,502	S. on C. R.....	589	1,021*	380	153
N. on Euclid Ave.....	3,151	3,035	2,450	2,006	E. on 12.....	2,131	1,122	1,683	946
S. on Euclid Ave.....	4,236	4,333	2,879	2,692	* Highway traffic detour on Monday.				
E. on 9.....	8,575	5,228	7,264	3,708	<b>District VIII</b>				
S. Bd. W. of City.....	7,122	5,059	4,005	2,617	On Imp-12-B-Dixieland.....	1,548	1,072	1,229	871
<b>Route 10. San Lucas to Sequoia National Park (District V)</b>					El Centro W. of Cy. at Jc. Rt. 26 to S. Bd.,				
San Lucas S. of Cy. at Jc. Rt. 2	108	103	123	142	W. on 12.....	2,937	3,255	3,082	3,880
<b>District VI</b>					N. on 26.....	3,342	3,905	3,293	3,896
Monterey-Fresno Co. Line.....	120	86	113	45	E. on Mulberry Lane.....	2,701	2,714	2,819	3,774
Parkfield Jc.,					S. on 26.....	3,949	4,288	3,954	4,165
W. on 10.....	227	186	192	122	<b>Route 13. Salida to Route 23 at Junction (District X)</b>				
S. on C. R.....	115	46	38	22	Salida Jc. Rt. 4.....	369	552	285	295
E. on 10.....	332	224	230	144	E. of Salida at McHenry's Jc. C. R. to Modesto,				
Coalinga S. of City.....	591	495	614	499	W. on 13.....	621	947	606	683
Coalinga 3 Mi. E. at Jc. C. R. to Oilfields,					S. on C. R.....	2,121	2,262	1,907	1,854
W. on 10.....	855	844	786	764	N. on 13.....	2,103	2,230	1,872	1,824
N. on C. R.....	274	257	228	189	Oakdale, W. of Cy.....	1,615	1,474	1,500	1,504
E. on 10.....	680	680	578	617	Oakdale, E. of Cy.....	2,366	1,396	2,071	1,281
Oilfields at Oil King School,					Mountain Pass Jc. Rt. 40 to Yosemite,				
W. on 10.....	420	453	478	537	S. W. on 13.....	1,626	743	1,425	721
N. on C. R.....	270	297	298	387	S. E. on 40.....	400	185	486	359
E. on 10.....	221	215	217	178	N. E. on 13.....	1,311	590	1,199	558
Kings River Bridge.....	300	369	269	320	Sonora S. of City.....	1,914	1,410	1,714	1,253
Lemoore Jc. C. R. to Lemoore,					Sonora E. at Sullivan Creek Bridge,				
N. on 10.....	530	551	575	502	E. on C. R.....	891	475	508	485
E. on C. R.....	467	516	532	465	W. on 13.....	480	425	1,156	638
S. on 10.....	434	485	448	436	W. on 13.....	1,374	928	1,574	1,097
Hanford W. of Cy. Lts.....	1,382	1,821	1,431	1,710	Jc. S. H. and C. R. at Pooleys,				
Hanford E. of Cy. at Intersection C. R. N. to Kingsburg and S. to Corcoran,					W. on 13.....	890	557	938	538
W. on 10.....	2,941	2,660	2,217	2,036	E. on 13.....	1,116	576	979	566
N. on C. R.....	1,592	1,542	1,446	1,330	S. on C. R.....	203	142	116	134
S. on C. R.....	1,770	1,632	1,149	1,145	Strawberry, Jc. C. R. to Pine Crest,				
E. on 10.....	2,033	2,122	1,465	1,629	W. on 13.....	528	182	276	99
Goshen, Jc. Rt. 4,					E. on 13.....	315	140	201	74
W. on 10.....	1,235	1,137	1,145	830	S. E. on C. R.....	279	143	189	66
E. on 4.....	1,698	1,616	1,597	1,396	<b>District IX</b>				
Visalia Wye, Jc. Rt. 4 W. to Goshen and S. to Bakersfield and Rt. 10 E. to Visalia,					Jc. Rt. 23.....	110	89	104	64
W. on 4.....	2,512	2,525	2,254	2,240	<b>Route 14. Albany to Martinez (District IV)</b>				
S. on C. R.....	2,126	1,612	1,779	1,486	Albany at County Line.....	26,875	18,426	23,203	15,220
E. on 10.....	4,190	3,933	3,502	3,485	Jc. C. R. to Richmond, Cutting Blvd.				
Visalia E. to Cy. at Exeter Jc.,					S. on 14.....	20,626	12,863	19,279	11,419
W. on 10.....	2,095	2,013	1,903	1,828	W. on C. R.....	6,053	3,946	4,288	2,962
S. to Exeter.....	1,010	1,102	951	1,037	N. on 14.....	15,921	9,607	15,564	8,539
E. on 10.....	1,443	1,262	1,296	1,103	Jc. Franklin Canyon Rd.,				
Lemon Cove Jc. C. R. to Woodlake,					S. on 14.....	14,418	6,060	10,257	5,692
W. on 10.....	1,718	806	1,219	756	E. on C. R.....	3,523	1,458	4,047	1,437
N. on C. R.....	2,297	540	717	347	N. on 14.....	8,492	5,011	7,218	4,609
E. on 10.....	2,196	902	1,590	816	Crockett, south approach to bridge	6,009	3,559	5,602	2,933
Three Rivers E. of Town at Jc. C. R. northerly,					Carquinez Straits Bridge.....	*6,853	*4,164	*5,077	*3,487
W. on 10.....	1,418	676	1,212	650	Crockett 1 Mi. S. at Jc. C. R. to Crockett,				
					S. on 14.....	2,428	1,718	2,078	1,534
					W. on C. R.....	1,174	1,350	1,161	1,208
					N. on 14.....	2,021	1,391	1,687	1,148
					Martinez W. of Cy. Lts.....	1,109	633	885	540

Route 15. Route I Near Calpella to Route 37 Near Cisco. (District IV)		July, 1931		July, 1932		July, 1931		July, 1932	
Station location	Sun.	Mon.	Sun.	Mon.	Sun.	Mon.	Sun.	Mon.	
Ukiah N. at Jc. Rt. 1.....	1,037	877	862	660					
District III									
Upper Lake, S. of Cy. Jc. C. R. to Lakeport,									
W. on 15.....	1,196	1,094	901	795					
S. on C. R.....	710	518	512	413					
N. on 15, Main St.....	1,371	1,343	1,053	946					
Upper Lake, Jc. C. R. to Bartlett Springs,									
W. on 15.....	584	354	813	486					
E. on C. R.....	60	30	61	32					
S. on 15.....	610	325	806	497					
Lower Lake Jc., Jc. Rt. 49,									
W. on 15.....	895	476	649	371					
S. on 49.....	654	349	474	285					
E. on 15.....	559	273	403	238					
Williams, 5 Mi. W., Jc. Mt. House Rd.,									
W. on 15.....	442	245	239	142					
W. on C. R.-Old Rd.....	195	149	58	52					
E. on 15.....	615	376	299	177					
Williams W. of Cy.....	790	681	852	767					
Williams E. of Cy.....	645	617	620	659					
Colusa E. of Cy.....	1,000	889	841	804					
Sutter City, Jc. C. R.,									
W. on 15.....	925	743	845	642					
N. on C. R.....	334	304	309	288					
E. on C. R.....	360	402	378	313					
S. on 15.....	968	949	855	806					
Yuba City, Jc. Rt. 3.....	2,106	2,392	1,818	1,968					
Marysville E. of Cy.....	1,312	726	1,164	711					
Smartsville E., Jc. N. and S. Side Road,									
W. on 15.....	258	158	401	201					
W. on side road.....	81	63	69	48					
E. on 15.....	225	169	411	195					
Grass Valley W. of Cy.....	789	777	1,533	767					
Nevada City E. of Cy.....	793	574	1,005	701					
Jc. Rt. 15 and Washington Rd.,									
W. on 15.....	125	198	375	205					
N. on C. R.....	74	85	111	143					
E. on 15.....	225	181	428	249					
Emigrant Gap, Jc. Rts. 37 & 15	211	85	276	98					
Route 16. Hopland to Lakeport (District IV)									
Hopland at Jc. Rt. 1.....	722	751	696	676					
Lakeport S. of Town at Jc. C. R. to Kelseyville,									
N. E. on 16.....	1,200	1,015	1,018	913					
S. on C. R.....	976	831	862	792					
W. on 16.....	256	267	293	248					
Route 17. Roseville to Nevada City (District III)									
Roseville E. of Cy.....	4,627	3,088	4,626	2,907					
Auburn W. of Cy. Jc. Ophir Rd.,									
W. on 17.....	2,362	1,554	2,457	1,500					
N. on C. R.....	280	224	270	203					
E. on 17.....	1,967	1,555	2,202	1,525					
Auburn N. of Cy. Jc. Country Club Rd.,									
S. on 17.....	704	440	840	511					
E. on C. R.....	108	140	106	88					
N. on 17.....	610	473	795	498					
Grass Valley S. of City.....	1,416	907	1,505	1,058					
Nevada City S. of City.....	2,121	1,942	2,578	2,123					
Route 18. Merced to Route 40 near Sequoia (District VI)									
Merced 1.6 Mi. E. at Interx. C. R. at 21st St.,									
W. on 18.....	2,199	2,165	2,230	2,046					
E. on 18.....	2,010	2,164	2,241	2,075					
W. on C. R.....	1,898	2,051	1,894	2,032					
Merced 12 Mi. E. at Interx. C. R. to Le Grand,									
W. on 18.....	1,227	993	1,515	1,142					
S. on C. R.....	96	52	114	90					
E. on 18.....	1,272	1,013	1,561	1,183					
Mormon Bar at Interx. with C. R. to Mormon Bar,									
S. on 18.....	1,372	1,023	1,651	1,155					
E. on C. R.....	311	196	321	237					
N. on 18.....	1,374	1,068	1,581	1,161					
E. on 18.....	1,251	930	1,465	959					
E. on 18.....	1,284	903	1,617	1,102					
Route 19. From Route 9 West of Claremont to Beaumont via Riverside and Fullerton to Pomona via Brea Canyon (District VIII)									
Los Angeles Co. Line E. City Limits Pomona	4,378	3,887	4,518	3,799					
Bet. Pomona and Ontario at Chino Cross Rds.,									
W. on 19.....	3,856	3,223	4,192	3,233					
N. on C. R.....	1,207	1,195	1,270	1,363					
S. on C. R.....	1,697	1,481	1,675	1,528					
E. on 19.....	3,517	2,739	3,695	2,684					
East of Ontario, E. Cy. Lts. at Jc. of New S. Bd.-19-B, with Old Road,									
W. on 19, New Road.....	2,122	1,533	2,293	1,512					
S. E. on 19.....	4,069	3,026	4,706	2,918					
N. W. to Holt Ave.....	2,300	1,809	2,235	1,616					
At S. Bd.-Riv. Co. Line on 19.....	3,540	2,393	3,850	2,346					
Wineville E. of Cy.....	4,108	3,060	4,433	2,606					
Station location									
Riverside W. of Cy. at Santa Ana River Bridge.....	5,865	5,373	6,195	5,162					
Box Springs, Jc. Rt. 78,									
N. on 19.....				4,195	3,340				
S. on 78.....				2,811	2,246				
E. on 19.....				1,546	1,220				
Hemet Jc.,									
W. on 19.....				1,121	790				
S. on C. R.....				1,009	550				
E. on 19.....				823	596				
Beaumont, Jc. 26, W. on 19.....	883	724	1,068	778					
District VII									
S. W. of Pomona, Jc. Valley Blvd. and Brea Canyon,									
N. E. on Valley Blvd.....				13,002	8,062				
S. on 19.....				4,016	1,835				
S. W. on Valley Blvd.....				9,411	6,374				
Route 20. Route I Near Arcata to Redding via Weaverville (District I)									
Arcata N. of Cy. at Jc. Rt. 1.....	1,611	799	1,349	819					
Blue Lake, Mad River Br. East.....	266	179	343	281					
Willow Creek Jc. C. R. to Hoopa,									
W. on 20.....	185	140	148	117					
N. on C. R.....	195	117	171	118					
E. on 20.....	223	139	150	99					
Humboldt-Trinity Co. Line.....	264	171	218	154					
District II									
Big Bar Vicinity.....	124	108	135	184					
Weaverville, 3 Mi. S.....	296	237							
E. Douglas City Jc. Hayfork Rd.,									
N. on 20.....				140	127				
W. on C. R.....				85	75				
S. on 20.....				121	130				
Bet. Redding and Tower House at Schilling.....	368	296	378	338					
Route 21. Route 3 Near Richvale to Route 29 via Quincy (District III)									
Richvale Wye.....	439	384	411	334					
Oroville W. Jc. Marysville Rd.,									
W. on 21.....	978	1,062	1,030	1,031					
S. on Marysville Road.....	813	671	891	626					
E. on 21.....	1,722	1,663	1,845	1,603					
Oroville E. of Cy. Ridge Road.....	2,266	1,824	1,729	1,492					
Oroville E. of River Road.....	227	195	237	178					
At Feather River Br., River Rd. Miners Ranch,	147	44	165	70					
W. on 21.....	1,158	542	988	500					
S. on C. R.....	276	183	313	222					
E. on 21.....	1,002	412	776	344					
Bidwell Bar Bridge.....	691	285	555	292					
Berry Creek, E. of P. O.....	398	180	369	201					
District II									
Meadow Valley,									
W. on 21.....	289	249							
N. on C. R.....	175	153							
E. on 21.....	262	204							
Quincy.....	501	312							
Quincy, Spanish Creek Br. on Rd. to Keddle.....	614	467							
Paxton, Jc. Indian Falls Rd.,									
E. on 21.....	392	335							
S. on C. R.....	132	96							
N. on C. R.....	357	325							
Quincy, E., Jc. Marysville Rd.,									
E. on 21.....	309	257	474	378					
W. on 21.....	358	299	539	425					
S. on C. R.....	64	58	98	43					
Blairden, Jc. Mohawk Road,									
W. on 21.....			438	329					
S. on C. R.....			111	67					
E. on 21.....			338	265					
Jc. Rt. 29 on 21.....	358	242	302	202					
Route 22. San Juan Bautista to Route 32 via Hollister (District V)									
San Juan Bautista S. of Cy. at Jc. Rt. 2.....	3,100	2,145	2,095	1,384					
District IV									
Hollister, Jc. Rt. 32.....	521	232	1,005	581					
Route 23. Saugus to Route II at Alpine Jc. (District VII)									
Saugus Jc. with Rt. 4.....	3,399	2,140	4,714	2,515					
Palmdale S. of Cy. Lts.....	2,049	1,553	2,693	1,545					
Lancaster Jc. with Rt. 59 to Neenach,									
S. on 23.....	2,371	2,598	2,695	2,013					
W. on 59.....	831	1,043	799	847					
N. on 23.....	1,276	1,235	1,877	1,014					
Los Angeles-Kern Co. Line.....	867	732	1,450	663					
District IX									
S. of Mojave Jc. 58 to Barstow,									
S. on 23.....	882	661	909	882					
E. on 58.....	178	155	256	205					
N. on 23.....	1,041	808	1,124	1,022					
N. of Mojave Jc. 58 to Bakersfield,									
S. on 23.....	878	728	1,025	869					
N. W. on 58.....	345	311	413	378					
N. on 23.....	693	517	656	596					
Freeman Jc. N. Jc. Rt. 57,									
S. on 23.....	501	394	522	337					
W. on 57.....	72	61	81	58					
N. on 23.....	501	427	528	367					
Kern-Inyo Co. Line									
Olancha Jc. C. R. to Keeler,									
S. on 23.....			410	553					



Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
W. on Highland	2,449	1,220	2,192	1,223
N. W. on 31	1,464	946	1,702	1,107
Verdmont Jc. Rt. 31 and Kendall Dr.				
S. on 31	2,417	1,372	2,445	1,230
S. on Kendall	771	552	813	610
N. on 31	2,510	1,508	2,433	1,940
Jc. Rt. 31 with State Street				
S. E. on 31	1,558	1,003	1,473	936
S. on State	872	407	873	407
N. W. on 31	2,143	1,256	2,120	1,195
N. of Cajon Jc. C. R. to Swart-out Valley				
S. on 31	2,535	1,626	2,332	1,424
W. on C. R.	963	867	867	216
N. on 31	1,685	1,440	1,577	1,232
Victorville, 11 Mi. S. Jc. Rt. 59				
S. on 31			1,427	1,096
N. on 59			164	112
N. E. on 31			1,298	1,056
Victorville S. of Cy. Lts.	1,504	1,255	1,370	1,222
Helendale	964	832	870	836
S. W. Town Lts. of Barstow	1,031	992	971	976
N. Barstow, Jc. Rt. 58, E. on 31	622	544	598	600
Yermo E. of Cy. Lts.	494	423	432	483
Baker	426	399		
Baker, Jc. Lone Pine Rd.			402	493
S. on 31			19	6
N. on C. R.				
E. on 31			392	461
Nevada State Line	346	359	305	328

**Route 32. Route 2, Near Gilroy, to Route 4, Near Califa (District IV)**

Hollister Jc. Rt. 22				
W. on 32	721	626	1,140	761
S. on 22	521	232	1,005	581
E. on 32	1,227	803	1,814	1,214
Pacheco Pass at Santa Clara-Merced Co. Line	1,597	987	1,563	1,020

**District VI**

Junction-Jc. C. R. to Gustine				
W. on 32	1,611	1,066	1,483	1,015
N. on C. R.	441	274	378	209
E. on 32	1,270	841	1,240	835
Los Banos at S. P. Crossing (Near Maint. Yd.)	3,006	3,033	2,545	2,727
E. of Los Banos at Jc. C. R. to Dos Palos				
W. on 32	1,844	1,639	1,688	1,702
S. on C. R.	855	713	846	846
E. on 32	1,703	1,387	1,536	1,302
Merced-Madera Co. Line at Jc. C. R. to Merced				
W. on 32	1,378	1,108	1,338	1,137
N. on C. R.	523	492	506	528
E. on 32	992	772	971	739
Califa Jc. Rt. 4	906	762	842	721

**Route 33. Paso Robles to Route 4, Near Bakersfield (District V)**

Paso Robles E. of Cy. Lts.	1,450	1,413	1,315	1,285
Paso Robles 3/4 Mi. E. of Cy. Lts	1,121	913	992	934
Shandon Maint. Yard	670	516	647	459

**District VI**

S. L. O.-Kern Co. Line	534	348	467	263
Blackwell's Cor. Jc. C. R. N. to Coalinga and S. to Taft				
W. on 33	386	267	330	233
N. on C. R.	210	229	159	180
S. on C. R.	238	197	189	180
E. on 33	374	326	296	230
Lost Hills Inters. of Main St.				
W. on 33	712	663	463	510
N. on Main	35	55	47	64
S. on Main	192	167	95	120
E. on 33	641	585	459	508
Wasco Jc. Co. Rd. S. to Wasco, near S. P. R. R. Xing				
W. on 33	754	783	622	676
S. on C. R.	710	823	603	835
E. on 33	765	783	706	764
Famoso Jc. Rt. 4	576	584	483	515

**Route 34. Route 4, Near Arno, to Route 23, at Picketts Junction (District X)**

Twin Cities Jc. Rt. 4	404	355	443	366
W. of Ione Jc. C. R. to Michigan Bar				
W. on 34	88	95	70	43
N. on C. R.	49	53	106	83
E. on 34	92	78	160	110
W. of Jackson Jc. Rt. 65 to Placerville				
E. on 34	706	691	1,637	1,665
N. on 65	491	495	1,233	1,379
W. on 34	354	239	596	460
Pine Grove E. of Town				
W. on 34	539	277	428	244
N. on C. R.	259	178	380	238
E. on 34	785	433	806	482
Jc. C. R. to Silver Lake				
E. on 34	313	99	293	100
S. on C. R.	220	65	143	60
W. on 34	243	96	322	92
Picketts Jc. Rt. 23 and 34	222	97	312	168

**Route 35. Peanut to Kuntz (District I)**

At Peanut	58	39	54	46
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**Route 37. Auburn to Truckee (District III)**

Auburn E. of Cy.	3,236	2,188	2,872	1,930
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Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Colfax E. of Cy. Grass Val. Rd.				
W. on 37	2,366	1,495	2,084	1,435
N. on C. R.	256	177	221	209
E. on 37	2,322	1,396	1,951	1,287
Emigrant Gap Jc. Rts. 15 and 37				
W. on 37	1,974	1,170	1,749	970
W. on 15	211	85	276	98
E. on 37	1,998	1,184	1,735	993
Donner Lake Camp	1,952	1,150	1,679	975
W. of Truckee, Jc. with Rt. 38, S. to Lake Tahoe				
W. on 37	2,937	1,846	2,999	1,719
S. on 38	2,556	1,508	1,922	1,054
E. on 37	4,193	2,787	4,017	2,681
Truckee E. of Cy. at Jc. with Rd. 38 to Nevada Line				
W. on 37	3,210	1,943	2,201	1,507
E. on 38	2,775	1,599	1,913	1,145
N. to Hobart Mills	477	294	264	296

**Route 38. Myers to Nevada Line via Truckee River (District III)**

Mays, Jc. Rts. 38 and 11				
S. on 38	868	543	1,403	1,037
E. on 11	856	494	1,432	1,042
N. on 38	842	520	1,376	994
Pomins	2,141	1,563	1,626	1,151
Tahoe City Jc. Rt. 39				
S. on 38	1,696	1,287	2,910	2,071
E. on 39	1,470	1,151	3,040	2,248
N. on 38	1,512	816	2,517	1,603
Donner Underpass			1,980	1,038
Truckee, W. of Cy. at Jc. Rt. 37	2,556	1,508	1,922	1,054
Truckee, E. of Cy. Jc. Rt. 37	2,775	1,599	1,913	1,145
California-Nevada State Line	2,907	1,480	2,113	1,135

**Route 39. Tahoe City to Nevada State Line (District III)**

Tahoe City Jc. Rt. 38	1,470	1,151	3,040	2,248
State Line near Brockway	1,180	751	1,341	772

**Route 40. Route 13, Near Montezuma, to Route 23, Near Mono Lake (District X)**

Mt. Pass Jc. Rt. 13	400	185	486	359
1 Mi. E. of Groveland on 40	452	289	472	342
Mono 40-A. Jc. with Mno-23-H.	279	315	264	233

**Route 41. General Grant Park to Kings River Canyon (District VI)**

W. of Hume	226	52		
Jc. Co. Rd. to Hume				
W. on 41			154	43
S. on C. R.			74	34
E. on 41			116	32

**Route 42. Saratoga Gap to State Redwood Park (District IV)**

Saratoga Gap, Jc. Rt. 55	1,462	85	3,280	782
Waterman Switch				
E. to Saratoga Gap on 42A	1,483	194	3,416	814
W. to Redwood Park on 42A	664	34	1,130	223
S. on C. R. to Boulder Creek	966	208	2,349	650

**Route 43. San Bernardino to Big Bear Lake (District VIII)**

Foot Waterman Grade	6,148	2,343	4,941	2,236
Jc. Camp Seeley Road			4,939	1,793
W. on 43			1,087	526
N. on C. R.			4,123	1,378
E. on 43				
Squirrel Inn Jc. of New Forest Hwy. with Old Crest Drive				
W. Old Road	1,518	309	499	222
E. on 43	1,334	513	3,198	1,090
N. E. on Old Road	797	223	1,121	393
S. on 43	3,036	821	4,416	1,448
Jc. Burnt Mill Canyon Road				
W. on 43	3,068	1,013	3,285	1,133
N. on C. R.	2,581	794	2,328	850
E. on 43	1,619	672	1,996	832
Jc. Kueffel Canyon Road				
W. on 43	1,335	636	1,734	797
N. on C. R.	422	227	506	152
E. on 43	803	448	1,793	758
Running Springs Park Jc. Cy. Creek Rd.				
N. W. on 43	1,510	535	1,707	677
S. W. on Cy.-C. R.	505	148	890	189
E. on 43	1,925	650	1,932	774
W. End of Bridge over Big Bear Dam				
W. on 43-C	1,788	614	1,799	687
E. over Dam-43-E	1,662	614	1,604	623
N. E. on 43-D	831	296	979	418
1 Mi. from end of Rt. 43 Jc. C. R. to Pincknot				
W. on 43 to Fawnskin	369	160	329	146
S. on C. R. to Pincknot	145	43	145	67
E. on 43 to Baldwin Lake	390	168	341	170
Big Bear Lake Desert Rt. Jc. E. of Baldwin Lake				
N. to Desert, C. R.			138	71
W. to Big Bear Lake, C. R.			165	70
S. on E. side of Baldwin Lake, C. R.			28	10
Mill Creek Lower Control, Jc. Big Meadows Road				
S. to Redlands, C. R.			456	165
E. to Big Meadows, C. R.			263	75
N. to Big Bear Lake, C. R.			223	95

**Route 43. San Bernardino to Newport Beach (District VIII)**

Bet. San Bernardino and Colton, Jc. Mt. Vernon & La Cadena			5,248	4,901
N. on C. R.			43	61
E. on C. R.				



Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
N. on C. R.	65	51	-----	-----
E. on 58	368	365	-----	-----
Kliefelder, 2 Mi. S. E., Jc. new road	-----	-----	289	296
N. on C. R.-Old 58	-----	-----	115	80
E. on 58	-----	-----	384	367
Needles W. of Cy. Lts.	546	560	596	627
Needles 5.7 Mi. S. Jc. to Parker and Blythe	-----	-----	-----	-----
N. on 58	390	254	318	339
S. W. on C. R.	9	9	8	8
S. on 58	383	241	291	325

**Route 59. Route 4 to Route 31 Near Cajon via Lancaster (District VII)**

Bailey Ranch on L. A.-59-A	113	101	272	171
Lancaster, Jc. Rt. 23, on L.A.-59-C	831	1,043	799	847

**District VIII**

Jc. Rt. 31, on S.Bd.-59-A	-----	-----	164	112
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**Route 60. El Rio to San Juan Capistrano (District VII)**

El Rio Jc. Rt. 2 and 60	7,277	5,036	6,112	4,950
Oxnard S. of Cy. Lts. on Ven-60-A	6,113	4,063	5,418	3,122
Near L. A.-Ven. Co. Line, Jc. Decker C. R.	-----	-----	-----	-----
W. on 60	6,796	3,537	-----	-----
E. on 60	6,874	3,537	-----	-----
N. on C. R.	70	40	-----	-----
Topango Canyon on 60	16,355	7,146	12,898	5,346
On C. R.	2,842	1,293	2,836	761
Santa Monica Intex. Beverly and L. A. 60-B Santa Ynez Canyon	-----	-----	-----	-----
W. on 60	20,734	9,238	15,518	6,414
On Beverly Blvd.	11,377	2,568	9,137	2,331
E. on 60 (New)	36,182	16,241	21,091	8,797
On Santa Monica Canyon Rd.	22,299	7,453	20,091	7,631
Lomita on Redondo-Wilmington Rd. on 60	12,655	8,637	7,850	6,264
Seal Beach at L. A.-Orange Co. Line	23,539	10,970	-----	-----
Seal Beach, Hathaway Ave. Jct.	-----	-----	7,585	3,537
N. on 60 (New)	-----	-----	11,397	6,939
W. on 60 (Old)	-----	-----	18,721	7,801
E. on 60	17,802	7,081	12,429	5,121
Newport W. of Cy. Newport- Tustin Rd.	-----	-----	-----	-----
W. on 60	12,340	5,183	8,280	3,640
N. on 43	14,790	7,019	9,623	5,022
S. on 43	15,115	6,816	9,505	4,661
E. on 60	14,657	6,607	8,911	3,960
Serra Jc. Rt. 2 and 60	7,273	3,636	4,730	3,079

**Route 61. La Canada to Mt. Wilson Road via Arroyo Seco (District VII)**

Pasadena at N. Cy. Lts.	2,901	766	2,793	637
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**Route 63. Big Pine to Nevada Line via Oasis (District IX)**

Big Pine, Jc. Rt. 23	131	182	57	67
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**Route 64. Route 26 Near Indio to Arizona Line via Mecca and Blythe (District VIII)**

Indio, 1 Mi. S., Jc. Rt. 26, S.	-----	-----	893	1,219
E. on 64	-----	-----	402	425
Mecca, 2 Mi. W. Jc., Oasis Rd.	-----	-----	169	197
N. on 64	-----	-----	26	43
S. on C. R.	-----	-----	336	408
W. on C. R.	-----	-----	112	123
E. on 64	-----	-----	54	54
Desert Center	85	65	-----	-----
Blythe, S. D. A. Quarantine Sta.	-----	-----	169	231
Colorado River Br., E. of Blythe	-----	-----	-----	-----

**Route 65. Auburn to Sonora (District III)**

Auburn at Wire Br., Amer. Riv.	381	150	543	358
N. on 65	292	102	138	129
E. on C. R.	303	159	435	269
S. on 65	-----	-----	-----	-----
Placerville N. of Cy. Jc. Georgetown Rd.	345	303	381	297
N. on 65	160	168	136	170
N. on C. R.	340	270	512	464
S. on 65	330	258	429	417

**District X**

Central House Jc. Rt. 54 to Michigan Bar	742	528	1,123	628
N. on 65	775	475	1,243	555
W. on 54	719	594	1,206	626
S. on 65	-----	-----	-----	-----
N. of Jackson Jc. Rt. 34	491	495	1,233	1,379
N. on 65	706	691	1,637	1,665
E. on 34	354	239	596	460
W. on 34	-----	-----	-----	-----
Mokelumne Hill, Jc. Westpoint Rd.	-----	-----	355	263
W. on 65	-----	-----	131	118
E. on C. R.	-----	-----	274	184
S. on 65	-----	-----	-----	-----
San Andreas, S., Jc. Mt. Ranch Rd.	-----	-----	1,130	720
N. on 65	-----	-----	263	249
E. on C. R.	-----	-----	1,034	653
S. on 65	-----	-----	-----	-----
W. of Sonora Jc. Co. Rd. to Jamestown	313	298	390	186
N. W. on 65	189	96	199	97
S. W. on C. R.	245	251	329	195
S. E. on 65	-----	-----	-----	-----

**Route 66. Manteca to Route 5 Near Mossdale School (District X)**

Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Mossdale Jc. Rt. 5	3,821	2,847	3,288	2,508

**Route 67. Pajaro River to Route 2 Near San Benito River Bridge (District V)**

San Juan Bautista N. of Cy. at Jc. Rt. 2	3,811	1,740	2,084	1,458
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**Route 68. San Francisco to San Jose (District IV)**

N. Cy. Lts. S. San Francisco	20,136	13,672	18,678	13,565
S. San Francisco at Underpass	19,598	12,311	17,960	11,851
Burlingame Jc. Rt. 63 and Broadway	-----	-----	-----	-----
N. on 68	19,088	10,177	16,880	10,430
W. on Broadway	3,302	3,374	4,167	3,447
S. on 68	17,138	8,691	16,448	8,711
San Mateo, Jc. Third Ave.	16,360	7,715	15,429	8,010
N. on 68	3,642	1,734	2,772	1,339
E. on Third Ave.	4,582	2,446	3,615	1,956
W. on Third Ave.	14,351	7,129	12,865	6,719
S. on 68	-----	-----	11,991	5,952
Redwood City at N. Cy. Lts.	-----	-----	-----	-----

**Route 69. San Quentin Road (District IV)**

Calif. Park Wye, Jc. Rt. 1	4,465	2,315	3,527	1,779
Richmond to San Rafael Ferry	3,479	1,419	2,771	1,195

**Route 70 (District IV)**

Ukiah Jc. Rt. 1	992	1,271	1,058	924
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**Route 71. Crescent City to Oregon Line (District I)**

Crescent City N. of Town at Maint. Yd.	1,107	1,223	841	819
Oregon Line	635	545	418	462

**SECONDARY ROADS INCLUDED IN STATE HIGHWAY SYSTEM AUGUST 14, 1931**

**Route 72. Weed to Oregon Line (District II)**

Weed-13½ Mi. N., Jc. Montague Rd.	-----	-----	210	121
S. W. on 72	-----	-----	24	14
N. on C. R.	-----	-----	-----	-----
N. E. on 72	-----	-----	235	135
Jerome-2½ Mi. N. Jct. Little Shasta Road	-----	-----	-----	-----
N. on 72	-----	-----	198	223
W. on C. R.	-----	-----	48	79
N. on 72	-----	-----	204	192

**Route 73. Alturas to Oregon Line (District II)**

Alturas-5 Mi. N.-Jc. Rt. 28	181	107	130	126
N. on 73	-----	-----	278	176
New Pine Cr. Quarantine Sta.	-----	-----	-----	-----

**Route 74. Napa Wye to Carquinez Bridge (District IV)**

Napa Wye, Jc. Rt. 8, S. on 74	8,260	4,566	7,066	4,230
Jc. Sears Point Cut-off	-----	-----	8,322	4,830
N. on 74	-----	-----	545	273
W. on Cut-off	-----	-----	8,005	4,678
S. on 74	-----	-----	-----	-----
Carquinez Bridge	*6,853	*4,164	*5,077	*3,487

\* 24-hour count.

**Route 75. Oakland to Walnut Creek (District IV)**

Jc. C. R. to Orinda and Moraga	-----	-----	7,226	3,118
W. on 75	-----	-----	2,385	768
N. on C. R.	-----	-----	915	280
S. on C. R.	-----	-----	5,940	2,645
E. on 75	-----	-----	-----	-----

**Route 76. Bishop to Nevada Line (District IX)**

Bishop, N. of City, Jc. Rt. 23	298	293	272	353
N. on 76	-----	-----	-----	-----
Jc. C. R. 5 Mi. W. of State Line	-----	-----	52	61
S. on 76	-----	-----	52	42
W. on C. R.	-----	-----	68	52
N. on 76	-----	-----	-----	-----

**Route 77. Pomona to San Diego (District VIII)**

Prado, Jc. Rt. 43	-----	-----	748	437
N. on 77	-----	-----	-----	-----
†Corona, N. of Cy., Jc. Wineville and Pomona Roads	-----	-----	1,096	650
N. W. to Pomona	-----	-----	1,266	1,048
N. to Wineville	-----	-----	2,193	1,648
S. to Corona	-----	-----	-----	-----
Elstonsore, 2 Mi. N., Jc. Perris Cut-off	-----	-----	2,035	816
N. on 77	-----	-----	347	210
E. on C. R.	-----	-----	2,260	1,116
S. on 77	-----	-----	-----	-----
Elstonsore, S. of Cy. at Union Oil Plant	-----	-----	2,170	1,281

† Not on State highway.

**District VII**

Bonsall, 2.6 Mi. S. Jc. Ocean-side Road	-----	-----	1,473	868
N. on 77	-----	-----	917	470
W. on C. R.	-----	-----	806	562
S. on 77	-----	-----	-----	-----
Miramar, 1½ Mi. S., Jc. La Jolla Rd.	-----	-----	1,619	926
N. on 77	-----	-----	283	125
W. on C. R.	-----	-----	1,625	934
S. on 77	-----	-----	-----	-----

## One-Room Schools Vanish as Improved Highways Increase

**T**HE LITTLE red schoolhouse continues its retreat before the motor age. Its rate of disappearance is definitely proportioned to the rate of increase in improved highway mileage. Every acceleration in road construction is marked by a corresponding decrease in the number of one-room schools. In the old days it was necessary to take the school to the child because it was impossible to take the child to the school. Good roads have reversed that condition.

These points are well borne out by a recent comparative analysis of school and highway data by the American Road Builders' Association. These statistics, dealing with five typical states, reveal strikingly the meaning of better transportation to improvement in educational facilities.

In North Carolina, the analysis shows, there were 2989 one-room schools in 1924, and 1714 miles of improved highway. By 1930 the first class highway mileage had increased to 4025 while the number of single-room schools had declined to 1400. The State presents one of the most emphatic evidences of the principle that the consolidation of rural schools is entirely a matter of efficient transportation.

### JULY TRAFFIC COUNT

(Continued from page 39)

Route 78. Riverside to Temecula (District VIII)				
Station location	July, 1931		July, 1932	
	Sun.	Mon.	Sun.	Mon.
Box Springs, Jc. Rt. 19,	12	13	10	11
N. on 19.....	.....	.....	4,195	3,340
E. on 19.....	.....	.....	1,546	1,220
S. on 78.....	.....	.....	2,811	2,246
Perris, Jc. Hemet Road,				
N. on 78.....	.....	.....	3,159	2,611
S. E. on C. R.....	.....	.....	2,027	1,923
S. W. on 78.....	.....	.....	1,747	1,478
Route 79. Ventura to Castaic (District VII)				
Ventura-Jc. Rt. 2,				
E. on 79.....	3,074	2,354	2,786	2,197
Castaic, Jc. Rt. 4,				
W. on 79.....	2,031	1,343	1,798	1,022
Route 80. Zaca to Santa Barbara (District V)				
1 Mi. S. of Zaca, Jc. Rt. 2,	187	149	208	116
Los Olivos $\frac{3}{4}$ Mi. S., Jc. C. R.,				
N. on 80.....	.....	.....	290	193
S. on C. R.....	.....	.....	124	109
S. E. on 80.....	.....	.....	224	108
San Marcos Pass, at Summit.....	.....	.....	545	238
Santa Barbara, Jc. Rt. 2,				
N. on 80 connection.....	1,040	582	711	391

Husband arriving home late: Can't you guess where I've been?

Wife: I can; but go on with your story.—*Rotary Reminder.*

### TREES CLOSE TO HIGHWAYS

I think that I shall never see,  
Along the road, an unscrapped tree

With bark intact, and painted white,  
That no car ever hit at night.

For every tree that's near the road  
Has caused some auto to be towed.

Sideswiping trees is done a lot  
By drivers who are not so hot.

God gave them eyes so they could see  
Yet any fool can hit a tree.

—*Judge.*

## State Officers Named on Advisory Committee

**C.** C. CARLETON, chief of the Division of Contracts and Rights of Way of the Department of Public Works, has been appointed a member of the Advisory Committee to the California Motor Vehicle Legislative Committee by the chairman, Assemblyman William B. Hornblower.

The Legislative Committee was created by the last Legislature to review and study existing motor vehicle legislation and consider amendments and revisions. It will make a detailed analysis of suggested amendments to the act and report on the proposed revisions to the Legislative Committee.

Other State officials on the Advisory Committee are: Russell Bevans, Registrar and E. Raymond Cato, Chief of Enforcement, Division of Motor Vehicles; Vincent D. Kennedy, Railroad Commission; Daniel J. O'Brien, Department of Penology; Rolland A. Vandegrift, Chief of the Department of Finance and Ralph H. Taylor, Agricultural Legislative Committee.

Other members include representatives of automobile clubs, automotive industries, motor car dealers associations, chambers of commerce, farm bureaus, electrical railways, motorcycle and peace officers associations; traffic, county supervisors and underwriters association.

Fashion Note for Men—There will be little change in the trousers pocket this year.

Dad (describing animal)—And the cow carries two horns on her head.

Willie—And does she blow 'em to let you know she's coming, dad?—*L. A. Chronicle.*

STATE OF CALIFORNIA

# Department of Public Works

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JAMES ROLPH, JR. ----- Governor

COLONEL WALTER E. GARRISON ----- Director

JAMES I. HERZ ----- Deputy Director

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HARRY A. HOPKINS, Taft

TIMOTHY A. REARDON, San Francisco

PHILIP A. STANTON, Anaheim

FRANK A. TETLEY, Riverside

C. H. PURCELL, State Highway Engineer, Sacramento

JOHN W. HOWE, Secretary

HUGH K. McKEVITT, Attorney, San Francisco

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L. V. CAMPBELL, Office Engineer

T. E. STANTON, Materials and Research Engineer

FRED J. GRUMM, Engineer of Surveys and Plans

C. S. POPE, Construction Engineer

T. H. DENNIS, Maintenance Engineer

F. W. PANHORST, Acting Bridge Engineer

R. H. STALNAKER, Equipment Engineer

E. R. HIGGINS, Comptroller

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J. W. VICKREY (Acting), District IX, Bishop

R. E. PIERCE, District X, Sacramento

General Headquarters, Public Works Building,  
Eleventh and P Streets, Sacramento, California

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R. L. JONES, Deputy in Charge Flood Control and  
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Rights

A. N. BURCH, Irrigation Investigations

H. M. STAFFORD, Sacramento-San Joaquin Water  
Supervisor

GORDON ZANDER, Adjudication, Water Distribution

KATHERINE A. FEENY, Chief Clerk

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W. K. DANIELS, Deputy Chief of Division

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C. H. KROMER, Structural Engineer

CARLETON PIERSON, Specification Writer

C. O. PALM, Chief Clerk

C. E. BERG, Engineer, Estimates and Costs

J. W. DUTTON, General Superintendent Construction

W. H. ROCKINGHAM, Mechanical Engineer

C. A. HENDERLONG, Assistant Mechanical Engineer

W. M. CALLAHAN, Electrical Engineer

## DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

FRANK B. DURKEE, General Right of Way Agent

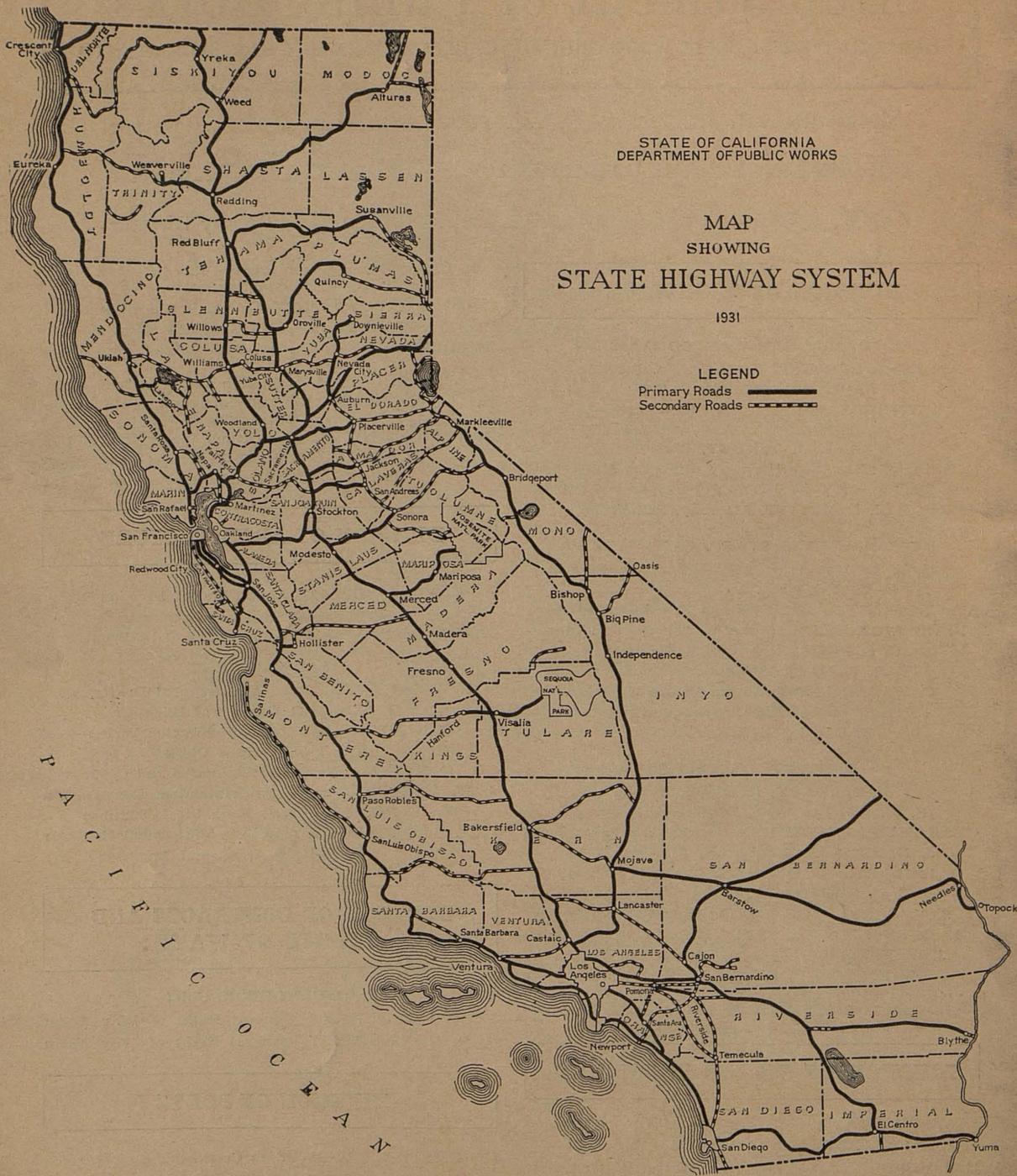
C. R. MONTGOMERY, General Right of Way Agent

## DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

MAP  
SHOWING  
STATE HIGHWAY SYSTEM  
1931

LEGEND  
Primary Roads ———  
Secondary Roads - - - - -

inches

1 2 3 4 5 6 7 8 9 10 11(A) 12 13 14 15

centimeters

0 1 2 3 4 5 6 7 8 9 10

D50 Illuminant, 2 degree observer

L*	38.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	87.34	82.74	72.06	62.15
a*	13.24	18.11	-4.34	-13.80	9.82	-33.43	34.26	11.81	48.55	-0.40	-0.60	-0.75	-1.06	-1.19	-1.07
b*	15.07	18.72	-22.29	22.85	-24.49	-0.35	59.60	-48.07	18.51	1.13	0.23	0.21	0.43	0.28	0.19

Density

0.04	0.09	0.15	0.22	0.38	0.51
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Golden Thread

16(N)	17	18(B)	19	20	21	22	23	24	25	26	27	28	29	30
48.25	38.62	28.86	16.19	8.29	3.44	31.41	72.46	72.95	29.37	54.91	43.96	82.74	52.79	50.87
-0.16	-0.18	0.54	-0.05	-0.81	0.48	20.98	-24.45	16.83	13.06	-38.91	52.00	3.45	50.88	-27.17
0.01	-0.04	0.60	0.73	0.18	0.48	-19.43	55.93	69.80	-49.49	30.77	3.001	81.29	-12.72	-29.46

Colors by Munsell Color Services Lab

Don Williams