Tongass National Forest

Forest-Level Roads Analysis

Prepared for
Tongass National Forest
Region 10
USDA Forest Service

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Executive Summary

This roads analysis is prepared at the Forest-level scale for the Tongass National Forest (Tongass or the Forest). It is focused mainly on maintenance level (ML) 3, 4, and 5 roads, which are designed for travel by passenger vehicles, and other roads of high public interest. The Tongass manages approximately 5,000 miles of road, of which about 1,200 (24 percent) are ML 3, 4, or 5 roads. The objective of roads analysis is to provide decision-makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

The specific objectives of the analysis include the following:

- Identify the appropriate long-term road system for ML 3, 4, and 5 roads;
- Utilize Tongass Land and Resource Management Plan (TLMP) and other Forest-wide decision documents for guidance;
- Optimize Alaska Marine Highway and recreation access;
- Meet community needs for connectivity and subsistence uses;
- Identify appropriate road upgrading opportunities leading to incorporation in the State Highway System or operated as system public roads; and
- Identify opportunities to reduce management costs.

The total annual maintenance costs for National Forest System (NFS) roads on the Tongass were $11.9 million for 2001. ML 3, 4, and 5 roads accounted for $8.6 million or 73 percent of this total, with ML 3 roads alone accounting for 69 percent of the total. Noncritical maintenance costs comprised 87 percent of total maintenance costs for ML 3, 4, and 5 roads in 2001, with the non-critical Forest Service mission category accounting for 72 percent of the total.

The interdisciplinary team (IDT) identified key issues concerning ML 3, 4, and 5 roads based upon the 1997 TLMP, the draft Supplemental Environmental Impact Statement (SEIS) for the Forest Plan Roadless Area Evaluation for Wilderness Recommendations, and project-level National Environmental Policy Act (NEPA) documents and analyses completed since 1997. These issues were relevant to seven broad areas of concern, including:

- Funding for road maintenance;
- Jurisdiction of ML 3, 4, and 5 roads;
- ML 3, 4, and 5 road use for subsistence;

- Social and economic use of the ML 3, 4, and 5 road system;
- Road use for recreation and tourism;
- Fish passage, fish habitat, and water quality; and
- Wildlife and threatened, endangered, or sensitive species.

To assess the benefits, problems, and risks posed by the current road system, the IDT evaluated the management scheme for the current road system with a number of tools, including road system mapping; road management objectives developed from a geographic information system and databases; capital investment and road maintenance budget projections; Forest cost guides; an extensive number of photos of road features; and the road conditions survey (RCS) database.

The key findings of this analysis include the following:

- The availability of ML 3, 4, and 5 roads in Southeast Alaska is sufficient to satisfy local demand for roaded recreation, subsistence, and community connectivity needs and demands in most districts.
- There is a need to expand the access to roaded recreation by visitors from cruise ships via marine access points.
- There is a need to upgrade ML 3 roads that serve as community connectors and major recreation and subsistence routes to public road status.
- The RCS database upgrade needs include a more robust software platform, a change in the database structure, a QA/QC process, and a link to the budget estimation process.
- Deferred maintenance costs appear to be substantially underestimated in the 2001 deferred maintenance costs report, primarily due to costs for fixing fish passage problems at road-stream crossings.
- The fish passage and sedimentation maintenance costs should be considered part of the critical categories of the deferred maintenance cost schedule.
- There is also a need for project or area-level road analyses to effectively manage the ML 1 and 2 roads in combination with ML 3, 4, and 5 roads.

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ACRONYMNS AND ABBREVIATIONS

ANILCA	Alaska National Interest Lands Conservation Act
BMPs	Best Management Practices
EA	Environmental Assessment
EIS	Environmental Impact Statement
FH	Forest Highway
Foster Wheeler	Foster Wheeler Environmental Corporation
FSM	Forest Service Manual
IDT	Interdisciplinary Team
INFRA	Infrastructure Application
MAP	Marine Access Point
ML	Maintenance Level
NEPA	National Environmental Policy Act
NFS	National Forest System
RA	Roads Analysis
RCS	Road Condition Survey
ROS	Recreation Opportunity Spectrum
SEIS	Supplemental Environmental Impact Statement
SO	Supervisor’s Office
SR	State Route (Highway)
TLMP	Tongass National Forest Land and Resource Management Plan
TSL	Traffic Service Level

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Introduction

This roads analysis is prepared at the Forest-level scale for the Tongass National Forest (Tongass or the Forest). It is focused on maintenance level (ML) 3, 4, and 5 roads, which are roads designed for travel by passenger vehicles. In August 1999, the Washington Office of the USDA Forest Service published Miscellaneous Report FS-643, *Roads Analysis: Informing Decisions about Managing the National Forest Transportation System.* The objective of roads analysis is to provide decision-makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

In October 1999, the agency published Interim Directive 7710-99-1 authorizing units to use, as appropriate, the roads analysis procedure embodied in FS-643 to assist land managers in making major road management decisions.

On January 12, 2001, the Forest Service issued the final policy (66 CFR 3219, Forest Transportation System) and rule (66 CFR 3206, Administration of the Forest Development Transportation System; Prohibitions; Use of Motor Vehicles Off Forest Service Roads) that govern the national forest transportation system and its administration. The rule and policy revise regulations concerning the management, use, and maintenance of the national forest transportation system. The final rule and policy are intended to help ensure that additions to the National Forest System (NFS) road network are essential for resource management and use; that construction, reconstruction, and maintenance of roads minimize adverse environmental effects; and that unneeded roads are decommissioned and restoration of ecological processes are initiated. (A list of the laws and regulations governing road operations is located in Appendix A.)

The new forest transportation system policy direction, which was issued in Amendment No. 7700-2001-2 to Forest Service Manual (FSM) 7700 (Transportation System) and also became effective on January 12, 2001, helps guide the implementation of the new roads policy. Included in the amendment is a requirement that decisions on the addition of new roads be informed by roads analysis and that Forest-scale road analyses primarily covering ML 3, 4, and 5 roads be completed by January 13, 2003 (Sections 7712.14 and 7712.15). It also requires that roads analysis be used to evaluate opportunities and priorities for reconstruction and decommissioning of roads. Further, it requires that decisions on changes in access or road-related actions that may have adverse effects on soil and water resources, ecological processes, or biological communities, be informed by roads analysis.

FSM 7712.1 provides the following information for the Roads Analysis process:

The Responsible Official shall incorporate an interdisciplinary science-based roads analysis into multi-forest, forest-scale, and watershed or area-scale analyses and assessments to inform planners and decisionmakers of road system opportunities, needs, and priorities that support land and resource management objectives. Conducted by an interdisciplinary team (IDT), the science-based roads analysis process provides Responsible Officials with critical information needed to identify and manage a minimum road system that is safe and responsive to public needs and desires; is affordable and efficient; has minimal adverse effects on ecological processes and ecosystem health, diversity, and productivity of the land; and is in balance with available funding for needed management actions.

Units are to use an authorized science-based roads analysis process, such as that described in the report *Roads Analysis: Informing Decisions About Managing the National Forest Transportation System* (USDA Forest Service 1999, Misc. Report FS-643). Pursuant to FSM 7710.41, the Deputy Chief, National Forest Systems, may approve other science-based analysis methods for field use through amendments to this chapter. Although completion of an initial roads analysis is important, additional iterations of analysis may be needed to address changes in conditions, such as available funding, inventory and monitoring results, severe disturbance events, or new regulatory requirements.

FSM 7712.13b, Roads Analysis at the Forest or Area Scale, further provides guidance for this Roads Analysis:

Roads analysis at the forest scale is critically important, as it provides a context for road management in the broader framework of managing all forest resources. Close coordination with broader scale ecosystem assessments and analyses is essential. Area-scale assessments may be appropriate on forests with assessment areas composed of islands or groups of islands, on forests with widely separated units, or in areas where watershed boundaries do not make logical or effective assessment boundaries. Examples include forests with large physically or ecologically discrete subdivisions, such as the large islands in Southeast Alaska, or widely separated units of National Forests, including National Forests in Texas, Mississippi, Florida, Missouri, and Louisiana, or on forests where watershed boundaries do not make logical or effective assessment boundaries (i.e., the coastal plains of the eastern United States).

1. Consider the following at this scale:

    a. Environmental issues potentially affected by road management proposals, such as soil and water resources, ecological processes, and invasive species spread and biological communities.

    b. Social issues potentially affected by road management proposals, such as socio-economic impacts, public access, and accessibility for handicapped persons.

    c. An evaluation of the transportation rights-of-way acquisition needs.

    d. The interrelationship of state, county, tribal, and other federal agency transportation facility effects on land and resource management plans and resource management programs.

    e. Transportation investments necessary for meeting resource management plans and programs.

    f. Current and likely funding levels available to support road construction, reconstruction, maintenance, and decommissioning.

2. Prepare a report with accompanying map(s) that documents the information and analysis methods used to identify access and environmental priorities, issues, and guidelines for future road management and the key findings. At a minimum, the report will include the following:

   a. Inventory and map all classified roads, and display how these roads are intended to be managed.

   b. Provide guidelines for addressing road management issues and priorities related to construction, reconstruction, maintenance, and decommissioning.

   c. Identify significant social and environmental issues, concerns, and opportunities to be addressed in project level decisions.

   d. Document coordination efforts with other government agencies and jurisdictions.

This roads analysis follows the six-step process prescribed by FSM 7712 and Forest Service Miscellaneous Report FS-643. The document is divided into five steps:

1) Setting up the Analysis
2) Describing the Situation
3) Identifying Issues
4) Assessing Benefits, Problems, and Risks
5) Describing Opportunities and Setting Priorities

The sixth step of the process is this publication, which describes the results of the analysis.

Project Area Description

The 16.8-million acre Tongass National Forest occupies about 7 percent of the area of Alaska. The Tongass is located in Southeast Alaska, the area commonly called the panhandle of Alaska, and extends from Dixon Entrance in the south to Yakutat in the north; it is bordered on the east by Canada and on the west by the Gulf of Alaska. The Tongass National Forest extends approximately 500 miles north to south, and approximately 120 miles east to west at its widest point. Figure 1 is a vicinity map of the Tongass National Forest.

The Tongass includes a narrow mainland strip of steep, rugged mountains and icefields, and more than 1,000 offshore islands known as the Alexander Archipelago. Together, the islands and mainland have nearly 11,000 miles of meandering shoreline, with numerous bays and coves. A system of seaways separates the many islands and provides a protected waterway called the Inside Passage. Federal lands comprise about

Insert Figure 1 (Vicinity Map of Tongass National Forest)

95 percent of Southeast Alaska, with about 80 percent in the Tongass National Forest (and most of the rest in Glacier Bay National Park and Preserve). The remaining land is held in State, Native corporation, and other private ownerships.

Most of the area of the Tongass is wild and undeveloped. Approximately 73,000 people inhabit Southeast Alaska, most living in 32 communities located on island or mainland coasts. Only eight of the communities have populations greater than 1,000 persons. Most of these communities are surrounded by, or adjacent to, National Forest System land. Only three towns are connected to other parts of the mainland by road: Haines and Skagway to the north, and Hyder to the south.

The economies of Southeast Alaska's communities are largely dependent on the Tongass National Forest to provide natural resources for uses, such as fishing, timber harvest, recreation, tourism, mining, and subsistence. Maintaining the abundant natural resources of the Forest, while also providing opportunities for their use, is a major concern of Southeast Alaska residents.

Ranger District offices on the Tongass National Forest are located in Yakutat, Juneau, Hoonah, Sitka, Petersburg, Wrangell, Thorne Bay, Craig, and Ketchikan. There are also two National Monuments (Admiralty Island and Misty Fiords) with offices in Juneau and Ketchikan (see Figure 1).

The Tongass manages approximately 5,000 miles of road, of which about 1,200 (24 percent) are ML 3, 4, or 5 roads. These roads are designed and maintained for passenger vehicles. A more complete description of MLs is provided under Step 2 – Describing the Situation and in Appendix B. Under the Tongass National Forest Land and Resource Management Plan (TLMP) of 1997, land is allocated into 18 land use designations (LUDs) for management purposes. TLMP provides management direction on the acceptability of roads in each of the LUDs (Table 1). On a mile per square mile basis, the Modified Landscape and Recreational River LUDs have the highest density of ML 3, 4, and 5 roads with 0.18 mile per square mile. The Timber Production LUD and Scenic Viewshed LUD have the next highest ML 3, 4, and 5 road density with 0.16 and 0.14 mile per square mile, respectively.

Table 1. Land Use Designation Area, Road Acceptability under TLMP, and Miles of Maintenance Level 3, 4, and 5 Roads.

LUD	Acreage	Road Acceptability	Miles of ML 3, 4, 5 Roads
Wilderness	2,622,913	No, except ANILCA Access	0.0
Wilderness National Monument	3,098,820	No, except ANILCA Access	0.0
Non-wilderness National Monument	163,654	No, except ANILCA Access	5.8
Research Natural Area	59,545	No	0.0
Special Interest Area	297,173	Yes, as related to the needs of the special interest	6.0
Remote Recreation	2,129,169	No, except ANILCA Access	0.3
Enacted Municipal Watershed	45,776	Yes, if associated with Municipal Watershed administration or salvage logging	0.0
Old-growth Habitat	1,131,059	Generally no, unless no other alternative route	128.6
Semi-remote Recreation	2,941,350	Yes, but generally low standard roads, except to link existing roads or access adjacent LUDS	25.3
Land Use Designation II	719,000	Yes, but only to provide linkages between adjacent LUDs for vital transportation needs	0.0
Wild River	129,650	No, except ANILCA Access	2.8
Scenic River	36,460	Yes, but must be compatible with Scenic River classification	1.1
Recreational River	36,470	Yes, but must be compatible with Recreational River classification	10.0
Experimental Forest	17,260	Yes	0.0
Scenic Viewshed	496,613	Yes	104.8
Modified Landscape	622,387	Yes	175.7
Timber production	2,580,821	Yes	632.7
Minerals[1/]	166,215	Yes	
Non-National Forest			115.0
Total ML 3, 4, or 5 Road Miles[2/]			1,208.1

[1/] The Mineral LUD is applied to the same area as other LUD designations. Consequently, no road miles were accounted for under this LUD.
[2/] In some locations, more than one LUD may be applied to the same area. Consequently, total area is not calculated.
ANILCA – Alaska National Interest Lands Conservation Act

STEP 1 - SETTING UP THE ANALYSIS

Purpose of Analysis

The main purpose of this analysis is to provide road management information to support Forest-wide road management decisions, and to provide long-term road management direction for the Forest relative to the ML 3, 4, and 5 road system.

Objectives of Analysis

This roads analysis is being conducted at the Forest-scale for the Tongass National Forest. The specific objectives of the analysis include the following:

- Identify the appropriate long-term road system for ML 3, 4, and 5 roads;
- Utilize TLMP and other Forest-wide decision documents for guidance;
- Optimize Alaska Marine Highway and recreation access;
- Meet community needs for connectivity and subsistence uses;
- Identify appropriate road upgrading opportunities leading to incorporation in State Highway System or operated as system public roads; and
- Identify opportunities to reduce management costs.

Typical ML 3 arterial road surfaced with aggregate.

Table 2. Interdisciplinary Team Members.

Name	Responsibility
Alan Olson	IDT Leader/Aquatic/Riparian/Geology
Walt Weaver	Road Engineering
John Ostendorff	Forestry/Road Engineering
Steve Negri	Wildlife
Mike Hall	Wetlands/Wildlife
Matt Dadswell	Socioeconomics/Recreation

Information Sources

This analysis is based on existing information, including:

- Tongass Land Management Plan (1997);
- Geographic Information System (GIS) data;
- Infrastructure Application (INFRA) data on road dispositions and management objectives;
- Road Condition Survey data;
- Maintenance plan and budgeting information;
- Recreation master planning documents;
- Forest Service manuals and handbooks outlining requirements of the Roads Analysis process (FSM-7710, Misc. Report FS 643);
- Input and other information previously gathered from the public through collaborative stewardship efforts;
- Existing decision documents (Environmental Impact Statement [EISs] and Environmental Assessments [EAs]);
- Existing Road Analyses conducted at smaller scales; and
- Draft SEIS on Roadless Area Evaluation and appendices addressing values and projects, including roads under consideration in roadless areas.

Plan for Analysis

The general tasks required for this roads analysis include the following:

- Collect and review existing data, surveys, and reports;
- Identify issues and alternatives;

- Conduct analysis of issues and identify road-related resource effects;
- Identify management opportunities; and
- Develop final report.

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Step 2 – DESCRIBING THE SITUATION

This section includes a summary of the commonly used terms and definitions in this report, a description of the TLMP guidance for the Forest, a description of the existing road system, and a description of road management in the Forest. Maps of the Forest showing the road system are presented in Figure 2 through Figure 12. A summary of road length by ranger district and maintenance level is presented in Table 3.

Terms and Definitions

The following commonly used terms are found throughout this report and are defined below.

Road: As used in this document, a road is a motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

Classified Roads: Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for motor vehicle access, such as State roads, County roads, privately-owned roads, National Forest System roads, and roads authorized by the Forest Service that are intended for long-term use.

Public road: A road open to public travel under the jurisdiction of and maintained by a public authority, such as states, counties, and local communities.

Private road: A road under private ownership authorized by an easement to a private party, or a road that provides access pursuant to a reserved or private right.

National Forest System Road: A classified forest road under jurisdiction of the Forest System. The term "National Forest System road" is synonymous with the term "Forest development road," as used in 23 U.S.C. 205.

Unclassified Roads: Roads on National Forest System lands that are not needed for, and not managed as part of, the forest transportation system, such as unplanned roads, abandoned travelways, off-road vehicle tracks that have not been designated and managed as a trail, and those roads no longer under permit or authorization.

Temporary road: Roads authorized by contract, permit, lease, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management.

Maintenance Levels:

- Level 1 – Closed more than 1 year
- Level 2 – High-clearance vehicles

- Level 3 – Passenger vehicles; surface not smooth
- Level 4 – Passenger vehicles; surface smooth
- Level 5 – Passenger vehicles; dust free; possibly paved

The Forest assigns roads both an operational and objective maintenance level. Operational levels represent the current status of the road. The objective level represents the intention to upgrade or downgrade the road at a future time.

Traffic Service Levels:

- A: Free flowing, mixed traffic; stable; smooth surface; provides safe service to all traffic
- B: Congested during heavy traffic, slower speeds, and periodic dust; accommodates any legal-size load or vehicle
- C: Interrupted traffic flow; limited passing facilities; may not accommodate some vehicles; low design speeds; unstable surface under certain traffic or weather
- D: Traffic flow is slow and may be blocked by management activities; two-way traffic is difficult; backing may be required; rough and irregular surface; accommodates high clearance vehicles; single purpose facility

Further detail regarding MLs and traffic service levels (TSLs) may be found in Appendix B and C, respectively.

Marine Access Points (MAPs): MAPs are shoreline locations where the public commonly accesses the Forest. Many MAPs were, or are, log transfer facilities when timber harvest activities occur in the area and are associated with a local road system. Some MAPs may not have any associated structures, but they still receive regular public use.

Table 3. Maintenance Level 3, 4, and 5 (Operational) Road Miles in the Tongass National Forest.

Administering Ranger District	Maintenance Level			Total
	3	4	5	
Admiralty National Monument	14.3	0.0	0.0	14.3
Craig	75.0	0.0	0.0	75.0
Hoonah	113.1	0.0	0.0	113.1
Juneau	15.8	2.2	0.4	18.4
Petersburg	347.5	0.0	0.1	347.6
Sitka	42.6	4.1	0.0	46.7
Thorne Bay	410.8	8.3	0.0	419.1
Wrangell	157.8	0.0	0.0	157.8
Yakutat	13.3	0.0	0.0	13.3
Ketchikan	0.8	2.0	0.0	2.8
Grand Total	1,191.0	16.6	0.5	1,208.1

Land Management Plan Guidance

The 1997 TLMP assigned management prescriptions to 18 different LUDs, which included the goals, objectives, and desired conditions within each LUD. The transportation standards and guidelines for each LUD are summarized below.

Wilderness: New roads are not permitted, except to access surrounding state and private land and valid mining claims or for access authorized under the Alaska National Interest Lands Conservation Act (ANILCA). Existing roads are to be closed unless authorized under ANILCA.

Wilderness National Monument: New roads are not permitted, except to access surrounding state and private land and valid mining claims or for access authorized under ANILCA. Existing roads are to be closed to public use unless authorized under ANILCA.

Nonwilderness National Monument: New roads are not permitted, except to access surrounding state and private land and valid mining claims or for access authorized under ANILCA. Existing roads are to be closed to public use unless authorized under ANILCA.

Remote Recreation: New Roads are not permitted except to access valid mining claims. Existing roads are to be closed to public use unless authorized under ANILCA.

Research Natural Area: Unless otherwise provided by law, roads are not permitted unless they contribute to the objectives or protection of the area.

LUD II: Existing roads are generally closed to highway vehicular use. Proposed roads should provide vital Forest transportation system linkage, or should serve authorized activities, such as mining, power, and water developments; aquaculture developments; or transportation needs determined by the State of Alaska.

Wild River: New Roads are not permitted, except to access valid mining claims and for transportation corridors authorized under ANILCA. Existing roads are to be closed to public use unless authorized under ANILCA.

Scenic River: Roads are allowed that provide access to the river, but must be compatible with the Scenic River classification. Roads should usually be built to Traffic Service Levels C or D.

Experimental Forest: Roads allowed as needed to accomplish the experimental forest objectives or to access other LUDs.

Minerals: The mineral LUD is generally applied on areas in conjunction with another LUD. Roads are allowed, but must be consistent with other resource values, to allow for the exploration and development of mineral resources.

Modified Landscape: Develop and manage cost-effective transportation systems, give special consideration to minimizing apparent landform modification, give special emphasis to fish and wildlife habitat values, and provide recreation access where appropriate.

Enacted Municipal Watershed: Allow roads needed for the routine operation, maintenance, and improvement of the municipal water system and watershed, or if consistent with legislation, establishing the watershed.

Old-Growth Habitat: New road construction is generally inconsistent with this LUD, but new roads may be constructed if no feasible alternative is available. Manage the existing roads to the Old-Growth Habitat objectives.

Special Interest Area: Provide and manage a transportation system compatible with, or which will improve the interpretation of, the unique values of the Special Interest Area. Access to valid mining claims is permitted.

Semi-Remote Recreation: Existing low standard roads are generally managed for use by high clearance or off-highway vehicles. Generally, new roads are not constructed in this area, except to link existing roads or provide access to adjacent LUDs.

Scenic Viewshed: Develop and manage cost-effective transportation systems that integrate resource requirements consistent with LUD direction. Give special consideration to minimizing apparent landform modification, and give special emphasis to maintaining fish and wildlife habitat values. Provide recreation access where appropriate.

Timber Production: Develop and manage cost-effective transportation systems that integrate resource requirements consistent with LUD direction. Consider future recreational access in location and design of roads.

Recreation River: Allow the construction of roads. The river may be readily accessible by road. Roads may parallel the riverbank and be conspicuous in places when viewed from the river.

The Forest has Standards and Guidelines for 22 Resource Areas, including:

- Air
- Beach and Estuary Fringe
- Facilities
- Fire
- Fish
- Forest Health
- Heritage Resources
- Karst and Caves
- Lands
- Minerals and Geology
- Recreation and Tourism
- Riparian
- Rural Community Assistance
- Scenery
- Soil and Water
- Subsistence
- Threatened, Endangered, and Sensitive Species
- Timber
- Trails
- Transportation
- Wetlands
- Wildlife

Many of these Resource Areas have specific guidance related to the transportation system. Forest-wide transportation standards and guidelines, as well as standards and guidelines for each LUD, are located in TLMP.

Generally, most NFS ML 2, 3, 4, and 5 roads on the Forest are considered open for public use. At times, during active log haul, for example, some roads may be closed to public traffic for safety reasons, but these occurrences are occasional and infrequent. All roads are continuously open to non-motorized and foot traffic.

The Standards and Guidelines for recreation in TLMP designate the entire Forest open to off-highway vehicle (OHV) use, unless designated closed in site-specific locations. Because the local terrain and dense vegetation often limit off-road vehicle use, typical OHVs, such as motorcycles, three and four wheelers, and all-terrain vehicles (ATVs), use forest roads (including the ML 3, 4, and 5 road system) for recreation and travel purposes. However, some effects of the OHV use in the Forest is being observed in some locations (see Roaded and Unroaded Recreation in Step 4).

Existing Road System Description

Because of the abundant waterways in Southeastern Alaska and vast areas of undeveloped land, travel by air and water continues to be the primary methods of travel between islands in the region. Historically, marine transportation has been the major method of moving commodities and passengers. During the last three decades, air services have satisfied the growing need for rapid transportation between communities and connections to the contiguous United States and Canada. An extensive roaded transportation system has evolved on the Tongass. Originally built for management of the timber resource, many of these roads have been converted to public use roads, state highways, and forest highways, which is decreasing the demand for air services and increasing demand for ferry transportation between islands.

The approximate 5,000-mile road system is diverse and vital for public use and resource management. The primary use of Forest roads in Southeast Alaska is to provide basic transportation. Most of the roads “out of town” started out as logging roads and were either taken over by the State of Alaska and improved to meet general transportation standards or improved by the Forest Service and remain forest roads. As communities have spread and new communities have developed, the forest roads have often become “main highways” (wide, single-lane, gravel roads). The objective is to work with members of the public to meet their access needs by providing a road system that is safe, stable, and affordable with minimal impact.

The need for Sitka Spruce for aircraft construction during WWII was an early commercial timber use in Southeast Alaska. After WWII, the advent of 50-year timber sale contracts for pulp and paper production resulted in timber harvesting and associated load building in localized areas of the Forest. Increased visitation and scenic viewing from passing ferries and ships dictated the development of more inland routes.

Although constructed to access timber resources, roads are useful for recreation, hunting, and subsistence use by residents. Driving for pleasure is a popular outdoor recreation activity for Southeast Alaska residents. Approximately 76 percent of the entire road system (all MLs) remains open to motorized vehicles and are maintained for multiple use. Over 1,000 miles of the road system connect communities with other communities directly or by access to the Alaska Marine Highway System. Only three communities, including Haines, Skagway, and Hyder, are connected to other parts of the mainland. There are proposals for building roads to connect communities within

Southeast Alaska and to connect Alaska with other cities in Canada (Alaska DOT & PF 1999).

The ML 3, 4, and 5 road system is essentially single lane. The roads and bridges are designed for off-highway loads. Collector and Local roads are approximately 14-feet wide with rough aggregate surfacing. Arterial roads are wide (16-feet), single-lane roads with smoother aggregate surfacing and designed for 30 mile per hour (mph) speeds. Approximately 18 percent (219.5 miles) of ML 3, 4, and 5 roads are surfaced in some manner, including aggregate, asphaltic concrete, bituminous surface treatment, native surfacing, and pavement. The majority of roads do not have a surfacing and are constructed with pit-run crushed rock, but they may have occasional improvements with the use of aggregates.

Fish habitat protection is a primary concern of forest managers because of the high potential of adverse effects from roads and the high importance of the resource to the commercial, recreational, and subsistence fishing stakeholders, and to the public in general. Current Best Management Practices (BMPs) direct that bridges be designed to accommodate a 50 to 75-year storm, and culverts at Class I, II, or III streams for at least a 50-year storm (FSH 2509.22, BMP 14.17). However, new stream crossings are usually designed to accommodate a 100-year storm using stream simulation methods. Designated wetlands are avoided whenever possible.

Whenever a forest road provides a connection between communities and serves local needs such as mail delivery or a school bus route, it can be designated a Forest Highway. Forest Highways are usually upgraded to State highway standards, and jurisdiction may be given to the State. Currently, the State has operation and maintenance responsibility for 181 miles, or about half of the total Forest Highway road miles.

Primary Road functions

Most roads in the Tongass were originally constructed to access areas for timber harvest. However, roads currently have a variety of functions and individual roads may serve multiple functions. The IDT identified the following seven primary functions for roads in the Tongass:

Mainline (Arterial): Roads essential for maintaining access to a roaded portion of the forest. These roads are the main timber haul and commodity routes within the area served, but not community connectors.

Marine Access: Roads associated with state routes leading to and from an Alaska Marine Highway terminal, and roads leading to a Marine Access Point (formerly known as Log Transfer Facilities) with recreation or other public interest.

Community Connectivity: Roads not designated as state routes, regularly used to connect communities, and frequently used for commodities in and out of the forest, but not otherwise defined as “mainline.”

Subsistence – Dispersed Recreation: Forest roads that may have been built for other purposes, but provide general access to areas frequented by subsistence and recreational hunters, anglers, etc. Locals may use these roads simply for driving pleasure.

Administration and Destination Recreation: Access and parking for significant campgrounds, points of interest, and other popular tourist destinations.

Timber Access: Roads built for timber access, not meeting any of the other definitions.

Easement (Special Use, etc.): Roads serving other interests whose access rights are maintained by permit or easement.

Area Road Descriptions

This section of the report briefly describes the ML 3, 4, and 5 road system present on the Tongass. An inventory of roads on the Forest is located in Appendix C. The road system descriptions are grouped primarily by ranger district, but some systems are also grouped according to the island or area in which they occur. These groupings are primarily to provide geographic context for discussion purposes.

Yakutat Ranger District

Yakutat

The Forest road system on the Yakutat Ranger District is located on the mainland. It includes 13.4 miles of ML 3 roads (Figure 2). These roads are accessed via state and city roads, which link the Forest road system to the City of Yakutat, the MAP, and the airport. These roads are primarily used for subsistence and recreation by local residents. Sport fishing by non-residents results in a significant increase in road use between August and October.

Juneau Ranger District

The Forest road system on the Juneau Ranger District is located primarily on the mainland. It includes roads near Berners Bay, Juneau, Homeshore, and Hobart Bay (Figures 3a and 3b). Berners Bay and the Juneau area contain 18.4 miles of ML 3, 4, and 5 roads (Table 3 and 1 MAP [Homeshore]).

Berners Bay

There are two ML 3 roads located on Berners Bay that were constructed for mine access. The Kensington Mine is not active, but the road receives occasional mine-related use.

Juneau Area

The Jualin Mine is no longer active, but the associated access road receives occasional use by hikers and bikers. Other ML 3, 4, and 5 roads closer to Juneau are heavily used for recreation by residents and tourists. These include the driveway and parking lot near the Mendenhall Glacier.

Admiralty National Monument

The Forest road system on Admiralty National Monument is located on Admiralty Island. It includes two ML 3 roads totaling 14.3 miles (Figure 4).

Greens Creek Mine

The Greens Creek Mine Road on the north shore of the Island provides access to the Greens Creek Mine. This road receives little other use.

Angoon Work Center

An ML 3 road provides access to the Angoon Work Center, and it does not serve other functions.

Hoonah Ranger District

The Forest road system on the Hoonah Ranger District is located on Chicagof Island (Figure 5). It includes 113.1 miles of ML 3 roads and 6 MAPs.

Hoonah

A fairly extensive network of ML 3 roads connects Hoonah with MAPs at Whitestone Harbor, False Bay, and Freshwater Bay. These roads are primarily used for subsistence and recreation by residents of Hoonah and the Whitestone Logging Camp, although some Juneau recreationists use the roads to hunt in the Fall. Outfitter/guide use is increasing. The majority of recreation on the Hoonah District occurs on these road systems. These roads are also used for timber management.

Eight Fathom Bight

ML 3 roads connect the MAP in West Port Frederick with the interior of the island. This road system is used primarily for subsistence hunting. The roads are also being kept in the system to maintain future logging options.

Salt Lake Bay

Two ML 3 roads extend southeast and west from the MAP in Salt Lake Bay. These roads are used primarily for subsistence hunting; these roads are also being kept in the system to maintain future logging options.

Sitka Ranger District

The Forest road system on the Sitka Ranger District is located on Chichagof and Baranof Islands (Figure 6). It includes 46.7 miles of ML 3 and 4 roads (Table 3) and 25 MAPs.

Corner Bay

Most use of the road system extending southeast from Corner Bay on Chichagof Island is for timber or silvicultural management and other administrative purposes. These roads also receive some subsistence and recreation use. Most public use of the Corner Bay system comes from Tenakee Springs.

False Island/Chatham

The ML 3 roads in this road system connect MAPs in Sitkoh Bay and Peril Strait on Chichagof Island and also access the interior of the Peninsula. Currently, recreation and subsistence are the most common uses of these roads, but ongoing access for timber and silvicultural management by the Forest Service is also an important function of the road system. There is a new lodge at the False Island MAP, and there is also frequent administrative use of the False Island road system to access a Forest Service field camp. The majority of vehicles used are ATVs, although some pickup trucks are also used. Most users come from Sitka.

Sitka

Two short lengths of ML 3 and ML 4 road adjacent to Sitka on Baranof Island lead to Harbor Mountain and the Blue Lake Campground, respectively. These roads are primarily used by Sitka residents and visitors to the area for recreation, though there is also some subsistence use.

Petersburg Ranger District

The Forest road system on the Petersburg Ranger District is located on Mitkof, Kupreanof, Kuiu Islands (Figure 7). There is also a small road system at Thomas Bay on the mainland. It includes 347.5 miles of ML 3 roads and 0.1 mile of ML 5 road and 8 MAPs.

Kuiu Island

An extensive road system links MAPs at Saginaw Bay and Rowan Bay with Port Camden and the Bay of Pillars. These roads are used for timber management, as well as a considerable amount of recreation and subsistence use. Between 1985 and 1994, more black bears were harvested from the northern (roaded) portion of the island than from anywhere else on the Tongass National Forest. Data indicates that this was primarily recreational hunting.

Kake

Several ML 3 roads link the community of Kake, which includes a ferry terminal, to the interior of Kupreanof Island. The road system also accesses the MAP at Hamilton Bay. The road system is used for timber management, subsistence, and recreation. Most road-based subsistence and recreation users on Kupreanof Island come from Kake. Some local residents have proposed connecting Kake with Petersburg via the Portage Bay roads.

Portage Bay

Several ML 3 roads link the MAP at Portage Bay with the area on both sides of the Bay. The road system is used primarily for timber harvest, but it also receives occasional subsistence and recreation use.

Tonka

ML 3 roads link the east and west sides of the Lindenberg Peninsula with the MAP at Tonka on the Wrangell Narrows, which can be accessed by boat from Petersburg.

While the primary use of these roads is for timber harvest, they are also used for subsistence hunting.

Mitkof Island

Mitkof Island contains an extensive network of ML 3 roads that link MAPs at Blind Slough and Woodpecker Cove with non-Forest roads near Petersburg. The road system is used by residents and tourists for recreation and subsistence. Winter recreation use by the people of Petersburg is an important use.

Thomas Bay

Three ML 3 roads extend south from the MAP at Thomas Bay. Similar to most NFS roads in Southeast Alaska, these roads were originally constructed for timber management; however, for the last 20 years, these roads have been primarily used for recreation and moose hunting.

Wrangell Ranger District

The Forest road system on the Wrangell Ranger District is located on Zarembo, Wrangell, and Elotin Islands (Figure 8). It includes 157.8 miles of ML 3 roads and 10 MAPs.

Zarembo Island

ML 3 roads link the interior and southern coast of Zarembo Island with MAPs at Roosevelt/Deep Bay in the east and St. Johns in the west. Most use of the road system on Zarembo Island is for subsistence, recreation, and timber management. The Roosevelt and St. Johns MAPs are used heavily for subsistence hunting access by residents of Wrangell and, to a lesser extent, Petersburg.

Wrangell Island

Wrangell Island contains an extensive network of ML 3 roads that link MAPs at Earl West Cove on the east side of the island and Pat's Creek on the west with non-Forest roads near the City of Wrangell. The road system also extends to the southern part of the island. The ML 3 road system is used for subsistence and recreation, although the road system may be used for timber management on proposed sales. A loop road is being considered for this area. The heaviest recreation use on the district occurs on the Nemo Loop. Several developed recreation sites occur along this loop, as well as a trail with saltwater access. The loop is popular with residents interested in driving for pleasure. The Southeast Alaska Transportation Plan includes a proposal for a fast ferry terminal at the head of Fools Inlet in the southern part of the island.

Etolin Island

This road system extends from two MAPs on Anita Bay to the western portion of the island. The road system receives some use from subsistence hunters who transport ATVs from Wrangell. A new road system, King George, and MAP have recently been constructed on the island, but they have not yet been added to the GIS layers and INFRA database used in this analysis.

Thorne Bay Ranger District

The Forest road system on the Thorne Bay Ranger District is located on the northern half of Prince of Wales Island (Figure 9). It is the most extensive road system on the Forest and includes 419.1 miles of ML 3 and 4 roads (Table 3) and 14 MAPs. The road system, together with non-Forest roads, link most of the communities on the north half of the island, as well as Klawock and Craig; however, they do not connect with the communities of Port Baker and Port Protection.

An extensive network of ML 3 roads extends throughout the Thorne Bay RD. In addition, a section of ML 4 road extends the State-owned Thorne Bay Road to Naukati Bay, connecting communities in the northern portion of the island with those further south. Forest roads connect most communities on the island with the ferry terminal at Hollis (Craig Ranger District). In addition to the Alaska Marine Highway System, daily service is also provided between Ketchikan and Hollis by the Inter-Island Ferry Authority. A proposed ferry terminal is under consideration at Coffman.

The majority of use on most roads is recreation and subsistence, with some timber management. There are a number of timber sales presently under contract on the Thorne Bay Ranger District that would be accessed via the existing road system. Most people using the road system are residents of the island, but there is a growing component of users from outside the area. The island is especially attractive to visitors because it has an extensive transportation system accessing many recreation areas and because it has regular ferry access.

Craig Ranger District

The Forest road system on the Craig Ranger District is located in the central portion of Prince of Wales Island (Figure 10). It includes 75.0 miles of ML 3 roads and 6 MAPs. The Forest road system connects with the non-Forest road system linking Craig, Klawock, Hollis, and Hydaburg. The ML 3 roads are primarily used for subsistence and recreation by island residents, but the number of out-of-area users is growing steadily. Hunters bring their pickup trucks and ATVs to the island from Ketchikan. Polk Inlet and Twelvemile Arm, both of which were heavily used logging camps less than a decade ago, are now destinations for recreation.

Ketchikan-Misty Fiords Ranger District

Revillagigedo Island

The Forest road system on the Ketchikan-Misty Fiords Ranger District is located on Revillagigedo Island (Figure 11) and on the mainland (Figure 12). It includes 2.8 miles of ML 3 and 4 roads (Table 3) and 10 MAPs, all of which are on Revillagigedo Island. There are no ML 3, 4, or 5 roads on the mainland. The ML 3 and 4 roads are located on the south side of Revilla Road. A short section of a ML 3 road near White River links two sections of non-Forest Service roads. The majority of the roads in the Ketchikan-Misty Fiords Ranger District are ML 1 and ML 2 NSF roads, while the majority of roads accessible from Ketchikan are non-Forest Service roads.

Road Maintenance

Road maintenance costs for the Forest are categorized as annual, deferred, and capital improvement. Within each of these categories, costs are further categorized as critical or noncritical and related to either the Forest Service mission, health and safety, or resource protection. These terms are defined by the Department of Interior's Deferred Maintenance Working Group in "Financial Health - Common Definitions for Maintenance and Construction Terms" (USDI 1998).

> **Annual Maintenance**. Work performed to maintain serviceability, or to repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur.
>
> **Deferred Maintenance**. Maintenance that was not performed when it should have been or when it was scheduled and which was, therefore, put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, an increase in the costs to repair, and a decrease in asset value.
>
> **Capital Improvement**. The construction, installation, or assembly of a new fixed asset, or the significant alteration, expansion, or extension of an existing fixed asset to accommodate a change of purpose.
>
> **Critical Need**. A requirement that addresses a serious threat to public health or safety, a natural resource, or the ability to carry out the mission of the organization.
>
> **Noncritical Need**. A requirement that addresses potential risk to public or employee safety or health, compliance with codes, standards, regulations etc., or needs that address potential adverse consequences to natural resources or mission accomplishment.
>
> **Mission Need**. A requirement that addresses a threat or risk to carrying out the mission of the organization. Needs related to administration and providing services (transportation, recreation, grazing, etc.). Needs not covered by health and safety or natural resource protection.
>
> **Resource Protection Need**. A requirement that addresses a threat or risk of damage, obstruction, or negative impact to a natural resource.
>
> **Health and Safety Need**. A requirement that addresses a threat to human safety and health (e.g., violations of National Fire Protection Association 101 Life Safety Code or appropriate Health Code) that requires immediate interim abatement and/or long-term permanent abatement.

Deferred and capital improvement costs will be discussed in more detail during Step 5 of this analysis. Annual maintenance costs for ML 3, 4, and 5 roads consist of four main cost categories, including drainage, signs and traffic control, vegetation, surface/roadway, and road condition survey activities. Drainage-related activities include cleaning of drainage ditches and culverts. Signs and traffic control activities primarily include replacement of vandalized and deteriorated signage.

Vegetation-related activities include dry seeding and brushing on a 3- or 4-year cycle, depending on whether the road is considered a local, arterial and collector, or paved road. Surface/roadway costs include base course replacement, blading, and repairing paved surfaces, depending on the type of ML 3, 4, or 5 road.

Base maintenance costs for NFS roads on the Tongass are presented in Table 4. These base costs are adjusted by a locality factor and a use factor to obtain maintenance costs for specific roads. The locality factor accounts for increased costs due to items such as availability of equipment and mobilization. The use factor accounts for differences in maintenance needs based on the amount and type of use on a given road.

The total annual maintenance costs for NFS roads on the Tongass were $11.9 million for 2001 (Table 5). ML 3, 4, and 5 roads accounted for $8.6 million or 73 percent of this total. ML 3 roads alone accounting for 69 percent of the total. Noncritical maintenance costs comprised 87 percent of total maintenance costs for ML 3, 4, and 5 roads in 2001, with the non-critical Forest Service mission category alone accounting for 72 percent of the total.

Table 4. Base Annual Maintenance Costs.

Maintenance Level[/1]	Base Cost ($/Mile)[/2]
1	169
2	806
3	1,138
3+ Arterials and Collectors	2,051

[1/] The difference between a ML 3 Local and a ML 3+ Arterial and Collector is determined by the type of surfacing and the way the road is managed.
[2/] These costs exclude the costs for base course replacement and surface rock replacement.

Table 5. Tongass National Forest Annual Maintenance Report, 2001.

	Critical Costs ($)				Non-critical Costs ($)				
ML	**Mission**	**Health & Safety**	**Resource Protection**	**Critical Subtotal**	**Mission**	**Health & Safety**	**Resource Protection**	**Non Critical Subtotal**	**Total**
1		1,260	34,071	35,330	229,683		26,054	255,737	291,068
2		3,032	465,765	468,797	1,972,200		484,473	2,456,672	2,925,470
3		106,149	969,172	1,075,321	5,908,141	7,150	1,204,298	7,119,589	8,194,910
4		5,873	73,584	79,457	321,238	270	44,567	366,075	445,532
5		136	678	813	4,119		733	4,852	5,665
Subtotal ML 3, 4, and 5		112,158	1,043,433	1,155,591	6,233,498	7,420	1,249,598	7,490,516	8,646,107
Total		116,450	1,543,269	1,659,719	8,435,381	7,420	1,760,125	10,202,925	11,862,644
Percent ML 3, 4, and 5 w/in Category		96%	68%	70%	74%	100%	71%	73%	73%
Percent ML 3, 4, and 5 of ML 3, 4, and 5 Total		1.3%	12.1%	13.4%	72.1%	0.1%	14.5%	86.6%	100.0%

Figure 2 Map of Yakutat RD

Figure 2 – page 2

Figure 3a Map of Juneau RD

Figure 3a – page 2

Figure 3b Map of Juneau RD

Figure 3b – page 2

Figure 4 Map of Admiralty NM

Figure 4 – page 2

Figure 5 Map of Hoonah RD

Figure 5 – page 2

Figure 6 Map of Sitka RD

Figure 6 – page 2

Figure 7 Map of Petersburg RD

Figure 7 – page 2

Figure 8 Map of Wrangell RD

Figure 8 – page 2

Figure 9 Map of Thorne Bay RD

Figure 9 – page 2

Figure 10 Map of Craig RD

Figure 10 – page 2

Figure 11 Map of Ketchikan RD

Figure 11 – page 2

Figure 12 Map of Misty Fiords NM

Figure 12 – page 2

STEP 3 – IDENTIFYING ISSUES

Public Involvement

Substantial public involvement has occurred in recent years regarding roads. Public involvement was conducted for the 1997 revision of TLMP and the 2002 Road Rule. More recently, public involvement was conducted for the draft SEIS for the Forest Plan related to roadless area evaluations and wilderness recommendations. Public involvement has also occurred for numerous project-level decisions that included some aspect of road management. Because of the ample public involvement for these decisions, it was determined that no additional public involvement would be necessary to identify key issues for this roads analysis.

Key Issues

Interdisciplinary team members reviewed TLMP, the draft SEIS, and project-level NEPA documents and analyses completed since 1997 to identify road-related issues. The following road-related issues were identified in these documents:

- ♦ The effect of roads on communities (some favored new roads to connect communities, while others did not want improved access).
- ♦ The effect of roads on subsistence (improved access was considered a benefit to some and a detriment to others).
- ♦ The need for roads to maintain an economic timber program to support the local economy.
- ♦ The effect of roads on fish (fish passage and water quality).
- ♦ The effect of roads on recreation and tourism (some favored access for roaded recreation, while others favored maintaining areas for undeveloped recreation).
- ♦ The effect of roads on wildlife (improved access may cause some populations to decline due to increased hunting, both legal and illegal).
- ♦ The effect of new roads on unroaded areas and roadless values.

The interdisciplinary team discussed potential road-related issues during a meeting on August 12, 2002. Specialists subsequently refined the issues related to their resource area. These draft issues were modified based on comments from Forest staff. The order of the presentation of the issues does not reflect any priority for the importance of the issue to the public, Forest Service, or the IDT.

Issue: How does the existing ML 3, 4, and 5 portion of the road system affect the social and economic well being of the communities of Southeast Alaska? How should this portion of the road system be managed to provide for the social and economic well being of these communities? How should this portion of the road system be managed to meet State and Tribal needs? How should this portion of the road system be managed to provide public access to the National Forest?

The road system in Southeast Alaska evolved almost entirely to access timber management sites. Today, some of the Forest roads linking communities have been upgraded and incorporated into the State Highway System. In some areas, such as Prince of Wales Island, transportation networks have been developed between marine access points and existing communities.

The existing road system provides access for timber management, mining, and recreation and tourism activities, which together accounted for approximately 14 percent of total employment in Southeast Alaska in 2001. The marine waters are a major component of the transportation infrastructure. The road system provides access to marine access points and connects some communities with one another. The majority of residents in some communities favor being connected to other communities and transportation systems, while the majority of residents in other communities are against additional roads or marine access points and do not want to be connected to other communities or transportation systems.

Issue: How does the existing ML 3, 4, and 5 portion of the road system affect recreation and tourism, including scenic values? How should this portion of the road system be managed to provide for recreation and tourism, including scenic values?

Outdoor recreation opportunities offered by the Tongass National Forest play an important role in the quality of life for most Southeast Alaska residents. The recreation and tourism industry in Southeast Alaska has grown significantly over the past decade, with visitor-related employment accounting for approximately 11 percent of Southeast Alaska employment in 1999.

Some organizations and individuals believe that there is a need for more roaded recreation opportunities, including access from the marine waters transportation system for tourists. Interest has been expressed in road development at existing marine access points to provide greater access for visitors traveling via the Alaska Marine Highway or by cruise ship. Others believe that roadless areas should remain unroaded. Many families have favorite places where they fish, hunt, beachcomb, hike, or just go to get away. Many value the unique recreation experience offered by the lack of roads and necessity for boat access.

Issue: How does the ML 3, 4, and 5 portion of the existing road system affect the opportunity for subsistence uses by rural residents of Alaska? How should the road system be managed to continue to provide subsistence opportunities?

For many rural Alaskans, subsistence hunting, fishing, trapping, and gathering natural resources provides needed food and supplements rural incomes. Subsistence is also viewed by many, especially Southeast Alaska's Native Americans, as a lifestyle that preserves cultural customs and traditions, reflecting deeply held attitudes, values, and beliefs. Subsistence use varies greatly across the Forest, depending on proximity to subsistence users and the quality of subsistence resources in an area.

Under ANILCA, the Forest Service is required to maintain reasonable access to National Forest System lands for rural residents who depend upon subsistence. Increased road access can result in greater opportunities for subsistence hunting, but it may also lead to greater competition and decreases in the populations of the species on which rural residents depend.

Issue: What are the jurisdictional problems and solutions associated with the ML 3, 4, and 5 portion of the road system?

Approximately 115 miles of ML 3, 4, and 5 roads have been identified as "non-National Forest." In addition, some roads are in an interim "Forest Highway" status, these are roads that may be suitable to become State Highways. The jurisdiction of roads needs to be determined. Some roads are no longer needed for the purposes for which they were constructed. These roads need to be identified.

Issue: Is sufficient funding available to operate the ML 3, 4, and 5 portion of the Forest Road System as a "public road" system?

ML 3, 4, and 5 roads must be safe, properly signed, and maintained for sedan use. Is funding available to properly maintain these roads? Can the maintenance backlog be eliminated?

Issue: How do existing ML 3, 4, and 5 roads affect wildlife populations, including populations of Threatened, Endangered, or Sensitive (TES) species? How can this portion of the road system be managed to better protect wildlife resources?

Existing road use may have direct, indirect, or cumulative effects on wildlife. Direct effects are primarily a concern for large mammals and can include vehicle collisions, increased hunting or poaching, or disturbance during critical life stages (e.g., fawning periods for deer, late-summer feeding periods for bear). Indirect effects include habitat fragmentation, as well as habitat loss secondary to activities that are facilitated by vehicular access (e.g., timber harvest, mining, residential development). Cumulative effects include the extent to which ML 3, 4, and 5 roads allow access to areas served by ML 1 and 2 roads. Such effects are of less immediate concern in the Tongass, where localized habitat degradation may be offset by the widespread availability of unroaded habitat.

Issue: How do the ML 3, 4, and 5 roads affect fish habitat and water quality? How can this portion of the road system be managed to ensure fish passage and better protect fish habitat and water quality?

Freshwater and anadromous fish, and fish habitat, are important to the public, sport and subsistence fishermen, and commercial fishing interests. Roads have the potential to adversely affect fish populations by creating passage barriers and reducing habitat quality through sedimentation, loss of riparian function, and reduced water quality. In order to protect fish populations and habitat, maintenance of roads at stream crossings and in areas of high erosion potential is an important factor affecting maintenance budgets and backlog.

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STEP 4 – ASSESSING BENEFITS, PROBLEMS, AND RISKS

This section reports the results of the interdisciplinary evaluation of the major uses and effects of the ML 3, 4, and 5 road system. It addresses the various benefits, problems, and risks of the road system and whether the objectives of the road system are being met. These benefits, problems, and risks were identified through an IDT process that included answering questions in Forest Service publication FS-643, interviews with Forest Service staff, and IDT meetings to discuss these answers. Complete answers to these questions are presented in Appendix E of this Roads Analysis. A synthesis of the major findings of this IDT process is presented below.

Ecosystem Function

The ML 3, 4, and 5 road system provides some problems and risks to the ecosystem function in the Tongass. In general, these problems and risks are not severe and Forest plan standards and guidelines provide a high level of protection. Also, the Tongass is a relatively pristine area exhibiting a healthy ecosystem function. Roads are a primary indicator of human disturbance because they are the focus of initial interaction between humans and the forest. ML 3, 4, and 5 roads, and associated MAPs, are the principle means by which humans access the forest. However, human disturbance in the form of urbanization at the Forest edge, including hunting, fishing, recreation, timber harvest, mining, and other activities, occurs on a relatively small portion of Southeast Alaska. Over half the Forest's area is in LUDs where roads are prohibited or strongly discouraged.

The Tongass National Forest includes several contiguous roadless areas that exceed one million acres and represent large, unfragmented blocks of undeveloped land and waterways. However, the dominant forested ecosystem in the region is naturally fragmented by freshwater and marine waterways, muskegs, and mountains. Many of the Tongass roadless areas represent wildlife habitats, ecosystems, and visual character that are rare or exist nowhere else in the NFS, such as coastal islands facing the open Pacific, extensive beaches on inland saltwater, old-growth temperate rain forests, ice fields, and glaciers.

The ecosystem most at risk by resource management on the Tongass is the old-growth forest ecosystem. ML 3, 4, and 5 roads are an important factor to consider as part of the cumulative effects of human activities on the old-growth forest ecosystem. However, the level of risk should be considered well below any critical thresholds. Road construction in unroaded areas affects old-growth forests by contributing to forest fragmentation, direct removal of forest habitat, and ongoing disturbance to old-growth dependent wildlife (e.g., marten, goshawk, and marbled murrelet) because of increased access by humans. LUDs and standards and guidelines are designed to protect old-growth forest values and overall ecosystem function in the forest. Currently, the Tongass has approximately 130 miles of ML 3 road in the Old-growth Habitat LUD. Many of these roads were built prior to the development of the old-growth LUDs and are needed to provide access to other LUDs.

Natural forest disturbance in the Tongass results primarily from high winds during winter storms. ML 3, 4, and 5 roads may have a minor effect when long, straight road segments have a similar direction as the wind, which might result in a funneling effect that increases localized wind speed and the potential for blowdown.

Currently, invasive plants have not become a widespread problem on the Tongass. Several invasive species have become established in some areas, however. These species include the following:

- Japanese knotweed, in the road systems near Kake, Petersburg, and Sitka.
- Tansy ragwort on the Ketchikan and Prince of Wales Island road systems.
- Garlic mustard—a very aggressive species that can lead to major changes in understory vegetation—has appeared in the Juneau area.
- Canada thistle has appeared in the region, possibly brought in through horticultural stock
- Reed canarygrass was seeded for erosion control, and is now spreading into wetlands in the Petersburg Ranger District and into the vicinity of Twin Lakes in the Wrangell Ranger District.

The Forest is in a unique position (relative to other National Forests) to control the road-based spread of invasive plants before they become widespread. Implementation of contractual clauses designed to prevent the introduction or spread of noxious weeds by contractors and permittees would be a necessary element of any control program.

Proposals to develop additional road access from Canada may increase the risk of exotic insect species coming into the region. Some insects have already been observed (e.g., woolly aphid, spruce aphid); however, none have become established and no control efforts are underway.

Noise that results from road use is more likely to have adverse effects to wildlife on roads that connect communities, or that extend from the larger communities, because the frequency of road use is expected to be higher in these areas. Consequently, ML 3, 4, and 5 road systems with a higher risk of noise effects to wildlife include the systems on Prince of Wales Island, Wrangell Island, and Mitkof Island.

Aquatic, Riparian Zone, and Water Quality

The ML 3, 4, and 5 road system provides some problems and risks to the aquatic ecosystem, riparian zone, and water quality. The primary benefits of the road system are related to access for monitoring streams and implementing enhancement projects, such as fish passage structures at natural barriers. In general, ML 3, 4, and 5 roads are beneficial relative to ML 2 roads because of the higher standards of construction, and because levels of maintenance may result in a lower risk of adverse effects. These benefits are partially offset by the higher levels of use on ML 3, 4, and 5 roads. Problems and risks include adverse effects to fish passage, hydrology, coarse and fine sediment delivery to streams, loss of riparian function, and water quality. Many of these problems are related to inadequate culverts at road-stream crossings for older roads constructed to a lower standard than currently required.

Fish passage at road-stream crossings is perhaps the most important fish habitat issue on the Tongass that receives substantial attention by newspapers, environmental and timber industry groups, and the State legislature. Forest-wide, 715 culverts (or about 0.55 culverts per mile; 67 percent of surveyed culverts with complete assessments) are considered to have passage problems on ML 3, 4, and 5 roads. The Forest Service uses a conservative hydraulic modeling methodology when identifying fish barriers at culverts. Many culverts initially identified as having problems are secondary high flow culverts, or are at locations where little or no fish habitat is present upstream. Consequently, this rate of culvert problems is an over-estimate. Nevertheless, these results suggest that fish passage is a significant problem in the Forest. The Forest has recognized this issue and is addressing it through the development of the Road Condition Survey (RCS) database and through the implementation of a program to upgrade problem culverts. Currently, the Forest is developing a methodology for prioritizing the effort that includes an understanding of the amount of fish habitat affected by culverts with passage problems. The need for culvert upgrades is an important high priority component to road maintenance funding.

Roads can affect the hydrology of watersheds in several ways. Roads create strips of non-vegetated compacted soil across the landscape. Roads constructed through wetland areas may block or reroute flow patterns through the wetland. Precipitation that falls on road surfaces will collect in drainage systems (primarily ditches and culverts) and flow into streams and wetlands more quickly as runoff instead of infiltrating into soils. Road drainage systems can also act as an extension of the stream network, increasing the density of concentrated surface flow, which can result in changes to the natural hydrologic regime.

Running Water on Road Surface

Beginning in 1994, the Forest, in collaboration with the Alaska Department of Fish and Game and the Alaska Department of Environmental Conservation, began development of the RCS database (Flanders and Cariello 2000). The RCS database is a tremendous asset to the Forest that allows road engineers, fish biologists, and water resource specialists to monitor the environmental effects of roads and identify and prioritize road maintenance needs. Selected attributes in the database were summarized as part of this analysis. Overall, it was found that drainage structures, stream crossings, and cut and fill problems have the most potential to affect fish and water resources.

A query of the RCS database indicated that cut-slope or fill-slope erosion problems occurred more frequently than road surface erosion. Instances of surface erosion occurred on ML 3, 4, and 5 roads at a frequency of 0.16 per mile of road surveyed with an average length of road affected of 61 feet (maximum of 1,100 feet). In contrast, cut-slope or fill-slope erosion occurred at a frequency of 0.72 instances per mile of road surveyed with an average length of 98 feet (maximum 3,800 feet).

Road-stream crossings influence local stream channels and water quality by contributing coarse road fill material, fine sediment, chemical pollutants, and changes in stream hydrology. Existing roads may have road-stream crossings that were designed before current standards and may be at risk during flood events. Problems may include under-sized and too few drainage structures. Road-stream crossings can become major sources of coarse and fine sediment to stream systems if culvert failures occur during a flood event. Any time a road is built within the floodplain of a stream (e.g. at road-stream crossings), it will affect the ability of the channel to migrate, isolate portions of the floodplain, and constrict flow through that location. Stream crossings can also limit the movement of woody debris, which is an important component to fish habitat.

Location where a larger culvert is needed

A query of the RCS database indicates that road-stream crossing problems occurred at a rate of 0.29 problems per mile of the ML 3, 4, and 5, road system. The types of problems considered in this analysis included inadequate hydraulic capacity, fill slump or slide, improper culvert installation, stream in ditch, and sediment accumulation. The database also suggests that ML 3, 4, and 5 road-stream crossings at palustrine (PA) channel types have a relatively high frequency of problems. Palustrine channels have a low gradient and high retention of fine sediment, but they are often prime fish habitat in low elevation areas. Nearly a third (32.7 percent) of road-stream crossings of this channel type had a problem associated with it, often as a result of beaver activity. Moderate Gradient Mixed Control (MM) and Moderate Gradient Contained (MC) also had problem rates (14.5 percent and 14.3 percent, respectively) that were slightly higher than the Forest-wide problem rate of 13.7 percent. The highest number of ML 3, 4, and 5 road-stream crossings occurred at High Gradient Contained (HC) channel types (1,995 of 6,853 crossings), but the problems occurred at a rate (12.8 percent of that channel type) slightly lower than the Forest-wide rate. The latter three channel types are typically sources of fine and coarse sediment, which is transported to lower gradient channel types.

Sediment retention in palustrine channel type

Road-stream crossings are also locations where riparian function is lost. About 74.3 miles of Class 1 and 2 (fish-bearing) streams are within 100 feet of ML 3, 4, and 5 roads. The majority of this is at road-stream crossings. However, this represents a very small portion (approximately one-third of one percent) of the fish-bearing stream length (over 25,000 miles) in the Forest. Consequently, the risk of adverse effects is low.

The presence of exotic fish species has historically not been an important issue, but should be recognized as a risk, albeit relatively low at present. Exotic species have the potential to severely upset aquatic ecosystems in the Forest. The one known incident involves the recent introduction of northern pike to the Post Office Ponds in Yakutat, presumably human caused, from a small lake system in the Yakutat Ranger District. These lakes were previously the only known location for northern pike in Southeast Alaska. Roads, including the ML 3, 4, and 5 system, provide an efficient method to transport exotic species and introduce them to lakes and streams within the Forest.

Beaver activity affecting road drainage.

Frequently, access to areas used for recreation, hunting, or gathering in Southeast Alaska occurs through use of the NFS road system. Consequently, road derived pollutants, such as fine sediment, oil, and grease, are likely to increase and decrease in parallel with demand for access to the Forest. Areas with higher traffic levels have a higher risk of having road-derived pollutants.

Waterbodies listed as water quality limited under Section 303(d) of the Clean Water Act are categorized by the State of Alaska using a four-tier system. The highest tier, Tier 1 waterbodies, have assessments that verify that pollution is present and that controls are in-place or needed. Of the 21 Tier 1 sites, 11 were for debris in marine waters at marine access points (MAPs, formerly known as log transfer facilities), and two were related to timber harvest activities (including roads). Consequently, MAPs are one of the major transportation infrastructure issues related to water quality limited waterbodies. Roads (including the ML 3, 4, and 5 roads) appear to be a contributory factor in some watersheds with impaired waterbodies.

New road construction on the Tongass National Forest avoids wetland areas to the extent practicable. However, some older roads do cross substantial lengths of wetland. The Watershed Conservation Practices Handbook (FSH 2509.25) provides measures to protect wetlands. During project-level analyses, opportunities to reduce the effects of the road system on wetlands include the following:

- Relocate the roads out of wetland areas.
- Where relocation is not an option, use measures to restore the hydrology of the wetland. Examples include raised prisms with diffuse drainage, such as French drains.
- Set the road-stream crossing bottoms at natural levels of wet meadow surfaces.

Terrestrial Wildlife

The ML 3, 4, and 5 road system provides some problems and risks to terrestrial wildlife in the Tongass. In general, these problems and risks are not severe and Forest-wide the Tongass has relatively robust wildlife populations and habitat. However, project-level road analysis will likely identify localized problems and additional opportunities to minimize adverse effects. Relative to ML 1 and 2 roads, the ML 3, 4, and 5 roads receive more use. Consequently, the likelihood of human/wildlife interactions (including road-kills) is higher for ML 3, 4, and 5 roads.

The approximately 1,210 miles of ML 3, 4, and 5 roads on the Tongass National Forest equate to more than 2,500 acres of direct habitat loss. The effects of this loss are distributed over a vast area, however, and comprise less than 1/100 of 1 percent of the total area of the Forest. Forest habitat in the Tongass is naturally fragmented by muskegs, mountains, and waterbodies. Nevertheless, large areas of undeveloped landscape exists in the Tongass, including large blocks of temperate rainforest. The proportion of wildlife habitat that has been affected by added fragmentation due to roads is relatively small, and is offset by the availability of large blocks of undeveloped habitat throughout the Forest.

Moose and newborn calf on roadway

One possible source of concern is the amount of road that occurs in LUDs where road construction is discouraged. Approximately 130 miles (10 percent) of ML 3, 4, and 5 roads on the Forest occur in areas that have been designated as Old-Growth Reserves, where TLMP standards and guidelines allow road construction only where no other options are available. Many of these roads were built prior to these LUDs being designated, and all roads built following passage of the 1969 National Environmental Policy Act had the required environmental review prior to construction. A review of these roads in this analysis suggests that none are currently suitable for consideration for decommissioning (see Step 5). More than half of the roads in Old-Growth Reserves occur on the Thorne Bay and Petersburg Ranger Districts.

The primary concern with roads and wildlife on the Tongass National Forest is one of accessibility. A high road density allows a greater number of people into an area with fewer places for animals to hide, increasing the risk of overexploitation through hunting or trapping. Indeed, this has already occurred in few places on Prince of Wales Island, where the road system is relatively dense. An example is in the Staney Creek area where extensive logging and road system development have affected local wolf populations. Biologists with the ADF&G have documented the obliteration of wolf packs from this watershed, with subsequent recolonization from populations in an adjacent Old-Growth Reserve. Thus, the Staney Creek area appears to represent a population sink for wolves.

Deer, bear, marten, and mountain goats are also vulnerable to overharvesting and disturbance in areas of extensive road development. Increased hunter access can lead to unsustainable rates of deer harvest (and, potentially, illegal harvest) and may increase the potential for overtrapping of marten. Mountain goats and black bears can be over-hunted in areas where an extensive road system facilitates human access into the habitats (particularly old-growth forest) with which they are associated. Management direction for brown bear emphasizes the establishment of roadless refugia, where human disturbance would be minimal. Another key element for brown bears is the minimization of disturbance at key feeding areas (low-elevation valley bottoms and salmon streams) during the critical late-summer season. These are often the same areas of highest human use and most intense resource development activities.

Roads play an essential yet paradoxical role in subsistence hunting. Roads provide access to hunting and fishing areas, an attribute that is highly valued by residents. Proposals to close or decommission roads in some areas may run afoul of certain subsistence access provisions of ANILCA. At the same time, roads into rural areas can improve access for non-local sport hunters, which may reduce the availability of the animals on which subsistence hunters rely.

Economics

It is not possible to perform a financial efficiency analysis on the existing ML 3, 4, and 5 road system to determine whether revenues exceed costs because data on revenues are not collected in a way that allows them to be assigned to specific roads (i.e., just the ML 3, 4, and 5 roads) with any degree of accuracy. This absence of data on revenues also means that it is not possible to assess the changes in net revenue that would be associated with changes in the existing ML 3, 4, and 5 road system. Consequently, from a quantitative economic perspective, this roads analysis focuses more on road costs, such as annual and deferred maintenance, rather than a complete economic picture. However, other economic issues are examined on a qualitative basis.

Base annual maintenance costs for local ML 3 roads are approximately $1,138 per mile, while costs for arterial and collector ML 3 roads and ML 4 and 5 roads are approximately $2,051 per mile. Different localities in the Forest have somewhat higher costs than these base levels due to items such as availability of equipment and mobilization. Deferred maintenance costs are discussed in more detail in Step 5 of this roads analysis.

In terms of direct use, the majority of ML 3, 4, and 5 roads tend to be used for recreation and subsistence with use primarily by local residents or visitors from other parts of the region. Use of the ML 3 roads on the Thorne Bay Ranger District, for example, is thought to be primarily by local residents with about half the non-local users thought to come from Ketchikan. Local communities are, however, promoting tourism on Prince of Wales Island and the road system may prove attractive to visitors. The majority of the remaining sawmills in Southeast Alaska are located in the south portion of the Forest.

Wood products, recreation and tourism, and mining are the main economic sectors affected by the road system. The wood products sector is affected to the extent that the existing road system facilitates timber harvest. Although it is difficult to project where the employment associated with a particular timber sale will be concentrated, wood products employment tends to be concentrated in the communities located in the southern part of the forest, with the region's major operators located in Ketchikan, Wrangell, and Craig/Klawock. Other smaller operators tend to be concentrated on Prince of Wales Island. One exception to this is the Whitestone Southeast Logging Co. located in Hoonah (USDA Forest Service 2002).

Much of the growth in recreation and tourism-related employment in recent years has been associated with increases in cruise ship visitors. Data compiled at the Borough/Census Area level for 1999 suggests that lodging, restaurant, and recreation services employment (a common indicator of recreation and tourism employment) accounted for 11 percent of total employment in Southeast Alaska. Cruise ship operators have expressed concerns about the availability of locations to take visitors on day trips, including trips from MAPs and using the ML 3, 4, and 5 road system. It has been expressed that some of the available sites are currently over-utilized. Expansion of the ML 3, 4, and 5 road system in areas of interest by cruise ship operators, either through new construction or upgrades of ML 1 or 2 roads, could benefit the tourism-related component of the economy.

Two ML 3 roads located in the Berners Bay area north of Juneau were constructed for mine access. The Kensington mine is active on an exploratory basis and the road receives daily mine-related use. Approximately 318 workers were directly employed by the mining industry in 1999.

Commodity

Timber

Generally, ML 3, 4, and 5 roads do not directly affect road spacing and location or logging system feasibility on the Forest. Logging feasibility is directly affected by the presence or absence of roads. A road does not need to be maintained as a ML 3 road in order to provide adequate access for feasible logging systems. ML 3 roads do, however, provide more economical haul to MAPs compared to ML 1 and 2 roads, and provide a higher level of safety for both operators and others using the road. Relative to ML 1 and 2 roads, ML 3, 4, and 5 roads may also increase the operating season to some degree and reduce maintenance costs for trucks. On the other hand, ML 3, 4, and 5 roads also have higher maintenance costs for both the government and operators. Because ML 1 and 2 roads have a greater effect on logging system feasibility, the watershed or finer scale is most appropriate for addressing this road issue.


Thorne Bay log transfer facility and marine access point

Minerals

The Tongass National Forest has substantial mineral deposits including gold, silver, molybdenum, zinc, lead, and limestone. ML 3, 4, and 5 roads can provide safer and better access to these deposits than a ML 2 road. They can also provide more efficient transportation of ore. However, maintenance of ML 3, 4, and 5 roads costs more than ML 2 roads. Currently, two major mines are active: the Greens Creek Mine, and the Calder Mine. The Kensington Gold Mine obtained needed permits in 1997, but economic factors resulted in the need to substantially change the approach to processing the ore and treating waste products. Consequently, the mine is not currently active, but it may begin production in the near future if all needed permits or permit modifications are obtained. The Quartz Hill Mine is estimated to have about 12 percent of the world's molybdenum supplies, but the mine has not been found to be economically feasible under the current market. Access to the Quartz Hill Mine is by a private road reached from a MAP. Access to the Greens Creek, Calder, and Kensington Mines is primarily by barge or boat to a MAP that services a local road system. The ML 3 road from the MAPs at Hawk Inlet and Young Bay, which access the Greens Creek Mine, is under NFS jurisdiction.

The ML 3, 4, and 5 road system also provides access by mineral collectors and small-scale commercial miners to existing borrow pits. The roads and associated barrow pits are beneficial for these activities, which would likely not occur without the existing road system. Upgrading of ML 2 roads to ML 3, 4, and 5 roads could expand the areas accessible to mineral collectors that do not have a high clearance vehicle or prefer to avoid using lower standard roads.

Range management

There are no range allotments in the Tongass National Forest.

Water Production

Many of the larger communities (Ketchikan, Juneau, Petersburg, etc.) have municipal watersheds that are protected in order to maintain high water quality for domestic water supplies. There are no ML 3, 4, or 5 roads in these municipal watersheds. Smaller communities or areas not serviced by municipal watersheds may draw water from a variety of sources. ML 3 roads could affect these water sources (including improved access to facilities), but should be evaluated at a project level analysis. Relative to ML 1 and 2 roads, ML 3, 4, and 5 roads may have a lower risk of some adverse water quality effects (e.g., sediment) because of higher maintenance levels. However, higher use of ML 3, 4, and 5 roads could also increase the risk of contaminants (both chemical and fecal).

Special Forest Products

Special Forest Products are defined as products derived from non-timber biological resources that are used for subsistence, personal, spiritual, educational, commercial, and scientific use. These resources include, but are not limited to mushrooms, boughs, Christmas trees, bark, ferns, moss, burls, berries, cones, conks, herbs, roots, and wildflowers. Forest roads allow broader access to people gathering these resources. In particular, the ML 3, 4, and 5 roads allow people to travel farther distances to gather resources at prime locations. Traveling to these locations may result in higher competition for these resources (and possible conflict between local and visiting users), but may also allow some people to utilize resources they would be less likely or unable to gather near their community. The ability to gather at more distant locations may reduce over-harvest of products near communities, but may also result in adverse effects to resources not previously used or collected.

Special-Use Permits

Concessionaires (both for existing sites and future development or expansion) may require that an existing road be built, maintained at, or upgraded to a ML 3 or higher standard to safely accommodate passenger vehicle travel to these sites. Most existing recreation special use areas are based on access via salt water. There may be a need for ML 3, 4, and 5 roads to provide adequate access to recreation sites and resorts in the future, as tourism plays a greater role in the Southeast Alaskan economy.

General Public Transportation

Public transportation is a major benefit of the ML 3, 4, and 5 road system. All roads outside of communities were initially forest roads. Higher use roads, especially those connecting communities to Alaska Marine Highway terminals, became state routes. Local residents use roads for driving for pleasure, hunting access, and dispersed recreation and subsistence uses. There are no shared ownership roads, but a few private roads have Federal Land Policy and Management Act easements across federal lands (to private cabins, resorts, etc.)

ML 3, 4, and 5 roads, regardless of their primary function (e.g., timber, minerals, etc.), provide for faster and safer travel relative to ML 2 roads. Consequently, upgrades of ML 2 roads or new construction at ML 3, 4, and 5 standards benefits general public transportation and expands the amount of the Forest accessible to the public with highway vehicles. However, construction and maintenance costs are also higher.

All-terrain vehicle use of NFS roads

Motor vehicle accidents can be largely attributed to alcohol use and/or overdriving for conditions or designed use. Mixed traffic/underage driver/non-street legal vehicle issues are growing. Very few accidents occur because of the condition of the road and/or lack of traffic safety items (e.g. guardrails, approach rails, etc.).

Administrative Use

The Forest Service has responsibility for managing fish and game habitat on NFS lands, while the State manages the populations for sport fishing and hunting, including setting open seasons, bag limits, and other regulations. However, the Forest Service does have responsibility for managing subsistence harvests by rural residents where customary and traditional use determinations have been made. The road system is necessary for this administration, providing primary access for investigation and enforcement of timber theft, fish and game related activities, occupancy and abandonment of facilities, and vandalism. Relative to ML 2 roads, the ML 3, 4, and 5 road system is a benefit to more efficient administration by increasing the area that can be covered by patrols with a higher level of safety and lower maintenance costs for government vehicles. However, higher levels of ML 3, 4, and 5 roads may also increase unwanted or unlawful activities, and a public demand for increased enforcement. Law enforcement vehicles are frequently ferried among islands for enforcement work. Other activities include access to remote field camps, timber management planning and administration, fisheries improvement and maintenance projects, and maintenance of Forest Service cabins, recreation sites, and trails.

Protection

Similar to several other ecological, social, and economics aspects that could be affected, ML 3, 4, and 5 roads are a double-edged sword in terms of fire protection. ML 3, 4, and 5 roads provide quicker and safer access for suppressing fires, but they also increase the risk of human-caused fires. Although fire has been cited as a major factor in shaping vegetative conditions in other forests, it is not a primary factor within the Tongass National Forest due largely to the high annual rainfall in Southeast Alaska. Most fires within this region tend to spread very slowly and burn deeply. Many fires are the result of marine or shoreline recreation activities, primarily escaped campfires. Ninety-two percent of the fires recorded from 1958 to 1988 started from unattended recreational fires, with the average size of all fires comprising less than 7 acres (USDA Forest Service 1997b). Most fires are reported by passing boats or ships, but suppression equipment is mostly road based.

Roaded and Unroaded Recreation

Many residents of Southeast Alaska place a high value on the quality and availability of outdoor recreation opportunities in the region. This is evidenced by the fact that the proportion of Alaskan residents who participate in outdoor activities is generally much higher than elsewhere in the United States (Bowker 2001). Many local residents engage in dispersed recreation activities on NFS lands and adjacent saltwater.

The Tongass National Forest has the potential to provide a wide variety of recreation settings. The Recreation Opportunity Spectrum (ROS) has been developed to help identify, quantify, and describe these settings. The ROS system portrays the appropriate combination of activities, settings, and experience expectations along a continuum that ranges from highly modified to primitive environments. Seven classifications are identified along this continuum:

- Urban (U)
- Rural (R)
- Roaded Natural (RN)
- Roaded Modified (RM)
- Semi-primitive Motorized (SPM)
- Semi-primitive Non-motorized (SPNM)
- Primitive (P)

Figure 13 displays the recreation opportunities available on the Tongass by ROS class. The U and R settings account for a very small amount of the Forest Area and are not depicted on the graph.

The supply of unroaded recreation opportunities is expected to continue to exceed demand over the next decade (USDA Forest Service 2002; Table 3.4-16). All forms of access and travel may occur in RN settings, with access typically via passenger vehicle. RM settings are accessed by Forest roads maintained to MLs 2, 3, and 4 and available for public use. Access to R settings is primarily by passenger vehicle, while access to U settings is motorized, often with mass transit supplements.

Access to SPM settings is via motorized and non-motorized trails and Traffic Service Level (TSL) D roads, although some TSL C roads provide access to and through the area (see Appendix C for descriptions of TSLs). Access into SPM settings is provided via ML 1 or 2 roads, not ML 3, 4, or 5 roads. However, ML 3, 4, or 5 roads may be needed to reach these in the vicinity of an SPM setting.

ML 3 and 4 roads have the potential to affect the wilderness attributes of roadless areas by generating noise and dust, providing access, and affecting the natural integrity of the general area. The Draft SEIS for Roadless Area Evaluations for Wilderness Recommendations (USDA Forest Service 2002) identified 115 roadless areas that totaled approximately 9.7 million acres. Close proximity to a road may affect the eligibility of a roadless area for consideration for wilderness designation.

Off-road vehicle use is becoming more widespread in the Forest and has the potential to cause localized adverse environmental effects in areas of heavy use. These effects could include disturbance of wildlife, soil erosion, and associated water quality effects. Problems should be identified and addressed during project-level or district-level round analyses.

Regarding recreation, upgrading a road from ML 2 to ML 3 may result in more and different users using an area as access is improved. This could change the character of the area for existing users and affect their sense of place. Downgrading the maintenance level of a road may have the opposite effect by restricting the use of an area or road system for particular groups (i.e., those who only have highway vehicles).

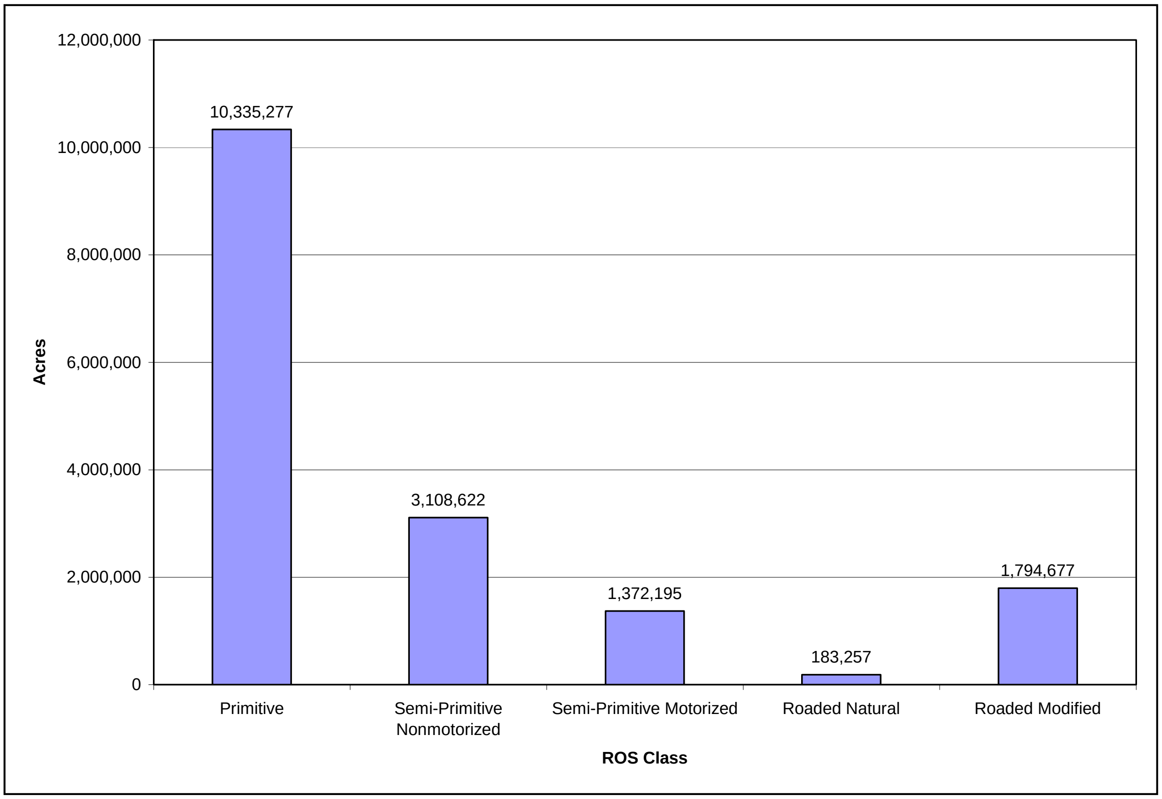

Figure 13. ROS Classes on the Tongass National Forest

Community road systems are limited, but they are heavily used for access to recreation sites, dispersed recreation, and attractions near local communities. Existing community road systems that include ML 3, 4, or 5 roads are primarily located near the larger communities of Juneau, Sitka, Petersburg, and Wrangell. The majority of the roads surrounding Ketchikan are non-Forest Service roads. There is an extensive road system connecting the small communities on Prince of Wales Island, and systems are developing near the communities of Hoonah and Kake. ML 3 roads comprise a large share of these roads. There is no interconnecting highway system between islands or between communities on the mainland.

Roads exist in other locations where timber harvest has taken place. Independent tourists and users from other parts of Southeast Alaska, as well as local residents, use road systems that are accessible from the Alaska Marine Highway System (ferries) or from a community for recreational purposes. Roads in locations where there are no communities or interconnecting access to the Alaska Marine Highway System receive relatively low levels of recreation use, primarily by local residents. However, recreation-related vehicle use has been growing on some remote islands, including Zarembo, Chichagof, and Etolin Islands, and isolated road systems on Kuiu and Kupreanof Islands. While the total amount of recreation use on these islands is low, it can be heavy at times, such as during hunting seasons.

The number of visitors to Southeast Alaska has increased significantly over the past decade with the number of cruise ship passengers visiting Juneau more than doubling, increasing from approximately 237,000 in 1990 to 632,000 in 2000. Other ports in Southeast Alaska, including Ketchikan, Skagway, and Haines, also experienced net increases in passenger volumes over this period. Sitka and Wrangell were exceptions to this general trend with decreases in passenger volumes during the latter half of the 1990s. Shore excursions have become an integral part of the cruise ship experience, providing increased revenues for ship operators and opportunities for local entrepreneurs. Despite a decline in the number of passengers since 1996, Sitka still received approximately 160,650 cruise ship visitors in 2000. Much of this activity has been concentrated at major ports of call (such as Ketchikan, Juneau, or Skagway). Several small and mid-size cruise operators are, however, now active in the region, often taking their customers to places, such as Hoonah, Metlakatla, and Petersburg, that are bypassed by the larger ships.

There has also been a significant increase in the number of outfitter/guide clients on the Tongass. In the Draft Shoreline Outfitter/Guide EIS, outfitter/guide use information compiled for the shoreline areas on the north part of the Tongass from 1994 to 1999 shows a dramatic increase in outfitter/guide use in shoreline areas, with the number of outfitter/guide clients increasing from approximately 1,550 in 1994 to 14,096 in 1999 (USDA Forest Service, 2001c). A survey of commercial recreation businesses conducted throughout Southeast Alaska in 2000 found that 73 percent of the businesses surveyed had experienced an increase in the number of clients they serve since 1995 (Alaska Division of Community & Business Development 2001). Cruise ship passengers accounted for 41 percent of total clients for all of the surveyed businesses, ranging from 22 percent of clients for businesses with fewer than 200 clients a year to 91 percent of clients for businesses with more than 10,000 clients a year.

A review of locations used by outfitter/guides between 1995 and 2001 identified just 12 locations that appeared to be located in the immediate vicinity of ML 3, 4, or 5 roads. Eleven of these areas received low levels of outfitter/guide use in 2001 (30 or fewer clients. The exception was Woodpecker Cove on Mitkof Island, which was visited by 137 clients for nature viewing. Woodpecker Cove was used as a Marine Access Point by the National Outdoor Leadership School (NOLS) for seakayaking expeditions. NOLS accessed the cove via the ML 3 road from Petersburg. While the database reviewed may not be entirely inclusive, it does provide some indication of the overall level of use of ML 3 roads by outfitter/guides. The majority of outfitter/guide locations identified on the Tongass are located along, or adjacent to, shorelines. There is also a concentration of locations on the Juneau Icefield.

Passive-Use Value

The development of the existing ML 3, 4, and 5 road system likely led to a reduction in the overall passive-use value held for the Tongass. This would be likely to occur because road construction, and especially road construction to facilitate timber harvest, results in a loss of undeveloped and wild areas. It is, however, important to note that the Forest-wide standards and guidelines outlined in the 1997 Forest Plan minimize the potential adverse effects of new roads on fish, wildlife, and cultural resources. Passive-use values are typically associated with natural resources, such as endangered and threatened species, pristine wilderness, unusual geological or natural conditions, or unique cultural heritage resources. They are rarely associated with developed areas or infrastructure elements, such as roads. While it is possible that some individuals may value the existence of roads on the Tongass independent of their use, it is reasonable to assume that these values, if they exist, would be lower than those associated with natural resources.

Social Issues

The Tongass National Forest encompasses an island archipelago that extends almost 500 miles south to north. The surrounding marine waters are a major component of the transportation infrastructure. Facilities that provide water to land to water access are a key component of all existing road systems and the overall transportation infrastructure in Southeast Alaska communities.

The majority of the ML 3, 4, and 5 roads on the Tongass were originally constructed for timber harvest, and the majority of the existing miles do not directly link communities with one another. There are some exceptions to this. These include the road on east Prince of Wales Island that connects Thorne Bay with Coffman Cove and the north Prince of Wales road that connects Naukati, Whale Pass, and other communities to Thorne Bay, Klawock, and others via Highway 929.

ML 3 road connecting communities on Prince of Wales Island

Access to paleontological, archaeological, and historical sites via ML 3, 4, or 5 roads provides opportunities for protection and interpretation for public education and enjoyment. It also increases the potential risk of detrimental effects associated with public use. In cases where active educational and interpretive programs are established, it is also necessary to implement measures to protect against vandalism.

The existing road system provides access to cultural resources sites in some locations. Auke Bay on the Juneau Ranger District, Petroglyph Beach by downtown Wrangell, and Sandy Beach in Petersburg are all areas where access to cultural sites is a concern. However, these areas are not accessed by Forest Service roads. Access problems elsewhere on the Forest include old canneries and mining sites on Prince of Wales Island where people go looking for historic artifacts. ML 3 roads provide access to these areas.

For many rural Alaskans, subsistence hunting, fishing, trapping, and gathering natural resources provides needed food and supplements rural incomes. Subsistence is also viewed by many, especially Southeast Alaska's Native communities, as a lifestyle that preserves cultural customs and traditions, reflecting deeply held attitudes, values, and beliefs. Eighty-five percent of rural Southeast Alaska households harvest subsistence food, with almost one-third of households obtaining at least half of their food from their own harvest activities.

The availability of subsistence resources is not uniform across the Forest and subsistence use varies by community. Edna Bay subsistence resource hunters gathered the most resources, measured in pounds per capita, while Skagway residents gathered the least (USDA Forest Service 1997b). Subsistence use historically occurred where access to the resources cost less in energy than the resources gathered provided, with the majority of gathering activities occurring in easily-accessed areas. Development of road systems allowed a movement out into new resource areas that had been relatively difficult to access.

It is often difficult to distinguish between recreation and subsistence use from a planning perspective. The majority of roads used for recreation (see responses to the recreation questions) are also used for subsistence. In some cases, people using the road system for subsistence purposes hunt in areas close to the roads. In other cases, they use the roads for access to the general area and hike some distance into the forest. Other types of traditional uses of animal and plant species in the vicinity of the road system include cedar bark stripping and berry picking. These types of activities vary by region.

Civil Rights and Environmental Justice

The existing ML 3, 4, and 5 road system facilitates economic activities, including timber harvest, recreation and tourism, and mining, as well as nontimber forest products and subsistence. Costs include those associated with planning, constructing, maintaining, and decommissioning roads, as well as non-priced costs, such as the potential for decreased water quality and habitat fragmentation. It is difficult at the Forest-level to assess whether certain groups of people are disproportionately affected by the existing road system. Financial costs associated with maintaining the existing system are, for example, borne by the federal government. Other localized costs, such as those that may be associated with increased subsistence use, decreased water quality, and habitat fragmentation, that have the potential to disproportionately affect specific groups of people need to be assessed at the project level.

Road management does have the potential to disproportionately affect different groups of people. In the case of subsistence, for example, the decision to upgrade a road from ML 2 to ML 3 could have the effect of increasing competition at particular sites and displacing Alaska Native or low income populations that presently use the area. Road development in close proximity to traditional use areas could disproportionately affect groups that value those areas by increasing access. Conversely, a decision to downgrade a road could disproportionately affect disabled and elderly people who would no longer be able to access an area.

STEP 5 – DESCRIBING OPPORTUNITIES AND SETTING PRIORITIES

To assess the problems and risks posed by the current road system, the IDT evaluated the management scheme for the current road system with a number of tools, including road system mapping; Road Management Objectives developed from GIS and databases; capital investment and road maintenance budget projections; Forest cost guides; an extensive number of photos of road features; and the RCS database. In addition to the issues-driven opportunities described below, the IDT sees the opportunity for area or landscape scale road analysis at the ranger district level to set priorities and schedules for acquiring detailed condition and risk information for all MLs. These analyses can also be used as an opportunity to review and update GIS road and MAP layers for consistency with current use. Review of the data layers used for the current Tongass Roadless Area Evaluation SEIS indicates that some ML 1 and 2 roads are not in the roads layer used in this analysis. In addition, some MAP layer attributes appeared inconsistent with other information used in this analysis, thus, reflecting the need to update GIS layers on a regular basis.

Marine Access

The Shoreline Outfitter Guide Draft EIS covering the northern ranger districts observed that four boats servicing large groups (12 or more people; likely derived from cruise ships) are limited in available access points to the Forest because of the need to maintain schedules and the need for MAPs that can accommodate larger boats. One representative of the cruise industry suggested that the industry feels squeezed between increasing demand for the use of the Forest and the environmental documentation process, which they feel is biased towards preservation interests, which prefer to limit the amount of access and development favored by the industry. Although shopping remains the number one on-shore activity, there is a demand for wild country activities, such as hiking, climbing, wildlife viewing (especially bear), and fishing. Many additional ports of call other than Ketchikan, Juneau, Skagway, and Sitka are attractive for cruise ships of 60 to 150 passengers. Mitkof Island has been referred to as the "undiscovered Alaska" regarding cruise ships.

Alaska State ferry using the Alaska Marine Highway

The Southeast Alaska Transportation Plan (Alaska DOT & PF 1999) made a number of recommendations for improving the year-round transportation in the region. The recommendations focused primarily on new terminals for the State's ferry fleet, additional types of ferries, and modifications in the frequency and service routes. The plan also made recommendations for some new and upgraded roads, primarily as access to the new ferry terminals. The Southeast Conference, a nonprofit corporation that advances the collective interests of the people, communities and businesses in Southeast Alaska, are in the initial stages of discussing additional transportation options that could be incorporated into the Southeast Alaska Transportation Plan. These options would also include new port facilities, as well as associated road improvements. The roads, ferry routes, and ferry terminals under consideration by the Southeast Conference can be found in Figure 2 through Figure 12.

The MAPs under Forest Service jurisdiction that could enhance regional transportation opportunities are listed in Table 6. They have been selected because capital improvements have been proposed, they are associated with roads that could be improved to ML 3, 4, or 5 status to enhance public access to National Forest System lands and facilities, and are included in the Southeast Alaska Transportation Plan or Southeast Conference discussions.

Roads in Old-Growth LUD

Approximately 129 miles of ML 3 roads are located in the Old-Growth Habitat LUD. TLMP direction states that roads in this LUD are to be avoided if reasonable alternate routes are available. These roads were examined to determine if they are currently needed for community connectivity, special use, recreation, or subsistence access. None of these roads could be identified to be considered for closing.

Deferred Maintenance Budgeting Needs

Deferred maintenance is maintenance that was not performed when it should have been or when it was scheduled and, therefore, put off or delayed for a future period. When

Table 6. Tongass Marine Access Points Proposals for Additional Cruise Ship and Ferry Passenger for Forest-based Activity and Community Access.

Marine Access Point	Ranger District	Affected Roads	Function	SE Alaska Transportation Plan	Southeast Conference	Forest Service Capital Investment
Blind Slough	Petersburg	Forest Highway 7	New AMH ferry terminal	In Final Plan	Under Consideration	Cabin
Coffman Cove	Thorne Bay	23, 30, 3030295	Small ferry terminal (30 car ferries)	In Final Plan	Under Consideration	
Eight Fathom Bight	Hoonah	8580	Potential small tourist ship access			Cabin
False Island	Sitka	7540	Access off Chatham Strait	Preliminary study		Field Camp
Hamilton Bay	Petersburg	6000	New Kake AK ferry terminal			
Mud Bay	Sitka	7590	Kruzof Island small tourist boat access			Cabin
Sitkoh Bay	Sitka	7548	Access to Chatham Strait	Preliminary study		
Whitestone Harbor	Hoonah	85304	Direct ferry service from Juneau to Hoonah		Under Consideration	Cabin
Fools Inlet	Wrangell	6265, 6270	Proposed So. Wrangell Is. AK ferry terminal	In Final Plan	Under Consideration	

allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, an increase in the costs to repair, and a decrease in asset value. Similar to annual maintenance costs, deferred maintenance is categorized as critical and noncritical and related to the Forest's mission, health and safety, and resource protection.

Most deferred maintenance items are related to resource protection. This includes all drainage, stream crossing, and fish passage work, and seeding (both hydroseeding and dry) of exposed soils. Items related to the Forest's mission include most deferred surface and roadway maintenance, maintenance of structures (MAPs, docks, floats, and ramps), and some signage (e.g., guide signs, boundary signs). Items related to health and safety include maintenance on turnouts, signage (e.g., regulatory signs, warning signs, and mile markers), brushing, and debris clearing.

Discussions with Forest staff and analysis of the RCS database suggest that substantial road maintenance has been deferred. The IDT queried the RCS database and applied per item cost estimates to develop an independent cost estimate for evaluation of the Forest's deferred maintenance budgeting needs for ML 3, 4, and 5 roads. The evaluation was conducted in two areas related to resource protection and the Forest mission: drainage and road stability problems (i.e., surface and roadway problems) and fish passage. Most drainage problems and fish passage are considered critical. Road stability issues are mostly noncritical (unless related to drainage).

Drainage and Road Stability

Drainage and road stability problems become critical when there is moderate to high risk that sediment could be delivered to a fish bearing stream or to a non-fish bearing stream that has the ability to transport sediment to fish bearing stream segments. The following types of road problems were queried from the RCS database:

- Surface erosion
- Standing or running water
- Ditch plugging
- Cut and fill slope erosion
- Inlet and outlet erosion (bank and fill-slope protection, energy dissipater, or outlet pool needed)
- Relief ditch and stream crossing problems (cut- and fill-slope slumping or sliding, inadequate capacity, sediment accumulation, improper installation, etc.)

Riprap to control a cut-slope failure

Not all problem types in the database were used in the analysis because they were rarely observed (e.g., stream abutment erosion, road rutting) or difficult to quantify (e.g., brush encroachment). Cost assumptions for fixing each of these problems were based upon the R10 Road Maintenance Cost Guide.

The results of the analysis (Table 7, including assumptions) suggested the total deferred cost for fixing drainage and road stability problems would be approximately $14.4 million. Most of these deferred costs (approximately $12.2 million) were related to fixing cut- and fill-slope problems. Of the remaining deferred costs, surface erosion ($573,120), stream crossing problems ($423,524), standing or running water ($388,000), and ditch plugging ($362,487) were highest.

Fish Passage

Fish passage at road-stream crossings is an important issue on the Tongass. Forest-wide, 715 culverts (or about 0.55 culverts per mile; 67 percent of surveyed culverts with complete assessments) are considered to have passage problems on ML 3, 4, and 5 roads (see Appendix E, Question AQ(10) for summary by ranger district). An additional 177 culverts with incomplete survey information may have problems. Assuming similar problem rates, this would mean approximately 890 that do not pass fish. However, many of the culverts that do not pass fish are overflow culverts. They only operate during periods of high flow, augmenting the flow provided by primary culverts that do pass fish; therefore, the number of culverts identified as having passage problems does not correspond to the number of road-stream crossings without adequate fish passage. Still, the need for culvert upgrades is an important component of the deferred road maintenance budget. The costs for correcting passage problems at a specific culvert are difficult to predict with high precision. Survey, design, and construction for fixing complex passage problems have recently been estimated to cost $25,000 to $100,000 with an average cost of about $36,000. At the lower end of the range, culverts would be re-engineered or replaced with a larger or different type of culvert. At the upper end, a culvert would be replaced by a bridge. The total costs to the Forest for ML 3, 4, and 5 roads are estimated to be approximately $32.1 million. Using this average cost, the deferred costs for solving all passage problems at ML 3, 4, and 5 road-stream crossings could be as high as $30 million. Currently, the Forest is developing a methodology for prioritizing the effort needed to upgrade culverts that includes an understanding of the amount of fish habitat affected by culverts with passage problems. The road analysis IDT concurs with this approach for addressing this issue, recognizing that upgrades will require a number of years to implement. Prioritization of effort for resolving passage issues for ML 3, 4, and 5 roads should be conducted in tandem with ML 2 roads. The IDT recommends that the Forest develop a timetable for completing upgrades as soon as practicable.

Summary of Deferred Maintenance Costs

The deferred maintenance costs developed during the regular 2001 budgeting process are displayed in Table 8. The total deferred costs are $32.4 million for ML 3, 4, and 5 roads for the Forest, about 46.9 percent of the total deferred costs for the Forest's road system. Of this, approximately $32.1 million are allocated under Forest mission and resource protection categories. This is about 27 percent lower than the $44.3 million the IDT calculated for fixing selected passage, drainage, and road stability problems. Considering that many maintenance items could not be considered in their analysis, the IDT believes that the $32.1 million figure is a substantial underestimate of deferred maintenance cost, especially considering that deferred maintenance for fixing passage problems could cost nearly this much alone. The IDT is also concerned that over 94 percent of the budget has been categorized as noncritical. Most drainage and all passage problems are considered critical in the R10 Year 2000 Road Maintenance Cost Guide. The current analysis suggests that a much higher proportion of deferred costs should be considered critical.

Capital Improvement Costs

The Forest has estimated $735.3 million of capital improvement that could be implemented in the Tongass. All of these costs are noncritical. Approximately 80 percent of the costs would be to further the Forest's mission.

Table 7. Estimated Deferred Maintenance Costs for ML 3, 4, and 5 Roads Based on RCS Database and the 2000 Road Maintenance Cost Guide.

Problem Feature	Craig	Hoonah	Juneau	Peters-burg	Sitka	Thorne Bay	Wrangell	Total	Total Cost
	Number of Occurrences per Ranger District								
Cut-slope erosion location	80	11	3	385	7	146	159	791	$ 10,536,208
Fill-slope erosion location	29	4	-	49	2	13	26	123	$ 1,638,374
Subtotal:									**$ 12,174,581**
Maintenance costs:									
Hydroseed beside road - station	*$ 71*	*station*							
Slide/Slump Removal - Endhaul	*$ 30*	*cubic yard*							
Buttress Cut Slope	*$10,223*	*each*							
Estimate 100 cy endhaul per occurrence; Avg. length of occurrence = 98 ft or 1 station									
Assume fill-slope erosion is approximately equivalent in scale and cost in most cases									
Major cut slope or fill slope erosion may warrant a case specific cost estimate									
Ditch erosion location	1	3	-	17	4	19	10	54	
Subtotal:									**8,251.90**
Maintenance costs:									
New Ditch - Common Material	*$ 153*	*station*							
Ditch Plugging Evident and/or	180	10	2	173	38	329	222	954	$ 362,487
Sediment Accum. in Culvert	2	8	1	61	25	23	59	179	$ 45,770
Subtotal:									**$ 408,257**
Maintenance costs:									
Clean ditch	*$ 2,248*	*mile*							
Find and Clean Culverts	*$ 256*	*each*							
Avg length = 294 ft. Clean equal amount on each end (300 ft) =894 ft or 0.169 mile									
Assume clean ditch & culvert									

Note: Cost per Item Assumptions are in Italics.

Table 7. Estimated Deferred Maintenance Costs for ML 3, 4, and 5 Roads Based on RCS Database and the 2000 Road Maintenance Cost Guide. (Continued)

Problem Feature	Number of Occurrences per Ranger District: Craig	Hoonah	Juneau	Peters-burg	Sitka	Thorne Bay	Wrangell	Total	Total Cost
Standing or running surface water		6	3	18	14	28	125	194	
Subtotal:									**$ 388,000**
Maintenance costs:									
replace culvert or new ditch	*$2,000*	*occurrence*							
Assume sometimes replace culvert & sometimes new ditch									
Surface erosion location	4	22	2	103		51	17	199	
Subtotal:									**$ 573,120**
Maintenance costs:									
Replace Surface	*75650*	*mile*							
Avg length = 67'. Replace equal amount of avg. on each end									
*201 ft / 5,280ft per mi*75,650 per mi =*	*2880*	*per occurrence*							
Hydraulic Flows Exceed Capacity	0	1	0	13	1	2	78	95	
Subtotal:									**$ 184,585**
Maintenance costs:									
replace culvert	*$ 1,943*	*each*							
Assume replacement size on average is 18-24" CMP									
Inlet / Outlet Erosion Problems	145	72	90	83	225	128	95	838	
Subtotal:									**$ 222,908**
Maintenance costs:									
riprap culvert	*$ 266*	*each*							

Note: Cost per Item Assumptions are in Italics.

Table 7. Estimated Deferred Maintenance Costs for ML 3, 4, and 5 Roads Based on RCS Database and the 2000 Road Maintenance Cost Guide. (Continued)

Problem Feature	Craig	Hoonah	Juneau	Peters-burg	Sitka	Thorne Bay	Wrangell	Total	Total Cost
	Number of Occurrences per Ranger District								
Stream Crossing Problems									
hydraulic flows exceed capacity	7	8	26	17	15	0	5	78	$ 151,554
fill slump or slide	1	0	0	17	0	3	8	29	$ 14,500
improper installation	5	29	26	11	37	0	15	123	$ 184,500
stream in ditch	4	2	34	0	0	1	4	45	$ 11,970
sediment accum in culvert	0	16	1	34	4	16	40	111	$ 55,500
sediment accum in ditch	1	3	1	3	0	0	3	11	$ 5,500
Subtotal:									**$ 423,524**
Maintenance costs:									
hydraulic flows exceed capacity	*$ 1,943*	*each*							
fill slump or slide	*$ 500*	*each*							
improper installation	*$ 1,500*	*each*							
stream in ditch	*$ 266*	*each*							
sediment accum in culvert	*$ 500*	*each*							
sediment accum in ditch	*$ 500*	*each*							
Grand Total:							**Total Cost:**		**$ 14,383,227**

Note: Cost per Item Assumptions are in Italics.

Table 8. Deferred Maintenance Costs for Roads from the 2001 Deferred Maintenance Report.

	Critical Costs ($)				Noncritical Costs ($)				
Maintenance Level	Forest Mission	Health & Safety	Resource Protection	Subtotal	Forest Mission	Health & Safety	Resource Protection	Subtotal	Total
1	177,371	1	889,858	1,067,230	2,901,994	961	11,994,282	14,897,238	15,964,467
2	467,968	4	2,248,143	2,716,115	3,380,856	1,276	14,601,113	17,983,245	20,699,359
3	536,069	22	1,300,062	1,836,153	13,144,298	176,904	15,780,479	29,101,681	30,937,834
4	16,948		30,915	47,863	700,141	2,051	720,743	1,422,936	1,470,799
ML 3-4 Subtotal	553,017	22	1,330,977	1,884,016	13,844,439	178,955	16,501,222	30,524,617	32,408,633
Total ML 1-4	1,198,356	26	4,468,978	5,667,360	20,127,289	181,193	43,096,617	63,405,099	69,072,460
Percent ML 3-4 w/in Category	46.1%	82.9%	29.8%	33.2%	68.8%	98.8%	38.3%	48.1%	46.9%
Percent ML 3-4 of ML 3-4 Total	1.7%	0.0%	4.1%	5.8%	42.7%	0.6%	50.9%	94.2%	100.0%

Table 9. Capital Improvement Costs for Roads from the 2001 Deferred Maintenance Report.

Maintenance Level	Critical Costs ($)				Noncritical Costs ($)				Total
	Forest Mission	Health & Safety	Resource Protection	Subtotal	Forest Mission	Health & Safety	Resource Protection	Subtotal	
1	0	0	0	0	1,096,099	205,190	116,294	1,417,583	1,417,583
2	0	0	0	0	62,811,847	8,188,420	7,844,101	78,844,367	78,844,367
3	0	0	0	0	417,453,208	55,020,026	46,166,778	518,640,013	518,640,013
4	0	0	0	0	109,100,702	13,637,586	13,637,586	136,375,875	136,375,875
ML 3, 4 Subtotal	0	0	0	0	526,553,910	68,657,613	59,804,365	655,015,888	655,015,888
Total 1-4	0	0	0	0	590,461,856	77,051,223	67,764,759	735,277,838	735,277,838
Percent ML 3-4 w/in Category	0.0%	0.0%	0.0%	0.0%	89.2%	89.1%	88.3%	89.1%	89.1%
Percent ML 3-4 of ML 3-4 Total	0.0%	0.0%	0.0%	0.0%	80.4%	10.5%	9.1%	100.0%	100.0%

Public Roads

It is appropriate for the unique relationship between the Tongass and the State of Alaska to provide adequate and safe access for the residents of Southeast Alaska, to operate much of the arterial portion of the road system as "public roads" that meet the safety standards of 23 CFR 1230.3. NFS roads are not generally considered public roads, because they may be closed for resource-related reasons. The essence of this special designation is a traveling surface for all classes of vehicles, full regulatory, warning, and direction signage, and a safe travel way (i.e., elimination of roadside hazards and adequate sight distance). Based on a review of the ML 3, 4, and 5 road system and its use by the public, the IDT recommends that the Forest consider designating 197.9 miles of road as public roads and upgrading them as needed to reflect this status. These roads are listed in Table 10.

Table 10. ML 3, 4, and 5 Roads Recommended for Designation as Public Roads.

Ranger District	Road Name	Route Number	Miles
Hoonah	Hoonah Gypsum	8530	28.9
Thorne Bay	East Prince of Wales	3000000	64.2
Thorne Bay	Coffman Tie	2300000	4.4
Thorne Bay	Coffman Cove Loop	3030000	19.3
Thorne Bay	North Prince of Wales	2000000	61.1
Thorne Bay	Twin Island Lake	2700000	6.1
Thorne Bay	Neck Lake	2500000	3.6
Thorne Bay	Shaheen	2050000	8.6
Thorne Bay	Loop	2050200	1.1
Thorne Bay	Tuxekan Passage	2054000	0.6
Total			**197.9**

Road Segments Proposed for Transfer To The State

There is a proposal for construction of a new ferry terminal in Fools Cove on Wrangell Island. Other locations for a ferry terminal on Wrangell Island may also be considered in addition to Fools Cove. A new ferry terminal would expand the Alaska Marine Highway and increase the level of traffic on Wrangell Island. The terminal could also be used by the Inter-Island Ferry Authority and provide transit to the mainland at the Cleveland Peninsula or to the mainland via Bradford Canal. If this proposed ferry terminal is implemented, the Forest may want to consider discussing with the State of Alaska the feasibility of transferring Road 6270 and portions of Road 6270 (approximately 24.4 miles in total) to the State for inclusion in the State Highway System.

ML 2 or ML 3 Road Segments to Upgrade or Downgrade

District-level road analysis with an appropriate level of public involvement can be an effective method of ensuring that operational and objective maintenance levels are in balance with existing and expected future levels of road use. Examination of Table 3 and Figures 2 through 12 suggest that different ranger districts in the Forest have somewhat disparate views on appropriate designation of ML 3 versus ML 2 roads. For example, the Ketchikan Ranger District has about 333 miles of ML 1, 2, 3, 4, and 5 roads yet only 0.8 mile (less than 1 percent) are ML 3 roads. In contrast, other districts range between having 11 percent to 63 percent of all roads designated as ML 3. Some of these differences reflect local differences in use of roads to link communities and how communities use the roads for recreation, subsistence, and other non-timber uses. However, some of the differences are also likely to be due to a mismatch between the type of use a road receives (or is designated) and its maintenance level. The appropriate balance is best identified at the district level.

Base annual maintenance, costs for ML 2 roads ($806/mile) are about 29 percent less than local ML 3 roads ($1,138/mile). Consequently, downgrading roads that do not receive sufficient use to support a ML 3 designation can represent annual savings. Table 11 identifies 48.7 miles of road that the Petersburg Ranger District identified for downgrading to either ML 1 or ML 2 status. In addition, the IDT identified 87.1 miles of ML 3 road used primarily for timber harvest and timber management activities in other districts that could be considered for downgrading to ML 2 (Table 12). However,

Table 11. ML 3 Roads Downgraded to ML 2 or ML 1 by the Petersburg Ranger District.

Route No.	Route Name	OPML[1/]	OBML[2/]	Length (mi)
43010	SPRING	2	1	0.9
43036	LIZZY	2	1	0.4
45602	HIGH BALL	2	1	0.5
46090	JIGGLE	2	1	1.1
46092	SELECTION	2	1	2.1
6205	PAN CREEK	2	1	1.2
6210	PAINT	2	1	1.2
6212	BOUNDARY	2	1	1.1
6282	SUMNER PASS	2	1	4.4
6317	CAPE STRAIT	2	2	7.4
6317	CAPE STRAIT	1	2	2.1
6304	LOST ROAD	2	1	0.4
6405	UPPER ROWAN BAY	1	2	3.0
6409	NORTHEAST KUIU	2	1	3.6
6410	KADAKE BAY	2	1	2.2
6411	RIDGE TOP	2	1	0.8
6414	WHISTLE PUNK	2	1	0.2
6423	UPPER PILLAR BAY	2	1	0.5
6425	DEAN CREEK	2	2	4.8
6425	DEAN CREEK	2	1	1.1
6431	PILLAR BAY	2	1	1.5
6437	BEAVER POND	2	2	5.6
6437	BEAVER POND	2	1	0.8
6441	CEDAR BIGHT	2	1	1.7
Total				48.4

1/ OPML = Operational Maintenance Level
2/ OBML = Objective Maintenance Level

deferred maintenance is still needed on these roads recommended for downgrading. These recommendations can be a starting point for individual districts to determine an appropriate balance between the different road maintenance levels.

A number of roads have a ML 2 status but appear to receive sufficient use and, therefore, warrant upgrading to ML 3 status. The IDT identified 71.8 miles of road that should be considered for an upgrade in status, which will offset to some degree the downgrading of other roads. These roads are listed in Table 13. When combined with roads recommended for downgrading from ML 3 to ML 2, a net downgrading of 15.3 miles of road would occur. This represents approximately $14,176 to $53,162 of base annual maintenance cost savings to the Forest, depending upon whether the ML 3 roads are local, collector, or arterial roads. In combination with the roads identified by the Petersburg Ranger District, the total savings would be $24,403 to $82,597.

Table 12. ML 3 Roads Recommended for Downgrading to ML 2.

Ranger District	Road Name	Route Number	Miles
Hoonah	8 Fathom Camp	8577	0.9
Hoonah	Mud River	8582	1.9
Hoonah		85811	4.2
Hoonah	Wassachusetts Cove	8513	6.6
Hoonah	Kennel Creek	8519	2.4
Hoonah	Iyoutug	8534	3.6
Hoonah	SLB	8578	6.3
Sitka	Corner Bay	7540CB	7.7
Sitka	COB	7520	2.8
Wrangell	Mussel Shell	6540	10.6
Wrangell	Anita Bay Access	6541	0.5
Wrangell	Burnett Inlet	6547	1.2
Wrangell	Wrangell Is.	6271	0.6
Wrangell	HighBush	50040	1.3
Wrangell	Salamander	50050	1.2
Wrangell		50051	3.6
Wrangell		50052	1
Wrangell	Lost Joe	50054	1.9
Wrangell	Big Hollow	50060	4.2
Wrangell		6578	0.8
Wrangell	NW Zarembo Connection	6588	3.2
Wrangell	Zarembo Lake	6592	5.8
Wrangell	S Zarembo Connection	6594	1.6
Wrangell	Stikine Strait	6597	2.2
Wrangell		52016	0.6
Wrangell		52019	2.4
Wrangell	Nowhere	52020	0.4
Wrangell	Deer Lake	52021	2.6
Wrangell		52022	3.7
Wrangell		52023	0.6
Wrangell	Zarembo North	52031	0.7
Total			**87.1**

Table 13. ML 2 Roads Recommended for Upgrading to ML 3.

Ranger District	Route Number	Route Name	Length in Miles
Craig	2120050		1.7
Hoonah	8544	NEKA-HUMPBACK	2.1
Petersburg	6256	THOMAS BAY	4.1
Petersburg	6360	HENRYETTA	0.7
Petersburg	6400	ROWAN BAY CAMP	0.2
Sitka	7520	TRAP BAY	10.0
Sitka	7576	HARBOR MOUNTAIN	0.8
Thorne Bay	1427000	HECETA ISLAND SPUR A	0.6
Thorne Bay	1444000	WEST PORT ALICE	4.9
Thorne Bay	1520000	EDNA BAY	13.9
Thorne Bay	1525000	EAST EDNA BAY TTF	5.8
Thorne Bay	1530000	SHIPLEY BAY	7.4
Thorne Bay	2000000	NORTH PRINCE OF WALES ROAD	14.4
Thorne Bay	2000860	MEMORIAL BEACH	1.3
Thorne Bay	2000866	MEMORIAL BEACH SPUR 6	0.4
Thorne Bay	2054305	NORTH STANEY	0.7
Thorne Bay	3000490	WHALE PASS WEST SIDE TTF	0.8
Thorne Bay	3025000		1.2
Thorne Bay	3030295	COFFMAN COVE	0.5
Total			**71.8**

RCS Database Improvements

The RCS database is a tremendous asset to the Tongass National Forest that allows road engineers, fish biologists, and water resource specialists[1] to monitor the environmental effects of roads and identify and prioritize road maintenance needs. For the database to be useful and cost effective, the following items are important:

- Specialists should be confident in the quality of the data.
- The collected data should be meaningful.
- The database should be accessible and easy to use.
- The database should be regularly updated.

The RCS database has grown substantially since first implemented in 1994 and the Forest is close to having complete initial survey information on all open roads in its

[1] For example, hydrologists, fluvial geomorphologists, and water quality specialists.

jurisdiction. This is a major accomplishment that the Forest can be proud of. The database occupies over 60 MB of electronic storage and has over 100,000 records, which are maintained in 9 Excel spreadsheets, one per ranger district. The Forest plans to transfer the database into a more robust database software package in the near future. The IDT concurs with this recommendation to make the database easier to use and maintain. The IDT also recommends that the data structure be updated at that time so that the database utilizes multiple related tables rather than a single table structure.

Based upon its use of the database for this roads analysis and discussions with Forest Service Staff that use the database, the IDT has some additional recommendations the Forest should consider:

- Conduct a statistical analysis of the database to discern crew- and/or district-level differences in problem frequency rates.

- Implement a Quality Assurance/Quality Control (QA/QC) process.

- Create a survey of staff using, or potentially using, the database.

- Build in the ability to estimate maintenance costs.

Summarization of some of the RCS data fields suggested that large differences might be present among the districts in the frequency of certain problem types. A detailed statistical analysis would be useful in discerning true differences and help to identify potential systematic biases in data collection or omission that could be corrected in a QA/QC process. The analysis could also help in identification of thresholds for determining critical road segments with a high frequency of problems. The Forest currently has a training module for conducting road surveys, which helps in maintaining consistency in data collection. Development of a formal QA/QC process may result in the implementation of additional measures that would improve data quality.

The 2001 Transportation System Maintenance Handbook (FSH 7709.58, USDA Forest Service 2002) identifies 64 data elements included in the RCS database. A survey of staff that use the database may help in determining the importance of these elements, identification of additional elements that are not currently collected, and identification of how the data is accessed and used. Field measurement of data elements is expensive and time-consuming. Collection of data not used, or rarely used, in identifying road maintenance needs or environmental effects has low cost-effectiveness. The statistical analysis suggested above may also help in identifying types of problems that are rarely observed and should have low priority for data collection efforts. Understanding how staff uses the data can also help in developing the database structure and user interface.

The RCS database can be expanded to include cost information that can be tied to specific problem types. The database could then be used to help estimate maintenance costs.

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