

CALIFORNIA HIGHWAYS

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MAKING THE HIGHWAYS SAFE—AERIAL PHOTOGRAPH OF GRADE CROSSING ELIMINATIONS ON THE SAN DIEGO COAST—The new pavement between Encinitas and Cardiff has been constructed on the west side of the Santa Fe railroad, doing away with both crossings and reducing the number of curves from eleven to four and lowering the maximum grade from 7.10 per cent to 4.75 per cent. Distance shortened 350 feet. A gasoline tax job. (Div. VII.) Photo by U. S. Air Service.

In this issue: APATHY MUST NOT DEFEAT THE COLTON BILL—AIRPLANE VIEWS OF LINE REVISIONS ON THE SAN DIEGO COAST—EXPERIMENTS WITH HYGROSCOPIC SALTS AS DUST PREVENTIVES.

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TABLE OF CONTENTS

Airplane View of Cardiff—Encinitas line change.....	FRONT COVER
Roster of the Department.....	Page 2
Apathy Must Not Defeat the Colton Bill—An appeal for needed federal legislation..... By Chairman HARVEY M. TOY.	Page 3
Line and Grade Changes Important Factors in Reconstruction of Southern Highway..... By A. N. GEORGE, Resident Engineer, Division VII.	Page 3
Use of Hygroscopic Salts as a Dust Preventive on Northern California State Highways..... By H. S. COMLY, Division Engineer, Redding.	Page 7
“An Outstanding Job”.....	Page 7
Widening the State Highway in Alameda County..... By A. W. McCURDY, Assistant Division Engineer, San Francisco.	Page 10
Forest Project to Open Smith River to Motorists.....	Page 11
What the Divisions Are Doing.....	Page 12
Opening Up the Owens Valley.....	Page 13
The Record for 1924.....	Page 13
Just Among Ourselves.....	Page 14
Map of Federal Aid Highway System.....	BACK COVER

Apathy Must Not Defeat the Colton Bill

By HARVEY M. TOV, Chairman, California Highway Commission.

PASSAGE by congress of the Colton bill will be the greatest forward step in road building in the United States since the authorization of the seven per cent system.

I am convinced congress is ready to enact this measure, with its 100 per cent federal aid for public land states, vitally important to the west, and its repeal of the per mile limitation of the present law, of great benefit to every state.

There is no substantial opposition. If the Colton bill dies in committee it will be because of the apathy of its friends, not the opposition of the few who may be opposed.

Other necessary federal aid highway legislation is practically certain of passage of this session; the Colton bill is still in committee at this writing. There is yet time to get it out and through congress, if every state highway department in this Union will make known in Washington the demand for this legislation. Congress will respond to the public need but that need must be made evident.

The states represented at the San Francisco convention voted unanimously an endorsement of the Colton bill. Let us stand together and see that it is enacted into law before next March.

Highway building is moving forward. Its course and the underlying plan must be as sound and practicable as possible. To this end, the Colton bill is the opportunity of the road builders of the nation.

Legislatures are now in session, governors should urge them to appeal to the congress. Let civic organizations join with highway departments in pressing for action at this session.

This is not alone the problem of the west, it is the problem of all the states. A truly national system of highways can never become an accomplished fact without united action by all sections of the country.

Eastern engineers and officials, who viewed western conditions last November, need not be convinced of the necessity of 100 per cent federal aid for highways through arid public lands. They should need no urging in the matter of the repeal of the per mile limitation, inconsistent as it is with the whole scheme of federal aid and not justified by conditions as they exist today.

Demand action by this congress. *Apathy must not defeat the Colton bill.*

LINE AND GRADE CHANGES IMPORTANT FACTORS IN RECONSTRUCTION OF SOUTHERN HIGHWAY

By A. N. GEORGE, Resident Engineer.

LINE and grade changes, eliminating bad curves, railroad crossings and other hazards, make the Jahn and Bressi contract, on the Coast boulevard between San Diego and Oceanside, one of the outstanding reconstruction projects completed on the state highway system during 1924. It was financed with gasoline tax and motor vehicle revenues.

The original pavement was among the first provided for by the California Highway Commission and was placed in 1912 and 1913 on a grade previously located and improved by the San Diego County Highway Commission. Viewed by present-day standards and the necessities of traffic, portions of both alignment and grade were poor.

The old pavement was but fifteen feet wide and four inches thick of a 1:2½:5 concrete mix.

A "Second Story" Job.

Heavy and constantly increasing traffic made improvement necessary and the project was undertaken as one of the first reconstruction contracts of the 1924 season. The new work included widening the old pavement to twenty feet with a "second story" of concrete where the old base was badly broken and with flush concrete shoulders where the original pavement was in good condition.

Surveys had been made at the time of letting the contract for some of the proposed line changes, but as plans and rights-

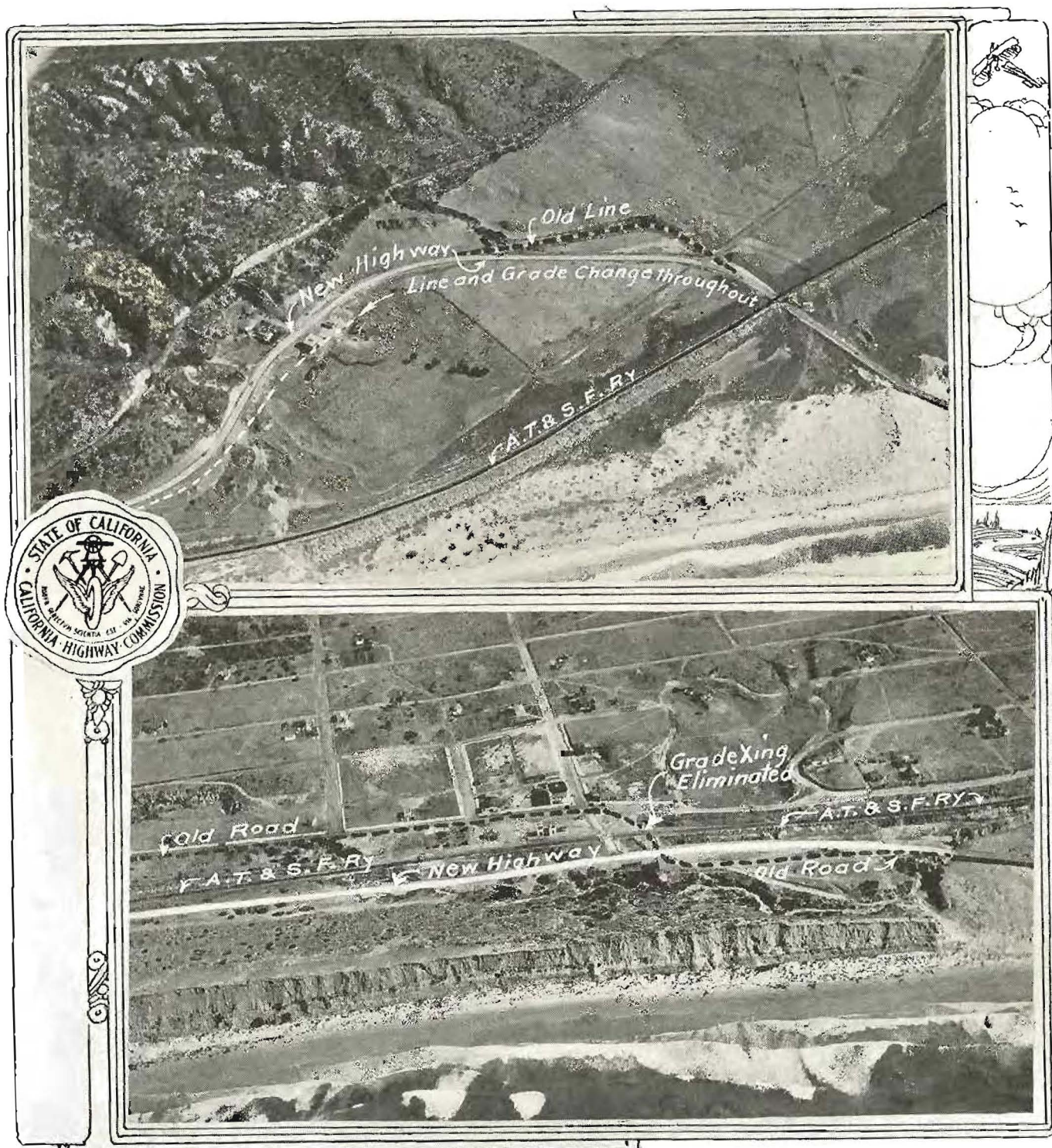
of-way for these were not completed they were excluded from the agreement. As fast as plans could be completed and rights-of-way secured, these exceptions were included in the contract. Numerous additional line and grade changes also were made which were not contemplated at the time the contract was let.

More Grade Separations Planned.

In a distance of eight miles, seven miles were built on either new alignment or new grade. Two grade crossings were eliminated and plans are being prepared for the separation of grades at two other points where gaps were left in the improvement. These latter two are the only other crossings of the main line railroad on this particular section of the highway. The minimum radius of any curve on the improved road is 400 feet and the maximum grade is 6.19 per cent, while on the old highway the minimum radius was 50 feet and the maximum grade was 7.47 per cent.

The contractors, Jahn and Bressi, had the best of equipment and were prepared to and did push the work to early completion. Mr. Bressi spent most of his own time on the job and the active cooperation he extended every plan for improvement made it possible for us to include many of the line and grade changes in the contract during construction. Credit also should be given to Mr. Henry Fenton, who had

LINE AND GRADE CHANGES REMOVE HAZARDS FROM HIGHWAY



ADDITIONAL AERIAL VIEWS, JAHN AND BRESSI CONTRACT—Above, near the San Diego city limits—four curves with radii of 166 feet to 400 feet changed to two curves with 400-foot radius and two with 500-foot radius. Grades of 6.4 to 7 per cent reduced to a maximum of 6.17 per cent. Below, Close-up of the line change at Cardiff, showing elimination of grade crossing and improved alignment.

a subcontract for the grading, and who cooperated heartily in planning and executing his work so that it fitted in with the progress in obtaining rights-of-way for the various line and grade changes.

Plan Advances Use of New Pavement.

It caused some confusion and extra work on the part of the resident engineer and the division office and some inconvenience to the contractors to handle the line changes and

secure rights-of-way during the progress of the contract. This plan of action, however, made possible the completion of the improvement and its use by the public about one year earlier than if all line changes had been worked out and all rights-of-way secured before the work was advertised for contract.

On completion of the contract, for the purpose of obtaining aerial photographs at various points, arrangements were made with the Commanding Officer of the United States Air Service at Rockwell Field, San Diego, for an airplane to take a photographer over the new work. A number of the views secured are reproduced in this issue of the bulletin. They, by no means, cover all of the line and grade changes made, but give an excellent idea of the nature of the work accomplished.

Data on Important Changes.

The following data regarding curvature and grades at a number of points photographed present just what was done from an engineering standpoint:

Summary of the work shown on the front cover, lower view, page four, and upper view, page six (Encinitas-Cardiff line change):

<i>Alignment</i>	
<i>Old</i>	<i>New</i>
1 curve, radius 500 feet	2 curves, radius 1,000 feet
1 curve, radius 400 feet	1 curve, radius 1,500 feet
1 curve, radius 90 feet	1 curve, radius 3,000 feet
1 curve, radius 150 feet	
1 curve, radius 760 feet	
1 curve, radius 1,292 feet	
1 curve, radius 288 feet	
1 curve, radius 85 feet	
2 grade crossings of Santa Fe Railroad.	No crossings of Santa Fe 350 feet shorter than old line.

Grades

Maximum, 7.10 per cent Maximum, 4.75 per cent

On section A, as shown in top view, page four, Station 0+00 to Station 27+00:

<i>Alignment</i>	
<i>Old</i>	<i>New</i>
1 curve, radius 166 feet	2 curves, radius 400 feet
1 curve, radius 288 feet	2 curves, radius 500 feet
1 curve, radius 200 feet	
1 curve, radius 400 feet	

Grades

400 feet, 7 per cent Maximum, 6.17 per cent
600 feet, 6.4 per cent

Section B, Station 439+00 to Station 503+00, as shown in upper view, page eight:

<i>Alignment</i>	
<i>Old</i>	<i>New</i>
1 curve, radius 80 feet	1 curve, radius 1,000 feet
1 curve, radius 50 feet	1 curve, radius 600 feet
1 curve, radius 250 feet	2 curves, radius 1,200 feet
1 curve, radius 353 feet	
1 grade crossing of Santa Fe Railroad.	Over-head crossing of Santa Fe (not yet built); new line is 1,062 feet shorter than old line.

Grades

Maximum, 6.47 per cent Maximum, 6 per cent
Section A, Station 255+00 to Station 287+00, as shown on page eight, lower view:

Alignment

<i>Old</i>	<i>New</i>
1 curve, radius 90 feet	2 curves, radius 1,000 feet
1 curve, radius 270 feet	
1 curve, radius 114 feet	

Grades

Maximum, 5.88 per cent Maximum, 5 per cent
Changes Section B, Station 273+00 to Station 300+00 (not shown in illustrations):

Alignment

<i>Old</i>	<i>New</i>
1 curve, radius 200 feet	1 curve, radius 5,000 feet
2 curves, radius 500 feet	
1 curve, radius 100 feet	

Grades

350 feet, 7 per cent Maximum, 3.5 per cent
Changes Section B, Station 315+00 to Station 365+00 (not shown in illustrations):

Alignment

<i>Old</i>	<i>New</i>
2 curves, radius 200 feet	1 curve, radius 3,600 feet
3 curves, radius 300 feet	1 curve, radius 5,249 feet
1 curve, radius 400 feet	
1 curve, radius 500 feet	New line is 115 feet shorter than old.
3 curves, radius 1,000 feet	

Editor's Note: Mr. George, the writer of the above article, was resident engineer on the Jahn and Bressi contract under the general supervision of S. V. Cortelyou, division engineer at Los Angeles. The accompanying aerial photographs were secured through his enterprise. Mr. George was himself an aviator with the United States Air Service during the war and is officially credited with having brought down a German plane.

BOSTON FOREFATHERS HAD THEIR TRAFFIC TROUBLES BACK IN 1757

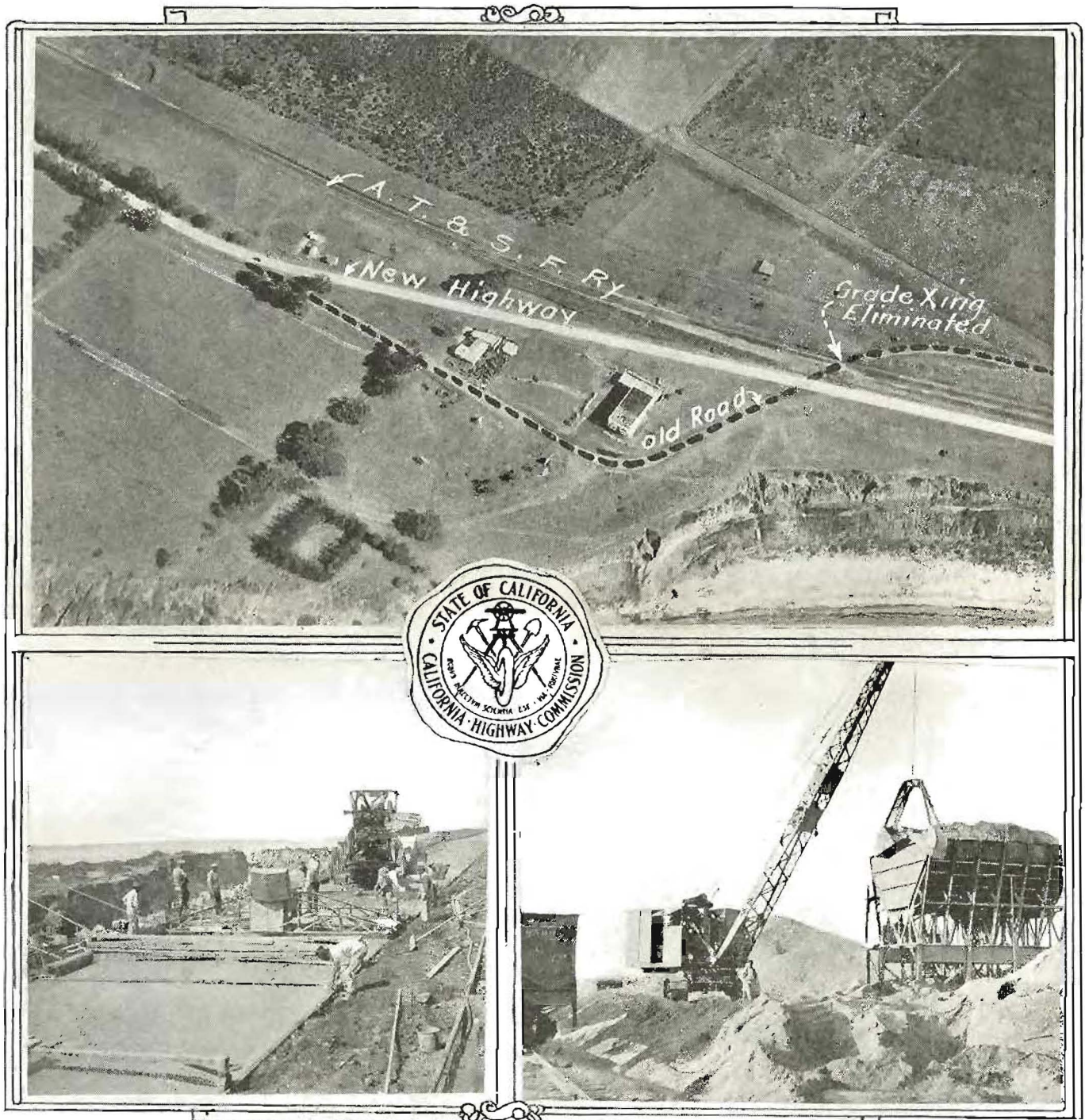
TRAFFIC regulation on the public highways is not wholly of modern origin, it is indicated by the Boston Transcript which cites a quaint old ordinance adopted by the selectmen of Boston in 1757.

Those city fathers declared that owing to "great danger arising oftentimes from Coaches, Slays, Chairs, and other Carriages, on the Lord's days, as people are going to or coming from the several Churches in this Town, being driven with great Rapidity, and the Public Worship being oftentimes much disturbed by such Carriages, it is therefor Voted and Ordered, that no Coach, Slay, Chair, Chaise or other Carriage, shall at such times be driven at a Greater Rate than a foot Pace, on Penalty to the Master of the Slave or Servant, so driving, of the Sum of ten shillings."

Not Loud Enough.

"Jack's got a new siren for his car."
"Really! What became of the blond one?"—*London Mail.*

IMPROVEMENTS MADE POSSIBLE BY THE GASOLINE TAX



CLOSE-UP VIEW OF THE GRADE CROSSING ELIMINATION AND LINE CHANGE AT ENCINITAS, JAHN AND BRESSI CONTRACT, SAN DIEGO COUNTY.—The new highway is located on the west side of the railroad near the ocean and the improvement in alignment is clearly evident. Below, the contractors' central proportioning plant and modern paving machinery in operation.

NAMED TO COMMITTEE.

The State Highway Engineer has approved the appointment of Equipment Engineer R. H. Stalnaker as a member of the Committee on Equipment of the American Association of State Highway Officials. He will represent California.

NEW ROAD INTO WEAVERVILLE.

"We could not ask for a better road at this time, or for a nicer grade."—*Weaverville Journal*.

Achievement.

Man (at scene of auto wreck): "What happened?"
Battered Swain (exultingly): "I—I kissed her!"

USE OF HYGROSCOPIC SALTS AS A DUST PREVENTIVE ON NORTHERN CALIFORNIA STATE HIGHWAYS

By H. S. COMLY, Division Engineer, Redding.

WHAT may be considered a severe test of calcium chloride and magnesium chloride as dust preventives has been made by Division II during the last three years on crushed rock and gravel surfaced state highways in several northern California counties.



H. S. COMLY

Application of these salts was made on about thirty-two miles of highway in various amounts and under different conditions of road surface and of the atmosphere, considering its humidity. Sections of the Pacific highway, in the Sacramento River drainage and across the summit in the Klamath River drainage, were the locations of these experiments. In all, parts of 115 miles of highway have been treated. Conditions in this part of the state vary from large, open valleys, foothills, rugged country, with areas of arid land, to timbered mountains with well-watered streams. The altitude averages 500 to 3500 feet.

Humidity Low.

During the summer months the humidity over this entire district is low. Dew is not found in the mornings and fog is practically unknown. As the efficacy of hygroscopic salts as a dust preventive depends directly on the moisture in the atmosphere, the severity of the test in the district described and on his particular highway is evident.

The first section treated was a stretch of four miles in the Sacramento River canyon, near its headwaters, between Castella and Dunsmuir. It had a surface of crushed rock of two-inch maximum size, but during the course of several years' maintenance the surface had become permeated with red sedimentary soil peculiar to this section. This soil has a rather large clay content which we now realize is essential when this treatment is attempted in dry atmospheres.

First Tried in 1922

The material used was commercial, granulated calcium chloride, containing 75 per cent pure hygroscopic element. The first application was made in July, 1922, at the rate of $2\frac{1}{2}$ pounds of commercial salt per square yard. The surface was thoroughly smoothed and saturated with water, after which the applications were made, at intervals of ten days, in two courses of $1\frac{1}{4}$ pounds per square yard each. For a month after the surface was sprinkled at intervals of one week.

This treatment held the road fairly well, during the remainder of the summer of 1922, under a traffic of about 1200 vehicles per day. Just before the fall rains set in, however, it appeared to have lost much of its potency.

In the spring of 1923, during the period of late rains, a second application of one pound per square yard was made and the road kept thoroughly smooth until the rains ceased and the roadbed was finally dried out for the summer. During the following summer months, the road carried more

than 1500 vehicles a day and remained smooth, firm and dustless without further maintenance.

It might be well to mention that, on the adjacent forty miles of road to the south, we spent about \$700 per mile during the summer in operating sprinkling trucks and drags in an effort, only partially successful, to hold the road under this same traffic.

Binder is Necessary.

During the summer of 1923, a stretch of three miles of crushed rock surface in the lower Sacramento Canyon, near Pollock, was treated with about $1\frac{3}{4}$ pounds per square yard of commercial granulated calcium chloride. Here the rock surface was a moderately hard slate, and, while this rock makes a smooth, durable wearing surface in itself, the surface is quite impermeable and has little binding or sticking qualities.

We soon learned that the small amount of moisture in the atmosphere was not sufficient to hold this type of surface effectively under a traffic of 1000 vehicles per day, and that the treatment was not economical unless a proper amount of suitable binder soil was incorporated with the surface. Practically all traces of this application disappeared within six weeks, although for the first three or four weeks it was quite effective. The cost of adding binder in this particular location was too great and no further applications were made.

(Continued on page 9.)

"AN OUTSTANDING JOB"

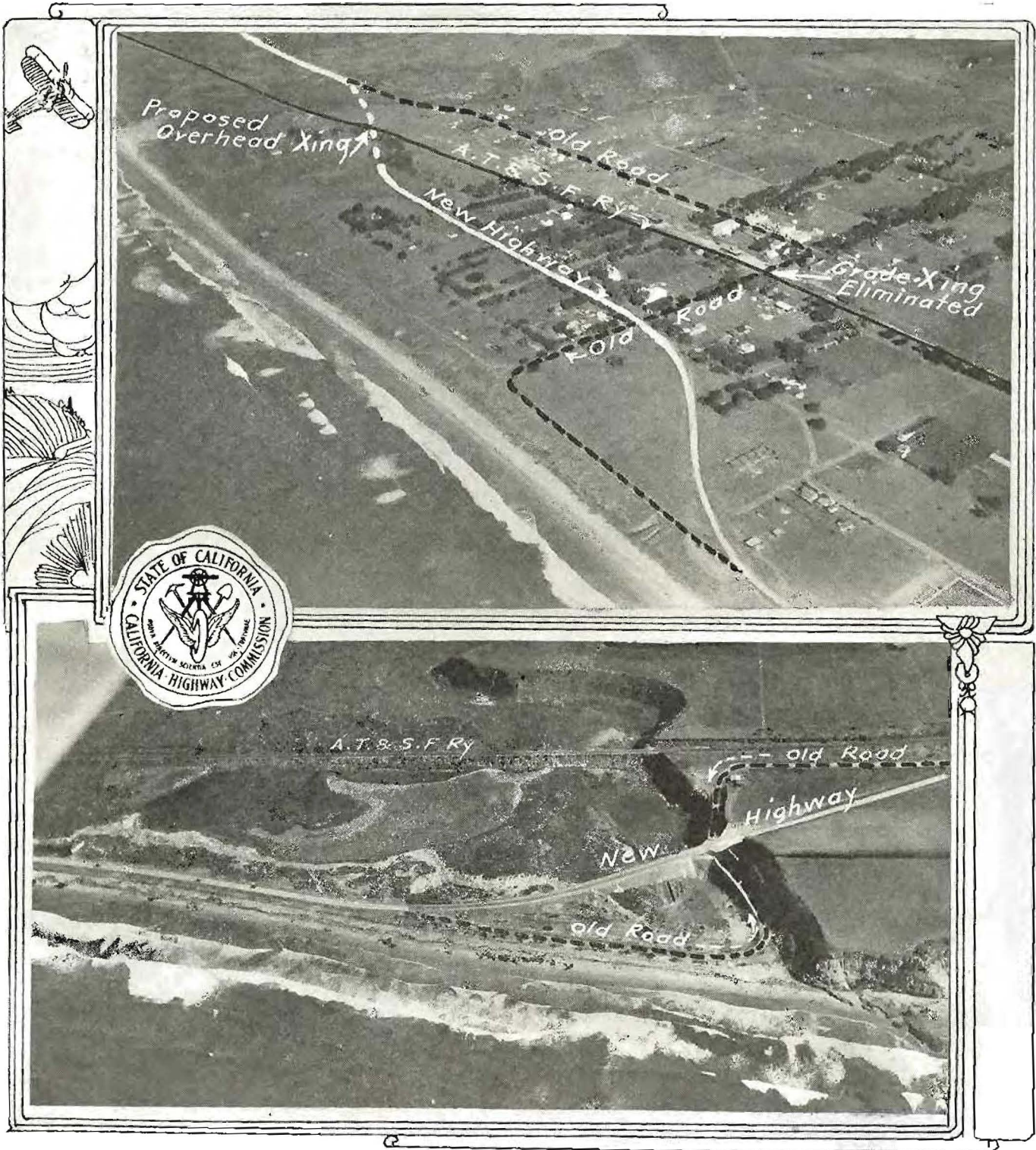
CHAIRMAN HARVEY M. TOY of the highway commission is in receipt of the following unsolicited letter from John Lawrence Fox, secretary of the San Diego Chamber of Commerce, regarding the San Diego-Oceanside paving contract:

"The Board of Directors of the San Diego Chamber of Commerce, at their last meeting, had called to their attention the efficient work of the State Highway Commission on the coast highway between San Diego and Los Angeles. From the discussion that followed, it appeared that it was the unanimous sentiment of the board that a letter of congratulation should be written to you in regard to the truly splendid and efficient way in which this project had been handled, not only by the State Highway Commission and its engineers, but by the contractors and all others who had taken part in the work.

"Throughout the months that the project has progressed, San Diego has always received the fullest cooperation from all those engaged on the work, and it is the belief of the Board of Directors that through this spirit of cooperation there has been an absolute minimum of inconvenience worked upon the traveling public making use of the road. Further, our contact with the work leads us to believe that it is one of the outstanding jobs of highway construction accomplished in the state.

"It is a real pleasure on behalf of the Board of Directors to express to you their appreciation."

ELIMINATION OF CURVES FEATURES SAN DIEGO CONTRACT



A SHORTER AND SAFER HIGHWAY—Above, Radical line changes at Carlsbad, on the San Diego coast, which will eliminate right angle turns and a grade crossing when the new overhead crossing is completed. Radius of curves reduced from a minimum of 50 feet to a minimum of 600 feet. Grades reduced from 6.47 per cent to a 6 per cent maximum. Line shortened 1062 feet at this point. Below, three curves with a minimum radius of 90 feet reduced to two with a radius of 1000 feet. Grade lowered from 5.88 to 5 per cent maximum.

COMLY TELLS OF SALT TESTS

(Continued from page 7.)

Early in the spring of 1924, a stretch of two miles of graveled highway in the northern end of the Sacramento Valley, at Redding, was treated with $3\frac{1}{2}$ pounds per square yard of commercial granulated calcium chloride, applied in two courses. This section had been surfaced with round creek gravel, impregnated with a considerable amount of sand containing a large percentage of iron-stained clay wash. The moisture in the atmosphere in this locality is somewhat less than in the preceding two cases. This stretch sustained a traffic of about 1500 vehicles per day effectively through the past summer. A light sprinkling was given it about once a month because of the extreme dryness of the season.

It should be noted also that this section was subjected to a large traffic of five-ton trucks in service on an adjoining paving contract. We expect that another application of about one pound per square yard, to be applied next spring, will hold this unit in good condition through next summer's traffic.

Experiments in Shasta Valley.

During June and July of 1924, a twenty-five-mile section of crushed gravel highway in Shasta Valley, south of Yreka, Siskiyou County, was treated with both commercial granulated calcium chloride and calcium chloride in solution. Separate units were treated with each material, applied in equal amounts per square yard and based on the actual anhydrous salt content of each. Like surface conditions were approximated as nearly as possible in order to make a fair test of each compound. Bearing in mind our previous experience, an effort was made to supply the surface with the proper amount of binder soils. The air in the Shasta Valley is very dry, except in a small irrigated area producing alfalfa, where the atmospheric moisture present was very noticeable in its effect on the treated highway passing through it.

All of the salts used were applied at the rate of 1.3 pounds per square yard of the anhydrous element contained in them, which is equal to $1\frac{3}{4}$ pounds of commercial granulated calcium chloride. One mile of the road was given a second application of magnesium chloride immediately following the first, each application containing 1.3 pounds per square yard of anhydrous element.

Plans for Next Summer.

This entire section carried an average of 1500 vehicles per day during the last three months of last summer, an exceptionally dry season. The only other maintenance was a light sprinkling every two weeks. The road remained quite dustless and equal to a pavement in riding qualities, particularly that portion on which the double application was made. We plan to make an equal application of each of the materials next spring, and expect this treatment to hold the road satisfactorily without maintenance through next summer's traffic, which, in all probability, will exceed 2000 machines a day.

It is not possible now to reach definite conclusions as to the relative merits of each of the materials used, but conditions indicate that the relative order of effectiveness is magnesium chloride in solution, granulated calcium chloride, and calcium chloride in solution.

In the section of California covered by these tests, the cost of application of hygroscopic salts, using equal amounts of

their anhydrous elements per square yard of surface, is practically the same for each material mentioned. Exclusive of providing binder for the surface, and using a strip twenty feet wide and 2.6 pounds of the anhydrous element per square yard for the first year, the cost amounted to \$900 per mile of road. The cost of a light application each succeeding year, say one pound of the anhydrous element or $1\frac{1}{3}$ pounds of the commercial salt, would be about \$300 per mile.

May be Continued.

Experience indicates that this process may be continued effectively for an indefinite period. Assuming the treatment will be effective for three summer seasons only, the average summer maintenance cost for the road surface alone will be about \$600 per mile. This will provide a surface practically equal to a pavement in riding qualities and one that will stand up under a traffic of 1500 vehicles per day. Maintenance of gravel and crushed rock roads under this volume of traffic, by the ordinary means of sprinkling, dragging and adding new crushed rock, will cost, on the average, more than \$1000 per mile per summer. This expenditure may provide a smooth road, but, with this volume of traffic, it will still be dusty and uncomfortable for the traveler.

Some Conclusions.

Use of hygroscopic salts, our experiments indicate, is an effective method of maintaining gravel or crushed rock roads subjected to a heavy volume of traffic. The amount required, and consequently the cost, will depend upon the humidity of the atmosphere. The judicious use of a suitable binder for the rock surface is essential to effective results in the dryer atmospheres and an aid to good results in more moist atmospheres.

It is highly essential that a road surface be provided which, with the moisture secured through the agency of the salt, will form a surface thoroughly resistant to the suction of rubber-tired vehicles. If the road surface is such that the small amount of water drawn from the air will not produce this result, the effectiveness of the treatment will be lost.

It is not reasonable to expect, therefore, that this treatment will be effective on a surface of small gravel or rock alone, except possibly in the most humid atmospheres. In preparing the surface, however, care should be exercised not to use an excessive amount of clay-like binder as the result in wet weather may prove undesirable.

These experiments were financed from special allotments made the division from the motor vehicle and gasoline tax funds.

At the San Francisco convention, an easterner was heard to say: "San Francisco has been well termed 'The Convention City.' Her hospitality is both inspiring and stimulating."

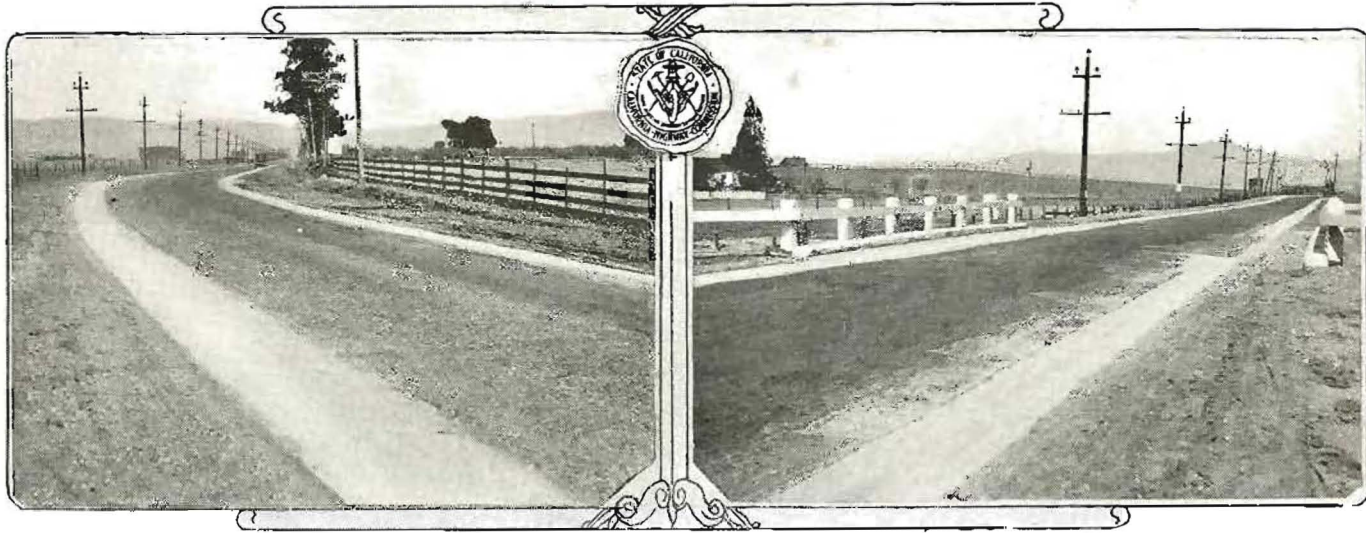
Quite Another Matter.

Irate Papa: "No, sir. My daughter can never be yours."
Bright Suitor: "Quite right, sir. She can not possibly be my daughter. I only wanted her to be my wife."

His Idea.

First Steno—"The idea of your working steady eight hours a day! I would not think of such a thing!"

Second Steno—"Neither would I. It was the boss that thought of it."—*Town Topics.*



GREENVILLE-LIVERMORE WIDENING JOB—Old fifteen-foot pavement in Alameda County, widened to twenty feet with flush concrete shoulders to carry increasing traffic. Right, new guard rail placed on culvert; at the left, curve superelevated with asphalt macadam. The new shoulder is seven inches thick and extends under the edge of the old pavement, strengthening it and prolonging its traffic service. (Photos by Div. IV.)

WIDENING THE STATE HIGHWAY IN ALAMEDA COUNTY

By A. W. McCurdy, Assistant Division Engineer.

AN INTERESTING feature of the widening work between Greenville and Livermore, Alameda County, recently completed in Division IV, was the plan adopted for superelevation of curves where the original pavement had been placed without this modern improvement in road building.

For 4.3 miles between these two points, the existing fifteen-foot concrete pavement was widened to twenty feet by laying flush concrete shoulders $2\frac{1}{2}$ feet wide and seven inches thick. The roadway width was graded to thirty feet and in some places thirty-four feet by addition of excess material from excavations.

How Superelevation Was Secured.

The superelevation was provided for on curves by using the surface slope for one-half of the old pavement as a base, and drawing a line that would raise the grade of the shoulder on the outer side of curves approximately seven inches above the grade of the shoulder on the inner side. The resulting wedge, or space left between the edge and grade of the new shoulder and the surface of one-half of the old pavement, was filled with asphalt macadam.

The latter work was done by state forces after completion of the shoulders by the contractor. Long run offs at each end of the curves accomplished the transition without sharp changes in grade. State forces also lengthened the existing pipe culverts and made necessary excavations and embankments before work was commenced on subgrade operations for paving.

In preparing subgrade, the contractor used a 30-h.p. tractor with scarifier and blade and all excavation was made to rough subgrade by this method. Much of the finished grade was done by a specially constructed Carr type grader. Some hand finishing was required where the edge of the new shoulder extended under the edge of the old concrete

pavement. This was done to seal the joint and strengthen the edge of the existing concrete slab.

A central mixing plant was used by the contractor, the equipment consisting of a three-sack Chicago-Smith paver with Johnson batch hoppers. Aggregates were hauled directly from their source in Niles Canyon and the mixed concrete was hauled to the point of use in Ford trucks, equipped with a specially designed body that permitted dumping from either side.

Unusual Tamping Method Employed.

An unusual method of tamping was employed in finishing the concrete, which proved most successful. A hand tamper sixteen feet in length with plow handles was made, similar to former models used on concrete work. The ends of the tamper were notched to allow of bearing on a 3-inch by 8-inch plank placed at right angles from the edge of the existing pavement to the header board. Care was taken to place one end of the plank at such places on the old pavement that in longitudinal finishing the surface of the shoulder would match flush, as close as possible to the grade of the present pavement surface.

As the tamper was moved ahead, a lap of three feet was made in finishing to insure a smooth riding surface.

Wet burlap was used for curing the new shoulders. It was used in rolls seventy-five feet long and, after being placed over the concrete was kept wet with frequent use of a hose.

Earth shoulders were graded to the edge of the new shoulder and the entire roadway crowned to match the existing pavement. The result is a much improved condition and a roadway adequate to handle for some time, it is hoped, the rapidly increasing traffic on this section of the highway.

W. A. Dontanville was the contractor and M. C. Fosgate, resident engineer. The improvement cost approximately \$54,500, or \$12,680 per mile.

The contract was financed with gasoline tax and motor vehicle revenues.

PISMO GRADE CROSSING ELIMINATION PLANNED

COMMISSION APPROVES BOLD SCHEME TO IMPROVE
LAST GAP IN COAST HIGHWAY; COUNTY
TO AID IN WORK

UNTIL recently, the Coast highway from Los Angeles to San Francisco was marred by two small gaps in that long stretch of continuous pavement. One of these, at the south city limits of King City, has just been eliminated by the construction of the San Lorenzo Creek bridge and the paving of the approaches, Monterey County, King City and the California Highway Commission cooperating. The elimination of the one remaining break, at Pismo Beach, now seems assured.

The short gap existing at this point includes a grade crossing of the main line of the Southern Pacific railroad, a bridge over a fair-sized creek, and several sharp turns. The alignment is poor. Numerous suggestions have been made for improving this condition, but the necessity of bringing the county, railroad company, the Railroad Commission, and the Highway Commission into agreement has delayed action ever since the initial construction of the highway.

New Plan Given Approval.

Recently, however, the commission decided upon a bolder improvement than any previously contemplated. The plan approved not only will eliminate all curves on the exception in question and substitute an overhead crossing for the present grade crossing, but also will eliminate or greatly improve the alignment of the highway for a half mile south of the present gap.

The cooperating parties have agreed to the proposed improvement and San Luis Obispo County has appropriated \$25,000 toward the cost of the work. It now appears reasonably certain that bids will be asked at an early date. When the work is finished, the Coast highway will present a continuous pavement from Los Angeles to San Francisco.

The plan agreed upon was suggested by the headquarters bridge department.

FOREST PROJECT TO OPEN SMITH RIVER TO MOTORISTS

THE forest highway project now nearing completion on Smith River, in northern Del Norte County, with the work under way along the same stream by a prison road camp, soon will open to motor travel one of the most beautiful sections of California, a district now utterly unknown to most residents of the state.

This is the opinion expressed by engineers of Division I, who are in contact with the progress of the grading operations that have been financed cooperatively by the United States Forest Service and the California Highway Commission.

The forest highway along the banks of Smith River, in the Siskiyou National Forest, has a grade of about 1 per cent and winds through a canyon, the walls of which have an elevation of 2000 to 5000 feet. The present road climbs to this elevation, high above the river.

Many Beauty Spots.

In the bottom of the canyon, never before accessible by a roadway, the engineers report a splendid growth of pine, cedar, oak, and redwood. In many places, the canyon widens into little flats and other beauty spots by which Smith River, fed by springs, flows unabated during the dry summer months.

The highway has good alignment and averages about twenty-one feet wide. Of the forty miles on the Redwood highway between Crescent City and the Oregon line on the road to Grants Pass, eighteen miles are under construction, twelve miles by contract and six miles by convict labor. In addition, twelve miles of grading has been finished and will be opened to traffic as soon as necessary bridges and surfacing have been completed.

Opening to travel of this twelve-mile section, which probably will take place next summer, will eliminate Gasquet mountain and greatly improve travel conditions between Crescent City and Grants Pass.

A new steam heating plant has been installed in the headquarters shop. It is equipped with an automatic feed and makes unnecessary the services of a fireman.

And Sometimes Kicks.

Father (upstairs): "It is time for that young man to go home."

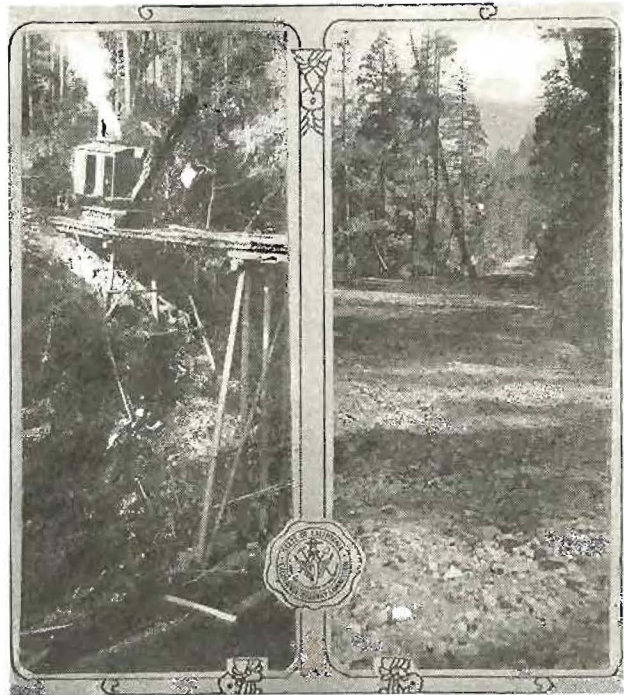
Young Man: "Your father is a crank."

Father (overhearing): "Well, when you don't have a self-starter a crank comes in mighty handy."—*Exchange*.

Surprise.

The first asphalt road in the United States was built in 1879 in front of the City Hill, Newark, N. J.—*Newspaper Item*.

This will come as a surprise to about 365,981 motorists who thought they drove over it this summer in other cities.—*Lackawanna Motorist*.



SMITH RIVER FOREST PROJECT—Construction scenes in Del Norte County where a forest highway project on the Grants Pass state highway connection is opening up a virgin territory. Left, steam shovel crossing temporary bridge. Right, the new grade along the river. (Div. I.)

WHAT THE DIVISIONS ARE DOING

ELECTRIC TRAFFIC GATES TO BE ERECTED NORTH OF EUREKA SLOUGH

DIVISION I reports a contract awarded for the erection of electric traffic gates on the drawbridge across Eureka Slough, at the northern city limits of Eureka. The gates are designed to prevent careless motorists from driving off the bridge when the lift span is raised. The operation of the gates will be controlled automatically by the raising and lowering of the span.

Division I keeps on breaking storm records. The record for low temperature also is having its inning, especially in the territory north of Willits. Traffic, however, has been kept moving with a minimum of inconvenience.

NEW LOCATION CUTS PACIFIC HIGHWAY DISTANCE TWO MILES

COMPLETION of the contract recently awarded Edwards Brothers of Los Angeles for the widening and relocation of eleven miles of the Pacific highway between Halfway Creek and Dog Creek, in the Sacramento River canyon, will cut the distance two miles between Redding and Dunsmuir, reports Division II. Considerable adverse grade also will be eliminated and the roadbed widened to 28 and 30 feet with rock surfacing 20 feet wide. Pipe culverts will be encased in concrete. The project will be financed with gasoline tax funds.

Grading Contract Finished.

Grading has been completed on the Bayha-Halfway Creek contract of the Nevada Contracting Company, north of Redding, and placing of surfacing should be completed by the end of this month. Some shoulder work and final cleaning remains to be done before the work is finally accepted. The highway is now open for twenty-four hours daily.

Dunn and Baker are expected to complete the extension of their contract for widening the Pacific highway between the state line and Shasta River early next month. Surfacing is now being placed.

With the completion of the grading in the vicinity of Weaver-ville, all work by state forces in Division II has come to a standstill. Some 2½ miles of grading and surfacing was done to improve the lateral connection with Trinity County.

Snow Plows Working.

Division II has had its snow plows working a number of times during the last month. Heavy snowfalls followed by unprecedented cold weather, which froze the snow, caused some trouble, but traffic was accommodated at all times.

WEATHER SLOWS DOWN GRADING ON CONTRACTS IN DIVISION III

COLD weather in the mountains and rain in the valley has slowed down grading operations on several contracts in Division III during the past month. The extremely cold weather made operations difficult in the Truckee River canyon, Nevada County, and there was a temporary shut down on the work between Boca and Floriston. The Truckee-Boca contract of Irey and Holden is practically finished.

C. R. Adams has nearly three miles of grading completed on the Colfax-Gold Run contract and is operating two power shovels with a force of sixty-three men.

Rain Delays Paving.

The contract of Giddings and Whyte for grading 6.9 miles of the Tahoe-Ukiah highway, west of Williams, Colusa County, have suspended operations due to the wet weather.

Rains at frequent intervals have delayed completion of the asphalt paving job, west of Chico, on the Chico-Orland state highway.

Shoulders are being built up and drainage improved on several sections of the trunk line highways in the Division III, in various parts of the Sacramento Valley.

The Lincoln and Victory highways to Lake Tahoe were closed to traffic by snow about December 15th.

BELTANE-SHELLVILLE CONTRACT COMPLETED, DIVISION IV REPORTS

GALBRAITH AND JANES have completed the contract for grading and paving between Beltane and Schellville, Sonoma County, Division IV, and the entire distance is open for traffic, except two miles between Beltane and Warfield which is on new right of way eliminating two grade crossings. This will be opened up as soon as the contractors complete the new bridge across Calabazas Creek which is being built by Sonoma County under state inspection. The bridge will be finished sometime during January and the entire route through the Valley of the Moon, from Santa Rosa to Schellville, will be open to traffic, a distance of twenty-five miles.

The roadway of the Peninsula highway through Menlo Park has been widened to fifty feet, and the pavement to thirty on the major portion of the Freeman and Whiting contract which is now complete except for construction of a concrete culvert near Menlo Park. Traffic facilities have been materially improved between Redwood City and Palo Alto.

Rapid Progress on Skyline.

Contractor J. P. Holland has begun operations on the last two miles of his grading contract on the Skyline boulevard. Crushed rock surfacing is being placed as fast as the work progresses and the time when one of the most scenic sections of the Skyline route will be opened for traffic is not far distant.

Contractor D. A. Foley has a narrow gauge industrial railroad at work hauling excavated material from South San Francisco for the construction of the fill for a section of the Bay Shore highway. A dredge also is at work excavating canals. Faster progress is expected when Belle Air Island becomes available as a source of material for the construction of the roadway embankment.

BIDS ASKED ON BIG GRADING CONTRACT IN DIVISION VII

BIDS will be opened in Sacramento, February 9th, for the grading of a section of the Coast boulevard between Arroyo Sequit and Las Flores Canyon, on the Los Angeles County coast. This section, 16.3 miles in length, is the only unit of the coast route between Santa Monica and Oxnard not completed or under way.

Bridge Under Way.

Construction has been begun by Contractor H. H. Peterson on the Sycamore Canyon bridge, north of Oceanside, San Diego County. The old wooden bridge has been removed and traffic handled over a short detour. The new structure will be of reinforced concrete.

All work on the Coast highway between Huntington Beach and Corona Del Mar has been completed and recommended for acceptance. Rapid progress is being made on the construction of the new bridge across Santa Ana River which will open the new highway to traffic. The bridge is being built by the county.

State forces will complete the grading and paving of approaches to the new reinforced concrete bridge over Santa Ynez Creek on the Coast highway, built by Los Angeles City.

REDLANDS-BEAUMONT PAVING JOB UNDER WAY IN DIVISION VIII

BASICH BROTHERS, contractors, have assembled equipment and started work on the contract for paving the trunk line highway between Redlands and Beaumont, a distance of approximately seven miles, reports Division VIII.

The grading and surfacing contract between the Sand Hills and the Colorado River at Yuma is nearing completion, and, with the building of the bridge across the Yuma irrigation canal, the entire unit will be open to traffic. Ledbetter and Company have begun work on the bridge.

Desert Division Fights Snow.

Strenuous efforts to keep the Crest Route open for traffic are being made by the maintenance forces of Division VIII. Twelve inches of snow have fallen in this section of the San Bernardino mountains to date, but traffic has been kept moving.

DIVISION ACTIVITIES

**NEW HIGHWAY SECTION TAKEN
OVER ON DIVISION X ROUTE**

SAN JOAQUIN COUNTY having secured the necessary rights of way, the commission has taken over and incorporated into the state highway system the Lodi-Lockeford section of the San Andreas lateral. The new highway which comes under the jurisdiction of Division X is 12.49 miles in length.

Two important asphalt concrete jobs have been completed in Division X during the month. Force and Currgan finished the Vacaville-Batavia unit, Solano County, after several delays due to rainy weather and the Valley Paving Company has completed work on the Banta widening job in San Joaquin County. The vialog test on the latter job shows but twenty-seven inches of roughness per mile, an excellent record. The overrun amounted to but 70 tons of asphaltic concrete, less than one-fourth of 1 per cent.

Survey Work Authorized.

C. W. Springer had charge of the completion of the work at Banta after Resident Engineer C. O. Dingle was transferred at the bridge department.

Authority has been granted for survey and drainage work on the Upper Stockton road, Sacramento County, which has been placed in charge of C. M. Butts. He also will have charge of the survey for the Arno cutoff on the same road.

State forces are now at work grading the approaches to the Dry Creek bridge, in Amador County, recently completed at county expense but under state supervision.

Grading of the Jackson-Pine Grove section is expected to be under way under contract in the near future.

BRIDGE DEPARTMENT NEWS

M. E. WHITNEY, recently transferred to the bridge department from Division X, has been assigned to the Rincon Seawall contract as assistant resident engineer.

A. L. Richardson has been assigned to the Chowchilla River bridge in Madera County, as resident engineer.

John C. Wilson, resident engineer on the Klamath River bridge, spent a few days in Sacramento recently in conference with Mr. Miller. His friends regret to learn of the illness of Mrs. Wilson, who is in a San Francisco hospital.

The twelve bridges on the Upper Stockton road, built by Polk and Polk, have been completed and A. J. Meehan, resident engineer, is in the office preparing his final report.

**MAINTENANCE STATION SITE
PURCHASED IN SANTA BARBARA**

THE maintenance department of Division V has taken possession of the new maintenance station site recently purchased by the commission in Santa Barbara. The property has an area of 130 by 343 feet and is located on West Haley street, near the intersection of San Pasqual street.

Division Engineer L. H. Gibson announces the residence of the local maintenance foreman will be established on the property, which will be headquarters for a district extending from the Ventura County line northward to Gaviota.

In addition to the maintenance foreman's residence, provision will be made at the station for storage of equipment and materials necessary for maintenance work in the vicinity of Santa Barbara.

Sure Proof.

Magistrate—"And what was the prisoner doing?"
Constable—"E were 'avin' a very 'eated argument with a cabdriver, yer worship."
Magistrate—"But that doesn't prove he was drunk."
Constable—"Ah! But there weren't no cabdriver there, yer worship."

OPENING UP THE OWENS VALLEY

SUBSTANTIAL improvement of the highway between Mojave, Kern County, and Independence, Inyo County, a distance of 133 miles, during the year 1925, is promised the people of southern California by the California Highway Commission. That traffic may be better served, this section of the state highway has taken over for maintenance until such time as funds for construction are provided.

The maintenance budget of Division IX, in which the section is located, includes approximately \$400 per mile for the work during the coming spring and summer. The pavement at Mojave will be connected with the improved highway in Inyo County by a better road than now exists across the Mojave desert.

The improvement will be made on the surveyed right of way wherever possible and will consist of grading and dragging, and if funds are sufficient, some surfacing. The work will be in charge of Division Engineer F. G. Somner of Bishop.

In Mono County, also in Division IX, the commission has taken over for maintenance an eighteen-mile section between McGee Creek and Deadman's Creek. Some grading, shaping and surfacing will be done.

Receipts from the motor vehicle and gasoline tax funds, to be received during 1925, make it possible for the commission to undertake the work.

THE RECORD FOR 1924

THE following, in brief, is the total of expenditures and mileage of roads completed by the California Highway Commission during the calendar year 1924:

EXPENDITURES.

Second state highway fund.....	\$1,811,114 33
Third state highway fund.....	6,833,368 34
Motor vehicle and gasoline tax funds (main- tenance and reconstruction).....	8,812,723 02
Miscellaneous funds	262,447 97

Grand total

FEDERAL AID.

Federal aid collected during 1924 (paid into bond funds)	\$3,556,684 86
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**MILEAGE OF ROADS COMPLETED AND
ACCEPTED DURING 1924.**

Original construction--	Miles
Graded and rock surface.....	282.8
Rock surface only (previously graded).....	145.3
Cement concrete pavements.....	29.2
Asphalt concrete pavements.....	10.1
Asphalt macadam	52.5

Total

Reconstructed pavements (various types).....	87.5
Reconstructed grades (widening and straightening)	39.0

Total miles completed and accepted (original
and reconstructed)

Work under way and bids pending January 1, 1925 (all types)	167.3
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Extensive.

Motorist—"It's preposterous. I'm an expert driver. What I know about driving would fill a book."

Policeman—"And what you don't know would fill a hospital. Give me your name and address."

That indefinable thing we call charm is what enables a girl to violate the traffic rules day after day with absolute impunity.

CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE
CALIFORNIA HIGHWAY COMMISSION
SACRAMENTO, CALIFORNIA

HARVEY M. TOY, Chairman;
N. T. EDWARDS and LOUIS EVERDING, Commissioners.

ROBERT M. MORTON, State Highway Engineer.

W. F. MIXON, Secretary.

We are pleased to permit publication of any of the matter contained herein or to loan cuts and this privilege is extended newspapers and periodicals without restrictions.

FRANK B. DURKEE, Editor
P. O. Box 1103, Sacramento, California.

Vol. 2

JANUARY, 1925

No. 1

JUST AMONG OURSELVES



HIGHWAY NEWS NOTES

Maintenance Man Transferred.

DIVISION I announces that C. A. Miller, formerly in charge of maintenance in Mendocino and Lake counties with headquarters in Willits, has been moved to Eureka where he will superintend maintenance activities in Humboldt and Del Norte counties.

Paul St. John has succeeded Mr. Miller at Willits.

We are glad to report that C. C. Darrow, chief clerk at Willits, is back at work after a recent severe illness.

B. W. Booker, chief draftsman in Division I, is the proud daddy of an eight-pound daughter.

Carlton Fletcher and Miss Helen Navarro, clerks at the division headquarters at Willits, have resigned and moved to San Francisco to accept positions.

"Beginning to Feel at Home."

Division II is "beginning to feel at home" in the new division headquarters at Redding. Division Engineer Comly is having the grounds cleaned up and lawns planted, that the new building may present a pleasing appearance to motorists passing through Redding on the nearby state highway. The division was accused of bringing with it from Dunsmuir an eight-inch snowfall.

Many of the Division II folks went home for Christmas. H. K. Ward, chief of party, and R. E. Ward, resident engineer, enjoyed short holiday vacations in San Diego.

Some Boy.

ACCORDING to reports from Division III, Albert Rogers McEwen, recently arrived son of A. R. McEwen, assistant resident engineer on the grading contract in the Truckee River Canyon, has filed an application for rodman with Mr. Haselwood's outfit.

John R. Andrews, formerly with headquarters, has been appointed clerk in Division III.

Mrs. Mary Brown, clerk with Division III, is recovering from a serious illness.

H. B. LaForge is acting assistant resident engineer on the Chico asphalt paving job.

W. H. Irish, assistant resident engineer, is recovering from an operation for appendicitis.

Division IV Man Turns Farmer.

M. C. Fosgate, formerly resident engineer in Division IV, is

ranching near Corning, Tehama County, where he owns farm property.

Ed Blockley, formerly assistant engineer, Division IV, has accepted a position with J. P. Holland, San Francisco contractor.

George J. Wagner, formerly resident engineer on the Skyline boulevard, is now with the American Toll Bridge Company, Crockett.

E. J. Brown, resident engineer on the Redwood City to Palo Alto widening job, plans to leave for Arizona as soon as his work is finished.

J. George Smith, draftsman, has resigned to accept a position with the California Pacific Title Insurance Company.

A. F. Janes, formerly assistant resident engineer, has accepted a position with the Pacific States Construction Company.

John A. Harley, formerly attached to the field forces in connection with widening work on the Peninsula, is in the Redwood Sanitarium, Redwood City, where he is reported as being well on the road to recovery following a recent illness.

Miss Marie B. Lennox, senior clerk in the Division IV office, recently parted company with a set of unfriendly tonsils. After a sojourn to the St. Mary's Hospital, San Francisco, followed by a few days convalescence at her home in Sacramento, she has again resumed her duties.

Miss Marie Hammerstrom, stenographer in the Division IV office, on a recent trip to the wilds of Contra Costa County was violently set upon by a host of poison oak germs and as a result was absent from her desk for several days.

Long Isolation is Over.

AFTER spending two years as resident engineer on the Big Sur grading job, on the Monterey coast almost out of touch with the world, E. B. Brown has returned to civilization and for the present has been assigned to duty in the division office at San Luis Obispo.

George Sowash, expert delineator of Division V, was a recent visitor in San Francisco.

W. P. Inman, draftsman, is back at his work after an operation.

George A. Tilton Jr., chief of party, enjoyed a vacation in Los Angeles following his return from the Kern River Canyon job in Division VI.

Engineer Transferred.

J. P. Andrews has been transferred to Orange County as assistant resident engineer on the McCray contract, reports Division VII.

H. H. Wildy and party are at Capistrano making a survey of the San Juan Creek to Galivan section which is under consideration for reconstruction during 1925.

Oh Joy, Rain on the Desert.

Division VIII is just tickled pink; it has rained on the desert. In fact, it rained twice at Newberry and rain has been reported at Amboy and Goffs. This will help the maintenance men.

McLeod Gets Homesick.

DIVISION engineer J. C. McLeod (and we have a suspicion that his family had something to do with it, too) began to get homesick for the northwest along about Christmas time; and so he tuned up his old bus, took a few days off, and started north. He traveled in snow all through Oregon, but he reached Washington state just before Santa Claus arrived.

R. A. Watkins, superintendent of equipment, Division X, was a speaker recently before the Lions Club of Sonora.

E. W. Zumwalt, of Division X, visited in San Francisco recently for a part of his vacation.

Maintenance Foreman F. M. Walker, of the Division X forces, and his crew, recently presented Mr. R. A. Watkins with the neatly mounted head of a large eight-point buck.

Division X, newest of the divisions, sends best wishes for the New Year to all other divisions.

Kern Engineers Hear Woodson and Grumm.

Fred J. Grumm, engineer of surveys and plans, and J. B. Woodson, division engineer at Fresno, were speakers recently at a dinner given by the Kern County chapter of the American Association of Engineers. Grumm told the meeting of the district convention of the association which he had attended in Los Angeles while in the south on his vacation. Woodson discussed the work under way with convict labor in the Kern River canyon.

January 13th was a lucky day for Claude Simpson, assistant file clerk, headquarters. The stork visited his home, leaving a baby daughter.

NEW BUTTE COUNTY BRIDGE TO AID DRAINAGE PROBLEM

THE completion of a 180-foot concrete bridge, now under way, over the Cherokee Canal by-pass on the Eastside highway in Butte County, near the town of Richvale, will aid materially in relieving a serious drainage condition which, in recent years, has occasioned loss to the farmers of the vicinity and interruption of traffic when flood waters have covered the pavement.

Traffic is being detoured over a short graveled roadway which has been constructed at the side of the bridge site. Necessary steps have been taken to provide for the safety and convenience of the public.

The removal of the existing reinforced concrete pavement caused the contractor considerable difficulty and proved that it was an excellent piece of construction. Over 100 pounds of dynamite was used to break up 180 feet of pavement. Construction of the bridge will permit the opening of a new drainage canal which is believed ample to handle future floods.

Including the roadway approaches, the structure will cost approximately \$16,000, of which \$5,000 will be paid by Butte County. The work is scheduled for completion about February 1st.

NEW MACHINERY STUDIED

THE California highway department was represented at the annual convention of the American Road Builders Association, held early in the month at Chicago, by Equipment Engineer R. H. Stalnaker. The extensive machinery exhibit in connection with the convention gave Stalnaker an opportunity to make a study of the latest road-building equipment on the market.

He also attended the annual convention of the Society of Automotive Engineers, which took place in Detroit, and later made a study of the equipment and methods used in the removal of snow from the highways in the vicinity of Chicago and other new equipment in use in the east.

Some Epitaphs.

(From the *Angier Idea*.)

Tom Jones has gone to heavenly heights;
He tried to drive without his lights.
Jack Hayes this busy life forsakes;
He never would relin his brakes.
Here's all that's left of Amos Bossing;
He tried to beat it to the crossing.
No more for Brown are earthly smiles;
He took the curve at forty miles.
Ted Small has gone to his abode;
He kept the middle of the road.
Here lies our friend poor Tony Dix;
For booze and gasoline won't mix.
Jim Henry's friends are all bereft;
He made a short turn to the left.
Ben Gray is free from earthly pains;
A rainy day—he had no chains.
Poor Bill's beneath the sod, alas!
He speeded up and tried to pass.
Now Tom has joined the heavenly band;
He tried to drive it with one hand.

Road Information.

No matter where you tour or roam,
The best old road is the road to home.

Fifteen

MUST COMPLETE THE INTERSTATE CONNECTIONS

A REVIEW of California's highway progress shows that not a single interstate road has been adequately improved, while several of them contain missing links from one to two hundred miles in length near the state borders.

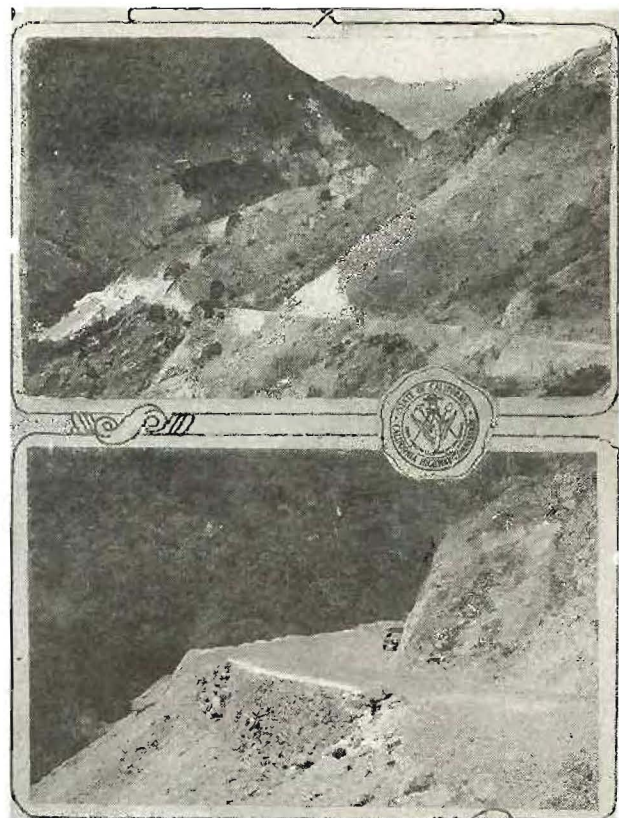
This raises the question, "Has California made good on her invitation to the motorists of the nation so far as interstate roads are concerned?"

California can show visitors an unequalled system of touring roads after they literally force their way across the barriers we have permitted to remain on the state borders.

Good Roads on Inside.

Our entering guests find generally improved roads across the neighboring states, with a few exceptions, until they reach the California border where they expect to realize their dreams of a motoring paradise. Sad is their disappointment when they begin to cross our unimproved sections which lie between the state line and the seven thousand miles of paved state and county roads which they ultimately find as they approach the centers of population.

This is not a criticism of the state highway commission which has very properly given its first attention to connecting the main centers of population, but the time has now come when the state highway program must be completely refinanced. We must provide liberally for the completion of our interstate roads at the state borders, that travelers may receive the welcome of genuine hospitality as they enter the state and carry away only pleasant recollections in the event they should depart.—*Motorland*.



NORTH OF SAN SIMEON--Scenes on the recently completed section of the Coast highway north of San Simeon, San Luis Obispo County. (Div. V.)



The map above does not show all of the state highways in California but only those included in the federal aid system, representing approximately 7 per cent of the total road mileage of the state, outside of cities.

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