



COLORADO HIGHWAYS BULLETIN ~

Practical Reasons for the Bond Issue.

An All-Mountain Trip From Long's
Peak to Pike's Peak by Auto.

Provisions of the Bankhead Federal
Aid Act.

Tree Planting Along Concrete High-
ways.

Issued by the
State Highway Department

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The meeting point of two centuries, found by the auto in Turkey Creek, Jefferson County.

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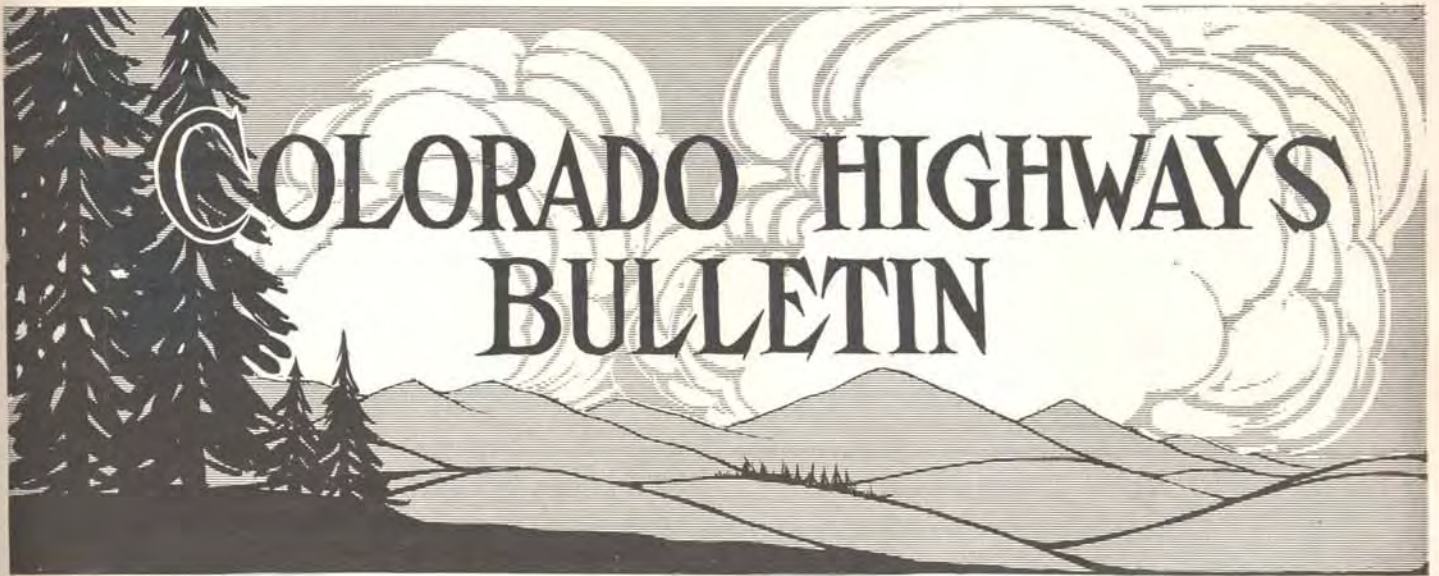
Address all communications to Colorado Highway Department, attention Pyke Johnson, editor, Colorado Highways Bulletin.

Owing to the necessarily limited edition of this publication it will be impossible to distribute it free to any persons or institutions other than state and county officials actually engaged in the planning or construction of highways, instructors in highway engineering, newspapers and periodicals and civic associations. Others desiring to obtain Colorado Highways can do so by sending 10 cents for each number desired. Associations desiring to distribute the magazine can obtain it at cost in lots of from 500 copies up.

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The rugged majesty of the Rockies in the high altitudes of Colorado. Mt. Hope, one of the points of interest along the new Independence Pass Road, Chaffee County.



Practical Reasons for the Bond Issue

Colorado Highway Engineer tells where the \$20,000,000 could be applied.

By J. E. Maloney, Chief Engineer, State Highway Department

WHY is it needed? Because the present state road fund is absolutely insufficient to more than maintain the present road system. The state and county road funds are derived from the following sources; county road funds to be used on county roads and also in meeting state aid:

1. By direct tax levy on all assessed property in the county.
2. Fifty per cent of all automobile license fees collected in the county.
3. Forest Reserve funds distributed to counties having Forest Reserves within their boundaries.

The levies vary considerably in the counties of the state, and run from eight-tenths of a mill to seven mills. The total amount raised in 1918 was about \$2,500,000 for the sixty-two counties. This fund must take care of some 42,000 miles of roads, with their many thousand bridges and culverts. The fund averages sixty dollars per mile, so if the county expends twelve hundred dollars for the repairs or construction of a bridge, or culverts some twenty miles of road are without funds for the season.

The state road fund at present is made up of the following receipts from the different sources, taking the probable receipts for the year 1919:

1. Direct levy of one-half mill on all property in the state	\$ 700,685.00
2. Fifty per cent of all automobile license fees collected in the state	205,000.00
3. From the Internal Improvement Permanent and Income fund	125,000.00
4. Miscellaneous items of interest, etc....	12,500.00
Total receipts	\$1,043,185.00

The counties set aside varying amounts to meet the state aid on the state routes in the counties. This will amount to about \$250,000 for 1919 for all the counties.

These amounts must provide for all the state work on 7,800 miles of state routes. This fund averages \$165 a mile of state road. When the commission gravels a mile of state road at a cost of \$3,000, twenty miles go without any maintenance for the year. If a bridge costing \$15,000 (and we have many of them) is built, then ninety-five miles of road somewhere in the state go without maintenance for the year. It has been found impossible to use the fund for construction, and also have it for maintenance and repair.

In opening roads over the mountains the very expensive construction involved means that, for every mile built, some forty miles in another section of the state is neglected.

The state road fund is sufficient for the maintenance of the present state road system, but improvements, surfacing, grading, bridges and all new construction must be provided for by some other means.

Why not buy a twenty-year loan at four and one-half or five per cent interest? A six-year construction program can be laid out to use:

- \$1,000,000 the first year.
- \$2,000,000 the second year.
- \$3,000,000 the third year.
- \$4,000,000 the fourth year.
- \$5,000,000 the fifth year.
- \$5,000,000 the sixth year.

So that at the end of the sixth year improvements will have been completed to the full extent of the fund. To do this from the present state road fund would take forty years.

What roads would be improved? What should be the character of the improvement? Would it be all expended on hard-surfaced pavements in the vicinity of the larger centers?

These questions bring up the further question of service to the larger part of the population, also the use made of the various roads, and the character of the traffic. There are certain fundamental points that should not be lost sight of in this connection.

First: The location must be made where the road is to stay for the future. This will involve re-location of many sections of our main system, and this must be done regardless of the character of the surfacing.

Second: The road must be graded, drainage and bridges of a permanent character must be provided; and this work must be just as thoroughly done for a gravel surface as for any kind of hard surfacing.

These two points include the really permanent parts of the highway; the location, the roadbed and drainage structure. And then the surfacing is to be placed on the prepared roadbed.

Many lessons have been taught by our war experience, and among them is the fact that water-bound gravel or crushed stone on some of the so-called hard-surfaced roads will not stand up under the truck traffic which has been so largely developed in the past two years, and which will keep increasing in the future.

Choice of the character of the base and surfacing to be used on any particular stretch of road must be governed by the kind and amount of the traffic using the road. An inspection of the articles published on traffic conditions in preceding issues of Colorado Highways will show that only a heavy traffic would warrant the investment necessary to use the higher types of surfacing; and it will also show the economy of the better class of surfacing. From the ordinary dirt road to a well-built gravel; from the gravel to the better class of macadam; from the macadam to the hard surface, there is in each case a definite, tangible, absolute saving which represents just as good dollars as anybody ever puts in his pockets.

The improved system would extend to each county in the state, connecting the county seats, one with the other, and would give a complete connected system throughout the state. A tentative idea may be given by the statement that about 4,000 miles would be included in such a plan.

All the connections over the mountain passes would be included, as also the Eastern, Northern, Western and Southern inlets.

The East, North and South highway branching to Greeley, Fort Collins and Boulder, and running through Colorado Springs and Pueblo to Trinidad; the Santa Fe Trail from Pueblo to Lamar; the Platte River Road to Fort Morgan, Sterling and Julesburg, with some branches of the Western, Northern and Southern highways, form the group of heavy traffic roads of the state which will justify the cost of hard-surfacing.

In my judgment the possible saving in the cost of operation of the present traffic amply justifies the expenditure of the \$20,000,000. In addition the increased value of the land, the increased school and social benefits, and these are no small items, make the expenditure desirable.

Attention is called to the fact that the federal government has just passed a Federal Aid bill which makes available for Colorado the additional sums of:

\$ 880,000 in 1919,
\$1,320,000 in 1920,
\$1,320,000 in 1921.

All these must be met by the state with a like amount but the state will be unable to meet and accept the appropriations unless some new provision for increasing the road fund is adopted.



Tell-tale marks of an avalanche, the white terror of the Mountains, Independence Pass, after repairs were made.

These amounts are not to be used for maintenance, so it means that if the present state fund should be used as far as it will go, to match the Federal Aid funds, then the 7,800 miles of state roads must go with little or no maintenance for three years. As this would result in an intolerable condition, the other alternative of refusing the Federal Aid would have to be accepted in the event no extra funds are provided.

COUNTIES MAY MEET FEDERAIL AID.

Already some of the wealthier counties, fearful lest Colorado will not meet the Bankhead provisions, have taken up the question of voting county bond issues in order to secure the federal appropriations for roads within their boundaries. It is a practical idea that merits favorable consideration, for the county voting bonds could not lose.



Mt. Princeton, Chaffee County, as seen from the crest of Chalk Canon. This is a bulwark of the Collegiate Range, ranked as one of the most beautiful mountain groups in Colorado.

Progress on Federal Aid Projects by States

Less than 45 miles of roads are reported completed by states availing of Federal Aid. Appropriations made by Congress to pay the Federal Government's proportion of the cost of state road building projects now total \$48,500,000. This soon will be increased materially. An addition of \$200,000,000 probably will be available during the next three years.

With these millions available and with the approval of the Federal Government on 760 road-building projects, involving 7,869.61 miles of roads, less than 45 miles—44.969 to be exact—of roads have been constructed under the Federal Aid plan.

The Information and Education Service of the U. S. Department of Labor, co-operating with such national organizations as the American Automobile Association, the Automobile Chamber of Commerce, and the National Highway Industries Association, is calling to the attention of state officials the desirability of at once getting under way such state road construction as has been approved by the Federal Government and for which the latter has set aside funds.

In addition to obvious benefits derived from improved highways, the Department of Labor urges a new argument, especially important at this time when labor conditions are arousing anxiety and business is endeavoring to find an unembarrassed way back to peace conditions. For the states at once to go in for road building is, according to the Department of Labor, a direct way to stimulate business

and absorb labor. To all that has been said heretofore on the value of good roads, now may be added road building's potentialities as an efficacious tonic for the industrial organization of the country.

The Department of Labor does not deny that road materials and labor costs are high. Rather, the Information and Education Service asserts, indications are that prices will remain high for some time to come and, in view of the forecasts for market conditions, it is imprudent to longer hold up state construction anticipating lower construction costs. Secretary of Labor Wilson, both in a recent address in New York City and in an article in *Collier's Weekly*, expressed the conviction that an era of unprecedented activities is ahead of American industry. He asserted his confidence in the ability of American industry to absorb, eventually, the labor released from the army and from war industries. He did not hesitate, however, to emphasize the fact that during the months of transition from war to peace conditions, the labor situation is fraught with disquieting possibilities if it is altogether neglected.

Road building will provide buffer employment for thousands of men until they can be absorbed by industries as the latter gradually reach their peace-stride production. Road building immediately pays dividends in increased land values. Roads are an asset to every state and to their permanent value as public improvements is now added their temporary value, of incalculable importance,

of stimulating business and protecting states against the possibilities of a period of general unemployment.

If the various states would get under way such road-building projects as have been approved by the Federal Government, \$56,171,846.72 would be spent for better roads and, if the construction costs are higher than in pre-war times, the actual financial outlay for the states need not be higher, since approximately half of the bill would be paid by the Federal Government.

There have been set aside to cover the Federal Government's portion of the costs on the 760 road projects approved in various states, more than \$21,000,000. This now is available for states which will go to work on their road construction on plans approved by the Federal Government.

Although federal aid for state roads has been avail-



The Three Sisters, Lake County, one of the many interesting sights along the Independence Pass Route.

able since 1917, but eight states report road projects, involving federal aid, completed. Arkansas has completed one project involving 5.540 miles, California has completed two projects of 6.785 miles, Louisiana has completed one project of four miles, Massachusetts has completed two projects of 13.802 miles; North Carolina, one project of 8.01 miles; Vermont, one project of .793 mile; Washington, one project of 3.5 miles; and West Virginia, one project of 2.53 miles. In all, ten projects have been completed of a total mileage of less than 45 miles.

In so far as getting under way road-building projects involving federal aid goes, Arizona, Connecticut, Delaware, Maine, New Jersey, Oklahoma, Rhode Island and Tennessee have five or less projects which now are approved by the Federal Government. Five projects in Illinois involve 178.75 miles of road and the estimated cost is \$2,946,311.92.

Texas, with 70 projects, leads in the number submitted

and approved by the Government. These involve 992.53 miles of roads, the estimated cost being \$3,968,494.43.

In estimated cost of road projects approved by the Government, Pennsylvania leads with a total of \$4,792,875.65, and Ohio is second with a total estimated cost of \$4,777,207.05. Pennsylvania's program calls for the building of 146.88 miles, while in Ohio 148.4 miles are involved.

The Information and Education Service, through the Division of Public Works and Construction Developments of the U. S. Department of Labor, emphasizes the fact that with more than \$45,000,000 now appropriated by Congress for federal aid in road building, less than 45 miles of roads have been completed under the Federal Aid plan. Such states as have been allotted Federal Aid on approved projects, the Department submits, are in position to give general business a great stimulus and to effectively combat the ills incident to general unemployment, by immediately getting the road building work under way.

To Push War Savings Stamps

At the recent conference of Liberty Loan and War Savings leaders of the Tenth Federal Reserve District at Kansas City, L. B. Franklin, Director War Loan Organization, outlined the Government plans for War Savings.

If it were only a question of raising a certain amount of money, say two billion dollars, the Treasury Department recognizes that this could be done, at a much less cost to the Government, through an active, intensive campaign for the sale of Liberty Bonds. However, they feel justified in taking the more expensive and difficult way, by continuing to instill the spirit of thrift and saving in the minds of the people.

It was impressed upon us all that every member of the school organization must support the scheme; that War Savings Societies should be organized by every teacher, in his or her class room, or in every school in the more rural districts. We were impressed also with the fact that the "wholesale selling idea" must be used, viz., that of selling the idea to the management of large stores and other similar employers of labor, such manager or head to group his employees into a War Savings Society and sell the idea to them, thus bringing about willing, automatic purchasers.

No quotas have been assigned to the various counties in Colorado but, as a state, we will be expected to sell approximately the amount sold last year.

From now until after the Fifth Liberty Loan we are to do three things: Get every school or class room organized with a War Savings Society; form societies in every natural group of citizens, such as business houses, lodges, churches, school districts, etc.; sell all the stamps we can but, primarily, build a sound and permanent organization.

It is expected that, in the promotion of sales, every postman will be instructed, through the postal organization, to do his best to sell War Savings Stamps. The banks of the state have been enlisted, and are practically 100% behind this movement. The 3,000 selling agents, throughout the State of Colorado, have been requested to continue their efforts, and all of the postoffices have a supply of stamps.



The Twin Lakes, Chaffee County, from Holy Cross Way, with Mt. Ebert in the background. Ebert and Mt. Massive are tied for the honor of being the highest mountain in the state, elevation 14,402 feet.

MORE than half-a-billion dollars for road construction in the United States either has been made available by Congressional enactment or authorization of special bond issues by states, or made probable within the next few months by legislative enactment submitting enormous bond issue propositions. At no previous time in the history of the nation has there been such a pronounced trend toward highway development as is evidenced by these measures.

Early estimates placed the total probable expenditure on roads by the states and the national government in 1919 at \$300,000. Since that time Congress has acted favorably upon the Bankhead rider attached to the post office appropriation bill, and the President has made the act operative by his signature. This Federal Aid bill provides that \$50,000,000 is made available immediately, another \$75,000,000 is added for the fiscal year beginning July 1, 1926, and the last \$75,000,000 is set aside for 1921.

North Carolina already has provided for an increased revenue of \$1,250,000, derived from automobile revenues, to meet the increased Federal Aid, and this is to be supplemented by an annual bond issue of \$1,000,000.

Illinois has voted \$60,000,000 and Pennsylvania \$50,000,000 for road improvements.

The Minnesota legislature has submitted the proposition for a \$100,000,000 bond issue for the construction of a definite state highway system, while the Michigan legislature has submitted a \$50,000,000 road bond issue for the specific purpose of building 5,000 miles of road. This is to be voted upon at a special election this spring.

Half Billion Dollars in Sight for Better Roads



The sister state of Wyoming, through its legislature, will vote at a special election, to be called immediately, upon a \$2,800,000 road bond issue, one feature of which will be the construction of a great highway from

Cheyenne to Yellowstone.

Even counties have entered the competition and news has just come that the County of Salt Lake has voted \$1,500,000 in bonds for construction of county roads.

The Georgia legislature soon will have before it a bond issue proposition providing for a \$40,000,000 bond issue, coupled with an additional \$20,000,000 tax. This latter item is as much itself as the proposed \$20,000,000 bond issue project now under consideration by the state legislature of Colorado.

Oklahoma elected a governor pledged to the specific platform of a state highway system, and a bond issue of \$40,000,000 is up for legislative consideration there. Virginia proposes an outlay of \$40,000,000, West Virginia has a campaign on for an increase, a \$10,000,000 road bond issue is being agitated in Alabama and a \$3,000,000 bond issue is being considered in Utah.

Oregon has already spent more than \$2,000,000 of a \$6,000,000 bond issue voted by the people of that state.

Not all of the sums could be made available for expenditure this year, and could not be spent if available, but the larger bond issues were voted or are proposed with the view of continuing road construction for many years to come. Every state where bond issues have been proposed is planning for a comprehensive highway system to take care of needs for years to come.

Long's Peak to Pike's Peak by Auto

A 135-Mile All-Mountain Highway.

By H. G. Hedden

A SCENIC trip of constantly changing splendor, without once leaving the mountains, can be made by motor from Long's Peak to Pike's Peak, two of Colorado's famous landmarks and tourist attractions. The distance by the most direct route is about one hundred and thirty-five miles, and every mile abounds in glories of Nature to please the eye and make the heart glad and grateful. Besides traversing immense playgrounds all the way, this trip furnishes rare sources of inspiration and study for artists, vast storehouses of knowledge for naturalists and mighty monuments to thrill the imagination with the romance and tragedy of human struggle and achievements, rugged pioneer history and charming Indian legend.

From Long's Peak, whose snow-clad summit stands 14,255 feet high and beckons travelers across the distant plains to that cloudland recreation region embracing Estes Park and the Rocky Mountain National Park, you drive southward to Allen's Park, Ward, Nederland, Rollinsville, Central City, Idaho Springs, Bergen Park, Evergreen, Conifer, Shaffer's Crossing, Pine Grove, Buffalo Park, Wellington Lake, Cheesman Lake, Woodland Park and Manitou, nestling at the foot of Pike's Peak, another giant sentinel of the Rockies towering above 14,000 feet, and crowned with ever-present snow.

The Arapahoe group of snowy summits, Mount McClellan, Gray's and Torrey's Peaks, Mount Evans and other lofty peaks are in close and gorgeous view at points along the trip, while lakes, rivers, creeks, waterfalls, reservoirs, timbered canyons, strange rock formations, gold, silver, lead and tungsten mines, rugged trails used years ago, factories, power plants, farms, ranches, hot springs, fishing hunting and rest resorts form a continuous treasureland for picture-taking and other enjoyment, and at the same time present a panoramic story of Colorado's industrial development dating back to the gold-rush days of '59.

The halfway point of this banquet of motor travel is practically reached at Bergen Park, in the Denver Mountain Park system. Here, if desired, a circle of Denver's Municipal Parks—Fillius, Genessee, Lookout, Starbuck, Little and Corwina—can be made by adding about forty-five miles and still staying within the mountains. This can be done by swinging over to Lookout Mountain, winding down its picturesque slope to the "hogback" road that connects Golden and Morrison and following this foothill drive to Bear Creek Canyon and thence up the canyon to Evergreen.

Lovers of history will want to pause in Lookout Mountain Park long enough to visit the grave of the late "Buffalo Bill" (Colonel William F. Cody), and also to sit a moment in the huge stone council seat at Colorow

Point, a mile and a half above sea-level, and the highest point on Lookout, where fifty years ago old Chief Colorow used to come from deep in the mountain fastnesses once a year with his Ute braves, hold council in the natural amphitheater sloping to the stone seat, and then come on down to Golden or Denver with a few of his most favored followers, carrying furs and articles of Indian handiwork to trade for the white man's wares.

The course of this trip can also be varied at other points, if the traveler so wishes. One main change of this kind—still keeping the auto on mountain roads—is to go from Allen's Park to Lyons and Boulder and thence to Nederland and Rollinsville. Another is to swing off the Rollinsville-Central City route and run into Golden over the Golden Gate Gulch road, and then climb Lookout Mountain and go on to Evergreen by way of Genessee and Bergen Parks.

When the Fall River road is completed from Estes Park through the Rocky Mountain National Park to Grand Lake, then the Long's Peak to Pike's Peak all-mountain drive can be varied further by following this new road to beautiful Grand Lake and coming into Idaho Springs and Evergreen via Granby, Fraser, Berthoud Pass (over 11,000 feet high) and Empire.

Although the direct route outlined now has many steep and rather difficult pieces of road, it is by no means a problem for experienced mountain motorists. Besides, the roads will be improved extensively in the next year or two, and diligent workers for the advancement of Colorado's touring attractiveness predict that this trip between these two giant peaks of extraordinary scenic and historic worth will be made by thousands of Colorado's appreciative citizens and by visitors from all parts of America and other lands, who will go forth to tell the world about this playground for the whole world.

A suitable highway of easy grades and other advantages all the way from Long's Peak to Pike's Peak will be a fitting memorial to the sturdy pioneering of Colonel S. H. Long, commander of an exploring party sent to Northern Colorado in 1820 by President Madison; and to Lieutenant Zebulon Pike, who discovered the peak of his name in 1806, at which time he also gained a distant view of Long's Peak. And such a highway will also do much to spread the fame of Denver as the gateway to twelve national parks and thirty-two national monuments—America's natural tourist center.

Approximately six million motor vehicles were in use in the United States by the first of the year. The production of new cars for 1918 should have been 2,000,000 to keep pace with the demand, but, owing to the war, only 1,100,000 were produced. Manufacturers have figured that it will require 1,000,000 new cars annually to keep up replacements.

Some Highway Bill Recommendations

An Abstract of a Statement made before the Senate and House Finance Committees by Highway Commissioner T. J. Ehrhart.

ROADS are the biggest business in Colorado and of personal importance to more people than any other public or private matter in the state, yet they have and are receiving less serious consideration from a business point of view than matters of trivial import to the people.

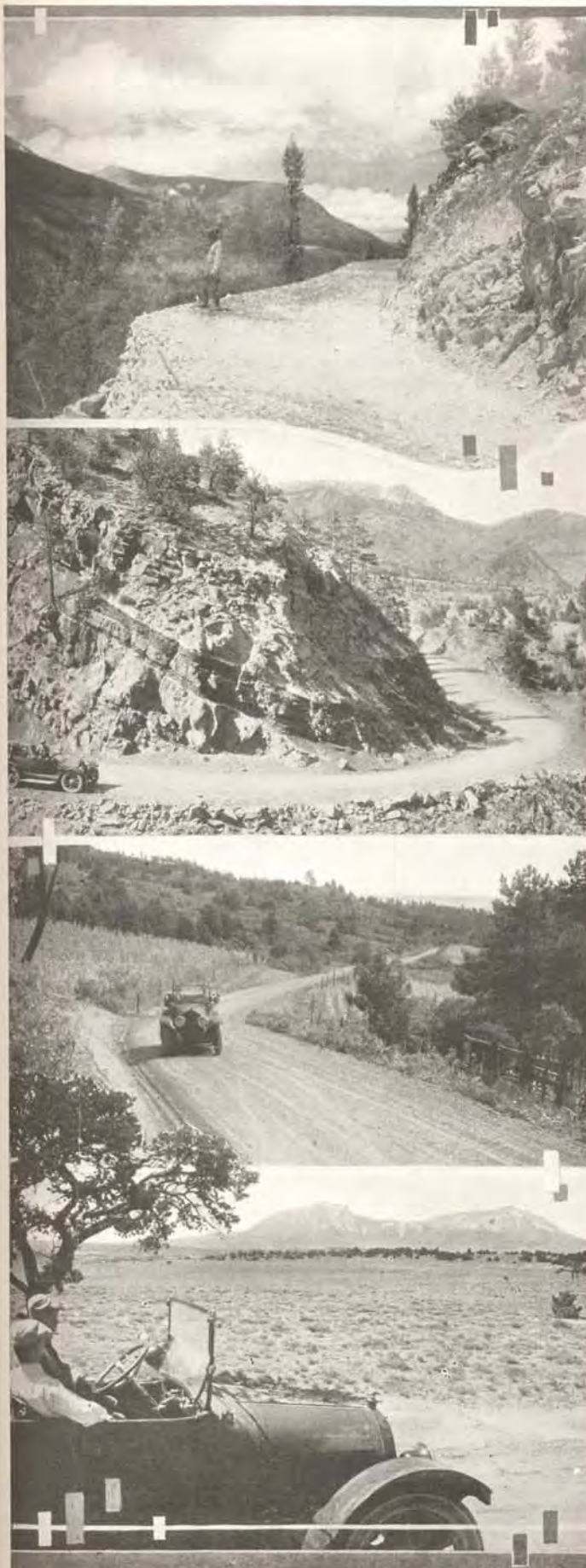
The county commissioners of the state are, without hesitation, meeting the emergency of higher costs and needed road improvement by increasing local road fund levies—in fact, these levies have increased the county road funds forty-five per cent., or more than \$800,000 in the past two years, making the county road funds this year approximately \$2,600,000.

Under the terms of the Bankhead bill Colorado's proportion, immediately available, according to the U. S. Bureau of Roads, is \$1,375,920.29; in 1920, \$1,648,384.71; in 1921, \$1,735,141.80, but in order to secure these funds the state must provide an equal amount each year. This includes Federal aid allotments under the former act. It is clearly evident that this cannot be done with the resources at hand. It seems to me that, if the state is offered this money for the improvement of its roads, every possible thing should be done to avail ourselves of the assistance from the government, if for no other reason than to provide labor employment and add to our business activities. We will, in addition, be getting many more miles of better roads, which will be a permanent asset to the whole state.

The legislature has before it for consideration several bills, that, if passed, will help materially in the acceptance of the Federal Aid appropriations. I refer to the transference of the Inheritance Tax fund, which now goes into the general fund, and I cannot conceive a better use for this tax than road building. Then there is the proposed increase in automobile and truck license fees. Our present fees are among the very lowest in the United States. I think that this fee should at least be doubled by placing it on a weight basis on automobiles: 25 cents per hundred weight up to 2,000 pounds; 40 cents on cars weighing from 2,100 pounds to 3,000 pounds; 50 cents on all cars weighing over 3,000 pounds; \$10 per ton capacity on trucks up to five tons and \$20 for each additional ton.

There is also the proposed gasoline tax of one cent per gallon, to be collected on gasoline used for propelling vehicles over our roads and streets. Other states are now considering such a tax. Under this tax our automobile tourists would contribute about \$50,000 to our road fund

(Continued on page 20.)



Top to bottom: Fall River road, Grand County; Dead Man's Canon, El Paso County; U. S. Forestry road, Jarr Canon, above Sedalia; Spanish Peaks, Huerfano County.

Hints for the Road Overseer

The modern road overseer, or patrolman, must be more than a good road builder; he must be a good judge of human nature, a diplomat, a patriot and have hard, common sense. A good road overseer is a mighty valuable man to his county and the state, and few people who meet him along the roadway realize that he is the hard-working faithful employe who does much to make their trip a pleasure.

The good road overseer will answer any and all questions courteously, no matter how foolish they are.

He will assist the traveling public, when in trouble, without charge. Most of those so helped appreciate the favor and may some day repay it with interest.

The good road overseer will see many people lose their tempers, but he will keep his under control. The man who keeps his temper is the man who comes out on top.

Machinery, tools or loads of material, not in actual use, will never be found on the right-of-way on this overseer's district. The gravel or stone used for maintenance will be found piled neatly at convenient places outside the ditch line. There will be no ridge of earth, sod or loose stone in the center of the road after he has dragged it.

The traveler will not see the road drag working on a hard, dry surface nor the planer or clay soil when the surface is wet and sticky in his district.

This overseer will drag the road just before the winter season, and again as the frost is leaving the ground in the spring. His last work in the fall and first in the spring will be that of cleaning inlets and outlets of all culverts and drains.

The good overseer will know the automobile laws and rules of the road. He will report violations to the proper officials, and report owners of cars carrying wrong number plates to the Secretary of State in Denver.

Attention to these and other apparently small details is what makes the difference between an excellent road and an ordinary road; between a valuable, efficient road overseer and an indifferent one. The good man takes a lively interest in the roads of his district; he is proud of them and their appearance.

Victory Loan Campaign

The State Council of Defense has sent the following rally call to all Liberty Loan workers to prepare for the Victory Loan:

To All County Chairmen and the Entire Organization of the Council of Defense:

Greetings:

During December and January just past, the United States Government spent \$2,000,000,000 a month.

We have probably passed the peak load in our national expenditures, as would seem to be indicated by returns available at the present writing.

The Congress now convening has appropriated more money, and the Government has contracted for expendi-

tures, exceeding the total expenses of the Government since President Washington took the oath of office.

This statement would almost stagger the imagination and may seem extravagant on the part of some persons not familiar with the subject.

Yet the war could have been won in no other way; and during the trying months of the past year, when President Wilson said, "Let's Go" and "Stint Until It Hurts," we applauded him and were carried by enthusiasm to points of sacrifice probably never experienced before by most of us.

All this inspiration is now gone, but the Government must still pay for the munitions, supplies and other equipment which was necessary in connection with our soldiery.

No one can estimate the number of lives and the amount of money saved by the quick termination of the war, brought about chiefly by the intelligent and decisive action of the U. S. Government on a large scale.

We have won the fight, now let's pay for it. Every member of the County and Community Organization is therefore urgently requested to get solidly behind the Liberty Loan organization for the purpose of securing our quota to this—the VICTORY LOAN—beginning about April the sixth.

The Four-Minute Men in Colorado will be thoroughly organized for this campaign. Get in touch with them immediately in your Community.

Yours very truly,

EXECUTIVE COMMITTEE,
STATE COUNCIL OF DEFENSE,

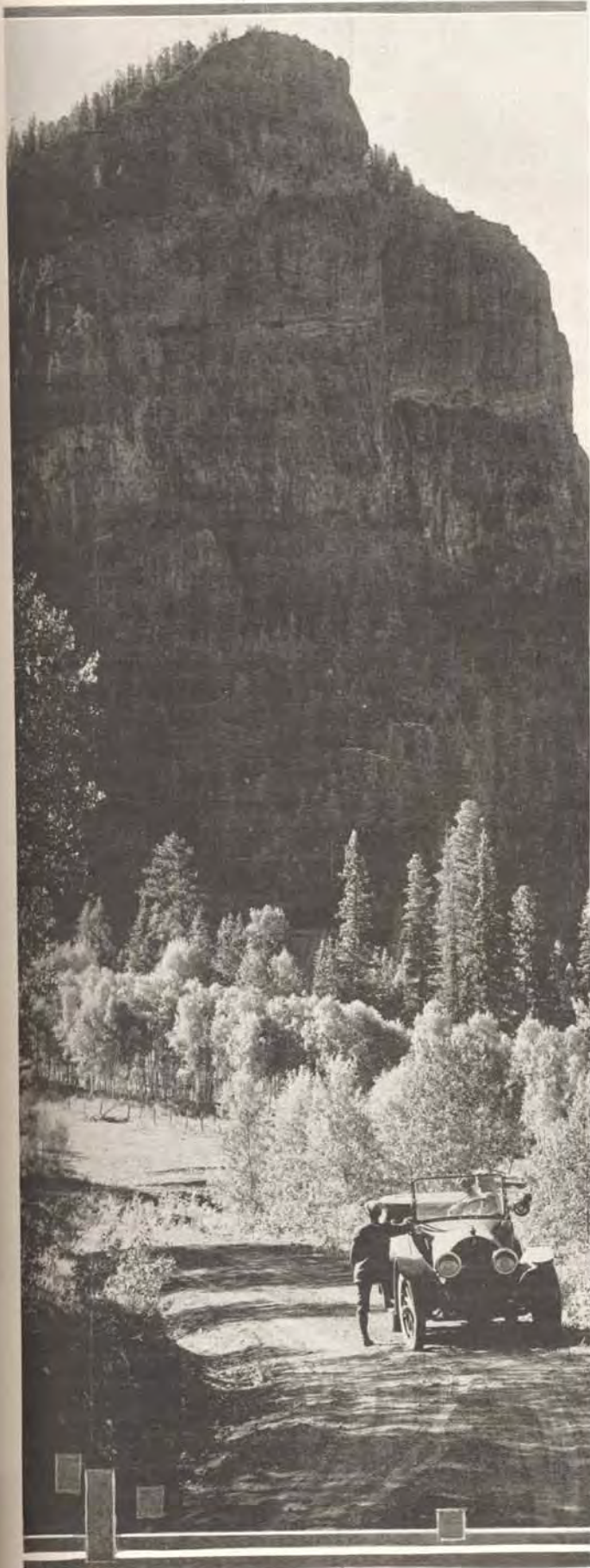
A. U. MAYFIELD, *Secretary*.

C. A. KENDRICK, *Chairman*.

A National Highway System

The information has reached this office that Senator Charles E. Townsend, of Michigan, announced his intention to introduce a new road bill, setting forth his ideas and outlining a comprehensive plan to place federal highway activities on a basis that will call for an interstate system, and definite direction of it through federal co-operation with the state highway departments. It was not expected that the bill will be taken up for serious consideration this session but, in view of the fact that Senator Townsend will probably be the next chairman of the senate committee on Post Offices and Post Roads, the announcement is significant. When this bill becomes available for discussion Colorado Highways readers will be given its contents.

"I believe that we ought to have a nationalized system of highways," said Senator Townsend. "I hope that before Congress expires we shall have before us a general scheme for building roads. But this appropriation (the Bankhead rider) is as wise an investment as we can make now. I hope the various state highway commissions will see to it that it is so expended that it will contribute to a national system. Let the states build the laterals, but let us have a system of highways extending through every state, east and west, north and south."



Indian Head, Wolf Creek Pass, Mineral County, from the entrance to the Pass. Thousands of these rugged headlands, scattered through Colorado.

State Pledged to Meet Federal Aid Funds

*Extract from a Letter, on the \$20,000,000 Road Bond
By Robert H. Higgins, to Legislative Committees
on Constitutional Amendments Issue.*

AT that time and during the years 1913 and 1914 the commission only had at its disposal one-half of the funds of the automobile licenses and the revenues from the Internal Improvement funds—all told, from all sources, the sum of between \$300,000 and \$400,000 per annum. This was ample, I considered, for the beginning. However, after one and one-half years' work of the commission, the people voted in 1914 election a direct tax of one-half mill for road purposes. The then Highway Commission agreed with several counties that they would return, through appropriations, an amount at least equal to the said counties, one-half mill tax. This agreement was faithfully kept throughout the years 1915-1916 and 1917, and, in my opinion, would have been continued until this very moment if it had not been that the Congress of 1916 made an appropriation for the improvement of Post Roads throughout the various states, and the Forestry Service of the federal government, the same year, appropriated an amount for road work in and through the Forest Reserves. Both of these appropriations were to be apportioned to the various states on the basis of the state meeting or matching the Federal Aid money dollar for dollar.

The people in those sections of the state where this federal money would help, asked and insisted that it be accepted by the Highway Commission.

I refer you to Session Laws of 1917, chapter 116, page 433, wherein the legislature pledged the faith of the state to provide funds to meet the Federal Aid Act of July 11, 1916.

The Commission, in accepting this Federal Aid money, added another obligation and use for the state road fund, and without any additional revenue accruing in 1918, they were unable in all cases to appropriate sufficient to all counties to cover their one-half mill levy as paid by the county. This caused some little dissatisfaction, and justly so, from a county standpoint. The year 1919 will be equally as bad in this respect and the years 1920 and 1921 will be worse if some of the legislation now pending is not passed and the revenue increased, as the Federal Aid money under the Post Road and Forest Reserve Acts increases each year and reaches the maximum of \$480 450 in 1921.

This Bankhead rider provides \$200,000,000 for road purposes. The money has to be accepted by the states within a limited time after notice has been received that it is available, and the proportion awarded a state and

(Continued on page 20.)



The Federal Aid Problem

The enactment of the Bankhead road bill, as a rider to the post office appropriation bill, is a victory for the cause of better roads far more important than the tangible results in road building that will follow the application of the money. It means that Congress at last has become interested in a good roads program, and the expenditure of this money will create a momentum that is bound to result in further and greater appropriations by Congress, as well as to encourage the state governments to vote bond issues. It means that a national highways system, linking the states, is about to commence, for good roads enthusiasts have been preparing for just such action, and an organization to promote a comprehensive national system has already been formed.

A national highways system will give direction to the better roads movement. It will permit the states to develop their cross-roads and laterals in conformity to a general scheme. It will bring to remote sections that great civilizer—the road. It will furnish labor to the unemployed. Road expenditures mean greater prosperity, for not only do they develop the country, and result in the economical handling of traffic, but the money is turned over and over, passing through many hands and keeping continually on the go. Unlike money tied up in the banks and working for a few, the dollar spent on better roads works for the entire community.

The appropriation of \$200,000,000 made by the Bankhead bill has certain limitation that might well be removed in the passage of further road appropriations by Congress, but it is a starter.

For instance, it says that the money must be expended on established post routes, and does not limit the expenditure to main routes, or through routes. It is not improbable that a good share will be spent on isolated routes. Very often a post road takes in a long detour through a sparsely settled district, and that only three or four miles of the route will follow a heavy traffic road. As a result the road used most heavily will benefit from the Bankhead bill funds only in spots, while a comparatively unimportant road may be developed far beyond its value economically. It seems to many better roads enthusiasts that greater value could have been secured for the money by permitting its use to connect stretches of heavy traffic roads lying between post roads, instead of leaving the total expense of eliminating these links to the states and counties.

Then, too, the Bankhead bill provides for a dollar-for-dollar expenditure by the states which benefit from the

Federal Aid. This is a very live question in the West where there is neither the population per square mile, the property value, nor the ability to pay on a 50-50 basis. The Colorado Highways Commission long ago suggested that these factors should be taken into consideration by the government in the distribution of Federal Aid moneys, and that states such as Colorado, New Mexico, Idaho, Utah, etc., should be allowed to put up only one dollar to the government's four dollars or five dollars. It is unjust to the sparsely settled and younger states to have to compete with rich and heavily settled districts such as those of New York and Pennsylvania, and to compete on the same basis.

However, unless an amendment can be put through at the next session of Congress the western states will have to accept conditions as they are, and hope for better terms.

The problem of meeting the Federal Aid appropriations is a serious one and makes it imperative that the legislature provide adequate funds for this purpose if the state is to benefit from Federal Aid.

Plain Arithmetic

There are 42,000 miles of public roads in Colorado; 35,000 miles of which are county and 7,000 miles state roads, representing a value of of \$42,000,000. The rights-of-way of these roads amount to 315,000 acres, and are worth, at a low valuation, \$10 per acre, or \$3,150,000. This brings the total value for road property to \$45,150,000. There are 85,000 autos and trucks in operation over these highways which, added to other vehicles, will represent, conservatively, a value of \$85,000,000, the operation of which cost \$40,000,000.

For the care and development of this magnificent property, owned by the people, over which they operate \$85,000,000 worth of equipment, we have available from all sources, county and state, about \$90 per mile to maintain the whole system and do all construction work, or a total of \$3,750,000, while \$40,000,000 are being spent annually in gasoline, oil, tire repairs, etc.

If a corporation owned an estate of 315,000 acres of land with \$42,000,000 invested in improvements, over which \$85,000,000 worth of vehicles were operating at a cost of \$40,000,000 per annum, and the traffic could be increased twenty per cent., with a reduced operating cost of ten per cent., would the directors hesitate to issue \$20,000,000 bonds and make ample provision from the millions of profits involved for maintenance and improvement?

Tree Planting Along Concrete Highways

By S. R. DeBoer, Landscape Architect for the City of Denver



Specimen trees should be left standing.

Tree planting is a matter of foresight; it is constructive work of which the next generation will probably derive greater benefits than those doing it. We have all met the man who did not want to plant trees because he would be dead before the trees would mature and get commercial value. That same man all wrapped up in his financial calculations failed to see what his ranch or his town or even his county would be if his father and other fathers had taken the same point of view. It is said that

the old Friesian people, an old tribe of farming people living in the low lands around the North Sea and the Zuidersee, in the middle ages used to build their houses and barns mainly of oak wood. They calculated that these buildings should last a hundred years, and they planted groves of young oaks to take the place of the trees which had been cut, the wood of which was to be used for repairing and rebuilding the buildings a hundred years hence. Even at the present time many farms over there are said to have groves of oak trees planted for that purpose.

We are not using as much consideration for future generations as all that any more. We are living so fast and so much in the present that we nearly never stop to think whether our children might possibly pass judgment on us for having failed to provide in some matters of this kind. For much as we hate to think of it there will be generations after us and others after them again, and so on forever.

But even if tree planting is largely a matter of foresight this does not necessarily mean that we are too old and worn to enjoy a great deal of the benefits ourselves. For tree growth is not so slow but what in ten or a dozen years trees of considerable size can be grown, specially in the faster-growing varieties. And in a score of years one can realize what an avenue of trees may develop into.

As long as our state was still in the period of dirt roads, there seemed little advantage of tree planting along them, for the shade of the trees would keep the road wet and soft and often impassable. On these roads tree planting could only be done to advantage on the North and West sides of the roads. But we are gradually outgrowing the dirt roads and hard surface roads are already built in some places and in sight for a great many others.

And it seems that more than at any time during the development of our state, this is the right time to follow up the building of a permanent and hard roadbed by the

planting of permanent rows of shade trees. And specially along the gray lines of concrete highways where the sun rays reflect their heat stronger than on any other road surface, no time should be lost in planting the young trees necessary for this purpose.

The general county road is 60 feet wide between property lines and the concrete roadways now being built are 18 to 20 feet in width. Taking the latter width as a maximum and allowing for a 10-foot macadam road on either side of it to take care of horse drawn traffic and heavy trucks which may be too heavy for the concrete surface, we would get a roadway of 40 feet width in all. Trees should not be closer to this roadway than 3 feet. According to this the minimum distance of the tree line from the center of the road should be 23 feet. This a minimum. Trees can be planted closer to the property lines without any disadvantage should conditions make this advisable.

No problem in regard to tree planting of this kind seems as serious as the one of irrigating the trees planted.



Tree borders, correctly planted, add immeasurably to the attraction of hard-surfaced roads. On the concrete road to Golden.

But if we think of the hundreds of miles of canals and ditches we have already built in this state, of the change which has been wrought in the land which once was part of the great American desert, the problem of irrigating a few lines of trees need not worry us.

Tree planting should begin in the sections where the

farm lands along the road are irrigated. In most of these sections it is possible to divert water from farm ditches to the trees along the road. The trees would mean a great deal to the people living along the road and in many cases they would take enough pride in them to take care of the irrigation of the trees.

On places where the road runs over narrow fills or through deep cuts, it should become the duty of the Highway engineer to make the roadbed wide enough to include room for the trees. For long dry hills water can be pumped from the creeks or from wells in the valleys and piped to the top of the hill. As a rule a galvanized iron pipe of 1½-in. diameter will be ample to irrigate the trees. Intake places on the creeks or at wells can be built with either stationary or portable engines and pumps. Where long distances are planted in trees and the hills to which water has to be pumped are numerous it might prove possible to have a good powerful pumping outfit move from one place to the other.

Until the time that tree planting along our roads is recognized as a necessity this latter method of irrigation may be found rather expensive. There is, however, no reason why such hills should not be left unplanted temporarily if not permanently. The charm of a road is often in the change of light and shade. After following a shady line of trees for several miles a sunny hill would become a pleasant change.

The kind of trees to be used for this planting on a large scale, should be a matter of careful study. Soil and drainage as well as irrigation conditions should be considered in this. The distance apart will depend on the variety again. As a general rule distances should be rather more than absolutely necessary. The cottonwoods on Grandview avenue in Arvada are from 45 to 50 feet apart and the West does not have a more attractive street than this one. Of course part of the attraction of this street is the view of the range.

And this takes us to the tree I should like to put at the head of my list of available tree varieties.

The native cottonwood. Sturdy as an oak, free from disease and insect pests, the pioneer of our trees. And we can plant the staminate tree to escape the cotton. But cotton and all, it is the best tree Colorado has grown thus far.

The American elm. No tree will stand more abuse than this variety. However, it is becoming subject to insect pests. English, Scotch and Cork elms are also valuable for highway planting.

Honey locust. This tree is well adapted to dry situations with a sandy soil. The tree is free from insect pests in Denver, where it is considered one of the best trees.

Hackberry. The Western hackberry is hardy here, but care must be used that Northern, or still better, home-grown stock is used. Dishonest tree agents will also bring the Mississippi hackberry into our state. This tree grows in Texas and at first sight looks like a valuable tree, but it is not hardy here, winterkilling every winter.

Green ash. Where the borers are not working in this



This magnificent line of cottonwoods has been planted along a dirt road, too close to the roadway, two bad points.

tree it is a useful variety. It should, however, not be planted in orchard sections where the oyster shell scale is found.

Oaks. Red, pin, and bur oak are very valuable for highway planting. Though the hardest one to transplant the Bur oak is the hardiest one of the three. Home-grown stock is preferable for all trees, but specially for oaks and other hardwood trees. There is no reason whatever that Colorado has to depend on other states for its trees and then get second grade, unacclimated stock. Colorado should have more tree nurseries and grow its own stock.

Maples. Soft maple can be used where scale insects do not bother it. Sugar maple and Norway maple should be used in sheltered locations only.

Poplars. Silver poplar is of great value for this work. Carolina poplar is no good. Lombard, black and Canadian poplar can be used occasionally.

Sycamores. In low ground locations this tree might prove successful.

This is by no means a full list of all the shade trees that can be grown in our state; Colorado does not lack in tree varieties even if our list is not as long as those of other states.

In hilly sections, like near Palmer Lake on the Colorado Springs road, it is quite well possible to use evergreen trees, pine and spruce. In such locations line planting will become difficult, but trees can be grouped, planting groups of from six to twelve in a group in places where conditions are favorable.

General maintenance of these trees should be taken care of from the public funds, be they government, state,

(Continued on page 20.)

Provisions of the Bankhead Federal Aid Act

How the \$209,000,000 Road Appropriation Will be Handled

FOR the information of readers of Colorado Highways the full text of the Bankhead bill, passed as a rider to the post office appropriation bill, is given below. It will be observed that the bill carrying an appropriation of \$9,000,000 is made for the construction of roads and trails in the national forests, under direction of the Secretary of Agriculture. Of this \$3,000,000 is available immediately, \$3,000,000 becomes available in 1920 and \$3,000,000 becomes available in 1921. This appropriation is in addition to the \$200,000 appropriation for federal aid on post routes.

The sections bearing upon the road appropriations are as follows:

"Sec. 5. That the act entitled 'An Act to provide that the United States shall aid the states in the construction of rural post roads, and for other purposes,' approved July 11, 1916, is hereby amended to provide that the term 'rural post roads' as used in section 2 of said act, shall be construed to mean any public road a major portion of which is now used or can be used, or forms a connecting link not to exceed 10 miles in length of any road or roads now or hereafter used for the transportation of the United States mails, excluding every street and road in a place having a population, as shown by the latest available Federal census, of 2,500 or more, except that portion of any such street or road along which the houses average more than 200 feet apart: PROVIDED, That Section 6 of said act be further amended so that the limitation of payments not to exceed \$10,000 per mile, exclusive of the cost of bridges of more than 20 feet clear span, which the Secretary of Agriculture may make, be, and the same is, increased to \$20,000 per mile.

"Sec. 6. That for the purpose of carrying out the provisions of said act, as herein amended, there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the following additional sums: The sum of \$50,000,000 for the fiscal year ending June 30, 1919, and available immediately; the sum of \$75,000,000 for the fiscal year ending June 30, 1920; and the sum of \$75,000,000 for the fiscal year ending June 30, 1921; said additional sums to be expended in accordance with the provisions of said act; PROVIDED, That where the constitution of any state prohibits the same from engaging upon internal improvements, or from contracting public debts for extraordinary purposes in an amount sufficient to meet the monetary requirements of the Act of July 11, 1916, or any act amendatory thereof, or restricts annual tax levies for the purpose of constructing and improving roads and bridges, and where a constitutional alteration or amendment to overcome either or all of such prohibitions must be submitted to a referendum at a general election, the sum to which such state is entitled under

the method of apportionment provided in the act of July 11, 1916, or any act amendatory thereof, shall be withdrawn by the Secretary of the Treasury from the principal fund appropriated by the act of July 11, 1916, or any act amendatory thereof, upon receipt of the certification of the governor of such state to the existence of either or all of said prohibitions, and such sum shall be carried by the Secretary of the Treasury as a separate fund for future disbursement as hereinafter provided; PROVIDED FURTHER, That when, by referendum, the constitutional alterations or amendments necessary to the enjoyment of the sum so withdrawn have been approved and ratified by any state, the Secretary of the Treasury, upon receipt of certification from the governor of such state to such effect, shall immediately make available to such state, for the purposes set forth in the act of July 11, 1916, or any act amendatory thereof, the sum withdrawn as hereinbefore provided; PROVIDED FURTHER, That nothing herein shall be deemed to prevent any state from receiving such portion of said principal sum as is available under its existing constitution and laws; PROVIDED FURTHER, That in the expenditure of this fund for labor preference shall be given, other conditions being equal, to honorably discharged soldiers, sailors and marines, but any other preference or discrimination among citizens of the United States in connection with the expenditure of this appropriation is hereby declared to be unlawful.

"Sec. 7. That the Secretary of War be, and he is hereby authorized in his discretion to transfer to the Secretary of Agriculture all available war material, equipment, and supplies not needed for the purposes of the War Department, but suitable for use in the improvement of highways, and that the same be distributed among the highway departments of the several states to be used on roads constructed in whole or in part by Federal Aid, such distribution to be made upon a value basis of distribution the same as provided by the Federal Aid road act, approved July 11, 1916; PROVIDED, That the Secretary of Agriculture, at his discretion, may reserve from such distribution not to exceed 10 per cent of such material, equipment, and supplies for use in the construction of national forest roads or other roads constructed under his direct supervision.

"Sec. 8. That there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, for the fiscal year ending June 30, 1919, the sum of \$3,000,000, for the fiscal year ending June 30, 1920 the sum of \$3,000,000, and for the fiscal year ending June 30, 1921, the sum of \$3,000,000, available until expended by the Secretary of Agriculture in co-operation with the

(Continued on page 20.)

Regulation of the Speed, Weight, Width and Height of Motor Trucks

By *George M. Graham, Chairman, Motor Truck Committee,
National Automobile Chamber of Commerce.**

I ask your consideration for my client, the motor truck. He is charged with wreaking untold damage upon the highways. He has cracked open the surface; he has made deep ruts; he has made holes into which the rains have beaten—and collapse has followed. This is the bad side.

But there are extenuating circumstances. It is admitted that he has done notable things for the country, performing almost incredible service in speeding up our war program. He has brought the manufacturer nearer his market, the farmer nearer the consumer, the finished war product nearer the shipping point. He has facilitated the rapid filling of orders, brought in raw materials, supplied the equivalent of man power, rendered less serious the shortage of horses and filled gaps occasioned by the deficiency in labor, material and transportation. The motor truck has been doing railroad work on short hauls, and public utilities companies would operate under a serious handicap but for his assistance. This is what my client has done on the good side.

But there are those who would banish him because he has damaged roads that were never suited to his use. He has not offended maliciously; his misdeeds have proceeded from the fact that he has height, width, weight and speed—particularly weight and speed. We admit that he has these attributes; he could not very well get along without them. But in spite of the trouble in which they have involved him, we believe that this is an ideal time to define his place and to ask justice in his behalf.

We believe that the truck has been as much sinned against as sinning, for out of 2,500,000 miles of highways in the country, not over 10% are improved and many of these are of the most mediocre quality. The unfitness of the road has not only resulted in damage to the highways, but has also militated against the efficiency of the truck.

Tests made by the California State Automobile Association show that it takes a pull of 218 lbs. to draw a 1-ton load on an earth road, and that this pull becomes less on better surfaces until it is reduced to 27.6 lbs. on the surface offering the least resistance. A Detroit manufacturer found that a 2-ton truck could make 16.4 miles per hour on improved roads, 9.5 miles on roads of medium type and 4.6 miles on dirt roads. In other words, the truck made 257% better time on highly improved roads than on dirt roads.

There are three main parties in the controversy with respect to motor trucks and their relation to highways. First, there are extremists who argue that all the truck has achieved does not compensate for the damage it has done to the highways. They would legislate it from the roads and ignore the blessings of a new transportation system that has taken its place with railroads and steamships. The second party comprises those who defend the motor truck, who are willing that it should bear a proper financial penalty for the damage it does and who are willing to compromise on the question of weight and speed. Between these is a third class which stands for compromise. These concede the place of the truck and believe

that adequate roads should be built for it, but they insist that until better roads are obtained the present highways must be protected even if it necessitates imposing restrictions on trucks.

My presentation will be directed to drawing into the closest possible accord these three viewpoints. As a basic proposition we beg to submit that the highway should be the servant of transportation, not its master. The truck has proved its adaptability to modern transportation problems, and civilization will lose unless means be found for its expanding application. If the roads are not adequate to heavy truck traffic they must be made so, for the truck has too great possibilities to be sidetracked for temporary considerations. Those who admit no place for the truck stand opposed to the spirit of the times.

Those legislators who vote against trucks, feeling that they are serving the interest of the farmer, should be reminded that actually they are working against the farmer's pocketbook, for it is a fact that the haulage of farm products by motor truck is cheaper than by team. This statement is supported by authoritative figures from the Department of Agriculture, showing that in 1918 the estimated costs of shipping wheat, corn and cotton from the farms to the shipping points were respectively 30 ct. by team and 15 ct. by truck, 33 ct. by team and 15 ct. by truck, and 48 ct. by team and 18 ct. by truck. Motor truck costs are now lower than were wagon costs in 1906.

For those who ask that trucks be not permitted to ruin the present roads before money, labor and material can be obtained for the building of new ones, we have only the highest respect. We feel sure that they will be our allies against unfair legislation, and we meet them in a spirit of co-operation. As manufacturers we know that we must build trucks that will do the least harm to the present roads.

The foremost men of the industry have given close thought to the matter of dimensions. Compromises and adjustments have been made and we are in agreement on a bill which we would like to see enacted by all of the legislatures. We wish to propose a combination of necessary fundamentals, equitable legislation, efficient administration and proper construction, and it is necessary to give the subject consideration at once. Despite poor roads and discouragement by state authorities, long distance motor haulage has been established all over the country. It is entirely possible that after the war the short-line railroad will be a thing of the past, not only because the truck can take care of short-haul business in less time and at a reduced rate, but because it saves labor and time by delivering goods at the consignee's door.

I should like to raise the question of how far trucks are responsible for the present damaged condition of the roads. Are they justly accused in this respect?

It is conceded that the roads were never in worse shape, but is this up to the trucks? Is it not rather the penalty for the lack of repairs? A leading road expert has said that during the past two years the roads have not suffered more damage than heretofore, but because of labor shortages and embargoes on material it has been impossible to make repairs. In our investigation we have found the opinion almost general that most of the damage is done in the spring. The condition of the road at that time is such that the impact of a vehicle results in more damage than could be inflicted in all of the other months put

*Abstract of a paper presented at a joint session at the fourth annual meeting of the American Association of State Highway Officials, and the annual meeting of the Highway Industries Association, Chicago, Ill., Dec. 2-6, 1918.

together. In our bill we have proposed a remedy for this in the shape of an embargo by which the local highway authorities can close any road, for not over 45 days in any one year, to a vehicle weighing more than 10,000 lbs.

Height and width are not the major problems with which we must deal; they can be speedily eliminated. The prevention of projecting loads does not concern the manufacturer, but is a matter for local regulation. We have fixed 12 ft. 6 in. as the greatest distance between the road and the top of the body, and 96 in. as the greatest width of body.

Weight and speed are the most difficult to contend with. The truck constantly grows in weight and if unrestrained will grow faster. We do not deny that the heavy truck running on solid tires at a high rate of speed does damage to the road, but it should not be forgotten that both its weight and speed serve a highly practical purpose. The cost of carrying the load decreases in proportion to the number of tons carried.

As a general rule the cost of operation in relation to carrying capacity decreases as the size of the truck increases. There are four reasons for this, as follows: (1) The cost of manufacture of a truck does not increase in proportion to the carrying capacity; (2) the so-called fixed charge, or overhead of operation, does not increase in proportion to the carrying capacity; (3) the actual operation cost does not increase in proportion to the carrying capacity, and (4) the weight of the truck itself does not increase in proportion to the carrying capacity.

From an economic standpoint this is a most important consideration, for truck owners have the right to operate their trucks to the maximum of economy and efficiency. They should be permitted to operate the heaviest possible trucks necessitated by their haulage problems, and roads should be made equal to the burden as speedily as possible. To take any other position is to work against an increasing army of motor truck users. Our plan for uniform truck laws calls for permission to operate a vehicle whose gross load is 28,000 lbs., but it provides that a highway commissioner may reduce this limit to 24,000 lbs. when it can be shown that a road will not stand a greater weight. It is also provided that the limit can be raised where highly improved roads make it possible. The plan also provides for license fees, maximum speeds in different sections, maximum weights and a fixed load per inch width of tire.

The load per inch width of tire has been fixed at 800 lbs. for all vehicles, whether equipped with steel or pneumatic tires. For vehicles weighing less than 6,000 lbs. gross, including vehicle and load—in other words passenger cars or light commercial cars—the maximum speed in open country is fixed at 30 miles per hour, with the proviso that this limit may be exceeded for $\frac{1}{4}$ mile in order to permit one vehicle to pass another. The maximum speed in suburban sections, villages and towns is fixed at 20 miles per hour, and in closely built parts of cities and towns at 15 miles per hour. The speed limit for pneumatic tired vehicles of from 6,000 to 28,000 lbs. gross weight, is fixed at 25 miles per hour in open country, 20 miles in suburban sections and 15 miles in congested sections.

Trucks equipped with solid tires and having a gross weight of from 4,000 to 28,000 lbs. are limited to 12 miles an hour in congested sections and in suburban sections to 15 miles per hour, except the 8,000-lb. vehicle for which the maximum is fixed at 18 miles and the 4,000-lb. vehicle for which the limit is placed at 20 miles. In the open country the following limits are fixed; 4,000-lb. vehicles, 25 miles; 8,000-lb., 20 miles; 12,000-lb., 18 miles; 16,000-lb., 16 miles; over 16,000-lb., 15 miles.

Motor vehicles used for carrying passengers for hire are divided into three classes—those of less than 6,000 lbs., 6,000 to 7,000 lbs., and 7,000 to 8,000 lbs. The first are limited to speeds of 30, 20 and 15 miles per hour according to section; the second to 30, 20 and 12 miles, and the third to 25, 20 and 12 miles.

In the case of trailers with solid rubber or pneumatic tires the speed permitted is the same as that fixed for the propelling vehicle.



Mary has a little lamb, with fleece as black as ink, The roads were good and that is why she has him—so I think. Miss Marietta Fry at the Denver Stock Show.

The motor truck is highly economical in its consumption of steel as compared to its carrying capacity. The steel required for the average railroad freight car is 25 tons, while a 2-ton motor truck requires $1\frac{1}{2}$ tons. The ton-mileage of a freight car per day is 800, 40 tons being the average load and 20 miles being the average mileage. An easy average for the 2-ton truck is 200 ton-miles, based on a 2-ton load and 100 miles per day. Therefore, four 2-ton trucks can do more work per day than one freight car. Building 50,000 steel freight cars and 1,250 locomotives to draw them requires 1,437,000 tons of steel. Only 300,000 tons of steel are necessary to build 200,000 2-ton trucks capable of doing the same amount of work as the freight cars and locomotives. This is a saving of 1,137,000 tons of steel. From the standpoint of national wealth and prosperity, does not this saving, plus the saving of time in favor of the motor truck, make insignificant the cost of repairing the damage to the roads?

As a temporary measure the ideal plan would seem to be the building of improved roads on the shortest routes between important centers and then the protection of these roads from washouts, cave-ins and the obstructions caused by snow and ice. Traffic should be temporarily centralized on such designated routes, so far as possible, thereby eliminating the necessity of sending trucks over side roads before they have been properly rebuilt.

There are three principal methods of financing by which may be obtained roads that will afford the truck its full opportunity of service. The first is direct taxation by the state. The second is enlarged federal aid based on the probability that the end of the war will see the Government owning a large number of trucks that will be applied to peace uses. Finally, there never was so great a warrant for bond issues as now.

Some Highway Bill Recommendations

(Continued from page 11.)

this year. The needs of the state road fund are so great that I believe that this bill should be passed as an emergency measure.

As State Highway Commissioner (and my term will have expired before any bonds can be sold) and as a citizen taxpayer of Colorado, I am heartily in favor of a \$20,000,000 bond issue. I believe the people will be amply justified in voting this issue from a strictly business point of view, and as a gilt-edged investment, which will yield them greater profits than the steel or packing industries have paid.

State Pledged to Meet Federal Aid Funds

(Continued from page 13.)

not accepted within the limit, is divided up among the states that accept their original allotment. The Highway Commission has made their appropriations to the various counties and accepted the Federal Aid money on Post Roads and Forest Reserves for the year 1919, and has less than \$10,000 on hand in the contingent or emergency fund. If we are to progress in our road building some more revenue must be provided.

Tree Planting Along Concrete Highways

(Continued from page 16.)

county or city. But, as already pointed out, many citizens along the road will take a pride in taking care of the trees in front of their property, specially in irrigating them. This will save considerable expense, but should not lead to the state or county releasing all responsibility for such trees. The whole tree line should be under continual supervision, specially in the summer, by one responsible man. Pruning will occasionally be necessary, but after the young trees are started one pruning every three years should be sufficient.

There is no more fitting memorial to our dead boys in France than two living lines of green foliage. Trees planted along the Denver-Golden road, to name only one example, in memory of those who left the two counties through which the road runs, never to return, would still be the talk of the country in long years hence, maybe in years when people speak about wars as things of the past.

Probably the West had no greater tree lover than former Mayor Speer. Miles and miles of boulevard trees stand there as silent witnesses of the vision of Denver's great mayor. Once he dreamt of a great highway planted with trees, to connect Denver with the Platte Canon, and he proposed to name it after one of the state's wealthiest men, if the latter would donate the forty thousand dollars necessary to plant the trees. The proposal was refused. The man has been dead for several years already,

lawyers and courts have wrangled over his estate. There probably is somewhere a sumptuous piece of granite in a cemetery to which no man cares to lift his eyes. Think of the chance this man missed, think of the blessings that would have gone up daily, had he put a measly few dollars, for to him the sum was small, into a line of living foliage tying Denver with the Platte Canon mountains.

Provisions of the Bankhead Federal Aid Act

(Continued from page 17.)

proper officials of the state, territory, insular possession, or county, in the survey, construction and maintenance of roads and trails within or partly within the national forests, when necessary for the use and development of resources of the same or desirable for the proper administration, protection and improvement of any such forest. Out of the sums so appropriated the Secretary of Agriculture may, without the co-operation of such officials, survey, construct, and maintain any road or trail within a national forest which he finds necessary for the proper administration, protection and improvement of such forest, or which in his opinion is of national importance. In the expenditure of this fund for labor preference shall be given, other conditions being equal, to honorably discharged soldiers, sailors and marines."

D. C. D. Route Honored

Representatives from forty-five states, representing the transcontinental highways associations of the nation, met in Kansas City on January 21, and organized the Associated Highways of America. This is the national organization that was discussed at the Chicago meeting in December. The main purpose of the Associated Highways of America will be to urge upon Congress the wisdom of the establishment of national highways, of their construction and maintenance by the Federal Government.

D. J. Young, president of the D. C. D. highway, in which Colorado is vitally interested, and W. A. Palmer, secretary and general manager, attended the Kansas City meeting and both were made members of the board of directors of the national association. President Young was named as one of the four additional members of the executive committee which, together with the president, secretary and treasurer will form the general executive committee.

The recognition given to the D. C. D. route at this meeting was very gratifying to the people all along the route, as it gives this route rank as one of the great highways of the nation.

As soon as the weather permits Ed O'Neill, contractor who has worked on the Rifle to Meeker road, will put on a full force and rush the road through to completion this season. The force on the road worked throughout most of the winter season.

The Blue Lodge of Colorado Road Builders

The Story of a Retiring State Highway Commissioner

THE past month saw the retirement from the Colorado State Highway Commission of Mr. Leonard E. Curtis of Colorado Springs, representing Road District No. 2 on the commission. This district includes the counties of Lake, Chaffee, Park, Teller, Elbert, El Paso, Lincoln, Kit Carson, Cheyenne and part of Douglas county. Governor Shoup appointed in his place Mr. E. E. of experience with commercial and good roads associations in connection with the subject of better roads.

Mr. Curtis was brought up on an Illinois farm, near Galesburg, so that the importance of good roads was early impressed upon him, and he never forgot to urge them on every occasion. He was graduated from Yale Academy in 1872, and from the law school two years afterward.

Most of the subject's Nichols of Manitou, one of the prominent citizens of El Paso county and a good roads advocate, who, as a hotel man, has made himself thoroughly familiar with their value to the state.

Mr. Curtis, during his term, endeared himself to the other members of the commission by his qualities of fairness, courtesy and foresight, as well as bringing to his work many years legal practice took place in New York City where he practiced law from 1874 until 1896. He rose to the top of his profession and, among other important cases with which he was connected, had charge of the Westinghouse side of the great patent dispute between that company and the General Electric Company that lasted sixteen years.

In 1896 Mr. Curtis' health failed and he came to Colorado to recuperate. He went to Colorado Springs and has resided there continuously since that time. At first he took up his profession in the Springs, but soon saw the opportunity in the young state for electrical development. The firm of Curtis and Hine was formed and reorganized the electric light and gas company at Colorado Springs and rebuilt the plant.

With the backing of banking interests friendly to the company Mr. Curtis financed and built the water power plant on the Animas river for Silverton and Durango, as well as a large Mexican power plant and the Central Colorado Power Plant. The latter involved an investment of approximately \$10,000,000.

Mr. Curtis became interested in the good roads movement actively more than fifteen years ago. He was president of the State Good Roads association the year the State Highway Commission was organized, was president of the Colorado Springs Automobile club for seven years and chairman of the committee on streets and highways of the Colorado Springs Chamber of Commerce, which did much toward promoting the good roads movement in the state.

Mr. Curtis did a great amount of work on the present state highway law. Although a Republican he was appointed a member of the commission by Governor E. M. Ammons, a Democrat, and was reappointed by another Democrat, Governor J. C. Gunter.

Mr. Curtis has always favored more liberal expenditures for roads and has written and done considerable public speaking in

advocacy of this policy. He believes that the present time is the psychological time for making this policy effective and is a supporter of the proposed bond issue plan for constructing a greater and better system of roads in Colorado.



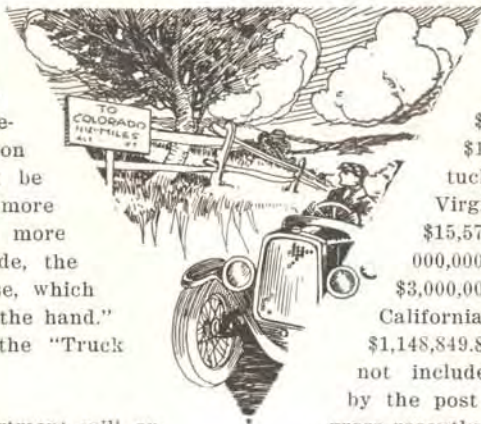
Mr. Leonard E. Curtis of Colorado Springs, retiring member of the State Highway Commission from District No. 2.

Testimonial to Charles R. McLean

A recent issue of the Daily Record of Canon City contained a very unique testimonial to Charles R. McLain, whose years of unremitting service in the interest of good roads were recognized by the chamber of commerce of Canon City. A set of engrossed resolutions was presented to Mr. McLain by the chamber, in which appreciation of his work was expressed. It was a most unusual recognition of public work.

Sign Posts Along The National Highway

THE movement in several states to restrict motor trucks is by no means original with this age. Two hundred years ago the town authorities of Boston were compelled to adopt an order to restrict the "cussedness" of the famous Boston teamsters as follows: "Trucks shall not be more than 18 feet long, may employ not more than two horses in one team, carry no more than one ton, have tires four inches wide, the driver to go at the head of the thill horse, which he must govern by a halter to be held in the hand." The law was efficacious, and this was the "Truck Law of 1720"



"Definite estimates" announced by the Department of Agriculture for road building this season are given in detail as follows: Maine, \$1,500,000; Rhode Island, \$90,000; Connecticut, \$4,000,000; New York, \$12,000,000; New Hampshire, \$175,000; Kentucky, \$1,500,000; Alabama, \$1,000,000; West Virginia, \$16,000,000; Illinois, \$9,000,000; Iowa, \$15,574,000; Louisiana, \$4,674,000; Texas, \$20,000,000; Nebraska, \$1,657,089.07; North Dakota, \$3,000,000; Wyoming, \$653,000; Colorado, \$3,900,000; California, \$20,000,000; Arizona, \$900,000; Nevada, \$1,148,849.80; Idaho, \$1,000,000. The estimates do not include the \$200,000,000 expenditure authorized by the post office appropriation bill by action of Congress recently.

The Connecticut State Highway Department will expend approximately \$4,000,000 during 1919, according to State Highway Commissioner C. J. Bennett. This will be an approximate increase of 20 per cent over the ordinary expenditure of the department.

There is now available for road construction in Mississippi approximately \$3,000,000, according to State Highway Engineer Xavier A. Kramer. About half of this fund was held over from last year because of scarcity of labor and high prices. It is expected that the entire fund will be spent this year.

County appropriations in Oklahoma for 1919 will amount to about \$3,000,000 to \$4,000,000, according to State Engineer Max L. Cunningham, while the amount to be handled by the state will depend upon the action of the legislature.

Pennsylvania now has sixty-nine projects for road improvement under contract located in thirty-three counties, the amount of money covering the contracts totaling \$5,407,678.77, with a mileage total of 150.52. Federal aid amounts to \$567,360, but this will be applied toward the contracts. Local appropriations plus federal aid total \$2,356,929.01, making the net cost to the state for road improvement \$3,050,749.76. This illustrates the value of meeting federal aid and county appropriations. Types of construction are reinforced and plain concrete, brick water-bound macadam, bituminous concrete, asphaltic block, bituminous macadam.

South Carolina road enthusiasts are to be congratulated for their foresightedness. Although a bond issue cannot be voted in that state until 1920 the legislature has been asked to authorize additional license fees on automobiles, based on a horse power rating. These funds are to be used in preliminary work of plans, surveys and other preparation. Altogether it is planned to build 1,060 miles of hard surface roads and 500 miles of sand and clay roads to connect with every county seat not on main lines.

A recent issue of the American Motorist, published in Washington, D. C., contains a glowing description of the Phantom Canon highway, once the roadbed of the old Florence and Cripple Creek Shortline. Not only is it praised for its magnificent scenic qualities but because of its relation to industrial districts and the historical associations with Cripple Creek, the world's greatest mining camp.

The State of California, which has voted \$33,000,000 for the construction of a highway system totaling approximately 3,000 miles, needs another bond issue of \$10,000,000 to complete the system and build subsidiary roads that the various counties demand. The new bond issue question is now being agitated, although the state highway commission has spent \$23,000,000 from the bonds sold and still has some \$7,000,000 worth of bonds unsold. The first California bond issue was in 1909-1910 for \$18,000,000; the second issue was in 1915-1916 and provided for \$12,000,000 for continuation of work on the system and \$3,000,000 to be spent on a state-counties co-operative basis for important routes.

The Arizona Highway commission, which met recently in Phoenix, passed a resolution calling upon the legislature to submit a bond issue for \$30,000,000 to build a comprehensive system of roads for commercial and other demands, the election to be called especially for this purpose.

The Oregon legislature is humming with road bills this session, chief among the measures up for consideration being a proposition for the submission of a \$10,000,000 bond issue. As the bond limit of the state is \$18,000,000, and there are some \$7,500,000 bonds outstanding, this would be the maximum issue possible to secure.

Among the most important plans suggested are: completion of the Pacific Highway and the Columbia River Highway; a loop around Tillamook; a road from Roseburg to Coos Bay; one from Eugene part way to the Coast; construction of part of the John Day Highway, and opening of the North and South route through central Oregon. A complete readjustment of license fees, imposition of a gasoline tax, a classification of roads to carry heavy traffic, under five-ton trucks, water board macadam and common dirt or gravel roads are suggested. One bill makes it a penitentiary offense to lay a patented road in Oregon.

The State Road Commission of Utah has let the contract for the Ogden-Hooper road to the Strange-McGuire Paving Company of Salt Lake on a bid of \$65,191.70.

County commissioners of Jefferson county, Idaho, held a special election on March 1 to vote on a \$200,000 bond issue for construction of roads and bridges. The election at Genessee, Idaho, for the creation of the Genessee Highway District resulted affirmatively and means the construction of 27 miles of hard-surfaced roads this spring.

Road Work and Road Builders the State Over

Bids on the road between Georgetown and Silver Plume were opened on February 24. The work to be done includes reduction of the grade widening of the road.

County Commissioner Fred Catchpole of Pagosa Springs called upon Commissioner T. J. Ehrhart recently to urge the completion of the road from Pagosa to Chama, New Mexico, to give La Plata County an outlet to the south; also improvement of the Wolf Creek Pass road.



Silverton be completed this summer.

County commissioners from all parts of the state are visiting or writing the Highway Commissioner to urge that work on projects or improvements in their counties be started early this spring and pushed through this season. One of these visitors, not a county commissioner, however, was John A. Clay, of the Animas Forks Power company, who urged that the road from Durango to

County commissioners of Park county, Montana, have decided to call a special election immediately to vote on the issuance of \$200,000 worth of bonds for construction of roads and bridges.

Plans for a bridge over the Río Grande River at Wassons, Mineral County, on the Creede-Wagon Wheel Gap road, has been approved by the highway commission of the state.

E. E. Nichols of Manitou was appointed by Governor Oliver H. Shoup to succeed Leonard E. Curtis as the representative of the Second Road District of Colorado on the State Highway Commission.

Chris Wallrich, county commissioner of Alamosa county, was a visitor at the State Highway Commission offices recently in the interest of protecting the state road from the overflow of the Río Grande river at Alamosa by construction of a new bridge.

The Highway Commission is pushing ahead rapidly on the surveys for the demonstration hard-surfaced roads authorized for this year's budget, running for distances varying from half-a-mile to two miles out from the principal centers of population. Surveys for these hard-surfaced roads have been completed at Greeley, Brighton, Fort Morgan and Pueblo. Engineers are now working on the survey at Boulder and work has just been commenced on the bridge over the Platte river at Merino, to give better connection between Wray and Idalia in the northeastern corner of the state.

Tony Monell, county commissioner of Montrose, dropped into the Highway Commission offices last week to urge improvement of the North and South highways from Montrose.

Another visitor was Alexander McCallum of Lincoln county, who asked that the roads North and South through Lincoln county, and that the road through Arriba and South from Limon be improved.

Robert Young, of Walsenburg, former county commissioner of Huerfano, stopped at the Highway offices when in Denver last month, to discuss the road project No. 2, providing for surfacing of the road from the Pueblo County line south to Trinidad.

Montezuma county commissioners have advertised the projects for two bridges in their county, one over the canal east of Dolores and the other in the McElmo canon, west of Cortez. The first is to be a 35-foot span and the latter a 70-foot span.

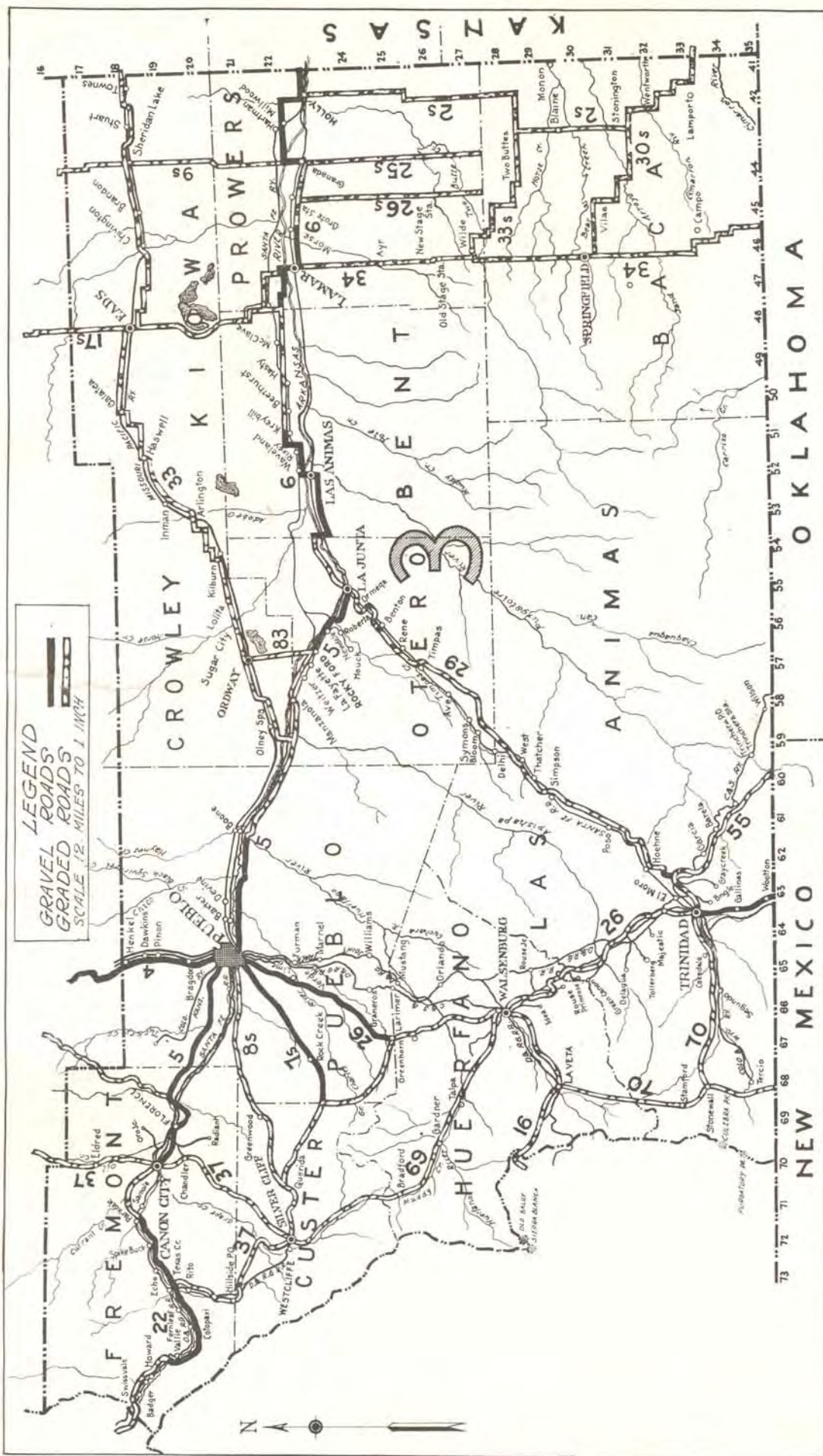
Logan County has been impressed with the needs of reconstruction and has made a road levy this year of 4.21 mills, which will raise \$110,000. Up until four years ago the county road tax had never exceeded one-half of a mill. Arthur W. Hand, county commissioner, was a visitor at the State Highway Commission offices last month and announced that \$50,000 would be expended in the construction of a bridge over the South Platte River at Merino.

State Highway Commissioner T. J. Ehrhart and Chief Engineer J. E. Maloney of the commission inspected two Federal Aid road projects in El Paso county last month, in company with County Commissioners Harry Scholten, Joseph B. Fowler and J. W. Potter; William Bartel, road supervisor, and Clarence O. Ford, county surveyor, with the result that the state officials approved the projects and work will start this spring.

Project No. 1, pertaining to a road from the Allen Road to Husted, and from Monument to Palmer Lake, is virtually approved and only awaits a survey by the county. It will eliminate bad turns, grades and grade crossings. The state highway commission appropriated \$15,750 for this work, and the Federal government a like amount.

The other project was that for the highway over Ute Pass from Cascade through to Green Mountain Falls. This survey will place the road on the east side of the railroad from Cascade to the county line and will eliminate four bridges, and four grade crossings. El Paso will receive \$31,500 from the state and Federal Aid this year, for construction, aside from \$10,000 state funds for repair and construction of county roads, not Federal Aid projects.

"I was present at the preliminary meetings held some years ago to find some beginning of funds for our state highways," says W. A. Insinger, former member of the executive committee of the Colorado Good Roads association, in a recent issue of the Greeley Tribune-Republican. "At that time already the boosters were strongly arguing that this state should borrow, like other progressive states, millions of dollars for highways. Naturally the contractors were talking the loudest. It was the State Highway Commissioner who strenuously opposed the plan, for the time being, on the ground that it would be wiser to start slower and gain more time by study and profit from experience with the already large bond issues, with which other states had already started. His opinion prevailed, the half-mill levy was proposed and was soon ratified by the voters. Colorado went slower and more conservatively than many states; but now the time has come when it can no longer lag behind. No other state, excepting perhaps California (which has already borrowed millions), has so much to gain by developing its resources as a state, on top of the well-known economy of better transportation."



Map showing the gravelled and graded roads in Road District No. 3.