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# AMERICAN HIGHWAY POLICY

BY  
CHARLES L. DEARING



WASHINGTON, D.C.  
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1941

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## DIRECTOR'S PREFACE

This study is the outgrowth of inquiries directed to the Brookings Institution by the Commissioner of Public Roads of the United States Public Roads Administration. As he pointed out, over 2 billion dollars of public money is expended annually in the improvement and maintenance of somewhat more than 3 million miles of public roads in the United States. This cost must be distributed among federal, state, and local groups and must be allocated among taxpayers according to various classifications. Authority over the location, design, and maintenance of these roads must likewise be distributed among various government agencies. Yet the economic and political issues involved have not received from students of economics and government and from public administrators the continuing and intensive attention needed for their solution. As a result, controversies of long standing have recently tended to sharpen—both those among different groups of taxpayers and those arising between highway transportation enterprises and competing forms of transportation, notably the railroads.

As an approach to the solution of these problems, the federal and state governments have, during recent years, spent large sums in state-wide highway planning surveys. An enormous amount of factual information has thus been brought together. In the absence of some agreement as to underlying principles, however, it has not been possible to marshal these data to the solution of the controversial problems of highway financing and administration.

The main purpose of the author of this volume has been to analyze the basic purposes and classify the principal beneficiaries of the several types of public roads.

Utilizing the abundant data of the highway planning surveys and other pertinent material, Mr. Dearing has tried to place the entire matter in proper historical perspective and to view the problems of highway management, not as isolated phenomena, but rather in their practical relation to general transportation policy. He has been alert to temper the theoretical ideal with considerations of administrative feasibility based upon previous field studies which the Institute for Government Research of the Brookings Institution has conducted in some half dozen states and in Montgomery County, Maryland, during recent years. By putting the great mass of country-wide data and personal experience to the test of general principles, he has, we believe, provided a tool which should prove of great value to legislative bodies and highway officials in attacking financial and administrative problems.

On various questions relating to matters of tax policy, the author was assisted by Daniel T. Selko of the Institution's staff.

EDWIN G. NOURSE  
*Director*

Institute of Economics  
December 1941

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I wish to make grateful acknowledgment to H. S. Fairbank, United States Public Roads Administration, and J. C. Nelson, Bureau of Agricultural Economics, who read the book in manuscript and offered many valuable suggestions. Responsibility for factual accuracy, interpretation, and conclusions rests, of course, upon the author.

CHARLES L. DEARING

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## INTRODUCTION

American highway policy embraces a wide range of practical problems and issues of public policy. Federal, state, and local agencies of government share the responsibilities involved in designating, building, maintaining, financing, and policing a transportation system composed of more than 3 million miles of public roads. These roads enable some 32 million motor vehicles to move with relative freedom from farm to market; from rural and urban dwelling to churches, schools, shopping centers, places of recreation, and seats of government; between villages and between major centers of population. They carry the bulk of all inter-city travel, in some 27½ million privately owned automobiles.

These roads also carry a substantial portion of the nation's commerce in 4½ million trucks of widely varying speed, weight, and other essential physical characteristics. Large numbers of these trucks are owned by farmers and are used as essential equipment in the distribution of agricultural products. Some are owned by industrial concerns and are similarly used in the distribution of industrial products; others are operated "for hire" as contract and common carriers of property. Still others are owned by government agencies and are used directly in the transportation of pupils to and from schools, in the operation of the military establishments, and in the administration of various other public services such as delivery of the mails.

The primary problem encountered by governmental agencies in the provision of road facilities capable of supplying such an extensive range of services is to devise a satisfactory method of distributing authority and re-

sponsibility among the several levels of government and of allocating the financial burden among individual taxpayers. And, of course, the policy adopted to govern one type of governmental service must be reconciled with other lines of public action. During recent decades the solution of these problems has been made increasingly complex.

First, revolutionary changes in the methods of supervising and financing road improvement have brought all levels of government into this field of endeavor, thereby complicating the problem of distributing primary authority and responsibility. As late as 1880, exclusive responsibility for the provision of rural roads rested with local governments. Townships and road districts served as administrative units; management was amateur rather than professional; and a medieval system of "working out the road tax" supplied the chief means of road support. Under such an arrangement there were no real problems of allocation, among either levels of government or beneficiaries.

But this system of road management produced unsatisfactory roads, even for wagon transportation. During the latter half of the nineteenth century a movement for road reform captured widespread popular support and set in motion forces which have produced revolutionary changes in the structure and concept of road management. Professional direction has been universally substituted for amateur supervision; working out the road tax has been replaced by complex systems of money taxes and special charges.

Townships gradually gave way to the counties in local road administration; state governments entered the field, first by offering educational and financial aids



to local agencies, and finally by assuming exclusive jurisdiction over primary highways; and the federal government slowly expanded its financial participation. And, throughout the entire period, total expenditures for road purposes have grown enormously. Between 1921 and 1939 annual expenditures increased from 937 million to more than 2 billion dollars. The road budget now bulks large in all state and local operations, ranking with education and public welfare as one of their three major functions.

Until recently, the federal role was limited to the administration of grants-in-aid designed to encourage the states to provide the standards of road development deemed necessary to serve national interests. During the past decade, however, greatly increased amounts of federal funds have been expended for road purposes in the interest of economic stabilization and relief of unemployed. Although all levels of government contribute financially to the support of public roads, the physical properties involved are, with minor exceptions, owned by state and local governments. Moreover, these agencies exercise all the primary functions of management.

As a result of the broad changes in the structure of road management, several controversial questions have emerged. The first group concerns the relations between state and local levels of government. (1) Do public roads still produce services that are of primary benefit to the local community as distinguished from the broader geographic areas of the state or the nation? (2) If so, should the local taxing powers and administrative machinery be used to provide these services; or should the state perform this work for the localities as an incidental part of its principal responsibility—the provision of pri-

mary highways? (3) If the latter expedient is adopted, how should the costs be allocated between state and local taxpayers?

A second series of questions pertains to federal and state relations. If nation-wide interests require the improvement of certain roads to standards which the states are unable or unwilling to provide, (1) how should the desirable amount of federal expenditure be determined; (2) by what method should federal expenditures be made; and (3) who actually receives the resultant benefits?

The second main problem of road management, namely, that of allocating the financial burden among the beneficiaries of the road system, has been complicated by the rapid emergence of a group of special beneficiaries. During most of the past century, the limitations imposed by unimproved roads and horse-drawn vehicles restricted road travel to community environs. Taxes levied on land were considered an equitable measure of benefits. Thus, the problem of allocating the financial burden was solved in a relatively simple, if somewhat arbitrary, fashion. But with the rapid motorization of road use after 1920, accompanied, of course, by an extended radius of travel, the traditional problems of "special users" arose again. Pressures were exerted on government agencies to provide road facilities that would expedite and cheapen the inter-community movement of goods and people, and make it generally more attractive. The resultant efforts gradually produced an interconnected system of highways improved according to *optimum standards* of motor vehicle use—that is, standards measured in terms of over-all speed, economy of operation, convenience, and safety.

In the aggregate, these systems of highly improved

highways include something like 20 per cent of the country's total road mileage. (The proportion varies among the states according to local conditions and the method of classification followed.) But they carry the bulk of motor vehicle travel and account for a substantial portion of all road costs.

It has long since been conceded that some portion of the benefits flowing from the use of these improved facilities is enjoyed more directly by motor vehicle users than by other classes of beneficiaries. But no satisfactory answer has been found for two of the specific questions involved.

1. Viewing the problem of road management as a whole, is it possible to distinguish the benefits derived by motor vehicle users in the form of economical transportation from those benefits that are associated with land and home ownership and with the administration of various essential functions of government? If so, can these benefits be measured with sufficient precision to serve as a basis for allocating road costs among beneficiaries?

2. Assuming agreement could be reached with regard to the portion of total road costs assignable to motor vehicle owners as a class, how should this amount be divided among the various classes of motor vehicle users? Should the basis of division be according to the physical characteristics of the vehicle, that is, according to such factors as gross weight, wheel load, axle load, length, height, and ability to maintain speed? Or should the basis be the character or purpose of use, that is, business or pleasure?

Because of the obvious difficulties presented by these technical questions, it is not surprising that the method of treatment has varied considerably among the 48

state jurisdictions and numerous local agencies. These variations in policy have prolonged and tended to introduce irrelevant considerations into the so-called subsidy controversy. Reduced to essential elements, this controversy revolves around two questions.

First, is the general taxpayer (or, for that matter, any taxpayer) bearing road costs that should be assigned to the motor vehicle users as a special class?

Second, is one class of motor vehicle owners, for example, passenger cars or light truck operators as distinguished from heavy bus and truck operators, bearing a disproportionate share of the financial burden that is properly allocable to motor vehicle users as a whole?

The third of the interrelated developments tending to introduce disturbing elements into highway management impinges on the much broader field of national transportation policy. The general question is whether or not public ownership and management of the road plant gives highway transportation, whether commercial or private, an uneconomic competitive advantage over transportation enterprises, such as the railroads, which are privately owned but subject to comprehensive public supervision. The specific question is whether or not the financing and taxing policies applied in highway management enable some highway transport operators to escape a portion of the costs incurred by the state in furnishing them with the road facilities which have given rise to active road-rail competition.

Repeated efforts have been made to evaluate the conflicting claims involved in all of these controversial phases of road management. Over a period of years the several states have experimented with a wide variety of devices and theories of road management, and currently various states apply highly different and at times conflicting systems of allocating financial and administra-

tive responsibility for the road function. Several public inquiries have been conducted by agencies of the federal and state governments. In addition, privately sponsored groups have made elaborate studies of the subject.

All of these efforts have run into one basic difficulty—the inability to reach agreement with regard to the underlying principles that should govern road management. It is of course evident that attempts to find a satisfactory solution for this troublesome problem will continue to be inconclusive if disagreement persists with regard to the basic purposes and the real beneficiaries of public roads. Obviously, the financial responsibilities to be borne by a given class of motor vehicle users cannot be determined until the total responsibility assignable to all motor vehicle users has been agreed upon. And this decision turns upon the identification of all the principal beneficiaries of public roads, supplemented by some practicable principle to govern the distribution of costs in accordance with the relative benefits enjoyed.

The purpose of this study is to formulate the principles which should govern the location of responsibility, the exercise of authority, and the distribution of the financial burden with respect to public roads. We have not undertaken to devise engineering and tax formulas by which these principles may be applied in the various state and local jurisdictions; nor have we undertaken any quantitative investigation of the so-called subsidy question. The study deals exclusively with the problem relating to the provision of rural road facilities. City streets fall outside the scope of the analysis except to the extent to which such facilities constitute essential connecting links of rural road systems.

The first two chapters trace the evolution of highway policy in European countries and outline the principal

developments in American highway policy to 1916.

Chapters III and IV describe the administrative and financial organization of modern road management in this country: where primary authority and responsibility rest, and the extent of variation among the states with respect to administrative method and financial policy. By picturing present-day highway management as a going concern, we hope to establish a realistic basis for the formulation of principles, as well as their practical application. This organization, built around the state level of government as the chief proprietor of the American system of public roads, imposes important limitations upon what may realistically be advanced as a solution for the problems of road management in their broader setting of the national transportation problem.

The next chapter analyzes the basic purposes and beneficiaries of the public roads and attempts to identify the essential factors of road use and benefits that must be taken into account in the formulation of governing principles.

In Chapter VI we bring together the descriptive and analytical materials presented in the preceding chapter and formulate general principles which in our judgment offer a feasible basis for the distribution of authority and responsibility among levels of government and of the financial burden among beneficiaries.

Chapter VII indicates some of the issues which may suggest the desirability of making adjustments between public policies applied to road management and those currently affecting the general transportation problem. The final chapter summarizes our conclusions and recommendations. In Appendix A we have traced in some detail the chief factors which gave direction and force to the good roads movement between 1880 and 1916.

## CHAPTER I

# EVOLUTION OF HIGHWAY POLICY IN EUROPEAN COUNTRIES

Provision of road facilities falls into that broad category of productive enterprise which has traditionally been reserved to government. Instead of having highways constructed and operated by private enterprise for private profit, we have in the main looked to government to provide services of this type. Rarely does the individual have occasion to inquire closely into the operation of the governmental machinery which supplies these facilities, or into the precise reasons why they are provided directly by public agencies rather than by private enterprise. It is perhaps even truer now than it was a century ago that "roads belong to that unappreciated class of blessings, of which the value and importance are not fully felt, because of the very greatness of their advantages, which are so manifold and indispensable, as to have rendered their extent almost universal and their origin forgotten."<sup>1</sup>

The legal and political considerations which have been involved in the development of highways as state enterprises must, however, be clearly understood if we are to develop sound highway policy. In this chapter, therefore, we first sketch the broad legal concepts which have always governed the provision of highways and then trace the evolution of highway policy in leading European countries. In the second chapter we indicate the forces which motivated the reforms of American highway policy during the last two decades of the nineteenth century.

<sup>1</sup> W. M. Gillespie, *Road-Making: Roads and Railroads* (1853), p. 15.

The common-law doctrine "right of passage" underlies the entire highway function. This doctrine in turn is a constituent element of the theory of political sovereignty around which the structure and functions of modern government have been developed.<sup>2</sup>

It is axiomatic that sovereignty, regardless of the specific institutional forms through which such authority is exercised, can be preserved only if the state and its citizens alike possess mobility. The minimum requirement on the one hand is that the state and its agents have access to all parts of the territory over which authority is to be exercised, and on the other that the citizens be guaranteed avenues of egress from and ingress to their homes, places of business, and places where government functions are carried on. Early Saxon law recognized these requirements of sovereignty by imposing upon all lands an obligation to perform three necessary public duties (*trinoda necessitas*): to repair roads and bridges; to maintain castles or garrisons; and to aid in repelling invasion.<sup>3</sup>

This fundamental doctrine of public "necessity" has of course been elaborated and broadened in order to meet the requirements of an evolving social order. And in this process not only has the highway function become

<sup>2</sup> "Our conception of an executive power, under whatever names and in whatever forms it is exercised, is that its first business is to preserve order. And that this power should be one and uniform in every part of a land ruled by the same laws appears to us so far from remarkable that anything contrary to it has the air of a puzzle and an anomaly. . . . Yet it is so modern that there was demonstrably a time when it was an innovation. It belongs to the political theory of sovereignty which has superseded the feudal theory of autonomous personal allegiance. It assumes that the rights of private feud and war, rights exercised without contradiction far into the Middle Ages are for us intolerable and impossible. It assumes, moreover, that a central authority has become strong enough to subdue local competition and jealousy." Sir Frederick Pollock, Bart., *Oxford Lectures and Other Discourses* (1890), p. 66.

<sup>3</sup> Sir William Blackstone, *Commentaries on the Laws of England in Four Books*, Vol. I, p. 263.



articulated with and inextricably woven into the total concept and structure of organized government; it has been consistently retained as one of the distinguishable primary responsibilities of government. Moreover, the original common-law concepts governing the right of passage have gradually been translated into constitutional and statutory standards which define the legal relationships of the individual to the state in the provision of road facilities.

During the course of the nineteenth century leading European countries reached general agreement on the broad principles that should govern the provision of road facilities. Each country, of course, applied these governing principles through administrative and financial mechanisms adapted to the peculiarities of its governmental forms. But during all periods, a basic obligation has been imposed upon each individual as a unit in the social structure to contribute to the provision and maintenance of road facilities. Such facilities in the aggregate have never been viewed as serving the needs of any particular class of society or of any one geographical division of an organized state.

The precise nature of the assumptions and propositions which contributed to the formulation of these general principles is of more than passing historical interest. These underlying judgments represent the cumulative thought and experience of the countries in which road systems were developed extensively and to comparatively high standards contemporaneously with the promotional era of railroad transportation. They had been thoroughly articulated long before the advent of the motor vehicle era, even in its experimental phase.<sup>4</sup>

<sup>4</sup> As in the case of all important social and economic movements, it is impossible to name an exact date as marking the beginning of the motor vehicle era. It seems clear, however, that the motor vehicle exerted no

And what is more important, fundamental reforms in American road administration, which in turn preceded the motor vehicle era by at least two decades, were patterned on, if not borrowed bodily from, European systems.

### I. IN ENGLAND

With the decay of the manorial system in England the ancient common-law obligation to provide adequate rights of passage was for the first time translated into statutory terms. Through the provisions of the 1555 statute,<sup>5</sup> Parliament intervened in the function of road management. It assumed no direct administrative or financial responsibility, but defined the purposes to be served by road development, the rights of individuals with respect to road use, and the manner in which the obligations connected with provision and maintenance were to be allocated among individuals and governmental units. Between the date of this initial parliamentary intervention and the beginning of the eighteenth century, concepts of road management remained fairly stable, being adapted to the requirements of an economy predominantly domestic and rural.

Two main features of the governing system are of interest here:<sup>6</sup> (1) the basic obligation to maintain existing public roads rested individually on the inhabitants of each parish;<sup>7</sup> and (2) the concepts and administrative

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determining influence on public road policy prior to 1915. See below, p. 46 and App. A, for discussion of the good roads movement.

<sup>5</sup> 2 and 3 Philip and Mary, c. 8.

<sup>6</sup> There is no need to follow in detail the tortuous course of road legislation. The story is well told in Sidney and Beatrice Webb, *English Local Government: The Story of the King's Highway* (1920). See also *Halsbury's Laws of England*, 2d ed. (1935), especially Vols. 15 and 16.

<sup>7</sup> While exact comparisons cannot be made between American and English units of government, so far as administration of the highway function is concerned, the English parish corresponds with the American county and the English administrative county with the American state.

method used in the discharge of these obligations were static or negative rather than dynamic in character.

*The individual had a large measure of responsibility for road support.* Although the parish was designated as the administrative unit for road purposes, and under statute its inhabitants could be held collectively responsible for the provision of adequate facilities, the individual citizen was held liable for three distinct types of contributions.

First, as a resident of the parish the individual was required to contribute to the normal support of public roads in money and labor at the same rate as all other inhabitants.<sup>8</sup> While the parish as a whole could be "fined" as many times as required to remedy any alleged defects in road maintenance, it appears that "this general and continuous collective liability was . . . merely an uncomfortable background to the onerous personal duty imposed upon each inhabitant."<sup>9</sup>

Second, as a land owner the citizen was subject to special assessments for the maintenance of roads immediately serving his property. Failure to discharge these financial obligations rendered the individual liable to legal action through the process of "presentment and indictment" before the appropriate judicial tribunal.<sup>10</sup>

<sup>8</sup> During the greater portion of the period from 1555 to 1698, "statute labor" constituted the chief source of road support, although in 1654, in "An Ordinance for Better Amending and Keeping in Repair the Common Highwaies within this Nation," Parliament provided for the levy of a compulsory road tax. Webb, *The Story of the King's Highway*, pp. 19-20.

It appears, however, that for at least a century subsequent to this enactment, compulsory money taxes were levied sparingly, generally without much practical success.

<sup>9</sup> The same, p. 15.

<sup>10</sup> Under this system the local magistrate or some other competent officer made a "presentment" to the "quarter session" alleging that particular roads or the roads in general of a parish were insufficiently repaired. If an indictment was made by quarter sessions, a fine was levied against the entire parish and some individual or officer was designated

Third, in addition to these financial responsibilities, practically all citizens were liable to public service in the capacity of surveyors of highways or highway overseers.<sup>11</sup> We gather from accounts of the time, however, that this office was not actively sought after, nor were its duties performed with any particular skill. "In a grumbling, but on the whole good-tempered sort of way we see the farmers, in the rural parishes, taking it in turns to serve the office, occasionally pressing into the service the village innkeeper, or a little independent craftsman or shopkeeper."<sup>12</sup>

By comparison with modern standards of road management, the exaction of funds for road maintenance through the system of presentment and indictment of individuals and of parishes seems exceedingly ponderous and primitive. It must be recalled, however, that it represented a considerable advance over the ill-defined common-law obligations. And when viewed in the light of the prevailing ideas as to what constituted adequate road facilities, the administrative method is seen to be reasonably well adapted to the objective sought.

*For more than two centuries, the provision of road facilities was governed by a static concept of the highway function.* The individual and parochial obligation was discharged by maintaining the public ways according to "customary standards." This consisted largely in keeping them free of obvious obstructions. Legally, no obligation existed to improve a roadway beyond the stand-

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to apply the proceeds of the fine (when and if collected) to the improvement of the road or roads in question. It then became necessary for this designated individual to obtain payment of the fine assessed against the parish.

<sup>11</sup> Clergymen and doctors were exempted by law; and, apparently through common consent, the nature of the duties rendered them inappropriate for performance by the "gentry."

<sup>12</sup> The same, p. 27.

ard that had prevailed at some previous time,<sup>13</sup> although parliamentary enactments of the period comprehended the dynamic power to "enlarge an ancient customary service at the public cost."<sup>14</sup>

The static concept of the road function might have proved adequate had not the character of an evolving economy demanded an entirely different type of road facility. During the greater portion of the fifteenth, sixteenth, and seventeenth centuries, the bulk of road travel and transportation was by horseback and "droving"; that is, the transportation of cattle, pigs, geese, and the like, over the roads under their own power. But by the beginning of the eighteenth century, a new type of road utilization was emerging. Its economic origin is found in the rise of metropolitan areas, the rapid growth of foreign trade, the increase of manufacturing and local distribution centers, the production for exchange rather than for domestic consumption, and the final political consolidation of England and Scotland (1707).<sup>15</sup> These developments necessitated increased travel in order to carry on the governmental and commercial work of the country, and consequently imposed vastly different demands upon those responsible for the construction and maintenance of roads.

<sup>13</sup> One observer, writing as late as 1833, noted that "a parish cannot be indicted . . . unless it can be shown that such road has been in a better state than at the time of complaint." And the Webbs supplemented this by the observation that "a parish was not legally required to raise the public right of way from one grade to another, a footway to a bridleway, or a bridleway to a cartway." The same, p. 58.

<sup>14</sup> For example, it was specifically provided that "the highways are to be enlarged, better amended, and repaired so as to promote trade, in a way for which, admittedly, 'the ordinary course appointed by the laws and statutes of this realm is not sufficient.'" The same, p. 18.

<sup>15</sup> See Clive Day, *A History of Commerce* (1928), pp. 210-11; Webb, *The Story of the King's Highway*, pp. 62-63; and C. R. Fay, *Great Britain from Adam Smith to the Present Day* (1928), pp. 23-24, 173-77.

The efficient performance of this type of transportation service, of course, required a road which was at least passably smooth and consistently surfaced to withstand both the wear and tear of traffic and weather conditions. Parochial road administration dependent upon amateur management and local revenues proved wholly incapable of providing this quality of facilities.<sup>16</sup>

*In the nineteenth century a dynamic conception of road policy emerged.* The next significant phase of development in English road management, extending up to the end of the nineteenth century, was concerned primarily with the attempt to adapt the administrative machinery and the distribution of the financial burden for road support to these rapidly enlarging demands for improved facilities. What was required was the substitution of a dynamic for the traditional static concept of the road function, not merely the overhauling of old machinery and methods. This necessity was not readily grasped, for it appears not to have occurred to those who became articulate in demanding improved road facilities that any inequity might be involved in expecting the increased burden to be borne by the assessment of labor and money levied against local taxpayers. On the contrary, it seems to have been taken for granted "that the new users of wheeled traffic had a grievance against the parishes which they passed through. The passengers demanded the new kind of road without paying for it."<sup>17</sup>

Moreover, as in almost every phase of economic and social development where new methods of doing things demand legislative consideration, the attempt was made to resolve the inevitable clash among the interested

<sup>16</sup> For accounts of the condition of English roads during this period see Samuel Smiles, *Lives of the Engineers* (1862), Vol. I, pp. 164-207, 231; Vol. II, pp. 135-36, 375-76.

<sup>17</sup> Webb, *The Story of the King's Highway*, p. 72.

groups by placing negative restrictions and prohibitions upon the development of the new rather than by adapting the traditional method of performing the function to the requirements of a changing order. Thus in England the legislature initially attempted to solve the problem by a system of "injunctions and prohibitions as to the construction of wheeled vehicles, the way they were to be drawn, the weight they were to carry, and the number of horses or oxen to be used." It made no effort to approach the problem constructively by broadening the tax base for the support of road services in accordance with the new purposes served by the facility.<sup>18</sup>

The basic conflicts here, as in the case of modern highway regulation, were whether public authority should build the highway to accommodate the existing or anticipated use to be made of it or should limit the use of the existing highway by arbitrary regulation with a view to preserving it from destruction.

The forces working toward modernization were, however, too powerful to be ignored altogether. The initial

<sup>18</sup> The same, p. 74. Any one who assumes that the long struggle between the conflicting interests of users of our modern highway system is an exclusive product of the motor vehicle era may gain instruction from the following commentary written in 1755: "If a person would know, what number of horses or beasts in a cart or waggon are allowed by the statutes for the preservation of the roads; let him take what treatise at present he pleases concerning the highways, he must read over the whole, before he shall be sure that he hath found all which the law hath enacted concerning the same; and such is often the inaccuracy and confusion, that when he hath perused the whole, perhaps he may be still to seek. For as to this instance before us, there have been regulations made concerning the same, by ten different acts of parliament, at very different times. Before he can have any competent knowledge thereof, he must lay all these ten acts together; and when he shall have done this, he will find amongst them so many repeals, and revivals, and explanations, and amendments, that it will even then be no easy matter to conclude with certainty how the law doth stand as to that article." Richard Burn, *The Justice of the Peace and Parish Officer*, 16th ed. (1788), Vol. I, pp. viii-ix.

attack was made on the problem by delegating to local authorities the power to levy tolls for the maintenance of heavily traveled roads. This, of course, represented an attempt to shift the burden of road maintenance from the local residents of the parish to the traffic originating outside the parish.<sup>19</sup>

It is in the theory underlying this particular type of road taxation that we find the foundation for the subsequent development of turnpike companies. These companies had their origin in the creation by Parliament of special statutory bodies to administer designated sections of main roadways. They were not designed to supplant, and in fact never wholly supplanted, the local road authorities in the administration of the road function.

Gradually, however, the turnpike trustees accumulated greater powers over the administration and use of highways. Eventually they acquired all the powers possessed by local government agencies, and added new ones of a sweeping nature. For

they could buy land compulsorily in order to widen narrow ways and improve gradients. They could erect bars against byelanes, close up ancient highways, divert others at their pleasure and compel every one to travel by the new road they had constructed. In this way an ancient hamlet might find itself suddenly deprived of a public road, in order that the journey from one town to another might be shortened or straightened, or even so that a particular mansion or farmhouse might be favoured with easy access to the market town.<sup>20</sup>

Thus it developed that a device, created by Parlia-

<sup>19</sup> The legal basis for the method of distributing the financial burden had been established in the 1555 statute (see above, p. 12), which among other things empowered the justices in quarter sessions to levy a special tax upon a parish adjoining one in which it could be demonstrated that the legal maximum tax levy failed to produce revenues adequate for the proper maintenance of its roadways. It is in this provision that we find definite recognition of the community values created by road development.

<sup>20</sup> Webb, *The Story of the King's Highway*, pp. 119-20.



ment to perform a specialized portion of the road function, gradually took the form of a permanent method of over-all road management, overshadowing in many respects the powers and duties of local parish authorities. One of the most unfortunate results of the turnpike system was the tendency to center public attention and action on a system that was incapable of furnishing any solution for the basic problem of road management. Even at the peak of their development, turnpike companies provided only one of the several necessary classes of road facilities—the so-called arterial or national routes. In focusing attention on the turnpike, or commercialized system of toll-charging designed to supply these main facilities, the underlying and necessary service provided by the much larger mileage of local roads was commonly overlooked. On this aspect of the problem the Webbs observed that at the peak of the turnpike development not more than 20 per cent of the total road mileage was included in the turnpike system.<sup>21</sup>

The toll system proved inadequate even for the provision of these main arteries. The engineering and ad-

<sup>21</sup> "If we had confined our reading between 1800 and 1830 to the voluminous Parliamentary Papers, to the reports and evidence of such experts as Macadam and Telford, and to the books, articles, and pamphlets about roads that abounded in these years, we might easily have imagined that by this time the bulk of the roads throughout the kingdom had become turnpikes, and that the condition of such byways and country lanes as still remained under the jurisdiction of the parish Surveyor of Highways was of no importance. This was not the case. Out of a total length of recognized public highway in 1820 of about 125,000 miles, only about 20,875 miles, or little over one-sixth, was under Turnpike Trusts; and even by 1838 the mileage under Trusts had only increased to about 22,000, leaving, it was computed, no less than 104,770 miles, with an annual expenditure of more than a million sterling, under parochial control. Nor did the minority of turnpike roads include all the ways much frequented by man, beast, and vehicle. . . . These hundred thousand miles of miscellaneous streets, roads, and lanes were, in 1830, as in 1730 or in 1630, still administered by the thousands of separate parishes and townships, according to the mediaeval assumption of personal services and parochial obligation." The same, pp. 193-94.

ministrative genius that Thomas Telford and John Louden Macadam devoted to turnpikes did not succeed in saving them from complete extinction in England by the end of the nineteenth century. The oft-quoted observation of Sir James Macadam (son of J. L. Macadam) that, after 1830, the "calamity of the railways" fell upon the turnpike system is the popular explanation for its demise.

It should be recalled, however, that as early as 1726, long before the coming of railroads, popular dissatisfaction with the toll system assumed the proportions of revolt. Disorders of such violence occurred that the military forces were called to restore order.

The defects were inherent in the system itself. In 1864 a committee of the British House of Commons summarized the issues as follows:

... the turnpike tolls were "unequal in pressure, costly in collection, inconvenient to the public, and injurious as causing a serious impediment to intercourse and traffic"; ... the abolition of Turnpike Trusts "would be both beneficial and expedient"; and ... the most practicable course was to let the turnpike roads be vested in a public authority as had been done in South Wales.<sup>22</sup>

By 1895 all turnpike trusts had been dissolved, and the road functions performed by them during the preceding century and a half were restored to normally constituted governmental agencies.

In the meantime, significant progress had been made in adapting the normal machinery of road administration and financing to John Louden Macadam's dynamic theory that "roads must be made to accommodate the traffic, not the traffic regulated to preserve the roads."<sup>23</sup>

<sup>22</sup> The same, p. 221.

<sup>23</sup> The same, p. 172.

Two general types of reform were accomplished through a series of parliamentary enactments running from 1835 through 1894.<sup>24</sup> The first consisted in enlarging the administrative unit charged with primary authority and responsibility for road development. The ancient parochial system was gradually supplanted by a more centralized system of management centering in the county councils and in "rural sanitary authorities." As an essential part of this reform, the laws eventually incorporated the major portion of Macadam's thesis that efficient road administration could be attained only by replacing amateur local road surveyors with technically trained road officials devoting their entire time and energy to the task, and by substituting compulsory road taxes for "statute labor,"<sup>25</sup> that is, working out the road tax.

The second, and equally important, reform is found in the statutory recognition of national responsibility to contribute to the support of certain classes of roads. Grants-in-aid, rather than direct operation, were used to discharge this responsibility. It is significant that the first direct expression of national concern with the condition of rural road facilities came from the General Post Office and the Board of Agriculture.<sup>26</sup>

<sup>24</sup> The most important of these enactments are: An Act to consolidate and amend the Laws relating to Highways in the Part of Great Britain Called England, 31st August 1835 (5 and 6 Wm. IV, c. 50); An Act for the better Management of Highways in England, 29th July 1862 (25 and 26 Vic., c. 61); The Local Government Act of 1878 and 1888 (41 and 42 Vic.); The Local Government Act of 1894 (56 and 57 Vic., c. 73).

For a brief account of the evolution of road laws during this period see Jeremiah W. Jenks, "Road Legislation for the American State," *Publications of the American Economic Association*, Vol. IV (1889).

<sup>25</sup> Webb, *The Story of the King's Highway*, p. 173.

<sup>26</sup> "The growing postal business of the country, at a time when all mails were road-borne, and, since the union between England and Ireland, the need for improving the means of travel between London and Holyhead, had, from the very beginning of the nineteenth century,

It was under the patronage of the heads of these two departments of the national government that Thomas Telford and John Loudon Macadam gave new direction and impetus to the science of road building and administration. As we have already seen, these efforts were directed largely toward improved turnpike administration. But with the dissolution of these organizations the turnpike mileage was turned back to the jurisdiction of the highway districts and highway parishes. This imposed upon local taxpayers maintenance burdens which had previously been borne in large measure through the payment of tolls by traffic originating outside the district. The resultant increase in tax burden caused sufficient resentment to induce the national government in 1876 to advance substantial grants-in-aid to the local communities. Since that time Parliament has consistently, either through grants-in-aid to local authorities or through assumption of direct responsibility for main roads, participated actively in the administration and financing of the road function.<sup>27</sup>

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been leading the Postmaster-General to interest himself in the state of the main lines of road. We see him writing to different Turnpike Trusts, stirring up Quarter Sessions, indicting parishes and sending his 'riding surveyors' to inspect the principal routes. . . . Meanwhile another department of the national government had been bestirring itself in the attempt to get a better administration of the roads. The Board of Agriculture . . . had, from 1794 onwards, been incidentally reporting on the unsatisfactory condition of the English highways and constantly pressing for their improvement." The same, pp. 167, 170.

<sup>27</sup>English rural highways are now divided into three groups: Class 1, Class 2, and Unclassified. The Ministry of Transport created in 1919 now exercises full jurisdiction over Class 1 highways and finances the function exclusively from general funds of the exchequer. See *Highway Administration and Finance in 15 Countries*, Brochure No. 94, prepared by the International Chamber of Commerce, p. 45 ff.

## II. IN FRANCE AND GERMANY

By the end of the nineteenth century other leading European countries had developed similar systems for distributing the administrative and financial responsibilities involved in the provision of roads. In fact, rationalization of road management occurred somewhat earlier in continental countries than in the British Isles. The time lag, however, is not especially pertinent to this analysis; it is perhaps attributable to the British reluctance to abandon time-honored methods of doing things.

During the nineteenth century France developed what was generally conceded to be the most complete system and the best quality of roads in Europe. According to statutory definition, all rural roads were divided into five classes, but the basic division, so far as governmental responsibility was concerned, consisted of a three-way classification:<sup>28</sup>

*Route nationales* (first class). These were maintained entirely by the state and came under the supervision of the Minister of Public Works.

*Routes départementales et chemins de grande communication* (classes two and three). This class of roads was supported by the *départementes*,<sup>29</sup> with some aid from the various local subdivisions.

*Chemins vicinaux ordinaires* (local roads of classes four and five). These roads were under the immediate jurisdiction of the local officials of the *canton* or *commune*.<sup>30</sup> Expense for extraordinary repair or unusually

<sup>28</sup> See Wm. H. Waddington, "Local Government and County Councils in France," *The Nineteenth Century*, Vol. 23 (1888), pp. 927-36.

<sup>29</sup> These divisions correspond most nearly to our county unit of government.

<sup>30</sup> These French subdivisions correspond in general to our district or township.

heavy investment involved in bridge construction, for example, was in some instances shared by the *département*.

*Chemins ruraux* (sixth-class roads) were recognized as public ways but were not legally classified for administrative and financial purposes. In other words, no one was held liable for their maintenance.

In addition to these assignments of direct responsibility for road provision, it was a common practice for the French state to make special grants-in-aid to its minor local subdivisions for the permanent improvement of roads over which these local agencies exercised primary jurisdiction.

Revenues for the support of the normal road function were derived from three principal sources: statute labor (*prestations en nature*), which could be paid in money if desired by the "rate-payer"; general county rates; and state general funds. Incidentally we find no evidence that the turnpike or toll system was used in France to any great extent during this period.

One other feature of the French system deserves mention: the method used in dealing with the "special user" problem. In addition to the normal road taxes levied by the various levels of government, the national government imposed a special assessment (*subventions industrielles*) on specified industries that used "large wagons" and carted "very heavy loads,"<sup>31</sup> on the theory that such utilization caused an "abnormal wear and tear of the roads, the repairing of which cannot be fairly charged on the general body of ratepayers."<sup>32</sup>

<sup>31</sup> Especially sugar factories, distilleries, and other industries which used the roads heavily during the rainy and winter seasons when they were the most liable to damage.

<sup>32</sup> Waddington, *The Nineteenth Century*, Vol. 23, p. 935.

The amount to be assessed against special users was arrived at through administrative bargaining and adjudication between the affected private parties and governmental agencies; and the proceeds were strictly earmarked for application to specified sections of roads.<sup>83</sup>

Thus we find that the special user problem that bulks so large in general discussions of modern road management is not a product of the motor vehicle age. It has intruded into and complicated the formulation of acceptable taxing principles during every important phase of highway development.

In Prussia, and the German states generally, roads were grouped, according to main purposes served, into three classes: state, provincial, and local.<sup>84</sup> Military ways and those connecting large centers of population made up the state class. These were provided and supported wholly by the state. Provincial roads composed of feeders to the state system were supported jointly by state aid, provincial general revenues, and tolls collected under the supervision of public authority. And local roads were managed and financed by villages and districts.

It should be noted that the turnpike or toll system proved as unsatisfactory in Germany as it had in Eng-

<sup>83</sup> "The amount of the 'subvention' is debated between the 'agents-voyers' and the parties interested, and a fair arrangement is generally agreed upon under the sanction of the 'conseil général'; but if the parties cannot agree the matter is referred to the 'conseil de prefecture,' or administrative tribunal, with whom the final decision lies. The 'subvention industrielle' must always be spent on certain specified roads, or sections of roads, and cannot be applied indiscriminately to the general purposes of the 'service vicinal.' Some manufacturers prefer contracting for the keeping up the roads they use, and these arrangements must also be sanctioned by the 'conseil général' or its permanent committee." The same.

<sup>84</sup> Jenks, *Publications of the American Economic Association*, Vol. IV, pp. 198-99.

land. Among other defects, the expense of toll collection was exorbitant, amounting to 17 or 18 per cent of gross receipts. By the end of the nineteenth century this method of road administration had been generally abandoned in Germany.<sup>85</sup>

#### SUMMARY

From this review we find that leading European countries had by the end of the nineteenth century developed systems of road management governed by several widely accepted sets of general principles. Fundamental to the entire scheme was the classification of the road function as an essential activity of organized government. Moreover, after extensive experimentation with the turnpike or toll system, it became an accepted canon that public authority should retain direct jurisdiction over the provision of road facilities rather than delegate the responsibility to publicly supervised private enterprise.

The second governing principle was based on the recognition that given classes of roads serve different broad purposes in widely varying degrees. Making allowance for variations in technical terminology and legal classification, in actual practice the operating systems were designed to distribute primary authority and responsibility among the recognized levels of government according to the degree of interest possessed by the inhabitants of each in three distinguishable classes of roads: (1) general purpose roads, serving broad state or national interests in general communication, national defense, the postal service, and similar governmental functions; (2) community service roads, serving primarily as avenues for neighborhood commercial, social,

<sup>85</sup> The same, p. 183.



and governmental communication, but also as feeders to the general purpose system; (3) local or land access facilities, functioning primarily as avenues of ingress and egress for land and buildings.

Third, the amounts to be spent by the various levels of government on these several classes of roads were determined according to customary legislative processes. And the desired funds were raised through application of the prevailing principles of general taxation. In short, the controlling purpose of the system was to distribute the financial burden of highway support, not according to the immediate benefit derived by each individual user, but according to the collective benefits enjoyed by distinguishable groups of individuals because of the social and economic services generated by various classes of roads.

We also find that these general governing principles were kept sufficiently flexible to take account of special circumstances. Thus, under all systems, recognition was given to the problems created by special users who stood to benefit from road facilities not only as ordinary citizens, but through direct use of the road as an integral part of a business enterprise. In France, special charges, such as the "industrial subventions," were assessed against specified users. Under the English system, the problem was first met by holding users individually liable for the entire cost of repairing any damage caused by "extra ordinary" use. Each case was determined on its own merits, according to prevailing judicial concepts of what constituted "extra ordinary" use. The entire process was therefore judicial and remedial in nature and was based upon what we have called a static concept of the highway function. Subsequently this approach was supplanted by the turnpike system

based on the theory that roads should be built to "accommodate the traffic, not the traffic regulated to preserve the roads." Toll charges were adjusted with a view to compensating the companies for expenditures incurred in providing facilities adequate to support the types of traffic that were legally permitted to use the roads. The toll system, even during the heyday of turnpikes, was never applied to more than a fraction of the total road mileage.

## CHAPTER II

### EVOLUTION OF HIGHWAY POLICY IN AMERICA TO 1916

American road management has passed through all the conceptual and structural changes revealed in the historical evolution of European systems.<sup>1</sup> In this country, however, the adjustments lagged substantially behind those in Europe, for it was not until near the end of the nineteenth century that American road management began to feel the influence of forces that had been operative in Europe for more than a century. This time lag created an accidental historical coincidence between the period that witnessed fruition of basic reforms in road management and the period during which motorized highway use reached maturity. As a consequence, it has been widely maintained that technological change has been accompanied by fundamental alterations in the character and distribution of highway services. Much of our recent discussion of highway administration and finance has been confused by a preoccupation with the

<sup>1</sup> It should also be noted that American highway policy takes its form from English common law and administrative practice. Legal provision for the road function constituted one of the earliest concerns of the colonies. The first American road law was passed by the general assembly of Virginia in 1632, while the first road to be built by American white men was constructed at Jamestown shortly after 1632. The way between Boston and Plymouth was begun in 1639. In the province of New York, the first laws relating to road-building were passed in 1664. And in 1666 Maryland passed its first road laws. In 1692 Pennsylvania placed the control of highways under the jurisdiction of townships and is credited with the construction of the first important macadam road built in America—the Lancaster Turnpike, running between that place and Philadelphia, constructed in 1794. (See *A Compilation of the Messages and Papers of the Presidents* (Bureau of National Literature, Inc.), Vol. XX, under "Roads, Public.") These enactments form the statutory base for subsequent development of local road administration.

new problems imputed to the rise of motor vehicle transportation rather than with analysis of the underlying nature of the road function. The impact of this emphasis upon administrative and financial policy has been so sharp (see Chapters III and IV) that careful scrutiny of its historical foundation is in order. The circumstances that surrounded late nineteenth century reform of road management in this country supply the materials for such an inquiry.

At the beginning of American national life we were, in certain significant respects, in a situation quite different from that which existed in the Old World. Here, the demands of political unity and of the common defense, the settlement and economic development of the West, and the need for commercial routes between West and East made transportation a particularly vital problem and gave tremendous impetus to proposals and undertakings for the construction of transportation facilities. At the same time, American government had certain constitutional and political peculiarities. Under our system of constitutional federalism, powers were divided between the federal government and the states. The doctrine of states' rights and the principle of decentralization in general were strongly held and were supported by sectional interests as well as by the current ideas of democracy. Within the states, the tradition of local self-government was deeply rooted, and was maintained by pioneering agricultural conditions. For many reasons, neither the state legislatures nor the people as a whole were equipped or ready to recognize or adopt sound principles. As a result, administrative progress lagged behind extensive physical growth; and it was not until 1880 that the modern course of evolution in highway policy really began.

## I. INTERNAL IMPROVEMENTS PERIOD

Between 1800 and 1830, determined efforts were made to launch the national government upon a comprehensive scheme of internal improvements, involving mainly the provision of roads and canals. It was generally agreed that such transportation routes, both commercial and military, were necessary to the proper functioning of a central government. The advocates of a strong national government had apparently assumed that the governmental authority would take the initiative in supplying adequate lines of communication and thus minimized such objections to the adoption of the Constitution as were "drawn from the great extent of the country which the Union embraces." On this point Madison observed

. . . that the intercourse throughout the Union will be daily facilitated by new improvements. Roads will everywhere be shortened, and kept in better order; accommodations for travelers will be multiplied and meliorated; an interior navigation on our eastern side, will be opened throughout, or nearly throughout, the whole extent of the thirteen States. The communication between the western and Atlantic districts, and between the different parts of each, will be rendered more and more easy, by those numerous canals, with which the beneficence of nature has intersected our country, and which art finds it so little difficult to connect and complete.<sup>2</sup>

By 1808, however, little progress had been made in supplying satisfactory means of commercial intercourse between the territory lying west and that lying east of the Alleghenies. For in that year, even before the striking deficiencies of the young nation's transport system had been dramatized by the War of 1812,<sup>3</sup>

<sup>2</sup> *The Federalist*, John C. Hamilton, ed. (1866), No. 14, pp. 134-35.

<sup>3</sup> During the great constitutional debates on the power of the national government to prosecute internal improvements, a report of a House committee on Monroe's message of 1817 maintained that "the em-

Albert Gallatin, then Secretary of the Treasury, presented to the Senate a comprehensive plan for the development of an integrated scheme of internal improvements to be undertaken by the central government.<sup>4</sup> Briefly the plan called for a broad development which, according to Gallatin, adhered to the "great geographical features of the country" and was "calculated to diffuse and increase the national wealth in a very general way, by opening an intercourse between the remotest extremes of the United States."<sup>5</sup>

Gallatin found that two factors, the scarcity of private capital and the extent of territory compared with the population, were chiefly responsible for the slowness with which internal improvements were being undertaken. He concluded that "the General Government can alone remove these obstacles."<sup>6</sup> Three general lines of development were specifically recommended in the report:

1. A system of great canals and a continuous turnpike to provide an inland navigation route from Massachusetts to North Carolina and a turnpike from Maine to Georgia uniting all the major seaports along the Atlantic coast.

2. Communications, both canals and roads, across the Alleghenies between the Atlantic and "Western" rivers.

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barrassments of the nation during the war, from the want of good roads and canals, both in relation to trade and the transportation of cannon and military stores, have been too recently and sensibly felt to be forgotten. Vested with the power of making war, the Constitution could never have intended the General Government should make it under such disadvantages." *Annals of Congress*, Vol. 31, 15 Cong. 1 sess., p. 457.

<sup>4</sup> Reproduced in full in *American State Papers*, Class X (*Miscellaneous*, Vol. I), pp. 724-922. For a brief analysis of the report see B. H. Meyer, *History of Transportation in the United States before 1860* (1917), p. 135.

<sup>5</sup> *American State Papers*, Class X (*Miscellaneous*, Vol. I), p. 740.

<sup>6</sup> The same, pp. 724-25.

3. Canals forming land navigation routes between the Atlantic seacoast and the Great Lakes and the St. Lawrence.

To finance this ambitious scheme Gallatin proposed the application of surplus treasury funds—at that time (1807) assuming disturbing proportions for a government which had not as yet undertaken any very extensive public services.<sup>1</sup>

Centralized operation of the facilities called for in the comprehensive plan was not contemplated. The federal government was merely to sponsor the plan, build the roads, and then turn them over either to private corporations or to the various states through which the proposed routes would pass. The funds derived from the sale of the completed projects were to be used for further extension.

But the main issue of internal improvements, that is, the public need for them and the appropriate agency to meet that need, became entangled in the intricate constitutional debates of the period and in the rising tide of sectionalism.

Arguments relative to the power of the federal government to engage in the work of internal improvements took three main forms. It was contended at one extreme that the federal government possessed full power under the Constitution to prosecute internal improvements of demonstrated national importance; at the other, that the national government had no such power under the Constitution or that its power in this respect was sufficiently debatable to justify the conclusion that a constitutional amendment would be required for the legal entry of the federal government into this field.

<sup>1</sup> The same, p. 740; W. S. Shultz and M. R. Caine, *Financial Development of the United States* (1937), p. 137.

Others held that, even though doubt might be entertained as to the power of the federal government under the Constitution to prosecute such works directly (by construction and operation), the power to appropriate funds did exist and therefore the desired objective could be attained satisfactorily through joint action by the national and state governments. Each proposition had its advocates. The specific issues were brought into sharp focus by presidential messages and vetoes of bills calling for expenditure of public funds on roads and canals. In general the early presidents, while ostensibly favoring a nationally developed system of transport facilities, consistently vetoed appropriations, thereby preventing systematic action on such a program.<sup>8</sup>

Madison, Monroe, and Jackson maintained that a constitutional amendment would have to be adopted before the federal government could proceed with admittedly desirable improvements. Monroe in his First Annual Message (1817) stated:

Disregarding early impressions, I have bestowed upon the subject all the deliberation which its great importance and a just sense of my duty required, and the result is a settled conviction in my mind that Congress do not possess the right [to establish a system of internal improvements]. . . . In communicating this result I can not resist the obligation which I feel to suggest to Congress the propriety of recommending to the States the adoption of an amendment to the Constitution which shall give to Congress the right in question.<sup>9</sup>

*The animating influences of the entire struggle came from the rising tide of sectionalism.* On the surface it appears that in this early period considerations of constitutionality exerted decisive influence on the relation-

<sup>8</sup>See, for example, the messages of Madison, 1817, Monroe, 1822, and Jackson, 1830, in *Messages and Papers of the Presidents*, Vol. II, pp. 569-70, 711-52; Vol. III, pp. 1046-56.

<sup>9</sup>The same, Vol. II, p. 587.



ship of government to transportation. The constitutional controversy was, however, merely symptomatic of another and more disturbing set of forces which were at work. A significant transformation was taking place in political thinking and alignments—a transformation brought about by the economic changes at work after the War of 1812. Turner observes that the leaders of this period were “changing their attitudes toward public questions as the economic conditions of their sections changed” and “were obliged not only to adjust themselves to the interests of the sections which they represented, but also, if they would achieve a national career, to make effective combinations with other sections.”<sup>10</sup>

This sectional controversy was injected into the internal improvement question chiefly because of the uneven rate at which improvements had been made in different areas of the country. The New England states, New York, and Pennsylvania had already spent substantial sums on roads and canals. They were not anxious to contribute to the cost of making similar improvements in other areas, particularly when such improvements threatened to increase the commercial advantages of those regions. Baltimore, for example, stood to gain and New York to lose by the extension of the Cumberland Road into Ohio and westward.<sup>11</sup>

<sup>10</sup> F. J. Turner, *The American Nation: A History*, Vol. 14, *Rise of the New West, 1819-1829* (1906), p. 6.

<sup>11</sup> In order to allay the fear that in any national development of internal improvements, funds would be spent according to transportation requirements at the time, and therefore unevenly as among geographic regions, a compromise plan was offered by the advocates of national action providing (1) that no part of any national program should be prosecuted in any state without its consent and (2) that all federal funds appropriated for such purposes “shall be distributed among the several States, in the ratio of representation which each State shall have in the most numerous branch of the National Legislature.” *Annals of Congress*, Vol. 31, 15 Cong. 1 sess., p. 22. See also Meyer, *History of Transportation in the United States before 1860*, p. 139.

In spite of constitutional and sectional difficulties which blocked the adoption of an integrated system of internal improvements during the first quarter of the eighteenth century, a substantial number of projects was undertaken by the federal government. In 1806 Congress passed "an act to regulate the laying out and making of a road from Cumberland in the State of Maryland to the State of Ohio."<sup>12</sup> Subsequent attempts to maintain this national turnpike by the mandatory collection of tolls evoked the same constitutional objections which had been raised against the Gallatin proposal. Consequently, in 1822, Monroe, in line with his previous stand on the internal improvement issue, vetoed a bill providing for the collection of federal tolls to be used in maintaining the Cumberland Road.<sup>13</sup> With this action the federal government withdrew from active participation in the provision of road facilities and did not re-enter the field, in any substantial way, until 1916.<sup>14</sup> And by 1832 primary jurisdiction over the Cumberland Road has been assumed by the various states through which it passed.<sup>15</sup>

## II. THE TURNPIKE ERA

Failure of the national government to provide needed facilities for general highway communication made it necessary for the states to assume the obligation. In the discharge of their responsibility the states employed a

<sup>12</sup> For data on the Cumberland Road see Meyer, *History of Transportation in the United States before 1860*, p. 12; Institute for Government Research, *Bureau of Public Roads*, Service Monographs of the United States Government, No. 26 (1923), p. 3; *Federal Aid to Good Roads*, H. Doc. 1510, 63 Cong. 3 sess., Chap. XII; and Jeremiah S. Young, *A Political and Constitutional Study of the Cumberland Road* (doctoral dissertation submitted to University of Chicago, 1902).

<sup>13</sup> *Messages and Papers of the Presidents*, Vol. II, pp. 711-12.

<sup>14</sup> As noted below, however, federal interest was revived in a limited way as early as 1893 through creation of the Office of Road Inquiry.

<sup>15</sup> Pa., Ohio, Va., and Md.

variety of methods. Some undertook in a limited way to provide general purpose roads through state administrative agencies and state funds. Others delegated some of the responsibility to counties and townships. Still others combined these methods with turnpike operation.<sup>16</sup> But in the main, the period between 1800 and 1850 is characterized by experimentation with what may be termed the "commercial concept" of road management.<sup>17</sup> While privately organized and financed corporations were widely used, the essentially public nature of the road function was maintained by means of comprehensive public supervision.<sup>18</sup>

Application of this commercial concept of management constituted an effort (1) to shift the main burden of support for general purpose roads from the general

<sup>16</sup> Between 1785 and 1845, Pennsylvania, for example, followed four different courses: (1) direct construction of roads by state officials with the use of state funds; (2) state grants-in-aid to counties accompanied by very little state supervision over the activities of the county commissioners; (3) state designation of roads with instruction for local government to execute and pay for the program; and (4) delegation of the road-making function to turnpike companies, accompanied by state subscription to the capital stock of these companies. Wilbur C. Plummer, *The Road Policy of Pennsylvania*, pp. 45-46. (A thesis presented at the University of Pennsylvania, 1925.)

<sup>17</sup> The modern version of the "commercial" or "public utility" method of road management is discussed in Chap. VII.

<sup>18</sup> State acts incorporating turnpike companies typically included exercise of the following public regulatory powers: (1) approval of road location; (2) amount of capitalization; (3) regulation of toll rates; (4) location of toll gates; (5) specification of permissible loads, physical characteristics of vehicles, and other conditions of use; (6) provision for return of roads to public status upon abandonment of charter, failure to maintain properly, or expiration of fixed period. See J. A. Durrenburger, *Turnpikes—A Study of the Toll Road Movement in the Middle Atlantic States and Maryland* (1931); A. B. Hulbert, "Paths of Inland Commerce," in *Chronicles of America*, Vol. 21 (1929); J. L. Ringwalt, *Development of Transportation Systems in the United States* (1888); Meyer, *History of Transportation in the United States before 1860*; F. J. Wood, *Turnpikes of New England* (1919); and W. M. Curtis, *Development of Highway Administration and Finance in New York* (1937).

taxpayer to the direct users of such facilities<sup>19</sup> and (2) to use the organizational and managerial capacities of regulated private enterprise for the provision of this portion of the road system. As in England, toll charges, graduated according to type of use, were relied upon as the chief source of revenue. It was the general practice, however, to supplement these revenues with public funds, which were ordinarily advanced as state subscriptions to the capital stock of turnpike companies, as outright grants in aid, or as tax abatement.<sup>20</sup> It was thus admitted that roads generated services and benefits which could not equitably be assigned solely to a limited class of direct users.

Highway policy based on the commercial concept failed to produce satisfactory results. In this country, as in England, the incidental reasons were indifferent management, excessive cost of administration due principally to the expenses inherent in toll gate operation, and the rise of railroad competition.<sup>21</sup> With reference to the latter point it must be recalled that railroad competition contributed only to the abandonment of the turnpike system of road administration. It did not result in the elimination of highways from the domain of pub-

<sup>19</sup> For example, the Pennsylvania state act incorporating the Philadelphia and Lancaster Turnpike Company (1792) declared: "Whereas, the great quantity of heavy articles, of the growth and produce of the country, and of foreign goods, which are daily transported between the city of Philadelphia and the western centres of the state, requires an amendment of the highway, which can only be effected by artificial beds of stone and gravel, disposed in such manner as to prevent the wheels of carriages from cutting into the soil, the expenses whereof will be great, and it is reasonable that those who will enjoy the benefits of such highway should pay a compensation therefor, and there is reason to believe that such highway will be undertaken by an association of citizens if proper encouragement be given by the legislature." Ringwalt, *Transportation Systems in the U.S.*, p. 30.

<sup>20</sup> Durrenberger, *Turnpikes*, pp. 51-56, 101, 154-59.

<sup>21</sup> The same, pp. 58-162; Wood, *Turnpikes of New England*, p. 52.

lic policy; for, as turnpike companies dissolved, the affected road mileage merely reverted to full public status and was subsequently maintained by public authority out of public revenues.<sup>22</sup>

These incidental factors merely hastened the abandonment of the toll system, which was unsound in theory and practice. By overemphasizing the "special user" interest in road provision, the turnpike system violated the traditional concept of the highway function. As we have already noted, that concept viewed the provision of road facilities as an essential function of govern-

<sup>22</sup> It will be recalled that in England the return of "disturnpiked" road mileage to local government jurisdiction and the consequent increase in the financial burden imposed on these communities greatly accelerated the movement for reform of road management in that country.

In this country turnpike mileage reverted to direct public management through several different methods: (1) sale of turnpike properties to local government authorities, (2) condemnation proceedings instituted by public authority, and (3) voluntary abandonment of charter by turnpike companies. In Pennsylvania, for example,

"Upon petition of twenty-five or more taxpayers of any county that it would be for the best public interests that a certain turnpike should be a public road, the Courts of Quarter Sessions were directed to appoint a jury to view and condemn such turnpike and assess damages to the owners of the turnpike, the damages to be paid by the county. . . . After being condemned, the turnpike was maintained as any other public road, that is, by the township supervisors. Since 1905, it has been the duty of the county to maintain condemned turnpikes. . . . The Spoul Law, of 1911, provided for condemnation of the turnpikes on the routes of the proposed state highways by a somewhat similar procedure if the turnpike company and the State Highway Commissioner could not agree upon a purchase price." (Plummer, *The Road Policy of Pennsylvania*, p. 56.) And with reference to abandonment, the situation was as follows: "If a turnpike company, by a majority vote of its stockholders, released title to its road, or a portion of its road, the law provided for the release of the company from all responsibilities in connection with keeping the road in repair. Upon abandonment of a turnpike, it was the duty of the board of directors of the turnpike to notify in writing the road supervisors in the township through which the abandoned turnpike passed of their action. Upon receiving such notice it became the duty of the township supervisors to keep the road in repair. The toll gates were then taken off the road. Since 1905, it has been the duty of the county to maintain abandoned turnpikes." The same, p. 58.

ment to be financed and managed like other similar governmental activities. The problem of special users and special facilities entered into the superstructure, not the foundation, of highway policy. When governmental agencies began to reassume direct responsibility for turnpike mileage they were, in effect, re-establishing highway policy upon its traditional basis.

### III. THE PERIOD OF LOCAL MANAGEMENT

One might reasonably assume that readjustments would have resulted in the creation of state road agencies to administer the road mileage previously controlled by turnpike companies. Instead, such control reverted to county and township agencies. By about 1850 the states had abandoned practically all direct interest in the management of road affairs. In explanation of this development, it must be recalled that a legal and administrative structure for road administration was already in existence. Throughout the turnpike period, local communities continued to bear full responsibility—administrative as well as financial—for the provision of facilities necessary for local travel. And in keeping with this responsibility, they exercised complete authority over the creation, abandonment, and improvement of such facilities. These local agencies which thus inherited complete road responsibility were, however, highly ineffective; in fact, they were almost medieval in concept and operation.

Until well toward the close of the nineteenth century two characteristics were common to local road administration. One was universal dependence upon amateur direction of road construction and maintenance. The other was an equally widespread dependence upon "statute labor," or working out the road tax, as the chief means of support for the roads.<sup>28</sup>

<sup>28</sup> The best general treatments of local road management between 1850 and 1890 are found in W. M. Gillespie, *Road-Making: Roads and*

*Road supervision by amateurs produced unsatisfactory results.* One of the main obstacles to effective road management during this period was the failure of the public and legislators alike to realize that road-making required both technical skill and specialized administrative methods. While the township was commonly employed as the primary administrative unit,<sup>24</sup> the actual road repair was ordinarily carried on in numerous semi-autonomous road districts within each township.

Direct administrative authority was commonly vested in township "commissioners of highways" chosen annually at the town meeting in those states that had towns or townships. At the same meeting subordinate officials termed "overseers" were chosen to exercise direct administrative authority in each of the road districts of the town or township. Under this system, the commissioners might exercise general authority in the form of instructions on how to grade the road; in addition, they had power to designate new roads. The overseers supervised the actual work done on the roads, chose the time for doing it, summoned individuals subject to road work, and collected fines for failure of such individuals to appear. Under such an arrangement a road overseer might have supervision over no more than three or four miles of road.<sup>25</sup>

This method of highway administration produced neither technical skill nor continuity of policy. Since

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*Railroads* (1853); Jeremiah W. Jenks, "Road Legislation for the American State," *Publications of the American Economic Association*, Vol. IV (1889); and Clemens Herschel, *The Science of Road Making* (1890).

<sup>24</sup> In New England, the unit was the town; in the southern states, the county. Counties were ordinarily divided into road districts. Jenks, *Publications of the American Economic Association*, Vol. IV, p. 169.

<sup>25</sup> U. S. Department of Agriculture, *Proceedings of Convention of the National League for Good Roads*, Office of Experiment Stations, Bulletin 14 (1893), pp. 70-76.

no professional qualifications were required, the office tended to become a political sinecure, thereby discouraging the development of trained road engineers.<sup>26</sup>

Even had trained highway engineers been available they could not have been adapted to such an extremely localized organization.<sup>27</sup> For without centralized direction, it would have been practically impossible to obtain uniformity in any one road over any considerable distance or to bring all of the roads of a township or a county up to the best standards of that time.

*Financing road development through the system of working out the road tax contributed to the inefficiency of local road administration.* As late as 1889, the majority of the states depended upon statute labor as the chief source of support for road maintenance. And six states made no provision whatever for a money road tax.<sup>28</sup> The New York law with reference to statute labor was fairly typical of the system as a whole: "Every person owning or occupying land in the town in which he or she resides, and every male inhabitant above the age of twenty-one years residing in the town where the assessment is made, shall be assessed to work on public highways in such town."<sup>29</sup>

<sup>26</sup> E. Burrough, *State Aid to Road-Building in New Jersey*, U. S. Department of Agriculture, Office of Road Inquiry, Bulletin No. 9 (1894), p. 7; and "Country Roads and Road Laws," *Report of the Commissioner of Agriculture*, 1868, p. 363.

<sup>27</sup> One student of the period remarked: "In other occupations, an apprenticeship of some years is thought necessary before a person is considered as qualified to practise with his own capital; while a road overseer, the moment that he is chosen, is thought fit to direct a work requiring much science, at the expense of the town's capital, of time, labor, and money." Gillespie, *Road-Making: Roads and Railroads*, p. 344.

<sup>28</sup> Jenks, *Publications of the American Economic Association*, Vol. IV, p. 170.

<sup>29</sup> Gillespie, *Road-Making: Roads and Railroads*, p. 342. See also E. J. Hill, *Hill's Highway Manual*, a compendium of the highway statutes



It was the duty of the overseers to notify those assessed for highway work and to instruct them either to appear in person or send an able-bodied substitute or to commute the assessment in money at a rate fixed by law. Various combinations of facilities such as a team, wagon, plow, or horses, if accompanied by a man to manage them, could be substituted for the labor assessment.

All observers of the period agree that the system of working out the tax was subject to a wide variety of abuses in practical operation and was fundamentally inequitable as a means of distributing the financial burden of road maintenance. Legal provisions to the effect that "every person notified to labor on the public roads . . . shall be required to appear at the place appointed by the supervisors at the hour of 8 o'clock in the forenoon, with such necessary tools and implements as said supervisor may direct, and work industriously and diligently, doing at least eight hours' faithful labor in each day at such work"<sup>30</sup> could not in the nature of the case be strictly enforced. "Working out the road tax" came to be viewed more as the occasion for neighborhood social gatherings and the exchange of the latest accumulation of stories than as a tax contribution.

In addition to these defects, the township or district unit of road management failed to distribute the financial burden in accordance with the range of community interest in the roads. Even under the conditions of relatively self-contained domestic economy, the conduct of public business at the county courthouse, ordinary social and commercial intercourse, and school attendance

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referring to the state of Illinois (1873), p. 74; and *Road Laws of Oregon* (1901), compiled by the Secretary of State, p. 12.

<sup>30</sup> *Road Laws of Oregon*, p. 14.

commonly required travel beyond road-district and township boundaries.<sup>31</sup> The level of social and economic life of an entire community could, therefore, be affected by the indifference or incompetence of a single district or township.<sup>32</sup>

We find unqualified agreement that the combination of statute labor and amateur supervision resulted generally in poor roads. In 1868, the United States Commissioner of Agriculture reported that good roads "were the exception in all the States."<sup>33</sup> And as late as 1904, only about 7 per cent of the country's 2,151,000 miles of public roads could be classified as "improved."<sup>34</sup> By comparison with European standards the American system of road administration was obsolete and the quality of the roads strikingly inferior.<sup>35</sup>

It is difficult to formulate a wholly satisfactory explanation for the apparent complacency with which, for more than half a century, the American rural community permitted itself to remain literally mired in the mud,

<sup>31</sup> The rise of railroad transportation had not, of course, in any way lessened the dependence of rural communities upon roads for this type of travel.

<sup>32</sup> "In one town, its public spirit, wealth, and pride, may induce it to make a good road; in the adjoining town, a short-sighted policy, looking only to private interest in its narrowest sense, may have led the inhabitants to work upon the roads barely enough to put them into such a condition as will allow a wagon to be slowly drawn over them." Gillespie, *Road-Making: Roads and Railroads*, p. 343.

<sup>33</sup> "Country Roads and Road Laws," *Report of the Commissioner of Agriculture*, 1868, p. 353.

<sup>34</sup> Annual expenditures per mile of road amounted to only \$37, of which \$19 was accounted for by statute labor. "Progress and Present Status of the Good Roads Movement in the United States," *Yearbook of the Department of Agriculture*, 1910, p. 270.

<sup>35</sup> "Of all the great nations of the world America has the worst roads; and in view of its great progress not only in the industries and in commerce, but also in the comforts and conveniences of life, this is a most surprising fact. Foreigners often speak of the reported condition of our roads in tones which show that they do not understand how so great a nation can submit to such a handicap to its industries and to all its activities." *Maryland Geological Survey*, Vol. III (1899), p. 413.

seasonally isolated from the energizing currents of social and economic life. Perhaps the best explanation is found in the general political pattern, which was already outmoded after the Civil War, but which retained a strong hold on popular thinking. It was a pattern that had grown out of community self-sufficiency, that had established through the country the principle of election in place of appointment, that had discounted expertness and depended on rotation in office, and that had accepted the "spoils system" at all levels of government. The principles of road administration were similar to those governing the administration of the schools. In neither field was American society yet conscious of its needs or of its collective capacity; and in neither field had standards of performance been professionally formulated and accepted by public opinion. The country was preoccupied with expansion and was concerned more with extensive than with intensive accomplishment. With respect to transportation, railroads largely monopolized the popular imagination. They were also more interesting to economists, publicists, and leaders in general.<sup>86</sup>

#### IV. THE BASIS OF REFORM

With the completion of the railroad network and the collateral trend toward urbanism,<sup>87</sup> it became apparent

<sup>86</sup> Jenks remarked that economists, "attracted by the more interesting political subject [of railroad development and legislation], have neglected the common roads." He said he did not "know of any writer, excepting Sax, that has treated the subject with any degree of fullness. Of course, the works on Administrative Law treat the subject from the legal standpoint and those on Finance from that of taxation, but, as a rule, only a few general remarks touch the economic question." *Publications of the American Economic Association*, Vol. IV, p. 154.

For a brief account of promotional and regulatory activities with reference to railroad transportation during the period see Leverett S. Lyon, Victor Abramson, and Associates, *Government and Economic Life*, Vol. II (1940), Chap. XXII.

<sup>87</sup> According to the Urbanism Committee, 1890 marks the point at

that wide disparities had arisen in the rates at which improvements were being made in the different media of transportation. Railroad service was being extended and technically perfected; highway service, constituting an integral part of practically all traffic movement, had undergone little if any net improvement for fifty years. The rural economy was restricted by eighteenth century standards of mobility in an era when the urban population was reaping the direct benefits of modernized technology and organization. There arose a national undercurrent of pressure for adjustments that would enable the rural population to share in the new ways of life emerging from industrialization. Road reform was hit upon as one of the most direct and obvious methods of achieving this objective.<sup>38</sup>

The good roads movement, which assumed the proportions of a national crusade during the last decades of the nineteenth century, has been variously interpreted as an organized effort on the part of American bicyclists and manufacturers to obtain facilities for pleasure "cycling"; as a movement to saddle upon the farmer the cost of roads to be used by automobile "joy riders"; and as a device for expanding the market for road-building machinery and materials. These explanations suffer from the defects of oversimplification and historical inaccuracy.<sup>39</sup> Fundamentally the movement for road reform

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which the "urban population trend had definitely established itself." *Urban Government* (1939), Vol. I, p. 6, Supplementary Report of the Urbanism Committee to the National Resources Committee.

<sup>38</sup> It will be recalled that toward the end of the nineteenth century agriculture was undergoing a transition from a domestic to a mechanized or capitalistic organization. Specialized cash crops were becoming increasingly important, making all-weather road facilities indispensable if the farmer was to maintain a profitable flow of produce to the urban markets. See Charles and Mary Beard, *The Rise of American Civilization* (1927), Vol. II, especially Chap. XXII.

<sup>39</sup> As we indicate in some detail in App. A, these and many other special-interest groups played important roles at one time or another in the

sought to remove some of the disparities between the rural and urban segments of the national economy. The objective was to bring the standards of rural road transportation up to those already achieved through railroad development for urban areas and for the nation as a whole. It enlisted the support of political parties; national, state, and local government agencies; business in general, including the railroads; and a wide range of organized citizens' groups.

Although an infinite variety of detail is found in the proposals for the reform of highway policy, all of the major plans had three features in common. First, none of them considered the turnpike or toll system an appropriate means of administration or financing; second, all of them proposed the professionalization of road management; and, third, all insisted that systematic classification of roads according to their principal purposes provided the necessary basis for a redistribution of financial and administrative responsibility.<sup>40</sup>

With reference to road classification and redistribution of primary responsibility, Clemens Herschel proposed the following system:

Class 1. State roads, to be controlled and maintained wholly by the State.

Class 2. District roads, to be controlled and maintained by the State, but the expense thereof to be borne by the towns and cities of the districts in which said road shall lie, and the State, in such proportions as said Board shall apportion.

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agitation for road improvement. Whatever may have been the expectation of private benefit, their promotional efforts were in the main based upon the recognized need for modernization of normal road management.

<sup>40</sup> With reference to the latter two points, one student of the problem observed: ". . . it is believed that no system can succeed that does not make provision, at least, (1) for some classification that will ensure the application of means where they are needed, and especially (2) that does not secure skilled roadmakers to supervise the work." Jenks, *Publications of the American Economic Association*, Vol. IV, p. 216.

Class 3. Town roads to be controlled and maintained as now provided by law.<sup>41</sup>

It will be noted that the Herschel recommendation looked to the immediate centralization of control over so-called state roads in a "board of highways and bridges," and the delegation of direct authority and responsibility over the remaining two classes to county commissioners and town officials respectively.

Jenks was in agreement with the underlying thesis of the Herschel proposal and recommended that roads should be carefully classified into three general categories according to relative importance.<sup>42</sup> However, he

<sup>41</sup> *The Science of Road Making*, p. 62.

<sup>42</sup> "It needs, further, to be taken into consideration that the different roads vary so much in the character of the traffic over them that some classification is clearly required, in order that various plans of support, adapted to the varying circumstances, may be adopted. In the case of merely local roads leading from two or three farms to the main road, almost the whole benefit of the road comes to the farmers themselves. To be sure their increased facilities for getting their products to market, if this local road were improved, might help somewhat the dealers in the neighboring town; but this advantage is so slight compared with that derived from the main road that it may well be neglected entirely. If we consider, on the other hand, a main road running through several townships, and joining thriving cities, it becomes evident that the land-owners in any one township, especially in the township lying nearest the market, receive probably not half the benefit, a large part of it going to the market town and another part to the farmers living at a greater distance from it. It seems clearly unjust that the town should be asked to undertake the whole support of such a road; and, besides, we may be reasonably sure that in many cases the conflicting interests of towns in different situations will hinder the building of through roads, if the matter is left in the hands of town authorities. . . .

"From the standpoint of justice, then, local roads should be separated from main roads; and it seems probable that the support of local roads by the local residents, say the residents in a township, and that of the main roads by the inhabitants of larger administrative divisions, as the county, will divide the burden of support as fairly as it can be determined. The experience of the leading countries of the world favors this plan. In addition, special contributions might be taken from those whose use of portions of the road tended to wear it unduly." *Publications of the American Economic Association*, Vol. IV, pp. 175-77.

saw no immediate need for any high degree of centralization at the state level, and proposed distribution of jurisdiction along the following lines:

(a). Roads of the first class, main roads connecting large towns in the same or adjoining counties or those much used for long distance traffic, should be controlled solely by the county authorities and supported by county funds. So far as such a road served in part of its length as a local road the town benefited thus might contribute to its support.

(b). Roads of the second class, those connecting roads of the first class or serving as principal feeders to them, also those serving as connecting roads for two or more townships, should be supported mostly by the towns in proportion to the benefits received, aid being given by the county in case of special expense, such as the building of a costly bridge, or in case of real inability to pay on the part of the town. The management of these roads, details of working, etc., should be in the hands of the county authority.

(c). The roads of the third class, merely local roads, should be supported by the town and managed by town officials.<sup>43</sup>

These guiding principles, extensively advocated during the last two decades of the nineteenth century, gained wide support and gave form and direction to the major adjustments which occurred between 1890 and 1916.

The obsolete system of road management which we have described was, of course, not immediately rebuilt to conform with these principles. Transitions were made gradually and without any particular uniformity among the states. Some important features of the reform program have not yet been adopted. On the other hand, some trends gained too much momentum and have

<sup>43</sup>The same, p. 212. On the question of state centralization, Jenks observed: ". . . from the economic standpoint, it seems that, in great measure, the railroads, and they alone, are really of state significance, and that consequently but few roads if any should be supported directly from the state treasury." The same, p. 211.

passed beyond the goal originally fixed. But during this transitional era, when the handling of rural roads was little affected by the use of motor vehicles, all the essential groundwork was laid for a reasonably satisfactory system of road administration—one capable of adaptation to the requirements of expanding governmental functions and to the prevailing technological improvements in the means of moving goods and people from place to place.<sup>44</sup>

The evolution of the basic system followed three interrelated courses: (1) substitution of money taxes for statute labor; (2) expansion of the taxing and administrative unit; and (3) inauguration of a federal-aid policy.

*Money taxes gradually replaced the statute labor system.* From the beginning of the movement for better roads it was clear that statute labor could not furnish sufficient support for an expanded road program. The higher cost of improved roads and the need for more or less continuous employment of skilled workers made it impossible to acquire a labor supply (not to mention materials) of the requisite quality in terms of a given number of days' labor on the road. One state after another obtained the funds for road building and maintenance by replacing statute labor with general tax levies on property. Poll taxes for labor on the road were not abolished in all cases, but provision was made in every state for commuting the labor requirement into money.

In 1898 the New York legislature passed an act designed to encourage the outright repeal of all road labor

<sup>44</sup> We are not suggesting that motor vehicle manufacturers and users played no role in the good roads movement. Their influence was, of course, felt. But analysis of the motivating forces clearly indicates that during the really formative portion of the period under review their role was a minor, if not negative, one. See App. A.



taxes. This act, known as the Fuller-Plank Act, provided that towns substituting cash collections for the road labor tax could receive from the state 25 cents (increased to 50 cents in 1902) for every dollar raised locally. Under this stimulus cash revenues were enormously increased, as shown by the fact that state expenditures for this purpose increased from \$34,517 in 1899 to \$1,057,605 in 1908.<sup>45</sup> By 1904, contributions in the form of statute labor had dropped to about one-fourth of total country-wide collections for rural road purposes.<sup>46</sup> And, in 1910, the federal Office of Public Roads reported that "the old system of paying road taxes in labor . . . is being rapidly discarded for the better plan of requiring all road taxes to be paid in cash."<sup>47</sup> By 1916, this trend had reduced the labor tax, whether actually worked out or converted into cash payments, to an insignificant portion of total expenditures for highway purposes.

*After 1890 the taxing and administrative unit was steadily expanded in size.* During the period from 1890 to 1916, significant changes occurred in the organization of road administration. Most of these changes were corollary to the basic reform of tax policies. The effective employment of full-time road engineers and the utilization of technically improved methods of road-making required not only the substitution of money revenues for statute labor, but the creation of enlarged taxing units capable of producing sufficient revenue to support the new organization and methods. Neither the road district nor the township unit was capable of supporting

<sup>45</sup> *Yearbook of the Department of Agriculture*, 1910, p. 271.

<sup>46</sup> In 1904 the Office of Public Roads reported that total expenditures for roads in that year were \$79,000,000, of which \$19,000,000 was in the form of road labor. The same, p. 270.

<sup>47</sup> The same, p. 274.

an organization competent to carry out sustained and balanced road operations. The enlargement of the tax base was accomplished primarily by establishing the county as the principal taxing unit and by the development of a supplementary system of state-administered aids. On the administrative side, the general tendency was toward substitution of technical management for amateur supervision; toward enlargement of the local administrative unit; and toward the creation of state highway agencies vested with direct jurisdiction over designated portions of the public road mileage.

*State aids for local highway purposes developed rapidly between 1890 and 1917.* Beginning with New Jersey in 1891, state after state made substantial provision for aid to local units for highway purposes.<sup>48</sup> In all cases state participation was validated by official declarations that major portions of the benefits generated by road use are of general rather than local utility, being distributed widely although not uniformly throughout society as a whole.<sup>49</sup> The arguments which induced Massachusetts to assume a portion of the financial responsibility for road development were summarized as follows:

The argument used before the committee on roads and bridges was that much money was uselessly applied, and therefore wasted, and that no systematic methods were being used to secure good intertown communication. It was also shown that in many instances towns were called upon to keep in repair long stretches of highways which were of little importance to them, for the reason that they were ways of communication between large centres of supply or manufacture, lying in other

<sup>48</sup> The legislative history of state-aid enactments in leading states, together with a discussion of the forces which motivated such enactments, are given in App. A.

<sup>49</sup> See *Acts of New Jersey, General Public Laws*, c. 201, preamble, approved Apr. 14, 1891 (New Jersey State-Aid Law).

municipalities. It was maintained that manufacturers, teamsters and farmers would be greatly benefited by the construction of a general system of roads throughout the Commonwealth, inasmuch as the cost of the highway transportation would thereby be greatly reduced, and the saving to the citizens from this source, in a term of years, would pay for the entire cost of the improvements. Representatives of nearly every trade and profession from all parts of the Commonwealth supported this petition before the legislative committee, with the result that the Legislature was induced to recognize the popular demand for better roads.<sup>50</sup>

The growth of state aid for roads as indicated by the date of passage of the first state highway aid laws is shown by the table on pages 54-55. By 1917 all 48 states were giving aid for local highway operations. The type of aid provided, however, varied from informal advice on administrative and financial matters to direct money grants accompanied by state supervision over local activities.<sup>51</sup>

*After 1893 the states began to assume direct supervision over designated road systems.* The establishment of state highway commissions or departments, vested with exclusive jurisdiction over a portion of the road system, was a natural outgrowth of the initial state-aid policy. Early in the period a number of states had dis-

<sup>50</sup> Massachusetts Highway Commission, *Report 1893-1897*, House Doc., January 1894, p. 3.

<sup>51</sup>"In some States the aid offered consisted only of advice which might be accepted or rejected by the local authorities who retained absolute control over all the roads. In such States no financial aid was extended. In those States which provided for financial aid, its acceptance generally implied an agreement on the part of the county to accept the supervision of the State authorities until the work of construction was completed, after which the road reverted to full county control. In other States the joint participation of the State and county in the construction of certain classes of roads, generally the most important ones, was made mandatory; and there were still other variations which differentiated the systems as adopted by the several states." U. S. Department of Agriculture, *Agriculture Yearbook*, 1924, p. 98.

covered that financial aids alone would not insure the development of the integrated system of main roads regarded as necessary to serve state-wide interests. Massachusetts created a state highway department in 1893. By 1907, twenty states had followed suit; and by 1917 some type of state highway agency was operating in all of the states (see following table).

CHRONOLOGICAL DEVELOPMENT OF STATE RESPONSIBILITY FOR ROAD FUNCTION

State	First State-Aid Law Passed <sup>a</sup>	State Highway Organization Created <sup>b</sup>	State Highway System Designated <sup>b</sup>
Alabama.....	1911	1911	1915
Arizona.....	1909	1909	1910
Arkansas.....	1913	1913	1923
California.....	1895	1911	1910
Colorado.....	1909	1909	1917
Connecticut.....	1895	1895	1913
Delaware.....	1903	1917	1917
Florida.....	1915	1915	1915
Georgia.....	1908	1916	1919
Idaho.....	1905	1913	1915
Illinois.....	1905	1905	1913
Indiana.....	1917	1917	1917
Iowa.....	1904	1904	1913
Kansas.....	1911	1917	1918
Kentucky.....	1912	1912	1912
Louisiana.....	1910	1910	1921
Maine.....	1901	1907	1913
Maryland.....	1898	1904	1908
Massachusetts.....	1892	1893	1893
Michigan.....	1905	1905	1913
Minnesota.....	1905	1905	1921
Mississippi.....	1915	1916	1924
Missouri.....	1907	1913	1917
Montana.....	1913	1913	1913
Nebraska.....	1911	1911	1921
Nevada.....	1911	1917	1917
New Hampshire.....	1903	1905	1905
New Jersey.....	1891	1894	1917
New Mexico.....	1909	1905	1912
New York.....	1898	1898	1907

<sup>a</sup> U. S. Department of Agriculture, *Agriculture Yearbook*, 1924, p. 98.

<sup>b</sup> Data supplied by U. S. Department of Agriculture, Bureau of Public Roads.

**CHRONOLOGICAL DEVELOPMENT OF STATE RESPONSIBILITY FOR  
ROAD FUNCTION—Continued**

State	First State-Aid Law Passed <sup>a</sup>	State Highway Organization Created <sup>b</sup>	State Highway System Designated <sup>b</sup>
North Carolina.....	1901	1915	1915
North Dakota.....	1909	1913	1917
Ohio.....	1904	1904	1911
Oklahoma.....	1911	1911	1913
Oregon.....	1913	1913	1917
Pennsylvania.....	1903	1903	1911
Rhode Island.....	1902	1896	1903
South Carolina.....	1917	1917	1917
South Dakota.....	1911	1913	1919
Tennessee.....	1915	1915	1915
Texas.....	1917	1917	1917
Utah.....	1909	1909	1912
Vermont.....	1898	1898	1917
Virginia.....	1906	1906	1918
Washington.....	1905	1905	1905
West Virginia.....	1909	1913	1917
Wisconsin.....	1911	1907	1917
Wyoming.....	1911	1917	1919

During this formative period, however, many of the state organizations were strictly limited with respect to funds and jurisdiction.<sup>52</sup> Their chief function was to supervise the expenditure of state grants to co-ordinate the road activities of local agencies, and to carry on general research and promotional work in the highway field. But by 1916, state financing of designated systems had largely replaced state aid as the chief means of stimu-

<sup>a</sup> In 1916, the U. S. Department of Agriculture sent a questionnaire to state governors requesting certain information relating to the administration of highways. These data were used to determine whether or not the constitutional and statutory powers and duties vested in each state highway organization qualified it to participate in the benefits provided by the 1916 Federal Aid Road Act (39 Stat. L. 355). The answers to the questionnaires disclosed that 12 states had highway commissions vested with full power over state road systems; 17 had organizations with limited power but which came within the provisions of the act; 9 had commissions with such limited power that they failed to qualify; and 7 states had created no state highway departments or commissions.

lating state-wide interest in highway development. For in that year direct state expenditures had risen to about 44 million dollars, while allocations to local units amounted to only 15 million.<sup>53</sup> And, by 1921, direct state activities accounted for roughly 36 per cent of state and local highway expenditures.<sup>54</sup>

It may also be noted that during the period of basic reform in road management, experimental steps were taken to deal with the slowly emerging problem of special users. Although automobile use was still restricted largely to metropolitan areas, the pressure for rural roads adapted to this new means of transportation was already being exerted on road administrators. This problem was met by increasing registration fees, which had been originally levied merely to defray costs of recording titles to vehicles. By 1914, it had become general practice to appropriate the bulk of the revenues derived from these fees to special funds for highway purposes.<sup>55</sup>

*Prior to 1916 federal participation was largely confined to aid through educational and promotional activities.* During the years following 1838, when the last federal appropriation was made for the Cumberland Road, governmental concern with road development remained dormant. In 1893, however, with the establishment of the Office of Road Inquiry<sup>56</sup> the federal government re-entered this field of activity on a very limited scale. Although a relatively small appropriation was made in 1912 for financial aid to the states in the

<sup>53</sup> U. S. Bureau of the Census, *Financial Statistics of States, 1916*, pp. 88 and 99.

<sup>54</sup> Records of the Bureau of Public Roads.

<sup>55</sup> James W. Martin, "The Motor Vehicle Registration License," *Bulletin of the National Tax Association*, Vol. XIII (1927), p. 10.

See also U. S. Department of Agriculture, *Yearbook, 1914*, pp. 216, 224.

<sup>56</sup> Established by the Secretary of Agriculture under the provision of 28 Stat. L. 264, 266.

construction of post roads,<sup>57</sup> federal participation in road development between 1893 and 1916 consisted

FEDERAL EXPENDITURES FOR ROAD PURPOSES, 1894-1916<sup>a</sup>

Year	Office of Road Inquiry	Post Road Construction	Total
1894.....	\$ 2,997	—	\$ 2,997
1895.....	6,902	—	6,902
1896.....	9,568	—	9,568
1897.....	7,874	—	7,874
1898.....	7,978	—	7,978
1899.....	7,470	—	7,470
1900.....	7,854	—	7,854
1901.....	13,991	—	13,991
1902.....	19,957	—	19,957
1903.....	29,996	—	29,996
1904.....	34,813	—	34,813
1905.....	34,319	—	34,319
1906.....	36,480	—	36,480
1907.....	56,834	—	56,834
1908.....	57,473	—	57,473
1909.....	73,836	—	73,836
1910.....	116,315	—	116,315
1911.....	113,348	—	113,348
1912.....	157,949	—	157,949
1913.....	151,455	\$ 500	151,955
1914.....	225,355	37,996	263,351
1915.....	267,241	265,327	532,568
1916.....	497,785	165,000	662,785

<sup>a</sup> Annual reports of the Secretary of Agriculture; and U. S. Treasury Department, *Combined Statement of the Receipts, Expenditures, Balances, etc.* for the years specified.

largely of educational, research, and promotional work.<sup>58</sup> Expenditures for these purposes, however, increased rapidly throughout the period (see table above).

<sup>57</sup> Direct federal aid for construction was experimentally provided by the Post Office Appropriation Act for the fiscal year 1913, which created a committee of inquiry on federal aid for post road construction. This act carried an appropriation of \$500,000 "to be expended by the Secretary of Agriculture in co-operation with the Postmaster General in improving the conditions of roads to be selected by them over which rural delivery is or may hereafter be established. . . . *Provided*, that the state or the local subdivision thereof in which such improvement is made under this provision shall furnish double the amount of money for the improvement of the road or roads so selected." 37 Stat. L. 539, 551.

<sup>58</sup> For example, the Office of Road Inquiry conducted tests of road-building materials; made studies of soil characteristics; studied methods

Direct federal participation in the financing of road development did not become an established policy until the passage of the Federal Aid Road Act of 1916. This phase of highway policy is discussed in the next chapter.

#### SUMMARY

From this review we see that by 1916 there had developed in this country a broad philosophy of the highway function embodying five general propositions:

1. The quality of road facilities affects so intimately the administration of general functions of government and the conduct of ordinary social and commercial life that full and direct responsibility for the supply of adequate facilities must be retained by public agencies and discharged through a competent administrative organization.

2. All groups of society and all functions of government are not served uniformly by the various physical segments of the road system; consequently, as a basic guide to distribution of responsibility among levels of government, roads should be classified according to predominant purpose.

3. At each of the levels of government, the quantity and cost of basic facilities to be supplied should be determined through the normal budgetary process of weighing the need for road facilities as against the demands for health, educational, and other public services.

4. The annual cost of such facilities should be distributed among the individual taxpayers according to the principles of taxation currently utilized in financing other general functions of government.

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of road making and maintenance; and, in various ways, such as the operation of "good roads trains" and the construction of short sections of "demonstration roads," aided in selling the country on the benefits to be derived from road improvement. See App. A.



5. If special users or groups demand facilities in addition to the basic system provided under the normal budgetary procedure, or if they make "extraordinary" use of the basic system, the resultant costs should be assigned to such users through a system of special charges.

Modern highway policy has evolved through adaptation of these propositions to the enlarging conception and scope of government and to the changing commercial and social life of the country.

## CHAPTER III

### PRESENT SYSTEM OF HIGHWAY MANAGEMENT

The public highway policy now in operation in the United States vests all primary authority and responsibility for the designation, construction, and maintenance of roads in the governing bodies of the states and their local subdivisions. This basic arrangement is supplemented by federal activities consisting in the main of financial support rather than direct provision of facilities. In this chapter we describe (1) general trends in aggregate highway expenditures and the broad features of intergovernmental financial relations; (2) the main characteristics of management systems relating to highway planning, financing, construction, and maintenance employed by state and local governments; and (3) the objectives and extent of federal participation in road provision. Our immediate purpose is not to weigh the merits of these arrangements but to show the operating actualities that must be considered in any proposal for broad revision of financial and administrative method.

#### I. GENERAL TRENDS IN AGGREGATE HIGHWAY EXPENDITURES AND INTERGOVERNMENTAL FINANCIAL RELATIONS

Aggregate highway expenditures by all levels of government have shown a vast increase—from 937 millions in 1921 to more than 2 billion dollars in 1939 (see table on page 61). Moreover, increased federal and state participation in highway development has had a revolutionary effect on the distribution of financial responsibility among levels of government, especially since 1920.

**EXPENDITURES FOR HIGHWAY PURPOSES BY LEVELS OF GOVERNMENT AT WHICH FUNDS WERE RAISED, SELECTED YEARS, 1921-39**  
(In thousands of dollars)<sup>a</sup>

Year	By the Federal Government				By the 48 States <sup>b</sup>			By Local Rural Units <sup>b</sup>			Total for All Levels
	Federal Aid	Special Programs	Relief	Total Federal	Net Direct Expenditures <sup>c</sup>	Transfers to Local Units	Total State <sup>d</sup>	Net Direct Expenditures <sup>e</sup>	Transfers to State	Total Local <sup>f</sup>	
1921..	57,856	5,480	—	63,336	273,761	6,451	280,212	593,735	■	593,735	937,283
1926..	88,979	11,445	—	100,424	426,880	23,848	450,728	557,766	72,769	630,535	1,181,687
1930..	80,290	13,611	—	93,901	826,926	66,898	893,824	666,793	38,615	705,408	1,693,133
1936..	230,590	28,496	455,247 <sup>h</sup>	714,333	606,335	77,541	683,876	420,000	■	420,000	1,818,209
1939..	195,095	29,135	947,192 <sup>h</sup>	1,171,422	625,810	154,085	779,895	420,000 <sup>i</sup>	■	420,000	2,371,317

<sup>a</sup> Data for federal (other than direct expenditures by relief agencies), from U. S. Treasury Department, *Combined Statement of Receipts, Expenditures, Balances, etc.*, for the years indicated. Direct federal expenditures by relief agencies, and all state and local expenditures, furnished by the Public Roads Administration.

<sup>b</sup> Debt retirements omitted; interest on outstanding debt included.

<sup>c</sup> Total expenditures on state-administered systems less receipts from federal-aid and transfers from local units.

<sup>d</sup> From state sources only.

<sup>e</sup> Total expenditures on locally administered systems, less receipts from the states and from the federal government.

<sup>f</sup> From local sources only.

<sup>g</sup> Not reported.

<sup>h</sup> Includes an indeterminate amount expended on city streets, alleys, etc.

<sup>i</sup> No official estimate of local highway expenditures has been made for 1939. There is no indication, however, of significant change in the amounts spent by local units for highway purposes. Preliminary estimates by the Tax Foundation (see the *Tax Review*, December 1940) place total local expenditures roughly 10 per cent higher than the 1936 figure. But it does not follow that local highway expenditures have increased in like proportion. On the contrary, while a slight increase is likely, growing federal contributions argue against significantly larger net direct expenditures by local units. Of course, local units might have spent less in 1939 than they did in 1936. Generally speaking, however, the financial position of local units has been improving since 1936, with the result that local budget items show no marked tendency to decrease. In any event, there is little likelihood of a change of sufficient magnitude to alter any of the basic trends which this table indicates.

*Federal expenditures have shown an extraordinary increase, both absolute and relative, throughout the period.* The increase from 63 millions in 1921 to 1,171 millions in 1939 represents a relative growth from 6.8 to 49.4 per cent of total expenditures for road purposes. The increase up to 1930 is due to expansion of the normal federal aid program. During the past decade, however, the sharp rise in federal contributions, from 94 millions in 1930 to 1,171 millions in 1939, has resulted from vastly expanded federal activity in the promotion of economic stabilization and public relief. In 1939 expenditures for these latter purposes accounted for approximately 80 per cent of total federal expenditures for roads.

*One of the most arresting features of the period since 1916 has been expansion of highway activities carried on by state agencies.* Since 1924 all states have had fully organized highway agencies vested with authority over main routes classified as "state systems." Greatly increased revenues have been placed at their disposal. And by virtue of the prestige and power thus accumulated, state highway agencies have often been able to exert substantial influence over the conduct of road functions nominally under local control.

State expenditures have grown from 280 millions in 1921 to nearly 780 millions in 1939. This represents an increase in the states' share of total nonfederal highway expenditures from 32 per cent in 1921 to 65 per cent in 1939. The greater portion of the increase is explained by the expansion of development programs on so-called primary or state-controlled highway systems. Net direct expenditures for these purposes increased from 274 millions in 1921 to 626 millions in 1929. It will be observed, however, that such expenditures have decreased since 1930 and that this retrenchment

has been almost exactly compensated by expansion in normal federal aid allotments to the states and in direct federal relief expenditures on primary systems. Thus, between 1930 and 1939, direct state expenditures decreased about 200 millions. However, normal federal allotments to the states increased by about 115 million dollars during the same period; and in 1939 direct federal relief expenditures on primary roads amounted to 74 millions,<sup>1</sup> making a compensating federal expenditure of 189 million dollars.

Most states have found it either desirable or expedient to extend the range of state interest beyond the designated system over which state agencies exercise exclusive managerial authority. This extension has been accomplished through various forms of state financial aids to local subdivisions, accompanied in most cases by one degree or another of supervision over the application of such funds. The precedent for state aids was established in the early days of the good roads movement, usually before the state had assumed full responsibility for a designated system of roads. The method has persisted partially because of pressure from local units to retain jurisdiction over roads in which community interest predominates; partially because of the reluctance of state legislative bodies to assume full administrative and financial responsibility for vast mileages of local roads in which the state at large has only a limited interest. In 1921 transfers to local units amounted to only about 2½ per cent of total state disbursements; but by 1939 such transfers had grown to nearly 20 per cent.

The rapidity with which state highway activities have expanded has tended to create an erroneous impression that local government agencies have been eliminated from any important participation in road management.

<sup>1</sup> Estimate supplied by Public Roads Administration.

This impression arises from the fact that the contribution of local units decreased from 63 per cent of the expenditures by all levels of government in 1921 to about 18 per cent in 1939. In aggregate terms, however, local expenditures remained fairly stable during the 1920 decade and, even after the sharp decline since 1930, amounted to more than 400 millions in 1939. It is interesting to note that while local contributions have been decreasing, the amounts spent for local road development have remained fairly stable, due to increases in the transfers of state-raised funds to local units mentioned above and in direct federal relief expenditures on secondary and feeder roads. Thus, in 1921, the state transfers were only 1 per cent as much as the amount raised by local units; but by 1939 they had increased to 37 per cent. Moreover, of the 947 millions spent in 1939 by the federal government for relief purposes, an estimated 329 millions<sup>2</sup> were applied to secondary and feeder roads over which local units exercise primary jurisdiction.

The foregoing generalizations relate to the country as a whole and thus obscure the marked variations which exist in the several states. Since the actual work of road supervision is carried on by the 48 states and their subdivisions, an examination of the several state systems is essential for an accurate understanding of American road management.

## II. STATE AND LOCAL ROAD MANAGEMENT SYSTEMS IN VARIOUS STATES<sup>3</sup>

While all states maintain similar general patterns of territorial-governmental organization, being divided in-

<sup>2</sup> Estimate supplied by Public Roads Administration.

<sup>3</sup> Basic data for this section were obtained from the 48 state highway organizations. At our request the Commissioner of Public Roads, U. S. Public Roads Administration, sent a questionnaire to each state agency

to counties which are subdivided into towns or townships, the particular systems by which highway management is allocated in individual states reveal extreme structural complexity and wide diversity of method. The chart on page 66 shows the striking differences between states in the distribution of financial responsibility among state and local units. Analysis of the statutory structure of road management by individual states shows two main and distinct types: (1) the highly centralized, and (2) the distributed. A classification of states according to these broad categories, together with a subclassification in the second category, is presented in the table on page 67.

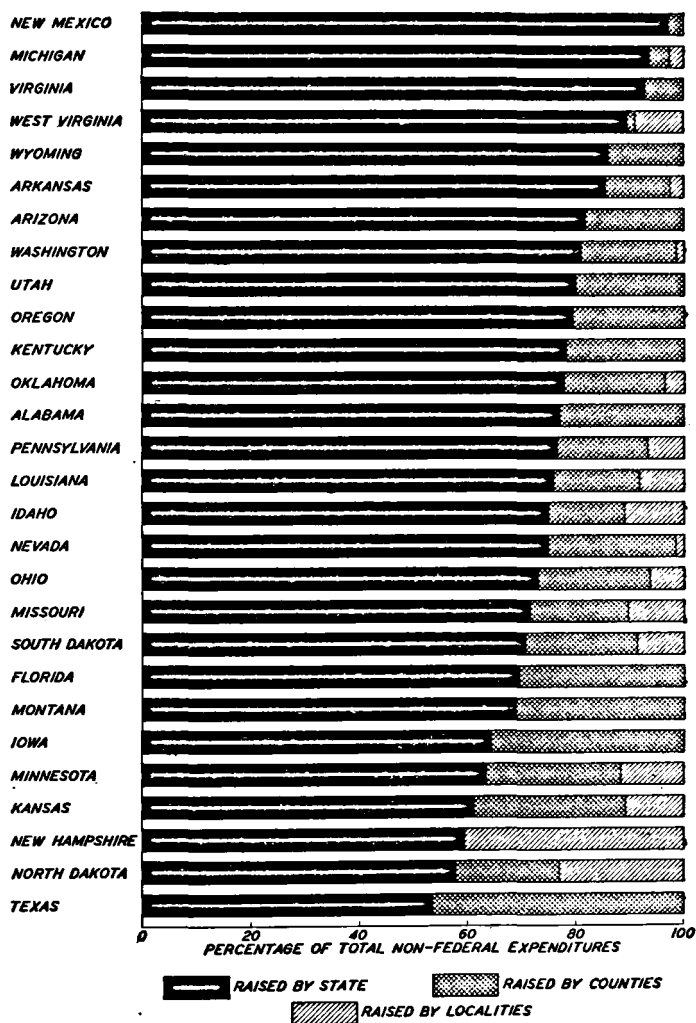
The centralization or distribution of authority and responsibility shown in this classification involves certain activities fundamental in highway policy—the location, alteration, abandonment, and improvement of roads, and taxation for their support. The distribution is that provided by statute; and, as will later be made clear, local subdivisions in many cases do not currently exercise all their statutory powers. Nevertheless, these powers are of considerable significance to the institution of local self-government, for they constitute a residual authority which may be invoked if occasion should arise. We must keep this fact in mind when interpreting those systems of modern road management which show a marked tendency toward centralization.

1. *Centralized authority and responsibility.* Four states have located virtually full responsibility over the road function in the state government. This has been accomplished in three states through single enactments which not only relieved local units from direct financial responsibility, but also deprived them of any effective

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soliciting detailed information concerning the constitutional, statutory, and organizational structure of the road function.

## PROPORTION OF NONFEDERAL HIGHWAY FUNDS RAISED BY STATE AND LOCAL GOVERNMENTS IN 28 STATES<sup>a</sup>



<sup>a</sup> Adapted from U. S. Public Roads Administration, Highway Planning Surveys, Table F. S. 26. The fiscal periods studied are not uniform for all states, ranging from 1934 to 1937.



control over the future course of local road development. All rural highways have been placed under the practi-

STATUTORY DISTRIBUTION OF PRIMARY ADMINISTRATIVE RESPONSIBILITY  
FOR RURAL ROAD MANAGEMENT<sup>a</sup>  
Classified by States as of 1940

Centralized in State	Distributed		
	State-County- Township (3-way)	State-County (2-way)	State-Township (2-way)
Delaware North Carolina Virginia <sup>a</sup> West Virginia	Illinois Kansas <sup>b</sup> Maine Massachusetts Minnesota Missouri <sup>b</sup> Nebraska <sup>b</sup> New York North Dakota Ohio Pennsylvania South Dakota Wisconsin	Alabama Arizona Arkansas <sup>b</sup> California Colorado Florida Georgia Idaho <sup>b</sup> Indiana Iowa Kentucky Louisiana <sup>d</sup> Maryland Michigan Mississippi Montana Nevada New Jersey New Mexico Oklahoma Oregon South Carolina Tennessee <sup>b</sup> Texas Utah Washington <sup>b</sup> Wyoming	Connecticut New Hampshire Rhode Island Vermont

<sup>a</sup> Information supplied by Bureau of Public Roads from questionnaires submitted to state highway officials.

<sup>b</sup> Township or special district organization optional.

<sup>c</sup> County organization optional.

<sup>d</sup> State-parish.

cally exclusive supervision of the state highway department in four states: North Carolina<sup>4</sup> (1931), Virginia<sup>5</sup>

<sup>4</sup> Public Laws and Regulations of 1931, c. 145.

<sup>5</sup> Acts of Assembly, 1932, c. 403. It should be noted that Virginia permits counties to retain direct jurisdiction over their roads. Three counties have exercised this option.

(1932), West Virginia<sup>6</sup> (1933) and Delaware<sup>7</sup> (1935).

Administrative centralization in this group of states has been accompanied by state assumption of full financial responsibility for road development. In Delaware no other unit has power to levy taxes for rural highway purposes.<sup>8</sup> In West Virginia the state levies all taxes for road purposes except the poll tax of \$1.00, which is levied by the county courts for secondary road purposes.<sup>9</sup> And all road expenditures in North Carolina are derived from state-collected funds. Not only has financial responsibility for the road function been entered in the state, but real estate has been relieved, for all practical purposes, of any contribution to current highway support.<sup>10</sup> The practical effect of this policy in Virginia was to relieve real estate of an average annual levy of \$3,250,000. But it has been the general practice to require counties to levy local taxes for previously incurred local road indebtedness.

2. *Distributed authority and responsibility.* In 44 states statutory provision has been made for widely varying degrees of local participation in road development. But even in these states a distinction must be made between the systems which provide only a nominal distribution of authority and responsibility and those in

<sup>6</sup> Acts of the West Virginia Legislature of 1933, c. 40, Art. 1, secs. 26-28.

<sup>7</sup> The Delaware law provides that on and after the first day of July 1935, all public roads, highways, and bridges in the state previously under the care, management, and control of the levy courts of the respective counties should be under the absolute care and control of the state highway department. Revised Code of Delaware, 1935, c. 55, sec. 1645.

<sup>8</sup> Revised Code of Delaware, c. 6, sec. 212.

<sup>9</sup> Local units, however, remain responsible for road debt incurred prior to 1933.

<sup>10</sup> As a matter of fact, in Virginia, counties are prohibited from levying property taxes for the construction and maintenance of highways. Acts of Assembly, 1932, c. 415, sec. 3.

which decentralized methods are applied in actual operating practice.

*In a number of states a high degree of practical centralization has occurred under statutes providing for distributed managerial systems.* Pennsylvania furnishes the best example of this type of development. Gradual but effective centralization has been accomplished in two ways: (1) substantial expansion of mileage under direct control of the state, and (2) assumption by the state of major financial responsibility for the improvement and maintenance of township roads which remain under the nominal jurisdiction of township officials.

Direct state jurisdiction has increased first through gradual expansion of the so-called "original" state system (designated in 1911) to include most of the "main" or "through" routes in the state. To this system there were added in 1931 and 1937 large mileages of "rural" roads, some portions of which had been improved under various state-aid provisions. The rural road mileage in 1939 was classified for administrative purposes approximately as follows:

State system:	
"Original" system .....	14,510
"Rural road" system .....	23,161
County system .....	1,798
Township roads .....	46,200

This administrative classification, however, does not reflect the true picture so far as actual control is concerned. While the 46,200 miles of township roads remain under the legal jurisdiction of local officials, the state, since 1937, not only has borne a large portion of the financial burden of their support, but has exercised important controls over location, physical specifications, and supervisory personnel. In 1934 as much as 77 per cent of road expenditures from nonfederal sources was

supplied from state-collected sources; and township units supplied only 54 per cent of the amount expended on local roads. The distribution is shown in the accompanying table.

ROAD EXPENDITURES FROM NONFEDERAL SOURCES IN PENNSYLVANIA, BY CLASSES OF ROADS AND LEVELS OF GOVERNMENT AT WHICH FUNDS WERE RAISED, 1934<sup>a</sup>  
(In thousands of dollars)

Road Classification	State	County	Local	Total
Primary.....	61,789	—	—	61,789
Secondary.....	499	14,524	—	15,023
Tertiary.....	4,915	79	5,887	10,881
Total.....	67,203	14,603	5,887	87,693

<sup>a</sup> Derived from Highway Planning Surveys, Table F. S. 26.

The figures shown in the table, however, do not reflect the degree to which centralization has proceeded in Pennsylvania, for the state has appropriated from its own highway funds a total of \$17,100,000 to be used for the improvement of township roads in 1938-41. Moreover, townships are prohibited by law from budgeting any funds or levying any tax for township road maintenance. They may, however, raise funds for snow removal and road improvement.<sup>11</sup>

Thus, while statutory authority and responsibility are still distributed among state, county, and township units in Pennsylvania, the state has assumed, in fact, a preponderant and increasing share of power. The practical centralization achieved in the state through gradual and indirect methods is similar in scope and intent to that effected directly in North Carolina, Virginia, West Virginia, and Delaware. Irrespective of the method used,

<sup>11</sup> Laws of Pennsylvania, 1937, Act No. 51-A (H. 1200), approved June 5, 1937.

the single objective and the result have been to shift the major costs involved in the provision of all classes of rural roads from rural property and general taxpayers to motor vehicle users. For as we shall point out in the next chapter, these states obtain the bulk of their non-federal highway revenues from various types of motor vehicle license fees and from imposts on gasoline.

*Although the trend toward centralization has been widespread, in a majority of the states local units of government retain substantial authority and responsibility.* These local units have retained a considerable degree of administrative initiative and supervisory control. And they continue to make substantial financial contributions for road support.

In general, the states that adhere to the principle of distribution have employed road classification as the basis for allocating responsibility among state and local levels of government. In the practical application of this device, however, the states have used a great variety of arrangements and labels. State systems, for example, have been constructed through use of a combination of techniques, including constitutional, legislative, and commission designation, and through application of widely varying criteria as to what classes and quantity of roads should be included.<sup>12</sup> As a result, the proportion of total

<sup>12</sup> In Colo., N.Dak., Oreg., Nev., and Pa., state systems have been determined by statutory designation of an original "fixed" system of state highway routes accompanied by delegation to the highway commission of discretionary authority to expand the fixed system through absorption of county and local roads. Another group of states (Conn., Wyo., Ariz., and Ark.) has made no attempt to name specific routes by statute. They have vested wide discretion for the selection of routes to be included in the state system in the highway commission or other controlling state authority.

A less prevalent method of designation is found, for example, in Minn., where the constitution itself contains designation of the trunk highway system, with provision for the subsequent adjustment and expansion in the physical composition of this system.

rural mileage included in state systems varies from 35 per cent in Florida to 6 in South Dakota (see table below).

PERCENTAGE DISTRIBUTION OF RURAL ROAD MILEAGE BY LEGALLY DEFINED HIGHWAY SYSTEMS IN 30 STATES, 1936-37<sup>a</sup>

State	State	County	Local
Florida.....	35.3	19.0	45.7
New Hampshire....	26.6	73.4	—
Maryland.....	24.1	67.8	8.1
Utah.....	23.9	76.1	—
Virginia.....	20.1	79.9	—
Arizona.....	19.1	80.9	—
North Carolina....	18.4	81.6	—
Ohio.....	17.7	33.0	49.3
Idaho.....	16.4	46.9	36.7
South Carolina....	16.2	83.8	—
Wyoming.....	16.0	84.0	—
Arkansas.....	15.8	84.2	—
Kentucky.....	15.4	84.6	—
California.....	14.2	85.8	—
West Virginia.....	13.6	86.4	—
Vermont.....	12.7	18.7	68.6
Colorado.....	12.5	51.4	36.1
Oregon.....	11.9	5.6	82.5
Nevada.....	11.6	88.4	—
Texas.....	11.3	88.7	—
Wisconsin.....	11.3	17.6	71.1
Louisiana.....	9.9	33.4	56.7
Illinois.....	9.7	17.7	72.6
Montana.....	8.4	91.6	—
Iowa.....	8.3	13.4	78.3
Oklahoma.....	8.1	91.9	—
Nebraska.....	8.1	66.7	25.2
Kansas.....	7.1	13.7	79.2
Missouri.....	6.7	93.3	—
South Dakota.....	6.3	20.6	73.1
30 states.....	11.9	57.8	30.3

<sup>a</sup> Based on Road Inventory Studies of Highway Planning Surveys, Public Roads Administration.

However, the fact that various portions of the state road mileage have been legally classified as state highways does not always mean that all such mileage is

actually maintained by state agencies or with state-controlled funds. For example, in Florida, only a little over half the state-designated mileage is actually being maintained by the state highway commission.<sup>13</sup> In Arizona portions of a legally designated state highway system have not actually been put under the jurisdiction of state highway officials. Thus, in some states we find a "potential" state system, the control of which resides in local units until mileage is officially transferred to the state organization.

With this word of caution as to the almost total lack of standard terminology, it may be said that in a majority of the states, primary authority and responsibility are distributed among state and local units in terms of legally designated road systems. In some states this designation runs in terms of state primary, county, and township roads with the governing body of the unit—state, county, or township—exercising over the roads assigned to such unit all the important powers of location, alteration, abandonment, and improvement. In other states, where the township unit is not used, authority is distributed in terms of state primary, county trunk, and county local. And the distribution and organization of authority and responsibility are still further complicated in many states by provisions for the optional creation of special road districts.

Two examples will suffice to illustrate the extreme variations now found in the operating structures of those states which retain systems of distributed responsibility.

One type of managerial system is represented by Missouri, where responsibility for the road function is

<sup>13</sup> In 1938 only 7,168 miles out of 12,974 designated as "state system" mileage were being maintained by the highway commission. *History of the State Road Department of Florida*, prepared by the Division of Highway Planning, April 1939, p. 16.

distributed in a relatively clear-cut fashion among state, county, and township or special district units. The state function is two-fold. It exercises exclusive financial and administrative jurisdiction over the state highway system.<sup>14</sup> This system comprises less than 10 per cent of the total road mileage, but in 1934 it absorbed 68 per cent of all nonfederal road expenditures made in the state (see accompanying table).

ROAD EXPENDITURES IN MISSOURI FROM NONFEDERAL SOURCES,  
BY ORIGIN OF FUNDS, 1934<sup>a</sup>  
(In thousands of dollars)

Road Classification	State	County	Local <sup>b</sup>	Total
Primary.....	17,570	—	—	17,570
Secondary.....	871	4,534	—	5,405
Tertiary.....	—	145	2,687	2,832
Total.....	18,441	4,679	2,687	25,807

<sup>a</sup> Derived from Highway Planning Surveys, Table F. S. 26.

<sup>b</sup> Includes township and special districts.

Major responsibility for all other rural road activity in the state is vested in county agencies, with the town-

<sup>14</sup> The state system came into existence under the broad terms of the following enactment:

"There is hereby created and established a state-wide connected system of hard surfaced public roads extending into each county of the state, which shall be located, acquired, constructed, reconstructed, and improved and ever after maintained as public roads, and the necessary grading, hard surfacing, bridges and culverts therefor shall be constructed by the state of Missouri. Such state-wide connected system of hard surfaced roads shall be known as the 'state highway system.'" Revised Statutes of Missouri, 1939, sec. 8678.

The state system is now composed of the basic legislative system to which subsequent additions have been made in the form of: (1) secondary state highway systems, (2) supplementary state highway systems, (3) traffic relief state highways, (4) "300-mile additional primary highways systems," and (5) "park connections with state highways" made under specific legislative designations.



ships participating in varying degrees.<sup>15</sup> Nevertheless, while the law provides that "the county highway commission shall have absolute jurisdiction and control over all highways constituting a part of the county highway system,"<sup>16</sup> it appears that with reference to the location of county highways, the state highway commission exercises considerable supervision.<sup>17</sup> Where counties have exercised the option to utilize the township, the board of directors of that unit is required to divide it into one or more road districts and to appoint a road overseer for each district.<sup>18</sup> The road overseer is generally charged with the grading and ordinary maintenance of roads and bridges.

With respect to financing there is relatively little financial interdependence among state and local units in Missouri, for the latter raise locally about 90 per cent of the funds expended on county and township

<sup>15</sup> County highway commissions are empowered to: ". . . locate, lay out, designate, construct, and maintain, subject to approval of the state highway commission, a system of county highways not exceeding in the aggregate one hundred miles in any county, by connecting by the most practicable route the several centers of population in the county, in such manner as to afford a connection with such of said centers of population as are not now located on any state highway with such state highway, and so as to afford, as nearly as may be done, a connection with county highways connecting the centers of population of adjoining counties, to the end that all parts of the county shall be connected with the state highway system as now laid out and designated, and that the inhabitants of the county generally shall have and enjoy a system of highly improved farm-to-market roads." Revised Statutes of Missouri, 1939, sec. 8504.

<sup>16</sup> The same, sec. 8508.

<sup>17</sup> Before proceeding to construct any designated part of the county system the county commission must "submit such location to the state highway commission for its approval, and, upon approval of such location by the state highway commission, the county highway commission shall proceed to procure the right-of-way for said county highways." The same, sec. 8505.

<sup>18</sup> The same, secs. 8813-14.

roads. County and local jurisdictions are also clearly separated, for county units furnish only 5 per cent of revenues expended on township roads.

A considerably different type of managerial organization is found in Ohio. In this state, primary administrative authority is distributed on a three-way basis among state, county, and township units; and financial responsibility is widely diffused because the state supplies funds to the counties and the counties in turn supply funds to the townships.

The state highway department is vested with full power over the designated state system and is also empowered to co-operate with the "counties, townships, villages and other subdivisions of the state in the construction, reconstruction, improvement, maintaining and repairing of the public roads and bridges of the state."<sup>19</sup> County authorities have initial control over designated county roads and in addition they "may co-operate with the department of highways" in projects involving the elimination of railway grade crossings on the state highway system and the improvement of state highways resulting in a pavement of more than 20 feet in width.<sup>20</sup> Township trustees are vested with initial authority over township roads and may "with the approval of the county commissioners or state highway commissioner, as the case may be, maintain or repair a county road or an inter-county highway or main market road within the limits of their township."<sup>21</sup>

While under the basic statutory arrangement state, county, and township units are individually charged with supervision of legislatively designated road systems, provision has been made for extensive inter-agency

<sup>19</sup> Throckmorton's Ohio Code Annotated, 1940, sec. 1178.

<sup>20</sup> The same, sec. 1191.

<sup>21</sup> The same, sec. 3370.

co-operation.<sup>22</sup> The extent to which such arrangements have been employed is reflected clearly in the distribution of financial responsibility (see accompanying table).

In 1935, state-collected funds bore the entire non-federal cost (99.9 per cent) of the state road system comprising about 18 per cent of total rural road mileage and 80 per cent of the mileage that has been improved with

EXPENDITURES FOR ROAD PURPOSES IN OHIO, BY CLASSES OF ROAD AND LEVELS OF GOVERNMENT AT WHICH FUNDS WERE RAISED, 1935<sup>a</sup>

Road Classification	State	County	Local	Total
Primary.....	18,385	21	—	18,406
Secondary.....	8,977	4,915	18	13,910
Tertiary.....	3	2,829	2,325 <sup>b</sup>	5,157
Total.....	27,365	7,765	2,343	37,473

<sup>a</sup> Derived from Highway Planning Surveys, Table F. S. 26, supplied by U. S. Public Roads Administration.

<sup>b</sup> Includes townships and special road districts.

high-type surfacing. In addition, funds originating from state sources supplied 64.5 per cent of the amounts spent on the secondary and tertiary road systems. In absolute amounts these state allotments, aggregating approximately 9 million dollars, almost equalled the total revenues raised by county and local units for road purposes. In the aggregate, state-collected funds accounted for 73 per cent of all nonfederal rural road expenditures made in the state. Somewhat similar financial relationships prevailed between county and local units. The counties supplied 55 per cent of all funds expended on township road support.

<sup>22</sup> For example, “. . . the state, county, and township shall each maintain their respective roads as designated in the classification hereinbefore set forth; provided, however, that either the county or township may by agreement between the county commissioners and township trustees contribute to the repair and maintenance of the roads under the control of the other.” The same, sec. 7467.

### III. FEDERAL ROLE IN PROVISION OF ROADS

The previous discussion has indicated that the role of the federal government in the provision of roads has been restricted for the most part to the granting of financial aid to the states and that such aid has been increasingly important. The federal government has not become the proprietor of any designated national system of highways, nor has it assumed any direct administrative authority over the roads that have been improved with the aid of federal funds. Federal participation depends for ultimate results on the complicated and diverse state and state-local organizations just described.

At this point, we are particularly concerned with the the origins and development of federal policy and recent significant changes in it from the standpoint of objectives and principles, and the relation of these objectives and principles to highway policy in general.

*The original purposes of federal participation were to facilitate governmental functioning and interstate commerce.* Passage of the Federal Aid Road Act of 1916<sup>23</sup> marked the reaffirmation of a continuing national responsibility for support of a portion of the road system. The extended legislative experimentation, investigation, and debate which preceded the enactment show clearly that its broad objectives were twofold.

It was designed, first, to obtain the type of roads that would facilitate the performance of various functions over which the federal government had assumed exclusive jurisdiction.<sup>24</sup> At this juncture especial emphasis

<sup>23</sup> 39 Stat. L. 355.

<sup>24</sup> The Joint Committee on Federal Aid concluded that "federal aid to good roads will accomplish several of the objects indicated by the framers of the Constitution—establish post-roads, regulate commerce, provide for the common defense, and promote the general welfare. Above all, it will promote the general welfare." *Federal Aid to Good Roads*, H. Doc. 1510, 63 Cong. 3 sess., p. 14.

was placed upon the relationship of improved roads to effective postal administration. The Secretary of Agriculture observed:

The question whether or not the Federal Government should participate in any large way directly in the construction of roads has long been before the American people. Hundreds of bills of almost every conceivable character have been introduced in Congress and debated. The Central Government has a very special and peculiar interest in good roads. It has under its control the transportation of mails, and, with the growth of the rural delivery, the difficulties confronting it in securing economic handling of mails have greatly increased and have been fully recognized.<sup>25</sup>

Specific provision was also made for the development of roads necessary to the proper administration of national forest resources. And subsequent development has made special financial provision for roads in national parks, Indian reservations, and other public lands. The traditional dependence of effective military effort upon appropriately located and improved lines of road communication, and the corollary national responsibility in this respect, were accepted as axiomatic.

The second major objective of the federal aid policy was to promote general commerce.<sup>26</sup> It must be emphasized that this phase of federal policy was embarked upon with the conscious purpose of securing an integrated road system, independently capable of furnishing lines of communication between geographical regions and centers of population. Its objective was not limited to the provision of feeder facilities for other transport media. Nor is there any evidence of any legislative intent to supply roads primarily for so-called "pleasure" use.

<sup>25</sup> *The Federal Aid Road Act*, S. Doc. 548, 64 Cong. 1 sess., p. 20.

<sup>26</sup> We use this term here in the broad sense of facilitating the movement of goods and people whether private or commercial.

This program was launched only after the most painstaking and exhaustive consideration. The joint committee named to advise Congress on the subject of federal participation in the road function was well aware, as indicated in the following observation, of the long-range implications of the proposed federal action:

The committee undertook this inquiry with full appreciation of its magnitude. Believing that when the United States once enters decisively upon the policy of Federal aid that policy will never be abandoned, we have deemed it of the utmost importance that before any plan shall be adopted or any definite steps taken, the subject shall be so thoroughly studied and all viewpoints so carefully considered that the Government will not be carelessly committed to any policy which may lead to unsatisfactory results.<sup>27</sup>

Moreover, the committee's conception of the desirable role to be played by roads in the development of transportation services was clearly indicated:

Large areas of virgin territory must be developed, first by trails, then by roads, next steam railroads, then electric lines, and, finally, by a system of intelligently and honestly constructed and maintained wagon roads, which, in this petrol age, with its motor truck and passenger bus, should vastly increase the happiness, prosperity, and comfort of our people and double the value of our agricultural lands. A great system of rural transportation would be developed with rates regulated by actual competition, open to poor and rich alike, as no expensive privately owned terminals, roadbeds, tracks, or equipment would be required. The good wagon roads would be open everywhere to the use of everybody, and the equipment, relatively inexpensive, would be within the means of many.

.....

We believe that permanent highways will result in very considerable adoption of auto-truck hauling in preference to rail transportation where the distance is within a half-day's run.<sup>28</sup>

<sup>27</sup> H. Doc. 1510, 63 Cong. 3 sess., p. 13.

<sup>28</sup> The same, pp. 14-15.

During the course of legislative consideration of specific proposals for federal participation in the road function, sharp controversy arose as to whether the federal government should direct its efforts toward the promotion of a limited interstate system or extend them to include secondary or farm-to-market mileage. Quite naturally the railroad interests contended for the latter policy, being well aware of the competitive implications of an improved system of integrated roads.<sup>29</sup> And they had active support in this position from a substantial congressional bloc which maintained that

... the railway station is the terminus for roads; that neither freight nor passengers will ever be carried long distances over roads as cheaply as they could be over railways, and that it is an idle dream to imagine that auto trucks and automobiles will take the place of railways in the long-distance movement of freight or passengers; that the proper function of roads is not to connect antipodal oceans nor the distant capitals of far-away States, but to make easy communication between the farms on one hand and the towns and railway stations on the other, to the end that the farmer may market his crops at less expense and the town dweller may get farm products more easily and at less cost.<sup>30</sup>

Moreover, the Secretary of Agriculture recommended

<sup>29</sup> The position taken by the railroads after 1910, through the American Highway Association, which they organized, is exemplified in the following statement by the president of the Southern Railway Co.: "At the risk . . . of seeming to be actuated by the interest of the railways, I have no hesitation in saying that, if the greatest good is to be done to the greatest numbers, the farmer is more interested in the improvement of the roads of the second class . . . those radiating from a market town or shipping station." W. W. Finley, "Good Roads and the Farmer," *Papers, Addresses, and Resolutions before the American Road Congress, 1911*, pp. 11-15. See also F. Harrison, "Selecting Roads to be Improved," *Proceedings of the Fourth American Road Congress, 1914*, pp. 171-73.

<sup>30</sup> Dorsey W. Shackelford, chairman of House Committee on Roads, *Proceedings of the Third American Road Congress, 1913*, p. 57.

that farm to market roads be given priority in the allocation of federal aid funds.<sup>81</sup>

Another vocal group contended, however,

. . . that the federal government will have done practically its full duty when it shall have taken over and improved and provided for the maintenance of the great interstate routes, the highways upon which the traffic falls most heavily, and the making and upkeep of which constitutes the greatest item of expense in a State highway system.<sup>82</sup>

The fundamental issues involved in this controversy with respect to the extent and nature of federal responsibility for highway provision were not met squarely in the 1916 law. Selection of routes to be aided was left entirely to the final discretion of the Secretary of Agriculture. The Federal Highway Act of 1921,<sup>83</sup> however, limited federal expenditure to a designated "7 per cent" federal aid highway system and instructed the Secretary of Agriculture in approving specific projects to "give preference to such projects as will expedite the completion of an adequate and connected system of highways, interstate in character."<sup>84</sup> We must, therefore, conclude that active federal participation in the road function was strongly influenced by the legislative judgment that national interest in the facilitation of interstate commerce

<sup>81</sup> D. F. Houston, in *Good Roads*, Hearings before House Committee on Roads, December 1913, Pt. 2, pp. 3-6.

<sup>82</sup> Statement of American Automobile Association, in *Good Roads*, Hearings before Joint Committee on Federal Aid in the Construction of Post Roads, 1913, p. 120.

<sup>83</sup> 42 Stat. L. 212.

<sup>84</sup> The same, sec. 6. This section also provides that "before any projects are approved in any State, such State, through its State highway department, shall select or designate a system of highways not to exceed 7 per centum of the total highway mileage of such State." This system was divided by law into (1) "primary or interstate highways," constituting not more than three-sevenths of the total, and (2) "secondary or inter-county highways" so located as to connect or correlate with the primary system.



could not be fully effectuated by sole dependence on governmental promotion and regulation of rail transportation. Energetic prosecution of this policy through constantly expanding appropriations has, of course, created an ever-widening area of competition between highway transport and rail transportation interests. We are not at the moment concerned with the wisdom of this policy nor with the precise nature of the issues created,<sup>85</sup> but rather with the operating problems that have emerged from choice of method.

*Federal participation was originally subject to important limitations.* It would have been entirely appropriate for the government to have pursued the declared objectives through the designation, construction, and maintenance of its own system of national roads. By this date all constitutional objections to such action had been removed.<sup>86</sup>

Choice of the grant-in-aid method was dictated by expediency, not necessity; but this choice reflected the acceptance of certain additional limiting principles. Under this system, administered since 1916 (with the exceptions to be noted below) according to the basic provisions

<sup>85</sup> These issues are discussed in Chap. VII.

<sup>86</sup> It will be recalled that during the early part of the nineteenth century the right of the federal government to engage directly in the work of highway construction and maintenance—that is, paid for out of the general federal funds—was contested by presidential vetoes and that the federal government gradually withdrew entirely from the field of highway development. These vetoes were based more on deference to inter-regional competitive jealousies than on constitutional considerations. In fact they were not adjudicated by the Supreme Court during this period. But during the period of railroad expansion the Supreme Court upheld the federal power to grant a federal charter to railroad corporations as a means of regulating commerce, facilitating postal service, and providing for national defense.

For a discussion of the leading cases see Edgar Howard Farrar, *The Post-Road Power in the Federal Constitution and its Availability for Creating a System of Federal Transportation Corporations* (1907).

of the 1916 and 1921 enactments, the national government has acquired no direct proprietary interest in the roads improved with federal funds, nor has it assumed any responsibility for their maintenance.<sup>37</sup> The program was not intended to relieve state and local governments of financial obligations appropriately allocable to them. Federal aid payments were to be matched dollar for dollar by state expenditures. Nor was the program designed to promote the growth of a duplicating organization or a nationally centralized bureaucracy. Its purpose was to accomplish national objectives through state and local administrative agencies, using the organization and technical competence needed in the exercise of state and local functions. Federal administrative participation was limited to (1) prescription of management and construction standards and (2) the distribution of funds among the states in accordance with a formula designed to satisfy the national interest.

With respect to managerial and construction standards the federal government has required the states, as a condition to eligibility for aid, to conform to prescribed standards of road location and construction.<sup>38</sup> This has been accomplished in part by the exercise of a considerable measure of indirect managerial authority. By requiring each state to centralize control over its primary road system in a state highway department, the federal aid acts enabled the national government to set

<sup>37</sup> The federal investment can be protected only by assumption of temporary maintenance responsibility for a particular segment of the federal aid system that is not being properly attended, and by deducting the costs so incurred from future aid allotments made to the state involved.

The legislative development of federal aid policy, together with the more important provisions of the principal enactments, are given in the *Investigation of Executive Agencies of the Government*, S. Rept. 1275, 75 Cong. 1 sess., pp. 353-63 and 455-61.

<sup>38</sup> 42 Stat. L. 212, sec. 8.

minimum standards of managerial efficiency.<sup>39</sup> And, as we have already noted, application of federal funds was limited to a designated federal aid road system, composed of not more than 7 per cent of the total rural road mileage in each state.

With respect to the source and application of federal aid funds, certain definite principles were adopted. In contrast to prevailing practice at the state level of government, the entire federal aid program has been financed from general funds. It is also worth noting that in the development of federal policy no significant effort has been made to distribute funds in accordance with the benefits derived by direct users of the highways. In fact the federal aid laws expressly stipulate that "all highways constructed or reconstructed under the provisions of this Act shall be free from tolls of all kinds."<sup>40</sup> Moreover, the geographic distribution of these funds has been based on a policy of furthering national requirements rather than on one which would merely have subsidized the states in providing facilities deemed necessary for their local needs.<sup>41</sup>

<sup>39</sup> The 1921 act provided "that before any project shall be approved by the Secretary of Agriculture for any State such State shall make provision for State funds required each year of such States by this Act for construction, reconstruction, and maintenance of all Federal aid highways within the State, which funds shall be under the direct control of the State highway department." The same, sec. 7.

<sup>40</sup> The same, sec. 9. This provision was subsequently amended to permit the use of federal aid in the construction of toll bridges. 44 Stat. L. 1398.

<sup>41</sup> Sec. 4 of the 1916 act provided that, after certain deductions for administration, appropriated funds should be allotted among the states as follows: "One third in the ratio which the area of each State bears to the total area of all States; one third in the ratio which the population of each state bears to the population of all the States . . . ; 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 routes and star routes in all the States."

This formula has been retained without basic alteration. The Act of

In spite of the limitations imposed upon federal participation, the national government has exerted a powerful and beneficial direct influence over the three main elements of highway development: (1) location of project; (2) physical specification, involving type of surfacing, width, strength, grade, curvature, etc.; and (3) priority of improvement. The indirect effects have been scarcely less important, for administrative and engineering standards prescribed for federal aid work have naturally permeated and influenced road management at all levels of government.

*During the past decade, federal highway policy has been dominated and complicated by recovery and relief objectives.* Prior to 1930 federal activity was governed exclusively by policies designed to produce adequate and economical road transportation facilities. More recently, road development has been extensively utilized as a device to promote economic recovery and to furnish relief to the unemployed.

The emergency and relief aspects of federal road activity began to emerge clearly in 1930 with the provision by Congress of a fund of 80 million dollars in addition to regular federal aid appropriations to serve as a "temporary advance" to the various states for use in matching regular federal aid allotments. The purpose of this special fund was to sustain employment by encouraging the states to continue road projects that would otherwise have been abandoned because of lack of funds. Thus the attempt was to induce economic stabilization through maintenance of the federal aid program within the framework of previously adopted criteria and objectives. But as the grip of depression forces tightened, indirect

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June 16, 1933 (48 Stat. L. 195) did, however, give a slightly heavier weighting to the population factor.

stabilization devices were supplemented by programs designed to furnish direct relief to the unemployed. And the federal aid program was rapidly geared into the operating requirements of these efforts.<sup>42</sup>

Previously adopted principles and limitations have been greatly modified in recent years. Federal road activity was extended materially beyond the designated 7 per cent federal aid system. This was accomplished first through provision for orderly expansion by specified amounts in those states that had accomplished adequate improvement of at least 90 per cent of the designated federal aid system.<sup>43</sup>

The next step in this development was of a wholly different nature. It opened the way for application of federal funds not only to all segments of the country's 3 million miles of rural highways, but to the urban extensions of these rural roads.<sup>44</sup> Beginning in 1933 sub-

<sup>42</sup> The public works appropriation of July 21, 1932, for example, provided \$120,000,000 as advances to the states (later written off as outright gifts) to be used on the federal aid systems. Its stated purpose was to furnish the maximum possible direct employment (47 Stat. L. 716).

<sup>43</sup> Statutory authorization was contained in sec. 304 of the 1932 emergency act, which reads as follows:

"The last paragraph of section 6 of the Federal Highway Act, approved November 9, 1921, as amended and supplemented (U.S.C., title 23, sec. 6), is hereby amended to read as follows:

"Whenever provision has been made by any State for the completion and maintenance of 90 per centum of its system of primary or interstate and secondary or intercounty highways equal to 7 per centum of the total mileage of such State, as required by this Act, said State through its State Highway department, by and with the approval of the Secretary of Agriculture, is hereby authorized to increase the mileage of the primary or interstate and secondary or intercounty systems by additional mileage equal to not more than 1 per centum of said total mileage of such State, and thereafter to make like increases in the mileage of said systems whenever provision has been made for the completion and maintenance of 90 per centum of the mileage of said system previously authorized in accordance herewith." 47 Stat. L. 709, 722.

<sup>44</sup> "Since July 1933, in the Public Works highway programs more than 11,000 individual projects have been placed under way. That 60

stantial amounts of federal emergency funds were made available for expenditure on "secondary or feeder" roads lying outside the federal system.<sup>45</sup> By 1935, relief and recovery considerations had, in the main, supplanted the original guiding principles of federal aid policy. Thus, in 1936 the chief of the Bureau of Public Roads reported to Congress: "Continuing the policy of the last

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per cent of these projects are off the federal-aid highway system of the states as they existed at the start of the program, roughly measures the velocity attained in broadening the program through liberalizing the federal highway policies. These projects off the federal-aid highway system provide for its extension at both its extremes, on the one hand, the feeder roads of the rural districts and on the other, the principal thoroughfares of cities and towns." Paper by Thomas H. MacDonald, Chief, Bureau of Public Roads, *Proceedings of 32nd Annual Convention, American Road Builders Association, 1935*, p. 16.

<sup>45</sup>The National Industrial Recovery Act (48 Stat. L. 195) authorized the President to grant not less than \$400,000,000 to the highway departments of the states for highway work and authorized emergency construction and extension of the federal aid highway system into and through municipalities and the emergency construction of "secondary or feeder roads."

Determination of the amount to be allotted to secondary and feeder road development was to be "agreed upon by the State highway departments and the Secretary of Agriculture." Pursuant to the terms of the act the Secretary of Agriculture with approval of the special Board for Public Works issued rules and regulations on June 23, 1933, providing: ". . . not more than 50 per cent of the funds apportioned to any State should be applied to projects on the Federal-aid system outside of the corporate limits of municipalities, and not less than 25 per cent to projects on extensions of the Federal-aid system into and through municipalities, the balance (not more than 25 per cent) to be applied to secondary or feeder roads, all subject to certain exceptions as might be required by existing conditions." *Report of the Chief of the Bureau of Public Roads, 1934*, p. 10.

The Hayden-Cartwright Act of June 18, 1934 (48 Stat. L. 993) authorized \$200,000,000 to be expended under the "same general plan" as the National Industrial Recovery Act. Rules and regulations applicable to the new act were issued July 13, 1934, the "most significant change" being the requirement that *not less than 25 per cent* of the funds should be applied to secondary roads, whereas *not more than 25 per cent* of the 1933 fund could be used for this class of roads. *Report of the Chief of the Bureau of Public Roads, 1935*, p. 9.

3 years, all highway construction was administered with employment of those on relief rolls as the primary objective."<sup>46</sup>

The injection of emergency considerations into federal road activity created general confusion in the country's highway policy. On the one hand, national responsibility both in terms of governing criteria and volume of financial contribution was tending to become vague and unpredictable. All important limiting features of the original federal aid policy that required dollar for dollar matching and application of funds to a physically defined system for all practicable purposes had been abandoned. On the other hand, state and local programming was thrown into confusion as a result of the hand-to-mouth federal policy with respect to appropriations.

In an effort to restore balance between normal and emergency road activities, some of the guiding principles of the original federal aid policy were reaffirmed in the 1934 enactment, which, for the first time since 1930

<sup>46</sup> *Report of the Chief of the Bureau of Public Roads, 1936, p. 5.*

All road appropriations from 1932 on contained stipulations with reference to minimum wages to be paid and maximum hours of labor. And the 1933 act specified "that the maximum of human labor shall be used in lieu of machinery wherever practicable and consistent with sound economy and public advantage." (48 Stat. L. 195, sec. 206.) This provision was administratively implemented by a series of detailed rules and regulations. One of the more important was as follows:

"A program of emergency construction highway projects shall be selected to meet the following conditions: A distribution of projects within the State which, measured in terms of both number and cost, shall bear a reasonably uniform relationship to the number of locally unemployed persons; a selection of types of construction that afford reasonable opportunities for employment of available unemployed persons; and the inclusion of types of construction that will permit employment through the winter months." U. S. Dept. of Agriculture, *Federal Legislation and Regulations Relating to Highway Construction* (1933 ed.), Regulation 18, "Projects under the Emergency Relief and Construction Act of 1932," p. 47.

carried regular federal aid appropriations to be matched by the states.<sup>47</sup> This effort was, however, not altogether successful. For the Hayden-Cartwright Act of 1936<sup>48</sup> incorporated into the normal federal aid a program of financial assistance for secondary road development, thus converting an emergency measure into a permanent extension of federal responsibility.<sup>49</sup>

In common with original federal aid policy this secondary aid program requires state matching of federal funds. The law, however, placed no specific limitation upon the percentage of total mileage to be included in the secondary system, providing merely that the sums appropriated "shall be applied to secondary or feeder roads, including farm-to-market roads, rural free delivery mail roads, and public-school bus routes."<sup>50</sup> By administrative ruling it has been provided that "the mileage of the initial system or group of secondary or

<sup>47</sup> The Hayden-Cartwright Act, 1934 (48 Stat. L. 993), in addition to making provision for emergency road expenditures, appropriated 125 million dollars annually for the fiscal years 1936 and 1937. The Bureau of Public Roads reported in 1937 that "for the past 4 years road construction supervised by the Bureau and financed in whole or in part with Federal funds, with the primary objective of providing employment to those on relief rolls, has progressed at a rate of approximately 20,000 miles a year. Although the volume of such work remained large, the past year was definitely a period of transition from an emergency program to the more normal Federal-aid road-construction operations." *Report of the Chief of the Bureau of Public Roads, 1937*, p. 1.

<sup>48</sup> 49 Stat. L. 1519.

<sup>49</sup> The features which distinguish this program from previous emergency activities were summarized as follows:

"In the emergency program Federal funds were available to pay the full cost of construction and, since employment was the primary objective, projects for improvement were selected without delay. The new program differs in that the States are required to match the Federal funds and they must also select a system of secondary roads for improvement, not exceeding 10 percent of the highway mileage, and carefully designed to connect agricultural districts with the main highway system." *Report of the Chief of the Bureau of Public Roads, 1938*,

p. 13.

<sup>50</sup> 49 Stat. L. 1519, sec. 7.



feeder roads in any state shall not exceed 10 per cent of the highway mileage of the state.”<sup>51</sup> This initial system may, however, be “modified or increased from time to time as justified by the progress of its improvement.”<sup>52</sup>

There is nothing in the desultory debate which accompanied the adoption of this secondary aid program to give warning that it launched the federal government upon a course of action differing in fundamental respects from that embraced in the original federal aid policy. That this is the case, however, may readily be inferred from the somewhat disingenuous arguments marshalled in its support.

In the course of legislative debate it was contended that “there is a widespread and well-founded demand” for the program and that “it is apparent that improvement of secondary roads cannot await completion of the primary highway system for the reason that the primary system never will be completed.”<sup>53</sup> That there was prevalent confusion as to the justification for the program is indicated by other statements to the effect that “we have built all the main highways we need for the present. We should now give our attention to the building of rural, farm-to-market roads and really help that large class of our population—the farmer—which has been paying taxes all these years for road improvement and which has received few benefits.”<sup>54</sup> And the Senate committee report on the proposal observed in part:

In future years, if the main roads on the Federal-aid system are brought to completion, it may be reasonably expected that

<sup>51</sup> Rules and Regulations for Carrying out the Provision of Section 7 of the Act of June 16, 1936 (49 Stat. L. 1519, 1521) . . . approved by the Secretary of Agriculture, Feb. 9, 1937.

<sup>52</sup> The same.

<sup>53</sup> *Congressional Record*, Vol. 80, Pt. 5, 74 Cong. 2 sess., p. 5580.

<sup>54</sup> The same, p. 5591.

congressional appropriations for such highways will be reduced, thereby permitting greater Federal assistance toward the building of farm-to-market roads. In the meantime there will be opportunity to determine the relative importance of over 2,000,000 miles of secondary roads with respect not only to priority of construction, but also proper location and type of surfacing. The large sums of money now being expended by the Works Progress Administration, while exceedingly helpful in improving rural roads throughout the entire Nation will cease to be available as unemployment decreases. There must be long continued and skillfully directed effort "to get the farmer out of the mud."<sup>56</sup>

Basically the secondary federal aid program is a subsidy program. It is designed primarily to transfer to the national budget a portion of the costs incurred in the discharge of state and local road responsibilities. As such it falls into a category of governmental activity that differs in important respects from original federal aid policy. For, as we have seen, the latter was adopted, not as a subsidy measure, but as an expedient substitute for the direct federal provision and maintenance of a limited system of road facilities deemed essential to the discharge of national governmental functions. It is obvious that once this distinction is abandoned it becomes impossible to establish any clear-cut line of demarcation between federal responsibility and state responsibility for the road function.

It is, therefore, unfortunate that the secondary aid program was not legislatively evaluated in terms of its true nature, as a new policy of important long-range political and economic implications, rather than merely as a relatively unimportant quantitative extension of previously validated national policy. Regardless of what decision might have been reached by adequate legislative consideration of the issues involved, adoption of

<sup>56</sup> *Federal Aid for Highways*, S. Rept. 1976, 74 Cong. 2 sess., p. 8.

the program in 1936 was premature. For complete data have not as yet been made available from the first official effort to collect and collate country-wide information with reference to the relative importance and function of various classes of roads. Moreover, this extension of federal aid activity tended to increase rather than reduce the duplication of effort and the confusion that had already been introduced into road management by public relief policy.

Relief administration of road work contributed greatly to the breakdown of policies and organization. While relief objectives have strongly influenced all governmental activity in the field of road development since 1930, the trend since 1935 has been toward specialized budgetary and administrative treatment of the "normal," as contrasted with the "emergency," phase of road activity. Road improvement projects, largely unrelated to the real priorities of highway transport development, have bulked progressively larger in the activities of governmental agencies charged with the administration of economic stabilization and work relief programs. As the table on page 94 shows, total annual expenditure by federal relief agencies for roads and streets increased from \$289,907,000 in 1934 to \$947,192,000 in 1939. Several federal agencies, notably the Public Works Administration, have participated in various phases of work relief; but since 1935 the Work Projects Administration has dominated the field.

Because of flexibility and the capacity to utilize a large proportion of unskilled labor, road work has bulked large, both absolutely and relatively, in relief programs.<sup>68</sup> The ratio of persons employed on WPA highway work to the total of WPA employees has

<sup>68</sup> Federal Works Agency, *Report on Progress of the WPA Program*, June 30, 1939, pp. 7, 94.

**ANNUAL EXPENDITURES OF FEDERAL EMERGENCY RELIEF AGENCIES FOR ROADS AND STREETS, 1934-39<sup>a</sup>**  
(In thousands of dollars)

Fiscal Year	Work Relief Agencies				Miscellaneous Agencies <sup>b</sup>	PWA			Total Work Relief, PWA, and Miscellaneous Agencies	
	CWA	FERA	WPA	Total		Grants	Loans	Total	Excluding PWA Loans	Including PWA Loans
1934...	283,000	—	—	283,000	—	505	6,402	6,907	283,505	289,907
1935...	—	255,000	—	255,000	25	6,040	21,090	27,130	261,065	282,155
1936...	—	—	406,779	406,779	845	24,544	23,178	47,722	432,168	455,346
1937...	—	—	593,617	593,617	1,900	35,888	12,495	48,383	631,405	643,900
1938...	—	—	501,336	501,336	4,845	25,001	2,473	27,474	531,182	533,655
1939...	—	—	881,448	881,448	2,515	61,358	1,871	63,229	945,321	947,192

<sup>a</sup> Table prepared by U. S. Public Roads Administration, Federal Works Agency, May 21, 1940 (Brookings files).

<sup>b</sup> Includes Departments of Interior, War, and Commerce, as well as Veterans' Administration; also includes some expenditures in territories and possessions.

ranged from 36 per cent in March 1937 to 47 per cent in September 1938.<sup>57</sup> And in 1939, 42.6 per cent of WPA funds was applied to road and street projects (see following table). In some states such projects have recently accounted for more than 60 per cent of all WPA expenditures.<sup>58</sup>

EXPENDITURES OF FEDERAL AND SPONSORS' FUNDS ON WPA-OPERATED PROJECTS, BY MAJOR TYPES OF PROJECTS<sup>a</sup>

Type of Project	Cumulative through June 30, 1939		Year Ending June 30, 1939	
	Amount	Per Cent	Amount	Per Cent
TOTAL .....	\$7,676,253,945	100.0	\$2,558,035,229	100.0
Highways, roads, and streets .....	2,936,169,121	38.3	1,090,436,542	42.6
Public buildings .....	828,436,880	10.8	264,079,634	10.3
Parks and other recrea- tional facilities .....	737,871,455	9.6	196,004,746	7.7
Conservation .....	312,266,480	4.1	98,444,534	3.9
Sewer systems and other utilities .....	762,599,772	9.9	245,855,876	9.6
Airports and other trans- portation facilities .....	197,280,528	2.6	66,022,198	2.6
White collar .....	985,991,719	12.8	323,177,185	12.6
Sewing .....	513,766,496	6.7	142,524,217	5.6
Goods, other than sewing	101,179,191	1.3	28,195,795	1.1
Sanitation and health .....	174,311,324	2.3	49,202,335	1.9
Miscellaneous <sup>b</sup> .....	126,380,979	1.6	54,092,167	2.1

<sup>a</sup> Federal Works Agency, *Report on Progress of the WPA Program*, June 30, 1939, p. 31.

<sup>b</sup> Includes adjustment of federal expenditures to total reported by the Treasury and sponsors' expenditures for land, land leases, easements, and rights-of-way, for which the distribution by type of project is not available.

These WPA activities through 1939 resulted in the improvement of some 280,000 miles of roads and streets,<sup>59</sup> at a cost of almost 3 billion dollars. Available

<sup>57</sup> The same, p. 93.

<sup>58</sup> W. Va., Pa., Ark., Tenn., and Ariz. for year ending June 30, 1939. The same, pp. 32 and 174.

<sup>59</sup> Including appurtenances such as bridges, culverts, guard-rails, and curbs.

data do not permit accurate segregation of these expenditures according to the class of road facility improved. It is known, however, that in terms of mileage, the bulk of the work has been done on rural roads as distinguished from city streets, and that rural road work has consisted largely of low-type surfacing<sup>60</sup> rather than paving operations. The following figures show the number of miles in all WPA road and street projects completed up to June 30, 1938.<sup>61</sup>

Rural roads .....		245,280
Paved .....	11,567	
New .....	5,933	
Improved .....	5,634	
Unpaved .....	233,713	
Urban streets .....		30,483
Paved .....	11,290	
New .....	5,001	
Improved .....	6,289	
Unpaved .....	19,193	
Other (parks, cemeteries, etc.) .....		4,041
Paved .....	790	
Unpaved .....	3,251	
Total .....		279,804

For the year 1939, at least two-thirds of the expenditure was made on rural roads and of this amount more than 80 per cent was applied to "secondary and feeder" as distinguished from primary mileage (see table on page 97). The relative magnitude of this phase of federal road activity is indicated by the fact that in 1939 WPA expenditures on secondary and

<sup>60</sup> Includes drainage of roadbed and application of non-rigid surfacing such as gravel and crushed rock.

<sup>61</sup> Federal Works Agency, *Report on Progress of the WPA Program*, June 30, 1939, p. 20.

feeder roads alone amounted to \$328,598,000 compared with about \$420,000,000 raised for road purposes by county, township, and other local governmental units. Moreover, these federal relief expenditures on feeder and secondary roads have in great measure offset decreases since 1930 in the amounts raised by local units.

The practical effect of federal relief activities has been to shift to the federal budget a major portion of the cost

RELIEF EXPENDITURES FOR ROADS AND STREETS, CLASSIFIED BY TYPE OF PROJECT, FOR YEAR ENDING DECEMBER 31, 1939\*

Type of Work	All Funds	Federal Funds	Sponsors
<b>GRAND TOTAL</b> .....	<b>\$886,959,574</b>	<b>\$662,822,264</b>	<b>\$224,137,310</b>
Primary roads.....	92,165,960	73,685,330	18,480,630
Secondary and feeders...	445,002,372	328,598,411	116,403,961
Streets and alleys.....	292,052,510	217,960,832	74,091,678
Sidewalks, curbs, bridges, roadsides, etc.....	45,593,547	33,455,236	12,138,311
All other.....	12,145,185	9,122,455	3,022,730

\* From data supplied by Public Roads Administration.

of providing a purely local governmental service. The federal projects, of course, have public sponsorship; but the basic matching feature of federal aid policy has for all practical purposes been abandoned. Contributions by sponsors to WPA projects have not aggregated more than 25 per cent of total road relief expenditures (see table above), and a substantial portion of this amount has been contributed in the form of services, materials, and equipment rather than cash. It is doubtful, moreover, that many communities can afford even to maintain all of the facilities that they have acquired from work relief operations.

All of the federal expenditures for WPA work on highways have come from general funds. Despite an increasing tendency to emphasize the long-term eco-

conomic value of the work and its contributions to economic stabilization, the primary purpose of the federal works program has been to create jobs for unemployed employables. It was and is necessary, therefore, that the primary cost of road work for relief purposes be assigned to the levels of government and to the groups of taxpayers selected to bear the burden of public relief expenditures. A marked change has thereby been brought about with respect to the distribution of financial responsibility for highway construction and doubtless also for highway maintenance. Consequently, current issues of highway financing have been profoundly influenced and greatly complicated by the use of the highway function as a means to recovery and relief ends.

In addition to these effects on the amount and source of appropriations and on the distribution of the tax burden, the geographic allocation of funds and of work projects has also been influenced. The volume, character, and location of unemployment have been determining considerations in the appropriation and allocation of funds. Thus, projects are selected because of their capacity to provide the maximum amount of employment to the particular classes of unemployed labor that are to be found in various regions of the country. Many of the projects so selected are useful additions to state and local highway systems; but it does not follow that a given community would select the same projects or in the same order of priority in the course of a normal programming of highway work for its ordinary transportation needs.

Several other features of the WPA road-relief program have injected basically disturbing elements into previously established and well-tested federal-state cooperative arrangements in the field of road develop-



ment. The WPA has administered this program through its own field organizations rather than through existing state and local highway agencies. In the selection of projects and in securing sponsorship the WPA has functioned largely through local rather than state agencies, thereby failing to utilize the standards and organizational arrangements developed over a long period of years as a means of implementing federal aid policy. In general there has been a tendency to abandon the basic criteria and practical operating arrangements that previously had served reasonably well to allocate the road function among the several levels of government. This trend has produced a more complex managerial structure characterized by additional dispersion and overlapping of authority and responsibility among the several levels of government.

## CHAPTER IV

### THE SYSTEM OF HIGHWAY REVENUES

Two fundamental changes have taken place in recent years in the methods of distributing the financial burden of road development. One of these, as observed in the preceding chapter, relates to the relative amounts contributed by federal, state, and local governments. The net result of this change has been to increase substantially the financial responsibility of the federal government and the states as compared with local governments. The other fundamental change relates to the types of revenue which have been employed for highway financing. An accurate understanding of developments in the revenue system is important, of course, as an aid to the formulation of principles of highway policy. The purpose of the present chapter is to measure the trend toward special forms of revenue for highway financing and to indicate the wide range of differences among the states in this respect.

#### I. IMPORTANCE OF TAXES LEVIED ON MOTOR VEHICLE USERS

Since 1920 there has been an uninterrupted increase in the absolute amounts contributed by motor vehicle users to road development. These contributions have consisted mainly of gasoline taxes and registration fees. Between 1921 and 1930 such contributions show a relative increase from less than 20 per cent to 56 per cent of total road expenditures; but by 1936 they had dropped to 45 per cent<sup>1</sup> (see table on page 101). This

<sup>1</sup> It should be noted that these figures indicate simply the sources from which funds are drawn for purposes of highway financing. They do not

recent decline in the relative importance of user taxes does not reflect a basic change in tax policy. On the contrary, it is entirely due to the great increase in federal road expenditures in the interest of economic stabilization and relief (see table on page 94).

RELATIVE IMPORTANCE OF GENERAL REVENUES AND SPECIAL TAXES LEVIED AGAINST HIGHWAY USERS IN SELECTED YEARS, 1921-36<sup>a</sup>

(Dollar figures in thousands)

Year	General Revenues <sup>b</sup>	User Taxes			Total Revenues	<i>User Taxes as Percentage of Total Revenues</i>
		Registration Fees	Fuel Taxes	Total User Imposts		
1921..	\$ 540,710	\$118,943	\$ 3,683	\$122,626	\$ 663,336	18.5
1926..	661,084	262,413	174,036	436,449	1,097,533	39.8
1930..	682,274	344,713	518,220	862,933	1,545,207	55.8
1936..	1,045,943	...	...	864,964	1,910,907	45.3

<sup>a</sup> Figures supplied by Bureau of Public Roads.

<sup>b</sup> Includes all federal, state, and local highway revenues from property taxes and other general levies.

It should be emphasized that federal contributions do not constitute a uniform proportion of total highway revenues in all states. In the 28 states for which we have data, the range is from 11 per cent in New Hampshire to 70 per cent in Nevada (see table on page 102). This situation reflects in some measure, of course, the temporary abandonment of the dollar-for-dollar matching principle on which normal federal aid policy has been based.

enable one to pass judgment on the so-called subsidy question; that is, to determine whether the highway systems are "paying their way," or to the extent of the states' assumption of highway costs over and above the amounts borne by special beneficiaries of the highways. As will subsequently be shown, "cost," in the ordinary economic sense of the term, cannot be determined for such governmental activities as highway promotion.

VARIATION AMONG 28 STATES IN IMPORTANCE OF FEDERAL HIGHWAY  
CONTRIBUTIONS, 1935-36\*

State	Federal Contributions for Highway Purposes	Total Revenues Expended for Highway Purposes	<i>Federal Contributions as Percentage of Total Revenues Expended for Highway Purposes</i>
New Hampshire..	\$ 890,080	\$ 8,216,922	10.8
Ohio.....	6,693,537	43,512,592	15.4
Pennsylvania....	17,956,400	103,604,988	17.3
Florida.....	3,760,729	21,620,832	17.4
Iowa.....	5,721,976	32,868,801	17.4
West Virginia....	2,558,900	14,565,235	17.6
Minnesota.....	5,764,204	30,200,295	19.1
Kentucky.....	4,239,189	20,230,591	21.0
Louisiana.....	3,639,765	16,996,678	21.4
Virginia.....	4,997,151	23,145,974	21.6
Washington.....	6,133,076	23,878,057	25.7
Alabama.....	5,731,879	22,182,514	25.8
Texas.....	21,301,041	70,251,078	30.3
Oregon.....	6,505,816	21,336,298	30.5
Michigan.....	15,854,977	49,566,271	32.0
Kansas.....	8,329,075	25,967,416	32.1
Oklahoma.....	6,370,000	19,322,300	33.0
Arkansas.....	4,804,113	14,356,070	33.5
Missouri.....	11,636,700	32,743,500	35.5
Utah.....	2,399,458	6,746,428	35.6
Arizona.....	4,365,124	9,736,836	44.8
Idaho.....	5,242,674	11,408,182	46.0
Montana.....	5,756,317	12,374,073	46.5
South Dakota....	4,410,175	9,034,981	48.8
North Dakota....	4,584,335	8,687,157	52.8
New Mexico.....	3,914,073	6,882,563	56.9
Wyoming.....	4,159,270	6,865,789	60.6
Nevada.....	3,950,853	5,651,715	69.9
All 28 states...	\$181,670,887	\$671,954,136	27.0

\* Computed from U. S. Public Roads Administration, Highway Planning Surveys, Table F.S. 26.

Since basic highway policy is determined at the state level of government, the significant facts with regard to normal financial methods are best revealed by describing the salient features of state and local revenue policies.

## II. STATE AND LOCAL REVENUE POLICIES

Since 1921 all states have placed an increasing share of the burden of highway support on motor vehicle users. The following table shows user imposts as a percentage of total highway revenues with and without federal contributions.<sup>2</sup>

Year	As Percentage of All High- way Revenues	As Percentage of State and Local High- way Revenues
1921 .....	18.5	20.4
1926 .....	39.8	43.8
1930 .....	55.8	59.5
1936 .....	45.3	72.3

The growing importance of user taxes has reduced in relative terms the contribution of general revenues, including property taxes, to highway support. It should be emphasized, however, that individual states show wide variations in their degree of dependence on user taxes. A few states are financing all current state and local highway expenditures from special taxes on highway users. In a large number of states, however, property taxes continue to supply a substantial proportion of all funds collected from nonfederal sources. Dependence on user taxes ranges from 54.0 per cent to 95.6 per cent of total revenues from nonfederal sources (see table on page 104).

It should not be inferred that all revenues derived from user taxes are applied to highway purposes. On the contrary, the proportion of user imposts expended for highway purposes varied widely among the states, as shown by the table on page 105.

Two additional features of highway revenue trends are important to an understanding of state and local

<sup>2</sup> Computed from figures furnished by the Bureau of Public Roads.

**MAIN CLASSES OF NONFEDERAL FUNDS EXPENDED FOR HIGHWAY PURPOSES IN 28 STATES, 1935-36\***  
(Dollar figures in thousands)

State	General Revenues			User Imports				Total Non-federal Revenues	User Imports as Percentage of Total Non-federal Revenues
	Property Taxes	Miscellaneous General Revenues	Total General Revenues	Motor Fuel Taxes	Registration Fees	Miscellaneous User Imposts	Total User Imposts		
New Mexico.....	\$ 122	\$ 10	\$ 132	\$ 1,952	\$ 770	\$ 114	\$ 2,836	\$ 2,968	95.6
Virginia.....	1,052	112	1,164	12,039	4,367	579	16,985	18,149	93.6
Michigan.....	2,141	1,663	3,804	17,004	12,903	—	29,907	33,711	88.7
Washington.....	2,016	73	2,089	13,021	2,470	165	15,656	17,745	88.2
Wyoming.....	347	57	404	1,862	292	148	2,302	2,706	85.1
Ohio.....	5,726	205	5,931	19,928	10,295	665	30,888	36,819	83.9
Arkansas.....	1,105	514	1,619	6,112	1,787	34	7,933	9,552	83.1
Idaho.....	1,089	24	1,113	3,481	1,456	115	5,052	6,165	81.9
Oklahoma.....	1,960	405	2,365	7,423	2,531	633	10,587	12,952	81.7
Arizona.....	969	12	981	3,612	535	244	4,391	5,372	81.7
Alabama.....	2,737	327	3,064	10,738	2,337	312	13,387	16,451	81.4
Oregon.....	2,847	100	2,947	8,696	2,121	1,067	11,884	14,831	80.1
Utah.....	867	—	867	2,898	325	257	3,480	4,347	80.1
Pennsylvania.....	16,297	2,069	18,366	34,062	32,730	491	67,283	85,649	78.6
Louisiana.....	2,663	265	2,928	6,877	3,446	106	10,429	13,357	78.1
South Dakota.....	967	123	1,090	1,707	1,447	381	3,535	4,625	76.4
Nevada.....	385	40	425	886	184	206	1,276	1,701	75.0
Florida.....	4,175	540	4,715	12,922	—	223	13,145	17,860	73.6
Kentucky.....	3,143	1,681	4,824	8,404	2,711	52	11,167	15,991	69.8
Missouri.....	5,735	789	6,524	8,193	6,120	270	14,583	21,107	69.1
Montana.....	2,009	58	2,067	3,777	774	—	4,551	6,618	68.8
West Virginia.....	1,761	2,057	3,818	4,760	3,015	413	8,188	12,006	68.2
Texas.....	15,460	616	16,076	20,167	12,621	86	32,874	48,950	67.2
Kansas.....	5,936	129	6,065	7,707	3,079	787	11,573	17,638	65.6
Iowa.....	9,433	43	9,476	9,933	7,476	262	17,671	27,147	65.1
North Dakota.....	1,618	7	1,625	2,373	102	3	2,478	4,103	60.4
Minnesota.....	10,556	41	10,597	9,829	3,838	172	13,839	24,436	56.6
New Hampshire.....	2,934	433	3,367	2,458	1,387	115	3,960	7,327	54.0
All 28 states.....	106,050	12,393	118,443	242,821	121,119	7,900	371,840	490,283	75.8

\* U. S. Public Roads Administration, Highway Planning Surveys, Table F.S. 26.

## SYSTEM OF HIGHWAY REVENUES

105

MOTOR VEHICLE IMPOSTS EXPENDED ON ROADS, COMPARED WITH TOTAL  
MOTOR VEHICLE IMPOSTS COLLECTED BY STATE AND LOCAL UNITS, FOR  
28 STATES, 1935-36<sup>a</sup>

State	Total Receipts from Motor Vehicle Imposts <sup>b</sup>	Motor Vehicle Imposts Expended on Rural Roads <sup>c</sup>	Percentage Motor Vehicle Receipts Expended on Rural Roads
Ohio.....	\$69,515,732	\$30,887,685	44.4
Florida.....	24,567,373	13,145,029	53.5
South Dakota....	6,019,660	3,534,402	58.7
New Mexico.....	4,635,990	2,836,168	61.2
North Dakota...	3,762,105	2,477,766	65.9
Texas.....	49,257,227	32,874,262	66.7
Oklahoma.....	15,800,400	10,587,300	67.0
Louisiana.....	15,381,948	10,428,729	67.8
Arkansas.....	10,728,448	7,933,343	73.9
Minnesota.....	18,425,893	13,839,138	75.1
Michigan.....	39,132,116	29,907,136	76.4
Kentucky.....	14,568,142	11,167,308	76.7
West Virginia....	10,207,634	8,188,453	80.2
Iowa.....	21,861,889	17,670,879	80.8
Wyoming.....	2,845,313	2,301,953	80.9
Montana.....	5,612,828	4,551,018	81.1
Missouri.....	17,496,900	14,583,300	83.3
Idaho.....	6,014,837	5,052,428	83.0
Kansas.....	13,770,764	11,573,633	84.1
Nevada.....	1,496,223	1,275,674	85.3
Utah.....	4,053,242	3,479,852	85.9
Virginia.....	19,455,274	16,984,674	87.3
Washington.....	17,868,575	15,656,124	87.6
Alabama.....	15,218,135	13,386,444	88.0
New Hampshire..	4,429,207	3,960,209	89.4
Oregon.....	12,892,975	11,883,693	92.2
Arizona.....	4,623,435	4,390,644	95.0
Pennsylvania....	66,092,150	67,282,538	101.8 <sup>c</sup>

<sup>a</sup> U. S. Public Roads Administration, Highway Planning Surveys, Tables F.S. 7 and F.S. 26.

<sup>b</sup> Excluding imposts collected by incorporated units.

<sup>c</sup> Figures in this column represent expenditures from motor vehicle imposts regardless of the year in which these imposts were collected; thus it is possible, as in the case of Pennsylvania, that expenditures in one year may exceed receipts for that year by the amount of any balances carried over from previous years.

financial policy. First, state highway activities have become almost totally dependent on revenues derived from highway users both for current expenses and capital outlays.<sup>3</sup> This is exclusive, of course, of federal contributions.

From the table on page 107 it may be seen that in 1935-36 about 278 million dollars out of 284 millions of state-expended highway funds were derived from user taxes. It may also be seen that, except for federal contributions, these revenues furnished almost the full support for the so-called primary highway systems of the country, for only 6.5 millions out of the 274 millions applied to the support of these primary systems were derived from general revenues.

Second, state aids to local agencies for highway purposes are universally made from revenues derived from highway users so that local units are also increasingly dependent on such revenues for financing their road activities. In 1935-36 about 94 millions out of 206 millions, or 45 per cent of the total nonfederal funds spent by counties and other local units (townships and road districts), came from state-collected user imposts.

In general, it may be said, however, that in so far as local agencies exercise any real control over local road activities, their funds are derived from taxes on property. In 1935-36 county and local units (28 states) spent 112 millions from general revenues. Of this amount 106 millions were derived from property taxes. (See table on page 107.)

Once more a full appreciation of the structure of current revenue systems is best obtained by classifying the states according to the scheme adopted in Chapter III.

<sup>3</sup> It has become the universal practice to pledge revenues from highway users to the servicing of debt incurred for state highway purposes.



**SOURCES OF NONFEDERAL REVENUES EXPENDED FOR ROAD PURPOSES, SHOWING AGENCY BY WHICH FUNDS WERE SPENT AND ROAD SYSTEMS ON WHICH EXPENDED, for 28 STATES, 1935-36\***  
(In thousands of dollars)

Type of Revenue	Spending Agency				System of Road on which Spent			
	State	County	Local	Total	Primary	Secondary	Tertiary	Total
Property taxes.....	513	81,039	24,498	106,050	3,430	75,323	27,297	106,050
Miscellaneous.....	5,872	5,096	1,425	12,393	3,100	8,043	1,250	12,393
<b>Total general revenues</b>	<b>6,385</b>	<b>86,135</b>	<b>25,923</b>	<b>118,443</b>	<b>6,530</b>	<b>83,366</b>	<b>28,547</b>	<b>118,443</b>
Fuel taxes.....	183,328	55,477	4,016	242,821	178,203	51,494	13,124	242,821
Registration fees.....	87,577	32,146	1,396	121,119	83,274	28,975	8,870	121,119
Other user imposts....	6,996	792	112	7,900	6,369	1,274	257	7,900
<b>Total user imposts...</b>	<b>277,901</b>	<b>88,415</b>	<b>5,524</b>	<b>371,840</b>	<b>267,846</b>	<b>81,743</b>	<b>22,251</b>	<b>371,840</b>
<b>Total highway revenues.....</b>	<b>284,286</b>	<b>174,550</b>	<b>31,447</b>	<b>490,283</b>	<b>274,376</b>	<b>165,109</b>	<b>50,798</b>	<b>490,283</b>

\* Derived from U. S. Public Roads Administration, Highway Planning Surveys, Table F.S. 26.

In all states in which administrative centralization has been written into law, the burden of highway support has been transferred to the motor vehicle user. Virginia, for example, derived 93.6 per cent of all nonfederal highway revenues from motor vehicle taxes in 1936 (see the accompanying table).

IMPORTANCE OF USER TAXES IN SELECTED STATES HAVING CENTRALIZED ADMINISTRATIVE SYSTEMS<sup>a</sup>  
(Dollar figures in thousands)

Type of Revenue	Virginia 1936		Pennsylvania 1934	
	Amount	Percent- age of Total	Amount	Percent- age of Total
User taxes.....	\$16,985	93.6	\$67,283	78.6
Property taxes.....	1,052	5.8	16,297	19.0
Miscellaneous general revenues.	112	.6	2,069	2.4
Total nonfederal revenues ex- pended on highways.....	\$18,149	100.0	\$85,649	100.0

<sup>a</sup> U. S. Public Roads Administration, Highway Planning Surveys, Table F.S. 26.

In the group of states which has achieved a high degree of centralization within a statutory framework of distributed authority, the situation regarding the financial burden is much the same as in the states with legally centralized systems. As early as 1934 Pennsylvania derived from user imposts almost 80 per cent of all nonfederal funds applied to road purposes. In the case of Pennsylvania, it will be recalled that since 1934 an increasing proportion of the funds spent on local roads has been derived from state-collected user imposts.

This centralized financial arrangement is by no means characteristic of the revenue systems in all states. For in those states which have retained effective distribution

of administrative authority, the revenue systems are not only composed of complex intergovernmental arrangements within a given state, but they reveal wide variations among the states.

Some states exhibit a high concentration of financial responsibility at the state level. In Ohio, for example, 31 million dollars, or nearly 84 per cent of all highway

IMPORTANCE OF USER TAXES IN OHIO, 1935\*  
(Dollar figures in thousands)

Type of Revenue	Road System on Which Expended			
	Primary	Secondary and Tertiary	Total	Percent- age of Total
User taxes.....	\$18,387	\$12,501	\$30,888	83.9
Property taxes.....	14	5,712	5,726	15.5
Miscellaneous general revenues.	1	204	205	.6
Total nonfederal revenues expended on highways.....	\$18,402	\$18,417	\$36,819	100.0

\* U. S. Public Roads Administration, State-Wide Highway Planning Survey, Table F.S. 26.

revenue from nonfederal sources, is derived from state-administered user imposts (see table above). Of this amount, 12½ millions, or nearly 40 per cent, are allocated to local roads, constituting two-thirds of the 18 millions of revenue expended on such roads.

In Missouri, on the other hand, state-administered user imposts produced less than 15 millions, or 69 per cent of all revenues from nonfederal sources, and of the amount which these user imposts produced, only a little more than a million, or 7.3 per cent, was applied to local roads, comprising but 14.5 per cent of the 7.4 millions spent on local roads (see table on page 110).

Thus, for the states in which a high degree of discretion legally reposes in local units, it may be said in gen-

eral that (1) primary systems are, for all practical purposes, wholly dependent on state-wide imposts, and (2) the major portion of all highway funds is derived from imposts levied on users of motor vehicles. But in many of these states a substantial portion of the funds ex-

IMPORTANCE OF USER IMPOSTS IN MISSOURI, 1934<sup>a</sup>  
(Dollar figures in thousands)

Type of Revenue	Road System on Which Expended			
	Primary	Secondary and Tertiary	Total	Percentage of Total
User imposts.....	\$13,514	\$1,069	\$14,583	69.1
Property taxes.....	—	5,735	5,735	27.2
Miscellaneous general revenues.	217	572	789	3.7
Total nonfederal revenues expended on highways.....	\$13,731	\$7,376	\$21,107	100.0

<sup>a</sup> U. S. Public Roads Administration, State-Wide Highway Planning Survey, Table F. S. 26.

pendent on secondary and local roads is derived from property taxes and other imposts of a general nature.

We have seen from this and the preceding chapter that striking dissimilarities exist among the states with regard to the administrative and financial methods used in the provision of roads. No attempt has been made here to evaluate the relative merits of these contrasting arrangements. The differences, however, are so pronounced that we must determine whether or not the services generated by the roads provided under such arrangements differ in fundamental respects. Analysis of the purposes and identification of the beneficiaries of the modern road system furnishes the basis for this determination.

## CHAPTER V

### PURPOSES AND BENEFICIARIES OF MODERN ROAD FACILITIES

In preceding chapters we have sketched the background and evolution of highway policies in this country. With this chapter we begin an analysis of facts and theories for the purpose of defining so far as may be possible the principles on which highway administration and finance should be established. We shall deal with the following matters as fundamentally relevant to the problem of establishing principles: (1) the physical structure of the highway system; (2) character of the functions performed for private users; and (3) direct governmental use of the modern road plant.

If policies are to be formulated on the basis of experience and facts, it is essential that adequate data should be at hand for study. We have greatly improved the engineering and administrative techniques of road building and maintenance, but until quite recently, our information regarding the use characteristics of public highways has been derived largely from casual observation and random sampling. In 1935, however, the United States Bureau of Public Roads (now U. S. Public Roads Administration of the Federal Works Agency) formulated plans for a nation-wide highway planning survey to be conducted by the several states in co-operation with the federal bureau.<sup>1</sup> The general purpose of the program was to assemble the facts necessary to "the

<sup>1</sup> Authority and funds were derived from the Hayden-Cartwright Act of 1934 which authorized the Secretary of Agriculture to allocate, from federal highway funds appropriated under the act, "not to exceed 1½ per centum of the amount apportioned for any year to any State"

establishment of a definite, economically and socially defensible integrated highway improvement program in all States" and to maintain a continuous collection of pertinent data in the future.<sup>2</sup> By 1940, all 48 states and the District of Columbia were participating in the survey program. Quantitative data of the type supplied by these planning surveys must be made continuously available to administrators and legislators alike if scientific and orderly programming is to be universally substituted for guesswork and political expediency in the costly business of providing adequate highway facilities. Although the planning studies have not been brought to the same degree of completion in all states,<sup>3</sup> the avail-

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for surveys, planning, etc. This authorization applied to the federal aid highway system, extensions thereof, and to secondary or feeder roads.  
<sup>48</sup> Stat. L. 993-96.

<sup>2</sup> *Report of the Chief of the Bureau of Public Roads, 1937*, pp. 65, 66. In each state the survey program was divided into three major groups of studies defined as follows. (1) Rural road inventory—designed to determine and map all the physical characteristics of every mile of rural road and to study municipal grade crossing problems. (2) Traffic surveys—designed to establish the characteristics of highway vehicles and their flow over various types and classes of roads. (3) Financial surveys: (a) fiscal study—designed to determine the varying methods of financing the highway and other functions of government at the several levels of government, including sources of funds, methods and objects of expenditure, etc.; (b) vehicle allocation study—designed to determine the residence distribution of the payers of various motor taxes; (c) road use study—designed to measure the benefits accruing to users of various types and classes of highways; and (d) road life study—designed to determine and project the average life of various types of roads and road elements.

For details see annual reports of the Chief of the Bureau of Public Roads for 1937, 1938, 1939, pp. 65, 64, and 69 respectively.

<sup>3</sup> As nearly as could be determined from Public Roads Administration records, the status of the surveys as of October 1940 was as follows:

1. Road inventory: about 75 per cent complete with about 34 states more than 90 per cent finished.
2. Traffic: about 93 per cent complete, with about 44 states more than 90 per cent finished.
3. Financial: the fiscal, vehicle allocation, and road use studies are about 86 per cent complete as an average, with 37 states more than 90 per cent finished.

able data contribute much to an understanding of the physical structure of the road system, and to an identification of its various uses and beneficiaries.

### I. PHYSICAL STRUCTURE OF ROAD PLANT

As was explained at the beginning of this study, the fundamental purpose of road provision is to implement the rights of access and of passage. It may be said that, when these rights have been satisfactorily recognized, a country will possess a basic road plant giving access to land, dwellings, business establishments, and other institutions, public and private, and permitting legally unobstructed interchange of goods and people among these units. This is the minimum road plant necessary to any organized community.

*Generally speaking, the country possessed its basic road plant at the turn of the century.* The table on page 114 indicates that total road mileage in this country increased between 1904 and 1939 by about 24 per cent; but this apparent increase is to some extent exaggerated. Some of it resulted from a recording for the first time of mileage already in existence and use<sup>4</sup> and some from

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4. The road life study averages roughly 55 per cent complete, with only 7 states more than 90 per cent finished.

At the present time about one-fifth of the states have published preliminary reports of progress of findings, but we are informed by the Public Roads Administration that few, if any, states contemplate publication of a final report of all facts and findings of the "basic" planning surveys. It is more probable that the information will be filed for public use as a reservoir of information (constantly added to by the continuing phases of the surveys) on which governmental and other bodies may draw for the study and solution of problems arising from the administration and financing of the highway function of government.

<sup>4</sup> For example, between 1904 and 1914 several western states acquired large areas of former Indian land and organized counties. These counties reported road mileages in the latter years which were existent, though unreported, in 1904. In addition a great many counties actually organized and in existence in 1904 failed to file any reports until 1914. These two factors alone account for about 40 per cent of the total increase reported between 1904 and 1914.

TREND IN TOTAL MILEAGE OF LEGALLY DEFINED HIGHWAY SYSTEMS, 1904-39<sup>a</sup>

Year	All Roads		State System			Local System		
	Mileage	Index (1921=100)	Mileage	Percentage of Total	Index (1921=100)	Mileage	Percentage of Total	Index (1921=100)
1904.....	2,151,379	73.6	—	—	—	2,151,379	100.0	79.0
1909.....	2,199,645	75.2	—	—	—	2,199,645	100.0	80.8
1914.....	2,445,761	83.6	—	—	—	2,445,761	100.0	89.9
1921.....	2,924,505	100.0	202,915	6.9	100.0	2,721,590	93.1	100.0
1923.....	2,995,727	102.4	251,611	8.4	124.0	2,744,116	91.6	100.8
1924.....	3,004,411	102.7	261,216	8.7	128.7	2,743,195	91.3	100.8
1925.....	3,006,183	102.8	274,911	9.1	135.5	2,731,172	90.9	100.4
1926.....	3,000,190	102.6	287,928	9.6	141.9	2,712,262	90.4	99.7
1927.....	3,013,584	103.0	293,353	9.7	144.6	2,720,231	90.3	99.9
1928.....	3,016,281	103.1	306,442	10.2	151.0	2,709,839	89.8	99.6
1929.....	3,024,233	103.4	314,136	10.4	154.8	2,710,097	89.6	99.6
1930.....	3,009,066	102.9	324,496	10.8	159.9	2,684,570	89.2	98.6
1939.....	2,912,283	99.6	520,524	17.9	256.5	2,391,759	82.1	87.9

<sup>a</sup> 1904, U. S. Department of Agriculture, Office of Public Roads, Bulletin No. 32; 1909, the same, Bulletin No. 41; 1914, the same, Bureau of Public Roads, Bulletin No. 390; 1921-30, Bureau of Public Roads releases; and 1939, Highway Planning Surveys, U. S. Public Roads Administration. Local road mileage for 1939 in 18 of the 48 states based partially on estimates. Accurate data are not available for years excluded.



a more complete or even exaggerated reporting;<sup>5</sup> but probably a larger part of the apparent net increase was due to the normal growth of road systems in "going" states, especially the younger, developing states west of the Mississippi.<sup>6</sup>

It appears, therefore, that once the country became fairly well settled throughout its entire area, no further expansion of the road plant, so far as geographic coverage is concerned, was required. Considering geographic coverage alone, the cost of providing the basic road plant has not been appreciably affected either by the technological revolution that resulted from the almost complete substitution of motorized for horse-drawn vehicles or by the phenomenal increase in motor vehicle traffic.

*The modern dynamic concept of road management involves standards based on optimum mobility.* When we say that a poor road is uneconomical, we mean simply that the cost of traveling over it is as much or more than the cost of improving it. The cost of traveling over it is measured in loss of time, diminished movement, wear-and-tear, discomfort, various inconveniences, and accidents. All of these items of expense may be reduced and some practically eliminated by improving the road.

<sup>5</sup> Centralized machinery necessary for full reporting was made available for the first time through establishment of state highway departments. Moreover, the rapidly developing state-aid device provided the first tangible inducement for full, and perhaps even exaggerated, inventory of road mileages. In most states, allocation of funds to counties was based in part on mileage.

<sup>6</sup> Between 1904 and 1914 there was a net increase of 168,050 miles for the country as a whole, occasioned by an increase of 206,763 miles in 31 states and a decrease of 38,713 miles in 17 states. More than 73 per cent of the 31 states' increase in mileage occurred in 12 states, 10 of which were newly admitted or young, developing states west of the Mississippi River. On the other hand, 11 of the 17 states showing decreases in mileage were the older, established states or early centers of population and commercial activity; and two others were early settled, well-developed trans-Mississippi farming states—the original "jumping off" places in the westward movement.

When a community is provided with a basic road plant, these facts soon become apparent. In other words, if economical operation is the sole consideration, the long-run cost of improving a road so as to facilitate movement over it will be no more and may be less than the aggregate long-run expenditure by individual users if the road were left unimproved.

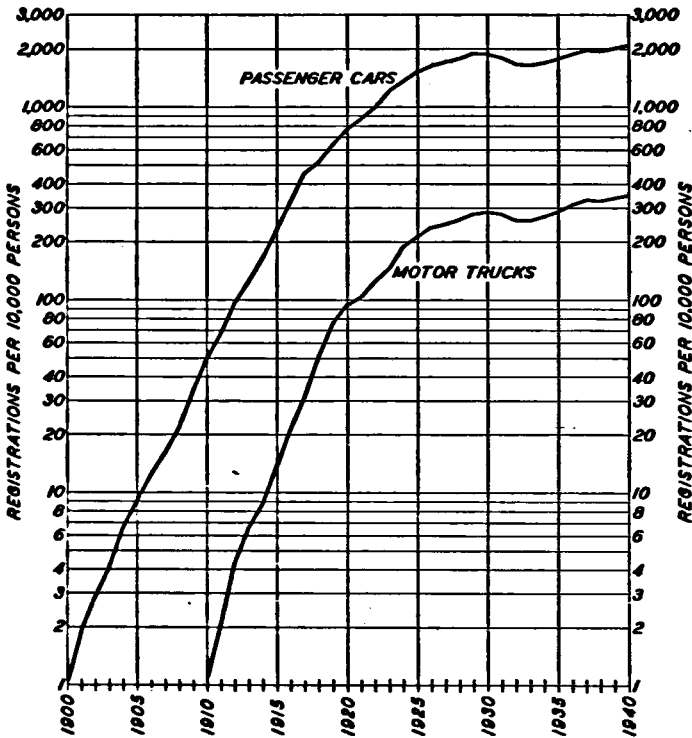
From this axiom emerges the modern dynamic concept of road management, shifting emphasis from the maintenance of traditional, customary, and practically unchanging standards to the provision of facilities that permit an optimum mobility of people and goods. When the basis of optimum mobility is adopted, standards of construction and maintenance become, obviously, different, more exacting, more technical, more closely linked with engineering study, and more evolutionary.

*Modernization has resulted in varying degrees of improvement.* The rapid growth of automotive transportation has sharpened conflicts among the groups that use, or are affected by, the roads. In order to accommodate the highways to the technical requirements of automotive transportation and to the standards of optimum mobility introduced by motor vehicles, different physical segments of the road plant have been brought to widely varying levels of improvement.

The year 1930 marks the end of an epoch in modern road development. The period between 1900 and 1930 received the full impact of the forces released between 1880 and 1900 by the good roads movement and subsequently accelerated by motor vehicle use. All states had been functioning for a decade with central highway organizations; and their efforts had been markedly unified by federal policy. This policy had not yet been

distorted by economic stabilization and relief programs. Moreover, as indicated by the following chart, the rate of growth in motor vehicle ownership was leveling off.

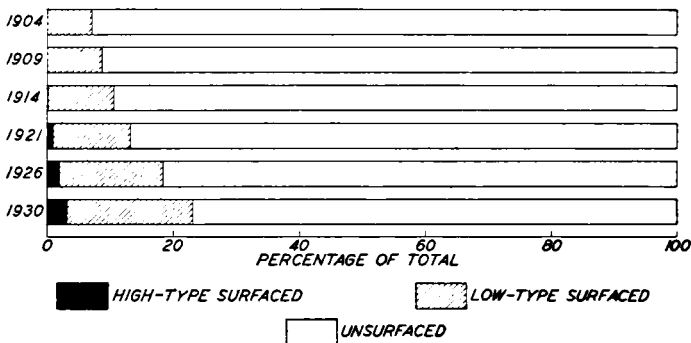
GROWTH OF PASSENGER CAR AND MOTOR TRUCK REGISTRATIONS IN THE UNITED STATES, 1900-39<sup>a</sup>  
Per 10,000 Persons



<sup>a</sup> Population data for 1900-29 from *Statistical Abstract of the United States, 1940*, p. 11; for 1930-40, U. S. Bureau of the Census, Series P-3, No. 10 (Mar. 15, 1941) and Series P-3, No. 16 (Aug. 2, 1941). Registrations from Automobile Manufacturers Association, *Automobile Facts and Figures* (1941), p. 11.

In 1930, only 23 per cent of the total mileage of the country had received any type of surfacing and only about 3 per cent of the total had been developed to the physical standard of high-type surfacing generally associated with the "modern highway" (see chart below).<sup>7</sup>

PERCENTAGE OF TOTAL RURAL ROAD MILEAGE HAVING SEVERAL SURFACE TYPES<sup>a</sup>  
(Selected years, 1904-30)



<sup>a</sup> Adapted from table 1, App. B.

Although improvements were not limited to the so-called "state" systems,<sup>8</sup> high-type surfacing was concentrated there. About 70 per cent of this mileage had been surfaced, 21 per cent of it with high-type pavement (see upper chart on page 119). By contrast, only 17 per cent of the total local mileage had been surfaced and only 0.8 per cent with high-type pavement (see second chart on page 119).

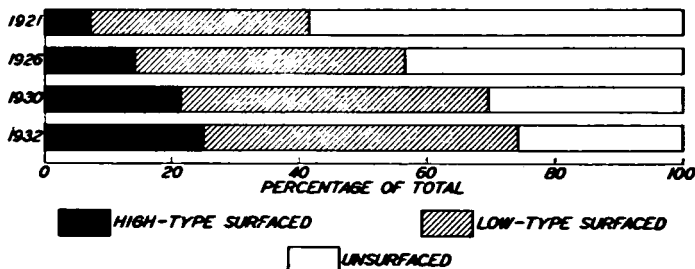
Since 1930 the states have continued improvement

<sup>7</sup> Including Portland cement concrete, bituminous concrete, brick, and block.

<sup>8</sup> Composed of legally designated mileage over which state agencies exercise primary jurisdiction.

programs at varying rates. By 1938, about 37 per cent of the total mileage had been surfaced, some 5 per cent of the total having been improved with high-type surfacing. The bulk of road mileage included in state

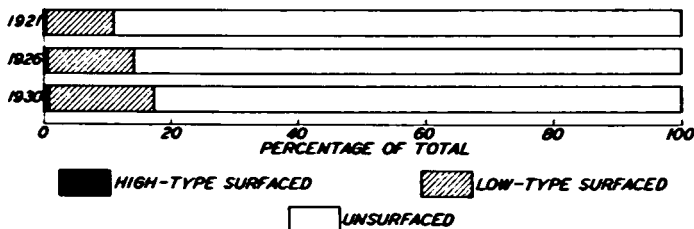
PERCENTAGE OF TOTAL STATE SYSTEM MILEAGE HAVING SEVERAL SURFACE TYPES<sup>a</sup>  
(Selected years, 1921-32)



<sup>a</sup> Adapted from table 1, App. B.

systems had received some type of surfacing, approximately one-third having been improved to high standards. Both state and local programs, especially local, have been materially influenced by economic stabiliza-

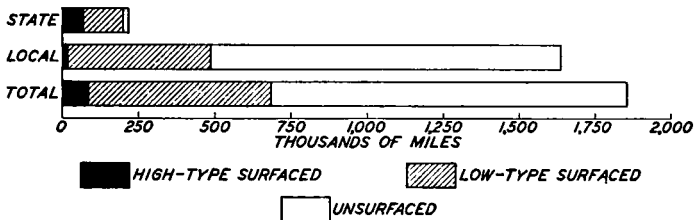
PERCENTAGE OF TOTAL LOCAL SYSTEM MILEAGE HAVING SEVERAL SURFACE TYPES<sup>a</sup>  
(Selected years, 1921-30)



<sup>a</sup> Adapted from table 1, App. B.

tion and relief considerations. Thus the substantial increase in surfaced mileage on county and local systems may be attributed in considerable degree to these factors. Nevertheless, as late as 1938, about 70 per cent of the local mileage remained unsurfaced in the 30 states for which complete physical inventory data are available; and only 1 per cent of the county and other local mileage had been improved with high-type surfacing (see chart below).<sup>9</sup>

#### DEGREE AND TYPE OF SURFACING IN 30 STATES, 1937-38<sup>a</sup>



<sup>a</sup> Adapted from table 2, App. B.

*Traffic is concentrated on the limited portion of the system which is highly improved.* When roads are compared on the basis of their legal classification, we find that 74 per cent of the traffic volume is concentrated on the state highways, which include only 11 per cent of the total mileage.<sup>10</sup>

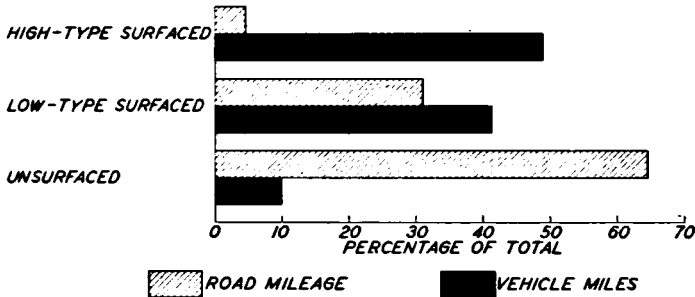
When roads are compared according to types of improvement, a similar concentration appears. In 32 states for which comparable traffic data are available, paved

<sup>9</sup> For variations among the states see table 2, App. B. It should be noted also that about 80 per cent of the total low-type surfaced mileage cannot be classified as an all-weather road, for that percentage has not received an oil-treated surfacing.

<sup>10</sup> These statements refer to 28 states for which complete and comparable data are available. See table 3, App. B, for variations among states.

(high-type surfacing) roads, constituting only 4.5 per cent of the total rural mileage, carry 48.9 per cent of the motor vehicle miles traveled annually. At the other extreme, the unsurfaced roads, constituting 64.5 per cent of the total mileage, carry only 9.9 per cent of the total traffic (see following chart). Such concentration of

PERCENTAGE OF TOTAL DAILY VEHICLE MILES CARRIED BY ROADS OF VARIOUS IMPROVEMENT STANDARDS IN 32 STATES<sup>a</sup>



<sup>a</sup> For supporting data see table 4, App. B.

traffic on improved roads is characteristic of all states even though the intensity of concentration varies considerably among the states. Thus the proportion of total traffic carried by unimproved roads ranges from 20.4 per cent in New Mexico, where 89.8 per cent of the total mileage remains unsurfaced, to 1.4 per cent in Ohio, where only 14.6 per cent of the mileage falls into the unsurfaced classification.<sup>11</sup>

Advocates of accelerated road development through federal financing have argued from these data relating to the physical characteristics of the road plant that "highway improvement in America is in its infancy"<sup>12</sup>

<sup>11</sup> See table 4, App. B.

<sup>12</sup> Statement by Representative Cartwright in support of the secondary

and that "there must be long continued and skillfully directed effort 'to get the farmer out of the mud.'"<sup>13</sup> The implication is that some 2,000,000 miles of rural roads that "have received no improvement whatsoever other than the hand-method, makeshift type of work that is done by individuals and communities directly concerned"<sup>14</sup> must be raised to considerably higher levels of development in order to meet desirable standards of mobility. Moreover, it is proposed in effect that the costs incurred in such a vast improvement program should be financed by expansion of federal aid activity and by increased allotments to local roads of state-collected taxes on motor vehicle users. Such proposals raise issues, some of which may readily be resolved and others clarified by analysis of the various purposes served by modern roads.

## II. CHARACTER OF FUNCTIONS PERFORMED FOR PRIVATE USERS

All roads of whatever type eventually merge into a vast physically interconnected system, enabling traffic to flow more or less freely throughout its entire extent. Because of this purely physical feature it has been assumed, first, that for purposes of allocating the financial burden, the entire road plant should be treated as a whole and, second, that the motor vehicle user should be viewed as the primary if not the sole beneficiary of values created by road development. As we shall later see, neither of these assumptions is valid. For the modern road system is a multiple-purpose, joint-use facility; and its various units produce services that are distributed unevenly among the various members of society.

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federal aid road program. (See p. 90 above.) *Congressional Record*, Vol. 80, Pt. 5, 74 Cong. 2 sess., p. 5579.

<sup>13</sup> *Federal Aid for Highways*, S. Rept. 1976, 74 Cong. 2 sess., p. 8.

<sup>14</sup> *Congressional Record*, Vol. 80, Pt. 5, 74 Cong. 2 sess., p. 5579.



There are three interrelated functional characteristics concerning private use which must be recognized in the formulation of an equitable system of modern road management: (1) land access, (2) community service, and (3) inter-community mobility.

*The primary function of a substantial portion of the road plant is to furnish access to the land.* About 65 per cent of the country's road mileage is unsurfaced. These relatively unimproved roads are of negligible importance from the standpoint of general motor vehicle use. For as we have seen, they carry only one-tenth of the motor vehicle miles traveled annually. But these unimproved roads are of fundamental importance to rural land owners. For they furnish the only means of access to about half of the country's farms and 35 per cent of the rural dwellings (see accompanying table).

EXTENT TO WHICH RURAL INSTITUTIONS ARE SERVED BY VARIOUS CLASSES OF HIGHWAYS IN 38 STATES\*  
(Figures are percentages)

Type or Class of Highway	Mileage	Churches	Dwellings	Business Establishments	Schools	Farm Units
Paved . . . . .	4.2	8.8	15.8	32.1	6.3	7.5
Surfaced . . . . .	33.3	52.0	49.5	50.2	45.9	46.8
Other . . . . .	62.5	39.2	34.7	17.7	47.8	45.7

\* Compiled from U. S. Public Roads Administration, State-Wide Highway Planning Surveys. See App. B, table 5, for variations among states.

The true worth of these access roads derives from the fact that without them, land would be valueless. Whether or how they should be improved should depend largely upon the judgment of local residents regarding the effect of such improvements upon the productiveness and profitability of land and other private property. Consequently it would appear entirely appropriate to assess the major cost incurred in their

improvement and maintenance against property owners.

In applying this principle, it must be borne in mind that although the access function predominates in a portion of the road plant, it is not limited to any single class of roads. Thus the mileage which, as we shall see later, has been improved to obtain optimum community and inter-community mobility, fulfills also the access purpose for more than half of all rural institutions. As the table on page 123 shows, 82 per cent of the business establishments, 65 per cent of rural dwellings, and 54 per cent of the farm units are served directly by improved mileage. This additional factor must be considered in the allocation of road costs.

*The facilitation of community life is one of the important functions of all classes of roads.* The primary concern of each community in the matter of road provision has always been to secure a standard of improvement adequate for the purely community movement of goods and people generated in the everyday process of marketing produce and buying supplies, in going to school and to church, in conducting business with government officials, and in administering the various general functions of government.<sup>15</sup>

We have observed that during the present century a limited segment of rural road mileage has been raised to progressively higher standards of development. But all segments of this improved portion of the system have not been raised to a uniform standard. Thus, by 1938

<sup>15</sup> After the road district and township unit were found inadequate, the county or a corresponding level of local government was almost universally made responsible for the provision of community service road facilities. This development, as we have seen, was based on the need of an administrative and taxing unit capable of supporting professional as distinguished from amateur road management, and one large enough to include all individuals possessing a direct and common interest in the quality of service offered by the roads of that particular community.

about 31 per cent of the legally designated state system mileage had been improved with high-type surfacing, while only 1 per cent of county and other local mileage had been similarly developed.<sup>16</sup> These variations are not the results of capricious administration. They reflect the fact that, with reference to roads designed primarily to facilitate mobility, a differentiation occurs between the users who are and those who are not primarily interested in community service. In dealing with this phase of the problem we again encounter the complicating factor of overlapping function or joint use. The substitution of motor- for horse-drawn vehicles has not reduced the importance of the community service purpose. It has merely extended somewhat the geographical boundaries within which community activities are carried on; and it has created important time and comfort economies in the conduct of these activities. Thus the vastly increased mobility introduced into our national life by motorization is expressed in large part by shuttle-movement rather than by long-distance traffic. This basic characteristic of road use is illustrated by the fact that during 1939, in 11 representative states, 85 per cent of all passenger car trips beyond city limits, or entirely on rural roads, extended a distance of less than 20 miles. About 80 per cent of truck-trips extended less than 20 miles from their point of origin.<sup>17</sup> Moreover, as appears from the table on page 126, a surprisingly large portion (37.5 per cent) of rural road trips was made up of vehicles shuttling back and forth, with origin and desti-

<sup>16</sup> Data for 30 states. See App. B, table 2.

<sup>17</sup> R. H. Paddock and R. P. Rodgers, "Preliminary Results of Road-Use Studies," *Public Roads*, May 1939, pp. 49-50.

It will be noted that these data cover only 11 states. They appear, however, to be fairly representative of the country as a whole. See pp. 45 and 46 of *Public Roads* just cited.

nation less than 5 miles apart. Passenger car and truck operations went over 100 miles from their starting point on fewer than 2 per cent of all their trips. And, about 60 per cent of all motor vehicle miles traveled on rural roads (as distinguished from the number of trips) is accounted for by trips of less than 50 miles in length.

PASSENGER CAR AND TRUCK TRAFFIC OUTSIDE CITY LIMITS IN ELEVEN STATES<sup>a</sup>

Length of One-Way Trip from Point of Origin (In miles)	Trips Taken		Vehicle Miles Traveled	
	Number (In thousands)	Per Cent	Number (In millions)	Per Cent
0 to 4.9.....	1,020,011	37.5	2,550.0	6.2
5.0 to 9.9.....	715,211	26.3	5,364.1	13.1
10.0 to 19.9.....	551,743	20.3	8,276.1	20.1
20.0 to 29.9.....	185,620	6.8	4,640.5	11.2
30.0 to 39.9.....	81,953	3.0	2,868.3	6.9
40.0 to 49.9.....	38,046	1.4	1,712.1	4.1
50.0 to 99.9.....	85,140	3.1	6,385.5	15.5
100.0 to 249.9.....	35,654	1.3	6,239.4	15.1
250.0 to 499.9.....	4,662	.2	1,748.3	4.2
500.0 to 999.9.....	935	.1	701.3	1.7
1,000 and over.....	534	<sup>b</sup>	801.0	1.9
Total.....	2,719,509	100.0	41,286.6	100.0

<sup>a</sup> *Public Roads*, May 1939, p. 52.

<sup>b</sup> Less than 0.1 per cent.

The constant flux of short-radius traffic creates an illusion of sustained mass movement on primary or high density highways. It is this illusion that has inspired grandiose schemes for a network of east-west and north-south transcontinental super-highways.<sup>18</sup> Even such a

<sup>18</sup> Recently, an official commission concluded with regard to Virginia highways:

"That there is a general tendency to over-estimate the amount of so-called through traffic and to over-emphasize the importance of, and need for, a large mileage of trunk highways located and built primarily to serve such traffic. That of over 90,000 passenger car drivers interviewed at many hundreds of places on the Secondary System, over

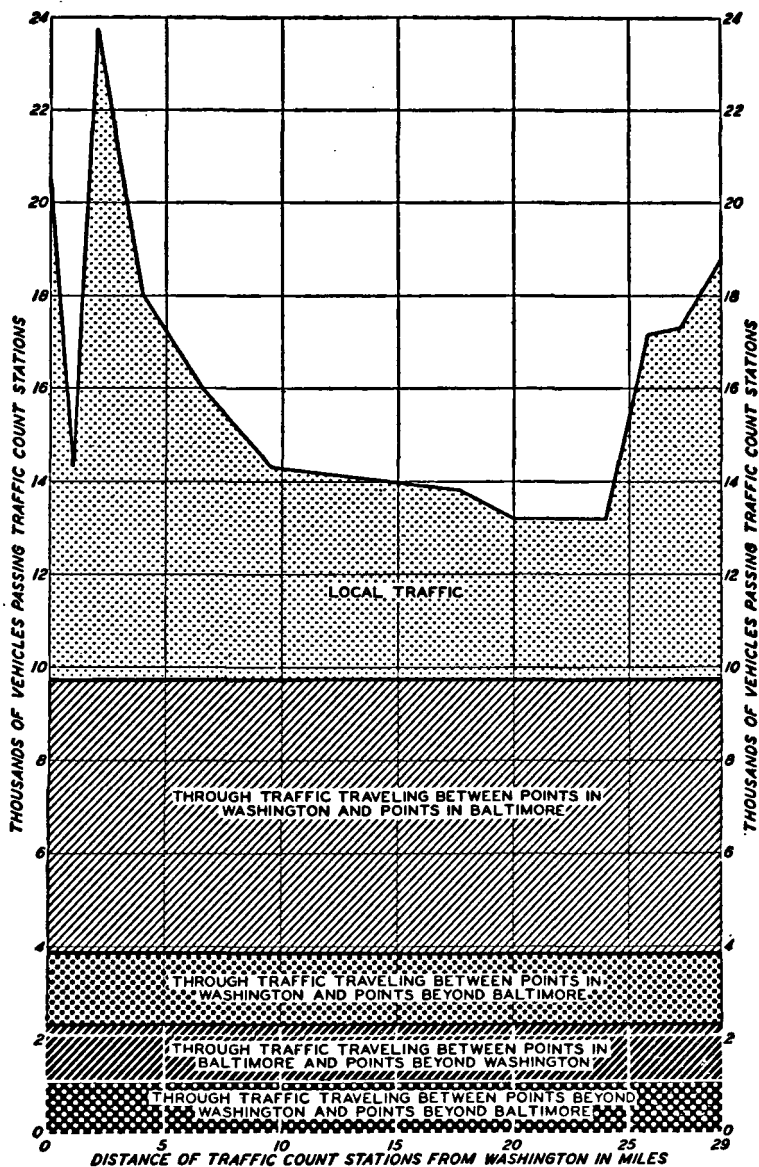
heavily traveled route as U. S. No. 1 between Washington, D. C., and Baltimore, Maryland, carries a relatively light volume of traffic that has originated at or is destined to points beyond these two terminal areas. About one-half of the extreme high-density volume found on this route within a four-mile radius of each city is generated by purely local traffic moving in and out of the metropolitan area. The bulk of the remainder is accounted for by vehicles moving between the two cities (see chart on page 128).

We must conclude then that the community service purpose extends throughout the entire range of the highway plant. But as in the case of land access, some portions of the road system serve primarily to facilitate purely community travel. Most, but not all, of these roads carry relatively light traffic volume. They serve in a dual capacity. First they serve as feeder facilities, enabling the residents of communities located away from main highways to gain access to those thoroughfares for purposes of inter-community travel. And second, they serve as avenues for that portion of community travel—from the home to church, school, shopping centers, and places of employment—which cannot, in the nature of the case, be performed by the limited mileage of highly improved routes included in the state systems. Roads included in the county and local systems must be used in gaining access to about 78 per cent of the rural

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44,000 or almost one-half were traveling less than 10 miles and over 85 per cent less than 30 miles. That at the other extreme, less than 3 per cent were traveling as far as 75 miles and less than 2 per cent were traveling over 100 miles. This in spite of the fact that, as vehicles were stopped, and interviews made, at road intersections only, many short trips between intersections were missed whereas all long trips were necessarily recorded." *Report of the Commission to Study Primary and Secondary Systems of Highways in Virginia*, Va. S. Doc. No. 6 (1940), p. 82.

## RELATIVE IMPORTANCE OF LOCAL AND THROUGH TRAFFIC ON U. S. NO. 1 BETWEEN WASHINGTON, D.C. AND BALTIMORE, MARYLAND<sup>a</sup>



<sup>a</sup> Adapted from chart, p. 92, of *Toll Roads and Free Roads*, H. Doc. 272, 76 Cong. 1 sess.

churches, 77 per cent of the dwellings, over one-half of the business establishments, 86 per cent of the schools, and 85 per cent of the farm units.<sup>19</sup>

There are therefore two considerations with regard to the community service function of modern roads that must be taken into account in the formulation of highway policy. All roads serve in one degree or another to facilitate the economical and convenient conduct of community life. And this function predominates in some segments of the road plant. Consequently, it would appear that some portion of the responsibility for road provision should be allocated to those local agencies of government that are primarily concerned with the administration of community services. And a portion of the total road bill should be paid from some type of general tax levy assessed against the local taxpayer.

*A limited portion of the road system has been improved to obtain optimum inter-community mobility.* In the process of obtaining optimum mobility, each local community has been concerned with more than the facilitation of its own activities. It has sought to gain access to major markets, centers of population, recreational areas, and seats of government. It has recognized the need and existence of a large social and economic integration. In fact, the smallest communities merge in larger ones; and all may be represented as overlapping concentric circles, becoming altogether the national community. So far as highways are concerned, the state has been looked upon as the largest community or sum-total of communities, and therefore an appropriate unit for

<sup>19</sup> Based on Road Inventory Tables No. 10, Planning Surveys, Public Roads Administration, for the following 30 states: Ariz., Ark., Calif., Colo., Fla., Idaho, Ill., Iowa, Kans., Ky., La., Md., Mo., Mont., Nebr., Nev., N.H., N.C., Ohio, Okla., Oreg., S.C., S.Dak., Tex., Utah, Vt., Va., W.Va., Wis., Wyo.

the provision of inter-community or general-purpose roads.

Such roads have been created, in the main, by building higher standards of improvement into certain of the roads which were already serving community needs and by connecting these improved roads so as to make a physically integrated system. The controlling purpose has been to achieve optimum inter-community mobility measured in terms of economies of time, operating costs, convenience, and safety. The effort to realize these economies has, in the main, dictated the standards of improvement—that is, the location, curvature, gradients, and surfacing of general purpose roads. But as we have seen, it has been possible to supply about 75 per cent of the country's highway traffic (measured in terms of motor vehicle miles traveled) with high standards of mobility by the improvement of state highway systems which, in the aggregate, embrace only about 11 per cent of the country's road mileage. The bulk of the remaining traffic is carried by the relatively small portion of the mileage in the county systems that has been improved to standards comparable to state development.

It is in the benefits derived from the use of this limited mileage of general purpose roads that we find a true general identity of interest among highway users. It logically follows then that motor vehicle users as a class should be held responsible for a major portion of the financial burden incurred in the provision of the roads which facilitate inter-community mobility.

In establishing the limits of this responsibility two factors, drawn from our preceding analysis, must be kept in mind. First, from the standpoint of cost analysis, a large portion of road mileage cannot be justified by demands for or returns from optimum mobility. A substantial portion, something like 50 per cent and probably



more,<sup>20</sup> of the country's total road mileage would be abandoned if rural roads were maintained solely to secure optimum mobility—that is, to accommodate the effective demand of motor vehicle users for improved roads. This follows from the fact that at tax rates (or prices) sufficient to maintain a road system that satisfies the requirements of the vast majority of users, the extreme low-density mileage fails to earn more than a fraction of its maintenance cost. Consequently, if such mileage is to be retained, the general level of rates imposed on all users must be raised high enough to make up the deficiencies in earnings on the low-density roads.<sup>21</sup> But a large majority of users derive few if any added

<sup>20</sup> It should be remembered that in this study we are not concerned with quantitative measurement of factors of this character. That can be done only with reference to conditions prevailing in each state. We are interested here only in the identification of basic factors which must be recognized in the formulation of generally acceptable systems of road management.

<sup>21</sup> In Virginia, for example, the Commission to Study Primary and Secondary Systems of Highways reported:

"That the total traffic carried on all secondary roads carrying less than 25 vehicles per day, comprises only 14 per cent of the total traffic carried by all roads in the Secondary System, and that when the services being rendered by the Primary System are included, the total traffic carried by all roads carrying less than 25 vehicles per day, although they comprise 42 per cent of the total rural primary and secondary road mileage, carry less than 3 per cent of the total rural traffic. . . .

"That during the fiscal year ending June 30, 1938, there were traveled upon all secondary system roads a total of 588,691,345 vehicle miles which produced \$2,925,796 in motor vehicle taxes, and during the same year there was actually expended upon all secondary roads the sum of \$6,684,541. This system was subsidized to the extent of \$3,758,745 from revenues produced on primary highways and city and town streets, and on its roads were produced only 44 per cent of the amount expended upon them. . . .

"That on a road carrying 10 vehicles per day there is produced \$18.10 per mile per year in motor vehicle taxes, which sum would pay less than 10 per cent of its annual cost as a surfaced road, and that on a road carrying 25 vehicles per day there is produced \$45.25 per mile, which sum would pay less than 25 per cent of its annual cost as a surfaced road." Va. S. Doc. No. 6, pp. 82, 83.

Calculations for other states vary only in minor detail.

benefits from these increased payments, since their travel is done on other roads.

Even if it is assumed that through abandonment of roads that possess little traffic importance, the remaining portions of the system would lose all of the traffic now generated by the extreme low-density mileage,<sup>23</sup> the majority interest of motor vehicle users would suffer no net loss. For the total amount of the increased payment necessary to compensate for the lost traffic could then be applied to the purchase of better service on the remaining roads. Thus, under any system of management which treats the provision of road facilities as an ordinary commercial enterprise, the choice between abandonment or retention of low-density mileage would be based solely upon the ability of the affected traffic to contribute an amount sufficient to decrease the unit cost of services provided by the total plant.

Moreover, common experience is sufficient to show that unobstructed passage contributes directly to optimum mobility. Consequently, any road system designed to provide optimum mobility would rigidly limit the number of access points. It would concentrate traffic from feeder systems at points calculated to facilitate flow on the high-density route, regardless of the immediate inconvenience imposed upon the numerous individual units seeking to utilize the main route. The right of access would be based on vehicle-use rather than upon property ownership. Thus, the mere fact that farms, dwellings, and business establishments happened to lie adjacent to a highway would give the owners or

<sup>23</sup> Of course, all such traffic would not be lost, for the individuals affected would merely move to new locations. Moreover, most of these low-density roads cannot be abandoned, for as we have seen, they serve important access functions.

occupiers no legal rights in that road other than those acquired by virtue of motor vehicle ownership.

Second, a differentiation must be made between those individuals on the one hand whose primary interest is in inter-community mobility and those on the other who are directly concerned with the mobility of goods and people primarily associated with community life. As we have seen, all units of the traffic that converge on and move over a general purpose highway have a common interest in the condition of that highway, its quality, extent, and cost.<sup>23</sup> But all units of the merged traffic do not have a common interest in the condition of a road that gives access to the general purpose highway. A common interest in all improved roads among all users might theoretically be established by viewing the provision of road facilities as an enterprise to be managed according to the forces of market competition. Under this system all costs would be assigned to direct users under the assumption that vehicle use is the true measure of values generated by the road plant. And as a corollary, community service facilities would be treated merely as feeders to the main traffic system to be located and developed solely in their capacity to generate traffic for the main system. Such a scheme is obviously based on analogy between the road and railroad plant.<sup>24</sup> It has

<sup>23</sup> It must be recognized, however, that the individuals who are utilizing a general purpose road as a substitute for a community service facility might readily choose to bear the full cost of a lower and less costly type of road that would be wholly adequate for all community needs. This situation would arise when inter-community use of a given route becomes so preponderant as to interfere seriously with the movement of local travel, much of which may not be primarily concerned with time costs. In short, they might prefer to sacrifice joint-use economics in order to avoid the hazards and inconveniences that are associated with high-density traffic.

<sup>24</sup> That is, it assumes that community service and land access roads

the charm of simplicity but overlooks the true character of the land access and community service functions performed by the basic road plant as well as their relationship to that physically limited segment of the entire system which possesses general purpose characteristics. Moreover, it fails to take account of the third significant characteristic of the road plant: governmental use of road facilities.

### III. GOVERNMENTAL USE OF THE ROAD PLANT

Governmental agencies occupy two fairly distinct relationships to the highway function: they exercise exclusive managerial jurisdiction, constructing the plant, laying taxes for its support, and prescribing the conditions under which it may be used; and they make direct use of the plant in the provision of public services, such as education, delivery of the mails, and operation of the military establishment.<sup>25</sup>

Government use of roads presents two interrelated operating characteristics which must be dealt with in the formulation of principles to govern road management. First, by virtue of a combination of factors (constitutional provisions, custom, and the characteristics of the road plant itself), the location of major authority over governmental services that depend in one degree or another upon the quality of road facilities does not correspond with the assignment of jurisdiction over the provision of those facilities. Second, facilities deemed sufficient for private use are at times found to be inadequate for the proper performance of governmental

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bear the same relationship to general purpose facilities that a branch line bears to a main railroad line. These points will be considered in greater detail below.

<sup>25</sup> In 1939, federal, state, local, and municipal agencies owned almost a half million motor vehicles, principally trucks and passenger cars. (See App. B, table 6.) Since then, federal ownership has been greatly expanded by motorization of the army.

functions. Brief analysis of the manner in which various levels of government utilize the road plant in the provision of rural mail service, in the administration of national defense activity, and in the operation of rural schools will serve to illustrate these points.

1. *Rural free delivery.* Rural road development in this country has been significantly influenced by the transportation requirements of federal postal administration. Rural free delivery was inaugurated in 1897. Thus Congress recognized that the rural as well as the urban population was embraced within the common law obligation of the postal service to "deliver" as well as to "carry" the mails.<sup>26</sup> This service was designed to bring rural areas into closer communication with the current of national life. Theodore Roosevelt observed in 1902:

Rural free delivery is no longer in the experimental stage; it has become a fixed policy. The results following its introduction have fully justified the Congress in the large appropriations made for its establishment and extension. . . . It is justified both by the financial results and by the practicable benefits to our rural population; it brings the men who live on the soil into close relations with the active business world; it keeps the farmer in daily touch with the markets; it is a potential educational force; it enhances the value of farm property, makes farm life far pleasanter and less isolated, and will do much to check the undesirable current from country to city.<sup>27</sup>

The service today in contrast with the situation in 1897 is shown in the table on page 136.<sup>28</sup> Rural free delivery now reaches about 26 million people. And of the country's 3 million miles of rural road 1.4 million have been designated as rural free delivery routes.

<sup>26</sup> *Annual Report of the Postmaster General, 1897.*

<sup>27</sup> *A Compilation of the Messages and Papers of the Presidents, Vol. XV, Second Annual Message, p. 6764.* See also Louis Melius, *American Postal Service (1917)*, Chap. II; and *Annual Report of the Postmaster General, 1897-1900.*

<sup>28</sup> *Annual Report of the Postmaster General for 1897 and 1938.*

	1897	1938
Number of routes .....	82	33,144 .
Number of carriers .....	84	33,062
Population served .....	44,280	25,943,625
Mileage of routes .....	1,843	1,387,445
Mileage per year .....	"	420,106,847
Cost of service .....	\$14,840	\$91,195,761
Cost per mile traveled .....	"	\$ .2089
Average length of routes .....	"	41.99

The national need for adequate post roads was advanced as an important reason for adoption of the initial federal aid road policy. Early efforts of the federal government to provide effective rural postal service encountered an almost insurmountable obstacle in the extremely poor quality of rural roads. It will be recalled that at this time (about 1900) responsibility for the provision of roads rested principally with county and township units. State road agencies, where they existed at all, did little more than advance modest grants in aid and exercise rather limited supervisory and educational functions.

The constitutional power of the federal government to establish post roads had lain dormant for almost three-quarters of a century. Under these circumstances the federal government was faced with the choice of designating, constructing, and maintaining a national system of post roads or of persuading, by means of financial aids, the state and local agencies to provide a standard of facility adequate for the effective performance of a national service. It chose the latter alternative.

As a partial explanation for adoption of this permanent policy (in 1916) the Secretary of Agriculture observed: "The Central Government has a very special and peculiar interest in good roads. It has under its con-

" No data given.

trol the transportation of mails, and, with the growth of the rural delivery, the difficulties confronting it in securing economic handling of mails have greatly increased and have been fully recognized."<sup>30</sup> In distributing the financial burden for the road function it is, therefore, necessary to recognize that the federal government either directly or through a system of financial aids must assume responsibility for the standard of road improvement deemed essential to effective performance of the postal service.

A similar factor must be considered in connection with national defense, although some distinguishing features are apparent.

2. *National defense.* Governmental policy with reference to transportation has throughout the nation's history been strongly conditioned by military requirements. In general, however, military authorities have held that a transportation plant designed to serve the basic transportation needs of the country would automatically meet the major demands imposed by defense efforts. In 1819, Calhoun, as Secretary of War, observed:

A judicious system of roads and canals, constructed for the convenience of commerce, and the transportation of the mail only, without any preference to military operations, is itself, among the most efficient means for "the more complete defense of the United States." Without adverting to the fact, that the roads and canals, which such a system would require, are, with few exceptions, precisely those which would be required for the operations of war; such a system, by consolidating our Union, increasing our wealth and fiscal capacity, would add greatly to our resources in war.<sup>31</sup>

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<sup>30</sup> *The Federal Aid Road Act, Summary of the Federal Aid Road Act of July 11, 1916*, S. Doc. 548, 64 Cong. 1 sess., p. 20.

<sup>31</sup> *Report of Secretary of War Relative to Roads and Canals*, submitted in response to a resolution of the House instructing the Secretary of War to report on "a plan for the application of such means as are within the

More recently, government agencies have attempted through positive regulatory and promotional policies to "foster and preserve" for normal purposes a transportation system that could be readily adapted to emergency uses.<sup>32</sup>

*In the past, the War Department has merely designated highways having military value.* Until quite recently, strictly military considerations have not exerted any primary directive force on federal participation in the road function. But in the administration of federal aid road policy there has been close collaboration between the Bureau of Public Roads (now Public Roads Administration) and the War Department. This collaboration has been controlled by the following set of principles adopted in 1921.<sup>33</sup>

1. Roads which must be constructed for commerce and national development will, in general, be identical with those required for military purposes.

2. Such roads as are required to serve local needs of military posts, etc., should be taken care of by the War Department.

3. The War Department, except in the most critical

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power of Congress, for the purpose of opening and constructing such roads and canals, as may deserve and require the aid of government, with a view to military operations in time of war." H. Doc. 87, 15 Cong. 2 sess., p. 3.

<sup>32</sup> The range and character of these governmental activities are traced in *Investigation of Executive Agencies of the Government*, S. Rept. 1275, 75 Cong. 1 sess., Chap. VIII, and in Leverett S. Lyon, Victor Abramson, and Associates, *Government and Economic Life*, Vol. II, Chap. XXII.

<sup>33</sup> These principles were set forth in a memorandum from the War Department (approved by the General Staff) to the Bureau of Public Roads. See testimony of Chief of Bureau of Roads: *Interstate Highway System*, Hearings before Senate Committee on Post Offices and Post Roads, 67 Cong. 1 sess., Pt. II, pp. 212-16.

See also Lieutenant Colonel Paul E. Tombaugh, "War Department's Interest in Highway Development," *American Highways*, Vol. XVIII (1939), p. 17.



strategic areas, will refrain from recommending locations or priorities of construction of highways.

4. A general network of good roads connecting important depots and mobilization and industrial centers has more strategic value than transcontinental roads.

5. The War Department's primary interest is in insuring adequate highway facilities between important strategic points and vital areas.

On the basis of these principles the War Department designated the major highway routes considered to be of primary value for military purposes. All such routes were included in the federal aid highway system,<sup>34</sup> and were improved by the states with financial aid from the federal government. Recent technological changes in the methods of prosecuting war have introduced important new elements into the relationship of highways to military administration.

*Motorization of the army will greatly expand the direct governmental use of highways.* Five "streamlined" or triangular divisions are now in the process of organization with complete mobility the goal.<sup>35</sup> Plans of the Quartermaster Corps of the Army called for operation of 286,000 vehicles by the fall of 1941, as compared with the 14,000 attached to that division in 1939.<sup>36</sup>

<sup>34</sup> *Federal Highway Act, 1940*, Hearings before the House Committee on Roads, 76 Cong. 3 sess., p. 202.

<sup>35</sup> War Department Press Release, Oct. 19, 1939.

<sup>36</sup> The chief of the Motor Transport Division of the Quartermaster Corps said: "It may surprise you to learn that in our Army of 1,400,000 men, about one-third of the men, that is, approximately 400,000 will be either drivers or mechanics of some kind of motor vehicles, be it truck, tank, passenger car, or motor cycle. The fact brings to our mind a picture of our new army differing considerably from that of armies of the past. . . . The new picture is surprising even to us in the Army." Brigadier General Joseph E. Barzynski before the Maryland Truck Association, Baltimore, Md., Feb. 20, 1941.

This increase in the military use of the highways has of course made it necessary for the military establishment to assume a more active role in the formulation of highway policy. It has not, however, required the exercise by military authorities of any direct responsibility over the establishment of priorities for road improvement. The relationship between the civil and military establishments, so far as major arteries are concerned, still appears to be governed by the principle that if roads are improved to meet civilian standards they will automatically serve military requirements. In line with this policy, the War Department has collaborated closely with the Public Roads Administration in the formulation of federal policy in respect to the extent, location, design, and priorities of road development. The joint effort has been particularly important in connection with the designation of a strategic highway network embracing 78,780 miles, practically all of which is included in the previously designated federal aid highway system.<sup>37</sup> The War Department has also suggested criteria for the improvement of the strategic system to military standards.<sup>38</sup>

*Military plans now apparently include provision of special highway facilities to meet defense requirements.* The current road program as reoriented to the defense effort involves two main classes of development: (1) improvement of the strategic network, (2) provision of specialized access facilities including reservation access and tactical roads. Work on the strategic network may in some respects be considered an integral part of the normal federal aid program. But such projects as the

<sup>37</sup> For location and discussion of the strategic network see *Highways for National Defense*, Federal Works Agency, Feb. 1, 1941, p. 3.

<sup>38</sup> Lieutenant General Stanley H. Ford, *Proceedings of the American Road Builders Association*, 1940. See also Federal Works Agency Press Release, Sept. 9, 1940.

construction of "parking lanes" for motorized military convoys bear no necessary relationship to normal civilian traffic. The purpose of these facilities is to obviate the use of the highway surface for "side-track" purposes, thereby allowing free passage of military and civilian traffic.<sup>39</sup>

There is even more reason to treat the provision of military access roads as an integral part of the defense program. Reservation roads, located within army cantonment areas and military bases, are designed for the exclusive use of these establishments. The same may be said of "access" roads designed to connect army and navy reservations, as well as industrial plants engaged in production of defense supplies, with main roads, railroads, and waterways. Similarly, improvement of "tactical" roads must be charged to the defense account, since they will be used almost exclusively for military maneuvers, thereby excluding effective civilian use.<sup>40</sup>

*The defense program complicates the problem of financing and necessitates larger federal aid.* Modernization of the military establishment involves federal use of the state-owned road plant, a use that will be extensively and intensively increased and somewhat different in character, without direct payment for such use.

Where roads are provided specifically for military purposes and paid for out of the budgets of military establishments, no special problems are created for nor-

<sup>39</sup>The Work Projects Administration has announced a project calling for the construction of parking lanes one-half mile long, located at two-mile intervals on alternate sides of the 324-mile system in West Virginia that has been designated as of strategic importance. West Virginia is to contribute \$460,000 and WPA \$1,700,000 of the cost. Federal Works Agency, *The WPA Week in National Defense*, No. 4, Mar. 12, 1941.

<sup>40</sup>For a discussion of the specific military purpose to be served by these classes of roads, together with estimates of the amount of funds required for their provision, see Federal Works Agency, *Highways for National Defense*, Feb. 1, 1941.

mal road management. But where additional outlays are made on the general road system to meet specialized military requirements, allowance must be made for that fact in distributing the total financial burden for the road plant among groups of taxpayers. Moreover, consideration must be given to the method of road utilization that will be employed by a motorized army.

As we have seen, the universal practice among the states is to place the major burden of road support upon motor vehicle owners by the exaction of various kinds of user charges, principally gasoline taxes and license fees. In the performance of some federal functions such as rural free delivery, payments for road utilization are made at the same rate as civilian users. The vehicles used by rural mail carriers are privately owned, and, therefore, subject to all state gasoline tax levies.

The situation is radically different with respect to military use, for these vehicles are federally owned and operated and consequently are exempted from the payment of state gasoline taxes and license fees. If no direct means of compensation can be found, indirect payment for military use of state property could be made in the form of federal grants in aid. Such payments would correspond in principle to rates paid by the government for services performed by privately owned transport enterprises. The grant-in-aid method of payment, while less exact, would appear to be the most equitable method available since public roads are not operated as a commercial enterprise.

3. *Education and road use.* Another important area of direct governmental utilization of the road plant is found in the field of rural education. The resultant problems, however, arise chiefly out of state-local relation-

ships and consequently differ somewhat from those created in connection with the federally operated postal service and military establishment.

*Efficient operation of the modern system of rural education is basically conditioned by the prevailing standards of road development.* No special problems concerned with the distribution of financial responsibility would arise out of this situation if it were not for the facts that (1) the distribution between state and local agencies of authority and responsibility for the highways is not the same as for the schools, and (2) standards of road improvement required in the administration of rural school systems do not coincide with those deemed acceptable for other purposes.

During the present century the emphasis in public school administration has been toward the establishment of a rural school unit which can be operated at a reasonable cost per pupil, cost being measured in terms of a minimum standard curriculum, satisfactory minimum standards of schoolhouse location, lighting, heating, sanitation, safety, etc., and minimum standards of teacher-training and ability.<sup>41</sup> It appears to be generally agreed that an enrollment of from 240 to 280 pupils per school is required for economical operation.<sup>42</sup> The transportation implications of modernized public school administration are quite obvious.<sup>43</sup> In order to operate an efficient rural school, the pupils must be assembled

<sup>41</sup> Howard A. Dawson, *Satisfactory Local School Units* (1934), Chap. II.

<sup>42</sup> The same, p. 39.

<sup>43</sup> "So closely related are consolidation and transportation that the success of the transportation system largely determines the success of the consolidation project. If transportation is poorly planned, is too expensive, or is otherwise unsatisfactory, many of the advantages claimed for the consolidated school are not likely to be secured." W. G. Reeder, *Administration of Pupil Transportation* (1939), p. 3.

from a relatively large area. Consequently, those living long distances from the school must use a disproportionate part of their day walking to and from school, they must be transported by their parents, or they must be transported by the school authorities. Within recent years an increasing number of states have assumed responsibility for transporting pupils to consolidated school units.

Fifteen years ago, about 875,000 pupils were being transported to rural schools at public expense. The number has since increased to almost 4,000,000, requiring the operation of some 93,000 buses over more than a million miles of school bus routes.<sup>44</sup>

The increasing importance of road use for school transportation purposes is indicated in a general way by the fact that school buses have accounted for more than half the production of all buses during the past ten years and that between 1935 and 1939 more than four times as many buses were manufactured for school purposes as for commercial inter-city passenger transportation.<sup>45</sup>

*School transportation makes exceptional demands upon unimproved roads.* Since less than 40 per cent of the total rural road mileage has been improved with any type of surfacing (less than 5 per cent with high-type surfaces) it naturally follows that a transport operation which seeks to reach all the rural population must utilize a substantial portion of unimproved roads. North

<sup>44</sup> For data showing the increase of pupil transportation between 1925 and 1940, see App. B, table 7.

Transportation of rural school pupils has developed at widely varying rates in the several states. Data for 1935-36 show that the proportion of pupils transported as compared with total enrollment varied from 68 per cent in Ohio to 2.2 per cent in Nebraska. Computed from U. S. Office of Education, *Statistics of State School Systems, 1935-36*, pp. 112-13; and *Bus Transportation*, January 1940, p. 51.

<sup>45</sup> See App. B, table 8.

Carolina's highly developed system of pupil transportation uses 51,300 miles out of the 57,000 miles of rural roads in the state. The operation amounts to 26 million bus-miles annually; only 20 per cent of this is generated on surfaced roads.<sup>46</sup>

A large portion of Montana's school bus routes is located on county and local roads, most of which have undergone only elementary improvement.<sup>47</sup> In Oklahoma about 14 per cent of the school bus route mileage is located on hard-surfaced roads; 48 per cent on improved roads;<sup>48</sup> and the remainder on wholly unimproved roads.<sup>49</sup> Seventy-five per cent of the school bus routes in Texas is located on unimproved roads.<sup>50</sup> And field studies in 40 of Alabama's 67 counties indicate that about 40 per cent of the roads designated for school bus routes is in an "unsatisfactory" condition.<sup>51</sup> These are examples taken at random.

The situation in other states differs somewhat, owing to varying stages reached in road improvement. It may be said, however, that, for the country as a whole, a large portion of rural pupil transportation occurs over roads that have not been developed to facilitate either all-weather travel or the operation of large vehicles. But

<sup>46</sup> Data supplied by the Equipment Engineer of the North Carolina State School Commission.

<sup>47</sup> As of 1940, about 50 per cent of the school bus routes were located on county and local road systems. Of the latter mileage, none was paved; less than 1 per cent was bituminous treated; and the remainder was either graveled, graded, and drained, or in a primitive condition. Data supplied by the Montana State Highway Commission from State-Wide Highway Planning Survey.

<sup>48</sup> Defined here as graveled, oiled, or any dirt road that has been brought to standard grade and drainage and is regularly maintained.

<sup>49</sup> From correspondence with Oklahoma Department of Public Instruction.

<sup>50</sup> From correspondence with Texas State Department of Education.

<sup>51</sup> From correspondence with Alabama State Superintendent of Education.

considerations of economy and safety in pupil transportation have required the use of school buses with relatively large seating capacity.<sup>52</sup> Consequently, those interested in the furtherance of educational activity have exerted continuous pressure for the improvement of local roads up to standards required for rural pupil transportation, without regard for the criteria that would otherwise be applied in the normal provision of land access and community service facilities. They have advocated, and have been successful in securing, state aid in the financing of local roads.<sup>53</sup> And, more recently, federal highway policy has been similarly influenced. Thus, the 1936 secondary federal aid act (see page 90) specified that the funds appropriated for that purpose should be applied to "secondary or feeder roads, including farm-to-market roads, rural free delivery mail roads, and public school bus routes."<sup>54</sup>

<sup>52</sup> In the two states which are transporting the largest number of school children daily the larger buses are favored. The North Carolina State School Commission reports "the most practical type" is a bus carrying 50 to 60 children. *North Carolina State School Commission Report, 1936-37, p. 12, 1937-38, p. 29.*

For Ohio, capacities as great as 50 to 70 pupils are reported. "However, there is a tendency to object to the use of extremely large buses. Probably capacities of fifty to fifty-five will prove satisfactory under present conditions." Ohio Director of Education, *Eighty-third and Eighty-fourth Annual Reports, 1939, p. 215.*

The various state departments of education have adopted the following standards as minima for school buses:

Basic Pupil Load	Range of Body Lengths
24	170"—185"
30	180"—210"
36	215"—230"
42	245"—265"
48	255"—285"
54	290"—315"

Representatives of the Forty-Eight State Education Departments, *Minimum Standards for School Buses (1939), p. 19.* For technical details see this report.

<sup>53</sup> See App. A.

<sup>54</sup> 49 Stat. L. 1519, 1521.



*Educational requirements have become a significant factor in highway financial policy.* No question of taxation equities with reference to highway financing are raised so long as such financial aids are advanced out of general funds and so long as the specialized purpose of road development accomplished with these funds is recognized in the distribution of the total burden for road provision. When these conditions are met, the same taxpayers support both the educational function and that portion of highway costs which is increased in improving roads to meet the specialized demands of school transportation. But we have seen that state-aid road funds advanced to local levels of government are derived exclusively from special taxes imposed on motor vehicle users. The controlling theory is that such users are the exclusive beneficiaries of the values created by road provision. Such a theory is patently inapplicable to the assignment of that part of the costs incurred to furnish the specialized standards of highway development dictated by educational requirements. This follows as a necessary conclusion from (1) our previous analysis indicating that a large portion of the rural road plant would be abandoned if effective motor vehicle user demand constituted the sole criterion of road provision, and (2) the fact that satisfactory school transportation appears to require the improvement of substantial portions of the road plant that carry an insignificant portion of total traffic volume and are consequently of little direct concern to motor vehicle users as a class.<sup>55</sup>

<sup>55</sup> It is quite possible that, in some states, pupil transportation has been pushed beyond economical limits; that the long-run costs of maintaining the necessary road facilities will exceed the costs of resettling the affected school population or of maintaining decentralized schools. We are not concerned in this study, however, with the evaluation of such issues. Consequently we express no judgment concerning the validity of current trends in the administration of rural education. Our point is that if a community has adopted an educational program requiring

## SUMMARY

When the highway system is viewed in terms of the physical plant and standards of development, it is apparent that the road system as a whole has been developed to serve four more or less distinct purposes.

(1) Access to land is basic to the entire road function and every physical segment of the road plant serves this purpose in some degree. (2) There exists a community service function which extends throughout the entire physical range of the road plant. (3) There exists in a sharply limited segment of the total road plant a general purpose function—of inter-community transportation—which has been superimposed on the two other purposes served by road development. (4) All roads serve a variety of governmental objectives.

We have seen that the several distinct types of benefits which flow from road use are distributed unevenly among identifiable groups of beneficiaries:

Land owners enjoy the principal benefits of the land access service. The individual land owner has a direct interest in the road which serves his property and an indirect interest in other roads.

The community service values produced by roads are distributed widely among the residents of particular communities. The benefits enjoyed by individual residents have no direct relation to land ownership or motor vehicle use.

General purpose, inter-community roads produce a wide variety of benefits that are enjoyed by society as a

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specialized road facilities which cannot be justified for other purposes, the full additional cost of such facilities should be assigned to the educational budget. Strict application of this policy would exert a salutary influence on both road and educational programs by requiring the advocates of each to justify proposed expansion in terms of true purpose and cost.

whole. They facilitate land access and community service as well as provide inter-community transportation. Motor vehicle users as such derive the principal direct benefits from this class of roads, the standards of development being formulated primarily in terms of economies in motor vehicle use.

The government's use of roads is also varied in character. The administration of various essential functions of government, such as postal service, education, and national defense, involves varied degrees of direct use of all segments of the road system; and in some instances it necessitates the provision of additional facilities not needed for ordinary private purposes.

The foregoing analysis of purposes and beneficiaries of highways has thus indicated that the road system is a multiple-purpose and joint-use public facility—producing services that are distributed unevenly among the members of society. The distinctive features or characteristics of these services must be kept in mind in the formulation of principles to govern road management and the allocation of costs.

## CHAPTER VI

### DISTRIBUTION OF MANAGERIAL AUTHORITY AND FINANCIAL BURDEN

In the present chapter, we shall attempt to give general answers to two main questions: How may managerial authority and responsibility be distributed among levels of government in such a way as to provide a well-adjusted, practicable, and reasonably effective organization? And how, in general, should the financial burden be distributed to assure a reasonable measure of equity to the distinguishable beneficiaries of the road plant? Neither of these questions can be answered independently of the other.

In a democratic government, ultimate authority and financial responsibility belong to the people who in the mass are at once voters, taxpayers, and users of the roads; and it is one of the accepted principles of democracy that any governmental function and the authority to lay taxes for its support should be adjusted to the opinion of the community most directly interested. At the same time, administrative efficiency requires that, so far as possible, jurisdiction over any activity be assigned to that level of government which is best fitted technically and financially to do the work.

Sections I and II below deal with the broad question of distributing administrative and financial authority and responsibility among levels of government. The remainder of the chapter is concerned with the problems encountered by each level of government in allocating among beneficiaries the financial burden incurred in the provision of its allotted portion of road services.

### I. PRESENT DISTRIBUTION OF AUTHORITY AND RESPONSIBILITY AMONG LEVELS OF GOVERNMENT

Under existing arrangements, state and local governments, with exceptions that are of negligible importance, own and manage the highways. Federal participation is primarily through financial aids administered under co-operative arrangements with state highway agencies. Until some demonstrable need arises for the creation of a highway system specifically designed to serve national purposes, there would appear to be no need for enlargement of federal jurisdiction to include proprietary activities. So far, the grant-in-aid system has proved capable of accommodating the federal interest in this field.

As described in a previous chapter, the distribution of authority between state and local levels varies widely among the states. In some states, local governments have been wholly relieved from any responsibility for road provision. And in others the historical statutory obligations and powers of local government have been retained, but financial responsibility has, in the main, been transferred to the state.

*In all states, distribution of responsibility was originally guided by a three-fold classification of roads.* All states have recognized the need of classifying roads according to predominant purposes. At present three types of statutory or administrative classifications are found among the states: (1) classification into state primary, state secondary, and county systems; (2) classification into a state primary and secondary system, county system, road district and special road districts; and (3) classification into state trunk lines and county systems classified by county roads and township roads.

Regardless of the names given to the classes, each

state has legally recognized: (1) a portion of the system in which the general purpose predominates over community service and land access; (2) another portion in which the community service purpose predominates over the land access; and (3) a residual portion in which land access is the only appreciable purpose. Originally, primary jurisdiction and financial responsibility of state agencies was limited in the main to the provision of general purpose roads. This was desirable and necessary because centralized and technically competent administration was essential in order to secure a properly connected road system improved uniformly to standards required for optimum inter-community mobility. Since a broad community of interests existed with respect to the actual and potential use of these general purpose facilities, it was appropriate that a state-wide tax levy should be imposed for their support.

The provision of roads to meet those community services and land access needs that were not automatically accommodated by the general purpose system was left to the initiative of local governments, principally the counties. Decisions with respect to the desirable standards of physical development for these latter portions of the road plant thus rested on the willingness or ability of each community to assume the financial burden involved.

*The recent tendency has been to abandon scientific road classification.* During the past decade the classification of roads according to predominant purpose has been less frequently used as the controlling method of allocating responsibility between state and local levels of government. First, through progressive absorption of local road mileage into the system for which the state assumes full responsibility, a large number of state "primary" systems contain mileage that by any scientific

criteria would be excluded from the "general purpose" classification.<sup>1</sup> Second, in other states statutory distinctions between the primary administrative jurisdiction of state and local agencies has tended to lose practical significance because of the transfer to state agencies of a large portion of the financial burden for local road support. And as we have seen, a few states have assumed complete administrative and financial responsibility for the entire rural road function. It will be recalled that the extension of state responsibility, whether by expansion of state-controlled mileage, extension of financial aids, or complete centralization of authority, has been financed exclusively from revenues derived from charges imposed on motor vehicle owners—not from general funds.

Regardless of the political motivations involved, the progressive effects of the abandonment of scientific road classification has been to relieve rural property and local government of a major portion of the costs incurred in providing community service and land access roads.

Three assumptions underlie the trend toward centralized road administration and finance: (1) that motor vehicle owners derive all primary values generated by the road plant; (2) that there exists among road users

<sup>1</sup> The present classification of the Virginia road system furnishes a striking illustration of this development. "At the present time the State, or Primary System, is comprised of 9,432 miles, which is more than double the mileage in the original trunk system. And, although it seems unquestionable that the intent behind the law creating the original system was to provide State-wide transportation and arterial connections between Cities, large Towns and other population centers, the system by now has so grown that it contains . . . many miles upon which the word 'primary' could only be interpreted to refer to their administrative significance. As almost irrefutable evidence of this is the fact that the original system of 4,002 miles served last year over 70 per cent of the total travel carried by the entire system of 9,432 miles as now established." *Report of the Commission to Study Primary and Secondary Systems of Highways in Virginia*, Va. S. Doc. No. 6 (1940), p. 145.

a homogeneity of interest with respect to all segments of the rural road plant; and (3) that actual road utilization constitutes a valid measure of the benefits enjoyed. These assumptions must be rejected as inapplicable to the management of the road plant as a whole. For, as we have seen in the preceding chapter, the road plant is a multiple-purpose joint-use facility, the different parts of which produce services that are distributed unevenly among the various members of society. These basic characteristics must be given recognition in the formulation of sound highway policy.

## II. PROPOSED BASIS OF DISTRIBUTING RESPONSIBILITY AMONG LEVELS OF GOVERNMENT

Theoretically, appropriate weight could be given to the several factors involved in highway management by assigning a monetary value to each of the identifiable purposes served by every physical unit of the road plant. For example, in any given state the annual road tax bill would include amounts to cover: (1) the access and community services performed by all rural roads, (2) the benefits derived by motor vehicle owners from utilization of the various types of roads. We have rejected this method of distributing responsibility primarily because of its administrative impracticability. It involves the difficult, if not impossible, task of evaluating historical as well as current costs and of assigning specific monetary values to the component elements of a joint-use facility, one in which the relative importance of such elements varies markedly from one unit of the plant to the other. Moreover, unless full authority and responsibility for the road function are located at a single level of government, such a system would necessitate highly complex arrangements for inter-governmental payments.



*Road classification based on predominant purpose furnishes a feasible guide for distributing responsibility among levels of government.* The keystone of this system of road management is the scientific designation in each state of a general purpose highway system. The general purpose system should be administered by a state highway agency and supported primarily by state-raised funds. Primary authority over and financial responsibility for all remaining roads should be vested in local agencies.

From a technical standpoint proper classification of a general purpose road system can be achieved with a satisfactory degree of precision. All controlling criteria with regard to the classification, standards of development, and methods of financing of the general purpose system must be related directly to the primary purpose of such a system, namely, to facilitate optimum inter-community mobility.

The existing road mileage which connects centers of population, recreational areas, and seats of government, automatically provides the framework of the general purpose system. Operating data are now available to indicate in quantitative terms what additional routes must be included in order to achieve the greatest inter-community mobility. Economies of time and vehicle operating cost, comfort, and safety considerations constitute the chief determinants. It necessarily follows that, with reference to the inclusion of different roads in the general purpose system, priorities must be determined in the first instance in terms of the relative contribution of such roads to these economies. And since the general purpose roads must form a physically inter-connected system, they should include urban streets wherever necessary to obtain continuous flow of traffic.

The proportion of the road mileage that should be included in the general purpose system will differ considerably from state to state according to variations in the composition of traffic, distribution of population, and land use. Moreover, the extent of the general purpose system will vary from time to time in the same state because of such forces as shifts in population and technological change.

Once a scientifically constituted general purpose road system has been established in each state, the remaining mileage automatically falls into the category of community service or land access facilities. In some areas, local agencies may find it desirable or feasible to distinguish between the physical portions of these roads in which either the community service or the land access function predominates. If not, the problem of local road management will be to determine, through the normal budgetary process, how the costs of local road support shall be distributed among land owners on the one hand and the general tax-paying members of the community on the other. We return to this phase of the problem under our discussion of the distribution of the financial burden among beneficiaries.

*Certain financial adjustments among the several levels of government are of necessity required.* This is because the system of management proposed here is based upon the predominant purpose served by each class of road. The necessary supplemental adjustments must be made between federal and state governments on the one hand and state and local units on the other.

Adjustments between national and state governments are required because under existing arrangements the federal government is wholly dependent upon state-owned facilities for the carrying out of specific national

purposes. As we have seen, the proper performance of some federal functions requires a network of roads improved to standards which some states would not provide for their own purposes. For all normal purposes these objective may be accomplished by: (1) the conduct of broad research into the technical and economic phases of road management, (2) the prescription of uniform minimum standards of road development, (3) the encouragement of competent administrative organizations, and possibly (4) some payment to compensate the state for tax-free federal use of the state-owned road systems. Expansion beyond these limits tends to transform federal aid activity into an outright tax equalization program. The net result is to transfer to the federal budget financial responsibility that should be carried by the states. And as we shall explain later, such expansion also complicates the problem of allocating highway costs among beneficiaries.

Emergency considerations may at times justify additional federal expenditures to provide specialized road facilities for military purposes and to create employment for those on the relief rolls. However, for purposes of budgetary justification and the allocation of costs among levels of government, these emergency activities must be evaluated in terms of defense and relief policy.

The case of state-local relations presents a somewhat different problem. When the proper administration of state-administered services requires a standard of road development substantially in excess of those found adequate for community needs, a mutually agreeable portion of the costs involved should be borne by the state through some form of grant. The amount agreed upon should be charged to the particular service—education, public relief, and the like—for which the

facility is required. Valid though these purposes may be, grants should not be used as an indirect device for extending the state's financial responsibility for road development beyond appropriate limits. A properly designated general purpose system will include all mileage in which state-wide interest predominates, thereby minimizing the occasion for inter-governmental payments.

It must also be remembered that when the state assumes full responsibility for the general purpose system it provides facilities which simultaneously meet community service and land access needs, thereby relieving local governments of the cost of facilities which they would otherwise have to provide for themselves. Consequently, it seems entirely appropriate that local agencies should accommodate their road programs to state requirements where no excessive outlays are involved.

In thus stating the principles that should regulate inter-governmental financial arrangements, we realize that tax equalization among states and among counties within a state may be desirable. Such equalization, however, should not be undertaken as a particular feature of road financing.

Up to this point in our discussion we have dealt only with the distribution of authority and responsibility among levels of government. The next step is to devise a system of levies which will assign to individual taxpayers at each level of government an equitable portion of annual road costs.

### III. PROPOSED DISTRIBUTION OF THE FINANCIAL BURDEN AMONG BENEFICIARIES

With regard to the general financial burden we have already concluded that the primary costs of general purpose roads should be assigned to state-wide taxpayers; that the primary costs of community service and land

access facilities should be assigned to local taxpayers; and that provision should be made for limited inter-governmental payments. Equitable allocation of these burdens among individual taxpayers must in turn be governed by the manner in which the benefits created by the use of community service and land access roads on the one hand and general purpose systems on the other are distributed among individuals and groups.

1. *Distribution of costs for community service and land access facilities.* Since a properly classified general purpose system designed to facilitate inter-community travel simultaneously supplies a very substantial portion of the requirements of land access and community service, most local governmental units will be primarily concerned with the standards to be maintained in order to facilitate access to land and dwellings. Decisions regarding the improvement of land access roads—for example, whether they should have a simple graded and drained or a graveled or oiled surface—will depend on the judgement of local residents relative to the effect on the value of and income from property and business.

*The cost of land access facilities may appropriately be assessed against local property.* It should be understood that this levy would cover, not merely property served exclusively by land access roads, but all taxable rural property falling within the jurisdiction of the local government unit. Many land owners and occupiers will contribute as state taxpayers to the support of general purpose roads, which, because of their location, may serve incidentally as land access facilities for such taxpayers. This fact, however, should not be taken as ground for exemption or relief from the local support of land access roads in general. A substantial portion of all rural road mileage must be supported on the

basis of its access function. Unless property is generally taxed for the support of such mileage, the land owners who are directly served only by land access roads are discriminated against in favor of those whose property abuts on the general purpose system. For the land owner who is not on the general purpose road also contributes, as a motor vehicle user, to the support of a general purpose road that does not reach his property. Moreover, even though the total road contributions of these two differently situated property owners are equal, the one located on a general purpose road, the surface of which has been improved, enjoys a superior land access facility.

*Local responsibility should extend also to improvements designed to facilitate community service.* The responsibility of local governments is of course not limited to the provision of land access roads. Every community will find it desirable to raise portions of its local road plant to higher standards in order to facilitate local marketing, access to schools, churches, and the courthouse, and to improve the general economic and social levels of community life. Consequently, a general levy on local taxpayers should be employed to bear the cost of these improvements.

We are not concerned in this inquiry with the specific sources of local revenue to be tapped for this purpose. The sources and amount of funds to be applied should be determined through the general governing process and the budgetary procedure acceptable to each community.

Final decisions with regard to the desirable standards of local road development must of course be controlled in important respects by the financial demands made

upon each local government for the provision of other equally important services.<sup>2</sup>

It may be contended that the method of general taxation here proposed for financing community service facilities does not take account of the differential uses made of those facilities by various groups of motor vehicle owners. This is true in so far as direct payment is concerned. But it must be remembered that our underlying scheme of road classification is based on predominant use; it does not attempt to put a precise monetary value on every use to which the two main classes of roads may be put. Thus, we make no effort to place specific levies on motor vehicle users for the use of community service facilities. But, as indicated in the next section, we propose to assign to motor vehicle users the major financial responsibility for support of general purpose roads. In practical effect this means that the general motor vehicle user will be called upon to support a very substantial portion of the community service functions—costs that would otherwise have to be borne by local taxpayers. For as we pointed out earlier (Chapter V) the general purpose systems have been created in the main by improving selected local roads that continue to serve community needs as a by-product of their optimum-mobility purpose.

2. *Distribution of the financial burden for the general purpose road systems.* Although a properly classified general purpose system will comprise only a relatively small portion of the total mileage, the cost of its necessarily superior development will absorb a large portion

<sup>2</sup> Some of the problems encountered by a county in managing its road system and in reconciling the conflicting claims for other services are discussed in detail in *Government of Montgomery County, Maryland*, Chap. IX, a survey by the Brookings Institution, 1941.

of the total road budget. Thus, if equity is to be achieved, extreme care must be exercised in devising a system for distributing this cost among taxpayers.

*Charges imposed on motor vehicle users should form the basis of the revenue system for support of general purpose roads.* Since the primary objective of a general purpose system of roads is to supply optimum mobility, a charge which at least roughly corresponds to the value of mobility must be included in the system of taxation. Through modern technical developments, the motor vehicle has come to be the chief means of highway transport; and the preponderant portion of mobility values accrues to the users of motor vehicles.

The existing system of user charges based on gasoline imposts, supplemented by licenses and fees, provides elements which can be utilized in distributing charges.<sup>8</sup> Moreover, the fact that these levies, under effective administrative systems already in existence, have gained widespread acceptance and proved economical to collect argues strongly for retention of as much of this system as possible.

In final analysis, the gasoline tax may be considered as a device for measuring the dynamic factors of highway occupancy. Amounts paid in gasoline taxes by different users correspond to the mileage traveled and the gaso-

<sup>8</sup> For the portion of total road budgets supplied by the several types of user imposts, see Chap. IV.

A discussion of the specific types of user imposts employed by the several states, together with the relative amounts contributed by the different classes of vehicles, may be found in Bureau of Public Roads, *The Taxation of Motor Vehicles in 1932 (1934)* (prepared by G. P. St. Clair).

For a more generalized discussion of the development of user taxes see Finla G. Crawford, *Motor Fuel Taxation in the United States (1939)*; James W. Martin, "The Motor Vehicle Registration License," *Bulletin of the National Tax Association*, Vol. 12 (1927), pp. 193-208 and Vol. 13, pp. 9-12.



line consumed by different vehicles. Thus, an eight-ton truck consumes substantially more fuel than a light truck or passenger car and consequently will pay for its use of the highways at a substantially higher rate. The tax is paid during the actual process of road use.<sup>4</sup> In this respect, the gasoline tax serves the same purpose as a graduated scale of direct tolls.

Moreover, imposts on gasoline have distinct administrative advantages, since they can be collected incidentally to the sale of fuel. In effect, filling station operators serve as toll collectors for the state. Excessive administrative costs which have characterized most toll-road experiments are thereby avoided.

The gasoline impost offers a reasonably satisfactory method of charging for highway occupancy. However, it is not capable of exacting from all vehicles, irrespective of relative use, an appropriate contribution to the fixed capital costs of providing a standard highway. Nor does it constitute a satisfactory method of dealing with the extra-cost problem that arises from differences among vehicles in their physical relationship to the road.

*In the design of a system of user charges, the wide variations in vehicles and in the intensiveness of their use must be recognized.* As we have observed, modern highway management is governed by a dynamic concept, in contrast to the static theory that characterized some periods in highway management. Under the static theory, each individual case of damage caused by a so-called extraordinary use of roads maintained to "customary standards" was assessable by court action against the individual user held to be at fault.

<sup>4</sup> Thirty-nine states make some form of exemption for fuel not consumed in highway use. See Tax Research Foundation, *Tax Systems*, 8th ed. (1940).

The modern state has deemed it socially desirable to provide roads that will permit the free flow of all vehicles, even though they differ in speed, width, height, and weight, rather than to exclude the variant types altogether or require them to use inadequate roads, thereby reducing the general level of speed, safety, and convenience.

In consequence of the policy of providing general purpose facilities designed to permit an optimum flow of traffic composed of heterogeneous units, a joint-cost problem is encountered in the distribution of the tax burden.

Some portion of the total cost involved in furnishing the facility is properly chargeable to all users regardless of the extent of their use. This follows from the fact that the costs incurred for acquisition of right of way, construction of bridges, preparation of sub-grade, and to some extent provision of the surfacing, are largely independent of traffic volume up to the point at which congestion forces either superior design or the provision of additional physical facilities. Therefore, the basic system of charges must exact from each user something in the nature of a contribution to these basic capital costs. A flat license fee levied on all motor vehicles is appropriate for this purpose.

In addition, two specific questions arise with reference to the distribution of the tax burden. (1) Has the state incurred any incremental costs in the provision of facilities capable of accommodating vehicles that possess special physical characteristics, measured by gross weight, wheel load, width, length, and height? (2) Does the fact that traffic consists of many kinds of vehicles give a substantial advantage on the roads—in effect discriminatory or preferential treatment—to certain classes

of vehicles, for example, buses and trucks, while creating disadvantageous conditions for other types? In short, does there exist a significant factor of differential road occupancy, and, if so, can it be dealt with through taxation?

Engineering opinion is divided on the question of incremental costs. No satisfactory engineering agreement has yet been reached with regard to the extent to which the state has actually incurred extra costs because of the physical relation of buses, trucks, or other special vehicles to the road. Some authorities contend that highway design and costs are controlled in large measure by the type of pavement required (1) to withstand the effects of natural elements, and (2) to provide adequate facilities for the majority of vehicles, that is, passenger cars and small trucks. In support of this position it is pointed out that highways recently constructed which exclude heavy vehicles have used pavement designs adequate for mixed traffic.

Others contend that the heavier and larger vehicles require the construction of thicker and wider pavements, as well as stronger bridges in order to maintain the optimum flow of all traffic and to prevent damage to the physical structures.<sup>5</sup>

Less controversy exists over the question of differential road occupancy. Common experience, supported by factual evidence, clearly indicates that even though the

<sup>5</sup> From the technical standpoint of highway design, gross weight has significance with reference to bridge capacity; wheel or axle load to impact on pavement; width, height, and length to pavement width, road curvature, and clearance of overhead structures.

The nature of the engineering controversy with regard to appropriate weighting of these physical factors, together with a discussion of the positions taken by various interested parties, are set forth in *Public Aids to Transportation* (1940), Vol. IV, p. 81 ff. (prepared by the Office of Federal Coordinator of Transportation).

highway is designed so as not to be damaged by the use of the heavier vehicles, the general standard of mobility and convenience is lowered by their presence on the road. Some of the factors which tend to irritate the average passenger car driver are inherent in any road which attempts to accommodate all types of vehicles and uses. Thus, the minor inconveniences, such as those resulting from passing bulky vehicles, must be offset against the monetary economies of joint use. If passenger car operators desire an exclusive road plant, free from the "nuisance factors" introduced by trucks and buses (whether commercial, private, or governmental), they must sacrifice the substantial contributions to road support now made by those vehicles.

There are, however, other elements in the problem of road occupancy which require more specific recognition than they have received to date in highway administration and tax policy.<sup>6</sup> The effect of slow-moving vehicles on the general flow of traffic has passed the stage where it can be dismissed merely as a "nuisance factor."

Treatment of this problem, so far as the allocation of highway costs is concerned, must take account of at least four factors. (1) For all practical purposes, the ability of passenger cars to maintain speed is limited only

<sup>6</sup> "Highway design, until recently, has paid scant attention to the needs of rapidly moving vehicles. In extenuation it may be said that the movement has not long been so rapid as to require special consideration, and also that in the pioneer phase of road building, from which we have only just emerged, the paramount need of a merely passable road surface prevented attention to what would have been considered excessive refinement of design. So, we may explain the preoccupation of the early road designer with such static economics as the balancing of cuts and fills, his easy acceptance of tortuous alignment, and his long-time scorn of even such simple concession to the movement of vehicles as the super-elevation of curves." H. S. Fairbank, "Utilization of the Planning Survey," *Proceedings of the Twenty-Fourth Annual Highway Conference*, 1938, p. 103.

by driver preference and judgment or by law. (2) In contrast, the ability of trucks and other heavy vehicles to maintain speed is conditioned by the pulling capacity of the vehicle, its gross weight, and road design—principally grade. (3) The presence of slow-moving vehicles in the line of traffic on a two-lane road tends to reduce all traffic to the speed of the slowest vehicle.<sup>7</sup> (4) In such a case, a majority of users are unable to realize the advantages that the road was designed to provide. And, what is equally important, if the general slow-down is sustained or recurring, normally good driver judgment tends to be overcome by irritation. From sheer exasperation a driver may attempt to pass a slow-moving vehicle even though the sight-distance is not sufficient to guarantee re-entry into the flow of traffic without collision. Both lines of traffic are thereby subjected to acute hazards.

Recently developed data give some indication as to the major source of these hazards, and suggest alternative lines of corrective action. Operating tests indicate that under ideal conditions<sup>8</sup> light tractor trucks<sup>9</sup> weigh-

<sup>7</sup> This phase of the problem has been summarized as follows: "Nearly all rural roads today are 2-lane roads. The great majority will always remain 2-lane roads. The presence in the traffic stream on such a road of vehicles moving at speeds substantially less than the average speed of the stream, whether such vehicles be trucks or passenger cars, is a cause of inefficiency, inconvenience and accident hazard. The problem created is a serious one, and the public is genuinely concerned." Paper presented by J. Trueman Thompson, professor of civil engineering, Johns Hopkins University, at the demonstration of driver-behavior and vehicle performance studies at Baltimore, Md., Oct. 27, 1939. U. S. Public Roads Administration, *Studies of Driver Behavior and Vehicle Performance*, p. 20.

<sup>8</sup> Tests were conducted on dry pavement using new vehicles without governors, and the results were plotted in the form of smoothed curves. The performance indicated is therefore optimum, the effect of variations in driver skills, weather conditions, and improper vehicle maintenance having been eliminated.

<sup>9</sup> Manufacturers' rated capacity of 1.5 tons.

ing 12 thousand pounds gross can sustain a speed of at least 27 miles per hour on a 6 per cent grade. But sustainable speed drops to 10 miles per hour when the gross weight is increased to 30 thousand pounds. On the same grade, heavy tractor trucks<sup>10</sup> weighing 20 thousand pounds gross can maintain at least 22 miles per hour. But when the gross is increased to 40 thousand pounds, the sustainable speed drops to less than 12 miles per hour. Medium tractor trucks<sup>11</sup> show similar variations in performance.<sup>12</sup> Efforts are now being made to determine the minimum level of speed which must be maintained under various conditions of grade and traffic volume in order to prevent undesirable and dangerous congestion. When this minimum standard of performance has been determined for each state or region, several lines of positive action are possible: (1) exclude all vehicles of whatever character that are incapable of meeting the prescribed standards of performance; (2) redesign the highway in order to reduce grades, improve alignment, and possibly even provide additional facilities capable of segregating the substandard vehicles from the normal flow of traffic, at points where they cause congestion; or (3) exact a special user charge from the vehicles that occasion unusual road occupancy.

<sup>10</sup> Manufacturers' rated capacity of 5 tons or more (about 400 cu. in. piston displacement).

<sup>11</sup> Manufacturers' rated capacities of from 2 to 5 tons (300 cu. in. piston displacement).

<sup>12</sup> These data are taken from unpublished results of "gradeability" tests of new tractor trucks of different makes, conducted by the Public Roads Administration. For a discussion of methods used and some implications of the studies see C. C. Saal, "Comparison of Methods for Determining the Hill Climbing Ability of Trucks," *Public Roads*, Vol. 19 (1939), pp. 233-40, and Thompson, *Studies of Driver Behavior and Vehicle Performance*.

As stated at the outset, this study does not attempt to determine the specific amounts that each group of beneficiaries should contribute to road support. It is limited to identification of the various factors that must be taken into account in the formulation of principles to govern road management. With regard to the distribution of the financial burden among beneficiaries of the general purpose system, we have found that a complete system of user charges should include: (1) an impost on gasoline consumption to serve as a general measure of occupancy; (2) a flat fee, unrelated to relative road use, so that each vehicle may make some contribution to the fixed capital costs of the standard road plant; and (3) a system of graduated fees imposed when it is found by engineering study that vehicles of special physical or operating characteristics require substantial additions to road facilities or tend in operation to reduce the standard of general use in terms of speed, safety, and convenience.

Thus, the proposed method treats the general purpose road system as a joint-cost enterprise up to the point at which identifiable groups of users force additional capital outlays. When this point is reached, for any segment of road, the total additional costs are to be allocated exclusively to the limited group of users demanding the additional facilities. Because of the possibility of rapid changes in the volume and character of traffic flow, the system of rates should be kept flexible. Facilities which at one time may be classed as marginal may subsequently be included in the standard plant.

Scientific measurement of user need for general purpose roads is the only sound method of determining the amount of taxable resources which should be devoted

to this service. It is clearly inappropriate for a state to attempt to short-cut these difficult scientific procedures by a rule-of-thumb program based on "what the traffic will bear" in the form of special user charges.

The engineering decisions on which the proposed system of user charges must be based will always be subject to reasonable differences of opinion. But it is now feasible for each state government to formulate a fairly precise system of charges, since scientific measurement is rapidly replacing rule-of-thumb calculations. The imponderable elements in the making of road policy are rapidly being reduced.

Moreover, the range of disagreement can be further narrowed if both engineering and taxing decisions are restricted to limited objectives. In other words, special charges designed to measure any of the three factors noted above should be based exclusively on the physical relationship of the vehicle to the road, and not upon the business profits derived from road use. If use of the highway within limits established by the state enables an industrial or business enterprise to profit commercially, taxable income is thereby created and the state can tax that income directly. In formulating a system of charges, therefore, no distinction need be made on the one hand between the commercial and private truck and bus operations or on the other between the so-called pleasure and business uses of private passenger cars.

It should also be noted that efforts to allocate road costs have been tremendously complicated by proposals to incorporate charges for historical costs. Any such attempt, of course, is faced with the problem of selecting a base year from which to calculate the value of capital additions, and necessitates the adoption of depreciation rates for invested capital as well as making allowance



for obsolescence. These determinations involve not only the arbitrary choice of a base period but also a costly and usually inconclusive physical valuation. In our judgment, the problem of formulating a satisfactory system of road financing designed to meet current needs is sufficiently complicated without attempting to incorporate corrective factors for historical road policy.

3. *The allocation of the burden of federal expenditures.* It will be noted that in our discussion of the allocation of costs among beneficiaries we have made no specific reference to federal contributions. This problem has been enormously complicated by the recent proliferation of federal highway activity. It will serve to clarify the issues, however, if a clear-cut distinction is made at the outset between those outlays which are designed to improve the standards of general purpose roads and those which are specifically intended to facilitate various other public activities such as the relief of unemployment.

*All federal outlays made for such purposes as the secondary federal aid program, unemployment relief, and economic stabilization should be charged to general funds.* Prior to 1930 federal activity carried on by means of the normal federal aid policy was primarily concerned with the improvement of roads which would be included in properly classified general purpose systems. In recent years, however, federal road policy has embraced two additional lines of action (see Chapter III).

A secondary federal aid road program has been inaugurated. According to declared legislative policy the federal outlays necessary to effectuate this program will be made in the interest of federal land use programs, school transportation, and the rural free delivery. The second extension of federal activity has involved the

expenditure of vast sums for road purposes as one means of effecting economic stabilization and providing work relief for unemployed.

Both programs are primarily concerned with the development of road mileage which would not be included in properly classified general purpose systems. Consequently, according to the governing principles outlined above, the resulting costs are not properly chargeable to motor vehicle users.

To the extent that economic stabilization and relief projects are located on the general purpose system, motor vehicle users of course reap the immediate benefits of improved facilities. It does not follow, however, that the capital costs of these improvements should be assessed against motor vehicle users. For it must be remembered that both programs were legislatively conceived and are being executed according to standards which give only incidental consideration to the criteria that would govern economical development of highway transport facilities.

Because of the specialized demands of these stabilization and relief projects, it has been found necessary to modify in important respects the standards which have been gradually developed to govern economical road improvement. Thus, the priorities and location of projects and the standards of technical efficiency applied to relief projects have by no means been identical with those that would have governed had economical transportation been the major objective. Under these circumstances, the diseconomies inherent in adapting technical construction standards to relief and stabilization objectives must be borne by the general taxpayer.

Considerably more complicated issues are encountered in allocating the burden of expenditures incurred in

furtherance of what may be termed the normal federal aid program—that administered under the basic provisions of the 1916 and 1922 federal aid highway acts (see Chapter III). The chief complication arises from the fact that motor vehicle users are the principal direct beneficiaries of federal expenditures ostensibly made in the general national interest.

*Only limited amounts of federal aid expenditures applied to general purpose road systems may properly be charged to general revenues.* Under the basic system of management proposed in this study, all primary authority and responsibility and full proprietorship over the road plant remain with the states and their local subdivisions. Primary jurisdiction over general purpose road systems is vested in state agencies, and major financial responsibility for such roads is allocated to motor vehicle users. If these governing principles are to be applied in practice, consistency can be preserved only by limiting rather sharply the federal role with respect to general purpose roads.<sup>13</sup>

Thus limited, the appropriate federal role would be primarily to induce the several states to adjust their individual programs to national requirements. Originally, the main problem was to force the establishment of effective highway organizations in each state; to secure a physical integration of the state systems on a national scale; and to promote the desirable uniformity among the states with respect to construction, maintenance, and regulatory standards. Within the past two

<sup>13</sup> Special scenic and memorial highways, and development of roads serving federal lands, are not included in this statement. Expenditures for such purposes must be evaluated by reference to the particular governmental activity involved—such as national forest conservation, maintenance of national parks and monuments, and the administration of Indian affairs.

decades marked progress has been made in the achievement of these federal objectives, and the resulting financial burden was properly borne by the general taxpayer.

To the extent that continuing federal outlays are required to maintain the standards already attained, the same method of financing is appropriate. Similarly, where effective operation of military vehicles requires re-design of or additions to the basic road plant, that is, the type of plant deemed adequate for all private purposes, the full incremental cost should be considered an integral part of the military establishment budget.

Federal aid appropriations, from general funds, may also quite properly include amounts sufficient to compensate the states for tax-free federal use of the state-owned roads (see page 142).

When federal contributions exceed the amount necessary to accomplish the national objectives just mentioned it becomes extremely difficult to devise a workable method of allocating the financial burden among beneficiaries. The net effect of such excessive contributions, if paid from general funds, is to transfer to the general taxpayer some portion of road costs that might more equitably be assigned to motor vehicle users.<sup>14</sup> Such costs can be assigned to motor vehicle users only by the development of a special system of federal charges capable of distributing the burden of these federal outlays equitably among the various classes of users. The present system of federal levies on gasoline, automobiles, and accessories, lubricants, and tires, does not serve this purpose. For, it must be remembered that the productivity of these levies has never been recognized by statute either as the basis or the limiting factor of federal aid

<sup>14</sup> So long as the matching provisions of the federal aid enactments are retained, it must be assumed that the various states consider the projects financed with federal aid as necessary and integral parts of their road improvement programs.

highway policy. Thus, the federal gasoline tax is treated as an excise, collected at the refinery with no exemptions or credits for non-highway uses.

Current federal levies, the incidence of which falls on motor vehicle users, should therefore not be considered as having any direct bearing on the proper extent of normal federal aid activity. Rather, they must be evaluated in terms of their equity as a means of general taxation. This issue is discussed in the next section.

If, in the formulation of future policy, the attempt should be made to assess a portion of federal aid expenditures directly against motor vehicle users, the co-operative relation that has served remarkably well for several decades to delimit the federal from the state role in the highway field would soon terminate in a conflict for primary jurisdiction. For the federal government would be forced to develop a system of user charges that would duplicate in every important respect the basic system of charging proposed above for use by the states to support their general purpose road systems. The inauguration of such a policy could be justified only on the assumption that the national government should replace the states as the proprietor and manager of the country's general purpose road systems. We have found no evidence either from the evaluation of American highway policy or from analysis of the purposes and beneficiaries of the modern road plant that would indicate the desirability of any such revolutionary redistribution of responsibility for road provision.

#### IV. SOME CONTROVERSIAL ASPECTS OF PRESENT HIGHWAY REVENUE SYSTEM

In the effort to construct a satisfactory system of special charges, numerous experiments have been tried during the past two decades. Most of these have been

built around gasoline levies supplemented by registration fees graduated in relation to such factors as manufacturers' rated capacity, gross weight, wheel load, pay load, length, and tire equipment. The rapidity with which technological improvements have occurred, together with the highly technical problems involved, has made scientific revision of these systems extremely difficult. Existing systems consequently embrace certain elements adapted to physical relationships which no longer prevail.<sup>15</sup>

More recently, discernible tendencies have developed (1) to employ these user charges for purposes to which they are theoretically unsuited, and (2) to impose others which bear no necessary relationship to the problem of allocating costs for the use of general purpose roads. The ton-mile tax on trucking operations now levied in some jurisdictions furnishes one illustration of the first tendency. The fact that it represents an effort to measure the profitableness of road use renders it inapplicable as a method of relating special charges to extra capital outlays. As we have previously suggested, the income derived from road use can be more effectively reached and with greater equity by other taxes.<sup>16</sup>

Another illustration of the first tendency noted above is found in the widespread current application of state-

<sup>15</sup> Obsolete elements are observable to the extent that license fees are based on superficial capacity ratings: gross weight rather than wheel load as a measure of road impact, etc.

<sup>16</sup> The ton-mile tax can be administered only through reports furnished by individual operators. Such reporting involves not only complex record keeping by operators but extensive and costly enforcement methods. Moreover, in actual practice, evasion is inevitable because of the structure of operations embracing a complex of commercial and private operators with a preponderant number of small units poorly equipped for record keeping. The net effect of this tax is to penalize business units (1) which can be reached because of their conspicuous position, and (2) which regardless of size make accurate reports.

wide user charges to finance portions of the road system which, if properly classified according to their predominant purpose and use, should be supported by local taxes. In some states, this practice is limited to the granting of financial aids to local units of government; in others, it has been carried to its extreme by imposing on motor vehicle users full financial responsibility for the entire road plant. The net effect of this

EXTENT OF DIVERSION OF USER CHARGES, 1934-39<sup>a</sup>  
(Dollar figures in thousands)

Year	Motor Fuel Taxes	Registration Fees	Motor Carrier Taxes	All Diverted User Imposts	Total User Funds Distributed	<i>Diverted Funds as Percentage of Total User Funds Distributed</i>
1934...	\$ 88,927	\$32,129	\$ 1,094	\$122,150	\$ 883,717	13.8
1935...	110,471	33,910	2,761	147,142	940,436	15.6
1936...	119,408	46,603	3,333	169,344	1,057,995	16.0
1937...	119,404	38,096	3,913	161,413	1,195,132	13.5
1938...	121,257	32,682	4,345	158,284	1,175,202	13.5
1939...	136,382	40,965	4,307	181,654	1,226,916	14.8

<sup>a</sup> Figures supplied by Bureau of Public Roads.

misapplication is to saddle the motor vehicle user with the cost of facilities which have not been provided to meet his needs.

Examples of the second tendency are found in the use of charges whose primary incidence is on motor vehicle users for financing services unrelated to road use. This practice is generally referred to as diversion. The volume of diversion, according to figures published by the Public Roads Administration, is shown in the table above for each major class of user impost.

The proportion of user taxes diverted reached its peak in 1936 when 16 per cent of total revenues expended from user taxes was applied to services other

than highways. But the absolute amounts of funds so diverted have followed an upward trend, reaching a peak of nearly 182 million dollars in 1939. Revenues derived from gasoline have contributed the major portion of diverted funds. Diversion to other governmental purposes of funds ostensibly collected for highway purposes appears to be an accompaniment of the growing need for state revenue to finance obligations assumed since the beginning of the depression. As the accompanying table shows, general funds have been

PURPOSES FOR WHICH USER CHARGES HAVE BEEN DIVERTED, 1934-39<sup>a</sup>  
(Thousands of dollars)

Year	General Funds	Relief	Educa- tion	Other Purposes	Total
1934.....	70,618	9,800	30,875	10,857	122,150
1935.....	86,658	16,925	30,773	12,786	147,142
1936.....	88,720	36,438	33,217	10,969	169,344
1937.....	77,032	39,718	36,879	7,784	161,413
1938.....	74,024	41,059	37,663	5,538	158,284
1939.....	126,110	21,463	29,130	4,951	181,654

<sup>a</sup> Figures supplied by Bureau of Public Roads.

the major beneficiaries of diverted user charges, although very substantial amounts have been earmarked for relief and educational purposes.

Before passing judgment on this practice the reader may find it helpful to consider its implication in terms of the principles thus far established to govern the application of user charges. From the standpoint of these principles, two sharply different meanings attach to the term "diversion": one, when it refers solely to the practice of borrowing or appropriating to other purposes funds ostensibly collected specifically for highways; the other, when it refers also to the levy of registration fees and supplementary imposts on gasoline specifically for



the support of other general functions of government.

To understand clearly the pros and cons of the current diversion controversy, these two meanings of the term must be sharply distinguished. The first, in effect, constitutes a breach of faith with road users. Either the user rates have been fixed so high that they produce more revenue than is required to maintain the road plant in satisfactory condition, or the plant is being permitted to deteriorate because of the diversion of road funds to other purposes. In either case an element of inequity is involved; for it must be remembered that if motor vehicle users are to be held primarily responsible for the support of general purpose roads, they have the right to demand that the state manage the road function according to accepted judicial standards of reasonable and nondiscriminatory charging. In any event it should be clearly recognized that in this type of diversion the state is using its position as a monopolist in the provision of road services to exact a monopoly profit from highway users.

An additional objection may be raised to periodic diversion of road funds, even if subsequently restored, on the ground that it needlessly disturbs the entire program of road maintenance and improvement. Those responsible for highway programming can readily adjust operations if the amount of available income is known in advance. Once contractual commitments have been made for new construction and for necessary maintenance, the limits within which economical rearrangement can be made become extremely narrow.

By contrast to the kind of diversion just discussed, the use of specific imposts on motor fuel and vehicle registration for services other than general purpose roads must be evaluated in terms of general tax policy.

Briefly stated, the suitability of user imposts for the financing of general purpose roads arises from the clear-cut relation which exists between such roads and the use of motor vehicles. To establish a similar basis for financing other functions from user imposts, it would be necessary in each case to discover some equally clear-cut relation to the consumption of gasoline.

Generally speaking no such clear-cut relationship has been seen to exist, and public opposition to the diversion of user charges has been steadily developing. Beginning in 1928 a movement among the states to prohibit the practice by constitutional amendment has been rapidly gaining ground. Eleven states now have such amendments<sup>17</sup> and two others have proposals under consideration.<sup>18</sup> All of the amendments prohibit the application of user imposts to any purpose other than the provision of public highways. Some, however, go farther and forbid the application of user imposts to roads and streets over which the taxing government does not exercise primary jurisdiction. It should also be noted that some of these amendments provide that special user charges shall be in lieu of other taxes on motor vehicles. Incorporation of such provisions in organic law highlights the question whether or not the payment of special charges for road purposes should exempt motor vehicle owners from the payment of a property tax on motor vehicles for the general support of government. This question can be answered categorically. Wherever it is customary to tax personal property for the general support of government there is no reason whatever for exempting property in the form of motor vehicles.

<sup>17</sup> Kans. (1928), Mo. (1928), Minn. (1932), Colo. (1934), Calif. (1938), Mich. (1938), N.H. (1938), Idaho (1940), Nev. (1940), N.Dak. (1940), and S.Dak. (1940).

<sup>18</sup> Iowa and Wis.

Public sentiment against diversion was further revealed and the practice itself was discouraged by a provision inserted in the 1934 Federal Aid Road Act. This provision declared:

Since it is unfair and unjust to tax motor-vehicle transportation unless the proceeds of such taxation are applied to the construction, improvement, or maintenance of highways, after June 30, 1935, Federal aid for highway construction shall be extended only to those States that use at least the amounts now provided by law for such purposes in each State from State motor vehicle registration fees, licenses, gasoline taxes, and other special taxes on motor-vehicle owners and operators of all kinds for the construction, improvement, and maintenance of highways and administrative expenses in connection therewith, including the retirement of bonds for the payment of which such revenues have been pledged, and for no other purposes, under such regulations as the Secretary of Agriculture shall promulgate from time to time: *Provided*, That in no case shall the provisions of this section operate to deprive any State of more than one-third of the amount to which that State would be entitled under any apportionment hereafter made, for the fiscal year for which the apportionment is made.<sup>19</sup>

Intelligent disposal of the so-called diversion issue can be made only after public policy has been determined with reference to controlling principles of highway finance.

*Diversion of user revenues already assigned to road purposes is clearly objectionable.* If it is decided to make motor vehicle users primarily responsible for general purpose roads by imposing special charges in the form of gasoline taxes and registration fees, such user imposts are automatically rendered inappropriate for other purposes. Moreover, diversion serves no practical purpose. On the contrary, it complicates the entire budgetary process. Until such time as the general purpose road

<sup>19</sup> 48 Stat. L. 993, 995.

plant has been developed to optimum standards, nothing is gained by the use of user revenues for other purposes, since deficiencies in highway requirements will have to be supplied from general funds.

*Additional user charges for other than general purpose roads can be justified only on grounds of expediency.* If an optimum standard of development should ever be attained for general purpose roads, and it is thought that the revenue-producing possibilities of user imposts have not been exhausted,<sup>20</sup> the decision to exploit this source of revenue will be based solely on expediency. Criteria of expediency will of course be governed by currently held concepts of equity in general taxation. In the modern constitutional state "ability to pay" is generally accepted as the criterion for general taxation.

*Levies on gasoline do not constitute an adequate measure of ability to pay.* Automobiles have long since passed from the category of luxury commodities to that of an essential of modern life. When the gasoline tax was adopted in 1919, automobile ownership was relatively restricted. In that year there were 16 persons in the United States for every registered passenger car. Since then, automobile ownership has become widely distributed in terms of income groups, urban and rural areas of the country, and geographic regions. In 1938 there was one registered automobile for every 5.2 people in the United States (see table on the following page).

Moreover, 60 per cent of all nonrelief American families incur expenses for automobile operation (see table on page 184). In addition, at least half the non-

<sup>20</sup> Experience has demonstrated that the demand for gasoline is relatively inelastic. It is primarily this factor, rather than considerations of equity, which has induced taxing authorities to utilize gasoline imposts for general revenue purposes.

relief families in all regions, whether urban or rural, incur automobile expense directly.

The distribution of automobile ownership and expenditures by income groups, shown in the table on page 185, reveals that a substantial portion of the burden

FARM AND NON-FARM POPULATION PER REGISTERED PASSENGER CAR, 1919-38\*

Year	Total	Farm	Non-Farm
1919.....	16.0	—	—
1920.....	13.0	—	—
1921.....	12.0	—	—
1922.....	10.0	10.1	10.1
1923.....	8.3	9.5	7.9
1924.....	7.3	8.9	6.9
1925.....	6.6	8.0	6.2
1926.....	6.1	7.6	5.6
1927.....	5.8	6.8	5.6
1928.....	5.6	6.4	5.4
1929.....	5.3	6.2	5.0
1930.....	5.3	7.3	4.9
1931.....	5.5	—	—
1932.....	6.0	—	—
1933.....	6.1	—	—
1934.....	5.9	—	—
1935.....	5.7	—	—
1936.....	5.3	—	—
1937.....	5.1	—	—
1938.....	5.2	7.0	4.7

\* Automobile Manufacturers Association, *Automobile Facts and Figures*, U. S. Bureau of Agricultural Economics release of June 22, 1939, on farm population; and U. S. Census Bureau.

imposed by levies on the consumption of gasoline would be borne by individuals in low-income brackets. Of all nonrelief families reporting expenditures for automobile operation in 1935-36, only 14 per cent had annual incomes of \$3,000 and over, while 48 per cent had annual incomes of less than \$1,500.

It may be noted in passing that of the 1,500,000

colored families (except sharecroppers) in the South, 74 per cent received incomes less than \$750. Twenty-four per cent of this class incurred automobile expense, and 32 per cent of those with incomes between \$750 and \$1,000 made expenditures for automobile operation.

In American practice the personal income tax is generally considered the best measure of ability to pay. As a rule, neither federal nor state income tax laws re-

URBAN AND RURAL NONRELIEF FAMILIES INCURRING AUTOMOBILE  
EXPENSE, BY REGIONS, 1935-36<sup>a</sup>  
As Percentage of all Reporting Families

Region	Aggregate	Urban	Rural
New England.....	59	56	69
North Central.....	61	52	80
South.....	51	53	49
Mountain Plains.....	81	73	85
Pacific.....	77	72	88
United States.....	60	55	67

<sup>a</sup> Adapted from data furnished by United States Travel Bureau, Department of Interior. The Travel Bureau computations are based on estimates of consumer incomes and expenditures for the United States and five regions from June 1935 to July 1936 made by the Study of Consumer Purchases conducted by the U. S. Bureau of Home Economics and the U. S. Bureau of Labor Statistics in co-operation with the National Resources Committee.

quire a contribution from families with annual incomes below \$1,500.

These considerations indicate that taxes on the consumption of gasoline cannot be justified on the ground of tax-paying ability. Consequently, this fact must be clearly recognized in considering proposals to employ this tax in financing general functions of government, such as education, public health, and national defense.

Another consideration arises from the fact that a substantial portion of all gasoline imposts is derived from business uses of the highway. Consequently such charges are reflected in the prices charged by those businesses

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ALL NONRELIEF FAMILIES AND THE NUMBER WHICH INCURRED  
AUTOMOBILE EXPENSES, 1935-36\*

(By Income Groups)

I. ALL NONRELIEF FAMILIES

Income Groups	Aggregate		Urban		Rural	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
\$ 0- 749.	5,477,868	22	2,185,769	15	3,292,099	31
750-1,499.	9,255,253	37	5,048,991	36	4,206,262	39
1,500-2,999.	7,756,991	31	5,204,022	37	2,552,969	24
3,000-over..	2,373,481	10	1,722,095	12	651,386	6
Total.....	24,863,593	100	14,160,877	100	10,702,716	100

II. ALL NONRELIEF FAMILIES INCURRING AUTOMOBILE EXPENSE

\$ 0- 749.	2,008,641	13	695,230	9	1,313,411	18
750-1,499.	5,182,372	35	2,261,121	29	2,921,251	41
1,500-2,999.	5,701,987	38	3,433,348	43	2,268,639	32
3,000-over..	2,079,823	14	1,456,383	19	623,440	9
Total.....	14,972,823	100	7,846,082	100	7,126,741	100

III. FAMILIES INCURRING AUTOMOBILE EXPENSE AS A PERCENTAGE OF  
ALL NONRELIEF FAMILIES

\$ 0- 749.	—	37	—	32	—	40
750-1,499.	—	56	—	45	—	69
1,500-2,999.	—	74	—	66	—	89
3,000-over..	—	88	—	85	—	96
All groups..	—	60	—	55	—	67

\* U. S. Travel Bureau, U. S. Department of the Interior. The estimates are based upon the Study of Consumer Purchases cited above. Nonrelief families are those receiving no relief whatsoever during the 12 months preceding an interview in 1935 or 1936. Income includes the earnings of each member of the family, income from profits, dividends, rents, etc., estimates of value of occupancy of an owned home and of home-grown food used by the family. (See National Resources Committee, *Consumer Incomes in the United States*, p. 14.) Urban areas include cities with population over 2,499.

for commodities and services offered to the public. The possibility is suggested that businesses subjected to the gasoline levy are to that extent placed at a disadvantage in competition for the consumer's dollar, compared with

businesses not subject to the tax. It would therefore appear that an impost on gasoline which makes no allowance for that part entering into business costs is inappropriate as a source of revenue for financing general functions of government at any level. As suggested above, if it is deemed advisable to tax the business income created by highway use it should be done by the same methods employed for the taxation of business income generally.

#### SUMMARY

Our analysis in this chapter has led to the following conclusions.

1. The keystone in the construction of an administratively feasible and equitable system of road management is the designation in each state of a properly constituted general purpose road system—administered by a state highway agency. The classification and development of such a system should be governed exclusively by standards designed to produce optimum intercommunity mobility.

2. The general purpose road system should be supported primarily from special imposts levied against motor vehicle users. This follows from the fact that the principal direct benefits of improved mobility—economies of time and operating costs, increased safety and convenience—are enjoyed by motor vehicle users.

3. The highly diversified physical characteristics of motor vehicles, however, require a system of levies designed to measure differential road occupancy as well as the cost of any additional physical facilities provided to meet the requirements of unusual size and weight characteristics.

4. Imposts on gasoline consumed in road utilization furnish a reasonably satisfactory measure of the dynamic



factors of highway occupancy occasioned by the great majority of motor vehicles. They must be supplemented, however, by charges designed to distribute equitably the fixed capital costs of general purpose roads which are necessarily incurred regardless of the volume of individual vehicle operation, and the capital outlays incurred because of the additional facilities required to accommodate vehicles of unusual operating or physical characteristics.

5. Once the general purpose road system has been properly classified in each state, administrative and financial responsibility for the remaining rural road mileage should be vested in local units of government. The standards of development for community service and land access roads should be determined by the expressed judgment of land owners and occupiers with regard to the effect of land access road development upon the profitability of land use, and by effective community demand for improved standards designed to meet the requirements of local community life. The cost of such facilities should, therefore, be supported by a general tax levy on all rural property, supplemented by such general funds as each community deems appropriate for the financing of general community services.

6. Road classification according to predominating purpose does not give specific recognition to governmental utilization of the road plant. To deal with this problem financial adjustments must be introduced at two points: between the federal and state governments on the one hand, and the states and their local subdivisions on the other.

Federal-state adjustments are required because the federal policy has been to depend upon state-owned road facilities for the administration of those national

services which are affected in one degree or another by the standards of road development. In some cases the proper performance of these federal functions calls for a standard of development which would not be provided by all the states merely to serve their own purposes. Moreover, some national functions, such as defense, involve extensive tax-exempt utilization of the general purpose system which we have concluded should be supported primarily by direct imposts on private motor vehicle users.

The major division of financial responsibility between state and local levels of government is accomplished by proper road classification. In some cases, however, the administration of such governmental services as education requires a standard of community service road development substantially in excess of that which the local community is willing to provide. Since this supplementary state interest does not justify absorption of the mileage involved into the general purpose system, thereby shifting the entire cost to motor vehicle users, the only alternative is to induce local communities to improve these roads to the desired standard with general funds advanced by the state. Proper designation of the general purpose system will minimize the necessity for such financial adjustments.

The next chapter deals with some of the main issues that have arisen in the effort to reconcile highway policy with the various lines of public action that affect the general transportation problem.

## CHAPTER VII

### HIGHWAY POLICY AND THE GENERAL TRANSPORTATION PROBLEM

The development of a system of general purpose roads improved to a degree permitting high standards of mobility of persons and goods has brought some highway transport operations into direct competition with other transportation enterprises, particularly the railroads. By 1930 the range and intensity of this competition had reached sufficient proportions to occasion considerable official concern; and when the financial effects of the depression were added to those produced by increasing competition, widespread demand arose for the readjustment of public policy affecting all forms of transportation. These demands had a logical basis in the fact that public policy with respect to the different types of transportation has been varied and not infrequently conflicting.

Thus it was contended, with specific reference to the problem with which we are concerned, that inequalities of competitive opportunity arose between highway and rail services because of (1) differences in character and degree of regulation imposed on these transport agencies and (2) subsidization of highway transport through provision of roads at public expense.

#### I. CHARACTER AND DEGREE OF REGULATION

During the modern era, the provision of transport facilities has never been entrusted exclusively to private enterprise. Government has consistently retained the right to intervene when and where it has been thought necessary to protect or promote the public interest. To this end, public policy at all levels of government has

experimented with a wide variety of devices. The country has depended upon direct government ownership and management for the provision and maintenance of the physical rights of way used by all transport agencies, excepting the railroads and pipe lines. Even the railroads were aided by land grants, and their location was more or less dictated by state charters and subsequently by federal regulation.

In addition, all commercial enterprises undertaking to furnish transport services have always been subjected to the ancient common-law standards of responsibility to the public; and both state and federal governments have supplemented these obligations and made them more specific by means of an increasingly wide range of statutory and administrative controls. Beginning in 1887 with the Act to Regulate Interstate Commerce, the federal government has progressively extended its regulatory authority in this field. With the passage of the Transportation Act of 1920, the federal government assumed what amounts to managerial supervision over the railroads and ancillary agencies. Through major subsequent enactments, similar supervision has been extended to water and air transportation and to motor carriers on the highways.<sup>1</sup> In the meantime, all of the states have continued to promote and regulate highway transportation, as well as other transport media.<sup>2</sup>

By 1940 public policy had moved far in the direction

<sup>1</sup> Motor Carrier Act, 1935, 49 Stat. L. 543; Civil Aeronautics Act of 1938, 52 Stat. L. 973; Merchant Marine Act of 1936, 49 Stat. L. 1985, and amendments, 1938, 52 Stat. L. 953; Transportation Act of 1940, 54 Stat. L. 898.

<sup>2</sup> For discussion of the evolution and present status of governmental relations to transportation see *Investigation of Executive Agencies of the Government*, S. Rept. 1275, 75 Cong. 1 sess., Chap. VIII, and Leverett S. Lyon, Victor Abramson, and Associates, *Government and Economic Life*, Vol. II (1940), Chap. XXII.

of equalizing competitive transport media in so far as that objective could be effected by the application of uniform regulatory devices.<sup>3</sup> But the troublesome problem of public subsidy remained.

## II. THE ISSUE OF PUBLIC SUBSIDY

Stripped of all the irrelevant issues that have been introduced by special interest groups, the so-called subsidy controversy revolves around six propositions. (1) Railroads serve the same general types of social and economic purposes as the highway system, and are fully as essential to the general functioning of organized government. (2) Users of the road plant are in substantial competition with the railroads. (3) The railroad plant is privately owned and financed; it is subject to property taxes; and the rates charged railroad patrons must therefore be sufficient to cover all costs, including capital charges and taxes. (4) The road plant is state-managed and thus enjoys a preferred position in the capital market; the road system is supported at least partially through general taxation and of course the state collects no taxes from its own property. Consequently, neither the commercial nor private users of the highways are required to cover full capital costs and tax contributions in fixing rates or calculating expenses.<sup>4</sup> (5) In the effort to maintain plant and retain patronage, the privately

<sup>3</sup> We do not imply that this phase of transportation policy has been permanently settled. Many controversial points remain. For example, sharp differences of opinion exist concerning the distribution of regulatory authority between the executive branch of government and the so-called independent regulatory commissions. Moreover, the wisdom of applying uniform regulatory patterns to all transport agencies, regardless of their varying economic characteristics, is by no means accepted by all students of the problem. We are here merely outlining, not critically analyzing, the broad trends in regulatory policy.

<sup>4</sup> In the case of private trucking, this rate calculation occurs in comparing the cost of performing one's own service with the rate charged by public carriers.

owned and operated railroads are therefore placed at a competitive disadvantage as compared with the users of the publicly supported highway system. And, finally, (6) the maintenance of an economical, efficient, and stable transportation system requires the equalization of these real or alleged differences.

The first four statements amount to premises, from which is drawn the conclusion stated as the fifth proposition, which leads to the final conclusion that equalization is required. In this section, we shall confine ourselves to a description of the present situation and a statement of the general conclusion to be drawn from it. The following section will be concerned with possible methods of handling the situation.

The first of the propositions above has occasioned considerable futile debate. No useful purpose seems to be served by laboring the relative contributions that road and rail services make to the general social welfare. Society, as it is now constituted, could not exist without transport arteries capable of performing the *type* of services offered by railroad transportation. Nor could modern community life, either urban or rural, survive without modern roads. As Professor Frankfurter has stated:

To think of contemporary America without the intricate and pervasive systems which furnish light, heat, power, water, transportation, and communication, is to conjure up another world. The needs thus met are today as truly public services as the traditional governmental functions of police and justice. That both law and opinion differentiate from all other economic enterprise the economic undertakings which furnish these newer services is not the slightest paradox. The legal conception of "public utility" is merely the law's acknowledgment of "irreducible and stubborn facts."<sup>5</sup>

<sup>5</sup> Felix Frankfurter, *The Public and Its Government* (1930), p. 81.

With respect to the second factor—competition—it appears that even where highway and railroad facilities parallel each other, only a portion of the service performed is in fact directly competitive. As already pointed out (Chapter V), the bulk of motor vehicle operation, even on main roads, consists of short-radius, shuttle-like movements as distinguished from long-distance or inter-city trips. Only by making the untenable assumption that every dollar spent on motor vehicle operation diverts potential expenditure for railroad service can complete parallelism of competition be established between the road plant and the railroad system.

The third of our three premises needs little comment. It can be accepted as representing a fair statement of the facts regarding basic conditions and rate requirements. Railroads are privately owned, subject to taxes, and must include capital charges and taxes in their rates.<sup>6</sup>

<sup>6</sup>In this connection, however, it must be recalled that public policy with respect to railroad rate regulation has always recognized the essentially public character of railroad enterprises. Although the railroads are supported by charges collected from the direct users of railroad service, under the monopolistic situation that has prevailed until recently the railroads have in effect been permitted by public regulatory authority to apply principles of general taxation in the construction of rates. As Commissioner Eastman has recently observed: "Giving weight to the value of the service is like adjusting taxation to the ability to pay. . . . It has been a time-honored principle in the making of railroad freight rates all over the world, and apparently with good results." "Traffic Problems of Today and Tomorrow," address of Joseph B. Eastman, chairman, Interstate Commerce Commission, before the Associated Traffic Clubs of America at Philadelphia, Pa., Oct. 22, 1940. *Traffic World*, Oct. 26, 1940, p. 1011.

Some portion of the rate, therefore, represents a tax levied against the general taxpayer for the support of a railroad system deemed adequate by public authority to meet general social and economic needs. In practical effect this system of charging requires some shippers to pay considerably more than the actual cost of performing the service. Thus, while the railroads are permitted to act as taxing agents of the government, they cannot tax the general community, as the government does. On the contrary, the full incidence of the charge falls upon the shippers who patronize the railroads. In terms of strict equity, some portion of the charge

The fourth proposition is that the highways are given advantages (usually referred to as subsidies) over railroad competitors in the form of lower capital costs and in certain tax policies. The nature of these advantages will now be considered.

1. *Capital costs.* The advantage enjoyed by highways and highway users from the standpoint of capital costs arises *solely* from the fact that where borrowing operations are necessary the state is ordinarily able to borrow more cheaply than can railroad corporations.<sup>7</sup> No items or types of capital cost are escaped simply by virtue of the state management of highways. Under any circumstances amortization and interest charges and maintenance and operating costs must be met.

The lower cost of raising capital is due in part to the superior credit of a public body having power to tax, and in part to the fact that the securities of state and local governments have enjoyed a tax-exempt status. Where capital improvements are financed on a "pay as you go" basis—that is, out of current tax collections—the highway system of course enjoys no advantage over the railroads.

2. *Tax differential.* The tax differential presents a more complex problem. The differential advantage possessed by highways may arise either because the charges levied on highway users are not sufficient to cover the costs incurred by the state in developing and maintaining the road, or from the fact that the right-of-way owned or controlled by the state is not subject to general taxation.

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should be allocated directly to the general taxpayer. The issue assumes importance only when the railroads come into direct competition with a publicly operated service such as road provision, in which a portion of the total cost is actually borne by the general taxpayer.

<sup>7</sup> This appears to be true even though public policy has sought to make railroad corporations akin to public agencies.



Data are not available with which to show the extent to which those sections of the road system whose services compete directly with those of the railroads are, under present tax policy, supported by the general taxpayers. In principle, as we have indicated in Chapter VI, the primary burden of supporting general purpose roads should be borne by motor vehicle operators as a whole and not by the general tax-paying public. If properly applied in each state, this system of charging would dispose, in large measure, of the contention that highway transportation enjoys a competitive advantage in this regard.

The general facts with respect to taxes on the right-of-way are as follows.<sup>8</sup> States levy no taxes directly on the value of physical improvements such as bridges, culverts, drainage, structures, and pavements. With respect to the acquisition of rights-of-way for road purposes and the resulting (or accompanying or related) tax methods, the states have followed two different practices. First, under "dedication and acceptance" the original owner retains title to the land used for road purposes, and the state merely acquires an easement. Virtually all of the right-of-way for legally designated local roads has been acquired in this way. The tax roll remains unaltered; and, consequently, the state suffers no loss in tax revenue. Second, the states have used condemnation proceedings or outright purchase when the improvement of roads to modern standards has necessitated the abandonment of right-of-way acquired under dedication and acceptance. When large parcels of land are taken, the general practice is to deduct such land from the assessed acreage of abutting property. It is doubtful,

<sup>8</sup> Based largely on reports supplied by the Farm Credit Administration from field representatives in the twelve Federal Land Bank Districts covering property tax policies.

however, that any net tax deficiency results, since it is customary for the states to profit immediately from the increased values occasioned by road improvement. This may be done by reassessing the abutting land and by adding to the tax rolls all the improvements—stores, filling stations, industrial plants, and the like—which follow road development.

It must be concluded, therefore, that the state suffers no appreciable net loss in tax revenue because of the use of land for road purposes; but the taxes just mentioned fall upon property owners rather than upon motor vehicle users. So far as community service and land access roads are concerned, there is no valid objection to this taxation. It must be recognized, however, that by virtue of this tax policy one element of cost of general purpose roads is borne by the property-taxpayer rather than by the motor vehicle user. Viewed solely from the standpoint of road finance as distinct from competitive position, this inequity is considerably mitigated if not fully offset by the fact that general purpose roads produce, as by-products, substantial land access value.

Nevertheless, present tax policies as applied to the road plant give some advantage to highway users and agencies which are in direct competition with railroads. This is because these highway users are not required to cover general taxes on any portion of the land or improvements devoted to general purpose roads.\*

### III. METHODS OF EQUALIZATION

The foregoing discussion has revealed three sources of competitive advantage enjoyed by those sections of the road system which compete directly with the rail-

\* In other respects, of course, they are on a tax parity with competitive transport mediums since their rolling stock and business operations are subject to general tax levies.

roads: (1) a possible advantage, of unknown extent, arising from the fact that general funds contribute to the support of the road system, or that existing systems of user charges do not properly allocate road costs among different classes of vehicles; (2) an advantage in borrowing capital funds; (3) an advantage in the fact that some of the physical properties devoted to road services are not directly taxed by the state which owns them. The means of eliminating the first differential—in so far as it may exist—have been indicated in the preceding section. The issues and problems involved in bringing about equalization with respect to the cost of capital funds and the lack of taxes on highway physical properties may be briefly summarized.

The advantage in borrowing capital arises, as we have seen, in part from the superior credit of the government and in part from the tax-exempt status enjoyed by state and local securities. This differential could be reduced or eliminated in the following ways: (1) by applying to government securities the same tax levies which are now imposed on the obligations of private enterprise; (2) by extending to railroad securities the tax-exempt status now enjoyed by publicly operated enterprise; and (3) by using the public credit to finance railroad rights-of-way.

We are not interested, in this study, in analyzing the merits of these several alternatives, which obviously relate to public policy with respect to transportation as a whole. It is sufficient for present purposes simply to have indicated the ways in which the advantage possessed by highways in raising funds can be equalized—if desired.

Serious difficulties would be encountered in any effort to achieve equalization with respect to taxes on physical

properties in highways and railways respectively. If the adjustment were to be made by subjecting motor transportation to appropriate tax levies, two definite segregations would have to be made. First, highway operations which are directly competitive with railroad service would need to be segregated from the entire complex of road use. Such segregation would clearly be necessary since, as we have seen, the predominant uses of the rural road plant are in no way competitive with railroad service; the relationship between highways and railroads is predominantly complementary rather than competitive. It would, therefore, be grossly inequitable to subject all road users to a compensatory tax merely because of the administrative difficulties involved in segregating the relatively small bulk of competitive services. Second, the portion of total road cost attributable to these specific competitive services would have to be segregated from other costs in order to secure an appropriate tax base. Moreover, these two segregations would have to be made for each state since the states have full proprietary control over the road function.

Consequently, if equalization of competitive opportunity is to be sought as an objective of national transportation policy, some method must be found to induce each state to adopt the desired taxing policy. Under present federal-state relationships, the federal government has no express power to compel state conformity with such an equalization program.

If it should be deemed preferable to secure equality of tax treatment by exempting railroad trackage and right-of-way from state and local property taxation, the national government would still be faced with the problem of inducing the states to accept the desired tax policy.

#### IV. THE COMPETITIVE ADVANTAGE ARISING FROM JOINT USE

The procurement of equalization by means of the methods indicated above would not dispose of the controversy over capital costs. This is because highway operators have a competitive advantage over railroad enterprises arising out of the economies of joint use. Only a portion of highway traffic is directly competitive with the railroads. Both commercial and long-distance trucking and much long-distance passenger car traffic might utilize the railroads, but for a large part of the local traffic and some of the longer-distance traffic there is no practical alternative to the use of the highways. The tax revenues from this essentially noncompetitive traffic decrease the burden which would otherwise have to be borne by highway users who directly compete with the railroads. This joint-use advantage from the standpoint of capital costs is of no small significance; in fact, the economies inherent in such joint use doubtless explain in large part the competitive advantages enjoyed by highway operators.

There are only two means of eliminating this type of competitive advantage. The first would be to require highway users which compete with the railroads to pay the entire capital cost of general purpose highways; the second would be for the regulatory agencies to establish, on an arbitrary basis, a parity of competitive rates.

The adoption of the first of these expedients would clearly be inconsistent with the principles of highway financing outlined in the preceding chapter and would introduce among highway users an inequity that those principles are designed to remove. Obviously, there would be no equity in requiring commercial operators to meet the full costs of general purpose roads, while at the same time permitting their use by the general

public. On the other hand, if special truck-and-bus roads were built for and charged to truck and bus operators, solely for the purpose of bringing about road-rail equalization, the economies inherent in joint use would be sacrificed. It should be noted that the incidence of such sacrifice would fall on the general as well as the special highway user, for the substantial contributions now made by these truck and bus operators to the support of public roads would automatically be transferred to the specially provided commercial roads.

Under the second alternative, with rates arbitrarily equalized by a regulatory commission, competitive parity would obviously be established. But by the same token the advantages of competition based on economic efficiency would be substantially destroyed. Competition would remain a determining factor only so far as the service feature is concerned.

The equitable and economically sound method of dealing with this problem is that outlined in the preceding chapter. It may be recalled that under the principles suggested, each state would allocate to highway users as a whole and to the various types of highway users their appropriate share of capital charges.

#### V. THE PUBLIC UTILITY METHOD

The difficulties that have just been discussed arise primarily from the fact that exclusive managerial responsibility for the provision of roads has been vested in governmental agencies while, in the case of railroad transportation, managerial responsibility has been divided between private enterprise and government. Thus we have found that even though motor vehicle users as a whole are made fully responsible for the support of the roads which have been developed primarily to meet their demands, highway transportation would re-

tain the economies inherent in a state-managed, joint-use enterprise. To overcome the difficulties inherent in this situation, some groups have proposed that the entire road plant be managed as if it were a regulated public utility operating in direct competition at all points with railroad services.

While the theoretical and practical implications of this thesis of highway management have not been thoroughly developed, the essence of the argument has been stated as follows:

According to this theory, the entire highway plant of the state and its subdivisions is looked upon as essentially a unit, whose parts are interrelated because traffic passes freely and extensively among the various road systems, urban and rural, which compose it, and whose character is that of a transport facility providing essentially private uses. Highway users are looked upon as representing a demand for either a consumption service or a business service, and payments made by them in the form of license fees, gas taxes, or other special-user taxes are regarded as fees or prices for use of the highway plant.<sup>10</sup>

With reference to the element of costs that should be reflected in the commercial pricing policy, Allen observes:

From the broad, economic point of view, highway costs are perhaps best defined as the annual sums necessary to provide full payment for the use of scarce resources devoted to highways rather than to alternative forms of investment. Defined in this way, costs clearly include maintenance, administration and supervision, policing and traffic control, and an annual depreciation charge on all portions of the plant subject to exhaustion in service-rendering capacity, so that such service-rendering capacity will remain "intact" over time. Many students now go farther and include

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<sup>10</sup> Edward D. Allen, "The Theory of Highway Costs and Their Allocation," *Journal of Land and Public Utility Economics*, Vol. XV (1939), pp. 272-73. See also, the same, pp. 404 ff.; and Shorey Peterson, "Highway Policy on a Commercial Basis," *Quarterly Journal of Economics*, Vol. 46 (1932), p. 417.

also interest on the entire unamortized investment, and some even contend that a charge for taxes foregone because the property is publicly owned should be included in the highway-cost concept.<sup>11</sup>

The commercial or "public utility" theory of highway finance has also been advanced by railroad management in support of its contention that highway users are benefiting from public subsidies.<sup>12</sup> Moreover, in a recent decision, the Federal District Court for Southern Illinois adopted quantitative studies of highway cost and allocation based on the commercial concept of highway pricing, observing in part as follows:

The highway system owned by the state and its subdivisions is a public utility supplying facilities which constitute an actual monopoly which is subject to inter-governmental regulation and control. The annual cost of operating such utility should be determined in the same manner as for a privately owned public utility.<sup>13</sup>

The public utility method confuses distribution of road costs among beneficiaries with equalization of competitive opportunity among transport media. Thus, application of the public utility concept of road management to the entire road system entirely disregards the characteristics of road use. For it must be recalled that the provision of roads to meet the demands of private motor vehicle users constitutes an important but by no means the exclusive responsibility of the state. Its activities with reference to the maintenance of large portions of the road plant and the supply of specialized standards of development in limited segments are governed pri-

<sup>11</sup> Allen, *Journal of Land and Public Utility Economics*, Vol. XV, p. 270.

<sup>12</sup> Charles B. Breed, Clifford Older, and W. S. Downs, *Highway Costs*, Association of American Railroads (1939), p. iii.

<sup>13</sup> *Breashear Freight Lines, et al. v. State of Illinois*, 26 Fed. Supp. 908, 909.



marily by the access requirements of property owners and by the needs of the state itself for the type of road services which will facilitate the performance of governmental functions. If it were true, as implied in the public utility concept of road management, that rural roads are supplied largely in accordance with effective demand of private motor vehicle users, a large portion of the present plant would be abandoned outright and standards of development throughout the remainder of the plant would be substantially modified.

To bring the underlying assumption of the public utility concept into conformity with the purposes and uses of the road plant, it would be necessary to recognize all of the demand factors, both in the provision of the physical facilities and in the pricing of the service. The process thereby becomes circuitous. Nothing is gained in the way of administrative precision, nor has the necessity for road classification been obviated. This fact is recognized by some of the writers who have examined the public utility concept. Allen, for example, observes: "Only by examining intensively the nature of benefits derived from a road system, whether unimproved or improved, whether urban or rural, will it be possible to indicate to what extent the benefits accruing from a highway plant are closely enough tied in with vehicle use to warrant meeting the costs of that plant through user-revenues."<sup>14</sup>

All that the state could hope to gain from the application of the public utility method would be the realization of a profit from road management. This profit could be plowed back into further expansion of road facilities, thereby tending to over-expand the road

<sup>14</sup> Allen, *Journal of Land and Public Utility Economics*, Vol. XV, p. 276.

plant. Or the profit could be applied to the financing of other governmental services. In either case, the alleged capacity of the device to facilitate socially desirable allocation of resources is rendered illusory. The only other purpose to be served by the public utility method is to equalize the competitive opportunities of alternative transport media; but, as already pointed out, its use even for this purpose must be limited strictly to that portion of road services which is directly competitive with other transport media.

#### SUMMARY

Our discussion of highway management in relation to the general transportation problem started with the accepted principle that no form of transportation has ever been exclusively private. All forms are subjects of governmental policy; and all must be managed in such a way as to protect the public interest.

The controversy over the respective positions of railroads and highways revolves around the proposition that highway users are in fact subsidized by the state and the demand that competitive opportunity should be equalized. We find that all important elements of subsidy can be very largely disposed of by allocating the major costs of general purpose roads to motor vehicle users by means of special charges graduated according to types and degrees of road use.

Even though this principle were applied consistently in all states, those highway users who are in direct competition with the railroads would retain certain advantages with respect to capital costs and tax contributions. Their capital cost advantage would be retained because the highway is a joint-use enterprise, in which costs are distributed among some users who are com-

petitive with railroads and some who are not. Additional capital cost advantage might exist because of the tax-exempt status of state securities.

Tax advantages enjoyed by highway transport operators result in the main from the fact that the states do not tax their own property. But they participate directly in the benefits of road improvement by taxing all of the values created by road development and use. The incidence of such levies, however, falls partially on the general taxpayer.

These capital-cost and tax advantages must be removed if the goal of national policy is to be absolute equalization of competitive opportunity between highway and railroad transportation. We have found, however, that such equalization cannot be brought about by measures directly involving highway financing without conflicting with some of the principles of logical, economical, and equitable highway management and without encountering serious practical difficulties.

The desirability of adopting such measures must therefore be determined with reference to over-all national transportation policy. These special issues cannot be assessed adequately within the limited framework of the present study.

## CHAPTER VIII

### SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

In the preceding chapters we have attempted to isolate and identify the main problems and issues of public policy which must be recognized in the formulation of principles to govern American highway policy. The analytical portions of the study dealing with the evolution and present structure of highway management and with the purposes and beneficiaries of modern roads furnish the basis for two broad generalizations regarding the fundamental political and economic nature of the road function.

First, public roads have always been supplied by government as one of the several essential public services. Only occasionally has any significant portion of the responsibility for their provision been entrusted to private enterprise. And on those occasions the delegation of responsibility has been accompanied by rigid and comprehensive public supervision. This method of dealing with the road function is grounded on two fundamental facts—that the efficiency of government is dependent upon mobility, and that in making a living and maintaining community life, the individual is equally dependent upon the right of access to land and other property. The individual, now as under the common law, cannot be denied access to a public road, nor can the state discriminate against an individual by withholding or limiting the right of passage. Moreover, the state is required to maintain public roads according to standards fixed by statute and judicial interpretation. And mileage, once

designated as "public," can be abandoned only after those parties whose interests are directly affected have been given an opportunity to be heard.

Second, the modern road plant is a multiple-purpose facility, producing services that are distributed unevenly throughout society. All classes of roads serve in one degree or another to give access to land and dwellings; to facilitate the movement of goods and people primarily associated with community life; to supply the avenues of optimum inter-community mobility; and, finally, to expedite the administration of various essential functions of government. Thus it follows that individuals and groups of society benefit in widely varying degrees from the values produced by the several parts of the road plant.

#### I. THE KEYSTONE OF SOUND HIGHWAY POLICY

Based on our analysis of the essential political and economic characteristics of the road function, we have attempted to formulate a set of governing principles, bearing in mind that the theoretical ideal must at many points be tempered by considerations of administrative feasibility. Some expedients which appear to combine theoretical soundness with administrative simplicity have upon analysis been found deficient in both. Thus we have rejected the so-called public utility concept of road management, which would treat the entire road plant, or at least major segments of it, primarily as an ordinary commercial enterprise to be operated by the government according to the motivating forces of the profit system.

In the search for an acceptable system of management we have found that although separate systems of roads have not been provided to serve each of the four major

purposes just noted, certain segments of the total road plant have in fact been designed to meet the varying requirements of fairly distinguishable groups of beneficiaries. At one extreme there is an extensive mileage of relatively unimproved roads whose predominant purpose is to furnish access to land. At the other extreme there is a limited mileage of highly improved roads whose predominant, but by no means exclusive, function is to furnish optimum inter-community mobility. Between these two extremes lies a twilight zone of mileage which serves partly to enable the residents of individual communities to gain access to main arteries of travel; partly to facilitate purely community travel—from the home to church, school, the market place, and places of employment; and partly, in common with all roads, to give access to land. We have found, however, that regardless of the varied purposes of the travel carried by these intermediate types of roads, interest in their condition and extent is centered primarily in the community. These are the considerations which underlie our adoption of road classification according to predominant purpose as the keystone of a sound system of road management.

Specifically, we have proposed the designation in each state of a scientifically constituted system of general purpose roads, with primary jurisdiction vested exclusively in state agencies, and with the major financial burden assigned to motor vehicle users. Inclusion or exclusion of mileage in these general purpose systems, as well as standards of improvement, would be governed exclusively by criteria of inter-community mobility.

In determining the standards to which the general purpose system should be developed in each state, the state highway organization must formulate a long-range

development program based on estimates of effective motor vehicle user demand and must calculate the expected annual outlays required for such a program. The inherent difficulties involved in this task are gradually being reduced. Through co-operative effort, federal, state, and local agencies are accumulating an extensive body of engineering and economic data. Rule-of-thumb criteria are gradually giving way to reasonably precise planning and performance.

For all normal purposes the legislature in dealing with the question of standards of development must rely on the technical recommendations of the state highway organization. Unusual situations may arise, however, in which the legislature would be justified in modifying the recommended technically optimum rate of road improvement. This might occur when it is found necessary to utilize a relatively larger portion of the state's taxable resources for other governmental objectives. This does not mean that the amounts which could be exacted from motor vehicle owners as a charge for the mobility values of a technically optimum general purpose road system may be used appropriately to supply budgetary deficiencies incurred on account of the necessary expansion of such other governmental activities as education and public welfare. It merely means that through the reduction of special levies for highway purposes, the taxable capacity of motor vehicle owners as general taxpayers will be relatively increased.

## II. DISTRIBUTION OF FINANCIAL BURDEN AMONG BENEFICIARIES

As a necessary corollary to the principles on which the general purpose systems are to be constituted and developed, an appropriate system of user charges would have to be designed to compensate the state for the

actual costs incurred in the provision of these physical facilities. The highly diversified physical characteristics of motor vehicles require a system of levies designed to measure differential road occupancy as well as the cost of any additional physical facilities provided to meet the requirements of unusual size and weight characteristics.

Charges on gasoline consumed in road utilization furnish a reasonably satisfactory measure of the dynamic factors of highway occupancy (see page 162). Gasoline levies must be supplemented, however, by charges designed to distribute equitably (1) the fixed capital costs of general purpose roads which are necessarily incurred regardless of the volume of individual vehicle operation, and (2) the incremental capital outlays incurred because of the additional road facilities required to accommodate vehicles of unusual operating or physical characteristics (see page 164). Even if added costs are not actually incurred on account of such vehicles it may be found that their utilization of the standard road plant tends to lower the level of general use and justifies the imposition of a penalty charge to compensate for differentials of road occupancy.

Once the general purpose road system has been properly classified in each state, administrative and financial responsibility for the remaining road mileage falls automatically into the jurisdiction of local units of government. The standards of development for community service and land access roads will be determined (1) by the expressed judgment of land owners and occupiers with regard to the effect of land access road development upon the profitability of land use and (2) effective community demand for improved standards designed to meet the mobility requirements of local



community life. Consequently, the cost of such facilities should be supported by a general tax levy on all rural property supplemented by such other funds as each community deems appropriate for the financing of general community services.

There is no formula by which such determinations can be made. They must be made as an integral part of the functioning of each local government, involving the decision as to the amounts to be applied to road services by comparison with demands for other services normally supplied by local government. In selecting the appropriate unit of local government to supervise the community service and land access portion of the road function, it must be kept in mind that the smallest effective administrative unit for road management is one which can command professionally competent personnel, proper equipment, and an adequate operating budget. The township unit has been found wholly inadequate to meet these requirements. In most states the county or some corresponding unit has been found best adapted to this purpose.

It will be noted that we do not propose to assign directly to motor vehicle users any portion of the cost of community service and land access roads. In taking this position we fully recognize that these road facilities generate values of direct benefit to motor vehicle users. However, a properly designated general purpose road system automatically provides direct access to a substantial proportion of rural land, dwellings, schools, churches, etc., and in addition carries a very substantial volume of purely community traffic. Consequently, by assigning primary responsibility for the general purpose road system to motor vehicle users, local communities are relieved to a very considerable extent of road costs

which they would otherwise have to incur. Therefore, the direct contributions made by motor vehicle users to general purpose roads would appear to be more than ample to offset the incidental user benefits generated by community service and land access roads.

### III. INTERGOVERNMENTAL FINANCIAL ADJUSTMENTS

Road classification according to predominant purpose, which we have proposed as the basic device to govern distribution of administrative and financial responsibility for the road function, makes no specific allowance for governmental utilization of the road plant. To deal with this problem, financial adjustments must be introduced at two points: between the federal and state governments on the one hand, and the states and their local subdivisions on the other.

Federal-state financial adjustments are required because the federal government, rather than constructing and maintaining its own national system of highways, has depended upon state-owned road facilities for the administration of those national services which are affected in one degree or another by the standards of road development. In some cases the proper performance of these federal functions calls for a standard of development which would not be provided by all the states merely to serve their own purposes. Moreover, some national functions, such as defense, involve extensive tax-exempt utilization of the general purpose system which we have concluded should be supported primarily by direct charges on private motor vehicle users. Consequently, the basic system of state and local financing proposed here must be supplemented by federal contributions.

We have concluded that the federal role in the high-

way field should be sharply limited to those types of activities which are designed to serve broad national objectives. If this is done, the resultant costs are properly chargeable to the general funds. If, on the other hand, federal aid outlays for the general purpose road systems are permitted to expand unduly, the practical effect would be to transfer to the general taxpayer capital costs that should be borne by the motor vehicle users in each state. It would then be necessary to correct the situation by imposing a federal system of charges on motor vehicle users. But such a process would be senselessly circuitous since the user revenues would have to be returned to the states in proportion to the amounts collected in each state. Any other basis of distribution—for example that of some special “need”—would constitute a tax equalization program. User charges, based on services rendered, are clearly inappropriate for tax equalization purposes.

The direct and clear-cut way to preserve a sharp line of distinction between the appropriate spheres of the federal and the state governments is to leave to the several states the exclusive jurisdiction over the administration of special motor vehicle user charges. Federal participation will thereby be limited to such expenditures as can be justified in the general national interest.

In all major respects satisfactory division of financial responsibility between state and local levels of government can be accomplished by proper road classification. In some cases, however, the administration of such governmental services as education appears to require a standard of community service road development substantially in excess of that which the local community is willing or able to provide. Since this supplementary state interest does not justify absorption of the mileage

involved into the general purpose system, thereby shifting the entire cost to motor vehicle users, the only alternative is to induce local communities to improve these roads to the desired standard with general funds advanced by the state. Proper designation of the general purpose system will of course minimize the necessity for such financial adjustments.

The general plan of highway management outlined in this study offers no formula by which the total costs of road provision may be neatly allocated between general taxpayers and motor vehicle users. Such a determination in monetary terms can be made for the country as a whole only by aggregating the results of studies conducted in each of the states. And these studies cannot be made with any degree of accuracy until classification of the total road mileage according to predominating functional characteristics has been substituted in each state for the prevalent system of road classification based on historical and administrative factors.

The method of road management proposed here is based fundamentally on the conception of the entire road function as an essential activity of organized government—one that cannot appropriately be delegated to private enterprise. Full recognition is given to the fact that identifiable groups, land owners and occupiers as well as motor vehicle users, derive specialized benefits over and above those which are distributed throughout society. Moreover, the system of management suggested recognizes that with regard to certain segments of the rural road plant, the special benefits bulk so large that the primary costs incurred in the provision of such facilities may appropriately be assigned by the state to special classes of users. We have concluded that a system

of management which makes proper allowance for these functional characteristics of the road plant will serve reasonably well to meet all the requirements of equity in taxation, and will provide a sound basis for the eventual establishment of a parity of competitive opportunity among highway and railroad enterprises.

## APPENDIXES

## APPENDIX A

### THE GOOD ROADS MOVEMENT

WITH THE COLLABORATION OF ADAH L. LEE

The movement for improved roads which toward the close of the nineteenth century developed to national proportions was in some respects similar to the campaign for internal improvements of which Henry Clay was the most ardent champion. The movement after the Civil War differed from that of the earlier period, however, in that it stressed the necessity for improvement and more efficient administration of existing roads rather than the creation of new ones.

With the rapid development of railroads, interest in wagon roads diminished, and politicians forgot the once aggressive campaign for "internal improvements." In general, the public believed that railroads would largely replace the highway system, and that horses would go out of use almost entirely for transportation purposes.<sup>1</sup> For two decades after the Civil War, Americans accepted with little protest the discomfort and inconvenience of bad roads.

#### I. DEFECTS IN THE SYSTEM OF ADMINISTRATION AND FINANCE

The fact that the American rural highway resembled a continuous mud hole while European countries were experimenting with improved methods of building and administering roads was attributable to several factors. Among these were the vast expanse of territory, the effort to maintain too many highways, the expense of

<sup>1</sup> Martin Dodge, "Ideas of Clay and Calhoun: A Return to Them is Now Imperative," *League of American Wheelmen Magazine*, Old Series XXXI, New Series I, No. 1, June 1900, pp. 16, 17, 18.

repairing them properly, popular indifference, and a defective system of road laws.<sup>3</sup> The last reason was perhaps the most important factor.

Under the township system of road management, direct supervisory control over the building and repair of roads was placed in the hands of annually elected district overseers. This office had, in many cases, become a sinecure, and the money voted for repairing roads was often wasted.<sup>3</sup> Moreover, the system was unsuited to the development of continuous stretches of improved roads. As one contemporary put it, "Neither of the Napoleons, nor both, could have ever made the roads of France the best in the world with 100 independent road overseers in each division of 100 square miles; that is, a road overseer for every square mile."<sup>4</sup>

Even more inefficient was the medieval poll tax method by which local communities financed their roads. The taxpayers themselves performed the work. Early in the summer the man who had a road tax assessed against him received a warning to work it out. On the designated morning he reported to the pathmaster with his wagon, plow, and scraper, and began to plow a furrow in leisurely fashion along the sides of the road, and occasionally across, where drainage seemed necessary. His periods of rest often were longer than those of plowing. At five o'clock he received credit for one day's work for himself and for his team, plow, scraper, and wagon—five days' work in all. Five or six others re-

<sup>3</sup> Governor Hill's message to the New York Legislature, discussed editorially in the *New-York Daily Tribune*, Jan. 13, 1890.

<sup>3</sup> E. Burrough, *State Aid to Road-Building in New Jersey*, U. S. Department of Agriculture, Office of Road Inquiry, Bulletin No. 9 (1894), p. 7.

<sup>4</sup> Chauncey B. Ripley, in U. S. Department of Agriculture, *Proceedings of Convention of the National League for Good Roads*, Office of Experiment Stations, Bulletin 14 (1893), pp. 73-74.



ceived credit for one or more days' work apiece. A contemporary commented: ". . . one energetic man and a pair of horses could have done more work in half a day than the whole of them." They often left the road in such condition that the first rain rendered it practically impassable.<sup>5</sup> The farmer often selected for road labor boys who were too young to perform a man's work, sent out unbroken steers and colts to be trained at public expense, and used tools and implements that were unfit for use. "Under this system, sitting on the fence smoking clay pipes and swapping stale stories has long been synonymous with 'working out the road tax.'"<sup>6</sup>

Since amateurs handled the business of road-making, highway engineering as a profession was practically non-existent. In 1868 the Commissioner of Agriculture stated: "Not until the professional engineer shall receive greater encouragement to make common road engineering, in all its details, more a specialty will it be more skillfully executed."<sup>7</sup> Progress in this direction was slow. As late as 1890 no engineers had been trained in the specialized field of highway construction, virtually no engineering schools existed,<sup>8</sup> and almost no technical literature on highway construction had appeared.<sup>9</sup>

With the rapid development of the country, traffic over the highways became heavier, and the need for improved roads became progressively more apparent. The

<sup>5</sup> *New-York Daily Tribune*, Jan. 13, Apr. 20, 1890.

<sup>6</sup> Ripley, *Proceedings of Convention of the National League for Good Roads*, 1893, p. 71.

<sup>7</sup> Henry F. French, "Country Roads and Road Laws," *Report of the Commissioner of Agriculture*, 1868, p. 363.

<sup>8</sup> Nathaniel S. Shaler, "The Common Roads," *Scribner's Magazine*, Vol. VI (1889), p. 478; *American Highways* (1896), Chap. XII.

<sup>9</sup> "Literature on the actual detail of road-making is scarce and fragmentary." C. Hershel and E. P. North, *Road Making and Maintenance* (1890), preface.

steady drifting of population toward the cities during this period increased the demand for transportation of agricultural produce of all kinds.<sup>10</sup> Wagon roads became ever more important to supplement rail and water in the transportation of produce to the centers of population. But many of the roads were actually impassable during the winter months. While urban dwellers, having supplied themselves with telford and macadam roads, were experimenting with elevated railroads, subway lines, and electric cars, the farmers remained isolated from markets and schools by a medieval system of rural transportation.

The agricultural class accepted this situation with equanimity. Preferring to repair the roads themselves rather than pay for efficient road work in higher taxes, they opposed any suggested improvements. A contemporary commented: ". . . the feeling prevails among farmers that their taxes are already greatly in excess of those of other citizens, and that the cost of transforming mud roads into macadam is so great as to be impracticable."<sup>11</sup>

## II. SELLING ROAD REFORM

Until the end of the nineteenth century the public was, in general, indifferent to the highway problem, but a few pioneers prepared the ground for a campaign that after 1890 assumed the proportions of a crusade. Soon after the close of the Civil War, Henry F. French, Commissioner of Agriculture, began a general investiga-

<sup>10</sup> *Documents of the Assembly of the State of New York*, Vol. V (1896), Report of the Special Committee on Good Roads, Doc. 26, pp. 18-19.

<sup>11</sup> Lewis M. Haupt, *A Move for Better Roads* (1891), p. 282. Another class that opposed any change in the administration of road work was the local road officials. Letter of William A. Sweet to *Engineering News*, Vol. XXIV (1890), p. 172.

tion of rural highways. By means of a nationally circulated questionnaire, he collected data on the administration, financing, and cost of constructing and maintaining common roads. The Commissioner stated that good roads "were the exception in all the States," and recommended the abolition of the labor tax and the appointment of permanent county engineers who could devote their full time to road work.<sup>12</sup>

Renewed travel abroad after the war drew attention to the inferior character of even the best American rural roads compared with those in Europe, and in several states, officials sought to remedy the situation. In 1869 Governor Claflin recommended that the Massachusetts legislature revise the road laws in order to provide more uniformity in their construction and repair. He urged also that the science of road-building be given a prominent place in the Massachusetts Agricultural College.<sup>13</sup> Concurrently with this discussion of road problems in Massachusetts, Essex County, New Jersey, was providing for the construction of hard-surfaced highways.<sup>14</sup> Mecklenburg County, North Carolina, also pioneered in road improvement. In 1878 the state legislature authorized the levying of a general property tax on all county property, city and rural, to be used for permanent highway improvement. There resulted a fine system of highways which in 1903 was still a model for the country.<sup>15</sup>

<sup>12</sup> He stated, however, that roads in eastern New York and New England had surfaces superior to those elsewhere. "Country Roads and Road Laws," *Report of the Commissioner of Agriculture*, 1868, p. 353. See also French, "Country Roads," the same, 1866, p. 538.

<sup>13</sup> Massachusetts State Board of Agriculture, *Prize Essays on Roads and Roadmaking*, 1870 (1870), p. 3.

<sup>14</sup> James Owen, "The Birthplace of American Road Improvement," *Good Roads*, Vol. III (1893), p. 313.

<sup>15</sup> Office of Public Road Inquiries, *Report*, 1903, p. 332.

These were but isolated instances of an awakening interest in highway improvement. Not until 1889 did the general public interest awaken in the common road as part of the national transportation system. It developed then, however, with remarkable suddenness. An observer wrote, "It is doubtful if in any country a social or economic question has ever so swiftly and effectively been brought to the attention of the people."<sup>16</sup>

#### A. The Principals in the Campaign and Their Motives

The campaign for good roads was energized by a curious combination of groups and motives. The academic profession furnished the theoretical framework; and special groups with monetary interests at stake supplied the driving force and funds necessary to the translation of the promotional scheme into practice.

1. *Academic.* A group of men in academic circles who were interested in improving governmental performance of basic functions was the first to bring the highway problem before the general public. Outstanding among them was Nathaniel S. Shaler, professor of geology at Harvard University. After extensive travel through the rural areas he concluded that the toll road system should be abolished, since a direct charge necessarily interfered with the free movement of goods and people. He recommended the establishment of highway engineering courses in the agricultural and mechanical colleges, the development of the county as an administrative unit for road work, the establishment of state engineers to supervise the construction and maintenance of roads, and the designation of a national highway commissioner in the Department of Agriculture who would "prepare and

<sup>16</sup> *Good Roads*, Vol. III (1893), p. 20; and Haupt, *A Move for Better Roads*, p. 1.

print as public documents accounts of the condition of roadways in this country with essays on the method of their construction."<sup>17</sup>

Lewis M. Haupt, head of the civil engineering department of the University of Pennsylvania, and Jeremiah W. Jenks, professor of political science and English literature at Knox College, Illinois, also made substantial contributions to the development of a theoretical basis for highway administration and finance.<sup>18</sup>

2. *Pecuniary.* The academic profession prepared the way for those whose interest in improved roads was a pecuniary one. It was this second group that waged a vigorous and ultimately successful campaign for better highway construction and administration. Most active in the campaign were the bicycle, the railroad, and, later, the automobile interests.<sup>19</sup>

a. *Bicycle interests.* Bicycle manufacturers were first in the field. Numerous articles on roads appeared in *Manufacturer*, *American Athlete*, and other periodicals devoted to the interests of "wheelmen." The League of American Wheelmen published a series of articles on the construction and maintenance of roads.<sup>20</sup> Colonel Albert A. Pope, of Boston, a leading bicycle manufacturer, was one of the most active supporters of the good roads movement. Addressing a convention of the National Carriage Builders' Association on the value of good roads, he remarked:

<sup>17</sup> *Scribner's Magazine*, Vol. VI, pp. 477, 483.

<sup>18</sup> Haupt, *A Move for Better Roads*; Jenks, "Road Legislation for the American State," *Publications of the American Economic Association*, Vol. IV (1889).

<sup>19</sup> The benefits that each special group could expect to reap from road improvement were spelled out in *Proceedings of the Convention of the National League for Good Roads*, 1892, p. 49.

<sup>20</sup> Haupt, *A Move for Better Roads*, p. 2.

. . . the question of the most particular interest, today, to you and to me, as manufacturers and merchants, in this whole question of good and bad roads is *what is the effect on our business?* . . . It must be clear to any man with the most ordinary business instincts that good roads mean thrift, liberality, and wealth.<sup>21</sup>

b. *Railroad interests.* During 1892 the bicycle interests made a special effort to gain the support of railroads for a good roads campaign. In January 1892 the first number of the League of American Wheelmen's *Good Roads*<sup>22</sup> summarized the railroads' interests in highway transportation. It pointed out that the territory contributing to the carrying trade of the railroad at each country town was extremely limited because of the poor condition of country roads, and that the resulting depressed condition of country town trade reacted upon the railroads' business.<sup>23</sup>

Colonel Pope made a direct bid for railroad support in securing road legislation. He urged every railway corporation to request its officers, agents, and employees to encourage a "right sentiment" in regard to highway improvements. It was also suggested that railroad executives should inform congressmen as to the importance of improved roads, and that they should request newspapers receiving their patronage to devote space to the matter.<sup>24</sup>

<sup>21</sup> *Highway Improvement*, address before the Carriage Builders' National Association, 1889, pp. 9, 12, 13.

<sup>22</sup> The first issue indicated the owners' intention of looking to commercial interests for financial support. "Especially will it ask and expect the support of those citizens whose business and property will receive pecuniary benefit by the improvement of the public roads and streets." Editorial.

<sup>23</sup> P. 40.

<sup>24</sup> *Wagon Roads as Feeders to Railways* (1892), p. 8. This pamphlet includes excerpts from letters received from railroads, and Pope's second, but not his first, letter addressed to them.

Railroad leaders entered the campaign with enthusiasm. For at this period it seemed a truism that the function of highways in the transportation scheme was to serve primarily as feeders to the railroads, and to a lesser extent in the same capacity to water transportation.

c. *Automobile interests.* Within a few years the automobile appeared upon the scene, and the bicycle interests, seeing in manufacturers and owners of horseless carriages potentially powerful allies in the good roads movement, made a bid for their support. In 1899 *Elliott's Magazine*, a League of American Wheelmen publication, remarked that owners of the new vehicles, who were learning much on their own account regarding road surfaces, were in many cases the men to whom bicycle interests had been "obliged to appeal for funds and legislation which must precede highway improvement." The magazine stated also that when the "law-maker wants good roads for his own private automobile to run over we are still more sure of his vote."<sup>25</sup>

Motorists willingly entered the campaign. As their number increased they demanded more and more insistently that interstate travel be unhampered by legislative restrictions and bad roads. They received the active support of the manufacturers of automobiles, automobile accessories, and supplies, as well as of petroleum refiners. The financial interest of these groups in the good roads movement of course increased in direct proportion to the expansion of automobile use.

Within a few years it became evident that the collective interests of automobile manufacturers and motorists were diverging from those of the railroads. In sponsoring the good roads movement the railroads had assumed that they would continue to dominate the transportation

<sup>25</sup> Vol. XXXI (1899), pp. 47, 98.

field. To them, roads patently meant one thing—a feeder service to the rail system. It is difficult to determine the precise date at which railroad leaders grew uneasy about the potential competition of the automobile interests, but not until 1910 were they sufficiently concerned over demands of automobilists for through roads to launch a counter drive for farm-to-market roads.<sup>26</sup> Only in 1916 did the railroads begin to regard the motor vehicle as a really serious competitor.<sup>27</sup>

d. *Other interested groups.* The vested interests in an efficient highway system grew with the development of the good roads movement. An important feature of this movement was the promotion of a profession of highway engineering. The result was an ever-increasing body of trained men<sup>28</sup> who were eager to apply their technique to highway development.

Progress in the science of road construction and growth in the volume of mileage under improvement brought an increased demand for specialized machinery and equipment. At the same time came a demand for specially prepared road materials to replace the natural rock used in earlier periods.<sup>29</sup> Specialized ma-

<sup>26</sup> See p. 260.

<sup>27</sup> See pp. 81-83. This judgment is based upon editorials and articles in the *Railway Age Gazette*, 1910-16. As late as December 1915 the *Gazette* treated with indifference a Des Moines, Iowa, newspaper article forecasting the importance of the private passenger car (Vol. 59, p. 1180). The first serious article by a railway executive on passenger car competition did not appear in this magazine until December 1916 (Vol. 61, p. 997).

<sup>28</sup> The growth of the American Road Builders illustrates this point. When H. S. Earle (who had been active in promoting good roads in Michigan and who was at the time president of the League of American Wheelmen) sent out an invitation, Dec. 26, 1901, to 200 persons to form an association, only three met with him. At their second annual convention in 1904 they had 1,129 delegates representing 29 states. Organized as the American Road Makers, this group subsequently became the American Road Builders Association.

<sup>29</sup> The early hard-surface highways in New Jersey and Massachusetts were constructed in accordance with the general principles of Telford



terials and special skills went into the building of the modern bridges and culverts that replaced simple wooden structures. By 1911 the Office of Public Roads had begun the study of road maintenance as a definite phase of highway work. State highway officials, as administrative agencies especially concerned with state financing and supervision of highways, formed in 1910 a preliminary organization, and in 1914 the American Association of State Highway Officials. Every year, therefore, from the beginning of the good roads movement until the passage of the act of 1916 added hundreds to the group who had pecuniary interests in the promotion of good highways.

### B. The Techniques of the Campaign

Unlike great national issues such as slavery or prohibition, the movement for better roads did not arouse

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and Macadam. These roads were crushed stone with rock dust binders. R. L. Morrison, "History of the Construction of Broken Stone Roads," *Canadian Engineer*, Vol. 26 (1914), pp. 513-16.

Crude oil was tried as a binder on dirt roads at least as early as 1898 (*Engineering News*, Vol. 40 (1898), p. 383). The Office of Public Roads Inquiry began to experiment with coal tar and crude oil in 1905 and carried on extensive research and experimentation with bituminous binders in the following years. The need for repairing some of the telford and macadam paving laid in the 1890's and the dust problem created by motor traffic stimulated this effort. See Office of Road Inquiry, *Circular No. 47* (1906) and *Bulletin No. 34* (1908); and "Bituminous Road Materials," *Proceedings of the Second Annual Good Roads Convention* (American Automobile Association), 1909, p. 81, for account of early experiments with these materials.

The Office of Public Roads also experimented during the same period with sugar refinery waste, sulphite liquors from pulp mills, calcium chloride, and light oils as binders. U. S. Department of Agriculture, Office of Public Roads, *Annual Report*, 1909, p. 4.

The first mile of concrete rural highway was laid in 1908 near Detroit (Lincoln Highway Association, *The Lincoln Highway* (1935), p. 5) and prizes were offered in 1909 for papers on concrete roadways by the Association of Cement Manufacturers. First Congress of American Road Building, *Transactions*, 1909, p. 47.

deep emotions or create bitter antagonisms, and unlike the national bank issue the good roads movement created no immediate economic issues of a highly controversial nature. An improved highway system was a common good about which there could be no quarrel. Banker, merchant, politician, railroad, newspaper—all could agree, without sacrifice of principle, to the desirability of improving the rural highways.

Moreover, any improvement in a stretch of road was a tangible physical accomplishment plain for all to see. Perhaps the improved section extended only half a mile, poor material might have been used, inefficient machinery employed. But to the traveler, the local newspaper, or the good roads advocate, the improvement was a net gain and fresh evidence of the importance of good roads. Then, as now, traffic gravitated toward the improved route. And what one community had, others wanted.

Equally important, the improved road was a "free" road. With virtually no information at hand on traffic volume and with the difficulty of determining true economic cost in any case, millions of highway users could endorse better roads without much concern as to the financial burden such improvements would mean to them individually.

The most important methods used for selling good roads to the country were the distribution of good roads literature, and the organization of good roads conventions. Other devices utilized by good road enthusiasts were the offering of prizes for essays on road construction and maintenance,<sup>30</sup> the circulation of photographs

<sup>30</sup> During 1890 two groups—a Committee on Better Roads and the *Engineering Record*—offered prizes for essays on road construction and maintenance. William H. Rhawn, president of the American Bankers Association, initiated the first of these. Haupt, *A Move for Better Roads*, Introduction.

showing poor roads and contrasting pictures of improved ones,<sup>31</sup> the formation of good roads associations,<sup>32</sup> the construction of model highways,<sup>33</sup> and the operation of "good roads trains."<sup>34</sup>

<sup>31</sup> The state commission appointed to report on Massachusetts highways used this method. In 1891 the New York and Connecticut divisions of the League of American Wheelmen offered prizes for "the best collection of photographs showing the need of improved roads." (Statement of Haupt in the *Engineering Magazine*, Vol. I (1891), p. 337.) The National Highway Association distributed in 1912 and 1913 an elaborately printed volume with illustrations of poor and improved roads.

<sup>32</sup> These increased in number as the campaign developed. In 1890 a Good Roads Improvement Association became active in New York under the leadership of William A. Sweet of Syracuse, New York. Mr. Sweet put down 600 feet of Belgian block paving in Syracuse at his own expense in order to demonstrate good roads to his fellow citizens. (*Engineering News*, Vol. XXIV (1890), p. 172.) Similar associations sprang up in other states, including Pa., Mass., R.I., Ill., Tenn., and Ga. The same, Vol. XXV (1891), p. 307.

<sup>33</sup> The Office of Public Roads constructed sample sections of improved roads throughout the country as a demonstration of engineering technique, often with the additional purpose of stimulating interest in the use of local materials, slag, chert, or gravel for road improvement. Office of Public Road Inquiry, *Annual Report*, 1898, p. 160.

<sup>34</sup> Between 1900 and 1905 several model roads were built cooperatively in connection with these good roads trains. The agricultural colleges and experiment stations furnished the materials and labor; the manufacturers donated the machinery and equipment; the railroads provided free transportation for the machinery as well as for representatives and experts of the Office of Public Roads. The first good roads train furnished by the Illinois Central Railroad operated from April to August, 1901, in the Mississippi Valley between Chicago and New Orleans. (Office of Public Roads Inquiry, *Annual Report*, 1901, p. 243.) In 1901 the Southern Railway Company sent out a good roads train for a five-month tour through Va., N.C., S.C., Tenn., Ala., and Ga. It covered 4,037 miles, and at 18 places its crew built object lesson roads while its experts held conventions. (*Yearbook of the Department of Agriculture*, 1902, p. 118, and *Annual Report of the Office of Public Road Inquiries*, 1902, p. 310.) Other trains operated in 1901 and 1902, and in 1905 the Missouri, Kansas and Topeka Railway, the Chicago and Northwestern, and the Union Pacific operated good roads trains. (*Yearbook of the U. S. Department of Agriculture*, 1902, p. 118; *Annual Report of the Office of Public Roads Inquiry*, 1902, p. 310; 1903, p. 339. For material regarding good roads trains operating in 1909-11 see *Good Roads Party*, 1909; *Journal of the Engineers Society of Pennsylvania*, March 1911, p. 95; American Highway Association, *Good Roads Yearbook*, 1912, p. 15.) Wherever a good roads train

1. *Distribution of good roads literature.* The bicycle interests pioneered in the distribution of literature on road improvement. In 1890 the League of American Wheelmen issued three pamphlets on highways<sup>35</sup> and in September 1891 distributed "The Gospel of Good Roads: A Letter to the American Farmer," by I. B. Potter.<sup>36</sup> Its new monthly magazine, *Good Roads*, did much to collect and disseminate information for the campaign.

Subsequently the Office of Public Roads Inquiry,<sup>37</sup> the bicycle interests, and the National Good Roads Association were all active.<sup>38</sup> In 1908 the National Grange campaigned for state and federal aid. From 1910 to 1916 the American Highway Association, an organization of the railroad interests, and the National Highway Association, representing the motor vehicle group, endeavored through the printed page to give direction to federal aid legislation.

2. *Good roads conventions.* Between 1890 and 1916 thousands of conventions met to discuss road improvement. These varied from small gatherings of local groups to national and international conventions.<sup>39</sup> We

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stopped for construction of an object lesson road, the officials aboard staged a "convention," and sought to organize local and state good roads associations. *Congressional Record*, Vol. 48, Pt. 1, 62 Cong. 2 sess., p. 919.

<sup>35</sup> Reprinted in *Engineering Magazine*, Vol. I (1891): E. P. North, "Highways and National Prosperity," pp. 47-56; Haupt, "The Importance of Good Wagon Roads," pp. 332-37; Isaac B. Potter, "Common Roads of Europe and America," pp. 613-26.

<sup>36</sup> Published in *Good Roads*, Vol. I (1892).

<sup>37</sup> Provided for by Congress in 1893. This office collected and disseminated information that would develop public interest in better roads.

<sup>38</sup> The movement had the full support of the press. Writing Aug. 31, 1898, the Director of the Office of Public Roads Inquiry stated, "The press of the country seems to have become thoroughly aroused in behalf of the road movement." *Report*, 1898, p. 160.

<sup>39</sup> Most of them left no written record of their proceedings.

shall mention here only the most important of these gatherings.

In October 1892 the first national good roads convention met at Chicago concurrently with the opening of the World Columbian Exposition. Colonel Pope and General Roy Stone, a New York civil engineer, led in promoting the gathering.<sup>40</sup> The call for this convention was issued by an impressive group, including C. F. Mander-son, president of the United States Senate. The gathering was designed to encourage the continuation of efforts to provide an exhibit of road materials at the Columbian exposition; endorsement of General Stone's National Highway Commission bill then pending in the House of Representatives; and the perfection of a national good roads organization with local units which would be "planted, if possible, in all the School Districts of the country."<sup>41</sup>

The delegates provided for a second convention to be held in Washington in January 1893 concurrently with the meeting of the National Board of Trade. Its purpose was the discussion of national legislation and the means of obtaining uniformity in state laws.<sup>42</sup>

As a result of an interstate good roads convention held in St. Louis in 1898, the National Good Roads Association was organized in November 1900. Representatives of 38 states participated in the organized proceedings. For more than ten years this society agitated aggressively for good roads.<sup>43</sup>

<sup>40</sup> *Good Roads*, Vol. I (1892), p. 46; National League for Good Roads, *Proceedings*, 1892, p. 48.

<sup>41</sup> The same, p. 49.

<sup>42</sup> The same, 1893, p. 12.

<sup>43</sup> Its extensive work as publicity agent is evident from the following statement: "During the last 20 years the State, interstate and national good-roads associations have held over 2,000 county, State, national, and international roads conventions. We have issued and distributed vast

In 1908, 1909, and 1910 the National Grange and the American Automobile Association sponsored three national good roads conventions. In 1912 and 1913 the A.A.A. alone sponsored two federal aid conventions. From 1910 to 1914 the American Highway Association sponsored four annual congresses. Organizations such as the American Road Builders Association and the engineering societies, for example, devoted sessions of their annual meetings to discussion of many phases of the good roads movement.

### III. DIVERGENT OBJECTIVES AND ARGUMENTS

At the beginning of the campaign for good roads there was little agreement concerning the physical character of the roads to be provided. Some leaders talked as though the objective were telford or macadam surfacing for the entire two million or more miles of rural roads, while others apparently had nothing more in mind than the better grading of dirt roads. As a matter of fact, many leaders were so preoccupied with praising the value of "better" roads that they made little effort to define their objectives. It seemed necessary to convince the public first of the benefits to be derived from good highways; for a time, therefore, they discussed only incidentally the methods by which that system could be obtained.

Writers and speakers described all sorts of gains that would result from better roads. For example, the chief of the Forestry Division, United States Department of Agriculture, stated at an early good roads convention that only better roads would render possible the economical management of national forests. Sometimes

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quantities of literature on the subject. The public press has always given us unqualified support. It has printed thousands of pages, ever educating communities." *Congressional Record*, Vol. 48, Pt. 1, p. 919.

enthusiasts contended that better roads would reduce the cost of living for the urban population.

### A. Persuading the Farmers

Most frequently, however, leaders directed their arguments to the farmer, who for the most part opposed improved highways because of their cost. General Stone, director of the Office of Road Inquiry, stated that the chief obstacle to road improvements was the "negative or hostile attitude of the rural population towards all effective legislation in this direction."<sup>44</sup> In the effort to overcome this hostile attitude the campaign attempted to persuade the farmer (1) that good roads would result in no great increase in taxes; (2) that they would reduce transportation costs; (3) that they would increase the value of farm land; and (4) that they were necessary to the maintenance of desirable levels of rural cultural life.

1. *No great increase in taxes.* Turning their attention to the most persistent opponents of the movement, writers assured farmers that the greater part of increased taxes would fall upon city dwellers. In an article in *Good Roads*, William P. Richardson's special appeal to the farmer was in terms of shifting the burden of better highways to the cities. He stated that the bill he favored would "give to the farmer a gold dollar's worth of good roads for ten cents, from the fact that the farming lands of the state" paid "only about ten per cent of the state taxes."<sup>45</sup> One of the main objectives of the New York Good Roads Improvement Association was to win farm support for a pending road bill by convincing agri-

<sup>44</sup> *Engineering News*, Vol. XXXIX (1898), p. 326.

<sup>45</sup> "The State and the Farmer," *Good Roads*, Vol. III (1893), pp. 84-87.

culturalists that a state appropriation would be met largely out of nonagrarian taxes.<sup>46</sup>

2. *Reduced transportation costs.* Editorials and pamphlets repeatedly directed the attention of farmers to the money-making potentialities of improved highways. "The amount of money lost to farmers because they cannot readily get to market," stated the *New-York Daily Tribune*, "is annually greatly in excess of what it would cost to keep the roads in good repair."<sup>47</sup> Potter's "Gospel of Good Roads" emphasized the direct relationship between good roads and agricultural prosperity. Drawing on European practice, it appealed to farmers to endorse federal aid.<sup>48</sup>

Soon after the appearance of this article John M. Stahl, secretary of the National Farmers' Congress and editor of the *Farmer's Call*, sought to demonstrate to farmers that better roads would bring them substantial financial gains. He endeavored by the use of data, including the use of ton-mile rates on railway and waterborne tonnage, and various estimates and computations relating to wagon haulage, to arrive at comparative costs for rail, water, and wagon transportation; to estimate the aggregate tonnage and ton mileage of freight mov-

<sup>46</sup> Letter of William A. Sweet to *Engineering News*, Vol. XXIV (1890), p. 172. This association sought data on foreign highway development in its effort to demonstrate the value of good roads to the farmer. In November 1890, it requested the Department of State to have its consuls gather material on "the practical results brought about by the use of improved roads and their value to farmers as compared with ordinary dirt roads."

<sup>47</sup> Aug. 12, 1890.

<sup>48</sup> The pamphlet pointed out that European governments ". . . instead of rolling up and hoarding a ridiculous surplus, spend large sums in the building and repairing of the country roads. The result is that in Europe the farmers drive 20 to 30 miles from home to market with immense loads, in all kinds of weather, at all seasons of the year, and return home the same day. The European horse hauls twice as much as an American horse, simply because the roads are much better." *Good Roads*, Vol. I (1892), pp. 16, 17, 21.



ing by wagon; and to compute the potential savings to the country to be gained from road improvement.<sup>49</sup> Stahl estimated that this annual saving would be \$512,000,000. He pointed out that farmers would gain further from better roads by their opportunity to place butter, berries, and perishable vegetables on the market more quickly.<sup>50</sup>

About 1895, the Office of Road Inquiry also endeavored to compute wagon transportation costs for the entire country. It sent out a questionnaire requesting 10,000 farmers throughout the country to supply information on "average length of haul, in miles, from farms to market or shipping points, the average weight of load hauled, and . . . the average cost per ton for the whole length of haul."<sup>51</sup> On the basis of these data the Office arrived at a total tonnage of products hauled over the public roads of 313,349,227 and, using the average cost of \$3.02, computed the "annual cost of hauling on the public roads" at \$946,414,665. It stated in a report of April 1896, ". . . all things being considered, nearly, if not quite, two-thirds of this vast expense

<sup>49</sup> In 1892 Stahl presented his figures before the Illinois Highway Improvement Association and the National Farmers' Congress. They also appeared in *Current Topics* and *Good Roads*. Only two of Stahl's estimates are available. Both contain considerable statistical data but are so lacking in precision of statement that it is impossible to reproduce the calculations by which he derived his estimates.

<sup>50</sup> *Good Roads*, Vol. I (1892), p. 336. Others also used statistics in an effort to win farm support. See *Engineering News*, Vol. XXV (1891), p. 140; Jenks, *Publications of the American Economic Association*, Vol. IV (1889), pp. 12 ff.; Haupt, *A Move for Better Roads*.

<sup>51</sup> The Office arrived at the following averages for the United States: average weight of load, 2,002 pounds; average wagon transportation cost per ton mile, 25 cents; average total cost per ton for the whole length of haul, \$3.02.

The Office estimated the total weight of farm products to be 219,824,227 tons; the Division of Forestry estimated the volume of forest products hauled over the public roads at 93,525,000 tons. Office of Road Inquiry, *Circular No. 19* (1896).

may be saved by road improvement, and this at a total cost not exceeding the losses of three or, at the most, four years by bad roads."<sup>52</sup>

Although these estimates made by Stahl and the Office of Road Inquiry did not escape challenge, they formed the basis of arguments as to the value of improved roads for many years.<sup>53</sup>

3. *Increase in value of farm lands.* Throughout the good roads movement proponents of the campaign spoke in glowing terms of the increase in land values that would result from better highways. In 1889 Professor Jenks stated: "If the road to the town is a good one, it is hardly extravagant to say that two-thirds of the good farms in the Mississippi Valley, of which the present value is from forty to fifty dollars an acre, would be increased in value to the extent of ten dollars an acre, if good roads were made by them."<sup>54</sup>

The virtual boom in New Jersey real estate which accompanied the development of paved highways in that state furnished perfect ammunition for the good roads campaign, and leaders of the movement made the most of it.

At the International Good Roads Congress of 1901, General Stone said: "The general advance in value of

<sup>52</sup> *Circular No. 19*, p. 2. Revised and elaborated estimates were subsequently made by the Office of Road Inquiry. See *Circular No. 23* (1896).

<sup>53</sup> When the Joint Committee on Federal Aid made its report in 1915 it concluded that "by a reasonable and practical improvement, with material less expensive on an average than macadam, a saving can be made of at least 8 cents per ton-mile" and that this would amount to an annual saving in highway costs of \$504,000,000. *Federal Aid to Good Roads*, Report of Joint Committee on Federal Aid in the Construction of Post Roads, H. Doc. 1510, 63 Cong. 3 sess., p. 16.

<sup>54</sup> *Publications of the American Economic Association*, Vol. IV, p. 159. Stahl also argued that good roads would increase land values. *Good Roads*, Vol. 2 (1892), p. 336.

the property along the line [a proposed object lesson road] would enhance the national wealth by hundreds of millions taxable by the States."<sup>55</sup> In 1912 and 1913 the National Highway Association distributed literature in which it claimed that 2 million miles of improved highways would increase land values 10 billion dollars, a gain of approximately one-third over prevailing values.<sup>56</sup> The Joint Committee on Good Roads, while refraining from making any estimates in dollars and cents, concluded that good roads would "materially raise the value of farm property."<sup>57</sup> During the legislative debate of 1916 a member of Congress argued that the average percentage increase in the value of farms contiguous or close to good roads was from 75 to 100 per cent.<sup>58</sup>

4. *Cultural value of good roads to rural communities.* Another argument used to attract farmers into the movement was the one that emphasized the importance of good roads for the maintenance of rural social life and for education. At hearings in 1904 on the Brownlow and Latimer federal aid bills it was maintained that when the season of "bottomless roads" arrived, attendance at rural schools became small and irregular. The consolidation of small and unsatisfactory rural schools with large, centrally located ones was feasible only where the roads were uniformly good. Poor roads, therefore, were a great handicap to educational progress.<sup>59</sup> In 1908 both

<sup>55</sup> U. S. Department of Agriculture, *Proceedings of the International Good Roads Congress, 1901*, Public Road Inquiries, Bulletin No. 21, p. 55.

<sup>56</sup> *National Highways*, p. 6.

<sup>57</sup> H. Doc. 1510, 63 Cong. 3 sess., p. 18.

<sup>58</sup> Representative Kincheloe, Kentucky, *Congressional Record*, Vol. 53, Pt. 2, 64 Cong. 1 sess., p. 1367. Representatives Alman of Alabama and Howard of Georgia made similar statements. The same, pp. 1374, 1397.

<sup>59</sup> *Roads and Road Building*, Hearing before the Senate Committee on Agriculture and Forestry, 58 Cong. 2 sess., p. 77. Also issued as S. Doc. 204.

Senator John H. Bankhead and the Joint Committee on Federal Aid made similar statements.<sup>60</sup> In 1916 Senator William H. Thompson stated in the Senate that "the success of the consolidated schools depends almost entirely upon the condition of the public roads."<sup>61</sup>

On one point then, the campaign's leaders could agree: that the farmers would benefit in several important ways from an improved highway system. In order to convince that reluctant group of the direction in which its interests lay, writers and speakers turned upon it the full force of their propaganda. Although appeals to the farmers predominated particularly during the campaign's early years, these arguments were an important factor in the movement until it culminated in the 1916 federal aid act. The agricultural class finally allowed itself to be persuaded, and in 1907 the National Grange entered the good roads movement.<sup>62</sup>

### B. Methods Proposed to Attain Objectives

Two decades before the awakening of general interest in good roads the academic writers on American highways realized that some centralized control was essential to the development of a system of modern highways built in accordance with the most progressive engineering ideas. As early as 1870 New England students of highway problems were recommending state supervision. About 1882 a movement for "national co-

<sup>60</sup> *Congressional Record*, Vol. 42, Pt. 6, 60 Cong. 1 sess., pp. 5152, 5157.

<sup>61</sup> "... it has been demonstrated that the falling off in school attendance in bad road sections is as high as 18 out of each 100 pupils enrolled, and that in States with improved roads the average daily attendance is 78 per cent while in the States with unimproved roads it is only 59 per cent." *Congressional Record*, Vol. 53, Pt. 8, 64 Cong. 1 sess., p. 7512.

<sup>62</sup> See p. 255.

operation in road building" developed,<sup>63</sup> and by 1885 the management of principal highways by state highway boards had become a matter of general discussion.<sup>64</sup> In 1885 the Pennsylvania legislature considered a proposal for state aid as a means of gaining local co-operation for road improvement.<sup>65</sup>

1. *Early arguments for state and federal aid.* During the movement's early years a few urged federal aid. In 1889, Colonel Pope sought to place responsibility for highway development in the hands of the federal government.<sup>66</sup> In 1890 the winners of the first and third places in a national essay contest recommended national control.<sup>67</sup> By 1892 at least two state organizations, the Missouri Good Roads Convention and the Rhode Island Republican Convention, went on record in favor of national aid.<sup>68</sup> Stahl, fearing that such methods might work against agricultural interests, believed the national government might assist local authorities in obtaining funds, as was the case in England; but he opposed national or state roads as "dangerous and vicious expedients."<sup>69</sup>

<sup>63</sup> Roy Stone, *Proceedings of First Annual Meeting of the Missouri State Roads Improvement Association and Roads Improvement Convention*, 1893, p. 22.

<sup>64</sup> Shaler, *American Highways*, p. 90.

<sup>65</sup> J. L. Ringwalt, *Development of Transportation Systems in the United States* (1888), p. 39.

<sup>66</sup> "Highway Improvement," address before the Carriage Builders' National Association, 1889, p. 11. He recommended a commissioner of highways in the Department of Agriculture, and state highway commissioners.

<sup>67</sup> *Engineering Record, Road Construction and Maintenance, Prize Essays* (1892).

<sup>68</sup> National League for Good Roads, *Proceedings of the Convention*, 1892.

<sup>69</sup> "We have become too prone to appeal to distant agencies while neglecting the instruments at hand. We should not lose sight of the fact that the more we can localize measures and undertakings, the more surely can we locate responsibility." *Report, Twelfth Annual Session of the National Farmers Congress*, 1892, p. 35.

At the two national good roads conventions held in 1892 and 1893 the delegates discussed federal aid at some length. At the Chicago convention General Stone favored extension of federal credit to state and local government units, and justified federal aid on the ground that it was a traditional national function, and on the needs of the rural mail service and national defense.<sup>70</sup>

Events soon demonstrated that discussions of federal aid and the form it should take were premature. The Department of Agriculture declined to sponsor any form of federal aid for highway development. When it became clear that Congress would not pass General Stone's bill for an independent national highway commission, the good roads convention of 1893 requested a federal appropriation to be administered by the Department of Agriculture. And with the creation of the federal Office of Road Inquiry in 1893, the good roads movement concentrated its efforts upon the promotion of state aid. Under the leadership of General Stone, the Office of Road Inquiry pioneered in collecting data on state road legislation,<sup>71</sup> and sent out speakers familiar with accomplishments of the more progressive states to address road conventions and to assist state legislative committees in drafting road laws.

2. *Development of state aid.* In the meantime the states were taking up the problem. In 1889 several gov-

<sup>70</sup> National League for Good Roads, *Proceedings of the Convention*, 1892, pp. 6-15.

<sup>71</sup> From time to time the Office published data showing the progress of state road legislation. See *State Laws Relating to the Management of Roads*, Bulletin No. 1, covering laws enacted 1888-93; "Progress of Road Legislation and Road Improvement in the Different States," in Department of Agriculture *Yearbook*, 1905, pp. 624-27, and a similar report in the *Yearbook* for 1910, pp. 265, 297; also articles printed by the Office at various times dealing with individual states.

ernors made references to the road problem in their annual messages; and by 1891 numerous proposals were current for effecting a general revision of rural highway financing and management.<sup>72</sup> New Jersey took the lead in 1891 by passing the first state aid law. Massachusetts followed in 1894, Connecticut in 1895, and New York in 1898.

a. *New Jersey.* In New Jersey the success of the Essex County hard-surfaced roads offered a direct challenge to Union County to improve her highways.<sup>73</sup> Moreover, many were becoming cognizant of the fact that the overseer system was not only inefficient but unsuited to the development of continuous stretches of improved highways. Agitation of the matter led to the passage in 1889 of an optional county bonding law which provided county aid to the minor municipal divisions.<sup>74</sup> Union County soon could boast paved highways, and, more important to the good roads movement, a real estate boom developed.<sup>75</sup>

The immediate success of the paved highways laid down in the progressive counties, the dissatisfaction with local road administration, the successful operation of a county aid law, and the general discussions of state aid which were current in several states made the achievement of state aid a relatively easy matter.<sup>76</sup> When the

<sup>72</sup> Pope, address before the Carriage Builders' National Association, *Proceedings*, 1889, pp. 10-12. See also State Board of Agriculture of New Jersey, *Eighteenth Annual Report*, 1890-91, pp. 37-38.

<sup>73</sup> Charles C. McBride, editor of the *Elizabeth Daily Journal*, "The Famous Roads of Union County," *Good Roads*, Vol. 3 (1893), p. 295.

<sup>74</sup> The same, p. 287. The bill became Laws of New Jersey, Session of 1889, c. 41, approved March 19.

<sup>75</sup> *Good Roads*, Vol. 3 (1893), pp. 286-97. Enthusiasts overlooked the fact that conditions were ripe in 1890 for considerable suburban development in northeastern New Jersey.

<sup>76</sup> New Jersey State Board of Agriculture, *Nineteenth Annual Report*, p. 567.

legislature passed the measure in 1891 it justified the step on the grounds of the general utility of highways."

b. *Massachusetts*. State aid in Massachusetts resulted primarily from agitation of the industrial groups, who realized that the common roads were no longer limited to local travel but provided important transportation facilities for the state as a whole.<sup>78</sup> They aroused popular interest in improved roads—an interest which the legislature was finally induced to recognize in 1894 with the enactment of a state aid law. This act provided for the laying out, grading, and completing by the state of roads accepted by the highway commission as state highways, "three fourths of the expense to be paid by the State and the remaining one fourth by the county in which the road lay."<sup>79</sup>

<sup>78</sup> Preamble to Acts of New Jersey, General Public Laws, c. 201, approved Apr. 14, 1891.

In addition to the two laws cited above, the legislature passed other road laws between 1888 and 1892. The text of these laws will be found in New Jersey State Board of Agriculture, *New Jersey Road Laws*, 1892.

An abstract of the same as given in Office of Road Inquiry, *State Laws Relating to the Management of Roads*, is as follows:

"1. The roads of a township are placed under the management of the township committee, and money may be raised by township bonds for grading, macadamizing, and improving the same; bonds to be authorized by vote of the annual town meeting.

"2. The board of chosen freeholders of any county may designate certain roads as county roads and improve the same by the issue of county bonds.

"3. The state shall pay one-third of all cost of road improvement so authorized by the chosen freeholders, within the limit, at present, of \$75,000 per annum.

"4. Whenever the owners of two-thirds of the lands fronting on any public road will undertake to pay one-tenth of the cost of improving such road, it shall be the duty of the board of chosen freeholders to cause such improvements to be made.

"5. The office of overseer of highways is abolished.

"6. All road taxes are to be paid in money."

<sup>79</sup> Massachusetts Highway Commission, House Doc. 45, 1894, p. 3.

As summarized in the *Journal of the Massachusetts Highway Association*, Vol. I (1896-97), p. 4. See also Shaler, *American Highways*. Shaler was a member of the state highway commission.



c. *New York*. Agitation for reform of rural highway administration in New York began in 1890 with the organization of a state good roads association and the introduction of State Senator Richardson's bill providing for a state highway system.<sup>80</sup> The legislature, however, rejected this proposal for a highly centralized form of control and in 1893 accepted Governor R. P. Flower's compromise plan,<sup>81</sup> in the form of a county option law.<sup>82</sup>

Two years later the legislature, acceding to popular pressure, appointed a special committee on good roads which visited New Jersey, Massachusetts, and Connecticut, where state aid laws were in operation.<sup>83</sup> From the perspective thus gained the special committee presented to the legislature in 1896 a comprehensive picture of the function of New York highways with recommendation for state aid.<sup>84</sup> Two years later, following widespread discussion at farmers' meetings, intensive campaigning on the part of the League of American Wheelmen, and the building of object lesson roads, the legislature passed the Higbie-Armstrong and Fuller laws.<sup>85</sup>

<sup>80</sup> Governor Hill's description of the plan, *Documents of the Assembly of the State of New York*, Vol. V (1896), Doc. 26, p. 8.

<sup>81</sup> Annual Message to Legislature, Jan. 3, 1893, in C. Z. Lincoln, ed., *State of New York, Messages from the Governors* (1909), Vol. IX, p. 198; "Road Improvement in New York," *Good Roads*, Vol. 3 (1893), p. 65. The Governor also opposed national participation in highway development. *Good Roads*, p. 64.

<sup>82</sup> *Laws of New York 1893*, Vol. I, c. 333. An official résumé of the law may be found in a note on "Highway Improvement" in Lincoln, *State of New York, Messages from the Governors*, Vol. VIII, p. 1042.

<sup>83</sup> *Documents of the Assembly of the State of New York*, Vol. V (1896), Doc. 26, p. 14.

<sup>84</sup> The same, pp. 18-21.

<sup>85</sup> The Higbie-Armstrong Act (*Laws of New York*, 1898, Vol. I, c. 115) authorized state aid to an amount equal to 50 per cent of the expense of construction of county roads ordered by a board of supervisors. Thirty-five per cent of the expense was to be paid by the county and 15 per cent by owners of property fronting on the improved road if they had petitioned for it. If not, the 15 per cent was to be assessed on the town or towns in which the road was situated.

The Fuller Act (the same, c. 351) provided for state aid to towns

Other states rapidly followed the lead of these pioneers. By 1904 thirteen states had some form of state aid,<sup>86</sup> and by 1917 all 48 states were supplying aids of various types to their local subdivisions.<sup>87</sup>

In each state numerous factors combined to bring about state aid laws. But the most important factors in the move for road reform undoubtedly were the universal dissatisfaction with the poll tax and the general recognition of the fact that the self-contained road district representing the township area had outlived its usefulness. It obviously was not feasible to provide technical training in highway engineering for an elective road supervisor, nor was it practical to give full-time employment to an engineer in so small a unit.

Several other circumstances, some of a more fortuitous character, aided the movement. Massachusetts was sufficiently industrialized for her trade interests to profit from inter-city and inter-state roads. Consequently, good roads proponents found support for their argument that highways served all interests of the state and therefore were a proper subject for financing out of the general tax fund. And, the circumstance that population density in northern New Jersey and parts of New England was such as to call for suburban development and a more intensive agriculture enabled sponsors of good roads to claim a direct causal relationship between the development of highways and increases in land values. Moreover, these increases in land values swept aside any need for considering whether the reduction in wagon

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maintaining roads under the money system. Lincoln, *State of New York, Messages from the Governors*, Vol. VIII, p. 1042.

<sup>86</sup> F. G. Young, "Tendencies in Recent American Road Legislation," *University of Oregon Bulletin*, Vol. 2 (1905), p. 16.

<sup>87</sup> U. S. Department of Agriculture, *Agriculture Yearbook*, 1924, p. 98.

transportation costs had been purchased at too high an expenditure in tax outlays.

It is also worth noting that the advocates of federal aid found it essential to espouse state aid and consequently centralized state supervision as a necessary condition to the attainment of their federal aid objective.

3. *Renewed agitation for federal aid.* Early in the present century a new and more vigorous movement for federal aid began under the leadership of the bicycle interests and Martin Dodge, director of the Office of Public Road Inquiries.

In March 1902, Representative Otey of Virginia introduced in Congress a bill providing \$100,000,000 for the construction of federal highways, but the investment contemplated was too extensive to receive serious attention.<sup>88</sup> In December 1902 Representative Brownlow of Tennessee proposed the creation of a Bureau of Public Roads and the appropriation of a more modest sum, \$20,000,000, to aid the states in the construction of roads.<sup>89</sup> Following the introduction of these federal aid bills in 1902 the demand for federal funds to help improve the common roads became a major objective of the good roads movement.<sup>90</sup>

Members of the Fifty-Ninth Congress introduced during its first session (March 4, 1905, to June 30, 1906) more than twenty bills, resolutions, and memorials providing for the construction of highways, the appropriation of funds, the creation of a bureau, distribution of the Treasury surplus, highway development, etc.

<sup>88</sup> H. R. 12650, 57 Cong. 1 sess., introduced to Committee on Agriculture by Mr. Otey, Mar. 17, 1902.

<sup>89</sup> This bill was drawn by Director Dodge of the Office of Public Road Inquiries, according to his statement made later. First Annual Federal Good Roads Convention, *Proceedings*, 1912, p. 119.

<sup>90</sup> Young, *University of Oregon Bulletin*, Vol. 2.

In succeeding Congresses similar proposals appeared. In addition to bills for general projects, many proposals were made for specific military, post, and national forest roads. Some provided for utilization of army officers in the construction of roads.

During the extended debates which ensued, there was no general controversy over the desirability of some type of federal participation in highway provision, the opposition that did develop being sectional in character, or poorly organized.<sup>91</sup>

Without exception the platforms of political parties contained endorsements of some form of federal aid.<sup>92</sup> And leading statesmen of the period called attention to the importance of good roads as an instrument for advancing the general national welfare.<sup>93</sup> All advocates of good roads—academic writers, statesmen, and special interest groups alike—classified the provision of road facilities as one of the essential functions of government.

Nor did any important controversy arise over the question of constitutionality of federal participation in road development. From the very beginning of the good roads movement leaders justified federal aid on the grounds of developing the mail service and promoting national defense. General Stone stated in 1893:

<sup>91</sup> Representatives of the northeastern states, which had spent millions of dollars between 1890 and 1916 creating a relatively extensive mileage of hard-surfaced highways, contended that use of the general tax fund to build roads in other states was unfair to them. The other principal arguments offered in opposition to the 1916 bill were that there was no money in the Treasury; that the nation should concentrate on national defense plans; that the measure was pork-barrel and analogous to river and harbor bills; that federal administration of the fund would prove impracticable; that federal aid for local road improvements would discourage state-aid programs; and that it was unconstitutional.

<sup>92</sup> See K. H. Porter, *National Party Platforms* (1924); *Congressional Record*, Vol. 53, Pt. 15, Appendix (1916), pp. 1988-2018.

<sup>93</sup> See, for example: address of President Theodore Roosevelt, *Good Roads as an Element in National Greatness*, Bulletin No. 26 of the Office

The interest of the general Government in the common roads has been newly demonstrated by recent events; on the one hand, a successful experiment in the rural free delivery of mails, and on the other, a failure of railway transportation for troops in an emergency. Both these events show the need of good roads to the general Government, even regarding that Government in its narrowest aspect, as something apart from the people it governs. It needs post roads and military roads all over the country.<sup>84</sup>

The Joint Committee on Federal Aid assured the Congress: "Federal aid to good roads will accomplish several of the objects indicated by the framers of the Constitution—establish post roads, regulate commerce, provide for the common defense, and promote the general welfare. Above all, it will promote the general welfare."<sup>85</sup>

Although there was general agreement as to the desirability and constitutionality of federal participation in road development, sharp differences of opinion did arise with respect to the administrative form and the financial extent of such action. On these issues the positions taken by the automobile and agricultural interests—the two major groups of sponsors—ran parallel at first, but subsequently diverged in important respects.

a. *Automobile interests enter movement for federal aid.* The automobile played no part in the formative pe-

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of Public Road Inquiries (1903), p. 79; and address of Woodrow Wilson, *Proceedings of the American Road Congress*, 1912, Pt. II, p. 7.

<sup>84</sup> Missouri State Roads Improvement Association, *Proceedings of First Annual Meeting*, 1893, p. 23.

The initiative for introducing rural free delivery of the mails appears to have been taken by postal authorities. In the summer of 1891, the Universal Postal Union, in convention at Vienna, Austria, out of courtesy to the American delegates, adopted resolutions favoring the free distribution of mail on a house-to-house basis.

The U. S. Post Office Department was at that time experimenting with the distribution of mail in small towns and villages.

<sup>85</sup> H. Doc. 1510, 63 Cong. 3 sess., p. 14.

riod of the good roads movement. At the turn of the century there were only 5,000 automobiles in the country.<sup>96</sup> As might be expected, the early years of automobile development had been devoted to reliability tests and publicity stunts designed to win approval of a revolutionary device from a highly skeptical public.<sup>97</sup>

It was not until about 1908 that the pioneer work of demonstrating the automobile's usefulness began to produce tangible results. At this time, however, motor vehicle users appeared to be less interested in the movement for federal financial aid than in the removal of obstacles to their use of the new invention. One of the main obstacles was restrictive state legislation.

When the American Automobile Association held its first good roads and legislative convention jointly with the National Grange in 1907, the chairman of the A.A.A. legislative committee stated that 31 states required registration of motor vehicles and charged a fee varying from 25 cents to 25 dollars; that eight states extended no privileges to motorists from other states; that speed limits varied from 4 to 20 miles an hour. Expressing the reaction of the growing body of motorists to these conditions, Mr. Terry stated,

Highways are national. For all purposes of interstate travel, highways belong to the citizens of the United States, with the absolute right to travel thereon and to make ingress and egress

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<sup>96</sup> H. C. Spurr, *Motor Vehicle Transportation* (1922), p. 7.

<sup>97</sup> Numerous tests, endurance runs, and mountain climbing trials characterized this period. In addition to publicizing the motor vehicle as a means of transportation, they performed the functions which the professional racetracks and the proving grounds perform today. *Engineering News*, Vol. XXXII (1894), p. 147, Vol. XL (1898), p. 367, Vol. XLI (1899), p. 142; Waldemar Kaempffert, ed., *A Popular History of American Invention* (1924), Vol. I; League of American Wheelmen, *Good Roads*, Vol. 23 (1896), p. 594.

from the various States, unhampered by the narrow restrictions sought to be imposed by provincial enactments.<sup>98</sup>

The interest of automobile manufacturers and owners was not limited to the removal of restrictive legislation. These groups also wanted good and continuous roads. From 1905 on, there was no question but that the motor vehicle owners would use their influence to direct the good roads movement toward the construction of continuous main line highways with a network of coast to coast routes the ultimate objective.<sup>99</sup> In 1907, the motorists took official action to enter the good roads campaign when a New England motor club called a good roads convention to meet at Springfield, Massachusetts.<sup>100</sup> In the same year the Good Roads Board of the A.A.A. began actively to promote the interests of the motorists in good roads.<sup>101</sup>

Highway developments in the northeastern states far outran progress in other sections. By the close of 1909, the New England states had appropriated almost \$4,000,000 for through lines of trunk highways. In 1910 the New York legislature provided for the completion of a through route between New York and Albany and in 1911 for the completion of 1,464 miles of trunk line highways.<sup>102</sup> At the same time the manufac-

<sup>98</sup> *Proceedings of the First Annual Good Roads and Legislative Convention*, 1908, pp. 27-32.

<sup>99</sup> For evidence of the growing interest in this subject, see *Good Roads Magazine*, Vol. VI (1905), pp. 533, 851; *American Motorists*, February 1911, p. 108; Connecticut State Highway Commission, *Biennial Report*, 1907-1908, p. 11; A.A.A., *Yearbook*, 1907, p. 62; *Engineering News*, Vol. XLVII (1902), p. 365.

<sup>100</sup> A.A.A., *Yearbook*, 1907, p. 64.

<sup>101</sup> The most important accomplishment was completion of plans for joint conventions in 1908 (held also in 1909 and 1910) with the National Grange in support of the Grange's \$50,000,000 state aid bill.

<sup>102</sup> *Southern Good Roads*, Vols. 7 and 8, February 1913, p. 19.

ture and sale of automobiles increased rapidly so that the potential value of interstate motor travel and the need of financial aid for the poorer states became more and more evident.

With the rapid increase in automobile ownership, motor interests concentrated their efforts on two interrelated objectives. They advocated the construction of a network of principal highways throughout the country and they attempted to prevent the dissipation of funds in the indifferent improvement of a vast mileage of local roads. The National Highways Association, which became active in 1912 and 1913, endeavored to gain federal authorization for an integrated system of highways to be constructed and operated under the administration of a national highways commission.<sup>103</sup> The A.A.A. advocated limiting federal participation in the good roads movement to the development of trunk lines, contending that

the Federal Government will have done practically its full duty when it shall have taken over and improved and provided for the maintenance of the great interstate routes, the highways upon which the traffic falls most heavily, and the making and upkeep of which constitutes the greatest item of expense in a State highway system.<sup>104</sup>

In justification of this position the automobile interests contended:

Experience has demonstrated that in permanent and economical progress certain principles have been established. This development can be divided into four great sub-divisions: Town-

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<sup>103</sup> National Highway Association, *National Highways and Good Roads Everywhere* (1913).

<sup>104</sup> Statement of American Automobile Association quoted in *Good Roads*, Hearings before the Joint Committee on Federal Aid in the Construction of Post Roads, 1913, Pt. I, p. 120.

The Association, however, was obviously willing to compromise on



ship, County, State and Nation. Each sub-division has a function to perform, namely: the township in its lateral roads, the county in its market roads, the state in its inter-county roads, and the government in its interstate roads.<sup>105</sup>

According to the program advocated by the automobile groups, the appropriate function of each of these levels of government in the field of road development was as follows:

#### INTER-STATE ROADS.

In these days of multiplying travel National highways across the various States naturally come into existence. To these roads traffic gravitates and compels durable construction and systematic maintenance. A State which does not provide interstate road connections with adjoining States is plainly at a disadvantage. Such a road brings commensurate value for the expenditure. Always keep in mind that these roads are available to those living in the territory traversed as well as to the ones who come from a distance. Just as a railroad builds its most important lines first, so should a commonwealth construct arteries of communication which accommodate the greatest volume of tonnage and meet the wants of the largest number of people.

#### STATE ROADS.

Since these inter-state roads are a prime necessity of the State, and are demanded by the fullest development of the commonwealth, it is plain to be seen that if their cost, either in whole or in part, is placed upon the National Government, then the State will have that money to utilize in its bounden duty to create State systems connecting county seats with each other, thus supplying branches of the main trunk highways. These inter-county roads should be built and maintained at the expense of the State.

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this question. It agreed not to oppose improvement of market roads if the United States government wished to improve them and recommended that a federal appropriation be authorized, one-half to be used to match state funds, and the other half to be used for the "construction, maintenance and improvement of highways." The same, p. 125.

<sup>105</sup> From "Whyfore of the Washington Convention," A.A.A., *Second Federal Aid Good Roads Convention*, 1913, p. 7.

**COUNTY MARKET ROADS.**

The next sub-division is the county system, meaning the highways which form the main market roads, and the central point of which naturally is the county seat. Such county highways should be paid for at the joint expense of the State, county and township, in such proportions as best meet the needs of the various States.

Practically every farmer, going from his farm to the market, passes over a section of main highway, and its improvement benefits country and city residents alike; hence any plan which seeks to expend large amounts from the cities should be the result of co-operation between the urban and rural localities.

**TOWN ROADS.**

Finally, we have the town roads, which form the fourth sub-division in the system. Such town highways are best governed by the town officials, and should vary as the local conditions of each town demand. They could be built jointly at the expense of the State and the town, the cost being borne equally, both for construction and maintenance. In this manner a system of town highways would fit into the county system, just as a county system would become a part of the State system, and that in turn a part of the National plan.

**NATIONAL PARTICIPATION IN ROADS.**

Any National participation in roads progress, having in view the good of the entire country, should proceed along important lines. As the State plans its inter-county roads through both rich and poor counties, through well-developed and sparsely settled districts, in order to develop the State as a whole, so should the Federal Government build inter-state roads through rich and poor States, through developed and undeveloped resources, in order that the weaker parts may be strengthened and all sections more closely knit together. It is clear that populous States will require more expensively built roads than will the sparsely peopled States. In this way there will automatically come about an equitable distribution of money, keeping in mind the fact that some of the newer States may properly receive such additional consideration as will benefit the Nation as a whole.<sup>106</sup>

<sup>106</sup> The same.

b. *Agricultural interests enter movement for federal aid.* In 1907, about the same time that automobile interests became active in the campaign for federal aid, the National Grange voted to support the good roads movement. During 1909 the Grange engaged in a "wide-spread educational campaign" seeking support for a bill which created a federal highway department and proposed the distribution of 50 million dollars among the states for road development. It sent out hundreds of thousands of pamphlets to farmers purporting to show the reduction in haulage costs and the increase in farm values which would result from better roads; it distributed literature to 10,000 newspapers on the losses from bad roads; and it prepared special articles for syndicated newspaper material. The Grange urged farmers and local granges to petition Congress in support of the bill.<sup>107</sup> Finding that one objection of Congress to federal aid was the lack of state highway departments in many states, the National Grange, as noted above, also strove to further state aid and state administration of local roads.<sup>108</sup>

At the outset, the motor vehicle interests and the farm organization displayed a willingness to co-operate. In 1908, 1909, and 1910, the Grange, the A.A.A., and the automobile manufacturers held three joint conventions. In addition to the Grange, which chiefly represented northern and middle western farmers, the Farmers Educational and Co-operative Union, claiming two million members, representing the southern and southwestern rival group, joined in the third convention.<sup>109</sup>

<sup>107</sup> A.A.A., *Proceedings of the Second Annual Good Roads Convention*, 1909, pp. 23-24.

<sup>108</sup> The same, p. 24.

<sup>109</sup> Other co-operating organizations were the Office of Public Roads, the American Roadmakers' Association, the American Society of Equity,

The two groups, however, had radically different views as to the purposes for which federal funds should be used. The motor interests, as we have seen, advocated the concentration of funds on the creation of main trunk highways. The agricultural and railroad interests favored improvement of farm to railroad or farm to market roads.<sup>110</sup>

The case for concentrating federal aid upon the type of road improvement that would be of greatest immediate benefit to the farm population was presented in broad declamatory terms. One of the reasons offered most frequently for seeking national aid for rural roads was that the farmer had been discriminated against in the allocation of federal funds. This argument was advanced in various forms.<sup>111</sup> The Department of Agri-

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and National Civic Federation. *American Motorists*, August 1910, p. 319; A.A.A., *Proceedings of the First Annual Good Roads and Legislative Convention*, 1908, p. 64.

<sup>110</sup> The Office of Public Roads changed its views in regard to the manner in which improvements should be brought about. As first director of the Office, Roy Stone virtually recommended paving the entire rural road system. *Yearbook of the Department of Agriculture*, 1894, p. 501; the same, 1895, p. 490; *Good Roads for Farmers*, Farmers' Bulletin No. 95. This idea drew forth sharp criticism as being visionary.

In the interests of the farming class the *Engineering News* challenged concentration of the good roads movement on hard-surfaced highways. (*Engineering News*, Vol. XXX (1893), p. 434; Vol. XLIV (1900), p. 434.) Whether because of this criticism or not the Office changed its views on the improvement of country roads. Soon after the criticisms in *Engineering News* it admitted that "the majority of our public highways will of necessity be composed of earth for many years to come." (*Earth Roads*, Farmers' Bulletin No. 136 (1902).) Even as late as 1910 the Office considered the dirt road the only practical one for most of the country. (Director of the Office of Public Roads, *Report*, 1910, p. 770.) After 1912, however, spokesmen for the rural areas were endeavoring to secure an allocation of national funds for the entire road mileage of the country.

<sup>111</sup> In addition to the documents referred to below see: *Good Roads*, Vol. I (1892), pp. 17-18, 22-23; address of William Jennings Bryan before Convention of the American Road Makers Association, *Good Roads Magazine*, Vol. 8 (1907), pp. 106-07; statement of Special Committee appointed by National Good Roads Association, to appear before

culture, for example, pointed out that "the farms of the United States comprise less than one-fourth of the total property of the country yet that small fraction pays the whole cost of building roads."<sup>112</sup> And the Senate Committee on Agriculture and Forestry was told:

The farmer is unable to get to the towns through the long, dreary months of winter, because he is made a prisoner by the bad condition of the roads. Make the roads good and you make the farmer a better and a more intelligent citizen, coming in contact with his fellows. . . .

For one hundred and twenty-seven years the farmer has borne the heaviest burdens of life. He has responded to every call of duty. Never before has he come to Congress and asked a single thing, and now for the first time in more than a century and a quarter he comes here and knocks at the doors of Congress and says, "Gentlemen, help us to build good roads for all the people." He believes, with Lincoln, that this is a "Government of the people, by the people, and for the people."<sup>113</sup>

A favorite method of particularizing the argument that the farmer received short measure of the federal largess was to call attention to federal expenditures for other media of communication and for other purposes, often with the implication that they did not benefit the farmer.<sup>114</sup> It was argued that the farmers were entitled to federal funds for rural road improvements because they had helped finance—for the benefit of others—rivers and harbors, coast defenses, the Panama Canal, public buildings (in cities), irrigation projects, pensions,

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the House Committee on Agriculture in support of the Brownlow bill in 1904; *Good Roads Magazine*, Old Series XXXI, New Series Vol. V (1904), p. 64.

<sup>112</sup> *Yearbook*, 1897, p. 177.

<sup>113</sup> Statement of Winthrop E. Scarritt, *Roads and Road Building*, Hearing before the Senate Committee on Agriculture and Forestry, 58 Cong. 2 sess., p. 7.

<sup>114</sup> For example, see League of American Wheelmen, *Must the Farmer Pay for Good Roads?* distributed as Office of Road Inquiry, *Circular No. 31*.

subsidies to railways, tariffs for the benefit of the industrialists, and a "thousand other purposes."<sup>115</sup>

By 1916 this type of argument was used for rebuttal purposes as well as for constructive argument. Chief opposition to a federal aid measure came from the northeastern states—an area that had enthusiastically embraced state aid programs in the nineties and by 1916 had built up an extensive system of hard-surfaced highways. By way of rejoinder western and southern representatives cited alleged inequities of federal pension and tariff policy. The pension argument was clinched in these picturesque terms:

Surely the man who is fortunate enough to live in a great State like New York, Massachusetts, or Pennsylvania should not for one moment want to hold their forefeet in the Federal Treasury all of the time and keep off a few of these Western

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<sup>115</sup> In the House debate on 1916 road bills, for example, Representative Davenport of Oklahoma phrased the argument thus: "In the past our Government has donated millions of acres of land as a subsidy to railroad companies to induce them to construct railroads, yet practically nothing has been done for the improvement of dirt roads or national highways. We have to-day in the United States daily Rural Delivery Service, which traverses about 42,000 miles of different highways of the Nation, coming in daily contact with more than 20,000,000 people living in the rural districts. I do not anticipate that anyone will seriously oppose the passage of this bill in the House, but if they should do so, I desire to invite their attention to the fact heretofore mentioned that in the early construction of railroads throughout the United States land was donated to the railroads as an inducement to the corporations to construct their lines, at an estimated value now of more than \$1,000,000,000. There has been appropriated for rivers and harbors since 1875, \$592,395,000; for the building of levees alone to June 1902, \$16,582,000; for the construction of public buildings up to June 1911, \$213,376,000. Again, we have expended nearly \$400,000,000 on the Panama Canal; for the construction of roads in Porto Rico, the Philippine Islands, and the Territory of Alaska, \$8,300,000. . . ."

"I now think the time has come when we should consider the interest of those who live in the rural communities and provide for the improvement of our internal highways, so that those living in the rural district may reap as great benefit from Government as those living in cities, on railroads, and navigable streams." *Congressional Record*, Vol. 53, Pt. 2, 64 Cong. 1 sess., p. 1455.

and Southern states. The South has been for years paying great pension bills where the people of other sections of the country have had their feet in the long trough drinking all of the slop. Do you mean to say that this road bill, that might take a little revenue from some of the great States of the East that have been preying on this Republic all of these years, should forsooth, not pass for that reason?<sup>116</sup>

Nor was the rural contribution to the moral and material fiber of the nation forgotten. Southern legislators, borrowing from physiocratic doctrine, contended that farms were the source of our national wealth and the origin of the best people and that it was, therefore, important to the nation to retard the drift of population toward the cities. Senator Bankhead concluded his 1908 address on good roads with these words:

Year after year the human tide flows from the country to the city. . . . Do not let us have great mobs of the unemployed, combining the scum of Europe with the misled boys from our American farms, so long as there are millions of acres of land waiting to be tilled and homes waiting to be built. Good roads will make farm life attractive; they will bring the isolated dweller closer to his neighbor, and I feel confident they will check the movement of our rural population to the great cities.<sup>117</sup>

The Joint Committee on Federal Aid expressed the same thought as follows:

With city population increasing three times as fast as rural population, and production of foodstuffs not near keeping pace with increase in population, there is surely need to make farm life more pleasant and farm operation more profitable. The problem is one of national importance, for congestion of popu-

<sup>116</sup> Statement of Representative Quin of Mississippi, the same, p. 1391.

<sup>117</sup> The same, p. 6737. See also the remarks of Representative Brett of North Carolina, p. 1400; Representative Adamson of Georgia, pp. 1452-53; Senator Vardman of Mississippi, pp. 6784-85. For further illustrations of their argument see also Representative Price of Maryland, p. 1459; Representative Kincheloe of Kentucky, p. 1367; Representative Aswell of Louisiana, p. 1280; and Representative Thompson of Oklahoma, p. 1394.

lation in cities is a national evil. Upon country life we depend chiefly for the strength and vigor of body, mind, and moral character that make a nation great.<sup>118</sup>

Members of Congress often contended that the federal government had a direct obligation to facilitate the rural free delivery mail service. Generally, however, they made the point in terms of roads to serve both the mails and agriculture. For instance, Representative Quin of Mississippi observed:

The gentleman from New York [Mr. Magee] said that our Republic has given the rural route system and carried mails through muddy roads to the farmers. He thinks that is a great favor which the Congress has conferred upon the people. I just cite the gentlemen to the great cities of this Republic where nine mail deliveries are made a day and nothing is thought about it, and he thinks it is a great favor of the Government to carry mail once a day, or perhaps three times a week, to the man out in the country, the great taxpayer and supporter of this Government. It is a right that he has. He is entitled to good roads, and the Federal Government, with all of its activities, should give the farmers of this country roads over which to haul their produce to town.<sup>119</sup>

c. *The railroad position on federal aid.* By 1910 the railroads had assumed the leadership in opposition to the National Highway Association and the A.A.A., which advocated the construction of a limited mileage (about 50,000 miles) of interstate highways under the administrative supervision of a national highway commission.

At the risk . . . of seeming to be actuated by the interest of the railways, I have no hesitation in saying that, if the greatest good is to be done to the greatest numbers, the farmer is more

<sup>118</sup> H. Doc. 1510, 63 Cong. 3 sess., p. 18.

<sup>119</sup> *Congressional Record*, Vol. 53, Pt. 2, p. 1391; see also the remarks of Senator Gallinger of New Hampshire and of Senator Bankhead of Alabama. The same, p. 6428.



interested in the improvement of the roads of the second class . . . those radiating from a market town or shipping station.<sup>120</sup>

And they had active support in this position from a substantial congressional bloc which maintained that

. . . the railway station is the terminus for roads; that neither freight nor passengers will ever be carried long distances over roads as cheaply as they could be over railways, and that it is an idle dream to imagine that auto trucks and automobiles will take the place of railways in the long-distance movement of freight or passengers; that the proper function of roads is not to connect antipodal oceans nor the distant capitals of far-away States, but to make easy communication between the farms on one hand and the towns and railway stations on the other, to the end that the farmer may market his crops at less expense and the town dweller may get farm products more easily and at less cost.<sup>121</sup>

Moreover, the Secretary of Agriculture recommended that farm to market roads be given priority in the allocation of federal aid funds and stated: "The roads which the Nation most needs to have improved are those that lead from the farm to the nearest railway station. . . . I suppose everybody will agree that the railroad is the national road for the vast majority of the people."<sup>122</sup>

Curiously enough, the railroad position does not appear to have been influenced by any concern over the competitive potentialities of highway transportation. In 1913 a spokesman for the railroad interests told a congressional committee:

<sup>120</sup> W. W. Finley, "Good Roads and the Farmer," *Papers, Addresses, and Resolutions before the American Road Congress, 1911*, pp. 11-15. At the 1914 Congress, Fairfax Harrison, successor to Finley as president of the Southern Railway, repeated these ideas. "Selecting Roads to be Improved," *Proceedings of the Fourth American Road Congress, 1914*, pp. 171-73.

<sup>121</sup> Dorsey W. Shackelford, chairman of House of Representatives Committee on Roads, *Proceedings of the Third American Road Congress, 1913*, p. 57.

<sup>122</sup> D. F. Houston in *Good Roads*, Hearings before the House Committee on Roads, 63 Cong. 2 sess., Pt. 2, p. 4.

I do not care where the good roads are built just so long as they are built to meet the real necessities of the situations. I mean by that I do not care whether under those circumstances they parallel our road from one end to the other. I do not regard them as factors in long-distance transportation and I welcome them in connection with the development of the areas surrounding our system.<sup>123</sup>

Another spokesman, when asked if he thought a highway would successfully compete with a railroad as a long distance transportation line or mail route, replied, "I do not see how it can be expected to so compete."<sup>124</sup>

#### IV. IMMEDIATE LEGISLATIVE BACKGROUND OF THE 1916 FEDERAL AID HIGHWAY ACT

Between 1893 and 1913 federal participation in the highway field involved no direct financial aid to the states or their local subdivisions. In 1912, however, Congress created an investigating committee to report on the subject of federal aid in the construction of post roads and appropriated a post road fund of \$500,000.<sup>125</sup>

This was the initial and experimental step in a program of financial participation which has since expanded to the point where the federal government now bears a substantial share of the total highway bill and plays an important if not definitive role in the formulation of highway policy.

The 1912 law named the Secretary of Agriculture and the Postmaster General as administrators of the fund and required them to select and improve certain roads, and to establish rural mail delivery over them. It directed them to report on the increase in the territory which could be served by carriers as a result of improve-

<sup>123</sup> Testimony of W. W. Finley in *Good Roads*, Hearings before the Joint Committee on Federal Aid in the Construction of Post Roads, 1913, Pt. I, p. 28.

<sup>124</sup> Testimony of Alfred Noble, the same, p. 10.

<sup>125</sup> *Congressional Record*, Vol. 53, Pt. 2, p. 1467.

ments, the possible increase of delivery days, the amount required in excess of local expenditures for proper maintenance of these roads, and the relative saving to the government in the operation of the rural delivery service and to the local inhabitants in the transportation of their products as a result of the improvements. The administrators were also directed to promote such co-operation among the states as would insure equitable and uniform state highway regulations, and to report to Congress within one year their recommendations for a general plan of national aid for the post road improvement in co-operation with the states and counties.<sup>126</sup>

The project, a co-operative arrangement, required the states or their subdivisions to contribute double the amount expended by the federal government. In operation this experiment brought out some illuminating facts. The first program which the authorities worked out called for equal allotments of the fund to all the states. The plan failed completely. Some states ignored the federal offer of co-operative road improvement; some refused outright to participate; and most of the others were unable to enter into the plan. Some of the southern states were hampered by the fact that federal contracts prohibited the use of convict labor. And the eight-hour day requirement for federal contracts precluded co-operative agreements in some states. The great diversity of local fiscal procedures involved "long delays," "the most unsatisfactory conferences," and "troublesome routine."<sup>127</sup>

<sup>126</sup> 37 Stat. L. 552, approved Aug. 24, 1912.

<sup>127</sup> The Director of the Office of Public Roads commented: "I never imagined that co-operation was such a difficult thing. . . . We thought by dividing the appropriation equally among all the States . . . that we could allot the whole sum in that way on a fairly equitable plan." *Agriculture Appropriation Bill*, Hearings before the House Committee on Agriculture, 63 Cong. 2 sess., p. 12.

The officials, therefore, conducted the experiment by selecting a number of projects throughout the country where "different topographic, soil, and climatic conditions" were found.<sup>128</sup> They had not advanced these road improvement test cases sufficiently at the end of the year to answer the act's inquiries as to potential savings in transportation costs for rural mail delivery, increased efficiency of service, etc. The authorities were, however, quite obviously convinced that any plan of national aid to the states would have to be administered through co-operation between federal officials and state highway agencies.<sup>129</sup> The other factor of major importance was the discovery that it was impractical from the construction angle to limit improvements to those sections of road traversed by the rural mail service. Even where such limitation was practical the localities co-operating in the work wanted continuous market roads.<sup>130</sup>

<sup>128</sup> For a detailed history of this experimental road fund, see *Joint Report of the Progress of Post-Road Improvement*, H. Doc. 204, 63 Cong. 1 sess.

<sup>129</sup> On this point the Secretary of Agriculture testified: "It has seemed to me that the State should be the lowest unit with which the Federal authorities should deal, and I should like very much to see an expert State highway commission unit indicated as the State agency for handling the work, if that could be done; and if by such a course the majority of States that do not now have expert State highway commissions were induced to create them, with adequate power and funds, the expenditure would have been justified." David F. Houston, in *Good Roads*, Hearings before the House Committee on Roads, 63 Cong. 2 sess., Pt 2, p. 5.

In their report to Congress the Cabinet officials stated: "This constant necessity of changing the method of supervision or of handling the funds to meet the special and peculiar conditions arising under the local laws makes it obvious that effective national aid in highway improvement is conditioned on certain definite and uniform action on the part of the States which will permit either the State government or the local administrative subdivisions to act in harmony with the Federal Government, according to some uniform plan, in expending the joint funds which might be created by allotments of Federal aid." H. Doc. 204, 63 Cong. 1 sess., p. 13.

<sup>130</sup> This point came out in the testimony of the Director of the Office of Public Roads, Dr. Logan Waller Page, who stated: "We at first intended not to use the money unless it was all used on rural free-delivery

Meanwhile the investigating committee, known as the Joint Committee on Federal Aid in the Construction of Post Roads, was collecting information on foreign and domestic road systems and holding hearings. Besides assembling a mass of valuable material, the report emphasized the extensive popular demand for federal aid and officially endorsed such a step.<sup>131</sup> It refrained from recommending any specific bill or plan for federal aid.<sup>132</sup>

At the end of 1913 the House Committee on Roads conducted further hearings on federal aid plans. These hearings formed the last step in the search for information; thereafter Congress took over the problem of discussing and deciding the form that federal aid should take. This deliberation resulted in the 1916 Federal Aid Highway Act. With the passage of this act the good roads movement completed the achievement of its major objectives—state and federal participation in the development of a national highway system.

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roads. But we have never yet found such a road. . . . A rural free-delivery route will start on a road, branch off, and then turn around and come back, and then there will be a strip of road that is not rural free delivery at all. . . . We could not fly around out of the way of portions of the roads that were not used for free delivery. The local people would not put up the money on that basis. They wanted the work done on the main market roads." *Agricultural Appropriation Bill*, Hearings before the House Committee on Agriculture, 63 Cong. 2 sess., p. 14.

<sup>131</sup> The final report of this committee was issued as *Federal Aid to Good Roads*, H. Doc. 1510, 63 Cong. 3 sess.

<sup>132</sup> The following comment made during the time the Joint Committee on Federal Aid was active is informative: "Secretary [of Agriculture] Houston: I have appreciated the fact that there is a definite sentiment in both Houses of Congress in favor of further Federal Aid." [The \$500,000 for experimental improvement of rural post roads had already been made.]

"The Chairman: Well, I think that is not so true as it would be if it were stated the other way—that the constituencies of the Senators and Congressmen who make up the two branches are so determined upon this matter that it would not be possible to resist it." *Good Roads*, Hearings before the House Committee on Roads, 63 Cong. 2 sess., Pt. 2, p. 8, December 1913.

## APPENDIX B

### STATISTICAL TABLES

#### 1. PHYSICAL CHARACTER OF RURAL ROADS, BY SYSTEMS AND BY TYPES, 1904-39<sup>a</sup>

##### I. ALL RURAL ROADS

Year	Mileage			Percentage Sur- faced		
	Total	High- Type Surfaced <sup>b</sup>	Other Surfaced	Not Surfaced	High- Type	All Types
1904...	2,151,379	...	153,530	1,997,849	...	7.1
1909...	2,199,645	...	190,476	2,009,169	...	8.7
1914...	2,445,761	3,296	253,996	2,188,469	.1	10.5
1921...	2,924,505	25,774	361,683	2,537,048	.9	13.2
1923...	2,995,727	38,416	400,925	2,556,386	1.3	14.7
1924...	3,004,411	45,593	426,074	2,532,744	1.5	15.7
1925...	3,006,183	53,750	467,510	2,484,823	1.8	17.3
1926...	3,000,190	58,409	491,655	2,450,126	1.9	18.3
1927...	3,013,584	64,914	523,807	2,424,863	2.2	19.5
1928...	3,016,281	72,406	613,731	2,390,144	2.4	22.7
1929...	3,024,233	81,719	580,716	2,361,798	2.7	21.9
1930...	3,009,066	92,059	601,500	2,315,507	3.1	23.0
1931...	...	...	...	...	...	...
1932...	...	...	...	...	...	...
1933 <sup>c</sup> ...	...	...	...	...	...	...
1934 <sup>d</sup> ...	...	...	...	...	...	...
1935 <sup>d</sup> ...	...	...	...	...	...	...
1936 <sup>d</sup> ...	...	...	...	...	...	...
1939...	2,912,283	...	...	...	...	...

## STATISTICAL TABLES

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 1. PHYSICAL CHARACTER OF RURAL ROADS, BY SYSTEMS AND BY TYPES,  
 1904-39—Continued

## II. STATE SYSTEM\*

Year	Mileage				Percentage Sur- faced	
	Total	High- Type Surfaced <sup>b</sup>	Other Surfaced	Not Surfaced	High- Type	All Types
1904...	...	...	...	...	...	...
1909...	...	...	...	...	...	...
1914...	...	...	...	...	...	...
1921...	202,915	14,707	69,665	118,543	7.2	41.6
1923...	251,611	25,339	86,061	140,211	10.1	44.3
1924...	261,216	31,126	100,983	129,107	11.9	50.6
1925...	274,911	36,244	108,610	130,057	13.2	52.7
1926...	287,928	41,022	122,037	124,869	14.2	56.6
1927...	293,353	46,642	129,924	116,787	15.9	60.2
1928...	306,442	53,173	139,965	113,304	17.4	63.0
1929...	314,136	61,070	147,254	105,812	19.4	66.3
1930...	324,496	69,522	156,699	98,275	21.4	69.7
1931...	328,942	80,985	161,715	86,242	24.6	73.8
1932...	358,210	89,726	176,334	92,150	25.0	74.3
1933 <sup>c</sup> ...	480,920	95,274	215,219	170,427	19.8	64.6
1934 <sup>d</sup> ...	510,796	109,000	252,860	148,936	21.3	70.8
1935 <sup>d</sup> ...	523,267	111,905	262,435	148,927	21.4	71.5
1936 <sup>d</sup> ...	536,548	115,030	277,925	143,593	21.4	73.2
1939...	520,524	...	...	...	...	...

\* 1904, 1909: Office of Public Roads, Bulletins 32 and 41.

1914: Dept. of Agriculture, Bureau of Public Roads, Bulletin 390.

1921, 1923-31: Harold G. Moulton and Associates, *American Transportation Problem*, p. 530.

1932, 1933: Bureau of Public Roads, *State Highway Mileage*, table M-4.

1934-36: The same, table SM-1 to 4.

1939: Latest available estimates based on 30 state replies to telegraphic request in March 1939.

Data not available for other years or for items marked (...).

1. PHYSICAL CHARACTER OF RURAL ROADS, BY SYSTEMS AND BY TYPES,  
1904-39—Continued

III. COUNTY AND LOCAL SYSTEM

Year	Mileage			Percentage Sur- faced		
	Total	High- Type Surfaced <sup>b</sup>	Other Surfaced	Not Surfaced	High- Type	All Types
1904...	...	...	...	...	...	...
1909...	...	...	...	...	...	...
1914...	...	...	...	...	...	...
1921...	2,721,590	11,067	292,018	2,418,505	.4	11.1
1923...	2,744,116	13,077	314,864	2,416,175	.5	12.0
1924...	2,743,195	14,467	325,091	2,403,637	.5	12.4
1925...	2,731,172	17,506	358,900	2,354,766	.6	13.8
1926...	2,712,262	17,387	369,618	2,325,257	.6	14.3
1927...	2,720,231	18,272	393,883	2,308,076	.7	15.2
1928...	2,709,839	19,233	473,766	2,276,840	.7	16.0
1929...	2,710,097	20,649	433,462	2,255,986	.8	16.8
1930...	2,684,570	22,537	444,801	2,217,232	.8	17.4
1931...	...	...	...	...	...	...
1932...	...	...	...	...	...	...
1933 <sup>c</sup> ...	...	...	...	...	...	...
1934 <sup>d</sup> ...	...	...	...	...	...	...
1935 <sup>d</sup> ...	...	...	...	...	...	...
1936 <sup>d</sup> ...	...	...	...	...	...	...
1939...	2,391,759	...	...	...	...	...

<sup>b</sup> Includes Portland cement concrete, bituminous concrete, brick and block.

<sup>c</sup> Urban street mileage under state jurisdiction not included under state system in 1933.

<sup>d</sup> Because of adjustment of B.P.R. published mileages to include "bituminous macadam" under "other surfaced" roads, certain differences from published figures appear in the years 1934-36.

<sup>e</sup> Before 1933, where states had assumed control of all or practically all highways, the mileage formerly classed as local mileage remained in this classification; beginning in 1933 this mileage is classed as state mileage.



## STATISTICAL TABLES

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 2. PHYSICAL CHARACTER OF RURAL ROADS, BY SYSTEMS AND BY TYPES,  
 1937-38\*  
 (30 states)

## I. ALL RURAL ROADS

States	Mileage				Percentage Surfaced	
	Total <sup>b</sup>	High-Type Surfaced <sup>c</sup>	Other Surfaced <sup>d</sup>	Not Surfaced <sup>e</sup>	High-Type	All Types
Maryland.....	16,502	2,593	6,788	7,121	15.7	56.8
California.....	88,838	10,004	40,918	37,916	11.3	57.3
Illinois.....	102,684	11,390	48,579	42,715	11.1	58.4
Ohio.....	82,449	8,060	62,354	12,035	9.8	85.4
Louisiana.....	38,508	3,405	13,160	21,943	8.8	42.9
North Carolina..	56,980	4,937	24,643	27,400	8.6	51.9
West Virginia..	32,590	2,437	8,189	21,964	7.5	32.6
Florida.....	28,378	1,834	9,979	16,565	6.5	41.6
Wisconsin.....	81,488	4,920	53,480	23,088	6.0	71.7
South Carolina..	42,776	2,326	10,684	29,766	5.4	30.4
Oregon.....	36,398	1,783	16,523	18,092	4.9	50.3
Iowa.....	101,809	4,843	35,560	61,406	4.8	39.7
Virginia.....	45,465	2,198	27,376	15,891	4.8	65.0
Missouri.....	115,926	4,007	31,950	79,969	3.5	31.1
Texas.....	170,317	5,903	33,782	130,632	3.5	23.3
Kentucky.....	56,222	1,910	24,871	29,441	3.4	47.6
New Hampshire..	12,378	414	7,240	4,724	3.3	61.8
Arizona.....	17,573	528	3,775	13,270	3.0	24.5
Arkansas.....	54,325	1,614	13,162	39,549	3.0	27.2
Vermont <sup>f</sup> .....	13,376	377	6,528	6,471	2.8	51.6
Oklahoma.....	100,068	2,787	12,218	85,063	2.8	15.0
Montana.....	61,525	1,449	8,691	51,385	2.4	16.6
Utah.....	19,208	287	6,227	12,694	1.5	33.9
Kansas.....	129,401	1,817	28,374	99,210	1.4	23.3
Nebraska.....	100,081	1,029	17,169	81,883	1.0	18.2
South Dakota..	100,210	971	18,951	80,288	1.0	19.9
Idaho.....	28,020	197	9,467	18,356	0.7	34.5
Colorado.....	74,896	476	11,579	62,841	0.6	16.0
Nevada.....	23,274	51	3,100	20,123	0.2	13.5
Wyoming.....	23,040	15	3,930	19,095	"	17.1
All states....	1,854,705	84,562	599,247	1,170,896	4.6	37.3

\* U. S. Public Roads Administration, Highway Planning Surveys, Road Inventory tables.

<sup>b</sup> Excludes mileage of special systems not duplicated in state, county, and local systems.

<sup>c</sup> Includes Portland cement concrete, bituminous concrete, brick, and block.

2. PHYSICAL CHARACTER OF RURAL ROADS, BY SYSTEMS AND BY TYPES,  
1937-38—Continued  
(30 states)

II. STATE SYSTEMS

States	Mileage				Percentage Surfaced	
	Total	High-Type Surfaced <sup>a</sup>	Other Surfaced <sup>d</sup>	Not Surfaced <sup>e</sup>	High-Type	All Types
Maryland.....	3,982	2,337	1,645	—	58.7	100.0
California.....	12,637	4,732	7,395	510	37.4	95.9
Illinois.....	9,650	9,590	23	37	99.4	99.6
Ohio.....	14,557	6,434	8,013	110	44.2	99.2
Louisiana.....	3,816	2,868	903	45	75.2	98.9
North Carolina.....	10,463	4,391	5,531	541	42.0	94.9
West Virginia..	4,428	2,012	1,917	499	45.4	88.7
Florida.....	6,489	1,306	4,526	657	20.1	89.9
Wisconsin.....	9,208	3,889	5,135	184	42.2	98.0
South Carolina..	6,916	2,217	3,728	971	32.1	86.0
Oregon.....	4,343	1,095	3,102	146	25.2	96.6
Iowa.....	8,462	4,818	3,501	143	56.9	98.3
Virginia.....	9,111	1,271	7,295	545	14.0	94.1
Missouri.....	7,801	3,476	4,274	51	44.6	99.4
Texas.....	19,218	5,131	10,494	3,593	26.7	81.3
Kentucky.....	8,651	1,778	6,548	325	20.6	96.3
New Hampshire..	3,297	407	2,787	103	12.3	96.8
Arizona.....	3,358	215	2,375	768	6.4	77.1
Arkansas.....	8,591	1,538	6,200	853	17.9	90.1
Vermont <sup>f</sup> .....	1,700 <sup>h</sup>	364	1,336	—	21.4	100.0
Oklahoma.....	8,145	2,550	4,262	1,333	31.3	83.6
Montana.....	5,104	1,444	3,467	193	28.3	96.2
Utah.....	4,625	272	3,422	931	6.4	80.4
Kansas.....	9,219	1,585	6,638	996	17.2	89.2
Nebraska.....	8,051	958	6,650	443	11.9	94.5
South Dakota..	6,334	967	4,452	915	15.3	85.6
Idaho.....	4,574	190 <sup>i</sup>	3,486 <sup>j</sup>	898	4.2	80.4
Colorado.....	9,297 <sup>i</sup>	470	5,960	2,867	5.1	69.2
Nevada.....	2,691	51	2,338	302	1.9	88.8
Wyoming.....	3,696	15	3,346	335	.4	90.9
All states....	218,414	68,371	130,749	19,294	31.3	91.2

<sup>a</sup> "Other surfaced" includes low-type bituminous, plain macadam, plain gravel, and soil surfaced.

<sup>e</sup> Includes graded and drained earth, unimproved earth, and primitive roads.

<sup>f</sup> Macadam and gravel "mixed in place" transferred from "high type" to "other surfaced."

2. PHYSICAL CHARACTER OF RURAL ROADS, BY SYSTEMS AND BY TYPES,  
1937-38—Continued  
(30 states)

III. COUNTY AND LOCAL SYSTEMS

States	Mileage				Percentage Surfaced	
	Total	High-Type Surfaced <sup>a</sup>	Other Surfaced <sup>d</sup>	Not Surfaced <sup>b</sup>	High-Type	All Types
Maryland.....	12,520	256	5,143	7,121	2.0	43.1
California.....	76,201	5,272	33,523	37,406	6.9	50.9
Illinois.....	93,347	1,800	48,556	42,678	1.9	54.1
Ohio.....	67,892	1,626	54,341	11,925	2.4	82.4
Louisiana.....	34,692	537	12,257	21,898 <sup>c</sup>	1.5	36.8
North Carolina..	46,517	546	19,112	26,859	1.2	42.3
West Virginia..	28,162	425	6,272	21,465	1.5	23.8
Florida.....	21,889	528	5,453	15,908	2.4	27.3
Wisconsin.....	72,280	1,031	48,345	22,904	1.4	68.3
South Carolina..	35,860	109	6,956	28,795	.3	19.7
Oregon.....	32,055	688	13,421	17,946	2.1	44.0
Iowa.....	93,347	25	32,059	61,263	"	34.3
Virginia.....	36,354	927	20,081	15,346	2.5	57.7
Missouri.....	108,125	531	27,676	79,918	.5	26.1
Texas.....	151,099	772	23,288	127,039	.5	15.9
Kentucky.....	47,571	132	18,323	29,116	.3	38.8
New Hampshire	9,081	7	4,453	4,621	.1	49.1
Arizona.....	14,215	313	1,400	12,502	2.2	12.0
Arkansas.....	45,734	76	6,962	38,696	.2	15.4
Vermont <sup>f</sup> .....	11,676	13	5,192	6,471	.1	44.6
Oklahoma.....	91,923	237	7,956	83,730	.3	9.0
Montana.....	56,421	5	5,224	51,192	"	9.3
Utah.....	14,583	15	2,805	11,763	.1	19.3
Kansas.....	120,182	232	21,736	98,214	.2	18.3
Nebraska.....	92,030	71	10,519	81,440	.1	11.5
South Dakota..	93,876	4	14,499	79,373	"	15.4
Idaho.....	23,446	7	5,981	17,458	"	25.5
Colorado.....	65,599	6	5,619	59,974	"	8.6
Nevada.....	20,583	—	762	19,821	—	3.7
Wyoming.....	19,344	—	584	18,760	—	3.0
All states....	1,636,291	16,191	468,498	1,151,602	1.0	29.6

<sup>a</sup> Less than .05 per cent.

<sup>b</sup> Excludes 123 miles of (1) state highway and (2) state aid connecting links in municipalities.

<sup>c</sup> 25 miles of bituminous penetration shifted from "other surfaced" to "high type."

<sup>d</sup> Includes 5,812 miles of "other state rural system."

<sup>e</sup> Includes four miles of miscellaneous types.

3. DISTRIBUTION OF VEHICLE MILES OPERATED ANNUALLY ON LEGALLY  
DEFINED CLASSES OF RURAL ROADS IN 28 STATES, 1936-37<sup>a</sup>  
(Figures are percentages)

State	State Highways	County and Local Roads
Alabama.....	67.8	32.2
Arizona.....	65.5	34.5
Colorado.....	78.7	21.3
Florida.....	76.8	23.2
Idaho.....	73.2	26.8
Illinois.....	71.8	28.2
Indiana.....	75.1	24.9
Iowa.....	63.7	36.3
Kansas.....	62.7	37.3
Kentucky.....	78.4	21.6
Maine.....	71.4	28.6
Maryland.....	83.5	16.5
Missouri.....	73.8	26.2
Montana.....	67.1	32.9
Nebraska.....	69.2	30.8
New Mexico.....	83.2	16.8
North Carolina.....	81.6	18.4
North Dakota.....	63.2	36.8
Oklahoma.....	75.4	24.6
Oregon.....	73.3	26.7
South Carolina.....	76.9	23.1
South Dakota.....	71.1	28.9
Tennessee.....	92.3	7.7
Texas.....	70.8	29.2
Vermont.....	76.8	23.2
West Virginia.....	67.9	32.1
Wisconsin.....	78.3	21.7
Wyoming.....	80.1	19.9
Total.....	73.8	26.2

<sup>a</sup> Compiled from U. S. Public Roads Administration, Highway Planning Surveys.

STATISTICAL TABLES

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4. DISTRIBUTION OF THE MOTOR VEHICLE MILES OPERATED ANNUALLY ON THE VARIOUS TYPES OF RURAL ROADS IN 32 STATES, 1936-37<sup>a</sup>  
(Figures are percentages)

State	Paved <sup>b</sup>		Other Surfaced <sup>b</sup>		Unsurfaced <sup>b</sup>	
	Road Mileage	Vehicle Miles	Road Mileage	Vehicle Miles	Road Mileage	Vehicle Miles
Alabama.....	2.6	35.2	49.7	54.7	47.7	10.1
Arizona.....	2.1	23.1	16.3	57.3	81.6	19.6
California.....	10.2	64.0	42.7	32.3	47.1	3.7
Colorado.....	0.7	23.1	16.6	59.2	82.7	17.7
Florida.....	6.4	36.2	34.7	55.8	58.9	8.0
Idaho.....	0.5	13.9	29.0	71.9	70.5	14.2
Indiana.....	7.2	59.1	73.7	40.0	19.1	0.9
Iowa.....	4.8	51.5	35.0	34.2	60.2	14.3
Kansas.....	1.4	26.9	21.9	53.5	76.7	19.6
Louisiana.....	8.9	65.9	34.0	29.0	57.1	5.1
Maryland.....	15.3	58.3	40.5	37.7	44.2	4.0
Michigan.....	6.1	58.2	58.0	37.8	35.9	4.0
Missouri.....	3.4	57.7	27.6	32.1	69.0	10.2
Montana.....	2.2	30.0	14.0	47.7	83.8	22.3
Nebraska.....	1.9	33.2	16.9	44.6	81.2	22.2
Nevada.....	0.2	10.2	13.5	74.0	86.3	15.8
New Hampshire.....	3.5	35.7	59.6	62.8	36.9	1.5
New Mexico.....	0.2	8.3	10.0	71.3	89.8	20.4
North Carolina.....	8.4	54.3	43.5	34.6	48.1	11.1
North Dakota.....	—	2.1	15.8	77.5	84.2	20.4
Ohio.....	9.8	54.8	75.6	43.8	14.6	1.4
Oklahoma.....	2.7	45.9	12.3	32.5	85.0	21.6
Oregon.....	3.9	47.0	37.4	48.8	58.7	4.2
Pennsylvania.....	20.1	72.1	33.0	23.3	46.9	4.6
South Carolina.....	5.2	51.1	25.9	34.8	68.9	14.1
South Dakota.....	0.2	8.9	19.3	70.6	80.5	20.5
Texas.....	3.5	34.7	20.3	45.7	76.2	19.6
Utah.....	1.7	33.4	31.8	59.6	66.5	7.0
Vermont.....	6.6	55.0	45.3	41.4	48.1	3.6
Washington.....	4.0	52.8	47.4	43.9	48.6	3.3
West Virginia.....	7.5	50.4	25.1	34.3	67.4	15.3
Wyoming.....	0.1	0.8	16.3	80.3	83.6	18.9
Total.....	4.5	48.9	31.0	41.2	64.5	9.9

<sup>a</sup> U. S. Public Roads Administration, Highway Planning Surveys, Traffic Tables (TI). Most of the traffic counts were taken during 1936 or 1937.

<sup>b</sup> For types of improvement included in "paved," "other surfaced," and "unsurfaced" and for mileage figures, see tables 2 and 5.

**5. NUMBER OF SELECTED INSTITUTIONS SERVED BY RURAL ROADS OF SEVERAL  
IMPROVEMENT TYPES IN 38 STATES, 1936-37<sup>a</sup>**

State	Road Mileage				School Units			
	Paved <sup>b</sup>	Other Surfaced <sup>c</sup>	Unsurfaced <sup>d</sup>	Total	Paved	Surfaced	Other	Total
Alabama.....	1,495	29,242	28,060	58,797	129	2,140	1,249	3,518
Arizona.....	565	4,492	22,491	27,548	37	131	247	415
Arkansas.....	1,614	13,162	39,549	54,325	142	1,045	1,343	2,530
California.....	10,115	42,517	46,907	99,539	818	2,047	515	3,380
Colorado.....	493	12,527	62,235	75,255	20	547	1,696	2,263
Connecticut.....	1,215	6,989	3,226	11,430	116	462	50	628
Florida.....	1,894	11,738	21,481	35,113	80	430	720	1,230
Idaho.....	172	9,732	23,636	33,540	9	535	609	1,153
Illinois.....	11,390	45,457	42,715	99,562	1,311	6,863	3,568	11,742
Iowa.....	4,843	35,559	61,131	101,533	446	4,091	5,059	9,596
Kansas.....	1,810	28,098	98,290	128,198	186	2,456	5,121	7,763
Kentucky.....	1,910	24,500	29,871	56,281	201	2,704	3,334	6,239
Louisiana.....	3,297	12,924	21,889	38,110	192	711	532	1,435
Maryland.....	2,447	6,471	7,065	15,983	283	723	378	1,384
Michigan.....	5,461	53,335	33,347	92,143	586	5,456	1,041	7,083
Mississippi.....	1,876	27,206	31,507	60,589	97	1,720	1,305	3,122
Missouri.....	3,998	32,524	80,172	116,694	321	2,793	5,707	8,821
Montana.....	1,466	9,214	55,049	65,729	60	569	2,055	2,684
Nebraska.....	1,834	16,849	81,572	100,255	83	1,415	5,009	6,507
Nevada.....	51	3,100	20,123	23,274	6	62	148	216
New Hampshire.....	435	7,458	4,623	12,516	62	708	138	908
New Mexico.....	131	6,155	55,284	61,570	13	230	760	1,003
North Carolina.....	4,975	25,178	27,654	57,807	508	1,687	1,380	3,575
North Dakota.....	25	17,391	92,638	110,054	2	1,058	3,670	4,730
Ohio.....	8,060	62,354	12,035	82,449	693	3,284	314	4,291
Oklahoma.....	2,696	12,531	86,178	101,405	105	810	4,265	5,180
Oregon.....	1,800	17,507	27,460	46,767	172	1,274	463	1,909
South Carolina.....	2,284	11,422	30,512	44,218	207	1,099	1,992	3,298
South Dakota.....	229	19,524	81,392	101,145	15	1,544	3,539	5,098
Tennessee.....	2,724	36,524	23,376	62,624	232	3,581	1,356	5,169
Texas.....	6,580	37,657	141,624	185,861	311	2,524	6,501	9,336
Utah.....	289	6,915	14,274	21,478	22	150	83	255
Vermont.....	377	6,528	6,471	13,376	59	2,106	441	2,606
Virginia <sup>e</sup> .....	4,551	24,881	15,877	45,309	480	2,542	1,047	4,069
Washington.....	1,973	23,032	23,637	48,642	183	1,314	600	2,097
West Virginia.....	2,437	8,188	21,965	32,590	459	1,475	3,020	4,954
Wisconsin.....	4,981	54,503	22,793	82,277	691	5,552	962	7,205
Wyoming.....	15	4,026	20,684	24,725	1	128	641	770
<b>Total.....</b>	<b>102,508</b>	<b>807,410</b>	<b>1,518,793</b>	<b>2,428,711</b>	<b>9,338</b>	<b>67,966</b>	<b>70,858</b>	<b>148,162</b>
<i>Percentage...</i>	<i>4.2</i>	<i>33.3</i>	<i>62.5</i>	<i>100.0</i>	<i>6.3</i>	<i>45.9</i>	<i>47.8</i>	<i>100.0</i>

<sup>a</sup> Road Inventory Table #10, Highway Planning Survey, Public Roads Administration.

<sup>b</sup> "Paved" includes block, brick, concrete, high-type bituminous.

<sup>c</sup> "Other surfaced" includes low-type bituminous, plain macadam, plain gravel, soil surfaced.

<sup>d</sup> "Unsurfaced" includes graded and drained earth, unimproved earth, and primitive roads.

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5. NUMBER OF SELECTED INSTITUTIONS SERVED BY RURAL ROADS OF SEVERAL IMPROVEMENT TYPES IN 38 STATES, 1936-37—Continued

State	Farm Units <sup>f</sup>				Churches			
	Paved	Surfaced	Other	Total	Paved	Surfaced	Other	Total
Alabama.....	3,820	82,509	65,271	151,600	231	3,995	2,652	6,878
Arizona.....	1,941	3,670	7,319	12,930	43	62	162	267
Arkansas.....	3,196	27,824	67,454	98,474	140	944	2,076	3,160
California.....	33,508	98,190	30,491	162,189	432	794	138	1,364
Colorado.....	1,088	14,626	38,026	53,740	4	143	190	337
Connecticut....	2,349	13,150	2,781	18,280	126	327	21	474
Florida.....	2,020	12,728	27,601	42,349	147	693	1,259	2,099
Idaho.....	594	22,218	20,578	43,390	7	165	103	275
Illinois.....	22,603	107,467	59,832	189,902	389	649	1,120	2,158
Iowa.....	10,801	81,606	116,180	208,587	64	804	876	1,744
Kansas.....	3,508	40,534	89,433	133,475	84	711	757	1,552
Kentucky.....	6,816	90,283	89,819	186,918	246	2,566	1,877	4,689
Louisiana.....	9,031	37,939	45,113	92,083	361	1,380	1,140	2,881
Maryland.....	7,942	19,456	17,264	44,662	463	945	460	1,868
Michigan.....	16,126	155,261	43,759	215,146	293	1,879	253	2,425
Mississippi....	2,004	49,852	43,604	95,460	141	2,951	2,253	5,345
Missouri.....	9,101	77,006	159,965	246,072	150	1,555	2,497	4,202
Montana.....	154	1,132	2,676	3,962	24	174	224	422
Nebraska.....	2,272	28,649	92,749	123,670	11	306	517	834
Nevada.....	70	725	2,081	2,876	1	20	35	56
New Hampshire	1,017	16,580	5,877	23,474	36	393	25	454
New Mexico....	608	8,105	26,425	35,138	11	152	492	655
North Carolina	15,240	88,720	92,122	196,082	909	3,647	2,691	7,247
North Dakota..	17	16,147	57,213	73,377	—	329	645	974
Ohio.....	80,094 <sup>e</sup>	295,195 <sup>e</sup>	24,560 <sup>e</sup>	399,849 <sup>e</sup>	1,356	6,309	532	8,197
Oklahoma.....	5,010	24,607	149,018	178,635	44	264	1,180	1,488
Oregon.....	6,157	42,555	12,106	60,818	120	560	105	785
South Carolina	5,975	27,649	60,988	94,612	308	1,358	2,525	4,191
South Dakota..	421	22,479	50,857	73,757	2	396	528	926
Tennessee.....	7,172	111,926	57,381	176,479	313	4,544	1,424	6,281
Texas.....	12,639	80,041	244,089	336,769	237	2,380	5,368	7,985
Utah.....	1,869	14,237	13,086	29,192 <sup>b</sup>	22	111	34	167
Vermont.....	990	15,372	10,812	27,174	46	432	52	530
Virginia <sup>g</sup> .....	17,133	72,942	43,393	133,468	818	3,808	1,281	5,907
Washington....	10,254	69,148	20,341	99,743	96	445	88	629
West Virginia..	2,805	10,264	22,449	35,518	503	1,653	1,608	3,764
Wisconsin.....	13,172	117,997	25,418	156,587	220	1,688	201	2,109
Wyoming.....	22	3,135	12,284	15,441	—	21	42	63
Total.....	319,539	2,001,924	1,950,415	4,271,878	8,398	49,553	37,431	95,382
Percentage ...	7.5	46.8	45.7	100.0	8.8	52.0	39.2	100.0

<sup>a</sup> Does not include Arlington, Henrico, and Warwick Counties.

<sup>f</sup> Generally excludes rural dwellings with small acreage.

<sup>g</sup> Includes all farms and dwellings, except unoccupied houses.

<sup>b</sup> Includes 11,111 "farms without dwellings."

5. NUMBER OF SELECTED INSTITUTIONS SERVED BY RURAL ROADS OF SEVERAL IMPROVEMENT TYPES IN 38 STATES, 1936-37—Continued

State	Dwellings <sup>1</sup>				Business Establishments <sup>1</sup>			
	Paved	Surfaced	Other	Total	Paved	Surfaced	Other	Total
Alabama.....	8,265	65,168	38,931	112,364 <sup>k</sup>	1,405	5,369	1,411	8,185
Arizona.....	5,734	13,943	28,075	47,752	1,222	2,072	1,127	4,421
Arkansas.....	6,273	25,684	56,134	88,091	1,521	3,624	2,349	7,494
California.....	75,966	106,993	22,008	204,967	17,820	10,062	993	28,875
Colorado.....	994	13,234	19,730	33,958	702	2,258	3,152	6,112
Connecticut....	11,312	39,248	4,599	55,159	2,475	2,129	97	4,701
Florida.....	12,840	49,574	34,391	96,805	2,992	5,424	1,318	9,734
Idaho.....	820	5,355	4,666	10,841	205	919	459	1,583
Illinois.....	31,460	17,797	39,510	88,767	5,943	2,233	902	9,078
Iowa.....	2,543	12,068	9,905	24,516	701	1,217	825	2,743
Kansas.....	8,143	25,552	26,183	59,878	1,850	3,745	1,345	6,940
Kentucky.....	10,759	52,465	30,486	93,710	2,444	8,724	4,110	15,278
Louisiana.....	15,752	38,118	23,242	77,112	3,037	4,427	905	8,369
Maryland.....	22,693	45,921	12,769	81,383	3,801	3,467	556	7,824
Michigan.....	18,464	88,852	26,956	134,272	6,330	8,707	1,028	16,065
Mississippi.....	9,380	101,791	81,664	192,835	903	4,503	1,097	6,503
Missouri.....	7,000	33,853	24,125	64,978	3,335	5,478	2,985	11,798
Montana.....	2,631	14,758	36,194	53,583	1,567	5,205	5,213	11,985 <sup>l</sup>
Nebraska.....	862	3,705	3,110	7,677	491	1,005	729	2,225
Nevada.....	176	2,531	6,170	8,877	95	993	678	1,766
New Hampshire	4,136	40,587	9,543	54,266	876	2,780	97	3,753
New Mexico....	619	7,976	17,207	25,802	448	1,806	1,004	3,258
North Carolina.	38,630	59,974	49,259	147,863	7,588	9,061	3,536	20,185
North Dakota..	22	2,419	1,337	3,778	25	2,183	693	2,901
Ohio.....	645 <sup>m</sup>	5,834 <sup>m</sup>	1,889 <sup>m</sup>	8,368 <sup>m</sup>	7,551	7,746	168	15,465
Oklahoma.....	4,536	10,399	26,647	41,582	1,970	2,286	2,994	7,250
Oregon.....	5,727	17,863	4,285	27,875	1,516	2,537	334	4,387
South Carolina.	12,205	38,283	73,621	124,109	2,479	3,100	2,301	7,880
South Dakota..	23	3,220	2,820	6,063	38	1,445	664	2,147
Tennessee.....	11,733	98,652	29,272	139,657	3,691	10,667	1,055	15,413
Texas.....	14,110	75,238	90,561	179,909	5,607	16,441	10,954	33,002
Utah.....	1,237	6,268	2,884	10,389	453	662	183	1,298
Vermont.....	2,345	20,482	7,249	30,076	606	2,170	242	3,018
Virginia <sup>o</sup> .....	27,175	64,641	18,168	109,984	7,456	10,917	1,532	19,905
Washington....	8,957	21,035	5,457	35,449	3,897	4,838	485	9,220
West Virginia..	30,919	52,631	53,051	136,601	2,580	2,962	1,547	7,089
Wisconsin.....	13,766	58,768	15,272	87,806	4,533	8,263	1,120	13,916
Wyoming.....	39	2,322	3,917	6,278	23	629	547	1,199
Total.....	428,891	1,343,202	941,287	2,713,380	110,176	172,054	60,735	342,965
Percentage ...	15.8	49.5	34.7	100.0	32.1	50.2	17.7	100.0

<sup>1</sup> Year-round dwellings only; that is, "seasonal" dwellings excluded.

<sup>2</sup> Includes stores, gas stations, inns, garages, restaurants, tourist camps, and small shops.

<sup>k</sup> Excludes 372 businesses with "residences combined."

<sup>l</sup> Includes 7,898 "transportation terminals."

<sup>m</sup> Includes unoccupied houses only.



6. GOVERNMENT OWNERSHIP OF MOTOR VEHICLES

Type of Vehicle	Federal, 1939 <sup>a</sup>	State, County, and Municipal, 1938 <sup>b</sup>
Passenger cars .....	18,128	50,284
Buses .....	382	22,290
Trucks .....	104,408	117,239
Trailers and semi-trailers .....	—	8,610
Motorcycles .....	—	8,081
Unclassified .....	—	67,656
<b>Total .....</b>	<b>182,918</b>	<b>274,160</b>

<sup>a</sup> From replies to questionnaire sent to all federal agencies in February 1939 by W. T. Comeron, Secretary, Federal Interdepartmental Safety Council, Division of Labor Standards, Department of Labor. These data contain some overlaps where vehicles are owned by one agency and occasionally used by another.

Federal ownership of vehicles classified according to functional purpose was as follows in 1939:

	Passenger	Bus	Truck
Agriculture .....	5,652	65	36,600
Finance and taxation .....	2,000	—	121
Regulation of business .....	667	1	824
Labor and welfare .....	3,389	184	91,313
Law and order .....	734	2	31
Imperialism .....	4,670	128	19,809
Post office .....	—	—	8,390
Recreation .....	684	—	6,213
General-overhead-miscellaneous .....	332	2	1,107
<b>Total .....</b>	<b>18,128</b>	<b>382</b>	<b>164,408</b>

<sup>b</sup> "Publicly Owned Vehicles," *Public Roads*, October 1939, p. 167 (published by Public Roads Administration).

7. GROWTH OF PUPIL TRANSPORTATION, 1925-40<sup>a</sup>

Year	Number of Schools Using Buses	Number of School Buses in Operation <sup>b</sup>	Miles of Route—One Way	Children Carried Daily	Cost of Service
1940....	44,249	93,306	1,265,030	3,967,411	\$76,052,788
1939....	42,452	91,616	1,276,315	3,742,240	72,949,264
1938....	36,336	86,099	1,224,279	3,388,645	66,011,592
1937....	34,615	84,061	1,017,056	3,225,361	61,032,340
1936....	31,912	79,798	989,004	3,145,180	55,380,496
1935....	28,231	77,825	924,597	2,918,657	52,621,881
1934....	23,580	70,130	702,578	2,571,456	48,562,565
1933....	23,355	66,320	687,780	2,374,488	50,533,603
1932....	21,286	63,438	641,618	2,131,699	48,759,730
1931....	16,426	55,306	506,063	1,583,917	40,696,368
1930....	16,547	48,775	451,013	1,478,699	34,044,138
1929....	16,518	45,067	425,000	1,276,427	30,119,302
1928....	15,929	40,868	410,527	1,152,223	27,256,738
1927....	14,695	35,867	352,892	981,240	24,659,598
1926....	13,874	32,778	316,045	875,462	23,430,195
1925....	14,587	26,685	323,637	...	...

<sup>a</sup> From censuses of school buses as made by *Bus Transportation*. For some states the data are partially estimates. Compiled from annual statistical numbers of *Bus Transportation*.

<sup>b</sup> As would be expected, a part of the growth shown is due to more inclusive reporting of school bus operations as time passes. In its annual statistical report for 1933, for example, *Bus Transportation* reported that the growth shown by 1932 figures compared with 1931 was affected by more accurate reporting of data.

The figure used here is the gross figure reported. *Bus Transportation* estimates that around 1930 this figure included some 3,000 common carrier buses which carried school children and that in the last few years it includes some 6,000 common carrier buses.

8. COMMERCIAL PRODUCTION OF BUSES, 1925-39<sup>a</sup>

Period	City	Intercity	School	Total	School Buses as Percentage of Total
1925-29....	16,676	15,871	13,597	46,144	29.5
1930-34....	8,267	6,675	18,421	33,363	55.2
1935-39....	23,710	11,877	50,986	86,573	58.9

<sup>a</sup> Number of buses for 1930-39 taken from *Bus Transportation*, January 1940, p. 51. Buses for 1925-29 classified on basis of data in *Bus Transportation*, February 1930, p. 78. For purpose of this table sightseeing, hotel, and miscellaneous buses as reported for 1925-29 were classed as city buses. A small number of buses for each year not accounted for owing to discrepancies between sub-totals and totals were also classed as intercity.

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