This organization needs the support of every county engineer in Indiana, and I believe each of you needs this organization.

I would like to close with a quotation from a recent address delivered by the President of our National Society:

It is the engineer who must remove from the profession its incubuses and its parasites. It is he, also, who must bring about a better understanding between the public and the profession. He alone can eliminate misunderstanding and misapprehension and in the doing thereof benefit himself and remove a peril to society. And when one drives an evil from the state, he "betters his own sphere, hands down his name, pleases mankind, nature, and his God," and that is the most that any man can do.

THE FARM-TO-MARKET FEDERAL ROAD PROGRAM

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Just what do we mean by farm-to-market roads? Section 7 of an act approved June 16, 1936, commonly known as the Hayden-Cartwright Act, authorized to be appropriated to the several states, to be apportioned and expended under the provisions of the Federal Highway Act of 1921, as amended and supplemented, the sum of $25,000,000.00 for the fiscal year ending June 30, 1938, and a like amount for the fiscal year ending June 30, 1939, provided that the sums authorized be applied to secondary or feeder roads, including farm-to-market roads, rural free delivery mail roads, and public school bus routes.

The Federal Highway Act requires the Secretary of Agriculture to prescribe and promulgate all needful rules and regulations for the carrying out of its provisions. In compliance with this responsibility, the Secretary of Agriculture caused to be prepared and approved on February 9, 1937, certain basic rules and regulations for carrying out the provisions of the secondary or feeder-road legislation. Under these regulations, the following definition was given:

"Secondary or Feeder Roads" shall mean roads outside of municipalities, except as hereafter provided, which are not included in the Federal-aid highway system, and shall include farm-to-market roads, mine-to-market roads, rural free delivery mail roads, public school bus routes, and other rural roads of community value which connect with important highways or which extend reasonably adequate highway service from such highways, or which lead to rail or water shipping points or local settlements. The limitation with respect to roads within municipalities shall not be construed to prevent improvements into or through small municipalities when such improvements are necessary for continuity of service.
For the purpose of this discussion, I am going to assume that the subject as given was meant to include all that is covered in the Secretary of Agriculture’s definition of secondary or feeder roads.

PROVISIONS OF RULES AND REGULATIONS

These regulations stipulated further that all projects under the Secondary or Feeder-Road Act be initiated by the states and submitted in the same manner as other federal-aid projects, and that the funds apportioned to any state under the act be applied to projects, essentially rural in character, that are not on highway routes which are potential additions to the federal-aid highway system within a reasonable interval. It was further directed that the Chief of the U. S. Bureau of Public Roads determine to what extent secondary or feeder-road projects may be located on the state highway system. To accomplish a wide distribution of benefits within each state in the expenditure of funds authorized by the act, without a sacrifice of administrative or construction efficiency, the Chief of the Bureau of Public Roads was further directed to determine the minimum percentage of counties, applicable alike in each state, in which the funds authorized for any one or more fiscal years should be used. No projects are to be undertaken that do not provide for a surfacing or stabilization of the roadbed which shall be reasonably satisfactory for the traffic served. Grading and drainage as first-stage construction may be accepted: provided that the state highway department will enter into a satisfactory agreement for future surfacing or stabilization of the roadbed.

Continuing with the basic rules and regulations:

Each state highway department shall undertake the selection and designation of an initial system or group of secondary or feeder roads for construction or reconstruction based upon their relative importance as determined from factual data secured from statewide studies for the planning of a complete highway system, and submit a suitable description and map of such proposed system or group to the Bureau of Public Roads for approval: provided that prior to the selection, designation, and approval of such system or group of secondary or feeder roads, projects may be approved for construction if it is reasonably anticipated that such projects will become a part of such system or group.

The mileage of the initial system or group of secondary or feeder roads in any state shall not exceed 10 per cent of the highway mileage of the state as shown by the records of the state highway department at the time of the passage of the Federal Highway Act. The initial system or group of secondary or feeder roads may be selected, designated and approved in whole or in part in any state, and may be modified or increased from time to time as justified by the progress of its improvement.
After a secondary or feeder system or group of highways has been selected, designated and approved in any state, no project shall be approved which is not a part of a route embraced in such system or group.

Surveys and plans, specifications, and estimates for all projects in each state shall correspond to the character of the work contemplated and shall be in sufficient detail to show the quantity and kind of work involved and shall be prepared under the immediate direction of the state highway department, without reimbursement from federal funds. The state highway department, however, may utilize the services of well qualified county engineering organizations, acting under its direction, for the surveys, preparation of plans, specifications, and estimates, and for the supervision of construction for any project.

Project agreements for secondary or feeder road projects shall provide for the maintenance of such projects by the state to the extent permitted by state law; otherwise, the state shall submit, in the form prescribed by the Secretary, an agreement for such maintenance with the county or other political subdivision responsible therefor: provided, however, no project contemplating maintenance by a county or other political subdivision shall be approved if any road previously improved with federal funds under the provisions of the Federal Highway Act, as amended and supplemented, which the said county or other political subdivision has agreed to maintain, is not being satisfactorily maintained as determined by the Chief of the Bureau of Public Roads.

SUPPLEMENT TO RULES AND REGULATIONS BY CHIEF OF U. S. BUREAU OF PUBLIC ROADS

Supplementing the rules and regulations as prescribed by the Secretary of Agriculture, the Chief of the Bureau of Public Roads issued a memorandum on February 12, 1937, requiring that, in the expenditure of the combined funds authorized for the two-year fiscal period, 1938 and 1939, secondary or feeder-road projects be undertaken in not less than 50% of the counties of a state. In the State of Indiana with 92 counties, this means that projects must be undertaken that will enter at least 46 counties. In this same memorandum, provision was made for determining the percentage of the federal grant that may be used on highways now in the state system. In Indiana this amounts to $23\frac{1}{2}\%$, leaving $76\frac{1}{2}\%$ of the fund to be used on roads maintained by the counties. The Bureau of Public Roads further prescribes that:

Secondary highway funds must be matched with "state funds" raised under the authority of the state or any political or other subdivision thereof, and made available for expenditure under the direct control of the state highway department. This requirement permits considerable latitude in financing projects. In general, the Bureau will expect funds from state sources to be used for second-
ary or feeder roads in states where all of the revenue derived from motor vehicle registration and gasoline taxes accrues to the state highway department. In such states, no involuntary contributions from any political subdivision will be approved. In states where a portion of the motor vehicle registration and/or gasoline taxes is distributed to the counties and the amount so distributed to any county exceeds the requirement for debt service on highway obligations of the county, if any, the state at its discretion may arrange for such county to aid financially in the construction of any secondary or feeder road project undertaken in that county.

The Bureau stipulated that design requirements for alignment and grade for secondary or feeder roads be consistent with the topography and the purpose to be served by the improvement.

MANNER OF APPORTIONMENT TO STATES

The Federal Highway Act requires that congressional appropriations for highway purposes be apportioned to the several states in the following manner: one third in the ratio which the area of each state bears to the total area of all the states; one third in the ratio which the population of each state bears to the total population of all the states as shown by the latest available federal census; and one third in the ratio which the mileage of rural delivery routes and star routes in each state bears to the total mileage of rural delivery and star routes in all the states at the close of the next preceding fiscal year, as shown by certificate of the Postmaster General, which he is directed to make and furnish annually to the Secretary of Agriculture. In compliance with this Act, the Secretary of Agriculture made apportionments of the $25,000,000.00 appropriated for improvement of secondary or feeder roads on December 29, 1936. The sum set aside for the State of Indiana was $629,802.00, of which sum 23½%, or $148,003.00, may be spent on highways now in the state system, the remaining 76½%, or $481,799.00, to be spent on roads maintained by the counties.

ACTION OF STATE HIGHWAY COMMISSION

When the State Highway Department of Indiana received notice of this grant, and information on the rules and regulations prescribed by the Secretary of Agriculture and interpreted by the Bureau of Public Roads, as heretofore enumerated, ways and means for setting up a secondary or feeder-road system and a two-year program were considered. As an initial move, several decisions—five, to be exact—involving commission policy had to be made:

1. Matching Federal Funds. First, would the state expect the local county in which a project was to be set up on one of
said county's highways to contribute all or any part of the necessary funds required to match federal funds? The decision was no. The state decided to put up all money necessary to match federal funds on both state and county projects. The one requirement of the counties, however, is that a suitable right-of-way be furnished by the counties, free of cost to the Federal Government or the State of Indiana, on which to carry out improvements planned. There are several reasons why this should be, not the least of which is the fact that federal regulations will not permit any portion of federal road grants to be spent for rights-of-way, and, likewise, the statutes of the State of Indiana will not permit state highway funds to be spent for rights-of-way on highways maintained by counties. Naturally, then, you may ask, "How can state highway funds be used to match federal funds in the improvement of a county highway?" Our former highway commission, when fully advised of the conditions to be met in order that Indiana might claim its apportionment of the federal appropriation for secondary or feeder roads, sponsored legislation which became law on March 11, 1937, giving the State Highway Commission this authority. This same statute authorizes and empowers boards of commissioners to procure rights-of-way by grant, donation, purchase, or condemnation, and to pay for the same out of funds of such county. Many counties and local communities sponsoring secondary or feeder-road improvements are only too glad to arrange for the necessary right-of-way if their proposed projects are approved. Hence, it seems fitting and proper that this requirement should be made general.

2. **Width of Right-of-Way.** The second decision to be made by the state highway department was relative to width of right-of-way to be arranged for. The subject of width is more or less debatable and influenced by several elements, such as topography, nearness to municipality or built-up area, present and anticipated traffic, and future likelihood of becoming a part of the state highway system. Taking all of this into account, it was decided that sixty feet should be the minimum width sought and, in many cases, it should be seventy feet or even more. After all, so long as it is necessary to move fences, it costs very little more to get several feet additional provided buildings are not involved. Where buildings and trees are involved, but are not actually in the way of construction or do not create a hazard, it is agreeable that an exception be made by way of modified right-of-way grant.

3. **Mileage of Initial System.** The third decision made by the state highway department was relative to mileage to be included in the initial system of secondary or feeder roads. Rules and regulations set up by the Secretary of Agriculture limited the mileage of the initial system to not more than 10%
of the highway mileage of the state. Indiana chose to designate 5%, only one half of the allowable mileage at this time, feeling that it was desirable to withhold the other half until some future date or dates when, because of development of the portion chosen at this time and other changes that are bound to take place in various parts of the state, a more desirable selection can be made. Five per cent of the total county highway mileage in the state of Indiana amounts to approximately 3,340 miles.

4. **Apportionment of Mileage to Counties.** The fourth decision to be made by the state highway department was as to the manner in which mileage of the initial system should be apportioned to the several counties of the state. By trial, it was discovered that apportionment, under the same basis as that employed by the Secretary of Agriculture in allotting funds to the states, did not work out well; consequently, the following method was used: one third in the ratio which the mileage of county highways in each county bears to the total county highway mileage of the state; one third in the ratio which the area of each county bears to the total area of the state; and one third in the ratio which the vehicular miles traveled on the county roads of each county bears to the total vehicular miles traveled on the county roads of the state as shown by the State-wide Planning Survey.

5. **Presentation of Matter to Counties.** The fifth decision was to present the entire matter of selecting the initial secondary or feeder-road system and the selection of individual projects for fiscal years of 1938 and 1939 to the several counties of the state for the counsel and cooperation of their officers and interested citizens. Accordingly, a letter dated April 23, 1937, was prepared and sent out over the signature of Mr. Keefe, Chief Engineer of the State Highway Commission, to the county surveyor and to the county road supervisor, where they were not one and the same person, of each county of the state. This letter gave a general statement of the Hayden-Cartwright Act and bore attached a copy of the rules and regulations as laid down by the Secretary of Agriculture for carrying out the Act, and a copy of the memorandum issued by the Chief of the Bureau of Public Roads, further interpreting the rules, regulations, and intent of the Act. A meeting date was designated at each of the six state highway district headquarters; and, in Mr. Keefe's letter, each county was advised of the date and place of meeting where their officials were invited to be represented. Accordingly, these meetings were held between May 4 and May 11, 1937.

On the whole, these meetings were encouraging, some counties being represented not only by their county surveyors and highway supervisors, but by full boards of commissioners, auditors, county attorneys, and other interested citizens. Un-
fortunately, some few counties took an indifferent attitude and were not represented at all. These counties were again approached by letter, telegram, and personal visit by state district representatives, with the result that we now have substantially 100% co-operation. Each county was furnished a map of its respective county and a statement of the number of miles apportioned to it that might be included in the initial system of secondary or feeder roads, to be submitted by the State of Indiana for federal approval. Each county was asked to return its map, with roads marked thereon in substantially the mileage allotted it, indicating its preference of such initial system insofar as its county was concerned. It was to be expected that some differences of opinion would arise, even between the officials of individual counties, and more particularly as between neighboring counties, and in regard to facts revealed by the State-wide Planning Survey. Accordingly, the State Highway Commission, in requesting recommendations from the several counties, reserved the right to act as referee and make final decisions as between conflicting opinions and recommendations. After all, the State of Indiana could not submit a map to the Federal Government sponsoring a system wherein many jogs of a mile or two occurred at county lines because the roads proposed by adjoining counties failed to meet by that amount.

**CONCLUSION**

I have gone to considerable length in attempting to give a true picture of the many details involved to date in an effort to give to the people of the State of Indiana a secondary or feeder-road system meeting federal requirements, representative of and serving the best interests of our people. To date, Indiana has not submitted to the Bureau of Public Roads a map showing its proposed initial secondary or feeder-road system; however, it is hoped that this map may be completed shortly when certain factual data secured from state-wide studies have been compiled.

Indiana has prepared and submitted to the Bureau of Public Roads for its approval a complete program for the fiscal year of 1938. This program contemplates four projects on roads now in the state highway system, involving the improvement of 43.82 miles in seven counties, and fifteen projects on county highways, involving the improvement of 132 miles in twenty-one counties. Surveys have been made on a number of these projects and plans have virtually been completed on several, so it is the hope at this time that some contracts can be let and construction work started by early spring. A partial program for 1939 has also been submitted to the Bureau of Public Roads for its consideration.
The following question is asked daily: "What standards of construction and what type of surface is the state planning to use in secondary or feeder-road improvements?" I will attempt to answer this question in general terms. It is the desire of the Federal Government and the intent of the State Highway Commission of Indiana to improve as many miles to as high a standard as traffic needs and purpose to be served may require and available funds will permit. Two definite limitations are to be met, and a third is desired; namely, a definite sum of money must be spent in not less than 50% of the counties of the state, and it is desired to improve the maximum mileage possible in keeping with good practice. No less authority than Frank T. Sheets, former Chief Engineer of the Illinois State Highway Department, now President of the Portland Cement Association, made this statement in a talk at the 1933 Purdue Road School:

Adequate consideration of primary roads and city streets should not overshadow the great importance of secondary or farm-to-market roads. The development of this highway system will mean lower transportation cost, lower food prices, lower taxes, and a more well-knit social and economic structure. On such roads, the type of improvement should be in accord with traffic needs. Stage construction may well be used and so planned that each stage of improvement will permit additional development without economic loss.

In harmony with this thought, an effort is being made to secure right-of-way, grade, and alignment on all projects that will permit future expansion. At this time, only a modest surface that is in keeping with traffic requirements is to be provided. An effort will be made to utilize available local materials when suitable, having in mind the counties' maintenance, which will frequently be from local sources.

In conclusion, with apologies, I would like to leave this thought previously expressed in my talk before the 1936 Purdue Road School on the subject of "Stage Construction":

It is my belief that the highway authorities consistently adhering to the policy of stage construction will be able to improve the maximum number of miles and give appropriate service to the maximum number of people at the minimum cost. Let me suggest the following slogan to the supporters of stage construction: "Build highways where needed in the measure needed."

These principles may well be applied to the development of a secondary or feeder-road system.