

CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



SEPTEMBER
1938

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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To Bring Highways and Bridges in District IV to Adequate Standards Would Require Sum of \$67,409,200

By JNO. H. SKEGGS, District Engineer

NINE counties, namely, Alameda, Contra Costa, Napa, Marin, San Francisco, San Mateo, Sonoma, Santa Clara and Santa Cruz constitute District IV of the State Division of Highways, with headquarters at San Francisco, and are so located as to practically surround the San Francisco and San Pablo Bays. In this area of 6,592 square miles, which is 4.2 per cent of the entire area of the State, reside 1,677,251 persons or 27.7 per cent of the State's total population, according to the 1930 U. S. Census.

The motor vehicle registration in the district for 1937 was 528,243 automobiles and 39,191 trucks or 22.8 per cent and 23.9 per cent, respectively, of the State's total registration during that period.

The State highway mileage outside of incorporated areas is 1094 and inside of incorporated municipalities 186, or a total of 1280 miles within the district, which, in the main, is metropolitan. Notwithstanding this aspect there are numerous mountain ranges and long stretches of deep marsh areas bordering our bays and ocean which present varied and perplexing engineering problems as difficult to solve and probably more expensive than any other section within the entire State.

The acquisition of rights of way upon which to build and expand require an endless amount of work, patience and expense. On account of the growing population and expensive property improvements our land acquisition expense (including that financed from the $\frac{1}{2}$ cent gas tax to cities) approximates \$2,706,855 for the present biennial period ending June 30, 1939.

Of this sum \$1,326,170 has been expended to date. Money spent for this purpose never provides a single foot of highway grading or pavement. The preparation and handling of right of way matters require a highly trained and skillful personnel, including capable attorneys whose duties are the passing on all legal papers, preparation and trial in court of condemnation cases and numerous additional unclassified legal services.

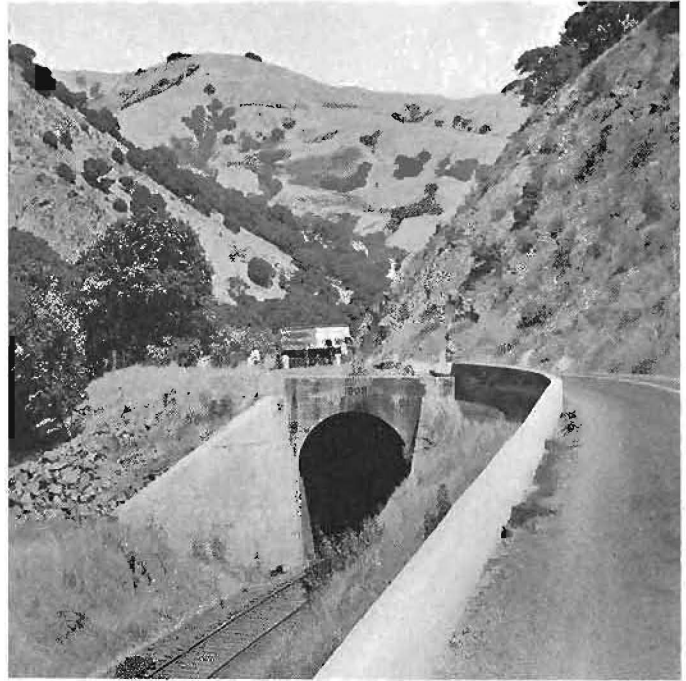
The highway mileage within the district, totaling 1280 miles is classified as follows:

- 11 miles, or 1%, unimproved and unoled earth roads.
- 135 miles, or 11%, oiled earth, inferior as to grade, alignment, width, drainage structures and carrying capacity.
- 295 miles, or 23%, graveled roads with light oil surfaces, expensive to maintain.
- 207 miles, or 16%, intermediate improved types of surfacing.
- 625 miles, or 49% high types of pavement.

Of the high types of pavement 153 miles are within municipal areas. There are 7 miles of highway bridges, exclusive of the two major structures across San Francisco Bay. Fifty per cent of the district mileage should be widened or rebuilt or both, and new bridges built in place or on realignment.

(Continued on next page)

Modernizing Roads Costly



Narrow roadway with blind curves over railroad tunnel in Niles Canyon between Niles and Sunol. (Below) Circuitous routing with blind curves on Franklin Canyon Road.



Top—Skyline Boulevard route near Woodwardia in Santa Cruz County. Original narrow county road maintained by State. Center—Blind intersection with Southern Pacific grade crossing with blind approach to Western Pacific underpass in background, near Sunol, Alameda County. Bottom—Blind curves on Russian River highway, between Gurneville and Monte Rio, Sonoma County.



Multiple lane highways are distributed as follows:

Rural	In Municipalities
3-lanes, 85 miles	3-lanes, 9 miles
4-lanes, 55 miles	4-lanes, 52 miles
	6-lanes, 2 miles

Divided Highways

4-lanes, 17 miles	4-lanes, 7 miles
	6-lanes, 3 miles

The majority of the trunk line highways serving the metropolitan bay area are of stage construction design or being so planned as to insure sufficient and permanent right of way to adequately provide relief on highways now taxed to capacity and with hopes of providing needed room for expansion in the future.

Much has been written, great effort put forward and large expenditures made toward the elimination of highway and railroad grade crossings and there yet remains much to accomplish in this direction. However, there is so much greater loss of life and property damage due to highways crossing each other at grade as to justify, at least, attention comparable to that being given to protection at railroad crossings.

In this district there are about forty highway grade crossings where separations should be considered at this time, the average cost of each will be about \$175,000. Several have been developed to the preliminary plan stage—None is estimated to cost approximately \$175,000; another approximately \$300,000.

Financing grade separations of this character will be a serious problem.

There are twenty-four bridges on the State highways, outside of municipalities, that are posted for restricted loadings and many other bridges, due to old age and fatigue, will shortly require the same treatment. The majority of these bridges are structures on county roads that came into the State highway system within the last six years at the time some 6,600 miles of road were turned over to the Divi-



Top—Narrow underpass with impaired clearance and inadequate sight distance beneath Western Pacific railroad near Sunol on State Route 107, Alameda County. Center—Railroad grade crossing of State Highway on "S" curve near Sunol station. Bottom—Narrow wooden bridge on Coast Highway, State Route 56, in Sonoma County, two miles northwest of Jenner.

sion of Highways through legislative action.

Due to the extremely heavy traffic within and adjacent to the large cities in the district we find it imperative that provisions be made for expanding the trunk line highways from two- and three-lane highways to four lanes divided, and several from four- to six-lane divided highways with provisions for local service roads on each side of and divided therefrom. This latter type of road, where in use, has proven a tremendous factor for safety and reduction of traffic congestion. Grade separations on these major traffic arteries are a necessity, but may be provided gradually.

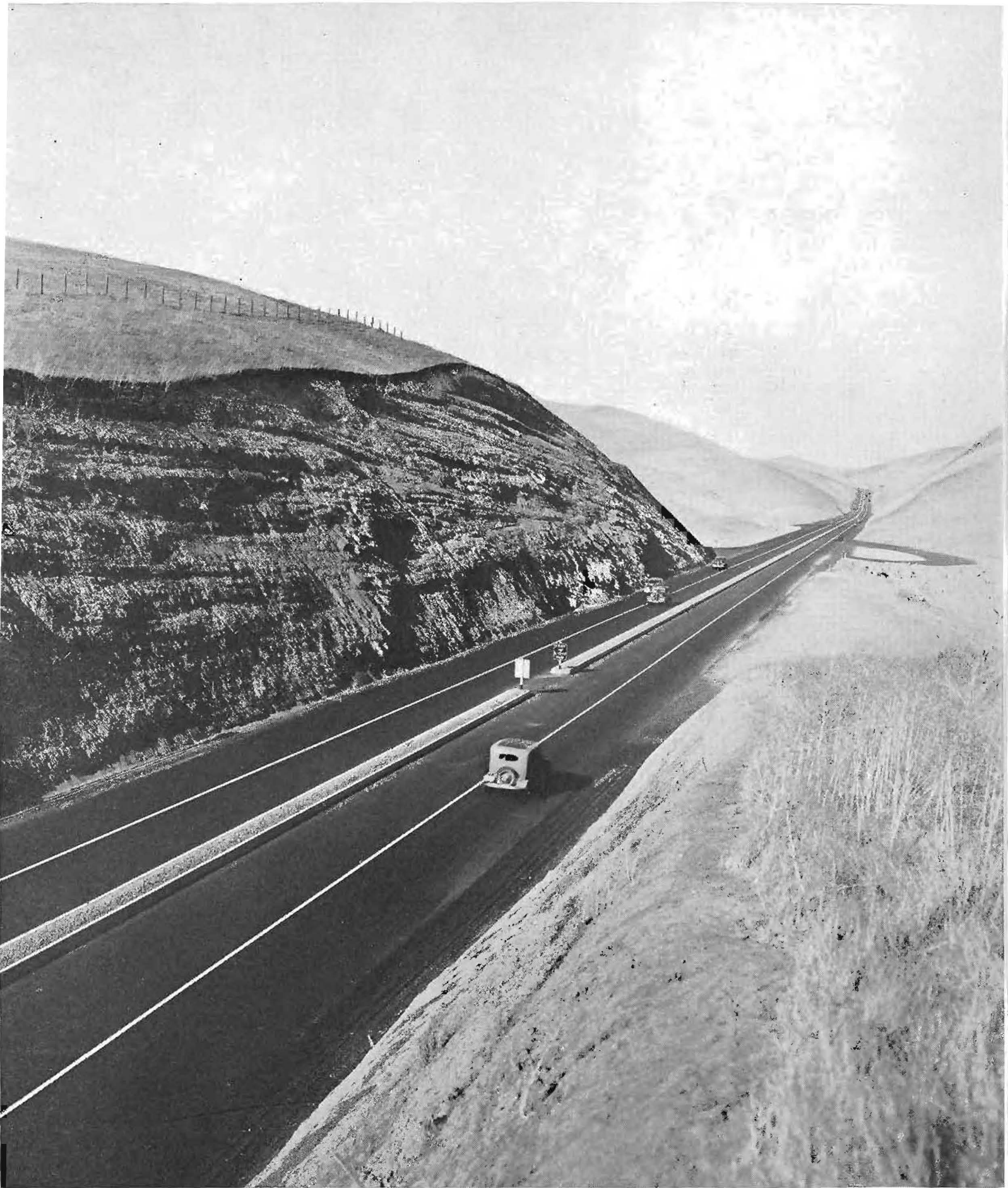
The maintenance of the district mileage is much more expensive than would be the case were sufficient funds available for the construction or improvement of roads upon which no State construction funds have been spent. Reconstruction of roads and bridges that are inadequate in alignment, grade, width and carrying capacity and the widening of roads that are in good condition, but have insufficient carrying capacity, would also help to reduce maintenance expense.

The average maintenance cost during the past five years amounts to approximately \$1,200,000 annually. Almost one-half of this sum of money could be saved each year if the highways serving the district could be immediately improved to the standard required to adequately meet traffic needs.

An old traffic count taken for one day at the northerly city line in Santa Cruz in 1916 showed 618 automobiles, 32 motorcycles and 29 buggies. Construction cost for this road amounted to \$24,800 per mile for grading and paving. As compared with this, a portion of the same route now under reconstruction will cost in excess of \$161,000 per mile. However, the present traffic count for one day, at Santa Cruz City line is 12,193 vehicles, the maximum hourly traffic count being 1,306 vehicles.

(Continued on page 28)





View of new Altamont Pass realignment, a modern four-lane divided highway. Note extensive parking area in right background.



Wide parking areas are provided on the realigned Altamont Pass Highway. Heavy rock cut on right is nearly 100 feet high.

Altamont Realignment Opened

"Dedicated to the public that built it, to those who participated in its construction, and to all who will travel over it—may they move speedily and safely, with the greatest happiness and satisfaction."

UTTERING these words of benediction as he pressed a white-hot branding iron against a rawhide riata held across the highway by two Livermore cowgirls, Governor Frank F. Merriam on August 4th burned away the symbolic barrier and officially opened to traffic the Altamont Pass realignment, locally known as Livermore Boulevard. This highly improved sector eliminates eight and a half miles of the old route with its narrow winding grades that long constituted a traffic bottleneck on State Highway No. 5 (U. S. 50), between Livermore and Tracy in Alameda County.

In this dedication address and in two separate celebration talks preced-

ing the ceremony, Governor Merriam stressed the safety factors of the new four-lane divided highway and made an earnest plea for careful driving.

"The wisdom of the engineers, the skill of workmen have given us one of the finest highways in the world complete with every safety feature, but there is one factor they can not supply," he said. "That is the reasonable regard for safety which must be given by every motorist on the highway."

AGAINST TAX RAISES

Referring to the gas tax funds which make possible the construction of such high type modern highways, Governor Merriam emphasized his stand against diversion of these funds for any other than highway and bridge construction purposes in these words:

"The highway question is a tremendous one. There exists a greater necessity for work in this field than ever before. Greatest care must be exercised

in conserving funds for this sole purpose. It has been said that I am in favor of increasing the gasoline tax. I wish to state that I am absolutely opposed not only to raising that tax but any other tax as well."

Joseph R. Knowland, treasurer of the State Chamber of Commerce and publisher of the Oakland Tribune, was general chairman of the dedication ceremonies held at western end of the new highway near Livermore. In introducing Governor Merriam, H. R. Judah, chairman of the California Highway Commission, and other speakers, Mr. Knowland paid a tribute to State Highway Engineer C. H. Purcell, Col. Jno. Skeggs, District Engineer, and other official and civic leaders for their enthusiastic efforts and interest that resulted in a splendid highway achievement.

LONG-PLANNED IMPROVEMENT

Construction of the new highway unit on the main artery between the San Francisco Bay area and Stockton and the upper San Joaquin Valley is

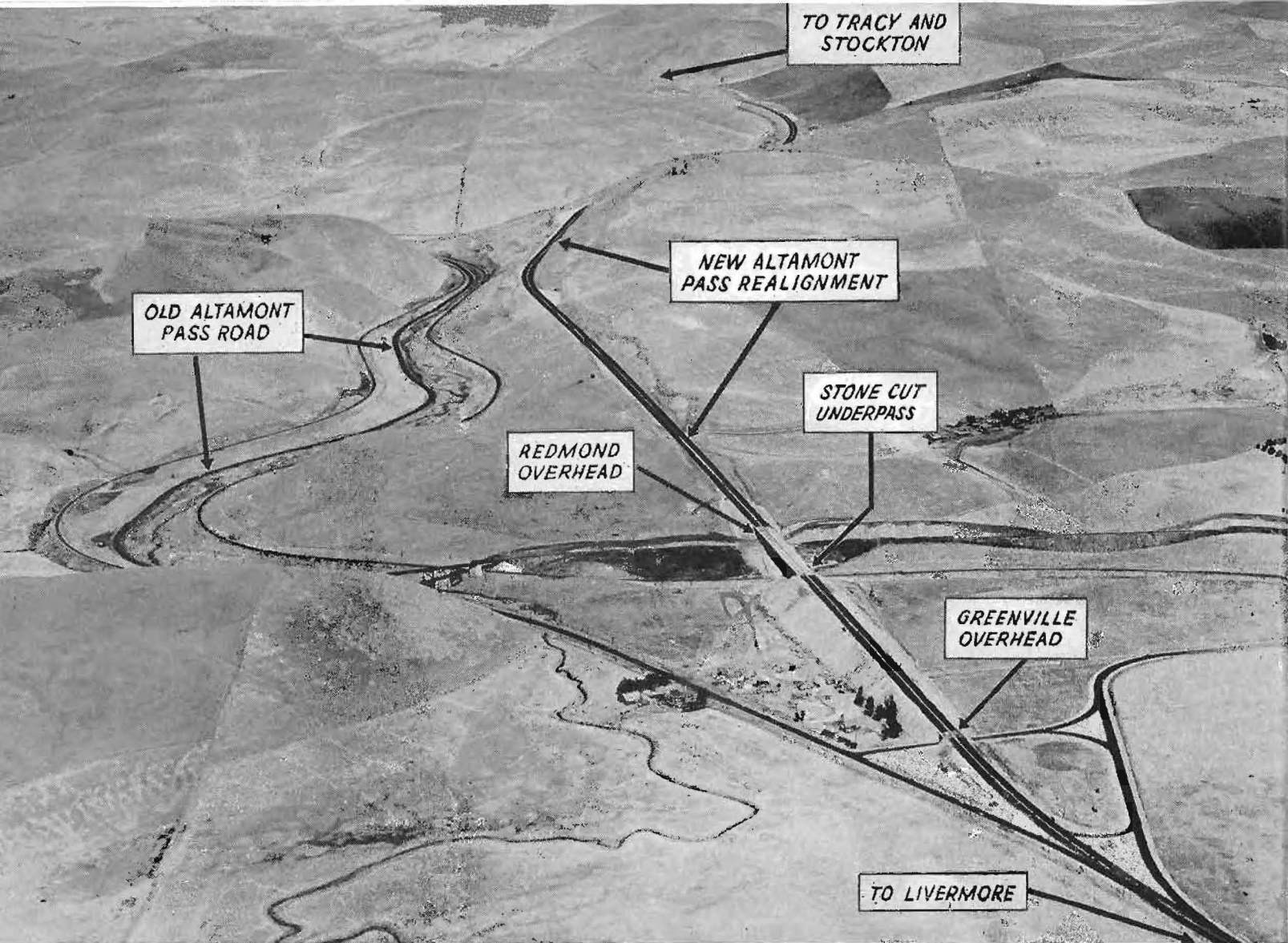


Photo courtesy of Metropolitan Oakland Area Commission
 Aerial view of Altamont realignment showing direct route straight through the hills compared with circuitous course and many curves of old road.

the consummation of exhaustive study toward relief from the serious traffic congestion on this route which has been becoming more acute each year.

Traffic on this route between the valley and the East Bay section has shown unusual increases in the past ten years. In the summer of 1926 traffic counts indicated a travel of about 2600 vehicles daily and by the summer of 1936 the count had risen to nearly 9000 cars daily.

Of these 2600 vehicles in 1926, approximately 10 per cent were trucks and in 1936 this percentage had increased to 20 per cent, with heavy units predominating in the ratio of about two to one.

This heavy trucking, carrying the produce of the valley to the coast and hauling equipment and supplies to Stockton and other valley centers, has been largely responsible for the

traffic congestion, as the long trucks with trailers or semitrailers moved slowly up the grades and around the curves on both sides of Altamont so that passing on the old two-lane road was at best hazardous and usually impossible. Most motorists who have traveled this highway in recent years have experienced the slow drag of traffic through the pass.

ENTIRELY NEW ROUTE

In comparison with the above cited traffic counts it is estimated that the new four-lane divided highway will comfortably carry from 2500 to 3000 vehicles per hour or 40,000 to 48,000 cars per 16-hour day.

The old route from Livermore east-erly was so situated that it was impracticable for the Division of Highways to reconstruct the highway in short sections, as is the usual practice

in the improvement of main highways, but necessitated relocation as an entirely new route over the 8½ miles between Greenville and Mountain House at some distance to the south of the existing road with no opportunity for intermediate connections. It also was desirable to construct the new road as a single unit in order to keep the cost of the required expensive construction to a minimum.

As it was estimated that the total cost of the improvement would be over one million dollars, it was not possible to include so large a project in a single biennial budget until the current biennium.

It was at the August meeting of the California Highway Commission, held in Oakland in 1936, that this important project was definitely placed in the proposed budget for the biennium covering the period from July



Altamont Realignment features: Top—In foreground overhead structure over Southern Pacific Railroad. Large arched underpass in background carries Western Pacific tracks. Center—Greenville overhead crossing both railroads. Bottom—Close-up of new highway showing raised 4-foot division strip with 6-inch curb and signed opening.



With a white-hot branding iron Governor Frank F. Merriam burns the rawhide riata barrier held by two Livermore cowgirls and opens the highway.

1, 1937, to June 30, 1939. Immediately after this decision was made, final preliminary surveys for the relocation were begun and preparation of plans and estimates followed the field work rapidly so that the Division of Highways was in a position to advertise for bids on the work shortly after the budget was signed by Governor Merriam late in the spring of 1937.

The importance of this project in the work proposed by the Division of Highways for the current biennium was evidenced by the breaking of ground for construction just fifteen days after the beginning of the biennium.

The new location of the Altamont Pass highway provides a four-lane divided roadway constructed to the modern standards of alignment, grade and pavement, suitable for a main arterial. The prevailing grade is approximately 5 per cent with a maximum of 6 per cent. The new route is nearly one mile shorter than the old road between Greenville and Mountain House.

The number of curves has been reduced from 60 to 15; the total curvature from 1500 degrees to 427 degrees; and the minimum curve radius on the new permanent relocation is 2000 feet as against the short 250-foot radii existing on the old road.

The pavement cross-section calls for two 2-lane, asphalt plant-mixed rock pavements on crusher run base separated by a raised strip 4 feet wide. Portland cement concrete curbs 6 inches high have been placed along each side of the dividing strip.

The roadway excavation has involved the movement of over two million cubic yards of earth and rock and the overhaul on this material amounted to nearly thirty million station yards. Over ten million gallons of water were required for embankment compaction and other construction purposes and nearly 18,000 lineal feet of various sizes of corrugated metal pipe were needed for drainage purposes.

The cost of the road construction on this project has amounted to about \$945,000.

The relocation of the route necessitated four grade separations, two with the tracks of the Southern Pacific Railroad and two with the Western Pacific Railway. To accomplish these separations three major structures have been built.

The largest is a reinforced concrete overhead which carries the highway over tracks of both railroads just easterly of Greenville. A second reinforced concrete overhead was constructed to carry the new road over the Southern Pacific at Redmond and

an underpass consisting of an earth filled concrete arch was placed under the Western Pacific tracks at Stone Cut near Redmond.

Each of these three structures provides a 50-foot roadway with a 4-foot parting strip in the center to carry the divided traffic way plan throughout the length of the improvement. Adequate sidewalks are provided on the three grade separations.

Cost of the Greenville overhead amounts to about \$125,000 and the separations at Redmond and Stone Cut, which were built under one contract, cost approximately \$137,000.

The three contracts under which this relocation has been effected total \$1,207,000.

The contractors for the grading and paving portion of the improvement were Granfield, Farrar and Carlin of San Francisco. The Greenville overhead was built by A. J. Raisch of San Jose, and the two structures near Redmond were constructed under a joint venture by Heafey-Moore and Fredrickson & Watson Construction Company and Fredrickson Brothers.

The extensive celebration program arranged by the State Chamber of Commerce with the cooperation of the Livermore, Tracy, and Stockton chambers and the Metropolitan Oakland Area Committee included a large civic banquet in Oakland on Wednesday evening, August 3, a breakfast at Liv-

(Continued on page 10)

Traffic on State Highways Shows 3.3 Per Cent Increase Over 1937

THE regular annual statewide traffic count taken on State highways Sunday and Monday, July 10 and 11, shows an increase of 3.3 per cent over the corresponding period in 1937.

Increases are shown by all of the various route groups for both Sunday and Monday, although the Sunday increases in all cases were smaller than those for Monday and were much less uniform.

The taking of the actual count followed the procedure of previous years and covered the 16-hour period from 6 a.m. to 10 p.m. for both Sunday and Monday. Traffic was segregated by hourly periods into the following classifications: California passenger cars, out-of-state passenger cars, buses, light trucks, heavy trucks, trailers drawn by trucks, trailer coaches, and other passenger-car trailers.

The comparisons for the various groupings are as follows:

PER CENT GAIN OR LOSS FOR 1938 COUNT AS COMPARED WITH 1937

	Sunday	Monday
All Routes	+1.26	+4.28
Main North and South Routes	+0.92	+4.45
Interstate Connections	+3.39	+5.69
Laterals Between Inland and Coast	+1.57	+3.65
Recreational Routes	+0.12	+3.13

The gain or loss of traffic volume for State Highway Routes 1 to 80, inclusive, which constitute the basis for the foregoing summary, is shown in the following tabulation:

Route	Termini	1938			
		Sunday		Monday	
		Gain	Loss	Gain	Loss
1. Sausalito-Oregon Line		10.92			4.54
2. Mexico Line-San Francisco		0.94		1.37	
3. Sacramento-Oregon Line		5.19		10.17	
4. Los Angeles-Sacramento		8.70		12.52	
5. Santa Cruz-Jc. Rt. 65 near Mokelumne Hill		0.72			2.80
6. Napa-Sacramento via Winters		15.86			4.92
7. Crockett-Red Bluff		5.32		2.75	
8. Ignacio-Cordella via Napa		0.49		6.79	
9. Rt. 2 near Montalvo-San Bernardino			1.18	2.48	
10. Rt. 2 at San Lucas-Sequoia National Park		13.82		13.71	
11. Rt. 75 near Antioch-Nevada Line via Placerville		4.56		6.12	
12. San Diego-El Centro		8.97		8.93	
13. Rt. 4 at Salida-Rt. 23 at Sonora Jc.		9.61			1.18
14. Albany-Martinez			12.04		4.55
15. Rt. 1 near Calpella-Rt. 37 near Cisco		2.23		18.12	
16. Hopland-Lakeport		4.50		15.88	
17. Rt. 3 at Roseville-Rt. 15, Nevada City			1.83	6.13	
18. Rt. 4 at Merced-Rt. 40 near Sequoia			8.85		10.09
19. Rt. 2 at Fullerton-Rt. 26 at Beaumont		6.86		6.43	
20. Rt. 1 near Arcata-Rt. 83 at Park Boundary			3.04	18.85	
21. Rt. 3 near Nichvale-Rt. 29 near Chilcoot via Quincy		60.45		56.35	
22. Rt. 56, Castroville-Rt. 29 via Hollister			4.69		5.79

Route	Termini	1938			
		Sunday		Monday	
		Gain	Loss	Gain	Loss
24. Rt. 4 near Lodi-Nevada State Line			2.24	5.88	
23. Rt. 4 at Tunnel Sta.-Rt. 11, Alpine Jc.		11.01			6.38
25. Rt. 37 at Colfax-Rt. 83 near Sattley		8.32			26.88
26. Los Angeles-Mexico via San Bernardino		2.21			4.78
27. El Centro-Yuma			6.74	0.62	
28. Redding-Nevada Line via Alturas			2.76	2.71	
29. Peanut-Nevada Line near Purdy's		17.80			4.63
31. Colton-Nevada State Line		16.90			13.44
32. Rt. 56, Watsonville-Rt. 4 near Califa			6.56		13.37
33. Rt. 56 near Camluria-Rt. 4 near Famoso		9.73			7.88
34. Rt. 4 at Galt-Rt. 23 at Pickett's Jc.		23.91			4.90
35. Rt. 1 at Alton-Rt. 20 at Douglas City		8.77			14.27
37. Auburn-Truckee			6.65	4.34	
38. Rt. 11 at Mays-Nevada Line via Truckee River			11.40	6.00	
39. Rt. 38 at Tahoe City-Nevada State Line		6.07			16.56
40. Rt. 13 near Montezuma-Rt. 76 at Benton			28.40		15.67
41. Rt. 5 near Tracy-Kings River Canyon via Fresno			11.01		4.24
42. Redwood Park-Los Gatos		5.62			0.42
43. Rt. 60 at Newport Beach-Rt. 31 near Victorville		3.73			8.47
44. Boulder Creek-Redwood Park		0.96			16.69
45. Rt. 7, Willows-Rt. 3 near Biggs		2.62			13.06
46. Rt. 1 near Klamath-Rt. 3 near Cray		16.68			34.73
47. Rt. 7, Orland-Rt. 29 near Morgan			11.94		2.03
48. Rt. 1 N. of Cloverdale-Rt. 56 near Aiblon			15.92	3.88	
49. Napa-Rt. 15 near Sweet Hollow Summit			8.18		8.24
50. Sacramento-Rt. 15 near Wilbur Springs		0.42			3.56
51. Rt. 8 at Schellville-Sebastopol		0.32			0.96
52. Alto-Tiburon		2.56			12.85
53. Rt. 7 at Fairfield-Rt. 4 at Lodi via Rio Vista		17.00			9.50
54. Rt. 11 at Parkins-Rt. 65 at Central House		17.50			15.30
55. Rt. 5 near Glenwood-San Francisco			14.30	5.46	
56. Rt. 2 at Las Cruces-Rt. 1 near Fernbridge			8.85		4.78
57. Rt. 2 near Santa Marin-Rt. 23 near Freeman via Bakersfield		15.47			8.22
58. Rt. 2 near Santa Margarita-Arizona Line near Topoc via Mojave and Barstow		13.08			8.75
59. Rt. 4 at Gorman-Rt. 43 at Lake Arrowhead		13.24		3.81	
60. Rt. 2 at Serra-Rt. 2 at El Rio		1.94			2.04
61. Rt. 4 S. of Glendale-Rt. 59 near Phelan		10.35			12.41
62. Rt. 171 at Northam-Rt. 61 near Crystal Lake		17.95			21.94
63. Big Pine-Nevada State Line		18.78			10.40
64. Rt. 2 at San Juan Capistrano-Blythe			3.47		1.22
65. Rt. 18 near Mariposa-Auburn		8.18			11.08
66. Rt. 5 near Mossdale-Rt. 13 near Oakdale		8.88			4.49
67. Pajaro River-Rt. 2 near San Benito River Bridge			9.04	5.20	
68. San Jose-San Francisco		13.92		2.82	
69. Rt. 5 at Warm Springs-Rt. 1, San Rafael			4.41	19.01	
70. Ukiah-Talmage		0.72			5.91
71. Crescent City-Oregon Line		17.00			6.12
72. Weed-Oregon Line		4.05			14.15
73. Rt. 29 near Johnstonville-Oregon Line		9.25			4.40
74. Napa Wye-Cordalla via Vallejo and Benicia		2.71			5.14
75. Oakland-Jc. 65 at Altaville		34.67			27.93
76. Rt. 125 at Shaw Ave.-Nevada State Line near Benton			5.82		1.32
77. San Diego-Los Angeles via Pomona		13.32			8.65
78. Rt. 12 near Descanso-Rt. 19 near March Field		9.91			4.22
79. Rt. 2, Ventura-Rt. 4 at Castaic		17.86			3.01
80. Rt. 51, Rincon Creek-Rt. 2 near Zaca		9.02			7.68

Practice
Traffic
Safety

Practice
Traffic
Safety

Practice
Traffic
Safety

Altamont Realignment Opened

(Continued from page 8)

ermore preceding the dedication and a luncheon at Tracy following the colorful ceremonial.

In his address at the Oakland banquet Governor Merriam said:

"It is not possible at this time to even attempt an estimate of the benefits which will accrue to Oakland, the entire San Francisco Bay area and all of Central California as a result of elimination of the unsatisfactory highway conditions which have obtained for so many decades.

"This new and wonderful highway with slight grades and virtually no curves is fast. Persons and freight will be carried over and through the smoothly rolling hills at a rapid pace and there will be more safety. Ship freight will be transferred from your ships calling at the modern piers of Oakland and in an hour or two may be carried to the valley destinations in record time. It will help your shipping and your industries. Also it will help business in the interior and contribute tremendously to the development of more satisfactory friendly and cultural relations between the city and the country."

Irving H. Kahn, vice president of the Oakland Chamber of Commerce, the toastmaster, was presented by Victor J. La Motte, president of the organization.

Mayor William J. McCracken of Oakland, the first speaker, declared it has been the ambition of the Oakland business and shipping fraternity for many years to smash the old Altamont barrier; that satisfactory business associations between the Oakland area and Central California could never be achieved until this new highway was built.

AMONG THE SPEAKERS

Among the other speakers were: George F. Tubbs, mayor of Livermore; C. P. Button, chairman of the Oakland Chamber's highway committee; H. R. Judah, California State Highway Commissioner; Earl Lee Kelly, Director, State Department of Public Works; C. H. Purcell, State Highway Engineer; Dr. E. J. Leach, chairman, Committee Coast Highway Commission.

Others at the speakers' table included President William Larsen of the Tracy Chamber of Commerce; Mayor James Lamb of Tracy; C. C. Cottrell, representing the State Automobile Association and Automobile Club of Southern California; P. G. Jasper and William F. Hart, members

of the State Highway Commission; Joseph R. Knowland; Carl Hoffman, publisher of the Post-Enquirer; Congressman Albert E. Carter; A. J. Lundberg, regional director California State Chamber of Commerce and president of the East Bay Transit System, and Harold D. Weber, general manager, Oakland Chamber of Commerce.

In his remarks Director Earl Lee Kelly stated that "the new Livermore Boulevard highway represented the largest excavation job ever let in one contract by the State and the completion of this section of the trunk highway leading from the East Bay into the San Joaquin Valley is probably second only to the San Francisco-Oakland Bay Bridge in importance to the development of the bay area. The steady increase in traffic on the route, which has been in progress over the past several years, will undoubtedly continue at an accelerated rate, and there is a marked feeling of satisfaction to the highway officials of California that in the development of the State Highway System, facilities providing for quicker and safer travel have been furnished to motorists who use this arterial."

Lantern Thieves Sentenced to Jail

Lives of motorists are occasionally endangered by the theft of red lanterns placed as warning signals at dangerous spots on the State highways. Such an incident occurred recently in the Merced district where Maintenance Superintendent Scott Sawyer reports the arrest of two culprits who were sentenced to thirty days in jail by Justice C. H. McCray.

The men who gave their names as Robert Burns and Harry Merchant, described as transients, stole a red lantern marking the edge of a flooded area of the pavement on the Merced-Los Banos Highway, six miles south of Merced. Local residents saw the theft and reported it to Highway Patrolman C. W. Farr, who made the arrests.

Superintendent Sawyer reports that as many as 25 red lanterns have been stolen in one night in his district.

New Bridge at Red Bluff is Dedicated

DEDICATION of the new seven-span steel and concrete bridge across the Sacramento River at Red Bluff August 6th was the high spot of a week-end celebration that included speed-boat races, a street dance, a minor league championship ball game and other special events and festivities that drew a crowd of over two thousand people.

The official bridge ceremonies began at 8 p.m. Saturday evening on the brilliantly illuminated new structure, when L. E. Bronson, secretary of the chamber of commerce, introduced Tom McGlynn as master of ceremonies, who in turn introduced the other speakers, including State Senator D. Jack Metzger and State Director of Public Works Earl Lee Kelly, representing Governor Merriam.

Paying a tribute to Senator Metzger's efforts at Sacramento in securing the new bridge, Mr. Kelly said the narrow old structure built by Tehama County in 1884 had stood for over half a century but the new one had been planned and built to stand for two hundred years.

At the conclusion of the speeches, Miss Red Bluff, in the charming person of Miss Phyllis Gadwood, clad in queenly attire and escorted by Mrs. Earl Lee Kelly and Senator Metzger, cut the ribbon barrier in a blaze of flashlights, officially opening the bridge to traffic.

Immediately after the official ceremonies Main street was given over to a free street dance and sports events continued the celebration program on Sunday.

The new bridge is of continuous steel girder construction, 820 feet long, with a 34-foot roadway and two 4-foot sidewalks. The structure consists of reinforced concrete piers with spread footings founded on steel H piles.

There are seven continuous, three-girder, steel deck spans. The center span is 126 feet long and is flanked on each side by three spans, one 143 feet, one 108 feet and one 96 feet in length.

Twelve lighting standards² placed



This picture affords a striking comparison of the new, wide Red Bluff bridge with the narrow old structure at left.

at intervals along the steel handrail provide illumination at night. These lights are of the sodium vapor type.

J. F. Knapp of Oakland was the general contractor on the project. The furnishing and placing of structural steel was subcontracted to Moore Dry Dock Company. Approaches to the bridge were built under a separate contract which also

included removal of the old bridge. This contract was handled by N. M. Ball and Sons.

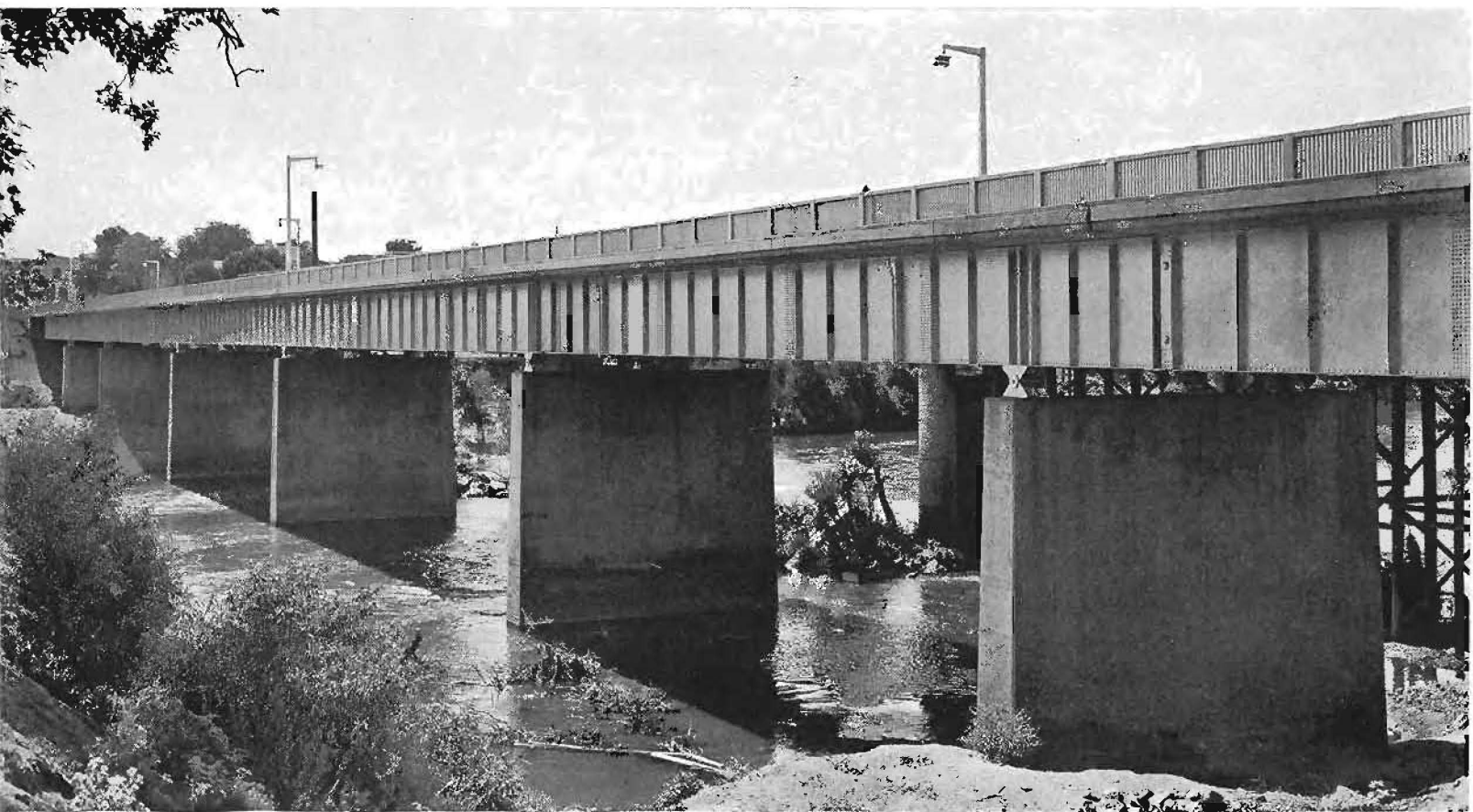
Cost of the bridge construction was \$250,000 and \$40,000 for the approaches.

Maximum height of pier shaft is 61 feet, minimum height 35 feet. All girders are 9 feet in depth and range in weight from 11 to 20 tons each.

Due to sustained periods of high water it was necessary to construct the steel girders with a guy derrick from the top of the bridge. In spite of the additional hazards presented by this method, no serious injuries or fatalities resulted.

The contract was approved May 20, 1937, and all work was completed July 25, 1938.

The steel girders of this 820-foot bridge are 9 feet in depth. Reinforced concrete piers are founded on steel H piles.



Relation of Engineering to Accident Prevention

The following article is the second and final part of a paper on "The Relation of Scientific Engineering to Accident Prevention" prepared and presented by J. W. Vickrey, Safety Engineer of the Division of Highways, at the Institute of Government held at the University of Southern California in Los Angeles, July 14, 1938.

By J. W. VICKREY, Safety Engineer, Division of Highways

ENGINEERING with relation to accident prevention on our rural State highways is like all other accident prevention work, a matter for selective attack.

The vast majority of rural road mileage has been inherited. When these roads were built there was no thought of motor vehicle traffic and consequently no provision was made to satisfy the demands which an entirely new type of transportation was to bring.

The first motor vehicles were compelled to accommodate themselves, both as to design and operation, to the roads that existed. This situation has long since been reversed. It is now the task of the highway engineer to see that the highways fit the present type and mode of traffic, and where extensive construction or reconstruction is contemplated that provision also be made for such probable future traffic requirements as can be foreseen.

SALVAGING OLD ROADS

Our thousands of miles of inherited rural roads can not be scrapped just because of certain inadequacies in meeting all the demands of motor vehicle traffic. Quite frankly, the public can not afford it, particularly the motoring public on whom more and more the entire financial burden for roads is being placed. We can ill afford to waste the vast potential traffic value of these older roads by failing to provide those funds—modest when compared with the cost of a brand new model—which are required for fitting them to meet the reasonable demands of the traffic they may serve.

The vast majority of the mileage is for two-lane traffic only. There is little reason to believe that in percentage of total road mileage this sit-

Governor Merriam Welcomes Delegates to Safety Conclave

An inspiring message of greeting was given by Governor Frank F. Merriam to the delegates of the Fourth Annual Western Safety Conference being held in Los Angeles as this magazine is going to press.

It reads as follows:

STATE OF CALIFORNIA
Governor's Office
Sacramento

GREETINGS

In welcoming the Delegates of the Western States Safety Conference to their Fourth Annual Meeting in the City of Los Angeles, September 12th to September 16th, 1938, I feel that the opportunity is freighted with a privilege and a duty. It is a privilege to welcome you who are vitally interested in campaigning to save human life. It is a duty of my office to solicit from you any suggestions which may be evolved in this Conference, for it is public interest such as yours which furnishes the inspiration and courage for constructive official action. Your membership is circumscribed by the boundaries of western geographical divisions, but your influence developed through this Conference can be and, I am sure, will be unbounded. I salute your efforts.

FRANK F. MERRIAM,
Governor of California.

uation will ever be greatly changed. The traffic which they now carry, or can be expected to carry in the predictable future, will not justify the cost for multiple-lane construction and all the other desirable safety features that can be incorporated into the design for that limited mileage of the road system where traffic volume does justify a super highway.

The engineer readily recognizes this and concentrates effort on those features that are economically feasible. There are two main avenues of approach: one to deal with features that have general application and may become parts of standard design policy; and the other, to deal with specific situations where the rate of accident occurrence is greater than the normal expectancy. Both are necessary in any complete program. Their value will depend upon the completeness and accuracy of the accident record and its correct analysis.

TWO ACCIDENT GROUPS

For purposes of review and analysis, traffic accidents fall naturally into two main groups: those involving only a single vehicle and those where two or more vehicles are involved. In the one the volume, density, and type of traffic need not be considered in connection with their study, while any study of accidents where two or more cars are involved that does not include consideration of the prevailing traffic, can have very little meaning. Pedestrian accidents demand separate and distinct treatment, inasmuch as another wholly different type of traffic is introduced.

Thorough analysis to determine the whole accident prevention program and proper relation between all parts of it, requires presentation of a number of broad combinations and their successive breakdowns by particular



Passenger car and truck crashed in the middle of the four-lane Bay Shore Highway near San Francisco. Three killed.

elements. No attempt will be made to go into these in detail. A single example of subdividing the two-or-more-car group of accidents will suffice to show how essential it is to make such breakdowns if we are to know with any degree of certainty not only what we should do to reduce accidents but where and how we should spend our time and money to accomplish the greatest results in the shortest space of time.

Two-car accidents are of three main types: "Approaching," where the vehicles involved are traveling in opposite directions on the same road; "Overtaking," where both are going in the same direction; and "Paths Intersecting," where the two are traveling different roads which intersect at grade. A minor subdivision of the last group covers those cases where the paths of movement of cars traveling on the same road intersect, as in making left or right or "U" turns not at road intersections.

PREVENTATIVE QUESTIONS

In what percentage of the total do these various types appear, in general or on particular stretches of road? Preventative measures are not the same for each type, nor do they call for the same expenditure.

Single-car accidents, to a casual thought the simpler of the two main groups, are nevertheless rather more difficult to divide into distinct types. A natural division is between those resulting from obstructions—other than motor vehicles—on the traveled

way and those in which the car left the traveled way.

Incidentally, it may be noted that aside from those cases where pedestrians are also involved, the vast majority of single-car accidents fall into that class reported as "drove off the road." In the absence of any evidence of specific defect in either machine or roadway, there arises the presumption that failure on the part of the driver was directly responsible. The engineer interested in accident prevention is not satisfied to accept such presumption as the complete answer until he has assured himself that no surface condition or element of geometric design of the roadway appreciably contributed toward the unsafe driving.

PEDESTRIAN PROBLEMS

The problem that is presented to the engineer by pedestrian accidents on our rural State highways is truly one of the most discouraging with which he has to deal—discouraging because there seems to be so little good reason why they should occur and because there is so little that he, as an engineer, can reasonably do to prevent them. I am speaking now of our own State. Pedestrian accidents represent less than 7 per cent of all accidents reported on the rural State highways. A much more serious aspect is presented when we note that if fatalities alone are considered, over 24 per cent are pedestrians.

To a much greater degree than the motorist, the pedestrian through

his own individual actions and exercise of judgment has the power to escape accident. The situation is rare when he can not safely step off the traveled way to permit passage of a motor vehicle. Only impatience compels him to cross a highway in the face of traffic. The motor vehicle on a rural highway is always to be expected by the pedestrian, while the pedestrian on our rural roads is not the normal condition which the motorist may expect and thus presents an element of surprise.

It is true that a large percentage of pedestrian accidents occur during darkness. Undoubtedly it is more difficult for the motorist to discern a pedestrian at night than in daylight, but this is not true of the pedestrian's ability to see an approaching automobile. Every advantage rests with the pedestrian to avoid collision with a motor vehicle if he will simply exercise the care which is demanded by a situation which otherwise will almost certainly result in either death or serious injury to himself.

DIFFICULTIES ENCOUNTERED

Thirty per cent of the pedestrians killed on our rural State highways last year were either under the influence of liquor or had been drinking. It is difficult to envision any physical safeguard that would appreciably affect this type of accident. Of the remaining 70 per cent only two per cent were reported as having physical defects, such as defective

(Continued on page 18)

Uniform Code for Loads, Size, Weight

THE seventeenth annual convention of the Western Association of State Highway Officials was held at Reno August 10, 11 and 12, at which there were gathered 100 registered delegates representing the eleven Western States and Texas, as well as a large number of guests.

President Lacy V. Murrow, Director of Highways in the State of Washington, called the meeting to order at 9.30 on the morning of August 10th and the delegates were welcomed to Nevada by Mayor John Cooper of Reno, and Governor Richard Kirkman Sr. of Nevada.

Following a roll call, the meeting was addressed by Dr. L. I. Hewes, Deputy Chief Engineer of the Bureau of Public Roads, who reviewed the progress of highway work and outlined the work being accomplished by the Highway Planning Survey. He described its final value as a guide to the proper planning of highways and a means of indicating their future needs. He pointed out in his talk that the data already collected showed many interesting facts not commonly known among those interested in highway work.

The delegates then adjourned to attend the luncheon provided by Nevada at the Riverside Hotel. Here the delegates were addressed by C. H.



Proposed Standard Load Dimensions and Speeds for Motor Vehicles Specific

1. **WIDTH.** No vehicle shall exceed a total outside width, including any load thereon, of 8 feet, except vehicles now in operation which, by reason of the substitution of pneumatic tires for other types of tires, exceed the above limit, provided further that in no case shall such width exceed 102 inches and that after January 1, 1945, no such vehicle and/or loads exceeding 8 feet in width shall be operated.

2. **HEIGHT.** No vehicle unladen or with load shall exceed a height of 13 feet 6 inches, except that the public body having jurisdiction may at its discretion, reduce this height to heights consistent with the condition of individual sections of highway.

3. **LENGTH.** (a) No vehicle and load thereon shall exceed an overall length of 35 feet.

(b) Combinations of vehicles shall consist of not more than two units, and, shall not exceed a total length of 60 feet, but the public body having jurisdiction may, at its discretion, reduce this length.

4. **SPEED.** (a) No motor vehicle shall be unnecessarily driven at such a slow speed as to impede movement of traffic, except when reduced speed is necessary.

(b) **MAXIMUM SPEED.** No truck shall be operated at a speed greater than 45 miles per hour.

(c) Vehicles equipped with solid operated at a speed not in excess of 10

5. **AXLE LOAD.** (a) The wheels at 10 miles per hour or less, shall be eq

(b) No wheel equipped with pne excess of 9,000 pounds, nor shall the t wheels equipped with pneumatic tires

No wheel equipped with solid ru load in excess of 8,000 pounds, nor sh having wheels equipped with such tires

An axle load shall be the total lo included between two parallel transvers

(c) The above limits are recomm roads, but should not be construed as p politan areas if any state desires.

(d) These weight specifications made more restrictive where temporary

6. **GROSS WEIGHTS.** (a) Subje recommended axle loads, no vehicle operated whose gross weight, with loa

ht, Recommended by W.A.S.H.O.



Purcell, State Highway Engineer of California and President of the American Association of State Highway Officials, on the subject of highway financing and the relation of highway building in the Western States to the general business conditions in the Eastern States.

After the luncheon the general meeting was addressed by E. P. Palmer, President Associated General Contractors of America on the subject of problems arising from labor organization in the highway field and by Roy McKaig of Idaho representing the Highway Users Conference on the subject: "Western Agriculture Needs Highway Transportation."

A separate meeting was held by the bridge committee of the W. A. S. H. O. in conjunction with a committee appointed to make a study of the question of permissible dimensions and loads for motor vehicles. This committee was appointed as a result of a resolution passed by the association at their meeting in Denver in July, 1937.

An open meeting was held which was attended by many representatives of bodies operating trucks on the highways and also by the traffic engineers of several of the States. Representatives of the trucking interests

(Continued on page 22)

ied in Resolution Adopted by Western State Highway Officials Convention

and rubber or cushion tires shall be 0 miles per hour.

s of all vehicles, except those operated equipped with pneumatic tires.

pneumatic tires shall carry a load in total load carried by any axle having s exceed 18,000 pounds.

ubber, or cushion tires shall carry a hall the total load carried by an axle s exceed 16,000 pounds.

ad on all wheels whose centers may be se planes 40 inches apart.

ended for all main rural and intercity inhibiting heavier axle loads in metro-

for wheel and axle loads may be cy road conditions justify.

ect to the limitation imposed by the or combination of vehicles shall be ad, exceeds that given by the formula

$W = 750 (L \div 40)$ where

W = total gross weight, with load, in pounds;

L = the distance between the first and last axles of a vehicle or combination of vehicles in feet.

The same limitations shall be applied to any group of axles within the vehicle or combination of vehicles.

(b) Provided further that the total gross weight, with load, on any group of axles of a vehicle or combination of vehicles where the distance between the first and last axles of the group is 18 feet or less, shall not exceed that given by the formula

$W = 650 (L \div 40)$ where

W = total gross weight, with load, in pounds on the group of axles under consideration;

L = the distance between the first and last axles of the group under consideration.

7. LOAD PER INCH OF TIRE WIDTH: No wheel equipped with pneumatic, solid rubber, or cushion tires shall carry a load in excess of 600 pounds for each inch of tire width.

The width of pneumatic tires shall be taken as the manufacturers' rating. The width of solid rubber and cushion tires shall be measured at the flange of the rim.

Protecting Highway Roadsides From Business Encroachments

TWO of the photographs on the opposite page contrast conditions immediately after the construction in 1932 of a new State highway approach from the south to the city of Modesto, and the condition of the same highway today.

When this road was laid out, it ran through vineyards and other agricultural land. It was open, unrestricted highway to the city limits of Modesto. Today, for a long distance south of the bridge, it is a 20-mile zone. Its development as a business section, attached to but outside of the city limits of Modesto, is continuing.

The third photograph on the page shows a portion of the new Vacaville Cut-off. The old road through Vacaville was winding and for the most of its distance was within business or residence district zones. It brought all of the through traffic between San Francisco and Sacramento in conflict with the local traffic of the city. The new route is shorter, has no restricted speed zones, and is generally much safer.

ROADSIDE DEVELOPMENT CONTROL

The respective photographs are intended to focus attention upon the problem of protecting the borders of important highways from the development of roadside businesses. Of recent years this subject has received intensive study by various planning commissions, university professors, the auto clubs, and by other interested persons and organizations. The Department of Public Works has been concerned with the question for many years, but it is only in the past three years that even limited funds have been available for the accomplishment of any program towards protecting the borders of such highways from business encroachments.

The ordinary highway right of way differs from a railroad right of way in the important respect that abutting property owners have, under decisions of our Supreme Court, a right of access to the highway. This means that they may develop their property for business purposes, and in so doing are entitled to such connections as will

permit vehicles to drive on and off the highway to their place of business. Vehicles coming into a fast-flowing stream of traffic create hazards, as well as interfering with the orderly flow of traffic on the highway. Due to the fact that the property owner has this legal right of access, the Division of Highways can not simply fence off the right of way as a railroad company can its right of way.

DIFFERENT METHODS TRIED

With the limited funds available, a substantial start has been made in the past three years towards meeting this problem. In practical application, several different methods have been tried. The simplest is the engineering solution of picking out a location for a highway where the existing conditions are such as to prevent any roadside developments. For example, highways have been laid out where one side of the road is protected by railroad right of way, or where both sides are protected by natural features such as a stream bed on one side and a steep bank of an arroyo or canyon on the other.

Another engineering solution which is being authorized is the construction of service roads outside of the lanes of the main highway, the service roads being physically separated from the lanes for through traffic by curbs or other means.

In certain instances, the problem has been attacked by condemning or buying from the abutting property all rights of access, so that the highway right of way can be fenced off or closed off as is a railroad right of way.

ZONING ORDINANCES ENACTED

Full credit must be given to the planning commissions and boards of supervisors in certain counties who have appreciated the seriousness of the problem of roadside development and who have attempted to provide a solution through the enactment of zoning ordinances. An ordinance prohibiting use of abutting highway property for roadside businesses does go a long way toward meeting this problem, although it can not provide

the full measure of safety to traffic on a through highway which can be provided by the acquisition of the rights of access from the abutting property.

The Division of Highways has recently tried out in rural communities a simple procedure consisting of securing the agreement of abutting property owners not to use the property for the development of any roadside business, and authorizing the fencing off of the right of way by public authorities in the event any attempt is made to establish roadside businesses on the abutting property.

AGREEMENT LIMITATIONS

The general purpose of agreements of this sort is to hold the roadside property in its present use or to limit its use to purposes other than business purposes. For instance, if the property is in use for agricultural purposes it may, without violation of the agreement, be changed to residential purposes, but the possibility of residential subdivisions being laid out with each house having its own entrance onto the through highway is eliminated by provisions in the agreement limiting the number of approach roads which can be constructed from any particular property.

The plan last mentioned has been utilized recently for the protection of the new Vacaville Cut-off. While the primary consideration in attempting to so restrict the development of roadside businesses has been public safety and the preservation of the efficiency of the road for through traffic, in this case an additional return should be received by the motorists in the protection to the scenic values of the road through the orchards of the beautiful Vaca Valley.

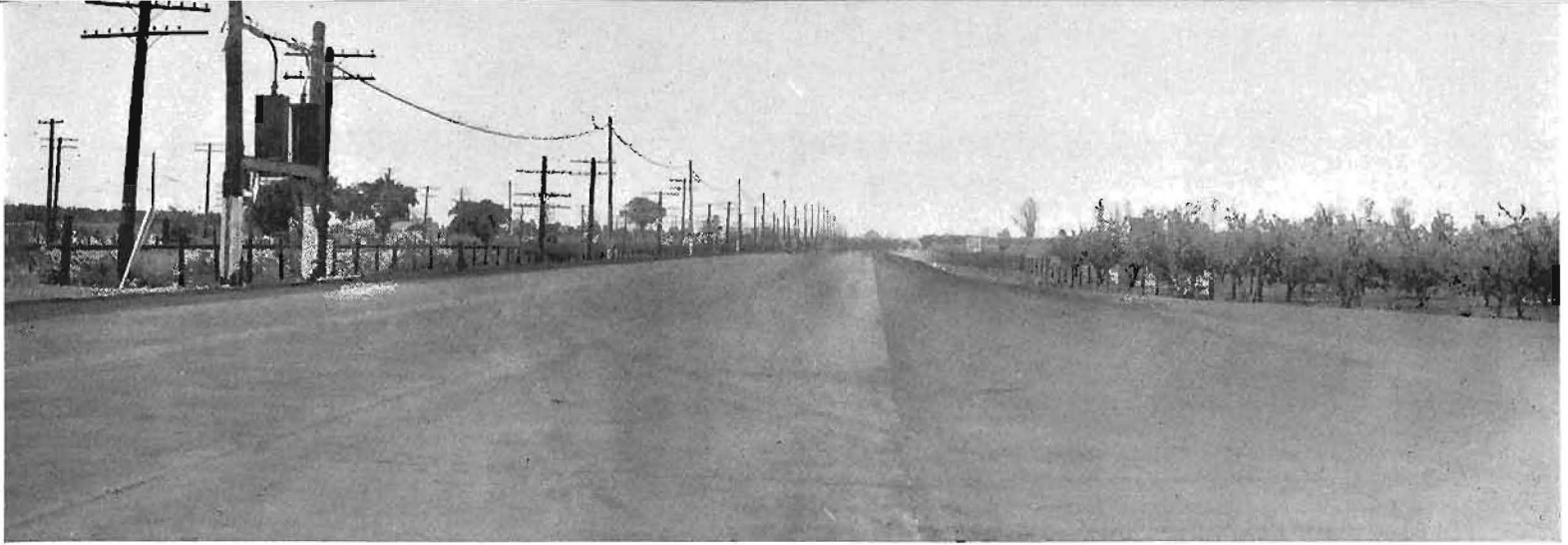
WOULDN'T DARE

Doctor—Your wife seems to have eaten something that has disagreed with her.

Henpeck—Oh, no, doctor; it wouldn't dare to.—*Mentor.*

"There's something dove-like about our child."

"Yes, he's pigeon-toed."



This is how the realigned State Highway No. 4 (U. S. 99) south of the city limits of Modesto appeared when built in 1932.



The same portion of the highway as it appears today transformed into a 20-mile zone by business development.



Right of way agreements secured by Division of Highways protect the Vacaville cut-off through beautiful Vaca Valley from business encroachments.

Relation of Engineering to Accident Prevention

(Continued from page 13)

sight, hearing, et cetera; the others were apparently normal persons. It is this situation that prompted the statement that there seems to be so little good reason why such accidents occur.

The question of what the engineer can do to reduce their number is very hard to answer. The preventive measures which commonly suggest themselves to the engineer as things within his province are sidewalks, pedestrian crossings, and lighting. A brief general review of the pedestrian accident situation on the rural State highway system immediately demonstrates the serious difficulties to be encountered when we try to apply such remedies.

During the past year we received reports of 576 pedestrian accidents occurring on the rural portion of the State highway system. This involves over 13,000 miles of road in 57 counties. Pedestrian accidents were scattered throughout 48 of these 57 counties, no one of which accounted for more than 6 per cent, with the exception of Los Angeles where approximately 14 per cent of the total occurred. Moreover, within the counties themselves there is little concentration to be found. Only in rare instances are there even as many as two pedestrian accidents reported at the same point or within the same immediate vicinity.

GREATEST OBSTACLE

This lack of concentration presents the greatest of obstacles to the engineer. Sidewalks could be of help only in preventing that type of accident where the pedestrian was walking on or along the highway. This represents only a little more than one fourth of the total. With accidents scattered as they are, it would require thousands of miles of sidewalks to effect any large percentage of these. Also, there is real doubt as to whether many of those who now are found walking along the highway would use a sidewalk if it were available. They are only pedestrians temporarily until such time as they can induce a passing motorist to pick them up; and they prefer to be either on or very close to the traveled way, thinking they will be better able to



National Safety Council

induce a driver to slow down and give them a ride.

More than one-third of the pedestrians were killed or injured while attempting to cross the highway. These attempts were made everywhere. To provide a sufficient number of safe crossings for these pedestrians to effectually reduce this type of accident is just as overwhelming as the problem of sidewalks.

The third measure which might conceivably be of benefit, would be lighting of the highways. Since night-time accidents are no more concentrated than pedestrian accidents in general, lighting, to be of any marked benefit for this particular purpose, would have to be just as universal as sidewalks or safe crossings.

Pedestrian traffic on rural highways in California is vastly different from that in densely populated States, where what we would be inclined to consider as urban conditions exist along a very large percentage of all their rural highways. There are along our rural highways a very few points where pedestrian traffic is perhaps of sufficient volume to call for special consideration.

These places are being studied in detail to determine what reasonable

measures may be taken to further safeguard this class of traffic, but the problem of accomplishing any marked reduction in pedestrian accidents for the rural highways of the State as a whole is one that will require much work other than that which can be brought about by any possible physical improvements. The engineer can contribute by clearly outlining the situation as it really exists, pointing out what he can do and is doing. Others must have a large part in solving this very difficult traffic problem.

The relation of scientific engineering to accident reduction appears to me to lie mainly in these two things:

First, to prepare by scientific method the necessary factual basis for a clear presentation of the whole traffic accident problem. Such a basis is vital, not only to the engineer for whatever subsequent action he is to take but also to all others engaged in any phase of accident prevention.

Secondly, as an engineer he must allocate his efforts and the expenditures under his control in such manner that they will return the maximum in total accident reduction.

The engineer will make frank recognition of his responsibility to so design, construct, and maintain the highways that they will to the most reasonable degree require and induce safe action on the part of the driver.

The driver at the same time must never be permitted to forget that the first and main responsibility lies with him. So long as he demands the right to drive a machine that will respond to his control, no amount of engineering on the part of some one else will ever provide him a guarantee of safety.

BAD ROADS KEEP 16,000,000 AMERICANS AWAY FROM CHURCH

Because of the important part played by the church in rural American life, the fact that many of our citizens are unable to attend church because of bad roads becomes especially serious, says Charles M. Upham, engineer-director of American Road Builders' Association. "Sixty per cent of the 32,000,000 farm people in the United States live on unimproved dirt roads which bad weather often makes completely impassable. This means that more than 16,000,000 Americans are unable to get to church during many months of the year."



August 4, 1938

Department of Public Works,
Sacramento, California.

Gentlemen:

On our way from Fresno to San Luis Obispo, about 20 miles out of Kettleman City, over the Cottonwood Pass, the foot and hand feed of our car became impaired, making it impossible for us to move, leaving us stranded in the suffocating heat of the desert.

Thanks to the State Highway workmen, Messrs. E. C. Henderson (equipment operator), and J. K. James (foreman), we were towed to shade where car was worked on and fixed so we could proceed on our way.

We wish you would publish in your "Department of Works" magazine that these gentlemen were more than courteous, obliging as well as skilled workmen, performing their duty and much more to the tax paying public, who should know the out of the ordinary services rendered.

Trusting you will give these State employees credit in your State publication, we are

Gratefully yours,

MRS. A. M. ROBLE,
WOODVILLE BOGARD,
O. K. FETHEWY.

India Wants It

Office Executive Engineer
Montgomery, B. D.
July 16, 1938.

California Highways
and Public Works.

Dear Sir:

Will you kindly send me a sample copy of your noted magazine for my perusal before I subscribe towards its issue.

Yours faithfully,

(Signed) CHAMPA LAL, I. S. E.,
Executive Engineer,
Montgomery Provincial
Division,
(B. D.) India.

Scotland Gets It

August 24, 1938.

California Highways
and Public Works,
Sacramento.

Gentlemen:

Having received your magazine for many months, I want to take this oppor-

tunity of expressing my appreciation for such a fine publication.

It may interest you to know that after reading every page, the magazine is sent to the automobile editor of one of the large daily newspapers of Glasgow, Scotland, and I assure you it is very much enjoyed.

Yours very truly,

JOHN M. GORDON.

Endorses Amendment

California Division
The Travelers' Protective Association
of America

August 17, 1938.

H. R. Judah, Chairman,
State Highway Commission,
Sacramento, California.

Dear Mr. Judah:

With reference to your article in the August, 1938, issue of the California Highways and Public Works magazine on page seven, permit us to endorse the proposed constitutional amendment protecting the gasoline tax revenues from being diverted.

We have several thousand members whom we will inform, and your Commission is free to use our endorsement to this amendment.

Respectfully,

ROBT. E. PFAEFFLE,
State Secty.-Treas.

Read to Students

San Bernardino,
August 16, 1938.

California Highways
and Public Works,
Sacramento, California.

Sirs:

For the past year I have had the pleasure of receiving your official journal CALIFORNIA HIGHWAYS AND PUBLIC WORKS. I have found the material contained therein most instructive. It has been a source of pleasure and pride to point out certain facts concerning our public highways which I read in your magazine to both my students and friends.

I should be very grateful to you to continue my name on your mailing list at my new address, 2906 North E Street, San Bernardino.

Sincerely,

(Signed) KENNETH V. DEARDORFF.

Gas Tax Does It

CALIFORNIA CHAIN STORES
ASSOCIATION, Inc.

San Francisco,
August 18, 1938.

Mr. H. Ray Judah,
Santa Cruz, California.

Dear Mr. Judah:

Several days ago I had the pleasure of driving over the new Livermore Pass road. It is certainly a fine piece of work and a most welcome addition to our state highway system. I drive a good many miles each month and that makes my gasoline bill considerable, but I never object to the gasoline tax because the results show up so splendidly in our highway system.

I hope you are able to continue until your plans for the entire State have been completed.

Yours very truly,

JOHN ARTHUR REYNOLDS.

JAR:LMH

Helpful to Library

THE UNIVERSITY OF WISCONSIN

University Extension Division

Madison, August 1, 1938.

Calif. Highways and Public Works,
P. O. Box 1499,
Sacramento, California.

Gentlemen:

The Department of Debating and Public Discussion of the University Extension Division is very anxious to secure three copies of: "Disastrous winter floods caused \$8,000,000 damage to State highways and bridges; Damage to bridges heavy," by W. A. Douglass in California Highways for April, 1938; to use in connection with its regular loan package library service in this State.

We shall find this publication especially helpful and shall appreciate your cooperation.

The Department of Debating and Public Discussion is the state-wide library functioning agency of the University Extension Division. Our loan service is rendered to the residents of Wisconsin with no expense other than the return transportation, hence we have no budget item for the purchase of material.

If at any time we can reciprocate, we shall be happy to do so.

Very truly yours,

ALMERE L. SCOTT, Director,
Dept. Debating and Public Discussion.

Highway Worker Injured by Truck With Bad Brakes

Marion Robinson, a maintenance leadingman of the State Division of Highways with headquarters at Klamath, was directing the work of a maintenance crew engaged in patching the pavement about one mile north of the Humboldt-Del Norte County line on the Redwood Highway on July 8 when he was struck in the back by a tank truck driven by E. A. Marsh of Eureka, and was knocked to the pavement on his face. He was taken to a hospital in Crescent City, where an examination revealed a slight fracture of the skull to the right of his nose, a fracture in the top rib on his right side and severe bruises on his face and one leg. He was confined to the hospital by his injuries for nearly a month.

The crew Mr. Robinson was directing was working on the west side of the pavement and traffic was using the east side. "Men and Equipment Working" signs were in place about 600 feet from the work on both sides and flagmen were stopping all traffic and cautioning them to proceed slowly.

The driver of the truck stated that the vehicle he was driving had faulty brakes and that he was following four cars when the leading car stopped suddenly, and, in order to avoid colliding with the car ahead he was forced to turn into the west lane where the truck struck Mr. Robinson.

The driver was fined fifty dollars by Justice of the Peace Fleishman at Klamath for reckless driving, driving without proper brakes and driving without a proper horn.

Automotive industries in the United States last year ranked first as consumers of rubber, plate glass, nickel, lead, mohair, and steel, it is revealed in annual reports. In the manufacture of motor vehicles factories used 80 per cent of the rubber, 73 per cent of the plate glass, 28 per cent of the nickel, 31.4 per cent of the lead, 40 per cent of the mohair, and 20 per cent of all the steel consumed in the United States during 1937.

"We'll get more mileage out of life if we never shift our mouths into high gear until we're sure our brains are turning over."—Ex.

Landscape Project Provides Parking on Donner Summit

By H. DANA BOWERS, Landscape Engineer

THAT roadside improvement can serve the motorist from the standpoint of safety as well as augment the natural scenery is exemplified in a landscape project recently completed at Donner Summit on State Highway Route 37 (U. S. 40).

From the top of Donner Summit at an altitude of 7135 feet there is unfolded to the eastward a panorama of unexcelled grandeur and beauty. About 1000 feet below, beautiful Donner Lake nestles like a jewel in a magnificent setting of evergreen forest. For the past several years this captivating vista constituted a source of traffic and pedestrian hazard because thousands of tourists, desiring to stop and enjoy the view, were forced to do so in an entirely inadequate space.

To eliminate these hazards and to provide an area where motorists would have plenty of room to park and spend all the time they wished, a section of the solid granite point lying directly below the famous Donner Summit Bridge was blasted away. An area 75 feet wide and 150 feet long was provided with an entrance way designed for safety under present traffic conditions. This area was oil surfaced and protected with rubble piers, chain railing and a walkway.

In this connection it is interesting to note an article in the California Highways for September, 1926, referring to the Donner Summit Bridge then recently completed and setting forth its advantages from a scenic and safety standpoint. The following excerpt is revealing of the advance made in highway construction standards in the past twelve years.

"High up amid the granite crags of the Sierra, Donner Summit Bridge, a forest highway project, is one of the unique structures on the State Highway System of California. It spans a rocky chasm at an elevation of nearly 7000 feet and was built to

make possible a grade of not to exceed 7 per cent from Donner Lake to the Summit; eliminating for all time the 18 and 20 per cent grades of the old road, first projected in early days, and for years the most difficult section of the most important interstate connection in northern California. The bridge has a handsome arch 110 feet in length with a depth of 70 feet. Its cleared roadway width is 24 feet, its total length including approaches is 241 feet.

"As a part of the lower approach span, there has been constructed an elevated observation platform 25 feet in length and 7 feet wide, on a pedestal of which a memorial tablet of the Native Sons is placed. Herein the motorists may enjoy, safely guarded from the passing traffic, the marvelous view of the high Sierra and the Donner Lake basin which unfolds below. It was near this spot that the Donner party turned back in October, 1846, balked by snow in its attempt to cross the summit. Because of the historical significance of this spot the observation platform was deemed appropriate. A wide parking place for automobiles also has been provided nearby
* * *

The "wide parking space" was a 12-foot shoulder on the opposite side of the bridge approach from the observation platform, making it necessary for visitors to cross the road and walk back to reach the observation platform.

The increase in traffic and the speed at which the modern automobile travels this road at the present time has changed a situation then considered comparatively free of danger into one of great hazard. Correction of this condition has been accomplished by the new improvement.



Parking area at Donner Summit lookout point on State Highway No. 37 (U. S. 40). Donner Summit bridge in background.



Huge crags originally barred access to point overlooking Donner Lake.



Rocks were blasted and safe entrance way and parking area constructed.

\$300,000 for Flood Relief

Governor Frank F. Merriam on August 25th approved the immediate allocation of \$300,000 from the \$5,000,000 Emergency Flood Relief Fund for the restoration of flood damaged levees, structures and drainage canals and emergency bank protection along the Sacramento and Feather Rivers in the Sacramento River Flood Control Project.

The Governor announced his action at a conference attended by Director of Public Works Earl Lee Kelly, State Engineer Edward Hyatt, and a delegation of Yuba County citizens headed by Senator W. P. Rich of Marysville.

The \$300,000 will be divided equally between the State Reclamation Board and the Division of Water Resources of the Department of Public Works.

Nine counties that will receive the direct benefit from the Governor's allocation are Butte, Glenn, Colusa, Sutter, Yuba, Yolo, Solano, Sacramento, and San Joaquin.

Twenty-five Year Club Formed in Highway Division

TO CELEBRATE a quarter century of service with the State and to establish a closer bond of friendship cementing twenty-five years employment by the same organization, a "Quarter Century Club" has just been organized by employees of the Division of Highways who began State service in 1912 or prior thereto, and had been in State service at least twenty-five years on December 31, 1937.

A prerequisite for membership in the club is twenty-five years service with the Division of Highways and all employees of the division are eligible for membership immediately upon acquiring the required service status.

It is of interest to note that of four hundred employees who entered the service of the State Highway Commission in 1912, the names of fifty-four were to be found on the 1937 employment roll. The majority of these 54 employees had not served continuously, but of the number, twenty-five had by December 31, 1937, served for 25 years; except when, in a few cases, on leave of absence during the World war.

During 1938, a number of others will attain the 25 year service credit.

Following are the names of twenty-one employees who had served at least twenty-five years on December 31, 1937, and who have participated in the formation of the club.

- C. N. Ainley, Associate Highway Engineer, District VII, Los Angeles.
- H. F. Allen, Associate Highway Engineer, District VII, Los Angeles.
- F. R. Baker, Associate Highway Engineer, District IX, Bishop.
- E. J. Bassett, District Office Engineer, District II, Redding.
- T. A. Bedford, Senior Highway Engineer, Headquarters—Sacramento.
- C. M. Butts, Associate Highway Engineer, District I, Eureka.
- S. V. Cortelyou, District Engineer, District VII, Los Angeles.
- S. Crespo, Maintenance Foreman, District II, Redding.
- H. C. Darling, Associate Highway Engineer, District IV, San Francisco.
- A. N. George, District Construction Engineer, District VII, Los Angeles.
- F. W. Haselwood, District Engineer, District II, Redding.
- R. W. Haverstick, Chief of Party, District VII, Los Angeles.

Uniform Code Recommended by W. A. S. H. O. Convention

(Continued from page 15)

were requested to give their views and to discuss the proposed provisions of a uniform code covering truck loads, widths, lengths and heights. Excellent cooperation was given in this matter by the carrier representatives and immediately after the opening meeting the committee agreed upon a recommended code to be adopted by the W. A. S. H. O.

On the following day, August 11th, the general meeting was addressed by Guy Kelcey of Signal Service Corporation on the subject: "Channelizing Traffic and Channel Lighting of Highways." After this came a discussion on the coordination of safety practices in eleven Western states and Texas which was joined in by representatives of practically all the states and resulted in a general agreement that a committee of W. A. S. H. O. should be formed to handle these matters.

In the afternoon the meeting was addressed by Charles Upham of the American Road Builders Association on the subject: "Streamline Traffic Demands Challenge the Highway Departments." Mr. Upham stressed the need for presenting data to show the necessity of future highway building in the Western states and said that unless this was done and members of Congress were convinced of the need, it was quite probable that Federal appropriations for such a purpose would be greatly curtailed in the future.

Following this address the report of the Committee on the Uniform Code covering axle loadings, widths,

- F. T. Maddocks, Senior Physical Testing Engineer, Headquarters—Sacramento.
- Grant P. Merrill, Superintendent, District IX, Mojave.
- C. P. Montgomery, Associate Highway Engineer, District VII, Los Angeles.
- James Moriarity, Chief Clerk, District IV, San Francisco.
- D. N. Sapp, Assistant Highway Engineer, District IV, San Francisco.
- R. H. Stalnaker, Equipment Engineer, Headquarters—Sacramento.
- T. E. Stanton, Materials and Research Engineer, Headquarters—Sacramento.
- R. A. Tremper, Assistant District Maintenance Engineer, District II, Redding.
- G. R. Winslow, Assistant Construction Engineer, Headquarters—Sacramento.

lengths and heights of truck was presented and was followed by a short discussion.

On Friday morning the meeting was addressed by Kenneth Godwin, Regional Engineer PWA, on the subject "Highway Construction Under PWA," and the program was concluded with a discussion of "Coordination of Safety Practices in Eleven Western States and Texas," which was participated in by representatives of practically all of the states represented.

At the request of Mr. Allen, this discussion was opened by Attorney Frank B. Durkee of the legal staff of the California Department of Public Works, who presented auditing and other related problems which have arisen in an attempt to comply with General Administrative Memorandum No. 39, particularly paragraph 39 of the memorandum dealing with reimbursement of public utilities.

The subject was closed with a discussion of the practices of the several states regarding the fencing of highways, particularly with reference to the maintenance of right of way fences.

Three resolutions were then presented by the resolutions committee and adopted. Resolution No. 1 recommending the uniform load dimension code is printed on a preceding page. Resolution No. 2 urged the American Road Builders' Association to hold its next convention and exhibit in San Francisco. Resolution No. 3 commended the American Automobile Association and affiliates for consistently fighting the diversion of road funds to other uses than road purposes.

The following officers were elected for the ensuing year: President, Charles D. Vail, State Highway Engineer of Colorado; Vice President, Joseph Stemmer, State Highway Engineer of Idaho; Secretary-Treasurer, George T. McCoy, Assistant State Highway Engineer of California.

He—Ants are supposed to be the hardest working creatures in the world.

She—Yep; but they still seem to have time to attend all picnics.—*Washington Post*.

Highway Work in 89th Fiscal Year Reported to Governor Merriam

THE 89th fiscal year of State government in California ended on June 30th last and also marked the mid point of the current fiscal biennium.

In his report to Governor Frank F. Merriam, Director Earl Lee Kelly of the Department of Public Works, stated that construction and maintenance activities of the Division of Highways were pushed ahead during the first year of the biennium to the end that work placed under way, as represented by work orders written, amounted to the total of \$34,216,800 for maintenance and construction on the State Highway System.

Segregation of this amount in authorized expenditures for construction and maintenance to the various classifications of highway work is shown in the following tabulation:

Work Orders Issued

July 1, 1937, to June 30, 1938

State Highway Construction and Maintenance Contracts.....	\$18,879,500
Day Labor Minor Improvements	603,800
Day Labor Betterments.....	690,400
Miscellaneous Day Labor Construction	1,919,700
Convict Construction.....	1,612,000
Construction subtotal	\$23,705,400
Day Labor Maintenance.....	10,176,400
Maintenance and Operation of San Francisco-Oakland Bay Bridge	335,000
Total	\$34,216,800

The \$18,879,500 required for the 258 contracts awarded during the 89th fiscal year provided for various types of construction and improvement as shown in the following summary giving the mileage and amount for each type.

Type of construction	Miles	Amount
Pavement	164.3	\$6,205,400
Plant-mix surfacing.....	178.3	3,192,500
Road-mixed surfacing.....	125.9	3,014,300
Oiled gravel surfacing (armor coat, etc.).....	469.5	1,058,900
Untreated gravel or stone surfacing	17.5	48,100
Graded roadbed	58.7	866,100
Dust oiled roadbed.....	56.2	9,200
Shoulder construction and oiling.....	79.2	48,100

Type of construction	Miles	Amount
Bridges and grade separations	(79)	4,145,200
Miscellaneous		291,700
Totals	1,149.6	\$18,879,500

The type designations in the above tabulation are based on the surfacing of the complete improvement and in each instance includes the necessary grading, drainage and base construction required for any given project. On certain contracts, even though the grading, base and construction of drainage structures may have been the major portion of the work, the improvement has been included under

the surface type. Listed shoulder improvements include contracts involving work on shoulders only.

The financing of these contracts from the various sources of revenue is shown in the following tabulation:

State Highway funds.....	\$10,682,600
Regular Federal Aid funds.....	6,095,700
Federal Grade Crossing funds.....	1,291,700
Federal Feeder Road funds.....	809,500
Total	\$18,879,500

The State highway funds listed in the above tabulation include allotments from money allocated to the Division of Highways from revenues of the State gasoline tax and motor vehicle registration fees.

To complete the monthly records of activities of the division for the fiscal year just ended, the following data are given for the work accomplished during the month of June.

Work placed under way between June 1 and June 30, 1938, is represented by the amount of \$4,762,000, which covers construction and maintenance work orders written and projects advertised for bid opening in July. This total includes activities from the various phases of State highway activities as shown in the following summation:

Construction	
Contracts awarded.....	\$1,240,600
Minor Improvements	29,200
Miscellaneous day labor construction.....	446,500
Subtotal	\$1,716,300
Advertised for Bid Opening in July	2,008,100
Maintenance	
General Maintenance	\$449,200
Replacements	288,800
Betterments	233,500
Slide Removal.....	38,100
Buildings and Plants	3,000
San Francisco-Oakland Bay Bridge Operation and Maintenance	25,000
Subtotal	*1,037,600
Total	\$4,762,000

* Includes \$114,900 in maintenance and betterment work let to contract.

"Say, dat guy busted the crystal of me watch. What should I do to him?"

"Go ahead, give him de woiks."—
Texas Longhorn.

Old Timer Had to Buy His Own Maintenance Outfit

Rodeo, Calif.
August 15, 1938

Mr. Jno. H. Skeggs
District Engineer, District IV

Dear Mr. Skeggs:

I received your letter advising me of a raise in wages and I want to thank you for your interest in my behalf.

Now let us review the past. In the spring of 1916, I took over the maintenance of the highway from Santa Rosa in Healdsburg and Cloverdale to Mendocino County line. Mr. C. C. Cottrell* informed me I would receive \$4.00 per day and I would have to furnish my own maintenance outfit.

I paid \$140.00 for a horse and buckboard, then there was hay to buy. With a wife and two children and rent to pay, I often wonder how I got by.

The new order of things is taken as a matter of course by present highway workers. With fine trucks, etc., they little know of the hardships of the early days.

All this, Mr. Skeggs, that you may know how I appreciate what I receive.

Sincerely,

J. D. WILLIAMS,
Construction Superintendent.

* Now with California State Automobile Association.

Bay Bridge Train Movements Controlled By Push Buttons

THE old switch tower, with its complicated rows of levers, will be replaced in the operation of the San Francisco-Oakland Bay Bridge electric railway system by two specially designed control boards.

One of these boards has been installed in the signal tower of the East Bay Yard opposite the Bay Bridge toll plaza. The other will be placed in the San Francisco terminal building on the track floor.

The long rows of mechanically interlocked individual levers will be succeeded by an all-relay route control system operated by controls arranged directly on a track diagram.

To set up a route by the control board, it is necessary only to press

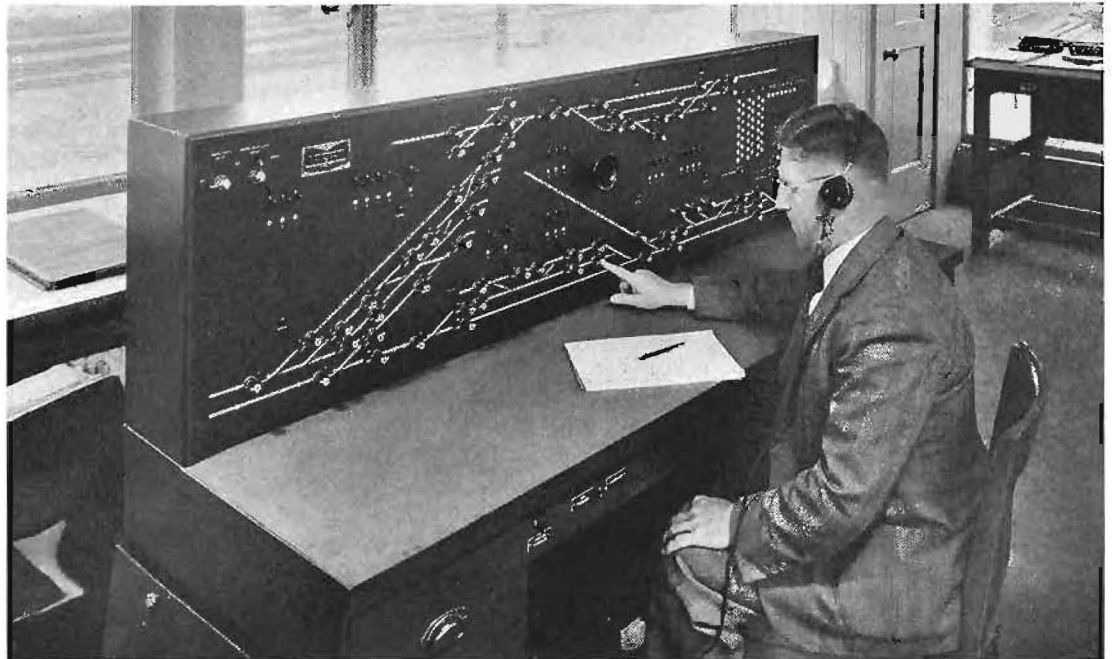
in the signal knob at the entrance to the route and the completion but-

ton at the exit from that route. The light in the signal knob will flash on instantly and will continue flashing until the switches are properly set and the signals are cleared. It then becomes a steady light.

AUTOMATIC OPERATIONS

When the train accepts the signal and enters the route, which is made visible on the board by occupancy lights, the signal returns to the stop indication and when the train has passed entirely through the route, the pressed-in knob is released and is ready for another operation.

Under the new system it is possible to set up a route for a succession of trains. When this is done, the signal knob is rotated 90 degrees rather than pushed in; but the completion button is operated as for one train.



Control board 6½ feet wide operating electric routing and switching of Bay Bridge trains.



A mechanical lever system would have required 92 levers and 60-foot switch tower.

The wayside signal will automatically clear for the next train while the route remains locked.

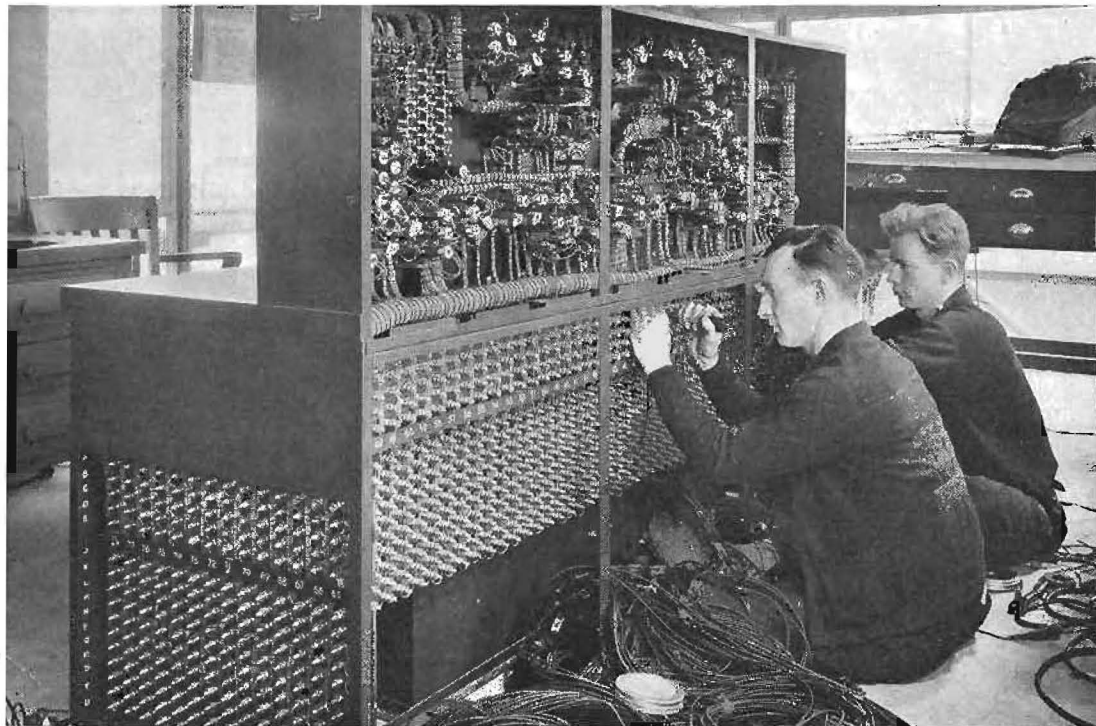
An additional feature on each of the control boards is a train identifier system. The tower operator must know the identity of each train as it approaches in order to route it accord-

ing to the train traffic schedule.

TRAIN CLEARING SYSTEM

In the case of westbound trains, as each train leaves the Oakland yard the Oakland operator, in clearing the train, also identifies it. This identity is transmitted to the San Francisco

tower by means of lights appearing on the control board each of which bears the number or letter of the train—the Key System trains operating by letter, Interurban Electric (S. P.) by number. As each train enters the San Francisco interlocking area its identification is canceled.



Rear view showing complicated wiring system of 6½-foot control board.

Had the mechanical lever system been used on the Bay Bridge trains, for the operation of the Oakland interlocking plan alone, it would have been necessary to have utilized 92 levers in a tower 60 feet long. The Oakland control board is 6½ feet in length and the San Francisco board is of similar length.

Each board contains the design of the track system for that particular interlocking area. In the case of the former, it includes all trackage in the East Bay Yard and in the case of the latter, the track system for the San Francisco loop, comprising that area from the bridge proper to the terminal building.

Bay Bridge Traffic Shows Increase Over Previous Month

TRAFFIC and revenues for the San Francisco-Oakland Bay Bridge last month reached a highpoint for the year, it was announced by Earl Lee Kelly, State Director of Public Works. A total of

777,363 vehicles crossed the bridge in August, Mr. Kelly said, producing revenues amounting to \$405,065.60. An average of 25,076 vehicles crossed the span every day. Comparative figures and totals are shown below.

	Total August	Total July	Total since Opening
Auto Trailers	1,848	1,829	26,299
Passenger Autos	693,297	667,608	14,913,556
Motoreycles	2,994	3,034	55,590
Tricars	1,167	1,001	17,290
Buses	13,432	13,467	194,032
Trucks	39,863	34,414	563,228
Truck Trailers	1,768	1,538	32,939
Toll Vehicles	754,369	722,891	15,802,934
Auto Passes	21,089	17,552	208,100
Truck Passes	1,905	2,029	20,305
Total Vehicles	777,363	742,472	16,031,339
Extra Passengers	244,728	241,163	3,793,908
Freight Pounds	111,016,500	87,499,250	1,374,747,659

The August report of traffic compiled by State Highway Engineer C. H. Purcell, however, indicated a drop from last year's figures, which showed that 853,579 vehicles crossed the bridge during August, 1937, averaging 27,535 vehicles a day, with revenues totaling \$453,213.40.

August traffic figures bring the total number of vehicles to cross the span to date to 16,031,339.

Freight increased to 111,016,500 pounds during last month, with the number of trucks and truck trailers totaling 41,631.

Both truck travel and freight pounds showed an increase over July, 1938, which had a total of 35,952 trucks and trailers and 87,499,250 freight pounds. August figures also represented an increase of more than 42,000,000 freight pounds and approximately 13,000 trucks and trailers over the corresponding period last year.



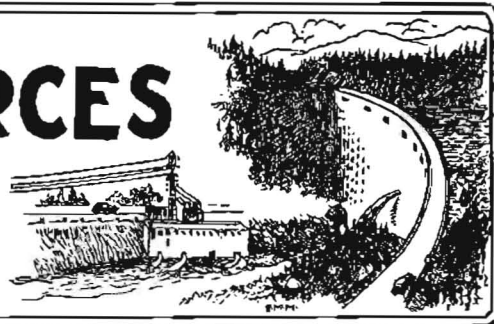
DIVISION OF WATER RESOURCES

OFFICIAL REPORT

FOR THE MONTH OF

August, 1938

EDWARD HYATT, State Engineer



INVESTIGATIONS of applications for allotments for money appropriated to the Emergency Fund for the restoration of public property, levees, flood control works, county roads and bridges, damaged by floods of the past season, throughout the State, and the supervision of the restoration work, have been continued by the Division of Water Resources representing the Department of Public Works, pursuant to the instructions from the Director of Finance.

Allocations totaling \$3,698,200 have been approved by Governor Frank F. Merriam for flood damage repair work pursuant to these reports and recommendations. Some of the work for which these allocations have been made are being performed by the Division of Water Resources and other work is being done by the applicant under contracts entered into by the Department of Public Works. Seventy-five of these contracts are now in force, work for which will cost \$1,879,300.

IRRIGATION DISTRICTS

Inspection of structures in the Mountain Division of Nevada Irrigation District was made during the month where repairs occasioned by storm damage of the past winter were under way. The district has submitted for approval a new project involving construction of a dam on Deer Creek and a diverting canal below Combie Dam on Bear River. Application has been made to PWA for a grant and loan in the amount of \$460,000 to carry out construction.

SUPERVISION OF DAMS

Applications have been received for the enlargement of the Jackson Lake Dam in Nevada County and Mountain King Dam in Calaveras County.

Applications for the repair and alteration of the White Dam in Modoc County and Sawmill Lake Dam in Nevada County, and for the repair and alteration of the Sawpit and Big Santa Anita Dams, both in Los Angeles County, have been approved.

Certificate of approval of Bonita Canyon Dam was issued on August 1, 1938.

WATER RIGHTS

Twenty-three applications to appropriate were received during July; 14 were denied and 15 were approved.

Among the applications received were one by the Shafter-Wasco Irrigation District in Kern County, one by the Southern San Joaquin Municipal Utility District in Kern County, and one by the South Santa Clara Water Conservation District in Santa Clara County. Among the applications approved was one by the Hollister Irrigation District in San Benito County.

Seventeen licenses were issued during July.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

During the past month all efforts of this office have been in the field gathering data from which to make a record of the amount of water diverted from the streams in the Sacramento and San Joaquin Valleys. This report will also show the amount of land irrigated, the return flow therefrom and also the flow in the valley streams. The sampling of water in the delta for salinity is being carried on at a number of stations sufficient to record the rate of advance of the salinity. At intermittent intervals samples of drainage and return flow water are being obtained in the Sacramento and San Joaquin Valleys.

CALIFORNIA COOPERATIVE SNOW SURVEYS

During the past month, work has begun in the mountains in preparation for next winter's snow surveys. Snow courses are being brushed out and old markers replaced with new ones where required.

The snow courses maintained and measured by the San Joaquin Light and Power Corporation in the watershed of the North Fork of the Kings River have been inspected and arrangements concluded for the cooperative building of a new shelter cabin in this region at Burnt Corral Meadows.

Arrangements were made with the Sierra National Forest to conduct an annual snow survey in the upper regions of the Middle Fork of the San Joaquin River, and new snow courses were established at Beysore Meadows, Chiquito Creek, Jackass Meadows, Clover Meadows and Cora Lakes.

CENTRAL VALLEYS PROJECT

Working under a cooperative agreement with the U. S. Bureau of Reclamation, the Division of Water Resources, representing the Water Project Authority of the State of California, has continued engineering studies in connection with the Central Valleys Project. The work has comprised the obtaining of data in the field and its analysis for use in connection with negotiations for the acquisition of water rights on the lands bordering the San Joaquin River. Studies have been continued of matters affecting the disposal of water made available by the project including analyses of present ground water conditions and the requirements of certain areas for additional supplies. Negotiations have been continued with public utility companies for the relocations of their facilities affected by the construction of certain units of the project.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project

Routine maintenance on the flood control project has been carried on during this period with a considerably reduced crew. Temporary repairs have been made to several bridges in the by-pass so that stock can be crossed.

Relief Labor Work

An average of 48 relief laborers have been employed in clearing in the Feather River overflow channel during this period.

Emergency Levee Repairs

Under Executive Order E-177, work has continued in repairing flood damage in Glenn, Shasta, Butte and Tehama counties. It is expected that this work will be terminated by October 1, 1938.

Bank Protection work under the State-Federal agreement of 1932 has proceeded during this period, at the Burkes ranch in Reclamation District No. 70, where 750 feet of bank protection has been installed, and at Eldorado Bend in Reclamation District No. 108, where the installation of 800 feet of protection is nearing completion.

Sacramento Flood Control Project Construction

The work being done by Claude C. Wood, under contract, in filling the borrow pit on the Burr Mitchell ranch north of Colusa, was completed on August 24, 1938.

Highway Bids and Awards for the Month of August, 1938

ALAMEDA COUNTY—Between Castro Valley Junction and San Leandro, about 3.5 miles to be graded and paved with asphalt concrete and portland cement concrete. District IV, Route 5, Section D. Frederickson and Westbrook, Lower Lake, \$275,947; Granfield, Farrar and Carlin, San Francisco, \$281,528; Union Paving Co., San Francisco, \$284,551; David H. Ryan, San Diego, \$285,271; N. M. Ball Sons, Berkeley, \$294,750; Hanrahan Co., Redwood City, \$298,751. Contract awarded to Jones and King, Hayward, \$289,769.25.

BUTTE COUNTY—Between 0.7 mile north of Biggs and State Highway Route 45, about 3 miles, a gravel base and armor coat to be constructed. District III, Feeder road. Piazza and Huntley, San Jose, \$19,349; Lee J. Immel, Berkeley, \$20,962; E. A. Forde, San Anselmo, \$21,734; Hemstreet and Bell, Marysville, \$21,760; Claude C. Wood, Lodi, \$22,413; Independent Construction Co., Ltd., Oakland, \$22,639; N. M. Ball Sons, Berkeley, \$22,853; D. B. Bishop, Orland, \$24,982; J. R. Reeves, Sacramento, \$33,129. Contract awarded to Charles Kuppinger, Lakeport, \$18,217.50.

LASSEN COUNTY—Between State Highway Route 28 at one mile northeast of Bieber and 21 miles northerly, about 2.5 miles to be graded and surfaced with road-mix surfacing and a seal coat to be applied. District II, Feeder road. Bernard H. Miles, Oakland, \$19,198. Contract awarded to Poulos and McEwen, Bieber, \$18,481.10.

LOS ANGELES-SAN BERNARDINO COUNTIES—Two spans of existing three-span bridge across San Antonio Creek at Pomona, consisting of one 37-foot span and one 27-foot span on concrete bents and abutments and portions of roadway approaches to be graded and surfaced with portland cement concrete pavement. District VIII, Route 19, Section Pom. A. W. E. Robertson, Los Angeles, \$19,817; Byerts and Dunn, Los Angeles, \$16,979; E. S. & N. S. Johnson, Pasadena, \$19,652; Oberg Bros., Los Angeles, \$20,387; J. S. Metzger & Sons, Los Angeles, \$18,898; C. T. and W. P. Stover, Claremont, \$17,750; The Contracting Engineers Co., Los Angeles, \$20,479; J. E. Haddock, Ltd., Pasadena, \$15,997. Contract awarded to Paul D. Lawrence Co., Los Angeles, \$14,120.60.

LOS ANGELES COUNTY—Sepulveda Blvd. between San Fernando Road and Brand Blvd., 3.7 miles to be paved with portland cement concrete, plant mixed surfacing and asphalt concrete. District VII, Route 158, Section L.A. Geo. R. Curtis Paving Co., Los Angeles, \$108,056; J. E. Haddock, Ltd., Pasadena, \$102,193; Gogo and Rados, Los Angeles, \$109,209; C. O. Sparks and Mundo Engineering Co., Los Angeles, \$115,848; Griffith Co., Los Angeles, \$107,256; Gibbon and Reed Co., Burbank, \$122,948; Oswald Bros., Los Angeles, \$114,927; Vido Kovacevich, South Gate, \$110,424; United Concrete Pipe Co., Los Angeles, \$115,067.00. Contract awarded to Matich Bros., Elsinore, \$108,598.00.

MARIPOSA COUNTY—Between Briceburg and El Portal, about 12.4 miles to be graded and surfaced with a mixture of the existing surfacing material and untreated crushed gravel or stone. District X, Route 18, Sections E, F, G, H. Granfield, Farrar and Carlin, San Francisco, \$538,642; United Concrete Pipe Corp., Los Angeles, \$669,827; George Pollock Co., Sacramento, \$707,840; J. E. Haddock, Ltd., Pasadena, \$925,719. Contract awarded to Mitty Brothers Construction Co., Los Angeles, \$509,744.75.

MENDOCINO COUNTY—Between Navarro and Maple Creek, about 6.3 miles to be graded, penetration oil treatment applied and reinforced concrete bridges to be constructed. District I, Route 48, Sections C, B, A. Claude C. Wood, Lodi, \$167,284; Hemstreet and Bell, Marysville, \$176,184; N. M. Ball Sons, Albany, \$177,855; Guerin Bros., San Francisco, \$191,658. Contract awarded to Johnston Rock Co., Inc., Stockton, \$153,854.80.

MENDOCINO COUNTY—A reinforced concrete box girder bridge across South Eel River nine miles northeast of Longvale and approaches. District I, Feeder road. Albert Siemer and John Carcano, San Anselmo, \$49,999; Bennett and Taylor, Glendale, \$60,666; Robert McCarthy, San Francisco, \$61,628; B. A. Howkins, San Francisco, \$95,381; Campbell Construction Co., Sacramento, \$62,545. Contract awarded to Fred J. Maurer & Son, Eureka, \$47,548.60.

MONTEREY COUNTY—Over Welby Hill, about 4.6 miles south of King City, about 0.9 mile to be graded and surfaced with natural rock asphalt. District V, Route 2, Section F. Macco Construction Co., Clearwater, \$40,850; N. M. Ball Sons, Berkeley, \$41,180; L. A. Brisco, Arroyo Grande, \$42,865; C. R. Butterfield-Kennedy Co., San Pedro, \$45,463. Contract awarded to Granite Construction Co., Watsonville, \$37,978.

ORANGE COUNTY—A reinforced concrete girder bridge across Santa Ana River two miles north of Newport Beach to be repaired. District VII, Route 60, Section A. The Robertson Co., Los Angeles, \$56,483; Byerts and Dunn, Los Angeles, \$59,635; Contracting Engineers Co., Los Angeles, \$72,449; W. E. Robertson, Los Angeles, \$55,910. Contract awarded to G. E. Kerns, Long Beach, \$40,736.00.

ORANGE COUNTY—A bridge across San Juan Creek 11 miles east of San Juan Capistrano to be repaired and approaches graded and surfaced with plant-mixed surfacing. District VII, Route 64, Section B. Dimmitt & Taylor, Los Angeles, \$22,355; Byerts & Dunn, Los Angeles, \$25,448; Gibbons and Reed Co., Burbank, \$18,960; Macco Construction Co., Clearwater, \$20,452; E. S. and N. S. Johnson, Pasadena, \$21,944; Contracting Engineers Co., Los Angeles, \$26,674; W. E. Robertson, Los Angeles, \$20,507. Contract awarded to A. L. Gabrielson, Arlington, \$18,193.23.

PLACER COUNTY—Between 0.8 mile east of Roseville and Rocklin, about 2.3 miles to be graded and paved with portland cement concrete. District III, Route 17, section A. Roc. Louis Biasotti & Son, Stockton, \$88,884; N. M. Ball Sons, Berkeley, \$87,352; A. Teichert and Son, Inc., Sacramento, \$91,073; A. G. Raisch, San Francisco, \$98,479. Contract awarded to Frederickson & Westbrook, Lower Lake, \$78,618.40.

PLACER COUNTY—Over the Southern Pacific Co. tracks at Colfax, a steel girder and reinforced concrete deck overhead crossing to be constructed. District III, Route 37, Section B. C. A. Teichert & Son, Inc., Sacramento, \$132,045; John Rocca, San Rafael, \$133,142; J. F. Knapp, Oakland, \$132,450; M. B. McGowan, Inc., San Francisco, \$123,131; P. J. Walker Company, San Francisco, \$126,623; B. A. Howkins & Co., San Francisco, \$123,834; Holdener Construction Co., Sacramento, \$130,390; Bates and Rogers Construction Corp., Oakland, \$130,052. Contract awarded to Cambell Construction Co., Sacramento, \$117,851.70.

PLUMAS COUNTY—Between 0.3 mile north of Spanish Creek and Quincy, one mile to be surfaced with road-mix surfacing and Class "A" seal coat. District II, Plumas County, Route 21, Section C. Hayward Building Material Co., Hayward, \$6,762; Claude C. Wood, Lodi, \$5,425; Lee J. Immel, Berkeley, \$5,538; Garcia Construction Co., Irvington, \$5,358. Contract awarded to Harms Bros., Vinton, \$5,205.00.

PLUMAS COUNTY—At Greenville, a steel girder overhead crossing with concrete deck over tracks of Western Pacific R. R. Co., a steel girder bridge with concrete deck across Wolf Creek and about 0.4 mile of roadway to be graded and surfaced with screened gravel and road-mix surfacing. District II, Route 83, Section B. A. Soda and Son, Oakland, \$124,631; John Rocca, San Rafael, \$127,501; Johnston Rock Co., Inc., Stockton, \$130,944; B. A. Howkins & Co., San Francisco, \$148,257. Contract awarded to George Pollock Co., Sacramento, \$117,584.85.

SAN BERNARDINO COUNTY—A reinforced concrete girder bridge at Santa Ana River one mile east of Colton. District VIII, Route 26, Section E. R. H. Travers, Los Angeles, \$92,380; Dimmitt & Taylor, Los Angeles, \$89,996; Mitty Bros. Construction Co., Los Angeles, \$85,610; J. E. Haddock, Ltd., Pasadena, \$84,097; Person & Hollingsworth Co., Los Angeles, \$74,688; Byerts & Dunn, Los Angeles, \$86,340; Gibbons and Reed Co., Burbank, \$81,679; Macco Construction Co., Clearwater, \$78,935; United Concrete Pipe Corporation, Los Angeles, \$85,252. Contract awarded to Vinson and Pringle, Phoenix, Arizona, \$67,903.24.

SONOMA COUNTY—Across Russian River at Cloverdale, a bridge to be constructed; about 0.3 mile to be graded. District IV, Feeder road. Fred J. Maurer and Son, Eureka, \$93,076; Chas. L. Harney, San Francisco, \$96,217; J. H. Pomeroy & Co., Inc., San Francisco, \$102,143; M. B. McGowan, Inc., San Francisco, \$101,419; E. T. Lesure, Oakland, \$96,392. Contract awarded to A. Soda and Son, Oakland, \$86,940.54.

SURPRISING ACCIDENT FACT

While it is the human tendency to blame the other driver for most traffic mishaps, national statistics show that motor vehicle deaths resulting from collisions with fixed objects have increased more rapidly than any other type of motor vehicle death, according to a recent report. During the ten-year period from 1927 to 1937 this type of fatality has increased 244 per cent with 3750 deaths and 95,000 injuries occurring last year alone.

"Waiter."

"Yes, sir?"

"Have you ever been to the zoo?"

"No, sir."

"Well you ought to go sometime. You'd get a big kick out of watching the turtles zip past."

"If someone left you a million dollars, what would you do?"

"Hire six good lawyers, and try to get it."

Highways and Bridges Would Cost \$67,409,200

(Continued from page 3)

To bring the roads, bridges and other structures in the district up to adequate standards to meet present day needs would require expenditures far in excess of funds now available as may be readily seen by reviewing the following tabulation:

365 miles 2-lane	New and reconstruction	\$16,607,500
58 miles 3-lane	Reconstruction	3,480,000
68.5 miles 4-lane	Divided, new and reconstruction	12,032,500
36.5 miles 6-lane	Divided, new and added construction	8,843,200
97 miles 2 to 3 lanes	Widening and reconstruction	4,365,000
75 miles 2 to 4 lanes	Widening and reconstruction	5,625,000
40.7 miles 3 to 4 lanes	Widening and reconstruction	5,956,000
40 Highway grade separations		6,000,000
Railroad grade separations and major bridges		4,500,000
		\$67,409,200

The total funds required in the amount of \$67,409,200 relates to the present system only. There are, however, a number of our heaviest traveled arteries connecting concentration centers by meandering or circuitous routings, which will require relocation to eliminate loss in time, hazards, excess distance, numerous crossroads and congestion. Large right of way and construction cost is involved in such relocation and these costs are not included in the above total.

Previous biennial budget appropriations have been inadequate to meet traffic requirements. Expenditures for the 85th-86th (1933-35) fiscal years budget for major construction projects totaled \$6,551,770. In the following biennium, 87th-88th (1935-37), the district construction expenditures totaled \$6,136,800.

The comparison between our actual construction requirements and our biennial allotments indicates that immediate relief is not in sight if present resources or revenue remain unchanged.

Traffic Cop: "Use your noodle lady! Use your noodle!"

Lady: "My goodness! Where is it? I've pushed and pulled everything in the car."

Doctor: "I will examine you for ten dollars."

Patient: "Go ahead. If you find it, I'll give you half."

In Memoriam Burton A. Towne

August 1, 1938, marked the passing of Burton A. Towne, first Chairman of the California Highway Commission.

August 2, 1911, Mr. Towne was chosen by Governor Hiram W. Johnson as one of the three appointed members of the Advisory Board of the State Department of Engineering, who then were named an executive committee to be known as the California Highway Commission in immediate charge of the expenditure of the first \$18,000,000 state highway bond issue.

Mr. Towne was selected to be Chairman of this first commission, the members of which had been chosen carefully by Governor Johnson for their outstanding fitness and integrity to handle this important new State enterprise, and who, with such rare foresight and forthright purpose, assembled the working personnel, and adopted the basic policies which have contributed so greatly to keep the State highway activities on the high plane that has ever since characterized them.

Mr. Towne brought to this first commission actual experience in successful roadbuilding in connection with the construction of the first county system of paved roads in San Joaquin County, one of the pioneer counties in systematic county road development in California.

After the State highway work had been satisfactorily launched, January 14, 1914, Mr. Towne retired from the commission so that he could concentrate his attention upon his large business and agricultural interests.

Never thereafter, however, did he lose interest in the continuation of a high standard of road development in California, and later served for a number of years as a director and also as president of the California State Automobile Association, and contributed to the orderly and scientific development of California's highways and the betterment of traffic conditions for the motoring public.

Mr. Towne was born in St. Paul, Minnesota, sixty-four years ago, attended the University of Minnesota, and was a member of the Delta Kappa Epsilon fraternity. He came to California and later married the former Alice Weinstock, member of a well-known Sacramento family.

He moved to the Lodi district thirty-five years ago and his home and vineyards became show places in San Joaquin County. Besides Mrs. Towne, two sons, Burton A., Jr., of Lodi, and Horace D. of Walnut Grove, survive him.

Sharp Reversal Noted in Attitude to Highway Funds

WITH the lessening of the property tax as a major source of highway revenue, more and more States have found it necessary to assist minor units of government in the financing of secondary and local roads, states Wilfred Owen of the Highway Research Board in an official publication. This has been accomplished either by grants of State-collected motor vehicle taxes to the counties and townships, or, in several instances, through the assumption of local road mileages by the State highway department.

Such a shift from local financing to State support has naturally reduced the amount of vehicle taxes available to the State highway departments for their primary systems. Added to this partitioning of the road dollar, the use of vehicle taxes for other than highway purposes has accentuated the drain on trunkline resources.

Fortunately during this period of unstable financing, gaps have been filled to a large extent by Federal aid, including both regular allotments and emergency work relief funds.

The serious implications in this trend were foreseen in Michigan last year by the State legislature. Recognizing the fact that State motor vehicle taxes had to a large extent replaced property and other local levies, and realizing the value of the primary road system as a state-wide general asset, the legislature appropriated from the general fund the sum of \$5,000,000 for the fiscal year 1938, and for each year thereafter.

Last month it was the payment of a \$1,750,000 general fund installment to the Highway Department which enabled Michigan to match its Federal aid allotment.

Prof.: "What are the properties of heat and cold?"

Stude: "Heat expands and cold contracts."

Prof.: "Correct. Give an example."

Stude: "In summer, when it's hot the days are long, and in winter when it's cold the days are short!"

STATE OF CALIFORNIA

Department of Public Works

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

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HARRY A. HOPKINS.....Assistant Director

EARL LEE KELLY.....Director
EDWARD J. NERON.....Deputy Director

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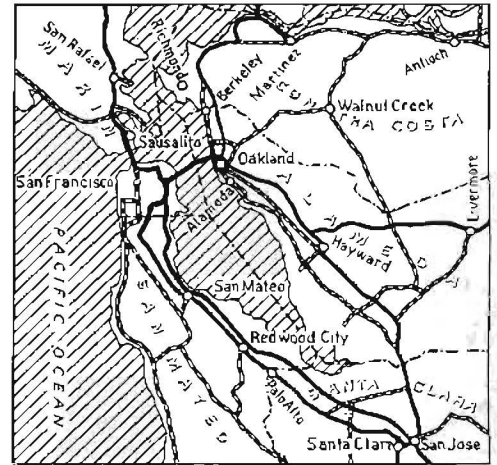
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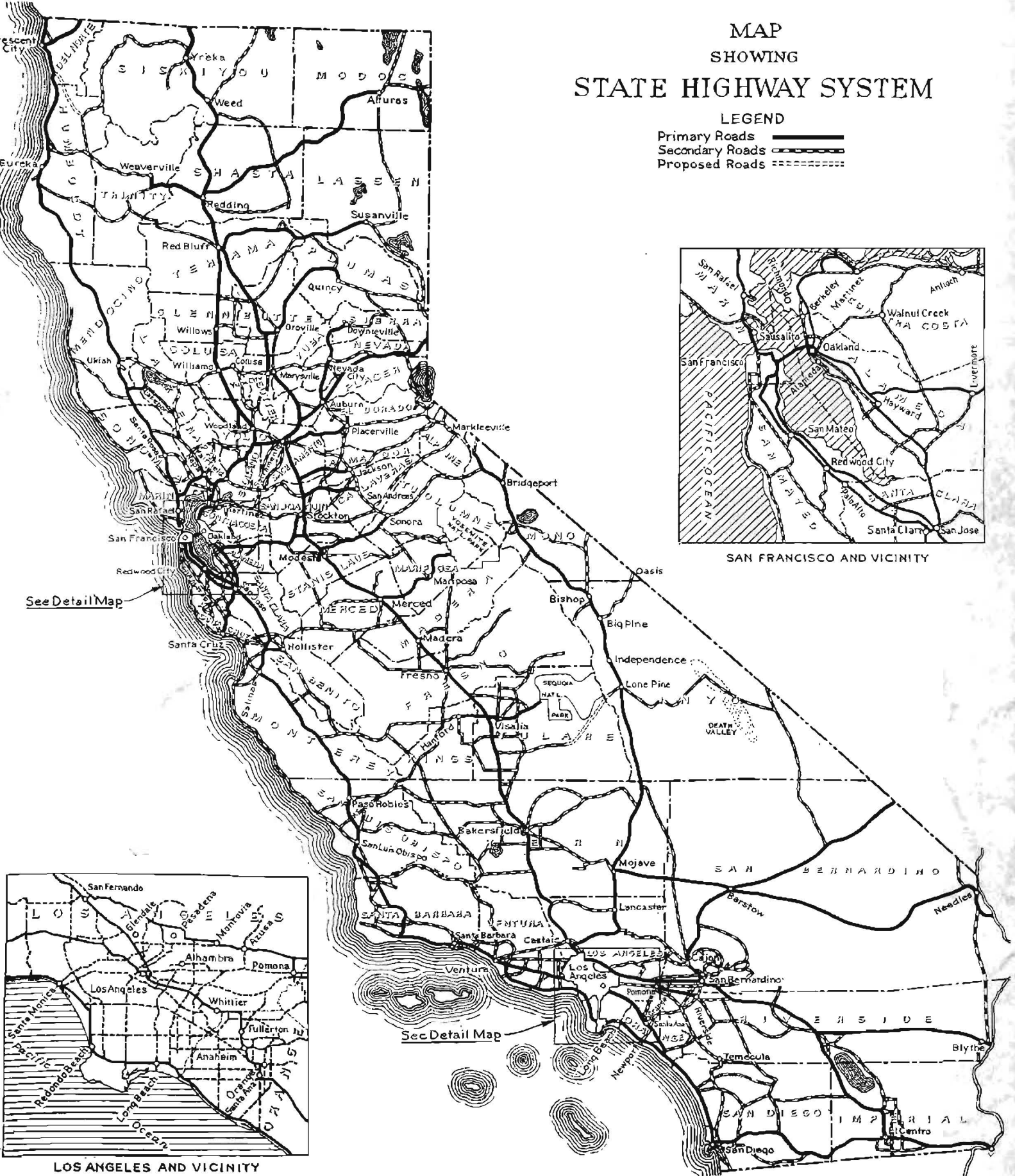
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MAP
 SHOWING
STATE HIGHWAY SYSTEM

LEGEND
 Primary Roads —————
 Secondary Roads - - - - -
 Proposed Roads : : : : :

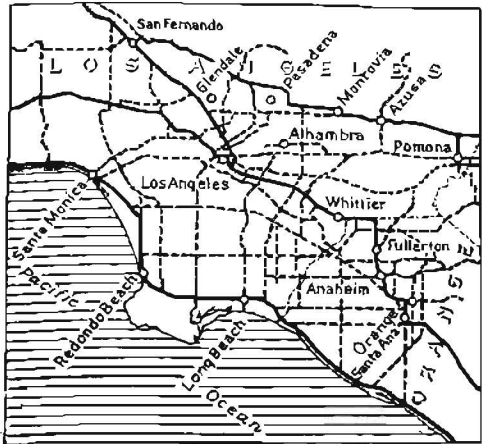


SAN FRANCISCO AND VICINITY



See Detail Map

See Detail Map



LOS ANGELES AND VICINITY