FINAL REPORT VOLUME III

Federal Lands Alternative Transportation Systems Study

Summary of Forest Service ATS Needs

prepared for

Federal Highway Administration
Federal Transit Administration

in association with

U.S. Department of Agriculture (USDA) Forest Service

prepared by

Cambridge Systematics, Inc.

in association with

Salish Kootenai College

January 2004

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This report documents alternative transportation needs in lands managed by the USDA Forest Service. It is a follow-on study to the original project, which estimated ATS needs for three agencies of the Department of the Interior.

Volume III includes a summary of alternative transportation needs and estimated costs between 2003 and 2022. The alternative transportation needs are categorized by state, type of project and type of expenditure. This volume also describes the study methodology used to determine ATS needs, and issues that can be addressed through ATS implementation.

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Executive Summary

This report includes an assessment of needs for Alternative Transportation Systems (ATS) in lands managed by the U.S. Department of Agriculture (USDA) Forest Service. This report documents an estimated ATS need of approximately $698 million over the next 20 years. Of this amount $522 million is estimated for surface transportation systems, $122 million for water transportation, and $54 million for transit enhancements which primarily provide access to non-motorized trails. Approximately $320 million is estimated for capital costs, $52 million for project development and $326 million, or $16.3 million annually for operations and maintenance. While the majority of expenditures are estimated for the first 10 years, this depends largely on the implementation of two major projects, the Mt. Hood Aerial Tramway ($141 million) and the Southeast Alaska Intermodal Ferry Project ($102 million). It should be emphasized that these estimates are preliminary and subject to change based on additional planning and environmental work.

Mt. Hood National Forest Oregon – Mt. Hood

This assessment was conducted as a follow-on project to an ATS needs study issued in 2001 by the U.S. Department of Transportation (U.S. DOT) for sites owned by the Department of the Interior. That report documented the need for ATS in lands managed by the National Park Service, the U.S. Fish and Wildlife Service, and the Bureau of Land Management. That study identified potential ATS needs at 137 of the 207 sites included in the study. The total cost of meeting those needs over the 20-year period from 2000 to 2020 was estimated at $1.71 billion. This total included project development, capital, and operations and maintenance costs. The total needs for the defined "short-term" period, 2000 to 2010, were estimated at $678 million.

The original ATS study was initiated in response to concerns that some of the sites have a level of use so high that it compromises the visitor experience and degrades natural, cultural, and historic resources. In many cases, these impacts are due less to the number of people visiting the site than the number of automobiles that are accommodated. To respond to this situation, Section 3039 of the Transportation Equity Act for the 21st Century (TEA-21) required the Secretary of Transportation, in coordination with the Secretary of the Interior, to "undertake a comprehensive study of alternative transportation needs in national parks and related Federal lands." The goal of the study was to identify opportunities for application of ATS to:

- Preserve sensitive natural, cultural, and historic resources;
- Reduce pollution;

- Relieve traffic congestion and parking shortages;
- Enhance visitor mobility and accessibility;
- Provide improved interpretation, education, and visitor information services; and
- Improve economic development opportunities for surrounding communities.

Since the original report focused on lands owned by the Department of Interior, it did not include the USDA Forest Service. The Forest Service manages more than 190 million acres of National Forests and Grasslands, many of which either surround or border Department of Interior sites that were included in the initial study. While the mission of the Forest Service is more diverse than that of the other agencies studied, recreation is a major element of the Forest Service mission and program. In 2003, the U.S. DOT and the Forest Service partnered to initiate an ATS study. A number of the site reports developed for the initial study noted the close proximity of Forest Service and Department of Interior lands, and specifically noted that cooperation with the Forest Service was essential to successful ATS implementation and operation. ATS provides a means to minimize the impacts of heavy use on sensitive places that are in high demand by managing that demand more effectively. ATS can be used to direct visitors among different Federal lands in a manner that protects the most sensitive resources. Proposed implementation of transit service into the Grand Canyon National Park and proposed expansion of existing systems serving Yosemite National Park and Mt. Rainier National Park are three major examples. Both the U.S. DOT and the Forest Service agreed that the follow-on study should follow a similar process to that used in the initial study.

In order to identify potential ATS sites for this study, the Forest Service asked for ATS proposals from all of their units. After a review of these proposals, 30 were selected for evaluation in the study, with site visits scheduled to all of them.

Table ES.1 summarizes the ATS needs identified in the study.

Table ES.1 Summary of Alternative Transportation System Needs on the National Forest Service Sites

	Short-Term Costs (2003-2012)	Long-Term Costs (2013-2022)	Total Cost (2003-2022)
Surface	$320,000,000	$202,000,000	$522,000,000
Water	$103,000,000	$19,000,000	$122,000,000
Transit Enhancements	$46,000,000	$8,000,000	$54,000,000
Grand Total	**$469,000,000**	**$229,000,000**	**$698,000,000**

In general, bus service is the most common form of transit service operating on Federal lands and is likely to continue as the predominant mode. The size and geographic scope of National Forests means that they often surround National Parks and in many cases surround or are adjacent to urban areas. This creates numerous opportunities to expand or connect with existing transit systems that serve other Federal lands or nearby urban areas. This strategy can help to reduce peak automobile traffic and its negative impacts on sensitive resources. One very promising characteristic of urban transit systems is that the peak usage of their vehicles occurs on weekdays, while peak demand in Forest recreational areas generally occurs on weekends. However, there are challenges in developing partnerships. Urban transit operating costs, even in small communities, can be very high, and available vehicles may not be suitable for areas with steep terrain and narrow roadways. Given the seasonal nature of most services, contracting with private providers can be a cost-effective strategy. It requires that performance and safety be closely monitored.

As in the original study, this study found that, at a majority of sites, transit needs are modest and can be served by a small number of vehicles operating on a seasonal basis. At some sites, there appear to be opportunities to recover at least a portion of operations and maintenance costs through fares. It should be noted that all costs reported in this study are preliminary and subject to change based on further study. Additional planning and environmental analysis is needed on most proposed projects.

Transportation needs and a growing demand for recreation in National Forests are the most significant factors influencing ATS needs identified in the study. In many areas additional visitors can be accommodated, but additional automobiles cannot due to the strain being placed on natural, cultural, and historic resources. Environmental concerns, as well as topography, are making roadway and parking lot expansion more costly and less desirable as a transportation solution. Many site managers believe that ATS can serve as a cost-effective method of accommodating additional visitor demand, while at the same time protecting resources and providing the visitor with additional recreational opportunities and a more pleasant experience. Another important consideration is that many Forest Service communities are finding traditional resource economies difficult to sustain. Increasing recreational activity can help to diversify local economies and create entrepreneurial opportunities for local residents.

Grand Island National Recreation Area
Michigan – Tour Bus

This study demonstrates that Forest Service lands face many if not all of the same types of problems facing Department of Interior lands and could similarly benefit from ATS solutions. Based on the findings of this study, which show a high level of need, the USDA Forest Service should be included in any program to provide funding for ATS on Federal Lands. Since it is unlikely, however, that this program will be capable of addressing all of these needs, partnerships with state and local governments, private business interests, and special interest groups will be critical in order to establish an effective transit program for both the USDA Forest Service and other Federal lands.

1.0 Introduction

This report includes an assessment of needs for Alternative Transportation Systems (ATS) in lands managed by the U.S. Department of Agriculture (USDA) Forest Service. This assessment was conducted as an addendum to an ATS needs study issued in 2001 by the U.S. Department of Transportation (U.S. DOT) for sites owned by the Department of the Interior. That report documented the need for ATS in lands managed by the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the Bureau of Land Management (BLM). The study identified potential ATS needs at 137 of the 207 sites included in the study. The total cost of meeting those needs over the 20-year period from 2000 to 2020 was estimated at $1.71 billion. This total included project development, capital and operations and maintenance costs. The total needs for the defined "short-term" period, 2000 to 2010, were estimated at $678 million.

The original ATS study was initiated in response to concerns that some of the sites have a level of use so high that it compromises the visitor experience and degrades natural, cultural, and historic resources. In many cases, these impacts are due less to the number of people visiting the site than the number of automobiles that are accommodated. To respond to this situation, Section 3039 of the Transportation Equity Act for the 21st Century (TEA-21) required the Secretary of Transportation, in coordination with the Secretary of the Interior, to "undertake a comprehensive study of alternative transportation needs in national parks and related Federal lands." The goal of the study was to identify opportunities for application of ATS to relieve traffic congestion and parking shortages; enhance visitor mobility and accessibility; preserve sensitive natural, cultural, and historic resources; provide improved interpretation, education, and visitor information services; reduce pollution; and improve economic development opportunities for surrounding communities.

Since the original report focused on lands owned by the Department of Interior, it did not include the Forest Service, which is part of the USDA. The Forest Service manages more than 190 million acres of National Forests and Grasslands, many of which either surround or border Department of Interior sites that were included in the initial study. While the mission of the Forest Service is more diverse than that of the other agencies studied, recreation is a major element of the Forest Service mission and program. In 2003, the U.S. DOT and the Forest Service partnered to initiate an ATS study. A number of the site reports developed for the initial study noted the close proximity of Forest Service and Department of Interior lands and specifically noted that cooperation with the Forest Service was essential to successful ATS implementation and operation. Proposed implementation of transit service into the Grand Canyon National Park and proposed expansion of existing systems serving Yosemite National Park and surrounding areas were two major examples identified. Both the U.S. DOT and the Forest Service agreed that the follow-on study should follow a similar process to that used in the initial study.

Grand Canyon National Park Arizona – Village Shuttle

This volume of the Forest Service ATS report summarizes ATS needs identified at the 30 sites included in the study. Additional sites may warrant ATS evaluation in the future. Section 1.0 describes the legislative mandate behind the original study, overall goals and objectives of the study, a definition of ATS, and a summary of the work tasks conducted. Section 2.0 describes the mission and goals of the USDA Forest Service as they relate to transportation issues. Section 3.0 includes a summary of issues that can be addressed by transit implementation. These include transportation, resource conservation, economic and community development, and recreation. Section 4.0 includes a description of transit needs identified in the study. Section 5.0 includes a discussion of opportunities for raising revenue to support ATS systems. Section 6.0 summarizes the transit needs identified in this volume of the Federal Lands ATS Study.

1.1 Section 3039 of the Transportation Equity Act for the 21st Century (TEA-21)

In 1998, the "Transit in Parks Act," or TRIP bill, was proposed by Senator Paul Sarbanes of Maryland. The goal of the bill as stated was "to encourage and promote the development of transportation systems for the betterment of the national parks and other units of the national park system, national wildlife refuges, recreational areas, and other public lands in order to conserve natural, historical and cultural resources and prevent adverse impact, relieve congestion, minimize transportation fuel consumption, reduce pollution (including noise and visual pollution) and enhance visitor mobility and accessibility and the visitor experience." As proposed, the bill would have authorized $50 million annually over five years for ATS that provide access to lands managed by the NPS, the BLM, and the USFWS. Specific objectives of the bill are highlighted in Figure 1.1.

Figure 1.1
Objectives of the "Transit in Parks" Act

To encourage and promote the development of transportation systems for the betterment of the national parks and other units of the National Park System, national wildlife refuges, recreational areas, and other public lands in order to conserve natural, historical and cultural resources and prevent adverse impact, relieve congestion, minimize transportation fuel consumption, reduce pollution (including noise and visual pollution) and enhance visitor mobility and accessibility and the visitor experience;

Initiate a new Federal transit program which would authorize $50 million in funding in each of the next five years to the three Federal Land management agencies in the Department of the Interior – the National Park Service, the U.S. Fish and Wildlife Service, and the Bureau of Land Management. The program will allocate capital funds for transit projects, including rail or clean fuel bus projects, pedestrian bike paths, or park watercraft access, within or adjacent to national park lands;

Formalizes the cooperative agreement between the Secretary of Transportation and the Secretary of the Interior to exchange technical assistance and to develop procedures related to the planning, selection and funding of transit projects in national park lands; and

To undertake a comprehensive study of alternative transportation needs in the national parks and related public lands eligible for assistance under this program. The study will better identify those areas with existing and potential problems of congestion and pollution, or which can benefit from mass transportation services, as well as identify and estimate project costs for these sites.

The proposed legislation built upon two prior initiatives:

1. A study of alternative transportation strategies in national parks was mandated by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The study identified many of the problems of overcrowding, traffic congestion, and pollution that were impacting the visitor experience in the more heavily visited national parks.

2. In November 1997, Secretary of Transportation Rodney Slater and Secretary of the Interior Bruce Babbitt signed a Memorandum of Understanding (MOU) in which the two departments agreed to work together to address transportation and resource management needs in and around the national parks. The MOU described some major issues facing site managers of Federal lands, and is quoted in Figure 1.2.

Figure 1.2
Department of Transportation – Department of the Interior
Memorandum of Understanding

"Congestion in and approaching many national parks is causing lengthy traffic delays and backups that substantially detract from the visitor experience. Visitors find that many of the national parks contain significant noise and air pollution, and traffic congestion similar to that found on the city streets they left behind.

In many national park units, the capacity of parking facilities at interpretive or scenic areas is well below demand. As a result, visitors park along roadsides, damaging park resources and subjecting people to hazardous safety conditions as they walk near busy roads to access visitor use areas.

On occasion, national park units must close their gates during high visitation periods and turn away the public because the existing infrastructure and transportation systems are at, or beyond, capacity for which they were designed."

The Transit in Parks Act was not enacted but portions of it were adopted in TEA-21, including Section 3039, which called for the Secretary of Transportation, in coordination with the Secretary of the Interior, to "undertake a comprehensive study of alternative transportation needs in national parks and related public lands." This study was managed jointly by the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA), and carried out by a consultant team led by Cambridge Systematics, Inc. and BRW, Inc. The field work for the study was conducted primarily in the summer and fall of 1999, with all volumes of the final report completed in draft in the spring of 2000 and issued as final in the fall of 2001.

All of the proposals and documents identified above, referenced only the Department of the Interior. However, the results of the initial study identified a number of Department of Interior sites where successful ATS implementation requires either Forest Service cooperation or implementation and/or operation of ATS facilities on Forest Service land. In addition, the scope of Forest Service recreational activity, and the location of many major recreational facilities on Forest Service property, clearly establish the need for such a study.

1.2 Goals and Objectives of the Study

The study was conducted to assess the opportunities and need for ATS projects on Forest Service lands. Study tasks included:

- Identifying existing and potential problems related to congestion, resource impacts, and visitor experience that might be addressed by ATS;
- Identifying and describing ATS needs at 30 sites identified by the USDA Forest Service;

- Quantifying, on a national basis, ATS needs for these 30 sites, including project development, capital, and operating and maintenance costs;

- Describing potential benefits from successful implementation of ATS, including those related to conserving the site's natural, cultural or historic resources, improving transportation services, increasing economic development in surrounding communities, and improving the visitor experience; and

- Identifying potential options for generating revenue to implement and support ATS on Federally managed lands.

1.3 Definition of Alternative Transportation Systems

For the purposes of this study, ATS refers to transit systems and transit or transportation enhancements eligible under Titles 49 and 23 that enhance transportation service or use and that are physically or functionally related to transit facilities, such as parking, pedestrian and bicycle access, walkways, and similar amenities that provide access to and within Forest Service lands. More detailed analyses will be required to determine eligibility of various projects such as those involving trails. This study identified existing ATS that need to be expanded or modified, as well as new ATS projects. The identified needs include services that would operate completely within the Forest Service sites, services that would link Forest Service sites to nearby National Parks and other Federal lands, services that provide regional links for both transit and non-motorized systems, and systems that link Forest Service sites to surrounding communities.

Transit vehicles identified in this study include trams, standard transit buses, small buses, historic trolleys, trolley cars, waterborne vessels, and aerial tramways. Other essential transit investments include maintenance and storage facilities and ferry piers. Transit enhancements identified include parking facilities, connections with non-motorized trails, shelters, and signage and information services. The ATS cost figures in the study include project development costs, including environmental evaluations, capital costs, and operations and maintenance costs. Capital costs are broken into vehicle costs and other infrastructure costs.

1.4 Summary of Study Tasks

The Forest Service ATS Study includes a report with four separate volumes. These volumes correspond to four study tasks, as described below.

Task 1. Develop an Inventory of Transit Technologies That May Be Appropriate for Use in Public Lands Settings

This project included an update of Volume I of the previous study, which provided an inventory of transit vehicle technologies. Volume I of the original study identified existing and emerging transit technologies appropriate for application on Federal lands. The consultant team utilized as a basis for this work the NPS 1994 *Alternative Transportation Modes Feasibility Study: Visitor Transportation System Alternatives*. Work included reviewing the alternative transportation modes described in the NPS study and updating the information as necessary. New emerging technologies including alternative fueled vehicles were incorporated, and economic data were updated. The consultant team sponsored an industry outreach session with developers and manufacturers of alternative transportation vehicles at the 1999 American Public Transit Association (APTA) conference. Volume I included detailed descriptions of many different vehicle technologies, in addition to information on clean fuel vehicles and intelligent transportation systems (ITS) applications.

For this project, the report was further updated to reflect changes to 2003. Efforts were focused on updating of vehicle characteristics and new technologies. A major priority for this update was to identify advances in clean fuel technology, which has experienced major advances in the last four years. These technologies provide an opportunity to enhance resource conservation and are thus of significant interest to Federal lands site personnel. In addition, the number and variety of specialized and historic-themed vehicles appropriate for recreational transit use have increased as well.

Lake Tahoe Basin Management Unit
California/Nevada – Historic Vehicles

Task 2. Identify Funding Sources for Federal Lands ATS Systems

This project also included an update of Volume II of the original Federal Lands ATS Study. Volume II included descriptions of various public and private funding sources available for developing, implementing, operating, and maintaining ATS systems. A variety of funding programs to support these activities are available through the FHWA and the FTA in Title 23, U.S.C. and Title 49, U.S.C., respectively. Chapter 2 of Title 23, U.S.C. includes the Federal Lands Highway Program (FLHP). This program primarily provides funding for roadway and bridge projects, but also may be used to fund ATS projects in the national park system, the forest highway system, and the Indian reservation roads system. Since 1999, the NPS has set aside between $8 million and $12 million annually from the Federal Lands Highway Park Roads and Parkways Program for ATS projects. There has been very stiff competition for this limited amount of funding, indicating that the real demand is much higher. Other Federal lands agencies, including the Forest Service, do not have dedicated funds available for this purpose.

Other FHWA and FTA programs that fund transit systems are established to provide funds primarily to states, metropolitan planning organizations (MPO), and transit operators. In order for the Federal land management agencies (FLMA) to receive funding or benefits from these programs, they should partner with state or local governments, or transit operators. While competition for Federal funds is intensive, some sites have successfully partnered with state DOTs, MPOs, and surrounding communities to fund transit projects.

The updated Volume II documents changes in funding eligibility and levels over the past four years and includes additional information on potential Federal funding sources for Forest Service ATS projects. The report also includes an updated section on user-funded and other potential revenue sources for Forest Service ATS projects. This section reflects the unique characteristics of the Forest Service Special Use Permit system, which in some cases requires provision of ATS services.

Task 3. Develop Estimates for National Transit Needs

Task 3, the results of which are documented in this volume, included the identification and costing of ATS needs for the Forest Service. Figure 1.3 identifies the cost categories used in the analysis. The work in this task was accomplished through site visits, follow-up telephone interviews, and review of documents obtained from site personnel and other sources.

Each of the identified sites was categorized in one of three levels, reflecting the level of planning that has taken place. It should be noted that for some sites there were multiple projects proposed and these projects, in many cases, had different levels of planning. The categories were defined as follows:

1. Sites that have existing ATS with modification and/or expansion proposed;

2. Sites that have conducted a formal planning process for the implementation of ATS services or that have identified a potential need for ATS through Management Plans or other formal planning processes; and

3. Sites that have identified a potential need for ATS through informal means.

Figure 1.4 shows the National Forest System lands, along with the 30 sites included in this study. Reports were developed for each of the 30 sites that were included in the study. The objectives of these reports, which are provided in Appendix C, were to:

- Identify existing conditions at the site;
- Document existing and anticipated transportation issues;
- Document non-transportation issues that may be addressed through ATS options;
- Document site plans related to transportation; and
- Identify feasible ATS alternatives along with level of planning achieved and estimated project costs.

Figure 1.3
Breakdown of Potential ATS Costs

Timeframe

- Short-Term (2003-2012)
- Long-Term (2013-2022)

Agency

- U.S.D.A. Forest Service

State

- Summary of costs by state

ATS Modes

- Surface
- Water Transportation
- Non-Transit ATS Modes

Project Cost Categories

Project Development
- Environmental evaluation
- Transportation Planning
- Engineering design
- Procurement activities

Capital Expenses
- Vehicles
- Vessels
- Maintenance Facilities
- Storage Facilities
- Docks and Piers
- Shelters and signs
- Parking facilities
- Transit terminal facilities
- Trail development and trailheads
- Information systems

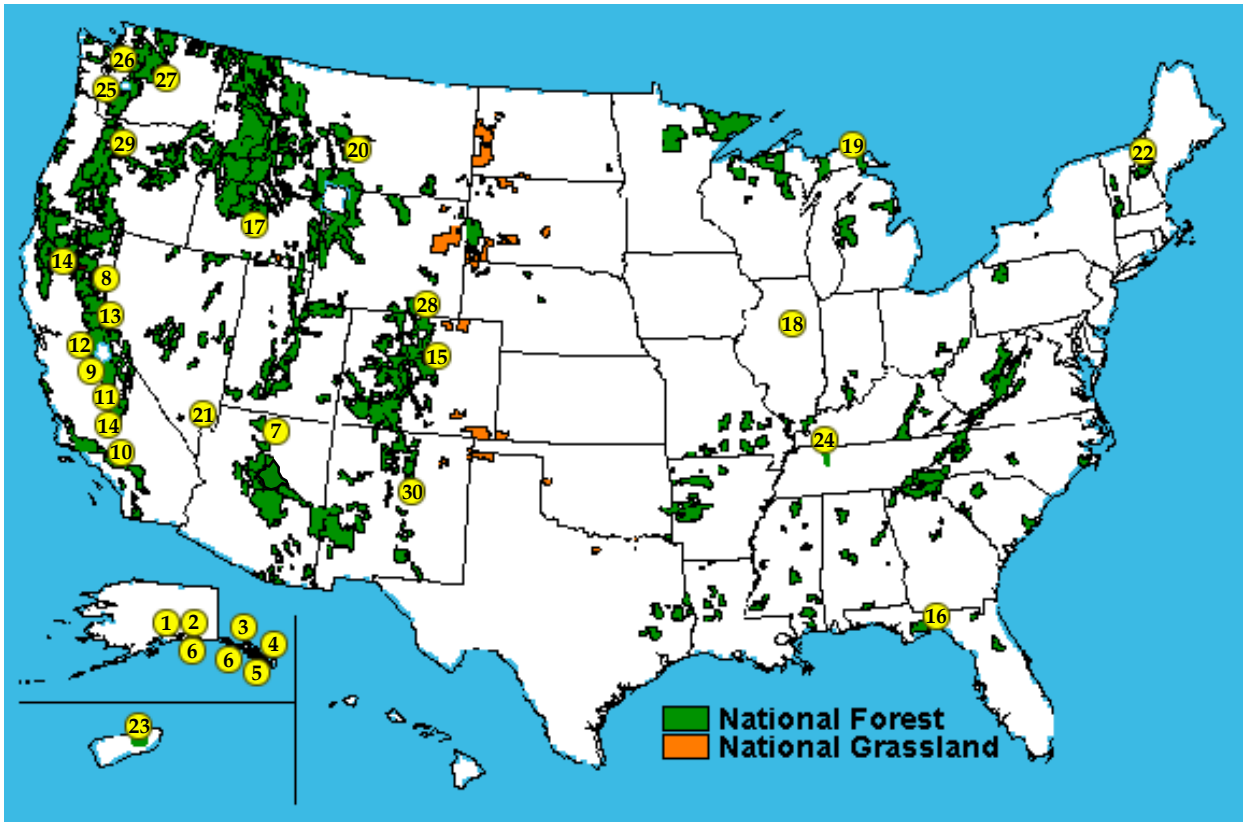
Operations and Maintenance
- Operating labor
- Fuel and supplies
- Vehicle maintenance
- Facilities maintenance
- Trail/trailhead maintenance

The format used for the Forest Service site reports is shown in Figure 1.5. Following completion of the reports, potential ATS alternatives were summarized, compiled, and categorized as shown previously in Figure 1.3. Projects related directly to transit services or infrastructure facilities supporting transit were presented separately from transportation enhancement projects. A cost estimation methodology was applied to each alternative, and the consultant team developed estimates of key cost estimation parameters, including route miles, days and hours of operation, frequency of service, and vehicle type. Needs for maintenance and storage facilities, shelters, additional parking spaces, and informational programs also were identified.

It is important to note that for many of the needs identified, a variety of operating strategies could be employed. For the most part, feasible ATS are relatively limited in scope and would operate on a seasonal basis. Site managers may prefer to own transit vehicles and either operate services themselves or contract operation to a private business. Some may prefer to simply contract all services to private companies, allowing those companies to supply vehicles as well as operating services. These decisions will be made after more detailed study at each site and will be based on a variety of factors, including the availability of equipment, location of the site, annual period of service, and availability of an adequate number of private operators to provide competition. Therefore, the final cost

estimates for these services may vary significantly based on the final planning analysis and the availability of funding. Appendix A includes documentation of the cost estimation methodology and the assumptions applied to each site.

Figure 1.4 United States Forest Service and Visit Sites



1. Chugach National Forest Iditarod Trail
2. Chugach National Forest Childs Glacier Transit
3. Tongass National Forest Mendenhall
4. Tongass National Forest Ferry/Intermodal
5. Tongass National Forest Prince of Wales Transit
6. Chugach/Tongass National Forest Information
7. Kaibab National Forest Grand Canyon Transit
8. Plumas National Forest Feather River Shuttle
9. Sierra National Forest Transit
10. Southern California National Forests Transit
11. Sequoia National Forest Transit
12. Stanislaus National Forest Transit
13. Tahoe National Forest Transit
14. Eastern Sierra Expanded Transit (Multiple Forests)
15. Arapahoe-Roosevelt National Forest Transit
16. Apalachicola National Forest Rail-Trail
17. Sawtooth National Forest Transit and Bike Trail
18. Midewin National Tallgrass Prairie Transit Connections
19. Grand Island National Recreation Area Ferry and Transit
20. Lewis and Clark National Forest Transit Extension
21. Spring Mountain National Recreation Area Shuttle
22. White Mountain National Forest Transit
23. Caribbean National Forest Tram
24. Land Between the Lakes Transit
25. Mount Baker-Snoqualmie National Forest Mount Rainer Transit
26. Mount Baker-Snoqualmie National Forest Stevens Pass Transit
27. Wenatchee National Forest Mather Memorial Bike/Hike Trail
28. Medicine Bow National Forest Rail/Trail and Off-Road Parking
29. Mount Hood National Forest Aerial Tramway
30. Cibola National Forest Transit Extension

Figure 1.5
Site Visit Report Outline

1. Summary
2. Background Information
   - Location
   - Physical Description
   - Mission and Goals
   - Visitor Characteristics
3. Existing Conditions, Issues, and Concerns
   - Transportation Conditions, Issues, and Concerns
   - Community Development Conditions, Issues, and Concerns
   - Natural or Cultural Resource Conditions, Issues, and Concerns
   - Recreational Conditions, Issues, and Concerns
4. Planning and Coordination
5. Assessment of Need
   - Magnitude of Need
   - Feasible Transit Alternatives
   - Other Feasible ATS Alternatives

2.0 Background

2.1 Mission and Goals of the Forest Service

The USDA Forest Service is a Federal agency that manages public lands in National Forests and Grasslands. The Forest Service also is the largest forestry research organization in the world and provides technical and financial assistance to state and private forestry agencies**. The stated mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.** The Forest Service motto, "*Caring for the Land and Serving People*," captures the spirit of the Forest Service mission, which is accomplished through five main activities:

- Protection and management of natural resources on National Forest System lands;
- Research on all aspects of forestry, rangeland management, and forest resource utilization;
- Community assistance and cooperation with state and local governments, forest industries, and private landowners to help protect and manage non-Federal forest and associated range and watershed lands to improve conditions in rural areas;
- Achieving and supporting an effective workforce that reflects the full range of diversity of the American people; and
- International assistance in formulating policy and coordinating U.S. support for the protection and sound management of the world's forest resources.

Congress authorized creation of what is now the National Forest System through the Organic Administration Act of June 4, 1897 (Chapter 2:30 Stat. 34-36) "to improve and protect" Federal Forests. The USDA Forest Service is vested with broad authority to "regulate occupancy and use and to preserve the forests therein from destruction" (16 U.S.C. 551). The law provided for establishment of Forest reserves "to improve and protect the Forest within its boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of the citizens of the United States." (16 U.S.C. 475).

Sequoia National Forest California

Over the years, the public has expanded the list of what they want from National Forests and Grasslands and Congress responded by directing the Forest Service to manage

National Forests for additional multiple uses and benefits and for the sustained yield of renewable resources, such as water, forage, wildlife, wood, and recreation. The Multiple Use Sustained Yield Act of 1960 (MUSYA) confirmed the Forest Service's authority to manage the National Forests and Grasslands "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes" (16 U.S.C. 528). Later legislation impacting the Forest Service included the National Forest Management Act (NFMA) of 1976, which required land and resource management plans that provide for multiple uses and sustained yield. The NFMA also called for "integrated consideration of physical, biological, economic and other sciences." (16 U.S.C. 1604(b)). Two major environmental laws, the National Environmental Policy Act of 1969 (NEPA) and the Endangered Species Act of 1973 (ESA) also have had major impacts on the planning and management activities of the Forest Service.

2.2 Organization of the Forest Service

The Forest Service manages public lands, known collectively as the National Forest System, located in 44 States, Puerto Rico, and the Virgin Islands. The lands comprise 8.5 percent of the total land area in the United States or 191 million acres (77.3 million hectares) of land, which is an area equivalent to the size of Texas. The natural resources on these lands are some of the Nation's greatest assets and have major economic, environmental, and social significance for all Americans. National Forests provide opportunities for recreation in open spaces and natural environments. With more and more people living in urban areas, National Forests are becoming more important and valuable to Americans. People enjoy a wide variety of activities on National Forests, including backpacking in remote, unroaded wilderness areas; mastering an all-terrain vehicle over a challenging trail; enjoying the views along a scenic byway; or fishing in a great trout stream, to mention just a few.

There are four levels of National Forest offices, as described below.

Ranger District: There are more than 600 ranger districts, each with a staff of 10 to 100 people led by a District Ranger. The districts vary in size from 50,000 acres (20,000 hectares) to more than one million acres (400,000 hectares). Many on-the-ground activities occur on the ranger districts, including trail construction and maintenance, operation of campgrounds, and management of vegetation and wildlife habitat.

National Forest: There are 155 National Forests and 20 Grasslands. Each forest is composed of several ranger districts. The person in charge of a national forest is called the Forest Supervisor. The district rangers from the districts within a forest work for the Forest Supervisor. The headquarters of a national forest is called the supervisor's office. This level coordinates activities between districts, allocates the budget, and provides technical support to each district.

Region: There are nine regions which are broad geographic areas, usually including several States. The person in charge is called the Regional Forester. Forest Supervisors of the

National Forests within a region report to the Regional Forester. The regional office staff coordinates activities between national forests, monitors activities on national forests to ensure quality operations, provides guidance for forest plans, and allocates budgets to the forests.

National Level: This is commonly called the Washington Office. The person who oversees the entire Forest Service is called the Chief. The Chief is a Federal employee who reports to the Under Secretary for Natural Resources and Environment in the USDA. The Chief's staff provides broad policy and direction for the agency, works with the President's Administration to develop a budget to submit to Congress, provides information to Congress on accomplishments, and monitors activities of the agency.

2.3 USDA Forest Service Strategic Plan

The Forest Service Strategic Plan, last revised in 2000, lists four specific goals and a number of objectives to guide the activities of the agency. Many of these goals and objectives directly address the need for ATS. The four major goals, with relevant objectives, are listed below.

Goal 1 – Ecosystem Health

Promote ecosystem health and conservation using a collaborative approach to sustain the Nation's forests, grasslands, and watersheds.

Objective 1a – Improve and protect watershed conditions to provide the water quality and quantity and the soil productivity necessary to support ecological functions and intended beneficial water uses.

Objective 1b – Provide ecological conditions to sustain viable populations of native and desired nonnative species and to achieve objectives for Management Indicator Species (MIS)/focal species.

ATS can support both of these objectives by reducing automobile traffic in sensitive ecological areas and reducing future demands for expanded roadways and parking facilities.

Goal 2 – Multiple Benefits to People

Provide a variety of uses, values, products, and services for present and future generations by managing within the capability of sustainable ecosystems.

Objective 2a – Improve the capability of the Nation's forests and grasslands to provide diverse, high-quality outdoor recreation opportunities.

Objective 2b – Improve the capability of wilderness and protected areas to sustain a desired range of benefits and values.

Objective 2c – Improve the capability of the Nation's forests and grasslands to provide desired sustainable level of uses, values, products, and services.

Objective 2d – Increase accessibility to a diversity of people and members of underserved and low-income populations to the full range of uses, values, products, and services.

Caribbean National Forest Puerto Rico – Waterplay

Objective 2e – Improve delivery of service to urban communities.

While the National Forest System serves a wide variety of economic uses, the majority of people who experience the System do so as recreational users. ATS can help provide benefits to these users in a number of ways, including:

- Reducing traffic congestion that is experienced in many popular areas;
- Reducing the negative environmental impacts that result from the need to accommodate automobile traffic, including air pollution, noise, and expansion of roadway and parking facilities;
- Providing additional opportunity for users to learn about the Forest and its natural, cultural, and historic resources;
- Dispersing users away from crowded areas to lesser-used attractions by providing shuttle services for wilderness/back-country trips;
- Providing opportunities for underserved and low-income populations with limited automobile availability to access Forests for recreational usage; and
- Partnering with existing urban transportation systems to provide improved access to Forest recreational areas located near large population centers.

Goal 3 – Scientific and Technical Assistance

Develop and use the best scientific information available to deliver technical and community assistance and to support ecological, economic and social sustainability.

Objective 3a – Better assist in building the capacity of Tribal governments, rural communities, and private landowners to adapt economic, environmental, and social change related to natural resources.

Objective 3c – Improve the knowledge base provided through research, inventory and monitoring to enhance scientific understanding of ecosystems, including human uses, and to support decision-making and sustainable management of the Nation's forests and grasslands.

Tongass National Forest Alaska – Totem Poles in Klawock

These objectives relate to improved understanding of the impacts of recreational use on the Forest and surrounding communities. Alternative transportation systems can help to accommodate human uses, minimizing negative impacts on the Forest while enhancing recreational and economic opportunities. In particular, ATS can help to increase the economic benefits of recreational use to surrounding communities, while helping to conserve natural resources.

Goal 4 – Effective Public Service

Ensure the acquisition and use of an appropriate corporate infrastructure to enable the efficient delivery of a variety of uses.

Objective 4a – Improve financial management to achieve fiscal accountability.

Objective 4b – Improve the safety and economy of USDA Forest Service roads, trails, facilities, and operations and provide greater security for the public and employees.

Objective 4d – Improve the skills, diversity, and productivity of the workforce.

Objective 4e – Ensure equal opportunity in employment practices.

Objective 4f – Provide appropriate access to National Forest System lands and ensure nondiscrimination in the delivery of all USDA Forest Service programs.

Alternative transportation systems can help to address a number of the objectives identified under goal 4. In some cases, transportation needs may be met more cost-effectively by ATS than by expansion of roads and parking areas, especially where demand is heavily concentrated during a peak season. Multimodal approaches that look at roadway and ATS together can be particularly effective in maximizing scarce resources. At some sites ATS was identified as a potential method of enhancing employment opportunities for those who lack automobile transportation. Another opportunity identified was enhancement of recreational opportunities for underserved populations located in both urban and rural areas.

3.0 Issues That Can Be Addressed by Alternative Transportation Systems

Great interest in ATS systems has been expressed by Federal lands site managers, including Forest Service managers. These managers recognize that various issues and concerns can be addressed by providing visitors with alternatives to the private automobile. This section describes transportation, resource conservation, economic and community development, recreational, and tribal issues that can be addressed through ATS implementation.

3.1 Transportation Issues

Forest service site personnel contacted for this study view ATS as a means of meeting visitor transportation and mobility needs. This section summarizes the numerous and varied transportation-related issues that influence ATS needs.

National Forest managers have identified a wide range of transportation issues that impact their sites. In Forests close to urban areas, such as the Arapahoe-Roosevelt National Forest in Colorado, the Angeles, San Bernardino, and Los Padres Forests in California, the Caribbean National Forest in Puerto Rico, and the White Mountain National Forest in New Hampshire and Maine, increased recreational use is resulting in traffic congestion and parking shortages during periods of peak use. In some cases, pedestrian safety also is a concern. Expansion of roadway and parking areas to accommodate additional demand often is prohibitively expensive or infeasible due to physical and environmental constraints. Public transportation service is being considered at these sites to meet excess demand, as well as to provide recreational opportunities for residents who lack automobile transportation. Other sites, such as the Midewin National Tallgrass Prairie in Illinois and the Lewis and Clark National Forest in Montana, are attempting to extend existing local transit service to promote use of their facilities.

Arapahoe-Roosevelt National Forest Colorado – Brainard Lake Loop Road Parking on August Sunday

A number of National Forests surround very popular, heavily visited National Parks. While the Parks receive the majority of visitors, significant traffic congestion often is experienced in neighboring National Forests and gateway communities.

These sites include the Stanislaus, Sierra, and Inyo National Forests near Yosemite National Park; the Snoqualmie National Forest surrounding Mount Rainier National Park; and the Kaibab National Forest which borders the Grand Canyon National Park. These sites are considering expansion of existing public transportation services or implementation of new services to help reduce private automobile traffic in these areas. National Forests in California also are considering longer, regional routes that would connect with local services and enable visitors to travel throughout the region without a private automobile.

Another major regional transportation project was identified in the Tongass National Forest of Alaska, which includes 80 percent of the land area of Southeast Alaska and surrounds virtually every major town and city. Lack of roadway access means that Southeast Alaska residents must rely on relatively expensive air transportation service and an aging ferry fleet to travel beyond their community. The Alaska DOT and the Forest Service are partnering on a plan that will use a combination of upgraded Forest Service roads and shuttle ferries to improve mobility between communities, and allow the elimination of infrequent and costly ferry routes. It is anticipated that the shuttle ferries and piers, which would be located on Forest Service property, would be candidates for ATS funding. A related project is a proposed transit system to link two ferry terminals on Prince of Wales Island. This system would serve both visitors and residents of the Island.

Other transportation issues identified were more localized. In the Land Between the Lakes National Recreation Area, for example, transit service has been proposed to link dispersed attractions and provide improved mobility to those arriving by boat and tour bus. The Mendenhall Glacier Visitor Center in Alaska's Tongass National Forest has experienced a major increase in visitation that is directly linked to the rapid growth in cruise ship traffic. More than 9,000 cruise ship passengers may be in Juneau (population 32,000) during peak season, and many ride tour or charter buses to the Mendenhall Visitor Center. Site managers are interested in alternatives for reconfiguring the current bus terminal area at the Visitor Center, which is not well-suited to serve the large surges of bus and pedestrian traffic. There also is interest in a shuttle system linking the City's bus system with the Visitor Center. The Grand Island National Recreation Area in Michigan's Hiawatha National Forest has identified a need to improve ferry access from the mainland to Grand Island as well as public transportation around the Island itself.

The National Forests contain a number of alpine ski areas within their boundaries, most of which are operated under special use permit. Some of these areas are experiencing growth in demand, but roadway and parking capacity often cannot easily be expanded due to physical and environmental constraints. The ATS projects identified as part of this study include expanded transit service to the Stevens Pass Ski Area in the Mt. Baker-Snoqualmie National Forest in Washington and a gondola system that could service two ski areas located in the Mt. Hood National Forest in Oregon.

Tongass National Forest Alaska –
Cruise Ships Docked in Juneau

3.2 Resource Conservation Issues

As a land resource management agency, resource conservation is a primary goal of the Forest Service, and transportation decisions must balance access needs with potential resource impacts. In recent years, there have been significant changes in public demand and use on National Forests. The increased recreational use on National Forests, combined with the rapid rate of rural economic development, has blurred the lines between private and public lands, elevating concerns about habitat fragmentation, the introduction of invasive species, and management of motorized use.

Chugach National Forest Alaska – Kenai Lake

The impact of roads and parking on natural resources and the overall recreation user experience is a major concern as traffic congestion increases. The Forest Service is looking at ATS as an alternative to minimize the impact of its extensive roadway system on the environment, particularly in areas popular with recreational users. For example, the Arapahoe-Roosevelt National Forest in Colorado is planning to remove part of a loop road which travels through an environmentally sensitive area around heavily visited Brainerd Lake. This would result in reduced parking capacity in the area, which the Forest Service hopes to compensate for with a transit system. At the Lake Tahoe Basin Management Unit, unauthorized parking along Nevada Route 28 has resulted in resource damage, including erosion impacting the Lake. Implementation of a transit service has been proposed, which would be followed by the installation of physical barriers designed to prevent off-road parking. Along the Kancamangus Highway in the White Mountain National Forest, there are numerous parking areas that serve swimming areas, trailheads, and scenic vistas. During peak seasons, and particularly on hot days, these parking areas overflow. At many locations parking expansion would have unacceptable impacts on adjacent rivers and wetlands. Public transportation is proposed as a method of meeting this excess demand. At the Caribbean National Forest in Puerto Rico off-road parking is having negative impacts on a unique and environmentally sensitive rain forest. At the Medicine Bow National Forest, uncontrolled snowmobile parking along the Route 130 Scenic Byway results in resource damage and safety hazards, and diminishes the experience of non-motorized trail users traveling toward a trailhead beyond the area. The Forest Service has proposed development of an off-road snowmobile parking area to mitigate this situation and provide a more hospitable environment for snowmobilers.

White Mountain National Forest New Hampshire – Sabbaday Falls

The proximity of Forest Service units to major National Parks is having impacts on Forest Service resources in some locations. Forest lands surrounding popular Parks, such as Yosemite, Sequoia, and Grand Canyon, are impacted by automobile

restrictions in the Parks themselves. Without improved coordination, the negative impacts of congestion, including resource damage and air pollution, may simply be moved from the Park to the Forest lands outside. In California, several of the Forests participating in this study identified potential transit routes that would either extend existing services further from the Park or implement new routes to serve a wider range of destinations. Sequoia, Stanislaus, and Sierra National Forests were among the Forests where services were proposed. A number of the routes proposed would link to gateway communities where parking and supporting infrastructure for transit may be more readily available.

3.3 Economic and Community Development Issues

The Forest Service has long had complex relationships with nearby communities that are economically dependent on Federal lands. Factors influencing the relationship between the Forest Service and local communities include the size of Forest Service holdings, the fact that many communities are surrounded entirely by Forest Service land, and the economic ties developed over many years through timber harvesting and recreational activities. In 1999, the Forest Service reported receipts of $628 million, with 65 percent coming from timber harvesting activities and 19 percent from mineral and energy extraction. Recreational uses accounted for 10 percent of revenue, with livestock grazing, special uses and leasing, and miscellaneous receipts accounting for the remaining six percent. Under Federal law, 25 percent of non-mineral receipts collected by the Forest Service must be returned to the States for distribution to counties for use in improving roads and schools. In 1999, these payments totaled $208 million.

The *Forest Service 2000 Strategic Plan* noted three components of agency activity that support economic activity. These include: 1) production of resource outputs; 2) agency direct expenditures; and 3) distribution of agency receipts. While resource outputs provide the largest economic benefit, agency direct expenditures are very significant to many of the smaller communities located adjacent to or within the Forest. In a number of communities with seasonal and/or resource-based economies, the Forest Service provides a large proportion of year-round employment.

The Forest Service calculates total income effect from its activities. Income effects include wage income; proprietary income (self-employment income); and property income, including rent and stock dividends. The total income effect of Forest Service activity was estimated at $37.7 billion in 1999. From this, $5.4 billion came from hunting, fishing, and wildlife viewing; and $21.1 billion came from other recreational activity. Therefore, these two categories accounted for 70 percent of all Forest Service income effects. Direct distribution of Forest Service receipts for recreation use totaled $15 million. Forest Service estimates of employment effects show a similar proportion with 146,000 of 906,000 total jobs resulting from hunting, fishing, and wildlife viewing activity; and 520,000 from recreation use. Of the 906,000 jobs supported by Forest Service activity, 38,000 result from either permanent or temporary employment by the agency itself. Forecasts provided in

the strategic plan showed modest increases in economic activity between 1999 and 2006, with total income effect increasing from $37.7 billion to $40.9 billion and employment increasing from 906,000 to 977,000. The report also notes that recreation-related jobs have wages slightly lower than jobs generated through timber harvesting and significantly lower than those generated through minerals and energy extraction.

Communities located in or near Forest Service sites have a tremendous stake in decisions made by National Forest System land site managers. As tourism has increased and resource-based industries such as agriculture and mining employ fewer people, the economic dependence of many gateway communities on nearby Forest Service lands has become greater than ever. In some cases, such as in the Lake Tahoe Basin Management Unit, communities find themselves needing to address overcrowding and rapid growth in both permanent population and tourism. In some areas located near large population centers, retirees and second-home owners are in conflict with other local residents over the amount of tourism and economic activity that should be promoted. Transit systems have been proposed in a number of these areas so that additional tourism can be accommodated without increasing the negative impacts associated with additional automobile traffic.

Chugach National Forest Alaska – Childs Glacier

Other communities are struggling economically and thus anxious to benefit from additional tourism and recreational use. Cordova, Alaska is the gateway to the eastern portion of the Chugach National Forest, and the spectacular attractions of the Copper River Delta and Childs Glacier. Cordova is heavily dependent on fishing and resource extraction, and is interested in promoting additional tourism. With access currently difficult and expensive, there is a limited tourist market. However, high-speed ferry service will be implemented shortly, increasing the potential market. Local transit service is seen by both the City and the Forest Service as essential to allow tourists to enjoy the area's attractions. It is anticipated that local businesses would actually operate the service, providing an important opportunity for entrepreneurship.

Regional economic development is a key consideration in two major projects identified. One is expansion of a regional bus service in the Eastern Sierras of California. This service would link major destinations in the Eastern Sierra, including the Inyo National Forest, Humboldt-Toiyabe National Forest, the Town of Mammoth Lakes and Mammoth Mountain Ski Area, Devils Postpile National Monument, Yosemite National Park, Mono Basin National Forest Scenic Area, and Mount Whitney. It is anticipated that the proposed service would increase the market for local businesses in the corridor by attracting both international and domestic tourists who wish to travel without a private vehicle.

The Southeast Alaska Ferry/Intermodal Plan described in Section 3.1 is another regional initiative designed to improve mobility and economic development opportunities for the 75,000 residents of Southeast Alaska. Lack of transportation limits tourism and job

opportunities for these residents, hampers their ability to get natural resource products to market in a timely fashion, increases the price of basic goods, and negatively impacts the quality and timeliness of medical care. The plan would have major benefits for the economic health of these communities.

Some of the non-transit ATS projects identified through this study also have implications for economic and community development. The proposed Iditarod National Historic Trail (NHT) in the Chugach National Forest in Alaska, the Medicine Bow National Forest rail-trail in Wyoming, and the proposed non-motorized trail in the Wenatchee National Forest in Washington are all designed to attract visitors to their respective regions, increasing the economic activity in local communities.

The difficult challenges of community and economic development have encouraged Forest Service managers to participate actively in local community planning activities. With limited funds available to maintain recreation sites and to service a growing number of visitors, partnerships are being emphasized. Close working relationships with local and state agencies, as well as the private sector and private non-profit support organizations are essential for most site managers. A number of the projects identified have been developed through partnerships with local governments, state agencies, and private, non-profit groups. The Iditarod NHT, the Medicine Bow Trail, and the proposed transit service in the Mt. Rainier area in the Mt. Baker-Snoqualmie National Forest are all examples of projects being developed through partnerships.

Employee transportation also is a significant economic concern at many Forest Service sites and has been mentioned as a potential benefit of transit service. Employee transportation has been identified as a particularly important issue in ski areas, which have intensive labor requirements on a seasonal basis and limited parking. The remote location of many sites makes commuting prohibitive for some employees, particularly those with low-paying or part-time jobs. Since housing near ski areas and other popular recreational locations often is expensive, transit service can help to attract and retain good employees by enabling them to locate where housing is affordable.

3.4 Recreational Issues

ATS systems frequently were identified by site managers as a tool that could be used to improve recreational opportunities for visitors. In many cases, recreational needs overlap with the economic and community development issues identified in Section 3.3. Gateway communities and Federal lands sites have identified opportunities to combine resources in order to enhance recreational activities. Support of recreational activity is the major focus of most of the projects proposed in this study.

At many sites, particularly near urban areas, popular trails have capacity to accommodate more recreational users; however parking at trailheads often is limited. Some of the more popular sites in the Southern California National Forests, the White Mountain National Forest, and the Arapahoe-Roosevelt National Forest in Colorado experience this

phenomenon. Being turned away from desired destinations, or having to delay their recreational activity while searching for a parking space, frustrates users and discourages them from returning. Many low-income residents are underserved by these facilities because they do not have automobiles available to reach them. Transit service can open up a major new market for Forest Service recreational areas. In areas like southern California, Brainerd Lake in Colorado, Spring Mountain National Recreation Area in Nevada, and Sandia Peak in New Mexico, local transit systems travel relatively close to Forest Service recreational sites, but do not serve them directly. Peak recreational use occurs on weekends, when regular transit service is reduced, creating an opportunity for additional utilization of local transit system equipment and resources. Also, many parking areas used for businesses and offices are not fully utilized on weekends, providing capacity for park-and-ride services.

Transit also can help to provide the visitor with a higher quality experience and a better understanding of the characteristics of the site. The Kancamangus Highway in the White Mountain National Forest, the Peak-to-Peak Highway in the Arapahoe-Roosevelt National Forest, the two major highways in the Land Between the Lakes National Recreation Area, and the Copper River Highway in Alaska's Chugach National Forest are all examples of roads that contain exceptional scenery as well numerous natural and historic sites. Transit service enables the visitor to enjoy these features without worrying about the distractions of driving. There also may be opportunities to provide interpretive services on transit vehicles to help educate visitors on the various features of the Forest and the wide range of activities that take place.

Transit services also are proposed to service specific recreational activities, including ski areas in the Mt. Hood National Forest, the Stevens Pass Ski Area in Washington State, boaters arriving at the Land Between the Lakes National Recreation Area, and rafting activity on the Feather River in the Plumas National Forest. The system proposed for the White Mountain National Forest is primarily oriented toward summer visitors but could be expanded to link five major ski areas that are either in or adjacent to the Forest.

Mt. Baker Snoqualmie National Forest Washington – Stevens Pass Ski Area Day Lodge

Some of the transit enhancement projects proposed are designed to enhance recreational opportunities for both visitors and local residents. Most of these projects involve either non-motorized trails or the supporting infrastructure for these trails such as parking and trailhead facilities. It is anticipated that these facilities will increase recreational opportunities and the quality of life for local residents, as well as providing additional incentives for tourism. The proposed rail-trail conversion in the Medicine Bow National Forest in Wyoming, for example, provides access to scenic areas but also has major historical significance as a link to important timber and mineral supplies. The GF&A Rail-Trail in the Apalachicola National Forest in Florida also has historic significance and will provide access to numerous recreational activities for the growing population in the Tallahassee and Gulf Coast area. In the Sawtooth National Recreation Area, a new

bicycle/pedestrian path and expanded roadway shoulders were proposed to separate automobile and non-motorized traffic. The Iditarod NHT in the Chugach National Forest in Alaska is one of the most prominent historic trails in the United States. The proposed restoration of 186 miles of trail presents major challenges in balancing varied and sometimes conflicting recreational activities. The Forest Service, in partnership with local communities, state government, and user groups developed a compromise plan that allows for both motorized and non-motorized activity, while limiting conflicts between them.

Wenatchee National Forest Washington – Cycling Club

4.0 Assessment of Alternative Transportation System Needs

This section provides a summary of ATS needs identified in the study. Detailed reports were prepared for each of the sites evaluated in the study and are included in Appendix C. These reports provide more detailed documentation on the nature of ATS needs and their justification.

Section 4.1 includes an overview of transit needs identified in the study and brief descriptions of proposed projects. Section 4.2 contains cost estimates of transit needs aggregated by state, mode (surface, water and transit enhancement projects), system status (expanding existing or new), and type of expenditure (project development, capital, and operations and maintenance). Section 4.3 briefly discusses potential economic impacts of implementing transit on Forest Service lands.

4.1 Overview of ATS Needs

Table 4.1 lists all the sites that were reviewed for ATS needs during this study. The table summarizes project sites by state, Forest, and includes annual visitation data from the Forest Service National Visitor Use Monitoring (NVUM), if available. NVUM data for approximately 25 percent of National Forests will not be available until spring 2004. The units of measurement used by NVUM are:

- **Forest Visits –** Entry of one person upon a national forest to participate in recreational activities for an unspecified period of time.
- **Site Visits –** Entry of one person on to a national forest site or area to participate in recreational activities for an unspecified period of time.
- **Wilderness Visits –** A wilderness visit is a site visit to a wilderness area of the Forest.

Table 4.1 Visitation Data for National Forests Included in Study

National Visitor Use Monitoring Program

State/Site	National Forest Visits	Site Visits	Wilderness Visits
Alaska			
Chugach NF	N/A	N/A	N/A
Tongass NF	N/A	N/A	N/A
Arizona			
Kaibab NF	560,000	690,000	6,500
California			
Angeles NF	3,500,000	3,900,000	100,000
Los Padres NF	1,515,000	1,800,000	123,000
Plumas NF	900,000	1,300,000	9,000
San Bernardino NF	N/A	N/A	N/A
Sequoia NF	N/A	N/A	N/A
Sierra NF	1,470,000	1,920,000	22,000
Stanislaus NF	N/A	N/A	N/A
California/Nevada			
Humboldt-Toiyabe NF	2,500,000	2,700,000	300,000
Inyo NF	3,820,000	5,720,000	174,000
Tahoe NF	3,690,000	4,450,000	17,000
Lake Tahoe Basin Management Unit	3,100,000	3,930,000	129,000
Colorado			
Arapaho-Roosevelt NF	6,200,000	7,800,000	400,000
Florida			
Apalachicola NF	1,980,000	2,600,000	69,000
Idaho			
Sawtooth NF	800,000	1,000,000	33,000
Illinois			
Midewin NTP	N/A	N/A	N/A
Michigan			
Hiawatha NF (Grand Island NRA)	700,000	800,000	10,000
Montana			
Lewis and Clark NF	476,000	530,000	30,000
New Hampshire			
White Mountain NF	2,700,000	3,500,000	70,000
New Mexico			
Cibola NF	2,880,000	3,170,000	708,000
Oregon			
Mount Hood NF	N/A	N/A	N/A
Puerto Rico			
Caribbean NF	470,000	850,000	0
Tennessee/Kentucky			
Land Between the Lakes NRA	1,580,000	2,460,000	0
Washington			
Mt Baker Snoqualmie NF	5,000,000	5,400,000	700,000
Wenatchee NF	2,530,000	2,725,000	300,000
Wyoming			
Medicine Bow NF	930,000	1,120,000	11,000

Notes: **National Forest Visit –** Entry of one person upon a national forest to participate in recreational activities for an unspecified period of time.

Site Visit – Entry of one person on to a national forest site or area to participate in recreational activities for an unspecified period of time.

Wilderness Visit – A wilderness visit is a site visit to a wilderness area of the Forest.

Table 4.2 summarizes the ATS needs identified in the study for each site, including mode(s). As shown in Table 4.2, most of the need is for bus systems, with most operating on a seasonal basis. There are a small number of tram proposals, water transportation projects, and non-motorized trail projects. In addition, one of the largest dollar proposals is for a gondola system on Mt. Hood. An alternative to the gondola system would utilize buses.

Table 4.2 ATS Needs by Site

State/Site	Aerial/ Surface Tram	Bus	Water Transportation	Parking	Trail	Other
Alaska						
Chugach NF		●			●	
Tongass NF		✶/●	✶	✶		
Chugach/Tongass NF						●
Arizona						
Kaibab NF		●		●		
California						
Angeles NF		●				
Los Padres NF		●				
Plumas NF		✶				●
San Bernardino NF		●				
Sequoia NF		✶/●				
Sierra NF		●			●	
Stanislaus NF		✶/●			●	
California/Nevada						
Inyo, Humboldt-Toiyabe NF		✶/●				
Tahoe NF	●	✶/●				
Colorado						
Arapaho-Roosevelt NF		●				
Florida						
Apalachicola NF					●	
Idaho						
Sawtooth NF		✶			●	
Illinois						
Midewin NF		●				
Michigan						
Grand Island NRA		✶	✶			
Montana						
Lewis and Clark NF		✶/●				
Nevada						
Humboldt-Toiyabe NF		●				
New Hampshire						
White Mountain NF		●				
New Mexico						
Cibola NF		●		●		
Oregon						
Mount Hood NF	●	●		●		
Puerto Rico						
Caribbean NF	●	●		●		
Tennessee/Kentucky						
Land Between the Lakes NRA		●				

Table 4.2 ATS Needs by Site (continued)

State/Site	Aerial/ Surface Tram	Bus	Water Transportation	Parking	Trail	Other
Washington						
Mt Baker Snoqualmie NF		✶/●				●
Wenatchee NF					●	
Wyoming						
Medicine Bow NF				●	●	

Legend: ● New Transit Need.
✶ Existing Transit Improvement Need.

It is important to note that the needs quantified in this study are not exhaustive for the entire Forest Service. A number of proposals submitted were not included in the study and there are other sites where needs may exist. One outcome of this study is that it will provide a framework for the Forest Service to use in identification and evaluation of ATS proposals in other Forests.

It also is important to recognize that the transit needs included in this study, including several capital-intensive projects, were identified through a limited planning and analysis process. In some cases, needs have been identified as part of Management Plans and other studies while some projects have been through more detailed planning. Cost estimates available from these more detailed planning efforts have been incorporated into the report. In most cases, extensive additional planning, analysis, and public involvement will be required to determine the technical, financial, and/or environmental feasibility for potential transit solutions prior to selecting preferred alternatives. The selected alternatives may differ substantially from the transit strategies identified as part of this study. The proposed Mt. Hood aerial tramway is an example of such a project, with a range of alternatives identified that vary greatly in scope and cost. Other projects, such as the Southeast Alaska Intermodal/Ferry project, would serve general transit needs as well as those related to the Forest, and thus could be eligible for traditional transit funding programs.

Proposed Projects

This section presents a brief summary of projects identified as part of this study. More detail on each site and proposed projects is provided in the field reports in Appendix C.

Alaska – Chugach National Forest Iditarod National Historic Trail

Designed to increase recreational opportunities on the Kenai Peninsula, this proposed transit enhancement project would develop a continuous recreational trail, roughly following the route of the historic Iditarod Trail. Large portions of this trail would be accessible to the Seward Highway and the Alaska Railroad route between Girdwood and Seward. The

Chugach National Forest Alaska – Historic Trail

trail and supporting infrastructure would provide a variety of additional recreational opportunities, including day hiking, camping, backpacking, and snowmobiling. In addition, the Iditarod Trail has great historic significance as the original 2,100-mile "Gold Rush" route between the port of Seward and Nome, on the Bering Sea. Development of the trail provides an opportunity to interpret the trail's history and provide access to many historic and cultural sites along its route. The proposed alternative includes 186 miles of trail. All of the trail would be available for winter use, while 137 miles would be available for summer use. The proposal includes 82 miles of trail reconstruction and 77 miles of new trail construction, of which 15 miles are winter only. The project includes 32 major trail bridges (over 20 feet) and 50 minor bridges and boardwalks. The route would have 36 total trailheads, including five new trailheads and three that will be reconstructed.

Alaska – Chugach National Forest Childs Glacier Transit System

Childs Glacier is one of the jewels of the Chugach National Forest (CNF) and the Cordova Ranger District. Cordova is not connected by road to Alaska's highway network, so visitors to Cordova arrive by air or sea. Transportation in and around the Cordova Ranger District, however, is limited; and options to reach the Glacier, which is located 48 miles from Cordova and 36 miles from the Airport, are limited to one small local shuttle service. The Forest Service has identified an opportunity for alternative transit service that would provide more readily available transit service between the community of Cordova, the airport, and Childs Glacier. It is likely that visitation to the Glacier will increase significantly when the Alaska Marine Highway System (AMHS) implements "fast" ferry service between Cordova and Whittier. The proposed alternative would provide additional transportation service to the site and possibly to other attractions along the way. As envisioned, this system would require the purchase of two buses and/or vans. The preferred operation would have this service provided by a local business enterprise by providing funding for additional vehicles or infrastructure to existing bus or taxi operators.

Alaska – Tongass National Forest Mendenhall Glacier Transit Service

The Mendenhall Glacier Visitor Center is a major attraction for visitors to Juneau, Alaska, and the Tongass National Forest (TNF). There are approximately 300,000 visitors to this Forest Service site each year. Located only 13 miles outside of downtown Juneau, it is popular with both independent travelers and cruise ship passengers. The congestion of visitors and vehicles at the Visitor Center is of concern to the Forest Service. The flood of passengers that often arrive at the same time from various cruise lines not only creates traffic congestion, but also negatively impacts the experience for all visitors to the Center. Establishing more scheduled service to the Visitor Center may allow better management of the vehicle and visitor traffic. Another option identified was the possibility of the Forest Service running a shuttle that would connect the local public transit agency, Capital

Transit, to the Visitor Center. This would give independent travelers and cruise passengers another flexible option to access the glacier. The shuttle could operate on a seasonal basis and possibly for the Forest Service's popular Fireside Presentation Series that are held at the Visitor Center.

The biggest issue facing the Forest Service at Mendenhall Glacier is that, with increasing visitation, the layout of the parking/bus loading area adjacent to the Visitor Center is not conducive to efficient vehicle and pedestrian flows. Several options for redesign of the area have been identified to mitigate these problems and help the Forest Service designate the safest and most efficient locations for the bus and shuttle staging areas as well as the pedestrian walkways.

Alaska – Tongass National Forest Intermodal/Ferry Project

The TNF is the largest National Forest in the United States, covering nearly 17 million acres, or 80 percent of the land area, in the Southeast portion of Alaska. Southeast Alaska is home to approximately 75,000 residents, who are dependent on a transportation system that is unique in the United States. Southeast Alaska is directly linked to the rest of the North American highway system by only two roads. The Alaska Department of Transportation and Public Facilities (DOT and PF), the Forest Service and the Southeast Conference, a consortium of municipalities in the region, have joined with other agencies in the region to develop an ambitious multipronged strategy to improve access. Many of the current priorities are documented in the report, *Southeast Alaska Proposed Public Road and Ferry Projects – Project Information and Summary of Benefits*, which was prepared by the Forest Service for the Southeast Conference in March 2003.

Tongass National Forest Alaska – Mendenhall Glacier

Included in the plan are road connections to southeast communities that will provide improved access and in some cases, permit long, expensive ferry routes to be either eliminated or shortened. Existing Forest Service rights-of-way will be upgraded for most of these projects, although new alignments will be needed in some places. Nine priority road projects totaling $215 million were identified in the report prepared for the Southeast Conference. It is anticipated that all of the road projects will be funded through the Federal Lands Highway Program. This plan also includes four shuttle ferry projects totaling $84 million for both vessels and terminals. The ferry projects are an integral part of the road projects, providing required short connections over channels. While FTA funding is anticipated, the ferry components of these projects would be logical candidates for a Forest Service ATS program.

Tongass National Forest Alaska – City of Kake, Kupreanof Island

Alaska – Tongass National Forest Prince of Wales Island Transit System

Prince of Wales Island is part of the Alexander Archipelago in the southernmost portion of the southeastern Alaska panhandle and is the third-largest island in the United States. Most of the island is located within the TNF and the Forest Service works closely with the 4,600 residents of the island to help them maintain a sustainable community while protecting Forest resources. Prince of Wales Island is the largest settlement in North America that has neither an instrumented airport nor road access. Access to the island is primarily by float plane or ferry. Recent implementation of a daily ferry route between the Island and Ketchikan through the new Inter-Island Ferry Authority (IFA) has already improved residents' mobility. A new route is planned from Coffman Cove, on the northern part of the Island, to Mitkof and Wrangell Islands. Ground transportation around the island, however, continues to be limited for both tourists and local citizens who either cannot drive or do not have access to automobiles.

As a result, a need has been identified for an island transit system to connect the principal island communities to the Clark Bay (Hollis) Ferry Terminal; Coffman Cove Ferry Terminal; Klawock Airport; area seaplane floats; and points of interest in the National Forest such as, the caves at El Capitan, fishing resorts and lakes, and campgrounds. The proposal could include purchase of vehicles and construction of garages and intermodal facilities, but would probably utilize local entrepreneurs to operate service.

Tongass National Forest Alaska –
Interisland Ferry Authority M/V Prince of Wales

Alaska – Chugach and Tongass National Forests Visitor Information Enhancements at Alaska Portals

The Forest Service has identified a need for enhanced informational displays oriented toward visitors. The limited number of "portals" through which visitors enter Alaska provides an opportunity to give visitors important information regarding recreational facilities, transportation options, and safety considerations. Visitors arriving in Alaska, particularly independent tourists, are faced with a variety of options. The terrain, weather, and proximity to wildlife found in coastal Alaska make it important that visitors choose activities appropriate to their physical condition and level of preparation. Improved information can be very helpful in matching visitors with activities that will be safe and enjoyable. The goal of the project as stated is to "offer consistent, professional, accurate information about transportation options and Alaska's National Forests at intermodal portals where visitors view or enter public land." Specific sites proposed include major airports, ferry terminals, cruise ship ports, and highway entrances. The proposal would "take a holistic and strategic" approach to the dissemination of information at key transportation portals. A consistent high-quality "look and feel" would be established that is attractive and easily recognizable. The concept of "one-look," "one message" would be applied to National Forests and other Federal/state lands as well. The use of a standard approach would reduce design, fabrication, and installation costs for fixed

displays. Partnerships with local chambers of commerce and municipalities could be developed to provide information on local tour services and transportation providers. Electronic kiosks also may be considered to provide visitors with an opportunity to make interactive queries on available activities and transportation options.

Arizona – Kaibab National Forest Grand Canyon Parking Garage/Bus Staging

The 1.6 million-acre Kaibab National Forest is directly adjacent to the Grand Canyon National Park (GCNP) and is split by the canyon into two major parts, the North Kaibab and the South Kaibab. The Forest accommodates a number of recreational activities, including camping, hiking, picnicking, biking, scenic vistas, wildlife viewing, cross-country skiing, and hunting. The South Kaibab serves as a gateway for visitors destined to the GCNP. With more than 3.3 million annual visitors accessing the Park from the south, the South Kaibab National Forest often experiences the negative impacts of traffic congestion and delay resulting from the large number of visitors accessing the park. In response to this issue, an ATS project has been proposed in the Tusayan Ranger District. The project includes the establishment of a bus shuttle system, connecting a park-and-ride lot, to be established near the Tusayan community and the south rim of the canyon located within the GCNP. The Tusayan community is located within the Kaibab National Forest about three miles south of the southern gate for the National Park. The proposal includes the construction of a parking/staging area with up to 2,400 parking spaces and a bus loading area. The original Forest Service plan called for 1,000 spaces which could serve as a first phase. The bus shuttle provides an opportunity for Grand Canyon visitors to park outside of the national park gate, take the bus shuttle to the south rim, avoid driving in congested traffic at the park gate, and avoid congested parking areas within the GCNP. The GCNP and FTA are currently working on a proposal for remote parking and shuttle service that may consist of either bus or light rail. The exact location of remote parking and the characteristics of the shuttle service are still under study. For purposes of this project, it is assumed that the Kaibab NF project would be integrated with the GCNP project. Costs for the GCNP project were included in the original 3039 study and are therefore not included in this study.

California – Angeles, Los Padres and San Bernardino (Southern California) National Forests Transit Routes

San Bernardino National Forest California

The San Bernardino, Angeles, and Los Padres National Forests are three of the four main forests in Southern California. They share many common physical attributes and a common visitor base in the Southern California area. These three Forests also provide scenic backdrops for many communities throughout the State, and they are a significant component of the quality of life in this area. Each of the Forests in Southern California get heavy visitation on weekend winter days with snow ("snow days"). During these days, there can be heavy traffic congestion and parking problems in the Forest. However, snow days are unpredictable and are,

thus, difficult to serve with alternative transportation. Therefore, the ATS alternatives identified focused on alternative transportation to serve the summertime activities in the Forest.

In the Angeles National Forest, the combination of high usage, concentrated destinations, and a local visitor base lead to the possibility of several different ATS. These systems would be focused on weekend days during the summer months and could likely utilize existing public transportation equipment for the bulk of the operations. This Forest is most accessible to the large population of Southern California, and in particular to a large number of residents who may not have private vehicles available to visit the Forest. Usage patterns in the Los Padres and San Bernardino Forests are more dispersed, and therefore there are fewer opportunities for ATS services. Nine potential shuttle routes were identified in the Angeles National Forest along with three routes in the Los Padres National Forest and one in the San Bernardino National Forest.

California – Plumas National Forest Feather River Shuttle

The Plumas National Forest occupies 1,146,000 acres of scenic mountain lands in the northern Sierra Nevada. Situated just south of the Cascade Range, the Plumas is versatile in its land features, not crowded, and enhanced by a pleasant climate. Outdoor enthusiasts are attracted year-round to its many streams and lakes, beautiful deep canyons, rich mountain valleys, meadows, and lofty peaks. In order to satisfy the transportation needs of the recreational water users along Feather River, some type of mass transportation options need to be available.

Plumas National Forest California – Boat Tow Vehicle

A potential ATS option for the Plumas National Forest would be the continuation and expansion of the current shuttle service for Feather River. The current ad hoc parking-and-shuttle service, organized and operated voluntarily by American Whitewater, is considered successful. However, the Forest Service would like to see more permanent arrangements made to accommodate boaters on the Feather River. These more permanent arrangements would likely include a long-term agreement involving the USDA Forest Service, PG&E, Plumas County, and American Whitewater on how to operate the water releases, parking, and shuttle. To accommodate Saturday boaters, the USDA Forest Service would like to see a permanent shuttle system, including a vehicle to tow boats put in place between Cresta Powerhouse and Cresta Dam.

To accommodate Sunday boaters, the Forest Service would like to have a parking lot constructed at Rock Creek Dam. A parking lot at this location would allow boaters to drive themselves to this site and launch their boats. In addition, there is a need to improve critical access turnouts along the highway. This would allow the shuttle bus and other vehicles a safe location to park their vehicles, while loading and unloading the rafts and kayaks. The turnouts should be supplemented by trails to get boaters and their watercraft

safely from the highway to the river. These turnout and trail improvements also would reduce the number of vehicles that park along the side of the highway and focus the water activity at key locations that would make the entire river more serviceable by a transit system.

California – Sequoia National Forest Transit Improvements

The Sequoia National Forest is located in the southern portion of the Sierra mountain range in Central California, adjacent to the Kings Canyon and Sequoia National Park. The Forest is spilt into two non-contiguous areas located to the north and south of the Sequoia National Park. The National Forest and adjacent National Parks have very integrated operations, and many visitors often do not realize which recreational sites and attractions are on Forest Service lands or Park Service lands. Major transportation issues that could potentially be addressed by an ATS include:

- Congestion at Hume Lake resulting from relatively high levels of visitation, informal parking along the road shoulders, and a number of popular day use facilities located along the lakeshore;

- Congestion at Lake Isabella/Kernville that results from highly used water-related day use and camping facilities on Forest lands and roadways that encircle the lake; and

- Need for improved connections between lodging facilities in gateway communities, lodging facilities on Forest Service lands, and day use sites in the Forest.

Three potential ATS projects have been identified to address these issues. One project includes the establishment of a transit shuttle system, as proposed by the Kings Canyon and Sequoia National Park that serves gateway communities and major destinations on National Forest lands and sites in the National Parks. The service would operate during the peak months of July and August, utilize existing stations and transportation facilities, and be operated by a concessionaire. Implementation of the system would be advanced by a partnership between the USDA Forest Service; private sector interests; and other Federal, state, and local agencies and organizations. A second potential ATS project includes provision of additional funding to improve service days, hours, frequencies, and amenities during the peak-use season for the existing transit services provided by Kern County Transit in the Lake Isabella area. The service improvements would focus on providing connections between lodging facilities, hiking, swimming, rafting, and tourist attractions around the Kernville area. A third potential ATS project is a peak season (July and August) shuttle service from the Kernville area of the Forest to the trailhead for the Trail of 100 Giants within the Giant Sequoia National Monument. This would make the trail more accessible to area visitors and help relieve parking congestion at the site on peak-use days.

California – Sierra National Forest Transit Improvements

The Sierra National Forest is located on the western slope of the central Sierra Nevada. It is known for its spectacular mountain scenery and abundant natural resources, such as

Bass Lake. The Sierra National Forest encompasses more than 1.3 million acres between 900 and 13,986 feet in elevation. The terrain includes rolling, oak-covered foothills, heavily forested middle elevation slopes, and the starkly beautiful alpine landscape of the High Sierra. It is estimated that between 20,000 and 25,000 people visit the Bass Lake area during major holidays, such as the Fourth of July and Labor Day. During these days, bumper-to-bumper traffic is common along key stretches of the road. The parking lots are completely full on these days, leading many people to park on the side of the road in illegal locations. Huntington Lake is reported to have even higher numbers of visitors than Bass Lake. Similarly to Bass Lake, the peak days are during summer holidays and weekends. During these busy days, there often are overflows of parking along the roadside creating unsafe conditions for the passengers in these cars as they exit and enter their vehicles. The illegally parked vehicles also are a safety hazard for the other automobile users of the road.

Sierra National Forest California – Bass Lake

Two potential transit alternatives were identified to serve Bass Lake and Huntington Lake in the Sierra National Forest. One option includes a bus route that connects the urbanized portions of Fresno County with the recreational activities of Bass Lake. A large percentage of the visitors to Bass Lake come from the City of Fresno. This regional bus system would provide visitors from the City of Fresno a means of accessing the lake without using their automobiles. Additionally, visitors from more distant locations, such as San Francisco and Los Angeles, would have a specific location available to drop off their cars without worrying about the road congestion or parking availability around Bass Lake. A shuttle around Huntington Lake is another potential ATS option. This shuttle would be designed to serve the heavily used northern and eastern edge of the campground. Additionally, this shuttle would likely connect with the primary camping and hiking locations around the lake. The times of operation of this shuttle would be during the busiest days at Huntington Lake, including Saturdays and Sundays from Memorial Day to Labor Day.

California – Stanislaus National Forest Transit Improvements

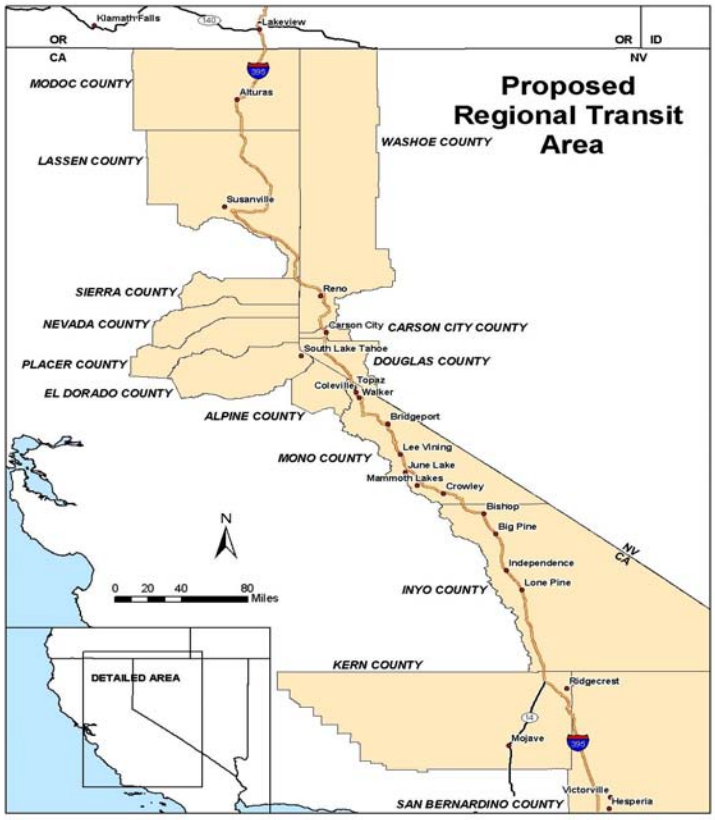
The Stanislaus National Forest is located in the Sierra Nevada mountain range north and west of Yosemite National Park. The Forest provides summer and winter recreational activities for visitors. Popular destinations include Pinecrest Lake, Lake Alpine, Cherry Lake, and the Bear Valley ski area. Forest roads also provide the main access route from the Bay Area and Northern California to Yosemite. The area receives substantial visitation at Pinecrest Lake and surrounding lakes and streams for boating, swimming, fishing, camping, hiking, and other recreational activities. Pinecrest Lake has limited parking available for day use near the lake. Visitors often drive short distances from their campgrounds or cabins and park illegally on environmentally sensitive land to more easily access the lake. A circulator shuttle could help relieve congestion, reduce illegal parking, and improve the quality of experience of Pinecrest Lake.

Another area that receives heavy visitation is the area around Yosemite National Park. The Yosemite Area Regional Transit System (YARTS) provides service to the Park from communities along SR 140 on the West side of the Sierras and along SR 120 and U.S. 395 on the East side. SR 120 on the west side, one of the primary access points to the Park, has no existing service through YARTS. A proposed Park Service ATS would involve building a remote parking area at Hazel Green (on the border of Yosemite) and operating a shuttle route from that parking area to Hetch Hetchy reservoir. The shuttle also could connect with the main YARTS service at Crane Flat or another location within the Park.

Finally, the Summit Ranger district of the Stanislaus National Forest has identified a 33-mile multi-use trail that would connect several communities, campgrounds, vistas, and recreational areas. This trail would utilize portions of Old Sonora Road (the former SR 108) to provide a continuous trail from Pinecrest Lake to Kennedy Meadows at the foot of the Sonora pass.

California/Nevada – Eastern Sierra Expanded Transit System (Humboldt-Toiyabe and Inyo National Forests)

The Eastern Sierra Expanded Transit System (ESETS) service area would serve international, American, as well as regional and local Nevada and California visitors to the various attractions in and adjacent to Inyo and Humboldt-Toiyabe National Forests. The primary destinations of the eastern Sierra area include the Inyo National Forest, Humboldt-Toiyabe National Forest, the Town of Mammoth Lakes and Mammoth Mountain Ski Area, Devils Postpile National Monument, Yosemite National Park, Mono Basin National Forest Scenic Area, and Mount Whitney. The ESETS service area encompasses a large geographic area from Reno, Nevada, to Ridgecrest, California, along the U.S. 395 corridor.



Eastern Sierra Expanded Transit System

Eastern Sierra's transportation system, including roadways, and in particular the transit system, will not be expected to meet the strain of the expected future recreational visitation growth and resulting service sector growth in the ESETS area. Transit service funding provided by Federal agencies and a Fee Demonstration

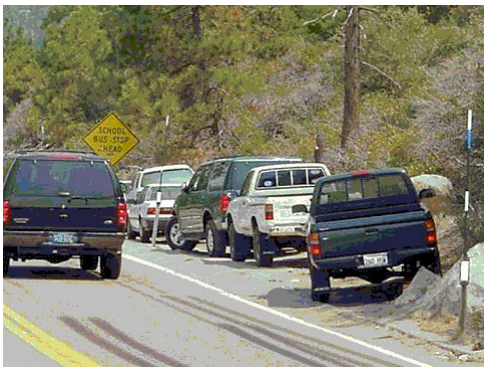
Authority for the CREST Route, YARTS, and the Reds Meadow/Devils Postpile will expire sometime in 2004. The recreational attractions throughout the area have limited (if any) ATS that provide transportation access. Generally, transportation access to the attractions are limited to automobile travel and parking lots in close proximity to the resource, campground, or trailhead. This current situation often results in severe overcrowding, traffic congestion, resource damage, and safety issues associated with visitation to these attractions.

The proposed ATS for the ESETS service area would include an expansion of existing transit services, the implementation of new transit services, and the integration of each. ATS options would include expansion of the CREST Route and YARTS to provide increased interregional transit services to better serve visitor and residential long-distance travel. Converting the Town of Mammoth Lakes Skier Shuttle (and summer services) from Mammoth Mountain Ski Area to town operation would be part of this expansion process. Associated bus fleet upgrades, land acquisition, and construction of a maintenance facility would be required for this conversion to meet FTA regulations. The implementation of new services would include services to meet the recreational needs of local attractions adjacent to the Town of Mammoth Lakes not currently served. The establishment of regional partnerships and relationships will be critical to ensure the success of this expanded ATS system. Partnerships between the Forest Service, NPS, Town of Mammoth Lakes, Inyo Mono Transit, Mammoth Mountain Ski Area, Caltrans, and other partners will be required to sustain the ESETS service.

California/Nevada – Lake Tahoe Basin Management Unit (Tahoe, Humboldt-Toiyabe, and El Dorado National Forests)

The Lake Tahoe Basin is a major recreational destination straddling the California/Nevada border in the Sierra Nevada mountain range. Visitation to the lake is year-round, with skiing the primary activity during the winter months. During the summer months a wide range of outdoor activities are available and lakeside casinos are a major year-round attraction. The Forest Service established the Lake Tahoe Basin Management Unit (LTBMU) in 1973, carving it out of three forests that overlapped the Lake Basin – Toiyabe, El Dorado, and Tahoe. The unit's name reflects the unique physical and environmental circumstances in the Basin. Protecting the water quality of the Lake is the primary goal of the unit.

Heavy year-round visitation to Lake Tahoe creates congestion and environmental problems in the Lake Tahoe Basin. Though encircled by roads, the Tahoe Basin has limited capacity on these roads and little prospect for increasing that capacity due to concerns for Lake clarity. The majority of roadway miles in the area are two-lane, windy roads through environmentally sensitive and physically constrained corridors. Residential and commercial development, as well as recreational sites, are dispersed throughout the basin mostly along highway corridors. With total visitation between two and



Lake Tahoe Basin Management Unit Nevada – Uncontrolled Parking along Route 28

three million a year, the population during a peak weekend can create major congestion in the area. The main highways to access South Lake Tahoe and Tahoe City and the North Shore are congested during both summer and winter weekends. Most visitors come to the area in private vehicles, though there is a shuttle connection between Reno-Tahoe airport and South Lake Tahoe.

Three ATS proposals have been recommended that would help alleviate some of the strain on the Basin's resources. These include a circulator service in the Camp Richardson area, one of the primary summer attractions on the South Shore of Lake Tahoe, with multiple sites attracting heavy visitation; a shuttle service for East Shore beaches that are threatened by increasing run-off and hillside degradation from off-road parking; and a shuttle service on the West Shore that provides transit access to major USDA Forest Service recreation sites, and a connection to the North Shore. Implementation of the East Shore Shuttle would be accompanied by installation of barriers to prevent parking along sensitive areas of Nevada Route 28.

Colorado – Arapahoe-Roosevelt National Forest Peak-to-Peak Transit Services

The Arapaho and Roosevelt National Forests and Pawnee National Grassland encompass roughly 1.5 million acres of public land in the Rocky Mountains, foothills, and short grass prairie of north central Colorado. The topography includes prairie lands, rolling hills, and snow covered mountain areas with several peaks that are over 14,000 feet in elevation. Recreational opportunities include camping, hiking, picnicking, bicycling, fishing, viewing wildlife, snowshoeing, cross country skiing, and downhill skiing.

Arapahoe-Roosevelt National Forest Colorado – Indian Peaks Wilderness

The Peak-to-Peak Highway is a National and State Scenic and Historic Byway that serves as a primary north-south travel corridor through the Boulder and Clear Creek Ranger Districts of the Arapaho-Roosevelt National Forest. The 55-mile route provides access to a number of activity areas, including the Brainard Lake Recreation Area, Indian Peaks Wilderness Area, 10 campgrounds, numerous trail heads, and several communities. The route also provides a connection between the Rocky Mountain National Park in the north and the Mount Evans Scenic Byway and Wilderness Area in the south. The Mount Evans area is located within the Clear Creek Ranger District and includes a popular 14-mile scenic roadway to the 14,264-foot summit of the mountain.

A Peak-to-Peak Transit Shuttle system has been proposed to enhance recreational opportunities at popular activity sites and reduce congestion at the trailheads served by the highway. The most significant need is for relief of traffic and parking congestion which occurs at the Brainard Lake area during summer weekends. A first phase option is to provide shuttle service within the Brainard Lake area itself. Users would be given the option of parking outside of the fee station and taking a shuttle or tram into the area. During times when the Brainard Lake parking area is full, use of the shuttle would be required. The bus

transit system also could connect with the existing Regional Transit District service approximately 17 miles away at the town of Nederland.

Another ATS option proposed is a transit shuttle for the Mt. Evans Byway to serve those visitors who arrive at the base of the mountain via their own automobile but would prefer to ride a shuttle van to the summit. Many individuals probably do not go to the summit because they are uncomfortable driving on the steep mountain roads with sharp turns and no guard rails. This alternative could involve purchase of vehicles by the Forest Service for use by existing private operators or contracting the service to a private operator.

Florida – Apalachicola National Forest Rail-Trail System and Staging Areas

The Apalachicola National Forest is located in the northwestern part of Florida near the City of Tallahassee. The area includes gently rolling terrain with longleaf pine forests, savannahs, and cypress ponds. The Forest includes numerous campgrounds, picnic areas, hiking trails, swimming sites, and other day use facilities. The close proximity of the Forest to the City of Tallahassee, Florida State University (FSU), and Florida A&M University (FAMU) provides convenient recreational opportunities for City residents and students. The traffic volumes on major roads into the Forest are forecast to steadily increase over the next 25 years, and they do not include bicycle lanes or pedestrian facilities, thus creating a potential safety hazard for bicyclists or pedestrians attempting to access the Forest.

In the early 1990s, local bicycle enthusiasts, businesses, interest groups, and the general public approached the USDA Forest Service and Florida Department of Environmental Protection requesting that they consider converting remnants of the former Georgia, Florida, and Alabama Railroad bed to a trail for non-motorized transportation. The trail is referred to as the Gopher, Frog, and Alligator (GF&A) Rail-Trail and would accommodate bicycling, hiking, walking/jogging, and equestrian activities. Ultimately, the planned trail would be 52.5 miles long and provide an alternative transportation option for connections between Forest recreation sites and the communities of Tallahassee, Sopchoppy, and Carabelle.

A portion of the project within City of Tallahassee already has been constructed. The next segment of the GF&A Rail-Trail to be constructed is within the Apalachicola National Forest. The proposed ATS involves construction of the necessary staging areas and support facilities that will allow the GF&A Rail-Trail to serve as an alternative transportation option for travel between recreational sites in the Forest. In the future, as the trail continues to expand to the north and the south, it also will serve as an alternative transportation option for travel between the Forest and adjacent gateway communities. The proposed ATS includes the construction of three staging areas that will include new or expanded parking facilities; access road resurfacing; rest room facilities; water systems; improved sidewalks/pedestrian access; and other amenities, such as informational kiosks, signage, picnic tables, and trash receptacles.

Idaho – Sawtooth National Recreation Area (Sawtooth National Forest) Transit Expansion and Pedestrian/Bicycle Trail

Central Idaho's Sawtooth National Recreation Area (SNRA) encompasses 756,000 acres of pristine alpine wilderness, glacial lakes, high peaks, and open valleys. The SNRA appears to have a high need for ATS, primarily because of its high level of visitation and proximity to the Sun Valley-Ketchum resort complex. Anticipated increases in outdoor recreational visitors, especially cross-country skiers in the North Valley area, will push existing parking facilities over capacity in the near future, creating a potentially more dangerous situation than already exists. Therefore, the SNRA needs to immediately manage short-term transportation impacts to the site.

Sawtooth National Recreation Area – North Valley/Galena Express Demonstration

During the 2002-2003 winter season, the regional travel demand management organization, Wood River Ride Share, in cooperation with the Blaine County Recreation District and the USDA Forest Service, staged a successful demonstration of a limited-schedule, free-fare shuttle between Sun Valley-Ketchum and the Galena Lodge cross-country skiing area in the southern portion of the SNRA.

Based on this demonstration project, implementation of a permanent winter shuttle service would be relatively straightforward because of the demonstrated strong support from local business and a growing demand for recreational shuttle services. Expansion of the Galena Lodge to Sun Valley-Ketchum shuttle service to the peak summer visitation season also appears worthy of additional investigation. Additional ATS improvements have been identified and include a pedestrian/bicycle trail at Redfish Lake in the Sawtooth Valley, and shoulder and safety improvements along State Route 75 in the Wood River Valley.

Illinois – Midewin National Tallgrass Prairie Transit Service

Midewin National Tallgrass Prairie (Midewin) is an emerging destination on the fringe of the Chicago metropolitan area. The unit comprises a portion of the former Joliet Army Ammunition Plant and is undergoing a long-term environmental mitigation and prairie restoration process. Although the conversion process currently requires that most of the site be restricted, areas gradually are being opened to the public. A welcome center was opened in 2003 to provide a point of contact with visitors and to house interpretive exhibits that promote the unit's mission of environmental education. Despite the access restrictions, annual visitation is estimated to be between 3,000 and 5,000 people. Midewin personnel have sensed considerable interest in the prairie from residents of Chicago and surrounding suburbs. They expect visitor volumes to grow as more educational and recreational opportunities are introduced.

An ATS is needed to accommodate greater visitation, especially on designated days during the summer. Two ATS options are being considered. The first includes a connection to Chicago. Midewin has experienced early success with group visits from Chicago. It is believed that a well-advertised program of transportation services between the City and the prairie on designated event days could improve the ability of City residents to enjoy the educational and recreational opportunities at Midewin. Three alternatives for providing this service are: 1) extension of Pace Bus Service from Joliet; 2) a shuttle to Union Station in Joliet which would connect with the regional rail system; and 3) charter bus services to different locations in the region. The second option includes improved circulation in the local communities near Midewin. Since much of the area currently is restricted, transportation around the site is presently provided to prearranged tour groups in 15-passenger vans. The current van fleet is not adequate for the volume of visitors that the prairie would like to accommodate on its designated event days. Three alternatives identified for regional service are: 1) use of the Joliet Station shuttle for local circulation; 2) dedicated service to local points in the region which also would be used for internal circulation; and 3) a dedicated tram system for internal circulation.

Michigan – Grand Island National Recreation Area (Hiawatha National Forest) Water Transportation and Tour Bus Improvements

The Grand Island National Recreation Area (NRA) is located in Lake Superior, about one-half mile from Munising, Michigan. The main recreational activities on the Island include hiking, mountain biking, backcountry camping, and a bus tour to several historic and overlook sites. About 2,600 visitors arrive to the Island annually by ferry, whereas 2,000 arrive by private boat or kayak. Grand Island has an existing ATS system which is comprised of two elements: 1) a ferry service that provides access between the mainland and the NRA; and 2) a bus service on the Island. The latter consists of an interpretive tour of the Island, in addition to pick-up/drop-off service, which has to be scheduled in advance through the bus operator.

A number of ATS opportunities and needs were identified by both Forest Service staff and the bus and ferry concessionaires. One alternative includes improved public information with better marketing of recreation opportunities at the Grand Island NRA. This includes improving the Grand Island web site and providing information to backpackers who frequent other camping areas in Munising and surrounding towns, as well as increasing public awareness of transportation services provided within the Island. Boat and tour vehicles would be upgraded to fit with setting and historic themes of the island, and a permanent dock provided on the mainland to support Forest Service administrative operations.

Other parts of the plan include construction of a breakwall to protect the mainland docking facilities, thus eliminating the need for dredging and docking facilities for private boats on the Island. The Forest would like to see the Grand Island NRA as part of a water transportation system that provides access to other tourist attractions in the Munising Area. Some additional opportunities identified by the Forest Service include increasing the extent of shore views available from the existing tour vehicles and extending the tour bus schedule by one week in October.

Montana – Lewis and Clark Interpretive Center (Lewis and Clark National Forest) Transit Service

The Lewis and Clark National Historic Trail Interpretive Center (LCIC) is part of the Lewis and Clark National Forest and resides in the Giant Springs State Park in Great Falls, Montana. The interpretive center is located on a bluff overlooking the Missouri River, along the trail used by Lewis and Clark, and provides 25,000 square feet of space for exhibitions, a theater, a retail store, and other hands-on activities. The center's emphasis is to provide information related to all aspects of the expedition completed by Lewis and Clark from 1804 to 1806.

Access to the LCIC is primarily provided by the local roadway system, and a recent $1 million expansion of the parking lot allows for adequate capacity during most times. The LCIC is roughly five minutes from downtown Great Falls and approximately 20 minutes from the Great Falls Airport. Access is limited for those without personal vehicles as the existing Great Falls Transit system does not provide routes that link to the LCIC.

Lewis and Clark Interpretive Center Montana – River's Edge Trail

Given the lack of transit service to the LCIC, there are three proposed bus and shuttle service options to address the needs of the center. The first is implementation of supplemental bus routes to handle increased visitation expected for the Lewis and Clark Bicentennial**.** Similar to when the LCIC opened in 1998, there are expectations that the bicentennial will generate a significant increase in visitation for the years 2004 to 2006, primarily during the months of May through September. Beyond the temporary needs related to the bicentennial, there also is discussion regarding how to improve connections of the LCIC with the River's Edge Trail and other Great Falls attractions such as the C.M. Russell Museum. One proposal is a partnership with Great Falls Transit to provide seasonal local shuttle service (May through September) to connect major recreational destinations in the Great Falls area. A major benefit would be additional access to key destinations for local residents, recreation seekers, and visitors. The final option involves provision of funding for distant schools to visit the LCIC**.** Montana is a very large state (fourth in terms of square miles) with a relatively small and dispersed population. Consequently, there are a number of school districts that are both distant and lack their own funds to visit the LCIC. While more than 6,000 students visit each year, this number could be increased with greater funding for long-distance school visits.

Nevada – Spring Mountain National Recreation Area (Humboldt-Toiyabe National Forest) Transit Connections

The Humboldt-Toiyabe National Forest is the largest forest in the United States outside of Alaska. It encompasses over 5.3 million acres of forest land in Nevada and approximately one million acres of land in eastern California. This Forest includes 10 separate districts throughout Nevada and California that consider unique features and opportunities for recreation. The Spring Mountain National Recreation Area (SMNRA), located near Las

Vegas, represents one of the 10 Districts of this Forest encompassing more than 316,000 acres of remarkable beauty and surprising diversity.

The SMNRA transportation system includes segments of three primary roadways, State Routes 156, 157, and 158, which provide access to the various campground, trail, picnic areas, and other attractions in the area. The Forest Service currently does not operate or provide a transit service within the SMNRA. Existing transportation issues and concerns in the SMNRA include resource management, quality of the experience, overcrowding and congestion, and transportation safety and access. Resource management issues reflect the Forest Service's desire to address the infringement and deterioration of Forest Service infrastructure (roadways, parking facilities, campgrounds). Resource concerns also include the need to manage, direct, and/or confine pedestrian use patterns to mitigate or reduce associated resource impacts. During the summer and winter seasons, overflow parking demand, associated with both day and overnight users, negatively impacts trail-head locations throughout the SMNRA as well as private resorts.

Transit services would provide an opportunity for the Forest Service to address these issues. The ATS for the SMNRA is proposed to include the implementation of two services, a local transit circulator and a regional transit service connection with the transit service provided by the Regional Transportation Commission of Southern Nevada (RTC). The services are proposed to be year-round with full service in the spring, summer, and fall and reduced service in the winter due to lower levels of visitation and weather-related issues. Both proposed services would directly serve the proposed Visitor Center along State Route 157.

New Hampshire – White Mountain National Forest Transit Services

The White Mountain National Forest (WMNF) is located in north central New Hampshire and southwestern Maine, encompassing approximately 800,000 acres of spruce and northern hardwoods and paper birch. The Forest includes 157 miles of road open to passenger car travel, 1,200 miles of hiking trails, 400 miles of snowmobile trails, 160 miles of the Appalachian Trail, 23 developed campgrounds, and numerous Nordic and alpine ski areas. Some of the most prominent physical features of the Forest include the Presidential Range of the Appalachian Mountains, which includes Mount Washington, the highest peak north of the Smokey Mountains and east of the Mississippi; Tuckerman Ravine which provides spring backcountry skiing and hiking opportunities; and the Kancamangus Highway, the primary sightseeing roadway through the WMNF. The WMNF provides year-round recreational resources, including hiking, camping, mountain biking, wildlife watching, fishing, hunting, picnicking, swimming, and canoeing/ kayaking. During the winter, there is snowshoeing, snowmobiling, alpine and Nordic skiing, and ice climbing.

It is estimated that the WMNF and surrounding area attracts six to seven million visitors annually, making it one of the most popular National Forests in the country. Peak visitation occurs during the summer months and the fall foliage season. Growth in visitation has led to increased automobile traffic throughout the WMNF which, according to the USDA Forest Service, has the potential to seriously impact the visitor experience as well as

forest resources, air quality, and currently available parking. This has been particularly apparent along the Kancamangus Highway.

Currently, limited shuttle bus services are operated in the WMNF by the Appalachian Mountain Club (AMC) to serve hikers and by the Mount Washington Hotel to serve hotel guests. The USDA Forest Service envisions expanded shuttle services as an ATS which could serve both hikers and sightseers, helping to reduce demand for private automobile use within the Forest while providing educational and interpretive opportunities related to visitor attractions and forest management. Various configurations of the shuttle service include a loop encompassing the White Mountain Trail National Scenic Byway; an extended loop encompassing the White Mountain Trail National Scenic Byway with an extension to Gorham and U.S. 2; and a limited two-way shuttle along the Kancamangus Highway between Lincoln and Conway, New Hampshire. Service would operate during peak summer and fall foliage visitation periods with stops at key visitor attractions. The shuttle would provide an alternative to private automobile use, helping to reduce growth in vehicular traffic throughout the WMNF. The system could be expanded to a winter shuttle, linking the five major alpine ski areas located within or adjacent to the WMNF.

New Mexico – Cibola National Forest Park-and-Ride Lot and Transit Extension

The 1.6 million-acre Cibola National Forest is primarily located in parts of central and north-central New Mexico. The forest also includes 263,954 acres of grasslands scattered across parts of New Mexico, western Oklahoma, and northwestern Texas. The Forest land ranges in elevation from 5,000 to 11,301 feet and includes wilderness areas, scenic drives, high mountain lakes, developed and primitive camping, winter snowshoeing, downhill and cross-country skiing, hundreds of miles of trails, Visitors Centers, and interpretive sites. The Sandia Ranger District is located just east of the City of Albuquerque and accommodates more than two million visitors annually. This district includes the Sandia Crest National Byway, the Sandia Peak Tramway, and the Sandia Peak Ski Area.

Cibola National Forest New Mexico – View from Summit of Sandia Peak

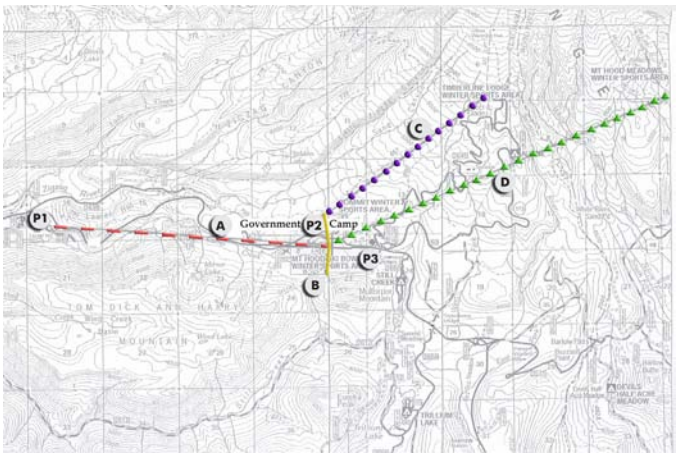
An ATS option has been proposed for the Sandia Ranger District of the Cibola National Forest. This includes the construction of a combined parking lot and staging area for automobiles, buses, and bicycles (in summer) as overflow and remote parking opportunity for the Sandia Peak Ski and Recreation Area. The lot is located near the base of the mountain several miles from the ski area, and outside the Forest boundary. The project includes a concessionaire bus shuttle system to provide the connection between the parking lot and the ski area. In recent years, the Sandia Peak Ski Area has been able to significantly expand its available parking on the mountain directly adjacent to the ski slope so that overflow parking is required only about 10 days per year, and in some years is not required at all. While the need and demand for the ATS parking lot and shuttle system to solely support the ski area is minimal, the lot could potentially be used for

regional commuter parking, parking for bicycle trips up and down the mountain, and overflow parking for all visitors on peak-use days (summer weekends and holidays). The lot could include a bus shuttle from the lot to the recreational use areas along SR 536 and to the scenic vista at the Sandia Peak summit on peak-use days. The parking lot also provides an opportunity to partner with the New Mexico Department of Transportation (NMDOT) by allowing the lot to serve as a commuter park-and-ride facility for ride share/carpools destined to Santa Fe or Albuquerque.

The western edges of the Sandia Peak Ranger District include the base station for the Sandia Peak Tramway and the Juan Tabo and La Cueva Day Use areas and several trail heads. There have been requests for the City of Albuquerque transit system (SunTran) to consider extending transit services to the Tramway base station located on Tramway Road just east of Tramway Boulevard. This could be extended to provide potential transit service connection from the Downtown Albuquerque Transfer facility to the Tramway base station, and the Juan Tabo and La Cueva Day Use areas.

Oregon – Mt. Hood National Forest Aerial Transportation System

The Mt. Hood National Forest (MHNF), located in north-central Oregon, encompasses approximately 1.1 million acres of dense forest and wildflower meadows, straddling the Cascade Mountain Range. Its most prominent feature is Mt. Hood, the tallest peak in Oregon and one of the tallest in the Northwest. The MHNF offers a variety of year-round recreational opportunities, including wilderness hiking, camping, sightseeing, and downhill and cross-country skiing. Because of Mt. Hood's elevation, it is snowcapped year-round, providing opportunities for summer skiing. MHNF is less than a one-hour drive from Portland, Oregon, a metropolitan area with nearly two million residents, and attracts four to five million visitors annually. Timberline Lodge, located on Mt. Hood, opened in 1937 and is owned by the USDA Forest Service. The Lodge provides lodging, restaurants, and year-round skiing opportunities, attracting nearly 1.9 million visitors annually.



Mt. Hood National Forest Oregon – Potential Aerial Tramway Routes

The town of Government Camp, located at the base of Mt. Hood is a focal point for recreational activity in the MHNF. It is in close proximity to downhill ski areas and offers lodging, restaurants, and limited retail. Primary access to Government Camp from the Portland area is via U.S. 26 which carries a high volume of auto and truck traffic, and can experience serious congestion west of Government Camp during winter periods of peak demand for ski recreation. U.S. 26 also is considered a hazardous highway and was designated a "safety corridor" by the Oregon Department of Transportation (ODOT) in 1996. Vehicular traffic on U.S. 26 is projected to double by 2020

and ODOT currently is pursuing a 10-year program of widening and safety improvement to U.S. 26.

As a strategy to foster economic development in the town of Government Camp, while also recognizing the need to improve traffic and circulation conditions related to U.S. 26, the Clackamas County Development Agency commissioned a study of aerial transportation opportunities in the Government Camp area. The study identified four possible aerial transportation alignments and recommended gondola technology as the most feasible, given its costs, flexibility, and operating environment. The study also identified potential areas for parking lots which would serve the gondola system. A gondola system could provide an attraction for sightseers while also serving skiers accessing the various ski areas in the vicinity of Government Camp. Depending upon choice of alignment(s) and parking location, the gondola system also could potentially divert traffic from U.S. 26 in the vicinity of Government Camp and the mountain road (Highway 173) to Timberline Lodge.

Puerto Rico – Caribbean National Forest Tram System

The Caribbean National Forest (CNF) is the only tropical rainforest in U.S. territory. The CNF, located in the Sierra de Luquillo Mountains of Puerto Rico, serves approximately 700,000 visitors annually. The main visitor attractions include waterholes, picnicking areas, and hiking trails, most of which are accessed through Puerto Rico (PR)-191. Sixty percent of the Forest visitors are local islanders who enjoy water play and picnicking in the hot summer months. Visiting tourists come from around the world, usually during the winter and early spring.

Caribbean National Forest Puerto Rico – Pedestrian Safety Issues

The majority of visitors to the Forest arrive either by private automobile or tour bus. The 1997 *Forest Land Management Resources Plan* determined that while the Forest has the capacity for additional visitors, it does not have the capacity for more vehicles. Therefore, the implementation of a mass transit system would be necessary to improve accessibility to the main Forest attractions. A transportation study completed in 2002, *Transportation and Access Study for the Caribbean National Forest (El Yunque)*, proposes the implementation of a mass transportation system that would include a number of elements. A satellite parking facility is proposed at kilometer 0.6, which is the location of an old electric power plant. If owned by the government, this site could be an in-kind contribution for the project. Shuttle buses are proposed that would transport passengers between the parking lot and El Portal Visitor Center, and a tram system would link the El Portal Visitor Center and other Forest attractions along PR-191. Access to private vehicles would be restricted beyond La Coca Falls. The project also would include construction of maintenance facilities at the Catalina Service Center. It is anticipated that the tram service would be operated by a concessionaire.

Tennessee/Kentucky – Land Between the Lakes National Recreation Area Transit Service

Land Between the Lakes National Recreation Area (LBL) encompasses an area of approximately 170,310 acres of wildlife, history, and outdoor recreation opportunities, surrounded by 300 miles of undeveloped shoreline. LBL is an approximately 50-mile-long by six-mile-wide peninsula created by the damming of the Cumberland and Tennessee Rivers by the Tennessee Valley Authority (TVA) in the late 1940s. LBL appears to have a high potential need for ATS through a combination of its geography, historical visitation levels, and proximity to a variety of other public recreational facilities, historic sites, and gateway communities.

Land Between the Lakes National Recreation Area – Elk and Bison Refuge

It appears that there are at least three basic ATS strategies that should be evaluated for possible implementation at the LBL NRA. One ATS alternative proposed by LBL staff is for the operation of an on-site shuttle bus connecting the Brandon Spring Group Center with the other day use facilities located along The Trace. Another potential option is for expansion of the original LBL proposed ATS service along The Trace to connect with Fort Donelson National Battlefield (NPS site) on the south and with the community of Grand Rivers on the north. This option also should consider connections to Paris Landing State Resort Park in Tennessee on the south and to the Kentucky Lake Dam Village State Resort Park on the north. Finally, there is potential for an east-west-oriented ATS route(s) to connect the LBL with the adjacent Lake Barkley and Kenlake State Resort Parks in Kentucky and nearby gateway communities such as Cadiz, Murray, and Aurora.

Washington – Mt. Baker Snoqualmie National Forest Mt. Rainier Transit System

The Mt. Baker – Snoqualmie National Forest in Washington State extends more than 140 miles along the western slopes of the Cascade Mountains from the Canadian border to the northern boundary of Mt. Rainier National Park. The Snoqualmie Ranger District appears to have a high potential for the successful implementation of ATS. The potential for ATS services in the Snoqualmie Ranger District has been identified through a combination of large and growing visitation levels, both in the Forest itself and at the Crystal Mountain Ski Area; a strong and expanding relationship between the National Forest and Mt. Rainier National Park; and recent successful efforts to create a multi-agency, public-private sector partnership to develop a regional visitor information center and transit staging area in the City of Enumclaw.

Mt. Baker Snoqualmie National Forest Washington – Crystal Mountain Ski Area

The original ATS proposal, identified by the Mt. Baker – Snoqualmie National Forest staff

during the development of the EIS for the Crystal Mountain Master Plan, calls for the implementation of a transit service linking the Enumclaw Welcome Center with the Crystal Mountain Ski Area. Moreover, the recently completed General Management Plan for Mt. Rainier National Park not only recommends the creation of regional "Welcome Centers," but identifies the need to establish and operate transit shuttle systems to provide an alternative means of transportation. It thus appears that a single combined visitor transportation system could be developed to accommodate the needs of both the winter visitors to the Crystal Mountain Ski Area and the summer visitors to Mt. Rainier National Park. This system also could serve as a national demonstration project in terms of how to plan, implement, and operate similar seasonal recreation-oriented transportation services.

Washington – Mt. Baker Snoqualmie National Forest Stevens Pass Area Transit Expansion

The Skykomish Ranger District area of the Mt. Baker-Snoqualmie National Forest and the Stevens Pass Ski Area appear to have a high potential for the successful implementation of ATS. The original ATS proposal identified by Mt. Baker-Snoqualmie National Forest staff envisioned the expansion of the existing guest shuttle bus system linking the Stevens Pass Ski Area with the community of Sultan approximately 10 miles further west to the community of Monroe. Some of the initially defined benefits of this expanded ATS system included the potential to reduce peak weekend traffic volumes and associated congestion along Route 2 through the communities of Monroe and Sultan during the ski season, and reduce the need for expanded on-site guest parking areas at Stevens Pass. The expanded ATS service also would facilitate access to the Forest via public transit by residents of the Seattle/Everett region.

The potential for expanding the existing ATS services in the Route 2 corridor has been identified through a combination of large and growing visitation levels, both in the Forest itself and at the Stevens Pass Ski Area, a strong relationship between the National Forest and the Stevens Pass Ski Area, and recent successful efforts through the Scenic Byway Committee to improve visitor transportation and interpretive services along the Route 2 corridor and the associated Old Goat Trail.

Washington – Wenatchee National Forest Mather Memorial Scenic Byway Bike-Hike System

The Okanogan and Wenatchee National Forests cover a combined area of approximately 4.5 million acres. The Forest encompasses an area about 40 miles wide and 140 miles long along the east side of the Cascade Mountains in central Washington State, stretching from the Canadian border on the north to the Yakima Indian Reservation on the south. The potential for ATS services in the Naches Ranger District has been identified through a combination of large and growing visitation levels; a strong and

Wenatchee National Forest Washington – Non-Motorized Trail

expanding relationship between the National Forest and adjacent Mt. Rainier National Park and Mt. Baker–Snoqualmie National Forest; and recent successful efforts to create a multi-agency, public-private sector partnership to develop a regional hiker-biker trail system named the Yakima Greenway.

The original ATS proposal identified by Wenatchee National Forest staff envisioned the development of a bike route along the Mather Memorial Scenic Byway between the summit of Chinook Pass and the eastern portal of the scenic highway near Naches, and to develop an accessible hiker/biker trail leading from the scenic byway corridor to the recreation opportunities in the adjoining Bumping River drainage area. It is estimated that approximately 30 miles of trail would be provided along the Route 410 corridor, with an additional approximately 12 miles of trail to be developed in the Bumping River drainage area.

At the same time, it must be noted that the severe topography and the sensitive natural environment associated with the improvement of these two corridors, particularly in the western portions of the Route 410 corridor approaching Chinook Summit, pose significant engineering challenges. However, at a minimum, a more detailed engineering and environmental impact assessment study of these potential ATS proposals appears to be warranted.

Wyoming – Medicine Bow National Forest Rail-Trail and Snowmobile Parking

The Medicine Bow National Forest is part of an administrative unit which also includes the Routt National Forest and the Thunder Basin National Grassland. These units cover just under 2.9 million acres in Wyoming and Colorado. The Medicine Bow National Forest is divided into three different districts and contains a wide range of topography, vegetation, and wildlife. Recreational opportunities also are varied, including camping, hiking, mountain biking, snowmobiling, cross-country skiing, alpine skiing, hunting, fishing, and recreational mining. Two ATS projects have been proposed for the Medicine Bow National Forest. Both projects are located in the Snowy Range Mountains of the Laramie District of the Forest in south central Wyoming and are being proposed to enhance and diversify recreational opportunities in the Forest. Other potential benefits of these projects include improved traffic safety and increased economic benefits to the gateway community of Laramie, Wyoming.

One proposed project is implementation of improved parking and access along the Wyoming Route 130 Scenic Byway for winter visitors using Forest trails. The 300 miles of trail (180 groomed) in the Snowy Range trails are among the most popular and highly visited snowmobile trails in the western United States, attracting visitors from a wide geographic area. There are also a wide variety of trails for non-motorized winter use. The proposed project would replace existing roadside parking with a new parking area that would

Medicine Bow National Forest Wyoming – Medicine Bow Peaks

address current capacity issues, improve safety, and provide a more pleasant environment for all winter recreation users. This project could be supplemented by information systems that, in times of high use, would encourage use of an alternate parking area to be developed in the Fox Park area near Wyoming Route 230.

The second project involves development of parking and trailhead facilities for a new 22-mile non-motorized recreational trail that is being developed through the National Forest along the right-of-way of the abandoned Coalmont Branch of the Union Pacific Railroad. This trail will increase non-motorized recreational opportunities in the Forest. While primarily a bicycling and walking trail, this also facility will be available for cross-country skiing, wildlife viewing, and those interested in the historical aspects of the railroad.

4.2 Transit Needs Cost Summary

This section includes cost estimates of ATS needs on Forest Service sites included in this study. The ATS needs identified fall into several categories, including bus, tram, aerial guideway, and waterborne transportation systems. Also included are transit enhancement projects which primarily provide access to non-motorized trails and supporting infrastructure such as parking and trailhead facilities.

Estimates were developed for project development, capital, and operations and maintenance costs. Project development costs include conceptual planning, environmental evaluation, and engineering design. Capital costs include vehicle capital costs and other capital costs. Vehicle capital costs include the costs of purchasing vehicles (bus, tram, trolley, etc.) or waterborne vehicles (monohull, catamaran, etc.). Other capital costs include maintenance and storage facilities, parking areas, docks, piers, administrative facilities, shelters, and waiting areas; and construction management costs for projects requiring significant construction. Operations and maintenance costs include the full range of administrative and operating and maintenance costs, including labor, benefits, fuel, parts, marketing expenses, and insurance. For the purposes of this study, operations and maintenance costs generally were estimated based on a single hourly operating cost that incorporates all of the factors identified above. For non-transit ATS alternatives, capital costs generally include trail development and cost for parking facilities, trailheads, and other supporting infrastructure. A more detailed description of the cost estimation process is included in Appendix A.

Table 4.3 includes the short-term and long-term transit needs identify by mode. All costs are presented in constant 2003 dollars and are not adjusted for inflation. Short-term needs are those anticipated between 2003 and 2012, while long-term needs are those expected to occur between 2013 and 2022. The total combined need for both periods (2003-2022) is estimated at $698 million. Of this total amount, approximately $469 million is required between 2003 and 2012 (short-term), with the remaining $229 million required between 2013 and 2022 (long-term). Of the total costs, $522 million are estimated for surface transportation systems (75 percent), primarily bus; $122 million are for water transportation (17 percent); and $54 million (eight percent) is estimated for transit enhancements.

Table 4.3 Summary of Alternative Transportation System Needs on the National Forest Service Sites

	Short-Term Costs (2003-2012)	Long-Term Costs (2013-2022)	Total Cost (2003-2022)
Surface	$320,000,000	$202,000,000	$522,000,000
Water	$103,000,000	$ 19,000,000	$122,000,000
Transit Enhancements	$ 46,000,000	$ 8,000,000	$ 54,000,000
Grand Total	**$469,000,000**	**$229,000,000**	**$698,000,000**

It important to note that over half (52 percent) of all short-term costs are included in only two projects, the Mt. Hood Aerial Tramway ($142 million) and the Southeast Alaska Intermodal Ferry Project ($102 million). These are major projects that are likely to be implemented over a long period of time; and the Tramway project in particular will require significant additional planning and analysis before it can proceed. The Southeast Alaska project has the support of the state DOT and other partners, which improves the prospects for funding from a variety of sources. Funding sources are not as certain for the Mt. Hood project; and the alternative system reported for cost purposes is the most ambitious and expensive. There are significantly less expensive options available if funding is limited. Therefore, if these projects are implemented, it is unlikely that completion will occur during the short-term period. A significant portion of the estimated total cost could thus shift into the long-term period or even beyond.

Table 4.3b summarizes ATS needs by mode and type of expenditure. During the next 10 years, project development costs are estimated at $40 million or 8 percent of the total estimated cost, capital expenses are estimated at $266 million or 57 percent of the total cost, and operations and maintenance costs are estimated at $163 million or 35 percent of total costs. Since most of the surface transportation systems proposed are seasonal in nature, the Forest Service may find it beneficial to contract the service to private or public transit operators and permit them to supply the vehicles. Another option is for the Forest Service to buy vehicles and have a contractor operate them. The mix of capital and operations and maintenance cost will vary depending on the option chosen. Since it assumed that most of the capital projects will occur in the short-term period, the majority of the costs estimated for the long-term period (71 percent) are for operations and maintenance.

Table 4.4 provides funding needs for existing systems (including expansion of those systems) and new systems. As indicated in the table, existing systems serving Forest Service sites are very limited. In many cases, the proposed systems would link with existing systems operated by others, such as the YARTS in California, or provide separate shuttle service to link with existing systems. An example of the latter is a proposed link between the Mendenhall Glacier in Juneau, Alaska, (Tongass National Forest) and the Juneau City transit system. Overall, 74 percent of the total costs are for totally new systems, and the proportion of estimated operations and maintenance costs going to new systems is even higher at 86 percent.

Table 4.3b Potential ATS Needs by Mode and Type of Expenditure

	Short-Term 2003-2012				Long-Term 2013-2022			
	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations and Maintenance	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations and Maintenance
Surface	$21,500,000	$ 95,500,000	$ 47,900,000	$154,900,000	$ 6,100,000	$40,600,000	–	$155,100,000
Water	13,400,000	39,300,000	50,200,000	–	5,900,000	13,200,000	–	–
Aerial Tramway	12,154,731	50,821,200	30,210,342	23,870,250	–	–	–	23,870,250
Other ATS	4,900,000	–	33,000,000	8,100,000	–	–	–	8,100,000
Total	**$39,800,000**	**$134,800,000**	**$131,100,000**	**$163,000,000**	**$12,000,000**	**$53,800,000**	**–**	**$163,200,000**

Table 4.4 Potential ATS Needs by System Status and Type of Expenditure

	Costs for Existing and Expansion of Existing Systems				Cost for New Systems			
	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations and Maintenance	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations and Maintenance
Short-Term (2003-2012)	$14,500,000	$45,700,000	$50,900,000	$23,600,000	$25,400,000	$ 89,100,000	$80,200,000	$139,500,000
Long-Term (2013-2022)	6,900,000	19,600,000	–	23,600,000	5,100,000	34,200,000	–	139,700,000
Total	**$21,300,000**	**$65,300,000**	**$50,900,000**	**$47,200,000**	**$30,500,000**	**$123,300,000**	**$80,200,000**	**$279,200,000**

Potential ATS Needs by State and by National Forest

Tables 4.5 through 4.7 summarize transit needs by state and by National Forest. Table 4.5 shows the total ATS needs in the short- and long-term periods, and the total ATS needs for the entire study period (2003-2022) by State and by Forest. Table 4.6 provides detailed information that supports the total costs shown in Table 4.5. In Table 4.6, the ATS costs for each state are separated into up-front costs (project development and capital) and operations and maintenance costs. Table 4.7 further breaks down the information provided in Tables 4.5 and 4.6. The up-front costs shown in Table 4.7 are separated into project development costs, vehicle capital costs, and other capital costs.

Alaska has the highest level of identified need, at $167 million. Due to the potentially high cost of the Mt. Hood Aerial Tramway, the State of Oregon and the Mt. Hood National Forest have the second highest estimated level of need, $141 million. Other States with the highest level of need identified are California, Nevada, Washington, and New Hampshire. Individual National Forests with identified needs greater than $100 million for the 20-year period are the Tongass NF (Alaska), the Inyo and Humboldt/Toiyabe National Forests (California/Nevada), and the Mt. Hood National Forest (Oregon). Individual Forests with between $30 and $100 million in needs identified are the Chugach NF (Alaska), the White Mountain National Forest (New Hampshire), and the Mt. Baker-Snoqualmie National Forest (Washington). Forests with between $10 million and $30 million in needs include the Angeles NF (California), the Sequoia NF (California), the Stanislaus NF (California), the Tahoe NF (California and Nevada), the Arapahoe-Roosevelt National Forest (Colorado), the Caribbean National Forest (Puerto Rico), and the Land Between the Lakes National Recreation Area (Tennessee and Kentucky).

Table 4.5 Potential ATS Needs by State and Site

	Short-Term Costs (2003-2012)	Long-Term Costs (2013-2022)	Total Cost (2003-2022)
Alaska			
Chugach NF	$24,749,540	$5,873,677	$30,623,217
Tongass NF	$107,816,868	$23,789,466	$131,606,334
Chugach/Tongass NF	$4,525,000	$500,000	$5,025,000
Total	**$137,091,408**	**$30,163,143**	**$167,254,551**
Arizona			
Kaibab NF*			
California			
Angeles NF	$14,084,706	$12,196,135	$26,280,841
Los Padres NF	$4,682,814	$4,065,379	$8,748,193
Plumas NF	$2,550,000	$250,000	$2,800,000
San Bernardino NF	$1,577,463	$1,549,277	$3,126,740
Sequoia NF	$8,390,993	$8,390,993	$16,781,986
Sierra NF	$4,861,921	$4,215,880	$9,077,801
Stanislaus NF	$7,473,460	$5,197,564	$12,671,024
Total	**$43,621,357**	**$35,865,228**	**$79,486,585**

Table 4.5 Potential ATS Needs by State and Site (continued)

	Short-Term Costs (2003-2012)	Long-Term Costs (2013-2022)	Total Cost (2003-2022)
California/Nevada			
Inyo, Humboldt-Toiyabe NF	$60,105,305	$54,364,569	$114,469,874
Tahoe NF	$5,697,131	$4,827,131	$10,524,262
Total	**$65,802,436**	**$59,191,700**	**$124,994,136**
Colorado			
Arapaho-Roosevelt NF	$5,711,944	$5,042,164	$10,754,108
Florida			
Apalachicola NF	$1,741,000	$300,000	$2,041,000
Idaho			
Sawtooth NF	$1,663,461	$1,427,711	$3,091,172
Illinois			
Midewin NF	$54,050	$54,050	$108,100
Michigan			
Grand Island NRA	$1,743,784	$977,224	$2,721,008
Montana			
Lewis and Clark NF	$1,039,301	$648,000	$1,687,301
Nevada			
Humboldt-Toiyabe NF	$19,697,061	$18,271,752	$37,968,813
New Hampshire			
White Mountain NF	$18,798,959	$17,589,156	$36,388,115
New Mexico			
Cibola NF	$4,818,545	$3,365,583	$8,184,128
Oregon			
Mount Hood NF	$117,056,523	$23,870,250	$140,926,773
Puerto Rico			
Caribbean NF	$13,965,066	$7,097,263	$21,062,329
Tennessee/Kentucky			
Land Between the Lakes NRA	$6,705,956	$5,614,654	$12,320,610
Washington			
Mt Baker Snoqualmie NF	$19,621,462	$18,132,886	$37,754,348
Wenatchee NF	$6,360,000	$840,000	$7,200,000
Total	**$25,981,462**	**$18,972,886**	**$44,954,348**
Wyoming			
Medicine Bow NF	$3,351,150	$590,000	$3,941,150

*Costs for Kaibab NF are incorporated into National Park Service proposed Grand Canyon Transit System.

Table 4.6 Potential ATS Needs by State, Site, Up-Front Costs, and O&M Costs

State/Site	Short-Term 2003-2012 Costs		Long-Term 2013-2022 Costs		Total 2003-2022 Costs	
	Up-Front Costs	Operations and Maintenance	Up-Front Costs	Operations and Maintenance	Up-Front Costs	Operations and Maintenance
Alaska						
Chugach NF	$ 19,749,540	$5,000,000	$ 873,677	$5,000,000	$ 20,623,217	$10,000,000
Tongass NF	$105,560,578	$2,256,290	$21,043,366	$2,746,100	$126,603,944	$ 5,002,390
Chugach/Tongass NF	$ 4,025,000	$ 500,000	-	$ 500,000	$ 4,025,000	$ 1,000,000
Total	**$129,335,118**	**$7,756,290**	**$21,917,043**	**$8,246,100**	**$151,252,161**	**$16,002,390**
Arizona						
Kaibab NF *						
California						
Angeles NF	$ 8,004,306	$ 6,080,400	$ 6,115,735	$ 6,080,400	$14,120,041	$12,160,800
Los Padres NF	$ 2,656,014	$ 2,026,800	$ 2,038,579	$ 2,026,800	$ 4,694,593	$ 4,053,600
Plumas NF	$ 2,300,000	$ 250,000	-	$ 250,000	$ 2,300,000	$ 500,000
San Bernardino NF	$ 901,863	$ 675,600	$ 873,677	$ 675,600	$ 1,775,540	$ 1,351,200
Sequoia NF	$ 2,965,503	$ 5,425,490	$ 2,965,503	$ 5,425,490	$ 5,931,006	$10,850,980
Sierra NF	$ 3,072,921	$ 1,789,000	$ 2,426,880	$ 1,789,000	$ 5,499,801	$ 3,578,000
Stanislaus NF	$ 3,408,440	$ 4,065,020	$ 1,132,544	$ 4,065,020	$ 4,540,984	$ 8,130,040
Total	**$23,309,047**	**$20,312,310**	**$15,552,918**	**$20,312,310**	**$38,861,965**	**$40,624,620**
California/Nevada						
Inyo, Humboldt-Toiyabe NF	$ 9,768,815	$50,336,490	$4,028,079	$50,336,490	$13,796,894	$100,672,980
Tahoe NF	$ 1,297,131	$ 4,400,000	$ 427,131	$ 4,400,000	$ 1,724,262	$ 8,800,000
Total	**$11,065,946**	**$54,736,490**	**$4,455,210**	**$54,736,490**	**$15,521,156**	**$109,472,980**
Colorado						
Arapaho-Roosevelt NF	$ 3,387,884	$ 2,324,060	$2,718,104	$2,324,060	$6,105,988	$4,648,120
Florida						
Apalachicola NF	$ 1,441,000	$ 300,000	-	$ 300,000	$1,441,000	$ 600,000
Idaho						
Sawtooth NF	$ 429,901	$ 1,233,560	$ 194,151	$1,233,560	$ 624,052	$2,467,120

Table 4.6 Potential ATS Needs by State, Site, Up-Front Costs, and O&M Costs (continued)

State/Site	Short-Term 2003-2012 Costs		Long-Term 2013-2022 Costs		Total 2003-2022 Costs	
	Up-Front Costs	Operations and Maintenance	Up-Front Costs	Operations and Maintenance	Up-Front Costs	Operations and Maintenance
Illinois						
Midewin NF	-	$ 54,050	-	$ 54,050	-	$ 108,100
Michigan						
Grand Island NRA	$ 1,743,784	-	$ 977,224	-	$ 2,721,008	-
Montana						
Lewis and Clark NF	$ 132,884	$ 906,417	-	$ 648,000	$ 132,884	$ 1,554,417
Nevada						
Humboldt-Toiyabe NF	$ 5,599,541	$14,097,520	$ 4,174,232	$14,097,520	$ 9,773,773	$28,195,040
New Hampshire						
White Mountain NF	$ 5,286,959	$13,512,000	$ 4,077,156	$13,512,000	$ 9,364,115	$27,024,000
New Mexico						
Cibola NF	$ 2,812,015	$ 2,006,530	$ 1,359,053	$ 2,006,530	$ 4,171,068	$ 4,013,060
Oregon						
Mount Hood NF	$ 93,186,273	$23,870,250	-	$23,870,250	$93,186,273	$47,740,500
Puerto Rico						
Caribbean NF	$ 7,998,776	$ 5,966,290	$ 1,130,973	$ 5,966,290	$ 9,129,749	$11,932,580
Tennessee/Kentucky						
Land Between the Lakes NRA	$ 4,003,556	$ 2,702,400	$ 2,912,254	$ 2,702,400	$ 6,915,810	$ 5,404,800
Washington						
Mt Baker Snoqualmie NF	$ 7,798,462	$11,823,000	$ 6,309,886	$ 11,823,000	$14,108,348	$23,646,000
Wenatchee NF	$ 5,520,000	$ 840,000	-	$ 840,000	$ 5,520,000	$ 1,680,000
Total	**$ 13,318,462**	**$12,663,000**	**$ 6,309,886**	**$ 12,663,000**	**$19,628,348**	**$25,326,000**
Wyoming						
Medicine Bow NF	$ 2,761,150	$ 590,000	-	$ 590,000	$ 2,761,150	$ 1,180,000
Total	**$305,812,296**	**$163,031,167**	**$65,778,204**	**$163,262,560**	**$371,590,500**	**$326,293,727**

*Costs for Kaibab NF are incorporated into National Park Service proposed Grand Canyon Transit System.

Table 4.7 Potential ATS Needs by State, Site, and Type of Expenditure

State/Site	Short-Term 2003-2012 Costs				Long-Term 2013-2022 Costs			
	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance
Alaska								
Chugach NF	$ 2,576,027	$ 759,719	$16,413,794	$5,000,000	$ 113,958	$ 759,719	-	$5,000,000
Tongass NF	$13,768,771	$41,054,115	$50,737,692	$2,256,290	$6,158,117	$14,885,248	-	$2,746,100
Chugach/Tongass NF	$ 525,000	-	$ 3,500,000	$ 500,000	-	-	-	$ 500,000
Total	**$16,869,798**	**$41,813,834**	**$70,651,486**	**$7,756,290**	**$6,272,075**	**$15,644,967**	**-**	**$8,246,100**
Arizona								
Kaibab NF *								
California								
Angeles NF	$1,044,040	$5,318,030	$1,642,236	$6,080,400	$797,705	$5,318,030	-	$6,080,400
Los Padres NF	$ 346,437	$1,772,677	$ 536,900	$2,026,800	$265,902	$1,772,677	-	$2,026,800
Plumas NF	$ 300,000	-	$2,000,000	$ 250,000	-	-	-	$ 250,000
San Bernardino NF	$ 117,634	$ 759,719	$ 24,510	$ 675,600	$113,958	$ 759,719	-	$ 675,600
Sequoia NF	$ 386,805	$ 2,578,698	-	$5,425,490	$386,805	$2,578,698	-	$5,425,490
Sierra NF	$ 400,816	$ 2,110,330	$ 561,775	$1,789,000	$316,550	$2,110,330	-	$1,789,000
Stanislaus NF	$ 444,579	$ 984,821	$1,979,040	$4,065,020	$147,723	$ 984,821	-	$4,065,020
Total	**$3,040,311**	**$13,524,275**	**$6,744,461**	**$20,312,310**	**$2,028,643**	**$13,524,275**	**-**	**$20,312,310**
California/Nevada								
Inyo, Humboldt-Toiyabe NF	$1,274,193	$3,502,677	$4,991,945	$50,336,490	$525,402	$3,502,677	-	$50,336,490
Tahoe NF	$ 205,713	$ 371,418	$ 720,000	$ 4,400,000	$ 55,713	$ 371,418	-	$ 4,400,000
Total	**$1,479,906**	**$3,874,095**	**$5,711,945**	**$54,736,490**	**$581,115**	**$3,874,095**	**-**	**$54,736,490**
Colorado								
Arapaho-Roosevelt NF	$441,898	$2,363,569	$582,417	$2,324,060	$354,535	$2,363,569	-	$2,324,060
Florida								
Apalachicola NF	$131,000	-	$1,310,000	$300,000	-	-	-	$300,000
Idaho								
Sawtooth NF	$56,074	$168,827	$205,000	$1,233,560	$25,324	$168,827	-	$1,233,560
Illinois								
Midewin NF				$54,050			-	$54,050
Michigan								
Grand Island NRA	$227,450	$849,760	$666,574	-	$127,464	$849,760	-	-

Table 4.7 Potential ATS Needs by State, Site, and Type of Expenditure (continued)

State/Site	Short-Term 2003-2012 Costs				Long-Term 2013-2022 Costs			
	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance
Montana								
Lewis and Clark NF	$ 17,333	$ 112,551	$ 3,000	$ 906,417	-	-	-	$ 648,000
Nevada								
Humboldt-Toiyabe NF	$ 730,375	$3,629,767	$1,239,399	$14,097,520	$544,465	$3,629,767	-	$14,097,520
New Hampshire								
White Mountain NF	$ 689,603	$3,545,353	$1,052,003	$13,512,000	$531,803	$3,545,353	-	$13,512,000
New Mexico								
Cibola NF	$ 366,785	$1,181,785	$1,263,445	$ 2,006,530	$177,268	$1,181,785	-	$ 2,006,530
Oregon								
Mount Hood NF	$12,154,731	$50,821,200	$30,210,342	$23,870,250	-	-	-	$23,870,250
Puerto Rico								
Caribbean NF	$1,043,319	$4,952,240	$2,003,217	$ 5,966,290	$147,518	$ 983,455	-	$ 5,966,290
Tennessee/Kentucky								
Land Between the Lakes NRA	$ 522,203	$2,532,395	$ 948,958	$ 2,702,400	$379,859	$2,532,395	-	$ 2,702,400
Washington								
Mt Baker Snoqualmie NF	$1,017,191	$5,486,857	$1,294,414	$11,823,000	$823,029	$5,486,857	-	$11,823,000
Wenatchee NF	$ 720,000	-	$4,800,000	$ 840,000	-	-	-	$ 840,000
Total	**$1,737,191**	**$5,486,857**	**$6,094,414**	**$12,663,000**	**$823,029**	**$5,486,857**	**-**	**$12,663,000**
Wyoming								
Medicine Bow NF	$ 360,150	-	$2,401,000	$ 590,000	-	-	-	$ 590,000
Total	**$39,868,127**	**$134,856,508**	**$131,087,661**	**$163,031,167**	**$11,993,098**	**$53,785,105**	**-**	**$63,262,560**

*Costs for Kaibab NF are incorporated into National Park Service proposed Grand Canyon Transit System.

4.3 Economic Impacts

The provision of ATS in the National Forests can have national economic implications as well as significant economic benefits for local areas surrounding the sites. These local and overall economic effects can be relevant for project planning as well as for program financing.

Impacts on public and private sector revenues and spending patterns occur as a result of three basic forces: 1) capital investment in equipment and facilities; 2) ongoing transportation system operations; and 3) changes in site visitation and associated visitor spending. The economic impact of the third item may result from increases in the number of recreational visitors to an area, or longer stays and higher expenditures from those who already come to an area. The economic impacts also can have very different interpretations, depending on whether they are examined from the viewpoint of the national economy or the viewpoint of local economic development. The economic impacts and benefits on a national and local level are discussed below.

National Perspective

The implementation of ATS, particularly transit service, requires continued capital investment and ongoing operations activities. Ongoing costs for non-transit ATS such as trails are lower and primarily include maintenance and public safety functions. Based on the estimated level of investment and ongoing operations for these systems, the following types of economic effects are expected to occur:

- Increased capital investment in transportation vehicles – mostly buses, with some waterborne vessels and rail or other types of shuttle systems. Such vehicle purchases support vehicle manufacturers and associated production-related jobs.

- Increased capital investment in right-of-way and terminal facilities – including parking lots, benches, shelters, loading docks or piers, vehicle maintenance and storage facilities, and in some cases dedicated travel lanes or other right-of-way improvements. The construction of these facilities would provide construction-related jobs.

- Increased project development expenditures – including engineering, architecture, and planning design work for new transit projects. These expenditures generate additional income and jobs for design and planning firms.

- Increased transportation-related employment – including operating and maintaining transit equipment and facilities that would provide jobs and associated income for vehicle operators and repair/maintenance workers.

- Increased spending on suppliers of materials and services – including suppliers of sheet metal, motors, rubber tires, plastic interior components, and other parts required by the

vehicle manufacturers. It also would include suppliers of wood, gravel, cement, structural metal, or other materials needed for the facility construction. It would further include suppliers of motor fuel and replacement parts needed for ongoing operation of the vehicles.

- There also could be induced effects caused by the spending of income by workers. In other words, when new jobs are created, they provide new sources of income that generate additional consumer spending demand which creates the need for additional jobs.

- Other effects on visitor spending patterns at some sites also will occur, because they will be able to accommodate greater demand and provide a higher level of service to visitors. While those effects represent definite benefits to visitors around the country, their economic effects would differ greatly from site to site. When viewed from the perspective of the overall national economy, though, they would appear as a redistribution of where visitor spending occurs and would not be expected to change the aggregate total amount of household spending on recreation activities in the United States. This assumes that the money available for recreation among domestic consumers is relatively fixed in a single year. However, attracting additional foreign visitors could increase the overall amount available.

Potential National-Level Impacts

The total capital and operating costs of ATS at all of the proposed sites were estimated and then summed to represent the national-level "direct effect" of the ATS program. The spending mix associated with these direct effects also was calculated based on available information about the types of vehicles, facilities, and services being proposed. (All estimates in this section are in constant 2003 dollars.)

These direct effects will generate additional flows of income and support additional jobs through the U.S. economy. During the original 3039 study, these flows of dollars, and particularly the indirect and induced effects, were calculated using the IMPLAN version of the national input-output model. That national model is primarily based on inter-industry purchase and spending data compiled by the U.S. Department of Commerce, Bureau of Economic Analysis. Additional calculations were not made for this project, but application of the same factors to the estimated Forest Service program costs provides a very rough estimate of the potential impacts of the ATS program.

Capital investment over the next 20 years, if all the transit needs identified in the study were funded, will involve $320 million of one-time direct spending. Adjusting the numbers for inflation, the original 3039 study estimated that total business output (sales) would be equal to $3.34 for each dollar of one-time direct spending, one job-year for each $44,000 in spending, and $1.05 in personal income for each dollar spent. Due to the equipment-intensive nature of vehicle manufacturing, the capital investment element of the program is expected to support roughly 25 jobs per million dollars of direct expenditure. Application of these factors to the estimated Forest Service expenditure would provide $1.07 billion in total business output, 7,270 job years, and $336 million in personal income.

Inflation adjusted factors for the $52 million estimated in project development expenditures over the next 20 years are $3.59 for each dollar of one-time direct spending, one job-year for each $28,900 in spending, and $1.48 in personal income. These professional service purchases are expected to generate $186 million of output, support 1,790 job-years of employment, and provide $77 million in personal income.

Average annual expenditures on operations and maintenance are expected to be $16.3 million per year. Inflation adjusted factors for these expenditures are $2.96 for each dollar of one-time direct spending, one job-year for each $29,000 in spending, and $1.24 in personal income. These expenditures are estimated ultimately to support $48 million in total business output (sales) each year, providing 560 jobs and $20.2 million in total personal income every year. Due to the more labor-intensive nature of transit operations and maintenance that element of the program is expected to support roughly 40 jobs for each million dollars in direct spending.

It is important to note that national spending on other types of programs or services (instead of transit) also could support jobs and provide income to workers within the United States. Thus, these figures represent just the economic effects of spending on the transit program and do not reflect the opportunity costs of foregoing other possible uses of Federal funds.

Potential Local/Regional Economic Impacts

From the perspective of communities in the local area surrounding a Forest Service site, the economic effects of implementing transit are different from the national perspective:

- The effects of changes in *visitor spending* patterns, while viewed as a redistribution of spending at the national level, are potentially very significant for the local economies of affected areas. For some gateway communities clogged roads, insufficient parking, or other problems of site access are now constraining the number of visitors or the length of time they stay in the community. In some of those cases, ATS can increase the number of visitors to the site and increase the amount of visitor spending in the surrounding communities. The aggregate change in local spending is both a measure of direct economic impact on the local economy and an indicator of the increase in site visitation that reflects benefits to site visitors.

- The direct capital investment in *purchases* of transportation vehicles will generally not provide jobs or income to local workers unless there happened to be a manufacturer of transit vehicles in the local area. That does not appear to be the case for most transit sites. Therefore, this analysis assumes that vehicle purchases (bus, boat, etc.) fully affect the national economy but affect the relevant local economies to a much lesser degree.

Tongass National Forest Alaska –
City of Kake, Kupreanof Island

- The direct spending on *construction* of right-of-way, docks and piers, trails, parking areas, and terminal/maintenance facilities will provide local construction jobs and associated income for workers which would generally not occur without the ATS investment. The construction activity would represent a net growth of jobs and income generated in the local area, as long as there are residents of the local area who could travel to the site to work on the construction.

- The direct *operations* activities would provide jobs and associated income for operators and maintenance workers which also will most likely not occur without the ATS investment. Operations activity will provide a net growth of jobs and income generated in the local area, as long as there are qualified residents who could travel to work at the site.

- The broader *indirect* effects will be much smaller at the local level than at the national level, since they will occur only insofar as there are some local area suppliers of materials used in manufacturing or delivery of the vehicles (very limited in most cases) or local area suppliers of construction materials and services (generally applicable for most areas).

- The *induced* effects caused by spending of worker income also will represent economic growth at the local level, insofar as it represents additional dollars spent on food, clothing, and other consumer purchases which would not occur without the additional local jobs supported by the ATS program.

5.0 Opportunities for Raising Revenue

Volume II of this study, *Financing Opportunities for Alternative Transportation Systems*, includes a discussion of the wide variety of public and private funding sources available to fund transit on Federal lands. This report was prepared for the original 3039 study and has been updated as part of this project to reflect program changes and provide additional background on Forest Service funding opportunities.

In addition to program funds, there are opportunities to recover revenue to offset operations and maintenance costs through fares. Existing ATS systems that serve National Forests are limited and in many cases are run by other agencies and authorities, or are operated as part of an agreement for a special use permit. Generally, services are limited to peak seasons, which may occur during summer vacation or winter ski season. The experience with these systems on Forest Service lands is limited to the point where revenue for new and expanded systems cannot realistically be estimated. In some cases, such as the Caribbean National Forest, where extensive study of ATS alternatives has been completed, required fare revenue has been estimated. In the case of the proposed tram system in the Caribbean National Forest, the recommended fare is $2.00.

Angeles National Forest California – Adventure Pass Sign

The Forest Service special-uses program authorizes use of USDA Forest Service managed lands that provide a benefit to the general public and protect public and natural resources values. Currently, there are more than 72,000 authorizations on the National Forests and Grasslands for 200 different types of uses. A special use permit is a legal document, such as a permit, lease, or easement, which allows occupancy, use, rights, or privileges of Forest Service lands. Special use authorization is required when a visitor needs to occupy, use, or build on National Forest Service land for personal or business purposes, whether the duration is temporary or long-term; when there is a fee being charged or if income is derived from the use; or when an activity on NFS land involves individuals or organization with 75 or more participants or spectators.

Forest Service personnel have indicated that special use permit conditions may require holders to provide alternative transportation in order to mitigate parking or roadway capacity deficiencies. This condition is applied to some ski operators, who experience heavy seasonal peaks in usage. It has been noted that using special permit fees to fund

alternative transportation may be difficult to implement and administratively more complex than some of the other methods identified below and in Volume II of this study.

Some of the alternatives for raising revenues are as follows:

- The site can charge fares for use of the ATS, similar to those charged by a traditional transit system. One of the problems with this option is that average party size is relatively high, and fares can become expensive for families and large groups. If free parking is provided at the visitor destinations within the site, such groups are likely to remain in their automobiles. Family or group fares can be used to mitigate this problem. Water transportation systems and trams generally are more successful in charging fees than traditional shuttle bus services.

- The local transit authorities that provide transit service to the sites can charge their normal fare. For example, there are a number of National Forests in California that have county-based public transportation systems already in operation. In some areas rural systems, such as YARTS, are already established. Additional service can be provided through either expansion of these systems or connector routes that may be operated by the Forest Service. Similar opportunities have been identified in larger urban areas to provide transit service with existing urban transit system vehicles on weekends or connector service to existing urban routes. The Angeles National Forest in Southern California, the Cibola National Forest in the Albuquerque, New Mexico area and the Arapahoe-Roosevelt National Forest in Colorado are three examples.

- Sites that charge entry fees could permit those who park-and-ride and use the transit system to enter for free. The number of automobiles permitted into the site could be limited through a reservation system, which also would encourage transit usage. Where the site has an objective of controlling visitation to a specific area, this option could have promise. The Brainard Lake area of the Arapahoe-Roosevelt National Forest in Colorado and the Caribbean National Forest in Puerto Rico are two sites where this system is being considered.

- Sites may provide "value-added" transit services with interpreters and charge a fee for those services. The goal would be to provide a high-quality interpretive experience that tells the story of the Forest attractions in a logical, accurate, and compelling fashion. The White Mountain National Forest in New Hampshire is one area where this may be considered, especially on the Kancamangus Highway Scenic Byway, which has many sites with natural, cultural, and historic significance. The Grand Island National Recreation Area in Michigan is another site where existing bus tours are enhanced by interpretive services.

There are impediments to charging user fees at various sites. These may involve legislative restrictions as well as political concerns. Unlike most National Parks, National Forests cover large areas and generally have many "inholdings" that are under ownership of other public agencies or private parties. Therefore, the ability to control access and charge fees is confined to limited areas.

While many ATS systems will require ongoing operating subsidies, the options listed above provide good opportunities to raise revenue from users. Site managers must understand their market and in many cases will need to apply market research techniques to determine whether fares can be charged, and if so, at what level.

6.0 Conclusion

The Forest Service Alternative Transportation Systems Study has identified significant needs for ATS among the 30 sites identified by the USDA Forest Service for this study. This report documents an estimated ATS need of approximately $698 million over the next 20 years. Of this amount, $522 million is estimated for surface transportation systems, $122 million for water transportation, and $54 million for transit enhancements which are primarily non-motorized trails. Approximately $320 million is estimated for capital costs; $52 million for project development; and $326 million, or $16.3 million annually, for operations and maintenance. While the majority of expenditures are estimated for the first 10 years, this depends largely on the implementation of two major projects, the Mt. Hood Aerial Tramway ($141 million) and the Southeast Alaska Intermodal Ferry Project ($102 million).

Because there are limited existing systems on National Forest lands, the majority of the needs identified are for new systems. During the 20-year projected period, 23 percent of estimated needs are for improvement or expansion of existing systems or facilities while 77 percent are for support of new systems.

Sawtooth National Recreation Area – North Valley Nordic Skiing Area

The study found that, at a majority of sites, transit needs are modest and can be served by a small number of vehicles operating on a seasonal basis. At some sites there are good opportunities to recover at least a portion of operations and maintenance costs through fares and increased fees. These sites are generally those where ATS systems are focused on a limited area and where access can be easily controlled.

Implementation of transit on Forest Service lands can help to achieve the following goals:

- Relieve traffic congestion and parking shortages;
- Enhance visitor mobility, accessibility and safety;
- Enhance mobility and accessibility for local residents;
- Conserve sensitive natural, cultural, and historic resources;
- Provide improved interpretation, education, and visitor information services;
- Reduce pollution; and
- Diversify economies and help to improve economic development opportunities for gateway communities.

Transportation needs, economic development needs, and resource conservation goals often work together to encourage implementation of ATS. Many sites can accommodate additional visitors but cannot provide the roadway and parking capacity required for additional automobiles. There are a number of reasons that make ATS a viable transportation option, including resource impacts of roadway and parking construction, presence of wilderness areas, general lack of automobile access such as in Southeast Alaska, and difficult topography. All of these factors can result in prohibitive project costs, even where the project is theoretically feasible. Many site managers believe that ATS can serve as a cost-effective method of accommodating additional recreational demand and improving the mobility of local residents, while at the same time conserving resources and providing the visitor with a more pleasant experience.

There appears to be a strong justification for a Federal funding program that will assist in addressing transit needs of Federally managed lands and help provide the financial stability required for these systems to succeed. Based on the findings of this study, which show a high level of need, the USDA Forest Service should be included in this program. Since it is unlikely, however, that this program will be capable of addressing all of these needs, partnerships with state and local governments, private business interests, and special interest groups will be critical in order to establish an effective transit program for Federal lands.

Appendix A

Conceptual Transit Planning Guidelines

Conceptual Transit Planning Guidelines

This section documents the general guidelines used to estimate the capital and operating costs of the conceptual transit services defined in this project. These guidelines were originally developed for the Section 3039 study of Alternative Transportation System (ATS) needs on Federal Lands conducted in 1999. That study included sites managed by the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the Bureau of Land Management (BLM). The same methodology was applied to estimate costs for the 30 Forest Service sites evaluated for ATS need in 2003. Costs were updated and are shown in the table at the end of this appendix. Some additional ATS options, primarily non-motorized trails, were included in the Forest Service study and these costs were documented as well. Appendix B documents the costing assumptions applied to each National Forest site.

A number of parameters impact the capital and operating cost of any type of transit service. These include, but are not limited to, the following:

- The assumed transit operating speed;
- The assumed service frequency or headway;
- The assumed daily, weekly, and annual hours of operation;
- The operating costs of the vehicles;
- The capital cost of the vehicles and supporting facilities such as passenger waiting shelters; and
- The need for vehicle maintenance facilities.

Each of these topics is briefly discussed below.

Assumed Transit Operating Speed

For any particular transit mode, a route operating at the highest practical speed between its terminus points without stopping is more efficient than one which is required to make stops on a regular basis at a number of intermediate locations. Thus, for example, an express bus operating between a suburban park-and-ride lot and a downtown business

district operates more efficiently than if the same vehicle were used on a local bus route with stops every few blocks.

For the general type of alternative transit services considered at any of the Federal lands sites, it was assumed that only bus or tram-type vehicles would be operated. Similarly, it was considered likely that one of two types of routings would be operated:

1. An internal site shuttle with multiple stops along internal Federal lands roadways; or

2. A linkage between either multiple site units or from a Federal lands area to a nearby gateway community using existing public roadways.

In the case of an internal site shuttle, an average operating speed of 15 miles per hour (mph) was assumed. In the case of a linkage-type operation between multiple site units or from a Federal lands area to a nearby gateway community, an average operating speed of 30 mph was assumed.

It also must be noted that the cycle time (the time required for each vehicle to complete a run and be ready for its next run) includes layover and recovery time. For the purposes of this analysis, an average layover/recovery time of five minutes or 10 percent of the run was used, whichever was greater. Average operating speeds different from these values were used when unique operating conditions made default values unrealistic.

■ Assumed Service Frequency

The assumed service frequency or headway is one of the most important factors in defining the cost of transit operations. For example, at an assumed operating speed of 15 mph (four minutes per mile), it would take 60 minutes for a bus to complete a 15-mile long round-trip. Including a 10 percent layover/recovery time factor, the total cycle time would be equal to (60 minutes) x (1.10) = 66 minutes. At an assumed service frequency of once every 60 minutes, a trip of this length would require:

(66 minutes per trip)/(60-minute service frequency) = 1.1 buses (say two buses)

At a service frequency of once every 30 minutes, a trip of the same length would require:

(66 minutes per trip)/(30-minute service frequency) = 2.2 buses (say three buses)

At a service frequency of once every 15 minutes, a trip of this same length would require:

(66 minutes per trip)/15-minute service frequency) = 4.4 buses (say five buses)

For the purposes of this analysis, a range of service frequencies was employed, with a "low" level of service being once every 30 minutes (two buses per hour), a "medium" level of service being once every 15 minutes (four buses per hour), and a "high" level of service being six to eight buses per hour (a bus every eight to 10 minutes).

Any "fractional" buses determined through this process (i.e., a 50-minute round trip/a 30-minute service frequency = 1.67 vehicles) were rounded up to the next full integer value (i.e., two vehicles). In addition, a 15 percent spare vehicle ratio was assumed, with a minimum of two spare vehicles in most cases.

Assumed Daily, Weekly, and Annual Hours of Operation

Once the number of vehicles required to operate a particular transit service at a specified headway was defined, it was necessary to translate this into the amount of service being provided, in terms of either vehicle-miles, vehicle-hours, or both. Given the conceptual nature of this analysis, only vehicle-hours of operation were usually estimated.

To the degree possible, vehicle-hours of operation were tailored to the specific and unique needs of each unit. The seasonal needs of each site were determined using visitation statistics if available. Also, varying service levels over the course of the day and by day of week (i.e., more on Saturday and Sunday than on Monday-Friday) were included for each site as necessary.

While recognizing the special nature of visitation at many of the sites that have been visited (i.e., widely varying visitation levels throughout the year), the following general planning assumptions were used as "default" values where no better information was available:

- For any park or other Federal lands area where transit service is to be provided, the service was assumed to operate 10 hours per day (i.e., 8:00 a.m. until 6:00 p.m.);
- For any park or other Federal lands area where transit service is to be provided, the service was assumed to operate seven days per week;
- For parks and other Federal lands with heavy summer visitation levels, transit services were assumed to operate only from May 1 through September 30 of any given year (153 days per year, including holidays); and
- For parks and other Federal lands with relatively steady visitation levels throughout the year, transit services were assumed to operate from January 1 through December 31 of any given year (365 days per year, including holidays).

Thus, for example, a transit route which requires the use of two buses to provide the assumed service frequency that is located in a park with heavy summer visitation levels resulted in the following annual hours of operation:

(two buses/hour) x (10 hours per day) x (153 days per year) = 3,060 annual vehicle-hours

Assumed Operating Cost of Vehicles

Once an estimate was made of the annual vehicle-hours of service to be operated, it was necessary to translate this into an estimated annual operating cost for the service. The operating cost of any particular transit service can vary widely and is dependent upon such factors as driver salaries, the cost of fuel, maintenance costs, etc.

In the course of previous work for the National Park Service, BRW determined during the original 3039 study that a cost of $50.00 per vehicle-hour (1999 dollars) was a good, all-inclusive approximation of typical transit operating costs. While higher and lower operating costs per hour have been observed, the typical midpoint of the range, for a number of different vehicle types and operating conditions, is approximately $50.00 per hour. Updated to 2003 dollars using a three percent annual inflation rate provides an estimate of $56.30 per hour.

For the purposes of this conceptual-level analysis, this value of $56.30 per vehicle-hour generally was used. However, for those situations where an existing ATS service was already in operation with documented operating costs per vehicle-hour significantly lower than this "default" value of $56.30 per hour, these documented lower costs were used.

For the example discussed above, a transit service requiring 3,060 annual vehicle-hours of operation would cost approximately:

(3,060 vehicle-hours) x ($56.30 per vehicle-hour) = $172,300 annually

Capital Costs of the Vehicles

As in the case of transit operating costs, a wide range of costs are observed with respect to the capital acquisition costs of transit vehicles. For example, the 1994 *Alternative Transportation Modes Feasibility Study* conducted for the National Park Service by BRW identified costs for 10-20 passenger shuttle/van-type vehicles in the range of $25,000 to $50,000 per vehicle, depending upon equipment. Similarly, this earlier study identified a cost range of $150,000 to $200,000 for a "standard," full-size (40-foot) urban transit bus capable of carrying 40-50 passengers. More recent work by BRW identified an average capital cost for a "full-size" urban transit bus of approximately $300,000 per vehicle.

For the purpose of this analysis, the following unit costs for "standard" bus-type vehicles were used:

Small/Medium Bus	$225,000 each
Full-Size Bus	$300,000 each
Over the Road/Tour Coach	$350,000 each

These costs are for transit-type buses. Many sites may be able to use school bus-type buses or shuttle-vans, which are much lower in cost. For example, Denali National Park's entire ATS operation is run with Blue Bird transit-style school buses, which cost on the order of $100,000 each.

For those locations where a "shuttle-" or "tram-" type service was considered, the following unit costs were used:

Powered Drive Unit	$100,000 each
Unpowered Trailer	$ 65,000 each

Adjustments were made based on cost information developed for the Volume I report, *Federal Lands Alternative Transportation System Study – Candidate Vehicle Technologies*.

Vehicle Maintenance Facilities

Where new transit services are being proposed, there may be a requirement for some type of maintenance facility to be provided as well. For the purposes of this project, three options were considered: 1) an appropriate vehicle maintenance facility already exists; 2) no such facility exists and would thus have to constructed in order for the proposed ATS service to be operated; or 3) the number of vehicles was too small (six or less) to justify construction of a new facility. The third option assumed that services would be provided by an existing operator, with a facility, but that some expansion may be needed.

For the purposes of this conceptual-level analysis, the following maintenance facility planning and design guidelines and unit costs were employed.

For small bus fleets such as those likely to be associated with virtually any Federal lands ATS services, the vehicle maintenance bays can be multifunction. The minimum size assumed for such a vehicle maintenance facility was one bus bay with an adjacent shop and parts storage area and a small office. The resulting minimum requirement was a 45-foot by 55-foot building. In addition, outdoor vehicle storage space requires 10.5-foot-wide lanes with enough length to accommodate the fleet. A unit length of the assumed vehicle length plus five feet was used to determine the length of the vehicle storage lanes.

The unit costs used at Mount Rainier National Park for a newly recommended vehicle maintenance building and associated equipment were: $130 per square foot for the building, plus $10.00 per square foot for paved vehicle storage areas.

Space requirements for various vehicle maintenance functions were assumed as follows:

Maintenance Facility Factors	Example – 10 Bus Fleet
General Repairs – one bay/20 buses	10/20 = 0.50 bay
Inspection – one bay/50 buses	10/50 = 0.20 bay
Major Repairs – one bay/60 buses	10/60 = 0.17 bay
Brake Repairs – one bay/100 buses	10/100 = 0.10 bay
Tire Repair – one bay/200 buses	10/200 = 0.05 bay
Body Repair – one bay/75 buses	10/75 = 0.13 bay
Brake Shop – four square feet/bus	Total = 1.15 bays (say two bays)
Tire Shop – four square feet/bus	
Common Work Area – six square feet/bus	
Equipment Storage – five square feet/bus	
Body Shop – four square feet/bus	
Parts Storage – 20 square feet/bus	
Total Shop Space – 43 square feet/bus	(43 square feet/bus) x (10 buses) = 430 square feet

Assuming a 40-foot-long, 10-foot-wide (including mirrors) transit bus, the minimum dimension of each enclosed bus maintenance bay would be as follows:

- Length = 40 feet + 10 feet (front clear area) + 10 feet (rear clear area) = 60 feet;
- Width = 10 feet + 10 feet (side clear area) + 10 feet (side clear area) = 30 feet; and
- Maintenance bay area = (60 feet) x (30 feet) = 1,800 square feet.

In addition, space should be provided in the building for offices, restrooms, and driver shower and break rooms. These auxiliary areas typically require approximately 15 percent of the total estimated shop space. For the example shown above, the auxiliary areas would be approximately (0.15) x (430 SF) = 65 SF. The total building size for this example 10-bus fleet would thus be as follows:

Maintenance Bays	Two bays at 1,800 square feet/bay = 3,600 square feet
Shop Area	430 square feet
Offices, Other	65 square feet
	Total = 4,095 square feet (say 4,100 square feet)

At an average cost of $130 per square foot, this example maintenance facility would cost approximately ($130 per square feet) x (4,100 square feet) = $533,000. An additional 60 percent was then added to building costs to account for site preparation, utilities, construction planning, and construction supervision; thus raising the total cost to $853,000.

Similarly, outside storage for the example 10-bus fleet would require approximately:

(40-foot bus length + five-foot space between vehicles)
x (10.5-foot-wide lanes)
x (10 vehicles) = 4,725 square feet of paved area
+ 10 percent for vehicle circulation = (0.10) x (4,725 square feet) = 473 square feet

Total = 4,725 + 473 = 5,198 square feet (say 5,200 square feet)

(5,200 square feet) x ($10.00 per square feet) = $52,000

The total cost of this example 10-vehicle maintenance facility, including outside vehicle storage, would be approximately $533,000 + $52,000 = $585,000. An additional 50 to 60 percent was added to the estimated cost of the facility for land cost, utilities, and construction management.

Other ATS System-Related Costs

In addition to vehicles and associated maintenance facilities, the operation of an ATS system also may have additional capital costs. These primarily include the provision of passenger waiting shelters or the creation/expansion of parking areas for visitor vehicles.

In the case of passenger waiting shelters, the use of standard, commercially available shelters was assumed for the purposes of this conceptual-level analysis. A typical high-quality, low-maintenance passenger waiting shelter with a capacity of 10-15 people costs approximately $10,000 installed on site.

With regard to parking areas for visitor vehicles, it was assumed that approximately 100 automobile sized parking spaces could be provided for each acre of land provided for this purpose. This assumes that the parking area contains full-size parking stalls, circulation lanes of relatively generous width, and a moderate amount of landscaping. Using these assumptions, every 100 spaces (requiring an area of approximately 43,560 square feet) would cost approximately (43,560 square feet) x ($10 per square feet) = $435,600 (say $436,000).

These values for passenger waiting shelters and visitor parking areas were used as appropriate.

While these values are appropriate for estimating the initial, one-time capital acquisition cost to initiate any newly proposed services, it is acknowledged that even the best maintained transit vehicles will eventually wear out and need to be replaced. The generally accepted life expectancy of a bus-type transit vehicle is 12 years. ***Therefore, for any Federal lands transit services that are assumed to be initiated over the next 10 years (i.e., 2001-2010), a replacement of the vehicle fleet will be required during the subsequent 10-year period (i.e., 2011-2020). If a particular transit service is not anticipated to be initiated until 2010 or later, no replacement of the vehicle fleet is assumed.***

Updated Costs for Forest Service Analysis

The short-term period defined for the analysis of Forest Service sites is 2003-2013 and the long-term period is 2013-2023. Costs were factored from 1999 to 2003, using a three percent annual inflation rate. Updated costs used for the Forest Service analysis are shown in Table A.1.

Table A.1 Unit Costs for Vehicles, Maintenance Facilities, and Other Facilities

	Unit Cost (1999$)	Unit Cost (2003$)	Width (Feet)	Length (Feet)	Capacity (Seated and Standees)	Vehicle Useful Life (Years)
Buses						
Small/Medium	$225,000	$253,239	8.5	30	20 to 45	12 to 15
Full Size	$300,000	$337,653	9.0	45	65 to 78	12 to 15
Tour Coach	$350,000	$393,928	9.0	45	45 to 65	15
Trams						
Drive Unit	$100,000	$112,551	6.0	15	N/A	5 to 12
Unpowered Trailer	$65,000	$73,158	6.0	25	20	5 to 12
Other Vehicles						
Vans	$50,000	$56,275	8.0	20	25	5 to 10
Trolley	$250,000	$281,377	8.0	30	20 to 45	10 to 15
Pontoon Boat	$40,000	$45,020	N/A	N/A	5 to 30	10 to 15
Other						
Maintenance Facility – Covered Area (per square feet)	$130	$146.32				
Maintenance Facility – Outside Storage (per square feet)	$10	$11.26				
Parking (per square feet)	$10	$11.26				
Signs (per item)	N/A	$500				
Shelters	$10,000	$11,255				
Pedestrian Bridge	N/A	$100,000				
Capital Cost of Bike/Pedestrian Trail (per mile)	N/A	$100,000				
Annual O&M Cost of Bike/Pedestrian Trail (per mile)	N/A	$2,000				
Bus Operating Cost (per vehicle hour)	$50.00	$56.30				

Appendix B

Cost Assumptions for Forest Service ATS Sites

Cost Assumptions for Forest Service ATS Sites

General Assumptions

- The methodology used to estimate number of vehicles, capital, and operating costs of vehicles and capital costs of vehicle maintenance facilities was obtained from Appendix A of the *Federal Lands Alternative Transportation Study – Summary of National ATS Needs* (August 2001). Project development costs are assumed as 15 percent of the total cost of vehicles and other capital costs (i.e., infrastructure, signs, benches, and other transit enhancement capital costs).

- Some unit costs from the report mentioned above are in 1999 dollars. For the purpose of this analysis, unit costs were adjusted to 2003 dollars assuming an annual inflation rate of three percent. The cost of vans, trolleys, and pontoon boats were obtained from the updated version of Volume I of the *Federal Lands Alternative Transportation Study – Candidate Vehicle Technologies*. Table B.1 shows the unit costs used for vehicles, maintenance facilities and parking, both in 1999 and 2003 dollars.

Sawtooth National Forest

Shuttle Expansion and Pedestrian/Bike Trail

- Existing service, assume no need for maintenance facilities. The service will be provided from mid-December through the end of March, for approximately 106 days per year.

- In addition to vehicles (three passenger vans), other capital costs include $5,000 for additional bus stop signage (from Field Report).

- The length of the pedestrian/bike trail is 2.0 miles.

Land Between the Lakes National Forest

North-South and East-West Shuttles

- Total cost includes the implementation of the full North-South route (Grand Rivers to Fort Donelson) and two East-West routes. The shuttle service will run four days a week (Friday through Monday), from Memorial Day to Labor Day, for a total of approximately 60 days per year.

- Capital costs include 10 small/medium buses, maintenance facilities and $96,540 for stop signs and shelters.

White Mountain National Forest

Shuttle Service

- Cost estimates assume the implementation of three shuttle routes. Shuttle service will run between mid-April through November, for a total of 200 days per year.

- Capital costs include 14 small/medium buses, maintenance facilities and $125,550 for signs and bus shelters.

Medicine Bow National Forest

Parking and Rail-to-Trail Project

- Cost estimates for the proposed projects were provided by the Forest Service.

- Operating costs associated with both the rail-to-trail and parking projects were estimated by Cambridge Systematics (CS).

Caribbean National Forest

Tram System

- Project costs provided by the Forest Service, including both capital and operating costs. It also includes the purchase of additional trams to meet future demand and replacement of three passenger buses. Costs were provided by the Forest Service in 2000 dollars, and inflated to 2003 dollars for the final report.

Midewin National Forest

Regional Transit Connection and Local Shuttle

- Service will be provided eight Saturdays between May and October. Assume service will be privately operated, and that no maintenance facilities will be required. Capital costs are estimated at $12,255 for a bus shelter and signs. We assumed three small/ medium buses to provide shuttle services between the site and a nearby transit station and within the site.

Mt. Baker – Snoqualmie National Forest

Mt. Rainier Transit System

- Assumes summer (100 days) and winter (120 days) services. Since summer service requires more vehicles, capital costs are based on the vehicle requirements to provide service between the satellite parking and the Sunrise Visitor Center. Capital costs includes $50,020 for bus shelters and signs in addition to maintenance facilities and vehicles.

- The Enumclaw route will require four large buses, whereas the satellite parking shuttle will require seven small/medium buses.

Stevens Pass Ski Area Transit Expansion

- For the shuttle service, assume that no maintenance facilities are required, because it will be privately operated, and there is an existing ATS serving the Stevens Peak Ski Area. A total of $25,510 for shelters and signage were added to the cost of six vehicles.

- Coach buses will be used to provide service. The operating plan assumes that the service will be provided from Thanksgiving to April 15, for a total of 120 days per year, with 30- to 60-minute headways. Fleet requirements assume 30-minute headways, which presumably will be provided during both morning and afternoon peak periods.

- The construction of a pedestrian bridge also is included in the cost estimate @ $100,000 (plus $15,000 for project development).

Arapaho-Roosevelt National Forest

Peak-to-Peak Highway Shuttle System

- The operating plan assumes that shuttle services will be provided mostly during the summer season. For instance, the Brainard Lake shuttle is assumed to operate 122 days per year. On the other hand, the Nederland-Brainard Connector is assumed to operate during peak days, for a total of 60 days per year, whereas the Mt. Evans route is assumed to operate 90 days per year.

- Assume that service will be provided by a private contractor. Capital costs only includes vehicles, signage, and shelters.

- The Brainard Lake Shuttle and Nederland to Brainard service will require the purchase of four large buses. The Brainard Lake Shuttle requires the construction of a small maintenance facility.

- The Mt. Evans route will be served by five vans. It is assumed that operating costs will be subsidized by fare revenues.

Grand Island NRA

Ferry and Bus tour vehicles

- Capital costs include new pontoon boats and two buses that would replace the existing fleet. These vehicles will reflect the setting and historic themes of the island. A maintenance facility on the island is included in the estimate to provide storage for the bus fleet and other NRA vehicles. No operating costs were provided.

Mt. Hood National Forest

Gondola System

- Costs for the gondola system were provide by the Forest Service.

- Several alternatives were presented for aerial tramway and bus service. These costs covered a wide range, so the cost used for this report is halfway between the least and most expensive alternatives.

Park-and-Ride

- The park-and-ride alternative assumes the construction of a parking lot for 2,000 cars and two shuttle bus routes from Sandy to Timberline Lodge and Mount Hood Meadows. Given the fleet requirements of the service, maintenance facilities are included in the estimate, and $48,020 in shelters and signage. The bus fleet will consist of 27 coach buses to provide service every 15 minutes to both destinations. The gondola system and the park-and-ride project are mutually exclusive; therefore, the project costs provided in the report are related to the gondola system, because it has the highest capital and operating costs. The park-and-ride total capital cost is estimated at $26.3 million, and O&M costs for the first 10 years of operation are estimated at $15.6 million. Capital expenditures for future bus replacement are estimated at $12.2 million. Note: All costs are in 2003 dollars.

- The bus service will operate during the winter season, for 120 days per year.

Kaibab National Forest

Parking and Transit Service

- The project includes the establishment of a bus shuttle system, connecting a park-and-ride lot, to be established near the Tusayan community and the south rim of the canyon located within the GCNP as a first phase, to be replaced with a light rail line when visitation outgrows the bus system capacity. A cost of approximately $150 million was documented in the original 3039 study under the Grand Canyon National Park. Since this cost was already included under National Park Service no additional costs were included in this study.

Cibola National Forest

Parking Lot and Shuttle to Summit

- Shuttle service to be provided between parking lot and the Sandia Peak summit during peak days (assumed operation is 34 days per year). It is assumed that the service will be privately operated, and there is no need to provide maintenance facilities. Capital costs include two small/medium buses, two shelters, and signs. The construction of a 250 vehicle parking lot also is included in the cost estimate.

- Service to Sandia Peak Tramway to be provided by transit operator (SunTran). Assume purchase of two large buses, one shelter, and several signs. Service will be provided three days a week for 10 hours, 156 days a year.

Tongass National Forest

Glacier to City Shuttle (Mendenhall Glacier)

- Capital costs include two small/medium buses, shelters, and signage. The service will operate every 30 minutes, for 150 days per year.

- Parking lot reconfiguration costs were estimated by CS assuming 37 spaces for vehicles and 21 spaces for recreational vehicles/buses (as shown in map included in the report). Operation and maintenance costs also were estimated by CS.

Southeast Conference Ferry Projects

- Capital costs were provided by the Forest Service, and include the cost of vessels and terminal facilities. Operation and maintenance costs were not reported.

- Long-term capital costs were assumed at one-third of the vehicle costs.

Prince of Wales Transit

- Three shuttle services are proposed at this location. The first service will provide a connection between Coffman Cove and Hollis ferry terminals, running twice a day for 120 days per year. Another service is proposed between Klawock and Craig, which will connect to the first route, thus having the same operating characteristics. Finally, it is assumed that during off-season, the Klawock-Craig route will operate once daily that is for the remaining 245 days.

- Cost estimates includes vehicles, maintenance facilities, and $50,020 for shelters and signage.

- Coffman Cove-Hollis route – two coach buses; Klawock-Craig Shuttle – two small buses.

Apalachicola National Forest

GF&A Rail Trail

- Capital costs were provided by the Forest Service. Operation and maintenance costs were estimated by CS.

Chugach National Forest

Childs Glacier Transit Service

- Capital costs include three small/medium buses, maintenance facilities, shelters, and signage. The service will run three times daily, during the summer season (90 days).

- Operation and maintenance costs are not included in the cost estimate. It is assumed that fare revenues will subsidize operating costs.

Iditarod Trail System

- Capital and operating costs were provided by the Forest Service.

Sequoia National Forest

Yosemite Area Regional Transportation System Expansion

- Costs for Sequoia NP Connections were provided by the Forest Service.
- Lake Isabella/Kernville and Trail of 100 Giants shuttles are assumed to be operated by the existing transit operator in Kern County. Capital costs include the purchase of five vehicles (small/medium buses) to provide both shuttle services and annual operation and maintenance costs.
- The Lake Isabella/Kernville route will operate 62 days per year, and service will be provided every 30 minutes.
- The Trail of 100 Giants shuttle will operate 62 days per year, providing six trips daily.

Tahoe National Forest

East Shore Lake Tahoe Shuttle Service (California/Nevada)/South Lake Tahoe Transit System

- Smokey Bear and Emerald Bay shuttles already operating within the Forest. Funding is needed for operating expenditures for both routes and additional trams for the Smokey Bear route. Operating costs were provided by the Forest Service.
- East Shore Shuttle costs include five large buses, maintenance facilities, and $50,020 for shelters and signage. The proposed service will operate on weekends only, 104 days per year, every 30 minutes during the morning and afternoon peak periods.

Plumas National Forest

Feather River Shuttle

- Costs for shuttle service expansion (annual operation and maintenance) and road turn-outs (capital only) were provided by the Forest Service.

Lewis and Clark National Forest

- Operating costs of adding a stop at the LCIC to Great Falls Transit bus service were provided by the Forest Service.
- The supplemental LCIC service is assumed to be operated by the existing transit operator in the area. Capital costs include two vans and some signage (at $3,000). This service is assumed to operate only between 2004-2006, to serve additional

visitation expected as a result of the Lewis & Clark bicentennial celebration. The service will operate between the months of May and September, for a total of 153 days per year, with runs every 30 minutes.

National Forests in Southern California

San Bernardino National Forest

- Only one shuttle route to provide service to the Lytle Creek Canyon. Assume that no maintenance facilities are required. Capital costs include vehicles (three small buses), shelters and signage. The service is assumed to run every 30 minutes, 50 days per year.

Angeles National Forest

- Nine routes have been proposed in this site. Capital costs include 21 vehicles (small buses), maintenance facilities for the 21-vehicle fleet, signage, and shelters. The service is assumed to run every 30 minutes, 50 days per year.

Los Padres National Forest

- Three shuttle routes have been proposed within this site. Capital costs include seven vehicles (small buses), maintenance facilities, signage, and shelters. The service is assumed to run every 30 minutes, with the exception of the Pfeiffer Beach Shuttle (which will run every 15 minutes), 50 days per year.

Sierra National Forest

Bike path and Shuttle service

- Bike path is five miles long. Operation and maintenance costs were not provided.

- Shuttle routes are assumed to be operated by a private contractor. Capital costs include vehicles, shelters, and signage. The Fresno-Bass Lake route will run hourly, whereas the Huntington Lake shuttle will run every 30 minutes. Service will be provide 50 days per year.

- Vehicle types:

  - Fresno/Bass Lake Shuttle – four large buses; and
  - Huntington Lake shuttle – three small buses.

Wenatchee National Forest

Hike/Bike Trail

- Trail length is 42 miles. Operation and maintenance costs were calculated by CS.

Inyo, Humboldt-Toiyabe National Forests

Eastern Sierra Expanded Transit System

- Capital and operation and maintenance costs were provided by the Forest Service staff. Shuttle services include expansion of existing services, implementation of new routes, vehicles, shelters and signage, and new infrastructure.

Spring Mountain NRA

SMNRA Regional Connector and Transit Circulator

- Both shuttle services are assumed to operate 365 days, with reduced operations during the winter season. The transit circulator is assumed to run every 30 minutes, except during the winter, when it will run hourly. The regional connector will run hourly at all times.

- The cost estimate includes the purchase of nine small/medium buses (for the Transit Circulator), four large buses (for the Regional Connector), maintenance facilities, shelters, and signage.

Stanislaus National Forest

Pine Crest Lake Circulator

- The Pine Crest Circulator will run every 30 minutes, during the summer season, for 112 days.

- Capital cost estimates include three small/medium buses, shelters, and signage. It is assumed that no maintenance facilities are required, and that the service will be privately operated.

YARTS Hetch Hetchy Extension

- This service will be provided between the Hazel Green Parking lot and the Hetch Hetchy reservoir. The shuttle will run during the summer season (112 days), every 60 minutes.

- Capital cost estimates include four vans, shelters, and signage. Maintenance facilities are not included, since it is assumed that the service will be privately operated.

Old Mono Rail Trail

- Capital costs provided by the Forest Service. Operation and Maintenance costs associated with this project were calculated by CS.

Appendix C

Field Reports