STATE FOREST ROAD PLAN

June 1982
Prepared in conjunction with the
Minnesota Forest Resources Plan

Minnesota Department of Natural Resources
Division of Forestry
St. Paul, Minnesota 55155

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EXECUTIVE SUMMARY

The purpose of this State Forest Road Plan is to guide the Department of Natural Resources (DNR), Division of Forestry's state forest road program over the next seven years. The plan is intended to achieve a common sense of direction among public and private road users, road cooperators, DNR administrators and DNR program staff regarding the administration, management and use of Minnesota's 1,800 mile state forest road system. The plan consists of a description of the issues relating to forest roads, an assessment of pertinent information and a recommended program for resolving the issues.

This plan was prepared in conjunction with efforts currently underway to develop a comprehensive Minnesota Forest Resources Plan (MFRP). One of the major topics to be addressed in the MFRP is the overall forest transportation system, which in its broadest sense includes major highways, railroads and roads on private and other public lands as well as state forest roads. This State Forest Road Plan is a first step toward dealing with broad forest transportation issues. It has been completed before the other portions of the MFRP so that detailed information on state forest roads can be used in addressing these broader issues.

The principle forest road issue discussed in the State Forest Road Plan is that management, use and protection of forest resources is constrained by an inadequate and deteriorating state forest road system. Almost 2.5 million acres (18 percent) of Minnesota's commercial forest land is more than one mile from a maintained road. Consequently, large volumes of timber cannot be properly managed or harvested. Wildfire control and fish, wildlife and recreation management are also restricted by inadequate access in some parts of the state. Deterioration of roads, bridges and culverts due to growing use by increasingly heavy timber harvesting equipment, trucks and recreational vehicles presents additional problems. These problems are exacerbated by the lack of a permanent, reliable source of road system funding and regular, coordinated transportation planning by agencies with road system responsibilities.

Timber harvesting and transport is one of the main uses of the state forest road system. Each year some 2,500 loggers and 15 major wood-based industries haul timber on state forest roads. State forests and other state-owned lands provide over 450,000 cords of wood annually, or about 20 to 25 percent of Minnesota's timber harvest. The volume of timber harvested annually from state lands has more than doubled over the last 15 years and is expected to keep increasing in the future.

An estimated 600,000 to 800,000 Minnesotans who use the state forests for fishing, hunting and other types of recreation benefit directly from the availability of state forest roads. In addition to being used for ski touring, snowmobiling and hiking, forest roads provide access for many other forms of dispersed recreation. Use of the state forests and state forest road system has expanded in recent years and is likely to expand further in coming years.

The state forest road inventory undertaken as part of the assessment, identified the extent and condition of the road system in order to provide a basis for ranking forest road needs. Inventory findings are summarized by region in Table 1. Of the 1,800 mile road system, 642 miles (36 percent) were considered to need major reconstruction and 127 miles (7 percent) were recommended for abandonment or transfer to other agencies. About 100 miles of new construction needs were identified. Of 45 bridges, 22 (49 percent) are projected to need repair or replacement. Projected costs of bridge reconstruction and road construction, reconstruction and maintenance projects over the next seven years are summarized by biennium in Table 2.

The goal of the state forest road program is to develop and maintain a state forest road system that will provide adequate access for the protection, management and utilization of Minnesota's forest resources. The Division of Forestry's strategy for attaining this goal is to continue to manage state forest roads in cooperation with other public and private land managers to ensure coordinated and responsible forest road use and development. The final section of the plan lists 23 objectives or specific tasks that need to be accomplished in order to achieve the forest road program goal. Each objective includes a concise description of which agencies will perform the work, when the work will be completed and how much funding will be needed to attain the objective during the next seven years.

Table 1. Summary of 1982 state forest road system inventory findings

Region	Total Miles	Miles in Need of Reconstruction	Miles Recommended for Abandonment	Miles of New Construction Needed	# of Bridges	Bridges in Need of Repair/ Replacement	# of Culverts
Bemidji (I)	752.7	288.6	51.2	28.3	21	12	638
Grand Rapids (II)	576.9	272.9	51.0	27.5	16	6	1,176
Brainerd (III)	345.3	25.1	24.6	36.6	1	---	253
Rochester (V)	123.6	54.9	---	8.2	7	4	64
TOTALS	1,798.5	641.5	126.8	100.6	45	22	2,131

Table 2. Projected costs (in 1982 dollars) of state forest road and bridge projects, fiscal years 1983-1989

	1983*	1984-85	1986-87	1988-89	Totals
Miles of New Roads	0	40	30	30	100
Cost of New Road Construction	0	1,006,000	754,500	754,500	2,515,000
Miles of Road Reconstruction	96	182	182	182	642
Cost of Road Reconstruction	1,443,000	2,726,250	2,726,250	2,726,250	9,621,750
Number of Bridges in Need of Repair or Replacement	4	12	3	3	22
Cost of Bridge Repair or Replacement	80,000	320,000	100,000	100,000	600,000
Miles of Roads in Need of Maintenance	1,800	3,600	3,600	3,600	12,600
Cost of Road Maintenance	359,696	719,392	719,392	719,392	2,517,872
Total Cost	$1,882,696	$4,771,642	$4,300,142	$4,300,142	$15,254,622

*Funds for fiscal year 1983 have already been appropriated.

The first seven objectives relate to planning and management of the state forest road system. By completing and implementing this State Forest Road Plan, all seven of these objectives will have been attained. The first two objectives involve development and maintenance of a state forest road inventory system. The third objective includes formulation of a variety of forest road policies. These new and revised policies are described in detail in the program section of this plan. Objectives 4 and 5 entail selecting, ranking and projecting costs for construction, reconstruction and maintenance projects. Tables 1 and 2 summarize the results of this effort on a statewide basis. More detailed information is presented in the program section of the plan and in the appendices. The sixth objective relates to revising the existing state forest road classification system. This objective has been attained in the program part of the plan, as has objective 7, which involves clarifying responsibility for the construction and maintenance of state forest system roads.

Objectives 8 through 11 concern funding and staffing for the state forest road program. Alternative methods of financing the program will be identified and evaluated as part of the Minnesota Forest Resources Plan (MFRP). A State Forest Road Supervisor and two regional Forest Road Specialist positions will be requested to facilitate forest road system management and coordination.

The twelfth objective entails preparation of comprehensive forest resource unit plans that will address forest roads in accordance with the state forest road policy and plan. Work on unit plans will begin after the MFRP is completed in 1983. Objectives 13 through 16 relate to operational aspects of road construction, reconstruction and maintenance projects that will be carried out within the guidelines set by the State Forest Road Plan, the MFRP and the unit plans. Table 2 summarizes projected costs of these projects.

Objectives 17 through 19 concern the development and updating of cooperative agreements with other public agencies and private concerns that use the state forest road system. The Division of Fish and Wildlife, the U.S. Forest Service, counties and large acreage private forest landowners are the primary groups that are or will be involved in these agreements.

Objective 20 entails development of a state forest road manual to ensure the availability of technical and professional guidance for those who build, manage and maintain state forest roads. The manual would include detailed information on procedures for state forest road inventory, classification, design, construction, maintenance, signing, numbering, mapping and development of project proposals and cooperative agreements.

The next two objectives involve recommendations for computerizing the forest road mapping and inventory systems. State forest road location data would be entered into the MLMIS file so that the roads could be shown on maps produced by the Land Management Information Center. The current manual forest road inventory system would be replaced by a computerized system.

The final objective requires a review of all right-of-way documents to ensure the integrity of the state forest road system.

Introduction

INTRODUCTION

The state forest road system exists to facilitate the management, protection and recreational enjoyment of Minnesota's 4.6 million acres of state forest lands. In addition, this 1,800 mile system of roads administered by the Division of Forestry facilitates transportation, commerce and development activities on several million acres of county, federal and private woodlands. Each year some 2,500 loggers, 15 major wood-based industries, and an estimated 600,000 to 800,000 Minnesotans who use the state forests for recreation, hunting and fishing benefit directly from the use and availability of state forest roads.

A number of new and varied demands have emerged to dramatically alter the scope and character of the state's forest road program since its inception nearly half a century ago. These demands include changes in forest land management and protection practices, advances in timber harvest technology, expanded interest in wildlife management, increased need for rural fire protection and increased demand for outdoor recreation. Many state forest roads and bridges, designed and built in the 1920's and 1930's, cannot adequately or safely meet the present or projected demands placed upon them.

PURPOSE AND SCOPE

The purpose of this State Forest Road Plan is to assist the Department of Natural Resources, Division of Forestry in meeting its responsibilities for managing the state forest road system. The plan consists of a description of the issues relating to forest roads, an assessment of pertinent information and a recommended program for resolving the issues. The plan is intended to serve as a seven year guide for managing and developing the state forest road system. Limited funding for fiscal year 1983 has already been approved. Budget proposals for the next three bienniums (1984-85, 1986-87, 1988-89) are presented.

This plan was written for Division of Forestry field staff, program managers and others within and outside of the DNR who share a concern for state forest roads. The plan is intended to communicate department policy to other state agencies, public and private organizations, forest industry representatives, private landowners, legislators and interested individuals.

The assessment includes an examination of all permanent state forest roads. The program combines management needs with technical information presented in the assessment to establish policy and direction for the forest roads program.

PROCEDURES

Development of this plan involved several tasks. The first task was to identify and describe forest road issues as part of the Minnesota Forest Resources Plan (MFRP) development process. Another basic task was to collect forest road inventory information from field sources. Road information was compiled at the District and Area levels and evaluated both regionally and in St. Paul.

Based on this information, forest road improvement and development projects were selected, evaluated and ranked. Funding needs were also projected. In addition, road inventory information was used to classify and map state forest roads in relation to other state and county roads, timber types, land ownerships and recreational developments (Appendix A).

A subsequent task was to review and update existing Division of Forestry policies relating to road system administration. Changes were recommended as needed to facilitate more efficient, effective operation of this system. This task was accomplished through the use of a task force composed of DNR employees knowledgeable in the area of forest road construction and maintenance (Appendix C).

Finally, implementation recommendations were developed to outline the actions and budgets needed to attain specific targets.

RELATIONSHIP TO THE MINNESOTA FOREST RESOURCES PLAN (MFRP)

This plan was prepared in conjunction with efforts currently underway to develop a comprehensive Minnesota Forest Resources Plan (MFRP). As explained in Planning Concept (MFRP Volume 1), a major emphasis of MFRP is the development of programs and policies that will assist in resolving important forest resource issues.

One of the major topics to be addressed in the MFRP is the overall forest transportation system. State forest roads are but one part of this system that also includes roads on private and other public forest lands. In its broadest sense the forest transportation system also includes the major highways and railroads used to ship forest products to markets. This State Forest Road Plan is a first step in addressing the broader forest transportation issue. It represents the Division of Forestry's preferred program for operation of the state forest road system. It has been completed before the other portions of the MFRP so that the detailed information on state forest roads can be used in addressing the larger forest transportation issue.

Accelerated development of the road plan has necessitated using a slightly different process than the one used to develop the MFRP. Complete information on timber, recreation and wildlife was not yet available. Multiple-use considerations were addressed only in the context of how they might be affected by an intensified program of forest road development and use.

Consequently, although this plan was developed as a part of the broader MFRP effort, it does not completely address the transportation issue. The preferred state forest road program may change when all the information on timber, recreation, wildlife and other resources is analyzed in the MFRP. Any changes will, however, be made before the MFRP completion date of June 30, 1983.

POTENTIAL PLAN USERS AND INTENDED BENEFITS

The State Forest Road Plan is intended to address issues important to five different groups: the general public, the Department of Natural Resources (DNR), other public agencies, the Governor and State Legislators and forest industries. Some of the potential benefits for each of these groups are listed below.

Benefits to the Public

1. The plan provides information concerning the Department's forest roads program and how it relates to the use and development of state forest lands.

2. The plan offers the public an opportunity to participate in forest road policy formulation and access development decisions.

3. The plan provides an opportunity for increased access to state forests lands through the implementation of a sound state forest road program.

Benefits to the DNR

1. The plan provides a better understanding among divisions within the DNR concerning the state forest road program and its benefits for them.

2. The plan facilitates better overall forest management by organizing the decision making process and by establishing guidelines and strategy for administering the forest road system.

3. The plan provides a logical basis for formulating division biennial budget requests and work plans.

Benefits to Other Public Agencies

1. The plan provides a basis for improved coordination between agencies, particularly resource management agencies, by allowing them to make decisions based on proposed state forest road program activities.

2. The plan provides the foundation for cooperative agreements and cooperative funding arrangements with other agencies involved in road building or maintenance activities.

Benefits to the Governor and State Legislators

1. The plan provides a policy framework to coordinate the state forest roads program with other programs such as minerals management, wildlife management, recreation development and highway transportation.

2. The plan offers the opportunity to analyze existing legislation and recommend additions or changes needed to meet statewide objectives.

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Benefits to Forest Industries

1. The plan aids in industrial capital expansion planning by committing the department to a long-term program of forest access improvement and development, thus assuring the future availability of increased supplies of timber from state lands.

2. The plan enables industrial and other road users to better define their role in helping to fund the construction and maintenance of state forest roads.

3. The plan facilitates cooperative transportation planning and coordinated road development by identifying needs and opportunities associated with access improvement.

Forest Road Issues

STATE FOREST ROAD ISSUES

INTRODUCTION

The Division of Forestry recently published a description of the most important forest-related issues (MFRP Volume 2: Issues Document) as part of its effort to develop a comprehensive forest resources plan. The need for an improved forest road system was identified as one of the ten most important forestry issues in Minnesota.

The following issue statement summarizes the concern about the state forest road system and the discussion clarifies various aspects of the issue. The opportunities listed at the end of this section are suggestions for resolving the issue. The opportunities are evaluated in the assessment and some are incorporated in the recommended state forest road program.

ISSUE STATEMENT

Management, use and protection of forest resources is constrained by an inadequate and deteriorating state forest road system.

DISCUSSION

Minnesota forest roads provide access for timber management, fish and wildlife habitat improvement and a variety of dispersed recreational activities. They also facilitate wildfire protection and law enforcement efforts. The total extent of forest roads on all ownerships in Minnesota is unknown at this time. The Division of Forestry administers approximately 1,800 miles of forest roads. These roads are an important part of the much larger statewide transportation system, which includes forest roads on other ownerships as well as township, municipal, county, state and federal highways.

The existing state forest road system does not provide adequate access for management of the state's timber and other forest resources. Almost 2.5 million acres (18 percent) of Minnesota's commercial forest land lies more than one mile from a maintained road (a road that is graded at least once per year) (Jakes 1980). In the Aspen-Birch Forest Survey Unit (Cook, Lake,

St. Louis, Carlton and Koochiching counties), over 1.6 million acres (30 percent) of the commercial forest land is more than one mile from a maintained road. Consequently, large volumes of timber cannot be properly managed or harvested due to inadequate road access. Fish, wildlife and recreation management are also constrained by inadequate access in some parts of the state.

Recent advances in technology have led to the use of larger, more efficient equipment for timber harvesting, transport, site preparation, regeneration and stand maintenance activities. Many existing state forest roads and bridges, built in the 1920's and 1930's, were not designed or constructed to support this heavier equipment. Township, county and state highways frequently have insufficient load-bearing capacities for today's modern equipment. Road and bridge deterioration, potential environmental problems and limitations on use of the new equipment are the result.

Inadequate funding for road maintenance is a continuing problem. The Boundary Waters Canoe Area Wilderness Act (P.L. 95-495) has provided a temporary source of state forest road improvement and development funding, but lack of a permanent, reliable source of road system funding continues to be a major concern.

Deterioration of bridges and culverts is an especially urgent problem. Over half of 28 state forest road bridges inspected by the Minnesota Department of Transportation in 1981 were reported to need repairs by 1985 in order to remain safe for use. Current estimates for repairs range from $10,000 to $60,000 per bridge. Upgrading existing roads and bridges to meet contemporary road standards is considerably more expensive than simply maintaining them at present levels.

Forest roads provide ready access for fire fighters and equipment in times of fire emergency and a network of fire breaks which can effectively slow or stop wildfires. Fire fighter response time, a critical variable in wildfire control, is largely dependent on the quality and extent of the highways and forest roads in the vicinity of a wildfire. Road construction and upgrading can, however, also increase fire risk by improving public access.

Increasing recreational use has placed additional demands on the forest road system. Forest roads provide access for hunting, fishing, camping and numerous other recreational pursuits. Many existing roads used for recreation

were not constructed to withstand the impacts of increasing numbers of vehicles. The size and weight of modern recreational camping vehicles make it necessary to upgrade forest roads in many areas. Four-wheel drive vehicles, trail bikes and other off-road vehicles (ORV's) can also damage forest roads, especially during wet periods of the year which often coincide with peak fishing and hunting activities.

No single agency has responsibility for the entire Minnesota forest road system. In some areas the responsibility for administering cooperatively developed and maintained roads is unclear. Although cooperative forest road agreements exist between the Division of Forestry and the Chippewa and Superior National Forests, coordinated transportation planning among the Division of Forestry, other state and federal agencies, county agencies and private landowners does not occur on a regular basis (Banzhaf 1980).

OPPORTUNITIES FOR RESOLVING THE ISSUE

1. Develop a long-term, comprehensive state forest road plan based on an updated forest road system inventory and assessment.

2. Upgrade current standards for the design, construction and maintenance of state forest roads and bridges to conform with contemporary standards.

3. Establish a permanent, adequate system of financing the state forest road program.

4. Re-establish a regular, full-time Forest Road Supervisor position within DNR to manage and coordinate state forest road system responsibilities.

5. Reconstruct existing forest roads and bridges as necessary to provide safe and efficient use, management and protection of state forest lands.

6. Expand the state forest road system in areas where a growing demand for timber and other forest products is found to exist.

7. Expand the state forest road system in areas with high potential for fish and wildlife management, recreational use or other non-timber uses.

8. Clarify responsibilities for the development, maintenance and use of forest roads on all ownerships.

9. Coordinate the planning, development and maintenance activities of all agencies and organizations having forest road system responsibilities.

Forest Road Assessment

STATE FOREST ROAD ASSESSMENT

INTRODUCTION

This assessment provides an overview of the current state forest road situation in Minnesota. It contains sections on the history of transportation and state forest roads; information about the use, administration and legal status of state forest roads; and a discussion of opportunities for improving the state forest road system.

TRANSPORTATION OVERVIEW*

The state's natural resources and industries are closely linked to one another, to other regions and to the entire settlement fabric by the transportation network. Perhaps more than any other human activity, transportation influences the distribution and character of settlement on the Minnesota landscape.

Early economic activities in Minnesota were oriented to water transportation; the trappers, fur traders, loggers and military personnel arrived and established their outposts along the water courses. In the mid-nineteenth century steamboats multiplied. Wagon and stage roads began to penetrate the neighboring wilderness, but were simply a brief prelude to the railway lines.

Railroads

Minnesota's first railroads extended inland from the principle river and lake ports, following the main wagon and stage routes. By 1880, railroads had become the essential backbone of the national transportation system with the Twin Cities serving as the major node on the northern transcontinental route.

Railroads were an important factor in the development of the early timber industry of the state. As the loggers moved farther and farther from the major rivers, the railroads gradually replaced the river drives. Many branch

*Much of the historical information in this section was adapted from the Atlas of Minnesota Resources and Settlement (Borchert and Gustafson 1980).

lines provided access to virgin tracts of timber. Logs were cut, loaded onto flatcars and shipped to collection points or directly to the processing mills. Lumber and finished products were also shipped by rail.

By 1900 Minnesota's basic rail network was in place, though a few more branch lines and iron mining lines were added before 1920. At that time, freight and passenger movement between cities in Minnesota was almost entirely dependent upon the railroad system, with only an unpaved grid of county roads along certain township and section lines.

The rising influence of automobile and truck transportation after 1920 led to a gradual shrinking of the rail network. Many unprofitable lines were left unmaintained and eventually abandoned. State government now provides modest assistance to the railroads in maintaining a few of the deteriorated, but needed, branch lines. While many of the shorter branch lines have been unprofitable for hauling freight, the main lines have, in most cases, remained profitable due to longer trains and longer hauling distance. In comparison to truck transport, railroads are better suited to hauling bulk commodities, such as coal or forest products.

Despite this, abandonments of branch lines in Minnesota are occurring with increasing frequency. Railroads have identified 1,122 miles of line in Minnesota, out of the system total of just over 7,000 miles, which are potentially subject to abandonment (Minnesota Department of Transportation 1982). In addition, two railroad companies operating in Minnesota have filed petitions of bankruptcy.

Access to distant markets often depends on rail transport. Participation in the Federal Rail Service Continuation Program and passage of the Minnesota Rail Service Improvement Program (MS 222.44 - 222.63) highlight the state's recognition of this important need. Recent repeal of the gross earnings tax on railroads and the creation of a State Rail Bank should also help preserve and maintain intrastate rail service.

Highways

In the early 1920's the state's highway system consisted largely of graded section line roads or improved trails that radiated outward from the major

urban centers such as the Twin Cities. By 1940 the overall network of state and federal highways had been greatly expanded, but the paved roads still mainly paralleled the major rail corridors emanating from the Twin Cities.

After World War II, however, the county road system, as well as the state and federal systems, were upgraded substantially. Major routes were widened, paved and redesigned for increased speed and safety. This improved access widened settlement choices for firms and individuals and contributed directly to the patterns of urban dispersal that developed during the 1950's and 1960's.

The historic radial routes to and from the Twin Cities area remain the most heavily travelled highway routes in the state for both non-commercial and commercial traffic. The most lightly travelled roadways in the state are those routes in areas of low population density, particularly from southwestern to northwestern Minnesota.

The state of Minnesota is now served by some 127,540 miles of streets and highways (Minnesota Department of Transportation 1978). Ownership of the current system of roads is divided up among approximately 2,750 separate governmental units. These units fall into the categories shown in Table 3.

Table 3. Ownership of Minnesota roadways.

Level of Government	System	Mileage
State	Trunk Highway	12,190
County	State Aid Highway	28,860
County	County Road	15,170
Township	Township Road	56,380
Municipality	State Aid Street	1,550
Municipality	Local Street	10,870
Other	Agency Road	2,520
	TOTAL	127,540

Source: Minnesota Department of Transportation (1978).

Highway Weight Limits*

In Minnesota, many roads are still limited to 73,280 pounds maximum gross weight. The interstate highways and certain other designated routes have 80,000 pound weight limits. This puts the state at a competitive disadvantage with Wisconsin, Michigan and Ontario, which have established uniform limits of 80,000, 156,000 and 135,000 pounds, respectively.

Because unprocessed forest products are of low value per unit of volume or weight, increases in state road weight limits would help to reduce the transportation component of delivered wood costs and the seasonality of logging. State law currently allows a 10 percent increase in weights for raw and unfinished forest products on 80,000 pound routes and a 20 percent increase on 73,280 pound routes from January 1 through March 7. This exemption is expanded to include the month of December for northern Minnesota.

Weight limits in other neighboring states also hinder Minnesota's ability to service midwest markets. Iowa, Illinois, Indiana and Missouri have established their weight limits at 73,280 pounds. Minnesota shipments must, therefore, be of 73,280 pounds instead of 80,000 pounds if they pass through any of these four states.

MINNESOTA STATE FOREST ROAD SYSTEM

History of State Forest Roads

The history of state forest roads goes back to the early 1900's when roads were developed by private logging companies throughout the forested regions of the state to access valuable timber stands. Later, during the Civilian Conservation Corps (CCC) era, a number of additional miles of road were developed for the purposes of timber management, fire protection and access to recreational developments.

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*This information was adapted from Minnesota's Timber Resources: Prospects for Development (Banzhaf 1980).

As the CCC program was phased out, forest road maintenance and improvements came to a virtual standstill. From the early 1940's to the early 1950's little maintenance was conducted on the many miles of state forest roads earlier created and maintained by the CCC.

By the mid-1950's the DNR had begun to reallocate limited funds from other programs to maintain and repair deteriorated sections of these early roads. The expenditure of state funds was necessary in view of the expansion and development of state forests for timber management and recreation purposes. State forest roads were also important in providing quick access for fire fighters into high-risk fire areas within the state.

The expenditure of funds throughout the 1950's was primarily limited to maintaining the roads by periodic grading and installation of culverts. The use of Consolidated Conservation Area funds allowed for limited road development within and around designated Conservation Areas.

In 1963 the Minnesota Resource Commission funded an "accelerated" state forest road program which allowed DNR to reconstruct several miles of road. For the duration of the project, from 1963 to 1975, a good deal of work was accomplished on state forest system roads, including a program of resurfacing certain roads with crushed rock and replacement of many deteriorated support structures. Regular forest road appropriations were expended on routine maintenance and road repair.

Between 1975 and 1980 funds were not generally available for extensive state forest road maintenance and improvements. Failure to plan and organize the roads program effectively resulted in erratic and often insufficient road appropriations. Consequently, road and bridge conditions have been rapidly deteriorating. Roads have been kept open largely through "spot repairs" using DNR personnel and equipment. However, increasingly heavy road usage in many areas has rendered this practice more difficult and less satisfactory. In some cases, major repairs are needed in order to continue using certain roads and bridges and to ensure the safety of the people they serve.

STATE FOREST ROAD USE

The purpose of the state's forest road system is to provide transportation facilities that will permit the efficient protection and management of forest resources, transportation of forest products and safe, reliable travel by resource users. Historically, this has meant that Minnesota's forest roads have been used for a variety of purposes and have helped meet many diverse public and private needs.

Recent road use information indicates that state forest roads are used most for (Minnesota DNR, Division of Forestry 1982A):

- Timber harvesting
- General forest management activities such as tree planting, thinning, inventory, pest control, timber stand improvement
- Forest fire protection, suppression and control
- Access to recreational areas or developments
- Fish and wildlife management access
- Hunting, fishing and other dispersed recreation
- Sightseeing and nature observation

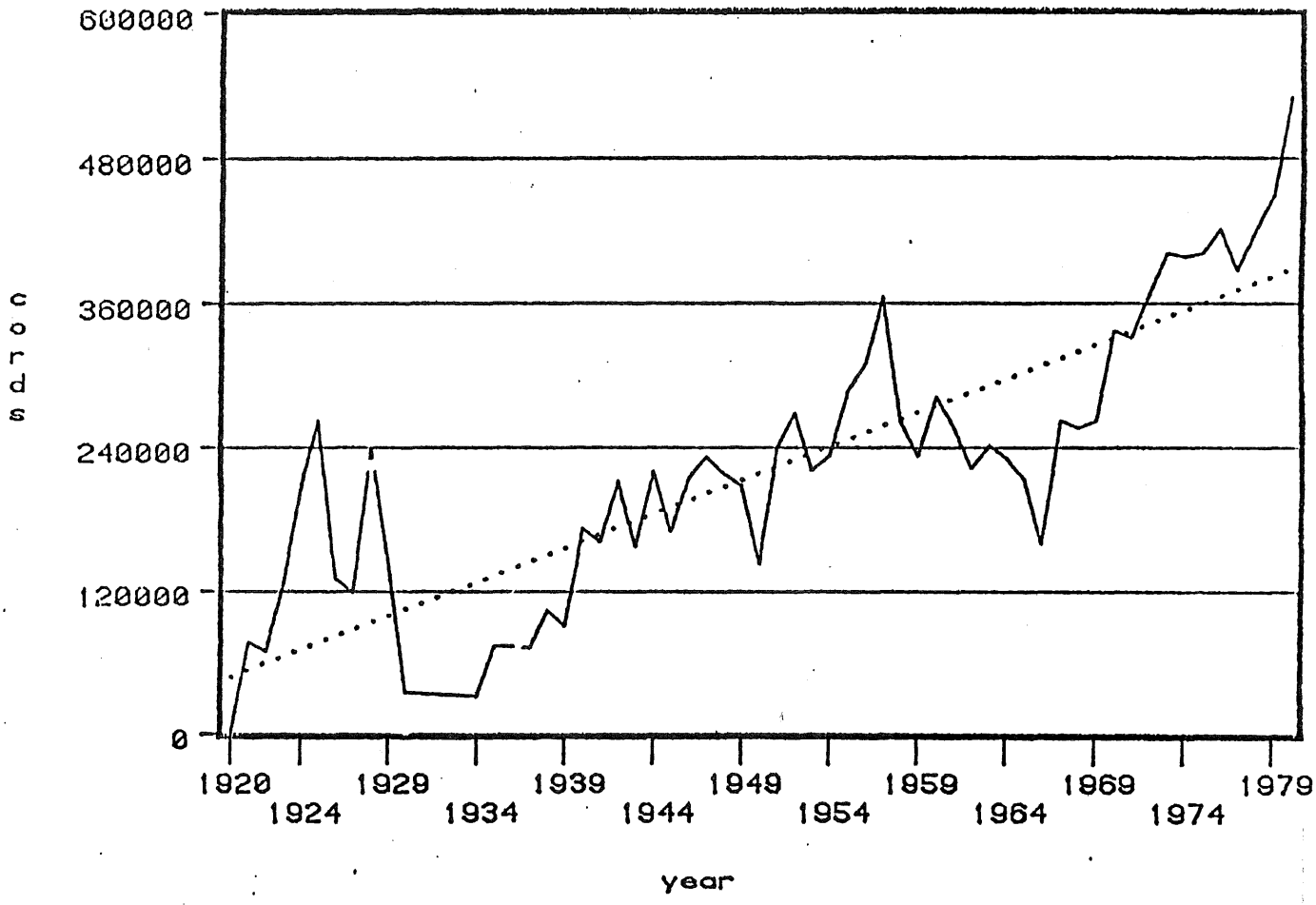
In addition to these uses, state forest roads also serve as designated recreational trails; school bus and delivery routes; and public transportation corridors. Approximately 1,380 miles of hiking, ski and snowmobile trails fall within units administered by the Division of Forestry. Much of this mileage is located on state forest roads.

Trends in Use

The forest roads program has expanded beyond its historical emphasis on fire fighting and lumbering. Still, timber harvesting remains one of the principle uses of the state forest road system. State forests and other state-owned lands now provide in excess of 450,000 cords of wood products annually, or about 20-25 percent of the total harvest required by the forest products industries in Minnesota (Figure 1).

The timber industry, the state's third largest ($2.3 billion in annual sales), depends in part on the state lands to provide a source of raw materials.

Figure 1 VOLUME OF TIMBER HARVESTED FROM STATE LANDS
1920 TO 1980, INCLUSIVE



Minnesota Department of Natural Resources, Divison of Forestry 1980

Recent rapid expansion of this industry has placed growing demands on state forest roads as larger and heavier log loads are harvested and transported from state lands.

The Minnesota State Comprehensive Outdoor Recreation Plan projects substantial increases in the demand for most dispersed recreation activities through 1995 (Minnesota DNR, Office of Planning 1979). State forest lands, roads and trails will be called upon to provide some of these additional recreation opportunities, particularly for ski touring, hiking, snowmobiling and primitive camping. In many areas, recreational road use may necessitate the upgrading of existing forest roads to accommodate increasing volumes of traffic.

State Forest Road Classification and Design

Forest roads, like other state roads, were constructed to various standards, depending on such factors as volume and type of use anticipated, facilities served, planned resource activities and road safety requirements. Proper design and construction of roads lessens their impact on the forest environment and significantly increases their utility and lifespan.

State forest roads are classified based on use criteria, development standards and road design and safety considerations. A classification system ensures that a range of alternatives is considered when selecting the appropriate road design. Classification presents development alternatives for varying types and intensities of road use and provides engineering information appropriate to such uses.

The existing system of classification (Classes A-D) was found inadequate and no longer effective by a DNR Roads Task Force appointed to study forest road classification and design standards. Based on this review, a recommendation was made to adjust and revise these standards to reflect new technology, to acknowledge changed administrative needs and to ensure conformance with recognized statewide road standards. The new system of classification utilizes five classes to describe forest road construction and development alternatives (see page 43).

State Forest Road Inventory

State forest road information for use in this assessment was collected over a four month period in early 1982 by the Division of Forestry. An extensive on-the-ground assessment was conducted to determine the extent, location and condition of roads presently included within the state forest road system.

Detailed information concerning road conditions, road use, existing mileage (by road class) and recommended maintenance and development needs was assembled to assist in formulating the State Forest Road Plan. The information obtained represents a complete inventory, rather than a sampling, of the current condition of state forest roads. A prioritized list of forest road and bridge development projects was also compiled. Local information was reviewed by DNR Area and Region staff foresters to check accuracy and to reconcile these requests with broader statewide needs and priorities.

The DNR's 1982 state forest road inventory effort represents the first such comprehensive study undertaken since 1974. This inventory is designed to assist in the identification and ranking of forest road needs on a statewide basis. A comprehensive listing of road system needs will permit more efficient allocation of limited road improvement funding resources and assist in formulation of a long-term forest transportation strategy. For a more detailed discussion of the forest road inventory process or information concerning its capabilities and applications, consult Appendix A.

Inventory Findings

As a result of the 1982 forest road inventory, much has been learned about the present condition of Minnesota's 1,800 mile state forest road system (Table 4). Perhaps most significant are the approximately 640 miles (36 percent of total mileage) which have been identified as "deteriorated" and in need of major reconstruction.

Many state forest roads are in need of more regular road maintenance (e.g., grading, light resurfacing, brushing or mowing of existing rights-of-way). In addition, 14 forest road bridges were listed as in need of repair or replacement. In many cases poor bridge condition has already resulted in restricted road use.

Table 4. State forest road mileage and number of bridges and culverts by region and area

Region and Area		Proposed Miles of Deletions	Miles by Class 1	2	3	4	5	Total Miles	# of Bridges	# of Culverts
Bemidji	11	15.4		56.9	49.9	23.5	5.2	150.9	2	203
Warroad	12	5.0		86.0	41.0	37.9	3.4	173.3	4	150
Baudette	13			3.0	40.6	91.8	22.2	157.6	5	110
Blackduck	15				23.7	59.2	44.5	127.4	10	123
Park Rapids	16	30.8			12.0	89.3	11.4	143.5	0	52
Region I Totals		51.2		145.9	167.2	301.7	86.7	752.7	21	638
Cloquet	21				11.0	8.6	0.8	20.4	0	21
Deer River	22	5.2	2.0		10.4	75.4	7.0	100.0	5	166
Hibbing	23	17.4		10.9	20.1	26.2	5.1	79.7	3	126
Orr	24	7.0				51.1		58.1	2	165
Duluth	25	21.4			23.8	80.1	8.4	133.7	3	305
Little Fork	26			13.1	17.8	33.3	4.7	68.9	1	124
Hill City	27				3.3	82.5	30.3	116.1	2	269
Region II Totals		51.0	2.0	24.0	86.4	357.2	56.3	576.9	16	1,176
Brainerd	31	2.5			7.9	3.5	0.2	14.1	0	14
Backus	32	21.0		10.5	15.5			47.0	0	22
Moose Lake	34	1.1			38.0	53.2	186.9*	279.2	1	214
Cambridge	35					5.0		5.0	0	3
Region III Totals		24.6		10.5	61.4	61.7	187.1	345.3	1	253
Lake City	51				.4	12.5	21.5	34.4	3	9
Lewiston	53				.4	62.8	24.1	87.3	4	55
Rochester	54					1.2	.7	1.9	0	0
Region V Totals					.8	76.5	46.3	123.6	7	64
Grand Totals		126.7	2.0	180.4	315.8	797.1	376.3	1,798.5	45	2,131

*Includes permanent winter use only swamp roads.

The need for an additional 100 miles of new development by 1989 was also identified by field inventory sources. All new development projects were ranked according to established criteria and are discussed later in this plan.

The survey also identified 127 miles of mostly Class 4 and 5 state forest roads which are recommended for abandonment or transfer to other agencies or individuals. Abandonment is indicated when an existing road no longer serves a legitimate forestry purpose.

ADMINISTRATION AND FUNDING OF STATE FOREST ROADS

Legal Status of State Forest Roads

The recently passed Forest Resource Management Act of 1982 (Minnesota Laws 1982, Chapter 511) confers the basic authority for operation of the state forest road system. Section 3, subdivision 3 of the act sets forth the following forest road policy:

> The commissioner (of natural resources) shall provide a system of forest roads and trails which provides access to state forest land and other forest land under his authority which is adequate to permit the commissioner to manage, protect, and develop those lands and their forest resources consistent with the forest resource management policy, and to meet demands for forest resources.

Prior to passage of this act there was no direct authorization to construct or maintain state forest roads for general forest management purposes. The Commissioner of Natural Resources is not a "road authority" as defined in Minnesota Statutes, Section 160.02. State forest roads are not a part of the county state-aid highway system as are the major roads leading into state parks. Nonetheless the legislature had given the commissioner various "road authority" powers prior to passage of the Forest Resource Management Act of 1982. The commissioner was authorized to use Consolidated Conservation Funds to construct and maintain roads in certain conservation areas (MS 84A.55, Subd. 10). In relation to his fire control duties, the commissioner was given the authority to construct firebreaks and to acquire by gift, purchase, or condemnation any easement or right of way needed to provide access to lands used for fire control or other public purposes (MS 88.09). The commissioner was also given the authority to close roads leading into any land used for

conservation purposes (MS 88.22). These specific authorities were in addition to general management authority that the commissioner had for all the public lands, parks, timber, waters, minerals and wild animals of the state (MS 84.027).

Over the years, the DNR came to operate a fairly extensive system of forest roads. The roads on state lands were developed for management purposes much as roads on private lands are. Some of the roads were taken over as they were abandoned by other units of government. In the Memorial Hardwood State Forest many of the roads are former driveways or field roads.

Because of the intermingled ownership patterns, state forest roads often cross lands that are not owned or managed by the state. The permission to cross these lands has been obtained in a variety of ways. In the case of lands administered by federal or county forestry agencies the necessary easements are routinely granted and filed. In recent years easements have also been obtained and filed when crossing private lands. On some of the older roads, however, informal agreements may have been negotiated with the owners. In some cases the state has sold timber on isolated tracts with the understanding that the purchaser would be responsible for providing access. The logger may have obtained permission to construct the road but the right to use the road was not passed on to the state.

Another area of concern is the restrictions on use or width of right of way contained in some easements. These easements may have been granted for timber management purposes with the understanding that after logging and regeneration the road would not be used. Modern forest management practices often require continuing access to the timber stands. The multiple use policy governing the management of state lands makes these restricted easements undesirable.

Because of the variety of means by which roads were added to the system, there are questions about the legal status of state forest roads. The prevailing opinion has been that state forest roads are not public roads as defined in MS 160.02. This means that state forest roads have not been subject to state standards requiring 66 foot rights of way, official establishment and vacation procedures and a number of engineering specifications. The state forest road system has not benefited from vehicle and fuel tax revenues used to construct and maintain public roads.

In the past the cost of obtaining permanent, unrestricted legal access to a tract of land often exceeded the value of the timber and other resources. With site preparation and regeneration costs running to several hundred dollars an acre, it is now necessary to guarantee permanent access to ensure the return on these investments. The existence of a legal access also makes a tract much more valuable if it is to be sold or traded to consolidate ownership. The Forest Resource Management Act of 1982 sets policies that require "adequate access" and "multiple use management." These factors indicate that when new state forest roads are constructed the DNR should obtain unrestricted easements with the minimum public road right-of-way of 4 rods. Adherence to these minimum right-of-way standards would also facilitate transfer of state forest roads to other road authorities should the road come to be used primarily for non-forestry purposes.

In an effort to clarify the status of older state forest roads, the recent state forest road inventory required a review of existing easements. The inventory also determined whether or not each state forest road has been kept in repair and used continuously for 6 or 15 years. Where easements are non-existent continued access to public lands could be ensured if the road were made public by common law dedication, statutory dedication or adverse possession.

Common law dedication occurs if permission to cross land has been previously granted by a landowner and that right has been exercised by the grantee for an unspecified period of time.

Minnesota Statutes, section 160.05 provides that "when any road or portion thereof shall have been used and kept in repair and worked for at least six years continuously as a public highway, the same shall be deemed dedicated to the public to the width of two rods on each side of the center line thereof and be and remain, until lawfully vacated, a public highway whether the same has ever been established as a public highway or not."

It may also be possible to maintain access across lands where the road has been in use for 15 years through adverse possession. Minnesota Statutes, section 541.02 prohibits legal actions to recover real estate unless it appears that the plaintiff, his ancestor, predecessor or grantor was seized or possessed of the premises in question within 15 years before the beginning of the action.

Establishing the legal right to cross property using any of these three methods would require litigation on a case by case basis. This would allow the DNR to maintain permanent access to public land but it would not make all state forest roads public roads. An alternative approach would be to get local road authorities to establish state forest roads as public cartways or roads. This would also guarantee permanent access without requiring expenditure of local funds to develop or maintain the roads.

Administrative Responsibility

The responsibility for operating, maintaining and administering Minnesota's state forest road system rests with the DNR, Division of Forestry. State statutes convey general authority to the Commissioner of Natural Resources who has delegated these responsibilities to the division.

Historically, DNR Area and District foresters have been charged with on-the-ground management responsibilities, while road construction priorities, maintenance requirements and funding decisions are handled by the central office staff in St. Paul. Field staff assist in planning and setting priorities by way of their requests for road construction and improvement projects.

Road maintenance and construction is carried out either by DNR personnel or by private contractors depending on the nature of the project and equipment needs. In addition, road repairs may be conducted by private timber operators in conjunction with harvest activities if specified by prior contractual agreement.

Cooperative Agreements

Cooperative agreements between the Department of Natural Resources and Minnesota's two national forests assist in coordinating road use and development activities on intermingled state and national forest ownerships. These basic agreements, signed in 1976 with the Chippewa National Forest and in 1981 with the Superior National Forest, form a basis for resolving transportation issues emerging as a result of concurrent road use and administration (Appendix D).

The agreements include provisions for addressing issues such as road use, construction, operations, and maintenance, use rights and responsibilities. Re-

cognizing the complexity of this important relationship, these agreements emphasize the need for improved cooperation and mutual understanding in the administration of the respective components of Minnesota's forest roads network.

Coordinated transportation planning is highly desirable given the degree of compatibility between DNR and Forest Service management objectives. Each shares major responsibility for conserving, protecting and administering Minnesota's forest lands to benefit the public. It is clearly in the best interests of both agencies to pursue coordinated planning and management insofar as possible.

Coordinated transportation planning between the Division of Forestry, counties and other state and private agencies does not yet occur on a regular and continuing basis (Banzhaf 1980). The state and counties, especially, share an interest in improving access to their inaccessible blocks of land, and in developing a partnership to work out a more stable funding mechanism for forest road improvement projects. Road use coordination with industrial and other private forest landowners presents an additional opportunity for expanding and improving access to Minnesota's forested areas.

Funding of the State Forest Road Program

Estimated Road Costs

Road costs for specific road projects vary widely according to road class, topography, geology and soils. Variation in cost is also dependent on the work to be accomplished. New construction costs are the highest, followed by reconstruction and then by maintenance.

The DNR estimates the costs for new construction and reconstruction to average $25,000 per mile and $15,000 per mile respectively. These costs compare well with those of other forest management agencies. For example, Chippewa National Forest estimated its road building costs for a single lane road with turnouts (similar to class 4) to range from a low of $12,000 per mile to reconstruct over flat terrain and good soils to a high of $35,000 per mile for new development on rugged topography. Superior National Forest's actual road building costs for the last four years for a similar type of road ranged from $9,000 to $15,000 per mile for reconstruction and from $22,000 to $25,000 per mile for new development. Additionally, Superior National Forest's costs for a two

lane recreational access road (similar to class 2) ranged from $50,000 to $100,000 per mile for new development. Reports from St. Louis County indicated similar road costs.

The DNR estimates the average cost for bridge replacement to be $60,000 per structure. These estimates are based on approximate costs for bridge replacement over the past 5 years. The costs are for a laminated wood panel bridge. The Minnesota Department of Transportation (MnDOT) has inspected some DNR bridges and estimates bridge replacement costs to vary from between $30,000 to $500,000 depending on span length and bridge width. MnDOT estimates for bridge life expectancy are approximately 40 years, assuming proper maintenance.

The DNR estimates average bridge repair costs, based on repair cost for the past 5 years, to be approximately $20,000 per bridge. Repair or maintenance of a bridge structure can consist of bridge redecking, painting steel members and renovation of abutments and associated construction components.

The DNR estimates an average cost of $200 per mile for road maintenance. This estimate is the result of information generated by the Division of Forestry's forest road inventory of 1982 which was completed by field staff with road maintenance responsibilities.

Historical Sources of Funding

Funds available for the construction, maintenance and improvement of state forest roads have, over the past several years, been inadequate to develop and maintain this system at a safe level. Forest road appropriations have been erratic and limited primarily to the maintenance of existing major roadways. Between 1975 and 1980, little new construction or improvement was accomplished due to a lack of planning and funding (Table 5).

Special state and federal legislative appropriations, including a 1.5 million dollar State Forest Road and Bridge Betterment bonding authority approved by the 1981 Stale Legislature (M.L. 1981, Chapter 304), have provided an important source of funds. To date $350,000 of these bonds have been obligated for forest road improvement projects. The balance is available for use when bond terms become more favorable (Minnesota DNR, Division of Forestry 1982B).

Table 5. State forest roads program, funding and accomplishments

Fiscal Year	Funding Level	Funding Source	Accomplishments: Reconstruction and Maintenance (miles)	Bridge Repairs	New Construction (miles)
Continuing	Variable	General Fund	Limited maintenance of existing roads		
1963-1975	Variable	Minnesota Resource Commission (LCMR)	Limited development and maintenance of existing roads		
1980	$441,733	BWCAW Forestry Intensification Program	94.8	7	24.75
1981	$408,937	BWCAW	783.2	1	1.8
	$ 71,033	Forest Road and Bridge Betterment Bonding	*	*	1.7
1982	$240,000	BWCAW	5.1 reconst. 460 maint.	4	
	$278,967	Forest Road and Bridge Betterment Bonding	19.8 reconst.	1	2.5

*Funds were used to purchase road reconstruction materials such as culverts and gravel and to complete emergency (temporary) road and bridge repairs.

Source: Minnesota Department of Natural Resources, Division of Forestry (1982B).

The Federal BWCAW Forestry Intensification Program has also made possible improvements to the state forest road system that would not have otherwise been possible using current funding sources. During fiscal years 1980 through 1982 over $1,000,000 of BWCAW funds were expended on state forest road improvement projects (Minnesota DNR, Division of Forestry 1981).

Because forest roads provide access for a variety of purposes, cooperative funding agreements with other units of DNR are often possible. In the past, the Division of Fish and Wildlife, in particular, has shown a willingness to cooperatively fund road projects where their management interests can be furthered by such an agreement. This gives added incentive for the Division of Forestry to pursue road building projects in areas where it would otherwise be impossible because of existing financial limitations.

EVALUATION OF OPPORTUNITIES

Management Opportunities

Development of the State Forest Road Plan represents a major opportunity for improving the management of the state forest road system. Planning provides the information and direction needed to formulate strategy and schedule activities over time to meet management goals and objectives. In addition, planning can provide the analysis and data needed to support important program and budget decisions which impact forest roads.

Planning addresses important forest road issues and opportunities by identifying programs and policies which best respond to anticipated future needs. Goals, objectives, targets and priorities developed in the forest road plan help link expected accomplishments to the Division of Forestry's overall program through the MFRP process. A framework is also created whereby interactions between division plans and other state, federal, county and local plans can be addressed. By clarifying and strengthening these relationships increased program effectiveness can be achieved.

Direction contained within the forest road plan will guide the operation and development of the state forest road system for the next seven years, with plan updates occurring regularly. Implementation of this plan and its major recommendations will require establishing a full-time Forest Road Supervisor position within DNR. In the past, one person served as both Rural Fire Protection Specialist and Forest Roads Specialist. With the increased emphasis on training rural fire departments and the transfer of the forest road program from the Wildfire Protection Section to the Forest Management Section, this arrangement is no longer adequate.

The forest road inventory conducted in conjunction with development of the forest road plan generated information which will be used to improve the efficiency and effectiveness of the state forest road program. Based on this information, a multi-year management program was developed to respond to identified needs and to focus management attention on resolving important road issues.

As a part of this program, criteria and standards for forest road construction have been revised and guidelines added concerning siting and project evaluation. Changes in many existing policies and procedures were also recommended. These changes are in response to the need to improve and expand the state forest road system to accommodate rapidly growing demands being placed upon it by forest road users. They are designed to assist the DNR in meeting its responsibilities by facilitating improved operation and administration of the road system.

Funding Alternatives

Funding for major state and county highways comes from a variety of sources. Fuel and vehicle tax revenues are an example of sustained program financing. State forest roads and road improvement programs, however, have less stable funding mechanisms. See page 32 for a review of current sources of state forest road funding. Historical funding deficiencies and fluctuations in biennial road appropriations highlight the need to develop a more stable and reliable means of financing the state forest roads program.

Recognizing the need for a consistent source of long-term operational and development funding, Minnesota's recently enacted Forest Resource Management Act (Minnesota Laws 1982, Chap. 511, Sec. 5, Subd. e) instructs the Commissioner of Natural Resources to establish "priorities for construction and improvement of forest roads to achieve the state forest road policy, including the development of alternative methods for financing forest road construction, improvement and maintenance, and for imposing a reasonable share of the costs of the forest road system on those who directly benefit from the availability and use of the system..."

In response to the requirements of the act, the DNR is examining various alternatives for financing the state forest road program. The study will concentrate on analyzing revenue generating capabilities, and the legal and political impacts associated with potential funding sources such as those listed below.

A. General Fund Appropriation
B. Bonding
    1. General Obligation Bonds
    2. Tax Revenue Bonds
C. Direct Taxation
    1. Property Taxation
        a. General Property
        b. Special Improvement District
    2. Sales and Use Taxes
        a. Forest Severence Tax
        b. Product Production Taxes
        c. Product Sales Taxes
D. Direct Revenue
    1. User Charges
    2. Product Sales
        a. Through Credits
        b. Through Increased Prices

An analysis of these and other funding methods will be included in the MFRP, which is scheduled for completion July 1, 1983.

Opportunities to Improve Access

Timber Outputs

The current system of Minnesota forest roads permits access to only a portion of the state's harvestable supply of timber. Road development, especially into presently inaccessible areas, presents a potentially major opportunity for increasing Minnesota's available supplies of timber. At the same time, access for other forest uses would be improved (Banzhaf 1980).

According to data gathered in 1977 by the U.S. Forest Service in its fourth Minnesota inventory, the Aspen-Birch Survey Unit (northeastern Minnesota) has the smallest percentage of commercial forest lands within close proximity to a maintained forest road (Jakes 1980). Here only about 26 percent of the commercial forests lie within one-fourth mile of a road while over 30 percent exceeds one mile.

In contrast, the Northern Pine Survey Unit (north central Minnesota) is reported to have more than 40 percent of its commercial forest lands within one-fourth mile of a road and only 18 percent in excess of one mile. Overall, nearly 2.5 million acres of Minnesota's commercial forest lands are estimated to be in excess of one mile from a maintained forest road.

Forest Service survey data also suggests some interesting differences with regard to the accessibility of the various Minnesota forest land ownerships. An average of only 21 percent of public forest lands, primarily state and county lands, and 31 percent of forest industry lands occur one-fourth mile or closer to a maintained road (Jakes 1980). The accessibility of non-industrial private forest lands is especially striking. Fully 95 percent of this ownership is estimated to be within one mile or less of a maintained forest road, compared to a statewide public forest land average of 66 percent.

It is impractical to establish a "road density" goal, such as having a road within one-half mile of all commercial forest land. In some areas of the state timber several miles from a road maybe accessible via winter swamp roads while in areas with rugged topography timber within one-fourth mile of a road may be inaccessible. In general the best opportunities for expansion of the forest road system is on public land in close proximity to major markets.

Nontimber Outputs

Nontimber outputs from forest lands include a wide variety of benefits and services such as recreation, wildlife, aesthetics and watershed protection. The levels of many of these outputs could be significantly increased as a result of road building and access improvements.

In Minnesota, outdoor recreation is a major industry, with much of the recreational activity occurring within the state's forest areas. Prime recreation sites are often occupied by mature stands of timber, and are close to both a road and a lake or stream (Jakes 1980). Improved vehicle access and links to other forest roads and road systems could promote expanded recreational use of Minnesota forest lands. Increased use would result in both direct and indirect economic benefits to local businesses and rural communities.

Fish and wildlife management is constrained by inadequate forest road access in some parts of Minnesota. Fish stocking, wildlife censuses, habitat manipulation and a variety of other management efforts would be facilitated by better access. In addition, opportunities for hunting, fishing and wildlife observation would be expanded.

Road construction and dispersed timber harvest activities benefit many kinds of wildlife. Species such as deer and grouse depend on an interspersion of timber age and size classes produced by road building and associated timber harvesting. Roadsides are also heavily used by rabbits, other small game and many songbirds for nesting habitat and cover.

Wildlife species diversity is enhanced when forested areas are managed to produce several timber age and size classes of more than one timber type in fairly close proximity. If well planned and executed, road building and silvicultural practices can increase the supply of many desirable wildlife species.

Perhaps the most challenging aspect of upgrading and expanding the state forest road system involves minimizing the adverse environmental impacts of road construction and improved access. Although road development improves opportunities for most kinds of outdoor recreation, fish and wildlife management, law enforcement and fire protection, it also increases the risk of illegal off-road vehicle use, poaching and wildfire. Some types of outdoor recreation, such as primitive backpacking and camping, are eliminated from roadless areas once roads are constructed in them. Wildlife species that inhabit extensive stands of mature timber or are intolerant of human activity may be reduced in number following forest road construction. Water quality and fishing opportunities may be decreased following road development if soil erosion and stream sedimentation are not adequately controlled. By considering all of these concerns during both the planning and operational phases of road development, most adverse impacts can be avoided or mitigated and multiple use benefits can be optimized.

Cooperative Road Agreements

DNR may also wish to consider securing additional cooperative road use, maintenance and construction agreements with counties, federal agencies, forest

industry and other public and private road users. By sharing administrative responsibilities with those who use state forest roads through a system of cooperative road agreements, construction, maintenance and management expenses could be distributed among those who benefit most directly from the use and availability of the road system.

Forest Road Program

STATE FOREST ROAD PROGRAM

INTRODUCTION

The State Forest Road Program section of the State Forest Road Plan is intended to build on the issue and assessment sections. It describes a course of action for the DNR to follow in remedying the problems discussed in the State Forest Road Issue section. The State Forest Road Program contains the following parts: 1) Goal, Strategy and Objectives, 2) Policy, and 3) Implementation Recommendations.

The Goal, Strategy and Objectives section describes a general goal for the state forest road program, the Division of Forestry's strategy for achieving the goal and specific objectives or tasks that will be undertaken to follow the strategy.

The Policy section describes how the DNR will manage the state forest road system. Policies are established for several elements of the road program such as road classification, road siting and methods of securing rights-of-way.

The last part of the State Forest Road Program is the Implementation Recommendations section. This section describes the actions that need to be taken to fulfill the program goal. It is organized to correspond with the State Forest Road Program objectives. Its purpose is to describe what is to be done, who will do it, when it will be completed and what it will cost.

GOAL, STRATEGY AND OBJECTIVES

Goal

It is the goal of the Division of Forestry to develop and maintain a state forest road system that will provide adequate access for the protection, management and utilization of Minnesota's forest resources.

Strategy

The Division of Forestry will manage state forest roads in cooperation with other public and private forest land managers to ensure coordinated and responsible forest road use and development.

Objectives

Conduct a comprehensive state forest road inventory and assessment system.

Maintain the state forest road inventory.

Formulate and implement state forest road policies regarding:

- classification
- siting criteria
- construction and maintenance
- mapping
- names and numbers
- signing
- securing rights-of-way
- water permits
- transfers
- abandonments
- seasonal closures
- cooperative agreements
- construction and improvement projects
- project proposals
- forest road manual
- revision of plan
- legislation

Develop criteria for the selection, evaluation and ranking of state forest road and bridge construction and improvement projects.

Identify needs, project costs and establish priorities for state forest road maintenance, reconstruction and new construction.

Revise and update the existing state forest road classification system and engineering design standards.

Clarify responsibility for the management, maintenance and construction of roads within the state forest system.

Develop and compare alternative methods of financing the state forest road system.

Fill the Forest Road Supervisor position to manage and coordinate state forest road system responsibilities.

Establish two forest road specialist positions in Bemidji and Grand Rapids to assist the Forest Road Supervisor in fulfilling his responsibilities.

Assist the DNR, Bureau of Engineering in establishing two additional engineering positions to work on state forest roads.

Prepare comprehensive forest resource unit plans which address forest roads in accordance with the state forest roads policy and the Minnesota Forest Resources Plan.

Expand the state forest road system in areas where a growing demand for timber, fish and wildlife management, recreational use or development of other non-timber uses is found to exist.

Reconstruct existing state forest roads and bridges to meet safety and use requirements.

Perform routine maintenance on the state forest road system.

Initiate a program of uniform state forest road signing.

Develop formal mechanisms for coordinating forest transportation planning on federal, state, county and private forest lands.

Update forest road use agreements with the Chippewa and Superior National Forests.

Continue to follow forest road policies and practices outlined in the Commissioner of Natural Resources' Wildlife/Forestry Coordination Policy and related documents.

Develop a state forest road manual.

Enter state forest road location information into the MLMIS file so that road locations can be reproduced on maps that will be available in the Land Management Information Center.

Develop and implement a computerized forest road inventory system.

Review all right-of-way documents and resolve any problems that exist.

POLICY

Classification

State forest roads are assigned to a given class based on expected use and road design and safety requirements. Classification ensures that a range of alternatives is considered when selecting the appropriate road design. Classification presents development alternatives for varying types and intensities of forest road use and provides engineering information appropriate to such uses.

Under the newly proposed system of classification, a range of five classes is used to describe forest road use and development possibilities (Table 6 and Figure 2). This system was developed to ensure the continued safe use and operation of state forest roads, while at the same time responding to the increased need for roads to be both durable and cost-effective. The new standards recognize recent advances in technology, expanded road use and safety needs and the desirability of conforming to generally accepted statewide road standards.

Description of State Forest Road Classes

Roads designated as Class 1 are multi-purpose two-lane roads for use in all types of weather. Class 1 roads, unlike other forest roads, are generally hard-surfaced and include a two foot minimum shoulder width. They are developed only where heavy two-way traffic volumes are anticipated. Examples might include major timber haul roads, access to heavily used recreation areas or key transportation routes. Only two miles of state forest roads fall within this class.

Class 2 and 3 roads are also multi-purpose, two-lane roads. Both are developed as all-weather gravel surfaced forest roads. Because class 2 roads are four feet wider than Class 3 roads, they can accommodate substantially higher vehicle speeds. Engineering design specifications for Class 2 roadways are also more exacting and uniformly applied. Class 2 and 3 roads serve a variety of purposes and may access moderately developed recreational sites.

Table 6. Engineering design specifications for state forest roads

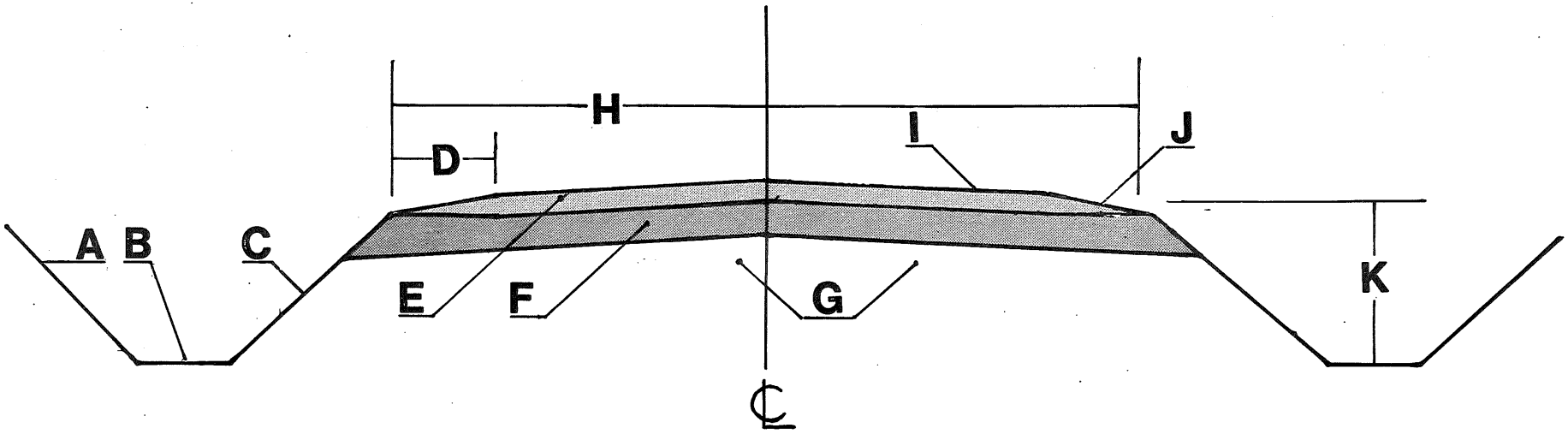
CLASS	Back Slope A	Ditch Bottom B	Side Slope C	Shoulder Width D	Structure Thickness E	Base Thickness F	Sub Base G	Roadway Width H	Crown Slope I*	Shoulder Slope J*	Ditch Depth K	Design Speed L	Structural Design Width M	Bridge Structure and Loading N	Turnouts O	Sight Distance P	Grades Q	Intersections R	Canopy Opening S	Right of Way T	Flood Design U
1	3:1 or flatter	2' to 4'	3:1 or flatter	2' min.	site specific	site specific	site specific	26'	1/8"-1/4" per foot	1/8"-1/4" per foot	2' to 3'	55 mph	two-lane	HS-20	no	base on design speed	not to exceed 7-8% slope; short grades 10%	adequate view corridors	adequate for road drying	66 feet across private property	desig for 5 year flood
2	2:1 or flatter	"V" ditch to 4'	3"1 or flatter	none	site specific	site specific	site specific	22'	"	"	2'	40 mph	two-lane	HS-20	no	"	"	"	"	"	"
3	2:1 or flatter	"V" ditch to 4'	3:1 or flatter	none	site specific	site specific	site specific	18'	"	"	2'	25 mph	as required	HS-20	no	"	"	"	"	"	"
4	2:1 or flatter	"V" ditch to 4'	3:1 or flatter	none	site specific	site specific	site specific	14' to 16'	"	"	2'	20 mph	as required	HS-20	optional	"	"	"	"	"	"
5	MINIMUM DESIGN NECESSARY FOR INTENDED USE *** FOR USE DURING WINTER OR DRY PERIODS ONLY																				

*Base and sub base will have this same slope.

V ditch - simple ditch with "V" bottom.

HS-20 Loading - refers to bridge structural requirements necessary to handle a semi-tractor and trailer of the following weight configuration. Tractor: 4 tons front axel, 16 tons rear axel. Trailer: 20 tons. The gross weight of the vehicle would be 40 tons. This matches bridge specifications for county state aid highways.

Figure 2. Typical State Forest Road Cross Section



A - Backslope
B - Ditch bottom
C - Sideslope
D - Shoulder width
E - Gravel thickness
F - Base thickness
G - Subbase
H - Roadway width
I - Crown slope
J - Shoulder slope
K - Ditch depth

Class 4 roads are multi-purpose, one-lane roads used to access timber areas where continued management is necessary. In addition, Class 4 roads provide access to primitive recreational facilities, fish and wildlife management areas or for hunting, fishing and other forms of dispersed recreation. The majority of longer, permanent state forest roads requiring routine maintenance are class 3 or 4 roads.

Class 5 roads are primarily timber harvest haul roads for use during dry periods or winter. Road design is both economically and developmentally the minimum necessary for intended use. Road maintenance is also minimal and may not be required on a regular basis. Class 5 roads may also serve as recreational trails.

For more information on road design or site-specific construction specifications refer to: Standards and Specifications for Highway Construction (Minnesota Department of Transportation 1978b).

Siting Criteria

Road location and design standards are determined by a number of factors, including: topography, climate, ownership, alignment and economic limits on hauling. These factors also influence potential soil and water quality impacts associated with road development.

Items to consider in planning and locating a state forest road include:

Road Grade and Width - The horizontal and vertical alignment of a road (its grade) can affect maintenance and trucking costs. Road width impacts the volume and velocity of runoff and the stability of the road. Roads should be constructed to a minimum acceptable width and should avoid long, steep grades where possible.

Road Density - Road density directly affects the total area of compacted soil, the volume and velocity of runoff, the potential for slope overloading and failure of cut or fill areas. The total miles of road in an area should be minimized consistent with development needs and planning priorities.

Obstacles - Rock outcrops, ledges, wetlands and other natural features which increase construction cost should be avoided where possible, consistent with access and development needs.

Water Crossings - Stream crossings can add significantly to the cost of a state forest road. They are also important from a safety standpoint. Care must be taken to ensure that water crossing structures are located with safety, cost and water quality considerations in mind.

Drainage - Proper drainage is essential to assure the permanence and usefulness of forest roads. Adequate planning and design and the strategic use of drainage structures will give the best results in improving flow capacity and road stability. Regular maintenance and inspection of drainage structures is necessary to ensure that roads remain stable and operational.

Excavation and Embankment - Creation of extensive backslopes and vertical cuts without adequate consideration of soil and climatic conditions, ground water flow, slope height and other site factors can pose dangers to forest road stability. Efforts should be made to locate roads so that excavation, exposed backslopes and cuts and fills are minimized. This helps reduce the risk of cutbank and fill area failures.

Surfacing - Road surfacing treatments depend on road use, location, construction costs and the availability of local materials. Durable surfaced roads help provide for smooth and efficient travel and protect the road sub-grade from saturation or disturbance.

Terrain - Natural physical features of the road corridor are particularly important in road location and siting decisions. Ultimately, criteria regarding curvature, gradients and the balancing of cuts and fills must reflect the shape of the terrain. Field-adjusted siting assists in designing and laying out forest roads so they conform as much as possible to natural conditions. Roads should be placed on high ground with gentle grades and away from steep banks and slopes where possible.

Water Quality Considerations

Forest management impacts on water quality are not considered to be a major, statewide problem in Minnesota. However, forest road construction can cause accelerated soil erosion and stream sedimentation, leading to a deterioration of water quality in forested areas. Road building activities can expose, disturb and compact forest soils, resulting in disruption of natural drainage patterns and the movement of unstable forest soils.

Water quality and other impacts associated with road building usually depend on the extent and location of forest roads and the manner in which roads are constructed and maintained. Other factors important in determining road impacts are road gradient, alignment, drainage potential of the road area and the extent to which the natural stability of the land is changed by road building activities. Impacts may also be related to topography, soils, geology or climate in the affected area.

In most cases, environmental impacts associated with forest road construction are the result of poor planning or design, improper construction, bad timing or failure to apply control measures where appropriate. Potential impacts are best dealt with early in the design and layout stages of road development. Proper planning, design and construction minimizes the potential impact of roads on the forest environment and can, at the same time, significantly increase their utility and lifespan.

An appreciation and understanding of the important relationship between forest roads and water quality is essential to protect state forest lands and their resources from inappropriate use and development. The adverse impact of forest roads on water quality will be reduced by:

1. Making water quality and other environmental considerations an integral part of all DNR forest road planning, design, layout and construction decisions.

2. Ensuring the consideration of important road design constraints such as road grade, width, drainage and water crossings in the layout and construction of state forest roads.

3. Encouraging the use of environmentally sound road building methods and preventive techniques where appropriate.

4. Complying with the state water quality management plan by implementing Best Management Practices (BMP's) designed to control nonpoint sources of water pollution caused by forest road building activities.

Construction and Maintenance

Currently, forest road maintenance and reconstruction work is carried out either by the DNR Division of Forestry, private road contractors, counties or townships, depending on the nature of the project and the type of equipment needed. Division policy is to use road maintenance contracts whenever possible. However, in areas where contractors are not available, or where seasonal work loads exceed the constractor's capabilities, road maintenance projects may be undertaken by the DNR. Road maintenance equipment (road graders, dump trucks) to assist in developing this minimum capability may be purchased or transferred to areas with high road maintenance requirements or where no contractors are presently available.

Mapping

A system of mapping is necessary to effectively utilize and manage the state forest road system and the lands it accesses. The State Forest Road Atlas prepared in conjunction with this plan will be maintained as the primary source of road maps on a statewide basis.

More detailed unit maps are also needed. Maps displaying forest roads (and other roads) by name and number and containing sufficient detail to permit ready identification of major transportation routes and key access points will be developed on a unit-by-unit basis when unit plans are prepared. Important physical features, land ownerships and developments should also be noted. Regular updating and distribution is necessary to ensure the continued usefulness of the maps.

Names and Numbers

All permanent state forest roads require a number for purposes of identification and inventory. Road names and numbers currently in use were assigned on a consecutive basis as roads entered the system. Additional study is needed to develop a more effective numbering policy. The study should consider the possibility of adopting either the Minnesota Department of Transportation or the U.S. Forest Service numbering policy.

Signing

It is the policy of the Division of Forestry to develop a sign system which will:

1. Provide for the safe and efficient travel of road users.

2. Be easily understood and recognized by road users.

3. Convey important location and safety information in a concise and cost-effective manner.

4. Be comprehensive and manageable by DNR field personnel.

5. Contain uniform statewide standards and procedures for the design, placement and maintenance of state forest road signs.

6. Enhance the Forest Officer's ability to enforce safety rules and use restrictions.

Aside from conveying information, signs become departmental signatures and convey important impressions to the user regarding the quality of management. Improper terminology, conflicting messages or bad location inhibit sign effectiveness and can limit compliance. Adequate signing is also important to ensure the safety of road users and to avoid questions of liability.

Road safety signs will follow specifications provided in the Minnesota Manual on Uniform Traffic Control Devices for Streets and Highways (Minnesota Depart-

ment of Highways 1973). Locational and informational signs will follow the Sign Manual (Minnesota Department of Natural Resources 1980).

Securing Rights-of-Way

To provide adequate access for multiple use management of state forest lands permanent rights-of-way will be secured for new road construction wherever possible. Easements must be obtained when constructing state forest roads across lands not under the jurisdiction of the Division of Forestry. The road rights-of-way should also be secured on state lands to ensure continued management access in the event of transfer, sale or exchange of various parcels of state land.

The Regional Land Specialist is responsible for obtaining easements. Division of Forestry personnel are responsible for providing the land specialist with a plat map showing the proposed right-of-way. Copies of the approved easement are sent to the landowner, Region and Area forestry offices and the Forest Management staff.

Water Permits

Permits to work in public waters are required for any projects planned in water or wetlands and for projects involving the drainage of wetlands. It is the responsiblity of the Area Forest Supervisor to obtain the necessary permits from the Regional Hydrologist and the U.S. Army Corps of Engineers.

Transfers

Responsibility for DNR forest roads which no longer serve a legitimate forestry purpose but serve other purposes will be transferred to the public or private agency that benefits most from the continued use and availability of these roads. Transfer actions should be initiated only where roads can be shown to serve purposes other than those for which they were constructed, and only after consultation with others involved in the use, management or maintenance of the road. Other DNR divisions, local and regional government officials, forest industry representatives and the public should be notified in advance of DNR intentions to transfer road responsibility.

In cases where roads continue to serve limited forestry purposes, cooperative road agreements may be needed to transfer partial management responsibility to other road users (see Cooperative Agreements page 53). Refusal of major road users to assume partial responsibility for improving, maintaining or administering state forest roads may result in initiation of abandonment procedures by the Division of Forestry.

Abandonments

Only those roads which continue to serve a legitimate (DNR) forestry purpose will be kept and maintained as a permanent part of the state forest road system. Roads which no longer serve such a purpose, or any other viable use, will be subject to abandonment.

In cases where road use unrelated to forestry use is still occurring, efforts should be made to transfer road responsibilities to the appropriate agency, organization or unit of local government. Abandonment may also be indicated where road transfer proceedings have been unable to produce agreement, or where shared responsibility for maintaining the road has been rejected.

Road abandonment proceedings will be initiated only after notification of the Regional Forest Supervisor and the Forest Management staff in St. Paul. Persons living on the road and those whose economic welfare will be affected by the proposed abandonment, must also be consulted. Local and county government officials should be notified. This information should then be submitted to the Attorney General's office and, pending a favorable opinion, the mileage can be deducted from current inventory.

Seasonal Closures

The Commissioner of Natural Resources has authority under M.S. Section 88.22 to temporarily close state forest roads and trails for the purpose of protecting roads and adjacent forest lands from damage or destruction.

Road closure may become necessary in the event of high forest fire danger or during periods of wet weather which cause road conditions to deteriorate. Various forest management practices or objectives may also require temporarily

limiting public road access. The authority to close state forest roads has been delegated to the Regional Forest Supervisors.

Prior to actual road closure, however, the Regional Forest Supervisor must determine the impact of the proposed closure on other DNR divisions and major public and private road users. An appropriate sign indicating the nature and duration of restrictions imposed should be posted at road entrances. Road barriers, reflectors and other equipment needed to safely close a road should be readily available for use in emergencies (e.g. washouts).

Cooperative Agreements

As stated in the Forest Resource Management Act of 1982 (Minnesota Laws 1982, Chapter 511, Sec. 5, Subd. 4), it is the policy of this state to coordinate all planning efforts with the appropriate state, federal, other public and private agencies in order to achieve "optimum public benefit...(and to)... enhance the productivity and multiple-use management of forest resources."

Cooperative road agreements respond to this direction by encouraging co-operative planning, funding, construction and maintenance of forest road and bridge projects where joint interests are involved. Coordination is highly desirable given the degree of compatibility between departmental objectives and those of other public and private forest managers. The opportunity to share in forest road responsibilities can promote effective partnerships, more stable road funding and an expanded ability to provide benefits to each of the participants at greatly reduced individual cost.

Cooperative agreements with other road users should be pursued, especially where intermingled land ownerships or multiple road uses make this a priority. Road agreements must include detailed, provisions for addressing construction, funding and operational issues and should clearly define road use rights and responsibilities. Mutual understanding and improved cooperation should be emphasized in negotiating such agreements.

Evaluation of Reconstruction and Development Road Projects

There are a number of important criteria which need to be examined when ranking state forest road projects in order of priority. These criteria are listed in

this section. At this time, however, it must be noted that the DNR has not developed a scientific method of applying criteria to road projects for ranking purposes. In the future the DNR will seek methods of improving its system for ranking state forest road projects.

The ranking of state forest road projects in this plan represents the best professional judgement of experienced forest resource managers after due consideration of the following factors:

Public Safety - Are roads being developed and maintained at levels which will ensure the safety of road users? How will project expenditures improve road and bridge safety?

Timber Harvesting Access - Will the project result in access to merchantable timber? How many acres? What species? Will the road project facilitate the attainment of allowable cut targets? What is the location of the road in relation to mills or wood processing plants?

Recreation Access - Is there a primitive campground, beach, trail or public access served by the road project? Is there a recreational development proposed? Is the road itself usable as a driving, hiking, snowmobiling or hunting trail?

Fish and Wildlife Management Access - Is the road needed for fish stocking or census purposes? Does the road provide access for wildlife management projects?

Forest Management and Protection - Does the road allow access for site preparation, thinning or other silvicultural practices? Is the road necessary as a fire break? Does the road permit access for fighting wildfires or for insect and disease control projects? Are there recreational sites on the road which need regular maintenance?

Cooperative Agreements - Will other state agencies, organizations or units of local government share in the costs of road construction and maintenance? Has the financial burden been equitably distributed among those who will directly benefit from the use and availability of the road?

Special Considerations - What affect will the road have on local residents and the local economy? Does the road provide a link between two roads? Will the road benefit other public or private land managers?

Cost - Are there special problems which would increase the cost of the project? Are there reasonable alternatives at a lower cost? Will the road remain stable over time? How many bridges or drainage structures are needed?

Each state forest road reconstruction or new road project proposal submitted through the 1982 state forest road inventory was subjected to a three step prioritization process. This process is explained in Appendix A.

Project Proposals

Forest road projects which include constructing or reconstructing a road or bridge within the next seven years are identified in this plan. All new projects have been assigned a priority rating based on factors listed above. The priority ratings indicate those projects to be undertaken during 1983 and the 1984-85, 1986-87 and 1988-89 bienniums. Project proposal forms will be used to initiate approved projects once the biennial budget has been established.

Project proposals for forest road and bridge construction and reconstruction must be submitted to the Regional Forest Supervisor for approval. The Forest Management staff in St. Paul allocates the funds to each region for approved projects and is informed when work begins through receipt of a copy of the project proposal. The Forest Management staff is directly responsible for forest road program coordination.

Projects which involve a change in existing road standards, minor changes in road alignment or road abandonments also require prior approval, although they may not be included in the road plan.

Forest road and bridge projects of an emergency nature may arise from time to time. These may not be included in the priority ratings in the Forest Road Plan. The DNR will give priority to emergency projects, especially when safety of road users is a factor.

Some of the projects proposed in this plan may be modified when more detailed unit management plans are prepared. Eventually the unit management plans will replace the statewide request for proposals approach used to identify road projects for this plan. The unit plans will apply the broad policies and direction formulated at the state level to individual forest management units. Unit forest management plans will provide road information to be used when MFRP is updated.

Forest Road Manual

The development of a comprehensive DNR Forest Road Manual is recommended to ensure the availability of a continuing source of technical and professional guidance in carrying out state forest road responsibilities. Rational, systematic guidelines are necessary to promote compliance with DNR road policies among those who build, manage and maintain state forest roads.

Other purposes for developing a Forest Road Manual include the need to:

1. Document and distribute comprehensive, standardized specifications and design criteria for forest roads and bridges.

2. Provide uniformity in the application of road policies and greater efficiency in the administration and management of the forest road program.

3. Provide field personnel with standardized contracts and forms for forest road projects.

Good judgement must, of course, accompany written guidelines to ensure proper implementation of specified practices. Road specifications must also be updated periodically to reflect new information, improvements in road technology or possible changes in DNR policy or operating procedures.

Distribution of the manual should be as broad as possible, including all Division of Forestry field offices, other DNR divisions, and various state, federal and county resource and transportation agencies. Private and industrial forest owners may also wish to consult the DNR Forest Road Manual.

The following is a list of topics that will be included in the DNR Forest Road Manual:

- Forest road inventory and classification procedures
- Road and bridge construction specifications
- Road safety requirements and design criteria
- Construction and maintenance scheduling
- Contract and purchase information
- Environmental quality guidelines
- Road siting criteria
- Road signing, numbering and mapping
- Road resurfacing, excavation and drainage
- Procedures for submitting project proposals
- Cooperative road agreements
- Bridge repair

Revision of the Plan

The Forest Resource Management Act of 1982 (Minnesota Laws 1982, Chapter 511) requires the inclusion of state forest road program recommendations in every update of the comprehensive state forest management plan. The act also requires that the assessment portion of the plan be updated at least once every ten years and the program portion every four years. The first regular update of the program will take place during the 1986-87 biennium. Assuming that the major recommendations contained in this plan are implemented, it should not be necessary to prepare a separate document for forest roads at that time. Rather the forest road program will be a part of the comprehensive plan.

The budget and construction projections contained in this State Forest Road Plan are the best current estimates of state forest road needs. Changes in economic or market factors and social, political or institutional variables may necessitate revising the plan and its major recommendations prior to the next regularly scheduled update.

Legislation

Recommendations for new forest road legislation or changes in existing legislation, if any, will be included in the MFRP.

IMPLEMENTATION RECOMMENDATIONS

The implementation recommendations in this section are based on the 23 objectives of the State Forest Road Program. They will be presented using the following format:

A. Objective: specific task to be accomplished.
B. Responsibility: who will perform the work.
C. Schedule: completion date.
D. Cost: amount of new funding needed to carry out the objective during the life of the plan. Cost estimates are in 1982 dollars.

1. A. Conduct a comprehensive state forest road inventory and assessment.

   B. DNR, Division of Forestry
      - State Forest Road Task Force
      - Forest Management Staff
      - Forest Resources Planning Staff
   C. July 1982
   D. Funded during 1981 legislative session.

2. A. Maintain the state forest road inventory.
   B. DNR, Division of Forestry
      - Forest Management Staff
      - Forestry Field Personnel
   C. Initial development of the system--July 1982; maintenance of the system will be an ongoing function.
   D. Funded during 1981 legislative session.

3. A. Formulate and implement state forest road policies regarding:
      - classification
      - siting criteria
      - construction and maintenance
      - mapping
      - names and numbers
      - signing
      - securing rights-of-way

- water permits
- transfers
- abandonments
- seasonal closures
- cooperative agreements
- construction and improvement projects
- project proposals
- forest road manual
- revision of plan
- legislation

B. DNR, Division of Forestry
- State Forest Road Task Force
- Forest Management Staff
- Forest Resources Planning Staff

C. Formulation of state forest road policies--July 1982; implementation of the policies will be an ongoing function of the state forest road program.

D. Funded during 1981 legislative session.

4. A. Develop criteria for the selection, evaluation and ranking of state forest road and bridge construction and improvement projects.

B. DNR, Division of Forestry
- Forest Management Staff
- Forestry Field Personnel
- Forest Resources Planning Staff

C. July 1982.

D. Funded during 1981 legislative session.

5. A. Identify needs, project costs and establish priorities for state forest road maintenance, reconstruction and new construction.

B. DNR, Division of Forestry
- Forest Management Staff
- Forestry Field Personnel
- Forest Resources Planning Staff

C. July 1982.

D. Funded during 1981 legislative session.

6. A. Revise and update the existing state forest road classification system and engineering design standards.
   B. DNR, Division of Forestry
      - State Forest Road Task Force
      - Forest Management Staff
      - Forest Resources Planning Staff
   C. July 1982.
   D. Funded during 1981 legislative session.

7. A. Clarify responsibility for the management, maintenance and construction of roads within the state forest system.
   B. DNR, Division of Forestry
      - Forest Management Staff
      - Forest Resources Planning Staff
   C. July 1982.
   D. Funded during 1981 legislative session.

8. A. Develop and compare alternative methods of financing the state forest road system.
   B. DNR, Division of Forestry
      - Forest Economist
      - Forest Management Staff
      - Forest Resources Planning Staff
   C. July 1983 (to be included in the Minnesota Forest Resources Plan).
   D. Funded during 1981 legislative session.

9. A. Fill the Forest Road Supervisor position to manage and coordinate state forest road system responsibilities.
   B. For requesting this position in the 1984-85 biennial budget request.
      DNR, Division of Forestry
      - Forest Management Staff
      - Operations and Planning Supervisor
   C. Starting date--July 1983
   D. 1984-85 biennium salary, travel and expenses: $35,000
      1986-87 biennium salary, travel and expenses: $40,000
      1988-89 biennium salary, travel and expenses: $45,000

10. A. Establish two forest road specialist positions in Bemidji and Grand Rapids to assist the Forest Road Supervisor in fulfilling his responsibilities.

    B. For requesting these positions in the 1983 biennial budget request or securing them from the present complement.
    DNR, Division of Forestry
    - Forest Management Staff
    - Operations and Planning Supervisor

    C. Starting date--July 1983.

    D. 1984-85 biennium salaries, travel and expenses: $58,000
    1986-87 biennium salaries, travel and expenses: $64,000
    1988-89 biennium salaries, travel and expenses: $72,000

11. A. Assist the DNR, Bureau of Engineering in establishing two additional engineering positions to work on state forest roads.

    B. DNR, Bureau of Engineering
    DNR, Division of Forestry
    - Forest Management Staff
    - Operations and Planning Supervisor

    C. Starting date - July 1983.

    D. Cost included in state forest road engineering costs.

12. A. Prepare comprehensive forest resource unit plans which address forest roads in accordance with the state forest roads policy and the Minnesota Forest Resources Plan.

    B. DNR, Division of Forestry
    - Forest Management Staff
    - Forest Resources Planning Staff
    - Forestry Field Personnel

    C. Forest resources unit plans will be completed between July 1983 and July 1989.

    D. Four planning positions (in accordance with the Forest Resources Management Act of 1982, Laws of Minnesota 1981, Chapter 511), support staff and general operating funds for 1984-85--$476,000; cost not estimated beyond 1984-85. Only a portion of these funds would be used on state forest road related tasks.

13. A. Expand the state forest road system in areas where a growing demand for timber, fish and wildlife management, recreational use or development of other non-timber uses is found to exist.

B. DNR, Division of Forestry
- Forest Management Staff
- Forestry Field Personnel

DNR, Bureau of Engineering

DNR, Regional Land Specialists

DNR, Division of Fish and Wildlife

DNR, Trails and Waterways Unit

C. New state forest road construction schedule (see summary of construction by region, Appendix A).

	1983	1984-85	1986-87	1988-89	Total
Road miles:	0	40	30	30	100

D. New forest road construction cost.

	1983	1984-85	1986-87	1988-89	Total
$ needed:	0	$1,006,000	$754,500	$754,500	$2,515,000

14. A. Reconstruct existing state forest roads and bridges to meet safety and use requirements.

B. DNR, Division of Forestry
- Forest Management Staff
- Forestry Field Personnel

DNR, Bureau of Engineering

C. State forest road reconstruction schedule. (see summary of reconstruction by region, Appendix A).

	1983	1984-85	1986-87	1988-89	Total
Road miles:	96	182	182	182	642
Bridge repairs*:	4	10	2	2	18
Bridge replacement*:	0	2	1	1	4

*Bridge repair and replacement estimates are based on inventory findings that the Division of Forestry has responsibility for 45 bridges. To

date 28 of these bridges have been inspected by MnDOT and 17 were found to be in need of repair or replacement. The figures indicated above show the number of repair or replacement projects the Division of Forestry feels will be necessary when MnDOT completes inspection of the remaining 17 bridges.

D. State forest road reconstruction cost.

	1983	1984-85	1986-87	1988-89	Total
Road recon. cost:	$1,443,000	2,726,250	2,726,250	2,726,250	9,621,750
Bridge repair cost:	$ 80,000	200,000	40,000	40,000	360,000
Bridge replace. cost:	$ 0	120,000	60,000	60,000	240,000
Total recon. cost:	$1,523,000	3,046,250	2,826,250	2,826,250	10,221,750
Funds from other sources*:	$1,523,000	700,000	700,000	700,000	3,623,000
Additional needed:	$	2,346,250	2,126,250	2,126,250	6,598,750

*1983--$1,150,000 available through appropriation for betterment of state forest roads and bridges (Minnesota Laws 1981, Chapter 304, Section 4).

1983--$373,000 available through BWCAW legislation (P.L. 95-495).

1984 thru 1989--$700,000 per biennium projected to be available through BWCAW legislation (P.L. 95-495).

15. A. Perform routine maintenance on state forest road system.
B. DNR, Division of Forestry.
C. Each state forest road will be maintained in a safe usable condition (some roads need constant attention while others may need maintenance once a year).

	1983	1984-85	1986-87	1988-89	Total
Approx. road maint. miles:	1,800	3,600	3,600	3,600	12,600

D. Forest road maintenance.

	1983*	1984-85	1986-87	1988-89	Total
Approx. road maint. costs:	$359,696	$719,392	$719,392	$719,392	$2,517,872

*Some funds for road maintenance are available from BWCAW legislation (P.L. 95-495). Other funds for maintenance in 1983 will be from the division's general operations and management budget and trust fund land management reimbursement. However, with recent general fund reductions some maintenance will not be completed.

16. A. Initiate a program of uniform state forest road signing.
    B. DNR, Division of Forestry
    - Forest Management Staff
    - Forestry Field Personnel
    C. The program will be initiated in fiscal year 1984 and maintenance of the signing system will be an ongoing function.
    D. Costs included in road reconstruction and maintenance costs.

17. A. Develop formal mechanisms for coordinating forest transportation planning on federal, state, county and private forest lands.
    B. DNR, Division of Forestry
    - Forest Management Staff
    - Forest Resources Planning Staff

    U.S. Forest Service
    - Chippewa National Forest
    - Superior National Forest

    County Land Commissioners

    Private forest landowners and managers
    C. July 1983
    D. Funded during 1981 legislative session.

18. A. Update forest road use agreements with the Chippewa and Superior national forests.
    B. DNR, Division of Forestry
    - Forest Management Staff

U.S. Forest Service
- Chippewa National Forest
- Superior National Forest

C. July 1984

D. Included in the cost for Forest Road Supervisor position.

19. A. Continue to follow forest road policies and practices outlined in the Commissioner of Natural Resources' Wildlife/Forestry Coordination Policy and related documents.

B. DNR, Division of Forestry
- Forest Management Staff
- Forestry Field Personnel

DNR, Division of Fish and Wildlife. Section of Wildlife

C. Coordination between Forestry and Wildlife is an ongoing function.

D. The cost of this activity is covered in the operating budgets of both divisions--no additional funding is required.

20. A. Develop a state forest road manual.

B. DNR, Division of Forestry
- Forest Management Staff

C. July 1984

D. Included in the cost for the Forest Road Supervisor position.

21. A. Enter state forest road location information into the MLMIS file so that the roads can be reproduced on maps at the Land Management Information Center.

B. DNR, Division of Forestry
- Forest Management Staff
- Forest Resources Planning Staff

DNR, Office of Planning

C. July 1984.

D. 1984-85 biennium--$5,000 for data entry and computer time.

22. A. Computerize the forest road inventory system.

B. DNR, Division of Forestry
- Forest Management Staff
- Forest Information Management Staff

C. The computerized system will be developed during the 1986-87 biennium--the implementation of the system will be an ongoing function.

D. 1986-87 biennium--$10,000 for data entry and computer time--implementation of the system will be included in regular operating budgets.

23. A. Review all right-of-way documents and resolve any problems that exist.

B. DNR, Division of Forestry
- Forest Management Staff
- Forestry Field Personnel

C. July 1985.

D. Cost included in the salaries and expenses of Forest Road Supervisor and Forest Road Specialist positions.

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Gossary of Terms

GLOSSARY OF TERMS

Abandonment. The practice of relinquishing control and discontinuing regular maintenance on roadways determined to no longer serve a valid forestry purpose.

Accessibility. The ease with which an area can be reached or entered.

Bridge. A structure, including supports, erected over a depression or obstruction such as water, a trail, or a railway, and having a floor for carrying traffic or other moving loads.

County Road. A road established and designated under the sole authority of the county board.

County State Aid Highway. A road or street established and designated under county jurisdiction in accordance with Minnesota Statutes, Chapter 162.

Culvert. A conduit or passageway under a road.

Developed Recreation. Outdoor recreation involving a concentration of visitors on a relatively small area.

Dispersed Recreation. Outdoor recreation in which visitors are diffused over relatively large areas.

Easement. A right to use or control property for a designated purpose.

Forest Road. Any permanent roadway constructed and maintained for the purpose of accessing forest lands. Forest roads may be administered by the state, counties, townships or local units of government, private industry, federal agencies or private landowners. (cf. state forest road)

Off-Road Vehicles (ORV's). Vehicles such as motorcycles, all-terrain vehicles, four-wheel drives and snowmobiles.

Right-of-Way. A general term denoting land, property or interest therein, usually in a strip, acquired, devoted or preserved for transportation purposes.

Road. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Roadbed. The graded portion of a road representing its top and side slopes, prepared as a foundation for travel.

Road Development Standards. A general term applied to all directions, provisions and minimum requirements pertaining to performance of work, and increasing the effectiveness or enhancing the appearance of forest roads.

Roadway. The portion of a road within the limits of construction.

Seasonal Closure. The periodic, temporary closure of roads accessing large forested tracts for the purposes of securing public safety and preventing damage to roads, trails and other resources resulting from vehicular travel.

Shoulder. The portion of a roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of the base and surface courses.

State Forest Road. Any permanent roadway constructed, maintained, or administered by the Minnesota Department of Natural Resources (DNR) for the purposes of accessing or traversing forest lands.

Structures. Bridges, culverts, catch basins, retaining walls, endwalls, underdrains and other features which may be necessary in the design, construction or maintenance of permanent forest roads.

Township Road. A road established by and under the authority of the town board, or reverted to township jurisdiction by the county board.

Appendices

APPENDIX A - STATE FOREST ROAD INVENTORY

FOREST ROAD INVENTORY

Three basic types of information were needed to develop the State Forest Road Plan. First, information on the extent, location and current condition of forest roads was necessary to provide a general overview and assessment of the state forest road system. Second, projected road improvement, maintenance and development needs had to be determined to assist in ranking and scheduling road and bridge projects and to identify possible development opportunities. Finally, administrative and managerial information was collected in order to assess present performance of the roads program and enable the formulation of policy and objectives for its future.

Methods

Inventory information for use in this plan was collected over a four-month period in early 1982 by the Division of Forestry from field units located throughout the state. Detailed survey information was compiled regarding road mileage, use and condition and estimates were made as to long-term maintenance and development needs. Inventory efforts were coordinated through the Forest Management Section in cooperation with Area Silviculturists and Regional forestry staff.

As part of the forest roads inventory, Area and District foresters were asked to complete a series of road inventory forms detailing information on individual forest roads. The inventory forms were designed to provide the following information:

- road number
- road name
- total mileage
- county or counties in which road is located
- total mileage by county
- Division of Forestry Area in which road is located
- road location
- maintenance responsibility

- who originally constructed road
- who funded road construction
- date of road construction
- number of years road has been kept in repair
- lands crossed by roads which are not administered by the Division of Forestry (explanation and related documents)
- number of miles of road by class
- location and condition of bridges
- location and condition of culverts
- recommendations for new road
- justification for new road
- recommendation for road extensions
- justification for road extensions
- recommendations for upgrading existing road
- road maintenance requirements
- estimated road maintenance costs
- purpose of road, including: timber land served (state, county, federal, private)
  fire control
  recreation (facilities and other uses)
  wildlife (areas and other uses)
  other (transportation route, school bus route, private homes, leases)
- recommendation on abandonment or transfer if road is not serving forestry purposes

The inventory process was designed to be ongoing and updatable in order to accommodate changes which occur as a result of road abandonments, transfers or new road development. Rapidly changing social, legal, financial and technical constraints acting on the organization also necessitate periodic updating of road inventory information. Computerization of road inventory information and records is recommended to assist in this process.

Application

Data generated as a result of the 1982 forest road inventory will be used for a variety of purposes. Inventory projections will form the basis for long-

range road planning, budgeting and program development. This information is to be used to facilitate improvement in the operation and administration of the forest road system. Inventory findings document needed improvements, thereby helping to justify long-range capital development requests.

Inventory findings have also been used to generate a series of maps which depict state forest roads in relation to public land ownerships, local vegetation types and proximity to recreational developments. These maps were compiled using survey information and information provided by county highway maps, SCORP maps and by computer generated (MLMIS) maps showing public land ownership and forest cover types.

Two copies of the completed State Forest Road Atlas were prepared for the Division of Forestry's Forest Management staff. The completed atlas shows all state forest roads by county throughout the state and includes copies of road inventory cards and listings of forest road improvement, development and maintenance needs. Modified versions of the atlas showing forest roads by Region and Area were also prepared and distributed to field forestry staff.

Priority Ranking of State Forest Road Projects

Using the state forest road project ranking criteria on page 54, a three phase process was used to assign priority rankings to new road and reconstruction projects submitted during the inventory.

Phase 1 - All projects were evaluated by Area and District personnel and ranked on an Area basis. This resulted in an Area priority ranking.

Phase 2 - All projects were evaluated by Region and Area personnel. This resulted in a Regional priority ranking.

Phase 3 - Regional priorities were reviewed by Forest Management Staff and Regional personnel.

The following charts detail budget projections for statewide and regional forest road needs through the 1988-89 biennium. All costs are in 1982 dollars. Detailed information concerning area and individual road needs is contained

in the inventory on file at the Minnesota Department of Natural Resources, Division of Forestry offices in the Centennial Building, St. Paul, Minnesota.

Budget Projections

1. New Development

Region	New Miles	New Miles by Class 1	2	3	4	5	Approx. Cost Inc. 15% Eng.
I	28.3			3.0	23.3	2.0	707,500
II	27.5		0.5		27.0		687,500
III	36.6			36.6			915,000
V	8.2			8.2			205,000
	100.6		0.5	47.8	50.3	2.0	2,515,000

Approximate cost per mile: $25,000

2. Reconstruction of Roadway

Region	Miles of Reconstruction	Miles of Reconstruction by Class 1	2	3	4	5	Approx. Cost Inc. 15% Eng.
I	288.6		66.9	79.2	120.8	21.7	4,328,250
II	272.9		3.7	178.9	86.6	3.7	4,093,500
III	25.1			23.3	1.8		376,500
V	54.9				54.9		823,500
	641.5		70.6	281.4	264.0	25.4	9,621,750

Approximate cost per mile: $15,000

3. Bridge Repair and Replacement*

Region	Repair Projects	Replacement Projects	Approx. Cost Inc. 15% Eng.
I	9	3	360,000
II	5	1	160,000
III			
V	4		80,000
	18	4	600,000

Approximate cost repair: $20,000 per project
Approximate cost replacement: $60,000 per project

*Bridge repair and replacement estimates are based on inventory findings that the Division of Forestry has responsibility for 45 bridges. To date 28 of these bridges have been inspected by MnDOT and 17 were found to be in need of repair or replacement. The figures indicated above show the number of repair or replacement projects the Division of Forestry feels will be necessary when MnDOT completes inspection of the remaining 17 bridges.

4. Maintenance Per Year

Region	Miles of Road	Maintenance Cost/Year	Maintenance Cost Through 1989
I	752.7	$150,520	$1,053,640
II	576.09	115,416	807,912
III	345.3	69,040	483,280
V	123.6	24,720	173,040
	1,798.5	$359,696	$2,517,872

Approximate cost per mile per year: $200

5. Road Abandonment or Transfer Requests (Proposed Deletions)

Region	Requested Abandonment or Transfer Miles
I	51.2
II	51.0
III	24.6
V	0.0
	126.8

6. Estimated State Forest Road Development and Maintenance Costs by Region (FY 1983-89).

Region	New Development	Reconstruction	Bridges	Maintenance	Total
I	707,500	4,328,250	360,000	1,053,640	6,449,390
II	687,500	4,093,500	160,000	807,912	5,748,912
III	915,000	376,500		483,280	1,774,780
V	205,000	823,500	80,000	173,040	1,281,540
	2,515,000	9,621,750	600,000	2,517,872	15,254,622

7. Projected Biennial Budget Needs

	83	84-85	86-87	88-89	Total
Total Needed	$1,882,696	4,771,642	4,300,142	4,300,142	15,254,622
BWCAW[1]	$ 373,000	700,000	700,000	700,000	2,473,000
Bonding[2]	$1,150,000	--	--	--	1,150,000
Net Needed[3]	$ 359,696	4,071,642	3,600,142	3,600,142	11,631,622

[1]Funds available through BWCAW legislation (P.L. 95-495).

[2]Funds available for betterment of state forest roads and bridges. (Laws of Minnesota 1981, Chapter 304, Section 4).

[3]The $359,696 net funding need for FY 1983 represents total needs for road maintenance. Some BWCAW funds will be available for maintenance of roads in northeastern Minnesota. Limited funds may also be available for maintenance of roads on trust fund lands. However most of the money originally budgeted for road maintenance in the 1982-83 biennium was lost to cuts in the Division's general operations and maintenance account. The result is that the maintenance needs will not be met in 1983.

APPENDIX B - ANNOTATED LEGAL BIBLIOGRAPHY

STATE FOREST ROADS - GENERAL PROVISIONS

Minnesota Statutes 1980. Section 84.027. Outlines the powers and duties of the Commissioner, including procedures for the selection, appraisal, and acquisition of lands.

Minnesota Statutes 1980. Section 84.63. Relates to conveyance of easements or interests in lands to the state and federal governments for construction of highways, roads and trails.

Minnesota Statutes 1980. Section 88.09. Pertains to forest fire protection and the acquisition of lands for fire protection purposes, inclduing road building.

Minnesota Statutes 1980. Section 88.22. Authorizes the closure of state forest roads and trails for the purpose of forest fire protection and proper maintenance of state forests.

Minnesota Statutes 1980. Section 89.031. Grants general management and control authority over state forests to the Commissioner of Natural Resources.

Minnesota Statutes 1980. Section 89.032. Grants land acquisition authority for administrative sites and road rights-of-way within state forests.

Minnesota Statutes 1980. Section 89.18. Sets regulations governing roads that cross state forest lands. Establishes system of permits.

Minnesota Statutes 1980. Chapter 160. General provisions relating to roads, including dedication of public roads.

Minnesota Statutes 1980. Section 164.08. Pertains to township roads and cartways.

Minnesota Statutes 1980. Section 541.02. Limits actions to recover real estate subject to adverse possession.

Minnesota Laws 1982. Chapter 511. Forest Resource Management Act of 1982. Establishes a forest resource management policy and plan, including a forest road policy which instructs the Commissioner to provide a system of roads and trails adequate to manage, protect, and develop state forest lands; requires inventory, classification and mapping of roads and the development of road improvement priorities and funding alternatives for financing the state forest road system; provides for the establishment of a Forest Management Fund which may be used, in part, for road improvements.

APPENDIX C - FOREST ROADS TASK FORCE MEMBERS

NAME	AFFILIATION	POSITION
Carson Berglund	Division of Forestry	Fire Protection Specialist
Cliff Carlson	Division of Forestry	Area Forester
Hubert Larson	Division of Forestry	Area Forester
Robert Maki	Division of Forestry	Area Silviculturist
Roger Manninen	Bureau of Engineering	Regional Engineer
C. Barry Morse	Division of Forestry	Silviculturist
Jim Weseloh	Division of Forestry	Forest Planner
Lawrence Westerberg	Division of Forestry	District Forester

APPENDIX D - COOPERATIVE AGREEMENTS WITH U.S. FOREST SERVICE

Superior National Forest Supplemental Agreement No. 1
Road Operation and Use

Chippewa National Forest Supplemental Agreement No. 6
Road Operation and Use

Chippewa National Forest Supplemental Agreement No. 1
Primitive Roads

DEPARTMENT OF NATURAL RESOURCES
STATE OF MINNESOTA

UNITED STATES FOREST SERVICE
SUPERIOR NATIONAL FOREST

SUPPLEMENTAL AGREEMENT NO. 1
(ROAD OPERATION AND USE)

This Supplemental Agreement is made and entered into this 3rd day of November, 1981; in accordance with the provisions of the Memorandum of Understanding dated March 18, 1981, between the Commissioner of the Department of Natural Resources and the Supervisor of the Superior National Forest.

WHEREAS, the Department and the Forest Service are responsible for the protection, administration and management of intermingled State lands and National Forest lands within the boundaries of the Superior National Forest, and

WHEREAS, the existing National Forest road system is often used concurrently for access to National Forest and DNR lands for protection, administration and management activities,

NOW, THEREFORE, it is mutually agreed as follows:

1. The Department of Natural Resources will require that their Timber Sale Contractors obtain road use permits from the Forest Service whenever a National Forest system road is used for hauling.

2. The Forest Service and the DNR agree to review any proposed DNR sale road connection to a system road prior to construction. The District Ranger and the Area Forester will coordinate the review. Road approaches will be constructed with proper drainage and the intersection angle will be a minimum of 75 degrees.

3. Forest Service road construction operation and use plans will be reviewed annually with DNR personnel. This review should be performed at the same time the District Ranger and the Area Forester exchange timber sale information.

4. This Agreement may be terminated by either party, following a thirty (30) day written notice of one party to the other.

IN WITNESS WHEREOF, the parties hereto have executed this Supplemental Agreement as of the day and year hereinabove written.

DEPARTMENT OF NATURAL RESOURCES

By: Joseph N. Alexander
COMMISSIONER

Title: _____

UNITED STATES FOREST SERVICE

By: Richard B. Lee
FOR

Title: Forest Supervisor

APPROVED AS TO FORM AND EXECUTION:

WARREN SPANNAUS

By: Robert C. Johnson
Special Assistant Attorney General

Date: 11/3/81

DEPARTMENT OF NATURAL RESOURCES
STATE OF MINNESOTA

UNITED STATES FOREST SERVICE
CHIPPEWA NATIONAL FOREST

SUPPLEMENTAL AGREEMENT NO. 6

(ROAD OPERATION AND USE)

This Supplemental Agreement is made and entered into this 22nd day of October, 1981; in accordance with the provisions of the Memorandum of Understanding dated December 28, 1976, between the Commissioner of the Department of Natural Resources and the Supervisor of the Chippewa National Forest.

WHEREAS, the Department and the Forest Service are responsible for the protection, administration and management of intermingled State lands and National Forest lands within the boundaries of the Chippewa National Forest, and

WHEREAS, the existing National Forest road system is often used concurrently for access to National Forest and DNR lands for protection, administration and management activities,

NOW, THEREFORE, it is mutually agreed as follows:

1. The Department of Natural Resources will require that their Timber Sale Contractors obtain road use permits from the Forest Service whenever a National Forest system road is used for hauling, except when such road use is already provided for in Supplemental Agreement No. 1, (Primitive Roads).

2. The Forest Service and the DNR agree to review any proposed DNR sale road connection to a system road prior to construction. The District Ranger and the Area Forester will coordinate the review. Road approaches will be constructed with proper drainage and the intersection angle will be a minimum of 75 degrees.

3. Forest Service road construction operation and use plans will be reviewed annually with DNR personnel. This review should be performed at the same time the District Ranger and the Area Forester exchange timber sale information.

4. This Agreement may be terminated by either party, following a thirty (30) day written notice of one party to the other.

IN WITNESS WHEREOF, the parties hereto have executed this Supplemental Agreement as of the day and year hereinabove written.

Department of Natural Resources
State of Minnesota

United States Forest Service
Chippewa National Forest

Supplemental Agreement No. 1

(Primitive Roads)

This Supplemental Agreement is made and entered into this 28th day of December, 1976, in accordance with the provisions of the Memorandum of Understanding dated December 28, 1976, between the Commissioner of the Department of Natural Resources and the Supervisor of the Chippewa National Forest.

WHEREAS, the Department and the Forest Service are responsible for the protection, administration, and management of intermingled State lands and National Forest lands within the boundaries of the Chippewa National Forest, and

WHEREAS, access to many tracts presently exists in the form of primitive roads and trails across lands administered by the Department and the Forest Service, and

WHEREAS, certain such roads and trails will, with minor maintenance, provide adequate access for purposes of protection, administration and management activities,

NOW, THEREFORE, it is mutually agreed as follows:

1. To jointly examine the need for use of existing primitive roads across lands administered by both parties for access to lands administered by the Department of Natural Resources and the Chippewa National Forest. A primitive road is defined an existing low standard road which is not graded and drained or surfaced.

2. To prepare a schedule and maps identifying those existing primitive roads crossing State and National Forest lands which are jointly agreed to as being necessary to provide access for protection, administration and management activities for either or both agencies.

3. Those portions of agreed upon primitive roads needed for access to either party's land, crossing lands administered by the other party, shall be listed on a schedule designated as Schedule A, to be attached to and made a part of this Agreement. Maps shall be identified on the map and on the schedule as "Map #1," "Map #2," etc., and shall be filed in the offices of the Commissioner and the Forest Supervisor. Schedule A shall individually list the roads covered by the Agreement and shall show: (1) Map Number; (2) National Forest lands crossed (Twp., Rge., Sec., Subdiv., miles); (3) State lands crossed (Twp., Rge., Sec., Subdiv., miles); and (4) approval date for both parties. Maps shall be drawn to a minimum scale of 2" - 1 mile or traced from aerial photographs and shall include the following: (1) Map number; (2) scale; (3) photo number if traced from photograph; (4) township, range and section; (5) State Ranger District name and National Forest Ranger District name; (6) mutually agreed upon restrictions on use such as seasonal closure because of soil conditions, disturbance in deer yards, nesting eagles, etc.; (7) Approval Block (date and signature

of Commissioner of Natural Resources and Forest Supervisor or their delegated representatives).

4. Proposals for addition of roads or segments of roads may be made by either party to the other. Additions shall become effective upon approval of the map by both parties.

5. When roads or segments of roads are no longer needed by either party, deletion of the roads or segments shall become effective upon written agreement of both parties.

6. Changes in conditions of use for roads or segments of roads covered under this Agreement shall become effective upon written agreement of both parties.

7. To permit the other party, its contractors and permittees to use the primitive roads shown on approved plats and Schedule A subject to the restrictions on use shown on the approved maps and Schedule A, for access to State or National Forest Lands for protection, administration, and management activities.

8. Improvement and maintenance on roads or segments of roads located on lands administered by the other party shall be limited to brushing, grading, and minor road repairs such as filling holes and replacing or constructing temporary bridges and culverts.

9. When roads covered by this agreement are used in conjunction with projects such as timber sales, impoundment construction, planting or shearing projects,

etc., which result in damage to the roadway, those portions of the damaged roadway located on lands administered by the other party shall be leveled and seeded to a grass mixture suitable for soil stabilization and beneficial to wildlife.

10. This Agreement, or any road or segment of road covered by this Agreement may be terminated by either party, following a thirty (30) day written notice of one to the other, provided that access for an existing timber sale or contract, or any contract which is in the process of being advertised, shall continue for the period of the sale or contract.

IN WITNESS WHEREOF, the parties hereto have executed this Supplemental Agreement as of the day and year first hereinabove written.

DEPARTMENT OF NATURAL RESOURCES

By: _____
Title: Deputy Commissioner

UNITED STATES FOREST SERVICE

By: _____
Title: Forest Supervisor
Chippewa National Forest

APPROVED AS TO FORM AND EXECUTION

WARREN SPANNAUS

By: _____
Special Assistant Attorney General

Date: 1/13/77