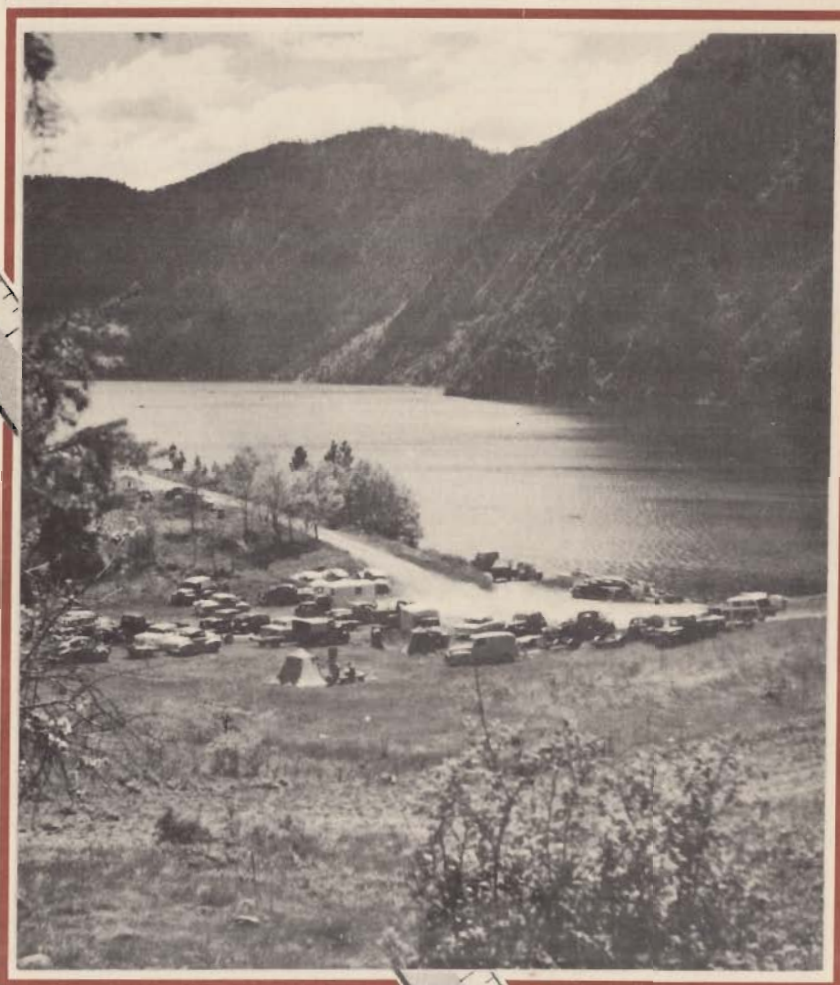


VALUE OF FOREST HIGHWAYS IN IDAHO



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VALUE OF FOREST HIGHWAYS IN IDAHO

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and

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Research in cooperation with the

IDAHO DEPARTMENT OF HIGHWAYS

and the

U. S. DEPARTMENT OF COMMERCE,

BUREAU OF PUBLIC ROADS

September, 1959

WORKING ARRANGEMENTS AND SUPPORT

Largely through the efforts of G. Bryce Bennett, State Highway Engineer in Idaho, and L. C. Cady, Executive Secretary of the Research Council for the University, a research contract between the Idaho Department of Highways and the University of Idaho was drawn late in 1957. The title of the overall project is Value of Roads to and in Public Lands in Idaho. In August, 1958, the first report was issued. This was entitled VALUE OF ROADS TO AND IN PUBLIC LANDS, Preliminary, Part 1, Vol. 1, Effect on Timber and General Values.

Although this volume is entitled Value of Forest Highways in Idaho it is considered a part of the major overall project.

The organization of the project is as follows--

Project Director; Norman Nybrotten, Research Professor,
College of Business Administration.

Advisory Committee; David D. Kendrick, Dean and Professor,
College of Business Administration, Chairman of Committee.

L. C. Cady, Dean of the Graduate School and Executive Secretary of the Research Council.

Earl F. Cook, Dean of the College of Mines and Director of the Bureau of Mines and Geology.

Ronald D. Ensign, Associate Director of the Agricultural Experiment Station.

Allen S. Janssen, Dean and Professor, College of Engineering and Director of the Engineering Experiment Station.

Ernest Wohletz, Dean of the College of Forestry and Director of the Forest, Wildlife and Range Experiment Station.

Liaison; Idaho Department of Highways, Edward W. Equals,
Planning Survey Manager.

U. S. Bureau of Public Roads, Region 8; John Sargent, Planning and Research Engineer; William Hall, Highway Engineer; Clifford R. Salmen, Divisional Engineer for Idaho.

UNIVERSITY OF IDAHO
MOSCOW, IDAHO

OFFICE OF THE PRESIDENT

September 16, 1959

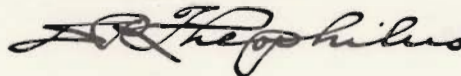
Mr. G. Bryce Bennett,
State Highway Engineer
State Department of Highways
State Capitol
Boise, Idaho

Dear Mr. Bennett:

I take great pleasure in transmitting the second report of research results from our cooperative project entitled "Value of Roads to and in Public Lands in Idaho." Work on this should be of especial interest to people in Idaho. To those who must make value determinations involving roads serving the extensive public lands in Idaho, it must be imperative reference material. We regard it as a major research project at the University and appreciate the opportunity to be of service.

The report, Value of Forest Highways in Idaho, treats many facets of values derived from forest roads. Most surely this treatise will help clarify many of the issues involved and be helpful to those responsible for translating them into action in the best public interest.

Sincerely,



D. R. THEOPHILUS
President

DRT:fes

FOREWORD

by Chairman of the Advisory Committee

In order to make a contribution to knowledge, research into economic values must usually deal with relatively elusive factors. Upon analysis many such factors can be isolated for measurement. Other factors have no meaning in isolation and can be measured realistically only in conjunction with other factors.

The value of forest roads must be derived from the economic activities served by the road. If the issue is one of incurring costs to serve the same unchanged activities as would be served without incurring the costs, the economic analysis need only to match the costs against gains through increased efficiency. In a growing, dynamic area such as Idaho this is not possible because these functions are destined to change in both nature and magnitude. Many of the values of the Forest Highways in the state are relatively hidden in potential growth. Some of the values are depressed for lack of understanding and development. It is through fostering a better understanding of the functions served and clarifying prospects for relevant change that this report makes its principal contribution.

David D. Kendrick

PREFACE

Under certain assumed conditions there can be a high direct relationship between value and cost. In order to have a high relationship it is necessary to have open market conditions and an alternative of buying or producing. There is no direct market for public roads. The value of these roads must therefore be determined through indirect means.

Some of the means of evaluation--such as the more obvious road-user savings--may lend themselves to ordinary accounting. In many instances, such obvious savings are sufficient to warrant road improvements. In other instances it is necessary to evaluate less tangible factors in order to determine the economic feasibility of road improvements or construction. Upon first analysis some of these factors may seem rather unrelated to the issue, but they are nonetheless of importance. These hidden values are often of vital and major importance. Some of them must be estimated through projections into the future. This study has dealt only in a minor way with those factors which appear obvious. Chapter II contains more of the obvious, clear-cut type of analysis than appears in other chapters.

In several of the chapters various functions are related to the Forest Highways. Evaluations of such functions are generally not made but the relationship to highway travel is explained. It is hoped that these explanations will be helpful to those who should ultimately make evaluations--road planners and legislators. It is especially hoped that the elements suggested, in Chapter IX, for improving apportionment of the Forest Highway Fund, will be helpful to those responsible for carrying out the directives of Congress in this matter.

Mainly for reasons of expediency the Preface is written by the Project Director. Dr. Wade H. Andrews, junior author, was employed on the project from February 15 to August 15, 1959, and worked mainly on Chapters V, VI, and VIII.

The study has received advice and information from many colleagues at the University of Idaho, from departments in the State government, the U. S. Forest Service, and private industry. At the University Dr. Harry C. Harmsworth was helpful in sociological analyses; Lewis S. Prater was very helpful in analysing mineral resources of the State; George D. Frazier furnished many data on the Idaho forest industry; James W. Anderson did field work for the study of forest communities; Leon Richard Weeks did legal research; members of the Advisory Committee have been available for consultation and have helped organize cooperation with the University; Sharon DeWitt has done both clerical and secretarial work and has done much to prepare the final draft.

The cooperation of the Idaho Department of Highways has been indispensable. L. P. Sheesley has responded gracefully to a multitude of requests for highway data and reports upon which the authors drew freely. Robert Hanson helped furnish sociological data related to highways. Frank Merritt has meticulously done the cartographic work and helped in getting the report processed. Edward W. Equals, Idaho Department of Highways, and John Sargent and William Hall, U. S. Bureau of Public Roads, have been very helpful in consultation and in furnishing materials for analysis.

University of Idaho
Moscow, Idaho
September, 1959

NORMAN NYBROTEN

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REPORT OF THE COMMISSIONER

The first part of the report contains a general statement of the work of the Commission during the year. It is followed by a detailed account of the work of each of the several divisions of the Commission. The report then gives a summary of the work of the Commission during the year, and a statement of the work of the Commission during the year.

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INTRODUCTION

General

A complex system of public road or highway classification has evolved in the United States. The basis for classification is ordinarily either the service rendered by the road or which unit of government has primary responsibility for the road. Ordinarily the reasons for classification are administrative and fiscal. Different, and often overlapping, financial programs apply to different highway or road designations. The "forest highway" is a designation based on the service rendered by the road. "The term 'forest highway' means a forest road which is of primary importance to the States, counties, or communities within, adjoining, or adjacent to national forests." This is based on a forest road being "a road or trail wholly or partly within or adjacent to and serving the national forests." (U.S. Code Annotated 23 Sec.101.) In this definition the proximity of both the geographic units served and the roads, in relation to national forests, seem to be factors defining a Forest Highway. In Section 3 (b) of the Federal-Aid Highway Act of 1958 the proximity seems to apply to roads only. ⁽¹⁾ From this definition the road may be on a county or state system and may receive various financial support. In addition, it may vary from a trail to the most advanced type of arterial highway.

In this report the term will be written as "Forest Highway" and there is to be assumed a mutual interest, in sharing the services of the road, between the national

forest as one entity and the State, County, or community as the other, in order that the road receive this designation. If the mutuality of interest is strong enough it is assumed that proximity is rather automatically allowed.

In Idaho with its more than 20 million acres of national forest land distributed throughout the State, there are relatively few roads upon which it is uncommon to see logging trucks, fire-fighting trucks, or other vehicles serving the national forests. Many of the State's communities, some of them being the major communities, are quite dependent upon or serve the national forests in a rather direct manner. Intermingled with the traffic caused by the proximity of the national forests is the ordinary traffic usually found on highways, some of these being segments of a trans-continental system serving in a very general way the region and nation.

The Problem

The growth in Forest Highways in Idaho especially as measured by growth in the expenditures, has not kept pace with the growth of the general highway program either in Idaho or in the Nation. To what extent the growth should have kept pace is a question that ought to be answered. Is the growth in the Forest Highway program retarded because the roads do not give adequate service, serve an area of retarded growth, or is there some other reason?

The Forest Highways, because of their being singled out from other highways by legal definition, have a complex sponsorship. The Federal Government has expressed a recognition of obligation in appropriating money to the Forest Highway Fund.

(1) The full text of this section is included in the Appendix. For a fuller legal interpretation of the terms see "Legislative and Administrative Development of the Forest Highway Program," also in the Appendix

Whether the amount appropriated in total at the national level is adequate and whether the Fund is distributed among the states in a manner and in amounts that most effectively enhance the best mutual interests of the State of Idaho and the Nation begs intensive investigation. At present half of the Forest Highway money received by a state is determined by the value of the national forest within that state and yet this very value is largely determined by the adequacy of the roads serving the national forests -- consequently national forest land, however high the potential value with adequate roads might be, receives less money for roads if its value is low because roads are lacking. The forest economy in large parts of the national forest area in Idaho is relatively immature, underdeveloped, and consequently has a much lower current value than potential value.

Rather than being based on the current value of the resource being served by the road to be built, it appears that the allocation of funds for road building ought to be based on the value of the road as reflected, at least partly, by the net change in the value of the resource. The value of the road is derived from its use--albeit this may be complex and varied from the standpoint of the economic evaluation.

Many of the values--especially those not directly associated with material production but serving the general public--are difficult to assess and to establish as to incidence of benefit. Some of these values are, however, of utmost importance in the life and living of individuals and in the development and defense of the Nation.

Objectives and Scope

The primary objective of this report is to present, quantitatively if feasible, such results of study that lead to a better evaluation of the services rendered, or might be rendered, by Forest Highways in Idaho. Although many of these results per-

tain in various degrees to the Pacific Northwest in general, the major emphasis will be given to those of especial importance to Idaho. Factors and conditions on which it is deemed that knowledge is somewhat commonplace will not be given emphasis. An effort will be made to stress relevant factors and conditions peculiar to Idaho, giving added attention to those areas and conditions most affected by Forest Highways either as they exist or as they might exist in an expanded program.

An explanation of the financial and physical relationships of Forest Highways to the general highway program in Idaho will be made. Comparisons of the systems--use and support--will be based on statistics made available; primarily from the Idaho Department of Highways, from the U.S. Bureau of Public Roads, the U.S. Forest Service, and several other sources.

Factors of apparent economic importance and associated with services of roads which either are or could be designated as Forest Highways will be presented. Some of these are production factors and some consumption factors. Some are private and others are public in nature. Some of the intercommunity relationships and individual-community relationships having bearing on the problem have been studied and will be reported.

In order to encompass the broader aspects of the problem it has been necessary to rely largely on secondary data and the experiences of those most qualified to judge individual issues. An effort will be made to integrate these judgments to bear on the problem, analyse the data or information with the most appropriate method at hand, and present the results in a non-technical manner.

The adequacy of the efforts of the past in building Forest Highways will be treated briefly. These efforts are rather automatically correlated with financial support. An attempt will be made to show how Idaho shares in the Forest Highway Fund and how

she might share differently in a formula which would probably more adequately consider the capacity of states to take responsibility in the development of roads serving the national forests either directly or indirectly.

Although the histories or analysis of certain specific Forest Highway projects are included in the report as examples of what has been done the overall evaluation of a Forest Highway program is not one of the objectives of this report. Information on costs of highways is only incidental. For a complete evaluation of the program it will be necessary to relate these values to costs. Although this study did not consider costs of highways or a highway program as a major objective, it is intended that it should contain information important to those responsible for carrying out the directive of Congress in studying Forest Highway needs (costs of a 10-year program) as set forth in Section 3(b) of the Federal Highway Act of 1958. (Text in Appendix) It is assumed that economic considerations dictate investigations of the values of the facility to be developed in order to determine the amount and nature of development. Unfortunately many of these values can not be added quantitatively in a simple manner, because they are not established by a common market, so they are described and the evaluation necessarily is left to the reader.

Definitions of Highway Terms

The Idaho Department of Highways was requested to define specific highway terms. Not all specific terms used are included in the following list but those not included will be defined where they occur in the report. Three specific sources were listed and the designation following each definition, or part of definition, indicates the source. The three sources are:

(a) TITLE 23 - HIGHWAYS, Public Law 85 - 767, 85th Congress, H. R. 12776

(b) Bureau of Public Roads, 1957, REPORT ON OPERATIONS, FOREST HIGHWAY SYSTEM

(c) State of Idaho, General and Special Laws, Regular 1951

Highway: The term "highway" includes roads, streets, and parkways; and also includes rights-of-way, bridges, railroad-highway crossings, tunnels, drainage structures, signs, guardrails, and protective structures in connection with highways. (a)

Public Lands Highway: Those main highways through unappropriated or unreserved public lands, nontaxable Indian lands, or other Federal reservations. (a)

Forest Highway: A forest road which is of primary importance to the States, counties, or communities within, adjoining, or adjacent to the National Forests. (a)

The Federal-Aid Highway Acts authorize projects on the Forest Highway System to be financed entirely from Forest Highway funds. Inasmuch as Forest Highways are coincident with State highways, county roads, and/or highway district roads, improvements may be financed with Forest Highway funds, other Federal funds, State and local funds, and/or a combination of these funds.

Construction projects which are financed in whole or in part with Forest Highway funds are jointly recommended by the State Highway Department, Regional Forester, and Regional Engineer of the Bureau of Public Roads.

"Projects on Forest highway routes which are also parts of a State or county highway system may be undertaken by the State or county independent of the Federal Government, except in cases of Class 1 and Class 2 Forest highway routes when the State may propose that the project be financed in part with Federal-Aid highway funds. In such cases, the project approval, financing, construction, and maintenance are handled in accordance with regulations

established for Federal-Aid projects." (b)

Forest Development Roads and Trails:

Those forest roads or trails of primary importance for the protection, administration, and utilization of the national forests, or where necessary, for the use and development of resources upon which communities within or adjacent to the national forests are dependent. (a)

Federal-Aid Primary Highways:

Main highways which comprise a system of connected roads selected or designated by each State through its State Highway Department, subject to the approval of the Secretary of Commerce. This system may be located both in rural and urban areas. (a)

The Federal-Aid Highway Act of 1921 directed each State Highway Department to designate seven percent or less of the total mileage within the State as the Federal-Aid highway system. In computing the maximum allowable mileage under the seven percent limitation, those roads or road sections within National Forests, Indian Reservations, or other Federal reservations are not considered although they are eligible for improvement with Federal-Aid funds in the same manner as any other road on the FA Primary system.

Federal-Aid Secondary Highways:

Farm-to-market roads, rural mail routes, public school bus routes, local rural roads, county roads, township roads, and roads of the county road class which comprise a system of connected roads selected by the State Highway Department in cooperation with appropriate local road officials, subject to approval by the Secretary of Commerce. Roads which are included in the Interstate System or Federal-Aid Primary system cannot be designated as Federal-Aid Secondary highways. (a)

This system, authorized by the Federal-Aid Highway Act of 1944, confines selected routes to rural areas except (1) that in any State having a population density of

more than two hundred per square mile as shown by the latest available Federal census, the system may include mileage in urban areas as well as rural, and (2) that the system may be extended into urban areas subject to the conditions that any such extension passes through the urban area or connects with another Federal-Aid system within the urban area, and that Federal participation in projects or such extensions is limited to urban funds. (a)

In 1933 provision was made to allow the use of Federal money in building urban extensions on Federal-Aid highways extending into and through cities. The 1944 Federal-Aid Highway Act created a Federal-Aid Urban System to provide specific matching funds to be used in the improvement of roads and streets within urban areas of 5,000 population or more.

National System of Interstate and Defense Highways:

The term "National System of Interstate and Defense Highways" applies to a system of roads designated within the continental United States, not to exceed forty-one thousand miles in total extent. The system shall be so located as to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers to serve the national defense and to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico. The routes of this system shall be selected by joint action of the State Highway Department of each State and the adjoining States, subject to approval by the Secretary of Commerce. All highways or routes included in the Interstate System as finally approved, if not already coincident with the primary system, shall be added to said system without regard to mileage limitation. This system may be located in rural and urban areas. (a)

Annual authorizations for the specific improvement of the Interstate System were

begun in the fiscal year, 1954. The Federal-Aid Highway Act of 1956 provided for a change in the amount of Federal participation in projects financed with funds authorized prior to June 20, 1956, from a maximum of sixty percent to a general maximum of ninety percent.

Indian Reservation Roads and Bridges: Roads and bridges that are located within an Indian reservation or that provide access to an Indian reservation or Indian land, and that are jointly designated by the Secretary of the Interior and the Secretary of Commerce as part of the Indian Bureau road system. (a)

State Highway: Highways in the State of Idaho, which comprise a system of the principal highway arteries including connecting highway arteries and extensions through cities and villages, and a road to every county seat in the State. (c)

In determining which highways or sections thereof shall be a part of the State Highway System, the Idaho Board of Highway Directors shall consider the relative importance of each highway to existing business, industry, and enterprises, and to the development of natural resources, industry and agriculture and be guided by statistics on existing and projected traffic volumes. The Board shall also consider the safety and convenience of highway users, the common welfare of the people of the State, and their financial capacity to acquire rights-of-way and to construct, reconstruct and maintain State highways. (c)

Local Road: Roads which comprise a system of all public highways in a county, except those included within the State highway system, those included within municipal street systems in incorporated cities and villages, and those under Federal control. (c)

Highway or Good Roads District Road: Roads which comprise a system of all public highways within each such highway or good roads district. (c)

Municipal Street System: All public highways within the corporate limits of a village or city except those which are a part of the State highway system. (c)

Proposed Forest Highway: These are routes deemed of primary importance to a State, county, or community which are within, adjoining, or adjacent to a national forest and have not been designated as Forest Highways but have been selected for study to determine the fiscal needs if they were to be designated as Forest Highways.

Status of Public Roads in Idaho

In the year 1958 there were 40,383.3 miles of road receiving various types of public support in the State of Idaho. Approximately 18 thousand miles were county roads. Over one-fifth of the roads were either Forest Development Roads or Forest Highways showing, although perhaps not fully, the demands of forest land upon the public road systems. (See Table 1.) The Forest Highway system consists of only 1,216.6 miles whereas 37.9 percent of the State's area is in national forest.

Responsibility for Operating and Maintaining Idaho Roads

There is a relatively complex financial structure supporting the public roads in Idaho. Some of the complexity has arisen from within the State and some has come as the result of various Federal programs arising partly as a result of the location of Federal lands in the State.

The State of Idaho operates and maintains roads designated as a part of the State highway system. Funds are provided by State highway user revenues which are supplemented by Federal cooperative funds administered by the U.S. Bureau of Public Roads. State highway user revenues accrue from motor fuels taxes, ton mile taxes, motor license fees, etc.

Table 1. Mileages of public roads on different systems in the State of Idaho (1)

Classification	Miles
State Highways	4,728.5
County Roads	18,056.0
Highway District Roads	9,594.9
National Park and Monument Roads	6.5
National Forest Development Roads	7,494.3
National Indian Reservation Roads	494.0
National Military Reservation Roads	3.0
State Park Roads	6.1
Total Miles of Public Roads	40,383.3

Classed by financial support

Federal-aid Primary System. This system includes 2,969.6 miles of the more important portions of the State Highway System. Of this mileage, 393.0 miles are in National Forests, 321.1 miles in other Federal Reservations and 647.1 miles are on the Interstate Highway System.

Federal-aid Secondary System. This system consists of 4,742.3 miles of which 1,621.6 miles are on the State Highway System and 3,120.7 miles are county and highway district roads.

Federal-aid Urban System. This system includes 69.7 miles, consisting of extensions of the Federal-aid Primary System or supplemental roads and streets in cities of 5,000 population or more. This mileage is not included in either Federal-aid Primary or Federal-aid Secondary mileage.

Forest Highways. The Forest Highways are included in the State, County, and Highway District systems. The Forest Highway System is divided into three classes as follows:

- Class I, 648.9 miles on the Federal Aid Primary System.
- Class II, 303.1 miles on the Federal Aid Secondary System.
- Class III, 264.6 miles on other Forest Highways.

(1) Source: Seventh Annual Report, Idaho Board of Highway Directors, Boise, Idaho, 1958

al-Aid Urban extensions, Federal-Aid Interstate System and the Forest Highway System. Federal-Aid Primary funds and Federal-Aid Interstate funds are limited to use on roads under State administration.

Inasmuch as Federal-Aid Secondary funds and Forest Highway funds are available for use on State highways and local roads, a division of funds is made between the State and local units. The State retains fifty percent of the Federal-Aid Secondary allocation for use on the State highway system. The balance of these funds is distributed to the counties and highway districts, provided local matching funds are made available within prescribed time limits. The distribution of Forest Highway funds within the State is determined jointly by representatives of the State Highway Department, the U. S. Bureau of Public Roads, and the U. S. Forest Service.

State highway user revenues are apportioned by State law, which provides that 70 percent shall be available to the State and 30 percent, but not less than \$1,000,000 annually, shall be apportioned to the local units of government. Of the amount available to local units, 9 percent is allocated among cities and villages with 300 or more residents on the basis of population. Of the balance of the amount of highway user funds available to local units of government, 10 percent is divided equally among the several counties. The remaining amount of 90 percent is distributed among the counties according to mileage of improved roads and revenue received from motor vehicle registrations, with each factor having equal weight. Counties in which highway districts are located further allocate this part of their share of State highway user revenues to these districts, 10 percent equally among the districts, 45 percent on the basis of revenue from motor vehicle registration and 45 percent on the basis of the mileage of improved roads within the district with the county sharing in this part as a district

Cooperative Federal Funds include Congressional authorizations for use in the improvement of the Federal-Aid Primary System, Federal-Aid Secondary System, Feder-

if it builds roads.

Counties are responsible for operating and maintaining all roads within their own boundaries; except those roads which are a part of the State highway system, those in municipal street systems, those in highway districts, and those under federal control. In addition to receiving a share of State highway user revenues, counties derive road and bridge funds from special levies, property levies, bond issues, Federal-Aid Secondary funds, Forest Highway funds, and a Forest Reserve Apportionment is made to counties in which national forests are located. Allocations of Forest Reserve funds to individual counties are based on the acreage of national forest lands contained in each county. Of the amount allocated to a given county, 30 percent is transferred to school funds, leaving 70 percent to be used as road and bridge funds.

Highway districts are responsible for operating and maintaining all roads within their areas of jurisdiction, except those under federal, state, county, or municipal control. As separate and distinct units of government involved in administering roads, highway districts enjoy the same sources of road and bridge revenue, or apportionments thereof, as do the several counties.

Municipalities with a population of 300 or more share in State highway user revenues and county and highway district levies. In addition, street funds are derived from property taxes, bond issues, and parking meter revenues.

In general these funds may not be used for any purpose whatsoever other than for building and maintaining roads and streets. One notable exception to this is that any revenues derived from parking meters may be used for off-street parking facilities.

Chapter II

BACKGROUND, GENERAL ROLE, AND EXTENT OF FOREST HIGHWAYS IN IDAHO

The definition of the Forest Highway was presented in the Introduction. Part of this definition called for a mutual service between the national forests and the State, county, or community. Idaho has vast areas of Federally-owned land. The national forests in Idaho comprise an area greater than half the size of New England and greater than all of the State of Maine. Two-thirds of all the land area in Idaho is Federally-owned. Nearly two-fifths (37.9 percent) of the State's area is in national forest. (See Figure 1.)

History and Development of Policy

The Growth of a National Philosophy Toward Development of the Public Lands

Early in our national, or even colonial, history, the western lands were recognized as a public asset. The principal problem in public policy was how to administer this asset in the maximum interest of the public. Among the leading public figures involved in the philosophical controversies of administering the public lands were Thomas Jefferson and Alexander Hamilton. Hamilton evidently was mainly interested in getting a good price for the land, in relatively large tracts, to improve the cash position of the United States Treasury. Jefferson, stressing the direct relationship between democracy and the widespread individual ownership of property, favored the alienation of lands in small tracts.

That the western lands were a "precious resource" that would "liberate us from our domestic debt, and perhaps, too from our foreign one" was a view held even by Thomas

Jefferson. ⁽¹⁾ Whether the liberation was to come directly from sales revenue only is not clear but, since it is so apparent that Jefferson saw the relationship between the economy of scale gained in operating democratic institutions and the settlement of land, it is probable that he envisaged part of the broadened tax base as a favorable factor in alleviating the federal debt. But during the many years which the Secretaries of the Interior and Commissioners of the General Land Office saw their duty toward the public domain simply as one of getting rid of it they needed no complex plan for conservation and development because they assumed that the buyers would husband the land, and, following the philosophies of John Locke and Jean J. Rousseau, there was no doubt in their minds that this would be in the best public interest.

Even though the philosophy was one of the government's getting rid of the public land the problem of internal improvements was in the minds of some of the responsible public officials and legislators. As early as 1802 money was set aside specifically for roads. April 30, 1802, Congress passed an act which specifically stated that part of the revenues from the sale of public lands should be used for road building. Part of Section 2 of the Act reads as follows: "Three per cent of the net proceeds of the lands of the United States, lying within the state of Ohio, . . . after deducting all expenses incidental to the same . . . shall be applied to the laying out, opening and making roads within the said state, and to no other purpose what-

(1) Ely, Richard T. and George Wehrwein. Land Economics, Macmillan Co., NY, 1940

LAND OWNERSHIP IN IDAHO 1958

SCALE OF MILES
10 5 0 10 20 30 40 50

--LEGEND--

- National Forests --- [light green box]
- National Parks --- [dark green box]
- Indian Reservations --- [light green box]
- Military Reservations --- [light green box]
- A.E.C. Testing Station --- [light green box]
- Public Lands (vacant) --- [pink box]
- State Owned Lands --- [dark grey box]
- Private Lands --- [white box]

- Existing Forest Highways --- [solid black line]
- Proposed Forest Highways [dotted black line]
- State Highways --- [dashed black line]

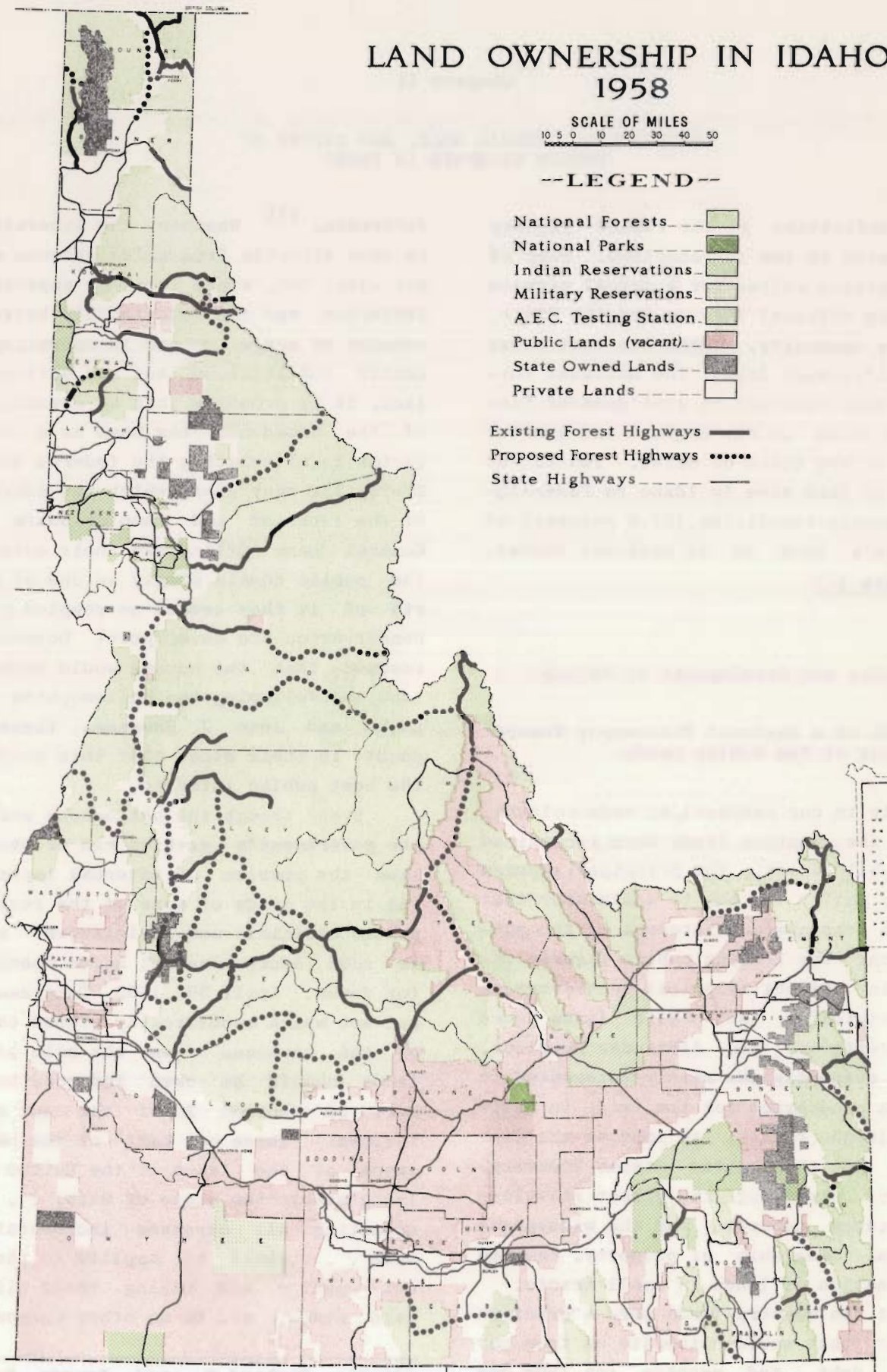


Figure 1. Land ownership in Idaho showing administering agency for public lands

ever;." (2) Evidently the Congress recognized that access roads were of positive value at least in promoting the sale of public lands and perhaps recognized that such access roads would tend to make the land more valuable. This Act was passed during the time that Congress was quite prone to think of sales revenue coming to the United States treasury as being of primary importance. Grants of similar nature, but varying in amounts, were also given to several other states over a period of a few years. Undoubtedly the protection of the public lands--especially protecting them from settlement either ahead of survey or title--was a consideration on the part of some of the legislators. In fact squatters had been removed from some of the public lands prior to this time.

Access to and in the public lands continued to be a problem throughout the nineteenth century. Various grants of lands for wagon roads were made over a period of years. It is especially noteworthy that these seemingly liberal grants were made up of land rather than money. It was, along with other later programs of disposal, a factor which accelerated the alienation of land and ultimately administration and operation. This was to become more complex than merely making the land sell easily.

Had the philosophy, policy of disposal and administration of public lands remained constant in nature the responsibility of the Federal Government would have been simpler. If there had been no alienation of the public lands the national responsibility would have been relatively simple. A task force of government employees could then have been sent into the public lands to operate them in the national interest. The transportation problem would have been one of moving the task force in, keeping it moving at the scene of operation, and also moving the supplies in and the product to

the market. The financial responsibility would simply have been one in the nature of military logistics. Policies and programs with intermediate complexities in financial responsibilities toward the public lands could have evolved--such as restricting the land tenure entirely to leaseholds, rather than freeholds mixed with other degrees of tenure. With the alienation of lands in "crazy-quilt" pattern, the formation of states, and development of local proprietary interests, the responsibility for all kinds of development became seriously confounded.

National Forests Considered

"Some day in the not far distant future the farmer in Kansas, Oklahoma, Nebraska, the Dakotas, or indeed in any of the great farming States, may, when the work of harvesting is over, pack tent and camp equipment in his automobile and, with his family, seek needed rest and recreation almost anywhere in the mountain reaches of the National Forests, east or west. He will be able, if he so desires, to journey at his leisure, camping where fancy leads him and untroubled by the need for making a town or settlement each night. He may go by ways hitherto closed to all but the adventurous tourist with saddle horse and pack outfit, through the mountains of Colorado, with their snow-capped peaks and green parks, or into the beauties and health-giving air of the high Sierras of California, the coast ranges of Washington and Oregon, the northern Rockies (3) or the cool altitudes of the Southwest."

It is probable that the above statement may appear quite optimistic to several of the readers who are acquainted with the remoteness of much of the national forest area in the Pacific Northwest. It will appear that it was especially optimistic when one considers that it was written in 1916. The reason for the particular optimism at that time was the passage of the Federal Aid Road Act of 1916 in which the

(2) United States Statutes At Large II, p. 226

(3) Merrill, O. C., Chief Engineer, U.S. Forest Service, "Opening Up the National Forests by Road Building", Yearbook of the United States Department of Agriculture, 1916, p. 521, Government Printing Office, 1917

congress appropriated a million dollars per year for the next following years for the construction of roads within the national forests, already covering 155 million acres. It might seem very optimistic, even though states and counties interested in national forests were to match these funds at least on a 50-50 basis.

That these funds were to be spent within the national forests was very probably the intent of the legislation. It evidently was not, however, the intent that the money should be spent solely in the interest of forest products because it was argued that within the forests there "are any number of mining camps, small agricultural communities, and individual farms. Counties, and even individuals, have built roads when money was available, and the Forest Service has done what it could with the funds at its disposal, but in spite of all this hundreds of settlers within the National Forests still have no means of communication with the outside world better than a pack trail." (4)

The author of this quotation certainly envisaged what was essentially later to be classified as a "forest road" of community importance as set up on the 1921 act and what is now termed a Forest Highway. The recreational use of forests was emphasized greatly at the time.

Although it still may not be clearly understood in a general way, the Secretary of Agriculture in his 1914 report stated that the Secretary should have an appropriation of funds for opening up the national forests and that this fund should not be raised out of proceeds of the forests. The reason for this is, as Merrill maintains, that "while it is true that the potential value of National Forest resources is exceedingly great, the money receipts from the sale of timber and from other uses are in many cases at present very small, due

(4) Ibid. p. 523

tudes. Evidently Indians could be very helpful in giving information as to existing paths and trails but, because of their wariness of the white man's invasion, could not be trusted entirely.

Captain Mullan stated that in his seven years he was not able to find a feasible course for the road farther south than the one he had chosen. ⁽⁶⁾ His report indicates that the Nez Perce Indians very nearly showed him the route that was later to become NFH Number 16. This is one of the Forest Highways already designated but part of it has not yet been built. It is to become part of the Lewis and Clark Highway. Even if he had been thoroughly versed on all the merits of the trail along the Lochsa River, it is doubtful that he would have recommended the route because of the value placed on serving locally along the road and his estimation of agricultural potential in other areas. This was true despite the fact that it was to be a military road, perhaps indicating that Mullan was aware of the mutuality that should exist among the users.

Areas Served

The national forests, and Forest Highways, are located in 41 states and Puerto Rico. Idaho ranks closely second only to Alaska in the amount of national forest. However, Idaho ranks first by a wide margin in the percentage of the state's area in national forest. In miles of Forest Highway per million acres of national forest, Idaho, with only 60 miles per million acres, ranks lower than all of the states except Alaska and Wyoming. This is true despite the fact that only four states have more Forest Highway than Idaho. This is evidence of the magnitude and importance of the problem in

⁽⁶⁾ Mullan, John, Captain U.S. Army, Report on the Construction of a Military Road From Fort Walla Walla to Fort Benton, Government Printing Office, Washington, 1863

the State's finances and development and the husbandry of the national resources in the State. (See Table 2.)

The Federal lands in Idaho are so located that they form a transportation problem beyond even what might be expected from either the vastness of the area or the percentage of the State's area constituting Federal land. The large area of Forest land, most of it very rough in terrain, lies in a north-south elongation forming a barrier to east-west transcontinental travel and to a considerable extent to within-state travel. To the nation as a whole this makes a formidable barrier. (See Figure I, Appendix.) Three principal east-west routes in northern Idaho contain segments of Forest Highway on which it is necessary to travel in order to cross the State. South of U.S. No. 10 (Forest Highway No. 7) there is no feasible east-west road north of Yellowstone National Park.

The public land barrier has left the State with many missing links in the highway network. Figure 2 shows that some of these have been bridged by the existing Forest Highways, whereas others would be bridged by proposed Forest Highways. The roughness of the terrain indicated in the relief map on the back cover largely accounts for the location of present roads and the routes proposed.

To some extent the national forest lands in the State are interspersed with lands in other uses and in other ownerships but the national forests are made up mainly of large blocks of land. However, many of these large blocks of land project into the agricultural areas and often leave only narrow corridors, usually the more fertile mountain valleys, which are being farmed or ranched.

People served locally: For the purposes of this project the Idaho Department of Highways made a tabulation of the number of people served directly by each Forest

Table 2. Relationship of the area of national forests to the states and territories and mileage of the forest highway system converted to miles per million acres of national forest as of June 30, 1958 (a)

State or territory	Total state area (thous-ands of acres)	Nat'l. forest area as of June 30, 1955 (thous-ands of acres)	Percent of state's area in national forest	Total mileage of forest highway	Miles of forest highway per million acres of nat'l. forests*
<u>WEST</u>					
Arizona	72,902	11,334	15.3	1,055.3	93
California	101,564	19,949	19.6	2,454.5	123
Colorado	66,718	13,737	20.6	1,493.7	109
Idaho	53,476	20,276	37.9	1,216.6	60
Montana	94,168	16,609	17.6	1,193.7	72
Nevada	70,746	5,057	7.1	368.9	73
New Mexico	77,866	8,611	11.1	655.6	76
Oregon	62,068	14,820	23.9	1,416.0	96
South Dakota	49,310	1,119	2.3	302.0	270
Utah	54,346	7,801	14.4	747.8	96
Washington	43,643	9,689	22.2	737.6	76
Wyoming	62,665	8,567	13.7	477.0	56
Alaska	375,296	20,741	5.5	401.2	19
<u>EAST</u>					
Alabama	33,030	621	1.9	367.8	592
Arkansas	33,985	2,360	6.9	633.3	268
Florida	37,478	1,074	2.9	289.9	270
Georgia	37,681	666	1.8	364.5	547
Illinois	36,096	211	0.6	301.8	1,430
Indiana	23,226	116	0.5	101.2	872
Iowa	36,019	5	-	20.0	4,000
Kentucky	28,853	457	1.8	351.4	769
Louisiana	31,055	561	1.8	398.2	710
Maine	21,258	46	0.2	14.0	304
Michigan	37,258	2,539	6.8	1,163.8	458
Minnesota	53,804	2,718	5.1	718.1	264
Mississippi	30,538	1,047	3.4	539.1	515
Missouri	44,591	1,359	3.0	1,000.5	736
Nebraska	49,432	206	0.4	23.5	114
New Hampshire	5,955	677	11.4	166.0	245
North Carolina	33,736	1,114	3.3	831.4	746
North Dakota	45,226	-	-	-	-
Ohio	26,382	104	0.4	133.6	1,285
Oklahoma	44,478	181	0.4	46.2	255
Pennsylvania	29,013	470	1.6	353.9	753
South Carolina	19,875	587	3.0	777.5	1,325
Tennessee	27,037	584	2.2	566.5	970
Texas	171,097	658	0.4	347.2	528
Vermont	6,420	229	3.6	119.1	520
Virginia	26,122	1,442	5.5	1,371.8	951
West Virginia	15,476	904	5.8	484.1	536
Wisconsin	35,939	1,464	4.1	469.1	320
Puerto Rico	2,198	33	1.5	44.6	1,352

(a) Source: U.S. Department of Commerce, Bureau of Public Roads. Report of Operations on Forest Highway System. Compiled from Tables 1 and 3.

* Derived by Idaho Department of Highways, Planning Survey.

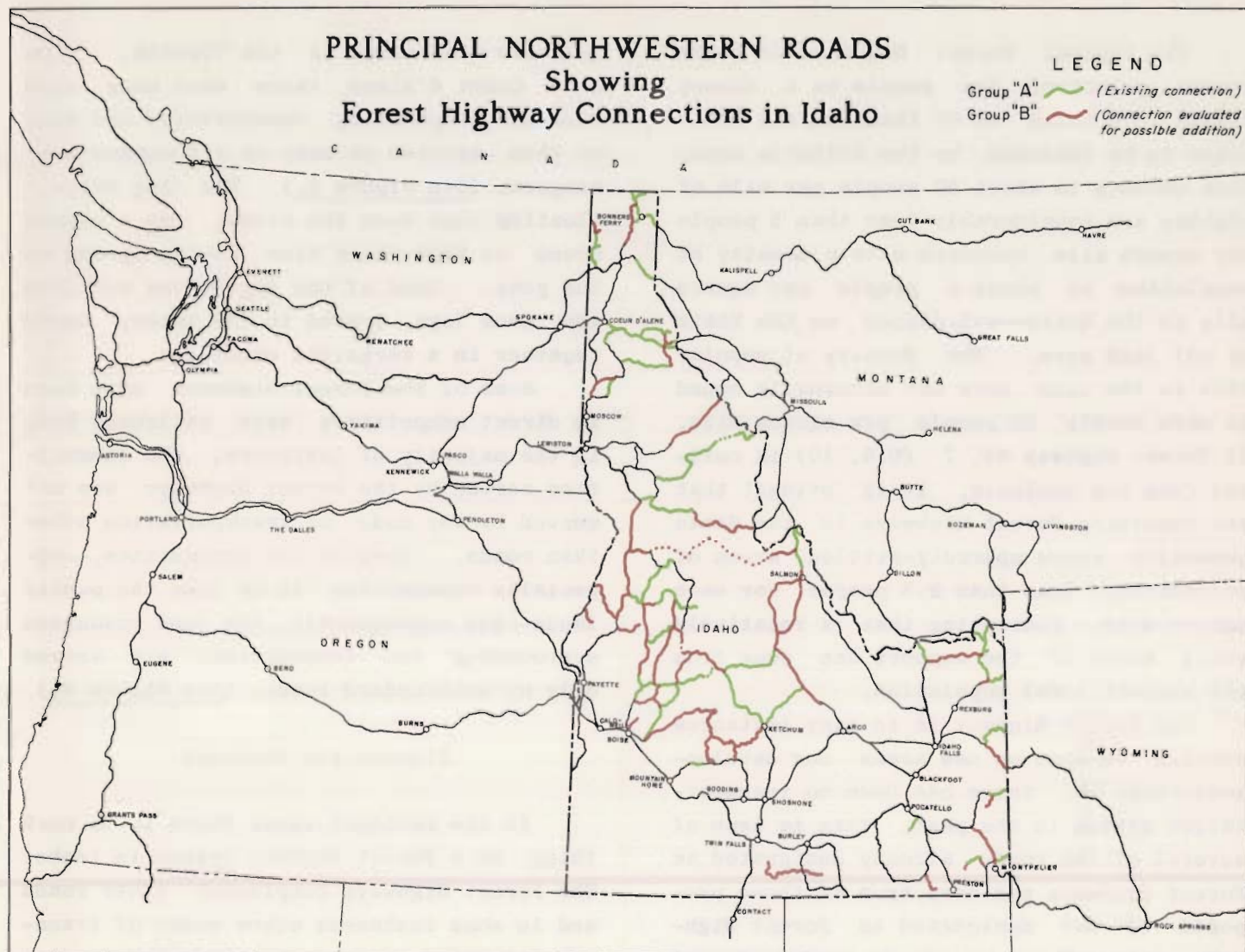


Figure 2. Map indicating gaps and connections in Idaho forest highways in relation to roads of the Pacific Northwest

Highway in the State. The need for the Forest Highway as direct access to their place of residence was the general criterion used for determining dependence on the highway in question.⁽⁷⁾ Impassable natural barriers were used as delineations of area served

⁽⁷⁾ The report to the project director (April 2, 1959) states, in part--"The criterion of direct access was used to delineate the area served with one exception: Area extension from the route was restricted to a five-mile band when access to the Forest Highway was direct, but alternative facilities were available."

where such barriers exist. (See Table II in Appendix.)

From the standpoint of determining both the complete needs for highways and the financial support to be expected from these local people, it would be desirable to have a rather complete inventory of such occupational and living factors which would affect their highway travel--also of the resources controlled. This was not feasible for this study but some data on place and season of dwelling were made available.

The typical Forest Highway in Idaho serves relatively few people in a direct manner. A total of 65 thousand was estimated to be included by the criteria used. This amounts to about 50 people per mile of highway and considerably less than 5 people per square mile compared with a density of population of about 8 people per square mile in the State--calculated on the basis of all land area. The density of population in the land area not nationally owned is more nearly 20 people per square mile. If Forest Highway No. 7 (U.S. 10) is omitted from the analysis, it is evident that the remaining Forest Highways in the State generally serve sparsely-settled areas of considerably less than 2.5 people for each square mile, indicating that a relatively small share of the support can come from the present local population.

The Forest Highway is in many instances serving to open up new areas for development--that is, there has been no transportation system in the past. This is true of several of the roads already designated as Forest Highways and more true of those proposed but not designated as Forest Highways. Some of the routes or roads proposed as Forest Highways are absolutely non-existent at present--even some of those already designated are impassable at times and others of the roads have not been completed so as to allow travel the full length of the designated route, the Lewis and Clark road being a notable example of a road not "punched through."

Some of the heavily forested areas of northern Idaho furnish watersheds creating sizeable streams and bodies of water. The early road and railroad policy considered the termini of water transportation seriously in planning facilities. At about the beginning of the 20th century the steamboat was important in passenger service--especially on Lake Coeur d'Alene and tributary water--and was equally important in carrying equipment and supplies to logging com-

munities and camps in the forests. On Lake Coeur d'Alene there were many such steamboats operating concurrently and some of them carried as many as a thousand passengers. (See Figure 3.) The "log drive," floating logs down the river, was a common scene at high-water time in the spring of the year. Some of the log drives continue and some logs travel in the water, bound together in a bargelike condition.

Some of the Forest Highways have been in direct competition with railroads but, in the majority of instances, the communities served by the Forest Highways are not served by any mode of transportation other than roads. Many of the communities,--especially communities in or near the public lands--and consequently the land resources surrounding the communities, are served only by substandard roads. (See Figure 4.)

Finance and Revenues

In the ordinary sense there is no such thing as a Forest Highway system in Idaho. The Forest Highways complement other roads and in some instances other modes of transportation in a manner bringing about integrated facilities for travel. Some of the roads designated as Forest Highways are also parts of other road designations and receive other types of financial support. Table I in the Introduction shows that there are at present 648.9 miles of Class I Forest Highways on the Federal Aid Primary System, 303.1 miles of Class II on the Federal Aid Secondary System and 264.6 miles of other Forest Highways designated as Class III. These are classes of predominant use--Class I being through traffic, III being of mainly local nature, and II being intermediate. The locations of these roads, how they are classified, and how they are integrated into other systems are shown in Fig. II of the Appendix. It is evident from Table I in the Appendix that about seven-eighths of the vehicular miles occur on the



Figure 3. Steamboat of the type existing on Lake Coeur d'Alene at the beginning of the forest highway program

Class I segments of the system.

The Federal funds received for Forest Highways by the State of Idaho are of great importance in the overall financing of the roads in the State. These funds currently account for about 10 percent of all highway funds on the State Highway System. (See Table III, Appendix.) From 1917, the time of the inception of the first Federal highway aid setting up the cooperative program between the Federal government and complying states, until June 30, 1958, a total of about \$168 million of Federal aid had been received for the Idaho State Highway System. Of this amount about \$39 million had come directly from the Forest Highway Fund to be used on the Forest Highways in the State. There were also miscellaneous Federal funds used on Forest Highways. These funds came from a variety of Federal agen-

cies whose objectives required access to some of the more remote resources in the State. In the aggregate the miscellaneous federal funds amounted to over \$6.4 million so that in total, including the Forest Highway Fund, there had been a total of about \$45.5 million of Federal aid designated to Idaho Forest Highways by June 30, 1958. (See Table 3.)

Except for about a 3-year period during World War II there has been an upward trend in the expenditures of money on the Forest Highways coincident with the Idaho State Highway System. In the beginning of the 1940-56 period somewhat less than one million dollars were spent per year whereas by the decade of the 1950's this figure had risen to around the three-million mark and in some years nearly four million. Some of this was due to dollar devaluation and in-

ROAD OR AIRPLANE FACILITIES SERVING IDAHO COMMUNITIES

LEGEND

- TOWNS OR PLACES SERVED BY PAVED ROADS
- TOWNS OR PLACES NOT ON PAVED ROADS
- AIRPLANE LANDING STRIP
- AIRPORTS WITH PARTIAL FACILITIES

(The towns or places shown have a population of 25 or more and /or have a post office, and are not served directly by a railroad.)

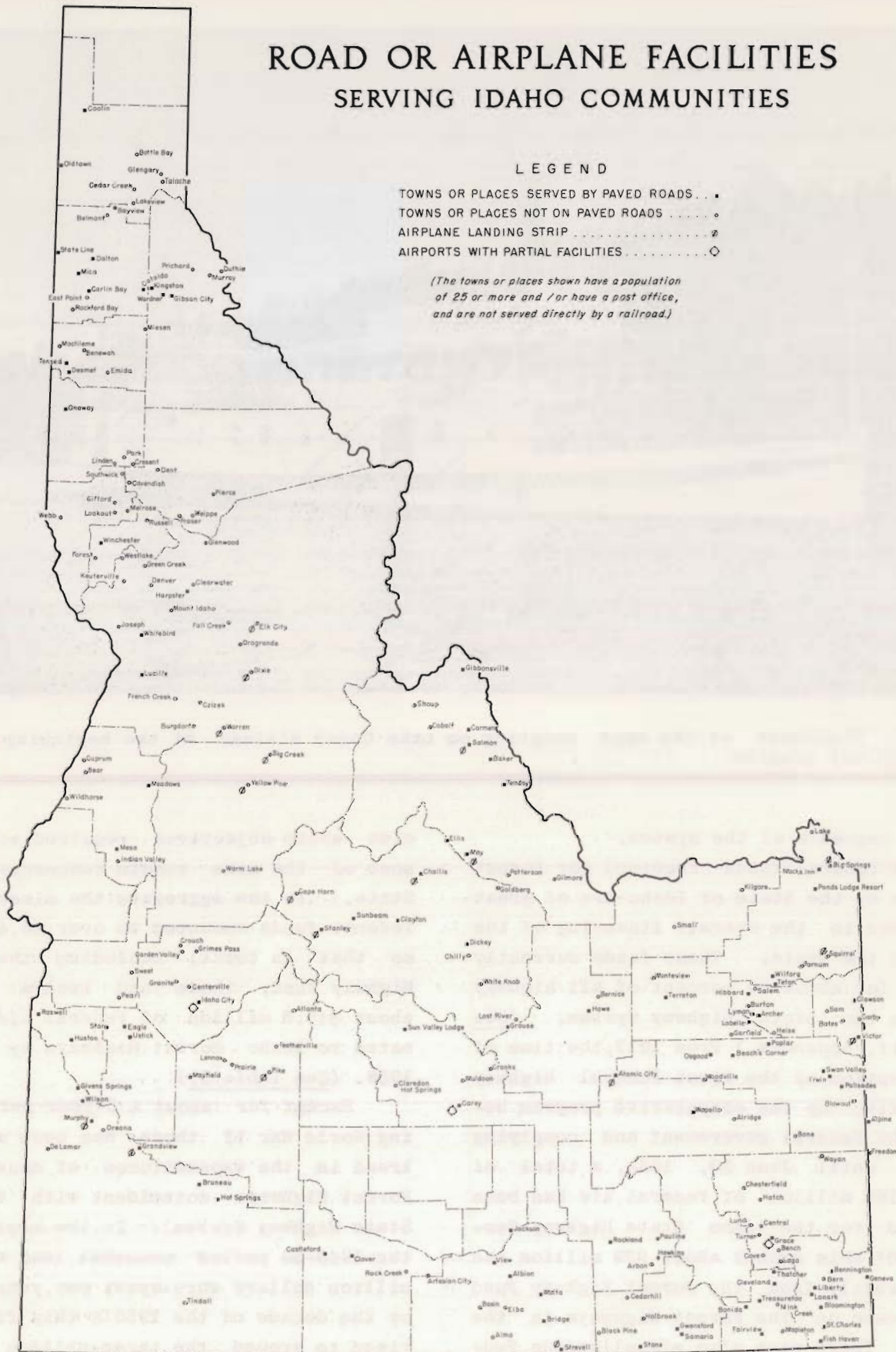


Figure 4. Map showing how places in Idaho with either at least 25 people or a post office are served with road or airplane facilities

Table 3 Summary of Federal Funds to the State Highway System

	Regular Federal Aid To State (3)	Emergency Funds	U.S. Army Engineer (1)	U.S. Recla- mation (2)	Public Land Funds	Federal Funds To Forest Highways	Misc. Funds To Forest Highways (1922)	Total Funds To Idaho
1917 - 1925	\$ 6,679,550.99	\$	\$	\$	\$	\$ 1,891,838.00	\$	\$ 8,571,388.99
1926	936,927.00					511,777.00		1,448,704.00
1927	944,988.00					511,021.00		1,456,009.00
1928	935,193.00					509,944.00		1,445,137.00
1929	932,962.00					502,652.00		1,435,614.00
1930	933,902.00							
1931	1,588,192.00	1,088,095.00			174,316.00	491,648.00		1,425,550.00
1932	1,554,594.00				103,580.00	938,836.10		3,759,679.10
1933	1,330,488.00	1,505,913.00*			10,698.00	946,904.51		2,605,078.51
1934	115,987.00	3,323,116.00			214,892.00	1,018,281.21		3,895,380.21
1935	137,072.00	1,964,596.00				1,507,272.64**		5,191,267.64
1936	1,352,745.00	3,178,387.00			114,708.00	710,576.00***		2,986,952.00
1937	1,536,486.00	490,857.00			104,108.00	735,550.00		5,370,790.00
1938	2,069,639.00	332,718.00			92,791.00	723,834.00		2,750,877.00
1939	1,851,962.00	187,487.00			37,509.00	963,408.00		3,458,556.00
1940	1,422,303.00	20,198.00			95,101.00	962,407.00		3,039,375.00
1941	2,041,054.00	2,436.00			687,173.00			2,224,775.00
1942	899,920.00	14,442.00			893,720.00			2,974,862.00
1943	1,453,846.00	822,524.00			12,263.00	720,348.00		1,446,973.00
1944	295,948.00	394,730.00			48,889.00	718,462.00		3,043,721.00
1945	128,060.00	94,374.00			5,432.00			690,678.00
1946	1,211,032.88	31,271.29				687,173.00		227,866.00
1947	2,925,106.05	35,105.37	19,120.81	865,972.92		2,553,938.00		3,786,242.17
1948	2,535,370.68	56,445.98	29,176.68	167,186.42		2,549,387.00		6,385,571.34
1949	2,782,355.42			268,619.66				2,724,677.91
1950	3,381,808.57	233,886.76	285,964.34	542,168.66		2,036,433.00		3,136,537.74
1951	3,586,109.39	25,565.22	497,776.82	267,046.95		2,040,877.00		6,480,261.33
1952	3,846,003.57	46,065.59	1,453,069.40	1,286,534.54		2,044,361.00		8,417,373.38
1953	6,577,610.16	2,282.45	405,567.14	2,017,632.39		2,037,716.00		8,673,034.10
1954	9,747,805.46		106,445.11	456,054.64		2,291,973.00		11,040,788.14
1955	7,767,468.35	106,926.86 (1)		7,508.14		2,289,655.00		12,602,278.51
1956	8,586,819.36	260,823.24		3,340.66		2,289,655.00		10,064,631.49
1957	9,543,904.85	4,805.80		3,523.84	420,509.00 (5)	2,290,177.00		10,986,741.88
To June 30, 1958	1,197,591.56		149,635.71	3,523.84		3,054,441.00		12,510,194.09
TOTALS	\$97,635,855.29	\$14,212,948.56	\$2,946,756.31	\$5,885,588.82	\$1,562,448.00	\$41,451,265.46		7,409,997.91
								\$163,894,863.44

* For 1932 and 1933

** National Recovery Forest Highway Funds

*** NRHF Funds \$473,196.00; FHCF Funds \$267,360.00

(1) For constructing State Highway No. 21 around Lucky Peak Dam and Reservoir

(2) For constructing State Highway No. 15 around Cascade Reservoir, and State Highway No. 29 around Palisades Dam and Reservoir

(3) Federal Aid Primary, Federal Aid Secondary, Federal Aid Urban

(4) Flood Relief in various localities

(5) \$13,509.00 - 1955; \$407,000.00 - 1957

FFRC	\$ 739,205.65
Sec. 8	1,130,466.16
EFH	614,336.00
FRD	1,146,361.86
10%	929.86
HNH	368,350.00
NRFRD	35,555.24
E.C. Dev.	4,924.32

Total Miscellaneous Forest Funds 1917 to Date \$ 4,040,128.89

Grand Total of All Funds for Idaho \$167,934,992.33

creased construction costs in current dollars but an adjustment for this shows that the program in the decade of the 50's was approximately twice that in the beginning of the period. (See Figure 5.)

To what extent funds from different agencies are spent independently or are tied together in a matching program wasn't clear from data immediately available. A determination of this could not be made by studying the laws and administrative policies because an individual road job, and consequently the financial arrangement, would often be decided on its own merits. This is especially true in the case of the financing received from localities.

Table 4 shows the accumulated totals of funds spent on Forest Highways in Idaho, the West, and in the Nation. In the first analysis it appears that, in Idaho, an undue portion of the Federal money has been spent on Class I roads relative to the other two classes. The 1958 figures show that in Idaho 74 percent of the total from all funds had been spent on Class I roads while nationally only 61 percent had been used on Class I and in the West 62 percent.

Actually the percentage of the State and local funds used on Class I routes in Idaho is greater than the Federal. Of the State and local funds spent on Forest Highways, 86 percent was spent on Class I compared with 71 percent of the Federal. Of the funds provided by the U.S. Forest Service for Idaho Forest Highways only 32 percent was spent on Class I, whereas 58 percent was spent on Class III. This situation is not one peculiar to Idaho but the conclusion can be drawn that local support has been more available for main-stem roads than for those of greater urgency in the more immediate interest of the national forests. What is quite different in the case of Idaho is that only about 2 percent of the State and local funds spent on Forest Highways was on Class III roads compared with the 58 percent spent by the U.S.

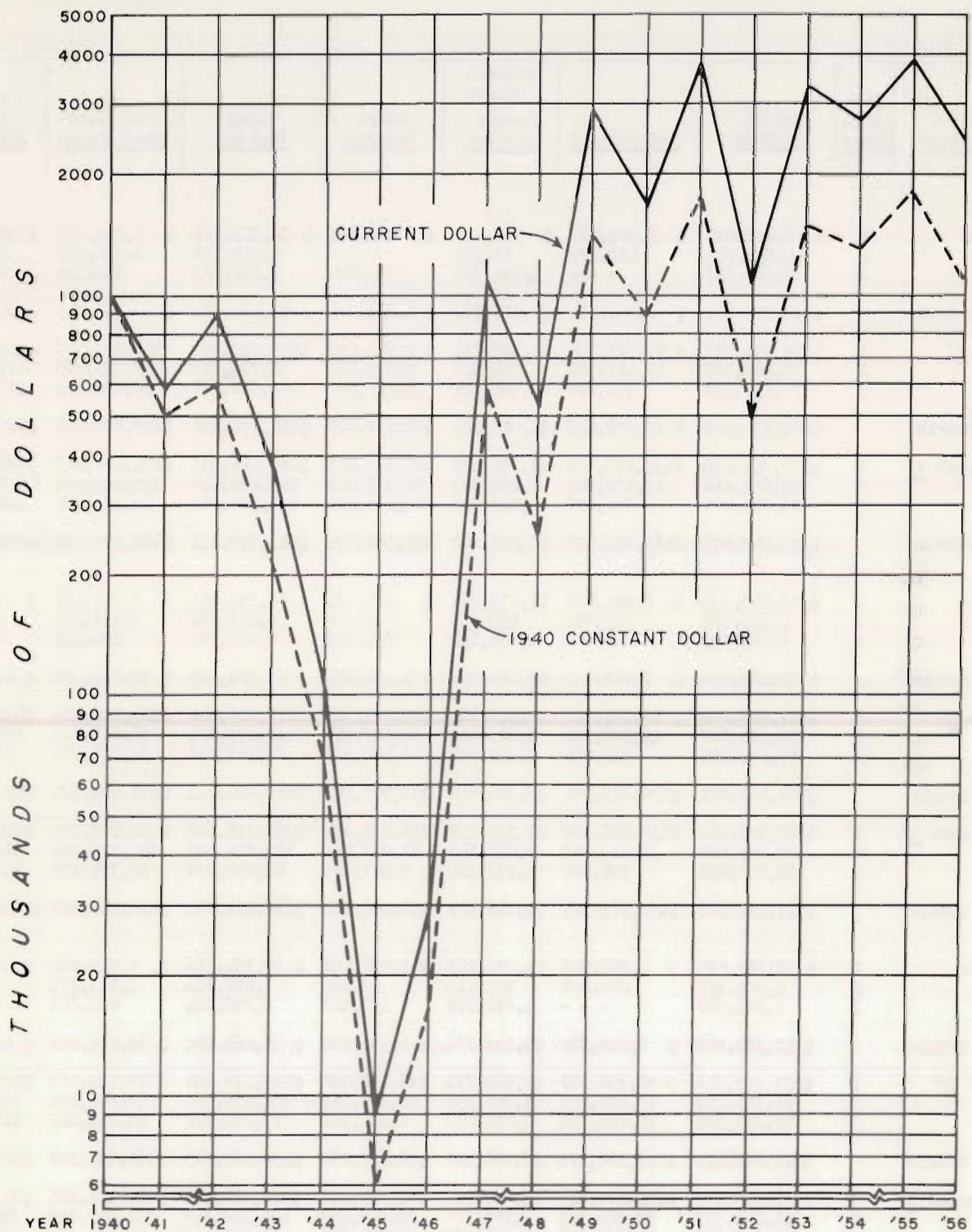
Forest Service and compared with over 22 percent in the West as a whole. A large part of this probably results from the paucity of population near the national forests and the lack of private-land resources either to be developed or to bear the tax burden.

Cost Components of Economic Significance

In early rural road building relatively little equipment or materials other than those immediately at hand were used. For example, stone bridges were fairly common in stony areas and wooden bridges in timbered areas. The building of the roads was a local problem. Farmers furnished both the man power and horse power--in some areas the furnishing of a two-horse team being deemed equal to furnishing one man.

Modern road building calls for various supplies and equipment usually not available locally. So far as the locality is concerned, the cost of materials and supplies has increased in relation to other components of cost. Rather than being done on the job, many of the materials have been manufactured elsewhere and arrive in a more nearly built condition. As a result the on-the-job labor has been decreasing in recent years. This is the case in Federal-aid projects. (See Figure 6.)

An analysis of the components of costs of road building is of economic importance in determining the ability to pay for the road. Whether the early-day, farmer road builder could afford to build roads often depended on the alternative uses for his and his horses' time. He was more likely to have time if his crops were light. He was rather definitely on a "do-it-yourself" basis. Nationally, and to some extent state-wise, this is still the case but the intermediate economic procedure is more complex. Road building creates employment and a market demand to some extent creates the ability to pay for roads.



Source: Idaho Department of Highways, Planning Survey

Figure 5. Construction expenditures on forest highways which are coincident with the Idaho State Highway System, 1940-1956

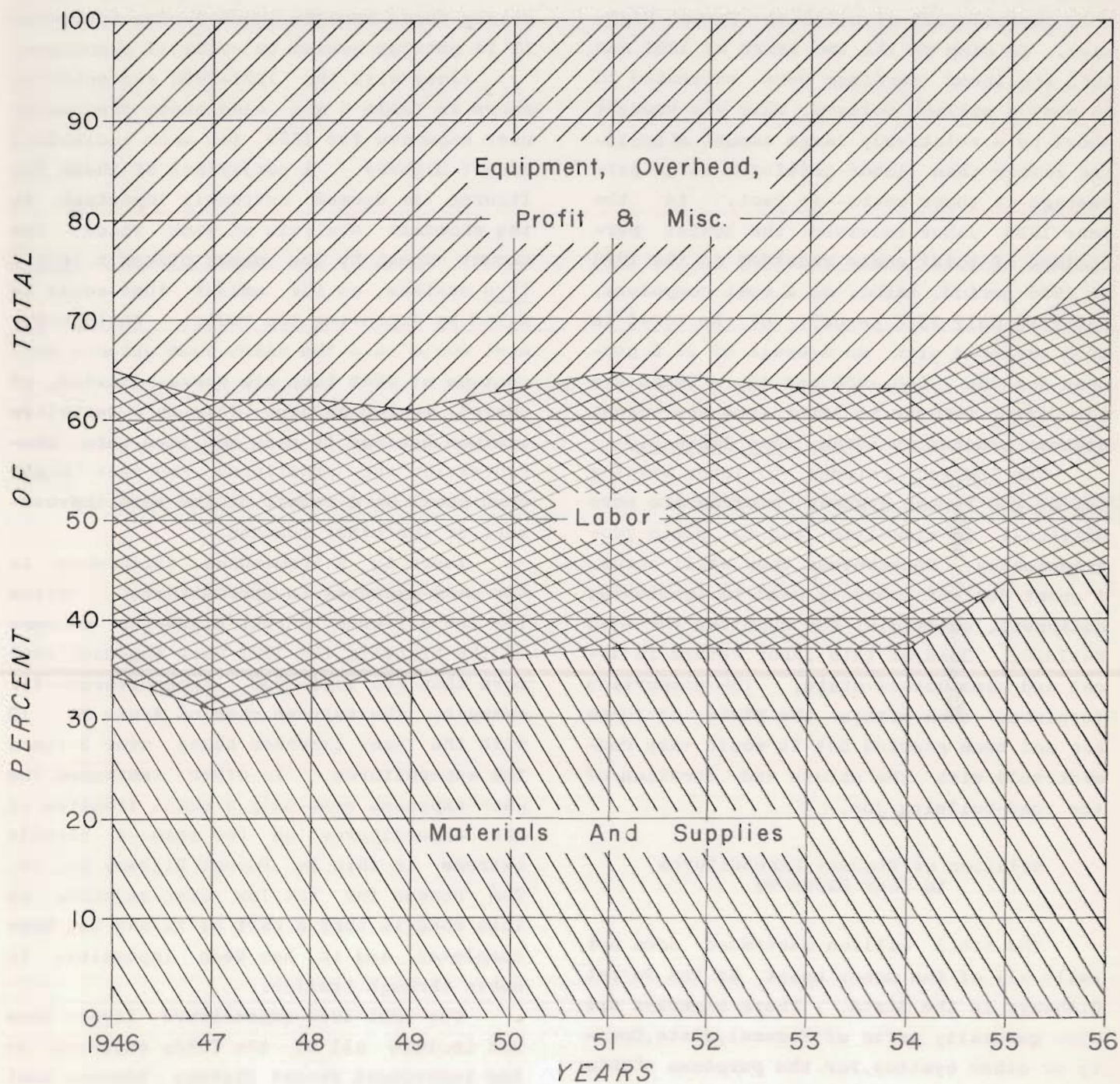
Table 4. Accumulated expenditures for construction on classes of highway in the forest highway system by Bureau of Public Roads and other agencies, to June 30 of 1956, 1957 and 1958 ^{1/}

Year	Location	For. Hwy. Class	Forest Highway	Federal-aid	Federal Funds Forest Service	Other Federal	Total Federal	State and Local Funds	Grand Total All Funds
1956	Idaho	1	\$ 25,401,035	\$ 5,673,211	\$ 792,476	\$ 490,666	\$ 32,357,388	\$ 8,350,030	\$ 40,707,418
		2	4,849,523	428,120	51,556	- - -	5,329,199	1,085,269	6,414,468
		3	7,523,117	- - -	1,266,750	593,126	9,382,993	320,442	9,703,435
	Totals		\$ 37,773,675	\$ 6,101,331	\$ 2,110,782	\$ 1,083,792	\$ 47,069,580	\$ 9,755,741	\$ 56,825,321
	West ^{2/}	1	\$136,576,311	\$ 79,397,794	\$1,105,711	\$ 7,973,206	\$225,053,022	\$146,696,390	\$371,749,412
		2	75,406,325	13,123,925	784,040	9,399,528	98,713,818	35,025,085	133,738,903
		3	76,557,272	356,687	3,154,454	20,459,365	100,527,778	35,132,941	135,660,719
	Totals		\$288,539,908	\$ 92,878,406	\$5,044,205	\$37,832,099	\$424,294,618	\$216,854,416	\$641,149,034
	National ^{3/}	1	\$139,943,208	\$135,885,869	\$1,152,023	\$16,863,511	\$293,844,611	\$284,639,063	\$578,483,674
		2	94,801,468	29,172,907	3,280,503	10,017,741	145,272,619	131,229,049	276,501,668
		3	78,803,227	592,625	4,045,557	21,139,422	104,580,881	46,353,084	150,933,965
	Totals		\$313,547,903	\$165,651,401	\$8,478,083	\$56,020,674	\$543,698,111	\$462,221,196	\$1,005,919,307
1957	Idaho	1	\$ 28,248,131	\$ 8,606,656	\$1,033,990	\$ 911,176	\$ 38,799,953	\$ 8,927,363	\$ 47,727,316
		2	5,249,958	513,074	258,652	- - -	6,021,684	1,281,161	7,302,845
		3	5,926,507	- - -	1,868,109	283,148	8,077,764	220,841	8,298,605
	Totals		\$ 39,424,596	\$ 9,119,730	\$3,160,751	\$ 1,194,324	\$ 52,899,401	\$ 10,429,365	\$ 63,328,766
	West ^{2/}	1	\$161,788,894	\$ 86,934,340	\$1,345,884	\$25,759,324	\$275,828,442	\$163,716,144	\$439,544,586
		2	90,426,587	15,398,318	1,120,684	10,527,742	117,473,331	38,610,525	156,083,856
		3	57,254,200	512,666	3,339,081	1,482,321	62,588,268	35,078,012	97,666,280
	Totals		\$309,469,681	\$102,845,324	\$5,805,649	\$37,769,387	\$455,890,041	\$237,404,681	\$693,294,722
	National ^{3/}	1	\$165,329,149	\$149,558,339	\$1,392,196	\$35,036,004	\$351,315,688	\$311,525,290	\$662,840,978
		2	112,827,037	33,219,988	3,617,147	21,056,435	170,720,607	142,121,260	312,841,867
		3	59,082,402	794,867	4,239,184	2,109,143	66,225,596	44,774,259	110,999,855
	Totals		\$337,238,588	\$183,573,194	\$9,248,527	\$58,201,582	\$588,261,891	\$498,420,809	\$1,086,682,700
1958	Idaho	1	\$ 28,867,475	\$ 8,258,505	\$1,033,988	\$ 1,204,418	\$ 39,364,386	\$ 9,746,614	\$ 49,111,000
		2	6,604,157	690,807	309,410	17,186	7,621,560	1,313,774	8,935,334
		3	5,901,588	- - -	1,890,378	283,148	8,075,114	210,841	8,285,955
	Totals		\$ 41,373,220	\$ 8,949,312	\$3,233,776	\$ 1,504,752	\$ 55,061,060	\$ 11,271,229	\$ 66,332,289
	West ^{2/}	1	\$171,279,518	\$ 96,238,889	\$1,560,891	\$26,198,106	\$295,277,404	\$179,910,167	\$475,187,571
		2	96,709,253	17,178,730	1,007,938	10,089,168	124,985,089	41,886,499	166,871,588
		3	59,099,700	12,868,751	3,617,290	2,334,981	77,920,722	40,336,042	118,256,764
	Totals		\$327,088,471	\$126,286,370	\$6,186,119	\$38,622,255	\$498,183,215	\$262,132,708	\$760,315,923
	National ^{3/}	1	\$174,819,773	\$164,477,847	\$1,607,203	\$35,982,158	\$376,886,981	\$336,121,686	\$713,008,667
		2	121,059,913	37,664,125	3,528,726	18,945,578	181,198,342	151,579,056	332,777,398
		3	60,999,538	13,083,633	4,538,468	2,989,526	81,611,165	50,309,325	131,920,490
	Totals		\$356,879,224	\$215,225,605	\$9,674,397	\$57,917,262	\$639,696,488	\$538,010,067	\$1,177,706,555

^{1/} U.S. Department of Commerce, Bureau of Public Roads. Report of Operations on Forest Highway System. Compiled from reports for the years included.

^{2/} Includes the western States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, Wyoming and Alaska.

^{3/} Puerto Rico included for the years shown.



Source: U.S. Dept of Commerce, Bureau of Public Roads, Highway Statistics, Summary to 1955 P. 148.

Figure 6. Relative changes in components of construction costs on Idaho federal-aid road projects, 1946-1956

Using average national distributions of the components of the costs of road building shows that Idaho derives a sizeable payroll out of building Forest Highways. In each of the two years of 1951 and 1955 the labor earnings were estimated to be over a million dollars. This was brought about by a relatively large amount of building rather than labor getting a large percentage in those years--in fact, in the year 1955 labor received the lowest percentage of total costs recorded in the 1946 to 1956 period. Labor, as a cost component, received only 25.8 percent of the total in 1955 compared with an average of 27.6 percent for the 1946-1956 period. These are the direct returns to labor from the Forest Highway program in Idaho. (See Table 5.)

The indirect returns to labor arising out of the Forest Highway program are more difficult to visualize and to place geographically. Nonetheless they still occur. A great deal of labor is used in furnishing equipment, materials, and supplies for road building. Some of this labor return is local and some out-of-state. The proportion furnished from within the State of Idaho has not been studied but it would vary considerably with the nature and location of the road-building job.

Relation of Highway Expenditures to User Expenses

The \$45.5 million mentioned does not tally all of the money spent on the Forest Highways in the State. These highways are also generally parts of Federal, State, County or other systems. For the purposes of this study the Idaho Department of Highways and the U.S. Bureau of Public Roads tabulated total expenditures on the individual Forest Highways in the State since the passage of the Federal Highway Act of 1921 setting up the Forest Highway Fund. Table 6 shows that a total of \$61.3 million had been used

in the 1921-1958 period. (8) In general the greatest expenditures were on Class I roads but there were notable exceptions, especially those brought about during World War II in getting access to critical resources.

Along with the 1921-1958 expenditures shown in Table 6 are also shown the motor user expenses for 1957 for each individual Forest Highway. A comparison of these two figures is deemed extremely important in the economic analysis of each road. The amount spent by the users places a tentative maximum on the amount that could be saved by improving the route. An improvement would save the users some unknown percentage of what they now spend--limited, of course, to 100 percent. This is a tentative maximum because it does not take into consideration the additional use that might come about as a result of the road improvement or for other reasons.

There is a tremendous difference in the user-expenses-to-expenditures ratios for the different Forest Highways. On some of the highways the 1957 user expenses were more than the 1921-1958 expenditures--for example, the extreme case of Route No. 12 with the user expenses being over 5 times the expenditures. In other instances the user-expenses were only a small fraction of the expenditures on the road--a notable extreme in this is Forest Highway No. 16. The reason for the low user-expenses on this road is that a part of it has not been completed and it has been impossible to serve through traffic.

The 1921-1958 expenditure figure does not include all of the funds expended on the individual Forest Highway because most of these roads, albeit usually in unimproved condition, existed before 1921. However, the amount of the expenditures prior to

(8) As of June 30, 1958, the U.S. Bureau of Public Roads in Report of Operations, Forest Highway System 1958 reported the total of all expenditures from all sources as \$66,332,289.

Table 5. Estimate of cost distribution of construction expenditures on forest highways which are coincident with the Idaho State Highway System ^{1/} 1946 - 1956

Year	Materials and supplies	Equipment, overhead profit & miscellaneous	Labor	Total *
1946	\$ 9,894	\$ 10,040	\$ 9,082	\$ 29,016
1947	350,382	421,570	340,371	1,112,323
1948	175,430	201,082	156,312	533,374
1949	990,917	1,112,965	802,033	2,905,915
1950	616,325	631,564	445,312	1,693,201
1951	1,424,305	1,351,753	1,042,454	3,818,512
1952	406,347	384,733	289,630	1,080,710
1953	1,243,505	1,243,505	892,080	3,379,090
1954	1,029,791	1,007,764	715,898	2,753,453
1955	1,718,977	1,179,844	1,007,946	3,906,767
1956	1,153,196	650,958	633,892	2,438,046
Totals	\$9,119,119	\$8,195,778	\$6,335,510	\$23,650,407

^{1/} Distribution of costs is based on percentages contained in a tabulation of elements of highway construction on Federal-aid projects, published by the U.S. Department of Commerce, Bureau of Public Roads, Highway Statistics, Summary to 1955, p. 148

* State of Idaho, Highway Planning Survey

1921 would comprise an insignificant part of the total and furthermore would largely have been "written off" by 1958. The roads having a low ratio of user expenses to expenditures on the road are mostly those requiring added improvements or the removal of traffic blocks or bottlenecks in order to encourage use. Any program using this analysis must consider how much of any added use of an individual road is new use and how much is shifted from other roads.

Mileages and Traffic

Figure 7 shows that there has been relatively little change over the years in the number of miles of highway in Idaho designated as Forest Highway. The trend in this total is much like the trend in the total mileage of public road in the State. There has been change in the amount of For-

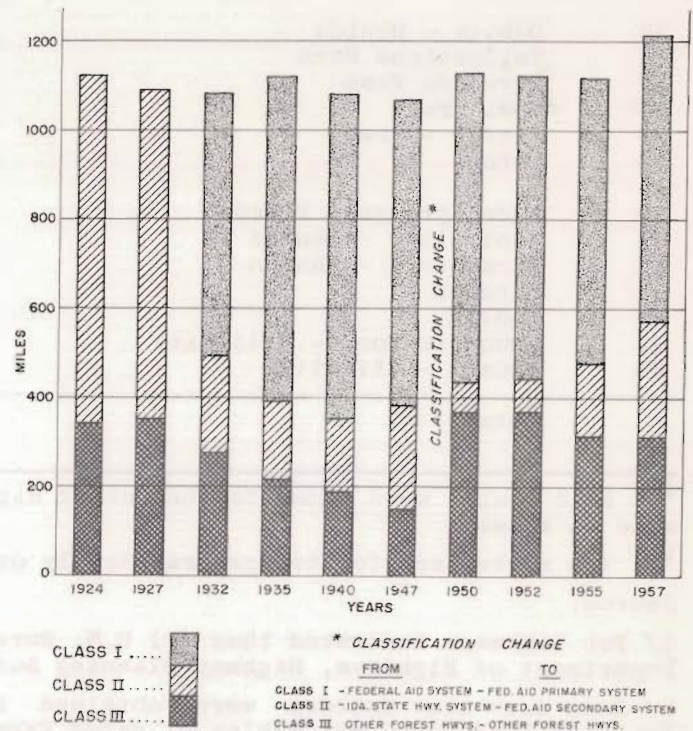


Figure 7. Mileage in each of the three classes of forest highways in Idaho for selected years following changes, 1924-1957

Table 6. Relationship of road user costs for the year 1957,
to total expenditures on forest highways
1921-1958

Route no. (1)	Route name (2)	Length in miles	Class	Expenditures 1921 - 1958 a/	Motor user expenses 1957 b/
1	North & South	30.1	I	\$ 906,585	\$ 838,907
2	Kootenai	17.2	I	1,058,450	522,977
4	Copeland - Porthill	11.2	I	254,657	83,715
5	Clark Fork	24.4	I	1,061,860	624,727
6	Priest River	37.1	II & III	2,542,466	648,550
7	North Pacific	61.6	I	12,298,237	7,450,611
8	North & South	27.7	II	1,319,783	248,233
9	Enaville - Murray	30.8	II & III	2,128,488*	167,927
12	Burke-Idaho-Montana Line	6.0	II & III	4,863*	25,429
14	Palouse	3.9	I	94,863	145,624
15	North & South	18.3	I	1,298,583	160,207
16	Lewis & Clark	101.0	I	6,998,040	187,621
17	Grangeville - Clearwater River	11.0	II & III	118,233*	76,418
18	Elk City	50.0	II	1,330,128	250,670
19	North & South	7.3	I	595,408	149,918
20	McCall - New Meadows	11.0	I	473,817	400,466
21	Warren Wagon Road	44.0	III	1,160,028*	251,760
22	Cascade - Knox	23.6	II	572,109*	183,281
23	North Fork Payette	33.0	I	4,266,555	1,215,961
24	Banks - Lowman	35.4	II & III	1,735,131*	175,784
25	Idaho City - Stanley	106.7	I	3,434,168	688,220
26	Ketchum - Clayton	117.6	I	5,496,382	931,098
30	Salmon-Idaho-Montana Line	42.0	I	2,407,225	698,323
31	Leadore-Idaho-Montana Line	13.4	II	169,035	35,025
33	Dubois - Monida	15.2	I	491,665	312,158
34	Yellowstone Park	41.7	I	3,905,515	1,575,988
35	Reynolds Pass	9.7	III	--	31,710
36	Rock Creek	16.5	II & III	458,948*	41,480
37	Victor - Irwin	20.9	II	1,157,941	313,988
38	Teton	5.5	I	125,162	78,040
40	Soda Springs - Freedom	22.6	II	215,839	88,718
41	Montpelier - Geneva	14.2	II	347,478	414,207
42	Strawberry - Sharon	12.1	II	548,537*	73,147
43	Bannock	16.1	II & III	387,694*	119,147
45	Coolin	5.7	III	382,488*	27,930
47	Mountain Home - Hill City	16.0	II	107,764	90,724
48	McCall - Stibnite	57.1	III	1,462,762	99,622
Total				61,336,908	19,428,311

(1) Four routes were added to the Forest Highway System, March, 1957. Data were not available on these.

(2) The routes are located geographically on the map in Figure 38 of the Appendix.

Source:

a/ For highways indicated thus (*) U.S. Bureau of Public Roads. All other highways, Idaho Department of Highways, Highway Planning Survey.

b/ Road user cost factors were obtained from Intra-Department correspondence, subject "Revised Road User Cost Tables," dated February 1, 1958. These tables are a revision of those found in the A.A.S.H.O. Manual, "A Policy on Road User Benefit Analyses for Highway Improvement," Pages 90-97 inclusive. The revision is designed to reflect prevailing unit costs in Idaho. For simplification in calculation it was assumed that all routes fall partially or entirely within two groups: Normal operation: (1) Tangent 2-lane highways, pavement in good condition, running speed 48 MPH, gradient class 0-3%, and/or, (2) Tangent loose surface highways in good condition, running speed 32 MPH, gradient 0-3%.

est Highway in each of the three classes, the great and abrupt changes being the results of changes in the basis of classification but also some arising out of changing use.

An inconsistency may seem to appear in that the expenditures for Forest Highways has risen sharply with essentially the same total mileage. There are two factors which enter into the explanation of this enigma-- (1) roads are being improved to meet higher standards, and (2) some of the routes designated as Forest Highway several years ago were not roads at all but merely routes approved as eligible for funds.

Figure 8 shows that the overall traffic on the Idaho Forest Highways, except for three war years, has been increasing at a steady rate. In 1953 the average volume was 2.2 times what it had been in 1941. The State's rural highways show a greater increase, but the Forest Highways show more than the statewide system. In a relatively undeveloped and progressing state, such as Idaho, it is logical to expect a smaller percentage increase in the main-stem roads and a greater increase in the roads reaching hinterland resources. This is borne out by the relative positions of the three curves in Figure 8.

As might be expected in an area growing dynamically, the increase in the use of Forest Highways has been far from being uniform among the different roads. Table II in the Appendix shows the average vehicle miles over the Forest Highways for selected years during the 1941-58 period. It was estimated that in 1958 the average 24-hour vehicle miles on Idaho Forest Highways totaled 587,035. This increase came in all classes of Forest Highways but not on all individual routes. As is evident from Figure 9, three segments of Forest Highway are reported to have lost but the majority of these roads carried greatly increased traffic. It should be borne in mind that increasing traffic should not necessarily

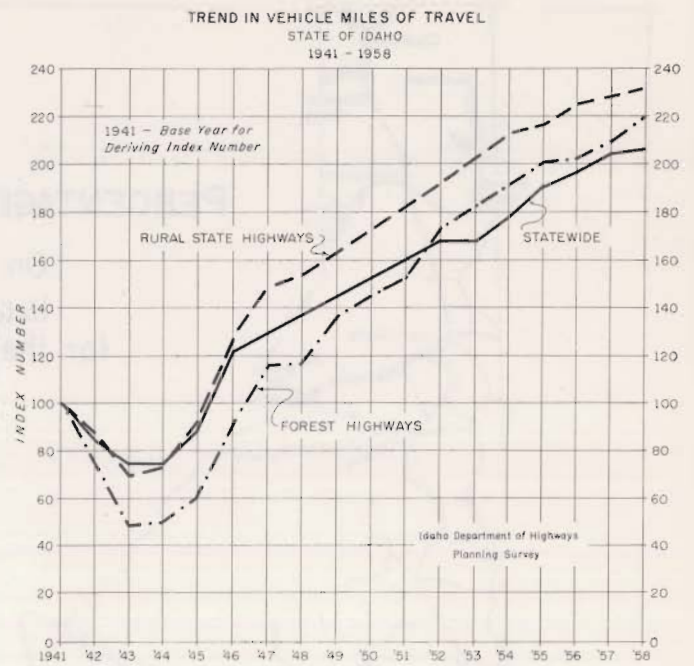


Figure 8. Trend in vehicle miles of travel on forest highways, the statewide system, and rural state highways, Idaho, 1941-1958

be used as a criterion for evaluating road building--in fact, if roads are straightened significantly vehicle miles may decrease. Furthermore, carrying the same volume more efficiently, safely, or comfortably may be adequate justification. The very dynamics of traffic flow is in itself a justification for road expansion which will accommodate unpredictable demands.

Case Studies of Selected Routes

Forest Highway No. 16 (Lewis and Clark Highway)--a case of national interest








The importance of a shorter route across the barrier of national forest land in Idaho has been considered for many years. Interstate traffic moving east-west or vice versa has to deviate either northward to U.S. No. 10 (Mullan Road) or southward to U.S. No. 30. This is a deviation adding many more miles to travel across the State and usually more miles to Idaho traffic seeking to enter east-west traffic. The route so long under consideration is Forest Highway No. 16 along the Lochsa River. This trail has achieved historic importance be-

STATE OF IDAHO

PERCENTAGE CHANGES IN TRAFFIC VOLUMES

On designated sections of the
INDIVIDUAL FOREST HIGHWAYS
for the year 1958 compared with 1947

LEGEND

No Record	
-20 to -1%	
0 to +50%	
+50 to 100%	
+100 to 150%	
+150 to 200%	
200% or more	

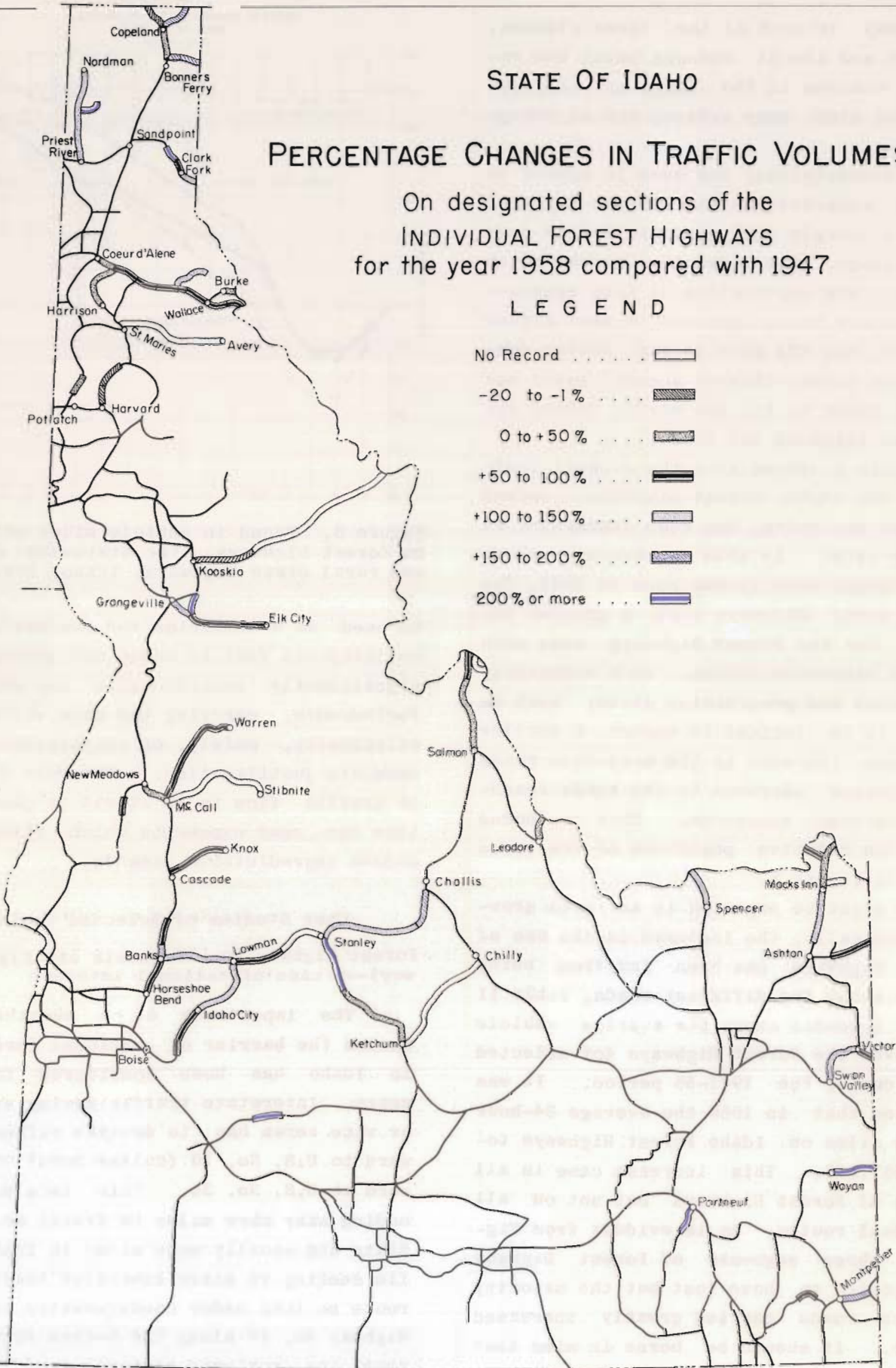


Figure 9. Percentage changes in traffic volumes for individual forest highways, Idaho, between 1947 and 1958

cause it was used by wild game and Indians in their nomadic seasonal movements in search of sustenance. The Lewis and Clark expedition followed approximately this route in their trek into the West and to some extent it became immortalized. The greatest historical feat and probably the greatest hitherto proof of its feasibility for a roadbed came in the summer of 1877 when Chief Joseph, leader of the Nez Perce Indians, made a fantastic logistic movement over the route--moving not only his braves but the women, children, and property as well. This retreat completely foiled the strategy of United States troops and ranks high in the annals of strategy.

Although the Lewis and Clark expedition was very probably the first of the white man's efforts to make an appraisal of the general path of the proposed Lewis and Clark Forest Highway, John Mullan, Captain in the United States Army, was probably the first to have considered the problem of a wagon road over this area. Much of his effort in the middle of the nineteenth century was that of designing and building a road from the Missouri River to the Columbia River in order to connect with a wagon or rail road, those two arteries of water transportation. The following quotation at least shows that he had considered several alternate routes and passes over the mountains before finally choosing what was later to become known as the Mullan Pass and U.S. 10 over the Bitterroot Range.

"In September, 1854, my party having been ordered in from the field, I determined to proceed to the coast by a new route, and the only one then left unexplored, namely, via the Lo-Lo Fork Pass; not that I felt or believed it to be practicable for wagons, but more with a view to arm my judgment with such facts as would not leave a shadow of doubt behind which should cause us to err in the final conclusion in so important a matter. This route I found the most difficult of all examined. After eleven days severe struggle with climate and country we emerged into the more open region where "Oro Fino" now stands, glad to leave behind us so difficult a bed of mountains. After examining all these passes my judg-

ment was finally decided in favor of the line, via the Coeur d'Alene Pass, as a proper connexion for a road leading from the head of navigation on the Columbia to that on the Missouri, and the result was so reported to Governor Stevens, under whose direction I was then acting." (9)

Near the beginning of the 20th century, a survey was begun by the Clearwater Short Line Railway Company as a preliminary to extending a track from Missoula, Montana, to Kooskia, Idaho. This survey began in the Village of Lolo and ended at Lolo Pass.

In 1909, the survey was extended to Kooskia via Johnson Hot Springs. "A portion of the right of way was acquired and the line was partly graded for a distance 18 miles west of Lolo. The line was never completed. In the process of this survey and construction, serviceable wagon roads were constructed which gave limited access to sections of the route both in Idaho and Montana. The first forest highway money expended on the route extended these wagon roads." (10)

On December 6, 1916, the Lochsa Trail extending from Kooskia to Lolo Pass on the Montana State Line, was designated as a part of the Lewis and Clark Highway on the State highway system. This action attested to belief in the importance of the route as an arterial crossing of a formidable barrier posed by the Bitterroot Mountains.

The first construction of any consequence was begun on the highway in the year 1920. The chronological history of the costs and work done between Kooskia and Lolo Pass at the Montana border is shown in Figure 10. Expenditures are expressed in dollars spent at the time indicated.

Throughout the history of the Lewis and Clark Highway there has been continuous

(9) Mullan, John, Report on the Construction of a Military Road from Fort Walla-Walla to Fort Benton, Washington Government Printing Office, 1863

(10) Neeley, J., Story of Lewis and Clark Highway, U.S. Bureau of Public Roads, p. 2

agitation for the completion of the segment not completed. As is evident from the chronology shown, there were many partial efforts spread over the past 40 years. Estimates on the costs of completing the road were made almost annually and virtually each estimate was greater than the preceding estimate despite the costs incurred in the meantime. Devaluation of the dollar, of course, played an important part in this enigma, but perhaps more important

was the increasing road standard demanded. It was also true that work progressed so slowly that some of the older efforts had become somewhat obsolete or had deteriorated.

Throughout the years the expressed attitude toward the efficacy of this road has varied--much of it logically being sectional in nature. Much of the support for the road has come from the roadside communities or areas outside of the State--par-

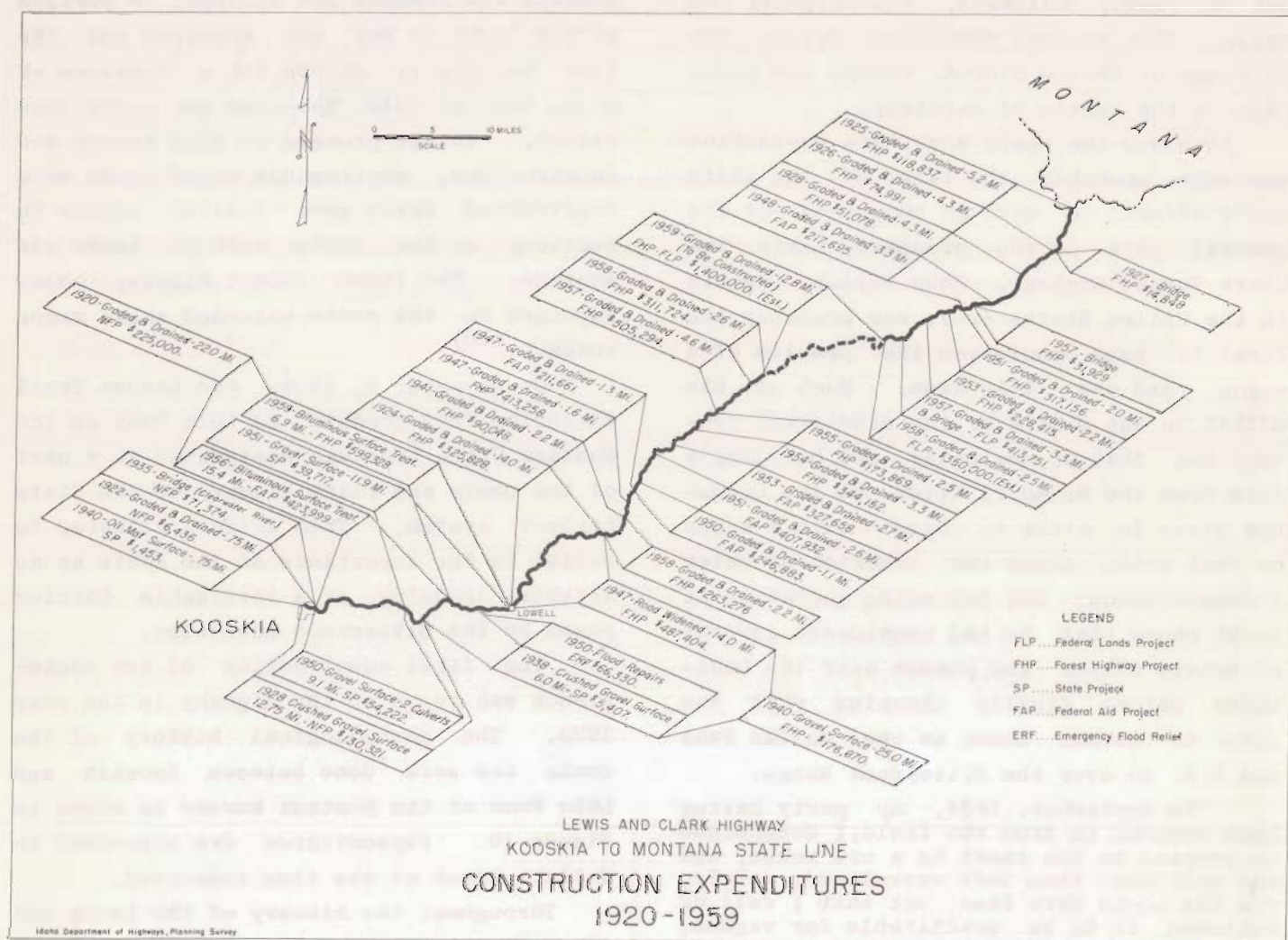


Figure 10. Chronology and classification of construction expenditures on Idaho Forest Highway No. 16 from 1920 to 1959

ticularly those areas which would be connected by the road. (11) Regardless of the attitude one takes toward the overall feasibility of this road, one lamentable fact is that millions of dollars of "investment," at least expenditure, has lain idle--in fact, deteriorating--while awaiting completion. Another formidable cost of the indecision has been the destruction of the virgin stands of timber, much of which might have been prevented had access been better. (12) Even 1920 would not have been early enough to save the main stands because the big burns were from fires of 1910 or earlier. Even with adequate access it will take about a century of time to recoup the forest vegetation--shorter for some types and longer for others.

In 1959 a section of road amounting to 12.756 miles remains unconstructed. The estimated cost of completing this section is \$1,400,000. In order to construct this route to an adequate standard consisting of a 26-foot oil mat surface, an estimated additional expenditure of \$4,600,000 will be required.

The importance of this road as a principal east-west arterial route is magnified by the paucity of existing primary facilities. The barrier imposed by the Bitterroot

(11) The Lewis-Clark Turnpike Association, comprised of civic leaders in Nez Perce, Idaho, Lewis and Clearwater counties has been extremely active in supporting the objective of completing the route to an adequate standard. The efforts of this Association include the publication of information designed to stimulate interest in surrounding states as well as in affected communities in Idaho.

The Greater Clarkston Association of Clarkston, Washington, has engaged in a variety of activities in support of finishing construction of the Lewis and Clark Highway. In addition to the usual efforts to generate interest in this project, this Association has sponsored automobile caravans along the trails taken 150 years ago by the explorers, Lewis and Clark. In 1956 the auto caravan traveled the Lewis-Clark return route from west to east, ending their journey in St. Louis, Missouri.

Mountain Range requires interstate traffic through central Idaho to detour to the north and south margins of the State via U.S. Route 93 and U.S. Route 10. Efforts to cross this barrier by railroad have been abandoned since anticipated benefits have not justified construction costs.

From the standpoint of long-range overall transportation planning this could become an extremely important road. Perhaps the greatest factor in this will be the action taken on the further development of the Columbia, Snake, and Clearwater rivers for navigation. This is especially true of the Columbia and Snake as far as to Lewiston to give a navigable connection with Portland, Oregon, and to the Pacific Ocean. Until this occurs this highway will probably have realized only a small portion of its potentiality.

Ashton-Yellowstone Relocation--U.S. 191

Logically there are great differences in the degree of economic justification for different road projects. Some projects are barely marginal while others are clearcut.

The Ashton-Yellowstone Park relocation shown in Figure 11 is a project that can be deemed an extremely successful one. It is

The Northwest Conservation League of Kennewick, Washington, along with the two above named Associations has participated in a bumper strip campaign designed to publicize the urgent necessity of increased funds to complete the Lewis and Clark Highway as quickly as possible.

On December 5, 1957, in a joint meeting with representatives of the State Highway Board, the U.S. Bureau of Public Roads and the U.S. Forest Service, Marshall Dana, representing the Portland, Oregon, Chamber of Commerce, made an impassioned plea to "drive out the 13.5 mile plug remaining to be constructed and unfreeze the large investment you now have so the road can be made productive."

(12) Nybrotten, Norman, et.al., Value of Roads to and in Public Lands, Preliminary, Part I, Volume I, Effect on Timber and General Values, University of Idaho, Aug. 1958

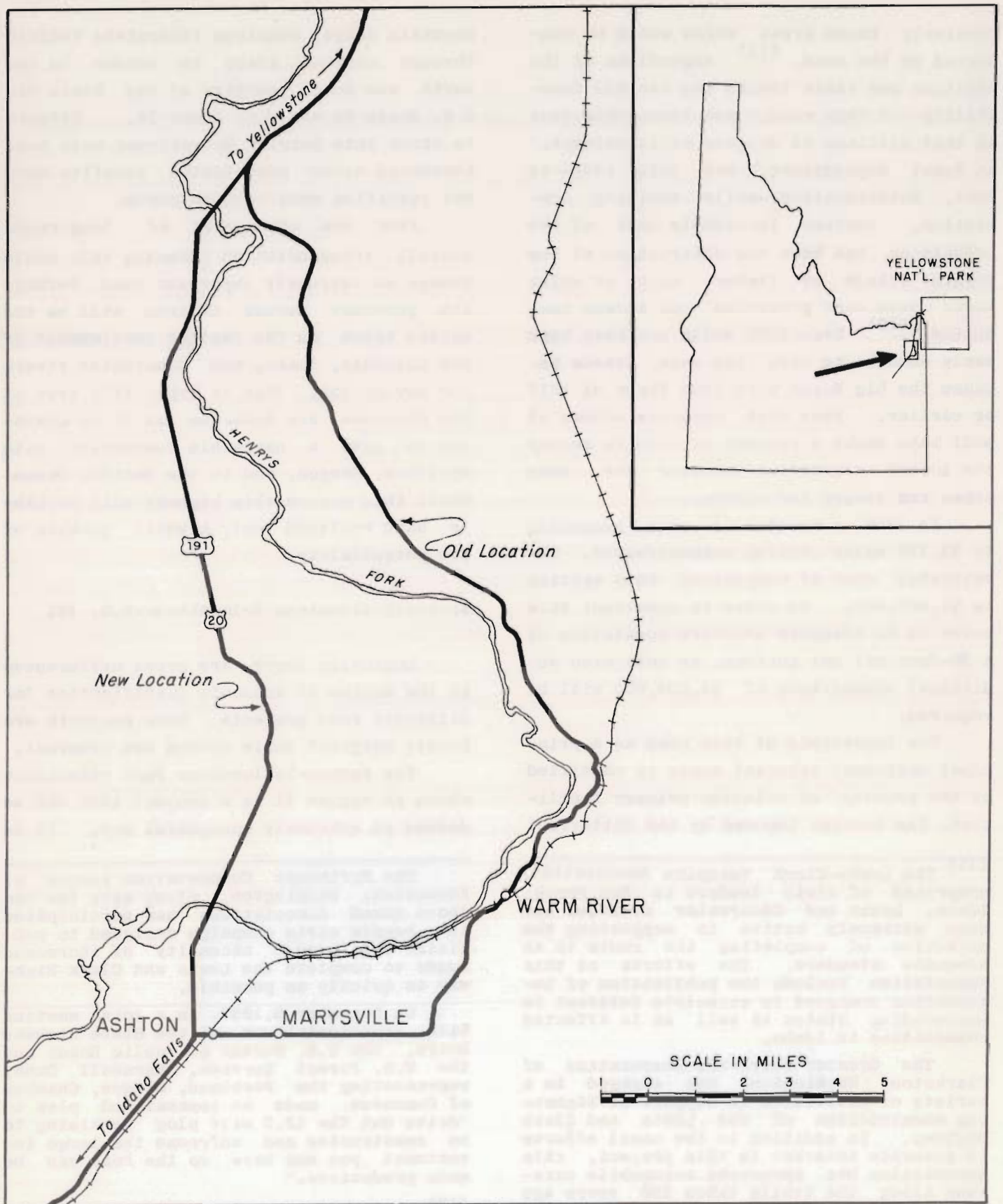


Figure 11. Map showing the relocation of the Ashton-Yellowstone Highway

not intended that this is representative of the average project or proposal on Forest Highways because this case is clearcut.

This is a highway of major importance to through traffic serving Yellowstone National Park among other uses. The length of the old route by way of Warm River, from Ashton to the juncture of the old and new routes in the north, was 28.937 miles. (13) That of the new route is 20.184. The annual highway user costs, including all vehicle costs plus an allowance of \$1.35 per hour for the driver's time, were \$1,812,626 on the displaced route and \$894,827 on the new route. The cost of relocating this route amounted to \$2,481,485. The user savings effected by the relocation amount to \$917,799 per year, or 37 percent of the costs. Differences in costs of maintaining the new route compared with the old route were not reported.

Different classes of traffic may benefit differently from a road improvement. On the Ashton-Yellowstone relocation it was estimated that the operating cost was decreased from 10.78 cents to 9.16 cents per mile for passenger cars. Truck operating costs were estimated to have decreased from $4\frac{1}{2}$ times to $2\frac{1}{2}$ times the cost of operating a passenger car.

Moyie Bridge on Forest Highway No. 2 (U.S. No. 2)--A Case with Several Alternatives

An analysis of costs and benefits to be derived from each of several proposals for relocating a bridge across the Moyie River for U.S. No. 2 was made available. Four relocation proposals have been made. Each of these would save about a mile to a mile and a half of distance and improve road standards. The summary results of the alternatives in comparison with the existing route follow:

(13) Data on this relocation are from the Planning Survey, Idaho Highway Department.

Route	Estimated const. cost	User costs
Existing	\$ 116,000	\$1,544,873
A.	2,026,000	939,752
B.	1,500,000	974,033
C.	4,572,000	930,388
T.	423,000	1,112,662

From these results it seems obvious that there is no question but to abandon the present structure. The principal question involved is which of the alternatives to choose--a question which will perhaps hinge on the availability of funds in competition with other projects also having various alternatives.

This brief view of these benefit-cost relationships indicates the need for careful consideration of the adequacy of funds for road and bridge improvements of this kind. In the case at hand there seems to be no question of what alternative to choose if merely \$423,000 were available and no more could be made available because this gives a sizeable return but if more money either is or will be available the decision is less automatic. A further inference to be gained from these results is that if projects such as this are still left undone there logically must be an urgent need for funds and perhaps a real need for intensive feasibility studies of other potential improvements.

Summary

The public lands were first thought of mainly as a factor which might give relatively direct expedient relief to the national treasury. The policy became one of selling the land rather than operating it. This, along with the federated form of government, made the responsibility for development more complex.

Even before the Highway Act of 1916 there was a considerable amount of private and official expression to the effect that there should be money appropriated for the development of the national forests. Ac-

cess was pointed out as a crucial problem. Captain Mullan, in laying out part of the route for Forest Highway No. 16, recommended a multiple-use road in the middle of the nineteenth century.

Forest Highways in Idaho serve sparsely-settled areas. The typical Forest Highway, excepting Forest Highway No. 7, traverses country having less than 2.5 people per square mile and thus there are few local people to give financial support to the highway. Only Alaska and Wyoming have less miles of Forest Highway per million acres of national forest than Idaho. The national forests in Idaho form an exceptional barrier to east-west travel; few and far-between routes cross the Bitterroot Range of the Rockies; and those that cross use segments of Forest Highway.

Although the use of Forest Highways has grown even more rapidly than the statewide highway system, revenues from the Forest Highway Fund have increased slowly. The emergency funds spent on Idaho Forest Highways during World War II indicate that the condition of many of these roads is substandard from the standpoint of meeting national emergencies. Some of the Forest Highways are impassable. The Class III Forest Highway, probably mainly because of the paucity of population, has an even greater financial problem than the others in Idaho.

The ratio between the highway construction costs and users' annual vehicular

expenses varies greatly among the Forest Highways in the State. In some instances the annual user expenses are more than the total costs of construction. This indicates a high potential for savings to be derived by the users through highway improvement. In some instances the ratio of the user expenses to the construction costs is very low but this is due primarily to the stage of development--considerable cost has been incurred on some routes but they still are not up to standards which would encourage use, in some instances they are not even "punched through" for any type of vehicle use.

Analyses of selected route improvements show that great user benefits have been derived. In some instances, notably in the Ashton-Yellowstone relocation, it is evident that the heavy vehicles have gained relatively more per mile than have passenger cars, albeit there has been a significant decrease in the costs of operating passenger cars. An analysis of a case having several proposed routes, as alternatives for improvement, shows that inadequate funds may force a choice which will not be the most economical in the long run. It appears that studies of the economic feasibility need to be accelerated in order to: consider real alternatives; to project future use in terms of the changing and growing economy; and to rationalize the priority of projects.

Chapter III

NEED FOR FOREST HIGHWAYS OF SEEMINGLY SURPLUS SUFFICIENCY

According to the Idaho Department of Highways the sufficiency ratings of those segments of the State Highways designated as Forest Highways average better than the average of the remaining State Highways. In the methods used the rating of the road with a lower volume is automatically adjusted upward relative to the road with higher volume. ⁽¹⁾ It is further true that these are averages and the ratings of individual roads "average" as low as 56, based on 100 being the idealistic standard. It should be borne in mind that these are roads with peak-season traffic flow but even beyond that they must be planned for several types of emergency traffic flow.

Virtually every highway has peak loads of traffic and slack periods. Near the large urban centers the peaks usually come during commuting times such as occur in response to labor shifts. For the through traveler it is inconvenient to be caught in the resulting traffic congestion because the roads are ordinarily not built to handle the peak flow in rapid through-transit style. In many recreational areas throughout the country roads are used mainly only for short seasons. Where feasible such roads serve interests other than recreation in order to share costs. Because the traffic flow over these roads is not steady over time, if a road is to accommodate peaks with reasonable expediency its capacity will seem rather extravagant at off-peak times.

⁽¹⁾ For a discussion of the methods used in Idaho see State of Idaho Sufficiency Rating Study, State Highway System 1957, prepared by Idaho Department of Highways in cooperation with the U.S. Bureau of Public Roads.

The nature of the demands on the Forest Highways of the Northwest is more nearly like the seasonally-used recreational road than the urban-rural commuter highways around urban centers or shift-worker roads near industrial areas even though they may be outlying areas. The significant traffic peaks in the Forest Highways of Idaho, rather than occurring twice daily generally occur seasonally. In some of the high-altitude roads there is relatively little traffic in the winter--in fact, a few of the highest roads of the Northwest are closed in winter. The fishing, hunting, camping, sight-seeing, logging, grazing--and much of the mining--fall very heavily into the summer and autumn. The high-altitude farming is also mostly a summer operation as is most of the construction and development work in high altitudes. Certainly the typical Forest Highway is not restricted to these summer-autumn uses because the bulk of the economy is on a year-round basis but these seasonal demands on the roads become very significant when superimposed upon the routine year-round travel.

Those peak demands caused by seasonal activity in the local economy and in cross-country travel, even though perhaps not given adequate full weight in an "average" sufficiency rating and not easy to evaluate in terms of "normal" travel, are fairly predictable. There are, however, some peak demands for which it is quite difficult to predict either the time or the intensity of the demand with any high degree of accuracy. Some of these are not peculiar to the traffic on Forest Highways of the Northwest, or

even to the Northwest, but it appears that these Forest Highways are more subject to the unpredictable demands than are highways in more mature economies and in economies depending on a wider range of industry. The general paucity of roads in the areas served by the Forest Highways is in itself a factor making traffic prediction difficult because if a road either gets wholly or partially blocked by landslides, wash-outs or the like, there often is no nearby alternate route upon which to detour traffic in an orderly manner. Such incidents often have significant effects over considerable distances in the rugged, sparsely-settled areas--often there being no turnoff to alternate routes within 50 or 100 miles of the scene of the incident.

Many of the emergencies difficult to predict are not man made. Others may be man made but beyond local control. Some of the emergencies will be described.

Spruce Bark Beetle Epidemic in Northern Idaho

One of the recent exigencies in forest management has been the spruce bark beetle infestations in the Pacific Northwest. In 1952 it was rather suddenly found that spruce beetles had invaded northern Idaho in epidemic proportions. The spreading of the beetles was very rapid and by the end of 1953 many of the original 400 areas of pure spruce stands in the eight national forests west of the continental divide were severely attacked and depleted. (2) The locations of these spruce stands are shown in Figure 12.

Although the spruce beetle epidemic had a very rapid rise, it also had a fairly rapid decline. If the mortality found in

1952 is represented by an index of 100, the index for 1953 becomes 190, or in other words, the mortality nearly doubled in one year from 1952 to 1953. The decline began in 1954 with an index of 160 and continued with an index of 60 in 1955 and only 20 in 1956. In the span of 4 years the infestation doubled and then decreased to one-fifth. (3)

It has been estimated that over $2\frac{1}{4}$ billion board feet of Engelmann spruce has been killed by the spruce beetle since the epidemic attack discovered in 1952. This epidemic was one which took its toll on both public and private land. The total infestation, by the end of 1957, had affected over $2\frac{1}{2}$ billion board feet of which about one-third billion was outside the national forests.

Upon realization of the seriousness of the beetle epidemic the forest industry responded with dramatic speed. Logging was evidently the large-scale answer both for abating the spread of the epidemic and for salvaging the affected timber. In three years from 1952 to 1954 the spruce logging increased from 172 million to 453 million board feet. Figure 13 shows the acceleration of spruce cut during the infestation period. In 1954 five-sixths of the spruce logged on these national forests had either been killed by beetles or was beetle-infested. By 1958 about three-fifths (58.4%) of the spruce logged was green--leaving about two-fifths as dead or infested. By this time there is evidence that the logging program was beginning to catch up with the spreading of the infestation because only 18.4 percent of the cut was spruce which had been infested for more than 1 year. (See Table 7.)

At the time of an exigency, such as the spruce bark beetle epidemic was, the need

(2) The Spruce Bark Beetle Infestation in Northern Idaho and Western Montana, Progress Report, U.S. Forest Service, Region I, Missoula, Montana, January 1957. (Data for this section are also drawn from reports for other years.)

(3) Terrell, Tom T., "The Engelmann Spruce Beetle Infestation in the Northern Rocky Mountain Region, 1956," Missoula Forest Insect Laboratory, U.S. Forest Service, Missoula, Montana

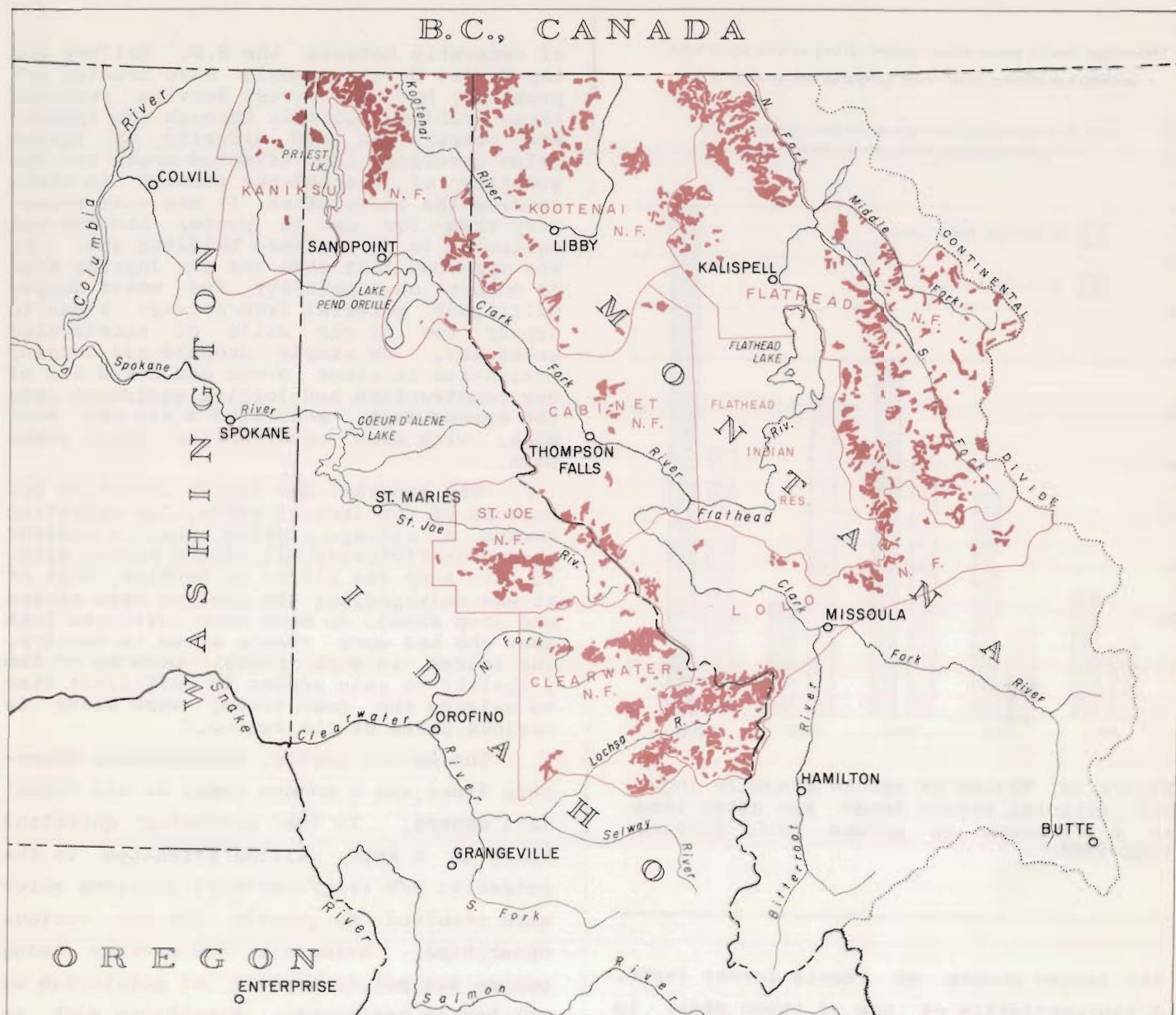


Figure 12. Areas infested by the spruce bark beetle in the epidemic discovered in 1952

for building access roads to the affected forest areas becomes clear. This is evidenced by the following (4)--

"Roads provide the accessibility essential for control and logging. Many miles of new or bettered roads will be ready for use in 1954 to make their important contribution toward the attainment of the control-by-logging objective. The \$8,428,500 appropriated by the Congress will provide 420 miles of federally constructed main spruce access roads. Purchasers of infested spruce sales are expending \$3,600,000 on 280 miles of spruce roads and private owners are spending over \$1,000,000 for 61

miles of spruce roads. Some of these roads are already in use. The remainder will be ready in 1954. In order to attain the 1954 goals, sale purchasers and private owners will make additional large expenditures for spruce access roads."

Over \$12 million of this money came either directly out of the federal treasury or out of stumpage on national forests. A total of 700 miles of roads were planned to be financed from these two sources.

The road problems associated with this spruce beetle epidemic were by no means confined to those on or serving only public lands. Private forest owners were caught in the same manner--this being more true of

(4) U.S. Forest Service, Reg. I, Missoula, Montana, Control of Spruce Bark Beetle Infestation, Jan. 1954

Percentage that the spruce-beetle infested cutting volume was of total infestation on National Forest Lands compared with all other lands

(Source: The Spruce Bark Beetle Infestation in Northern Idaho and Western Montana, United States Forest Service, Region 1, Missoula, Montana, January 1958)

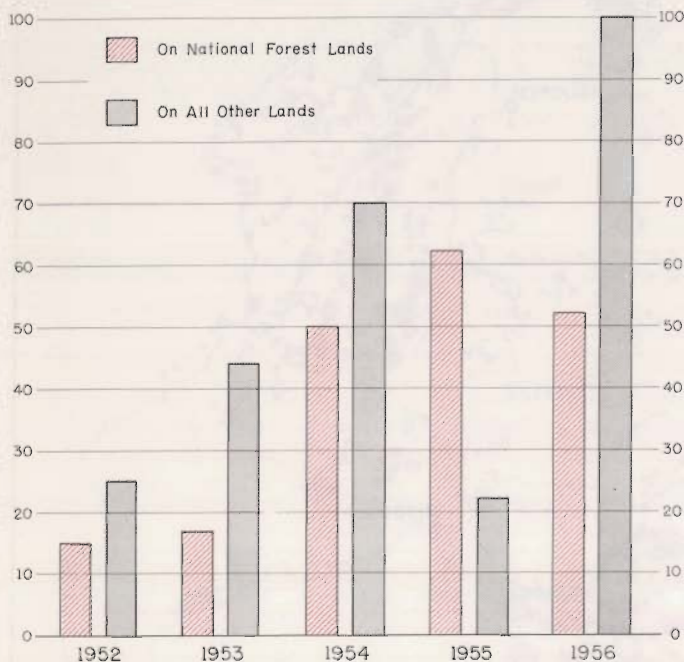


Figure 13. Volume of spruce annually logged off national forest lands and other lands as a response to spruce bark beetles, 1952-1956

the larger owners of remote forest lands. A representative of one of these made, in part, the following statement regarding the infestation. (5)

"It was immediately apparent that the infestation which concerned us was scattered in heavy concentrations throughout an irregularly-shaped area 15 miles long by 3½ miles wide containing 35,000 acres with no road other than a low standard Forest Service fire protection road, no part of which could be used for operations as large as would have to be mustered to maximize the salvage job. Fortunately there was an adequate haul road into the easternmost edge of the area. Road planning revealed the need for approximately 40 miles of main haul road, and about 80 miles of secondary and spur truck roads before all hot spots could be logged. The checkerboard pattern

of ownership between the N.P. Railway and the Forest Service could have created R/W problems, but the Forest Service resolved these problems quickly through the immediate preparation and offering of timber sales covering the effected areas and the granting of special-use permits in areas outside the infestation. It was only necessary then for us to muster the men and equipment to do the road building job. It was apparent that this was the logging area of number one priority and would supply sufficient material from salvage alone to supply two of our mills on accelerated schedules. We simply dropped all logging activities in other areas and moved all of our construction and logging equipment into the spruce area, scheduled a six day work week, with some construction going seven days.

"The program was fairly effective but because of the lack of roads, the operation became a salvage rather than a control operation. Virtually all of the spruce within this area was killed by beetles, most of it was salvaged, but the beetles were always one jump ahead. We were more fortunate than many who had more remote areas to develop. The losses in such areas, because of the inability to gain access in sufficient time to salvage the dead trees, were heavy in various parts of the region."

The spruce beetle, disregarding ownership lines, was a common enemy to all forest land owners. In the preceding quotation there is a note calling attention to the potential R/W (right-of-way) problems which were resolved so quickly for the various ownerships. Evidently the rivalry among owners was put in a state of moratorium by the beetle onslaught. Situations such as this, although by no means unique in forest-based communities, should serve toward the evolution of co-ordination in road building under more normal circumstances. Lessons may be learned on the value of a certain amount of access road as a stand-by for such emergencies.

To those immediately concerned the need for access roads becomes quite clear under such circumstances as a beetle epidemic--but not so the need for main-stem, all purpose roads. Often these roads, because they are all-purpose and usually do not abut an individual property, are simply taken for granted. The preceding quotation shows that it was necessary to shift the

(5) Rauch, George H., Vice President of Potlatch Forests, Inc. in a report addressed to the project director, May 13, 1959

Table 7. Spruce beetle infestation and spruce logged from eight western forest units--1952-1958 (a)

Owner-ship of the forest area	Production year July 1 to June 30 (b)	Infes- tation (millions of board feet)	All spruce logged in the eight areas(millions of board feet)						
			Infested		Salvage & Dead		Green		Total amount of spruce logged
			amt.	Percent of the infestation	amt.	Percent of the total logged	amt.	Percent of the total logged	
National									
Forest	1952	474	75	15.8	9	8.3	24	22.2	108
All other		80	20	25.0	3	4.7	41	64.1	64
Year's total		554	95	17.1	12	7.0	65	37.8	172
National									
Forest	1953	674	115	17.1	39	20.1	40	20.6	194
All other		111	49	44.1	18	18.0	33	33.0	100
Year's total		785	164	20.9	57	19.4	73	24.8	294
National									
Forest	1954	405	204	50.4	86	24.7	58	16.7	348
All other		77	54	70.1	17	16.2	34	32.4	105
Year's total		482	258	53.5	103	22.7	92	20.3	453
National									
Forest	1955	300	187	62.3	139	36.5	55	14.4	381
All other		41	9	22.0	22	43.1	20	39.2	51
Year's total		341	196	57.5	161	37.3	75	17.4	432
National									
Forest	1956	178	93	52.2	168	51.4	66	18.3	327
All other		10	11	110.0	30	47.6	22	34.9	63
Year's total		188	104	55.3	198	50.1	88	22.6	390
National									
Forest	1957 (c)	--- (d)	44	--- (d)	51	37.0	43	31.2	138
National									
Forest	1958 (c)	--- (d)	29	--- (d)	23	18.4	73	58.4	125

- (a) Source: The Spruce Bark Beetle Infestation in Northern Idaho and Western Montana, U.S. Forest Service, Missoula, Mont. Jan. 1958
- (b) Year shown is the beginning of the year--for example, 1952 means July 1, 1952 to June 30, 1953.
- (c) Juntunen, E.H., Chief, Division of State & Private Forestry, U.S. Forest Service, Reg. I, through memorandum furnished by Howard R. Jones, Ass't. Regional Forester, Reg. I, Missoula, Mont., May, 1959
- (d) Figures not available

lumber production to spruce away from other species. In fact, the production of Engelmann spruce into lumber in Idaho increased from 17.9 million board feet in 1949 to 221.3 million board feet in 1956. This was an increase of over 1,100 percent compared with an increase of 45.7 in lumber produced

from all species. ⁽⁶⁾ A shift of this kind has a profound effect upon the demand for main-stem roads--several of them designated

⁽⁶⁾ Wilson, Alvin K., Idaho Lumber Production, 1956, Forest Survey Release No. 1, page 7, Intermountain Forest and Range Experiment Station, Forest Service, USDA, Ogden, Utah, 1958

as Forest Highways or eligible for such designation in these areas. The shift in the geography of the raw materials for the forest industry is quite evident but is only one factor. The shift in the industry as a whole that sometimes must result because of such relatively unpredictable circumstances is more difficult to assess. In any event a different pattern of travel results and to anticipate the change a certain amount of "stand-by" feature is needed in the main-stem road system of the forest areas. This feature must take into consideration both the nature of the transportation and the capacity of the road. It is impossible to control some of these factors to the point where effects would be predictable within a very narrow range. Evidently the spruce bark beetle will not be eliminated and could break into epidemic scale again--especially if there are large remote areas of spruce stands with poor access. The Forest Highway system serves in this capacity.

The Role of Forest Highways in Fire Protection

Anyone having experienced the fearful excitement of being in or near a full-scale forest fire has had a real object lesson. If he, his job, or his property were close enough to have caused him personal risk, he is more likely to have realized the stark significance of the situation. Such realization is likely, however, to be essentially provincial and personal in nature. A person's equity in resources remotely located, even though it may be of great economic importance, must be evaluated in an abstract manner compared with nearby resources. This tends to be true of a stockholder in a large private corporation and it logically is also true for a citizen in respect to his equity in public assets.

Even though the instinctive feeling toward forest fires is probably highly

personalized and localized the modern techniques of coping with the problem have become both cooperative and widespread in nature. In view of this Idaho has passed what is called "Fire Protection District Law," part of the purpose of which states that "The protection of property against fire is hereby declared to be a public benefit, use, and purpose." (Idaho Code 31-1401). This law allows for relatively small districts of as few as 25 land holders with contiguous land aggregating at least 1,000 acres or of \$100,000 assessed valuation for the general property tax. Three non-salaried commissioners are the governing body for a district. The districts are recognized public corporations with--the right to sue or be sued; levy taxes up to 8 mills per dollar of assessment; acquire facilities, equipment, and land; and enter into agreements with municipalities, states, and other agencies--this all being for the purpose of fire protection.

In pursuit of the main purpose of fire protection these districts could easily have become rather major road-building agencies. The main limitation on this is the 8-mill limit on the taxing power. Regardless of the reason, these districts have not become significant in road building.

The lack of road building on the part of fire protection districts is not an indication that roads have not been needed. It is a common complaint among personnel in these districts that one of the main obstacles in carrying out their work is the lack of roads into more remote areas.

The pioneer of the West--especially from the 100th meridian states and westward--learned to be his own lookout and firefighter. The equipment used to fight the grass fires, prairie fires, or forest fires were his ordinary farm tools such as the ax, the spade, and the plow. Logically neighbors often came to the rescue but the

whole operation was restricted to a rural neighborhood operation.

The techniques of fighting fires have changed and have become more effective where it is possible to use these techniques. The airplane and chemicals have been effective, especially in spotting fires and in keeping small fires from spreading. When a forest fire has developed into a wide front it is generally agreed, among those who have specialized in fire protection, that mass movements of men and heavy equipment are vital to effective fire fighting. In Idaho rather large "timber protection associations" have developed. These are quasi-public associations of private and public land owners of all kinds, each owner having a real stake in the area protection in order to protect his own.

In nearly all instances of land ownerships it would be economically prohibitive for the individual small land owner to own, maintain, and operate his own fire fighting equipment. Much heavy and relatively expensive equipment is needed. In order to make the use of such equipment effective in an economic way it is necessary to move it fast, and relatively far, over the main-stem roads in and near forest areas. ⁽⁷⁾ The importance of this kind of service performed by the Forest Highway is certainly not well represented in a simple traffic count. Undoubtedly careful research could establish reasonable monetary values of this service to owners of private timber lands but the value of the protection afforded to public land in the preservation of one of the basic resources of our economy is not so easily expressed monetarily.

That roads have served as a valuable asset in protecting timber from fires can

⁽⁷⁾ The equipment shown in Figure 14 is owned jointly by two timber protection associations and moves relatively great distances depending upon the outbreak of fires and fire conditions. Earth-moving, water-moving, and man-moving equipment are vital to protecting timber from fires.



Figure 14. Heavy equipment being hauled for fighting forest fires: Courtesy A. B. Curtis

be proved without doubt. A definite relationship was found between forest fires and access roads in a study of the Clearwater National Forest in Idaho. ⁽⁸⁾⁽⁹⁾ An analysis of the roads and the fires in that forest showed that, although apparently as many fires started near the roads as away from the roads, the large burns are those that were beyond the reach of roads at the time of the fire. Although the monetary loss is difficult to assess with any degree of accuracy it is common knowledge that it becomes a tremendous aggregation of lost timber and jobs, denuded hills and floods, untold suffering and loss of wildlife, and the loss for a long period of time of the scenic beauty so natively abundant in the area.

⁽⁸⁾ Norman Nybroten, Henry W. Spiegel and Max E. Fletcher, Value of Roads to and in Public Lands, Preliminary, Part I, Vol. I, Effect on Timber and General Values, University of Idaho, Moscow, Idaho, Aug. 1958

⁽⁹⁾ Refer to the statement by A. B. Curtis, page 123.

Rural Roads and the Exigencies of War

Although these conditions were not unique to Idaho, there was an increased demand for essential transportation during World War II. Even though overall travel on the Forest Highways in Idaho decreased from a total of 267,497 average vehicle miles per 24 hours in 1941 to 129,938 in 1943 there was still an increased demand for certain transportation facilities.

As were other resources in general, the roads were deemed expendable during the War. The main-stem roads throughout the Nation were being "used up"--that is, the maintenance was not keeping pace with the rate of wear. To have a road system of this caliber to fall back upon during the War was certainly a great factor in preparedness. As a part of the whole transportation system this was extremely important in both civilian and military efforts.

In some instances--notably in tapping some of the vital resources of the West--the fortunate circumstance of being able to "use up" a road to mobilize the resources was not possible. In many instances access roads of suitable capacity did not exist and in some instances no roads existed. This brought about varied efforts at building roads to resources deemed essential to the war effort.

The locations of some of the essential resources needing better access during the War are shown in Figure 15. These resources were mainly forest, military, or minerals. A map interpretation probably underrates the road-building problem because distances appear to be less than actual. A total of 353.5 miles of rural road was considered in these--some of this was actually overlapping mileage on the same roadbed but the distance was a significant one. These war-essential efforts were kept secret for security reasons.

Financing these road improvements was a real problem during the War. The total

amounted to one-and-a-half million dollars, which would normally not rate as a large sum in road-building history but in the light of the time--considering both secrecy and expediency--it became fairly formidable. Cooperation was sought and received from several public and private agencies. In some instances cooperation was entirely limited to financing whereas in others it was extended into the actual operation of either or both construction and maintenance. Mining and forest interests built private roads not included in the totals cited. Information on these is difficult to obtain but with war-time supply scarcities these tasks probably contained abnormal difficulties and strains. The cooperative efforts of the several groups and agencies probably contained valuable lessons but whether it could be deemed efficient on normal standards is probably questionable.

A Forest Highway may or may not be an access road. The Forest Highways in Idaho are mostly not access roads--this being indicated by 53.3 percent of the mileage being Class I road and only 21.7 percent being Class III road. Although these highways are generally not access roads they served in the war-time extension of access roads because, in the majority of the instances, the essential resources being tapped were mainly located on the public lands. The relatively high sufficiency of the Forest Highways existing in Idaho at the outbreak of the War was an important factor in mobilizing some of the essential resources and serving military establishments.

Other Needs for Stand-by Forest Highways

The role of Forest Highways, or roads of the same type as the Forest Highway, has to some extent been described above in meeting three kinds of emergencies--a beetle epidemic, a war, and forest fires.

LOCATION OF RESOURCES To which emergency roads were planned during World War II*

STATE OF IDAHO

1958

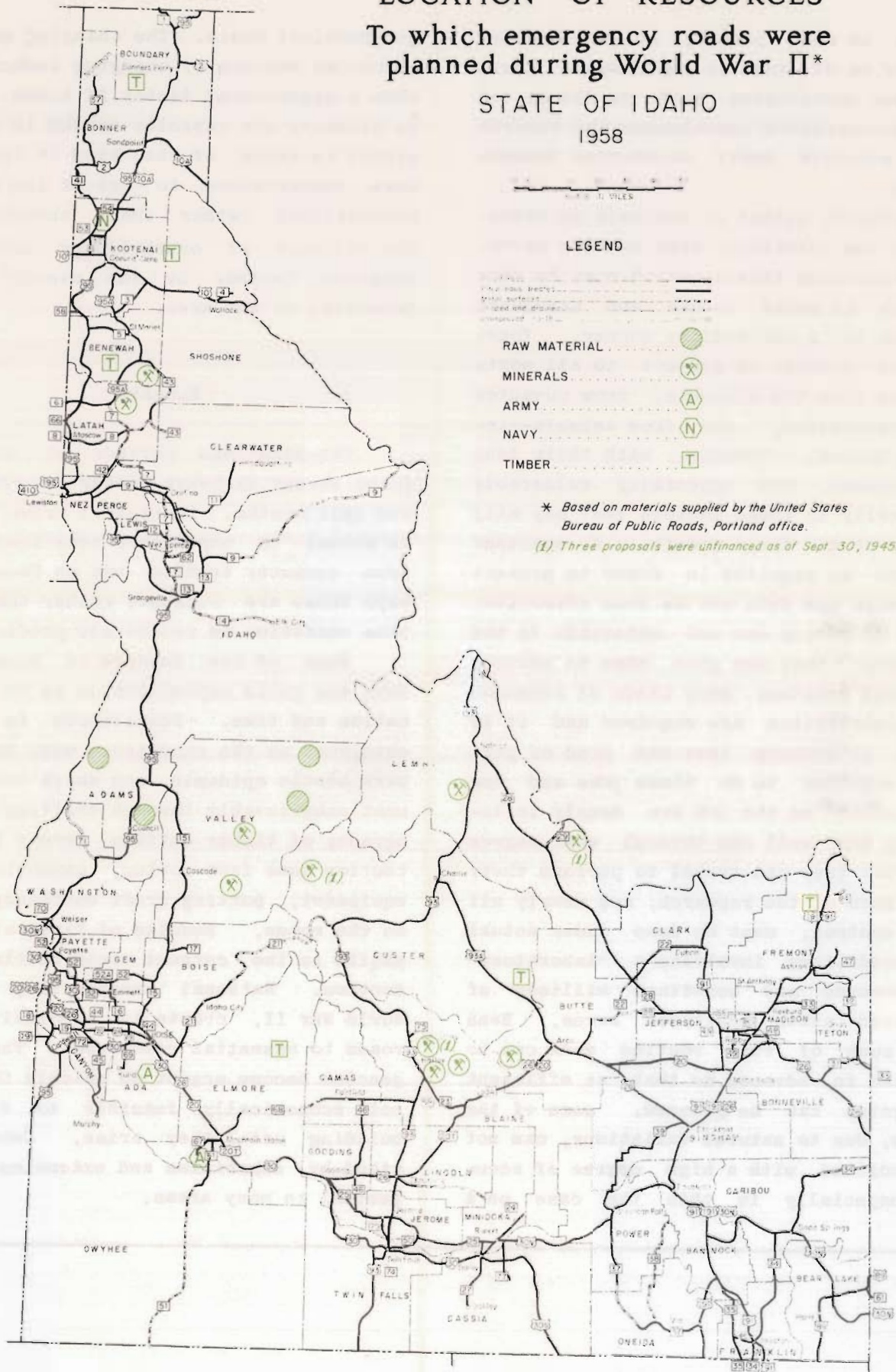


Figure 15. Locations of resources in Idaho to which emergency access roads were built or improved during World War II

At least to some people, one or more of these may be of dramatic importance. There are other emergencies such as floods or other quick-attack pestilences and hazards putting possible heavy short-time demands on roads.

Difficult either to evaluate or dramatize are the relatively drab routine operations, requiring travel, which must be done regularly in order to use and safeguard resources in a husbandlike manner. Vegetation in general is subject to all sorts of attack from the elements, from unwanted other vegetation, and from animals--including humans. Forests, with their long growth season, are especially vulnerable economically to these factors that may kill them or stunt their growth. A constant vigilance is required in order to protect the forests and this can be done effectively only by moving men and materials to the "hot spots" that may give rise to serious widespread problems. Many kinds of research and administration are required and it is logical to believe that the kind of personnel acquired to do these jobs and how they operate on the job are deeply influenced by how well and through what degree of comfort they can travel to perform their tasks. Much of the research, and nearly all of the control, must be done under actual field conditions involving a "laboratory" of thousands and sometimes millions of acres--and often scattered acres. Even though much of this routine work can be estimated in advance so that an efficient road system can be planned, some of the demands, due to natural variations, can not be predicted with a high degree of accuracy--especially is this the case on a

geographical basis. The changing quest for resources because of changing technology is also a significant factor. If there is error in planning the capacity needed in the road system in areas of this kind it thus seems more conservative to err on the side of overbuilding rather than underbuilding. The efficacy of overbuilding should be enhanced further by the overall growth potential of the area.

Summary

The peak-load periods of traffic on Idaho Forest Highways occur in the summer and fall months. In typical urban areas it is normal to experience peak loads daily from commuter traffic but on Forest Highways these are seasonal rather than daily. This variation is relatively predictable.

Some of the demands on Forest Highways are quite unpredictable as to both location and time. Pestilences in the forests, such as the experience with the spruce bark beetle epidemic, can shift traffic almost unbelievably through shifting the geography of timber cutting. Forest fire protection uses fast-moving, expensive, heavy equipment, putting great emergency demands on the roads. Results of fires also cause shifts in the current areas of timber production. National emergencies, such as World War II, create an abnormal need for roads to essential resources. These emergencies become urgent so quickly that it is not economically feasible to defer road building until they arise. Consequently stand-by capacities and extensions are essential in many areas.

Chapter IV

MINERALS AND FOREST HIGHWAYS IN IDAHO

Early Development and Regulations

Congress has struggled long and hard to establish mining laws for the public lands. The beginning of such laws began with the ordinance of May 20, 1785, which reserved one-third of all gold, silver, lead, and copper mined. Leasing of mineral lands was authorized in the Indiana act of March 3, 1807. This act not only gave leases on mines but also other factors such as access and wood for smelting ores. Lease terms were not to exceed 5 years. ⁽¹⁾

Much of the alienation of the public mineral lands was quite informal from the standpoint of law. Between 1785 and 1866, when a general mining law was finally passed, federal laws handled only specific cases and circumstances. Several acts were passed dealing with saline lands but these established no governing procedure in the general mining areas of the West. Regulations were set by the miners themselves. Donaldson gives the miners great credit in being able to create order stating regarding the regulations--

"They sprung from the sterling good sense of the American miner . . . They protected millions of property and aided in opening up a region of incalculable wealth. Prospectors, under this code of laws, with pick, pan, and shovel, on mountain side, amidst winter's rugged grasp, on the plains, under sunny skies, in the quiet nooks and flowery ravines of the lower slopes of the Sierras, lifted from the matrix of nature the golden treasure, and toiled on as safely protected in their property as if in the

midst of the highest civilization."⁽²⁾ Not all historians have painted the peaceful picture depicted by Donaldson. For example in the "muslin towns" springing up in the mining areas of the Northwest it has been claimed that "it was customary to protect beds against stray bullets, with sacks of flour or sand." ⁽³⁾

The mining act of July 26, 1866, opened the public mineral lands officially to exploration and occupation. In addition to the legal prescription ordinarily found in such acts, Donaldson quoted that the act is 'subject also to the local customs or rules of miners in the several mining districts, so far as the same may not be in conflict with the laws of the United States.' ⁽⁴⁾ Generally, this resulted in a system of recording claims with a local recorder under certain evidences of mineral potential and a requirement of a certain amount of mining to hold a claim.

The Situation in Idaho

The lack of mining regulations, or the way regulations developed, has had a profound effect upon the public lands in Idaho. Admitting prospectors to the public lands certainly speeded up the exploitation of some areas. All of Idaho was public domain at the time the general mining law of 1866 was passed.

⁽¹⁾ Donaldson, Thomas, The Public Domain, p. 319

⁽²⁾ Ibid., p. 321

⁽³⁾ Fuller, George W., A History of the Pacific Northwest, with special emphasis on the Inland Empire, Second Ed. Rev., Alfred A. Knopf, New York, 1952

⁽⁴⁾ Ibid., p. 321

One of the indications of the early importance of Idaho mining was the number of Chinese people, who had been brought into the Pacific Northwest for either of two purposes: (1) work in the mines, especially in the gold mines; and (2) work on railroad construction. Donaldson reported that Idaho in 1870 had 14,999 non-Indian people of whom 4,274 were Chinese. ⁽⁵⁾ The white population of the Territory had decreased in numbers from the peak of the mining rush in 1864 and 1865. At that time "She had then within her borders 75,000 white people--miners, prospectors, businessmen, professional men, merchants, packers and freighters, a few ranchers, and a host of adventurers, gamblers, and murderers." ⁽⁶⁾ Other Territories or States of the West showed relatively large Chinese population--especially in the already booming mining States of California, Nevada and Oregon.

As in the other States, the first great mineral rushes in Idaho were for precious metals. Several of the mining areas were bustling with the activities of prospectors, miners, and those serving these two groups.

In the cutover areas of the Lake States it was quite common for lumbering communities to cut so heavily that they lost their economic resource base. These communities then went into economic decay. Idaho perhaps mainly because of the lessons learned in the Midwest has been near enough to a sustained-yield basis in forest management so that forest communities usually have not lost their economic base--but this has not been true in Mining. Mining ghost towns can be found in several parts of the State--these having been established mainly on the basis of precious metals mining.

⁽⁵⁾ Ibid., p. 456

⁽⁶⁾ Donaldson, Thomas, *Idaho of Yesterday*, the Caxton Printers, Ltd., Caldwell, Idaho, 1941 (This was written some time before 1898.)

Even though much of Idaho's early mining was of precarious, mushroom growth, the State was destined to become one of the most important States in the production of several metals. These have been very important to the State's economy and have been of national importance.

At the time of the inception of the Forest Highway program in 1921 mining was a substantial industry in Idaho. (See Table 8) Lead had become the most important metal from the standpoint of gross value of production. Silver mines in the State were already producing annually silver valued at more than \$6 million. Gold production had already declined from its peak while copper and zinc had not yet come into heavy production. Gold production was accelerated during the business depression of the 1930's. The 10-year period following World War II witnessed a decline in gold production and a rapid increase in the value of copper produced. (See Figure 16.) The price of copper rose rapidly--approximately

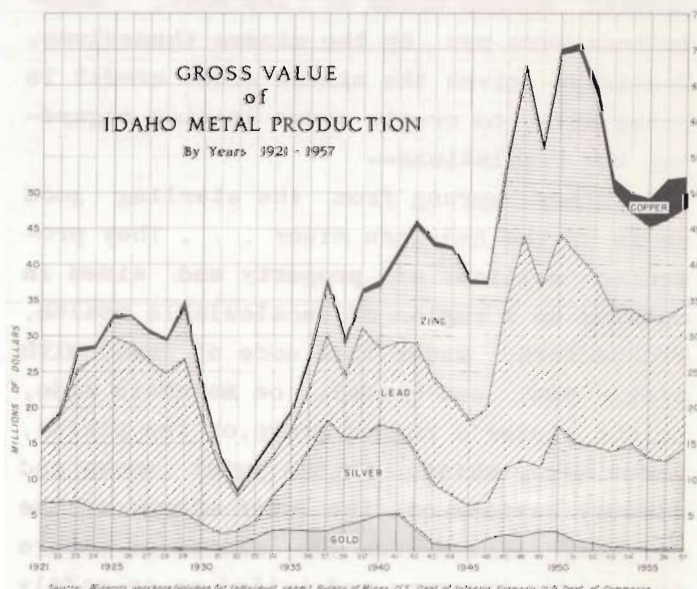


Figure 16. Gross value of Idaho metal production, 1921-1957

Table 8 . Production of five principal metals in Idaho by years 1921-1957,
and total value per year and totals for 1863-1957 (a)

Year	Gold Value	Silver Value	Lead Value	Zinc Value	Copper Value	Total Value
1921	\$ 552,938	\$ 6,184,989	\$ 9,559,558	\$ 94,006	\$ 172,521	\$ 16,564,014
1922	458,427	6,149,336	11,762,302	394,666	431,671	19,196,403
1923	733,913	6,158,099	18,550,214	2,292,009	603,303	28,337,540
1924	542,323	5,192,053	21,081,065	1,351,941	409,864	28,577,248
1925	415,640	5,324,178	23,930,319	2,828,573	473,217	32,971,930
1926	304,978	4,672,236	23,845,828	3,956,265	190,555	32,969,864
1927	322,286	5,014,840	21,127,673	4,024,831	305,281	30,794,913
1928	428,694	5,228,558	19,078,354	4,480,142	385,274	29,601,025
1929	428,729	5,006,065	21,329,321	7,212,181	1,038,707	35,016,005
1930	436,912	3,446,408	14,542,773	3,423,220	409,168	22,258,483
1931	393,882	2,079,521	8,759,414	1,577,839	127,963	12,938,621
1932	945,399	1,875,612	4,777,974	656,045	80,045	8,335,077
1933	1,641,227	2,422,152	6,226,473	1,852,739	119,283	12,261,874
1934	2,984,658	4,713,665	5,722,071	2,347,856	79,648	15,847,898
1935	2,935,870	7,361,278	6,322,895	2,736,581	173,976	15,530,600
1936	2,810,199	11,259,317	8,403,188	4,910,000	271,768	27,654,472
1937	2,865,135	15,151,137	12,237,898	7,045,870	540,144	37,840,184
1938	3,622,955	12,278,740	8,480,284	4,226,880	419,244	29,028,103
1939	4,083,170	11,690,336	15,263,806	4,945,096	523,328	36,505,736
1940	5,126,800	12,481,593	10,483,400	8,895,726	756,874	37,744,393
1941	5,243,560	11,855,936	11,960,196	11,862,600	854,556	41,776,848
1942	3,325,700	10,414,144	15,263,806	16,229,616	830,060	46,063,326
1943	1,078,280	8,320,128	14,468,550	18,728,712	604,240	43,199,910
1944	875,280	7,062,481	13,364,800	20,832,816	455,760	42,591,137
1945	622,300	5,790,341	11,772,884	19,196,490	417,960	37,799,975
1946	1,504,125	5,244,812	13,077,166	17,447,708	336,312	37,610,123
1947	2,274,370	9,362,930	22,735,872	20,102,698	688,800	55,164,670
1948	2,045,890	10,361,810	31,698,752	22,947,022	704,816	67,758,290
1949	2,724,015	9,095,085	25,058,484	18,985,640	566,572	56,429,796
1950	2,787,820	14,566,805	27,006,750	24,960,760	876,512	70,198,647
1951	1,577,240	13,352,231	26,542,698	28,436,044	1,045,440	70,953,653
1952	1,154,895	13,506,218	23,737,518	24,673,244	1,555,092	64,626,967
1953	617,050	13,249,704	19,547,820	16,595,190	1,800,064	51,809,828
1954	463,575	14,360,811	18,988,748	13,290,048	2,848,520	49,951,702
1955	370,020	12,518,168	19,120,574	13,115,244	4,191,028	49,315,034
1956	351,015	12,192,764	20,196,794	13,579,714	5,657,600	51,977,887
1957	414,750	13,710,520	20,224,800	13,487,660	4,533,000	52,370,730

1863
to

1957 \$192,333,378 \$495,235,295 \$911,000,460 \$421,331,021 \$57,654,547 \$2,077,554,701

(a) Source: Minerals Yearbook, (various volumes) U.S. Bureau of Mines, formerly U.S. Dept.
of Commerce, now U.S. Dept. of Interior

doubled--during the decade immediately following World War II and this accounts for much of the increase in the value of copper production but the principal change came as a result of the amount mined--the amount of the production in the late 1950's being about five times the production in the late 1940's. That the recent copper mining is an adjunct of other mining--especially of cobalt--is deemed important in the increased copper mining.

The metal mining in the State has been both a boon to, and a drain upon, the highways. These mineral deposits have been concentrated to some extent but many of them, especially more recent discoveries, have been in more remote areas and usually have depended mainly on the same transportation system as the forest industry. The mining industry and the forest industry, because of this proximity, have had a mutual interest in area development including the transportation facilities. In some areas both of these industries have intensive local interests along Class I Forest Highways. Figure 17 shows the location of the known mineral resources of Idaho. The famous Kellogg-Wallace area in northern Idaho (116° W. and 47° 30' N.) is located in the heart of the Coeur d'Alene National Forest adjacent to U.S. Highway No. 10. In this area U.S. 10 is designated as a Forest Highway. There are other mining areas along the main roads but for the most part they are away from them. It is evident that there is somewhat of an adverse correlation between the location of major agricultural resources and mining resources. The principal agricultural areas are mainly the broader mountain and river valleys--the valley of the Snake River in southern Idaho being the most important both from the standpoint of productivity and size. Major mineral resources in this area are relatively very few. Certainly exploration has been easier in these areas than in the more remote areas so, if the difference is due

to lack of discovery, it is likely that a complete knowledge of the resources would show relatively more in the more remote areas.

Although the overall mining industry in Idaho has been relatively stable in more recent years, there has been considerable change within the industry both from the standpoint of minerals produced and the areas of production. The great centers of silver mining have shifted from their beginnings. Gold, so very important in the early mining, is now relatively unimportant. Several of the bulkier minerals await a market for commercial development--transportation being a problem in this. The extensive phosphate beds in southeastern Idaho are more remote than is immediately apparent from a map, and lack of transportation facilities has been a significant factor in deterring the development and in discouraging many of the earlier efforts, which began in the early 1900's. Several of the Forest Highways proposed for southeastern Idaho would be of great importance to this development, which should have a fairly well assured prospectus because of the increased use of commercial fertilizers and the fast population growth of the West. Several of the minerals that are minor from the standpoint of normal production gain or lose importance as their use depends on national emergencies and changes in industrial technology. (7)

The Future of Mining in Idaho

Although certainly not as exciting as the early gold rushes, the present-day

(7) Hubbard, Charles R., A Survey of the Mineral Resources of Idaho (with map), Idaho Bureau of Mines, University of Idaho, Moscow, Idaho, August 1955. Anyone interested in the details of mining or mineral deposits in Idaho should find this pamphlet very helpful. Besides giving value and location data in itself, there is included a bibliography of 65 references on the subject.

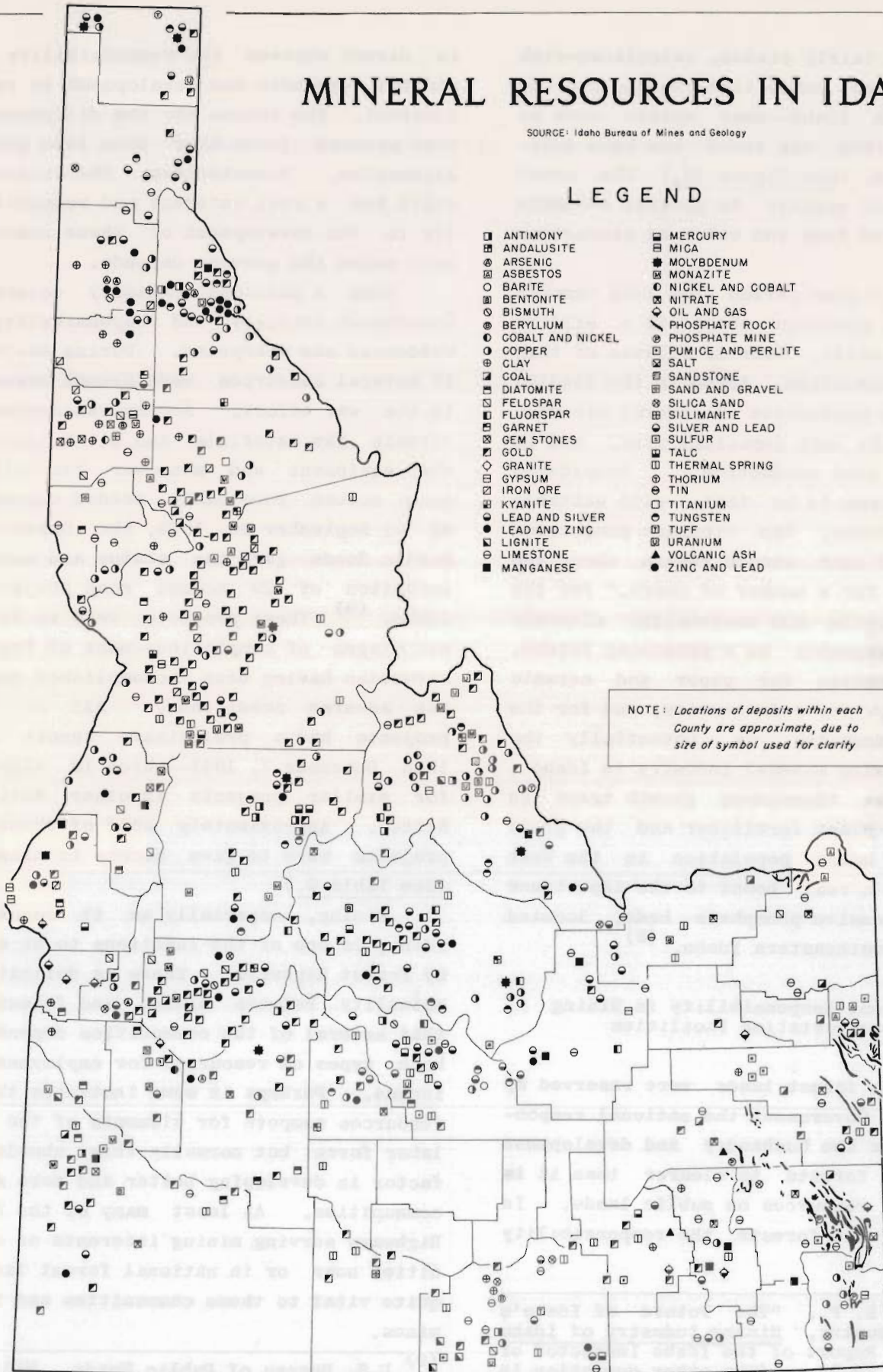
MINERAL RESOURCES IN IDAHO

SOURCE: Idaho Bureau of Mines and Geology

LEGEND

- | | |
|---------------------|----------------------|
| ■ ANTIMONY | ■ MERCURY |
| ■ ANDALUSITE | ■ MICA |
| ⊙ ARSENIC | ● MOLYBDENUM |
| ⊙ ASBESTOS | ⊙ MONAZITE |
| ○ BARITE | ⊙ NICKEL AND COBALT |
| ⊙ BENTONITE | ⊙ NITRATE |
| ⊙ BISMUTH | ⊙ OIL AND GAS |
| ⊙ BERYLLIUM | ⊙ PHOSPHATE ROCK |
| ⊙ COBALT AND NICKEL | ⊙ PHOSPHATE MINE |
| ⊙ COPPER | ⊙ PUMICE AND PERLITE |
| ⊙ CLAY | ⊙ SALT |
| ■ COAL | ■ SANDSTONE |
| ■ DIATOMITE | ■ SAND AND GRAVEL |
| ■ FELDSPAR | ⊙ SILICA SAND |
| ■ FLUORSPAR | ⊙ SILLIMANITE |
| ■ GARNET | ⊙ SILVER AND LEAD |
| ■ GEM STONES | ⊙ SULFUR |
| ■ GOLD | ■ TALC |
| ◇ GRANITE | ■ THERMAL SPRING |
| ■ GYPSUM | ⊙ THORIUM |
| ■ IRON ORE | ⊙ TIN |
| ■ KYANITE | □ TITANIUM |
| ⊙ LEAD AND SILVER | ⊙ TUNGSTEN |
| ⊙ LEAD AND ZINC | ■ TUFF |
| ■ LIGNITE | ⊙ URANIUM |
| ⊙ LIMESTONE | ▲ VOLCANIC ASH |
| ■ MANGANESE | ● ZINC AND LEAD |

NOTE: Locations of deposits within each County are approximate, due to size of symbol used for clarity



Idaho Highway Planning Survey

Figure 17. Geographic distribution of various known mineral resources in Idaho

mining is a fairly stable, calculated-risk industry. Metal production has had its ups and downs in Idaho--some metals more so than others--but the trend has been definitely upward. (See Figure 16.) The metal prices respond quickly to general economic conditions and thus the value of production fluctuates.

In the 95-year period from 1863 through 1957 Idaho produced about \$2.4 billion worth of minerals. Over \$2 billion of this was metal production. Idaho is the leading State in the production of several minerals including the very important zinc, and is second in lead production. Considered judgment seems to be that, with suitable price conditions, the "tonnage production of lead and zinc should remain about the same as now for a number of years." For the strategic metals and nonmetallic minerals there will probably be a promising future. "Clay production for paper and ceramic manufacture, for refractories, and for the aluminum industry is potentially the fastest-growing mineral industry in Idaho" The tremendous growth trend in the use of plant fertilizer and the great growth of human population in the West should give a real boost to the importance of the extensive phosphate beds, located mainly in southeastern Idaho. (8)

Government Responsibility in Mining Transportation Facilities

Because forest lands were reserved by the Federal Government the national responsibility for the husbandry and development of national forests is clearer than it is for mineral resources on public lands. In the case of the forests the responsibility

is direct whereas the responsibility for mineral husbandry and development is rather indirect. The reason for the difference is that mineral lands have gone into private alienation. Nevertheless, the Government still has a real interest and responsibility in the development of these resources upon which the economy depends.

When a national calamity occurs the Government interest and responsibility is evidenced and sharpened. During World War II several resources were deemed essential to the war effort. Access was needed to certain raw materials and at a time when the equipment and manpower for building such access were badly needed elsewhere. As of September 30, 1945, the Bureau of Public Roads gave the status and some description of 29 access road projects in Idaho. (9) These projects were in different stages of completion--most of the construction having been accomplished despite the adverse conditions. All of these projects had a preliminary report later than December 7, 1941--which is also true for similar projects in other Northwest States. Approximately half of these road projects were to give access to minerals. (See Table 9.)

Mining, especially as it occurs in Idaho, is one of the functions to be served by Forest Highways. There is definitely a mutuality between mining and forestry in that several of the communities depend upon both types of resources for employment and income. Perhaps in some instances the two resources compete for elements of the same labor force but normally this should be a factor in developing better and more stable communities. At least many of the Forest Highways serving mining interests of communities near or in national forest land are quite vital to these communities and to the mines.

(9) U.S. Bureau of Public Roads, Military, Naval, Industrial and Raw Material Access Roads, U.S. Bureau of Public Roads, Div. 8, Portland, Oregon, September 30, 1945

(8) Cook, E. F., "The Future of Idaho's Mineral Industry," Mining Industry of Idaho for 1958, Report of the Idaho Inspector of Mines, pp. 22-26. (The other quotation in the paragraph is from this article and the paragraph is generally based on this article.)

Table 9. Status of access road projects,
Idaho, USBPR, Div. No. 8,
Sept. 30, 1945 (a)

Type of establishment	Number of projects	Number of miles	Estimated cost
Raw materials	6	65.6	\$ 497,600
Naval station	1	7.5	2,000
Tungsten and antimony concentrates	3	148.3	378,250
Army	2	12.5	370,240
Lead, zinc and concentrates	2	22.0	66,504
Mica	1	6.2	28,366
Timber	7	54.9	151,564
Lead and zinc	3	19.9	28,800
Lead, zinc and silver	2	9.5	11,000
Copper	1	3.1	8,200
Garnet sand	1	4.0	14,000
Totals	29	353.5*	\$1,556,524

(a) Source: Military, Naval, Industrial and Raw Material Access Roads, United States Bureau of Public Roads, Division 8, Portland, Oregon, September 30, 1945

* In some instances there were two projects covering different improvements on the same road.

Summary

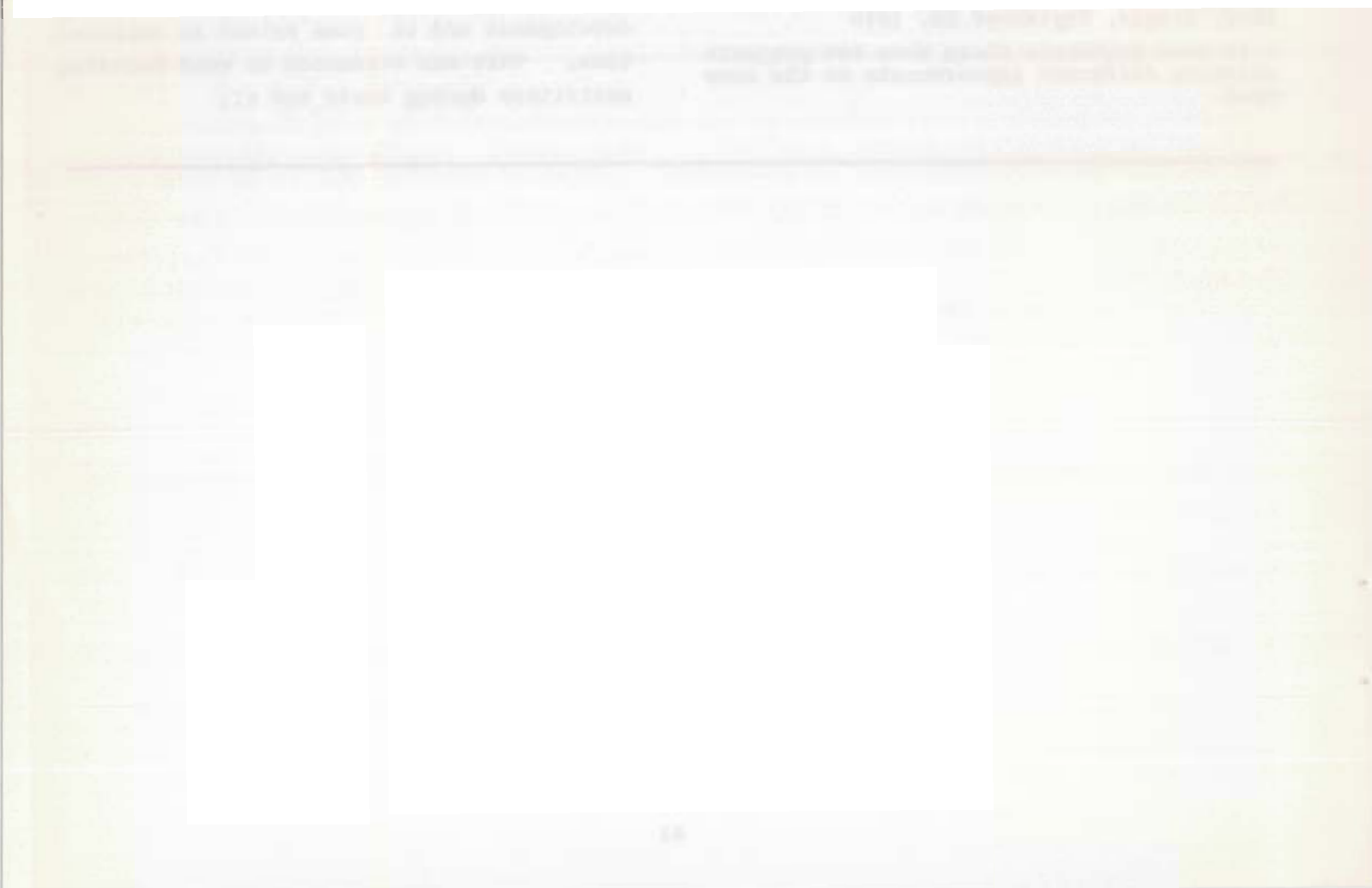
Some of the minerals mined in Idaho are of considerable importance nationally. The State is the leading one in zinc production and ranks second in lead production. The phosphate beds have a very rapid growth resulting from increased use of human population in the West. The income from mining is very important to the State.

Mining and forestry generally have mutual needs for some of the Forest Highways. Many of the major known mineral resources are located in or near the national forests. Thus the mining is one of the industries using and supporting the Forest Highways.

The more important known mineral resources of Idaho are generally remotely located from population centers. Lack of access has been a deterrent factor in mining development and to some extent in exploration. This was evidenced by road-building activities during World War II.

100

100



Chapter V

IDAHO COMMUNITIES AND FOREST HIGHWAYS

Three specific aspects involving the relationships between the national forests, forest communities and Forest Highways will be discussed in order to clarify their importance and interdependence. These three aspects include forest management policies related to communities, a study of the interdependence of forests and communities and the important role the highways play in community and individual development.

Forest Management Policy and the Forest Community

In addition to the integral role of Forest Highways and communities that has been recognized in the Highway Act the U.S. Forest Service has recognized the relationship between the forests and the forest communities. The policy and administrative decisions have recognized a responsibility toward the well being of the communities related to the national forest areas. This has been demonstrated in the formulation of laws and procedures which govern the activities of the national forests, appropriations made for road building, planning timber sales and planning forest work in order that forest employment may be sustained.

Specifically, the forest and community policy is evidenced in the sustained yield management and working circle concepts. In relation to the community L.S. Gross has written, "Wherever significant factors of community support are at stake, continuity of cutting at approximately equal annual rates is employed." (1) In explaining the organization of national forest management he says the following: "A working circle is a forest area from which a sustained yield of forest products is planned. Other con-

siderations which govern the delineation of the national forest working circles include community support, topography, transportation, and timber-growing potential." (2)

Again the policy states, "Continuity of employment, stability of communities, adequacy of administration, and intensity of management all require that the size of the working circle be held down to something approximating the minimum that will afford significant annual cuts." (3)

Specifically, in regard to community living and stability we find the following: "It is undesirable to have a single large woods operation, moving periodically, as community stabilization and the benefits of community life for the loggers are difficult, if not impossible, to attain under such a condition." (4)

A further statement related to travel and community living is included in the planning instructions. "One objective is to fix working-circle boundaries so that no logging operation will be beyond commuting distance from a permanent community. This objective. . . should be considered seriously in every case." (5) Forest supervisors in response to a questionnaire used in this study, indicated that community policy in their forests is in general agreement with these concepts. Although policies are kept flexible, to adjust the management of the forests to several other factors, community living and community stability are included as an important part of management policy.

The stability of community life including relatively consistent work opportunities will have a great deal to do with the population of forest communities and a

(1) Gross, L. S., Timber Management Plans on the National Forests, U.S.D.A., U.S. Forest Service, 1950, p. 1

(2) Ibid., p. 1

(3) Ibid., p. 2

(4) Ibid.

(5) Ibid.

stable, reliable labor force. Wide variations in employment usually result in a declining and unstable population. Such an unstable pattern brings about low levels of living, poor institutions and little or no growth and development. Such conditions have been related to forest communities where management policies have not been concerned with sustained yield and continuous production methods. The Sustained Yield Act, P.L. 273, provided specifically by act of Congress that stability of communities and normal family living should be a part of the national forest policy.

In dealing with the problems of stability in forest communities one writer has described two communities which were unstable, declining, and in danger of great distress or extinction due to the rapid and uneven cutting of timber resources. In this instance the Sustained Yield Act program of the national forest was applied to both the private and national forest land and these communities were rehabilitated, improved, and have shown considerable growth as a result.⁽⁶⁾ In addition they have provided the forest with a stable, well-trained labor force.

The costs of instability are high. There are economic and social costs. Economically property values decline, businesses are closed, taxes decline, income is uncertain and loss is high. Socially the educational, governmental, and religious institutions are unable to sustain adequate programs; sanitation and other facilities decline; housing and level of living declines. In moving loss of friends, home and job have a heavy impact upon the individuals own well being. In such times of stress family stability is taxed excessively and the rootlessness of the moving or separated family adds to the problem of

(6) Griff, Mason, Determination of Need and Feasibility of the Cooperative Sustained-Yield Program of the Forest Industry, Unpublished M.A. Thesis, Stanford University, 1952, pp. 85-86

personal as well as social instability. All of these add up to a great deal of human suffering, economic chaos and a less desirable labor force in areas of forest industry.

For these reasons forest policy has found it useful to consider the forest community in its basic policy and planning. In this policy the Forest Highway plays an important role.

National Forests and Communities in Idaho

One of the major criteria for consideration in the designation of any road or trail as a Forest Highway is the service the highway performs for communities that depend on or serve the national forests. A survey was made to determine the relationships between the national forests and the communities of the State and discover the location of these communities over the State in relation to the national forests and the highways--especially highways now either designated as Forest Highways or may possibly be eligible for such designation.⁽⁷⁾

Dependence

The twelve national forests that reported forest-community relationships in the State listed 153 different communities as being dependent upon the national forest to an important degree; these are shown in Figure 18. Fifteen of the 153 were named as dependent communities by two forests. Dependence in this instance is defined as

(7) The method used was a short questionnaire sent to all 16 of the national forests lying wholly or partly in the State of Idaho. Kootenai National Forest reported it had only 3 percent of its area in the State and has no Idaho community activity, therefore it was eliminated from the analysis. No Idaho communities were found to be related to the Bitterroot and Lolo National Forests but, because there was some employment or tourist activity within the Idaho portions of these areas, they are included in the analysis relating to these factors.

FOREST-COMMUNITY RELATIONSHIPS

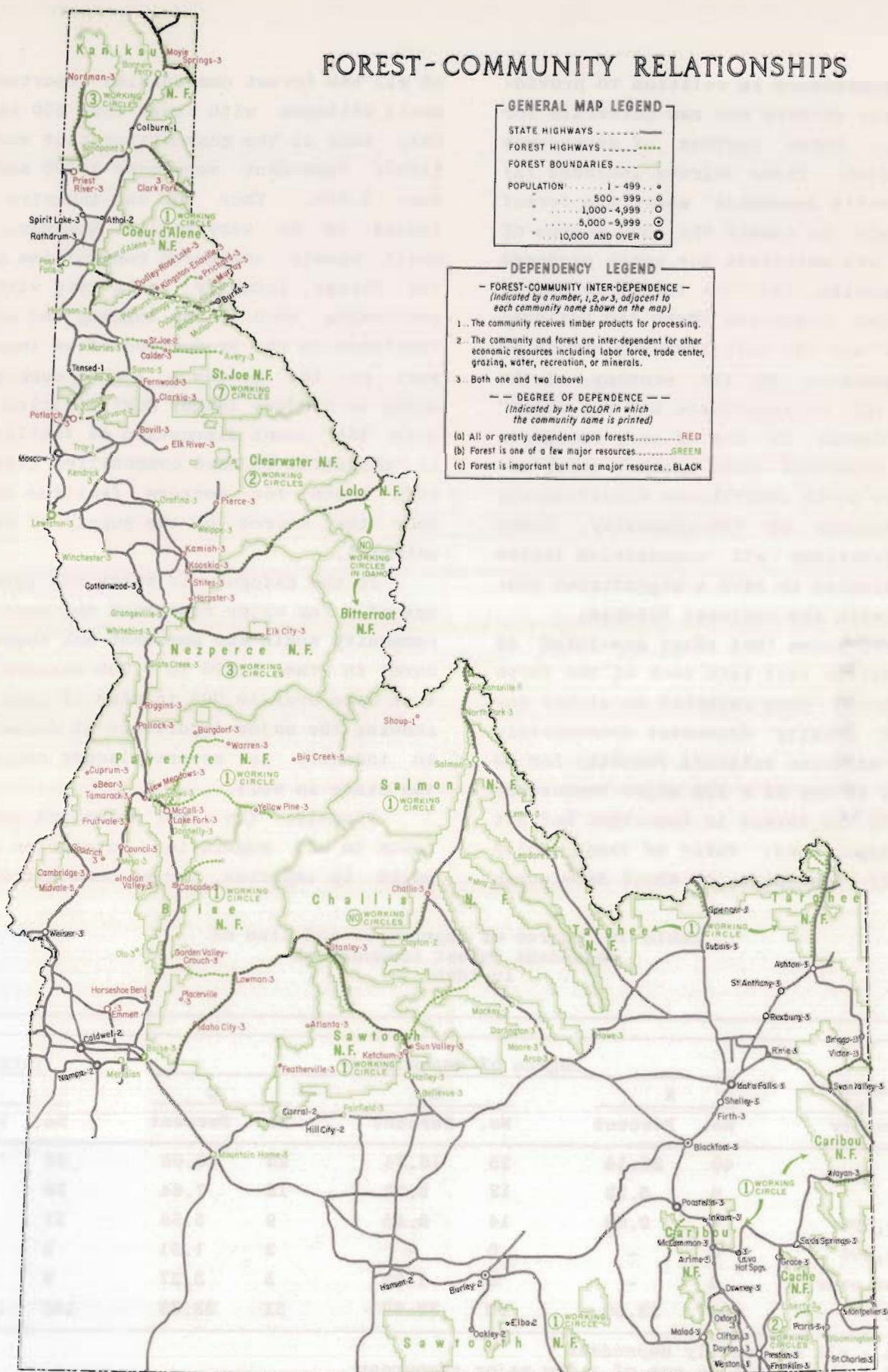


Figure 18. Forest-related communities in Idaho showing the relationship between the community and the national forests

economic dependence in relation to providing jobs for workers and raw materials for industries. Three degrees of dependence were indicated. These degrees included (A) "all or greatly dependent" where the forest is the only or almost the only source of jobs and raw materials for goods produced in the community, (B) "The forest is one of a few major resources where the national forest is not the only resource but is of major importance to the economy of the community, (C) "of importance but not major" where the forest is one of many resources or less important than another major resource but still contributes significantly to the economy of the community. Under these definitions all communities listed were considered to have a significant economic tie with the national forests.

Table 10 shows that about one-third of the communities fell into each of the three categories--52 were reported as either entirely or greatly dependent economically upon the adjacent national forests; for 50 the forest is one of a few major resources; and for 51 the forest is important but not of major importance. Forty of those wholly or greatly dependent, or about one-fourth

of all the forest communities reported, were small villages with fewer than 500 people. Only four of the communities that were entirely dependent were over 1,000 and none over 5,000. Thus the one-industry towns tended to be very small. However, these small widely scattered communities served the forest industry in a very vital way performing much of the logging and milling functions in the production of an important part of the nation's lumber supply. In order to produce lumber most efficiently and with the least disruption of families, it is essential to have communities that provide homes for workers' families located near the source of the supply of the raw material.

In the category in which the forest is one of a few major resources the small size community again was dominant but there were more in the 1,000 to 5,000 category and that were over 10,000 in size of population showing the major importance of forestry as an industry in several larger centers of the State as well.

Finally, the last one-third included towns in all population categories but as might be expected, larger communities were

Table 10. Degree of dependence and size of dependent forest communities in Idaho

Population of the Community	Degree of dependence*						Total	
	A		B		C		No.	Percent
	No.	Percent	No.	Percent	No.	Percent		
0 - 499	40	26.14	25	16.34	23	15.03	88	57.51
500 - 999	8	5.23	12	5.23	12	7.84	28	18.30
1,000 - 4,999	4	2.62	14	9.15	9	5.88	27	17.65
5,000 - 9,999	0	-	0	-	2	1.31	2	1.31
10,000 and over	0	-	3	1.96	5	3.27	8	5.23
Total	52	33.99	50	32.68	51	33.33	153	100.00

*Code: A - all or greatly dependent
B - the forest is one of a few major resources
C - of importance, but not major

relatively more numerous than in the previous categories.

These 153 localities are permanently settled places and most of them are classed as villages or cities. Some are hamlets with only a few residents. They do not include logging camps or temporary quarters. A few, but very few, are or have been company-owned towns. The trend has been away from company towns in this area as in other parts of the country. They include 95 incorporated places. An Aggregate of nearly one-half of the State's population is associated with the communities listed and share in some measure in the forest resources.

Thus it may be seen that an important number of the communities in Idaho have a close economic relationship to the national forests and for many their entire economic base is dependent upon work in or products from these forests. They are socially stable areas performing an important role in a national industry.

Distribution of Forest Communities

Figure 18 shows the distribution over the State of communities in relation to the national forests and shows the estimated degree of economic dependence on the forests. Three regions can be delineated from the dependence categories. One is the southeastern section of the State from Burley to Ashton where the forests share the economic functions of the area with several other major industries.

Another is the central section from Mountain Home to Arco and Salmon where the resources are narrowed to a relatively few and the forest is generally of major importance.

A third is the northern section from Boise north where the forests are the prime source of the economies of a large proportion of the communities.

Of particular note is the fact that the forest-related communities appear in every part of the State. This generally coincides with the state-wide distribution of national forests. About 38 percent of the area of the State is included in the national forests and national forest land lies in all but 10 counties. Most northern and central counties, however, generally have higher percentages of national forest area ranging up to a maximum of 86 percent in Valley County. (See Figure 19.) Not evident from the map in Figure 19 is the fact that there is a general association between the percentage of national forest land in a county and the quality of the privately owned rural land--that is, in general the greater the percentage of forest land in a county the poorer the privately owned rural land. This means that in counties having a large percentage of national forest land there is an unexpectedly great dependence on national forest resources. Figure 20 shows the lumber production and distribution of sawmills in the State. These generally parallel the major forest counties.

Forest Highways and Forest Communities

With the wide distribution of national forests and forest-related communities the pattern of highways serving these communities is also state-wide in scope. The Forest Highways serve as segments of this far-flung system.

Since the sections of designated Forest Highways in the State are also widely distributed they serve a large number of these communities either directly or indirectly. Twenty-four of these communities have Forest Highways as their only main roads; another 28 are located directly on a portion of Forest Highway but are also served by other main roads not designated as Forest Highways. The other 101 of the 153 forest communities listed are located on

PERCENT OF COUNTY IN NATIONAL FOREST STATE OF IDAHO

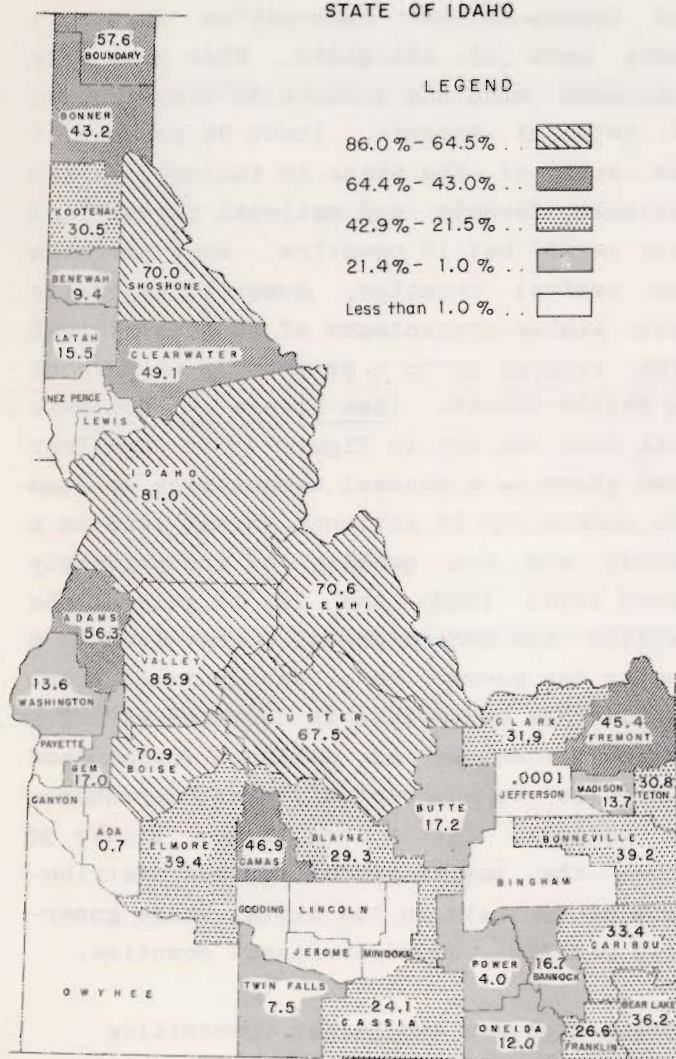


Figure 19. Percentage of area in national forest, Idaho by counties

12 major forests in the State. On the first two items checked it was found that 64 percent of the communities received saw logs and 78 percent obtained other wood products from the forests. (8) On request to indicate other ways in which the communities were dependent on the forests they listed grazing, water and recreation. Mining was also mentioned in some instances in connection with a few of the communities. Communities were reported as using the forests for recreation in almost all cases. In addition a high proportion, 71 percent, were reported as using the grazing resource with water following as important to 46 percent of the communities.

The communities were noted as providing important resources to the national forests in two ways, one, the location of the residence of the labor force that worked in the forests and the other as trading centers for workers and forest needs. Respondents indicated 65 percent of the forest communities listed were places of residence of forest workers. However, two of the twelve failed to answer this question. It is believed that had they done so the percentage would have been somewhat higher. Even so the labor force of the forests, whether publicly or privately employed, was drawn from many communities.

Communities serving as important trade and service centers for the needs of employees and the forests included 28 percent of those listed.

In several important respects, vital interdependence between the communities and forests was shown by the respondents.

other public roads, some small sections of which may be classified as Forest Highways.

Nature of Interdependence of Forests and Communities

In analyzing forest communities the forest supervisors were asked to indicate what the major resources of the forests were that were useful to the related communities and also what elements were provided by these communities that were useful to the forests.

Table 11 shows the responses from the

(8) Three items were listed in the inquiries sent out so they could be checked as to order of importance. These were (1) get saw logs, (2) get other wood and (3) residence of workers. Other factors of importance were written by the respondent to the inquiry without any suggestion in the questionnaire.

IDAHO SAWMILLS- 1956 and PERCENTAGE OF LUMBER PRODUCTION BY COUNTY

LEGEND

• Sawmill reporting production in 1956



Percent of state lumber production
(Not shown in counties or groups of
counties with less than 2.0 percent).

--- Subunit boundary

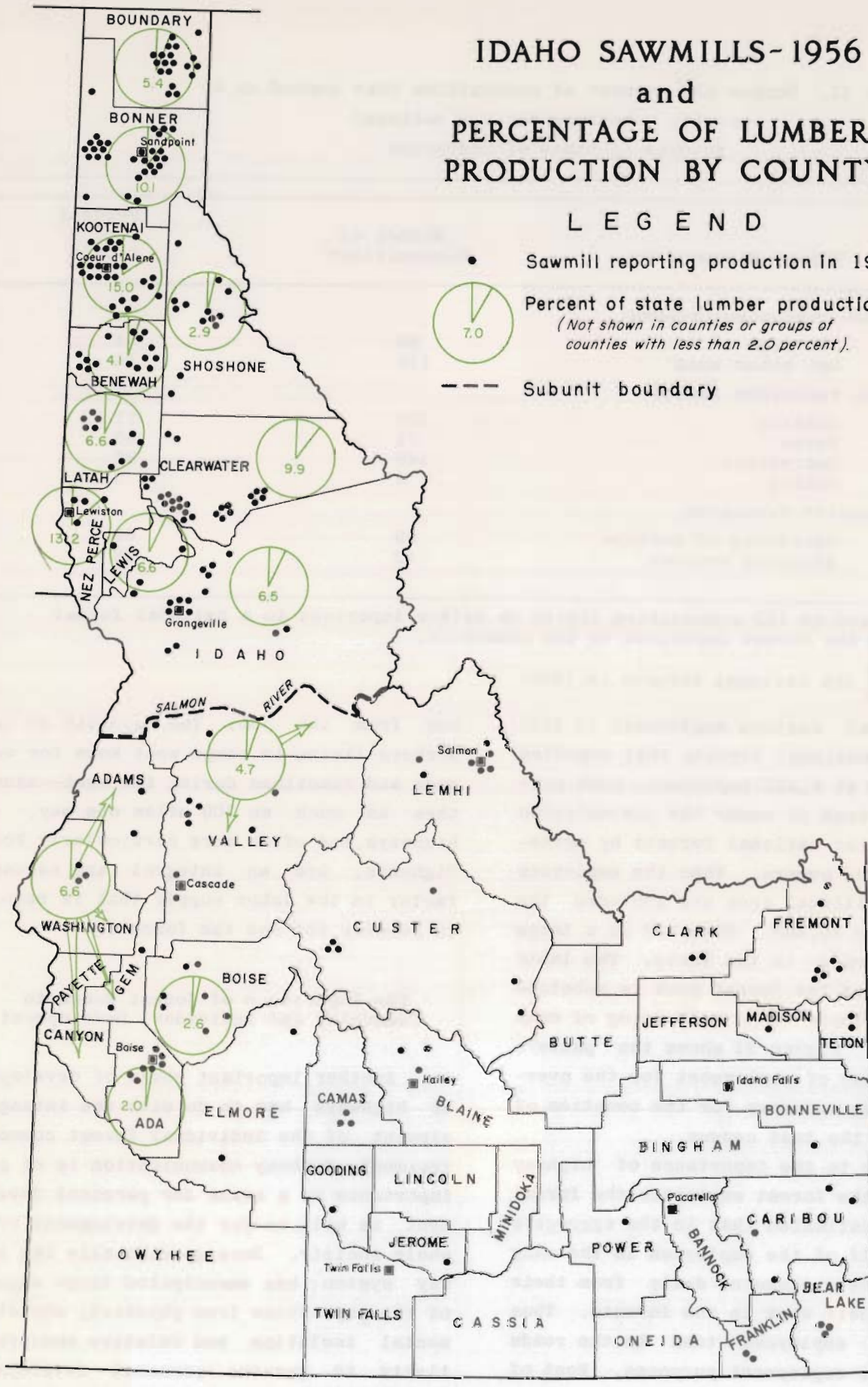


Figure 20. Location of operating sawmills in Idaho and percentage of the State's lumber produced in each county

Table 11. Number and percent of communities that depend on or provide resources for the national forests by types of resources

Types of resources	Number of Communities*	Percent of total*
Forest resources checked		
Get logs	98	64
Get other wood	119	78
Other resources listed		
Grazing	108	71
Water	71	46
Recreation	149	97
Mining	8	5
Community resources		
Residence of workers	99	65
Shopping centers	42	28

*Based on 153 communities listed as either important to a national forest or the forest important to the community.

Employment in the National Forests in Idaho

The total maximum employment in 1958 for the 15 national forests that reported was estimated at 8,525 employees. Some private forest land is under the jurisdiction of the adjacent national forests by agreement with the owners. When the employees from this additional area are included the total rises to 10,669. Forestry is a large major enterprise in the State. The labor force required for forest work is substantial and affects the well being of many communities. Figure 21 shows the pattern of distribution of employment for the overall lumbering industry for the counties of the State at the last census.

Relative to the importance of highway travel to the forest employees the forest supervisors estimated that in the aggregate about one-half of the employees in the many national forests commuted daily from their homes to their work in the forests. Thus about 4,300 employees took to the roads every day for employment purposes. Most of the others who lived in camps used the same roads at less frequent intervals to get to

and from the job. The majority of these workers living in camps went home for week-ends and sometimes during the week--many of them as much as 100 miles one way. The highways, and often more particularly Forest Highways, are an integral and necessary factor in the labor supply that is required to develop and use the forests.

The Importance of Forest Roads to Community and Individual Development

Another important phase of development of highways has to do with the intangible element of the individual forest community resident. Highway communication is of great importance as a means for personal development as well as for the development of the whole society. More specifically the highway system has emancipated large segments of the population from physical, social and mental isolation and relative non-productivity to greater personal development, social integration, community participation and economic productiveness.

STATE OF IDAHO 1950 EMPLOYMENT IN LUMBERING

LEGEND

- Number of workers employed in Sawmills,
Planing Mills, and Logging in the County
- Percent of the County's gainfully employed
working in Sawmills, Planing Mills, and Logging

Counties in which more than 15 percent of
the gainfully employed were working in
Sawmills, Planing Mills, and Logging

Counties in which 10 to 14 percent of
the gainfully employed were working
in Sawmills, Planing Mills, and Logging

Counties in which less than 10 percent of
the gainfully employed were working in
Sawmills, Planing Mills, and Logging

Source: 1950 Census of Population, Vol. II,
Characteristics of the Population,
Part 12, Idaho, Table 43

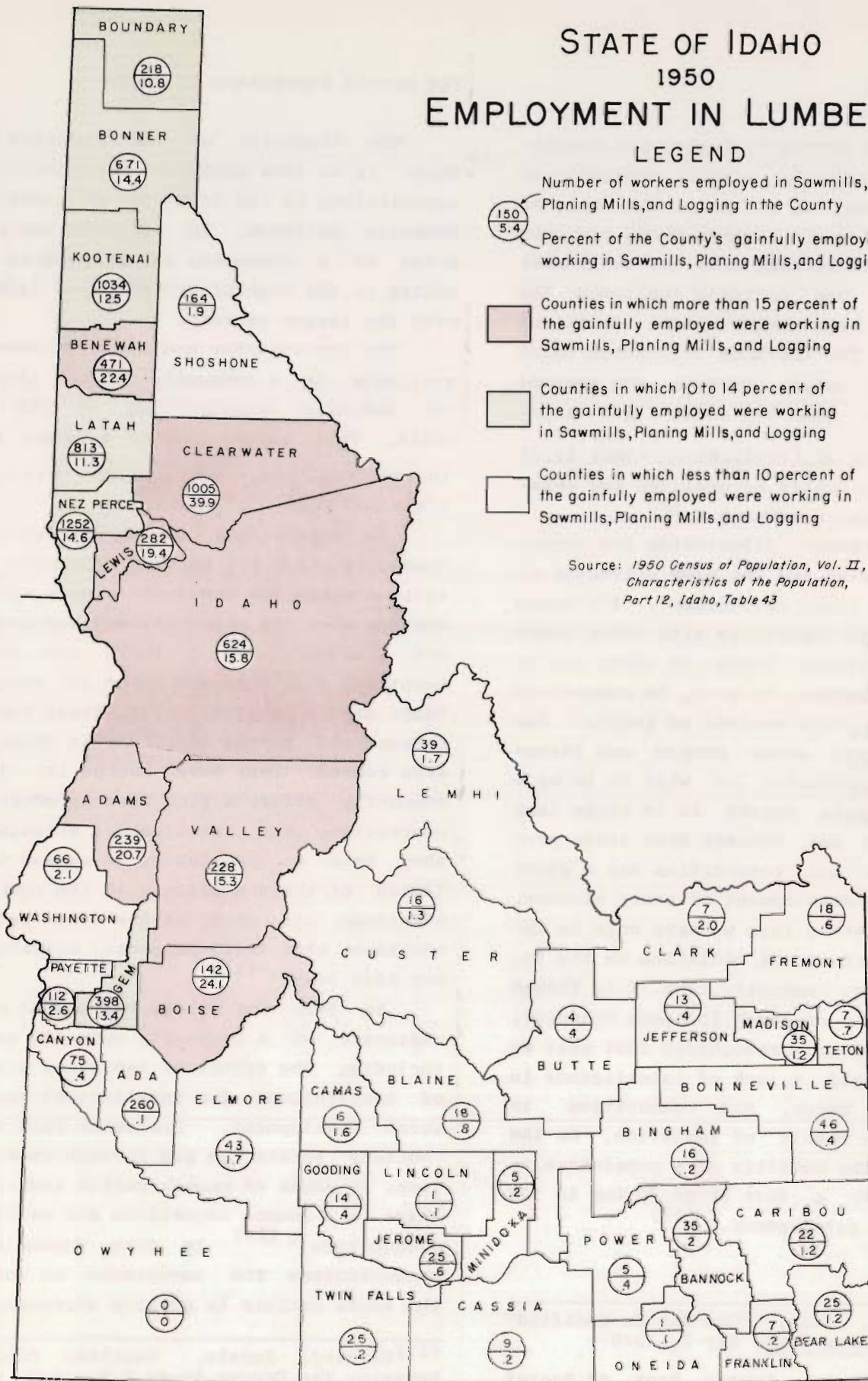


Figure 21. Percent of county's gainfully employed working in sawmills, planing mills, or logging, Idaho, 1950

The Individual

The noted French biologist and geneticist, Jean Rostrand, writing recently of the development of man said "The whole of that part of man's history which has gone by since those faraway ages (of early man) has not --or has scarcely --altered the morphological and physiological outfit of our species. The enormous difference which none-the-less exists between the ancient flint chipper and his modern heir is entirely the work of civilization--that is, of the culture gradually accumulated and transmitted by social tradition." (9)

This statement illustrates the importance of learning and the wide diffusion of knowledge in human development. The human being requires experience with other human beings of various kinds to learn how to behave as a person, to work, to comprehend and to live in a society of people. His experience with other people and things shapes the character of what he is as a person. In this regard it is clear that communication and contact with other persons, groups and communities has a great impact on the development of every citizen.

To understand this we have only to observe the effect of isolation on the individual and on community life. W.I. Thomas wrote from his research in human behavior, "It is now clearly recognized that what we ordinarily call a lack of intelligence in individuals, races, and communities is frequently a result of isolation. On the other hand, the mobility of a population is unquestionably a very large factor in its intellectual development." (10)

(9) Rostrand, Jean, "Can Man Be Modified" *Saturday Evening Post*, May 2, 1959

(10) Thomas, W. I., *Source Book of Social Origins*, p. 169, quoted in Robert E. Park, *Human Communities*, p. 27-28, The Free Press

The Social Importance of Roads

The character of the community as a whole is no less important than individual associations in the formation of individual behavior patterns. In addition the character of a community is inseparably connected to the highway system which links it with the larger society.

The institutions and cultural resources available in a community place a limit on the learning opportunities of its residents. This selectivity is a potent force in molding individual values, attitudes, ideas and points of view.

In emphasizing the importance of the community stamp Dr. Bernard discusses limitations which the community places upon its members when its opportunities and contacts are limited: ". . . there are perhaps countless able boys who never get away from their native habitat . . . their world is encompassed by the community in which they were reared. They never escape it. If the community offers a rich fare in education, recreation, and intellectual stimulation, they have an opportunity to expand to the limits of their ability. If the community offerings are poor, on the other hand, no one knows what their potential contribution may have been." (11)

In this way we see the impact of the character of a community upon its members including the effect of isolation and lack of institutions for intellectual and cultural development. Professor Park wrote, "society exists in and through communication. By means of communication individuals share in a common experience and maintain a common life." (12) In this emphasis on communication the importance of roads to the whole society is greatly stressed.

(11) Bernard, Jessie, *American Community Behavior*, The Dryden Press, N.Y. 1949, p. 568

(12) Park, Robert E., *op. cit.*, p. 174

The roads and highways perform the indispensable function of providing the major means for human contact. It is still through increasing human contact that man's social and cultural progress continues to grow and it is by this means that it has been possible to build the present level of civilization. For those communities on the periphery of the more-populated areas it is of greatest importance that highway access be built and maintained in an ever-improving condition in order that they may grow with the rest of the society. Inherent in extreme remoteness, whether by miles or difficult access, is a lag in cultural development with the rest of the State and nation. Such a lag includes retardation of manpower development, educational opportunities, health, development of skills, understanding

of public problems and participation in civic affairs.

Summary

National policy as well as national forest policy has for a long time given recognition to the interdependence of the national forests and the communities that serve them. The extent and consequence of this interdependence in Idaho is demonstrated in the number of communities and the high proportion of the population involved and the importance of this industry to the labor force of the State. Finally adequate highway communication between communities and the rest of the nation is of grave importance to the personal development of the individual citizen and to his community in the twentieth century.

Chapter VI

LOGGING CAMPS--SUBSTITUTES FOR ROADS AND COMMUNITIES

Life in logging camps--notably through Paul Bunyon stories--has been highly romanticized. Certainly some of the features emphasized in such stories made the life seem quite colorful. Many of the authors of such stories, however, failed to appreciate or relate the drabness of the routine, the limitation on the use of leisure time, and the general disutility of isolation. The erstwhile lusty bachelor, without the family and community responsibilities of the present type of logger, was the heroic center of such stories.

Trends in Distribution of Logging Camps in Idaho

It is apparent from Figure 22 that logging camps in Idaho have been distributed over much of the forested areas but concentrated more heavily in northern Idaho. The more remote and inaccessible areas of Clearwater County and Shoshone County have had large numbers of logging camps and most of these were still in operation in 1958. On the other hand the Coeur d'Alene National Forest, primarily in Kootenai County and that part of Shoshone County north of U.S. 10, had several relatively large logging camps in operation during the earlier part of the decade of 1949-58. Except for two camps for which accurate information was not available, only two of these camps remained in operation in 1958. One went out of operation between 1953 and 1958 while all of the others went out of operation before 1953. From the standpoint of forest management and development, including roads, Coeur d'Alene National Forest is considered to be a more mature forest economy than are

other forests throughout the State. The personnel on this forest were in general agreement that the development of the road system has played an important part in alleviating the necessity for logging camps or woods camps. (1)

All sixteen of the supervisors of the different national forests lying partly or wholly within Idaho were asked to comment upon the desirability of and trend in logging camp operations in their respective areas. There was essentially universal agreement that the logging camp, or more precisely the woods camp, is rapidly passing out of the picture. There was further agreement among these supervisors that highway and access-road improvement has played the principal role in this trend. The supervisors were also in essential agreement in stating that this trend is a desirable one from the standpoint of the forest community. The joint use of the highways for commuting from town to the logging operation and the hauling of logs to the sawmill was emphasized by several of the supervisors and there seemed to be somewhat of a consensus that it was reasonable to expect the woodworkers to commute up to the distance of the log haul if the roads were good.

(1) Actually, in the strictest sense, these are not all logging camps because they are not used exclusively for logging purposes. Several of the camps throughout the State have been used for several other purposes such as controlling fires, for insect control, in some instances for other aspects of forest management, and to some extent for recreational purposes. The "Blue Room" is a cabin normally used by camp guests either being entertained or on official visits--the senior author and the field worker having enjoyed such hospitality.

LOGGING CAMPS IN IDAHO 1949-58

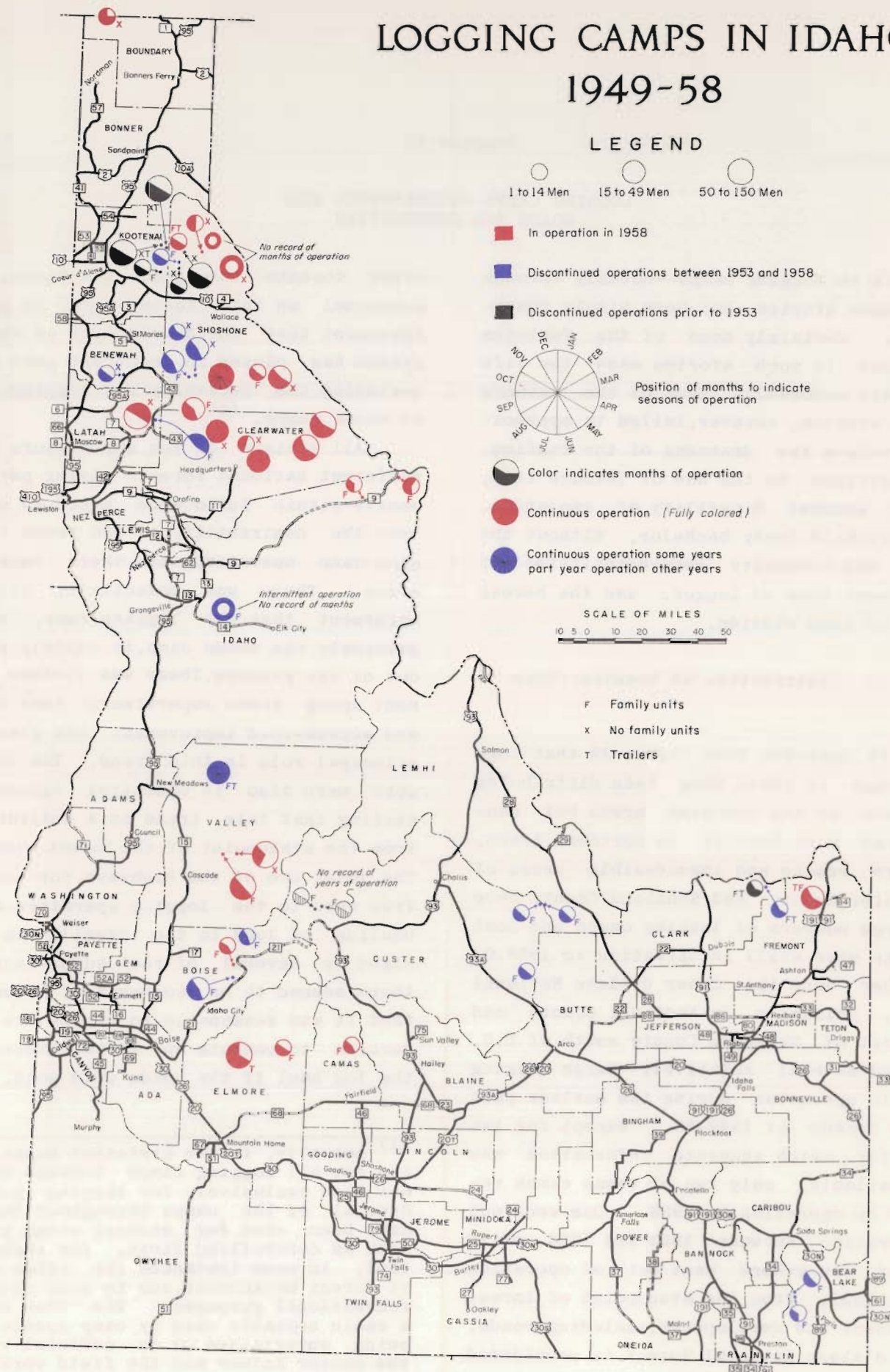


Figure 22. Location, size, and nature of logging camps in Idaho

Cost of Operating Logging Camps

As in many other areas of the Northwest and in some of the mining sections in other parts of the Nation, in many instances forest operations started with the "company town." That is, the lumber company built towns to accommodate their labor force--especially in the more remote areas. As in other parts of the Nation there has been a trend toward selling the real estate in these towns to the residents. Figure 23 is a picture of Headquarters, Idaho. This was still a company town in 1959, at the time of this writing. This town is a completely developed village and is owned and operated by Potlatch Forests, Incorporated. Potlatch Forests operates more logging camps in the State than does any other company. Responsible personnel⁽²⁾ of this company reported figures on both direct and indirect costs of maintaining logging camps. At least part of the disutility of isolation has reflected itself in an indirect manner--subsidies in food and lodging as well as rate of payment are given the woodworker beyond what the workers commuting from established communities receive. In fact in this one company a charge of \$0.90 per meal was made against the woodworker whereas the actual cost to the company was more in the neighborhood of \$1.30 per meal. It was also stated that this company has "accepted the premise that we must pay about \$2 per day additional wages to piece workers (about 70% of our employees are on piece work) working in these situations." Calculating only these two costs from the figures submitted by Mr. Rauch amounts to \$355.62 subsidy per woodworker in the year 1957. These are actual market costs quantitatively determined. On a basis of lumber output these costs add

(2) The information on operating camps and communities was obtained from Mr. George H. Rauch, Vice-President in Charge of Lands and Logging, Potlatch Forests, Inc. The exact figures and quotations are from a letter dated September 30, 1958.



Figure 23. Headquarters, Idaho

about \$1.70 per thousand feet of lumber. It is very probable that these are not the total costs even to the company and certainly there are imponderable, at least very difficult to measure, social and institutional costs brought about by isolation and divided families.

Woods Camps Provide and Need Mobility

The stability of a labor force for the woods operations of the timber industry is a cogent problem. Logging operations, being so dependent upon the vicissitudes of nature, cannot be brought into a static geographical situation such as the ordinary manufacturing plant having a steady flow of raw materials. The sustained-yield policies of the United States Forest Service attempt to stabilize operations through controlled growth and cutting management. The market demand for lumber and other products of the forests cannot, of course, be stabilized. This means that within a relatively small forested area logging labor must either be mobile enough to shift its location with current logging operation or it must be in and out of woods employment depending on

local operations.

Several of the larger lumber companies have maintained logging camps on a stand-by basis so that if the labor supply in the nearby established communities becomes inadequate they can shift their labor into the local logging camp to supplement the local labor. Some of the logging camps are relatively or have been relatively permanent--one of the camps in the Clearwater Forest having been in the same location, although rebuilt several times, for 25 years. Some of the more permanent camps actually serve auxiliary camps called "spike camps." The spike camp moves near to the logging operations and is dependent upon and responsible to the main camp. Actually, several of the camps shown in Figure 22 are spike camps. Figure 24 shows the living quarters and "cook shack" (actually the kitchen and dining hall) of a main camp and Figure 25 shows a picture of a spike camp associated with this main camp. Note that the spike camp is located very deep in the forest on rather severe road conditions. Communications with the main camp are maintained with two-way radios. Even to get from the public road system to the main camp shown it is necessary to travel over about 25



Figure 24. Camp X--a woodworkers' camp in Clearwater County, Idaho



Figure 25. Camp Spike X--a satellite of the camp shown in Figure 24

miles of private road.

The season of logging operations, partly because of changes in the methods and machinery used in logging and partly because of road conditions, has generally become longer than in the past. It is noteworthy, however, that very few of the camps have been in operation all year. Some of those that do operate the full year round are not served by public roads. The seasonality of camp operations necessitates migration. It is evident that the seasonal migration does not, to any significant degree, take place among the camps. In the late fall there is a general exodus out of the camps and in the spring a trek toward the camps.

The trailer has been gaining importance as a means for housing in and around the woods camps. Moving house trailers in and out of the woods creates a new demand upon roads--especially where these travel the same routes as the logging trucks. However, the problem of moving these trailers for loggers constitutes a relatively small part of the trailer-moving problem compared with the total trailer movement on the highways. The "Wide-Load" sign has become quite common on many of the State's roads--some of the trailers being in transit from trailer factories while others are being relocated for

routine living or recreational purposes. Several of the logging camps had trailers occupied by woodworkers' families. Other family housing units in camp, if provided, were usually for supervisory personnel.

Travel between the logging camp and the supply base, whether this base be a main camp or an established community, is of real importance to the timber industry. Since the truck has become the principal carrier of logs, such travel ordinarily goes over essentially the same roads as do the logs.

The logging camp came into being as a substitute for both adequate housing and means of transportation. Some of the early camps could be reached only by water or by rail--which is still true for some camps part of the year. Transportation facilities were frequently owned by the logging company. Undoubtedly the woodworker solely dependent upon his employer for egress must have felt a high degree of "captive" isolation. Evidently this rugged and isolated life had little appeal to the family man. In the early logging camps relatively few of the workers were married.

Woodworkers in Logging Camps Compared with those in Forest Communities

In order to observe in some detail the characteristics of forest people two field studies were made. One was a study of four forest communities. (3) These communities were generally typical of forest-related towns on the periphery of large forest areas in the State. They provided services and

manpower for forest work and milling of cut timber. The second study was a study of the populations of four logging camps that were located out in the forests. (4) These camps were serviced from two of the forest communities surveyed and were located from 20 to 50 miles farther into the forests. Both the towns and the camps were in the extensive northern Idaho softwood forest area.

These studies were directed toward an analysis of woodworkers whose usual daily residence was located either in the camps or in the towns. For purposes of this analysis residence was considered as being in the camps if the worker stayed in the camp during most of the working days of the year, returning to town only once per week or less even though his family resided in town. If he stayed at home with his family, commuting either daily or two to three times per week, the woodworker was considered as being a town resident.

Woodworkers are defined as all those working out in the woods operation in getting the timber out to the mill.

The logging camps are in the latter stages of a transition from the old lumber-jack, hand-labor era of the forest to the modern machinery-equipped logger who is usually skilled in a mechanized and specialized woods job. Along with this change in technology has come a change in the nature of the woodworker. He is no longer typically a strapping bachelor who more often than not spoke little English and often had no education.

(3) The forest communities studied ranged from a small hamlet of less than 20 homes to a county seat town of about 3,000 residents. The other two had 400 to 450 population. One of the latter was a company or private town built and operated for getting out timber. This community had most, but not all, of the usual institutions of a public village. Interviews were taken from all available households, about 80 percent, in all but the largest community. A 20-percent sample was drawn in the largest town.

(4) The four logging camps studied were all operated by one large lumber company. One of the four was a branch or spike camp of one of the other camps. The larger camps had a population of 40 to 50 men. There were four women interviewed in the camps representative of a very few who either went out and stayed with their husbands or they were older women who worked as kitchen helpers. It was estimated that over 80 percent of the camp personnel were interviewed.

Marital Status and Age

In analyzing the populations of four northern Idaho logging camps we find a substantial majority are married and have families. In Table 12 we note that over 56 percent are presently married while only one-third are single. A small percentage were in the divorced or widowed categories. The camps, however, contained few women or families. Only four women were interviewed; one was a widow while the other three were married to loggers working in the same camps. One of the women was a practical nurse and the other three worked in the kitchens.

The camps had been established in the same location for two or three decades but facilities were largely of a temporary nature. Roads leading to them had been graded but no permanent surfacing was applied. The men lived in small bunk houses and ate in the company mess halls. Supervisory personnel and the few with families lived in separate quarters.

However, in comparing the camp residents with those woodworkers that lived at home in the nearby forest communities there is still a substantially higher pro-

portion of unmarried men living in the logging camps. Almost all of those woodworkers living in the four towns studied were married as shown in Table 13.

In examining the age distributions of the logging camp residents Table 12 shows that most of these workers were over 40 years of age. In addition the single men, unlike the town residents, are largely in the older age groups. More of those above 60 years were single men than married. This indicates the decline of the era of the lumberjacks. In contrast only a few single men in the young 20 to 30 age group are in the logging camps. The rather small number of camp residents in the younger age group reflects somewhat the changes in mechanization which may reduce the number of replacements necessary. However, when compared to the larger proportion of young woodworkers that are town dwellers shown in Table 13, it seems that there is also a shift in marital status and residence by these younger men.

Education of Woodworkers

Table 14 shows that the education of camp resident woodworkers fell almost en-

Table 12. Marital status and age of logging camp residents

Age Groups														
Marital Status	20-29		30-39		40-49		50-59		60-69		70-79		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Married	10	8.06	12	9.68	23	18.55	17	13.71	7	5.64	1	.81	70	56.45
Single	8	6.45	4	3.23	4	3.23	9	7.26	15	12.10	2	1.61	42	33.87
Divorced	0	--	2	1.61	2	1.61	4	3.23	0	--	0	--	8	6.45
Widowed	0	--	0	--	2	1.61	1	.81	1	.81	0	--	4	3.23
Total	18	14.52	18	14.52	31	25.00	31	25.00	23	18.54	3	2.42	124	100.00

Table 13. Marital status and age of woodworkers residing in four forest communities

Age Groups														
Marital Status	20-29		30-39		40-49		50-59		60-69		70-79		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Married	41	32.54	23	18.25	34	26.99	20	15.87	3	2.38	0	--	121	96.03
Single	0	--	0	--	5	3.97	0	--	0	--	0	--	5	3.97
Divorced	0	--	0	--	0	--	0	--	0	--	0	--	0	--
Widowed	0	--	0	--	0	--	0	--	0	--	0	--	0	--
Total	41	32.54	23	18.25	39	30.96	20	15.87	3	2.38	0	--	126	100.00

tirely in the upper grades and high school years. Although almost evenly divided it is interesting to note that the old timers tended to fall into the lower educational categories and the younger ones in the upper. The four who reported no schooling and the four reporting less than four years were all from 40 to 75 years of age. The 6 percent with college work were in the younger age groups. The median number of

grades completed by the logging camp residents 24 years of age or older is 8.9 compared with 10.4 for the State.

In the forest communities the amount of formal education was somewhat higher than in the camps (Table 15). Almost half, 49 percent, had at least some high school work and a larger part of the town dwellers reported having some college than those in the camps. In addition there was a parallel

Table 14. Age and years of education of logging camp residents

Age	Years of Education											
	None		1-4		5-8		9-12		College		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
20-29	0	--	0	--	2	1.61	14	11.29	2	1.61	18	14.51
30-39	0	--	0	--	3	2.42	10	8.06	5	4.03	18	14.51
40-49	1	.81	0	--	11	8.87	13	14.51	1	.81	31	25.00
50-59	2	1.61	0	--	22	17.74	7	5.65	0	--	31	25.00
60-69	0	--	4	3.23	16	12.91	3	2.42	0	--	23	18.56
70-79	1	.81	0	--	1	.81	1	.81	0	--	3	2.42
Total	4	3.23	4	3.23	55	44.36	53	42.74	8	6.45	124	100.00

Table 15. Age and years of education of woodworkers residing in four forest communities

Age	Years of Education											
	None		1-4		5-8		9-12		College		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
20-29	0	--	0	--	2	1.59	29	23.02	10	7.94	41	32.55
30-39	0	--	0	--	7	5.56	10	7.94	6	4.76	23	18.26
40-49	0	--	0	--	20	15.87	17	13.40	2	1.59	39	30.95
50-59	0	--	0	--	14	11.11	6	4.76	0	--	20	15.87
60-69	0	--	0	--	3	2.33	0	--	0	--	3	2.33
70-79	0	--	0	--	0	--	0	--	0	--	0	--
Total	0	--	0	--	46	36.51	62	49.21	18	14.29	126	100.00

pattern between age and education, those with only grade school training tending to be older. None of the community residents had less than five grades and for those who had one or more years of college there were over 14 percent who had college training; this was over twice as high a percentage as for camp residents. Taken by education categories the woodworkers who were town residents had completed somewhat more years of education than camp residents. The median number of grades for the town residents was 10.8, about the same as for the State and well above that of the camp residents.

Income of Woodworkers

Income of woodworkers was generally higher for town dwellers than for logging camp residents. As shown in Tables 16 and 17 annual income for 25 percent of the camp residents fell in the \$2,000 to \$4,000 category while only 10 percent of the forest community residents were in this group. The modal group for the camp dwellers was 4 to 6 thousand dollars while that of the town residents was 6 to 8 thousand.

In relation to family patterns and income there was a tendency for the mode of the single men in the camps to fall below that of the married men. Since almost all were married in the forest communities comparisons on the family factor could not be made.

Although reported income of residents of forest communities is higher than that for the camp residents, Table 18 shows that 55 percent of the camp residents feel that their income is higher because they live in the logging camps. Over 40 percent, however, feel that it is not necessarily higher and, therefore, must have other reasons for taking a job there.

Highway Travel Among Woodworkers

There was a decided difference between camp and town residents on automobile ownership. Over one-fourth of the camp residents reported not owning any automobiles while all of the town dwellers owned at least one. Also, a smaller proportion of the camp residents reported owning two or more cars with about 22 percent having more than one while about 39 percent of the res-

Table 16. Marital status and annual income of logging camp residents

Marital Status	Less than \$500		\$500-1,999		\$2,000-3,999		\$4,000-5,999		\$6,000-7,999		\$8,000-9,999		\$10,000 or more		No income listed		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Married	1	.31	2	1.61	9	7.26	29	23.39	22	17.74	3	2.42	1	.81	3	2.42	70	56.45
Single	0	--	4	3.23	18	14.52	14	11.29	2	1.61	2	1.61	0	--	2	1.61	42	33.97
Divorced	0	--	0	--	3	2.42	4	3.23	0	--	0	--	0	--	1	.81	8	6.45
Widowed	0	--	0	--	1	.81	2	1.61	0	--	0	--	0	--	1	.81	4	3.23
Total	1	.31	6	4.84	31	25.00	49	39.52	24	19.35	5	4.03	1	.81	7	5.65	124	100.00

idents of the forest communities owned two or more.

Annual Mileage Driving to Work

Driving to work shows the importance of highway access to the job and the way of life of the worker.

Over half of those who stayed in the camps drove to and from the job at least to some extent during the year although none

of the roads to these camps were surfaced highways (Table 19).

About 48 percent of the camp dwellers did not drive their own automobiles to work. They either stayed in the camps, rode with others, or used company transportation in their travel to and from the logging camps. Part of the year no other access was possible except by company transport, some of it over private roads or private railroads.

Those who commuted most were family

Table 17. Marital status and annual income of woodworkers living in four forest communities

		Income Groups																	
		Less than \$500		\$500-1,999		\$2,000-3,999		\$4,000-5,999		\$6,000-7,999		\$8,000-9,999		\$10,000 or more		No income listed		Total	
Marital Status		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Married		0	--	1	.79	8	6.35	36	28.57	42	33.33	2	1.59	17	13.49	15	11.90	121	96.03
Single		0	--	0	--	5	3.97	0	--	0	--	0	--	0	--	0	--	5	3.97
Divorced		0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
Widowed		0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
Total		0	--	1	.79	13	10.32	36	28.57	42	33.33	2	1.59	17	13.49	15	11.90	126	100.00

Table 18. Camp residents' belief that income is or is not higher for staying in a logging camp, by marital status

Marital Status	Higher		Not Higher		Don't Know		Total	
	No.	%	No.	%	No.	%	No.	%
Married	32	25.81	36	29.03	2	1.61	70	56.45
Single	28	22.58	11	8.87	3	2.42	42	33.87
Divorced	5	4.03	3	2.42	0	--	8	6.45
Widowed	3	2.42	1	.81	0	--	4	3.23
Total	68	54.84	51	41.13	5	4.03	124	100.00

men. It is evident that for the camp worker who desired to maintain regular family contact there is a great amount of effort and expense required. That this desire for home contact is strong is shown from the fact that when asked 8 out of 10 married men stated they preferred living at home to living at camp and half of the single camp residents also agreed. Many of the single men were older woodworkers who had no home other than the camp. Some of the married men were not within driving distance

of their homes even on week ends whereas some stated because of marital difficulties they preferred to live in the camps.

In comparing woodworkers who were residents of the forest communities with those in the camps it was found that almost all town residents were married and there was a much higher percent of town dwellers driving their own cars to the job in the woods than those that were camp residents. Almost 40 percent of the residents of forest communities drove from 1 to 5,000 miles per year to and from their woods jobs while 36 percent drove more than 5,000 miles per year. Those relatively few who reported no mileage rode with others or were "gyppo loggers," i.e. small log hauling contractors and truck drivers whose trucks were located at or near their home and driving was part of their work.

The major role of highway transportation in forest occupations and in the maintenance of normal family living is evident. For those living in the logging camps the long distances of unimproved or slightly improved roads make camp living inescapable even though they generally do not prefer it.

Table 19. Marital status and number of miles driven to the job per year by camp residents

Marital Status	Annual Work Mileage									
	None		1-4,999		5,000-9,999		10,000 and over		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Married	27	21.77	20	16.13	21	16.94	2	1.61	70	56.45
Single	26	20.96	11	8.87	4	3.23	1	.81	42	33.87
Divorced	4	3.23	4	3.23	0	--	0	--	8	6.46
Widowed	2	1.61	2	1.61	0	--	0	--	4	3.22
Total	59	47.57	37	29.84	25	20.17	3	2.42	124	100.00

Summary

Logging camps, and also the old-type lumberjack, have been decreasing in number. A study comparing the residents of established forest communities showed some significant differences between town residents and those having camps as their main residence. Most of the woodworkers interviewed expressed a preference for living in an established community and driving to work. Nearly all the camp operations have been seasonal--mostly summer months. One large

lumber company estimated that camp workers received a subsidy of \$355.62 per worker in 1957. It was further estimated that this added about \$1.70 per thousand board feet to the price of lumber.

Camps provide a type of mobility for a labor force in the forest industry. However, operators generally express a preference for being able to draw labor from established communities. Evidently the woodworkers who live in established communities are very dependent upon roads for work, living, and pleasure.

Chapter VII

RECREATIONAL AND WILDLIFE TRAVEL

General Recreational Travel

Idaho provides many reasons for travel other than for immediate economic gain. The State has great natural variations in temperature, rainfall, altitude, landforms, vegetation, minerals, snow coverage, and wildlife. Compared with older, more-densely-settled parts of the United States, the "objects" of recreational travel have been commercialized to only a limited degree. Many of them have remained in public ownership and, at least in the ordinary sense, have not been commercialized at all. Community, city, and State parks are rather prevalent but people logically do not frequent them in great numbers as in states having great population numbers and relatively limited natural scenic beauty. The recreational developments in the State, as shown in Figure 26, are quite dispersed and varied in nature. As one might expect, the private developments are nearer the roads and away from the federally-owned lands. The amount of human access which should be made available to some of the wilder public land in the State is a controversial matter begging facts giving insight into future demands and needs to be considered in establishing long-run policy.

The State's major objects of recreational travel are land-based, including water resources, and are quite closely related to the public lands. The public lands are highly scenic throughout most of the State. Nevertheless, there are major recreational attractions concentrated in different parts of the State or outside the State's borders. Idaho is, of course, part of the scenic Northwest with its majestic

mountain peaks, mountain lakes, and parks but the proximity of the Yellowstone and Waterton-Glacier parks is a most important factor in recreational travel in the State. (See Figure 27.) Forest Highways in Idaho play an important part in serving both of these parks. For example, of the five entrances to Yellowstone, the most important "West Entrance" feeds directly into one of Idaho's Forest Highways. Segments of three Forest Highways in Idaho feed into Glacier.

During the first 45 years of the existence of Yellowstone National Park, only in the year 1915 did the number of visitors exceed 36,000. In 1917 the growth in the number of visitors to this park began to increase at a very rapid rate, and the rate, except for the years of World War II, has continued to grow rapidly. (See Figure 28.) Before 1917 automobiles were not allowed to enter Yellowstone Park, which may have been a significant factor in keeping down the number of visitors. Another factor which undoubtedly was significant in the increase in the number of visitors to the park following 1917 was the beginning of the widespread use of automobiles not only locally but for longer-range driving. The already mentioned factors probably were very important in themselves but it was road building and improvement, especially from a more national point of view, that gave these factors a chance to have a real effect. Roads to Yellowstone Park certainly were not good at the time automobiles were first permitted in the park. Wyoming residents, interviewed by the director of this study in 1936, stated that autoing tourists on the way to Yellowstone in the 1920's commonly carried such materials as fence posts in

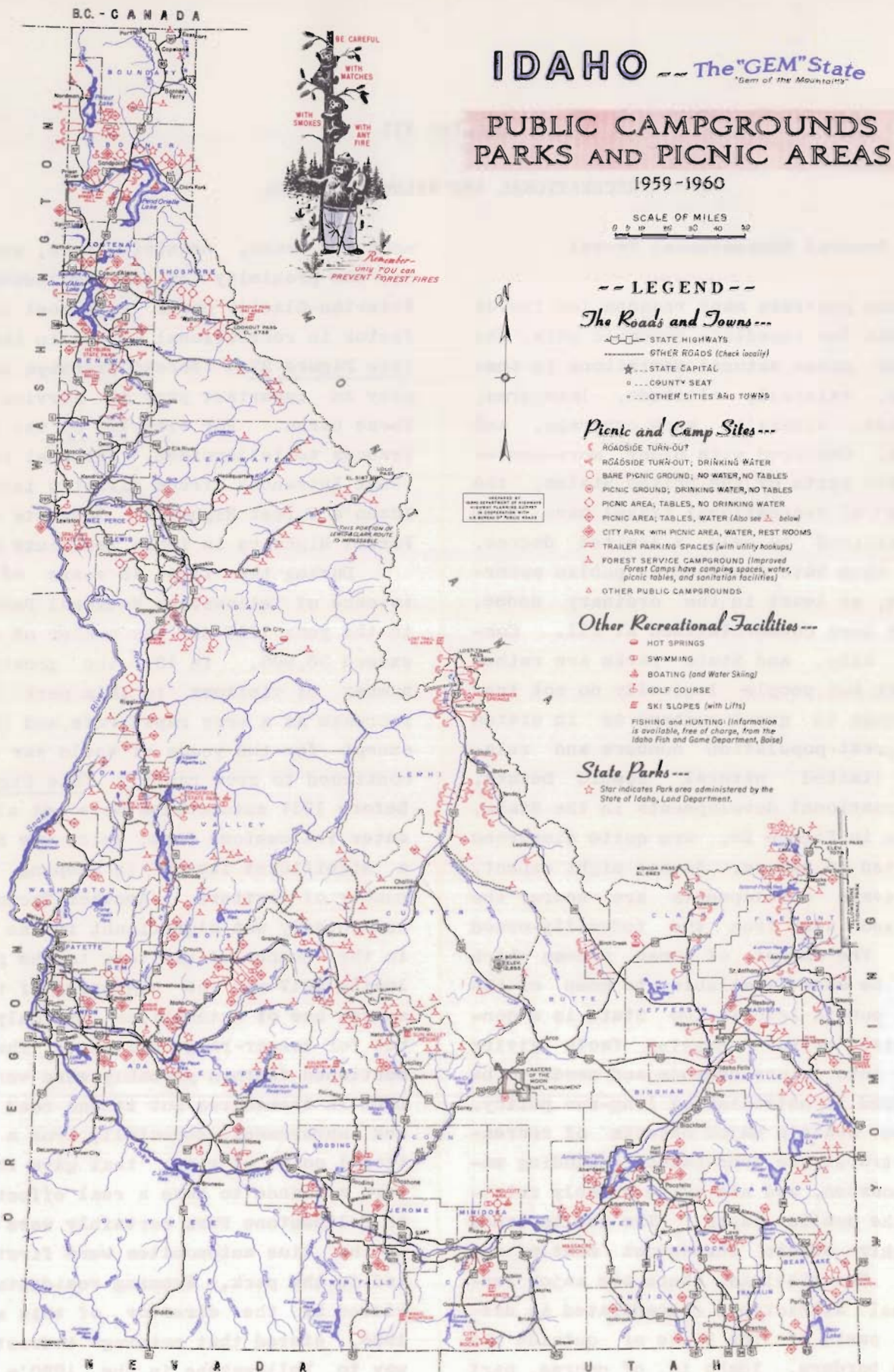


Figure 26. Public campgrounds, parks, picnic areas, and other outdoor recreational areas in Idaho

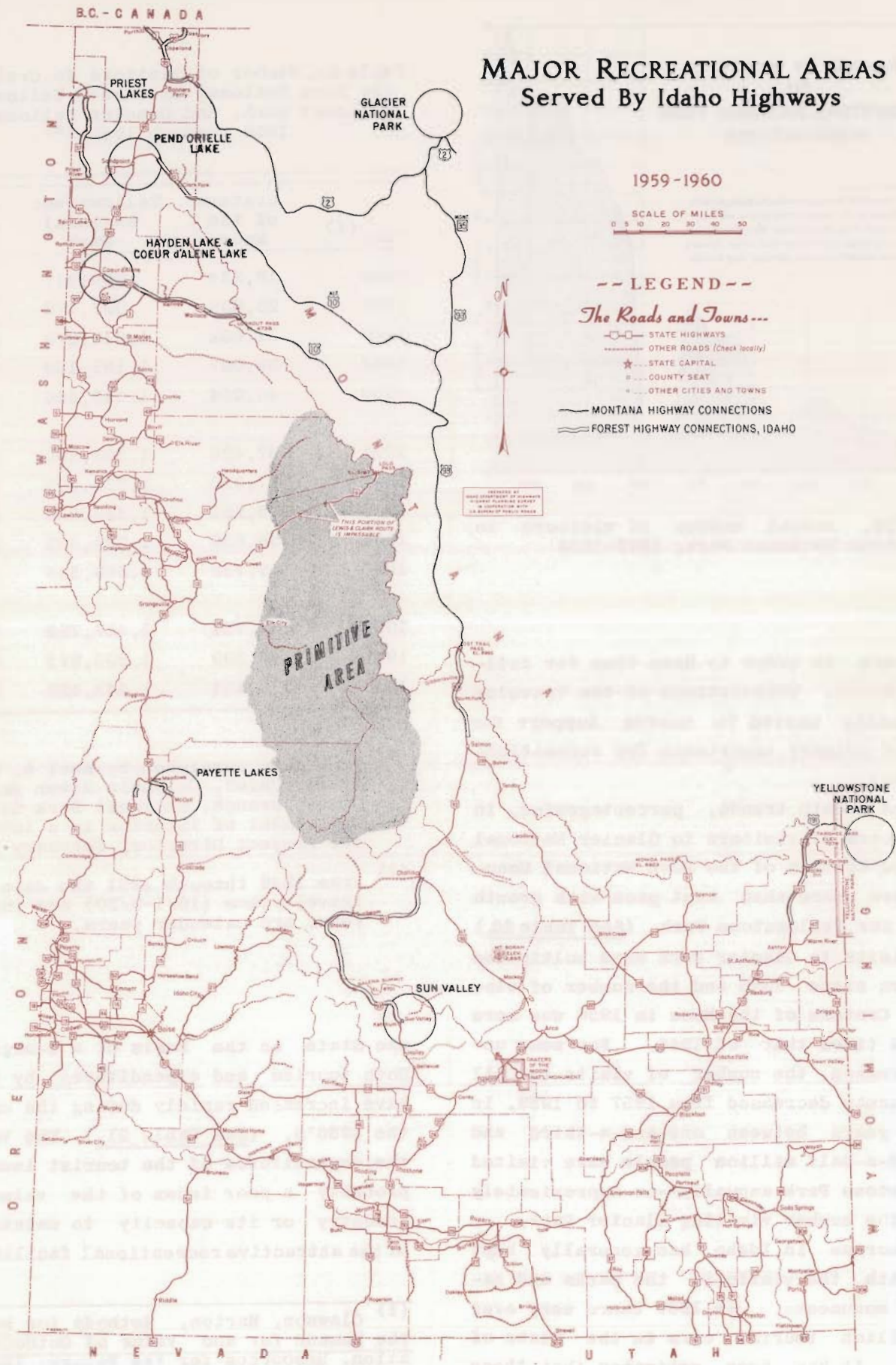


Figure 27. Major recreational areas served by Idaho highways

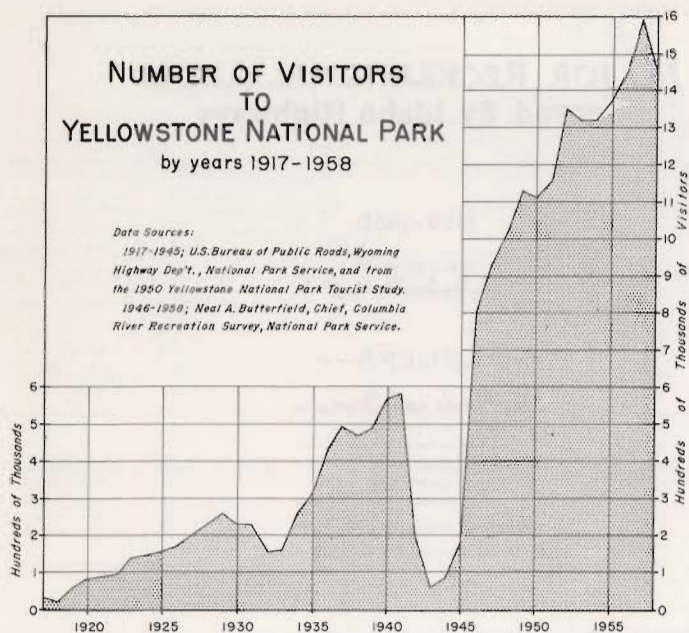


Figure 28. Annual number of visitors to Yellowstone National Park, 1917-1958

their cars in order to have them for filling washouts. Tribulations of the traveler undoubtedly served to muster support for roads of primary importance for recreational travel.

The growth trends, percentagewise, in the numbers of visitors to Glacier National Park and Craters of the Moon National Monument have more than kept pace with growth trends for Yellowstone Park. (See Table 20.) The visits to Glacier Park have multiplied $3\frac{1}{2}$ times since 1946 and the number of visits to Craters of the Moon in 1958 was more than 6 times that of 1946. For some unknown reason the number of visits to all three areas decreased from 1957 to 1958. In recent years between one-and-a-third and one-and-a-half million people have visited Yellowstone Park annually--or approximately twice the number visiting Glacier Park.

Tourism in Idaho has generally kept pace with the visits to the parks and national monuments. In 1957 there were over two million tourist cars in the State of Idaho. It has been estimated that these tourists spent over 78 million dollars in

Table 20. Number of visitors to Craters of the Moon National Monument, Yellowstone National Park, and Glacier National Park, 1946 through 1958 (a)

Year (1)	Craters of the Moon	Yellowstone National Park	Glacier National Park
1946	19,334	307,917	200,547
1947	26,639	937,776	327,300
1948	31,652	1,013,279	284,549
1949	36,027	1,131,159	432,208
1950	48,064	1,110,524	432,298
1951	57,434	1,163,894	496,142
1952	77,090	1,350,295	649,689
1953	95,221	1,326,853	633,430
1954	98,656	1,328,393	608,230
1955	107,759	1,368,515	674,085
1956	119,751	1,457,782	718,938
1957	146,399	1,595,875	759,161
1958	117,131	1,442,423	706,841

(a) From data furnished by Neal A. Butterfield, Chief, Columbia River Recreation Survey Branch, National Park Service, Department of Interior in a letter to the Project Director, February 29, 1959

(1) From 1946 through 1951 the data are for travel years (10/1-9/30) and following years are calendar years.

the State on the basis of a 1-night stay. Both tourism and expenditures by tourists have increased rapidly during the decade of the 1950's. (See Table 21.) The total of the expenditures of the tourist industry is probably a poor index of the value of the industry or its capacity to maintain some of the attractive recreational facilities. (1)

(1) Clawson, Marion, Methods for Measuring the Demand for and Value of Outdoor Recreation, Resources for the Future, Inc., 1145 Nineteenth St., N.W., Washington 6, D.C., Feb. 1959

Table 21. Travel and expenditures of autoing tourists in Idaho in four recent years (1)

Item	Four recent years			
	1950	1954	1956	1957
Average number of cars per day	3,729	4,966	5,390	5,510
Number of cars for the year	1,361,085	1,812,590	1,967,350	2,011,100
Persons per car (U.S. average)	3	3	3	3.41
Number of tourists in the year	4,083,255	5,437,770	5,902,050	6,857,851
Expenditure per person per day (2)	\$8.85	\$8.85	\$8.85	\$11.40
Total expenditures for the year (3)	\$36,136,807	\$48,124,265	\$52,233,142	\$78,179,501.40

- (1) These are from tabulations furnished by Louise Shadduck, Secretary, Idaho Department of Commerce and Development, in a letter to the Project Director, February 10, 1959.
- (2) The \$8.85 for the first 3 years is based on a 10-year-old Utah study and the \$11.40 is a national average developed by the United States Department of Commerce--according to Shadduck's original tabulation.
- (3) Predicated on an average of a 1-day stay in the State.

It does, however, serve as some sort of indicator of the overall demand for tourist facilities--the demand for roads being at least partially obscured in the overall demand for total facilities. Thus the gross value of the tourist trade, if correctly calculated, should at least put a limit on the net value.

Although various indexes have been put forth by many writers to measure the value of tourism most of the serious efforts have done more to point out either the difficulty or the futility of measurement than to develop an acceptable theory of measurement. As an example of the contrast to the economic measurement of tourism Caldwell⁽²⁾ states that "Coal statistics can be measured by tonnage, and milk production can be

measured by gallons or butterfat content, all of which are direct measurements." Most of these writers are undoubtedly generally aware of the fact that the measurability of economic value is not determined by the physical aspects of products used in attaining the satisfaction except insofar as such products have alternative uses and for which there is a predictable demand--that is, the value lies in the use rather than the object itself. Scenic beauty usually can not be placed on an ordinary market but generally the cost of looking can be related to expenditures having alternative uses. To get the clearest idea of the value of tourism, to the tourist, the total expenditures would be fairly adequate. To get the value for planning purposes, such as determining how tourists would support roads, detailed breakdowns and alternatives are needed.

Although the expenditures by tourists

(2) Caldwell, Harry Harrison, Tourism in Idaho, A Study in Tourist Resource Development, a thesis for Ph.D., Clark University Worcester, Massachusetts, 1951, p. 15-16

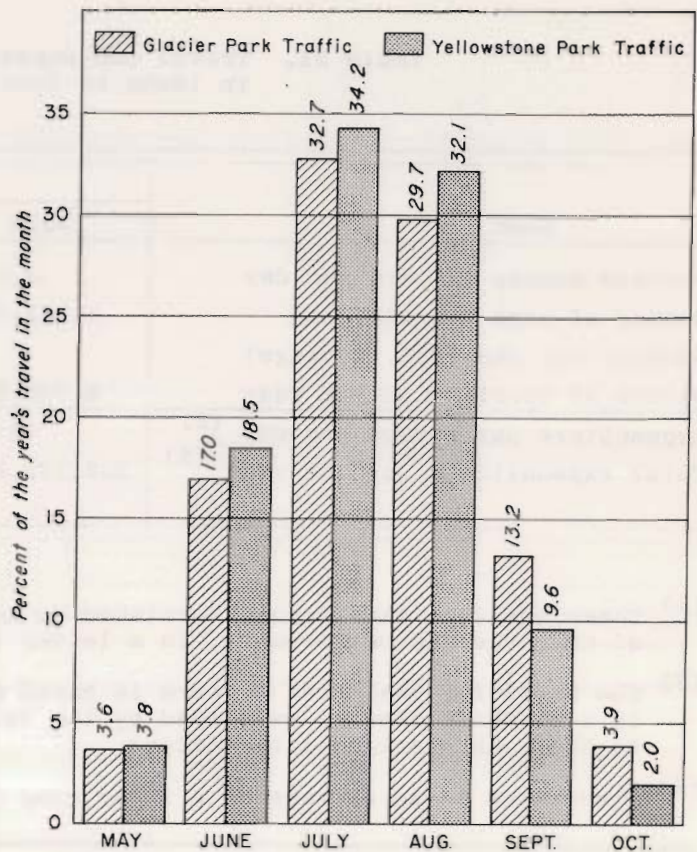
may not be a good index of the demand for a particular facility, changes in the total should fairly well reflect changes in the total demand. The doubling of total expenditures by tourists in Idaho over a 7-year period is probably not something that happened as a result of peculiar conditions existing at that time. The general population growth of the West has had and should continue to have a tremendous influence on the demand for recreational facilities in Idaho. It has been estimated that California's population alone will reach 22 million by 1975. (3) Some of the backpressure of this population will probably settle in Idaho, some of it perhaps only seasonally. Another more specific factor will be the increase in travel in Idaho because of the increase in population, especially because these two major national parks lie immediately to the east.

The casual observer may wrongly conclude that Idaho's rural roads are overbuilt if he observes traffic only part of the year. Heavy summertime demands are made upon the roads by the forestry and agricultural industries. The bulk of the recreational travel also adds to the seasonality of traffic. Figure 29 shows the seasonality of traffic to Glacier and Yellowstone parks--over 60 percent of the traffic in each of them being during July and August. Efforts have been made to lengthen these seasons, and the season of work in the woods has been lengthened but "peaking" of traffic during summer months probably can be alleviated to only a very limited degree.

Fish and Game

Both fish and game are important to Idaho's economy. Big game inhabits all sec-

(3) Gibson, Weldon B., *Pacific Northwest Tourism: A Billion Dollar Industry*, An Address Before the Pacific Northwest Trade Association Conference, Vancouver, B.C., May 9, 1955



Glacier Park traffic data from "Glacier National Park Tourist Survey", Montana Highway Commission, Planning Survey, 1951.

Yellowstone Park traffic data from a National Park Service press release, January 1959.

Figure 29. Seasonality of travel in Glacier and Yellowstone Parks

tions of the State which has an area one-fourth greater than the total of the six New England States. The national forest land in the State comprises an area about half the size of all of New England and big game is prevalent throughout. There are four major lakes--Coeur d'Alene, Payette, Pend Oreille, and Priest. These four lakes are recreational centers as are also some of the water reservoirs impounded by dams. Sales of boat licenses--county administered--have increased very rapidly during recent years. Much of the increase has come in areas necessitating considerable travel

to lakes, reservoirs or rivers. Even in Latah County with a largely rural population boating has increased considerably despite the fact that most of the residents must travel at least 50 miles to the nearest lake or 35 miles to the nearest navigable river. In this county sales of boat licenses increased from 127 in 1957 to 187 in 1958. The "marina," selling boating supplies, is a common business establishment even in communities quite remote from water-sports areas. Some of the counties containing principal water-sports areas report having sold several thousand boat licenses. The Fish and Game Department stocks lakes and streams with fish. Some of the streams receive natural salmon runs from the Pacific Ocean. The Coast Guard operates on some of the waters of the State.

Compared with a state like Pennsylvania the deer population is not heavy on a square-mile basis. However, on a per-capita basis the deer population is very heavy--in fact, the recent kill--although not as heavy as it should be--has approximated one deer for about 10 resident people. In 1956 there was a kill of 72,000 and in 1957 the kill was 62,000. About one-fourth as many elk were killed.

Evidently the big-game kill in Idaho could be considerably greater than it has been. The Idaho Fish and Game Department was asked to make an analysis, for this report, of the number of deer and elk killed compared with the number it would have been desirable to kill under ideal game management. In only 12 of the 38 big-game management areas were there as many as 75 percent of the deer killed as would have been desirable in the year 1957. In one area only 25 percent of the desired number were killed and in one area considerably less than 25 percent. Essentially the same situation existed for elk. (See Figure 30.)

Big-game hunting is relatively inexpensive for residents of Idaho. Hunting

seasons are long and licenses are rather nominally priced. The major expense and disutility of big-game hunting is to "get back where they are." There have been recommendations that wilderness areas should be in large blocks of land. Renne states that they "ordinarily should be large--at least one quarter million acres, and even 2 million acres may be too small if its boundaries are not properly located, for example, Yellowstone Park, which contains little natural range for its elk, antelope, deer, and bighorn." (4) It is apparent, however, from the game harvest records that very few big-game hunters are willing to go more than a mile or two beyond the point where their cars or trucks are left. Ross Leonard, Director of the Idaho Fish and Game Department stated that even in an area that seems adequately accessible from map interpretation the main reason for the undesirably low rate of kill is that the big game moves a few miles from the roads during the hunting season and the hunters do not follow it. There are those who feel that big game should be protected by lack of access but in Idaho the management of big game evidently is handicapped by the lack of access.

There has been a general increase in the number of people who hunt and fish in Idaho. During the period of 1947-1957 a great increase was evident in all kinds of hunting and fishing licenses issued excepting combination resident fish and game licenses and the reason for the decline in these evidently is that residents, instead of buying combination licenses, began buying separate fishing and hunting licenses. Because licenses are on a calendar year basis fishing licenses are bought in spring and normally hunting licenses are purchased later. Fishing incentives are thus quite

(4) Renne, Roland R., *Land Economics*, Harper & Brothers, N.Y., 1947, p. 323

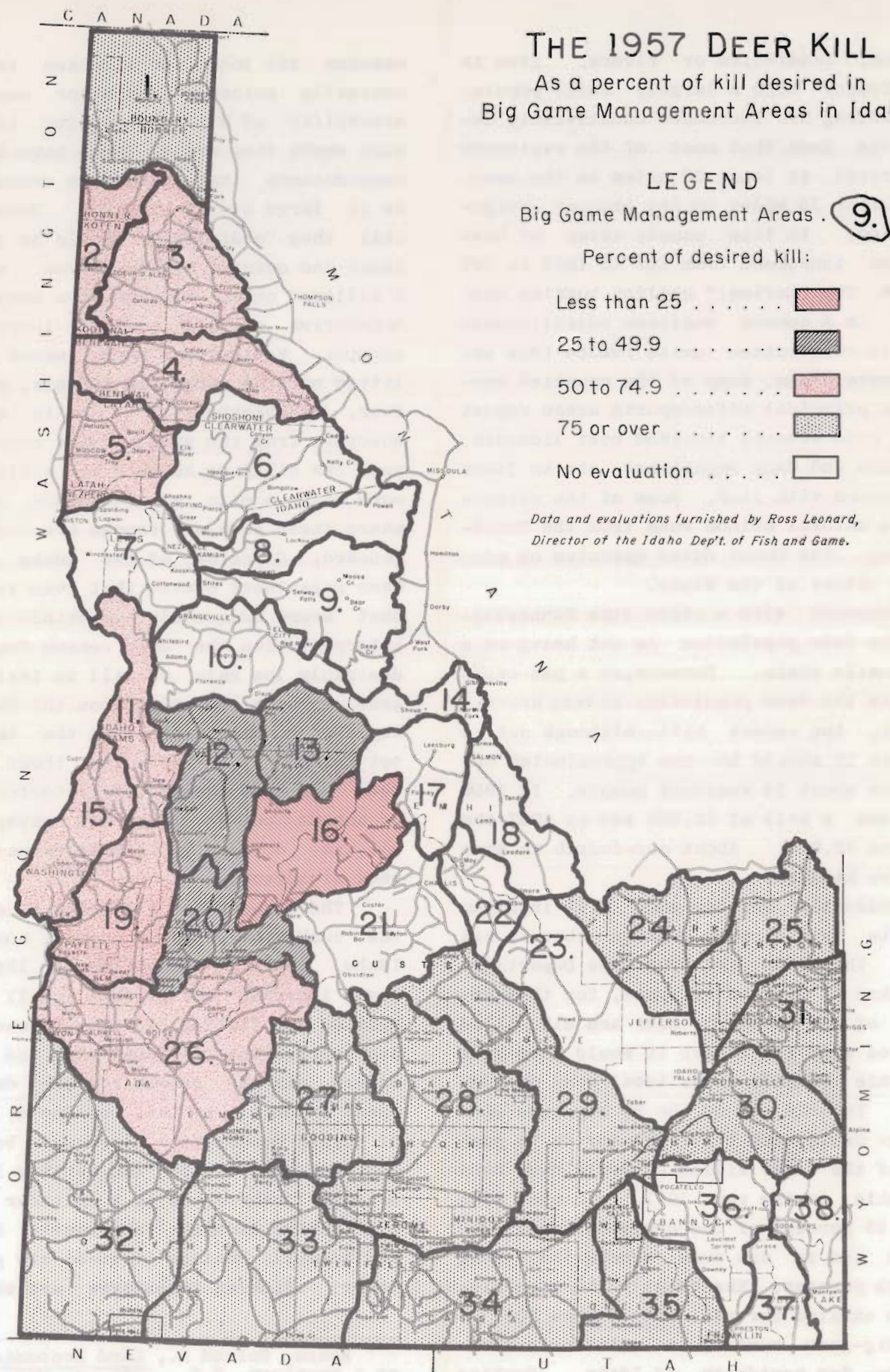


Figure 30. The 1957 deer kill as a percentage of the desired kill for game management areas in Idaho

likely to affect the purchase of combination licenses early in the year. The sale of non-resident big-game licenses has increased more rapidly than that of any other type of license. (See Table 22.)

In evaluating the importance of, estimating the demand for, and especially in planning the financing of roads in Idaho, it should be borne in mind that there are important out-of-state user and non-user interests. Income from the nationally-owned lands in the State can be completely limited by access to resources on these lands. For several reasons the non-resident use of Idaho roads is important and becoming more so.

One of the indices of growing out-of-state interest in the first-hand enjoyment of the resources of Idaho is the growth in the sale of non-resident hunting and fishing licenses. The total sale of non-resident licenses, based on number of licenses

sold, is still only about 36 percent of resident licenses. The principal difference is that the number of resident licenses has remained quite constant during the six-year period of 1952-1957 and has increased only about 10 percent above the number sold in 1948 while non-resident license sales have increased by more than 50 percent. (See Figure 31.) Undoubtedly some of this rapid growth is the result of growth in certain nearby urban areas but there is also evidence of more widespread interest.

The recreational value of roads, including the comfort of the driver, is difficult to determine specifically. Certainly this type of value is directly associated with the use of such roads and the willingness, on the part of the public, to support them. To a degree, there is a direct relationship between use, support, and value. From this standpoint the roads serving recreational travel in Idaho--the For-

Table 22. Idaho fish and game licenses and tags sold to residents and non-residents each year, by class of license, 1947-1957 (a)

Year	Resident licenses			Non-resident licenses				Deer tags	Elk tags
	Fish and game	Game	Fish	Big game	Bird	Fish	Tourist fish		
1947	123,552	32,571	28,970	1,471	876	8,411	27,683	32,034	27,361
1948	123,122	39,043	35,720	1,610	1,260	8,697	28,739	33,229	24,731
1949	118,443	42,389	39,249	1,352	986	9,023	29,715	33,432	31,262
1950	117,051	44,452	42,046	1,182	704	9,682	31,340	39,173	33,855
1951	118,761	45,701	41,778	2,229	709	11,471	36,528	99,553	43,198
1952	124,793	48,714	44,106	3,137	820	13,407	42,533	105,562	47,469
1953	126,772	46,030	44,456	3,309	1,035	14,641	46,632	101,582	44,097
1954	125,316	46,465	45,393	3,638	1,162	14,823	49,107	103,702	48,201
1955	118,139	46,315	47,095	3,729	1,133	13,042	41,379	106,840	50,757
1956	104,944	56,962	54,305	4,046	1,334	12,374	41,686	114,019	52,627
1957	104,035	57,036	57,504	4,882	1,818	13,837	M.F. Deer 327		
							2-Deer 7,166	110,836	50,732

(a) The data for this table were furnished by Ross Leonard, Director of the Idaho Department of Fish and Game.

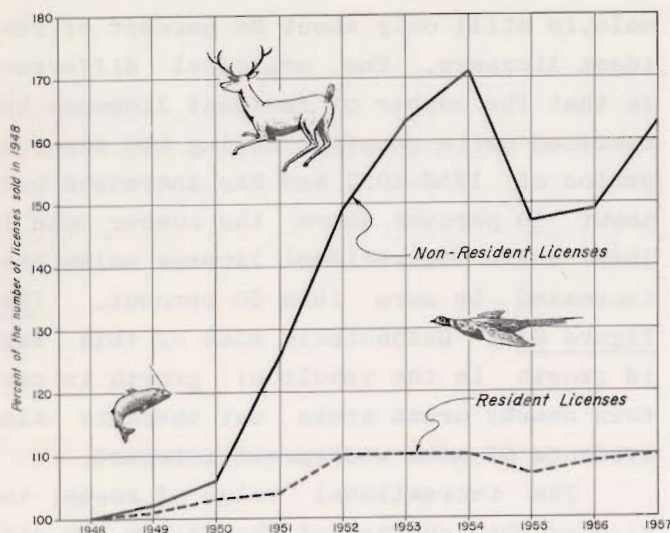


Figure 31. Rates of growth in sales of resident and non-resident fishing and hunting licenses by years, 1948-1957

est Highways playing a very significant role in this--are destined to increase in importance and value because of the anticipated increase in use. In order to get support through use it is necessary to "advance" some support to obtain the road to be used.

Summary

One of the most important factors in the recreational travel on the Forest Highways in Idaho is the location of the Waterton-Glacier Park and Yellowstone National Park. These, along with the large wilderness area, create a heavy seasonal traffic. The tourist traffic to these attractions

will grow along with the general growth in tourist travel. Traffic to the parks has increased very rapidly in recent years. The part of this going through Idaho will almost certainly grow even more rapidly because of the rapid growth in human population in the West. The continued growth of California, Oregon and Washington will be especially important. Routes from these areas to the parks and the wilderness cross over on Idaho Forest Highways. Other publicly-owned and privately-owned recreational facilities have been developing along with better access.

Hunting and fishing are important attractions in Idaho. There has been a fairly steady increase in the number of resident hunting and fishing licenses sold but the great increase, both from the standpoint of numbers and revenue, has come in non-resident licenses. Big-game hunting by non-residents tripled from 1947 to 1957 and non-resident fishing licenses increased about two-thirds.

The elk and deer kills have been too low to bring about the best game management. Summer browse is quite abundant in the alpine meadows but people have occupied the natural winter ranges. Because of this it is desirable to harvest game quite heavily in the early winter in order to avoid mass starvation among big game. The lack of a desirable kill is definitely associated with lack of access to the big-game areas.

Chapter VIII

THE FOREST HIGHWAY AS A FACTOR IN HEALTH AND EDUCATION

To demonstrate how modern living in rough-terrained, far-flung Idaho depends on Forest Highways, the two essential social institutions dealing with health and education have been studied and some of the results are included in this report.

Highways and Health

Concern with individual and public health has taken its place alongside of education, government, and making a living as one of the major subjects receiving much attention by the American people. This concern leads to many forms of activity in the field of health. Some of these are the private practice of medicine in both general and specialized forms, the nursing profession, the pharmacy industry, private and public health research in the biological, physical and social sciences, hospitals both physical and mental, industrial medicine and public health. The latter cuts across most of the others as well as having some unique areas of its own including sanitation and epidemiology.

Three phases of the field of medicine can be pointed out here as having a direct and immediate relationship to highway use and development in the State.

First, the availability of hospitalization for emergencies, major illness or specialized care.

Second, the availability of medical doctors when needed.

Third, public health services dealing with epidemiology, public health nursing, school health and other public problems in local areas.

Hospitals

Any analysis of general hospital use in the State of Idaho brings out immediately the importance of highway communication as a vital link in this type of care. Over half of the people, in order to get to a hospital, are required to travel on rural public highways.

Because of the expense of equipment and availability of specialized personnel, the hospitals are divided into three types according to the kind of equipment and the treatment available. In Table 23, these types are listed as (1) Regional hospital

Table 23. Types of general hospital facilities and number of counties having hospital facilities in Idaho

	Number of hospitals	Number of counties in the State where hospitals are located
Regional hospitals	4 *	4
Area hospitals	11	11
Community hospitals	27	22 **
Counties with no hospitals		9
Total	42	46

* Does not include Spokane, Washington, and others in Utah and Montana that serve Idaho residents.

** Two counties had two types of hospital facilities; Shoshone County had one Area and one Community hospital and Bannock County had one Regional and one Community hospital

centers, (2) Area hospital centers, and (3) Community hospitals. As shown in Figure 32 these hospitals are distributed about the State or in neighboring states largely in relation to two elements, (a) size of population of the communities served or (b) the proximity to other hospital centers. Thirty-five counties have a hospital of one of the three types, nine have none.

Regional hospital centers have nearly all types of health services, specialists and equipment. Area hospitals have the equipment and usual personnel necessary for treating adequately almost all illnesses and emergencies but lack certain expensive or infrequently used facilities. Whereas the Community hospitals are usually small, and although adequate for most illness, they do not ordinarily have expensive diagnostic

and treatment equipment and personnel for more difficult and special problems.

This variation in services means more dependence upon inter-community highways to obtain necessary and urgent health care for even larger numbers of the population. In this case 71 percent of the population must travel beyond the Community hospital areas to the Area or Regional hospitals for more specialized care. For care requiring the most highly skilled and expensive equipment 82 percent of the State's population must depend on highways to obtain assistance.

Another means of assessing the importance of highways in hospital use is in terms of the distance traveled to obtain the various types of services offered.

Table 24 shows average distances separating Regional centers, Area centers and

Table 24. Average distances between types of hospital centers for each hospital region to the nearest hospital facility

Type of facility	Regions and average number of miles					
	North- ern	Boise	Twin Falls	Idaho Falls	Poca- tello	State average
Distance from the Community to the Area hospitals	48.2	51.1*	49.5*	53*	42.6	48.88
Distance from Area to Regional hospital centers	83.3	77	**	164	82	101.58
Distance from Community to Regional hospital centers	154.5	51.1*	49.5*	53*	42.6	70.14
Distance from the County Seat of counties with no hospital to nearest hospital	24	28.7	21.5	41.7	***	28.98

* Some Regional hospitals also serve as Area centers for Community hospitals.

** There were no Area hospitals in the Twin Falls Region. See footnote above. State average miles includes only those regions with Area hospitals.

*** No counties in the Pocatello Region were without a hospital.

Locations of Hospitals, Hospital Regions, and Medical Doctors in Idaho 1959

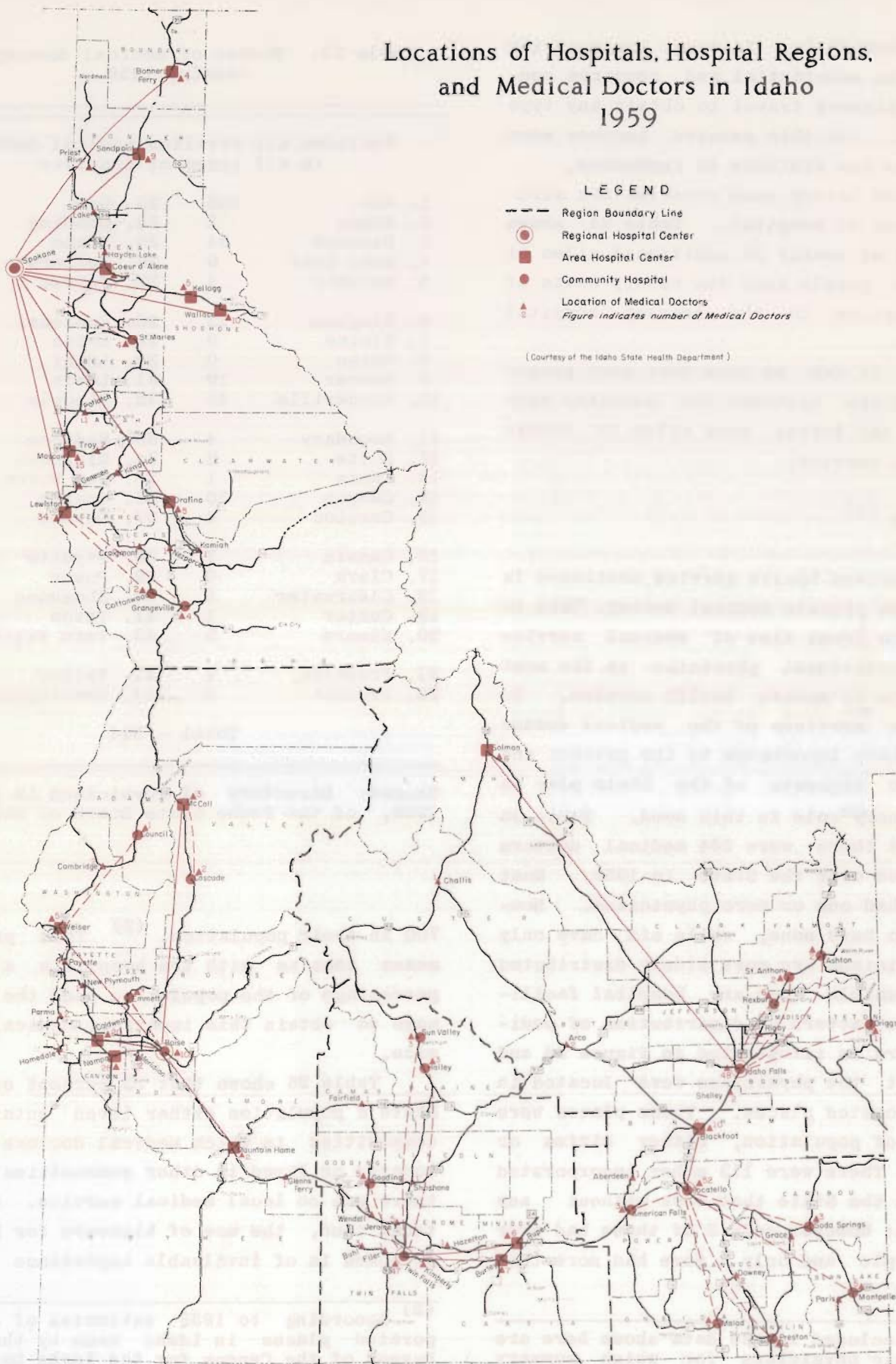


Figure 32. Locations of hospitals, hospital regions, and medical doctors in Idaho, 1959

Community hospitals. In every instance the distance is substantial and requires considerable highway travel to obtain any type of service. As this service becomes more specialized the distance is increased.

As noted before, nine counties are without any type of hospital. Table 24 shows an average of nearly 30 additional miles of travel for people from the county seats of these counties to the nearest hospital facilities.

Thus it may be seen that most people depend on the highways for hospital care and they may travel many miles to obtain this vital service.

Physicians (1)

The second health service mentioned is that of the private medical doctor. This is usually the front line of medical service and the individual physician is the most mobile type of modern health service. To obtain the services of the medical doctor is of primary importance to the patient and again the highways of the State play an extraordinary role in this need. Table 25 shows that there were 544 medical doctors distributed over the State in 1959. Most counties had one or more physicians. However, two have none, while six have only one. Physicians are more widely distributed and accessible than are hospital facilities. The pattern of distribution of medical doctors is illustrated in Figure 32 and shows that the physicians were located in 72 incorporated places. These places were centers of population, either cities or villages. There were 113 other incorporated places in the State that were without any physician; however, only 3 of these had over 1,000 people and only 8 more had more than

Table 25. Number of medical doctors by county, 1959

Includes all civilian medical doctors in all types of practice			
1. Ada	105	23. Gem	4
2. Adams	1	24. Gooding	7
3. Bannock	54	25. Idaho	4
4. Bear Lake	6	26. Jefferson	3
5. Benewah	4	27. Jerome	6
6. Bingham	13	28. Kootenai	19
7. Blaine	6	29. Latah	20
8. Boise	0	30. Lemhi	6
9. Bonner	10	31. Lewis	5
10. Bonneville	48	32. Lincoln	1
11. Boundary	4	33. Madison	6
12. Butte	2	34. Minidoka	6
13. Camas	1	35. Nez Perce	34
14. Canyon	50	36. Oneida	3
15. Caribou	4	37. Owyhee	1
16. Cassia	7	38. Payette	5
17. Clark	0	39. Power	3
18. Clearwater	5	40. Shoshone	15
19. Custer	1	41. Teton	1
20. Elmore	3	42. Twin Falls	52
21. Franklin	4	43. Valley	5
22. Fremont	4	44. Washington	6
Total - 544			

Source: Directory of Physicians in Idaho, 1959, of the Idaho State Board of Medicine

700 in their population. (2) This pattern means that as with the hospitals a large percentage of the population used the highways to obtain this important medical service.

Table 26 shows that 53 percent of the State's population either lived outside of communities in which medical doctors were located or lived in other communities where there was no local medical service. Inevitably then, the use of highways for health purposes is of invaluable importance to the

(1) Not included in the data shown here are osteopathic physicians for which summary data were not available.

(2) According to 1956 estimates of incorporated places in Idaho made by the U.S. Bureau of the Census for the Idaho Dept. of Highways

Table 26. Percent of population living in and outside of cities where medical doctors are located by state and hospital regions *

Area	Percent of population in M.D. cities	Percent of population outside of M.D. cities
State	47	53
Regions:		
Northern	47	53
Boise	45	55
Twin Falls	47	53
Pocatello	50	50
Idaho Falls	52	48

* Hospital Regions are shown in Figure 32.

majority of the population of the State and to many communities that are too small to be served directly.

In examining the various State regions the pattern remains fairly constant; only one area, the Idaho Falls region, had more than half of the population within communities where physicians were located.

Public Health

A third important health service with a close relationship to highway communication is that of public health. Although the field of public health activity does not ordinarily have the urgency of the siren and flashing lights of the speeding ambulance or the emergency of the hurrying physician, yet the requirements for available highway communication to carry out the work are equally necessary.

Public health activity is carried on at local, district and state levels. Public health leadership for local areas in Idaho is organized at the district level. Most

districts include several counties. The directors provide these counties with immunization, clinics, epidemiological and other special services. (3) Other important services provided by the districts are full-time sanitation and nursing services, programs of communicable disease control, maternal and infant hygiene, pre-school and school hygiene, and many types of conferences and clinics. (4)

The State provides the districts directly with several types of services. Some of these include district laboratories, public health engineering programs, youth rehabilitation services and crippled children's services.

It is apparent that the district system is designed to provide adequate public health services and facilities for large geographical areas with small populations where units of local government have difficulty in supporting all the health needs and functions of the community.

Many services such as clinics and conferences require participation of both the local people and the district health officials. The district level organization, in order to provide adequate services of this nature, must have great mobility with ready access to areas involving considerable road distance. With such a system it may be concluded that in one sense the public health program is designed to function in Idaho on a highway base.

Medical care and public health services are functionally inter-dependent with highway travel in Idaho. In order to obtain medical facilities a minimum number of users is required and at least up to a certain point it is efficient to have many people use the same facilities. In densely populated areas it is easier to keep the cost per capita relatively low for hospi-

(3) Biennial Report, Idaho Department of Health, 1956-1958, p. 6

(4) Ibid.

tals and public health facilities because there are enough people within easy access range but in the sparsely populated states, such as Idaho, it is necessary for people to travel relatively long road distances in order to obtain adequate health facilities and personnel. In this respect, because of its rural location, the average mile of Forest Highway in the State probably serves health needs to a higher degree than even that of the average highway. This added factor of importance of highway use is not reflected in simple traffic counts.

Highways and Public Schools

In American society academic training for youth holds an increasingly valuable place. The individual's useful contribution to his own well being and to his fellow's is more and more bound up in the formal training of his mind and in developing higher skills.

With evolving human and technological needs there has been a parallel development in the formal school system. One of the results of the changes is school consolidation.

In urban areas school development grew naturally and with little difficulty but in the more sparsely populated places, including smaller towns and rural areas, equal opportunity for education requires certain preceding social and technological developments. Specifically these developments were, (a) social acceptance of modern education, and (b) a rapid, flexible means of transportation. The first has come gradually and actually more slowly than the second. However, as acceptance of school travel grew, school growth and consolidation has moved ahead. The close relationship between the two elements of travel and school development is stated by an Idaho school official as follows; "The growth of public school transportation in Idaho has been synonymous with consolidation and re-

organization." (5) School changes have brought in the use of motor transportation and improved highways as an integral and fundamental part of the system. The necessity for good and safe roads the year round has become a natural expectation and as much a part of the paraphernalia of education as the school building or the teacher.

Some illustrations of the important effects of school transportation on rural areas are found in the following two statements. In A. P. Jeffries' report on transportation he says about previous reports, "It is noted specifically that the adoption of a school transportation program has increased school attendance and practically eliminated tardiness on the part of rural students." (6) The effect of the increase in school participation by rural children due to highway transportation was shown in a recent nation-wide study which included sample areas in 38 states. The 1954-56 Biennial Survey of Education in the United States in discussing rural and urban attendance says,

"Some years ago school statistics of this type commonly showed marked differences between urban and rural school systems in the persistence with which the pupils attended school. These differences have apparently now largely disappeared. The percentage index for the elementary schools for all groups of rural counties of all 38 States (with counties in the sample) was 87.3, compared to 88.2 for the Group II cities (25,000 to 99,999 population) and 85.8 for the Group I cities (100,000 or more population). For the secondary schools, the attendance indexes show even lower differences than for the elementary schools." (7)

Still another important result has been the equalization of educational opportunity for

(5) Jeffries, Allen P., "Transportation" section in Twenty-third Biennial Report of the State Board of Education, 1956-58, pp. 89-92

(6) Ibid.

(7) Biennial Survey of Education in the United States 1954-56, Chapter 3, Section IV, Statistics of Local School Systems: 1955-56, Rural Counties, U.S. Department of Health, Education and Welfare, p. 24

all areas and all people of the State.

School Transportation in the State

The patterns of highway use by the school systems of the State serve to demonstrate the degree of dependence of education upon highway transportation and show the extent to which highways have become a fundamental part of the educational system.

"Average Daily Attendance" is a standard concept used by school administrators generally in discussing school populations. The growth of school population may be seen in the change in the "ADA" over a period of years. In Idaho the ADA has grown from just under 96,000 in the 1945-46 school year to over 138,000 in the 1957-58 school year. (See Appendix Table IV.) This was a 44.4 percent increase.

Paralleling the growth of school attendance is the expansion in student transportation. Beginning just before the 1947 school reorganization law was passed in Idaho the average number of pupils transported each day was 30,034. (See Table 27.)

At this time also there were nearly 1,100 school districts. By the 1949-50 school year the number of students transported jumped to over 48,000 or an increase of 80 percent. By the 1957-58 year pupils transported in the reduced number of 153 districts stood at 64,855 or an overall increase of 117 percent over 1945-46.

Not only was there a growth in the number transported but in addition there was an increase in the proportion of students that came to be dependent upon highway transportation. In 1946, 30 percent of the ADA in the State was being transported in order to attend school, by 1958 this had increased to 47 percent. (See Appendix Table V.)

At the same time as the changes were occurring in the numbers and percentages of students transported there were like changes in the number of vehicles used and miles traveled. Table 27 shows that the number of buses has increased from 655 to 1,162 with most of the increase occurring in school district-owned buses rather than privately-owned or contract buses. Number

Table 27. School transportation expansion *

Year	Dist. owned buses	Contract buses	Total no. of buses	Avg. no. pupils trans. daily	Total no. of districts
1945-46	361	294	655	30,034	1084
1946-47	337	242	579	35,349	1088
1947-48	394	277	671	37,874	1011
1948-49	452	290	742	42,850	542
1949-50	525	281	806	48,031	391
1950-51	580	277	857	49,562	313
1951-52	656	318	974	51,339	270
1952-53	686	335	1021	54,465	216
1953-54	697	383	1079	57,702	190
1954-55	729	378	1107	60,386	189
1955-56	753	363	1116	60,620	174
1956-57	816	334	1150	63,366	169
1957-58	834	328	1162	64,855	153

* Twenty-third Biennial Report of the State Board of Education, Vol. XLI, December, 1958, p. 94

of pupils transported per bus per day was found to be about the same for both the first and last period with 45.8 in 1945-46 and 44.7 in 1957-58.

In terms of road mileage the trends for daily travel may be seen from three school years. (See Appendix Table VI.) The sharp increase in travel, from 17,725 miles per day in 1945-46 to 33,075 in 1949-50 and then to 51,916 for 1957-58, reflects all three factors, the increase in the average daily attendance, the number transported and the larger percent transported.

Idaho Compared to Other Areas

Some comparisons may be made between Idaho and other places on factors related to school transportation. However, the most recent national data are those found in the Biennial Survey of Education for 1952-54. From this source comparisons can be made of enrollment figures. Idaho had 20.6 percent of her population enrolled in elementary or high schools as against only 16.6 percent for the continental United States. In addition Idaho's population is proportionately greater in the dependent school age group. There was 25.8 percent of the Idaho population in this group while there was only 21.8 percent in the United States and 21 percent for the 11 western states. (8)

Again, in Idaho the proportion of school age children enrolled is substantially higher than in the United States, being 88.9 percent for Idaho and 83.5 percent for the United States. (9)

One further fact shown in the 1953-54 data is that Idaho stands highest in the western states and eleventh nationally in the percent of pupils transported. Adding

this to the following facts--the comparatively high proportion of Idaho population that is in the school age group, the high percentage of young people enrolled in school, the relatively large population (57.1 percent), and the widely dispersed population (no city over 40,000), the conclusion follows that highway transportation is the vital link in providing modern education to the youth of the State. Although the mileage on Forest Highways was not separated, it is evident that the Forest Highways, especially in the northern half of the State, play an important role.

In comparing transportation costs, the most recent data available show that for 1953-54 the average expenditure per pupil in average daily attendance in Idaho was \$20.00, whereas for the United States it was \$11.98. For the 1955-56 school year the average for Idaho was again \$20.00 and for the United States \$13.00. (10)

Opinions and Expectations of School Leaders

In discussing the relationship between roads and school operation, State school leaders expressed the opinion that sparsely settled forest or arid areas in the State where unimproved roads exist are those in which road improvements are needed in order that further school improvements can be made. Better roads were also reported as a factor in further school reorganization which in turn affects the breadth of the educational offering and the quality of teachers available. Consolidation of schools was advanced rapidly in areas of road improvement. It was stated that good teachers must teach too many different subjects, often in areas where they lack interest or professional training.

(8) Biennial Survey of Education in the United States, 1952-54, Chapter 2, Table 13, pp. 50-51

(9) Ibid., Table 17, pp. 58-59

(10) Data extrapolated from Biennial Survey of Education in the United States, 1952-54, Chapter 2, Table 19, pp. 66-67; and from op. cit., 1954-56, Chapter 3, Section IV, Table Q, p. 60

Some effects of better roads noted by the State Office of Education were that they require less time spent on buses, make less dangerous travel for school children, and have more direct access to school and thus allowed rural students to participate in school activities beyond the classroom.

State school leaders were also of the opinion that the number as well as the proportion of school children traveling by school buses would increase over the next 10 years. (11)

Summary

With over half the population of the State dependent upon many miles of travel over rural highways for reaching hospitals and medical doctors the role of Forest Highways is sharply defined in the field of health. Because they all serve rural areas these highways are of more than average importance. The public health program in Idaho is specifically organized in wide

district areas depending on the highway system to provide communication and service for the State.

Idaho schools have changed as the highway transportation system has changed reducing greatly the number of school districts and providing more equal educational opportunity between rural and urban children. However, this opportunity is almost entirely dependent upon the highway travel opportunities. Idaho has a growing number and proportion of students transported by bus and already stands at the top in the western states and near the top in the nation in percent of pupils transported to school. This places great emphasis on the Forest Highways that serve rural areas.

The integration of highways in the framework of major social relationships is an accomplished fact. Many of the most important human values and needs are closely associated with these institutions as exemplified by the fields of health and education.

(11) Questionnaire to the Office of the State Superintendent of Public Instruction.

Chapter IX

PLACING THE RESPONSIBILITY FOR ACCESS TO FEDERAL LANDS

Development of the Integrated Responsibility

The Federal Government early recognized the need for national roads. In 1806 Congress appropriated 7,000,000 dollars toward the construction of the Old Wilderness road. Since that time several specific grants have been made to and in road building. Prior to January 1, 1915, the Federal Government had aided in the construction or improvement of 35,477 miles of road to the extent of \$211,859,163. (1)

Our present federal aid system for building roads essentially dates back to the Good Roads Act passed in July, 1916. At the time of the passage of this act one of the significant impediments to gaining a system for financing and building roads was that several of the states did not have adequate road-building and road-financing agencies. Only 32 of the states had highway departments and it is very probable that several of these served only minor functions because the road problem was then thought of as being either at local or county level. Proponents for strengthened highway departments and greater interstate cooperation had, however, already appeared. One of the men who very effectively championed the cause for a federal aid system was Mr. Edwin A. Stevens who was Commissioner of Public Roads for the State of New Jersey. In 1915 he wrote an article stating that there is very little cooperation among the states and that the principal gain to

be gotten from the federal aid program would be cooperation among the states. (2)

Actually, Idaho was one of the states having a highway department at the time because it dates back to 1913 "when state-wide registration of automobiles was started. There was nothing of any great importance done by the State as a whole upon its highways until the formation of the Department of Public Works. This came in 1919, with the adoption of the cabinet form of government by the State." (3) Before 1919 there were two typical jurisdictions for road building and road control. The first of these was the county, represented by the county commissioners and the second group was called "road districts." The commissioners' records show that the number of these districts rose to at least 58 in Latah County. This was an average of about two per township and certainly localized the supervision of road building in the hands of the "overseer" for the district. Each one was responsible for roads in very limited areas and operating on capital raised by small contributions from land owners and from poll taxes, special property levies--and, if the local district was eligible, from the apportionment of Forest Reserve fees. After the formulation of the Bureau of Highways in the State of Idaho nearly all of these small road districts

(1) Chamberlain, Lawrence Henry, A Survey of Federal Aid and an Attempt to Evaluate its Effect Upon the States, p. 47, a thesis in political science, University of Idaho, 1932

(2) Ibid., Chamberlain, p. 49

(3) Howard, John Wilbur, A Study of the Physical Condition of Highway District Number Two, Latah County, Idaho, With a Discussion of the Road Surfaces, a thesis for the degree of Master of Science in Civil Engineering, University of Idaho, 1929, p. 10

ceased functioning or joined together to form a local Highway District. Actually, in 1959 only one such road district still remains in Latah County.

The county officials of Kootenai County, Idaho, state that there were at one time nearly 70 local road districts in that county. This was an indication that road building was at that time thought of as primarily a local problem. The through traveler at that time traveled by rail and water rather than upon the farmer's road. Coeur d'Alene Lake and several of the streams feeding it lie in Kootenai County. United States Highway Number 10 traverses the county from east to west. Road-user revenues to the local highway districts have increased greatly but it appears that growth in cosmopolitan travel, partly because of the intensive recreational area which has developed, has created problems beyond the scope and efficiency of local jurisdictions. The proximity of public lands also creates a problem for the small, local administrative unit partly because of the variation in needs and also because of the need for integrating the local roads with a widespread system. The county responsibility in road building has increased greatly in this area as has that of state and federal government.

Undoubtedly when abutting or nearby land owners made voluntary contributions to road work in their areas there must have been considerable pressure for contributions from agencies administering abutting or nearby public lands in the area. Certainly the contributing private land owner felt that the public land also reaped road benefits; or at least these lands formed a barrier through which or around which roads needed to be built. This feeling probably had been one of the causes for the policy of returning a percentage of the gross income from national forests to the states and counties within which the forests were located. It probably also served as a basis

for a more widespread demand upon the public land in claiming that the national forest should make its contribution toward maintaining the forest communities or at least paying a larger share toward roads not necessarily strictly local in nature.

After the passage of the Good Roads Act in 1916 there were arguments advanced at the national level indicating that many people were unwilling to concede that the West was fully compensated taxwise for the burden of the proximity of public lands. Some arguments were sectional. Examples to illustrate part of the problem were early drawn out of conditions in the East. For example one author ⁽⁴⁾ showed that there was a good deal of travel between the great metropolises of Philadelphia and New York and that such travel took place largely over the State of New Jersey. He compared this to the travel between the East and West coasts with the intermediate western states being in the same situation as New Jersey, caught with the burden of maintaining roads for non-local travelers. In general the states, especially the highway departments in the states, welcomed the federal aid system as it was set up for administration in the United States Bureau of Public Roads. Some of the people in the East expressed the opinion that the West with its sparse population spread over a large area was due to gain at the expense of the nation as a whole. One of the most outspoken of these critics was Senator Wadsworth of New York. He stated that the extensive public lands in the West were not a burden upon the public treasury of those states because the Forest Reserve fees returned to counties and the Mineral Leasing Act of 1920 adequately offset the fact that there were large areas of untaxable public lands in the western states. ⁽⁵⁾

(4) Mehren, E. J., "A National Highway Policy and Plan," American City, Vol. 9, pp. 1-5, January, 1919

(5) op. cit., Chamberlain, p. 57a

That these fees have been inadequate to offset the tax immunity of these lands has been recognized, at least in part, by later legislation.

The Agricultural Appropriations Act of June 30, 1906, provided that 10 percent of all the money received from Forest Reserves be turned over to the States or Territories for the benefit of roads and schools but that this was to be limited to not more than 40 percent of the amount provided for these purposes from other sources. Evidently this early "matching program" was intended to give considerable leverage in the use of federal funds and for the designated purposes of roads and schools. Just why this matching leverage was abandoned so soon is not clear but the matching proviso did not appear in the May 23, 1908, act (35 Stat. 251,260) which increased the payments to 25 percent and called for disbursement to county level on the basis of area of what is now called national forest.

Whether the Forest Reserve fees returned to the states and counties under the provisions of these acts are adequate to compensate for the loss of taxes resulting from tax-exempt federal lands in these states is a matter of some question. Upon first analysis it appears that the 25 percent of gross receipts from national forests which is returned to the states and their subdivisions constitutes a much greater percentage of the gross income than do the taxes on private lands in these states. This comparison is, however, not fully valid because the remote forest lands, partly because they are remote and partly because of the nature of the products, are more demanding upon and benefit relatively more from transportation facilities. It is apparent that these land areas are generally in an earlier stage of development than the comparable privately-owned lands. A larger percentage of the money expended for road purposes in these relatively undeveloped areas can be thought of

as capital investment rather than as operating costs as would be the case in areas having predominately private lands. There is a further significant difference in the gross income from private land compared with that from public land. Generally private land is being used more intensively and labor constitutes a greater share of the gross income on private lands than it does on public lands. The labor income is subject to many taxes and responsibilities not levied against land return as such. The demands of public lands upon public tax-supported institutions are certainly less on a per-acre basis but probably are not less on a per-gross-income-dollar basis.

Twenty-five percent of the gross proceeds from sales of timber in the national forests are returned to states containing national forests. It must be assumed that some of this money will be returned to the federal treasury in an indirect manner. It is of vital importance to efficient and economic operation of the national forests to maintain stable forest communities including both a labor force and a forest products industry in general. The return of the forest fees--in Idaho broken down into 70 percent to be returned to the local counties for road support and 30 percent for school support--is most certainly an important factor in helping to maintain some of these forest communities. Fairness is not necessarily a sole criterion upon which to determine how much federal money should be turned back to the forest communities. Effectiveness is a better criterion. The degree of maturity of forest economies and forest communities is a factor in the effectiveness of funds used for different purposes. Any percent of gross timber sales, however high, might be an inadequate formula for investment in an area of great potential but of low current production because of needed transportation facilities.

Idaho's Situation in Developing Federal Lands

There is not much doubt that Idaho has a very real interest in the development of the federal lands within its boundaries--regardless of whether these lands are reserved or opened to private ownership. The main difference resulting from public vs. private ownership is that of financing the development. If the lands were opened to private ownership, ordinary methods of taxation could be used whereas, since the lands are reserved, the nature of the accrual of development benefits establishes equity, and consequently responsibility, at both national and State levels. In many respects the problem and equity are mutual to the State, county, community, and the Nation.

Although there exists a mutuality of interest in the development of the federal lands, the ability to take responsibility in the development may not be proportionate for the parties to the mutuality. Frontier areas are usually notably short on capital relative to the opportunities for using capital. Often the capital risk is great in new areas, so capital is not easily induced away from older areas. It is nearly always the case that little information is to be had on the potentialities of newer areas so capital does not move into these areas in a rational manner. Much of the risk involved is associated with predicting what the government action will be in the development.

Idaho has been no exception in being a frontier with a capital shortage. Investigations of notes secured by mortgages on real estate show that in the early part of the 20th century interest rates of 20 percent per annum were quite common in the State. Interest rates on farm mortgages in which capital has been obtained from private sources have continued higher than the national average. This shortage of capital has been a deterrent factor in the develop-

ment of resources in the State--private as well as public. The capital extension for the development of highways to and in the federal lands, upon which much of the State is so dependent, logically proves to be quite burdensome.

Lumbering throughout the State is very dependent upon the national forests. The income from this industry has risen very rapidly since the end of World War II. In 1945 the income from lumbering was approximately \$30 million and by 1957 was over \$140 million. By 1968 it is estimated that it will rise to approximately \$210 million unless such factors as economic depression, war, or changing building technology have adverse effects. (See Figure 33.) Such

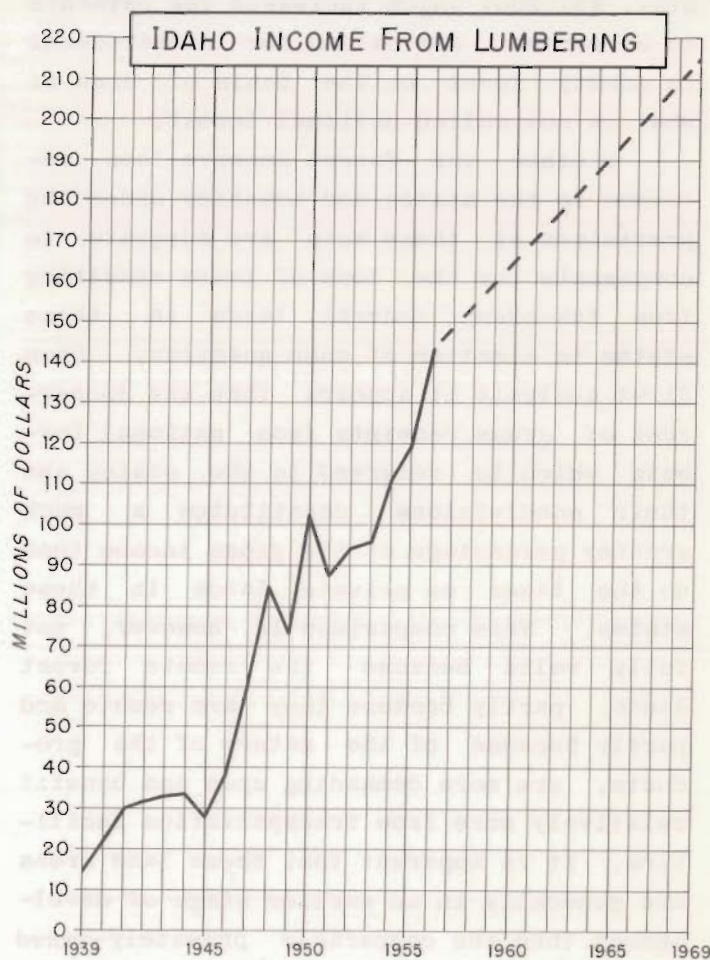


Figure 33. Idaho income from lumbering during 1939-1957, with projections to 1968

growth must, of course, further depend upon commensurate development of roads serving the national forests and the communities providing the labor force for the lumbering industry. The Forest Highways are and will be very important segments of the roads performing this service.

Although lumbering is most closely associated with the development and value of Forest Highways, agriculture--especially in the area north of Boise to the Canadian border--also has a real stake in the Forest Highway program. In fact, many of the farmers in the periphery of the national forests earn a major share of their livelihood either in the forests or industry directly dependent upon or serving the national forests. Even those who do not depend directly on the forests share the Forest Highways. The mining industry depends largely on mineral resources found on federal lands.

The land-based industries in Idaho--crops, livestock, livestock products, lumbering and mining--have grown at a rapid rate since the economic depression of the 1930's. Income from crops increased especially rapidly during World War II and, although it leveled off in the decade ending in 1957, it is expected to increase about 30 percent between 1957 and 1968. Incomes from livestock and from mining have increased rather regularly since 1939 and are expected to increase over 50 percent between 1957 and 1968. The aggregate income from these directly land-based industries increased from about \$150 million in 1940 to about \$550 million in 1957. The continued growth in these industries is of paramount importance to the economy of the localities and the State. They are all important to the West and the general public and the lumbering industry is important in returning revenues directly to the Federal Treasury. (See Figure 34.)

Allocating the costs of highways on either the benefits received by or the

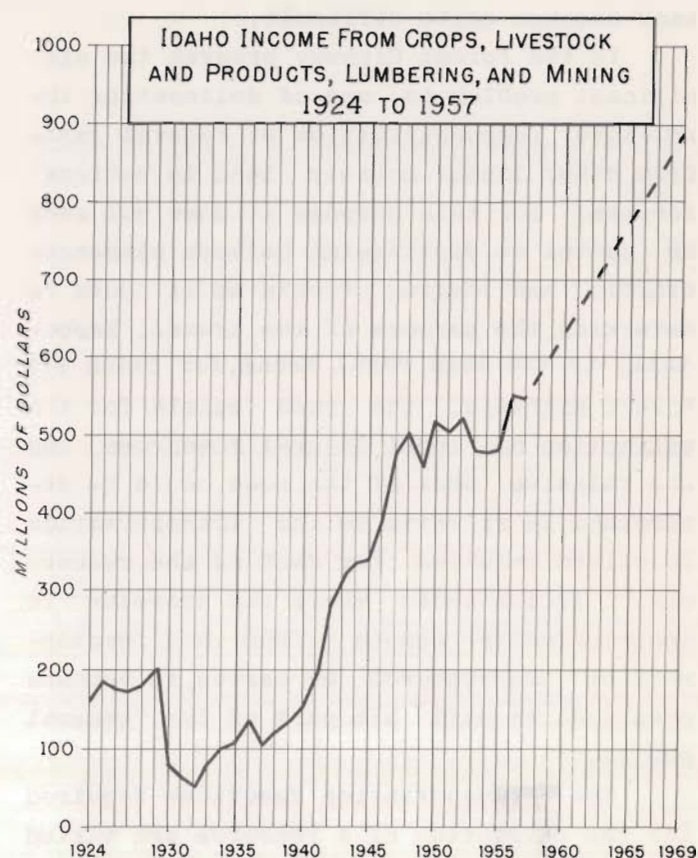


Figure 34. Idaho income from crops, livestock, livestock products, lumbering, and mining during 1924 to 1957 with projections to 1968

costs of serving different users of the highways is a knotty problem. St. Clair states, ⁽⁶⁾ "It is first necessary to find a means of assigning just proportions of the burden among the three major classes of beneficiaries: the property directly served; the general public; and the motor-vehicle users, respectively." This first step, if done conscientiously, is in itself a rather monumental task. Furthermore, the three groups are not mutually exclusive and in allocating among different types of land ownership--different types having different tax immunities and responsibilities--the

⁽⁶⁾ St. Clair, G. P., "Suggested Approaches to the Problems of Highway Taxation" Proceedings of the Twenty-seventh Annual Meeting of the Highway Research Board, Washington, D.C., 1947

task becomes quite difficult.

In the Forest Highway program the significant problem is one of delineating the relative responsibilities of federal lands from other lands--notably land in national forests. For this purpose it does not seem as useful to distinguish between passenger traffic and logging trucks as it does to determine the purpose of the travel. Especially in the more rural areas, for Class III Forest Highways, the road exists for the extraction of local natural resources and the relative uses of the road could be determined in relation to the transportation functions required for each of the resources. In instances where the traveler is geographically remote from his employment or the resource he serves, it becomes practical to call him part of the "general public."

The transportation functions required for the extraction of a resource are varied and may be direct or indirect. The costs of facilities for travel and transportation to utilize a resource may be very direct production costs such as hauling of equipment, raw materials, or products. These are easily associated with the industry involved. Commuter transportation is a necessary indirect cost. Facilities for commuter travel and other travel by the labor force in the industry, or those serving the labor force, may be thought of as "fringe benefits" in lieu of otherwise higher money wages. In this sense, all of the transportation costs can be charged against industry and classification of the nature of travel is often essential only insofar as it aids in the determination of whether the labor force would prefer to have the foregone wages or the facilities.

The principal theoretical problem of placing responsibility on a resource basis arises from joint use of facilities. An allocation of road costs among the industries must be made. The total benefits derived by a resource or an industry sets the

upper limit on costs that can be soundly incurred in providing the facilities giving rise to the benefits. A proportionate allocation on the basis of the benefits derived makes it possible to provide superfluous access. Where access is the absolutely limiting factor the benefits method can be tantamount to confiscation if not carefully applied. Maximizing the value of the resources should be the ultimate objective and this should determine all factors involved in building roads serving the resource. The effect must also be considered jointly with the effect on other resources. The value of the road itself must be considered. Those transportation functions not directly associated with the exploitation of resources--notably national defense, government, and other forces of ubiquitous effect, must be considered simultaneously.

A Formula for Apportioning Forest Highway Funds

From time to time various formulas have been suggested for apportioning the Forest Highway Funds among the States. Various factors have been suggested. Section 3 of the Highway Act of 1953 requested that a new formula be developed. In the research here reported there was developed a formula which seems to fit the philosophy for having a Forest Highway Fund distinct from other federal aid for highways. The discussion and the formula are presented for responsible consideration.

The national formula for apportioning Forest Highway Funds on the basis of area and value of national forest within a State compared with the total area and value within the Nation probably affects Idaho adversely regardless of the relative weight placed on area and value. Idaho's problem is associated with the fact that 65 percent of its area is federal land. This large amount of federal land is at least to some extent compensated in the formula but what

is not taken into consideration is that there is such a small tax base remaining to share the road costs. Perhaps a formula should be devised to take into consideration the burden on the remaining tax base and the ability of other resources and industries to share road costs. From a practicable standpoint it is necessary to devise a clear-cut, simple formula even though it may be arbitrary to some degree.

If resources were fairly uniformly spread--as, for example, in most of Iowa--a reasonably equitable apportionment of responsibility among different land ownerships could be made on an area basis. In the states containing the majority of the national forest land the natural resources are quite heterogeneously distributed both within the states and among the states. A direct measure of the revenue-raising capability of the land would be desirable but, unless unusually intensive and costly economic studies are made of these resources, no reasonably accurate direct measure can be developed.

The capability of giving employment or sustaining people is perhaps the best single index of the value of overall land resources and a better index of revenue-raising capability. Using the sustained population as an index could have considerable error from one type of resource to another and in many different cultures. But within a type of resource and in averaging several types of resources the individual errors probably compensate, resulting in a relatively low overall net error. An index of this capability, in the form of the population of a state, could be used in the apportionment of the Forest Highway Fund.

Also of great importance in measuring a state's ability to enter into a "partnership" with the federal government in developing the national forests is the revenue-raising capability of the areas remaining in the state after the national forests are exempted from ordinary property taxes. Or-

dinarily part of the revenue gained from private land would be used for development--especially on relatively undeveloped land. These revenues may be used as private funds or public taxes. If a state assumes some responsibility for development related to federal lands, the extent of the financial burden depends on both how much federal land is involved and also the amount of private (taxable) land remaining. To compensate for the differences among the states containing national forests, a ratio between the amount of national forest in a state and the total area of the state can be used as a factor in allocating the Forest Highway Fund.

In addition to factors used since 1922, the following formula considers the population of a state and also the ratio of the national forest area in the state to the total area of a state. According to this formula the portion of the Forest Highway Fund to be received by a state would be determined by:

$F_s / \Sigma F$; where F_s is the "state's factor" and the ΣF is the total of all the state factors.

The state factor would be determined by the formula:

$$F_s = (A_s/A_t + V_s/V_t)(P_t/P_s)(A_s/A_{ts});$$

where A_s is the area of national forest in the state

A_t is the total area of all national forests

V_s is the value of national forests in the state

V_t is the total value of all national forests

P_t is the total decennial population of all states having national forests

P_s is the decennial population of the state

A_{ts} is the total area of the state

The first right-hand term in the formula; that is, the term $(A_s/A_t + V_s/V_t)$; is the formula of giving equal weight to area and value of national forests in a state relative to the national totals--the formula used since 1922. Factor P_t/P_s adjusts

for the paucity of people in the state and the last factor adjusts for the amount of national forest relative to the rest of the land in the state. Table VII of the Appendix shows the apportionment among the states for 1958 and how the apportionment would have been made had the new formula been used in simple, unweighted form. Also in this table are shown the specific values of the components of the formula for the states in the West. As was intended, those states with low populations and a relatively large share of their areas in national forest would gain in the alternate formula. For the same reasons, the West would gain by the use of the alternate formula.

It would logically be impossible to derive a formula which would not be arbitrary in any sense. There are, however, some self-adjusting factors which can be injected into a formula of this kind. For example, in the old part of the formula the more developed the national forests are in a state, the more valuable they become and consequently the more federal money the state would get. This is probably contrary to sound investment in resource development because less additional capital is needed as improvements have been made. Development costs in new areas usually are quite great in amount. The second term, Pt/Ps , is a self-adjusting factor which reduces the share a state would get as the population--and presumably the tax-paying ability--of a state grows. The last term adjusts for any area changes made either in states or in the national forests.

Because they are multiplied together in the alternate formula, the ratios Pt/Ps and As/Ats do not lend themselves to separate weights. An additive arrangement of these ratios could be made practicable but more complex mathematical adjustment would be needed than in the multiplicative form. As the formula stands, the effect of these two elements is pooled into one single adjustment.

Although the alternate formula actually adjusts the old formula, it is evident that averaging the results from the two formulas would obtain the same results as a complex weighting system for the alternate formula. Table 23 shows how this can be done and how different states in the West would be affected with simple averaging or weighted averaging. Although the relative weights ultimately chosen must be somewhat arbitrary, it is logical to include the pooled effect of the new ratios in the alternate formula. This effect takes into consideration both the investment aspect and the burden aspect.

The Amount of Finance for Forest Highways

The national wisdom of investment in Forest Highways must be determined from the standpoints of the community, the county, the state and the nation as a whole. The yardsticks for gauging such wisdom must be in the category of expected returns and the alternative use of public funds or facilities.

There is considerable manifestation that forest roads have been under-financed from public treasuries. This seems notably true upon comparisons with developments of private land and especially so in comparison with areas where national forests provide the predominant resource. On many of these lands private roads have been built. Ordinarily these roads have been built with one predominant use (such as log hauling) in mind but most of the roads are open to the public except in unusual circumstances such as fires. Although the owners of these roads do not capture all of the "general-public" values of these roads, it is evident that they are maintained partly for commuters and other passenger traffic along with the predominant purpose. The building and maintenance of such roads is, to a great extent, evidence that the roads are profit-

Table 28. Apportionment of the Forest Highway Fund which would have resulted from an alternate formula or combinations of the formula used and the alternate formula

State	1958 apportionment of \$30,000,000*			
	Formula actually used	Alternate formula developed**	Average of the two formulas	
			Simple average	Two-thirds on formula used and one-third on alternate formula
Arizona	\$1,639	\$1,560	\$1,624	\$1,646
California	4,296	357	2,327	2,983
Colorado	2,154	1,494	1,824	1,934
Idaho	3,054	3,724	5,889	4,944
Montana	2,391	3,174	2,783	2,652
Nevada	533	1,065	801	714
New Mexico	1,202	873	1,037	1,093
Oregon	4,133	2,895	3,514	3,720
South Dakota	235	36	136	169
Utah	936	915	955	969
Washington	2,035	861	1,473	1,677
Wyoming	1,230	2,676	1,978	1,745
Alaska	2,615	4,989	3,802	3,406
East and Puerto Rico	3,331	378	1,854	2,347

* The figures for the states have been rounded to the nearest thousand.

** This formula adjusts for the population of the state and for the relative amount of national forest in the state compared with the area of the state.

able to the private industry--even without being able to capture all of the social and wider-community benefits. Especially such factors as national defense can be captured in only a small degree by these owners.

Another yardstick for measuring the financial support of Forest Highways is the growth in the support of these highways compared with the support of highways in general. It is evident that the federal aid to Forest Highways in Idaho has not kept pace with the regular federal aid for other highways. Figure 35 shows that the index of the amount of federal funds made available to Idaho has about tripled since the decade of the 1940's but the other highway aid has increased about sevenfold. This is true despite the fact that the growth in the use of Forest Highways has grown at approximately the same rate as that of other highways in the State. During 1940's

the use of Forest Highways lagged behind other highways but in the decade of the 1950's the growth has been more rapid in the Forest Highways. (See Figure 8.)

Despite the lack of improved roads, the increase in the number of vehicular miles of travel in Idaho has kept pace with personal income and other factors. (See Figure 36.) The highway traffic in 1956 was approximately four times as great as it was in 1929. Only during World War II was there a recession in the highway traffic in the State. The increase in traffic assuredly helps the highway financing in the State but waiting to get the revenue out of use is a slow, and probably uneconomical procedure. That the traffic has quadrupled does not mean that the present highways are adequate or economically extended--it may mean that highway travel has become more essential. It also means that highways are less inadequate than they were in 1929.

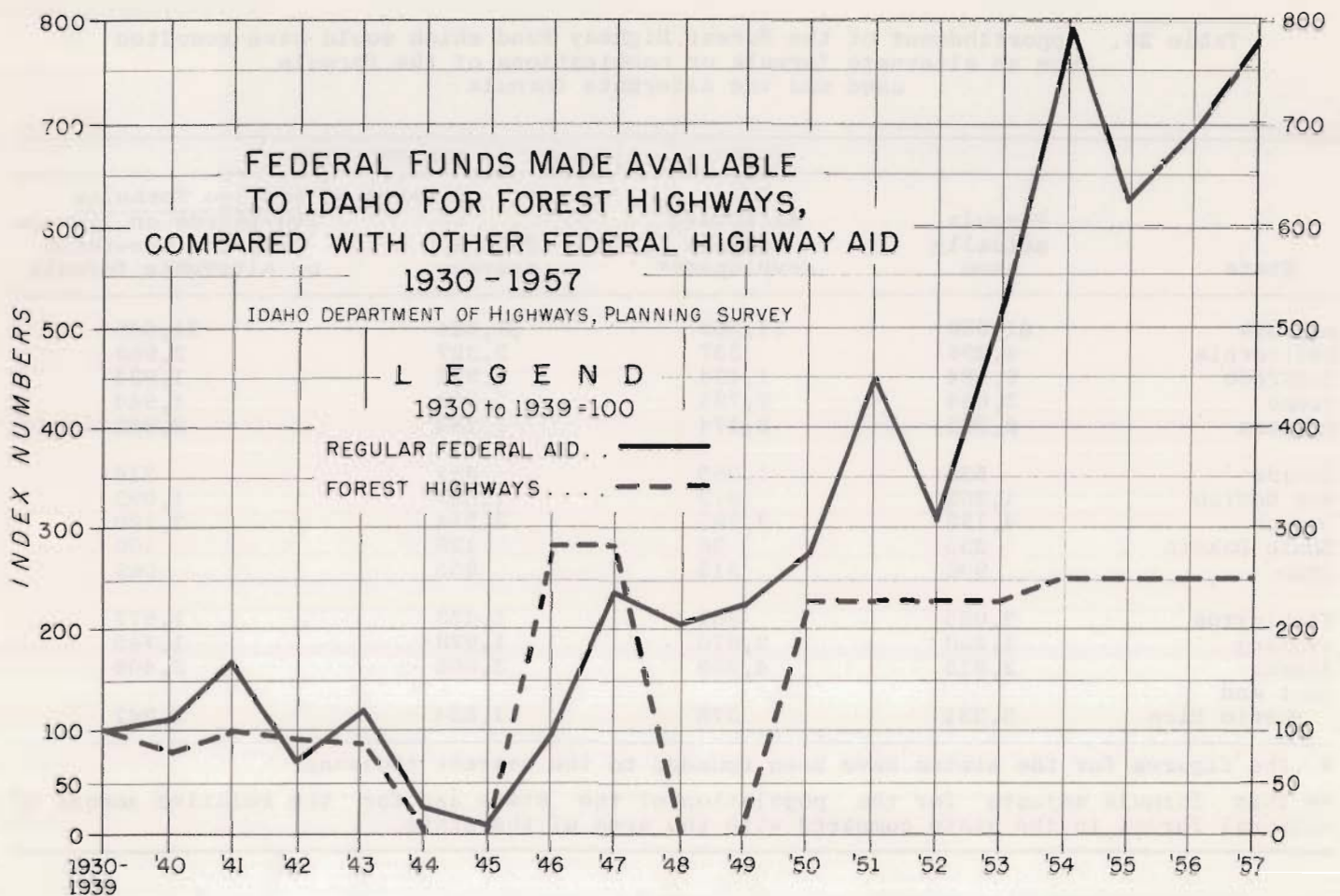


Figure 35. Federal aid to Idaho forest highways compared with other federal highway aid to Idaho, 1930 to 1957

Summary

As in the nation as a whole, the responsibility for building and maintaining roads in Idaho was rural and local in origin. Typically counties had several dozen "Good Road Districts" which have gradually given way to Highway Districts, to county, and to state responsibility. Although much strengthened later, there was a state agency for building roads in Idaho at the time federal aid was first initiated to encourage state cooperation.

Sectional arguments rose as to what

extent the states in the West were compensated for the tax-exempt federal land within their borders. One argument was that the Forest Reserve fees and minerals were adequate compensation but this soon proved inadequate for developing the roads needed mutually by the federal and private lands.

The economic growth of Idaho will no doubt be rapid in the next decade but because of the nature of the major industries in the State--agriculture, forestry, and mining--the dependence on road improvements will be great. The uneven and far-flung distribution of resources aggravate the

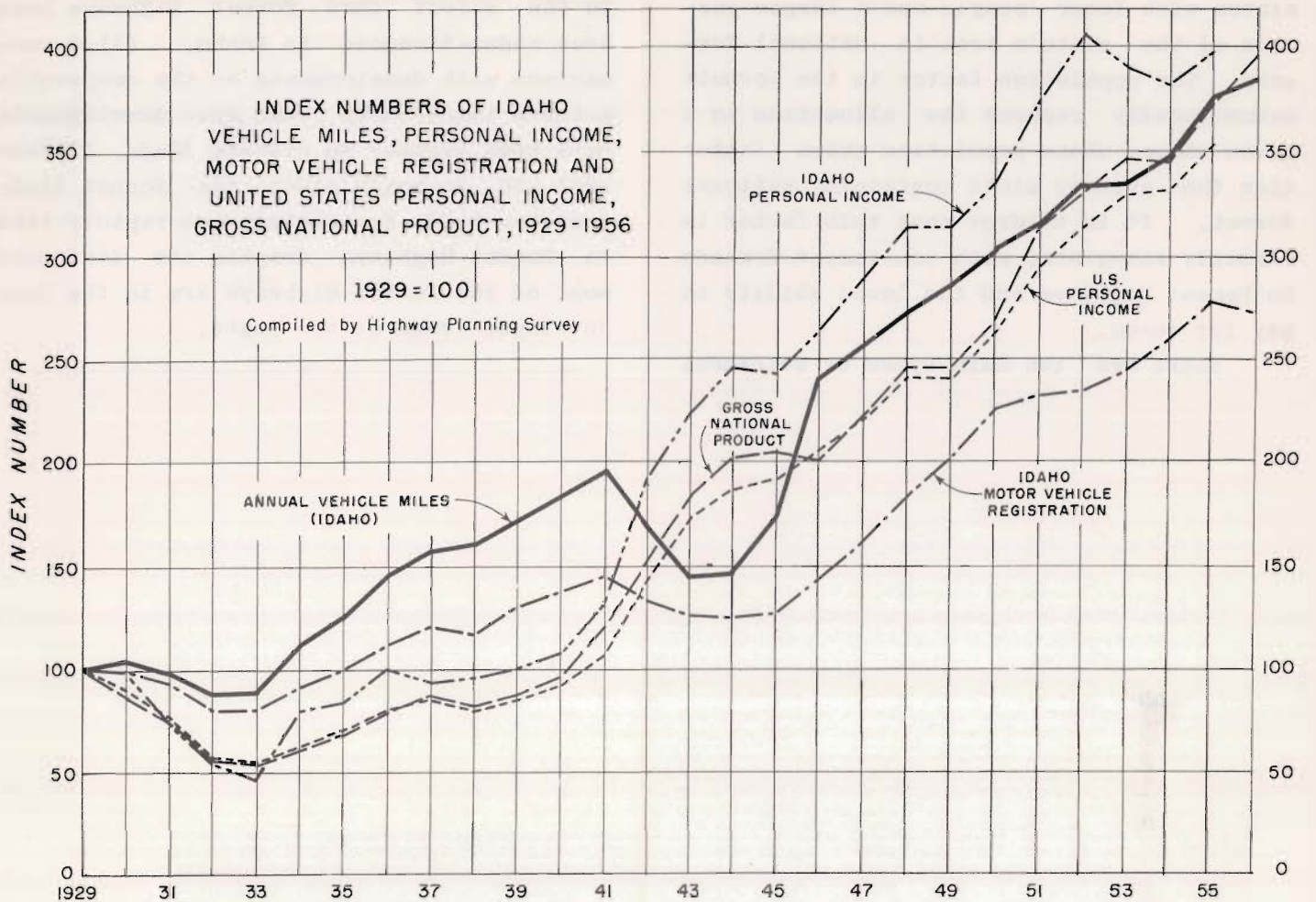


Figure 36. Trend in highway use in Idaho compared with trends in other economic factors

problem. The core of the problem of having the federal land in the State is not that there is so much of it as that there is so little other land and so few people sharing the costs of road building.

Using only area and value of national forests for apportioning the Forest Highway Fund among the states disfavors Idaho relative to those states which have more valuable forests because of a large local population supported through resources other than those in the national forests. A formula allowing more "investment capital" to flow into the states with relatively unde-

veloped forests, and less as development takes place, is evidently needed. An adjustable formula has been developed in this chapter.

The formula which has been presented adds two elements to the formula which has been used in allocating the Forest Highway Fund. These are two ratios: (1) the population of the state compared with the total population of all states containing national forests; (2) the area of national forest within the state compared with the total area of the state. Using these elements in the formula would allocate more to those

states with fewer people and a larger portion of the state's area in national forests. The population factor in the formula automatically reduces the allocation to a given state whose population grows faster than the average state containing national forest. It is evident that this factor is directly associated with non-forest demands on Forest Highways and the local ability to pay for roads.

There are two main types of evidences

to the effect that Forest Highways have been under-financed in Idaho. (1) a comparison with developments on the comparable private lands shows that road developments have been greater on private lands. (2) Federal aid to roads other than Forest Highways has been increasing more rapidly than to Forest Highways despite the fact that most of the Forest Highways are in the less developed areas of the State.

Chapter X

SUMMARY AND CONCLUSIONS

The Forest Highway program in Idaho has lagged behind both the general highway program in Idaho and the national program. This has been the case despite the fact that the use of the average Forest Highway has increased at the same or greater rate than other roads. The local support has been relatively much greater on Class I Forest Highways than on Class III, indicating that sources of local finance have been fairly heavily taxed but have been inadequate to meet the mutual needs of the community and to serve the national forests.

In 1958 there were 40,383 miles of public road in the State. Over 18 thousand miles were county roads. Only 1,217 miles were Forest Highway despite the fact that 37.9 per cent of the State's area is in national forest. Furthermore, forestry is one of the major industries in the State and essentially the only industry in many of the State's communities. Road development in the national forests and the land bordering national forests has lagged behind other areas of the State. The problem is greatest in counties north of Boise to the Canadian border. The human population density is less than 2.5 per square mile in Forest Highway areas.

Highway user revenues in the State are disbursed in a fairly complex manner based partly on population and partly on mileage of improved road in the eligible civil division in the State. Although there has been a trend away from small local units in road building and maintenance, there still exist many local Highway Districts with essentially the same status as counties in road functions.

The total of 1,217 miles of Forest High-

ways in Idaho may be misleading because this is on the basis of official designation rather than mileage of actual road. Some of these roads are segments of high-standard and well-maintained roads whereas some are roads of low standards. In some instances the roads have not been "punched through" and thus can not be traveled all the way from one end to the other. Several of them are in very difficult terrain and have been either under construction or undergoing improvement for many years.

Idaho has over 20 million acres of national forest land--the greatest amount in any state other than Alaska. Compared with other states the national forests and the forest communities are poorly served with roads. Only Alaska and Wyoming have as few miles of Forest Highway per acre of national forest as has Idaho. The State has only 60 miles of Forest Highway per million acres of national forest.

The dearth of highways traversing the national forests is of great importance to east-west transcontinental travel. If the northern tip of the forest area were placed at Chicago, Illinois, the southeastern tip would extend to South Carolina. Across this area the important through roads use Forest Highways at least part of the way. Between U.S. No. 10, which is coincident with Forest Highway No. 7, and Yellowstone National Park there is no east-west oiled or paved road.

A study of the components of road building costs shows a trend toward a smaller direct payment to labor. Logically all of the costs involved augment labor payrolls but the locality in which the road is built benefits more from the direct than the in-

direct. Because indirect costs (for prefabricated materials) have increased the "out-of-pocket" costs to Idaho have increased.

Case studies and analyses of construction costs in relation to savings in vehicle operating costs show that a great deal of opportunity exists for sound investment in public roads in Idaho. In several instances the vehicle operating costs for a single year are equal to total construction costs. In other instances the traffic flow has been very low in comparison with the construction costs because the roads have either not been completed or have not been brought to a standard which would encourage traffic.

The Emergency Factor on Idaho Forest Highways

The effects of three types of emergencies on the demand for roads were studied. Although these effects are not peculiar to Idaho, or the West, they probably are more serious in Idaho than in any other state.

Before the advent of large, mobile fire fighting equipment, the problem of forest fires was often hopelessly local in nature. It was then largely a job for horses and men with hand tools. During the time of those techniques huge areas of valuable timber were burned off the public lands in Idaho. The large, mobile, earth-moving, and spraying equipment changed fire fighting techniques and organization. The "smoke jumper" (parachutist from plane) has played a great part in spotting and fighting fires but the larger fires still demand mass movements of men and equipment. The stand-by use of the Forest Highway is essential to this type of operation.

Pestilences of other types may strike the public lands without much warning. The spruce bark beetle epidemic in the 1950's struck in many areas. Roads were a real asset in combating the spread of the beetle and in salvaging damaged timber. An epi-

demic of this type throws an unpredicted traffic flow on the roads in that the areas from which timber is cut is dictated by the pestilence rather than predictable factors such as growth and age of stands.

Experiences from World War II give testimony to the effect that hinterland roads are scarce in Idaho. At that time several public agencies, usually secretly, built roads to essential war materials. Idaho has deposits of a large variety of minerals--many of the most important of them located in the public lands. Some of them are located in the proximity of the national forests and there is a mutual road interest between the forest industry and the mining industry. In any area depending largely on a single industry road planning must be done in anticipation of the changes in the industry. In industries with great geographic spread--especially in relatively undeveloped areas--it is often impossible to anticipate to a high degree of accuracy the locations demanding roads.

Idaho Communities--A Factor in Forest Highways

In a democratic society the nation assumes responsibility for the general welfare of its citizens. If the citizens are directly engaged in developing or husbanding public property this responsibility is more direct. This was acknowledged to some degree when Congress set up the Forest Highway Fund for forest roads of primary importance to the state, county, or community near national forests. It was evidently recognized that it was in the best national interests to maintain the community of human resources jointly with the public's physical resources. Forest supervisors indicated that there were 153 forest-related communities in Idaho with varying nature and degree of interdependence with the forests. These communities are spread throughout the State with many of them on non-

paved or non-oiled roads. The "company town" has been giving way to the self-governed community. There is generally a greater interdependence between forests and communities in northern Idaho than in southern Idaho. Many of the towns in northern Idaho are based almost entirely on either logging, hauling, or milling forest products.

The logging camp has long been a substitute for both roads and established communities. For several reasons the logging camp is disappearing. In several areas it still exists by sufferance. Only a few of the older lumberjacks seem to think of the camp with fondness. Operators indicated that it is getting progressively more difficult to keep labor in logging camps and it is necessary to subsidize the workers to have them live there. Generally the operators indicate that they would rather obtain a stable labor force from a larger area over good roads than to try to hold them through immobilization and subsidy. Several operators pointed out the efficacy of joint use of roads for commuting and hauling logs. One of the yardsticks mentioned was that if a distance is not too great for hauling logs it is not too great for commuting. It should be borne in mind that geographically this is reverse commuting--that is, going from town to country for work. Commuting roads seem to be an essential factor of the forestry industry and recognized as such by most of the operators. These roads seem to be recognized "fringe benefits" and these benefits include many purposes other than commuting.

Safeguarding health and education in the national forest areas is based on heavy travel requirements. With an average human population of less than 2.5 per square mile the services and facilities are far apart. School transportation in Idaho is a much greater problem than in the average state. A larger percentage of pupils were transported by bus in Idaho than in any other

state in the West. The cost of school bus transportation in Idaho is in the neighborhood of \$20 per pupil compared with an average of about \$13 in the United States. An analysis showed that much of the difference was the result of the high costs in the sparsely-settled areas bordering the public lands. Health services are also relatively expensive because of the need for traveling great distances--notably so for the more specialized services and more adequate hospitalization. The Forest Highway is helping to alleviate this problem and consequently helps to maintain a more capable and stable labor force to serve the national forests.

Recreational Travel

Idaho has abundant hinterland resources for rural recreational travel. Many of the areas of great scenic beauty lie far from roads attempted by the ordinary tourist. The huge wilderness is essentially without roads. The locations of Yellowstone and Waterton-Glacier parks have a profound influence on the travel on the Forest Highways. This, along with the industry associated with forests, puts a summertime load of traffic on the rural roads. With the rapid population growth on the West Coast, this has increased very rapidly and will probably continue to do so. It has been estimated that tourists are currently spending about 100 million dollars per year and indications are that this will increase.

Hunting and fishing are quite important to Idaho. There has been a steady increase in licenses issued to residents but the great increase has come from out of the State. Big-game hunting by non-residents tripled from 1947 to 1957 and non-resident fishing licenses increased about two-thirds in the same period. Big-game hunting is relatively inexpensive for those who live in the forest-related communities. Many people in these areas have come to regard

big-game hunting as more than a sport. Interviews with woodworkers' wives and logging superintendents indicated that households depended to a fairly high degree on meat from game animals.

Evidently the harvest of deer and elk has been too light in many areas of the State. The kill has definitely been road-associated--that is, it has been too light in areas not adequately served by roads. Large numbers of big-game animals starve in the winter in rough hinterland areas with poor roads. Game management experts indicate a real need for getting enough hunters into these areas. Low license costs and doubled bag limits have not accomplished it so the need for better access is indicated.

Allocating the Forest Highway Fund

The Forest Highway Fund is a federal appropriation of money for forest roads of primary importance to the state, county or community in or near the national forest. Idaho has 37.9 per cent of its area in national forests and forest supervisors listed 153 communities as forest-related. Relatively few areas in the State are not either directly or indirectly involved in the forest industry. The Forest Highway Fund is an important part of the budget for the State's highway program. The initial appropriation for the Forest Highway Fund was enabled in the Highway Act of 1921. Allocations of this money among the states containing national forest land have been made on the basis of area and value of national forests within a state compared with national totals for area and value. Areas within states have remained rather constant but values have changed quite differently among the states. Idaho is one of the states whose value of national forest lands has been lagging--increasing only about 77 per cent while the national forests in the

nation as a whole increased about 238 per cent in value. It is evident that the lack of forest roads in the State is a significant factor in this lag and that the value factor has become adverse to Idaho in the allocation. It is also evident that the scarcity of developed resources in the periphery of the national forests has created a problem in building roads of mutual interest to the national forests and other resources. Idaho, along with some other states, has a problem of having an inadequate amount of privately-owned resources to tax for building roads to the most economic degree from the standpoint of the best investment in the national forests. It is apparent that development funds need to be "advanced" in order to maximize the value of the public lands in the State.

This research developed a formula which is designed to advance money for Forest Highways to those states which are relatively undeveloped and in which the national forest lands are a relatively great portion of the state's area. The formula is explained and illustrated in Chapter IX with further illustration in the Appendix. The relationship of degree of mutual interest between the national forests and the other revenue-raising resources of a state is adjusted through two elements added to the old formula for allocation. These factors are (a) the ratio of the total human population in all national forest states to the total population in the state in question and (b) the percentage of the state's area in national forest. The product of these is multiplied by the old formula. The alternate formula developed in this study would allocate significantly greater shares to those states with relatively small human population and large percentages of their areas in national forests. The alternate formula developed does not readily lend itself to a statistical weighting of the new elements introduced because

they are in multiplicative form. The effect of these elements can, however, be modified to any degree desired by averaging the results obtained from the new formula with those from the old formula and applying statistical weights to the two results.

The Forest Highway is very important to the State of Idaho--both from the standpoint of highway finance and the State's

development. Many of the State's resources are in very early stages of economic development. When developed, these resources will complement the increased value of the national forests. In fact many of the resources to be developed lie within the national forests. Roads will be vital to this and appear to be a national as well as a state problem.

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APPENDIX

Legislative and Administrative Development of the Forest Highway Program

The first Act passed by the federal government concerning forest development roads and forest highways was passed on July 11, 1916. (39 Stat. 355). The title of the Act was "An Act to provide that the United States shall aid the States in the construction of rural post roads, and for other purposes." Section 8 of this Act provides for the appropriation of money from the National Treasury for the fiscal year ending June 30, 1917, and each fiscal year thereafter, up to and including the fiscal year ending June 30, 1926. Supervision over the use of this money was to be by the Secretary of Agriculture. The Secretary was to use the money upon request from the proper officers of the State, Territory or county for the survey, construction, and maintenance of roads and trails wholly or partially within the national forests, when necessary for the use and development of resources upon which communities within and adjacent to the national forests are dependent. The statute then goes on to provide for cooperation with the states through state-federal agreements. It limits expenditures on roads or trails within any State, Territory, or county to not exceed ten per cent of the value--as determined by the Secretary of Agriculture--of the timber and forage resources on national forest lands, which are, or will be, available for income within the respective county or counties wherein the roads or trails will be constructed.

Congress limited the amount to be spent for access by the total value of the products of the area to be served. This

10 per cent limitation, if strictly interpreted and adhered to, would have been quite decisive in arresting the development of much of our public land. It would especially have put a high priority on the opening of timber and grazing lands nearer the market relative to more remote land. Conceivably some of the finest mature, virgin timber stands could not have been reached in time so that they would have become over-aged, decayed, and of so little value that they could not economically have been granted access under the most rational economic policy. It would largely have defeated the net-income concept in the administration of public lands. This limitation did not, however, remain in effect over a long period of time. It became superseded by the concept that if a resource is lacking only access, the determination as to whether access will be provided will depend on whether the value of the product will be greater than the cost of access. This essentially, rather than the 10 per cent limitation, puts a 100 per cent limitation on the cost of access and seems to be the economically sound approach.

One million dollars per fiscal year was allotted by the 1916 Act for the construction of these roads, but the Act did not define "forest highway," "forest development road," or "forest road." This Act, however, seemed to provide only for the development of "forest development roads" as distinguished from "forest highways." Thus "forest highways," as such, must have been provided for in a later Act. The Act of 1916 provides "for the development of roads and trails wholly or partially within the national forests, when necessary for the use and development of resources upon

which communities within and adjacent to the national forests are dependent." The 1958 amendment to the 1916 Act defines "forest development road" as roads "for the use and development of the resources upon which communities within or adjacent to the national forests are dependent." Both of these definitions are identical to this extent and do not include "forest highways."

The first amendment to the "Federal Aid Road Act" of 1916 which is of importance to this study was the "Federal Highway Act" passed on November 9, 1921. (42 Stat. 212) Section 23 of this Act concerns itself directly with "forest roads." Under the Act passed in 1921 the terms "forest development road" and "forest highway" are not defined and if included must have been included by inference from the term "forest road" as defined. This was the first appearance in an act of the definition of the term "forest road." "The term 'forest roads' means roads wholly or partly within or adjacent to and serving the national forests." Section 23 then goes on to appropriate out of the United States Treasury for survey, construction, reconstruction, and maintenance of forest roads and trails, \$5,000,000 for 1922, and \$10,000,000 for 1923. It says, "50% not to exceed \$3,000,000 for any one fiscal year, of the appropriation made or that may hereafter be made for expenditure under the provisions of this section shall be expended under the direct supervision of the Secretary of Agriculture in the survey, construction, reconstruction, and maintenance of roads and trails of primary importance for the protection, administration, and utilization of the national forests, or when necessary, for the use and development of resources upon which communities within or adjacent to the national forests are dependent, and shall be apportioned among the several States, Alaska, and Puerto Rico by the Secretary of Agriculture, according to the relative need of the various national

forests, taking into consideration the existing transportation facilities, value of timber, or other resources served, relative fire danger, and comparative difficulties of road and trail construction." (underscore supplied)

The 1921 Act did not define either "forest highway" or "forest development road." Here again, Congress seems to be defining the terms without labeling them. It is possible, however, that the meaning of "forest development road" was so well understood in common usage that it was felt that no definition or pronouncement of the term was necessary.

The 1921 Act gives the balance of the appropriation "for roads of primary importance to States, counties and communities within, adjoining, or adjacent to the national forests." (underscore supplied) This in essence seems to provide for "forest highways" as now defined in the 1958 Highway Act. Therefore, the Act of 1921, Section 23, provided for the development of "forest highways" and "forest development roads" although the terms were not defined in its section of definitions.

The Act goes on to provide for acceptance of cooperation of the "territories, States, and civil subdivisions" by the Secretary of Agriculture. Also, power to enter into contracts is vested in the Secretary of Agriculture. Construction work estimated to cost \$5,000 or more per mile had to be advertised and let to contract. The Act provides for the use of the appropriations for expenses and gives the Secretary of Agriculture power to do the work himself if bids are too high or unacceptable for some other reason.

To provide appropriations for the years 1926 and 1927, to the States, Alaska and Puerto Rico, the Act of 1916 was again amended in 1925 by specifically modifying Section 23 of the 1921 amendment.

This research failed to uncover the

legislative use of the terms "forest highway" and "forest development road" until these terms appeared in the Emergency Construction Appropriations Act of 1930. There is reasonable doubt whether these terms, as such, were used in any statute passed earlier than the 1930 Emergency Construction Appropriations Act. (46 Stat. 1031)

Under Title 23 United States Code, the section of the Code now designated to cover all highway legislation, there are specific definitions for "forest highways" and "forest development roads." These definitions seem to have first appeared in the definitions section of the title very recently. From all indications they appeared in the definitions section of the 1958 Federal-Aid Highway Act. (August 27, 1958, 72 Stat. 885)

Although the statutes did not use the term "forest highway" early in the legislation dealing with what was later termed as "forest highways," an administrative decision was made by the Secretary of Agriculture in February, 1922, which apparently had the force of law. ⁽¹⁾ This definition is that set forth in the 1921 Act, but the Secretary of Agriculture merely labeled the definition. It appears from both the Secretary's announcement and the various legislative acts that there should be a mutual interest between the national forests on the one hand and either a State, a county or a community on the other hand and

(1) In The Official Record, United States Department of Agriculture, Vol. 1, Number 5, Washington, D.C., February 1, 1922, there appears in part the following:

"Secretary Wallace has approved the appropriation of \$15,000,000 for the construction of national forest roads and trails among 27 States, Alaska, and Puerto Rico. Of this sum \$9,500,000, known as the national forest highway fund, is set aside for roads of primary importance to States, counties, and national forest communities. Five million five hundred thousand dollars, constituting the national forest development fund, will be used for the construction of roads and trails needed for the administration and utilization of the forests themselves."

that proximity, in relation to the national forests, of these civil divisions as well as the road is a factor in designation. Undoubtedly a rather liberal interpretation of the term could be made because the Forest Highway evidently must first of all be a forest road and a forest road may be built to develop resources upon which these communities are dependent.

The 1958 Act states: "The term 'forest development roads and trails' means those forest roads or trails of primary importance for the protection, administration, and utilization of the national forests, or where necessary, for the use and development of the resources upon which communities within or adjacent to the national forests are dependent."

"The term 'forest highway' means a forest road which is of primary importance to the States, counties, or communities within, adjoining or adjacent to the national forests." This most recent act also contains the usual definition of "forest road or trail," as a road or trail wholly or partly within or adjacent to and serving the national forests. It would seem important to note that the three definitions are different. Evidently it was the intent of congress to denote three different types of forest roads for which appropriations are made in this last Act. Congress has provided for these three types prior to this even though not specifically defining them. Nonetheless, they have been provided for in the appropriations section by description. Even here, it seems that they were not provided for by the label "forest highway" or "forest development road" until the Act of 1940 was passed.

The 1958 Act further provides "that the provisions of Title 23 shall apply to all unappropriated authorizations contained in prior Acts, and also all unexpended appropriations heretofore made, providing for the expenditure of federal funds on the following classes of highways." These classes

include "forest highways" and "forest development roads." The terms "forest highways" and "forest development roads" also appear in the appropriations provisions. Apportionment and allocation of funds is provided for along with the letting of contracts, regulations governing road construction, and cooperation with the States, counties and other local subdivisions.

It seems that the forest road system is thought of as primarily divided into two parts. The statement of C. M. Granger, Assistant Chief, United States Forest Service, made in a hearing before the Committee on Roads, House of Representatives, bears witness to this fact. "The forest roads and trail system as a whole naturally divides itself into two parts; the first highway system is that part which, while necessary to the forests, is of greater value for general public travel; the forest development system includes the roads and trails needed primarily for the protection, development and utilization of the forest resources." "However, the two naturally will interconnect." In a state such as Idaho, much of the general public which travels these roads is the labor force, directly or indirectly, that affords protection, development and utilization of the forest resources. Not only do these systems interconnect in a physical sense but each one, to some extent, performs both of the main functions.

That part of the local travel on Forest Highways not directly in the line of duty by that part of the population which, directly or indirectly, can be deemed as part of the labor force for the national forests can be thought of as "fringe benefits."

These benefits to the labor force are an expense to the employer--in this case the United States. Whether this is a wise expenditure depends entirely upon whether the money is as effectively spent in this manner as in any other alternative spending. How much the results of the expenditure are demanded, and how well received and used, would be important factors in the decision. This might most immediately be reflected through the public action taken by the people of Idaho.

None of these State's statutes refer to the terms "forest roads and trails," "forest highways," or "forest development roads." It appears, however, that these terms have been included in the statutes by inference. This is evidenced by the fact that federal funds have been used in building "forest highways" and "forest development roads" in Idaho without creating adverse litigation. Further confirmation is found in the phrase; "The legislature of the State of Idaho hereby renews its assent to the provisions of the act of congress approved July 11, 1916, and amendments thereof, or act supplementary thereto and accepts the provisions and benefits of any act of congress heretofore or hereafter enacted having for its purpose the construction, improvement and/or maintenance of public roads or highways in the state of Idaho." The use of the general terms "roads" and "highways" seems to cover "forest highways" and "forest development roads." The system appears to be working smoothly, and there is little or no litigation or controversy over Idaho's acceptance of the terms of the federal highway acts.

Federal-Aid Highway Act of 1958
Passed by the 85th Congress-2nd Session
Section 3

(b) Forest Highway Study.--The Secretary of Commerce, in cooperation with the Secretary of Agriculture and the appropriate officers of each State containing a national forest, the Commonwealth of Puerto Rico, and the Territory of Alaska, shall make a study to determine--

(1) the roads of primary importance to a State, county, or community which are within, adjoining, or adjacent to a national forest and have not been designated as forest highways;

(2) the amount necessary to complete construction of all designated forest highways;

(3) the amounts necessary for the

fiscal year ending June 30, 1962, and for each of the nine succeeding fiscal years to survey, construct, reconstruct, and maintain (A) roads described in paragraph (1) of this subsection if such roads were forest highways, and (B) roads designated as forest highways, in accordance with a program to be recommended by the Secretary of Commerce after consultation with the Secretary of Agriculture; and

(4) the method by which the amounts determined pursuant to paragraph (3) of this subsection should be apportioned for expenditure in the several States, Alaska, and Puerto Rico.

The Secretary of Commerce shall report the results of such study to the President and Congress on or before January 1, 1960.

Statement by A. B. Curtis, Chief Fire Warden,
Clearwater Timber Protective Association, Orofino, Idaho

I believe that I can safely say without fear of contradiction that the need for better roads and transportation facilities in our forests has been shown to be absolutely necessary if we are to advance and achieve progress in forest management. This year our Clearwater and Potlatch Association suffered the unusual experience of having over sixty fires set by lightning in some parts of our heavily forested and important timber production areas. Four of the fires became project immediately and all the problems of managing a project fire multiplied four times. Needless to say, the movement of men and equipment was a gigantic task and the need of better routes of transportation was quickly illustrated. On the four fires on the Clearwater Association over 30 bulldozers and 700 men were hastily moved into the fire fronts. The absence of roads in some areas necessitated movement of equipment by trains which were slow and blocked the progress which was badly needed in this instance. Tanker trucks, water wagons, pumping equipment and various other types of service machines had to go along with the wave of heavy earth moving equipment. Bridges on the railroad track caught afire to aggravate the problem and a catastrophe was nearly caused before the situation was controlled. Some of the existing roads into the fire area were narrow, crooked and steep which made transport haul difficult and certainly very slow. These handicaps are known to us who are in forestry work and certainly it will make a difference in our planning from here on out. We are dealing now in intensive protection and must plan our improvements with an eye to the future as we handle more and more--hotter and hotter forest fuels. Our goal, of course, is the absolute minimum of burned forest land and the keeping of as many acres as possible into production. These improvements must come under such a program.




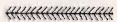





Figure I. Map showing the main highways in the United States and the national forest area in Idaho with an equal area transposed to a more populous area of the United States in order to show the nature and magnitude of the barrier



STATE HIGHWAYS and NATIONAL FOREST HIGHWAYS IN IDAHO

-LEGEND-

Forest Highways coincident with
Federal Aid Primary System (Class I) . . . 
Forest Highways coincident with
Federal Aid Secondary System (Class II):
State Highways 
Local Roads 
Other Forest Highways (Class III) . . . 
Forest Highway Route Numbers 25

State Highways on Fed. Aid Primary System . . . 
State Highways on Fed. Aid Secondary System . . . 
State Highways not on Federal Aid System . . . 

1959

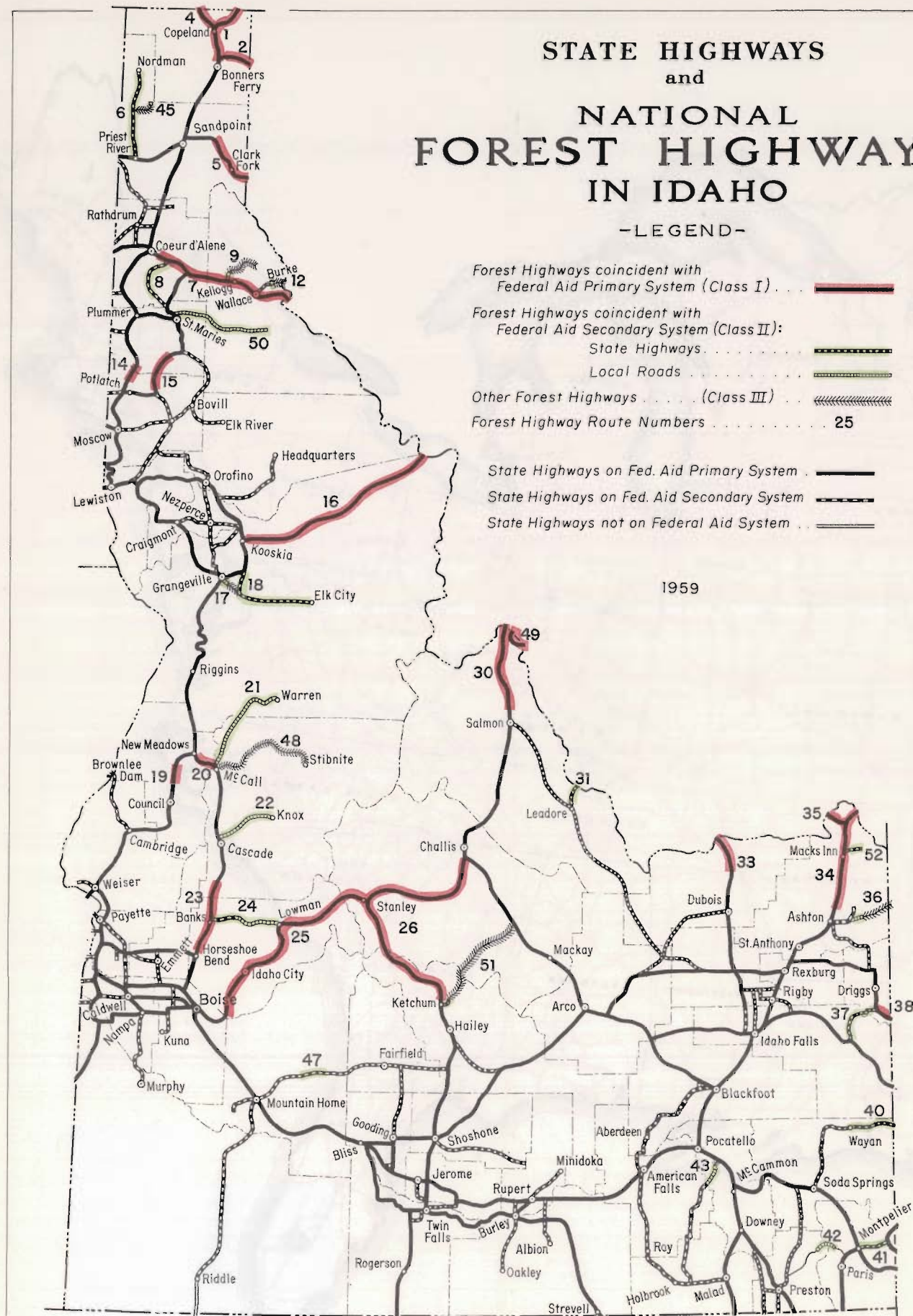


Figure II. State highways and forest highways in Idaho, by class and federal aid class

Table I. Average fifth-year 24-hour vehicle miles on individual forest highways which were so designated during 1941-1958, by class of forest highway and totals for classes (1)

Route no. (2)	Route name	Forest highway class	1941	1945	1950	1955	1958
1	North & South Highway	I	7,753	6,993	18,292	22,621	26,166
2	Kootenai Highway	I	5,270	4,404	8,963	16,257	16,931
4	Copeland - Porthill	I	3,004	1,132	3,352	3,560	2,915
5	Clark Fork Highway	I	7,212	4,632	10,989	19,414	21,393
6	Priest River Road	II & III	6,995	4,200	12,977	16,986	18,746
7	North Pacific Highway	I	107,578	61,962	157,620	232,939	238,743
8	North & South Highway	II	3,253	2,780	4,363	5,227	5,580
9	Enaville - Murray	II & III	1,948	1,906	4,542	6,705	7,500
12	Burke-Idaho-Montana State Line	II & III	450	271	515	615	639
14	Palouse Highway	I	2,176	1,225	2,937	3,380	3,705
15	North & South Highway	I	3,841	3,219	3,530	3,888	3,925
16	Lewis & Clark Highway	I	6,182	3,069	3,827	5,609	6,122
17	Grangeville - Clearwater River	II & III	1,000	600	1,076	1,642	1,870
18	Elk City Highway	II	4,103	1,399	4,773	5,497	5,747
19	North & South Highway	I	3,603	1,709	3,380	3,780	4,234
20	McCall - New Meadows	I	5,929	4,235	8,766	9,372	10,751
21	Warren Wagon Road	III	2,438	1,643	3,934	5,383	6,160
22	Cascade - Knox	II	2,197	1,322	3,065	3,225	4,130
23	North Fork Payette	I	17,758	11,216	24,627	29,369	33,149
24	Banks - Lowman	II & III	1,611	2,184	2,643	3,757	4,071
25	Idaho City - Stanley	I	12,438	7,997	17,856	16,178	19,243
26	Ketchum - Clayton	I	12,581	3,928	17,899	23,105	24,870
30	Salmon - Montana State Line	I	5,617	7,164	11,264	16,946	19,267
31	Leadore - Montana State Line	II	454	273	651	803	670
33	Dubois - Monida	I	2,143	1,520	4,256	6,706	8,192
34	Yellowstone Park Highway	I	31,142	14,527	35,245	40,621	42,477
35	Reynolds Pass	III	415	250	603	695	776
36	Rock Creek Road	II & III	612	693	784	904	960
37	Victor - Irwin Highway	II	2,616	1,371	3,313	7,339	8,532
38	Teton Highway	I	610	469	1,935	2,119	1,991
40	Soda Springs - Freedom	II	530	498	1,424	1,715	2,034
41	Montpelier - Geneva	II	2,355	2,897	5,199	9,717	11,103
42	Strawberry - Sharon	II	346	208	518	689	790
43	Bannock Highway	II & III	738	443	1,060	2,715	3,059
45	Coolin Road	III	119	112	183	293	798
47	Mountain Home - Hill City	II	480	416	1,216	2,080	2,080
Total vehicle miles			267,497	162,867	387,602	531,851	569,319
Class I			234,837	139,401	334,738	455,864	484,074
Class II			16,334	11,164	24,542	36,292	40,666
Class II & III			13,354	10,297	23,597	33,324	36,845
Class III			2,972	2,005	4,725	6,371	7,734

(1) Based on estimates made by Planning Survey, of the Idaho Department of Highways

(2) Four routes designated later than 1941 were not included in these tabulations but their inclusion would raise the grand total in 1958 from 569,319 to 587,035.

Table II. Estimates of population served by individual forest highways in Idaho ^{1/}

Route Name	No.	Rural Dwelling Units	Rural Pop.	Seasonal Dwelling Units	Urban Pop. On Route	Seasonal Dwelling Unit Pop.	Urban Pop. Contiguous to Route	Total
Bonniers Ferry - Eastport	1	267	854	17	--	65	2,103	3,022
Jct. US 95 - Montana State Line	2	136	435	9	109	34	--	578
Copeland - Porthill	4	132	422	--	--	--	--	422
Pack River - Montana State Line	5	89	285	28	547	106	--	938
Priest River - Nordman	6	171	547	48	--	182	2,057	2,786
Coeur d'Alene - Montana State Line	7	2,059	10,328	51	10,993	194	13,700	35,894
Jct. US 10 - Harrison	8	112	358	12	305	46	--	709
Enaville - Murray	9	161	515	1	--	4	--	519
Burke - Montana State Line	12	28	90	--	--	--	--	90
Palouse Highway (No. of Potlatch)	14	29	93	--	--	--	--	93
Emida - Harvard	15	69	221	--	--	--	--	221
Kooskia - Montana State Line	16	197	630	2	742	8	--	1,300
Grangeville - Jct. SH 14	17	36	115	--	--	--	3,000	3,115
Harpster - Elk City	18	88	282	17	--	65	--	347
Btw. Council & New Meadows (US 95)	19	9	29	--	--	--	--	29
McCall - New Meadows	20	83	266	16	2,178	61	--	2,505
McCall - Warren	21	190	608	97	--	369	1,403	2,380
Cascade - Knox	22	3	10	--	--	--	--	10
Smiths Ferry - Horseshoe Bend	23	61	195	26	--	99	401	695
Banks - Lowman	24	74	237	13	--	49	--	286
Ada County Line - Stanley	25	78	250	24	33	91	232	606
Ketchum - Jct. US 93A	26	182	582	108	757	410	33	1,782
Carmen - Montana State Line	30	130	416	18	--	68	--	484
Leadore - Montana State Line	31	1	3	--	--	--	159	162
Spencer - Montana State Line	33	16	51	--	--	--	70	121
Yellowstone Park Highway	34	56	179	137	--	521	--	700
Montana State Line - Jct. US 191	35	15	48	9	--	34	--	82
Jct. SH 47 - Wyoming State Line	36	22	70	--	--	--	--	70
Victor - Swan Valley	37	58	186	2	750	8	--	944
Victor - Wyoming State Line	38	21	67	--	547	--	--	614
Wayan - Wyoming State Line	40	53	170	--	--	--	--	170
Montpelier - Geneva	41	33	106	--	--	--	2,573	2,679
Strawberry - Sharon	42	2	6	--	--	--	--	6
Portneuf - Crystal	43	33	106	--	--	--	--	106
Jct. FH 6 - Coolin	45	35	112	6	--	23	--	135
SH 68 - Btw. Dixie & Camas Co. L.	47	15	48	19	--	72	--	120
McCall - Stibnite	48	43	138	2	1,403	8	--	1,549
Bitterroot - Big Hole	49	--	--	--	--	--	--	--
St. Maries - Avery	50	148	727	2	--	8	2,212	2,947
Ketchum - Chilly	51	2	6	--	1,185	--	--	1,191
Macks Inn - Big Springs	52	5	16	54	--	205	--	221
TOTAL - IDAHO		4,773	19,266	654	16,832	2,485	26,507	65,090

^{1/} Source: State of Idaho, Highway Planning Survey

Table III. Amounts and sources of money
available to the Idaho Department
of Highways from July 1, 1957
to June 30, 1958 1/

Four types of funds were available for use on the State Highway system during the past year. They included (1) revenue raised by State law; (2) Federal-aid apportioned by the Federal Highway Acts and amendments thereto; (3) Forest Highway funds apportioned under the Federal Highway Acts and amendments, and (4) Local cooperation from funds contributed by Counties, Cities, and Highway Districts.

1. State Funds (not including funds transferred to counties)

a. Motor Fuels Tax	\$ 9,645,116
b. Motor Vehicle Licenses	3,329,172
c. Motor Vehicle Dealers' Licenses	45,063
d. Reports and Fines	157,853
e. Caravan Permits	46,686
f. Port of Entry	318,615
g. Contractors' License and Miscellaneous	136,040
h. Ton Mile Tax	2,264,558
i. Transfer - Refund Fund	<u>140,530</u>
TOTAL	<u>\$16,083,633</u>

2. Federal Aid Funds

a. Primary Federal Aid	\$ 7,377,992
b. Urban Federal Aid	158,461
c. Secondary Federal Aid	<u>3,419,373</u>
TOTAL	<u>\$10,955,826</u>

3. Forest Highway Apportionment

a. 1958 Fiscal Year	\$ 3,054,441
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4. Local Government Cooperation *

a. Counties	\$ 816,261
b. Highway Districts	87,068
c. Cities	<u>56,035</u>
TOTAL	\$ 959,364

* Spent almost wholly to match Federal Aid Secondary funds allocated to local roads not on the State Highway System.

1/ Source: Idaho Department of Highways' Seventh Annual Report.

Table IV. Average daily attendance in Idaho schools for selected years for both elementary and high schools

	1945-46	1949-50	1957-58
State	95,775.36	111,038.28	138,310.51
1. Ada	8,446.79	11,040.07	16,637.29
2. Adams	652.53	611.24	631.15
3. Bannock	7,224.55	7,400.44	10,020.77
4. Bear Lake	1,452.81	1,625.83	1,669.49
5. Benewah	937.63	1,080.26	1,140.08
6. Bingham	4,616.76	5,223.44	6,592.73
7. Blaine	823.41	968.16	1,001.98
8. Boise	222.38	273.90	252.75
9. Bonner	2,619.50	3,001.35	3,441.45
10. Bonneville	5,338.97	5,747.00	9,746.95
11. Boundary	1,184.00	1,235.50	1,321.25
12. Butte	439.59	581.99	895.67
13. Camas	211.15	214.70	223.78
14. Canyon	7,838.44	9,511.97	11,217.92
15. Caribou	422.06	1,396.01	1,573.14
16. Cassia	2,849.37	3,123.30	3,656.77
17. Clark	143.64	184.75	205.20
18. Clearwater	1,156.08	1,524.40	1,774.75
19. Custer	492.77	706.13	771.73
20. Elmore	1,184.99	1,285.91	2,343.99
21. Franklin	2,362.67	2,402.75	2,455.11
22. Fremont	1,809.05	1,930.25	2,056.25
23. Gem	1,655.69	1,958.16	2,035.35
24. Gooding	1,803.99	2,254.88	2,323.48
25. Idaho	1,671.72	1,978.44	2,332.66
26. Jefferson	2,600.75	2,756.79	2,991.84
27. Jerome	2,178.62	2,581.13	2,977.47
28. Kootenai	3,830.30	4,208.64	5,748.32
29. Latah	2,707.33	2,933.13	3,165.26
30. Lemhi	981.86	1,210.70	1,457.29
31. Lewis	801.55	942.53	894.65
32. Lincoln	855.46	949.47	897.62
33. Madison	2,042.95	2,185.81	2,332.74
34. Minidoka	2,064.81	2,432.98	3,278.76
35. Nez Perce	3,087.04	3,187.97	5,014.20
36. Oneida	946.33	1,060.44	1,037.63
37. Owyhee	1,087.36	1,388.33	1,387.87
38. Payette	1,974.01	2,444.88	2,576.89
39. Power	642.06	770.36	962.11
40. Shoshone	2,888.12	3,876.71	4,996.34
41. Teton	782.20	852.51	820.04
42. Twin Falls	6,554.94	7,599.87	8,900.75
43. Valley	627.12	621.70	823.54
44. Washington	1,562.01	1,773.45	1,725.40

Sources: Twenty-third Biennial Report of the State Board of Education, 1956-1958; Nineteenth Biennial Report...1948-1950; Seventeenth Biennial Report...1944-1946 (See: Minimum Program of Education and Transportation table in each of the aforementioned reports)

Table V. Percent of the average daily attendance in elementary and secondary schools that were transported for school years 1945-46, 1949-50 and 1957-58

	1945-46	1949-50	1957-58
State	30.43%	47.34%	46.89%
1. Ada	6.33	52.53	30.80
2. Adams	... *	38.72	37.12
3. Bannock	31.13	33.14	30.48
4. Bear Lake	22.51	24.89	36.90
5. Benewah	34.98	43.42	50.23
6. Bingham	58.76	65.61	71.20
7. Blaine	43.42	35.43	49.10
8. Boise	8.99	38.72	36.12
9. Bonner	31.41	36.63	71.48
10. Bonneville	26.28	30.40	34.01
11. Boundary	47.55	70.09	87.34
12. Butte	27.82	55.68	53.37
13. Camas	... *	39.12	50.67
14. Canyon	29.09	31.33	41.14
15. Caribou	21.09	54.04	61.01
16. Cassia	47.91	52.97	49.47
17. Clark	... *	... *	47.55
18. Clearwater	14.88	34.37	53.18
19. Custer	16.48	57.93	57.36
20. Elmore	21.01	27.54	26.61
21. Franklin	51.13	53.44	58.38
22. Fremont	23.58	... *	46.88
23. Gem	10.62	40.04	54.09
24. Gooding	... *	53.13	55.35
25. Idaho	21.77	32.66	43.60
26. Jefferson	... *	64.45	72.04
27. Jerome	33.51	51.86	52.56
28. Kootenai	44.77	41.06	44.37
29. Latah	28.85	50.12	53.44
30. Lemhi	23.22	34.50	41.04
31. Lewis	35.56	41.61	51.93
32. Lincoln	52.02	53.18	50.70
33. Madison	44.64	54.23	61.68
34. Minidoka	68.58	51.69	81.28
35. Nez Perce	37.84	15.23	29.85
36. Oneida	28.36	40.42	43.56
37. Owyhee	69.16	59.91	67.75
38. Payette	43.58	46.98	47.93
39. Power	31.62	37.40	41.89
40. Shoshone	1.04	4.72	50.33
41. Teton	39.75	60.41	68.78
42. Twin Falls	29.23	38.44	49.45
43. Valley	9.73	31.12	48.69
44. Washington	20.81	55.93	60.51

* Data not comparable or not reported

Table VI. Number of vehicles used and road trip miles per day for school transportation for 1945-46, 1949-50 and 1957-58

State	No. of vehicles			Total road trip miles		
	1945	1950	1958	1945	1950	1958
	656*	806	1162	17,725.40	33,074.75	51,918.23
1. Ada	14	10	33	465.00	...	2,796.91
2. Adams	3	9	7	24.00	217.00	390.00
3. Bannock	47	35	33	333.00	1,166.00	1,852.00
4. Bear Lake	26	13	20	246.00	402.00	1,000.00
5. Benewah	13	18	19	604.00	475.40	607.40
6. Bingham	44	59	63	1,402.00	1,936.95	2,425.50
7. Blaine	12	12	14	333.00	492.00	517.00
8. Boise	2	3	6	70.00	220.00	343.00
9. Bonner	25	26	41	953.50	1,164.00	2,715.00
10. Bonneville	16	27	45	...	1,143.60	1,801.00
11. Boundary	18	22	24	475.00	772.00	900.90
12. Butte	2	7	8	54.00	415.00	460.00
13. Camas	..	2	6	...	118.00	425.00
14. Canyon	23	49	52	1,093.00	1,295.00	2,521.50
15. Caribou	8	22	23	227.00	3,107.00	1,240.00
16. Cassia	24	36	36	1,202.00	1,353.00	2,073.00
17. Clark	1	3	5	30.00	...	380.00
18. Clearwater	7	17	21	137.00	...	761.00
19. Custer	3	10	13	85.00	511.00	835.21
20. Elmore	9	8	12	395.00	238.00	861.20
21. Franklin	25	25	29	515.00	880.00	977.00
22. Fremont	14	19	21	308.00	746.50	784.30
23. Gem	4	16	12	130.00	515.00	469.80
24. Gooding	..	21	23	1,253.00
25. Idaho	15	26	32	705.00	1,023.30	1,139.00
26. Jefferson	26	36	41	...	1,437.00	1,697.61
27. Jerome	14	25	26	...	1,155.00	1,277.00
28. Kootenai	53	7	43	745.00	...	1,977.27
29. Latah	40	56	60	1,591.00	...	2,421.75
30. Lemhi	3	8	11	320.00	390.00	724.00
31. Lewis	14	14	13	334.30	162.00	625.00
32. Lincoln	14	12	14	513.00	563.50	727.00
33. Madison	17	18	27	359.00	784.00	1,112.00
34. Minidoka	27	26	40	771.00	830.00	1,637.00
35. Nez Perce	28	17	34	1,176.10	602.90	1,472.20
36. Oneida	11	9	10	350.00	283.00	467.80
37. Owyhee	6	13	19	350.00	912.20	818.22
38. Payette	11	15	19	448.00	595.20	701.00
39. Power	6	12	12	230.00	724.00	877.00
40. Shoshone	3	5	27	132.00	91.00	1,128.60
41. Teton	6	9	13	160.00	467.00	569.76
42. Twin Falls	..	2	71	2,834.00
43. Valley	1	5	9	...	220.00	323.00
44. Washington	11	17	20	295.00	613.60	938.90

* This figure has a discrepancy of one from the same total in Table 2.

Sources: Seventeenth and Nineteenth Biennial Reports of the State Board of Education for the 1946 and 1950 data. 1958 data obtained from page 11 of Annual Report of Idaho School Accounting System, Office of the Dept. of Education, Boise.

Table VII. Resulting apportionment of forest highway funds after adjusting for population and relative areas of national forest to state area *

State	$\frac{a}{As/At}$	$\frac{a}{Vs/Vt}$	Pt/Ps	As/Ast	Fs	$\frac{b}{Fs/\Sigma Fs}$	1958 Apportionment Method used	Proposed formula*
West								
Arizona	.063	.050	160.3	15.5	282.1	5.20	\$1,688,596	\$1,560,000
California	.110	.176	11.4	19.6	64.7	1.19	4,296,368	357,000
Colorado	.076	.068	90.9	20.6	269.9	4.98	2,154,398	1,494,000
Idaho	.112	.091	204.7	37.9	1576.6	29.08	3,054,441	8,724,000
Montana	.092	.068	203.9	17.6	573.8	10.58	2,391,346	3,174,000
Nevada	.028	.008	752.8	7.1	192.4	3.55	538,155	1,065,000
New Mexico	.048	.032	176.9	11.1	157.6	2.91	1,202,119	873,000
Oregon	.082	.194	79.2	23.9	523.4	9.65	4,132,640	2,895,000
South Dakota	.006	.009	184.6	2.3	6.4	.12	235,032	36,000
Utah	.043	.023	174.9	14.4	165.6	3.05	996,285	915,000
Washington	.054	.085	50.7	22.2	155.4	2.87	2,085,098	861,000
Wyoming	.047	.038	414.8	13.7	483.6	8.92	1,279,738	2,676,000
Alaska	.115	.060	936.8	5.5	901.5	16.63	2,614,976	4,989,000
East and Puerto Rico	.124	.098	1.2	2.2	68.4	1.26	3,330,808	378,000

* The formula used was: $(As/At + Vs/Vt)(Pt/Ps)(As/Ats) = Fs$;

where As is the area of national forest in the state

At is the total area of all national forests

Vs is the value of national forests in the state

Vt is the total value of all national forests

Pt is the total decennial population of all states having national forests

Ps is the decennial population of the state

Ats is the total area of the state

ΣF is the total Fs for all the states and Puerto Rico

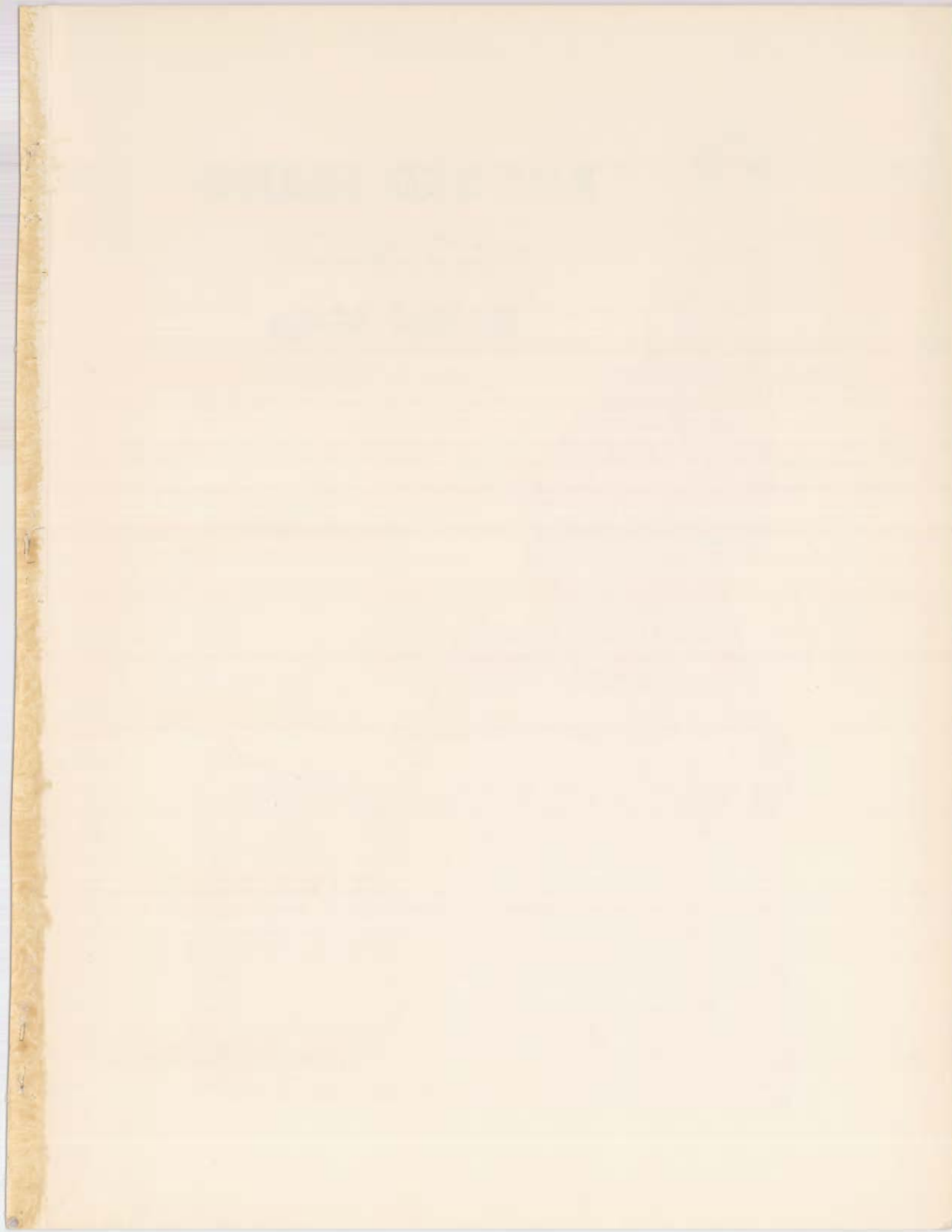
a/The areas and values in these are as of June 30, 1955.

b/This is the factor for apportionment with figures in percentages.

Table VIII. National forest areas		(1)		(National forest lands, and other lands administered by the forest service)		
State and unit (2)		Owned by the United States	Process of acquisition	Total	Other lands within unit boundaries	Gross area within unit boundaries
		Acres	Acres	Acres	Acres	Acres
Alabama	NF	620,651	261	620,912	1,130,387	1,751,299
	PU	83	-	83	11,437	11,520
Alaska	NF	20,742,290	-	20,742,290	35,256	20,777,546
Arizona	NF	11,328,496	4,305	11,332,801	770,942	12,103,743
Arkansas	NF	2,364,429	8,479	2,372,908	1,218,442	3,591,350
California	NF	19,926,534	20,599	19,947,133	4,179,040	24,126,173
	PU	14,491	-	14,491	132,688	147,179
Colorado	NF	13,725,338	2,270	13,727,608	1,465,943	15,193,551
Florida	NF	1,074,546	1,619	1,076,165	168,064	1,244,229
Georgia	NF	665,216	971	666,187	852,230	1,518,417
	PU	1,443	-	1,443	69,557	71,000
Idaho	NF	20,274,324	1,664	20,275,988	1,276,755	21,552,743
	PU	200	-	200	16,364	16,564
Illinois	NF	210,953	-	210,953	591,430	802,383
Indiana	NF	117,118	748	117,866	604,594	722,460
Iowa	PU	4,749	-	4,749	-	4,749
Kentucky	NF	458,352	711	459,063	398,012	1,357,075
	PU	116	-	116	54,498	54,614
Louisiana	NF	494,770	-	494,770	382,296	877,066
	PU	65,801	-	65,801	79,331	145,132
Maine	NF	41,004	-	41,004	12,547	53,551
	PU	4,858	-	4,858	22,897	27,755
Michigan	NF	2,550,371	10,068	2,560,439	2,525,755	5,086,194
	PU	-	-	-	17,284	17,284
Minnesota	NF	2,593,320	51,315	2,644,635	1,566,040	4,210,675
	PU	188,954	-	188,954	665,646	854,600
Mississippi	NF	988,133	85	988,218	1,443,877	2,432,095
	PU	58,956	-	58,956	283,381	342,337
Missouri	NF	1,353,290	1,652	1,354,942	1,966,886	3,321,828
	PU	7,401	-	7,401	55,612	63,013
Montana	NF	16,635,393	440	16,635,833	2,420,111	19,055,944
Nebraska	NF	206,082	-	206,082	1,181	207,263
Nevada	NF	5,057,911	1,440	5,059,351	319,375	5,378,726
New Hampshire	NF	674,246	135	674,381	123,910	798,291
	PU	3,158	-	3,158	3,516	6,674
New Mexico	NF	8,553,110	1,322	8,554,432	1,326,643	9,881,075
North Carolina	NF	1,079,919	60	1,079,979	1,741,261	2,821,240
	PU	43,418	-	43,418	459,978	503,396
North Dakota	PU	520	-	520	-	520
Ohio	NF	106,089	62	106,151	1,348,324	1,454,975
Oklahoma	NF	183,319	6,295	189,614	101,895	291,509
Oregon	NF	14,828,216	1,100	14,829,316	2,307,893	17,137,209
Pennsylvania	NF	467,170	241	467,411	269,166	736,577
	PU	3,667	-	3,667	908	4,575
Puerto Rico	NF	21,078	1,201	22,279	43,671	65,950
	PU	11,959	356	12,315	107,890	120,205
South Carolina	NF	587,278	-	587,278	836,062	1,423,340
South Dakota	NF	1,119,148	-	1,119,148	284,236	1,403,384
Tennessee	NF	594,768	-	594,768	609,334	1,204,102
	PU	-	-	-	7,795	7,795
Texas	NF	657,994	-	657,994	1,058,971	1,716,965
Utah	NF	7,804,839	4,524	7,809,363	1,110,375	8,919,738
	PU	4,301	-	4,301	10,249	14,550
Vermont	NF	230,366	1,460	231,826	397,178	629,004
Virginia	NF	1,417,587	2,653	1,420,240	2,489,417	3,909,657
	PU	27,421	-	27,421	77,412	104,833
Washington	NF	9,688,940	-	9,688,940	1,053,134	10,742,074
West Virginia	NF	903,137	854	903,991	899,226	1,803,217
	PU	-	-	-	29,651	29,651
Wisconsin	NF	1,466,548	720	1,467,268	556,989	2,024,257
Wyoming	NF	8,566,134	2,434	8,568,568	447,567	9,016,135

(1) Source: "National Forest Areas", USDA, Forest Service

(2) "NF" means National Forest and "PU" means Purchase Unit.



RUGGED IDAHO

--- Gem of the Mountains ---

Relief Map

