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14. ABSTRACT

This study is a review of the potential for alternative modes of transportation (walking, bicycling, transit and others) to and within June Lake Loop, Reds Meadow Valley, the Mammoth Lakes Basin, Convict Lake, Hot Creek, Rock Creek and Bishop Creek areas of the Inyo National Forest. These locations were identified in previous transit reviews and the grant application as potential nodes suitable for development of an enhanced multimodal network. This study analyzes the existing alternative transportation system and makes recommendations about the opportunities and challenges associated with making connections to and within these priority areas. All traditional alternative transportation modes (pedestrian, bicycle, private and public transportation services and transportation related information technologies) and any identified area specific methods of travel were reviewed.

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stakeholders, community members and interested parties.

Thank you for your insight, hard work and patience.
Deborah Tyrone

REPORT NOTES

This report is an overview of the existing alternative transportation system to and within the Inyo National Forest and the opportunities for enhancements to it. The report focuses on 7 key areas within the Forest: June Lake Loop, Reds Meadow Valley, Mammoth Lakes Basin, Convict Lake, Hot Creek, Rock Creek Canyon and Bishop Creek Canyon. The data, analyses, observations and suggestions presented in this report are for data collected and conditions present as of 2011. Subsequent changes in the transportation system or operating environment are not accounted for in this document.

The report begins with an introductory section (Sections 1 through 3) that provides background information about the study, its funding source and scope. A brief primer on the key components to transportation planning discusses the topics generally researched and addressed in a transportation study. This is intended to aid the reader's understand of why certain items may be considered in the report.

The Forestwide Overview provides a macro view of the Inyo National Forest to provide context. Pertinent visitor statistics provide relevant data about the Forest's visitor population. The transportation network to the Forest is reviewed by routes and modes of transport, including roads, foot paths, bicycle routes, public and private transportation services and passenger air carriers.

The Data Collection and Analysis effort was divided into a secondary data review of information gathered from other sources, and primary data, which was collected by the research team. The secondary data included transportation related studies and plans applicable to travel to or within the Eastern Sierra region. Partner agencies were asked to participate in the secondary data collection effort by providing applicable materials. Primary data was collected on visitor use, parking lot utilization, vehicle traffic volume and Wilderness trail permits. The data was gathered, processed and analyzed by the research team.

Sections 6 through 12 contain individual site reports for June Lake, Reds Meadow, Mammoth Lakes Basin, Convict Lake, Hot Creek, Rock Creek and Bishop Creek. Each report was drafted as a standalone document. This was intended to give the reader the ability to select locations of interest and read only those sections without the need to read the entire document. Each site report follows the same format as the main body: a brief context setting introduction, a review of pertinent data, analyses of applicable alternative transportation modes and the proposal of potential enhancements to the multimodal transportation system. Some of the information contained in the individual site reports is redundant from report to report. This was necessary to ensure that each report would be complete and relevant on its own.

The grant application noted that transportation related environmental impacts would be considered in this study. The Air Pollution, Fuel Consumption and Vehicle Emissions section touches on this topic. It may be found in Section 13 in the main body of the report. The Funding Sources section provides an overall discussion of funding and partnership building opportunities. Recent changes in the federal transportation law have left many unknowns about potential funding sources for alternative transportation projects. Partnership building may be the most effective means to finance transportation system improvements.

A Multimodal Transportation System Project Matrix was developed to show the depth and breadth of potential transportation improvements available to the Inyo National Forest. The project proposals suggested in Section 15 focus on broad forestwide initiatives derived from recurrent themes observed during data collection and analysis. The final section, Section 16, provides an overreaching Conclusion that refocuses on the goal and objectives of the study.

The Appendices contain support documentation for the detail oriented reader. Relevant background information including the grant application and its cited transportation studies are located in Appendices A and B. Inyo National Forest resource staff technical reports may be found in Appendix C. A chronology of community engagement contacts is located in Appendix D. Appendix E contains blank copies of the visitor use and parking survey protocols and data collection instruments. A sample of routes and schedules from ground transportation service providers with service or connections to the Eastern Sierra region is compiled in Appendix F. Appendices G, H and I contain the parking dot intensity maps for the June Lake, Rock Creek and Bishop Creek canyons. A reference list of transportation related documents is provided in Appendix J for informational purposes. Appendix K contains the full size maps represented within the document should the reader desire to print them in a larger format.

Note: Maps contained in the document are for illustrative purposes only. The information contained in the maps is broad and is not an inclusive representation of all possible data. The maps are meant to provide a visual context to the information in the body of the report. They should not be used for trip planning or navigation purposes.

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APPENDICES

EXECUTIVE SUMMARY

This study is a review of the potential for alternative modes of transportation to and within the June Lake Loop, Reds Meadow Valley, Mammoth Lakes Basin, Convict Lake, Hot Creek, Rock Creek and Bishop Creek Canyon areas of the Inyo National Forest. These 7 locations were identified in previous transit reviews and the grant application as potential nodes suitable for development of an enhanced multimodal network. This study analyzes the existing alternative transportation system and makes recommendations about the opportunities and challenges associated with making connections to and within these priority areas. All traditional alternative transportation modes; pedestrian, bicycle, private and public transportation services and identified area specific methods of travel were reviewed, as well as, transportation related information technologies.

The Transit in the Parks grant application that secured funding for this project referenced findings from previous transportation studies as a guiding influence in the project's development. The grant application, as well as the historic studies, noted the demand for parking as a critical factor in the need for development of alternative modes of transportation. The 7 study locations reviewed for this study were cited as significant nodes on the Forest where enhancements to the alternative transportation system would improve access and mobility currently limited by a lack of parking facilities.

Key data for each study site was reviewed to determine visitor demand and any deficiencies in the existing transportation infrastructure. Data collection and analysis included secondary and primary data sources. Applicable agency transportation plans and studies were reviewed for information relevant to the study's goal and objectives. Visitor use, parking lot utilization, vehicular traffic counts, trail permits and campground occupancy data was gathered to determine the locations and periods of visitor demand for access.

Parking data was collected in the June Lake Loop, Convict Lake, Hot Creek, Rock Creek Canyon and Bishop Creek Canyon areas using a convenience sample during the summer of 2011. The parking lot occupancy data showed that even during peak summer visitation periods, sufficient overall parking space capacity was available at most locations to meet demand. Roadside parking is generally not restricted on roadways within the Inyo National Forest. Specific events in key locations on the Forest, such as the June Lake Triathlon, may have parking demand in excess of parking supply. In areas where roadside or off-pavement parking was observed, it was generally attributable to visitors seeking a more convenient parking location close to their destination rather than a lack of formally designated parking areas.

Competition for parking in certain locations of the Inyo National Forest was exacerbated by obsolete parking management policies and practices. An imbalance in the allocation of day-use only and overnight permissible parking spaces created competition between user groups. Paved parking lots were underutilized when parking restrictions, equipment storage and parking space striping limited the number of available parking spaces. Unrestricted roadside parking acted as both a relief to congested parking facilities during periods of severe demand and as lawful competition to the Forest Service provided parking areas.

In an effort to provide an inclusive review of the alternative transportation system, all reasonable routes and practical modes of transport were reviewed for this study. Research based findings led to the development of potential multimodal transportation system enhancements that may improve access to and mobility within the Inyo National Forest. Project proposals range from broad forestwide policy initiatives to site specific suggestions.

Enhancements to the alternative transportation network on the Inyo National Forest may reduce the need to travel by personal vehicle and in many areas of the Forest offer a viable means of active transport. Though the demand for additional access via alternative means may not be warranted strictly based on parking survey data, the development of a comprehensive multimodal transportation system will improve access and mobility. In many locations on the Forest users choose to participate in active forms of transportation despite limitations in the network. Given a proper environment more users may potentially move out of their vehicles and self-select an alternative mode of transportation. Active forms of transportation may become more prevalent on the Inyo National Forest if opportunities to participate in them are offered in appropriate environments.

Opportunities to enhance alternative transportation system routes and modes were proposed forestwide and for each of the 7 site locations reviewed. Improvements to wayfinding, the promotion of existing multimodal transportation routes and modes and the utilization of technology to communicate transportation alternatives were themes applicable to the entire Forest. Site specific enhancements focused on the creation of a hospitable condition for all practical modes of travel using the existing built environment given the physical constraints of the natural setting.

Potential alternative transportation project funding sources were reviewed. Alternative transportation project funding sources available to the Inyo National Forest may be limited. Recent changes to federal transportation legislation eliminated dedicated financial support to public land management agencies for alternative transportation projects. Future innovative funding approaches may need to be based on fostering an atmosphere of partnership building within host communities. This would allow partner agencies to capitalize on discrete resources available to the various community organizations.

2.0 INTRODUCTION

2.1 ALTERNATIVE TRANSPORTATION SYSTEM STUDY PURPOSE

In 2008 the Inyo National Forest received a Federal Transit Administration planning grant to complete a detailed inventory of alternative transportation system components to and within the Forest. The alternative transportation system study is an effort to gather data to sufficiently inform transportation decision makers, identify potential funding strategies and make recommendations regarding connecting key sites within the Inyo National Forest with existing and planned interregional transportation systems. The study area extends along the US Highway 395 corridor from State Route 120 in Lee Vining to Whitney Portal Road in Lone Pine, California. The focus of this study will be the priority linkages identified in previous transportation studies.

This study is a review of the potential for alternative modes of transportation (walking, bicycling, transit and others) to and within June Lake Loop, Reds Meadow Valley, the Lakes Basin, Convict Lake, Hot Creek, Rock Creek and Bishop Creek. These locations were highlighted as potential transit nodes and linkages in the grant application. This study analyzes existing regional and local alternative transportation systems and makes recommendations about the opportunities and notes challenges associated with connecting these priority areas within the Inyo National Forest. The information contained in this report is as of 2011.

2.2 PROJECT FUNDING SOURCE

Funding for this planning study was secured through a competitive grant selection process of the Paul S. Sarbanes Transit in Parks (TRIP) program. The TRIP program was established in the 2005 transportation bill Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and codified in 49 U.S.C. 5320, to provide a discretionary funding source for alternative transportation planning and capital improvement projects on and to federal lands. The program was created by Congress to address increasing vehicle congestion in and around federal lands where the effects of traffic, pollution and crowding threaten the unique environmental and cultural treasures of America's national parks, wildlife refuges and national forests.

The Transit in Parks program is administered by the Federal Transit Administration (FTA) an operating administration of the US Department of Transportation (DOT). The FTA, in consultation with the Department of the Interior and the US Forest Service, makes merit based grant awards to alternative transportation system planning and capital improvement projects in or in the vicinity of national lands. Both federal agencies and their federal fund recipient partner agencies are eligible to receive funds under the program. The purpose of the TRIP program as stated in SAFETEA-LU is, "to enhance the protection

of national parks and public lands and to increase the enjoyment of those visiting parks and public lands." The derived program goals are:

- To conserve natural, historical and cultural resources.
- To reduce congestion and pollution.
- To improve visitor mobility and accessibility.
- To enhance the visitor experience.
- To ensure access to all, including persons with disabilities.

The program supports alternative transportation including bus, rail or any other publicly available means of transportation, as well as, non-motorized transportation systems such as pedestrian and bicycle modes.

In the future, funding will not be available under the Transit in Parks program. In an effort to streamline a complex array of existing federal highway programs a 2-year transportation bill, Moving Ahead for Progress in the 21st Century (MAP-21), was signed into law by President Obama in July 2012. The new transportation bill repealed 49 U.S.C. 5320 thereby eliminating the Transit in Parks program. Though many of the same alternative transportation system projects are supported under the newly created Transportation Alternatives (TA) program, there is no dedicated funding source for alternative transportation programs specifically serving federal lands.

2.3 TRANSPORTATION PLANNING KEY COMPONENTS

Comprehensive transportation planning combines as much hard science as it does soft science. Study of transportation systems includes review of the natural and built environment and engineering challenges contained within them. It also includes gaining an understanding of transportation system users and their behaviors. In general, a transportation study seeks to answer four key questions.

- Why are people traveling?
- Where is traffic coming from and where is it going to?
- By what route and means is traffic moving?
- And, is there room for more traffic?

2.3.1 WHY ARE PEOPLE TRAVELING?

The purpose for travel may be divided into 2 broad, though not necessarily mutually exclusive, categories: recreation and transportation. The reason people are traveling often dictates the method of transportation, or mode, and path, or route, they choose. If an individual is traveling for transportation purposes from their home to work they may prefer to make the most expeditious trip in route and means of transport. This is often in juxtaposition to travel for recreational purpose where the most scenic route, but not necessarily the most direct route, may be

preferable. And the means of transportation, the mode, in recreational travel may be part of the travel experience and flexible. Travel for transportation purposes is generally time sensitive and seeks the most direct route and most efficient mode.

This study focuses on travel for transportation purposes. To be considered a relevant transportation trip there must be an element of movement; getting from an origin to a destination, where the trip is not the sole reason for the travel, such as in sightseeing or recreational bicycling or hiking. The route and mode in transportation travel may be of upmost importance, whereas routes in recreational travel are often more easily exchanged. The opposite may be said for mode choice. While in recreational travel, if the trip purpose is to take a bicycle ride, the mode may be of more importance than the route. For example, a person wishing to take a recreational bicycle ride may sooner change the location of the ride than they would change to a hike, if their preferred route was unavailable. The reason for any trip may include elements of recreation and transportation, and it is admittedly often difficult, if not impossible to separate the 2 categories. When possible, every effort has been made to discount or remove purely recreational travel from consideration in this study. This study is to research alternative transportation systems as they relate to the transportation category. Why people are traveling is an integral component of the transportation analysis.

2.3.2 WHERE IS TRAFFIC COMING FROM AND WHERE IS IT GOING TO?

The location of trip origins and destinations provides the beginning and the end points of travel. The origins and destinations are typically defined at a level consistent with that of the transportation system being studied. Trip origins on a local level may be homes, hotels, campgrounds or a parking lot and at a regional level may include distant urban centers. Trip destinations on a local level may include restaurants, trailheads or work and, at a broader scale, towns or defined areas such as a National Forest or National Park. An origin is generally considered the generator of travel while the destination is the attractor.

The designations of origin/generator and destination/attractor of travel are not static in transportation planning. In the morning a home may be the origin and generator of a trip, with the workplace being the destination/attractor, in the evening the case may be the opposite with the workplace being the origin and the home being the destination. Generally, transportation studies are bi-directional using time to differentiate between trip directions. Morning (AM) trips may lead one direction with evening (PM) trips providing the counter direction.

This study reviews traffic movement at the macro and micro levels. At the macro level, origins at a regional, interstate level will be considered with the Inyo National Forest being the destination and attractor of travel. In some circumstances, as with long distance hiking or day trips to Yosemite National Park, where the trip originates on the Forest, the Inyo National Forest may be identified as the generator of travel and another location the destination.

Review at the micro level includes the Forest specific transportation nodes mentioned in the 2004 Field Report – Eastern Sierra Expanded Transit System (ESETS) report. These locations include June Lake Loop, Reds Meadow Valley, the Lakes Basin, Convict Lake, Hot Creek, Rock Creek and Whitney Portal. The Bishop Creek Basin has been added to the original ESETS study list at the request of current Forest Service personnel. Travel to and from Whitney Portal is addressed in a separate report.

2.3.3 BY WHAT ROUTE AND MEANS IS TRAFFIC MOVING?

The choice of route may be dependent on the method or mode of travel, and vice versa, the choice of mode may be dependent on the availability of routes.

Route choice may be based on many factors. As mentioned above, the route selected in strictly transportation related travel tends to be one that is most efficient. When traveling for the purpose of getting from an origin to a destination people tend to select the most direct route.

A comprehensive transportation network will have as few breaks in routes as feasible. If no path exists on a desired route people may invent their own through the creation of a path or change of mode. User created foot paths or roads often exist between origins of traffic and the attraction that spawned it. These user created trails may, for some users, supplant an existing sanctioned trail if the path provided is not the most direct route to the attraction. User created paths may alter traffic patterns and be a source of significant environmental degradation.

The means or method of travel is called the mode. Predominant alternative transportation system modes include pedestrian (foot), bicycle, mass transit and information technology systems, however, local context may expand the purview to include all-terrain vehicles, horse, snowmobile, etc. The original limited interpretation by previous transportation reviews to include only public transit will be expanded to include all traditional modes of alternative transportation. It may be necessary to use multiple routes or modes of travel to accomplish a single trip. A well designed and functioning transportation system will include a broad selection of routes and means to meet travelers' needs.

If a path in a transportation system does not exist for a desired mode of travel, people may change modes. For example, if a location is not accessible through public transit, an individual may choose to walk, ride a bike, hire a taxi or rideshare, effectively completing the break in the transportation system. In travel it may not always be possible to complete an entire trip with a single mode.

When planning for alternative transportation systems the impact of personal occupancy vehicles is considered as it affects the functioning of the greater transportation system. Modifications to the traditional roadway system are typically proposed in the framework of making improvements for an alternative transportation mode. Vehicular traffic patterns and parking demand will be researched in this study as a means to make informed decisions about alternative transportation routes and modes.

2.3.4 IS THERE ROOM FOR MORE TRAFFIC?

The utilization and availability of system capacity depends on the transportation system component reviewed. In an alternative transportation systems study not only is roadway usage reviewed for vehicular traffic patterns but also the use, availability and demand for alternative transportation system components of foot paths, bicycle lanes and parking, public and private transportation services and transportation related information technology are studied. The system capacity being maximized on a route for a particular mode does not mean that there is not capacity for other modes on that very same route. A mode shift may be all that is needed to return a failed route to a functioning capacity again. A classic example of mode shift in support of public transit is moving people from their single occupancy vehicles onto transit service as a means of condensing road demand to a few vehicles and improving roadway function. The more routes and modes available in a transportation system the better the system will be able to distribute demand. Users will have the ability to self-select the transportation option that best meets their individual travel needs.

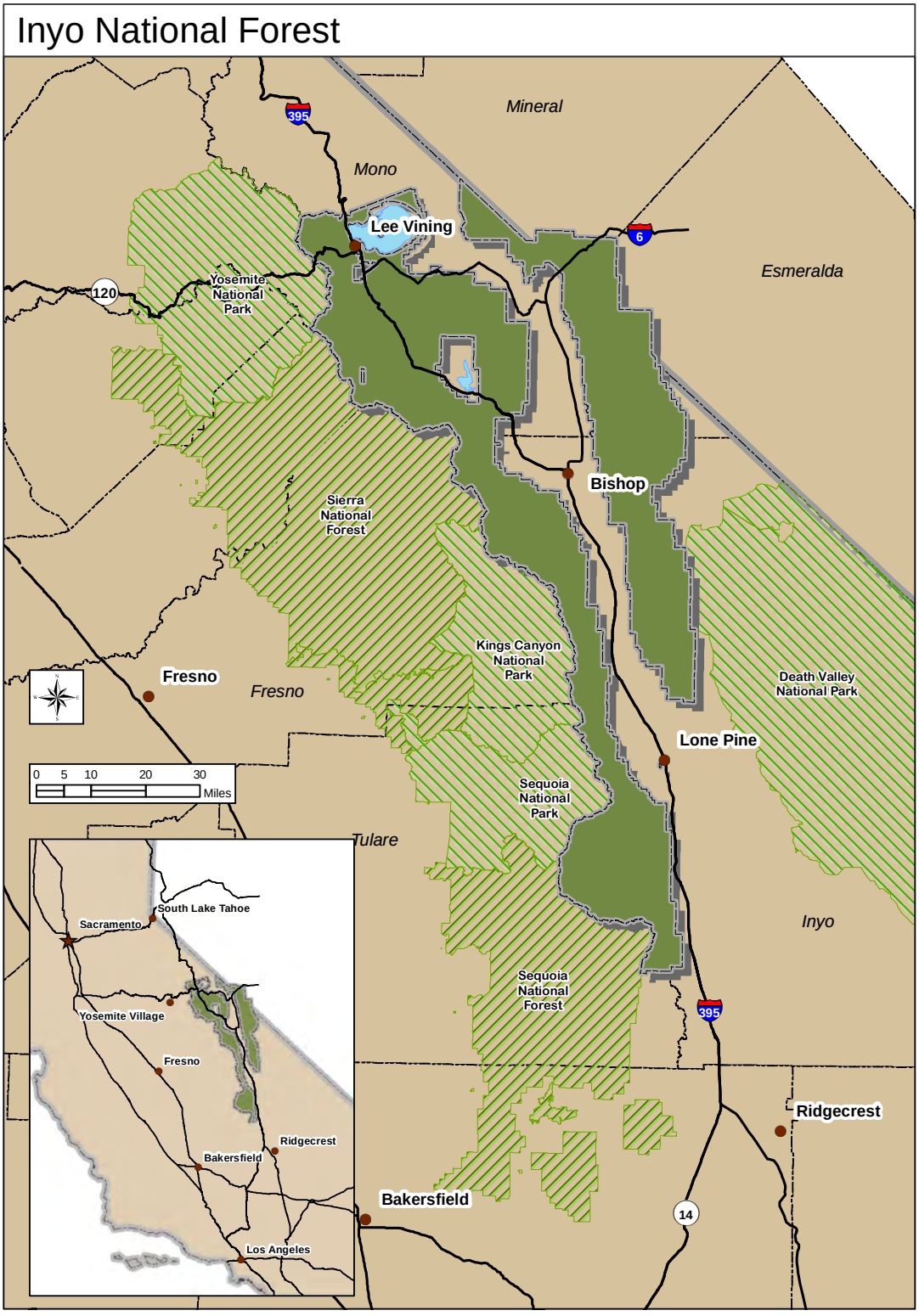


Figure: Inyo National Forest boundaries

2.4 DESCRIPTION OF THE STUDY AREA

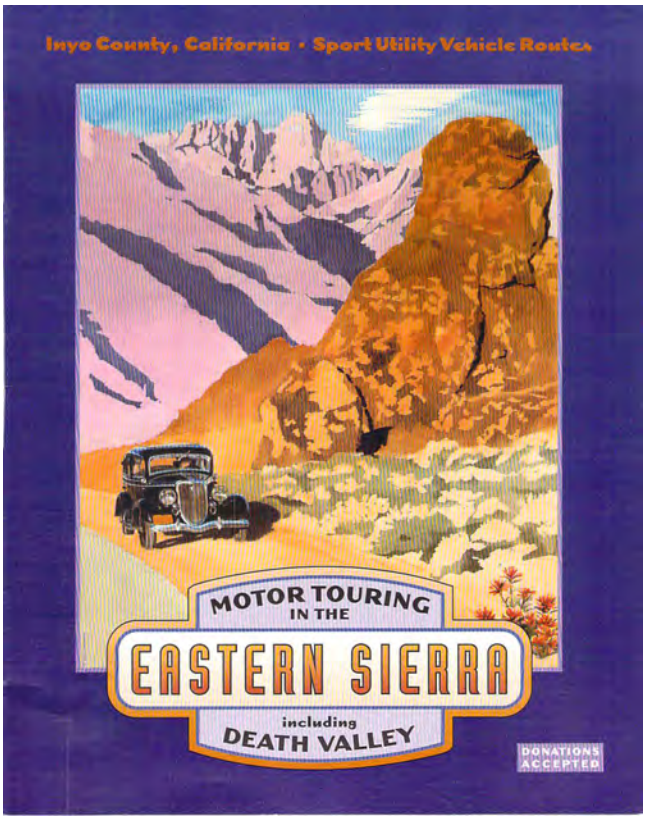
The Inyo National Forest was established in 1907 by proclamation of President Theodore Roosevelt as a means to set aside over 200,000 acres to prevent obstruction of lands needed to construct the Los Angeles Aqueduct. Over the years the Forest has grown to encompass 2.1 million acres with 7 Wilderness Areas, 7 Research Natural Areas and 2 Wild and Scenic Rivers.

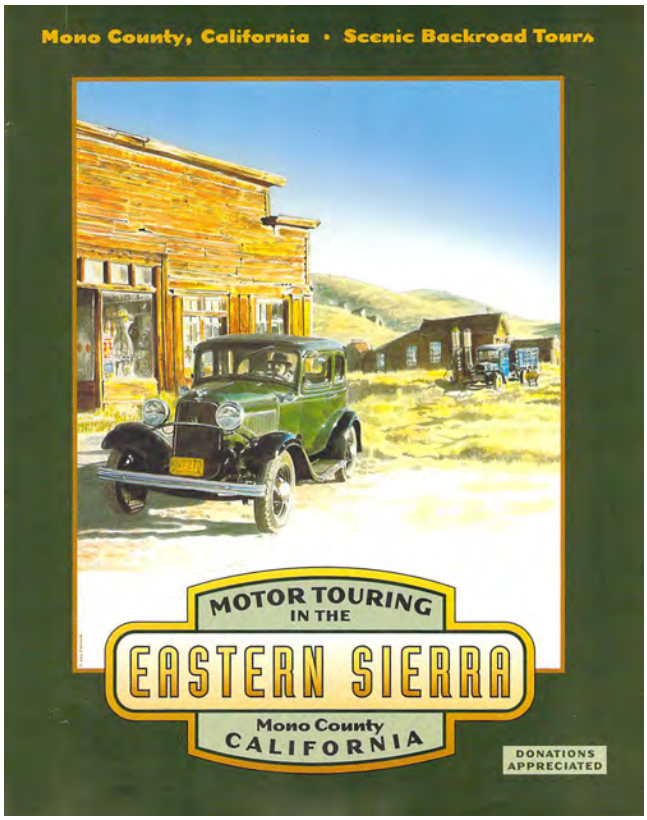
The Inyo National Forest boundary stretches 165 miles along Eastern California and the western border of Nevada. The Sierra Nevada and White Mountain ranges make up much of the Forest which is divided in two by the Long Valley Caldera and Owens Valley. The Forest climbs from desert floors to mountain tops with an elevation range from the Owens Valley floor at 4,000 feet to Mt. Whitney, the highest peak in the contiguous United States, at 14,495 feet.

Climate varies widely on the Inyo National Forest. Four seasons transform the Forest from a picture of gold and orange flashes in the fall into a winter wonderland to a deep cool green forest in the spring and a dry, clear-skied summer playground. The large disparity in elevation contributes to the breadth of temperatures on the Forest. In the winter, deep snow often covers the mountains closing mountain roads and passes from November through May. Temperatures in the summer vary with elevation and while valley floors may swelter in daytime temperatures in excess of 100 degrees, the foothills and mountains offer a cool respite with temperatures seldom above 80 degrees. In the high country summer nighttime temperatures can dip into the 30's or even 20's. Precipitation generally falls in the form of snow between January and May but the occasional summer thunderstorm can produce torrents streaming from mountain sides.

Freezing winter temperatures and snowfall contribute to road closures throughout the Eastern Sierra Nevada mountain range and foothills. Snow plowing operations make the Town of Mammoth Lakes and Mammoth Mountain Ski Area fully accessible year round destinations. The June Lake, Rock Creek, Convict Lake and Bishop Creek areas have restricted entrance in the winter when road closures due to snow cover limit vehicular access. Reds Meadow and the Lakes Basin recreation areas are closed in the winter to vehicle use. The winter closure of Tioga Pass (State Route 120) eliminates direct access between the Eastern Sierra region and Yosemite National Park.

A variety of natural and recreational attractions on the Inyo National Forest generate visitors from worldwide and domestic origins. The Inyo National Forest hosts unique natural wonders such as the Ancient Bristlecone Pine Forest, protecting the oldest trees in the world; Mono Basin Scenic Area, a highly mineralized volcanic lake nestled under towering cinder cones; and Devils Postpile National Monument, managed by the National Park Service, is a unique geological formation of columnar basalt. The Forest maintains a number of recreational facilities to support visitor use including 70 campgrounds, over 2,100 miles of motorized off-highway routes, over 1,200 miles of trails, trout stocked lakes and streams and, under special use permit, developed ski areas. Recreation opportunities abound in the summer months when





Figures: Eastern Sierra motor touring guide covers

wilderness backpacking, day hiking, camping, fishing, mountain biking and off-road touring brings the Forest to life. Much of the popular winter recreation activities of Alpine and Nordic (cross country) skiing, snowshoeing and snowmobile riding are concentrated in the Town of Mammoth Lakes and June Lake areas. The Forest and its partners maintain 266 miles of groomed recreational cross country ski and snowmobile trails in the winter season.

Though the Inyo National Forest produces a variety of natural resource commodities and continues to be a significant source of potable water, the predominant use of the Forest by visitors is outdoor recreation. The advent of the personal automobile accelerated visitation to the Forest and reports as early as 1924 showed that 88% of Forest visitors traveled via private automobile.

2.5 PREVIOUS INYO NATIONAL FOREST TRANSPORTATION PLANNING

The Eastern Sierra region and the Inyo National Forest have been the subject of a variety of transportation planning efforts in recent years. Particularly, the challenges associated with access to Reds Meadow and the Devils Postpile National Monument have produced a number of area specific transportation studies. The pressure of increased visitation with personal vehicles as the dominate mode of transportation has caused the Forest to seek local and regional alternative transportation solutions.

Two (2) transit studies of the Inyo National Forest were the impetus to seek grant funding for this alternative transportation system study. In 2004 a team of Federal Highway Administration and Federal Transit Administration personnel conducted a review of the transit system in the Eastern Sierra region focusing on access to the Inyo National Forest. A follow-up study in 2007 reviewed the progress since the original assessment and refined recommendations for future transportation planning and research. The focus of this forestwide alternative transportation system study is the priority nodes and linkages identified in the 2004 Field Report: Eastern Sierra Expanded Transit System (ESETS) and the recommendations presented in the 2007 Interagency Technical Assistance Group (TAG) review.

Figure: Inyo National Forest historic use of automobile photo

2.5.1 2004 FIELD REPORT – EASTERN SIERRA EXPANDED TRANSIT SYSTEM (ESETS)

The 2004 Field Report: Eastern Sierra Expanded Transit System (ESETS) conducted a transit service only alternative transportation feasibility study for the area along the US Highway 395 corridor stretching between Reno, Nevada, in the north, to Ridgecrest, California, in the south. The Field Report was produced by the Federal Highway Administration and the Federal Transit Administration. The Field Report stated that significant projected increases in visitation and overall growth in the Eastern Sierra region and Inyo National Forest, *"along with the issues of concern related to resource management, quality of the experience and various transportation congestion, safety, and access issues"* were the motivations for the transit review.

The Field Report found that the Eastern Sierra transportation system, including existing roadways and transit system was insufficient to meet the strain of expected future recreational visitation and resultant service sector job growth. The Field Report reviewed public transit services available at the time and found that Yosemite Area Regional Transportation Authority provided seasonal service from the Town of Mammoth Lakes to Yosemite National Park; the Reds Meadow Shuttle, operated under contract from the Inyo National Forest, provided seasonal access to Reds Meadow and the Devils Postpile National Monument; the Town of Mammoth Lakes contracted with Inyo Mono Transit to provide summer transit service within the Town primarily for residents and employees; and the Mammoth Mountain Ski Area operated winter skier shuttle service. At the time of the report, Inyo Mono Transit provided limited transit service between Reno, Nevada and Ridgecrest, California along US Highway 395 with its Carson Ridgecrest Eastern Sierra Transit (CREST) route. The report notes that, *"The CREST route is the sole regional transit provider (public or private) along the US Highway 395 corridor serving the rural populations of Inyo and Mono Counties as well as recreational users in the Eastern Sierra."*

To address the deficiencies in public transit the Field Report developed a number of feasible transit alternatives. The alternatives included interregional, regional and local transit service expansion opportunities many of which have been accomplished.

- Eastern Sierra Transit Authority (ESTA) was established in 2006 as a Joint Powers Authority between Inyo and Mono Counties, the City of Bishop and the Town of Mammoth Lakes and provides comprehensive public transit services including a vanpool program, deviated fixed routes, local in-town dial-a-ride, inter-county service and inter-state service on the US Highway 395 corridor extending from Reno, Nevada to Lancaster, California. After its creation ESTA assumed the public transit service responsibilities of Inyo Mono Transit including the CREST route.
- The CREST route, now operated by Eastern Sierra Transit Authority (ESTA), was expanded to provide split direction public transit service between Lone Pine, California and Reno, Nevada four days a week and between the Town of Mammoth Lakes and Lancaster, California three days a week. ESTA's US-395 corridor routes have recently been rebranded to US 395 North and US 395 South.
- Yosemite Area Regional Transportation Authority (YARTS) provides daily season service from the Town of Mammoth Lakes through the June Lake area to Yosemite National Park with stop locations in Lee Vining, California. The daily ESTA intercity service schedule was adjusted in 2011 to coincide with the YARTS departure time thereby expanding the reach of public transit service to Lone Pine, California.
- Eastern Sierra Transit Authority (ESTA) has assumed operation of the Reds Meadow Shuttle with passenger fares funding the summer season operation.
- Eastern Sierra Transit Authority (ESTA) has assumed the operation of the Town of Mammoth Lakes summer season transit operation and evening winter trolley service and is working to assume operation of the Mammoth Mountain Ski Area winter service.

- The Lakes Basin area is well served by summer season free daily trolley service funded by the Town of Mammoth Lake and operated by Eastern Sierra Transit Authority.

Two (2) public transit service expansion proposals in the 2004 Field Report have not been implemented: the East 178 Service Shuttle Bus to connect Sequoia National Forest to Kern County communities and the Recreation Areas Shuttles to meet the needs of recreational users by connecting the CREST route to area recreation opportunities.

This report will assess the feasibility of alternative transportation system improvements to the priority nodes and linkages on the Inyo National Forest. The analysis will not be limited to a transit only perspective as was done in the 2004 Field Report. Recognizing that a comprehensive transportation system provides as many routes and mode choices as possible, this alternative transportation study will review system improvements in pedestrian, bicycle, public and private transportation and information technology modes.

2.5.2 2007 INTERAGENCY TECHNICAL ASSISTANCE GROUP (TAG) REVIEW

An Interagency Technical Assistance Group (TAG) review of the Inyo National Forest transportation system was completed in 2007. The TAG field investigation was conducted by an interagency team of Federal Transit Administration, Federal Highway Administration, US Forest Service staff members in cooperation with National Park Service and Bureau of Land Management staff. The TAG review was requested by the Forest "to explore partnering opportunities and strategies for enhancing alternative transportation access to public lands in the Eastern Sierra." The review found that the recommendations in the 2004 Eastern Sierra Expanded Transit System report had widely evolved from concept to reality.

The TAG review interpreted the 2004 Field Report proposals labeled as "feasible transit alternatives" to mean "suitable for transit," noting that projected visitor use and financial sustainability would need to be analyzed to determine operational feasibility. The TAG report stated funding was the major challenge in the implementation of additional transit alternatives, noting that, not considering capital costs, passenger fares rarely cover more than 25 to 40 percent of operating costs in public transit. In its financial projections the 2004 ESETS Field Report estimated a fare box recovery between 0 and 20 percent, meaning 80 to 100 percent of operational cost would be subsidized through funding sources other than passenger fares.

The TAG review proposed 5 interrelated transportation planning recommendations for the Inyo National Forest.

- Public land management agencies should work cooperatively with stakeholders to support an integrated regional transportation plan that creates a regional, seamless and sustainable transit system.
- The existing transportation system should be maximized through consolidation of transit routes, improved wayfinding signage, development of promotional materials and information technology resources, alternative funding sources and unified regional transit fares.

- Research of a recreational shuttle, in conjunction with parking management strategies, for Whitney Portal.
- Research of recreational shuttle service to popular trailheads and recreation areas where parking demand exceeds capacity.
- Fund a Transit Extension Agent to work locally to integrate the transportation system planning on and off the Forest.

This alternative transportation system feasibility study attempts to fulfill many of the recommendations of the TAG review. The Transit in Parks grant money was used to fund a transportation planner to review and synthesize local and regional transportation plans. Research conducted for this study and the Whitney Portal alternative transportation system study will assess the feasibility of alternative transportation modes to key Forest locations.

2.6 GOALS AND OBJECTIVES

This study is a review of the potential for alternative modes of transportation (walking, bicycling, transit and others) to and within June Lake Loop, Reds Meadow Valley, the Lakes Basin, Convict Lake, Hot Creek, Rock Creek and Bishop Creek. These locations were identified in previous transit reviews and the grant application as potential nodes on the Inyo National Forest suitable for development of an enhanced alternative transportation network.

This study analyzes existing alternative transportation systems and makes recommendations about the opportunities and notes challenges associated with making connections to and within these priority areas. All traditional alternative transportation modes (pedestrian, bicycle, private and public transportation services and transportation related information technologies) and any identified area specific methods of travel will be reviewed.

The goal of this alternative transportation system study, as stated in the grant application, is to determine which areas and corridors in the Eastern Sierra region, particularly to and within the Inyo National Forest, are ready for additional transportation system improvements.

An objective of the study is to provide a unified comprehensive planning process that considers the goals, objectives and plans of individual partners within the greater context of regional connectivity. Through study research a forum will be created for participation in the transportation planning process with the exchange of information and data by partner agencies, neighboring communities and interested stakeholders.

The proposal of implementable alternative transportation projects is an objective of the study. A timing and prioritization schedule will sort locations and proposed enhancements with the greatest potential to improve alternative transportation access. A projection of future visitor use of alternative transportation proposals will provide a benchmark to compare projects.

Providing a financial basis from which to compare the feasibility of proposed alternative transportation system proposals is an objective of the study. Financial review will be a key component to assessing the financial sustainability of proposed alternative transportation system improvements. The financial impact of proposals will provide a broad scale estimate of expenses from which to compare projects between and across transportation modes. Potential traditional and innovative funding sources will be discussed as relevant to priority projects.

3.0 COMMUNITY OUTREACH

An assortment of local and regional public meetings and stakeholder interviews was used to provide background information for this study. These contacts were crucial to identifying transportation issues, developing alternative transportation system proposals and gaining an understanding of the potential for partnership. Outreach activities supported the study objectives to develop a comprehensive unified transportation planning process and explore partnership opportunities.

3.1 COMMUNITY ENGAGEMENT

Local and regional public meetings were used to present the goals and objectives of the Inyo National Forest alternative transportation study. The meetings provided an opportunity to reach elected officials, agency staff members, key stakeholders and the public at large. Project progress reports were furnished as significant milestones were met and as additional information and analysis became available. Public comment and feedback was accepted throughout the data collection process and interested parties were encouraged to provide input at any time.

3.2 KEY CONVERSATIONS

Strategic community members were solicited for targeted meetings. Interviews with individuals with local and historical knowledge were important in gaining an understanding of the local context. Key information sources included Forest Service permit holders, facilities and service provider operations managers, transportation professionals and interested citizens. Information gleaned from the interviews was used to develop alternative transportation proposals that could meet the needs of the community.

A chronological list of community engagement and key community member conversation activities is presented in Appendix D.

4.0 FORESTWIDE OVERVIEW

4.1 VISITOR STATISTICS OVERVIEW

The Inyo National Forest provides a wide spectrum of recreational opportunities and hosts a broad mix of international, nationwide, regional and local visitors. In an effort to quantify visitor use and satisfaction of forests and grasslands the US Forest Service conducts visitor surveys every 5 years. Forestwide visitor statistics presented here were gathered from the most recent National Visitor Use Monitoring (NVUM) survey conducted on the Inyo National Forest during 2011.

Total National Forest visits were estimated at 2,530,000 for the Inyo National Forest, a 35% decrease from the 2006 NVUM survey. A National Forest visit is defined as the entry of one person onto a National Forest to participate in one or more recreational activities. A single National Forest visit may include multiple site visits.

The NVUM survey estimates total Inyo National Forest visitation of 5,495,000 site visits per year. A site visit is one person participating in one or more recreation activities on the Forest.

- Total estimated site visits 5,495,000
- Developed day-use site visits 2,524,000
- Designated Wilderness visits 252,000

The 2011 NVUM survey data estimates of site visits represent a 9% increase in site visits from the 2006 NVUM survey. This data may suggest that a fewer number of people are visiting the Forest but making more trips to discrete sites within the Forest. The 2011 developed day-use site visits represent a 10% decrease in visits to developed recreational sites while estimated designated Wilderness visits increased 78%.

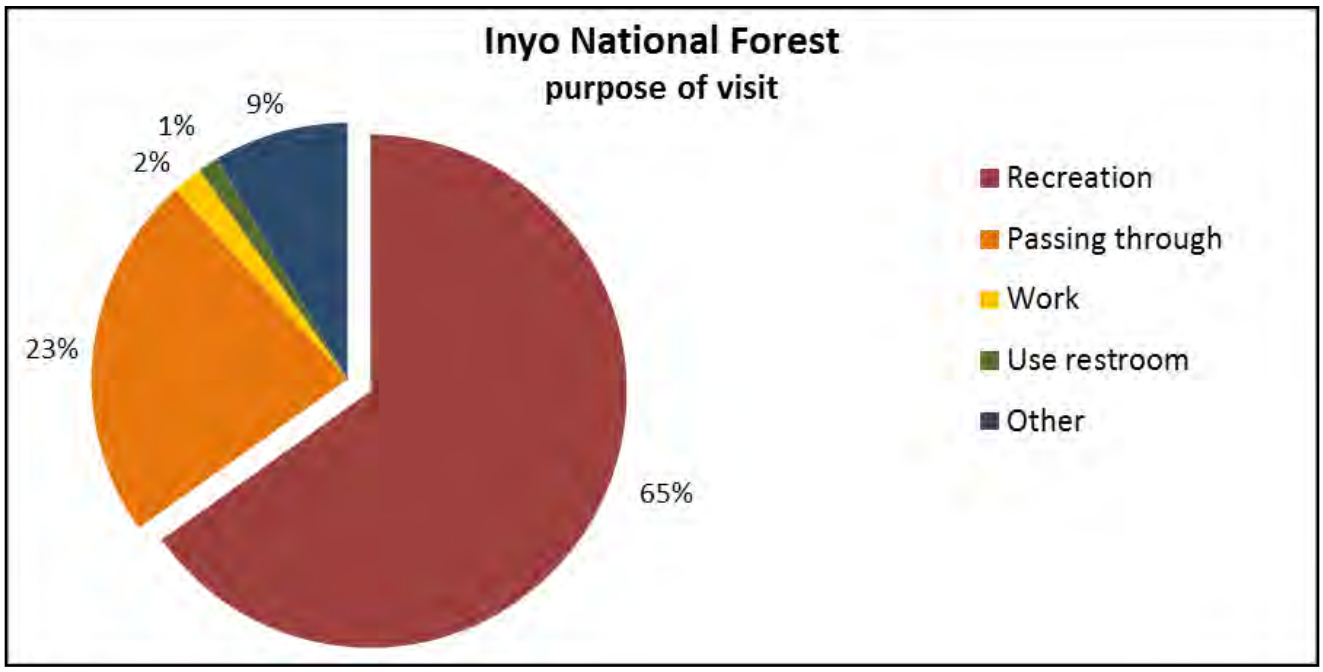


Figure: Inyo National Forest purpose of visit (2011 NVUM survey)

As shown above, the main purpose of visits to the Inyo National Forest was for recreation. Sixty-five percent (65%) of visitors reported "recreation" as the main purpose of their visit to the Forest. The Forest offers recreational activities for all four seasons of the year including, skiing, hiking, photographing nature, fishing and camping. Though the shoulder seasons of spring and fall may see fewer visitors, visitation during both the winter and summer seasons is very high. In the winter, visitation is concentrated in proximity to winter recreational activities such as the developed Alpine and Nordic skiing areas of Mammoth Mountain Ski Area and June Lake Mountain Ski Area, while summer visitation is more widely dispersed across the many recreational areas of the Forest.

The Inyo National Forest is conveniently located along US Highway 395, the only major north-south highway in Eastern California and a convenient route between the greater Los Angeles, California region and Western Nevada. The popular recreation sites and attractions of the Forest are located within easy access of the highway. The Forest is also located on a popular sightseeing route from the San Francisco, California Bay Area to Las Vegas, Nevada that includes attractions in Yosemite National Park, the Inyo National Forest and the Death Valley National Park. Convenient access to the Forest and to many of its most popular attractions may account for in-route stops reported as "passing through" (23%) by Forest visitors.

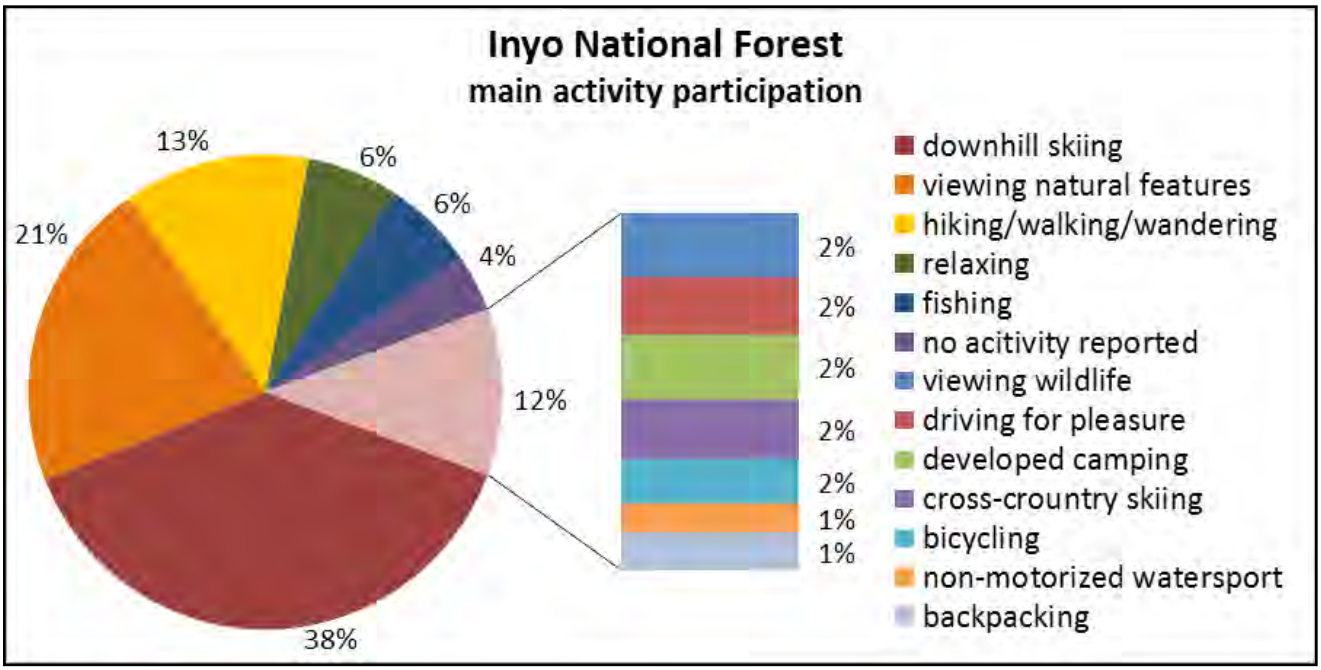


Figure: Inyo National Forest main activity participation (2011 NVUM survey)

The main activity participated in by visitors shows a combination of active and passive recreation. Downhill skiing, the highest reported main activity, is a winter season sport concentrated in the two developed ski areas located near the Town of Mammoth Lakes and the Village of June Lake. Many of the other activities such as hiking, fishing, viewing nature and wildlife could happen throughout the Forest at developed day-use sites, in the backcountry or in Wilderness areas.

For the purposes of this report, the use areas of the Forest are broadly divided into three activity zones: developed day-use sites, backcountry and designated Wilderness areas. Developed day-use sites may be interpreted as the higher use areas of the Forest where attractions, either natural or built, may encourage and support a greater level of visitation. Day-use sites often have amenities to sustain higher use levels such as paved access roads and parking lots, restrooms, hardened trails, picnic tables, boat ramps, docks, etc. Backcountry areas may be considered more remote and less accessible than developed day-use areas. Improved trails may still provide access; however, recreation is expected to be more dispersed than in developed areas so improvements are limited. Wilderness is a formal designation under the Wilderness Act of 1964 which defines Wilderness as:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and community of life are untrammeled by man, where man himself is a visitor who does not remain."

Entrance restrictions and limitations on roadway construction and the use of mechanical devices may significantly limit access to Wilderness areas for the general public. A level of isolation and solitude is maintained in Wilderness through unimproved routes and restrictions on modes of transport.

Developed day-use sites and significant access points to backcountry and Wilderness areas are the main focus of this study.

Visitor length of stay varies greatly depending on the use area. Developed day-use sites on the Inyo National Forest reported an average length of stay of 2.9 hours. The average length of stay was over 5 times greater for designated Wilderness areas which had an average length of stay of 15.6 hours. Visitor length of stay can be a significant variable in allocating limited resources such as parking spaces or designing mass transportation systems to accommodate visitation periods.

The average group size of the Inyo National Forest is an average of 3.5 people. Though it may be technically difficult to account for half a visitor, the number is useful as a general gauge of group size. A group of this size would fit into a standard automobile with potentially additional seat space available.

The NVUM survey reported that 2.5% of visits included a group member with a disability. Of this group, 86.8% found sites visited to be accessible. Though challenges associated with mobility are often readily recognized and considered, an individual with a disability is defined by the Americans with Disabilities Act (ADA) as a person who has a physical or mental impairment that substantially limits major life activity. The ADA does not specifically name all of the impairments that are covered. The 2010 US Census estimated that 18.7% of the general population had a disability with 12.6% a severe disability. The persons with disabilities population characteristics of visitors to the Inyo National Forest appear to differ significantly from national population estimates.

As shown to the right, the gender breakdown of visitors to the Inyo National Forest is fairly evenly divided between females and males.

Demographics such as age may be used as an indicator of group compilation. As shown to the right, the large percent of visitors under the age of 16 years may indicate that groups are made up of families. Visitors under the legal driving age are dependent on other people or modes besides personally driving an automobile to move them. This group may be inclined to use alternative transportation means for travel.

The Inyo National Forest 2011 National Visitor Use Monitoring (NVUM) survey reported that 93.3% of visitors were of the white race. The question of ethnicity found that 10.3% of survey respondents reported being of Hispanic background.

Visitor household income showed that the $50,000 to $74,999 and $150,000 and up categories had the largest reported amounts of 23% and 22% respectively. Those reporting an income of under $25,000 accounted for only 7% of visitors. The American Community Survey conducted in 2011 by the US Census Bureau reported a median household income bracket of $50,000 to $59,999 for the State of California. Income characteristics of visitors to the Inyo National Forest moderately exceed those of State of California population in general.

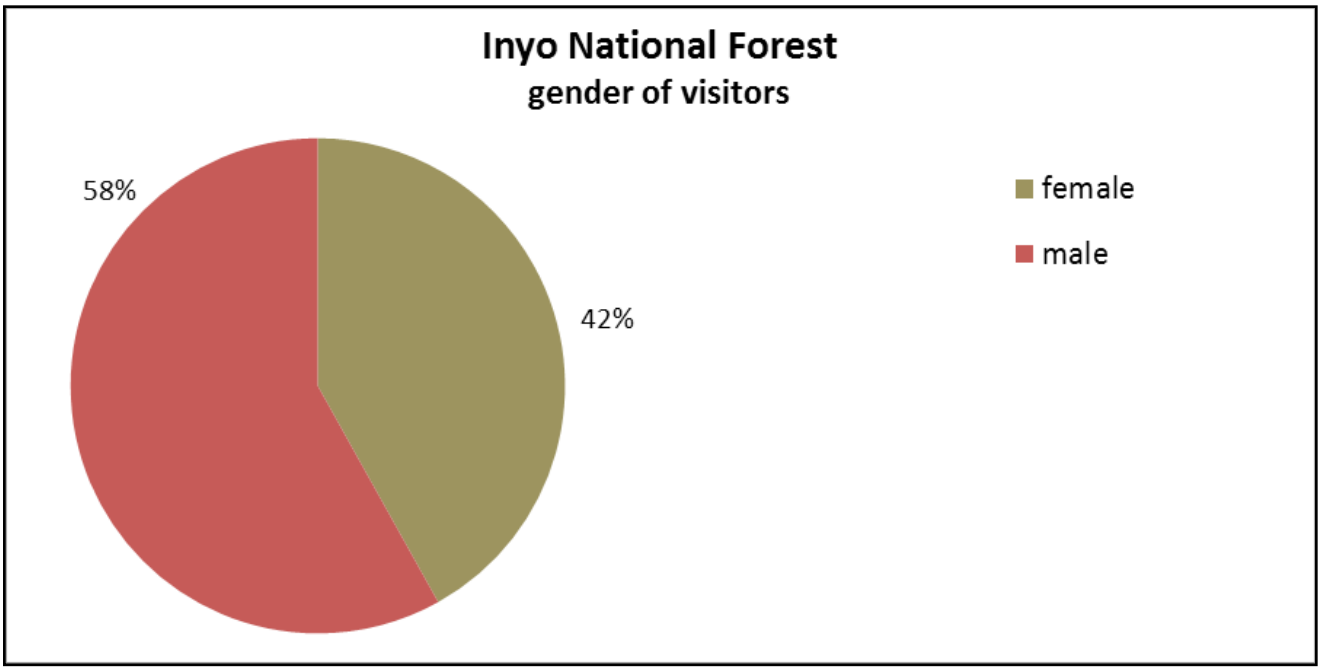


Figure: Inyo National Forest gender of visitors (2011 NVUM survey)

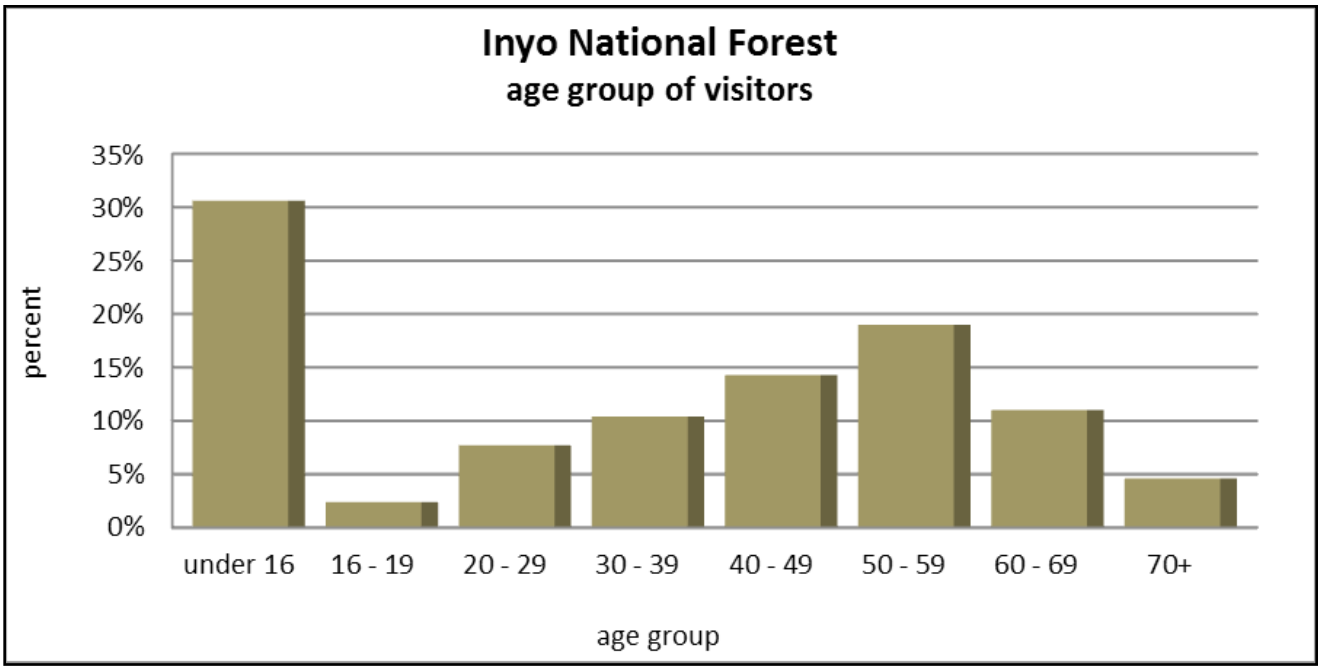


Figure: Inyo National Forest age group of visitors (2011 NVUM survey)

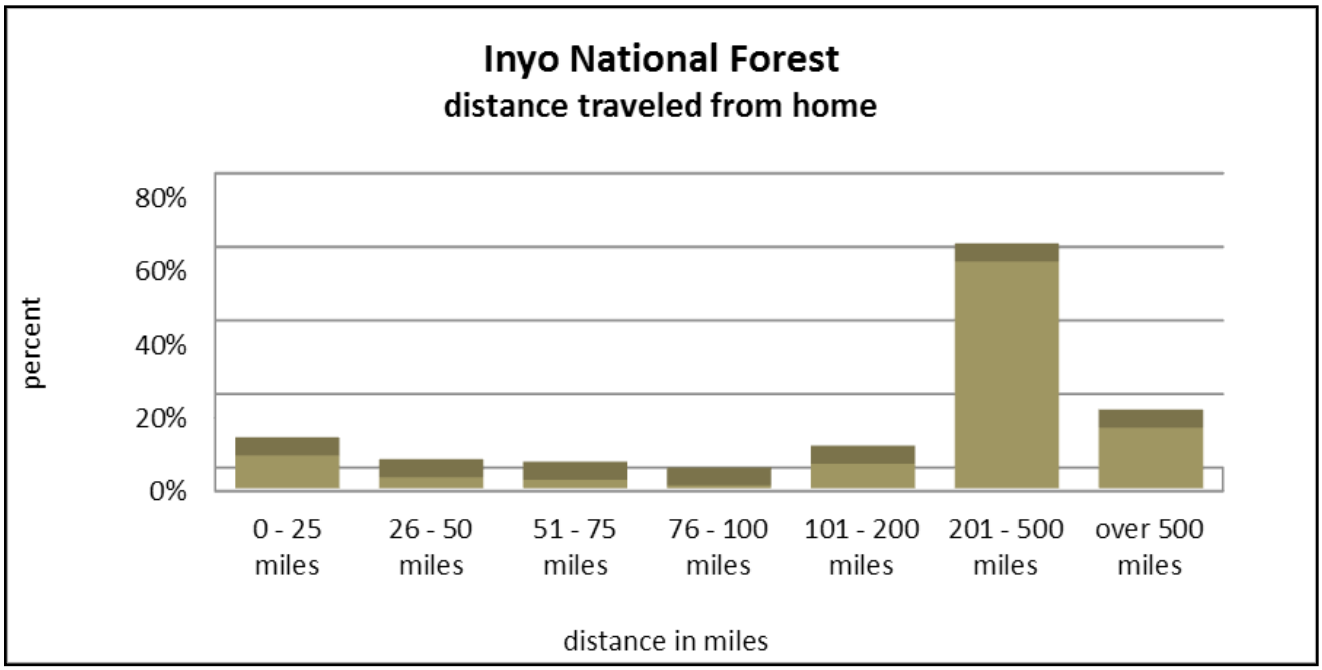


Figure: Inyo National Forest distance traveled from home (2011 NVUM survey)

The Inyo National Forest is predominantly located within 2 of the more sparsely populated counties of the State of California. Public lands consume much of Inyo and Mono Counties. The 2010 US Census reported a total population of 14,202 for Mono County and 18,546 for Inyo County giving a population density for the counties of 4 and 2 persons per square mile respectively. The predominant and closest visitor markets for the Forest are Southern California, the San Francisco Bay Area and to a lesser extent Western Nevada. These locations are between 201 and 500 miles distance from the Forest, and therefore, would correlate with over 60% of visitors reporting traveling that distance from home. Foreign travelers accounted for 6.6% of visitors.

The NVUM maps below show pictorially, by county, where visitors are traveling from. Transportation factors such as direct highway access and airline service can greatly impact the origin of travelers to an area.

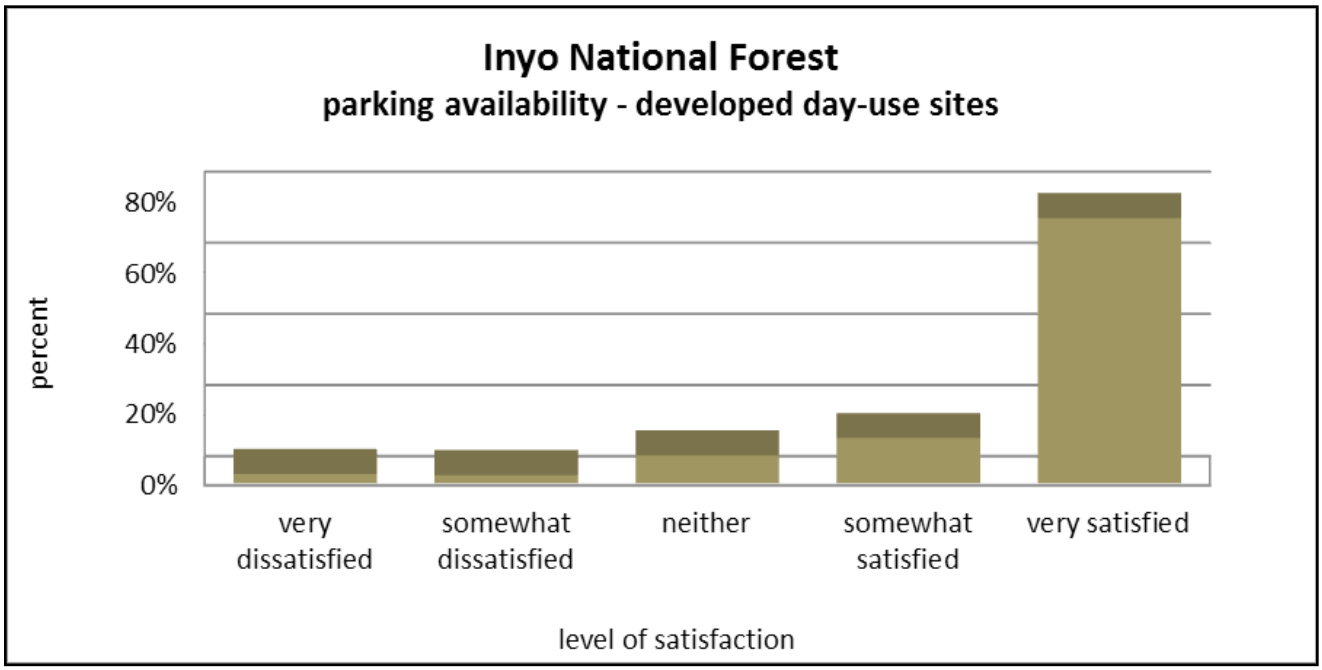


Figure: Inyo National Forest parking availability developed day-use sites (2011 NVUM survey)

The necessary amount and type of parking in the appropriate locations is important to providing adequate access. In some areas of the Forest where developed day-use sites are also the ingress and egress points for backcountry and Wilderness users, competition for parking by day-use and overnight users may present conflicts. The NVUM survey found 88% of visitors "somewhat" to "very satisfied" with parking availability at developed day-use sites forestwide. The performance rating for parking availability by Wilderness users was "keep up the good work" indicating that the Forest is performing quite well in this area.

The NVUM survey queried perceptions of crowding for developed day-use site visitors and designated Wilderness users. Perceptions of crowding are highly subjective and dependent on an individual's personal expectations and goals. As feelings of crowding are difficult to quantify, responses are generally reported in descriptive terms. The significance of the graphs is the skewing of the responses between the two end points of "hardly anyone here" and "overcrowded" therefore no intermediary qualifying labels were provided.

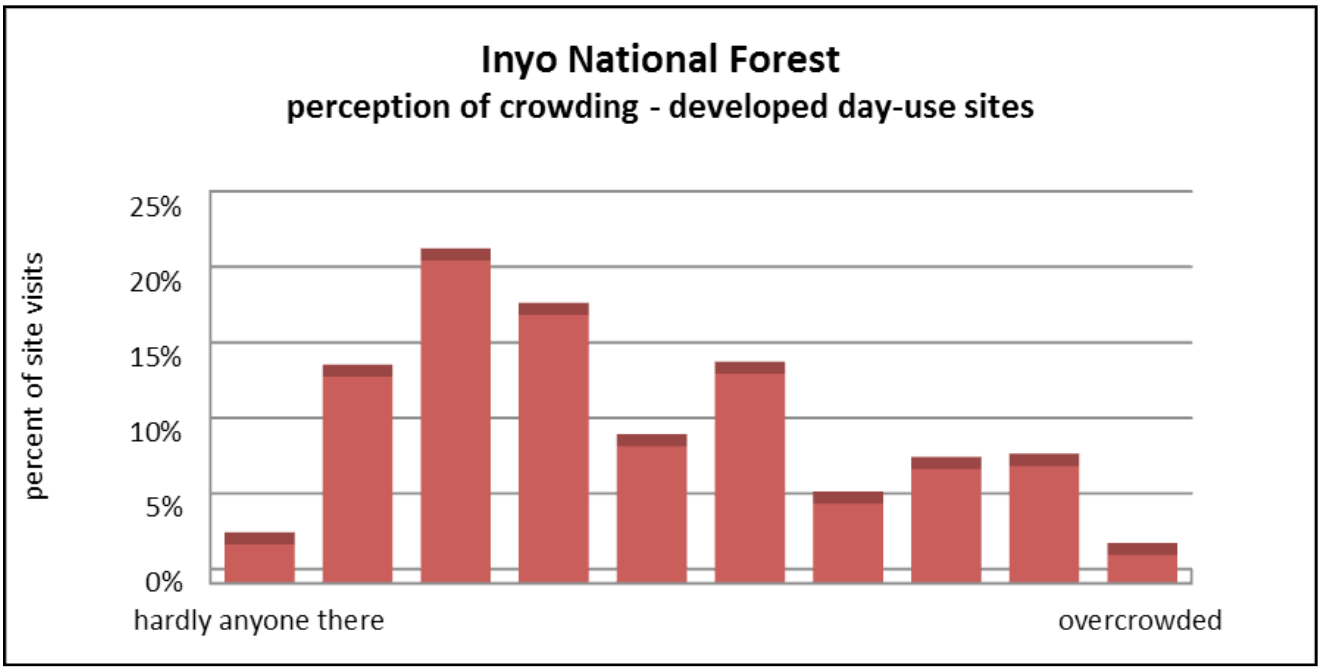


Figure: Inyo National Forest perception of crowding developed day-use sites (2011 NVUM survey)

Visitors may have different expectations of and sensitivity to crowding dependent on the experience they are seeking. An acceptable metric for perceptions of crowding at developed sites may be completely different than that for backcountry or Wilderness areas. Visitors at developed day-use sites reported minimal levels of crowding considering the presumably more consolidated and intense use at these locations.

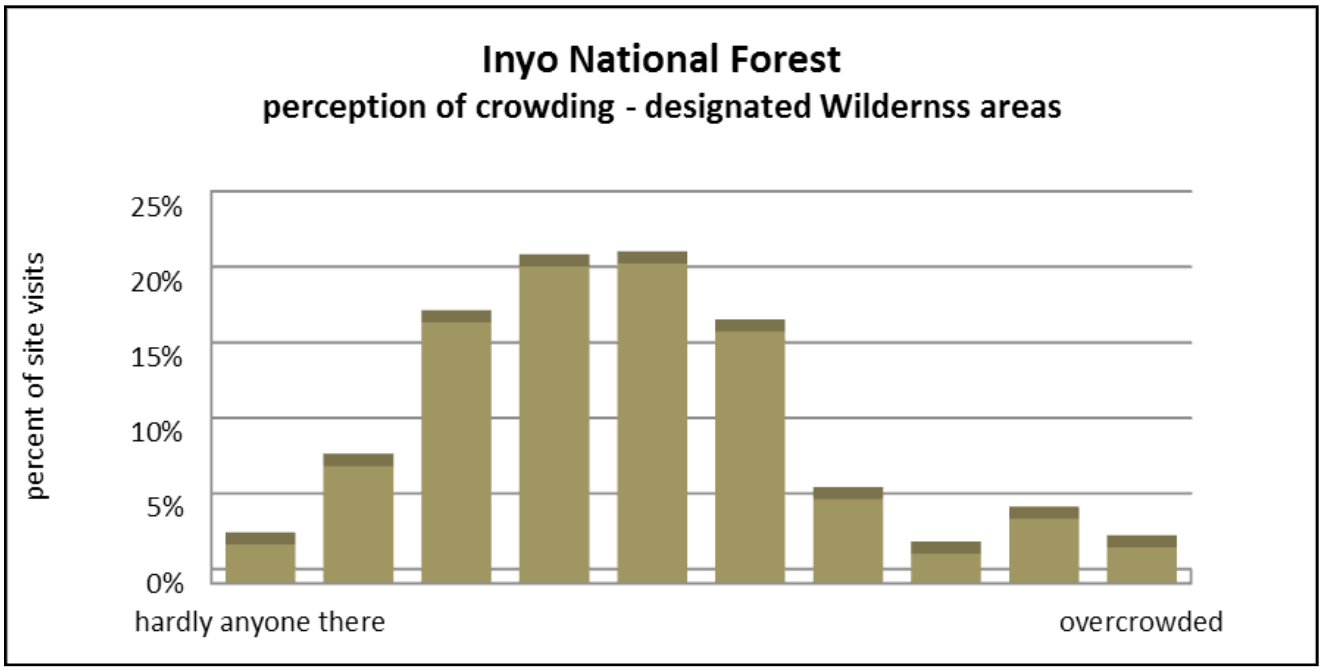


Figure: Inyo National Forest perception of crowding designated Wilderness areas (2011 NVUM survey)

Visitors to designated Wilderness areas reported a moderate degree of crowding. Visitors to these areas may be more susceptible to feelings of crowding, possibly having a higher expectation for solitude, than visitors in developed recreation sites.

General visitor profile and use data may be used to review existing transportation systems and act as indicators for the design of new or improved transportation networks. Demographic characteristics such as age or disability may imply the likelihood of a visitor to use a particular transportation mode or route. The activity participated in by a visitor may indicate a desired recreation level, passive or active, or show the need to consider necessary recreational equipment such as skis, fishing poles or backpacks. Visitor reported satisifaction and crowding data may support or refute perceptions by managers of the need for changes or improvements to transportation systems and infrastructure. Througout the balance of this report, the overview data from the National Visitor Use Monitoring survey will be combined with location specific data to formulate context appropriate alternative transportation system proposals for each study area.

4.2 TRANSPORTATION INFRASTRUCTURE OVERVIEW

The Owens Valley region is served by a multimodal transportation network of roadways, foot paths, bicycle routes, transit service providers and air carriers that provide connections to and within the Inyo National Forest. Many of these travel routes are presented on the official Inyo National Forest map.

4.2.1 ROADS

The regional road network is comprised of federal and state highways feeding a local transportation system. Federal highways create the backbone of the regional road network providing north-south access through Eastern California on US Highways 395 and 6. State, local and forest roads provide feeder routes off of the federal highways into the local communities and public lands. In many cases roadways do not provide through routes and terminate due to impassable mountain topography creating one way in and out. Many roadways, including state highways, are closed seasonally due to winter weather conditions.

Road improvements vary greatly throughout the region. The majority of US Highway 395 has been improved into a four lane divided highway. State roads are paved with generally a minimal shoulder, if any. County and forest roads may be paved, gravel or natural surface. An extensive network of unpaved roads is maintained in both Inyo and Mono Counties for predominantly recreational purposes. Topography is generally the limiting factor in roadway width as many roads snake through deep canyons and along river beds or mountain sides.

4.2.2 FOOT PATHS

The Inyo National Forest is well served by an extensive network of hiking trails as shown on page 31. The Pacific Crest Trail and the John Muir Trail extend through the Sierra Nevada mountain range providing long distance one way hiking opportunities. The John Muir Trail extends from Mt. Whitney on the Inyo National Forest to Happy Isles trailhead on Yosemite National Park. Trails from various locations on the Forest may provide access to the regional trails. Though for the purposes of this study, most hiking was categorized as recreational and therefore not fully analyzed, significant ingress and egress points for hikers were reviewed. Competition for parking between day-use and overnight visitors may be an issue at trailheads that serve as both popular day-use and backcountry entry or exit points. Over the course of the summer season trailhead parking lots may become congested with vehicles of long term hikers.

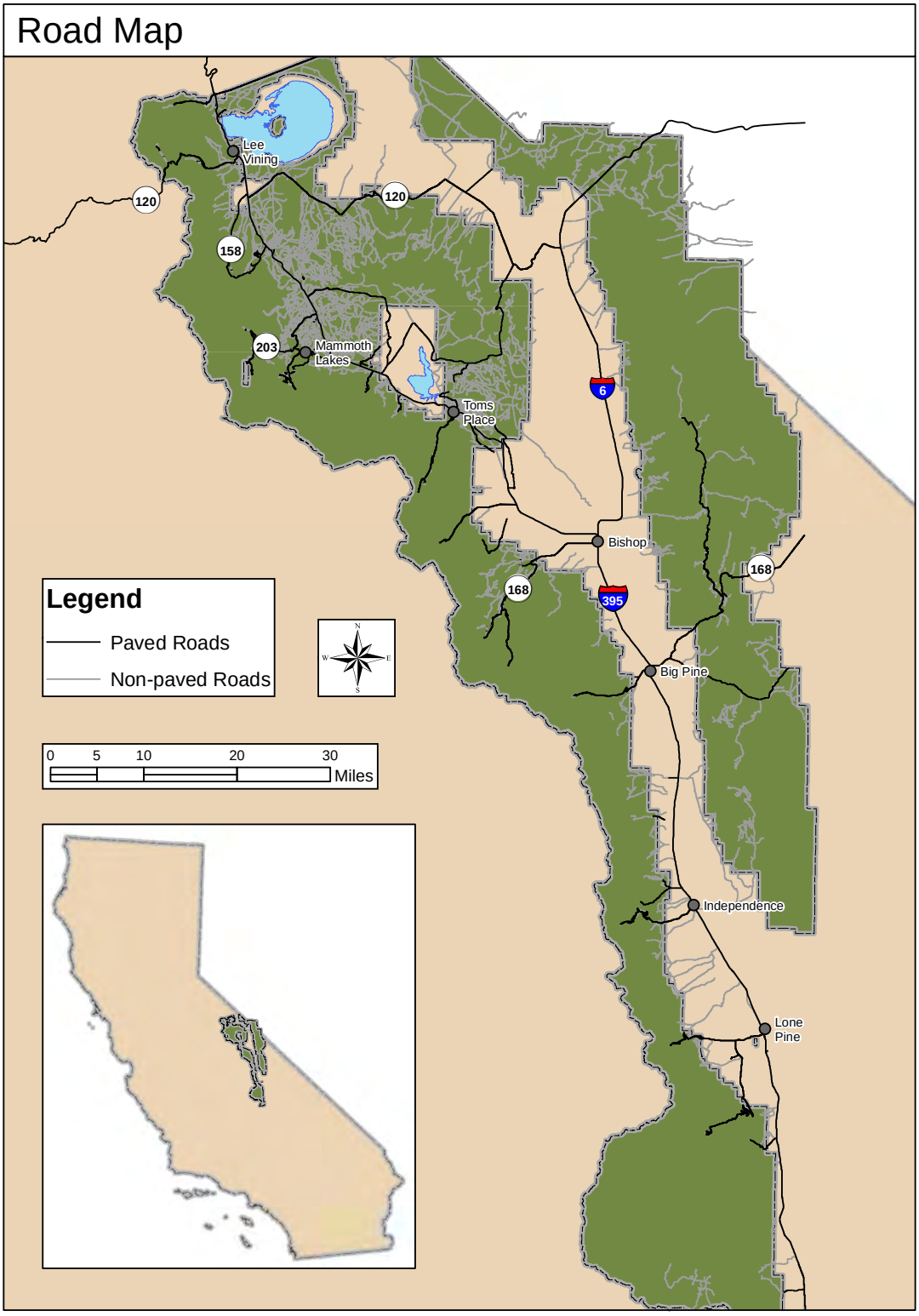


Figure: Eastern Sierra region roads network map

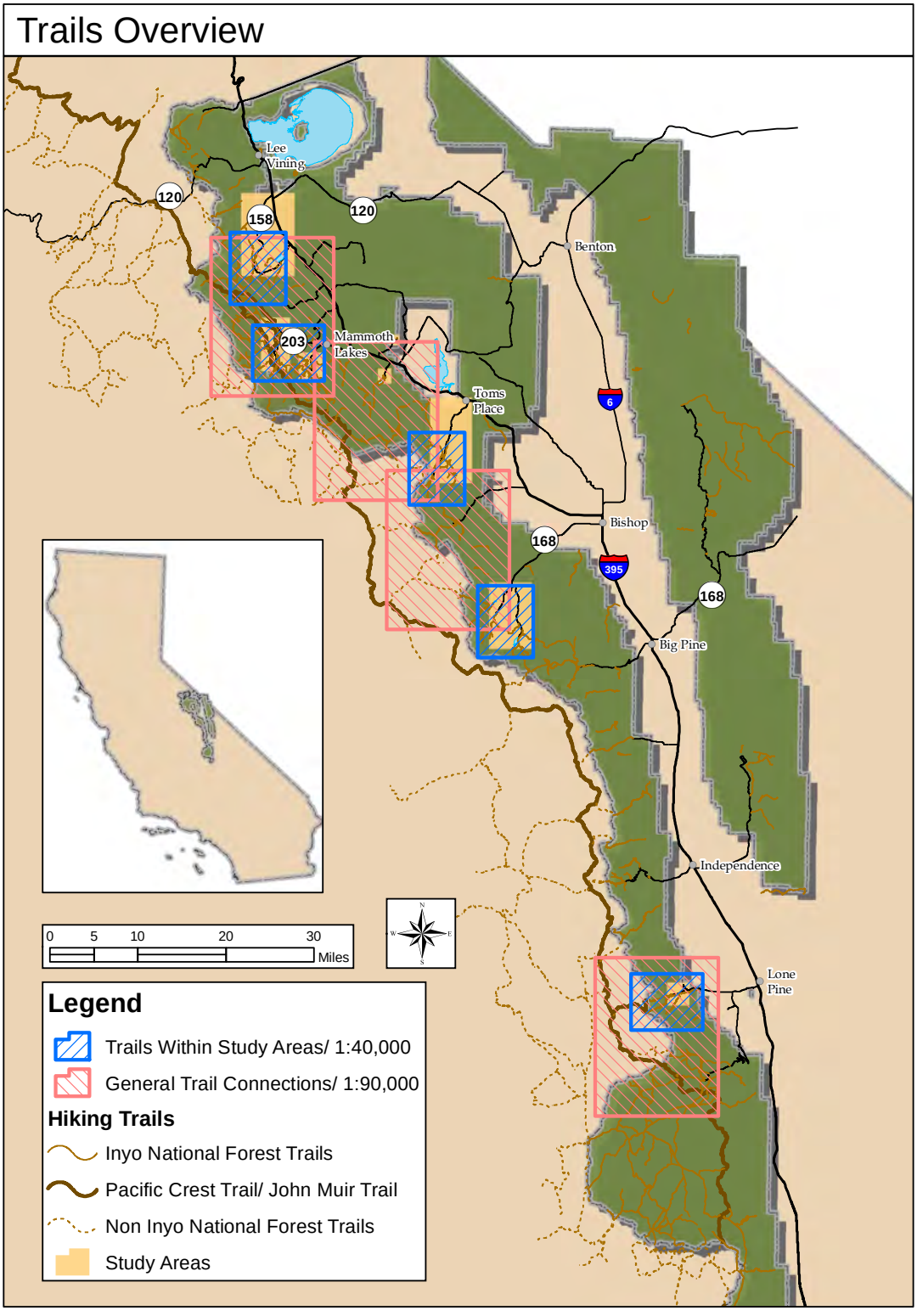


Figure: Inyo National Forest trails network map

Figure: US Highway 395 bicycle route photo

4.2.3 BICYCLE ROUTES

The US Bike Route System is a national network of officially designated bicycle routes as shown to the left on page 32. The program began construction in 1982 and has gained momentum in the past few years with renewed interest from American Association of State Highway and Transportation Officials (AASHTO) and bicycle advocacy groups. The bicycle system is meant to be a transportation network connecting urban, suburban and rural areas throughout the United States. Bike Route 85 alignment is consistent with US Highway 395 traveling through the Eastern Sierra region.

Bicycle traffic is permitted on all of US Highway 395 and portions have been formally designated as a bicycle route with roadway signage. The road has wide paved shoulders for most of its length through Mono and Inyo Counties. Though the roadway has a 65 miles per hour posted speed limit, the white line edge of lane marking and rumble strip help to define the space between bicyclists and motorists.

4.2.4 PUBLIC AND PRIVATE TRANSPORTATION SERVICE

Public transit service to the Inyo National Forest is provided by Eastern Sierra Transit Authority (ESTA) and Yosemite Area Regional Transportation System (YARTS).

Eastern Sierra Transit Authority (ESTA) provides regional and local transit service throughout Inyo and Mono Counties and along the US Highway 395 corridor between Reno, Nevada and Lancaster, California. Intercity trunk service on US Highway 395 is divided between north and south route segments. The northbound route operates Monday, Tuesday, Thursday and Friday from the town of Lone Pine, California to the airport and Greyhound station in Reno, Nevada. Travel time for the entire route is approximately 6 hours. The southbound route operates Monday, Wednesday and Friday between the Town of Mammoth Lakes and the Metrolink train station in Lancaster, California. Metrolink provides light rail access to the greater Los Angeles area. Travel time for the entire route is approximately 5 hours and 10 minutes. An additional connection to nationwide transportation service exists in Mojave, California where the Greyhound service stops at the McDonald's restaurant and ESTA stops at the Carl's Jr restaurant three blocks to the south.

Yosemite Area Regional Transportation System (YARTS) offers seasonal public transit service from the Town of Mammoth Lakes to destinations within Yosemite National Park. The Highway 120 route has weekend only service in June and September from the Town of Mammoth Lakes to Yosemite Valley with stops in June Lake and Lee Vining, California. During the peak visitation summer months of July and August daily service is available on the full route as well as an abbreviated route from the Town of Mammoth Lakes to Tuolumne Meadows with 4 mid-day trips between Lee Vining and Tuolumne Meadows Visitor Center. . YARTS service connects with the ESTA interstate and local service in the Town of Mammoth Lakes.

YARTS has partnered with Amtrak to provide thruway bus service from the Town of Mammoth Lakes to the San Joaquin train line in Merced, California. Tickets may be purchased on the Amtrak website with over the road transportation service provided by YARTS. The mutually beneficial partnership increases YARTS ridership potential and ticket outlets and extends the service area for Amtrak.

Figure: Amtrak San Joaquin Valley train route taken from www.Amtrak.com

Figure: Amtrak thruway bus from Merced, California to the Town of Mammoth Lakes, California taken from www.Amtrak.com

Public transportation service is available from regional locations to the Eastern Sierra area and Inyo National Forest. Eastern Sierra Transit Authority (ESTA) operates bus service on the US Highway 305 corridor between Reno, Nevada and Lancaster, California leading to connections with local and regional transportation services. Yosemite Area Transportation System (YARTS) provides public transit service from the Town of Mammoth Lakes to Yosemite Valley with continuing service to Merced, California. Major regional and interstate transportation networks are accessible from the major transportation hubs of Lancaster and Merced, California and Reno, Nevada. Direct connections to the nationwide transportation network of Amtrak trains or Greyhound buses are possible in the Town of Mammoth Lakes, Merced and Mojave, California and Reno, Nevada.

Figure: Central California region ground transportation service providers

Figure: Private transportation service brochure

A compilation of routes and schedules for transportation service provider making connections to the Eastern Sierra region is provided in Appendix F, and shown in the map on the opposite page.

A variety of private transportation service providers, such as Mammoth Taxi, are available to and within the Inyo National Forest. Forest Service permit holders may provide transportation service to their guests. The route between San Francisco, California through Yosemite National Park, the Inyo National Forest and Death Valley National Park is popular for sightseeing operations and private bus charter companies. Private transportation service to operate a taxi or shuttle service on or to Forest locations is an allowable use on the Inyo National Forest with a special use permit.

4.2.5 AIR CARRIERS

The Mammoth Yosemite Airport is located approximately 10 miles outside of the Town of Mammoth Lakes. Commercial air carriers Alaska Airlines and United Airlines serve the Mammoth Yosemite Airport. Year-round, non-stop service is offered from Los Angeles, California and non-stop winter service is available from San Francisco, San Diego and Orange County, California. Flying time to all California locations is under 1 hour and 20 minutes. Airfare prices vary by carrier and seasonal demand.

Ground transportation from the Mammoth Yosemite Airport to surrounding destinations may be provided by personal vehicle, lodging accommodation shuttle, rental car or taxi service. Public transit service is not available to the airport. There are no bicycle or pedestrian accommodations on the roadway from the airport.

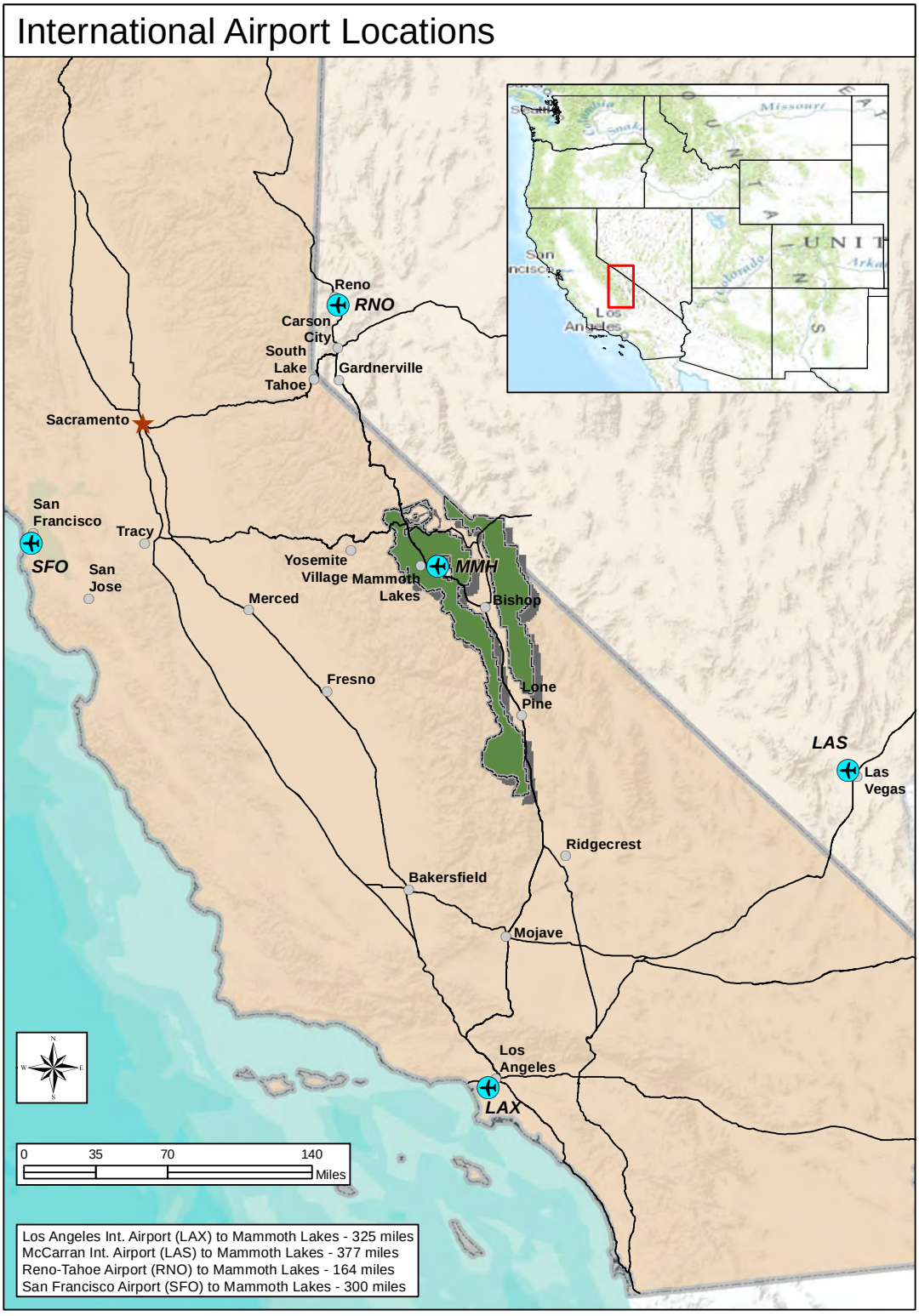


Figure: Sample of Central California international passenger carrier airport locations

Major international airports are located a distance from the Inyo National Forest. The Reno-Tahoe Airport is located in Reno, Nevada approximately 164 miles from the Town of Mammoth Lakes and a 3 hour drive. The Reno-Tahoe Airport is serviced directly by regional public transit from the Eastern Sierra area through ESTA's northbound US 395 North route. Airports in the San Francisco Bay, California area are located approximately 300 miles from the Town of Mammoth Lakes with a drive of 6 hours in the summer season. McCarran International Airport in Las Vegas, Nevada is approximately 377 miles distance and a 5 hour drive. Airports in the greater Los Angeles, California area are approximately 325 miles from the Town of Mammoth Lakes and about a 6 hour drive. Mountain pass road closures and snow may extend driving times or cause travel delays in the winter season.

The availability of transportation modes and routes greatly impacts where and the way people travel. Continuous routes, with limited breaks in time or space, are preferable. In general, the easier a path is to travel the more likely it will be used over other comparable paths. Travel for transportation purposes is generally time sensitive and seeks the most direct route and most efficient mode of transport. This study focuses on travel for transportation purposes.

A combination of secondary data review and primary data collection was conducted to inform this study.

4.3 SITE SPECIFIC DATA OVERVIEW

As a comprehensive transportation plan should include all current and anticipated modes of transportation. Transportation modes considered under this study included pedestrian, bicycle, public and private mass transit and transportation related information technology. Research included both secondary and primary data collection. Secondary research consisted of an extensive review of historic Inyo National Forest, local and interregional transportation plans, studies and reports. Primary data was collected on vehicle traffic counts, parking lot utilization and visitor uses.

An interdisciplinary team of physical and biological based science staff members assisted with the data collection and analyses. Field visits to observe any existing transportation related impacts and opportunities or impediments to the creation of an expanded alternative transportation system were conducted. Written staff reports, by discipline, captured the existing conditions for each area, reviewed secondary data for any foreseeable issues and anticipated potential impacts of any proposed changes to the transportation network.

Data relevant to a particular study area is contained within the report section for the appropriate area. A review and discussion of site specific data in combination with Forest and regional overview data is used to describe existing transportation related conditions and impacts, as well as, design alternative transportation system proposals for each study location.

In the future, the feasibility study's data and recommendations could be used for capital improvement grant proposals, environmental reviews to further assess proposed changes or as background material to inform transportation discussions and components of the Forest Plan revision.

GOALS AND POLICIES REPORT

for the

Inyo County General Plan

Prepared for:

Inyo County

Prepared by:

Jones & Stokes
BRW
Mintier & Associates
Applied Development Economics

Cover photographs:

Background	*Inyo County Courthouse*
Top inset	*Aberdeen*
Middle inset	*Shoshone*
Bottom inset	*West Bishop*

December 2001

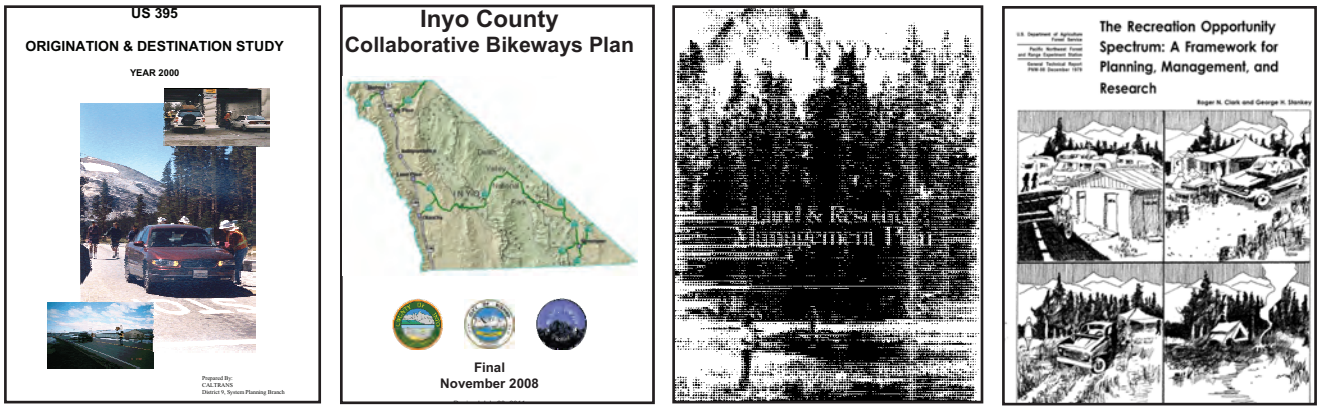


Figure: Covers of secondary data sources

5.0 DATA COLLECTION AND ANALYSIS

5.1 SECONDARY DATA REVIEW

State and local transportation studies and plans were reviewed for information relevant to this study. Aside from the 2004 Field Report: Eastern Sierra Expanded Transit System and 2007 Interagency Technical Assistance Group review; transportation related documents from state and local jurisdictions were reviewed for reference and direction on local and regional alternative transportation system goals and priorities. Regional studies and plans are summarized in this section. Area specific documents are reviewed in the appropriate site specific sections of this report. Information contained in these documents that is relevant to alternative transportation systems on the Inyo National Forest will be included in the appropriate individual site sections of this report.

5.1.1 GENERAL AND COMMUNITY PLANS

5.1.1.1 Inyo National Forest Land and Resource Management Plan

The Inyo National Forest Land and Resource Management Plan or Forest Plan, as it is commonly known, provides direction for the management of all lands and resources administered by the Inyo National Forest. The Plan contains forestwide Goals, Objectives and Standards and Guidelines to guide resource management. Management Prescriptions prescribe how areas on the Forest will be managed and Area Direction provides specific directives for twenty defined management areas on the Forest. The Forest Plan was drafted in 1988 and is currently in the revision process. The Inyo National Forest expects to complete the Plan revision over next three years.

The Forest Plan does not specifically address transportation or access issues as a resource. The forestwide Standards and Guidelines for Facilities and Recreation contain directives related to transportation issues. The Facilities section includes the following minimum conditions to ensure protection and enhancement of the Forest's facilities.

- *"Provide additions to the transportation system for resource development. Provide public access to public land and developed recreation sites, consistent with Forest Goals and Objectives.*
- *Consider mass transit options when vehicle use exceeds the capacity of existing roads or threatens to damage resource values or when public facilities can best be served by a community-wide system proposed by another entity.*
- *Provide trails for hikers, skiers, equestrians, bicyclists, snowmobilers, the handicapped, and off-highway vehicle users when compatible with user needs, level of development, and Forest Goals and Objectives.*
- *Coordinate trail construction, rerouting improvement, and maintenance with cooperating or affected agencies.*

- *Separate incompatible trail uses where feasible.*
- *Utilize existing developed facilities, roads, and trails for both summer and winter recreation activities, whenever possible, before developing new ones for exclusive seasonal use."*

Standards and Guidelines for the Recreation section of the Forest Plan includes the following minimum conditions to ensure protection and enhancement of the recreation opportunities of the Forest.

- *"Develop associated day-use facilities and interpretive and informational sites and trails, together with overnight campgrounds, to achieve a balanced facility package.*
- *Maintain activities and developments at levels that meet prescribed Recreation Opportunity Spectrum (ROS) classes as defined in the ROS Users Guide.*
- *Incorporate the increasing demand for mountain bike, equestrian, bicycle and Nordic opportunities into composite plans, community plans, trail plans, and programs."*

Management Prescriptions included in the Forest Plan serve to specify how the Forest resources will be managed. Each Prescription has a different resource emphasis. There are eighteen Management Prescriptions. The Prescriptions for Concentrated Recreation Area (#12) and Developed Recreation Site (#15) are the most applicable to this study. Areas within these classifications may experience high levels of use and act as attractors for visitor traffic. The emphasis of the directive for Concentrated Recreation Area is *"on providing a broad range of facilities and opportunities that will accommodate large numbers of people safely, conveniently, and with little resource damage."* The Recreation management direction states, "Maintain Roaded Natural and Rural ROS classes." The emphasis for Developed Recreation Site is to recognize the public demand for developed recreation site opportunities. The Recreation management direction states, *"Maintain Semi-Primitive Motorized, Roaded Natural, Roaded Modified and Rural ROS classes."*

Area Direction provides individualized management prescriptions for 20 areas on the Forest. The areas are defined by their unique characteristics. The Area Direction addresses the management situations and resource conditions that are specific to that area. Management areas covered in this study include June Lake Loop, Mammoth, Reds Meadow-Fish Creek, Convict-McGee and Bishop Creek-Buttermilk. Directives for these areas will be discussed in the applicable site specific sections of this report.

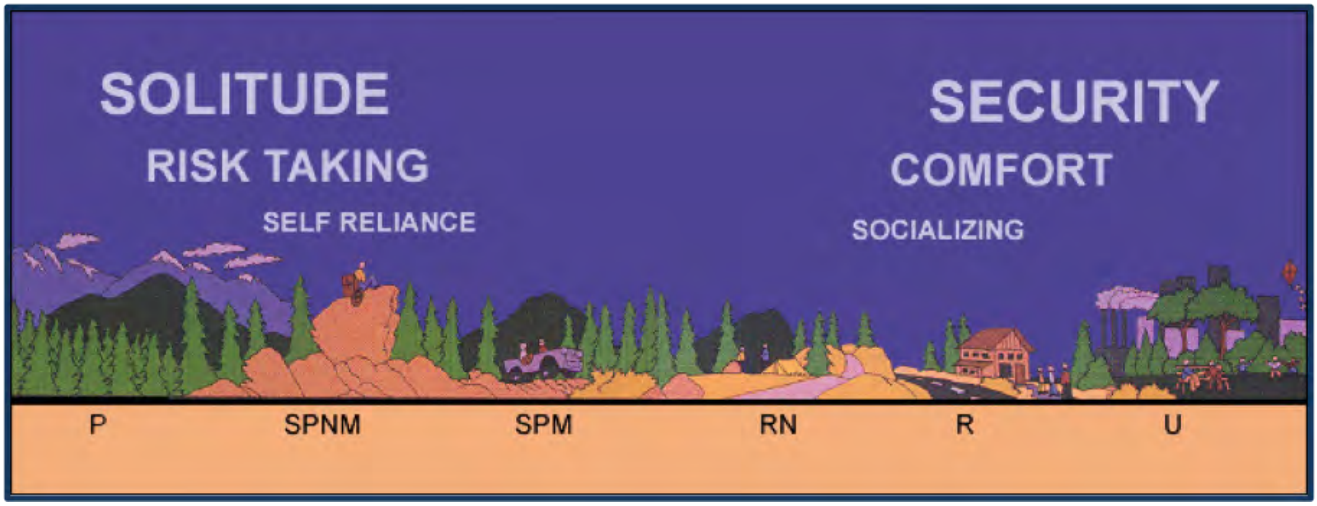


Figure: US Forest Service Recreation Opportunity Spectrum continuum taken from http://www.fs.fed.us/cdt/carrying_capacity/rosfieldguide/ros_primer_and_field_guide.htm

5.1.1.2 Recreation Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) is a recreation planning tool used by the Forest Service. It offers a framework for developing a diverse array of recreational experiences. A rationale for creating the ROS planning tool was the recognition that recreation is one of the principal services provided by forests and that *"non-recreation related decisions in forest settings are often the major influence on the nature of the recreation opportunities supplied."*

The Spectrum, shown above, is divided into six major classes for Forest Service use: Urban (U), Rural (R), Roaded Natural (RN), Semi-Primitive Non-Motorized (SPNM), Semi-primitive Motorized (SPM), and Primitive (P). The ROS classes fall along an intensity continuum of experiences from high use and high interaction in Urban settings to the most sparse use in the Primitive classification.

Access plays an important role in the Recreational Opportunity Spectrum categories. Six factors, shown to the right, are used to judge the opportunity setting of an area: access, other nonrecreational resource uses, onsite management, social interaction, acceptability of visitor impacts and acceptable level of regimentation. Accessibility may be described by the quantity and quality of routes provided and by the permitted modes of transport.

The Recreational Opportunity Spectrum uses access strategies based on the type of transportation facility provided to maintain the desired ROS experience at a location. Limited or more difficult pathways supply access to Primitive areas while highly improved transportation systems provide ease of access to Urban locations. Norm is the normal type of access conditions to be found in the physical setting. Compatible conditions are acceptable but more restrictive than normal. Inconsistent conditions are not generally compatible with the norm but may be necessary under certain circumstances. Unacceptable conditions should not be permitted under any circumstances. A combination of transportation related design and maintenance standards and regulations for determining and enforcing ease of access may be used to facilitate the desired experiences at a particular location.

The Urban, Rural and Roaded Natural Recreation Opportunity Spectrum (ROS) classifications afford the highest degree of access. Though the intensity of transportation routes and modes expected in each class varies, the classes all support moderate to high automobile use through improved roads and parking lots. Public transit service is an acceptable travel mode in the Urban Class.

The Urban Recreational Opportunity Spectrum class is the most intense setting with large numbers of people and developed facilities sufficient to support their use placed in a condensed area. The sights and sounds of man are integral to the experience offered in this classification. Access is ubiquitous with a multitude of improved pathways supplying access by multiple modes. Mass transit service is an appropriate transportation mode in the Urban classification to move the large groups of people present in these locations.

In the Rural class the sights and sounds of man are readily evident though less pronounced and less concentrated than in the Urban class. A high degree of social interaction is expected between the large numbers of people present in these areas. The physical environment may be dominated by infrastructure improvements. Improved roads and developed parking lots make accessing locations in the Rural class by automobile easy and convenient.

The Roaded Natural ROS class, though on the more intense end of the ROS spectrum, overs a more real outdoor experience. Opportunities for social contact are balanced with the chance to experience isolation. Improvements and facilities are scattered throughout the area. Access to these sites may be over improved gravel roads with paved double-lane roads only available at a distance.

Primitive	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Rural	Urban
Area is characterized by essentially unmodified natural environment. Interaction between users is minimal. Motorized use within the area is not permitted.	Area is characterized by predominantly natural environment. Interaction between users is low, but there is often evidence of other users. Motorized use is not permitted.	Area is characterized by a predominantly natural or natural-appearing environment. Opportunity to have a high degree of interaction with the environment. Motorized use is permitted.	Area is characterized by predominantly natural appearing environments with moderate sights and sounds of man. Conventional motorized use is provided for in construction standards and design of facilities.	Area is characterized by substantially modified natural environment. A considerable number of facilities are designed for use by large number of people. Opportunities for wildland challenges and risk taking are generally unimportant. Facilities for intensified motorized use and parking are available.	Area is characterized by substantially urbanized environment, although the background may have natural-appearing elements. Sights and sounds of humans are predominant. Large numbers of users can be expected. Facilities for highly intensified motor use and parking are available with forms of mass transit often available.

Figure: Recreational Opportunity Spectrum setting and experience characterizations

ROS designation/Roadway type	Cross-Country Travel	Non-Motorized Trails	Motorized Trails and Primitive Roads	Controlled	Full Access
Primitive	Norm	Norm	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized	Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized	Compatible	Compatible	Norm	Inconsistent	Unacceptable
Roaded Natural	Compatible	Compatible	Compatible	Norm	Norm
Rural	Compatible	Compatible	Compatible	Compatible	Norm
Urban	Compatible	Compatible	Compatible	Compatible	Norm

Figure: Recreation Opportunity Spectrum access strategies

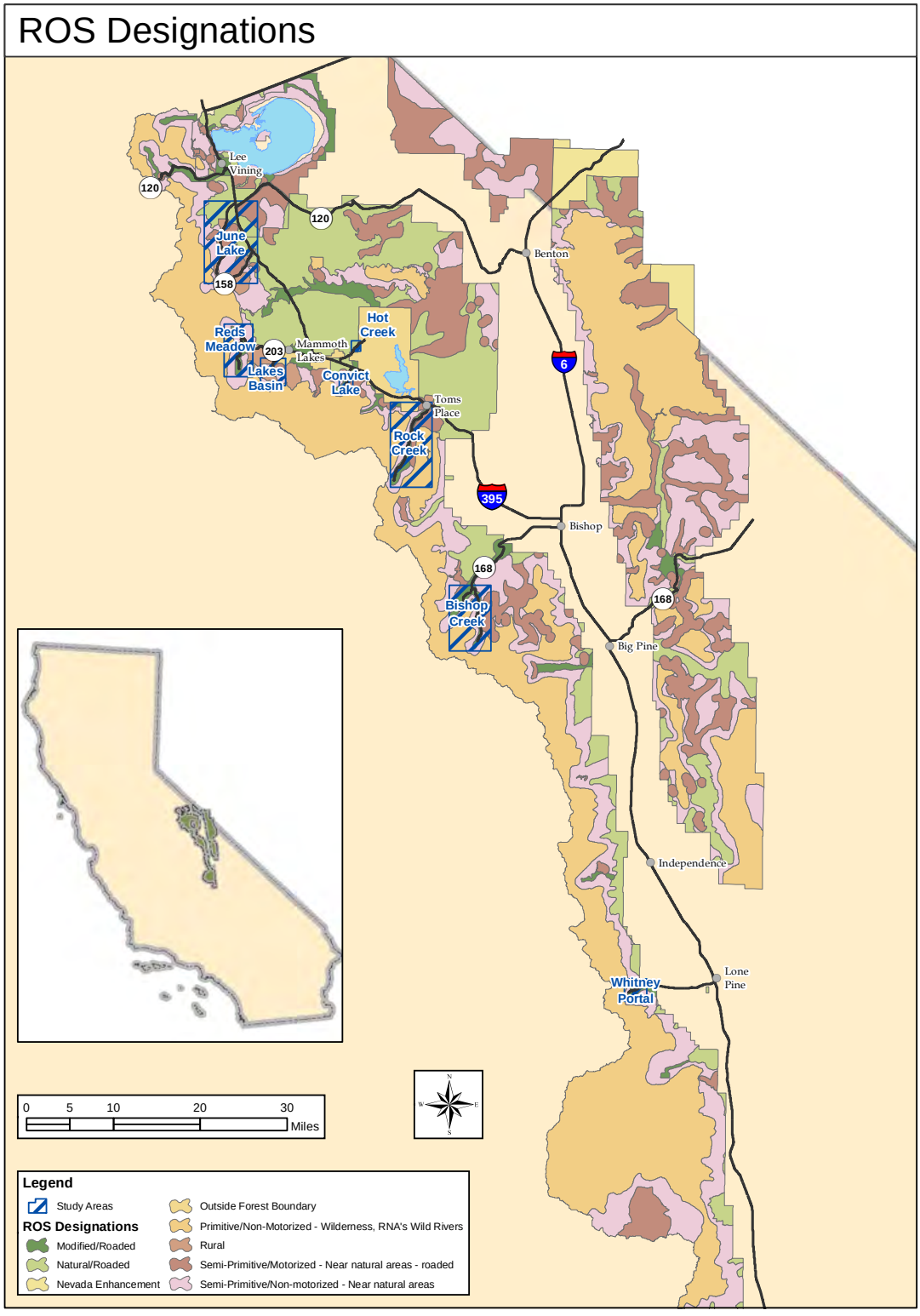


Figure: Inyo National Forest Recreation Opportunity Spectrum designations map

The Recreation Opportunity Spectrum is used by the US Forest Service as a planning tool to ensure a wide variety of recreational opportunities is available for National Forest visitors. The Urban, Rural and Roaded Natural classes are most pertinent to this study as they encourage a high degree of access through improved routes and multiple modes. ROS classes for each study location will be discussed in the applicable site specific sections of this report.

5.1.1.3 US Forest Service National Visitor Use Monitoring (NVUM)

The National Visitor Use Monitoring (NVUM) program provides a standardized metric of quantity and quality of visitation to National Forests. The information gathered in the NVUM program is required by Executive Order 12862 for development of Forest plans and implementation of the National Recreation Agenda. The program's goals are twofold. First, to produce estimates of the volume of recreation visitation to National Forests and Grasslands and second, to produce descriptive information about that visitation, including activity participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit. NVUM data collection is forestwide and findings may be extrapolated to the entire visitor population for a forest. The visitor survey is conducted on each forest once every five years. The most recent NVUM survey was conducted on the Inyo National Forest in 2011. NVUM survey results were presented earlier in the visitor statistics overview of the Forestwide Overview section of this report.

5.1.1.4 Mono County Circulation Element/ Regional Transportation Plan

The Mono County Circulation Element/ Regional Transportation Plan (2009) provides directives for the development of transportation and circulation systems. The document provides a review of existing conditions, needs assessment and recommended actions at the regional and community level. The Regional Policy Element focuses on maintaining existing roadways and developing additional transit and non-motorized transportation mode facilities. The Community Policy Element sections reflect transportation policies developed by local citizen advisory committees and are specific to the target areas. Community Policy Elements for Yosemite, June Lake and Town of Mammoth Lakes were reviewed as part of this project's secondary data analysis effort and will be discussed in the applicable site specific sections of this report.

5.1.1.5 Town of Mammoth Lakes Trail System Master Plan

The Town of Mammoth Lakes adopted the 2009 Trail System Master Plan to create a vision of an integrated trails network that would enhance recreational opportunities and mobility in the Mammoth Lakes area. The Master Plan synthesizes historic and current planning efforts into a single comprehensive trails document that supports the Town's "Feet First" initiative in support of active modes of transport and recreation. The Master Plan proposes hardened and soft surface trail improvements that would connect sites within the Town as well as the surrounding public lands of the Inyo National Forest.

5.1.1.6 Inyo County General Plan

The 2001 Inyo County General Plan provides the County with a consistent framework for land use decision-making. California state law requires each county and city to prepare and adopt a comprehensive long-range general plan to guide the community's physical development. Required elements of a general plan include such topics as land use and transportation planning. In addition to the 7 required elements, communities may include locally important topics. Inyo County chose to include an economic development component in its General Plan.

The Economic Development Element of the General Plan recognizes tourism as the most important component in Inyo County's economy. The Element notes the importance of working closely with public land management agencies and private landowners to ensure expanded tourism opportunities.

Transportation systems are included in the Circulation Element of the General Plan. The Plan notes that "the provision of an adequate and functional circulation system is vitally important to the economic vitality and quality of life within Inyo County." Roads, public transportation, bicycles and trails are included in the Circulation Element.

5.1.1.7 Inyo County Regional Transportation Plan

The Inyo County Regional Transportation Plan was updated by the Local Transportation Commission in 2009. The Plan provides policies, objectives, improvements and funding strategies for regional transportation movement of people and goods in Inyo County. The City of Bishop, communities of Big Pine and Lone Pine, and the Bishop Paiute Tribe and Lone Pine Reservation are within the purview of the Plan. The Action Element includes recommended transportation improvements for roadways, public transit, bicycle and pedestrian modes as well as information technology solutions.

5.1.1.8 Inyo County Collaborative Bikeways Plan

The 2008 Inyo County Collaborative Bikeways Plan is the official bicycle plan for Inyo County, the City of Bishop and the Bishop Paiute Tribe. The Plan describes existing bicycle facilities and programs, evaluates and prioritizes the need for future bicycle system improvements and the development of new routes. The Plan acknowledges that the compact design of all communities within Inyo County makes bicycling a viable alternative for local trips but recognizes that the long distances between communities limits the use of bicycles for intercity travel.

5.1.1.9 The Southern Inyo Heritage Trail and Park System

In 2007 the Lone Pine Economic Development Corporation (LPEDC) drafted a walking and bicycling heritage trail plan proposal to connect points of interest in and around the town of Lone Pine. The multi-phase project is intended to provide improved pedestrian and bicycle access to downtown Lone Pine and surrounding historical sites for both residents and tourists through sidewalk, safety and trail improvements.

5.1.1.10 Eastern Sierra Transit Authority Short Range Transit Plan

Eastern Sierra Transit Authority (ESTA) was established in 2006 as a Joint Powers Authority between Inyo and Mono Counties, the City of Bishop and the Town of Mammoth Lakes. The mission of the Eastern Sierra Transit Authority is to provide excellent public transportation services in an entrepreneurial style within the Eastern Sierra Region. ESTA provides public transit services including a vanpool program, deviated fixed routes, local in-town dial-a-ride, inter-county service and interstate service on the US Highway 395 corridor extending from Reno, Nevada to Lancaster, California.

The ESTA Short Range Transit Plan was drafted in 2008 to guide the development of public transit services in Mono and Inyo Counties. The Plan documents transit needs, establishes goals and performance standards and provides service plan recommendations for a five-year period. ESTA's mission is "to provide excellent public transportation services in an entrepreneurial style within the Eastern Sierra Region." Four key goals are recommended in the Transit Plan to achieve the Authority's mission.

- *Goal #1: Continue to provide safe and convenient transportation services to the residents and visitors of Mono and Inyo Counties for employment, shopping, education, medical, recreation and social service trips, while improving cost-effectiveness.*
- *Goal #2: Ensure that all transit programs can be provided at a high quality and are seamless to the user.*
- *Goal #3: Generate increased ridership among both residents and visitors, while retaining the existing ridership base.*
- *Goal #4: Provide public transportation services that are financially sustainable within existing and future potential private, local, state and federal funding programs and regulations in a cost-efficient manner.*

ESTA assumed operation of the Reds Meadow Shuttle through a cooperative agreement with the Inyo National Forest in 2009. The Reds Meadow Shuttle was instituted 30 years ago when a Forest Order limited vehicle access to the Reds Meadow Valley. The Reds Meadow Shuttle operates seasonally from the end of June, dependent upon snowfall and road clearing operations, until Labor Day. The shuttle service is intended to be self-supporting with passenger fares covering all capital and operating expenses.

Financial operating statistics for ESTA will be utilized throughout this report as performance metrics for financial feasibility assessments for any transit routes analyses. The ESTA 2011 Annual Report states an overall 24.1% farebox recovery percentage. The farebox recovery ratio is the portion of operating expenses that are met by the passenger fare paid. The average subsidy per passenger to account for the portion of operating expense not covered by the passenger fare is stated as $4.07 per passenger. Using operating expense net of passenger fares and service miles provided in the 2011 annual report it is calculated the subsidy per service mile is $2.78 per mile.

Eastern Sierra Transit Authority operating statistics					
Route	Operating cost	Passenger fares	Service Miles	Gross operating cost/service mile	Net operating cost/service mile
Intercity	$113,147	$23,828	84,279	$1.34	$1.06
Interstate	$371,901	$155,837	150,435	$3.07	$2.03
Reds Meadow	$461,554	$396,908	53,878	$6.90	($0.46)
All Other Routes	$2,479,047	$269,150	467,481	$5.30	$4.73

Figure: Eastern Sierra Transit Authority operating statistics

ESTA staff provided the above operating statistics by service type.

The calculated farebox recovery ratio (expressed here as a percentage) using the operating expense and passenger fares are 21% for Intercity, 42% for Interstate, 107% for the Reds Meadow Shuttle and 11% for All Other Routes.

5.1.1.11 Yosemite Area Regional Transportation Authority Short Range Transportation Plan

The Yosemite Area Regional Transportation Authority was formed in 1999 by a joint powers authority agreement between Mariposa, Merced and Mono Counties. The organization was created to provide transit service for visitors and employees into Yosemite National Park from gateway communities. The transit authority began fixed route operation through contract services in 2000.

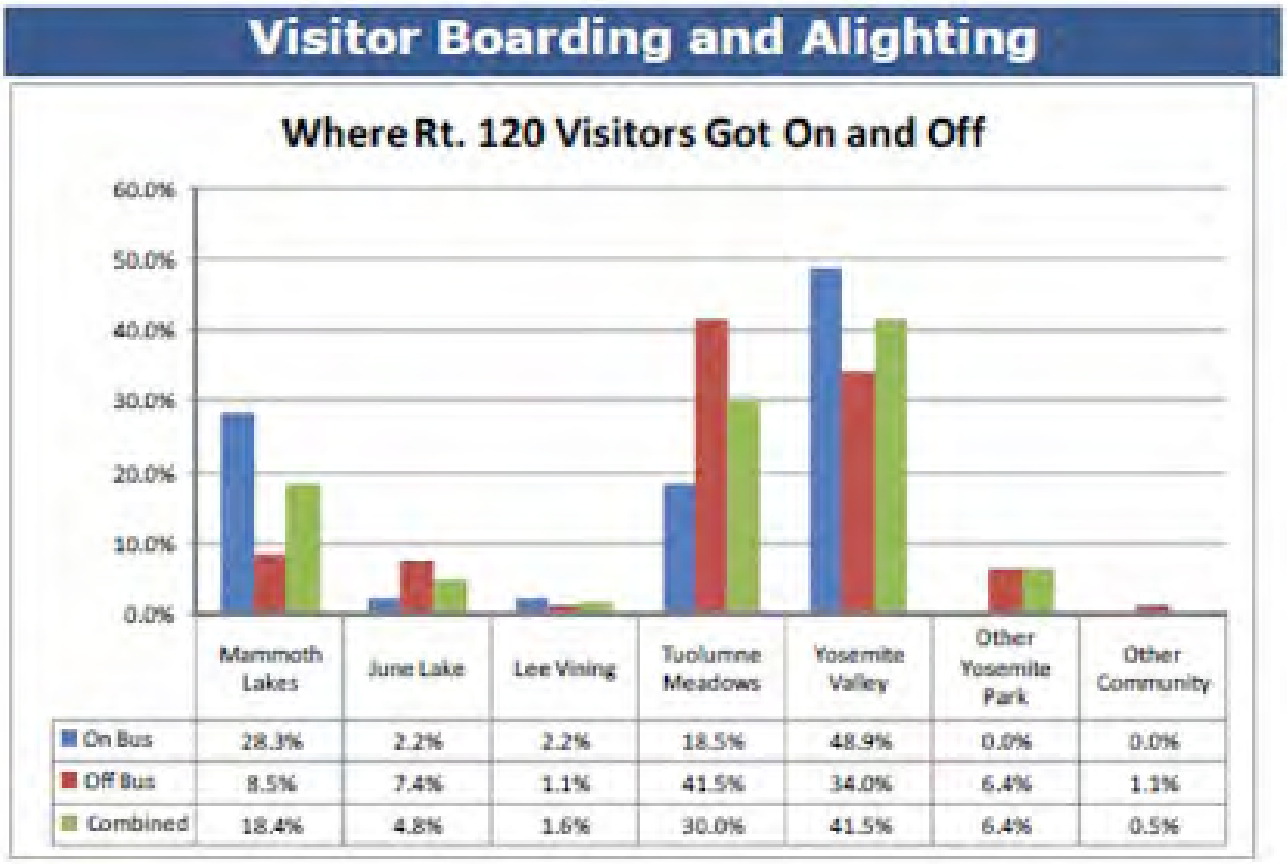
The mission statement for YARTS is:
"YARTS will provide a safe and convenient public transit alternative for access to Yosemite National Park and communities along its service corridors in the Yosemite region, serving visitors, employees and residents in a cost-effective manner. YARTS will achieve high customer satisfaction with reliable service. YARTS will provide good connectively to regional transportation access in the gateway corridors to Yosemite National Park. YARTS service is not intended to replace auto access or trans-Sierra travel, but is intended to provide a viable alternative that offers a positive experience, emphasizing comfort and convenience for riders while guaranteeing access to the Park."

In an effort to achieve its mission, YARTS developed 5 goals.

- *Goal #1: Continue to provide safe and convenient public transportation services to the residents and visitors to Merced, Mariposa and Mono counties, along the Highway 120 and 140 corridors to Yosemite Valley, for employment, recreation, shopping, education and social service trips, so long as service can be provided in a cost-effective manner.*
- *Goal #2: Ensure that all transit programs can be provided at a high quality of service.*
- *Goal #3: Provide an effective level of service in response to demonstrated community and visitor market needs.*
- *Goal #4: Provide YARTS services that are financially sustainable within existing local, state and federal funding programs and regulations in a cost-efficient manner.*
- *Goal #5: YARTS should continue to develop into a regional Yosemite gateway corridor public transit provider if expansion to other gateway corridors can be accomplished without adversely affecting existing YARTS services.*

YARTS provides interregional public transit service across the Sierra Nevada mountain range with its Route 120 service. The route begins it trip in the Eastern Sierra region at the Town of Mammoth Lakes. It then proceeds through the June Lake Loop and on to the Mono Scenic Basin Visitor Center and Lee Vining before traveling west on Tioga Pass (State Route 120) to its final destination, the Yosemite Valley. The fixed route operates on weekends in June and September and expands to daily service during the peak visitation months of July and August.

The YARTS Short Range Transit Plan states that the Route 120 "is predominantly a hiker and backpacker bus." The YARTS 2010 rider survey found that 69% of Route 120 users are camping, primarily in the backcountry or Tuolomne Meadows. Only 14% of riders reported staying in a hotel. One-way trips account for 86% of trips on the YARTS Route 120 service.



	Mammoth Lakes	June Lake	Lee Vining	Tuolumne Meadows	Yosemite Valley	Other Yosemite Park	Other Community
On Bus	28.3%	2.2%	2.2%	18.5%	48.9%	0.0%	0.0%
Off Bus	8.5%	7.4%	1.1%	41.5%	34.0%	6.4%	1.1%
Combined	18.4%	4.8%	1.6%	30.0%	41.5%	6.4%	0.5%

Figure: "Visitor Boarding and Alighting" taken from YARTS Short Range Transit Plan rider survey

The 2010 rider survey found that the majority of ridership activity on Route 120 was within the Yosemite National Park. Forty-three percent (43%) of riders traveled between Tuolomne Meadows and the Yosemite Valley. Bus stop locations within the Inyo National Forest at the Town of Mammoth Lakes, June Lake or Lee Vining, accounted for a combined total of about 24% of all boarding and alighting activity on the route.

RT 120 VISITORS	ON ▼						
OFF ▼	Mammoth Lakes	June Lake	Lee Vining	Tuolumne Meadows	Yosemite Valley	Other	No Answer
Mammoth Lakes				2.0%	6.1%		
June Lake					4.1%		1.0%
Lee Vining			1.0%				
Tuolumne Meadows	6.1%	0.0%	1.0%		28.6%		3.1%
Yosemite Valley	17.3%			14.3%			1.0%
Other	1.0%	1.0%		1.0%	6.1%	1.0%	1.0%
No Answer	2.0%				1.0%		

Figure: Visitor boarding and alighting table by location taken from YARTS Short Range Transit Plan

The table above was taken from the YARTS Short Range Transit Plan. It is a matrix of Route 120 passengers' stated entry and exit stop locations. Percentages for the table total 100% when all cells are combined. The table shows that about 21% of riders (17.3% combined with 6.1%) traveled between the Town of Mammoth Lakes and the Yosemite Valley. About 5% of passengers stated they traveled between June Lake/Lee Vining and locations within the Yosemite National Park.

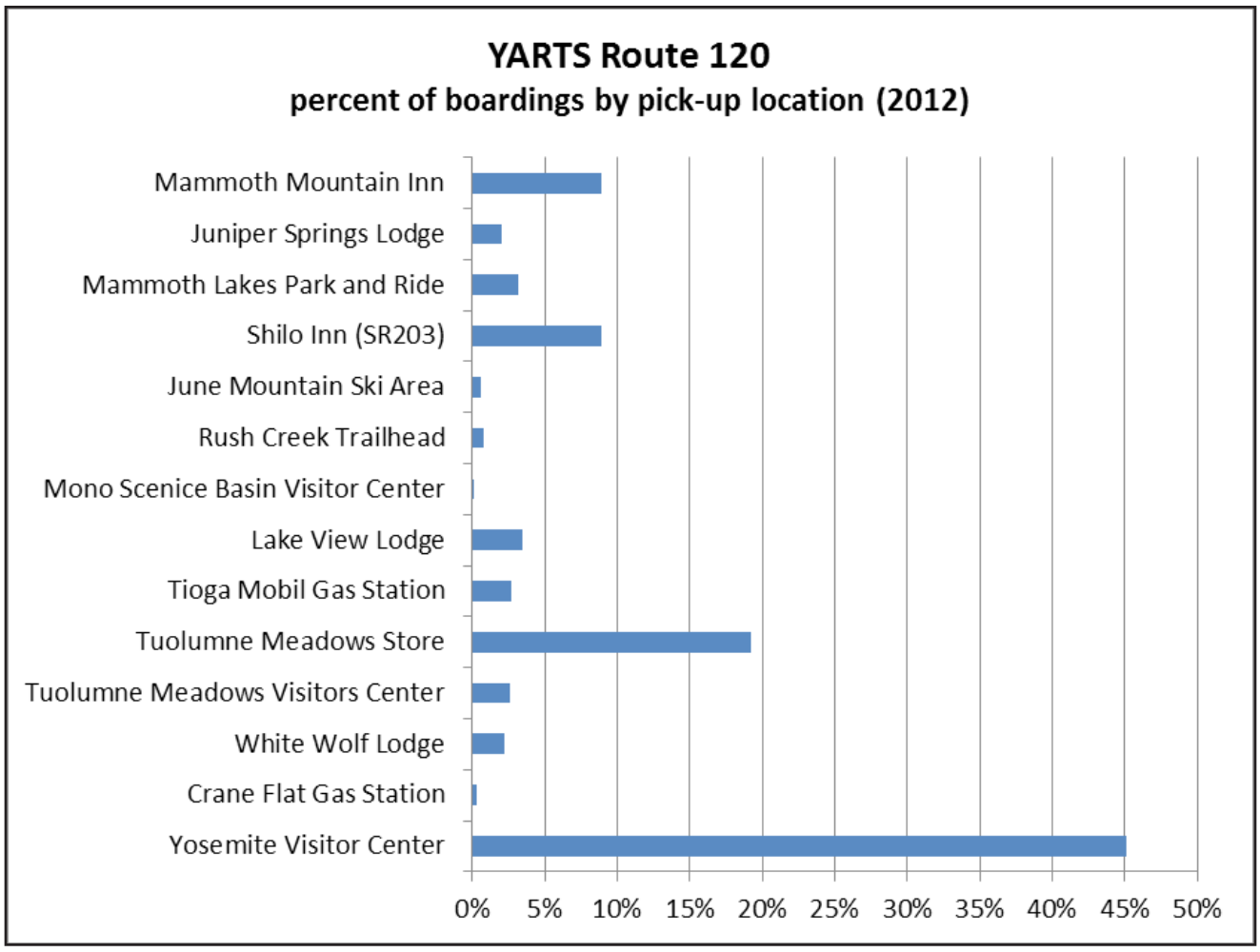


Figure: YARTS Route 120 percent of boardings by pick-up location graph

A review of YARTS monthly ridership reports for the 2012 operating season found that combined ridership from origins within the Eastern Sierra region accounted for 31% of total ridership for Route 120. Locations with the Mammoth Lakes (Mammoth Mountain Inn, Juniper Springs Lodge, Mammoth Lakes Park and Ride and Shilo Inn) accounted for 23%, the June Lake area for 2% and the Lee Vining area for 6% of total Route 120 ridership from the Eastern Sierra region. YARTS does not record passenger disembarkation locations; therefore, it is not possible to know where passengers exited the bus.

YARTS reports that the Mono County resident population has not been captured in Route 120 ridership. County residents traveling to Yosemite National Park for recreational purposes is seen as a potential target audience.

The YARTS Short Range Transit Plan states that stakeholder input indicated there was significant latent demand for transportation service between the Mammoth Lakes and June Lake areas and Tuolumne Meadows. It was noted that the single transit run with an early departure (8:00am) and late

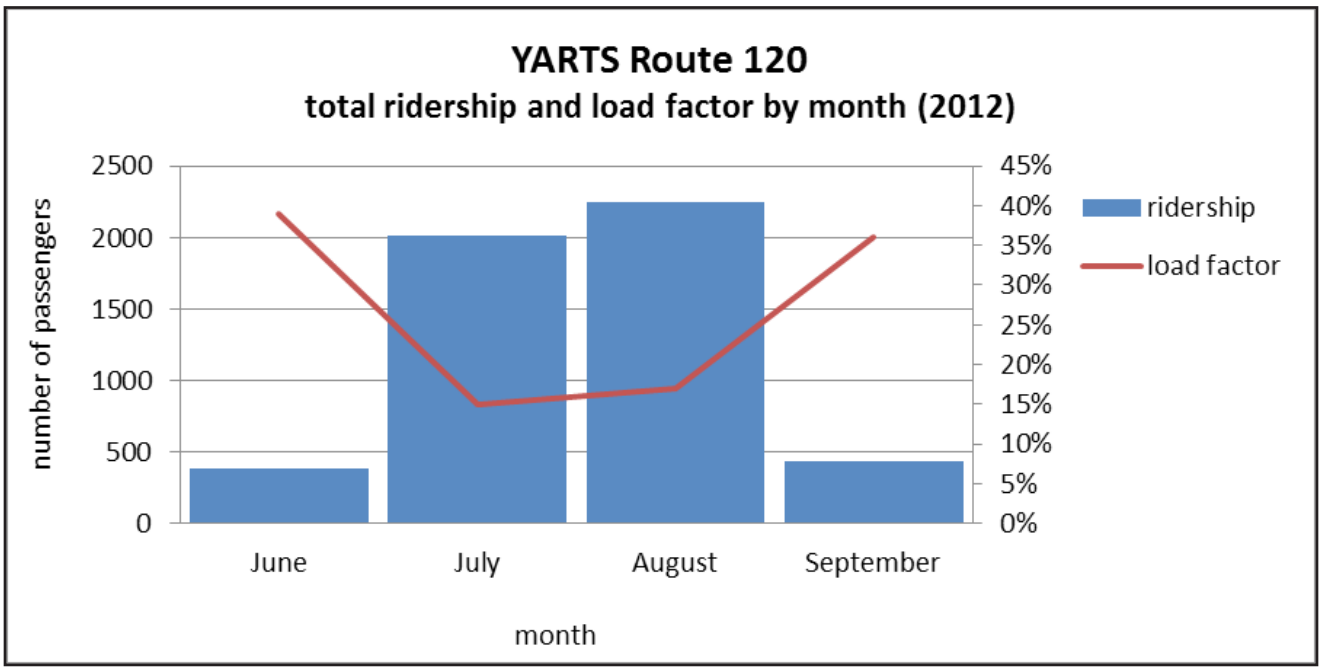


Figure: YARTS Route 120 total ridership and load factor by month graph

return (~9:00pm) was the reason for lack of ridership. Stakeholders stated that a service with multiple trips per day would improve current ridership significantly. The YARTS Short Range Transit Plan anticipates the addition of a mid-day trip between the Town of Mammoth Lakes and Tuolumne Meadows in the FY13/14 operating season. (Note: The proposed truncated mid-day trip was incorporated into portions of the 2012 operating season).

Load factor is a metric used in the transit industry to review the efficiency of transit service. It is calculated by dividing the total number of available seats by the number of occupied seats. Load factor may be calculated for an entire transit system, for an individual route or for an individual trip. There is not necessarily a correlation between the number of routes, runs or level of service provided by a transit agency and the number of passengers: providing more service does not equal more passengers.

Load factor is an important indicator because higher load factors generally translate to more of the operating costs of the service being paid for by passenger fares. There is usually a positive relationship between load factor and farebox recovery, the percent of operating costs supported by passenger fares. As the load factor increase and more seats are filled on a bus, the more of the operating costs are covered by passenger fares.

For YARTS Route 120, increases in service during peak ridership months did not produce a corresponding increase in passengers. As show in the graph above, the load factors for June 2012 (39%) and September 2012 (36%), when service was limited to weekend days only, were twice as high as those in July 2012 (15%) and August 2012 (17%) when daily bus service was available. The additional transit service served more riders albeit with less efficiency.

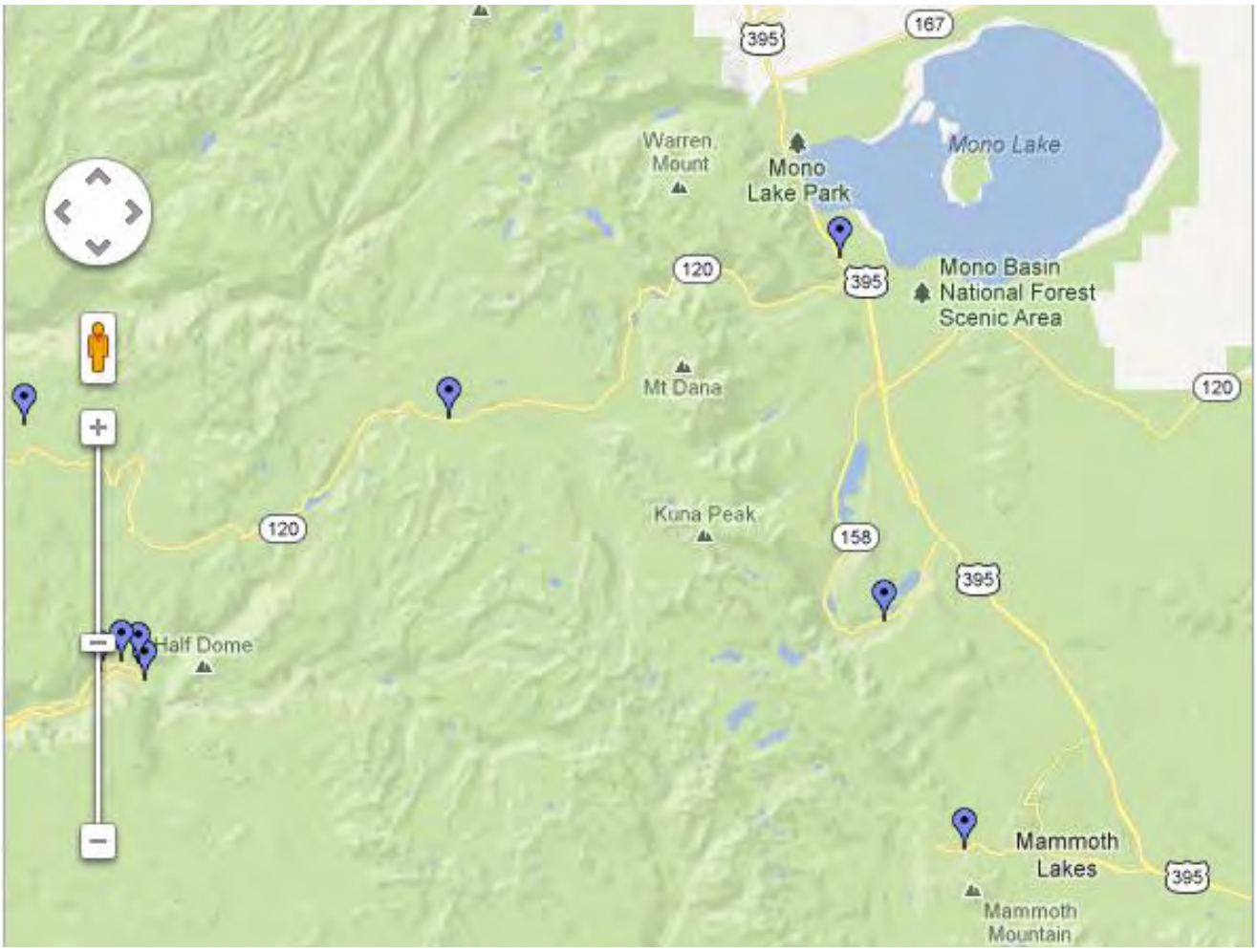


Figure: Amtrak stations in the Eastern Sierra region taken from www.Amtrak.com

YARTS reported a systemwide FY2011-12 farebox recover of 26.3%. In FY2011-12, Route 120 had an annual operating expense of $81,665. Capital costs and operating expenses in excess of 70% were funded from sources outside of passenger fares.

In pursuit of additional funding and ridership, YARTS has cultivated a partnership with the National Railroad Passenger Corporation, Amtrak. YARTS provides thruway bus service for Amtrak from the Town of Mammoth Lakes to the train station in Merced, California. YARTS bus stops in the Eastern Sierra region are listed as Amtrak stations for the Town of Mammoth Lakes, June Lake and Lee Vining. Amtrak passengers may make reservations and purchase tickets to or from these station locations through Amtrak with thruway bus service provided by YARTS. The 2010 YARTS Short Range Transit Plan rider survey found that 20% of Route 120 riders used Amtrak services and routes as part of their trip transportation.

Figure: Caltrans District 9

5.1.2 STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

The Inyo National Forest is included within the State of California Department of Transportation (Caltrans) District 9.

5.1.2.1 Origin and Destination Study 2000

The State of California Department of Transportation (Caltrans) conducts a roadside intercept study every ten years on US Highways 395 and 6 to obtain relevant data about trip movement and travel patterns. Survey locations included the principal arterials of US Highways 395 and 6 and minor arterial feeders into and within Inyo and Mono Counties. The survey period included both winter and summer season dates. The study conducted in 2000 was the third such survey. The 2010 survey results were not available at the time this report was drafted.

The Caltrans survey queried trip purpose and found that almost 55% of people were traveling for recreational reasons. The percent responses for recreational travel were highly dependent on survey location with 87.1% of those surveyed at Tioga Pass (SR 120), an entrance and exit point to Yosemite National Park, sighting recreational purposes while only 22.7% at the Sweetwater survey station near Benton, California stated such. Work was reported as the second highest reason for travel response category with 13.2%.

The main origin of travelers into the Eastern Sierra region was the combined Southern California region which produced 36% of vehicles entering the survey area. The State of Nevada accounted for 24% of respondents. The balance of respondents was fairly evenly divided between the Inyo/Mono County area, northern and central California.

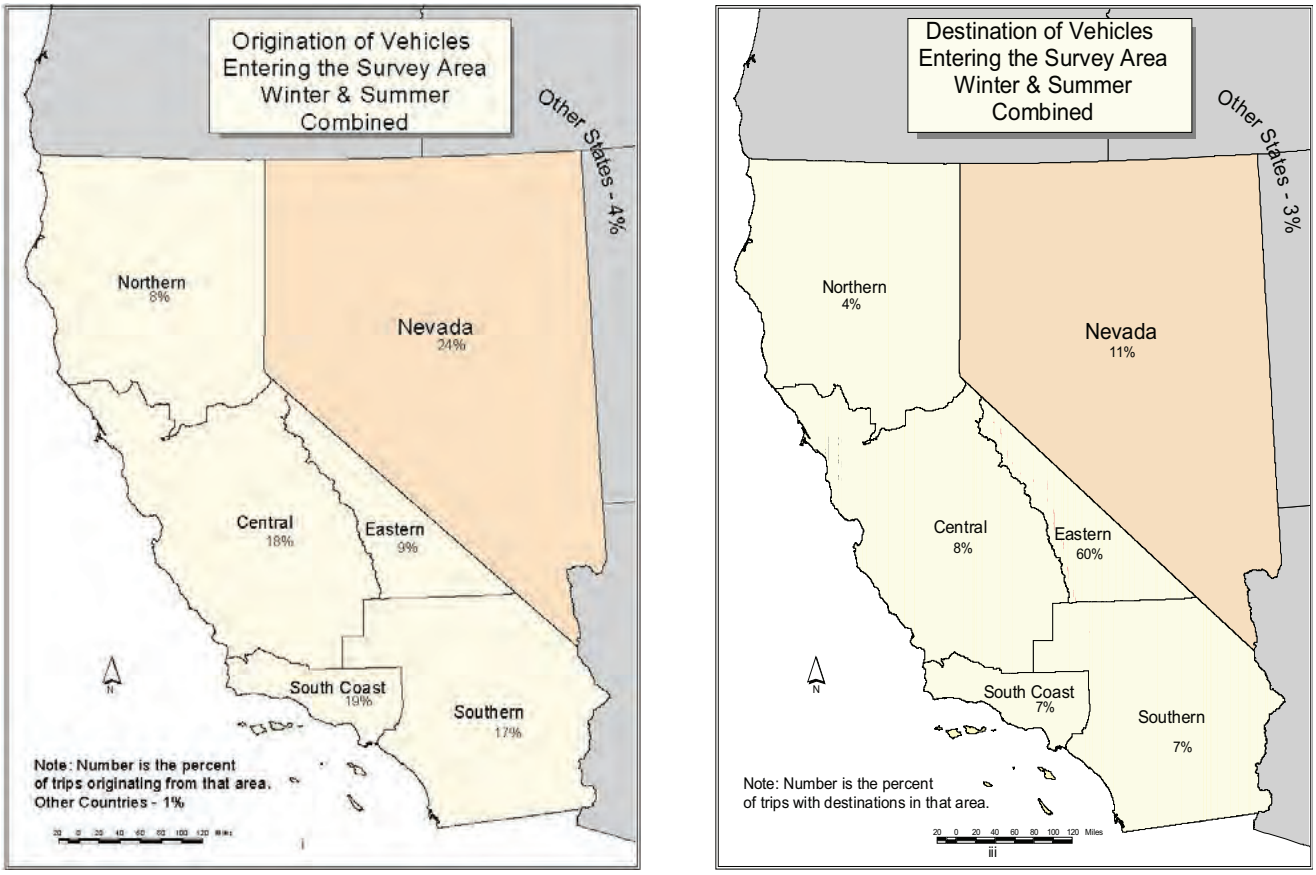


Figure: Origin and destination of vehicles taken from Caltrans 2000 Origin and Destination study

The main destination for travelers staying in the Eastern Sierra region was highly concentrated in the Town of Mammoth Lakes with 41% of respondents giving that final destination. Forty percent (40%) of travelers reported they were driving through the area in route to their final destination. While many travelers may be simply passing through the region, 31% of the respondents stated they "always stop" and 48% stated they "sometimes stop" in small communities.

The average number of passengers per vehicle was 2.18 and the predominant vehicle type was the passenger automobile at 33.5%. Combined with other consumer automobiles; the SUV, 20%; pick-up truck, 17.2%; and van, 10.2%, personal occupancy vehicles accounted for 80.9% of vehicles surveyed. Commercial truck traffic made up 11.5% of vehicular traffic on the US395 corridor.

5.1.2.2 Transportation Concept Reports (TCR)

The State of California Department of Transportation (Caltrans) develops Transportation Concept Reports (TCR) for roadways under the State of California's jurisdiction. The reports describe Caltrans's conceptual improvement options for a given transportation route or corridor over a 20-year planning horizon. The reports identify current and projected travel demand on the facility, identify facility deficiencies in relation to the concept report and identify broad and flexible options to achieve the 20-year concept plan. An objective of a TCR is to facilitate local, regional and state consensus on route or corridor concepts, improvement goals and planning strategies. The TCR is a tool for implementing interregional and statewide continuity within the State of California's transportation network.

Transportation Concept Reports for locations within the scope of this study include US Highway 395, Tioga Pass (State Route 120), June Lake Loop corridor (State Route 158), Minaret Road (State Route 203) leading to Reds Meadow Valley and Lake Sabrina Road (State Route 168) in the Bishop Creek Canyon. These reports were reviewed as part of the secondary data review for this alternative transportation system study. Information contained in TCR reports that is pertinent to study locations is addressed under the applicable site specific sections of this report.

5.1.2.3 State of California Department of Transportation traffic data

The State of California Department of Transportation (Caltrans) has many permanent traffic count stations, on roadways within their jurisdiction, throughout the Eastern Sierra region. General traffic data on the number of vehicles, time of day and direction of traffic flow is collected. Though the traffic counters collect data year round, data was extracted for the May 1st through October 31st primary data collection period targeted in this study. Traffic counter locations used in this report include 948 – Tioga Pass (State Route 120) just east of US Highway 395, 946 – south June Lake Loop (State Route 158), 947 – north June Lake Loop (State Route 158), 959 – West Forest Trail (State Route 203) and 975 – Lake Sabrina Road (State Route 168).

Information gathered from the traffic counters and other area specific secondary data sources was used in combination with primary data collected by Inyo National Forest staff to inform this study.

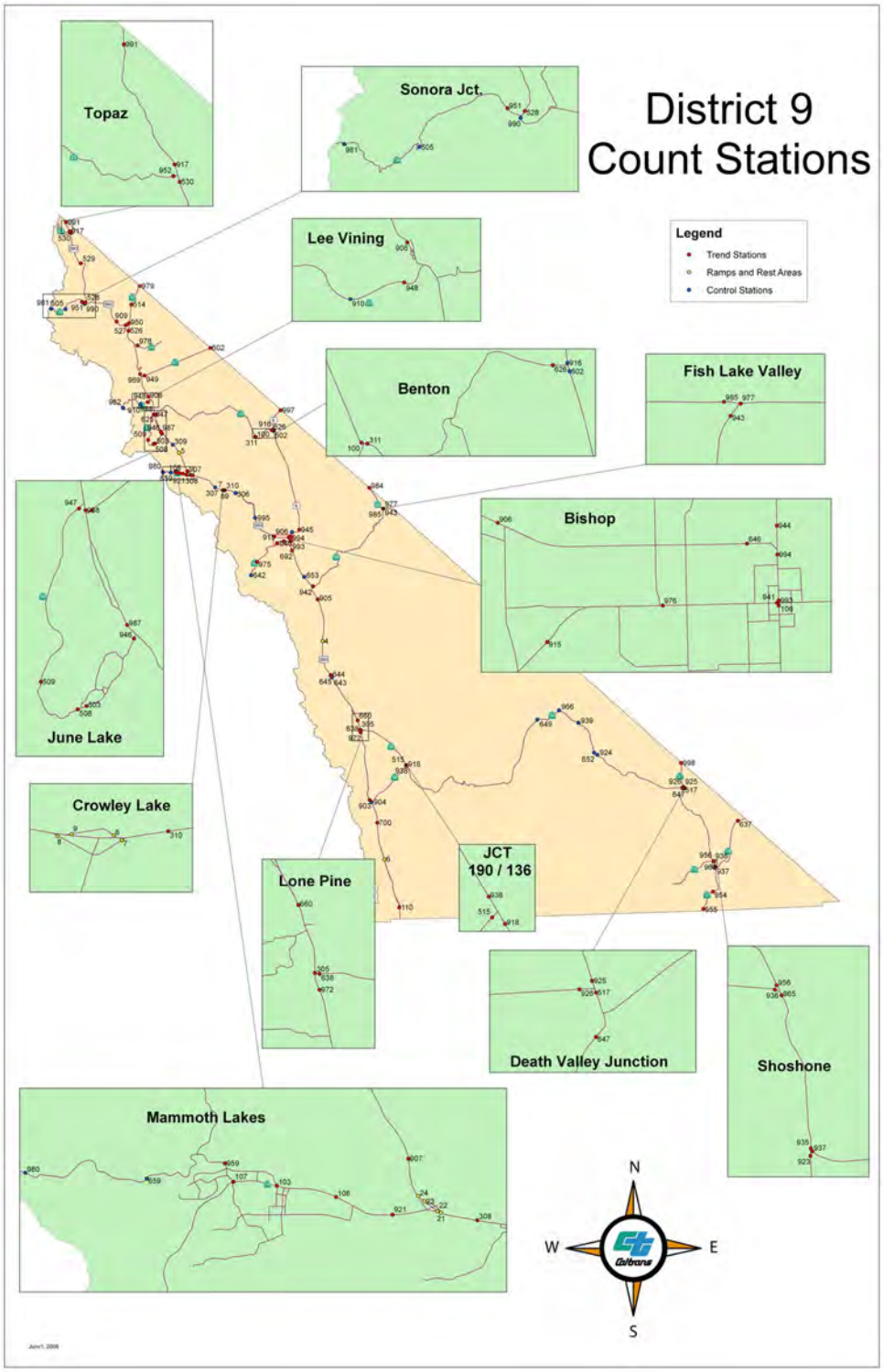


Figure: Caltrans District 9 traffic counter locations map

5.2 PRIMARY DATA COLLECTION AND ANALYSIS

The primary data collection effort for this project included visitor use, trail permits data, parking demand and GPS locations. Primary data on visitor use, vehicular traffic counts and parking lot utilization was collected to ascertain travel patterns and areas of parking and visitor demand. Field data was collected between May 1st and October 31st of 2011. This time period corresponds with trail permits quota restrictions and the peak period demand for trailhead access on the Inyo National Forest. Data and analysis contained in this report are as of 2011.

Data was collected and analyzed temporally for this study. Presentation of a single average number or percentage compiled from the entire data collection period or data set is often presented in this report for simplicity reasons; however, due to significant variations in visitation over time, both monthly and daily, a more detailed review may show significant variations in data. When feasible, richer data is presented by month, day or time of day. Individual study location reports contain more detailed information for that particular study area and specific sites within the location. All raw data is available in Excel spreadsheet format for further analysis.

A comprehensive field data collection calendar was drafted to allow for concurrent collection of visitor use, parking and GPS data. The research team consisted of 6 research assistants over the course of the May 1st through October 31st study period. A research assistant was assigned to collect data at 1 of the 8 study sites throughout the Forest. Dates for data collection were randomly selected and sites were assigned on a rotating basis in an attempt to maintain consistent sample sizes across study areas. Whitney Portal constituted its own independent research study, and therefore, received a larger number of data collection days.

August

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1 June Lake-KY Rock Creek-DL Angela off	2 Whitney Portal-AT Convict Lake-KY	3 Whitney Portal-AT Rock Creek-KY	4 Bishop Creek-KY Angela office	5 Convict Lake-DL Angela office Kristen off	6 Convict Lake-DL	7
8 Whitney Portal-AT Kristen off Seneca off	9 Whitney Portal-AT Rock Creek-KY+SS	10 Bishop Creek- KY+DL+SS	11 Convict Lake-AT+SS June Lake-KY Reds Meadow-DL	12 T June Lake-KY +SS DL - off **Angela's LAST DAY**	13	14 Bishop Creek-DL
15 Kristen off Seneca off	16 Convict Lake-KY June Lake-SS	17 Bishop Creek-KY Rock Creek-SS Whitney Portal-CH	18 Rock Creek-KY Convict Lake-SS	19 Kristen office June Lake-SS Whitney Portal-CH	20 June Lake-DL	21
22 Convict Lake-KY Seneca office	23 Kristen off Rock Creek-SS Whitney Portal-DL	24 Bishop Creek-KY Convict Lake-SS Reds Meadow-DL	25 Kristen office Convcit Lake-SS Whitney Portal-DL	26 T Bishop Creek-KY Seneca off	27 Whitney Portal-CH	28 Rock Creek-DL
29 June Lake-KY Seneca off Whitney Portal-CH	30 Kristen off Seneca off	31 Rock Creek-KY June Lake-SS Whitney Portal-CH	1 Kristen off Convict Lake-SS DL - off	2 Kristen off June Lake-SS DL- off	3	4

Figure: Visitor use and parking survey data collection calendar sample

5.2.1 VISITOR USE DATA

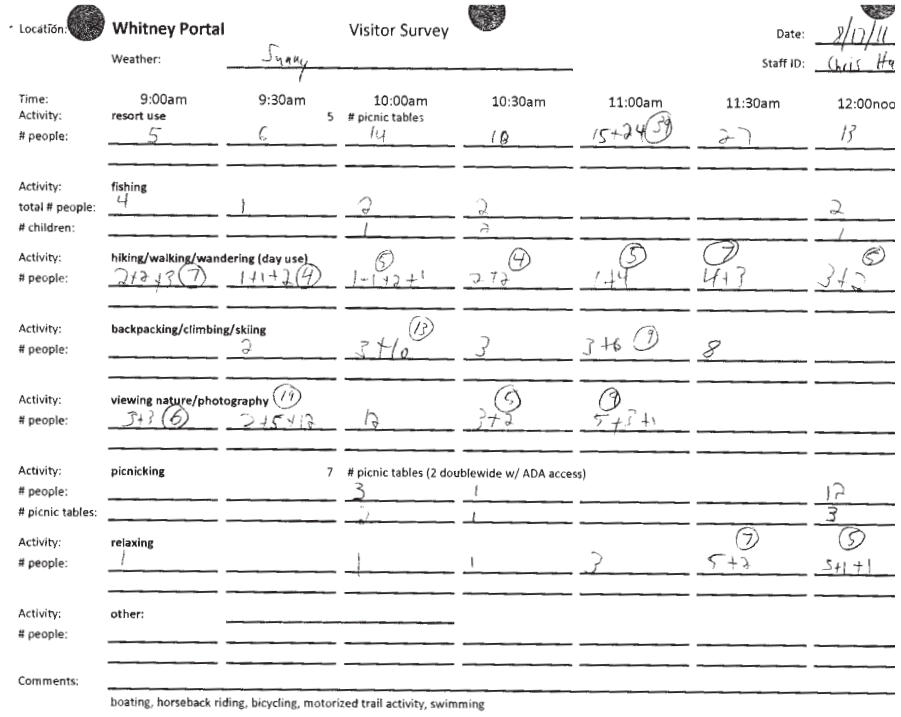
Visitor use data was collected at 2 sites on the Inyo National Forest: Whitney Portal and Convict Lake. The compact nature of these areas allowed for observation and recordation of visitor activities. Data on visitor activity participation was gathered to demonstrate, in general, the type of activities people were engaged in at the two locations with the understanding that some activities may lend themselves to utilization of alternative transportation system modes better than others. For instance, people engaged in an active form of recreation may be more inclined to participate in an active form of transportation. Various activities also have a variety of equipment requirements (e.g. fishing poles, backpacks, coolers) that may need consideration in the provision of transportation services.

Data collection instruments were developed to capture the predominant activities observed within the 2 day-use study areas. A tally sheet format with observations by activity and over time was designed. The list of activities included fishing, hiking/walking/wandering (day-use), backpacking/climbing/skiing, viewing nature/photography, picnicking, relaxing and other. The categories selected were the highest responses from the 2006 NVUM survey results for visitor activities. The "other" category required a written description by the research assistant of the activity observed, such as bicycling or wedding, that was not a typical use and not able to be classified under any of the predefined activities.

Observed visitor uses were recorded on the tally instrument. During each discrete data collection period an individual could be categorized as participating in only one activity, however, over the course of time, from one data collection period to another, a person's activity could change. Therefore, an individual labeled as "fishing" at 11:00am may be categorized as "picnicking" on the 12noon observation if their behavior had changed to that activity.

The length of time data was collected in a day and the number of data collection points per day varied by study location. The time period for data collection was scheduled to coincide with the peak daily visitation periods for each location. Data collection time intervals maximized the number of data collection points given the travel time limitations to the location, around the area and between sites. Visitor use data was collected on foot by walking around the Convict Lake and Whitney Portal day-use recreation and parking areas.

Visitor use data for Convict Lake will be presented in the applicable section of this report. Visitor use data for the Whitney Portal recreation area may be found in the Whitney Portal Alternative Transportation System study. Sample visitor use survey protocols and instruments are available in Appendix E.

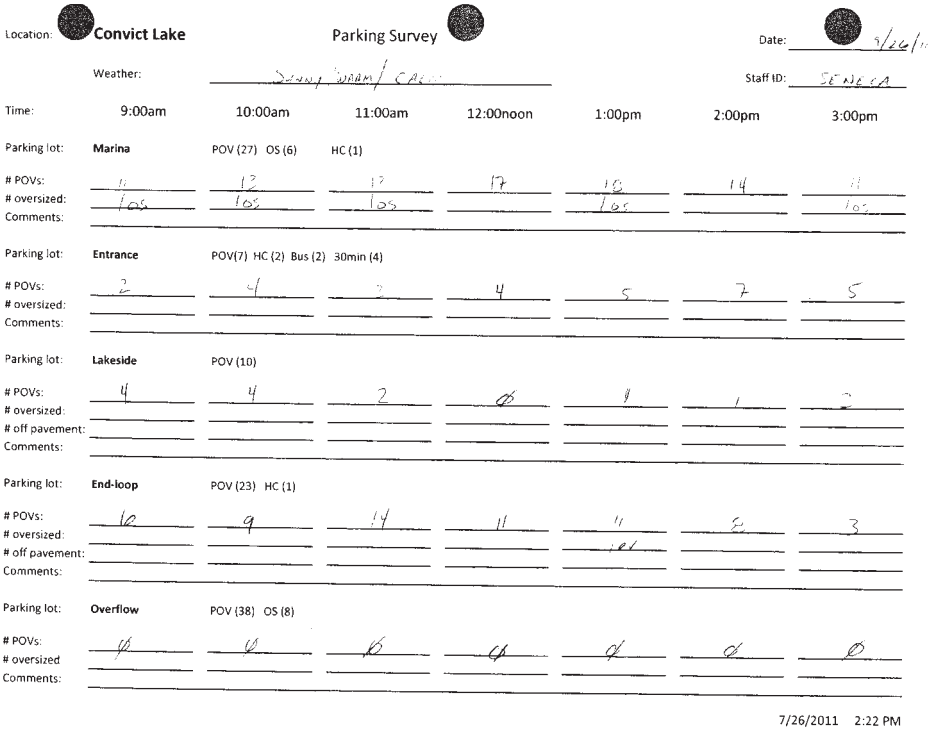


Location: Whitney Portal Visitor Survey Date: 9/17/11
Weather: Sunny Staff ID: Chris Hq

Time:	9:00am	9:30am	10:00am	10:30am	11:00am	11:30am	12:00noo
Activity:	resort use		5 # picnic tables				
# people:	5	6	14	10	15+24(39)	27	13
Activity:	fishing						
total # people:	4	1	2	2			2
# children:			1	2			1
Activity:	hiking/walking/wandering (day use)						
# people:	2+3+3(7)	1+1+2(4)	1+1+2+1(5)	2+2(4)	1+4(5)	4+3(7)	3+2(5)
Activity:	backpacking/climbing/skiing						
# people:		2	3+10(13)	3	3+6(9)	8	
Activity:	viewing nature/photography (14)						
# people:	3+3(6)	2+5+3	2	3+2(5)	5+3+1(9)		
Activity:	picnicking		7 # picnic tables (2 doublewide w/ ADA access)				
# people:			3	1			12
# picnic tables:			2	1			3
Activity:	relaxing						
# people:	1		1	1	2	5+2(7)	5+1+1(5)
Activity:	other:						
# people:							

Comments: boating, horseback riding, bicycling, motorized trail activity, swimming

Figure: Visitor use survey data collection instrument sample form



Location: Convict Lake Parking Survey Date: 9/26/11
Weather: Sunny, Warm/ Cas... Staff ID: Seneca

Time:	9:00am	10:00am	11:00am	12:00noon	1:00pm	2:00pm	3:00pm
Parking lot:	Marina	POV (27) OS (6)	HC (1)				
# POVs:	11	12	12	17	16	14	11
# oversized:	1os	1os	1os		1os		1os
Comments:							
Parking lot:	Entrance	POV(7) HC (2) Bus (2) 30min (4)					
# POVs:	2	4	2	4	5	7	5
# oversized:							
Comments:							
Parking lot:	Lakeside	POV (10)					
# POVs:	4	4	2	0	1	1	2
# oversized:							
# off pavement:							
Comments:							
Parking lot:	End-loop	POV (23) HC (1)					
# POVs:	16	9	14	11	11	2	3
# oversized:					1ev		
# off pavement:							
Comments:							
Parking lot:	Overflow	POV (38) OS (8)					
# POVs:	0	0	0	0	0	0	0
# oversized							
Comments:							

7/26/2011 2:22 PM

Figure: Parking survey data collection instrument sample form

5.2.2 PARKING DATA

Parking data was collected to determine where and when demand for parking existed. Demand for parking is used as an indicator of demand for access to an area by Inyo National Forest visitors. Formal parking areas, as well as, informal user created and roadside parking areas were inventoried and counted. Roadside parking is permitted along most roadways serving the Inyo National Forest. It provides overflow parking to congested parking lots in high demand areas and competition to parking lots in areas where it may be more convenient to park along the roadway than in the improved parking lot.

A site specific parking data collection instrument was developed for each study area. Data collection procedures included driving route maps to ensure consistency in collection procedures between research assistants. Again, data collection time intervals maximized the number of data collection points given the travel time limitations to the location, around the area and between sites.

Seasonal average parking lot occupancy rates were calculated for each paved parking lot within the study areas. This single number represents the overall average occupancy for the study period of May 1st through October 31st. Caution must be used when interpreting this number as significant variations in parking lot occupancy may exist over time by month or time of day.

To provide a contrast, the peak month average occupancy rate is offered. There is often a great disparity between the average and the peak month parking occupancy rates for an individual parking lot. The peak parking month is the month in which the highest parking occupancy rate was observed. Parking occupancy rates differ significantly between study area, by parking lot and over time within the same location. Parking data and analysis for each study location will be presented in the applicable site specific section of this report.

Sample parking survey protocols and instruments are available in Appendix E.

Inyo National Forest
parking lot occupancy by location

study area	parking area	seasonal average	peak	peak month
June Lake				
	Kiosk	19%	27%	July
	June Lake Beach 1	15%	29%	July-August
	June Lake Beach 2	12%	24%	July
	Overlook	3%	6%	June
	Silver Lake Parking	8%	9%	July
	Silver Lake Boat Launch	31%	36%	July
	Rush Creek Trailhead	43%	79%	August
	Aerie Crag Day-use	4%	5%	June-July
	Grant Lake (paved)	5%	8%	July
Convict Lake				
	Marina	78%	84%	July
	Entrance	44%	62%	July
	Lakeside	60%	83%	July
	End-loop	73%	96%	July
	Overflow	9%	16%	July
	Trailhead	4%	6%	August
Hot Creek				
	Main Paved	7%	9%	August
Rock Creek				
	Mosquito Flat	54%	81%	August
	Hilton Lakes/Davis Lake Trailhea	22%	68%	August
	Rock Creek Group	21%	25%	August
	Rock Creek Lake Campground	35%	56%	July
	Pine Grove Day-use	15%	17%	August
	East Fork Public Parking	3%	4%	August-September
Bishop Creek				
	SL Trailhead Overnight	69%	95%	August
	SL Trailhead Upper Day-use	49%	84%	August
	SL Trailhead Lower Day-use	34%	47%	July
	SL Dam/Boat Launch	51%	78%	August
	SL Weir Lake	32%	43%	July
	SL Roadside 1	16%	56%	June
	SL La Hupp Picnic Area	10%	17%	June
	SL Roadside 2	7%	13%	June
	SL Summer Resident	21%	42%	July
	Sabrina Pinwheel	20%	25%	August
	Sabrina Marina	64%	76%	August

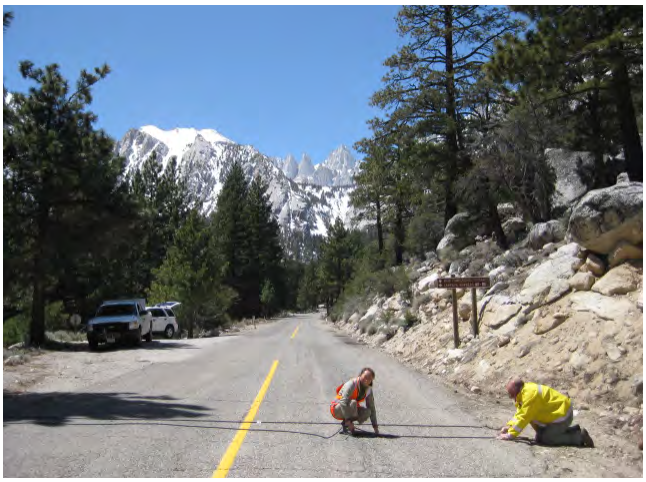
Figure: Inyo National Forest parking area occupancy rates

No review of the design or provision of parking spaces, travel routes or facilities was tested for compliance with accessibility laws and regulations. Accessibility designated or marked parking spaces were identified and inventoried only to show location and utilization of such spaces. Numerous federal laws and US Forest Service specific guidelines and standards dictate the rules and regulations governing the provision of accessible facilities and services.

5.2.3 TRAFFIC DATA

Traffic data was collected to determine level of vehicular traffic and directional peak period vehicular demand. In addition to the raw traffic data supplied by Caltrans for state roads, traffic counts were conducted by the Inyo National Forest staff members. Five (5) MetroCounts 5600 Vehicle Classifier System units were moved between data collection sites based on a randomly assigned data collection schedule. The MetroCounts equipment provides data rich with information including traffic volume, time of day, speed, vehicle classification and gap.

Figure: Traffic count equipment with study contact information and notice attached



Figures: Inyo National Forest traffic counter equipment installation by staff members

Traffic and Visitor Use Data Collection Schedule

Location		Date																												
		July																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Reds Meadow Valley																														
	Minaret Vista Station	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	north of Upper Soda Springs																															
Convict Lake																														
	CR07	x	x	x	x	x	x							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Rock Creek																														
	Rock Creek Road	x	x	x	x	x	x	x	x	x	x	x	x	x								x	x	x	x	x	x	x	x	x	x	x
Bishop Creek																														
	SR168							x	x	x	x	x	x	x	x	x	x	x	x	x	x											
	South Lake Road							x	x	x	x	x	x	x	x	x	x	x	x	x	x											
Whitney Portal																														
	Whitney Portal Road	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	west of group campground	x	x	x	x	x	x															x	x	x	x	x	x	x	x	x	x	x

Traffic counter movement

Date **July 6-7**
remove: Convict Lake, Whitney Portal
install: Bishop Creek (2)

Date **July 14**
remove: Rock Creek
install: Convict Lake

Date **July 20-21**
remove: Bishop Creek
install: Rock Creek, Whitney Portal-Campground

15 weekend
site visit
counter remove
counter install
parking study date

Figure: Traffic counter data collection calendar sample

A detailed traffic counter equipment installation and retrieval schedule controlled the movement of traffic counters between the 8 data collection locations. Research staff was charged with installing the traffic counter equipment in the roadway, retrieving the data off the units and performing necessary maintenance on the equipment. Traffic counters were installed for the duration of the study period at the Reds Meadow Minaret Vista Entrance Station and on Whitney Portal Road.

Seasonal average daily traffic (ADT) counts by location were compiled for the study areas associated with this report. The data for state roads comes from raw vehicle count data supplied by Caltrans. Vehicle counts for the May 1st through October 31st, 2011 period were extracted to provide consistency between Caltrans and Inyo National Forest data sets. Traffic count data was collected by the Inyo National Forest staff at 6 primary locations on the Forest.

Distilling vehicle traffic down to a single number allows for a broad overview of level of automobile activity by location. Roadways with larger ADT numbers have a higher number of cars traveling on them. The ADT for specific locations on the forest may indicate travel demand to those locations.

Traffic data for each location will be presented in the applicable site specific section of this report.

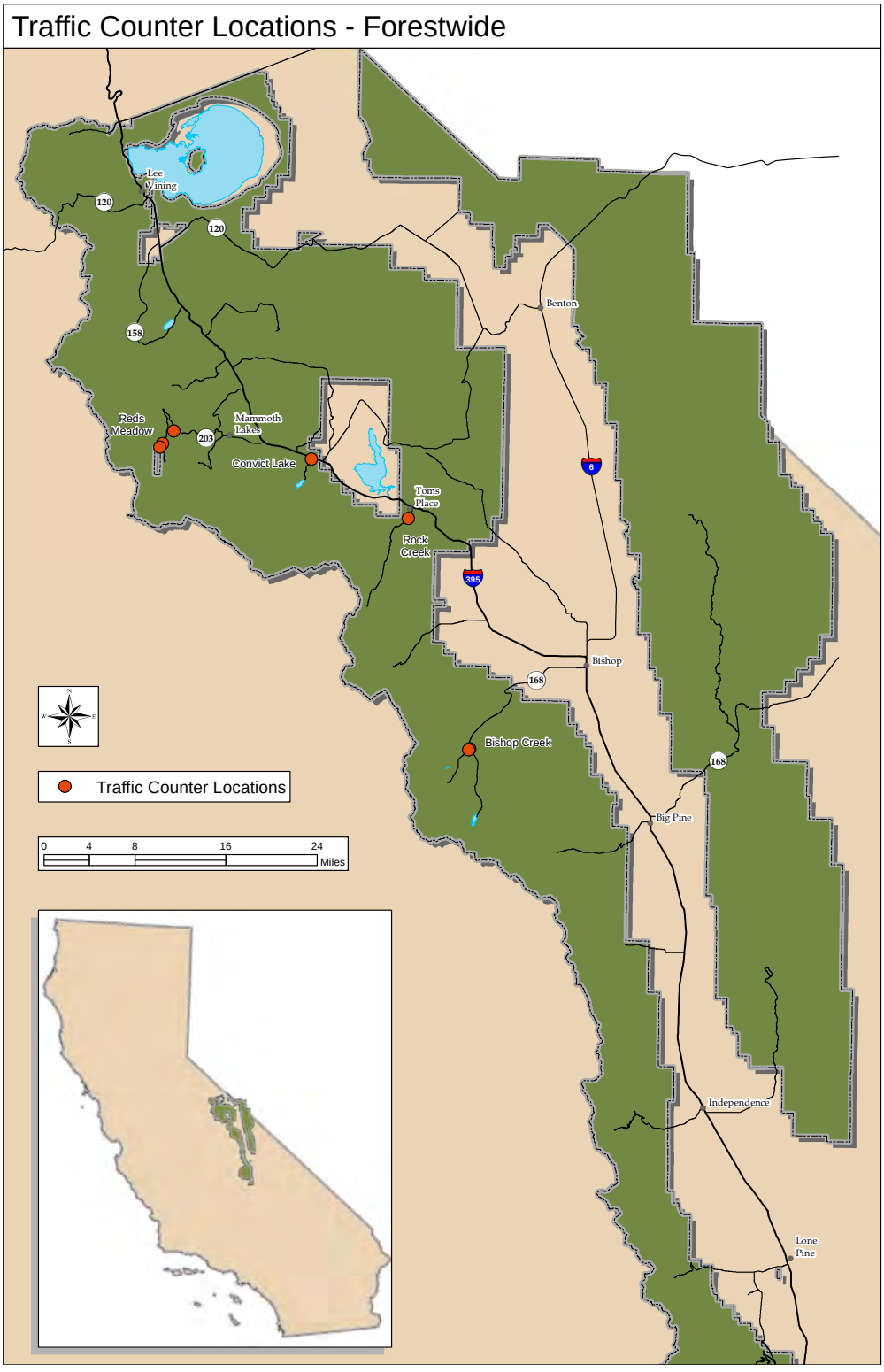


Figure: Inyo National Forest traffic counter locations forestwide map

Inyo National Forest traffic data collection dates			
Rock Creek	May 25	-	July 13
	July 21	-	August 1
	August 18	-	October 11
	October 21	-	October 31
Bishop Creek	May 3	-	May 24
	June 8	-	June 24
	July 7	-	July 20
	August 10	-	August 17
	September 13	-	September 21
	October 12	-	October 20
Convict Lake	May 4	-	June 8
	June 24	-	July 6
	July 13	-	August 11
	August 18	-	September 12
	September 22	-	October 31
Reds Meadow	June 24	-	October 31

Figure: Inyo National Forest traffic data collection dates by location

Inyo National Forest seasonal average daily traffic by location	
location	seasonal ADT*
Tioga Pass (SR120/US395)	2146
Tioga Pass - NPS Entrance (SR120)	2604
June Lake Junction (SR158/US395)	1916
June Lake Road - North (SR158/US395)	697
Minaret Road (SR203)	3635
Reds Meadow Valley Road	485
Convict Lake Road	663
Rock Creek Lake Road	630
Bishop Creek - Lake Sabrina Road (SR168)	955
Bishop Creek - Aspendell	232
Bishop Creek - South Lake Road	179
Whitney Portal Road	372
*Seasonal ADT: Data collected on various dates between May-October 2011 only	

Figure: Inyo National Forest average daily traffic (ADT) at study locations

5.2.4 TRAIL PERMITS DATA

Trail permits data was mined to access demand at entrance and exit points, length of Wilderness stay and party size. Trail permits data for the Inyo National Forest spanned the years 2006 through 2010 for the trail permit quota period May 1st through October 31st. Yosemite and Sequoia and Kings Canyon National Parks supplied data relevant to the Inyo National Forest for the same time period. Trail specific permit data for quota restricted trailheads will be presented in the applicable site specific section of this report.

Issued Wilderness trail permits were compiled by trailhead location for the May 1st through October 31st study period for the years 2006 to 2010 to determine areas of Wilderness permit demand. See graph on next page.

Wilderness trail permits data was gleaned for the study areas within this report. Individual quota restricted trailheads located within a study area were compiled into a basin total. Combined with the Whitney Portal basin, the subject of a companion alternative transportation system study, the trailheads included in this report account for over 70% of issued Wilderness trail permits on the Inyo National Forest. The percent of issued trail permits for locations within this report are shown graphically on the map on page 75.

The primary data analyses for traffic counts, parking lot occupancy, visitor use and issued trail permits is further refined within the applicable site specific sections of this report. A greater level of detail is provided where data allowed.

Inyo National Forest
issued trail permits for
trail permit quota periods (2006-2010)

basin	% of total
Whitney Portal	**32%**
Bishop Creek	15%
Reds Meadow	12%
Rock Creek	6%
June Lake	3%
Lakes Basin	3%
Convict Lake	1%
Other locations	28%
Total	100%

Figure: Inyo National Forest trail permits distribution by study areas

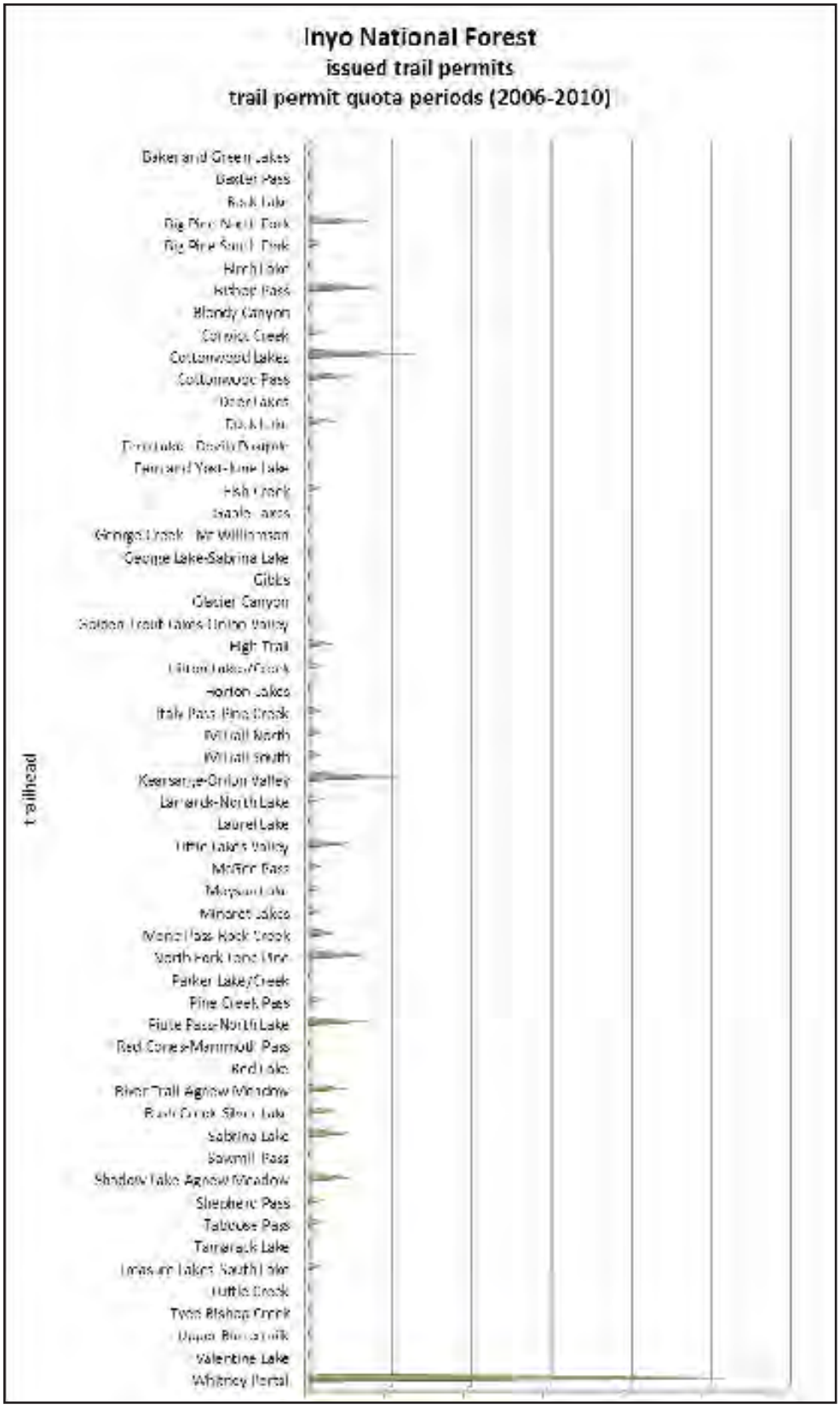


Figure: Inyo National Forest Wilderness trail permits distribution by trail graph

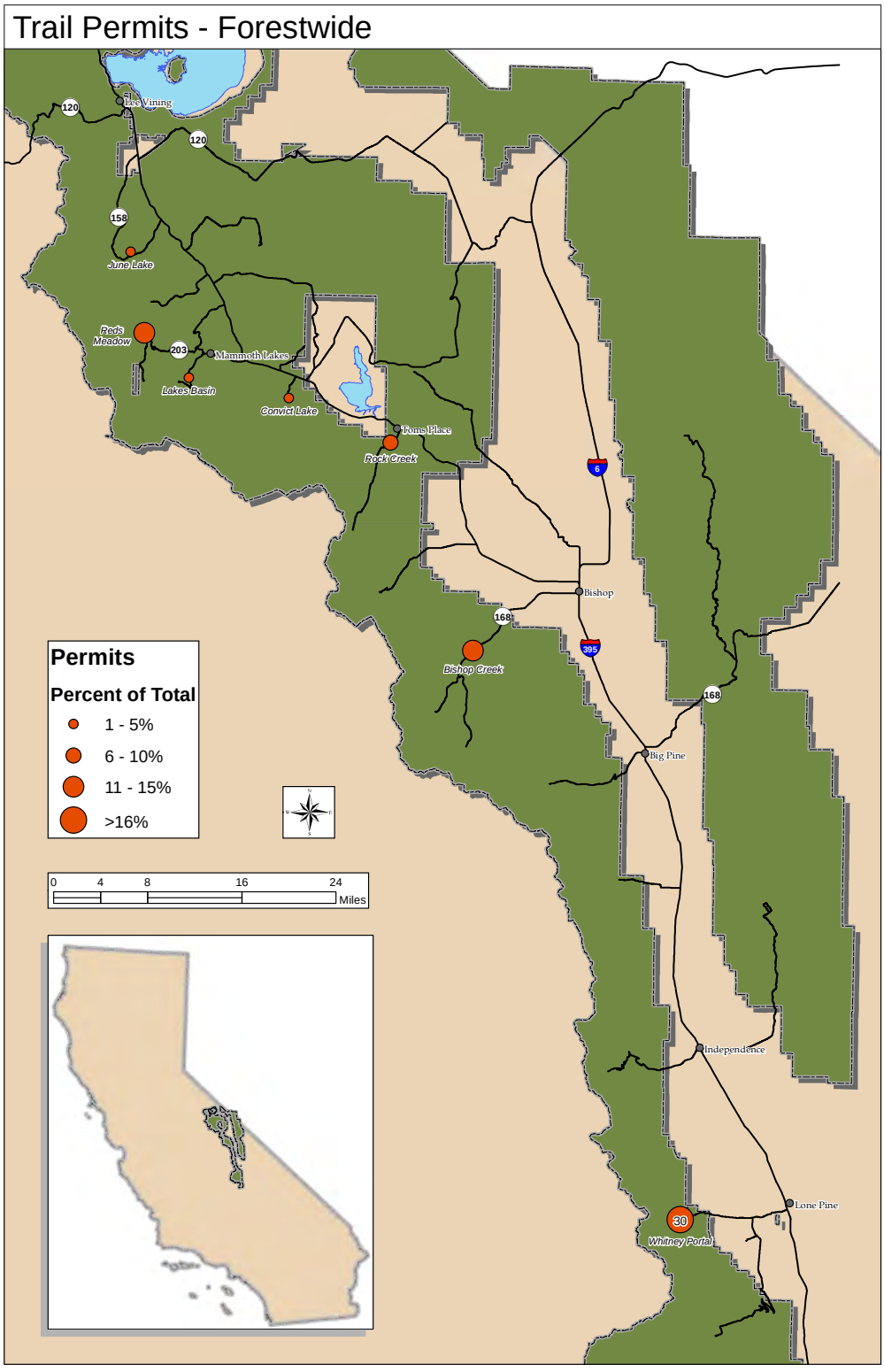


Figure: Inyo National Forest trail permits issued by location intensity map

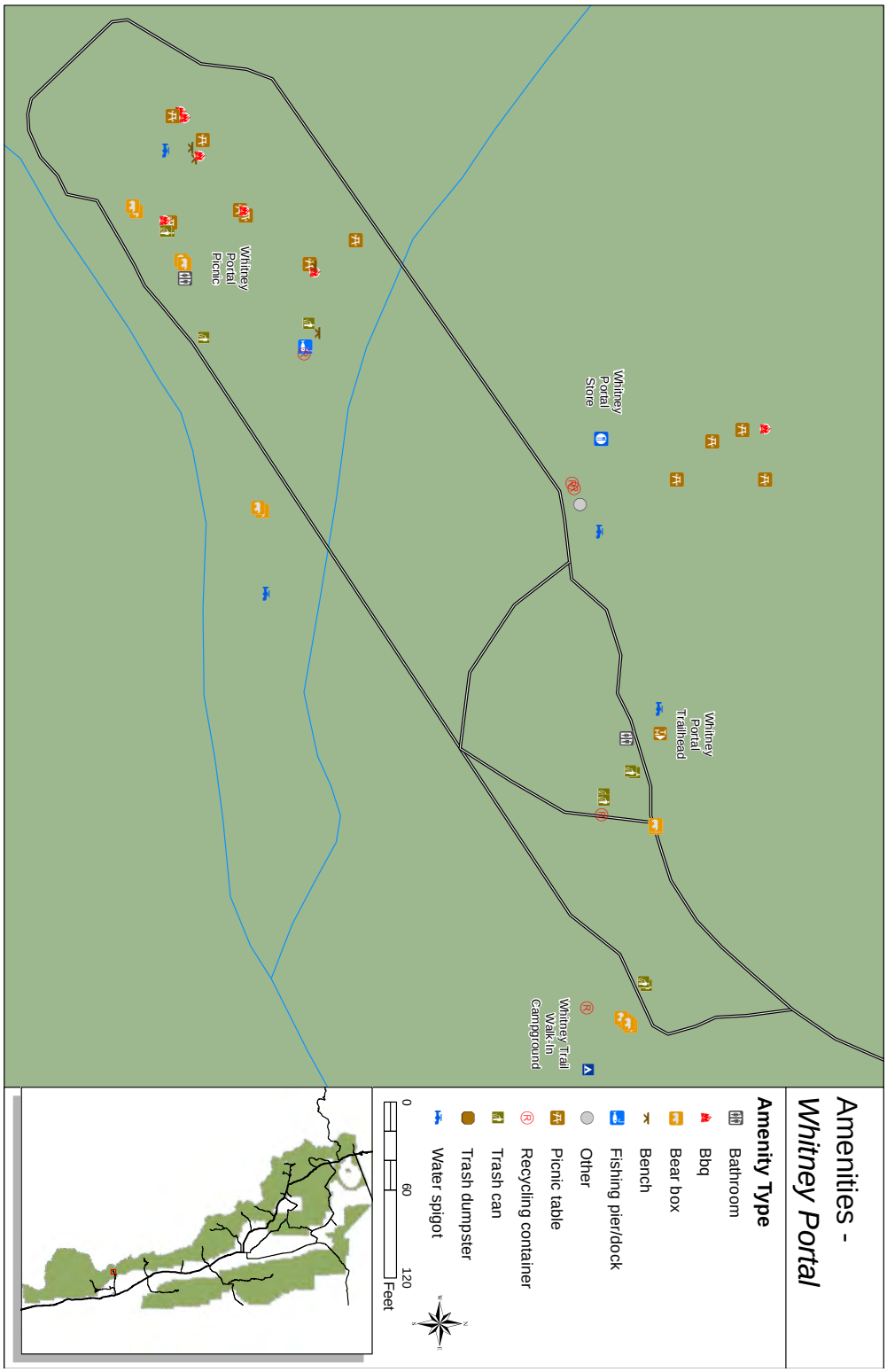


Figure: GPS data collection illustration

5.2.5 GPS DATA

A comprehensive GPS data collection effort inventoried signage, amenities (e.g. bathrooms, picnic/bbq areas, etc.) and user created parking areas at each of the study locations. The data provides a baseline record for the location of existing infrastructure improvements. GPS data may be used in site specific sections of this report for illustrative purposes.

Secondary and primary data collection efforts for this study were a group effort. Partner agencies facilitated the compilation of a transportation studies and reports reference list by providing applicable material. The State of California Department of Transportation supplied GPS equipment and detailed vehicle traffic data. Forest Service staff was assembled from a variety of departments to participate in interdisciplinary team reviews and to actively collect primary data. All raw data and data analysis produced for this report were shared widely with partner agencies and interested parties in an effort to disseminated information and knowledge to the greatest extent possible.

NOTE ABOUT DATA

Data for visitor use, parking and Forest Service traffic data was collected through a convenience sample. The data collection effort was limited by the personnel and equipment resources available to the project team, and therefore, data was collected on dates and at locations most advantageous to the study goals and objectives. The data collected at each location is site specific and cannot be extrapolated to the entire forest or to other sites throughout the forest. Using the data analysis to make inferences beyond the convenience sample should be done with care. The purpose of the primary data collection was to provide an overview of visitor use and demand and to demonstrate areas for further in-depth research.

11.1 EXECUTIVE SUMMARY

Improvements to the transportation system, including efficient use of existing facilities and additions to alternative transportation routes may improve access to and mobility within the Rock Creek Canyon area.

Travel by personal vehicle is the predominant means of transportation to the Rock Creek area. A comprehensive vehicular transportation network of paved roadways and strategically located parking areas near visitor attractions makes travel by automobile convenient. During peak visitation periods competition between users for parking may constrain access to a popular location in the Rock Creek area.

In the summer season high visitation creates congested parking lots in the Mosquito Flat area when parking demand exceeds the number of paved parking spaces. In lieu of utilizing the designated dirt overflow parking lot some visitors choose to park off pavement or along the roadside closer to the trailhead. Based solely on parking demand, transportation services to the Mosquito Flat area may be warranted.

Discontinuous alternative transportation routes may make travel by foot, bicycle or public transit difficult within the Rock Creek recreation area. A lack of dedicated pedestrian paths and missing trail segments between generators and attractors of foot traffic may make walking a challenge. The absence of on or off road bicycle facilities may limit the opportunities for travel by bicycle. And though public transportation service is available to the Rock Creek area it is not available to the recreation opportunities within it. Trail and transportation service enhancements may improve visitor access for a larger number of people.

PEDESTRIAN

Strengths

- Existing designated pedestrian trail network within basin
- Back country pack operations use and maintain parts of trail system
- Reduced speed limits in areas with mixed traffic sharing roadways

Challenges

- Road is occasionally the only path from parking area to trailhead or to visitor attractions

Opportunities

- Develop a pedestrian wayfinding signage master plan
- Install “Share the Road” signage on roadways with mixed traffic
- Install pedestrian wayfinding signage
- Construct missing segment of intra-canyon trail

BICYCLE

Strengths

- Recreational bicycle use of area roadways
- Canyon area accessible from neighboring residential communities
- ESTA transit route to Toms Place provides bicycle transportation on transit vehicles

Challenges

- Lack of bicycle lanes on Rock Creek Road
- Lack of bicycle route designation on Rock Creek Road
- Slow moving bicycle traffic in uphill/ inbound travel lanes

Opportunities

- Install bicycle parking facilities at visitor destinations
- Potential for travel by mountain bicycle on intra-canyon trail
- Bicycle lane proposed on inbound lane of Rock Creek Road in Federal Lands Access Program project
- Installation of MUTCD compliant “Bicycles may use full lane” signage on Rock Creek Road

AUTOMOBILE

Strengths

- No time limitations or restriction on parking at Mosquito Flat Trailhead area
- Parking sited throughout the area in key locations
- Roadside parking permitted on most roadways

Challenges

- High speed traffic on Rock Creek Road
- Lack of parking enforcement

Opportunities

- Speed limits conducive to mixed traffic on secondary roadways
- Gateway feature at entrance to Mosquito Flat single lane roadway and Rock Creek Lake campground area
- Redesign Rock Creek Lake Campground entrance road into a single lane, mixed traffic roadway
- Parking restrictions clearly denoted in signage and on wheelstops
- Install parking barriers, “no parking” signage or red curbing on Mosquito Flat single lane roadway
- Parking enforcement

PUBLIC OR PRIVATE TRANSPORTATION SERVICES

Strengths

- Multiple origins and destination within basin area
- Forest Service permit holders with sizeable operations within basin
- Weekday public transit service to Toms Place
- Forest Service permit holder(Rock Creek Lodge) provides seasonal winter transportation service

Challenges

- Potentially significant project funding costs for addition of public transit service
- Vehicle size and weight restriction on single lane roadway to Mosquito Flat area

Opportunities

- Encourage and support private shuttle operations
- Fund public transit service to destinations within the area

11.2 INTRODUCTION

The Rock Creek recreation area is located equidistance from the City of Bishop and the Town of Mammoth Lakes in the Eastern Sierra region of California. The narrow canyon is a popular visitor destination on the Inyo National Forest. The area supports a multitude of recreational opportunities for visitors.

The Rock Creek canyon has many attractions that entice a wide range of visitors. Relatively easy access on improved trails for day or overnight backcountry hiking trips is available in a number of locations. Rock Creek Lake supports fishing from the shoreline or private or rental boat launched at the public boat ramp. Camping facilities dot the landscape along the length of Rock Creek Road. Two (2) private lodges operate under permits from the Inyo National Forest and offer overnight accommodations and dining services to visitors in the Rock Creek area.

The Rock Creek recreation area is accessed by a single road that leads from US Highway 395 to its terminus at Mosquito Flat. Most visitor destinations such as the lake, trailheads and overnight accommodations are located off Rock Creek Road and accessed via entrance roads.

The Mosquito Flat area lies at the end of Rock Creek Road. The location supports trailheads for 2 Wilderness hiking trails, a walk-in campground and a picnic area. Day hiking is popular at this location where improved trails provide immediate access to the scenic backcountry. The Mosquito Flat area experiences high levels of visitation in peak summer months.

11.3 PREVIOUS INYO NATIONAL FOREST TRANSPORTATION PLANNING

The Transit in Parks (TRIP) program grant application that funded this alternative transportation system study noted that this project would review areas of interest specified in previous transit reviews. The 2004 Field Report – Eastern Sierra Expanded Transit System (ESETS) recognized the Rock Creek area as a location in need of public transit service. The Interagency Technical Assistance Group (TAG) report provides no specific direction in regards to the Rock Creek area and suggests review of recreational shuttle service to popular trailheads and recreation areas where parking demand exceeds capacity.

The TRIP grant application noted a number of specific linkages located on the Inyo National Forest that would be analyzed in this project. Mammoth Lakes to Rock Creek was identified as a priority linkage in the grant application. The grant application stated:
"In addition to regional service areas, there are a number of very specific linkages located on the Inyo National Forest that will be analyzed as part of this effort:

- *Service extensions from Mammoth Lakes to Hot Creek / Convict Lake / Rock Creek"*

11.3.1 2004 FIELD REPORT – EASTERN SIERRA EXPANDED TRANSIT SYSTEM (ESETS)

In 2004 a team of Federal Highway Administration and Federal Transit Administration personnel conducted a review of the transit system in the Eastern Sierra region focusing on access to the Inyo National Forest. The 2004 Field Report: Eastern Sierra Expanded Transit System (ESETS) conducted a transit service only alternative transportation feasibility study for the area along the US Highway 395 corridor stretching between Reno, Nevada, in the north, to Ridgecrest, California, in the south. The Field Report proposed a Recreation Area Shuttle service to the Rock Creek recreation area. The Field Report noted that recreation shuttles are *"to meet the needs of recreational users (residents, visitors, wilderness)."*

The Field Report gives *"resource protection/ lack of parking/preserve water quality/ maintain health and safety"* as the justification for a shuttle service to the Rock Creek recreation area. The recreation area is noted as one of the highest visitation locations on the Inyo National Forest. Parking areas and area campgrounds were reported to be over or at capacity between July 4th and Labor Day while private lodging accommodations were reported to be near capacity from Labor Day through October.

The shuttle service proposed in the Field Report would provide connectivity between Bishop, the Town of Mammoth Lakes and the Rock Creek recreation area. The decommissioned entrance station was proposed as a park and ride lot. The length of the shuttle service season was proposed from July 4th through Labor Day with daily service.

The Field Report provided general cost estimates for the service. Estimated capital costs were $180,000 for the purchase of 2 cutaway style 15 passenger buses. Operating costs of $65.00 per hour were quoted. No estimation of ridership or passenger fare price was proposed in the ESETS Field Report.

11.3.2 2007 INTERAGENCY TECHNICAL ASSISTANCE GROUP (TAG) REVIEW

The 2007 Interagency Technical Assistance Group (TAG) review of the Inyo National Forest transportation system proposed interrelated transportation planning recommendations for the Forest. A suggestion was for further research of a recreational shuttle service to popular trailheads and recreation areas where parking demand exceeded capacity. No specific site locations were called out for further research.

The Rock Creek recreation area will be reviewed to assess the need for recreational shuttle service. An analysis of parking lot usage will be used to indicate areas where parking demand exceeds available capacity. Aside from transit, other traditional alternative transportation modes (pedestrian and bicycle) will be included in a comprehensive review of the transportation network.

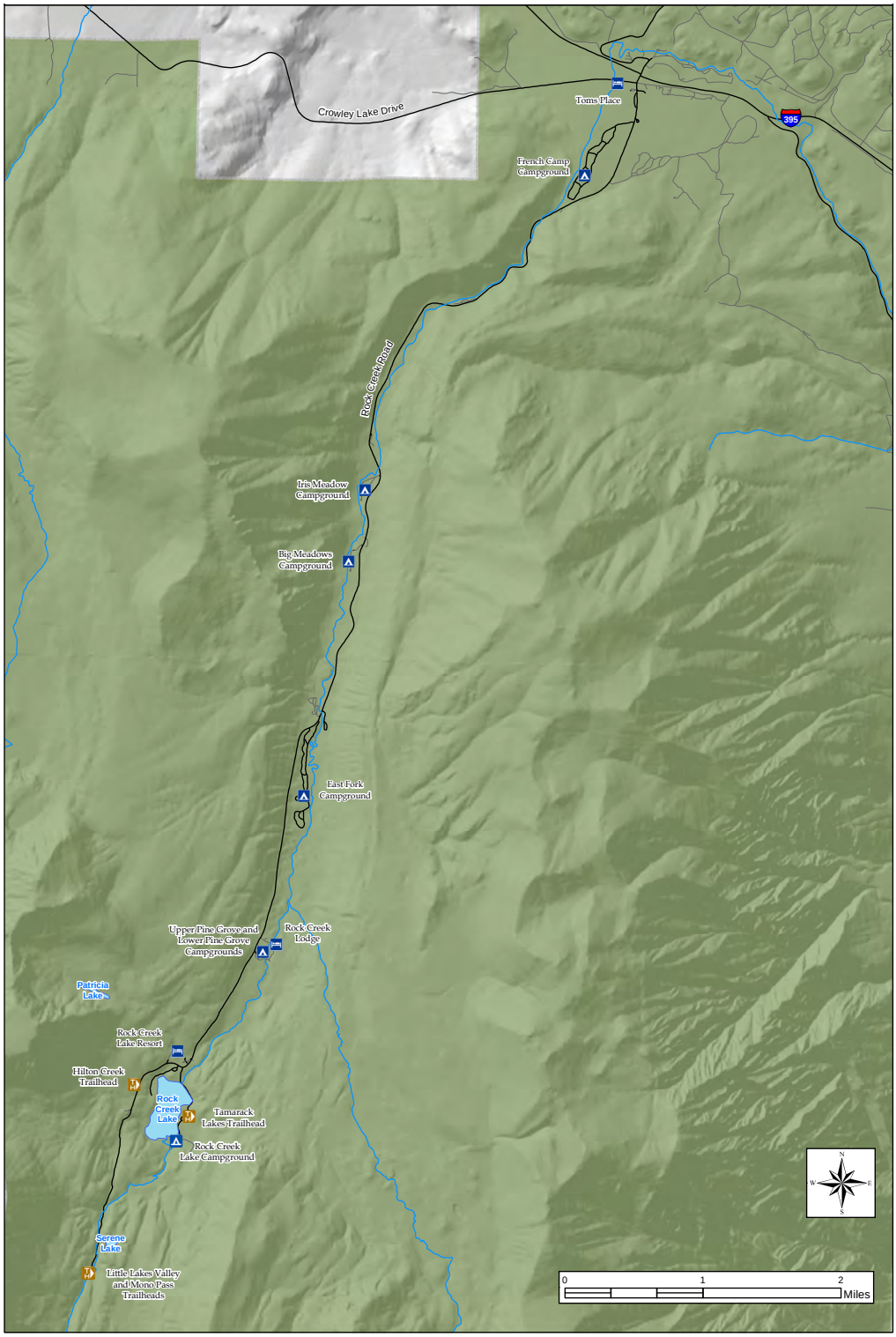


Figure: Rock Creek Canyon area roads network map

11.4 EXISTING TRANSPORTATION INFRASTRUCTURE OVERVIEW

A review of the existing transportation system was conducted to determine the travel routes and modes available to and within the Rock Creek recreation area. Roads, foot paths, bicycle routes and public and private transportation services were examined at the regional, local and site level.

11.4.1 ROADS

The Rock Creek area is located off of US Highway 395 approximately 30 miles from the Town of Mammoth Lakes and about the same distance from the City of Bishop. Sole vehicular access to the recreation area is via a two-lane, undivided, paved county road, Rock Creek Road. The road has a single intersection with US Highway 395.

Multiple agencies have authority over roadways in the Rock Creek recreation area which is bisected by the Mono and Inyo County line. The counties have jurisdiction over separate segments of the Rock Creek Road. The northern portion of the road is in Mono County while the southern section is in Inyo County. Design and maintenance of the roadway surface and signage on Rock Creek Road are the responsibility of the counties. The Forest Service has authority for entrance roads to recreational sites.

Roadside parking on Rock Creek Road is subject to the jurisdiction of Mono and Inyo Counties. Roadside parking is permitted on most segments of the road. The posted speed limit on the county maintained road segments is 35 miles per hour.

Forest Service control of Rock Creek Road begins at the entrance to the Mosquito Flat area where the road transitions into a single lane entrance road. Perpendicular parking spaces are incorporated into sections of the roadway in the Mosquito Flat picnic area. “No parking” signage restricts indiscriminate roadside parking along the road shoulders and in the dirt pull-outs on the entrance road. The posted speed limit on this segment of roadway is 10 miles per hour.

Crowley Lake Drive is an alternate route to access the Rock Creek area. The road intersects US Highway 395, north of the Rock Creek area; about 6 miles south of the Town of Mammoth Lakes exit. The roadway alignment is basically parallel that of US Highway 395 and passes through a few small communities, as well as, the Tom’s Place Resort. Crowley Lake Drive intersects Rock Creek Road a few yards from Rock Creek Road’s junction with US Highway 395. The road terminates just south of its intersection with Rock Creek Road and does not provide a southern access route.

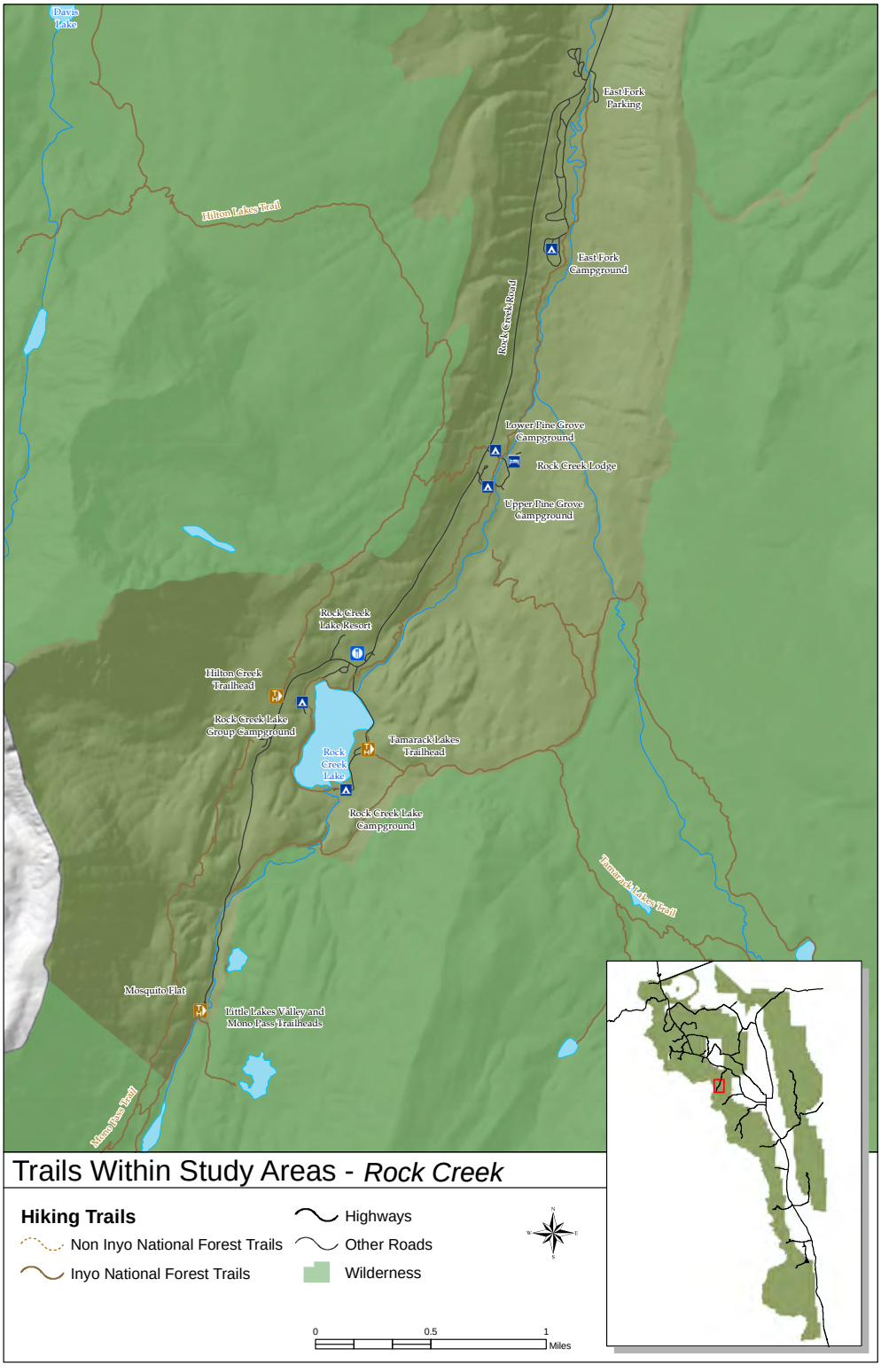


Figure: Rock Creek Canyon trails network map

11.4.2 FOOT PATHS

A network of Inyo National Forest designated trails make connections between regional and local origins and destinations in the Rock Creek area. The Mono Pass Trail, accessible from the Mosquito Flat area, provides a connection to the regional trail network. One-way long distance travel by foot is possible on the Mono Pass Trail. The trail leads to the Pacific Crest Trail that extends from the US border with Canada in the north to the border with Mexico in the south. Overnight wilderness trail permits for the Rock Creek area, including the Mono Pass Trail, accounted for on average about 5% of all issued hiking permits on the Inyo National Forest.

Existing trail improvements at recreation sites may improve mobility within specific locations in the Rock Creek area. A paved trail leads from the Rock Creek Lake Campground Trailhead parking lot to the lakefront.

An intra-canyon hiking trail connects origins and destinations within the Rock Creek canyon. The improved trail extends from the Pine Grove Campground and Day-use area to the Rock Creek Lake. A river crossing in the Rock Creek Lake area is not present making the trail discontinuous between the lake and locations in the Mosquito Flat area. As seen on the Rock Creek canyon trail network map, the trail is intended to extend from the Pine Grove Campground to the Mosquito Flat area. (See adjacent page)

Figure: Rock Creek Lake paved pedestrian path

Figure: Rock Creek intra-canyon trail

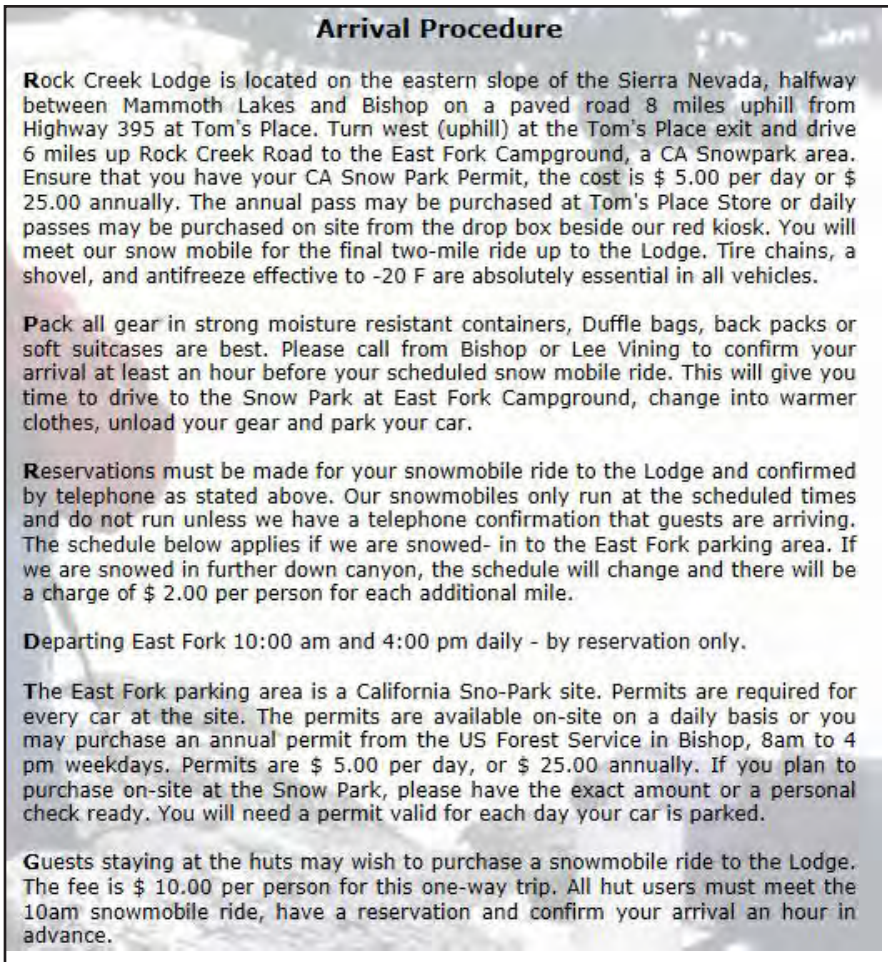
11.4.3 BICYCLE ROUTES

Travel by bicycle is not a predominant mode of transportation to or within the Rock Creek area though recreational bicycling on Rock Creek Road is popular. Regional travel by bicycle is an option within the Eastern Sierra region with sections of US Highway 395 classified as a Class II bicycle facility with the paved roadway shoulder designated as a State of California bicycle route. The considerable grade as the highway passes the Rock Creek area may make it an unlikely bicycle route. Crowley Lake Drive, which parallels a segment of US Highway 395, may provide an alternate route for bicycle traffic from neighboring communities and areas to the north.

Bicycle facilities are not available within the Rock Creek area. No enhancements for bicycle traffic have been made to Rock Creek Road leading from US Highway 395 to the area attractions and amenities. The lack of paved shoulders on Rock Creek Road necessitates that cyclists ride in the travel lane. Bicycle parking facilities are not provided at day-use or trailhead locations.

11.4.4 PUBLIC AND PRIVATE TRANSPORTATION SERVICES

Eastern Sierra Transit Authority (ESTA) provides year round interstate and intercity transportation service on the US Highway 395 corridor. The US 395 North and South routes pass the Rock Creek area on northbound trips from Lone Pine, California to Reno, Nevada on Monday, Tuesday, Thursday and Friday and on the southbound route from the Town of Mammoth Lakes to Lancaster, California on Monday, Wednesday and Friday. The Mammoth Express route travels via US Highway 395 between Bishop, California and the Town of Mammoth Lakes 3 times a day Monday through Friday. There is no weekend public transit service on US Highway 395 in this area. Public transit service is not available within the Rock Creek recreation area.



Arrival Procedure

Rock Creek Lodge is located on the eastern slope of the Sierra Nevada, halfway between Mammoth Lakes and Bishop on a paved road 8 miles uphill from Highway 395 at Tom's Place. Turn west (uphill) at the Tom's Place exit and drive 6 miles up Rock Creek Road to the East Fork Campground, a CA Snowpark area. Ensure that you have your CA Snow Park Permit, the cost is $ 5.00 per day or $ 25.00 annually. The annual pass may be purchased at Tom's Place Store or daily passes may be purchased on site from the drop box beside our red kiosk. You will meet our snow mobile for the final two-mile ride up to the Lodge. Tire chains, a shovel, and antifreeze effective to -20 F are absolutely essential in all vehicles.

Pack all gear in strong moisture resistant containers, Duffle bags, back packs or soft suitcases are best. Please call from Bishop or Lee Vining to confirm your arrival at least an hour before your scheduled snow mobile ride. This will give you time to drive to the Snow Park at East Fork Campground, change into warmer clothes, unload your gear and park your car.

Reservations must be made for your snowmobile ride to the Lodge and confirmed by telephone as stated above. Our snowmobiles only run at the scheduled times and do not run unless we have a telephone confirmation that guests are arriving. The schedule below applies if we are snowed- in to the East Fork parking area. If we are snowed in further down canyon, the schedule will change and there will be a charge of $ 2.00 per person for each additional mile.

Departing East Fork 10:00 am and 4:00 pm daily - by reservation only.

The East Fork parking area is a California Sno-Park site. Permits are required for every car at the site. The permits are available on-site on a daily basis or you may purchase an annual permit from the US Forest Service in Bishop, 8am to 4 pm weekdays. Permits are $ 5.00 per day, or $ 25.00 annually. If you plan to purchase on-site at the Snow Park, please have the exact amount or a personal check ready. You will need a permit valid for each day your car is parked.

Guests staying at the huts may wish to purchase a snowmobile ride to the Lodge. The fee is $ 10.00 per person for this one-way trip. All hut users must meet the 10am snowmobile ride, have a reservation and confirm your arrival an hour in advance.

Figure: Rock Creek Lodge winter arrival procedures taken from www.rockcreeklodge.com

Though no public transit service is available to the Rock Creek area, the Rock Creek Lodge, a permit holder of the Inyo National Forest, offers winter season transportation services to guests and patrons of the resort. The Lodge utilizes snowmobiles to transport guests to the facility from off-site parking locations when the Rock Creek Road is closed for the winter season. Lodge guests and restaurant patrons are charged one-way fares for the twice daily round trip service. The Lodge trains existing staff to act as transportation service drivers. The staff of the Rock Creek Lodge overcame the seasonal access limitations to their establishment by providing transportation services.

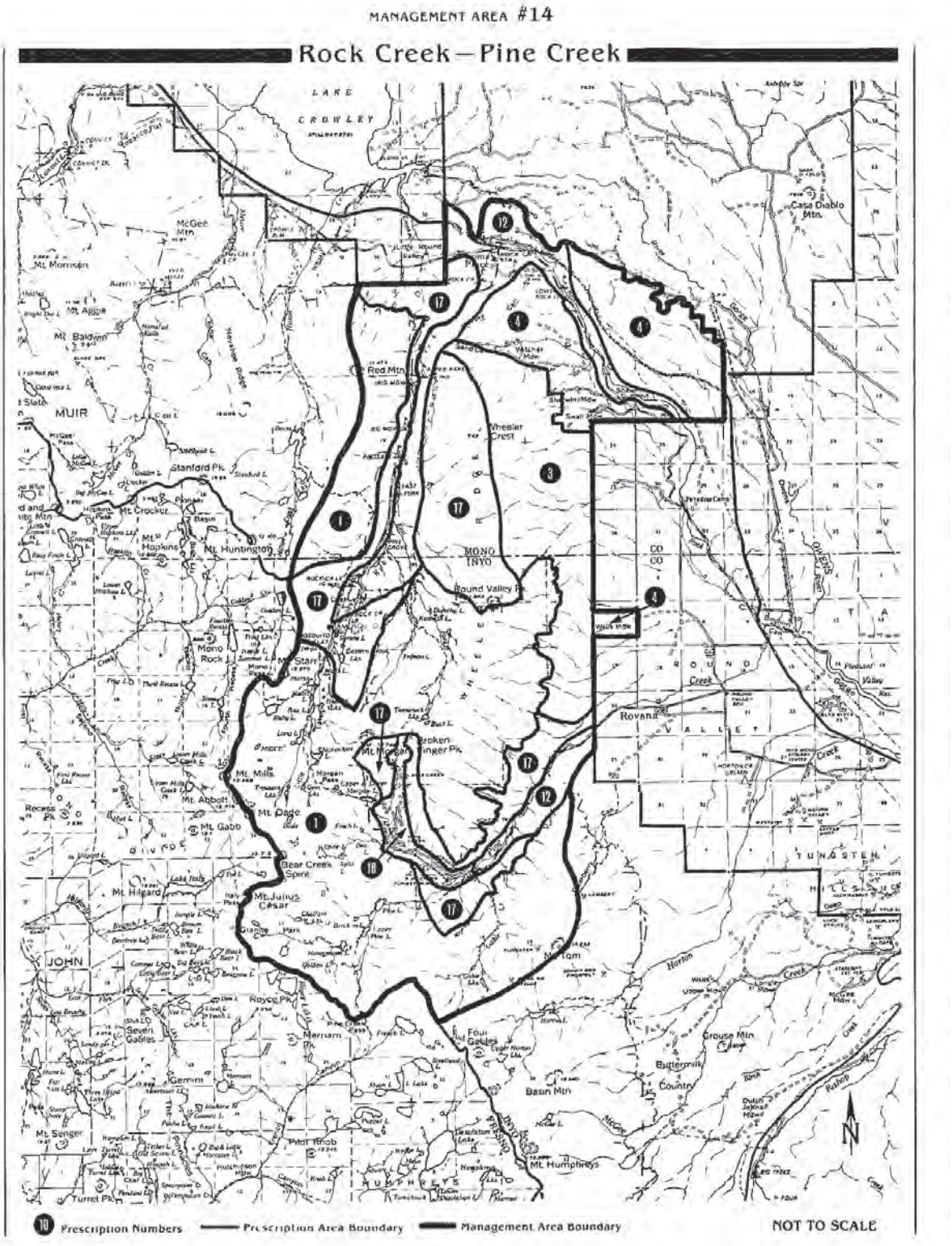


Figure: Rock Creek-Pine Creek Management Area #14 map taken from Inyo National Forest Land and Resource Management Plan

11.5 DATA COLLECTION AND ANALYSIS

A combination of secondary data review and primary data collection was conducted to inform this study.

11.5.1 SECONDARY DATA REVIEW

Pertinent transportation studies and plans were reviewed for information applicable to this alternative transportation system study.

11.5.1.1 INYO NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The Area Direction section of the Inyo National Forest Land and Resource Management Plan, or Forest Plan, provides individualized management prescriptions for 20 areas on the Forest, one of which is Rock Creek-Pine Creek (Management Area #14). The management area encompasses approximately 70,484 acres including 6,126 acres of Concentrated Recreation Area (Prescription #12) and 171 acres of Developed Recreation Site (Prescription #15). Areas within these 2 classifications may experience high levels of use and act as attractors or generators of visitor traffic.

The management area directives for Rock Creek-Pine Creek that may be relevant to this study are:

- *"Fully identify and program dispersed trail facilities in the area in Prescription #12 (Rock Creek) and Lower Pine Creek from Rovana to Scheelite. Include hiking and equestrian trail facilities."*

The Rock Creek Road and major recreation sites within the canyon are designated Prescription #12 Concentrated Recreation Area.

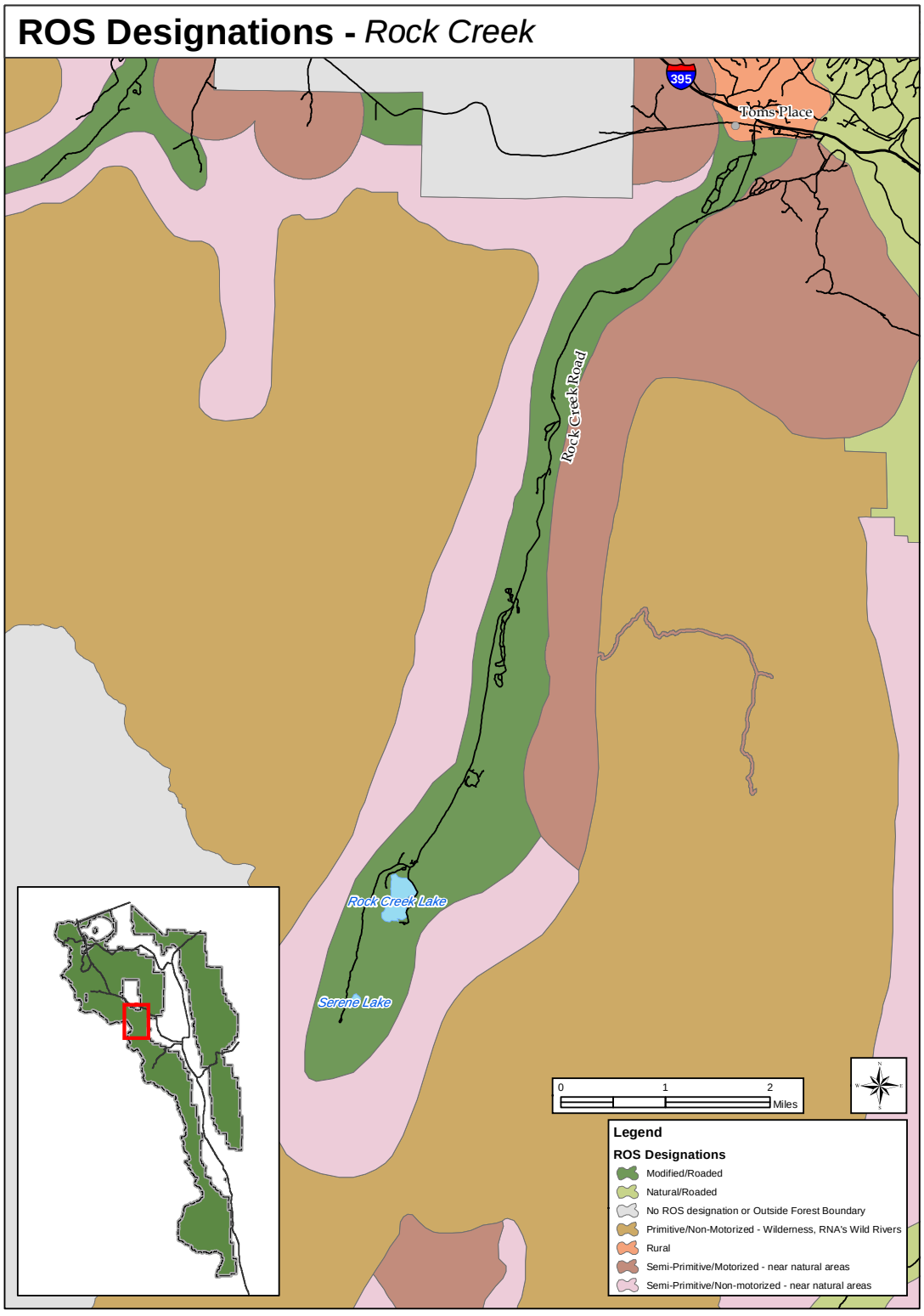


Figure: Rock Creek Canyon Recreation Opportunity Spectrum map

11.5.1.2 RECREATION OPPORTUNITY SPECTRUM (ROS)

The Recreation Opportunity Spectrum (ROS) is a recreation planning tool used by the Forest Service to ensure a wide range of recreational experiences to visitors. One of the determinants the Spectrum uses to assess experience type at a location is the type of transportation facility provided and the means of travel supported. Limited or more difficult pathways supply access to Primitive areas while highly improved transportation systems provide ease of access to Urban locations. Accessibility may be described by the quantity and quality of routes provided and by the permitted modes of transport.

The Rock Creek recreation area is within the Roaded Modified ROS designation a sub-classification of the Roaded Natural category. The Roaded Modified category is similar to the Roaded Natural class except the area may have been heavily modified with roads and facilities. In the Roaded Modified class one would expect more social contacts as a better quality and quantity of travel routes and modes makes travel to the area more attainable for a greater number of people. The environment maintains its natural character and pathways may be natural surface or paved when necessary. The Roaded Modified classification offers a high degree of interaction with the natural environment.

11.5.1.3 MONO COUNTY CIRCULATION ELEMENT/REGIONAL TRANSPORTATION PLAN

Adopted in 2009, the Mono County Circulation Element/Regional Transportation Plan establishes countywide transportation directives. Goals, policies and objectives of the plan support alternative transportation systems. Regional transportation goals to *"provide for the use of non-motorized means of transportation within Mono County"* and *"assist with the development and maintenance of transit systems as a component of multimodal transportation systems in Mono County"* are applicable to this study. The supporting policies and objectives encourage well-coordinated and well-designed transportation facilities.

11.5.1.4 INYO COUNTY GENERAL PLAN

Roads, public transportation, bicycles and trails are included in the Circulation Element of the Inyo County General Plan. The goal of the Bicycle and Trails section of the General Plan is to *"encourage and promote greater use of non-motorized means of personal transportation within the region."* The Public Transportation section of the Plan strives to provide effective, economically feasible and efficient public transportation in Inyo County. An implementation measure to *"encourage continued development of a transit system that will provide access to major tourist attractions"* supports the development of public transit.

11.5.1.5 INYO COUNTY REGIONAL TRANSPORTATION PLAN

The Inyo County Regional Transportation Plan is produced by the Local Transportation Commission to provide policies, objectives, improvements and funding strategies for the regional transportation movement of people and goods in Inyo County. The Action Element includes recommended transportation improvements for roadways, public transit, bicycle and pedestrian modes as well as information technology solutions. Many of the policies and objectives of the Regional Transportation Plan are similar to those contained in the Inyo County General Plan.

11.5.1.6 INYO COUNTY COLLABORATIVE BIKEWAYS PLAN

The Inyo County Collaborative Bikeways Plan is the official bicycle plan for Inyo County. The Plan describes existing bicycle facilities and programs, evaluates and prioritizes the need for future bicycle system improvements and the development of new routes. The Plan acknowledges that the compact design of communities within Inyo County makes bicycling a viable alternative for local trips but recognizes that the long distances between communities may limit the use of bicycles for intercity travel.

11.5.2 PRIMARY DATA COLLECTION AND ANALYSIS

Primary data was collected by the study research team on parking lot utilization and on 29 randomly selected days during the May 1st through October 31st, 2011 study period. Vehicular traffic data was collected for randomly selected periods within the study duration. Wilderness trail permits data for the trail quota period of May 1st to October 31st in the years 2006 through 2010 was furnished by Inyo National Forest staff.

11.5.2.1 PARKING SURVEY METHODOLOGY

The Rock Creek recreation area has a total of 290 marked parking spaces. The inventory of parking spaces by parking lot is shown in Figure: Rock Creek Canyon parking space inventory by parking lot.

Overnight parking restrictions in the parking areas within the Rock Creek recreation area vary by parking lot. All of the parking lots in the Mosquito Flat area permit overnight parking. There is no posted parking restriction in the Rock Creek Group Campground, Pine Grove, East Fork or Palisade parking areas. Overnight parking in the Rock Creek Campground area is limited to the Trailhead parking lot. (See Figure: Rock Creek Canyon parking space inventory by parking lot)

A parking lot survey including written protocol instructions and a survey instrument was created for the Rock Creek area. Vehicle parking was inventoried in designated Inyo National Forest parking lots and on the roadside. Roadside parking along Rock Creek Road was documented by defined parking zone. Data was collected on 29 randomly selected days during the May 1st to October 31st, 2011 study period. (See Figure: Rock Creek Canyon parking survey data collection dates)

The written survey protocol instructions were designed to maintain consistency in data collection methods between research staff members. The explicit instructions specified data collection locations and the appropriate way to record observations on the survey instrument. Experienced team members conducted data collection field training. This measure ensured the understanding and accuracy of the survey protocol by first time research assistants.

Parking survey areas included Inyo National Forest designated unpaved and paved parking locations within the Rock Creek recreation area. Parking areas were grouped on the survey instrument by location. Major parking areas were the Mosquito Flat (Trailhead, Picnic and Dirt Lot), Rock Creek Group Campground (Entrance, Boat Launch and Exit) and Rock Creek Lake Campground (Entrance, Trailhead, Picnic, End Loop and Hiker Exit). Trailhead and day-use parking lots (Hilton Lakes/Davis Lake, Pine Grove, East Fork and Palisade) and roadside parking in between the formal parking lots in the core study area were also counted. Parking areas located between the Entrance Station and the East Fork parking lots were counted twice daily on the inbound and outbound trips.

Rock Creek Canyon parking lots and marked parking space inventory			
	type of space		
parking lot	standard	oversized	accessible
Entrance Station	2	1	
Mosquito Flat			
Trailhead	70		1
Picnic	31		
Dirt Lot (dirt lot)			
Hilton Lakes/Davis Lake Trailhead	26		
Rock Creek Group Campground			
Entrance	16		
Boat Launch	16		
Exit	7		
Rock Creek Lake Campground			
Entrance	9		2
Trailhead	26		2
Picnic	4		
End Loop	20		2
Hiker Exit	8		
Pine Grove Day-use	6		
East Fork			
Public Parking	41		
Roadside (paved but unmarked)			
Palisade Campground (dirt lot)			

Figure: Rock Creek Canyon parking space inventory by parking lot

Rock Creek Canyon parking data collection dates		
day of week	month	survey site
Tuesday	July 5, 2011	Rock Creek
Tuesday	July 12, 2011	Rock Creek
Wednesday	July 13, 2011	Rock Creek
Saturday	July 16, 2011	Rock Creek
Tuesday	July 19, 2011	Rock Creek
Thursday	July 21, 2011	Rock Creek
Monday	July 25, 2011	Rock Creek
Thursday	July 28, 2011	Rock Creek
Monday	August 1, 2011	Rock Creek
Wednesday	August 3, 2011	Rock Creek
Tuesday	August 9, 2011	Rock Creek
Wednesday	August 17, 2011	Rock Creek
Thursday	August 18, 2011	Rock Creek
Tuesday	August 23, 2011	Rock Creek
Sunday	August 28, 2011	Rock Creek
Wednesday	August 31, 2011	Rock Creek
Tuesday	September 6, 2011	Rock Creek
Thursday	September 8, 2011	Rock Creek
Wednesday	September 14, 2011	Rock Creek
Friday	September 16, 2011	Rock Creek
Saturday	September 17, 2011	Rock Creek
Friday	September 23, 2011	Rock Creek
Wednesday	September 28, 2011	Rock Creek
Sunday	October 2, 2011	Rock Creek
Wednesday	October 5, 2011	Rock Creek
Tuesday	October 11, 2011	Rock Creek
Monday	October 17, 2011	Rock Creek
Friday	October 21, 2011	Rock Creek
Thursday	October 27, 2011	Rock Creek

Figure: Rock Creek Canyon parking survey data collection dates

Roadside areas between the parking lots were classified as "parking zones." Roadside parking data was captured to measure any unmet parking demand and its locations. Roadside parking is permitted on most state, county and forest roadways, unless otherwise restricted. Roadside parking is permitted on all segments of the Rock Creek Road except the single lane entrance road between the Rock Creek Pack Station and the Mosquito Flat area.

Parking spaces were inventoried by parking restriction and type. The number of marked personal occupancy vehicle (POV), oversized vehicle (OS) and accessible (HC) parking spaces was printed on the line next to the parking lot name. Classification by vehicle type was divided into personal occupancy vehicles and oversized vehicles (e.g. recreational vehicles, trucks with trailers, buses) that would not fit into a standard parking space. An oversized vehicle parking space was available at the Entrance parking lot. Accessible parking spaces were designated in the Mosquito Flat Trailhead and Rock Creek Lake Campground – Entrance, Trailhead and End Loop parking lots.

Parking survey data was collected 5 times during an individual day (8:30am, 10:00am, 11:30am, 1:30pm and 3:00pm) for the core Rock Creek study area between the Mosquito Flat and the East Fork day-use areas. Parking data was collected at the Entrance Station, Bridge and Forest Service Storage parking areas 2 times a day at the 8:00am and 3:30pm time periods.

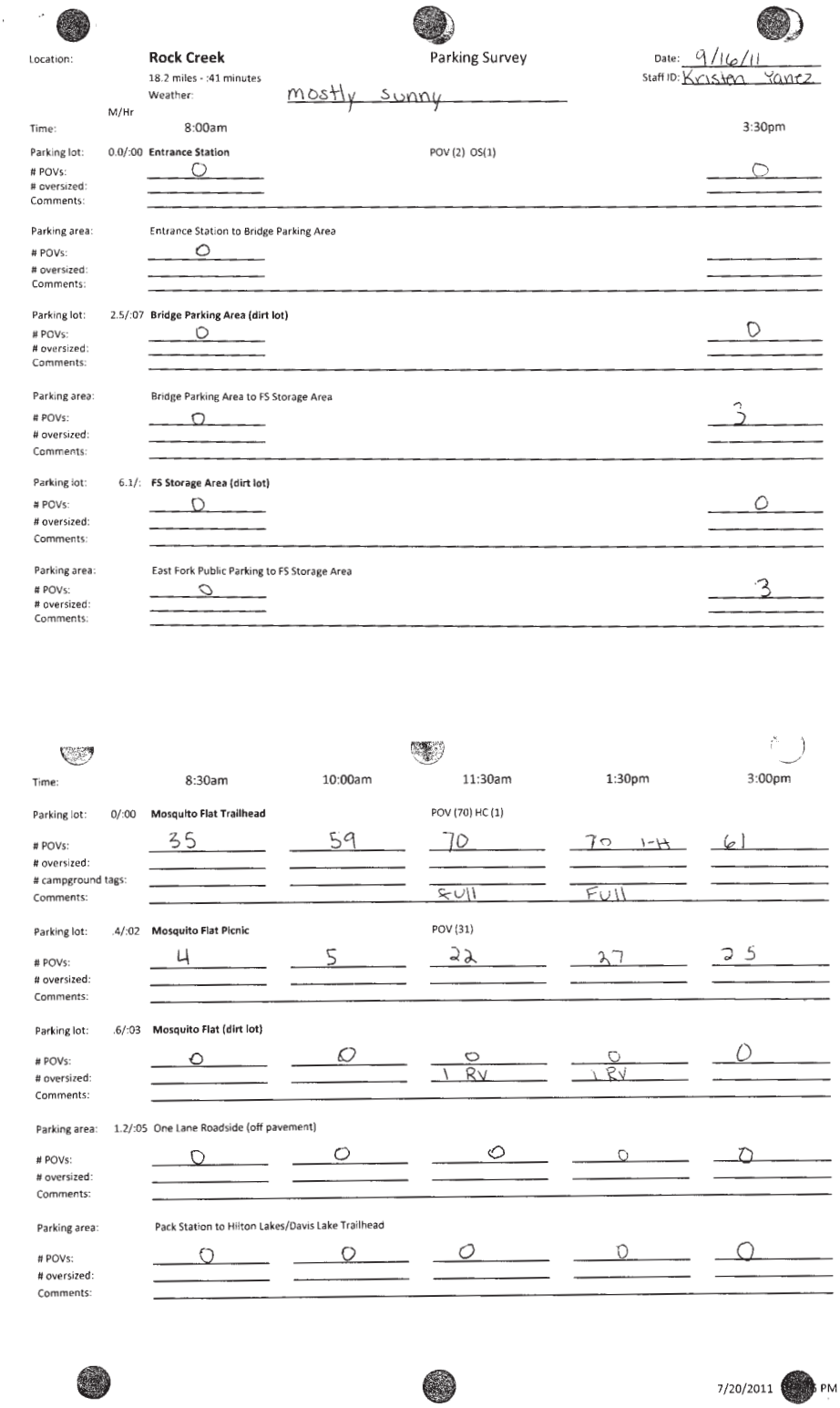
The number of vehicles observed in each define parking lot or in a parking zone were recorded on the tally sheet. Space was provided on the data collection instrument for written staff comments under each individual parking lot or for general comments regarding the study area as a whole, at the end of the instrument. Information regarding the date, the name of the research staff member conducting the survey and the weather were recorded at the top of the instrument.

The Rock Creek parking survey protocol and survey instrument are available in Appendix E.

11.5.2.2 PARKING DATA ANALYSIS

Temporal parking data was collected by month and time of day on 29 randomly selected days for the survey period of May 1st through October 31st, 2011. The data for discrete parking lots was analyzed and is presented graphically below. Data for parking zones is displayed visually on dot intensity maps found in Appendix H.

The overall parking occupancy for the Rock Creek core recreation area, excluding the Entrance, Bridge and Storage parking areas, was 34% for the study period. Overall seasonal occupancy rates are presented in Figure: Rock Creek Canyon parking areas and lots seasonal occupancy rates. The Mosquito Flat Trailhead parking lot had the highest calculated overall seasonal parking occupancy rate with 64% and the Mosquito Flat area as a whole experienced an average occupancy rate of 54%.



Location: **Rock Creek** — Parking Survey — Date: 9/16/11
18.2 miles - :41 minutes — Staff ID: Kristen Yanez
Weather: mostly sunny

	M/Hr		8:00am	3:30pm
Parking lot:	0.0/:00	**Entrance Station**	POV (2) OS(1)	
# POVs:			0	0
# oversized:				
Comments:				
Parking area:		Entrance Station to Bridge Parking Area		
# POVs:			0	
# oversized:				
Comments:				
Parking lot:	2.5/:07	**Bridge Parking Area (dirt lot)**		
# POVs:			0	0
# oversized:				
Comments:				
Parking area:		Bridge Parking Area to FS Storage Area		
# POVs:			0	3
# oversized:				
Comments:				
Parking lot:	6.1/:	**FS Storage Area (dirt lot)**		
# POVs:			0	0
# oversized:				
Comments:				
Parking area:		East Fork Public Parking to FS Storage Area		
# POVs:			0	3
# oversized:				
Comments:				

Time:			8:30am	10:00am	11:30am	1:30pm	3:00pm
Parking lot:	0/:00	**Mosquito Flat Trailhead**			POV (70) HC (1)		
# POVs:			35	59	70	70 1-H	61
# oversized:							
# campground tags:							
Comments:					FULL	FULL	
Parking lot:	.4/:02	**Mosquito Flat Picnic**			POV (31)		
# POVs:			4	5	22	27	25
# oversized:							
Comments:							
Parking lot:	.6/:03	**Mosquito Flat (dirt lot)**					
# POVs:			0	0	0	0	0
# oversized:					1 RV	1 RV	
Comments:							
Parking area:	1.2/:05	One Lane Roadside (off pavement)					
# POVs:			0	0	0	0	0
# oversized:							
Comments:							
Parking area:		Pack Station to Hilton Lakes/Davis Lake Trailhead					
# POVs:			0	0	0	0	0
# oversized:							
Comments:							

7/20/2011 PM

Figure: Rock Creek Canyon parking survey data collection instrument sample pages

Rock Creek Canyon parking areas and lots seasonal occupancy rates		
Mosquito Flat		**54%**
Trailhead	64%	
Picnic and dirt lot	31%	
Hilton Lakes/Davis Lake Trailhead		**22%**
Rock Creek Group		**21%**
Entrance	2%	
Boat Launch	47%	
Exit	3%	
Rock Creek Lake Campground		**35%**
Entrance	25%	
Trailhead	31%	
Picnic	47%	
End Loop	44%	
Hiker Exit	31%	
Pine Grove Day-use		**15%**
East Fork Public Parking		**3%**

Figure: Rock Creek Canyon parking lots and areas seasonal occupancy rates

Parking demand peaked in the month of July for the day-use areas and in August for the trailhead locations. The Rock Creek Lake Campground and Rock Creek Group Campground parking areas experienced highest parking demand in July. The Mosquito Flat Trailhead and Picnic parking areas and the Hilton Lakes/Davis Lake Trailhead locations had highest occupancy rates in August. Parking lot occupancy rates dropped precipitously in the month of October for all parking locations. (See Figure: Rock Creek parking lot occupancy by month graph).

The Mosquito Flat area experienced the highest parking lot occupancy rates in the Rock Creek recreation area. The Mosquito Flat Trailhead parking lot supports day and long-term hiking opportunities, as well as, a walk-in campground. The Mosquito Flat Picnic and Dirt Lot parking areas provide additional parking capacity during periods of excess demand. These 2 parking areas are located on the entrance road approximately .4 of a mile (650 feet) from the trailheads. Overnight parking is not restricted in any parking lot in the Mosquito Flat area. Roadside parking is prohibited on the single lane entrance road. Parking demand in the Mosquito Flat area shows a dramatic peak in the month of August. (See Figure: Mosquito Flat area parking lot occupancy by month graph).

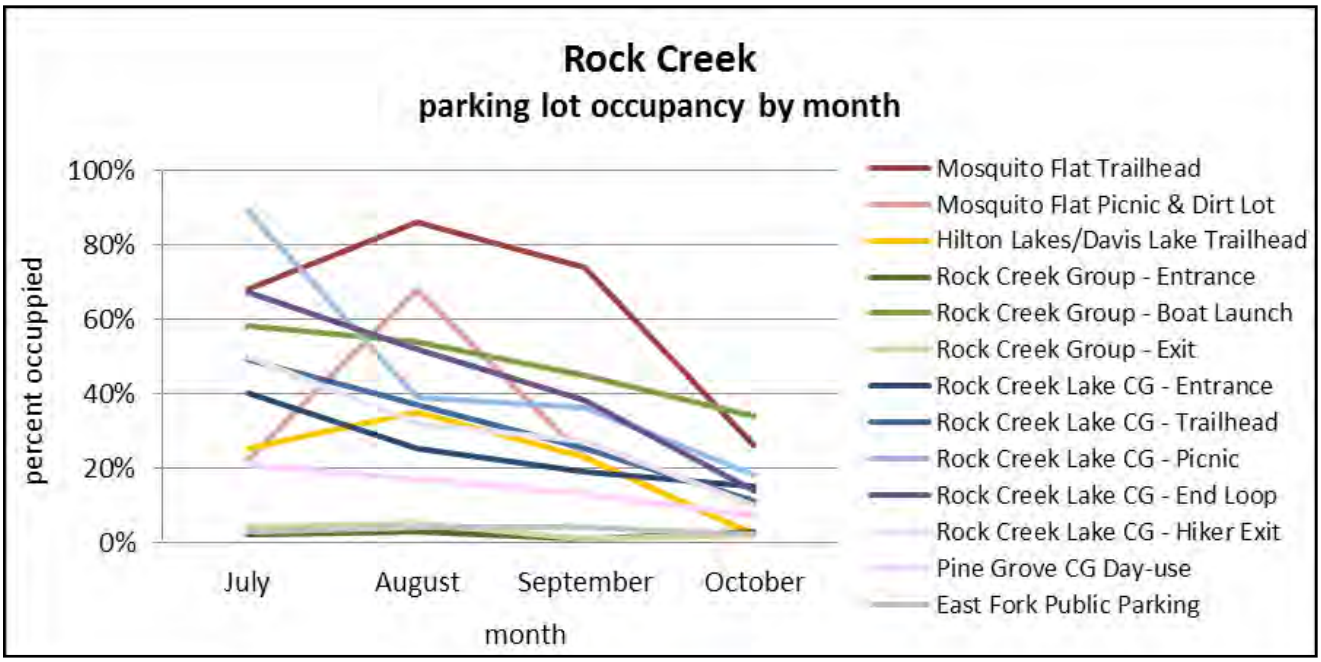


Figure: Rock Creek parking lot occupancy by month graph

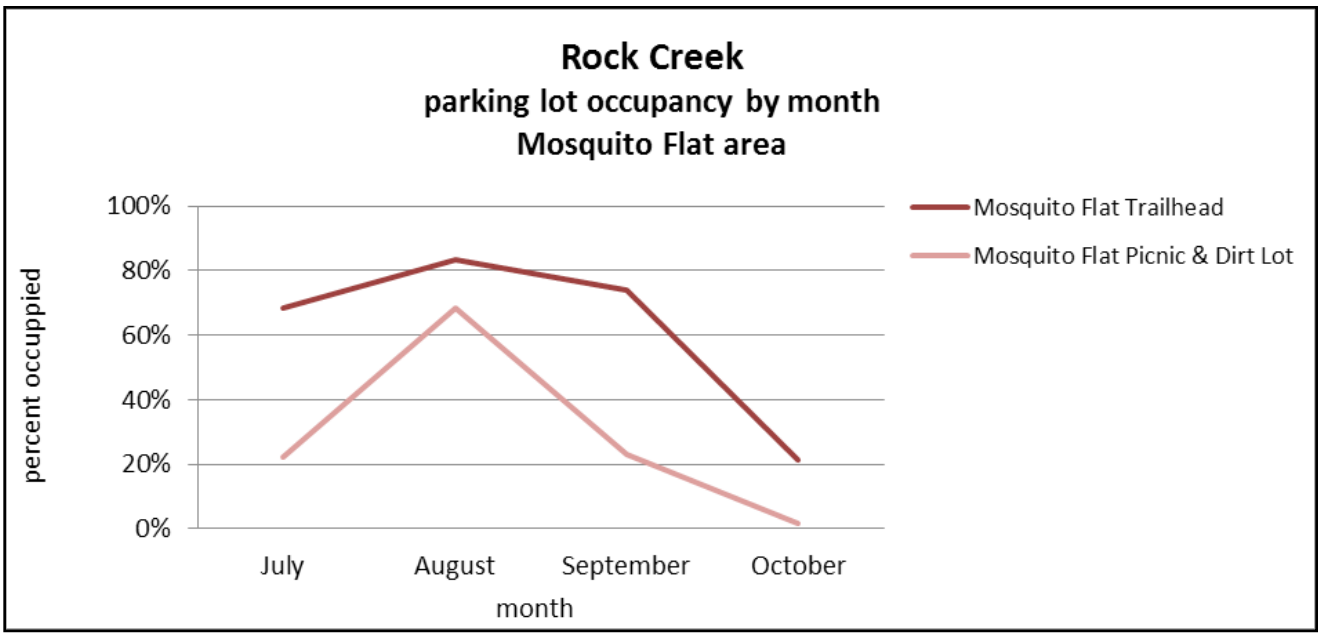


Figure: Mosquito Flat area parking lot occupancy by month graph

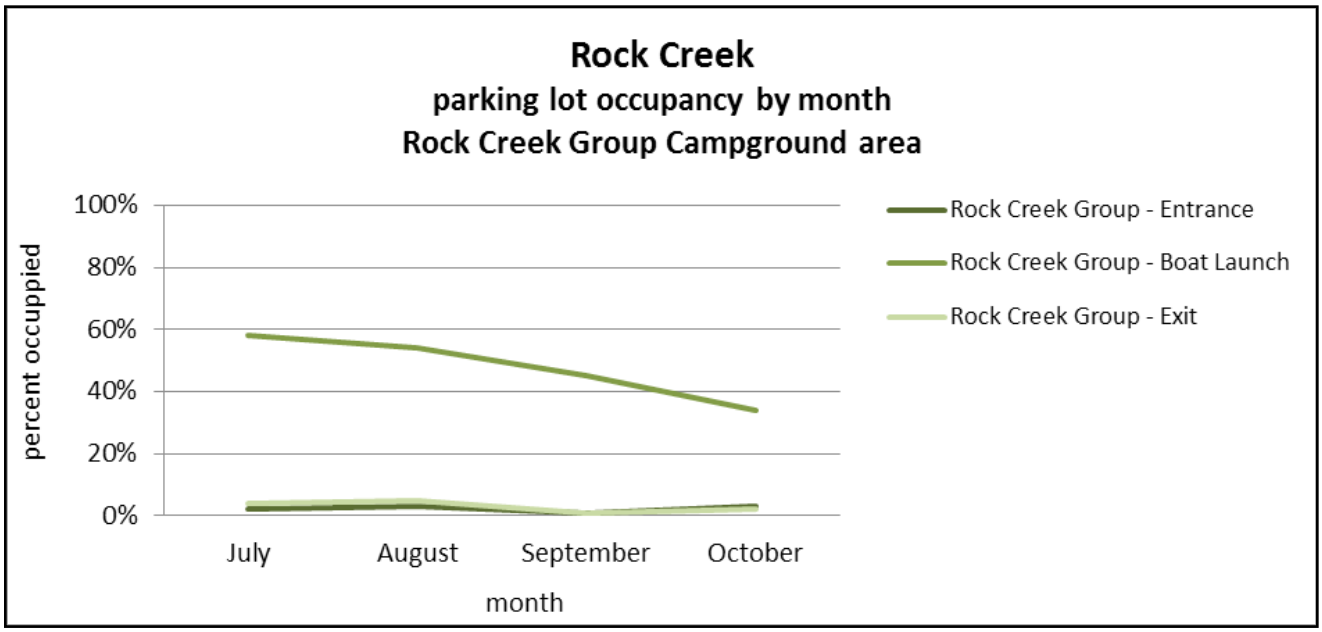


Figure: Rock Creek Group Campground area parking lot occupancy by month graph

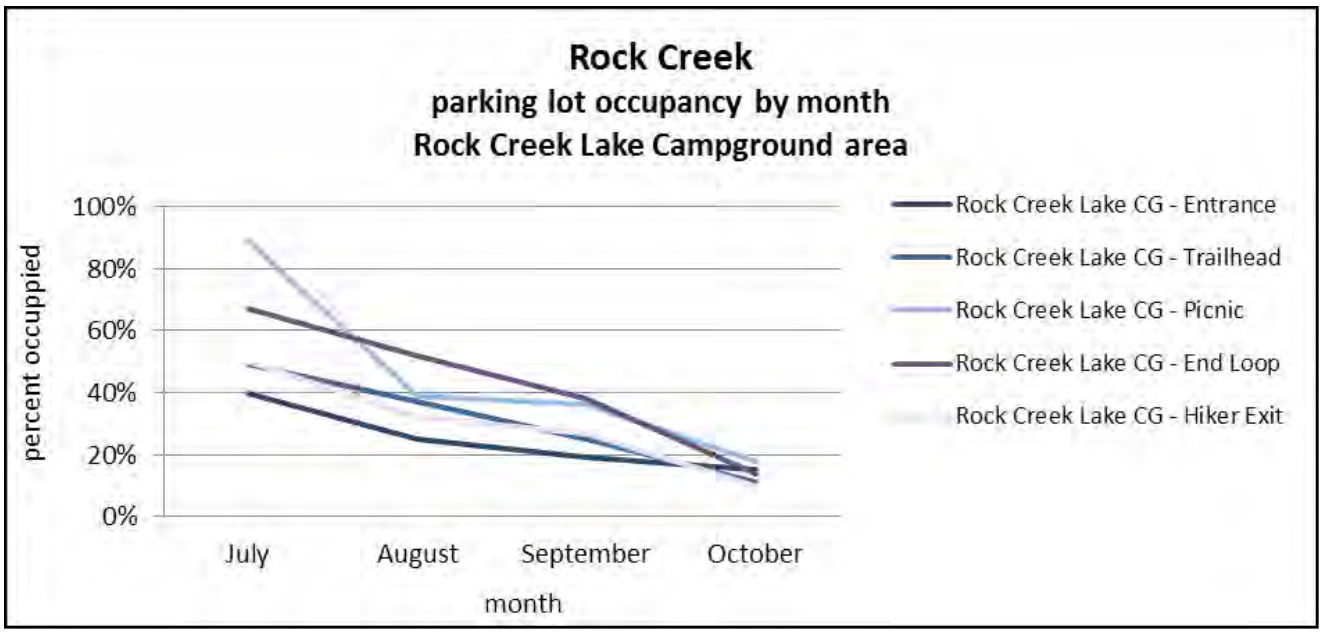


Figure: Rock Creek Lake Campground area parking lot occupancy by month graph

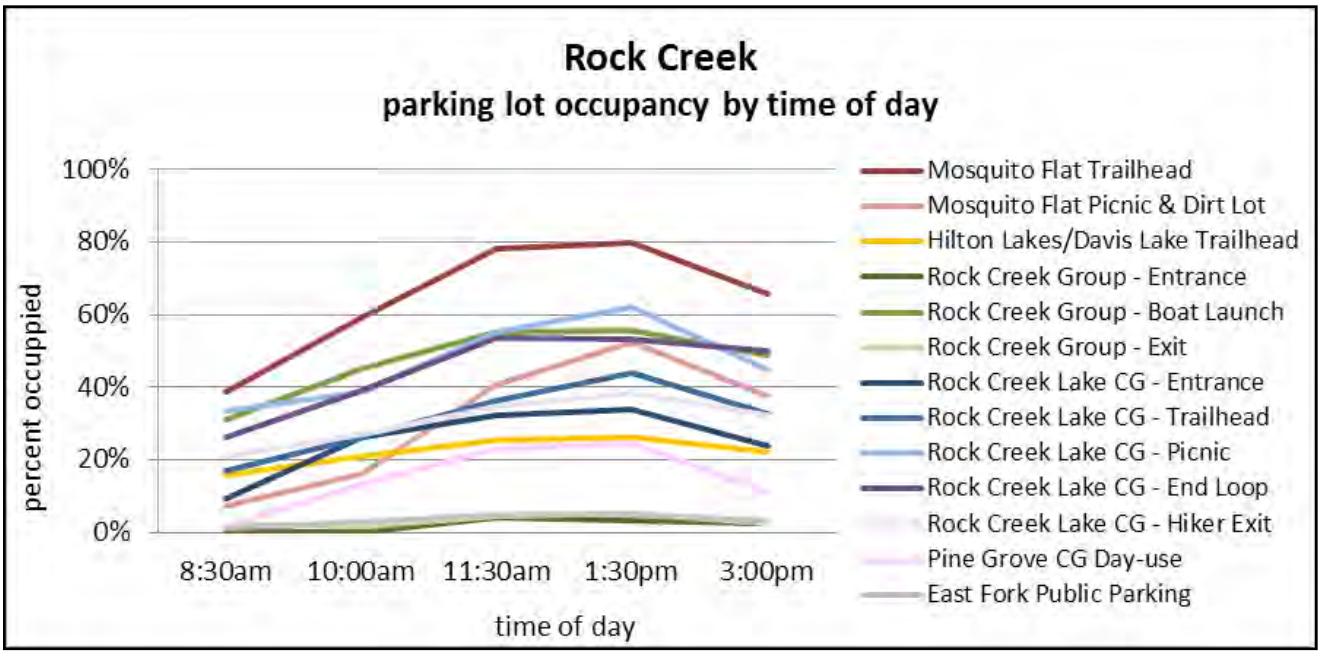


Figure: Rock Creek parking lot occupancy by time of day graph

Parking demand in the Rock Creek Group Campground area was focused at the Boat Launch parking lot. This location provides direct access to the lake and boat launch. Parking demand at the Entrance and Exit parking lots was de minimus. The overall parking occupancy rate for the Rock Creek Group area was 3%. (See Figure: Rock Creek Group Campground area parking lot occupancy by month graph).

The Rock Creek Lake Campground area experiences an early season peak and deminishing parking demand through the balance of the season. The overall occupancy rate for the area was 31%. (See Figure: Rock Creek Lake Campground area parking lot occupancy by month graph).

Though the demand for parking by parking lot was rather variable between months, the demand when viewed by time of day was more consistent. Overall, utilization levels are low in the morning, rise by mid-day and fall off into the late afternoon. The variation in parking throughout the day may indicate that visitors are entering and leaving the parking lots, whereas a stagnant parking pattern may indicate long-term parking. (See Figure: Rock Creek parking lot occupancy by time of day graph).

Parking demand in the Mosquito Flat area may indicate both short and long term parking patterns. Parking lot occupancy at the Mosquito Flat Trailhead lot was nearly 40% in the morning. Demand rose to 80% by mid-day and declined to 66% by late afternoon. The demand for parking at the Picnic and Dirt Lot followed a similar pattern, though these areas show little occupancy in the morning. This parking pattern may indicate that a number of parking spaces in the Trailhead lot are consumed by overnight parking, while few, if any, are used for overnight parking in the other 2 locations.

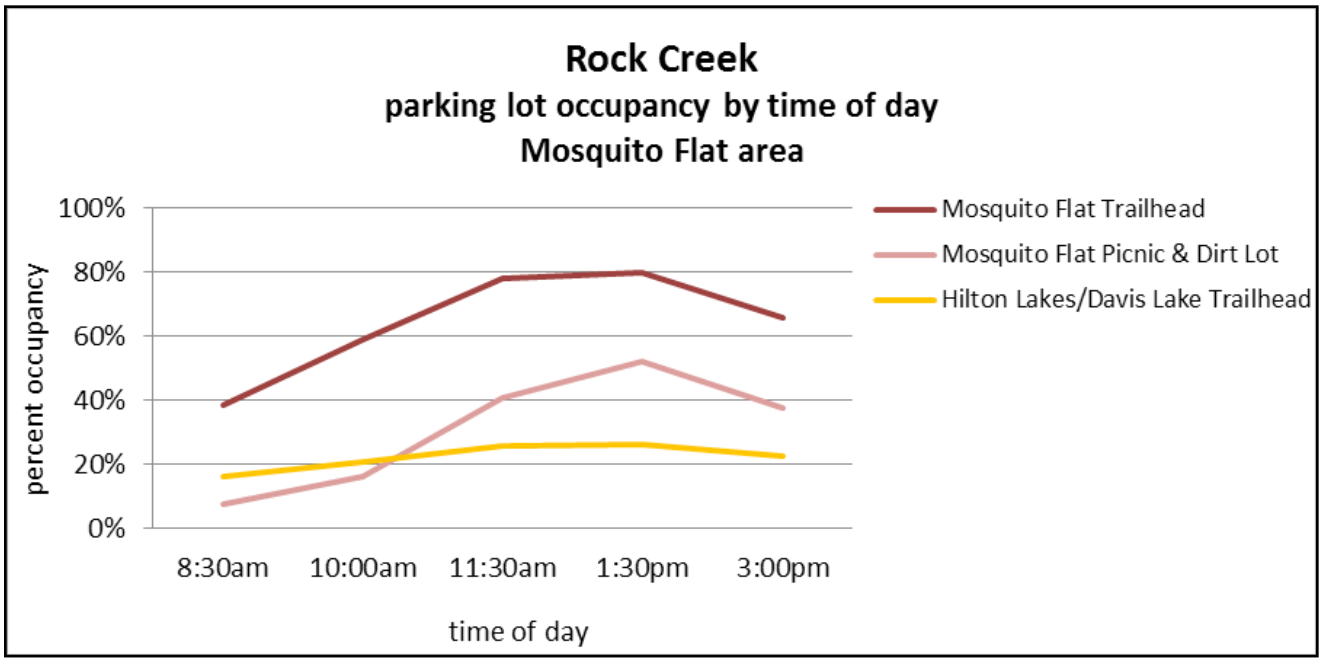


Figure: Mosquito Flat and Hilton Lakes parking lot occupancy by time of day graph

To contrast, the parking demand at the Hilton Lakes/Davis Lake Trailhead parking lot is fairly stagnant throughout the day. This parking pattern may indicate that cars are parked in this lot for extended periods of time. (See Figure: Mosquito Flat and Hilton Lakes parking lot occupancy by time of day graph).

Parking lot occupancy rates in the Rock Creek Group Campground and Rock Creek Lake Campground areas show a similar day-use parking demand trend line where demand is low in the morning, peaks at mid-day and declines in the late afternoon.

Parking data for the Mosquito Flat area, including the Trailhead, Picnic and Dirt Lot parking areas was analyzed to ascertain periods and level of excess parking demand. The following graph shows occupancy rates at the Mosquito Flat Trailhead and Picnic parking lots by data collection date and time. The graph shows that parking occupancy rate in the Picnic area follows, or lags behind, the demand in the Trailhead parking lot. Once the Trailhead parking area has reached capacity, parking demand flows to the Picnic parking area and then to the Dirt Lot. Each consecutive parking area acts as relief from parking pressures of the lot before it. Parking demand is greatest for parking spaces nearest the trailhead and diminishes with distance from the attraction.

Figures in the graph greater than 100% are attributed to vehicles parked off pavement.

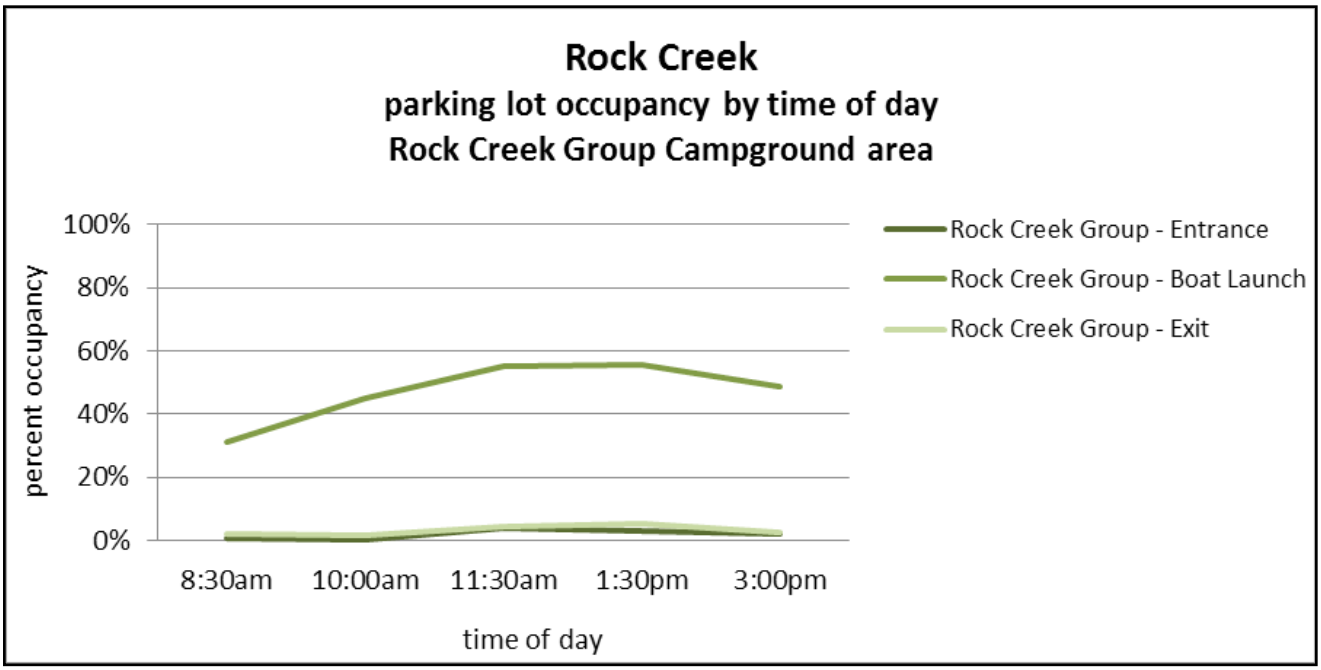


Figure: Rock Creek Group Campground area parking lot occupancy by time of day graph

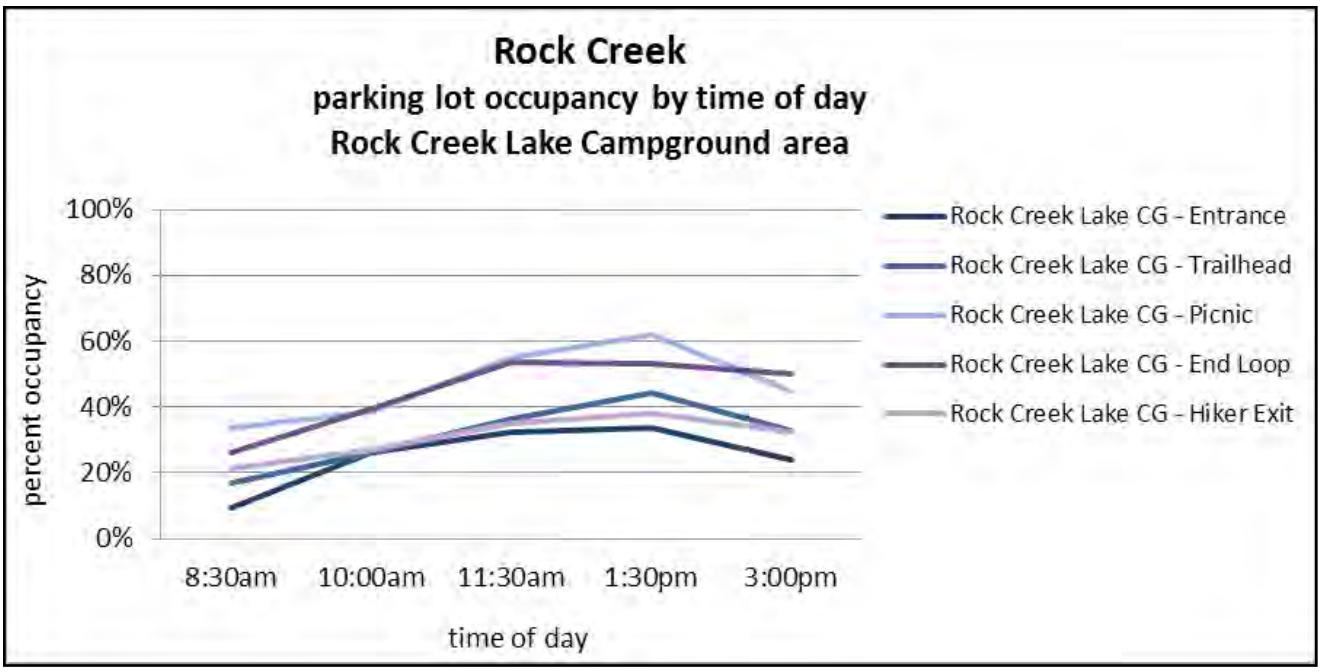


Figure: Rock Creek Lake Campground area parking lot occupancy by time of day graph

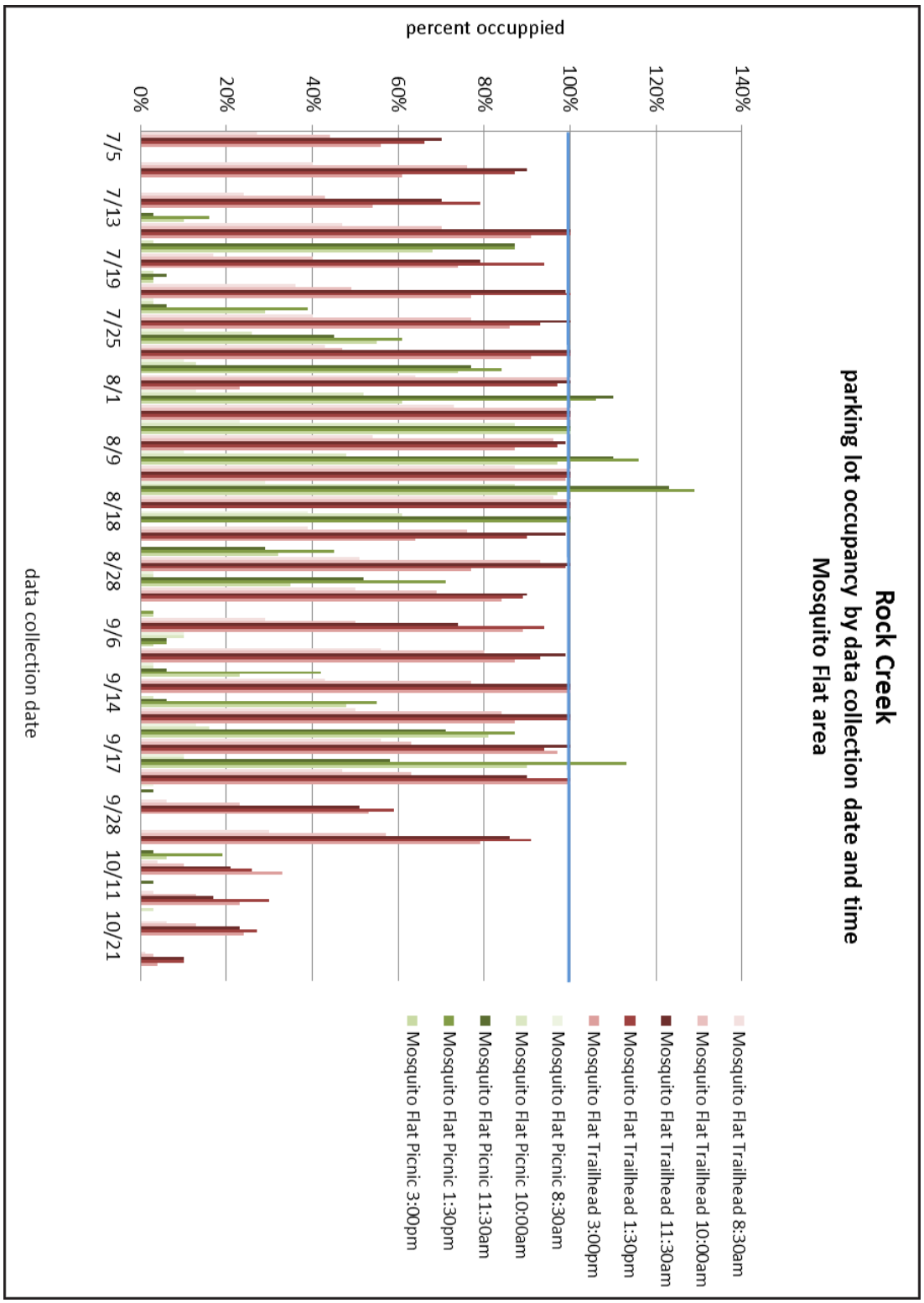


Figure: Mosquito Flat Trailhead and Picnic parking lots occupancy by data collection date and time of day graph

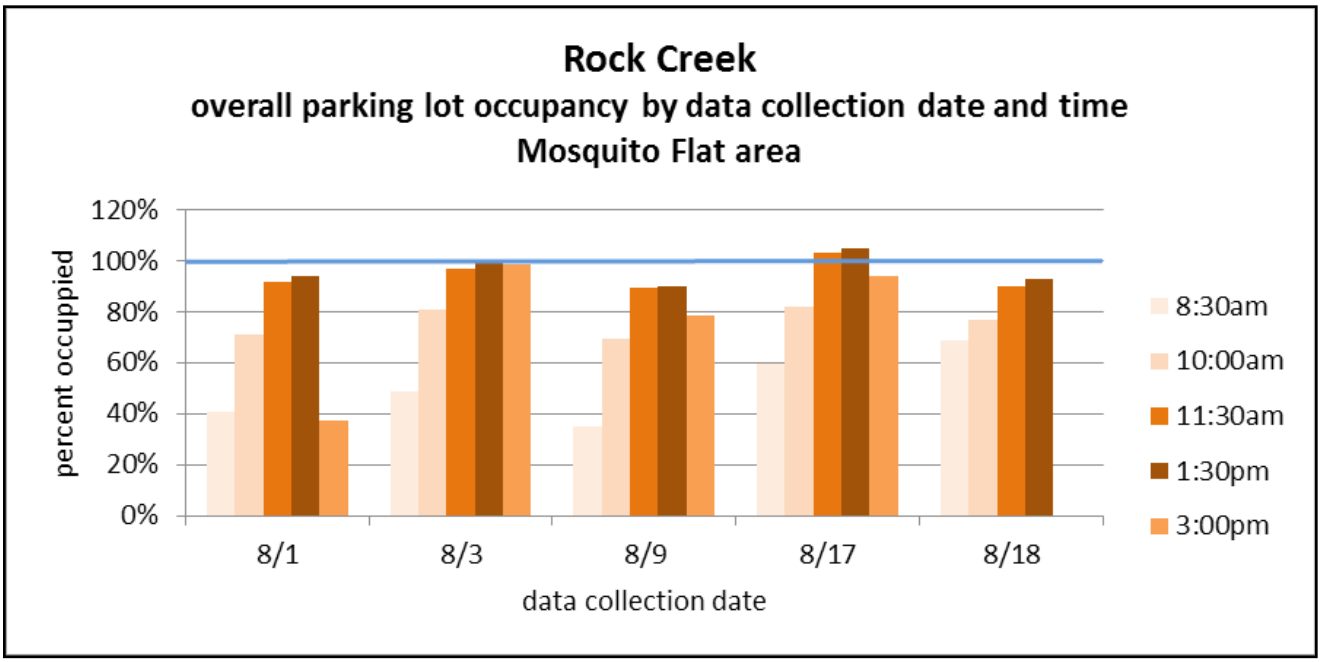


Figure: Mosquito Flat area overall parking lot occupancy by data collection date and time (select dates) graph

The parking lot inventories for the Trailhead, Picnic and Dirt Lot parking areas were combined to determine an overall occupancy rate for the Mosquito Flat area by time of day. The data shows that parking capacity was exceed on the August 17th data collection date at the 11:30am and 1:30pm observations. (See Figure: Mosquito Flat area overall parking lot occupancy by data collection date and time (select dates) graph).

Extraction of a single data collection date more clearly shows the occupancy levels for each time period. At the 8:30am observation the occupancy is high for the Trailhead lot but below 100%. By the 10:00am observation the Trailhead lot is full and continues with 100% occupancy until the 3:00pm time when usage begins to decrease. The Picnic parking lot acts as relief for excess parking demand at the Trailhead lot. Parking demand is low at the initial morning observation but shows significant growth by the 10:00am count when the Trailhead parking lot is at capacity. By the 11:30am and 1:30pm observations the Picnic parking lot is well above capacity. In the late afternoon, parking demand decreases and the Picnic area empties quicker (97% occupancy rate) than the Trailhead lot (99% occupancy rate). (See Figure: Mosquito Flat area parking lot occupancy August 17th only graph).

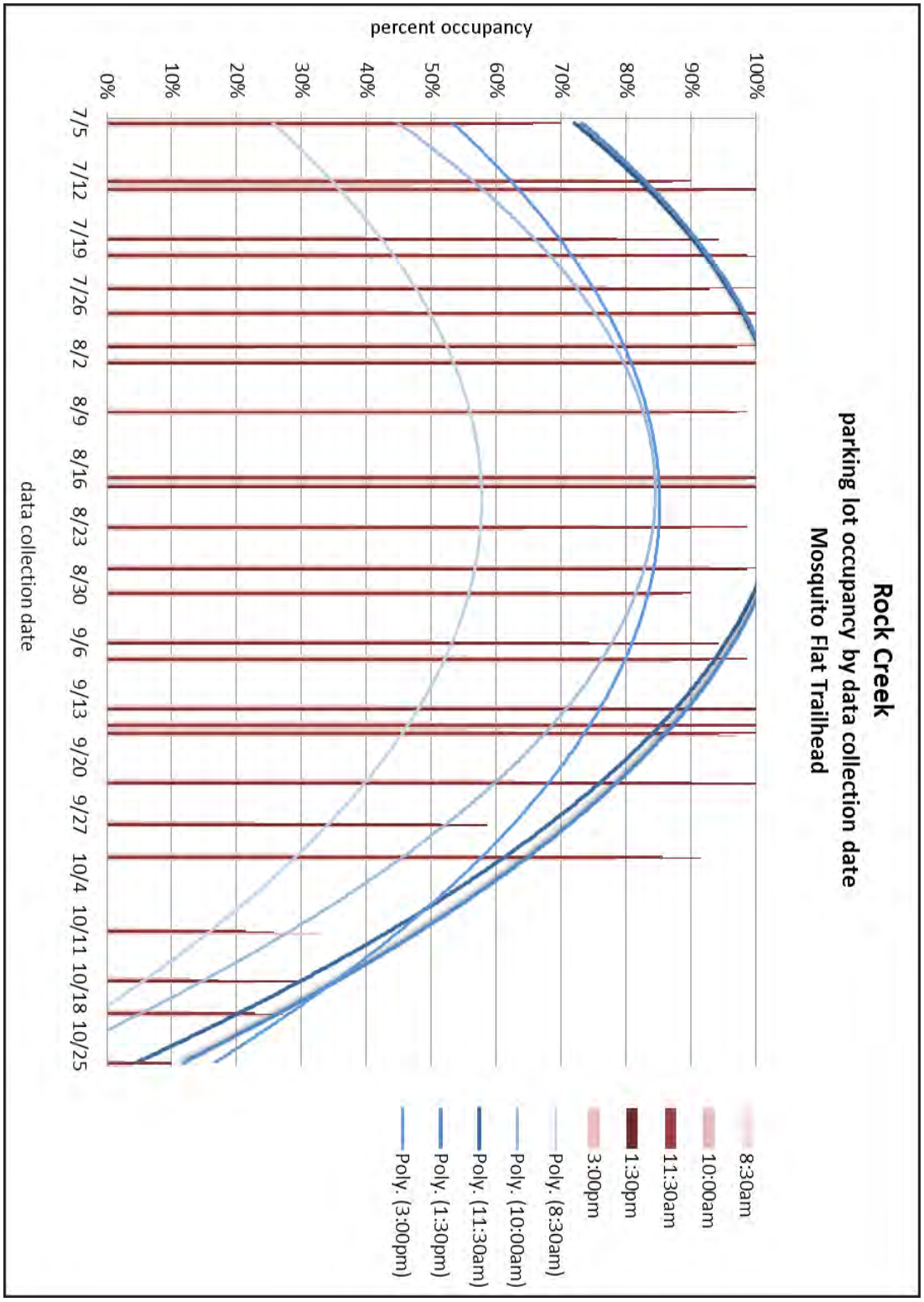


Figure: Mosquito Flat Trailhead parking lot occupancy by data collection date and time graph

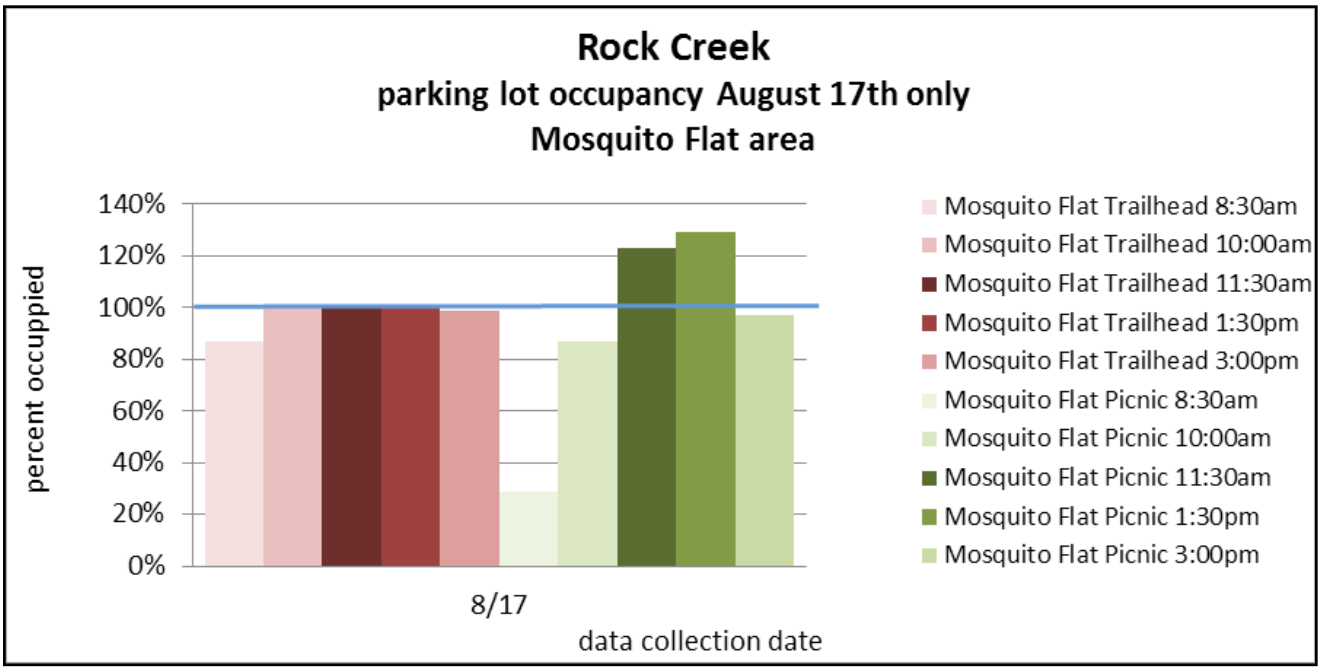


Figure: Mosquito Flat area parking lot occupancy August 17th only graph

Reviewing the parking data for the Mosquito Flat Trailhead lot shows dates and times of excess parking demand. Trendlines for each daily data collection time period have been added to the Mosquito Flat Trailhead parking lot occupancy by data collection date and time graph to show percisely when parking demand exceeds the supply of parking spaces. (See Figure: Mosquito Flat Trailhead parking lot occupancy by data collection date and time graph).

Parking demand at the Mosquito Flat area is greatest in the month of August between the 11:30am and 1:30pm data collection times. Observation times on either side of this peak period (10:00am and 3:00pm) show percipitously lower occupancy rate. The traffic count data for a typical day shows that approximately 100 vehicles have entered the Rock Creek area by 11:00am. If many of these vehicles are bound for the Mosquito Flat area, it would account for the full parking lot at the 11:30am observation.

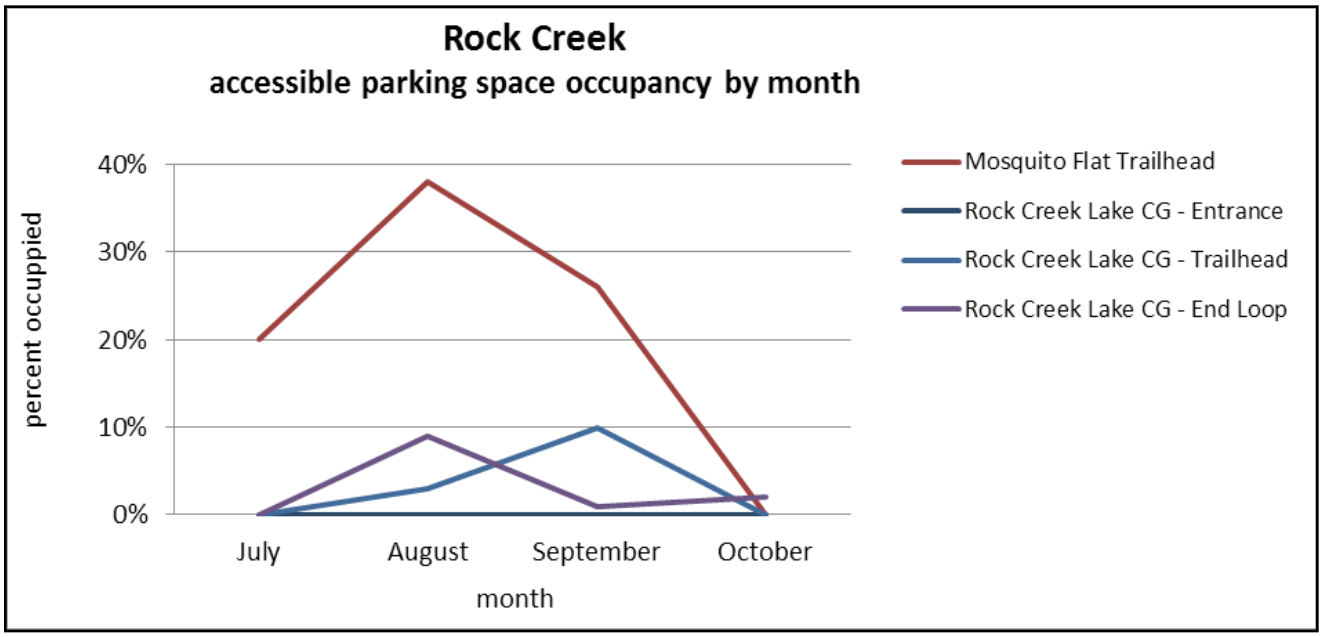


Figure: Rock Creek accessible parking occupancy by month graph

Rock Creek Canyon average number of vehicles parked in zone	
Mosquito Flat one lane roadside	0
Mosquito Flat entrance to Hilton Lakes/Davis Lake Trailhead	0
Hilton Lakes/Davis Lake Trailhead to Rock Creek Lake Group Campground	0
Rock Creek Lake Campground to Pine Grove Campground	0
Pine Grove Day-use to East Fork Public Parking	0
East Fork Public Parking to Forest Service Storage Area	1
Forest Service Storage Area to Bridge Parking Area	0
Bridge Parking Area to Entrance Station	0

Figure: Rock Creek Canyon roadside parking zones average number of vehicles

It is important to consider parking demand by the type of parking space available. Research of parking space utilization by configuration and restriction shows if the appropriate type and number of parking spaces are provided. Parking space type should support the activities offered at a location (i.e. truck and trailer parking at a boat launch ramp or overnight parking at a backcountry trailhead). If parking spaces of a certain configuration or restriction are underutilized they may be consuming valuable parking lot space that could be allocated to other types of parking. If insufficient parking is provided for certain user groups, visitors may park in regulated parking spaces or off pavement.

Vehicle type was divided into standard passenger automobile (POV) and any oversized vehicle (OS) or other vehicle configuration that required a larger than standard parking space or multiple parking spaces to accommodate it. An oversized vehicle parking space is provided at the Entrance Station parking lot near the Rock Creek Road and US Highway 395 intersection. No utilization of the oversized parking space was recorded during the study period.

Accessible parking spaces are designated in the Mosquito Flat Trailhead and the Rock Creek Lake Campground Entrance, Trailhead and End Loop parking lots. The Mosquito Flat Trailhead lot has 1 designated space and there are 2 each in the other locations within the Rock Creek Lake Campground area. Accessible parking space utilization was greatest at the Mosquito Flat Trailhead parking lot. (See Figure: Rock Creek accessible parking occupancy by month graph).

Roadside parking along Rock Creek Road was inventoried in roadside parking zones classified between the discrete parking lots or natural breaks in the survey route. Eight (8) roadside parking zones were observed along the road. The average number of vehicles observed in each parking zone over the study period is reported in Figure: Rock Creek Canyon roadside parking zones average number of vehicles. The parking data is presented visually on dot intensity maps by month of both parking lots and roadside parking zones in Appendix H.

Demand for roadside parking was minimal along Rock Creek Road. The roadside zone with highest parking demand was between the Forest Service Storage area and the East Fork Public parking lot. Parking on Rock Creek Road is authorized by Inyo and Mono Counties. Roadside parking does not appear to present a concern in the Rock Creek area.

11.5.2.3 TRAFFIC SURVEY METHODOLOGY

Rock Creek Canyon traffic data collection dates		
May 25	-	July 13
July 21	-	August 1
August 18	-	October 11
October 21	-	October 31

Figure: Rock Creek Canyon traffic data collection dates

Traffic data was collected using MetroCount 5600 vehicle classification equipment during the study period of May 1st through October 31st, 2011. The vehicle classifier collects rich data that can be mined to produce custom analyses. The firmware associated with the equipment can distill traffic volume, speed, gap between vehicles, type of vehicle, direction and time and date from the data collected. Data can be analyzed using any of these characteristics. The traffic graphs presented in this report were developed by amalgamating the data collected over the 4 time periods into 1 data set.

Traffic data was collected near the junction of Rock Creek Road and US Highway 395. The data includes all vehicles entering (inbound) and exiting (outbound) the Rock Creek area. This includes recreation home residents, resort guests, employees and visitors.

11.5.2.4 TRAFFIC DATA ANALYSIS

Nearly 101,000 vehicles were counted during the survey period for both directions (inbound and outbound). The calculated seasonal average daily traffic (ADT) was 630 vehicles. The division between inbound and outbound vehicles was even with an average daily traffic count of about 315 vehicles in each direction.

The daily distribution of vehicles for a typical day in the Rock Creek area is shown in Figure: Rock Creek virtual day vehicle distribution of inbound and outbound traffic graph. The inbound peak hour was between 10:45am and 11:45pm with an average of 62 vehicles counted. The outbound peak hour was between 12:00noon and 1:00pm with an average of 61 vehicles leaving the Rock Creek area during that hour.

The cumulative vehicle count for an average day at Rock Creek shows an even growth in inbound vehicles throughout the day. By 7:00pm 91% of all vehicles expected to arrive on an average day have entered the Rock Creek area. (See Figure: Rock Creek virtual day cumulative inbound vehicle counts graph).

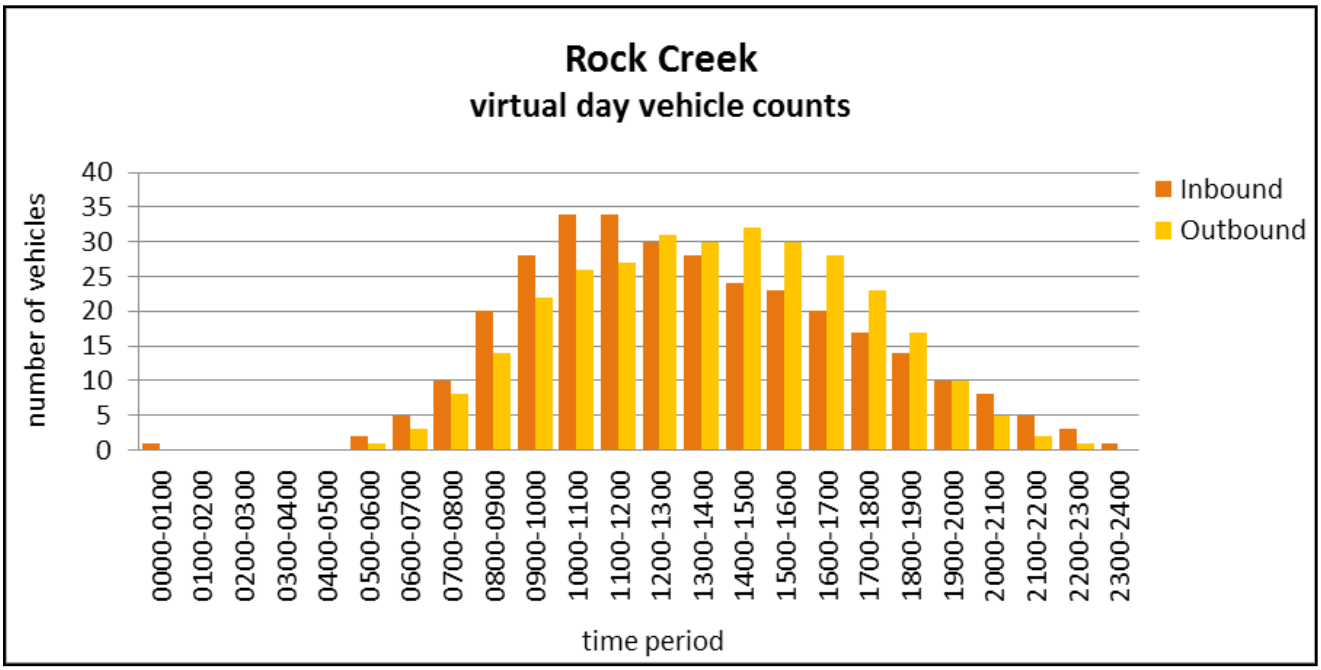


Figure: Rock Creek virtual day vehicle distribution of inbound and outbound traffic graph

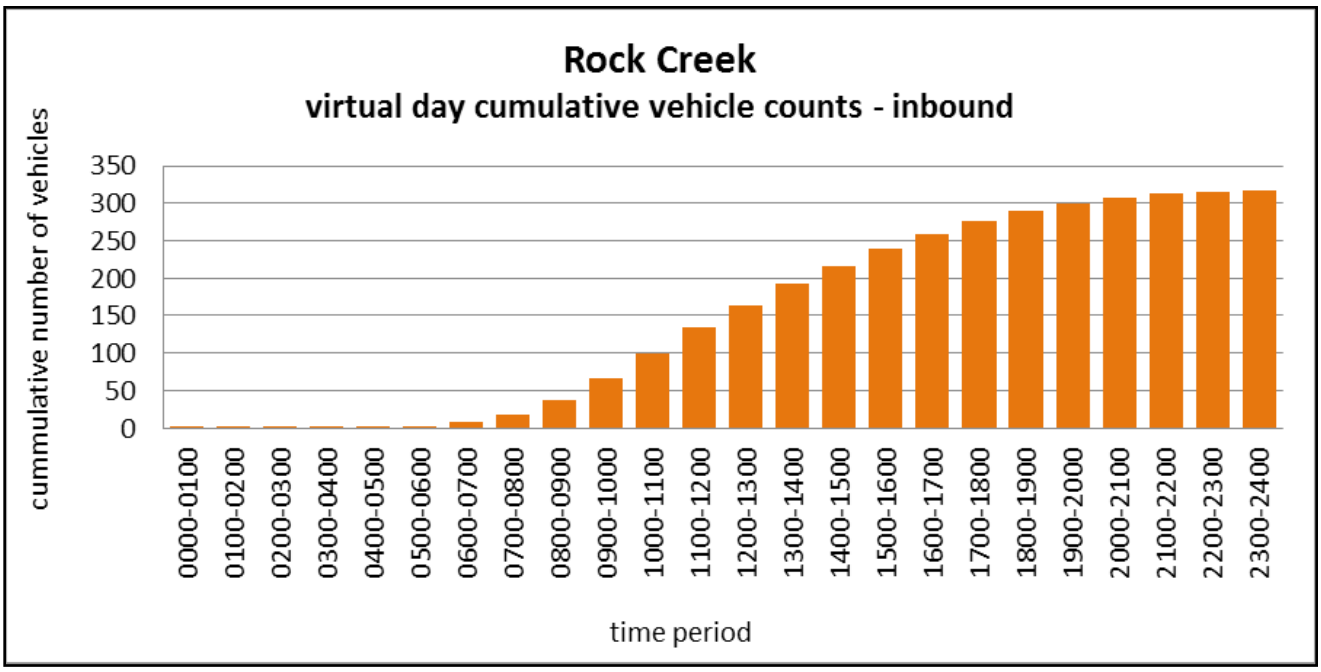


Figure: Rock Creek virtual day cumulative inbound vehicle counts graph

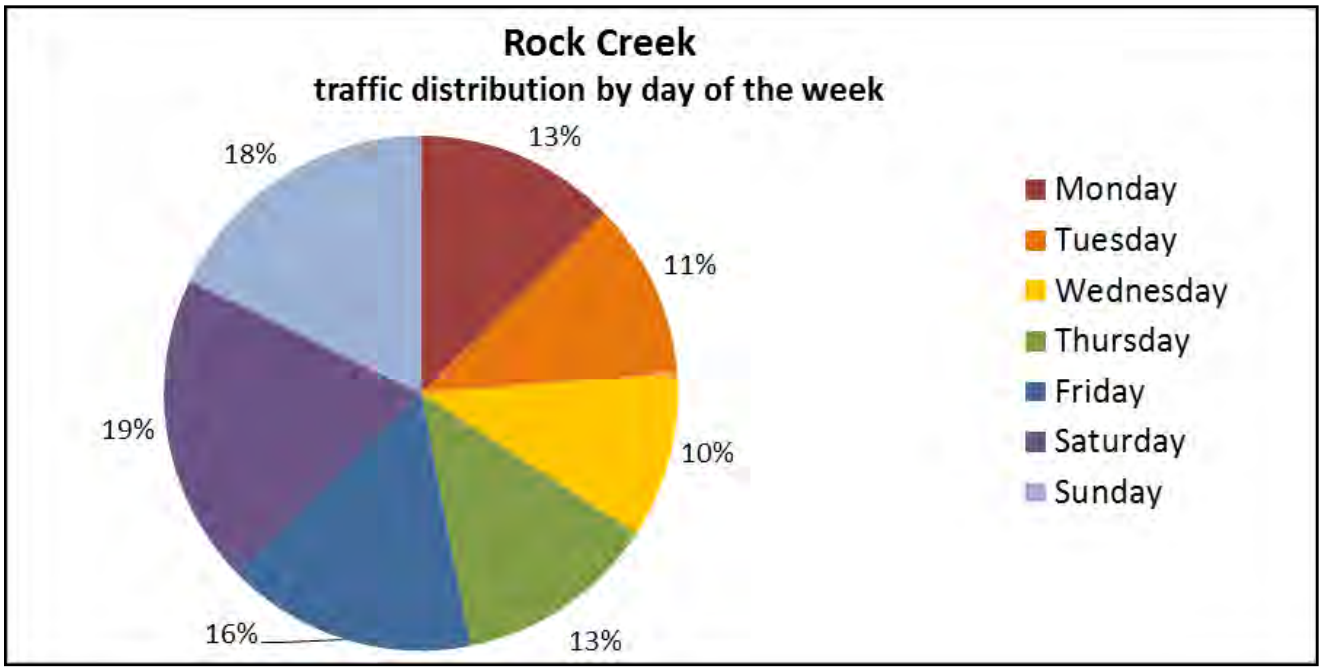


Figure: Rock Creek traffic distribution by day of the week graph

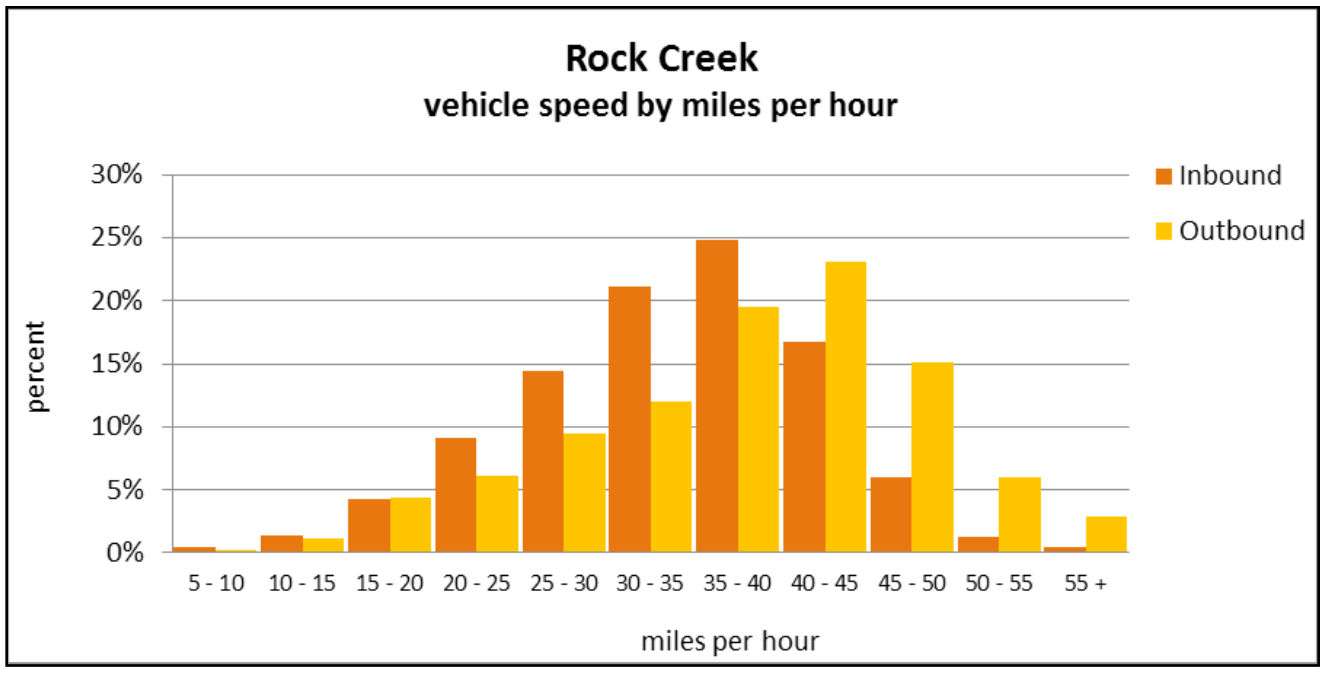


Figure: Rock Creek Road vehicle speeds in miles per hour graph

Traffic distribution by day of week is fairly even for the Rock Creek area. No particular day of the week dominates the traffic distribution. Individually neither weekend day commands a strong proportion of vehicular traffic. Weekend days (Saturday and Sunday) combined account for approximately 37% of total weekly traffic. The extended weekend of Friday, Saturday and Sunday combined account for 53% of the total weekly traffic. (See Figure: Rock Creek traffic distribution by day of the week graph).

The posted speed limit on the segment of Rock Creek Road where traffic counts were collected is 35 miles per hour. The average measured speed of all vehicles, inbound and outbound, was 36 miles per hour though inbound vehicles had an average speed (35 mph) 4 miles per hour lower than outbound vehicles (39 mph). Eighty-five percent (85%) of total vehicles traveled 45 miles per hour or less. (See Figure: Rock Creek Road vehicle speeds in miles per hour graph).

Calculation of average traffic distribution by month was not appropriate given the limited data set. Parking data is used to estimate temporal demand by month for access to the Rock Creek area during the study period.

11.5.2.5 TRAIL PERMITS DATA ANALYSIS

The Rock Creek Canyon area hosts 4 Wilderness trails: the Little Lakes Valley and Mono Pass trails accessible from the Mosquito Flat area, Hilton Lakes at a stand-alone trailhead on Rock Creek Road near the Mosquito Flat area and Tamarack Lake trail found in the Rock Creek Lake Campground. The area trails account for an average of about 5% of all overnight Wilderness trail permits issued on the Inyo National Forest during the annual trail permit quota period of May 1st through October 31st.

Wilderness entrance trail permits are required for all individuals and groups that plan an overnight stay in the backcountry on their hiking trip. Each permit regulated trail on the Inyo National Forest has a daily maximum number of hiking permits available during the annual trail quota period of May 1st through October 31st. The maximum group size is 15 people per permit in order to preserve the solitude of the backcountry. Little Lakes Valley and Mono Pass trails have a permit quota of 25 and 20 permits per day respectively. Hilton Lakes trail permit quota is 15 permits and the Tamarack Lake trail permit quota is 10 permits.

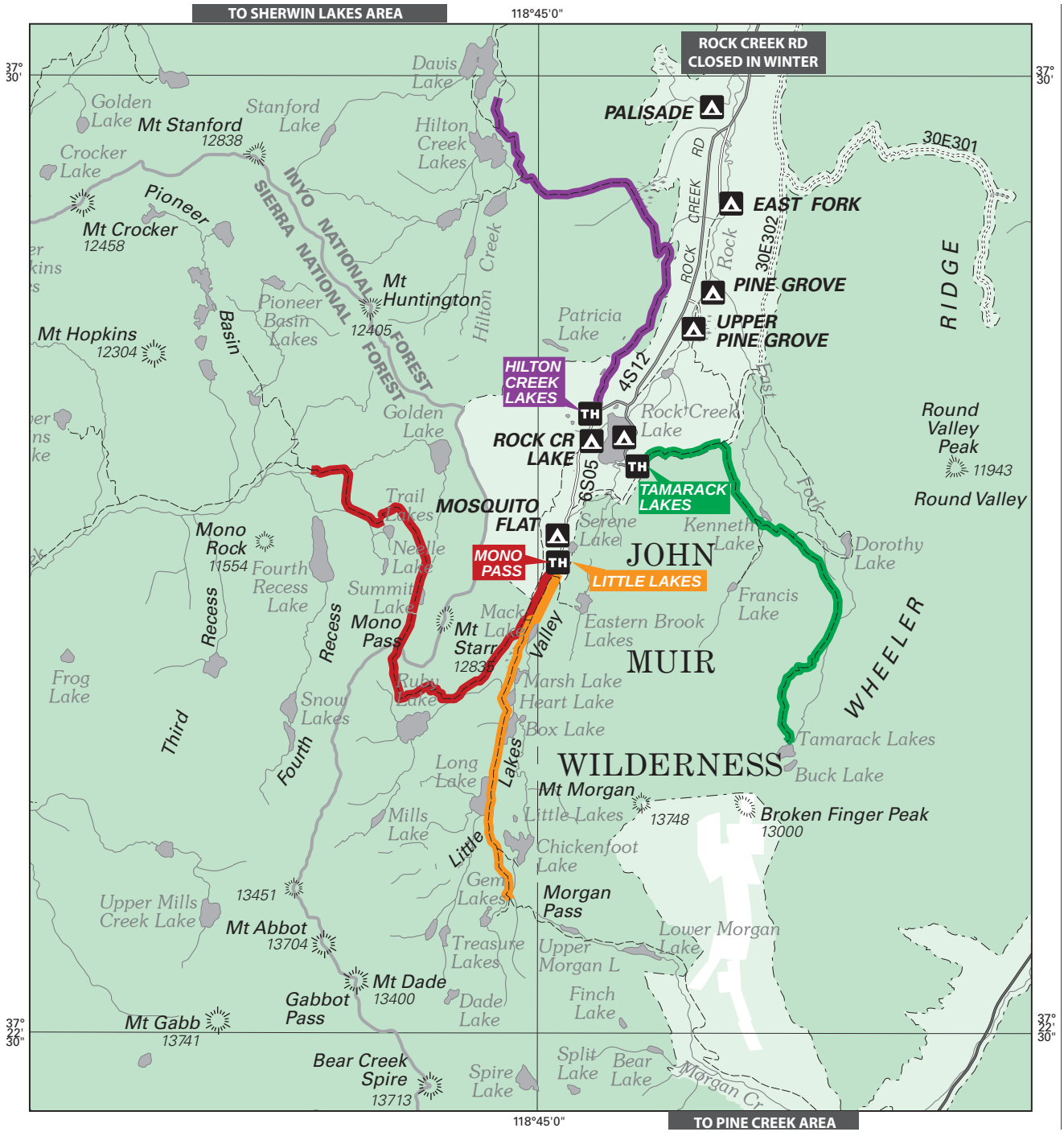


Figure: Rock Creek Canyon Wilderness trail map taken from www.fs.usda.gov/inyo/

Rock Creek Canyon Wilderness trail statistics				
	Mosquito Flat area			Rock Creek Lake Campground area
trail	Little Lakes Valley	Mono Pass	Hilton Lakes	Tamarack Lake
trail quota per day	25	20	15	10
Average # of entrance permits per year (2006-2010)	491	305	125	37
Avgerage party size	3	3	3	3
Avgerage # nights	2	4	3	2
% entering/exiting within basin	96%	83%	99%	100%
% of Inyo Nation Forest total permits	3%	2%	0%	0%

Figure: Rock Creek Canyon area Wilderness trail permit statistics

The Mosquito Flat trails are the most popular in the Rock Creek area. On average about 796 overnight Wilderness trail permits per year are issued for the Little Lakes Valley and Mono Pass trails located in the Mosquito Flat area.

Round trip hikes prevail in the Rock Creek area. The Little Lakes Valley, Hilton Lakes and Tamarack Lake trails had nearly 100% of hikers enter and exit within the Rock Creek area. These local trails offer limited connections to the regional hiking trail network. About 20 permits per year enter at the Little Lakes Valley trailhead for a one-way hike to a location outside the Rock Creek canyon.

The Mono Pass trail provides access to the John Muir and Pacific Crest Trails regional trail network. The Mono Pass trail had about 17% of permits or 60 permits per year enter at that trailhead and exit at another trailhead outside of the Rock Creek area.

The average length of overnight stay varied across trails within the Rock Creek area. Trails with a regional trail connection had longer average lengths of stay. The Mono Pass trail had an average of 4 nights per permit, the highest length of stay for the Rock Creek area trails. The Hilton Lakes and Tamarack Lake trails had, on average, 3 and 2 night stays respectively. The Little Lakes Valley trailhead, which shares an entrance with the Mono Pass trail but provides limited access to regional trail connections, had an average length of stay of 2 nights.

11.6 STRENGTHS, CHALLENGES AND OPPORTUNITIES

The strengths, challenges and opportunities in creating a comprehensive alternative transportation system in the Rock Creek recreation area were reviewed at the regional and local level by individual transportation mode. Data collected during the May 1st through October 31st survey period including parking lot occupancy, traffic counts and trail permits issued was analyzed to ascertain travel patterns and areas of parking and visitor demand. Based on site visits, data analysis, detailed reviews of existing conditions and user demand, a comprehensive list of achievable alternative transportation system improvements for the Rock Creek recreation area was developed.

11.6.1 PEDESTRIAN

Pedestrian travel to the Rock Creek area on a regional level is limited. Like many destinations within the Inyo National Forest, the remote location makes walking to the area feasible for a select few. Approximately 80 overnight trail permits per year or about 240 people begin one-way hikes from the Rock Creek area. The Mono Pass hiking trail provides a connection to the John Muir and Pacific Crest Trails regional trail network.

Active transportation by foot is feasible between origins and destinations within the Rock Creek recreation area. An improved hiking trail runs the length of the canyon supplying a travel route between generators and attractors of pedestrian traffic. The once continuous route is broken by a river crossing that may hamper travel for some individuals. Opportunities to improve pedestrian travel at the site level exist in specific locations of Rock Creek canyon area. The geographically consolidated layout of the Rock Creek Lake recreation area, with closely located generators and attractors of visitor traffic, is well suited for pedestrian travel. Vehicular traffic calming and roadway signage could be used to make the existing internal roadway more compatible to the mixed traffic it conveys. Reducing vehicle speeds and alerting drivers to the presence of other users in the roadway may make roads more hospitable for alternative modes of transportation.

The relatively short distances, shown in the Rock Creek Lake vicinity map on the next page, between parking lots and the lake front in the Rock Creek Lake recreation area also make it an excellent candidate site for enhanced accessible improvements. Designing and constructing pathways that meet accessibility standards would make features and amenities more accessible to visitors of all abilities.

SITE ANALYSIS: MOSQUITO FLAT AND ROCK CREEK LAKE CAMPGROUND ACCESS ROADS MIXED TRAFFIC ENVIRONMENT

Mixed traffic of motorists, pedestrians and bicyclists in the roadway is common in many areas of the Inyo National Forest where the road may be the only path between parking areas and attractions. Motorized and non-motorized traffic

Figure: Photos of users in roadways (top left and right and bottom left, Rock Creek Lake entrance road; bottom right, Mosquito Flat entrance road)

in a roadway is not incompatible; however, conflicts may arise when there is a great disparity between the travel speeds of users. A solution is to slow vehicular traffic to a minimum travel speed. Roadway design may be used to modify driver behavior. Site design techniques may be used to slow the speed of traffic thereby making the roadway more conducive to mixed traffic.

A gateway feature at the entrance to a recreation zone can act as a cue to drivers that they have left a higher speed road segment and have entered an area where lower speeds and mixed roadway traffic prevail. Narrowing travel lane widths acts as a visual cue to drivers causing them to naturally slow their speed. A gateway feature may act as a restriction point to decreases vehicle speeds.

A gateway feature may be created from a range of elements such as a monument sign, an entry gate, a constructed entranceway or natural features such as a cluster of trees or boulders. The gateway feature should complement the context of the area in which it is placed. The purpose of the gateway feature is to act as a visual cue and physical restriction so drivers naturally slow their travel speed.

Pavement markings are intended to act as a guide to drivers. A centerline in the roadway notifies drivers of bi-directional traffic and channels vehicles to one side of the road. A centerline may also encourage drivers to stay on only one side of a road even when it is occupied by other users. Lack of a centerline may allow drivers the freedom to shift their travel path and use the entire roadway surface uninhibited. On low speed, low traffic volume roadways that support mixed traffic, removing or limiting pavement markings may make room for other users and modes of travel.

Roadway signs provide necessary information to roadway users. Regulator, warning and informational signs are intended to inform drivers so they may make appropriate decisions about their driving behavior. “Share the Road” signage alerts drivers to the presence of mixed traffic in the roadway and acknowledges the legitimacy of alternative modes of travel to use and occupy the roadway. Speed limit signage sets the tone for travel on the roadway. Roadway signage assists users to understand the correct travel behavior and act accordingly.

The entrance roads into the Mosquito Flat and the Rock Creek Lake Campground areas provide excellent environments to apply the specific traffic calming techniques previously discussed. Aside from acting as vehicular access roads, each roadway also acts as a drive aisle for parking spaces built into the roadway as well as a pedestrian path for visitor accessing parked vehicles. Traffic conflicts may occur as thru traffic encounters slower moving traffic turning into or backing out of parking spaces directly into travel lanes. Entrance roads that act as parking lots and walkways may have an increase in traffic conflicts between vehicles and between vehicles and pedestrians.

The Mosquito Flat and Rock Creek Lake Campground entrance roads support a large amount of mixed traffic in the way of pedestrians utilizing the road as the only travel route. Individuals may enter the vehicular travel lane as they exit parked vehicles. In the Mosquito Flat area the Picnic and Dirt Lot parking areas act as overflow lots to the Trailhead parking lot. When individuals seeking access to the Little Lakes Valley and Mono Pass trailheads park in the Picnic or Dirt Lot they must walk on the entrance road to reach the trailhead. The Rock Creek Lake Campground entrance road acts as a direct path to the lake and as a connecting trail segment for the route that circumnavigates the lake. Parking areas located on the road are generators of pedestrian traffic and the roadway often represents the most obvious and simplest walking route.

Traffic calming treatments may create a more hospitable environment for mixed use traffic on roadways that act as parking lots and pedestrian paths.

1. Place gateway features at the entrance to recreation areas where the roadway supports mixed traffic.
2. Limit centerline roadway markings on roads that are single lane or have substandard lane widths and act as a critical pedestrian pathway.
3. Institute minimum vehicle speed limits on roadways that support mixed traffic.
4. Institute minimum vehicle speed limits on roadways where vehicle traffic movements from integral parking spaces may conflict with pedestrians and vehicular thru traffic.
5. Install “Share the Road” signage to alert drivers of the potential for other users in the roadway.

Site design techniques and treatments may be used to create a roadway that is conducive to all modes of travel.

11.6.2 BICYCLE

Regional travel by bicycle to the Rock Creek area may be feasible for a select few. The major residential centers of the Town of Mammoth Lakes and Bishop, California are approximately 30 miles away via US Highway 395. US Highway 395 has wide paved shoulders, a rumble strip along the outside lane and in segments is a state designated bicycle route. Rock Creek Road has a consistent uphill grade for inbound traffic that may present a challenge for bicyclist. The curvilinear nature of the road with limited sight distances and few refuge opportunities may make the road an undesirable bicycle path.

Future roadway rehabilitation projects are planned to include a bicycle lane or a paved shoulder on the inbound side of the Rock Creek Road. Installation of Manual on Uniform Traffic Control Devices (MUTCD) standard “Bicycles may use full lane” signage on Rock Creek Road would inform drivers of a bicyclist’s eligibility to occupy the vehicle travel lane. Expansion of bicycle routes through designation and roadway enhancements, where feasible, would improve the bicycle transportation system network.

An alternative to road bicycling within the Rock Creek canyon may be mountain biking. The distances between generators and attractors of visitor traffic within the Rock Creek area may be more conducive to travel off pavement by bicycle. Improvements to the intra-canyon hiking trail may make that route feasible for travel by mountain bike.

11.6.3 AUTOMOBILE

Travel by automobile dominates the Rock Creek recreation area. Simple automobile access on a two-lane paved road and strategically located vehicle parking near visitor destinations makes travel by personal vehicle convenient. High visitation rates during peak summer periods cause a shortage of parking spaces when parking demand exceeds paved parking space capacity in the Mosquito Flat area.

In the Mosquito Flat Trailhead and Picnic parking lots the demand for parking exceeds the supply of paved parking spaces during peak times in the month of August. The detailed analysis shows that between the 11:00am and 3:00pm time period, during the month of August, paved parking spaces in the Mosquito Flat area are near or at capacity. The Dirt Lot parking area is located approximately 650 feet down the entrance road from the trailheads and provides overflow parking during peak periods.

In other day-use locations of the Rock Creek recreation area parking demand does not exceed capacity. The Hilton Lakes Trailhead, Rock Creek Group Campground, Rock Creek Lake Campground, Pine Grove and East Fork areas have sufficient paved parking spaces to meet all parking needs. Accessible designated parking spaces show light usage in the data collected. In locations not served by a designated parking lot unrestricted roadside parking fills any parking needs.

SITE ANALYSIS: UTILIZATION OF PARKING LOTS

Parking lot configuration and utilization should maximize the number of parking spaces. Parking restrictions should be instituted only after engineering and design techniques to control parking have been exhausted. Parking restrictions that are not warranted should be removed to increase overall parking capacity. Parking restrictions that are not enforced should be eliminated.

The number of potential parking spaces in the Rock Creek area is limited by “no parking” restrictions on paved areas of parking lots that could support a viable parking space. Especially in areas of high parking demand, all paved parking lot surfaces should be utilized for parking.

Natural and engineered barriers should be used to eliminate off pavement parking in areas where it is not appropriate.

In areas where barriers are not feasible, signage should clearly articulate areas of "no parking." Wayfinding and regulatory signage should be consistent throughout the Inyo National Forest.

Parking restrictions by user group may create unnecessary competition for limited parking spaces. Restrictions on parking spaces in the Rock Creek Lake Campground area hold space for individuals that may be able to park elsewhere. When necessary, parking restrictions should be qualified by a time period, not a user group. Parking directional and regulatory signage should read "overnight" or "day-use." Specification of permissible parking hours on signage and wheelstops for day-use areas is preferable. (See opposite page).

The placement of equipment in parking spaces consumes available parking spaces. A water tank fill facility, interpretive sign and trash receptacles consume parking spaces in the Rock Creek Lake Campground area. Equipment and storage sited in parking spaces may compete for limited parking resources.

Travel by personal automobile is the predominant mode of transport to and within the Inyo National Forest. The existing vehicular infrastructure should be maximized to provide the greatest extent possible before additional costs are incurred to add capacity to the transportation system through alternative routes and modes. The site design techniques offered would help to achieve this goal.

11.6.4 PUBLIC OR PRIVATE TRANSPORTATION SERVICES

Eastern Sierra Transit Authority (ESTA) provides year round weekday interstate and intercity public transportation service on the US Highway 395 corridor. Three (3) transit routes pass the entrance to the Rock Creek canyon. The US 395 North and South routes may make a route deviation to the Toms Place Resort for passenger pick-up or drop-off with prior reservations. The Mammoth Express that travels between the City of Bishop and the Town of Mammoth Lakes departs US Highway 395 and travels on surface streets in the Rock Creek area. No weekend or holiday transit service is available on the US Highway 395 corridor routes. Public transit service is not provided within the Rock Creek recreation area.

Public transit service could be provided within the Rock Creek recreation area through a route deviation of the ESTA US 395 North, South or Mammoth Express bus routes or through the addition of a dedicated route between the Town of Mammoth Lakes and the City of Bishop as proposed in the ESETS Field Report.

The provision of transportation services by private sources is an option in the Rock Creek recreation area. Inyo National Forest permit holder, Rock Creek Lodge, offers winter transportation services to the guests and patrons of its establishment. Operation of an independent shuttle or taxi service to Forest Service lands would be possible with a special use permit from the Inyo National Forest.

The Inyo National Forest could encourage and support private provision of transportation service through Forest Service permit holders or special use permits. Transportation fares could be charged at fair market value or a Forest Service subsidized rate. The Forest could use a permit fee retention to financially support transportation services in areas where transportation services are highly desired but the fare necessary to garner riders may be insufficient to cover the cost of providing the service.

SITE ANALYSIS: ROCK CREEK RECREATIONAL SHUTTLE SERVICE

Recreational shuttle service was proposed to the Rock Creek recreation area in the Eastern Sierra Expanded Transit System (ESETS) review. The Transportation Advisory Group report suggested consideration of recreation shuttles to destinations where parking demand exceeded capacity. The Transit in Parks grant application noted Rock Creek as a key node on the Inyo National Forest.

Mass transportation may provide additional capacity to an overloaded transportation system by transporting people to areas where congested roadways or parking lots would otherwise have limit access. The Mosquito Flat area of the Rock Creek canyon experiences high parking demand and parking lots near or at capacity during the peak month of August. Recreational shuttle services may improve access to this location in particular.

Recreational shuttle service to the Rock Creek area may be warranted based on parking demand for the peak summer months of July and August. The estimated cost for the provision of public transportation to the Rock Creek area would depend on the trip frequency and if the service were part of an existing route or a new dedicated service. The gross operating expenses, proposed fare price and estimated ridership provided by ESTA are used for the following simplified cost estimation below.

ESTA staff proposed a dedicated route from the Town of Mammoth Lakes as the most viable means to service the Rock Creek Canyon area with public transit. The operating schedule proposed is 3 trips per day for the 77 days peak summer period between July and the beginning of September. The estimated cost per year is $38,955.84.

Ridership on the proposed public transit service was estimated to be on average 1.5 people per trip. ESTA staff proposed a $9.00 passenger fare. Operating costs above those paid by passenger fare revenue would be financed by the Forest Service. The operating subsidy is estimated at approximately $35,837 per year. A self-supporting passenger fare, with passenger fare revenues paying for the operating cost of the route, would be approximately $112.26 per passenger.

An alternative to a dedicated route may be a route deviation of the ESTA Mammoth Express service. This may be the most cost

Rock Creek Canyon
public transit service scenario operating cost estimates*

	miles	trips/day	cost/trip	cost/day	days/season	cost/season
dedicated public transit service from the Town of Mammoth Lakes	57	3	$168.64	$505.92	77	$38,955.84

*data supplied by ESTA staff

Figure: Rock Creek Canyon public transit service scenario estimated operating costs

Rock Creek Canyon
public transit service scenario ridership estimates*

	trips/day	days/season	trips/season	passengers/trip	fare	passenger fare revenue/season	subsidized operating cost/season
dedicated public transit service from the Town of Mammoth Lakes	3	77	231	1.5	$9.00	$ 3,118.50	$35,837.34

*data supplied by ESTA staff

Figure: Rock Creek Canyon public transit service scenario estimated ridership

effective way to provide public transit service to the Rock Creek area. The Mammoth Express route operates between the City of Bishop and the Town of Mammoth Lakes on weekdays. Three (3) round trips per day are schedule from Bishop in the morning, mid-day and evening.

The Mammoth Express route travels north on US Highway 395 from Bishop until it reaches the Rock Creek area. At the US Highway 395 intersection with Rock Creek Road the bus moves to the parallel roadway of Crowley Lake Drive. When the route enters and exits US Highway 395 at Rock Creek Road it could deviate to the Mosquito Flat area. A bus stop at Toms Place currently serves the Rock Creek area. The round trip distance between the intersection of Rock Creek Road and Crowley Lake Drive and the Mosquito Flat area is approximately 21 miles and would add about 50 minutes of travel time to the bus route. This transit alternative was not proposed by ESTA staff.

Ridership estimates for voluntary public transit service to the Rock Creek area would be low without a comprehensive parking management plan to restrict vehicle access and thus move visitors to transit or other alternative transportation modes. Transit route subsidizes of 95% may be necessary to support the provision of public transit service within the Rock Creek area.

Cost estimations are provided for exploratory purposes and to demonstrate the cost difference in types of service. Any change in route or stop locations or service additions would require approval of the ESTA Board of Directors.

Rock Creek
multimodal transportation system project matrix

mode of transport	project description	use level	cost estimate	partnering opportunity
Pedestrian				
	Develop a pedestrian wayfinding signage master plan	H	L	
	Conduct trail maintenance on existing trails	H	L-H	
	Install "Share the Road" signage on Mosquito Flat, Rock Creek Lake Group and Rock Creek Lake Campground entrance roads	H	L	
	Install pedestrian wayfinding signage	H	M	
	Develop a map for distribution to the public of the trail from area generators of visitor traffic to the Mosquito Flat area	M	L	Forest Service concessionaires
	Construct a bridge over water crossing on intra-canyon trail	M	H	trail advocacy groups
Bicycle				
	Install "Share the Road" signage on Rock Creek Lake Campground entrance road	H	L	
	Permit bicycle traffic on intra-canyon trail system	M	L	
	Install bicycle parking at Mosquito Flat and Rock Creek Lake parking lots	L	L	
	Promote bicycling on the forest through campground concessionaires and media outlets	L	L	Forest Service concessionaire
	Support installation of MUTCD compliant "Bicycles may use full lane" signage on Rock Creek Road	M	L	Mono and Inyo Counties, Federal Highway Administration
	Support construction of bicycle lane on Rock Creek Road in FHWA funded project	M	H	Mono and Inyo Counties, Federal Highway Administration
Automobile				
	Design a master parking plan for the Rock Creek recreation area	H	L	
	Create gateway feature to act as traffic calming cue	H	L	
	Post speed limits conducive to mixed use traffic on Mosquito Flat, Rock Creek Group and Rock Creek Lake Campground entrance roads	M	L	
	Denote parking restrictions on wheelstops	M	L	
	Install barriers and "no parking" signage along Mosquito Flat entrance road	L	L	
	Fund parking enforcement during peak summer visitation period	L	M	
Transportation Services				
	Fund recreation shuttle service	L	H	Eastern Sierra Transit Authority, Forest Service permit holder, private enterprise
	Fund additonal public transit service to area	L	H	Eastern Sierra Transit Authority
	Encourage development of private sector transportation services	L	L	Forest Service permit holders or private enterprise
Information Technology				
	Create a comprehensive transportation system network map showing routes, modes and connections for all transportation modes to and within the Rock Creek area	M	L	Mono County, Caltrans
	Create a parking map showing day-use only and overnight permissible parking areas	M	L	
	Support creation of a dynamic rideshare program	L	L	Inyo or Mono Counties, Caltrans, Eastern Sierra Transit Authority, private enterprise

Figure: Rock Creek multimodal transportation system project matrix

11.7 MULTIMODAL TRANSPORTATION SYSTEM PROJECT PROPOSALS

Preliminary multimodal transportation projects were developed that may improve access and mobility to and within the Rock Creek area. Field observations, data analysis and detailed reviews of existing conditions and user demand lead to the creation of a list of key alternative transportation system project proposals. Multimodal transportation system improvements included in the list were selected based on need and achievability. The diverse list of projects was distilled by mode of transportation.

The flow of pedestrian traffic in the Rock Creek recreation area would benefit from trail maintenance and traffic calming measures. Clearing trails of vegetation and obstructions in order to create an attractive and inviting pathway may enable visitors to walk between origins and destinations. As trails become more challenging, with rough terrain or breaks such as water crossing, less people are likely to utilize them. Completion of a continuous intra-canyon trail may improve access and mobility to high use locations like the Mosquito Flat area.

In locations where the roadway is the primary or only pedestrian pathway, traffic calming techniques may create an environment conducive to mixed traffic. Gateway features that narrow travel lanes act help to slow the flow of vehicle traffic. Road warning signage can alert drivers to the potential of mixed traffic in the roadway.

Both on-road and off-road opportunities exist for travel by bicycle in the Rock Creek area. The challenge of disparate speeds between automobiles and bicyclist on the uphill climb into the canyon and the need to ride in the vehicular travel lane may limit road bicycling to expert users. A continuous intra-canyon trail that allowed bicycle traffic may present an alternative to road bicycling.

Parking pressures are limited to the Mosquito Flat area of the Rock Creek recreation area. The parking lot occupancy and trail data suggests that long-term overnight hikers are consuming the parking spaces in the Mosquito Flat Trailhead parking lot and thus displacing day-users to the Picnic and Dirt Lot parking areas. Relocating overnight parking to the more distant parking areas would open the Trailhead parking lot for day-use visitors. In particular, the Picnic parking area will require signage and barriers to restrict off-pavement parking.

Based solely on parking demand, transportation services to the Mosquito Flat area may be warranted. Potential service options exist for either public or private provision of transportation services. Either choice will necessitate collaboration between the Inyo National Forest and a community partner.

Funding source availability and partnership building opportunities may dictate the implementation timing of multimodal transportation project proposals to and within the Rock Creek area. A definitive timing schedule is not proposed due to the understanding that limited funds may be available to accomplish projects. To assist the Inyo National Forest in selecting improvements, as funds and opportunities arise, the project proposal list was developed to demonstrate areas for potentially high, medium and low enhancement to the transportation network and to provide a broad estimate of cost.

Though many of the proposed projects are within the jurisdiction of the Inyo National Forest, projects may benefit from the orchestrated efforts of multiple agencies. Partnering with public or private organizations to accomplish the needed improvements to the transportation system may allow parties to combine expertise and funding sources and create a synergy in the completion of projects. Potential partnership building opportunities are supplied in the matrix.

11.8 CONCLUSION

Hiking, camping and fishing opportunities attract visitors to the Rock Creek recreation area. The readily accessible day hiking opportunities, 2 Wilderness trailheads and campground make the Mosquito Flat area a popular location with visitors. High summer season visitation during the peak month of August leads to parking pressures where parking demand often exceeds the supply of paved parking spaces.

Improvements to the transportation system may improve access to the Rock Creek area for a greater number of people. Efficient use of existing paved parking areas may increase the number of parking spaces available in high demand areas. Connecting broken segments in the intra-canyon pedestrian route may improve routes for travel by foot or bicycle. Providing a recreational shuttle service during peak visitation periods may broaden the alternative transportation modes available in the Rock Creek area and increase the number of visitors able to access the site.

12.1 EXECUTIVE SUMMARY

The expansive geographic layout of the Bishop Creek Canyon with steep mountain terrain and origins and destinations dispersed between 3 basin areas may best support travel by motorized means.

The Bishop Creek Canyon is a popular fishing and camping retreat with rugged mountain scenery and pristine lakes. Each of the 3 basin areas of the Canyon supports a varying degree of publicly and privately operated visitor oriented services. The level of day-use and overnight visitor activity differs between the South Lake, Lake Sabrina and North Lake areas.

Direct vehicular routes and strategically located parking make Bishop Creek Canyon highly accessible by automobile. Abundant parking, either in designated parking areas or roadside, supports visitor demand. Access to the area is not constrained by vehicle access or parking resources.

The development potential for alternative modes of transportation in the Bishop Creek Canyon may be better suited toward motorized means. Active transportation modes such as walking and bicycling may be feasible at specific locations but are unlikely for the long distances between generators and attractors of visitor traffic. Hikers making intra-canyon trips between trailheads within the Canyon may present a potential market for recreational shuttle service. Ridership estimates are low and the provision of on-demand service by a private operation may be the most economically feasible way to initiate a transportation service.

Mixed traffic in the roadways in the core recreation areas of each basin is likely. The absence of pedestrian pathway between parking areas and destinations requires travelers to use the roadways for access. Vehicular traffic calming techniques and appropriate warning signage may make roadways more conducive to the mixed traffic they support.

PEDESTRIAN

Strengths

- Existing local hiking trails with connections to regional hiking trail network
- Backcountry pack operations use and maintain sections of trail network

Challenges

- Narrow roadway widths with limited pedestrian refuge opportunities may make walking in roadway undesirable or hazardous
- Limited sight distance on roadways may make walking in roadway undesirable or hazardous
- Road is occasionally the only path from parking area to trailhead or attraction
- Long distances to walk between origins and destinations
- Mountainous terrain and constrained right-of-way widths limit opportunity for new pedestrian trails
- No pedestrian path from Hiker Overnight parking to Lake Sabrina Trailhead

Opportunities

- “Share the Road” signage on roadways that support mixed traffic
- Decommissioned roadways offer potential pedestrian trails between Aspendell and the Hiker Overnight parking lot
- Wayfinding signage from hiker overflow roadside parking at Parchers Resort to South Lake via pack trail
- Improved wayfinding signage from North Lake parking lots to trailhead

BICYCLE

Strengths

- Recreational bicycle use of area roadways
- Well maintained paved roadways to Lake Sabrina and South Lake

Challenges

- Lack of bicycle parking facilities
- Narrow road widths limit addition of bicycle facilities on roadways
- High speed vehicular traffic on State Route 168
- Dirt road to North Lake recreation area
- Narrow roadway widths and limited sight distances may make passing of bicyclist by vehicles hazardous

Opportunities

- Update road signage to MUTCD compliant “Bicycles may use full lane” on primary roadways
- “Share the Road” signage on secondary roadways

AUTOMOBILE

Strengths

- Roadways well maintained
- Sufficient parking at destinations
- Sufficient shoulder width on State Route 168 (Lake Sabrina Road) to support roadside parking

Challenges

- Roadside parking causing environmental damage especially along streambeds
- Lack of speed limit signage on South Lake Road
- Lack of parking for oversized vehicles at some day-use facilities
- Lack of parking enforcement
- State and County administered roadways

Opportunities

- Post minimum speed limits on roadways that support mixed traffic
- Gateway features at North Lake Road and Lake Sabrina Road entrances to act as visual cues and traffic calming
- Reallocate day-use only and overnight permissible parking at South Lake
- Clearly denoted parking restrictions in signage and on wheelstops or pavement
- Encourage long term parking at Parchers Resort and pack station for South Lake trailheads access
- Create area parking map showing quantity of parking available and restrictions for day-use only and overnight permissible parking locations

PUBLIC OR PRIVATE TRANSPORTATION SERVICES

Strengths

- Multiple origins and destination within canyon area
- Close proximity to the City of Bishop
- Permanent and seasonal residential communities that may benefit from transportation services within the area
- Forest Service permit holders with sizeable operations that may provide transportation services within the area

Challenges

- Sufficient automobile parking within canyon
- Seasonal visitation and operations
- Long distance to other Inyo National Forest recreation areas

Opportunities

- Encourage and support private service provide
- Fund public transportation service to and within the canyon

12.2 INTRODUCTION

The Bishop Creek Canyon is located on the Inyo National Forest near the City of Bishop, California. The area is characterized by steep mountains and canyons and pristine lakes. The man-made reservoirs of South Lake and Lake Sabrina are focal points of the area. Geographically the area is divided into 3 basins: South Lake, Lake Sabrina and North Lake. Each of the 3 areas offers lake fishing, hiking and camping opportunities.

The Bishop Creek recreation area is accessed by state and county roads. State Route 168, Bishop Creek Road, leads about 18 miles into the canyon from an intersection with US Highway 395 in the City of Bishop. The road eventually transitions into an entrance road for the Lake Sabrina recreation area. Inyo County administered South Lake Road and North Lake Road stem from Bishop Creek Road and provide access to the South Lake and North Lake recreation areas.

The Bishop Creek Canyon area is unique in that it has a combination of publicly and privately held land. The area hosts a mix of private residential and commercial uses, as well as, public recreational facilities. Two small private residential enclaves, Aspendell and Habeggers, incorporate private lands into the landscape of the Inyo National Forest.

Recreation is the prevailing visitor use in Bishop Creek Canyon. The location affords limited year round access to recreation areas. A number of Forest Service campgrounds offer summer season camping in locations throughout the area. Lake and stream fishing are popular in the trout stocked waters of South Lake, Sabrina Lake and North Lake. Eight (8) Wilderness hiking trails offer day and long distance hiking opportunities.

Each of the 3 basins supports a different level of private tourism development. Operated under permit from the Forest Service, the South Lake area offers a privately run resort with restaurant, a marina with boat rentals and a pack station that offers overnight backcountry trips. The visitor activity in Lake Sabrina is clustered lakeside where a Forest Service permit holder operates a store, restaurant and marina with boat rentals. Visitor services are limited to a permitted backcountry pack operation in the North Lake area.

12.3 PREVIOUS INYO NATIONAL FOREST TRANSPORTATION PLANNING

The Transit in Parks (TRIP) program grant application that funded this alternative transportation system study noted that this project would review areas of interest specified in previous transit reviews. The 2004 Field Report – Eastern Sierra Expanded Transit System (ESETS) did not recognize Bishop Creek as an area in need of public transit service. The Interagency Technical Assistance Group (TAG) report provides no specific direction in regards to the Bishop Creek area and suggests review of recreational shuttle service to popular trailheads and recreation areas where parking demand exceeds capacity.

12.3.1 2004 FIELD REPORT – EASTERN SIERRA EXPANDED TRANSIT SYSTEM (ESETS)

In 2004 a team of Federal Highway Administration and Federal Transit Administration personnel conducted a review of the transit system in the Eastern Sierra region focusing on access to the Inyo National Forest. The 2004 Field Report: Eastern Sierra Expanded Transit System (ESETS) conducted a transit service only alternative transportation feasibility study for the area along the US Highway 395 corridor stretching between Reno, Nevada, in the north, to Ridgecrest, California, in the south. The Field Report notes that recreation shuttles to popular destinations on the Inyo National Forest are "to meet the needs of recreational users (residents, visitors, wilderness)." No justification of specific need or estimation of ridership was provided in the report. The Field Report did not recognize Bishop Creek as an area in need of public transit service.

12.3.2 2007 INTERAGENCY TECHNICAL ASSISTANCE GROUP (TAG) REVIEW

The 2007 Interagency Technical Assistance Group (TAG) review of the Inyo National Forest transportation system proposed interrelated transportation planning recommendations for the Inyo National Forest. A suggestion was for further research of a recreational shuttle service to popular trailheads and recreation areas where parking demand exceeded capacity. No specific site locations were called out for further research.

The Bishop Creek recreation area will be reviewed to assess the need for recreational shuttle service. An analysis of parking lot usage will be used to indicate areas where parking demand exceeds available capacity. Aside from transportation services, other traditional alternative transportation modes (pedestrian and bicycle) will be included in a comprehensive assessment of the transportation network.

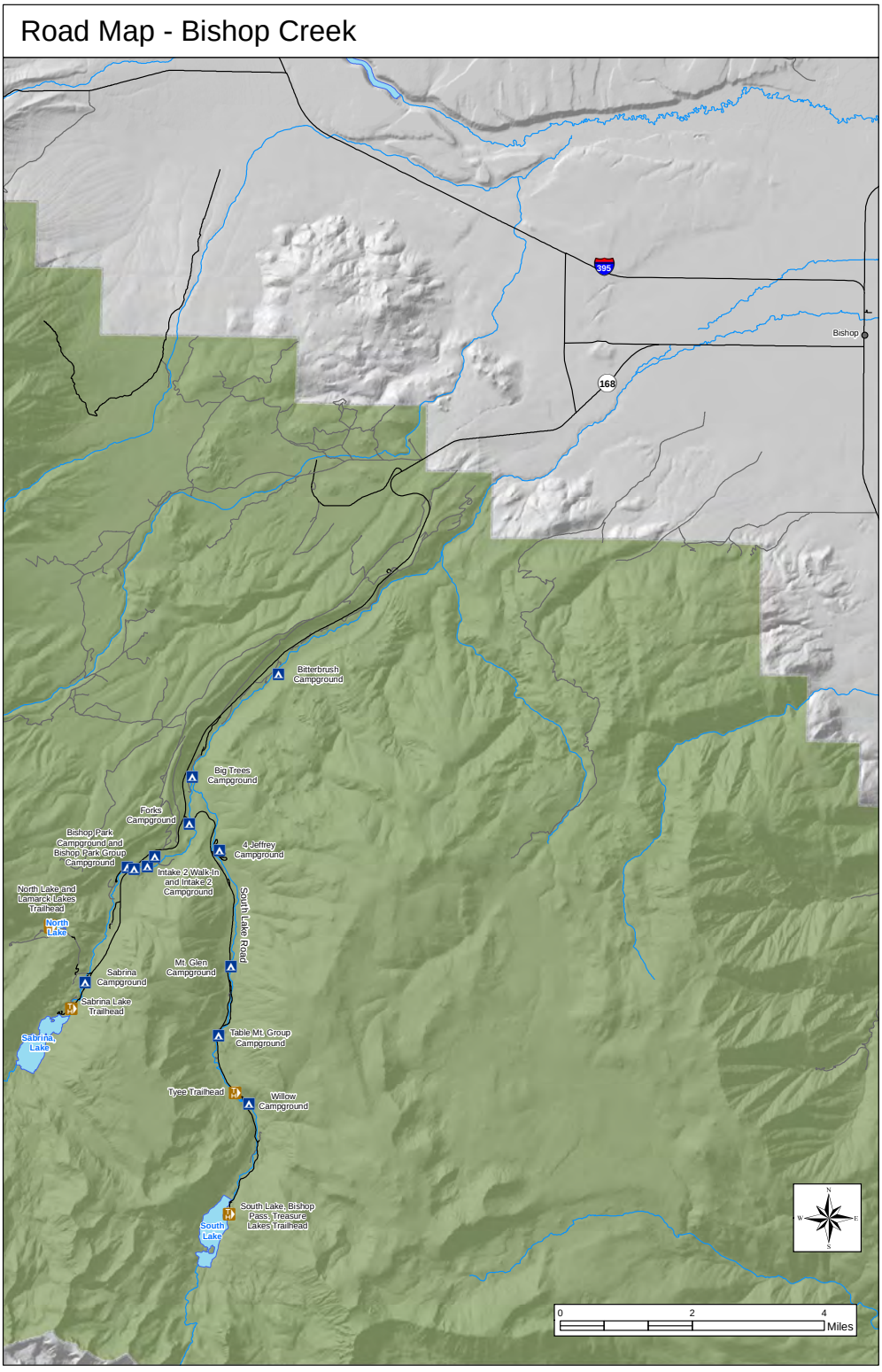


Figure: Bishop Creek area roads network map

12.4 EXISTING TRANSPORTATION INFRASTRUCTURE OVERVIEW

A review of the existing transportation system was conducted to determine the travel routes available to and within the Whitney Portal recreation area. Roads, foot paths, bicycle routes and public and private transportation services were examined at the regional, local and site level.

12.4.1 ROADS

The Bishop Creek recreation area is located approximately 18 miles from the junction of Bishop Creek Road (State Route 168) with US Highway 395 in the City of Bishop. The main access road into the canyon is State Route 168, a two-lane, undivided, paved roadway that transitions into the Lake Sabrina entrance road about 1/2 mile before reaching its end at the lake. Two (2) Inyo County roads branch from the state road and lead to the South Lake (South Lake Road) and North Lake (North Lake Road) recreation areas. The Forest Service assumes jurisdiction for each roadway about where it enters a recreation area. At that point the road generally has converted to internal circulation for a parking lot.

Bishop Creek Road (State Route 168) is a State of California designated State Scenic Highway from its beginning about 1.5 miles west of the community of Aspendell to Meadow Lane near the City of Bishop. The two-lane paved road acts as a collector roadway for residents and recreational travelers. The road has paved shoulders and curbing on some segments. Road closure gates limit access in the winter and the road is plowed of snow by Caltrans only to the Aspendell community. Overnight parking on the road is not restricted though topography and vegetation may obstruct roadside parking in areas. The posted speed limit on Bishop Creek Road varies between 45 and 55 miles per hour.

South Lake Road is under the jurisdiction of Inyo County. The two-lane, undivided, paved road provides access to the Habegger community and Inyo National Forest recreational sites within the South Lake area. The road does not have paved shoulders. The roadway is subject to road closure in inclement weather in the winter months. The posted speed limit is 35 miles per hour except where it passes through the community of Habegger where the speed is reduced to 25 miles per hour.

The maintenance responsibility of North Lake Road has been assumed by Inyo County. The mostly dirt road climbs from an intersection with Bishop Creek Road along the side of the mountain to the North Lake recreation area. The road provides seasonal access to Inyo National Forest recreational users and a pack station. There is no posted speed limit on the North Lake Road.

For roadways in the Bishop Creek Canyon area, the State of California and Inyo County authority and maintenance responsibility generally cease in the vicinity of the core recreation areas and reverts to Forest Service control. In these areas the road may become a parking lot drive aisle where perpendicular and parallel parking spaces are incorporated into sections of the roadway. Forest Service installed “no parking” signage may restrict indiscriminate roadside parking along the roadway. The posted speed limit on these roadway segments is typically 10 miles per hour.

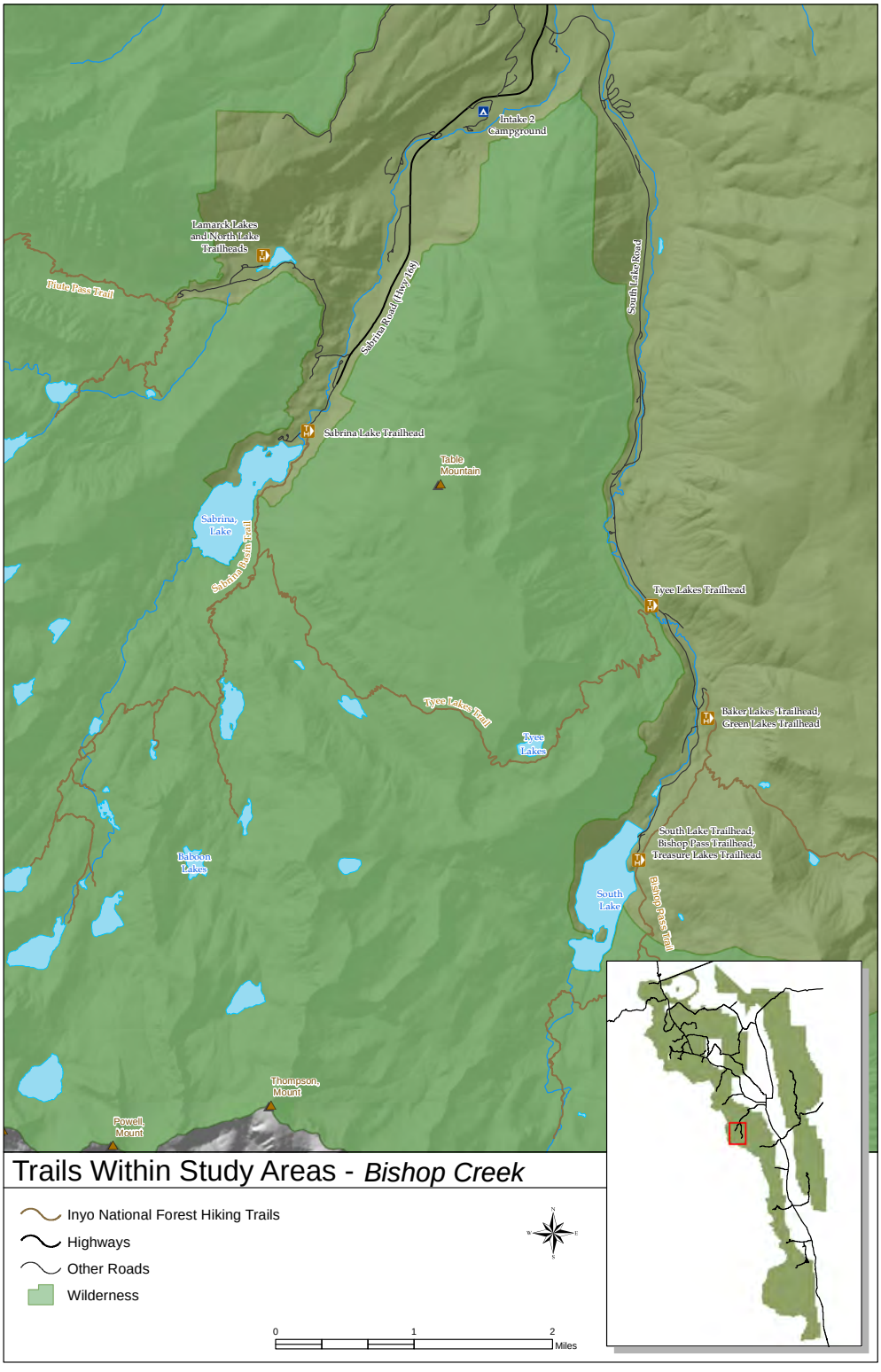


Figure: Bishop Creek Canyon area trails network map

12.4.2 FOOT PATHS

Regional and site specific foot paths exist to and within the Bishop Creek Canyon area. Local hiking trails provide regional connectivity to the Pacific Crest and John Muir Trails long-distance hiking trails. Improved pathways between origins and destinations within recreational sites facilitate mobility between generators and attractors of visitor traffic.

Wilderness hiking trail routes lead to regional destinations from the Bishop Creek Canyon. Connections to the Pacific Crest and John Muir Trails can be made from the Bishop Pass Trail found in South Lake area and the Piute Pass Trail located in North Lake area. The Baker and Green Lakes Trail located in South Lake provides a passage to the Big Pine Creek area found about 8 miles to the south.

Improved trails in day-use areas provide access to visitor attractions. A natural base trail improved with steps leads from the Trailhead Day-use Lower parking lot to the lake in the South Lake area. The restoration area located on South Lake Road offers a stabilized base pathway marked with stones to guide visitors through the site. Boulder stepping stones create a stairway from the road to the lake in the Lake Sabrina area.

Figure: Bishop Creek Canyon improved pedestrian pathway photos continued

Figure: Bishop Creek Canyon improved pedestrian pathway photo

Figure: Bishop Creek Canyon improved pedestrian pathway photo

Few developed foot paths make connections between overnight parking areas and trailheads within the Bishop Creek Canyon. In most locations the roadway is the only path between parking areas and visitor attractions. In the South Lake area additional overnight parking is located roadside along South Lake Road about 1.2 miles from the trailhead. South Lake Road acts as the conduit of pedestrian traffic from the roadside parking to the Baker and Green Lakes, Bishop Pass and Treasure Lakes trailheads. Overnight parking for the Sabrina and George Lakes trailheads in the Lake Sabrina area is located roadside on Bishop Creek Road (State Route 168) about 1/2 mile from the trailheads. The paved Lake Sabrina entrance road is the only path between the roadside parking and the trailheads. The Piute Pass and Lamarck trailheads in the North Lake area are accessed through the North Lake Campground with overnight and day-use parking approximately 3/4 of a mile away. The campground's dirt entrance road acts as the only path from parking areas to the trailheads.

12.4.3 BICYCLE ROUTES

Travel by bicycle is not a predominant mode of travel to or within the Bishop Creek Canyon area.

The steep mountain terrain, winding roadways, limited shoulder width and high vehicle speeds may make bicycle travel on Bishop Creek Road (State Route 168) undesirable. Bishop Creek Road makes a 5000 foot elevation gain in about 18 miles from the City of Bishop. The lack of paved shoulders on most roadway sections necessitates that bicyclists ride in the travel lane.

No enhancements for bicycle traffic on county roadways exist within the Bishop Creek Canyon area. South Lake Road is paved and has a speed limit conducive to mixed vehicle and bicycle traffic; however, the narrow lane widths, curvilinear roadway alignment and absence of roadside refuge locations may make the road a challenging bicycle route. Aside from the steep grade, the unpaved surface of North Lake Road may make the route unattractive for road bike traffic.

12.4.4 PUBLIC AND PRIVATE TRANSPORTATION SERVICES

Eastern Sierra Transit Authority (ESTA) provides year round interstate and intercity transportation service on the US Highway 395; however, the highway is a distance from the recreation areas in the Bishop Creek Canyon. The US 395 North and South routes pass the area on the trip from Lone Pine, California to Reno, Nevada on Monday, Tuesday, Thursday and Friday and the southern route from the Town of Mammoth Lakes to Lancaster, California on Monday, Wednesday and Friday. The Mammoth Express route travels via US Highway 395 from the City of Bishop, California to the Town of Mammoth Lakes three times a day Monday through Friday. There is no weekend public transit service on US Highway 395 in this area. Public transit service is not available to or within the Bishop Creek Canyon area.

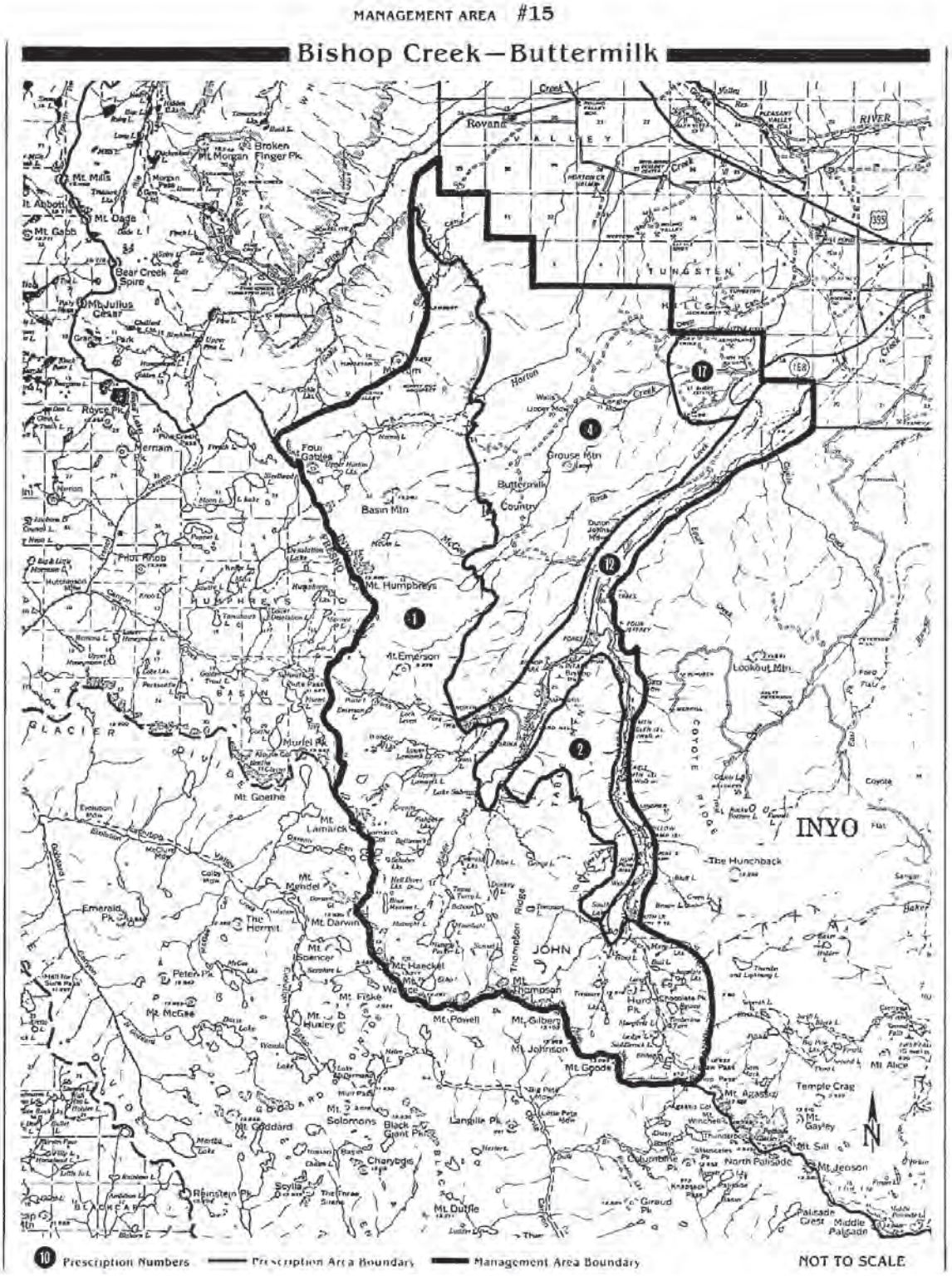


Figure: Bishop Creek-Buttermilk Management Area #15 map taken from Inyo National Forest Land and Resource Management Plan

12.5 DATA COLLECTION AND ANALYSIS

A combination of secondary data review and primary data collection was conducted to inform this study.

12.5.1 SECONDARY DATA REVIEW

Pertinent Inyo National Forest, regional and local transportation studies and plans were reviewed for information applicable to this alternative transportation system study.

12.5.1.1 INYO NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

The Area Direction section of the Inyo National Forest Land and Resource Management Plan or Forest Plan provides individualized management prescriptions for 20 areas on the Forest, one of which is Bishop Creek-Buttermilk (Management Area #15). The management area encompasses approximately 69,897 acres including 6,164 acres of Concentrated Recreation Area (Prescription #12) and 160 acres of Developed Recreation Site (Prescription #15). Areas within these 2 classifications may experience high levels of use and act as generators and attractors of visitor traffic.

The management area directives for Bishop Creek-Buttermilk that may be relevant to this study are:

- *"Identify and program dispersed trail facilities in the area in Prescription #12 to include hiking and equestrian opportunities."*

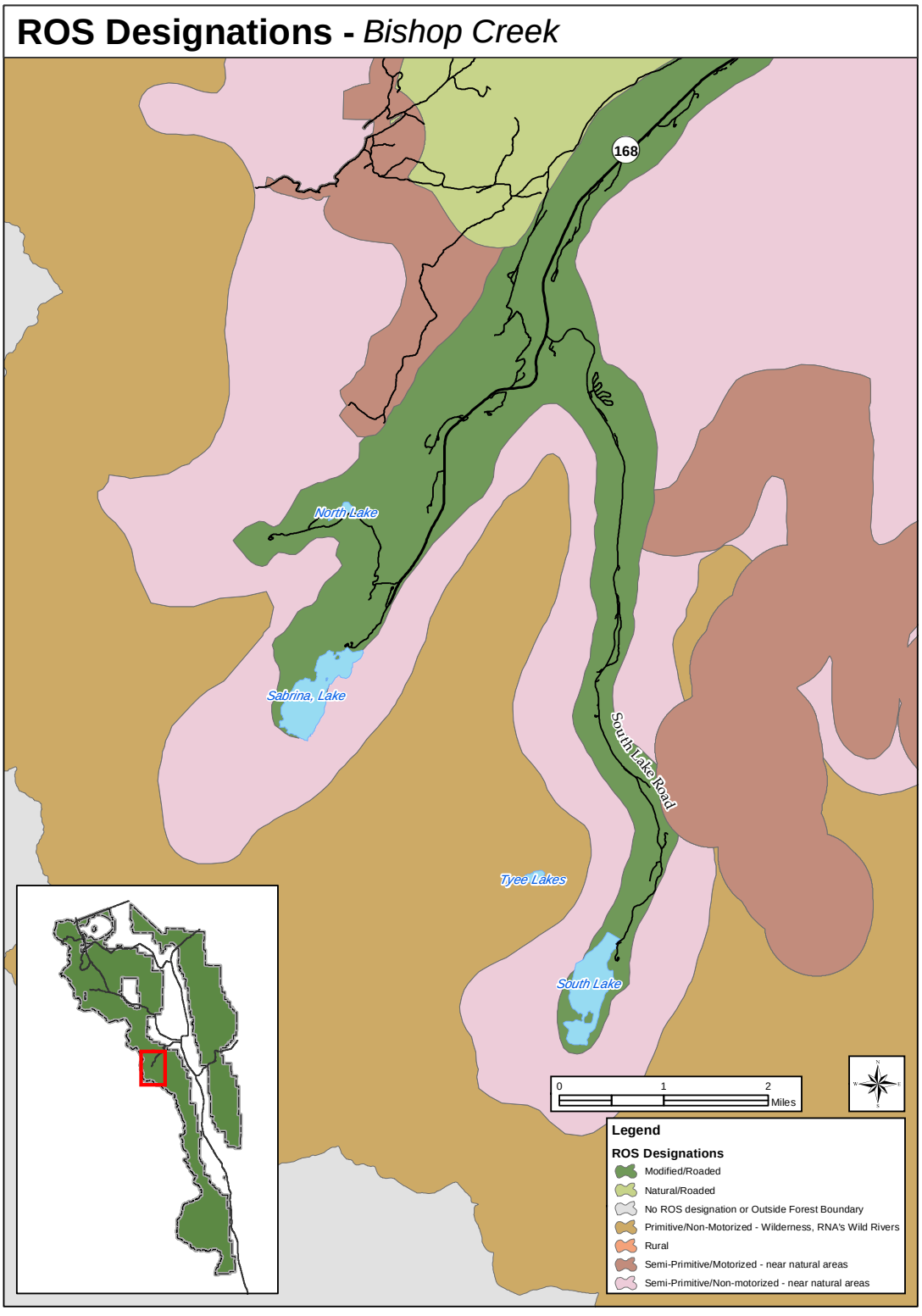


Figure: Bishop Creek Canyon Recreation Opportunity Spectrum map

12.5.1.2 RECREATION OPPORTUNITY SPECTRUM (ROS)

The Recreation Opportunity Spectrum (ROS) is a recreation planning tool used by the Forest Service to ensure a wide range of recreational experiences are available to visitors. One of the determinants the Spectrum uses to assess experience type at a location is the type of transportation facility provided and the means of travel supported. Limited or more difficult pathways supply access to Primitive areas while highly improved transportation systems provide ease of access to Urban locations. Accessibility may be described by the quantity and quality of routes provided and by the permitted modes of transport.

The Bishop Creek recreation area is within the Roaded Modified ROS designation a sub-classification of the Roaded Natural category. The Roaded Modified category is similar to the Roaded Natural class except the area may have been heavily modified with roads and facilities. In the Roaded Modified class one would expect more social contacts as a better quality and quantity of travel routes and modes makes travel to the area more attainable for a greater number of people. The environment maintains its natural character and pathways may be natural surface or paved, when necessary. The Roaded Modified classification offers a high degree of interaction with the natural environment.

12.5.1.3 STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) STATE ROUTE 168 TRANSPORTATION CONCEPT REPORT (TCR)

The State of California Department of Transportation (Caltrans) Transportation Concept Reports (TCR) describe the existing conditions and future conceptual improvement options for a given transportation route or corridor. The State Route 168 TCR designates Bishop Creek Road as a Major Collector road because it serves residents and recreational travelers commuting to the Bishop area and US Highway 395. No roadway projects are planned for State Route 168 in the Bishop Creek Canyon area, however, the extension of a Class III bicycle path to Cerro Coso Community College was proposed.

12.5.1.4 INYO COUNTY CIRCULATION ELEMENT/REGIONAL TRANSPORTATION PLAN

Roads, public transportation, bicycles and trails are included in the Circulation Element of the Inyo County General Plan. The goal of the Bicycle and Trails section of the General Plan is to “encourage and promote greater use of non-motorized means of personal transportation within the region.” The Public Transportation section of the Plan strives to provide effective, economically feasible and efficient public transportation in Inyo County. An implementation measure to “encourage continued development of a transit system that will provide access to major tourist attractions” supports the development of public transit.

12.5.1.5 INYO COUNTY REGIONAL TRANSPORTATION PLAN

The Inyo County Regional Transportation Plan provides policies, objectives, improvements and funding strategies for regional transportation movement of people and goods in Inyo County. The Action Element includes recommended transportation improvements for roadways, public transit, bicycle and pedestrian modes as well as information technology solutions. Many of the policies and objectives of the Regional Transportation Plan are similar to those contained in the Inyo County General Plan.

12.5.1.6 INYO COUNTY COLLABORATIVE BIKEWAYS PLAN

The Inyo County Collaborative Bikeways Plan is the official bicycle plan for Inyo County. The Plan describes existing bicycle facilities and programs, evaluates and prioritizes the need for future bicycle system improvements and the development of new routes. The Plan acknowledges that the compact design of communities within Inyo County makes bicycling a viable alternative for local trips but recognizes that the long distances between communities may limit the use of bicycles for intercity travel.

Bishop Creek Canyon
parking lots and marked parking space inventory

parking lot	type of space		
	standard	oversized	accessible
South Lake			
Trailhead Overnight	51		
Trailhead Upper Day-use	34		1
Trailhead Lower Day-use	6		2
Dam/Boat Launch	23	1	
Weir Lake	5		
Roadside 1	4		
La Hupp Picnic Area	6		
Roadside 2	7		
Summer Resident	7		
Tyee Lakes (dirt lot)			
Rock Parking Lot (dirt lot)			
Lake Sabrina			
Marina	34		
Pinwheel	23		
Overnight Hiker (dirt lot)			
Intake 2 (dirt lot)			
North Lake			
Trailhead Lot 1 (dirt lot)			
Trailhead Lot 2 (dirt lot)			
Day-use (dirt lot)			
Bridge (dirt lot)			

Figure: Bishop Creek Canyon recreation area parking space inventory by parking lot

12.5.2 PRIMARY DATA

Primary data was collected by the study research team on parking lot utilization and visitor use on 21 randomly selected days during the May 1st through October 31st, 2011 study period. Vehicular traffic data was collected for random periods during the study duration. Wilderness trail permits data for the trail quota period of May 1st to October 31st in the years 2006 through 2010 was furnished by Inyo National Forest staff.

12.5.2.1 PARKING SURVEY METHODOLOGY

The Inyo National Forest has developed numerous paved and unpaved parking areas near visitor destinations in the Bishop Creek Canyon recreation areas. The inventory of parking lots and the number of paved, marked parking spaces by lot is shown in Figure: Bishop Creek Canyon recreation area parking space inventory by parking lot.

A parking lot survey including written protocol instructions and a survey instrument was created for the Bishop Creek area. Vehicle parking was inventoried in parking lots and along the roadside in the South Lake, Lake Sabrina and North Lake areas. All parking lots were Inyo National Forest sanctioned unpaved or paved parking areas. Roadside parking along South Lake Road, Bishop Creek Road and North Lake Road was documented by defined parking zones. Data was collected on 21 randomly selected days during the May 1st to October 31st, 2011 study period.

The written survey protocol instructions were designed to maintain consistency in data collection methods between research staff members. The explicit instructions specified data collection locations and the appropriate way to record observations on the survey instrument. Experienced team members conducted data collection field training. This measure ensured the understanding and accuracy of the survey protocol by first time research assistants.

Parking survey areas included Inyo National Forest parking lots within the Bishop Creek Canyon area. The canyon was divided into 3 sections: South Lake, Lake Sabrina and North Lake. Individual parking lots within each section were given descriptive names based on their location. Parking lot locations for the South Lake section included Trailhead Overnight, Trailhead Upper Day-use, Trailhead Lower Day-use and Dam/Boat Launch lots all located in the South Lake core recreation area. Weir Lake, Roadside 1 and 2, LaHupp Picnic, Summer Resident, Tyee Lakes and the Rock parking lots were located along South Lake Road. The Lake Sabrina area included the Marina and Pinwheel lots at the lake, the Overnight Hiker dirt lot at the intersection between Bishop Creek Road and North Lake Road and the Intake 2 parking area. Parking lots in the North Lake group included Trailheads 1 and 2, Day-use and the Bridge parking area located at the entrance to North Lake Road.

Bishop Creek Canyon data collection dates		
day of week	date	survey site
Monday	June 20, 2011	Bishop Creek
Tuesday	June 28, 2011	Bishop Creek
Thursday	July 7, 2011	Bishop Creek
Thursday	July 14, 2011	Bishop Creek
Wednesday	July 20, 2011	Bishop Creek
Wednesday	July 27, 2011	Bishop Creek
Thursday	August 4, 2011	Bishop Creek
Wednesday	August 10, 2011	Bishop Creek
Sunday	August 14, 2011	Bishop Creek
Wednesday	August 17, 2011	Bishop Creek
Wednesday	August 24, 2011	Bishop Creek
Friday	August 26, 2011	Bishop Creek
Friday	September 9, 2011	Bishop Creek
Tuesday	September 13, 2011	Bishop Creek
Wednesday	September 21, 2011	Bishop Creek
Saturday	September 24, 2011	Bishop Creek
Monday	September 26, 2011	Bishop Creek
Friday	October 7, 2011	Bishop Creek
Friday	October 14, 2011	Bishop Creek
Thursday	October 20, 2011	Bishop Creek
Monday	October 24, 2011	Bishop Creek

Figure: Bishop Creek parking survey data collection dates

Parking spaces were inventoried by parking space type. The number of marked personal occupancy vehicle (POV), oversized vehicle (OS) and accessible (HC) parking spaces was printed on the line next to the parking lot name. Classification by vehicle type was divided into personal occupancy vehicles and oversized vehicles (e.g. recreational vehicles, trucks with trailers, buses) that would not fit into a standard parking space. Parking spaces designed for oversized vehicles were available at the Dam/Boat Launch parking lot in South Lake. Accessible parking spaces were designated in the South Lake Trailhead Upper and Lower Day-use parking lots.

Overnight parking restrictions varied by parking lot. In the South Lake core recreation area 51 overnight parking spaces were designated at the Trailhead Overnight parking lot with additional overnight parking located along the road near the Parchers Resort. Overnight parking in the Lake Sabrina area is located prior to the recreation area along the shoulder of Bishop Creek Road (State Route 168) before the roadway transitions to a narrow entrance road. The North Lake area has overnight parking in 2 dirt parking areas (Trailhead 1 and 2). Additional overnight parking for the Lake Sabrina and North Lake areas is located at the intersection of the Bishop Creek Road and North Lake Road in the Hiker Overnight dirt parking area.

Location: South Lake ing Survey Date: 8/24/11
Staff ID: Kristen Yanez
Weather: sunny/breezy

	M/Hr	8:30am	10:00am	11:30am	1:30pm	3:00pm
Time:						
Parking lot:	0/:00	SL Trailhead Overnight	POV (51)			
# POVs:		46	49	51	51	48
# oversized:						
Comments:						
Parking lot:		SL Trailhead Upper Day-use	POV (34) HC (1)			
# POVs:		23	24	32	31	29
# oversized:						
Comments:						
Parking lot:	0.1/:01	SL Trailhead Lower Day-use	POV (6) HC (2)			
# POVs:		0	0	1	2	1
# oversized:						
Comments:						
Parking Lot:		Dam/Boat Launch	POV (23) Trailer Parking (1)			
# POVs:		6	7	16	14	12
# oversized:		2 trailers	2 trailers	3 trailers	3 trailers	3 trailers
Comments:						
Parking area:		Dam to Wier Lake				
# POVs:		0	0	0	0	0
# oversized:						
Comments:						
Parking lot:	0.4/:03	Wier Lake	POV (5)			
# POVs:		2	1	2	2	1
# oversized:						
Comments:						

Figure: Bishop Creek parking survey data collection instrument sample. More on next page.

Roadside areas between the parking lots were labeled “parking zones.” Roadside parking data was captured to measure any unmet parking demand and its locations. Roadside parking is permitted on most state, county and forest roadways, unless otherwise restricted. Roadside parking is not restricted in most areas within the Bishop Creek Canyon. Roadside parking is prohibited by the Forest Service on the entrance road to Lake Sabrina (Bishop Creek Road) after it leaves State of California jurisdiction.

Parking survey data was collected 5 times during an individual day (8:30am, 10:00am, 11:30am, 1:30pm and 3:00pm) for all 3 sections of the Bishop Creek recreation area. The number of vehicles observed in each designated parking lot or in a roadside parking zone was recorded on the tally sheet. Space was provided on the data collection instrument for written staff comments under each individual parking lot or for general comments regarding the study area as a whole, at the end of the instrument. Information regarding the date, the name of the research staff member conducting the survey and the weather were recorded at the top of the instrument.

The Bishop Creek parking survey protocol and survey instrument are available in Appendix E.

Location: Lake Sabrina — king Survey — Date: — Staff ID:

Weather:

Time: (M/Hr)	8:30am	10:00am	11:30am	1:30pm	3:00pm
Parking lot: 7.8/:22 Intake 2 (dirt lot)					
# POVs:	6	10	13	8	7
# oversized:					
Comments:					
Parking lot: Intake 2 to Overnight Hiker (North Lake Road)					
# POVs:	0	0	1	0	0
# oversized:					
Comments:					
Parking lot: 10.6/:29 Overnight Hiker (dirt lot)					
# POVs:	3	3	3	3	3
# oversized:					
Comments:	* same 3 cars all day				
Parking lot: 11.2/:33 Marina	13	POV (34) 15	23	21	21
# POVs:					
# oversized:	3 trailers	3 trailers	4 trailers	3 trailers	3 trailers
Comments:					
Parking lot: Pinwheel	2	POV (23) 3	5	3	1
# POVs:					
# oversized:	4 trailers	4 trailers	4 trailers	4 trailers	4 trailers
Comments:	* same 4 trailers all day				

Location: North Lake — king Survey — Date: — Staff ID:

Weather:

Time: (M/Hr)	8:30am	10:00am	11:30am	1:30pm	3:00pm
Parking lot: 12.4/:40 Bridge Area (dirt lot)					
# POVs:	1	3	2	0	1
# oversized:					
Comments:					
Parking lot: 14.1/:50 Trailhead Lot 2 (dirt lot)	POV (~45)				
# POVs:	9	10	9	9	7
# oversized:					
Comments:					
Parking lot: Trailhead Lot 1 (dirt lot)					
# POVs:	33	35	32	30	29
# oversized:					
Comments:					
Parking area: Trailhead Lot 1 to Day-use					
# POVs:	3	2	2	2	2
# oversized:					
Comments:					
Parking lot: 14.9/:56 Day-use (dirt lot)					
# POVs:	0	2	3	4	2
# oversized:					
Comments:					

return to South Lake 11.8 miles, approximately 26 minutes

Other comments:

8/24/2011 7:40 AM

Figures: Bishop Creek parking survey data collection instrument sample pages

12.5.2.2 PARKING DATA ANALYSIS

Parking demand in the form of parking lot occupancy rates was used to assess the level and locations of visitor demand for access to the Inyo National Forest. Parking lot occupancy rates were determined for parking lots with a definitive number of marked parking spaces. In locations were a dirt parking area allowed for a more organic parking arrangement, an average number of vehicles was used as the metric.

Temporal parking data was collected by month and time of day on 21 randomly selected days in the May 1st through October 31st, 2011 survey period. The data for discrete parking lots was analyzed and is presented graphically below by the 3 sections: South Lake, Lake Sabrina and North Lake.

Parking demand in the South Lake area shows a significant peak in the month of August though the demand for parking at specific locations varied from month to month. Monthly parking lot occupancy rates show that the South Lake Trailhead Overnight parking lot experienced near capacity demand for the month of August. Parking lot occupancy dropped in the month of September for all parking locations in the South Lake area. (See Figure: Bishop Creek – South Lake area parking lots occupancy by month graph).

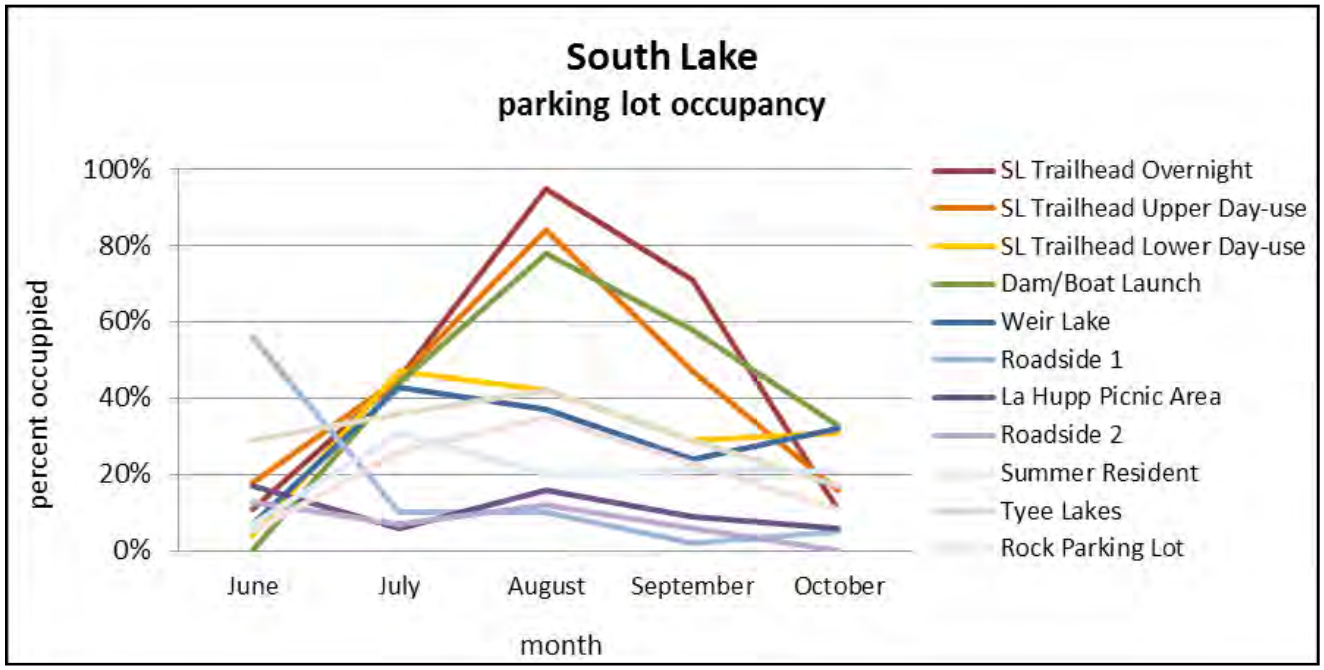


Figure: Bishop Creek – South Lake area parking lots occupancy by month graph

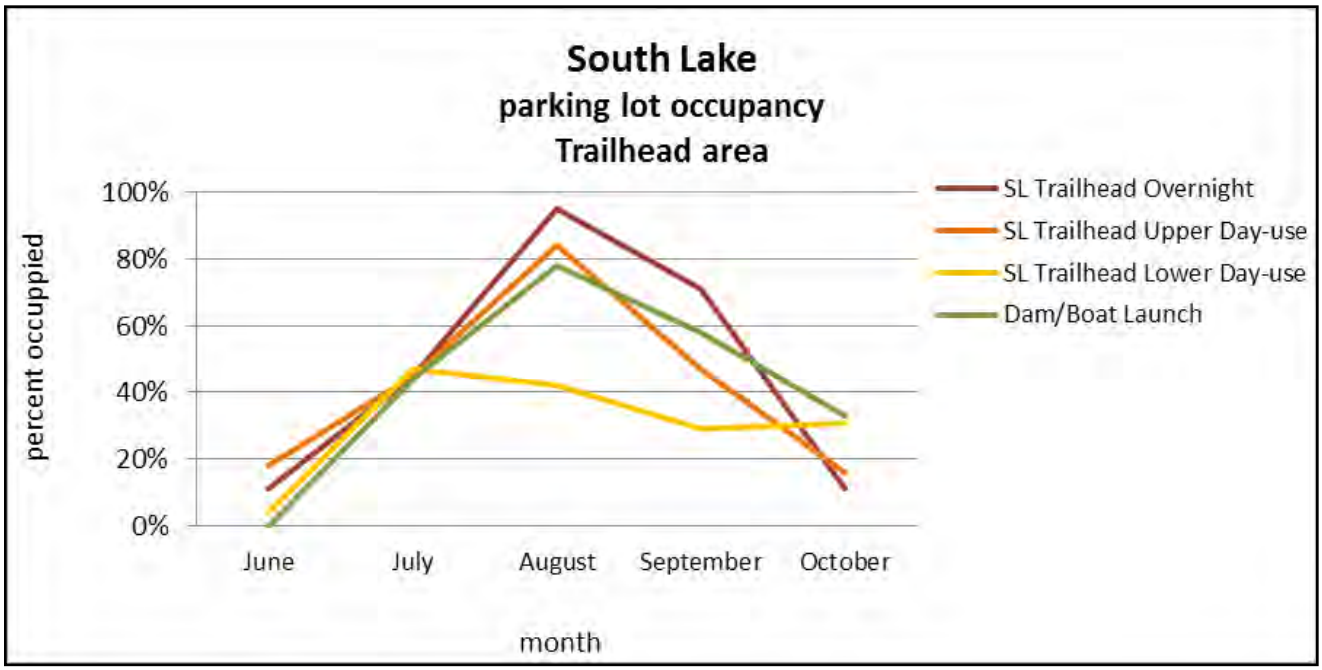


Figure: Bishop Creek – South Lake Trailhead parking lots occupancy by month graph

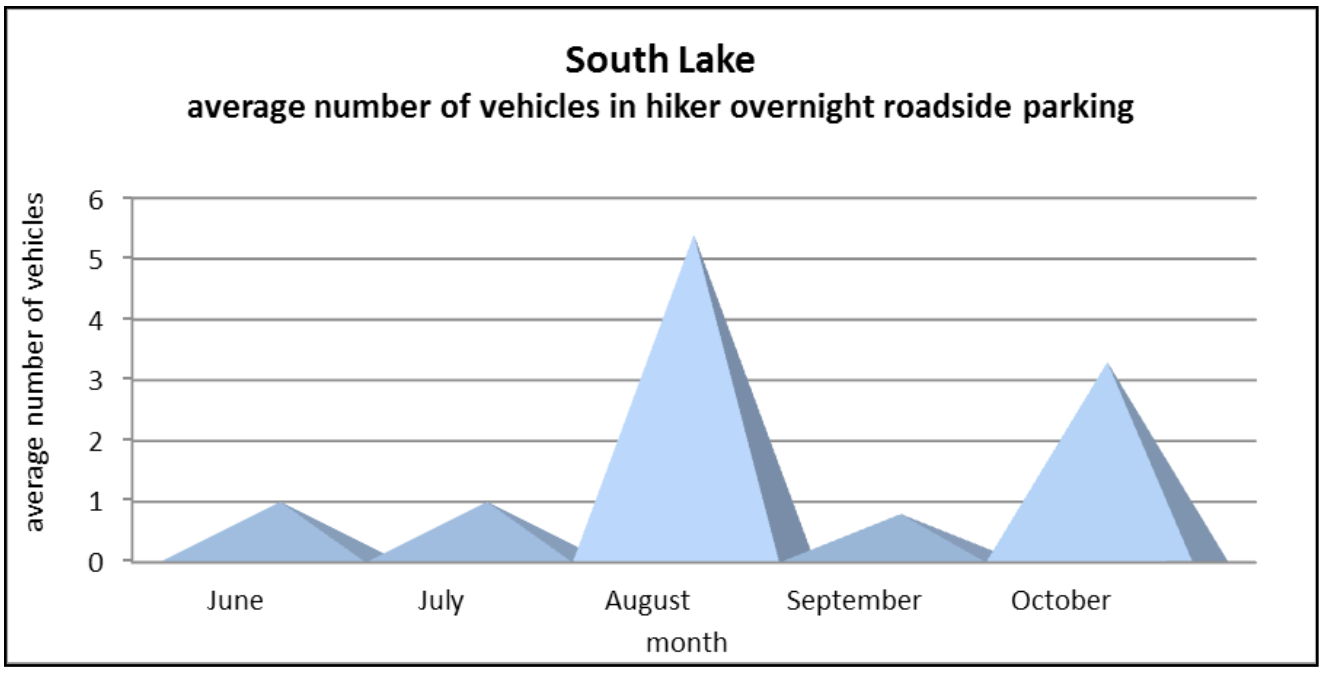


Figure: Bishop Creek – South Lake roadside parking average number of vehicles by month graph

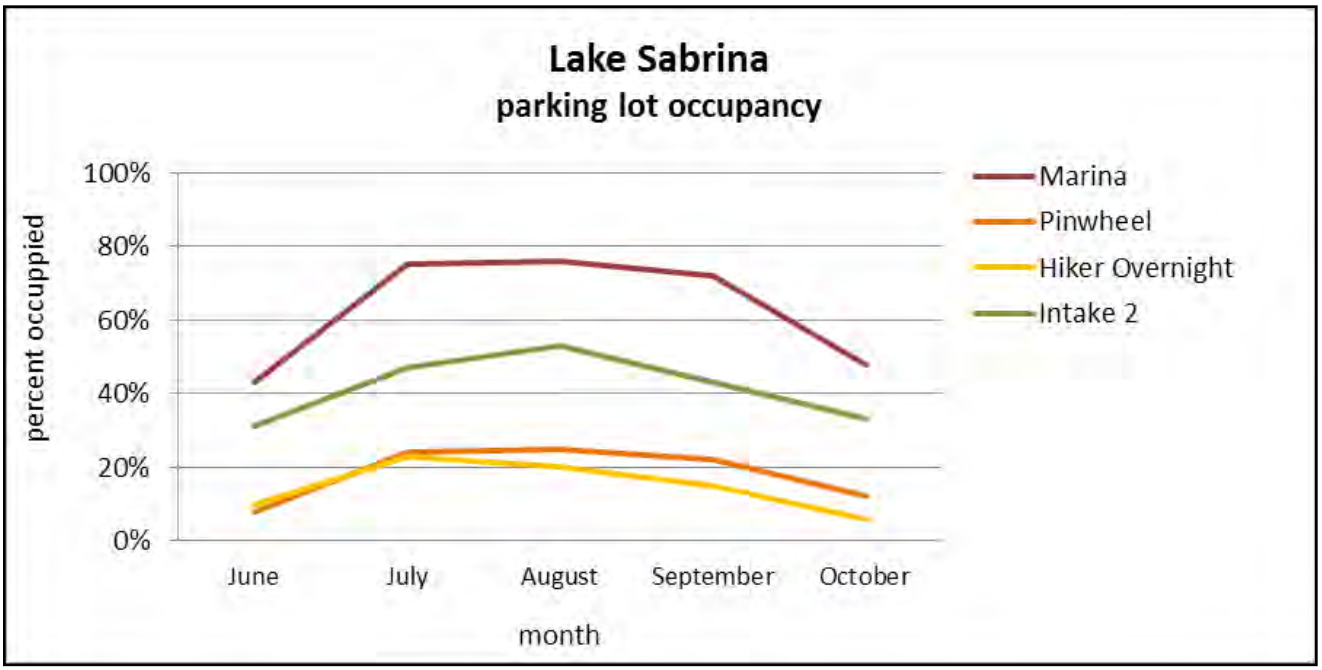


Figure: Bishop Creek – Lake Sabrina area parking lots occupancy by month graph

The South Lake Trailhead Overnight and Upper Day-use parking lots are located closest to the Bishop Pass and Treasure Lakes trailheads. The Dam/Boat Launch parking lot is located closest to the lakefront. The Trailhead Lower Day-use lot is located between the 2 sets of parking areas and acts as an overflow for them.

Demand for parking in the South Lake area was highest in the month of August. Parking occupancy rates during the peak month of August were especially high for the Trailhead Overnight and Upper Day-use parking lots where rates approached 100%. In contrast, for the same month, the Lower Day-use lot had an average occupancy rate of 42%. (See Figure: Bishop Creek – South Lake Trailhead parking lots occupancy by month graph).

Unmet overnight parking demand from the South Lake trailhead parking lot is displaced to the roadside of South Lake Road. Inventories of vehicles parked in the overnight roadside parking area showed August to be the peak month. On average about 5 vehicles were parked roadside during the month of August. (See Figure: Bishop Creek – South Lake roadside parking average number of vehicles by month graph).

Parking lot occupancy rates for the Lake Sabrina area were fairly consistent for the July through September summer season. For the parking lots located at the lake, the Marina lot showed relatively high occupancy rates while the Pinwheel parking lot had maximum occupancy rates of less than 30%. (See Figure: Bishop Creek – Lake Sabrina area parking lots occupancy by month graph).

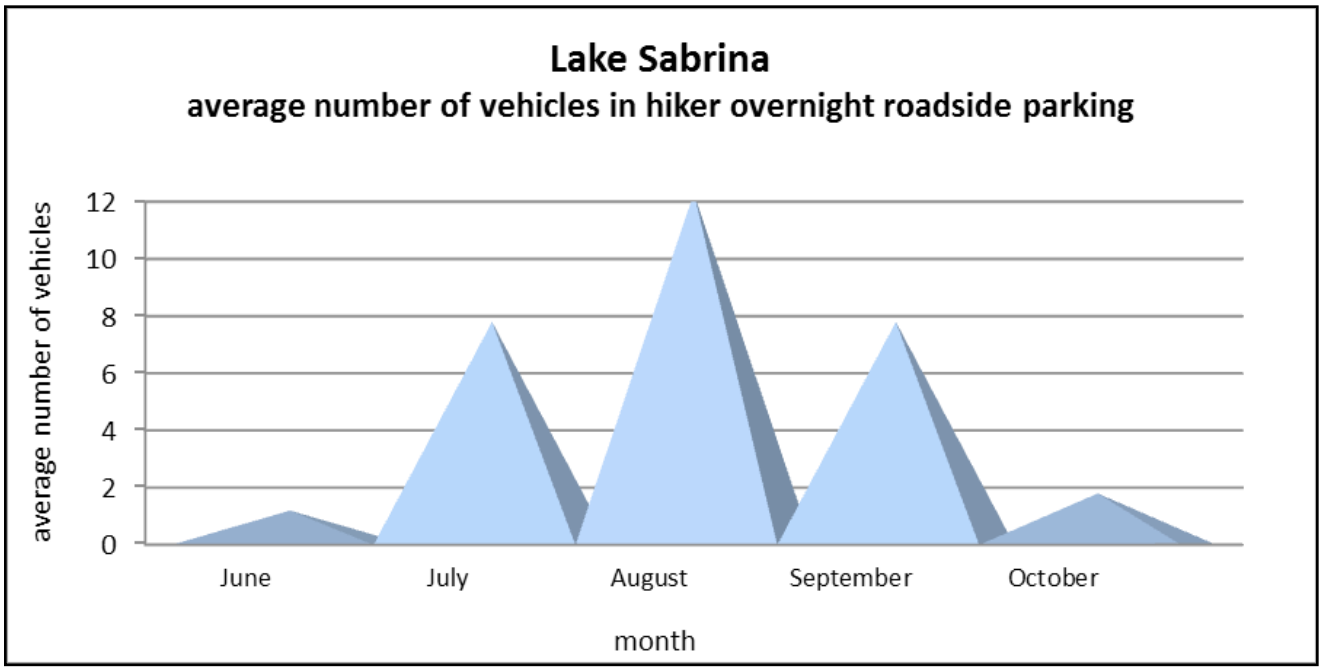


Figure: Bishop Creek – Lake Sabrina roadside parking average number of vehicles by month graph

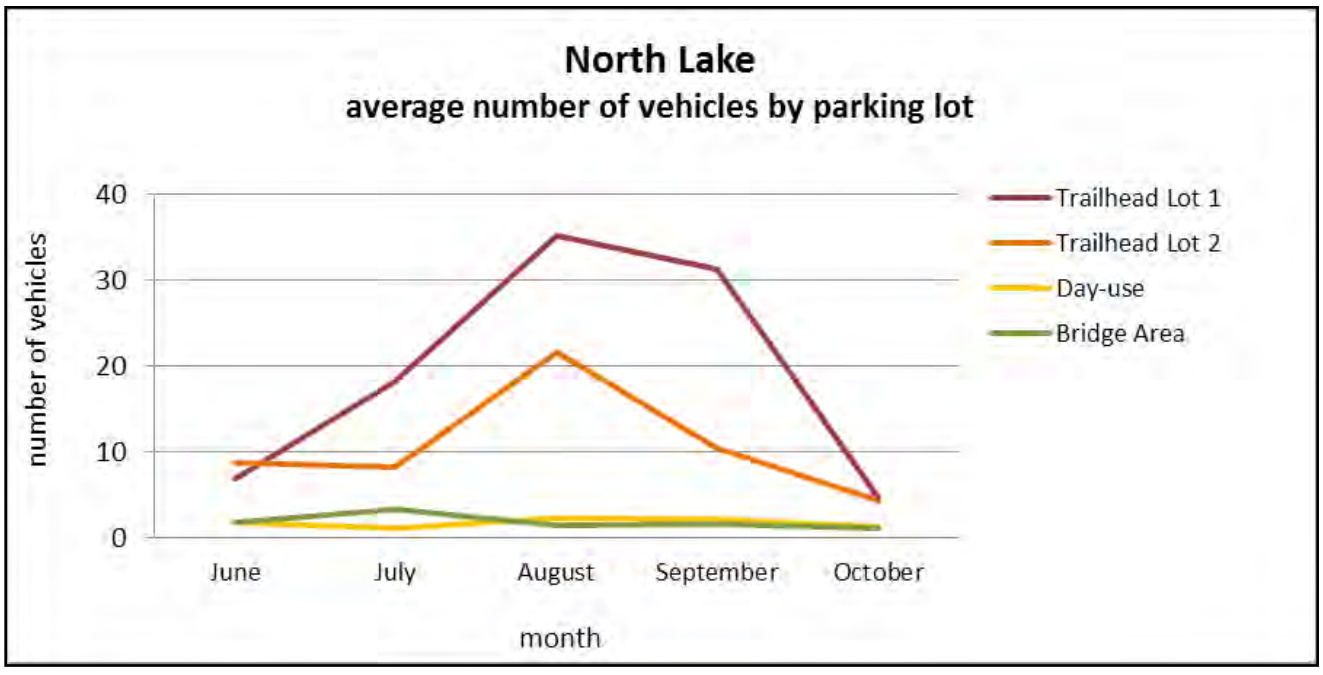


Figure: Bishop Creek – North Lake area parking lots average number of vehicles by month graph

No overnight parking is permitted in the Lake Sabrina core recreation area parking lots. Overnight parking for the trailheads in the Lake Sabrina area is available along Bishop Creek Road (State Route 168) and at the Hiker Overnight dirt parking area located at the North Lake Road intersection with Bishop Creek Road. The average number of vehicles parked along Bishop Creek Road in the area where overnight parking is permitted was 12 for the peak month of August. This segment of Bishop Creek Road acts as overnight parking for the Sabrina and George Lakes trails located in the Lake Sabrina area. (See Figure: Bishop Creek – Lake Sabrina roadside parking average number of vehicles by month graph).

The parking lot occupancy for the North Lake area was calculated by average number of vehicles. The designated overnight parking lots (Trailhead Lot 1 and 2) and day-use lot (Day-use) are unpaved and unmarked. Given the large size of the parking areas and an often organic parking pattern, the average number of vehicles was used as a gauge of usage.

Parking demand in the North Lake recreation area peaked in the month of August. Average number of parked vehicles in the Trailhead Lot 1 and 2 parking areas was 57 vehicles. Demand stayed high during the month of September with an average of 41 vehicles parked in the trailhead lots. Parking demand dropped precipitously in the month of October. Utilization of the Day-use parking lot was de minimus for the entire study period. (See Figure: Bishop Creek – North Lake area parking lots average number of vehicles by month graph).

12.5.2.3 TRAFFIC SURVEY METHODOLOGY

Traffic data was collected using MetroCount 5600 vehicle classification equipment during the study period of May 1st through October 31st, 2011. The vehicle classifier collects rich data that can be mined to produce custom analyses. The firmware associated with the equipment can distill traffic volume, speed, gap between vehicles, type of vehicle, direction and time and date easily from the data collected. Data may be analyzed using any of these characteristics. The traffic graphs presented in this report were developed by combining the data collected over the 6 time periods into 1 data set.

Bishop Creek Canyon traffic data collection dates		
May 3	-	May 24
June 8	-	June 24
July 7	-	July 20
August 10	-	August 17
September 13	-	September 21
October 12	-	October 20

Figure: Bishop Creek Canyon traffic data collection dates

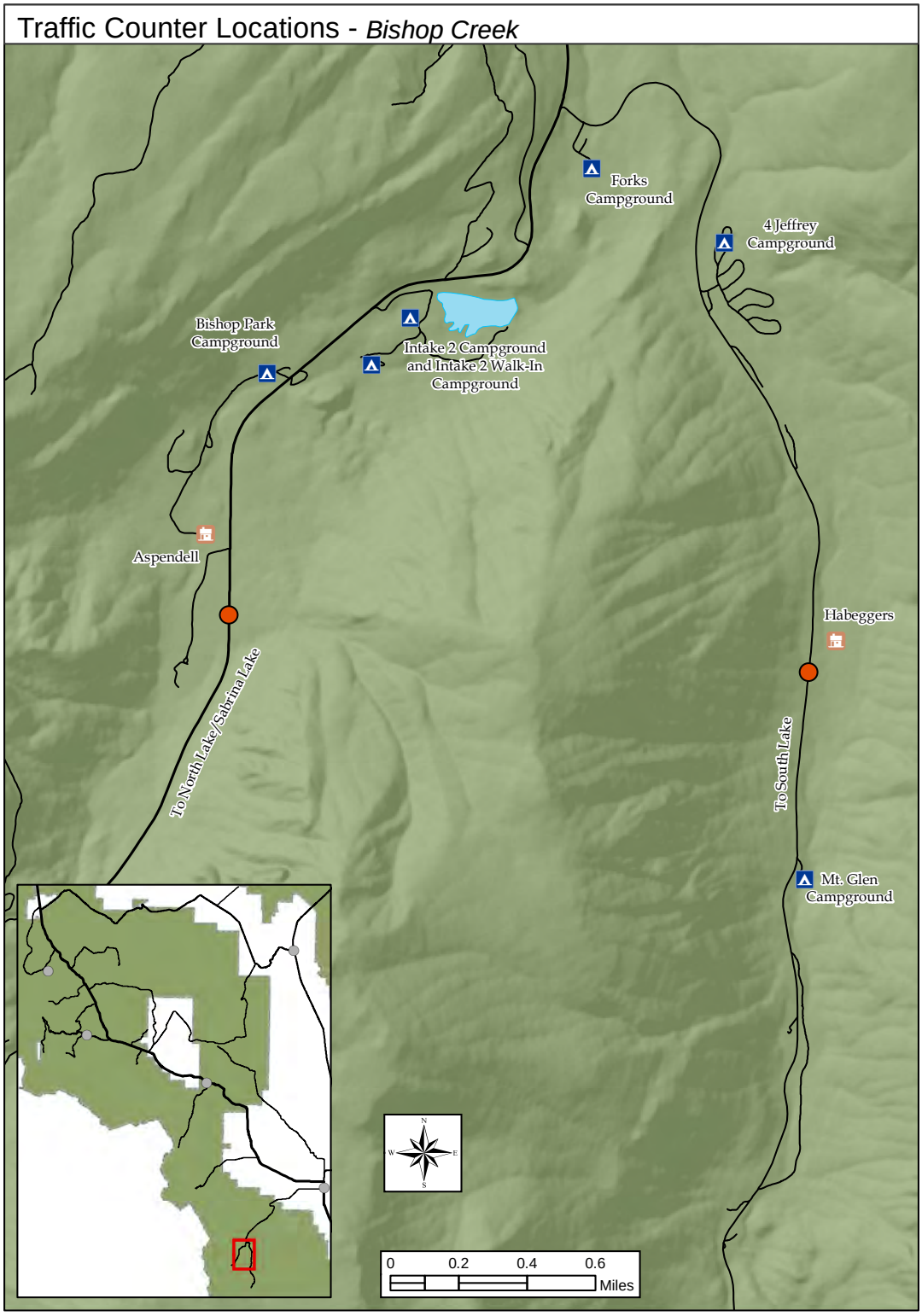


Figure: Bishop Creek Canyon Inyo National Forest traffic counter locations map

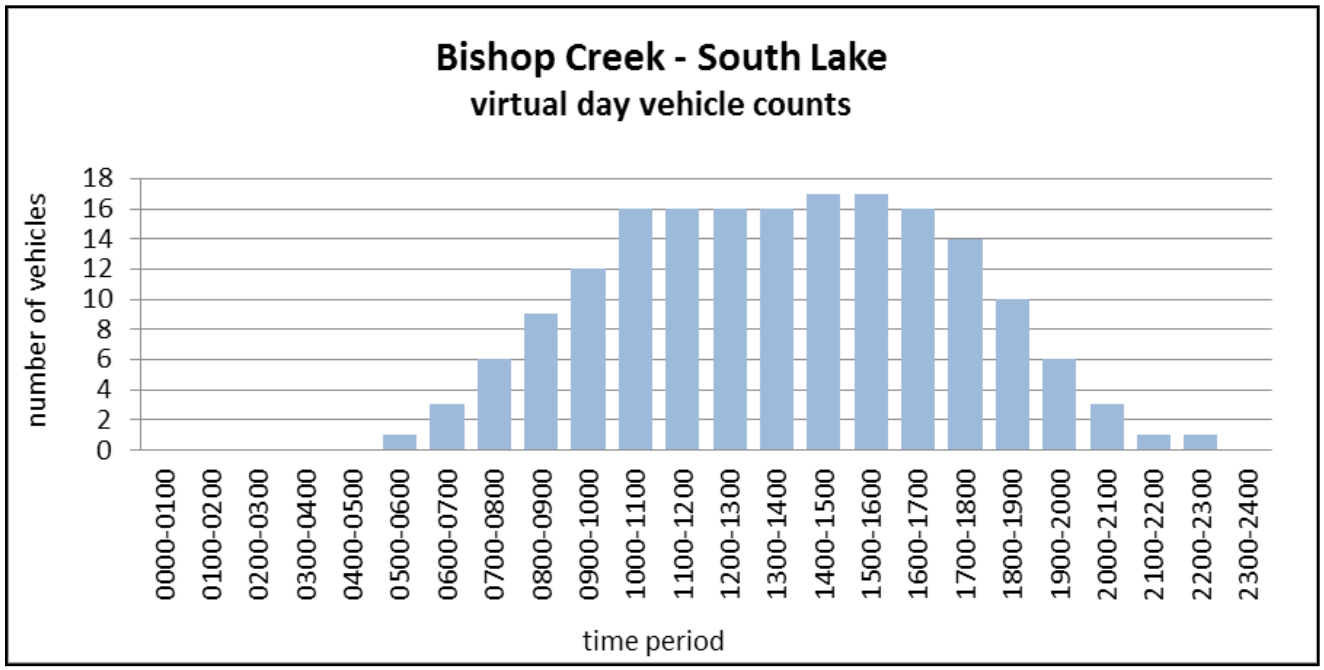


Figure: Bishop Creek – South Lake virtual day distribution by time of day graph

Traffic data was collected at 2 locations in Bishop Creek Canyon. On South Lake Road the traffic count equipment was installed at the road closure gate after the Habeggers community. Traffic data for the combined Lake Sabrina and North Lake areas was collected at the road closure gate after the Aspendell community on Bishop Creek Road (State Route 168). (See Figure: Bishop Creek Canyon Inyo National Forest traffic counter locations map). The data includes all vehicles entering (inbound) and exiting (outbound) the South Lake and combined Lake Sabrina/ North Lake areas. This includes local and seasonal residents, area business employees and recreational visitors. The traffic counters were located after the major community centers as to minimize the collection of residential area related traffic.

12.5.2.4 TRAFFIC DATA ANALYSIS

Temporal distributions of traffic data were analyzed by virtual day and week to determine periods and levels of demand. The traffic data is presented separately by South Lake Road and Bishop Creek Road traffic count stations. About 30,600 vehicles were counted for both directions at the South Lake count station during the study period. The calculated average daily traffic (ADT) was 179 vehicles. The daily distribution of vehicles for a typical day at South Lake Road is shown in the graph below. The inbound peak traffic hour was between 10:30am and 11:30am with an average of 16 vehicles. The outbound peak hour was between 1:45pm and 2:45pm with an average of 17 vehicles leaving the South Lake recreation area during that hour.

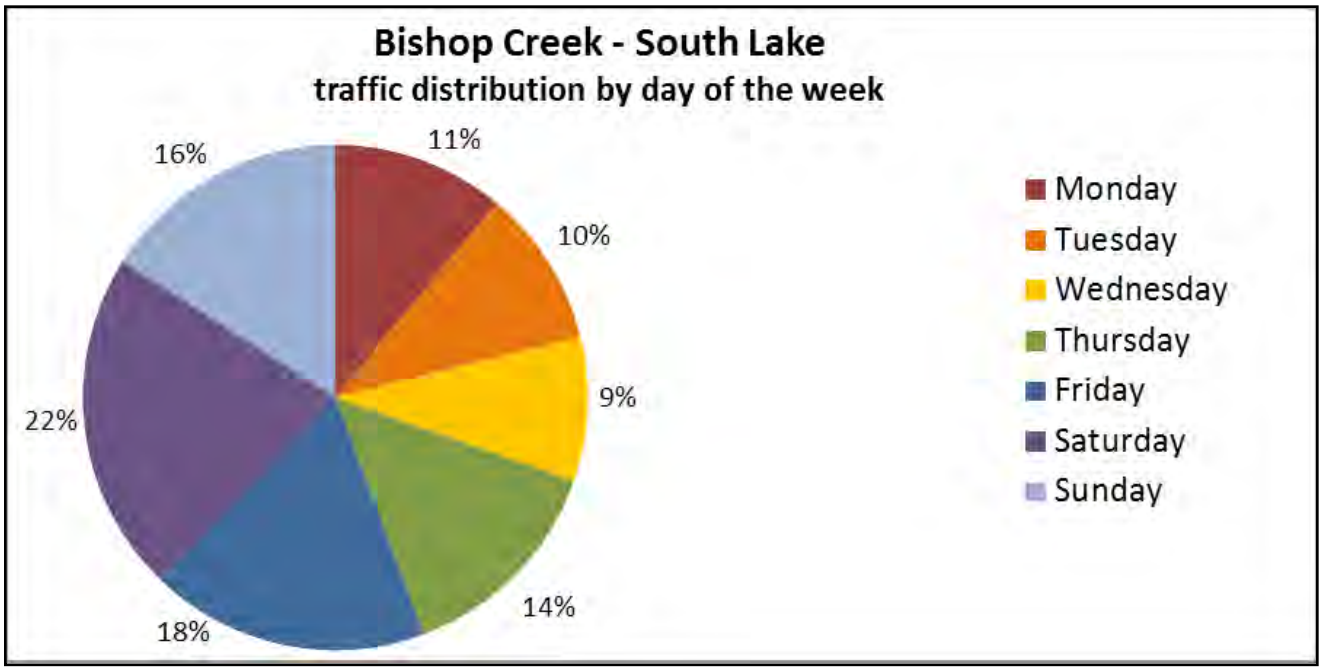


Figure: Bishop Creek – South Lake traffic distribution by day of the week graph

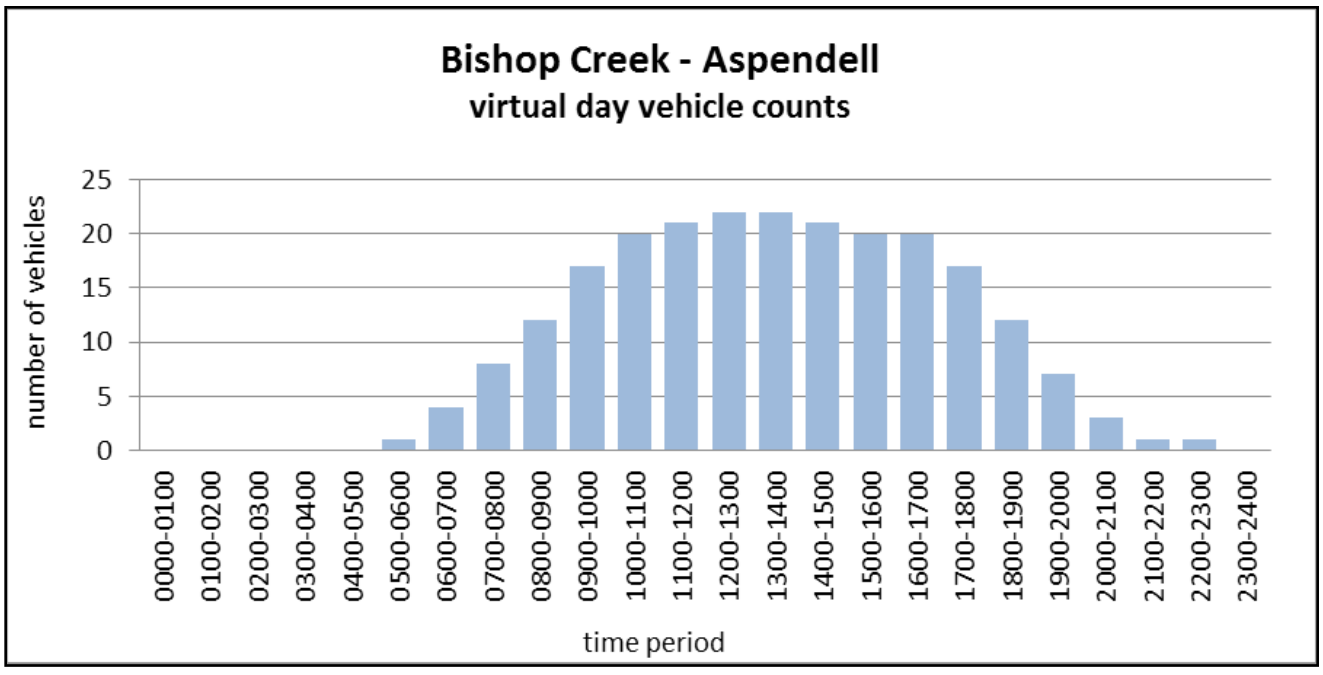


Figure: Bishop Creek – Bishop Creek Road virtual day distribution by time of day graph

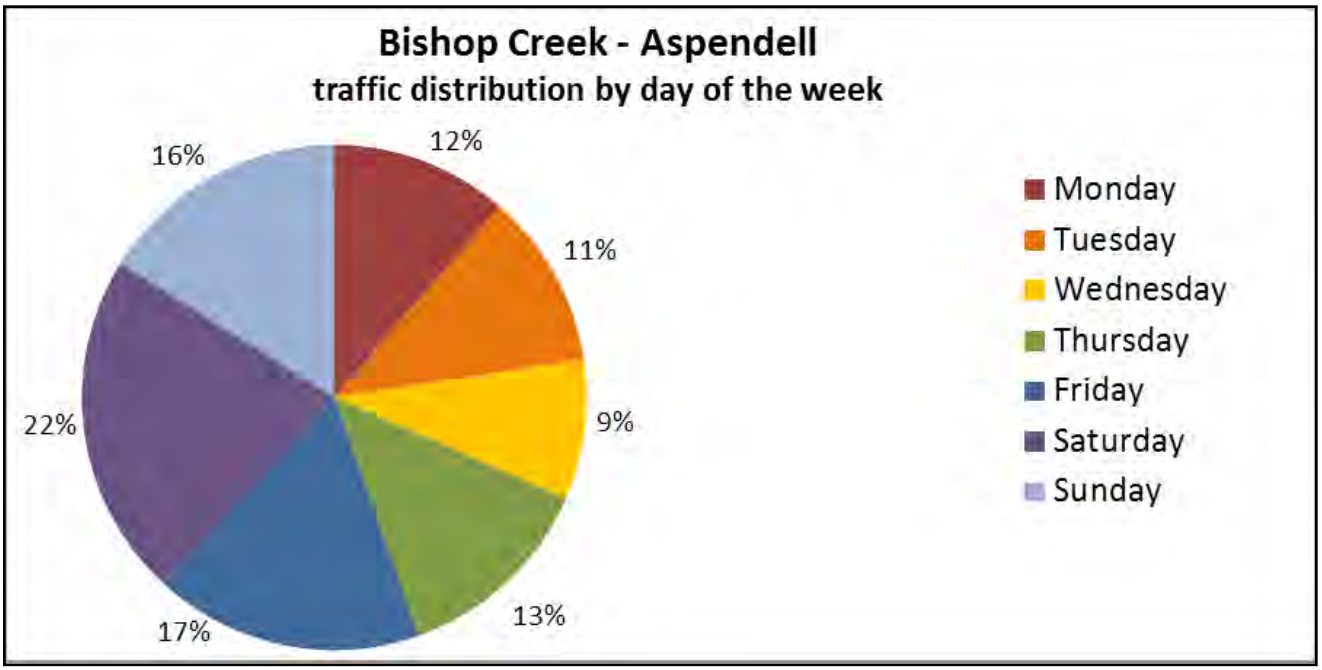


Figure: Bishop Creek – Bishop Creek Road traffic distribution by day of the week graph

Traffic distribution by day of week is skewed toward the weekend for the South Lake area. Saturday dominates the traffic count distribution accounting for 22% of the total week traffic volume. Weekend days (Saturday and Sunday) combined account for approximately 38% of total weekly traffic. The extended weekend of Friday, Saturday and Sunday combined account for 58% of the total weekly traffic. (See Figure: Bishop Creek – South Lake traffic distribution by day of the week graph).

Nearly 39,400 vehicles were counted for both directions at the Bishop Creek Road count station during the study period. The calculated average daily traffic (ADT) was 232 vehicles per day.

The daily distribution of vehicles for a typical day on Bishop Creek Road is shown in Figure: Bishop Creek – Bishop Creek Road virtual day distribution by time of day graph. The inbound peak hour was between 11:45am and 12:45pm with an average of 22 vehicles. The outbound peak hour was between 1:30pm and 2:30pm with an average of 22 vehicles leaving the Lake Sabrina/North Lake area during that hour.

Traffic distribution by day of week is skewed toward the weekend for the Lake Sabrina/ North Lake area. Saturday dominates the traffic count distribution with 22% of weekly traffic passing the Aspendell collection station on that day. Weekend days (Saturday and Sunday) combined account for approximately 38% of total weekly traffic. The expanded weekend of Friday, Saturday and Sunday combined account for 55% of the total weekly traffic. (See Figure: Bishop Creek – Bishop Creek Road traffic distribution by day of the week graph).

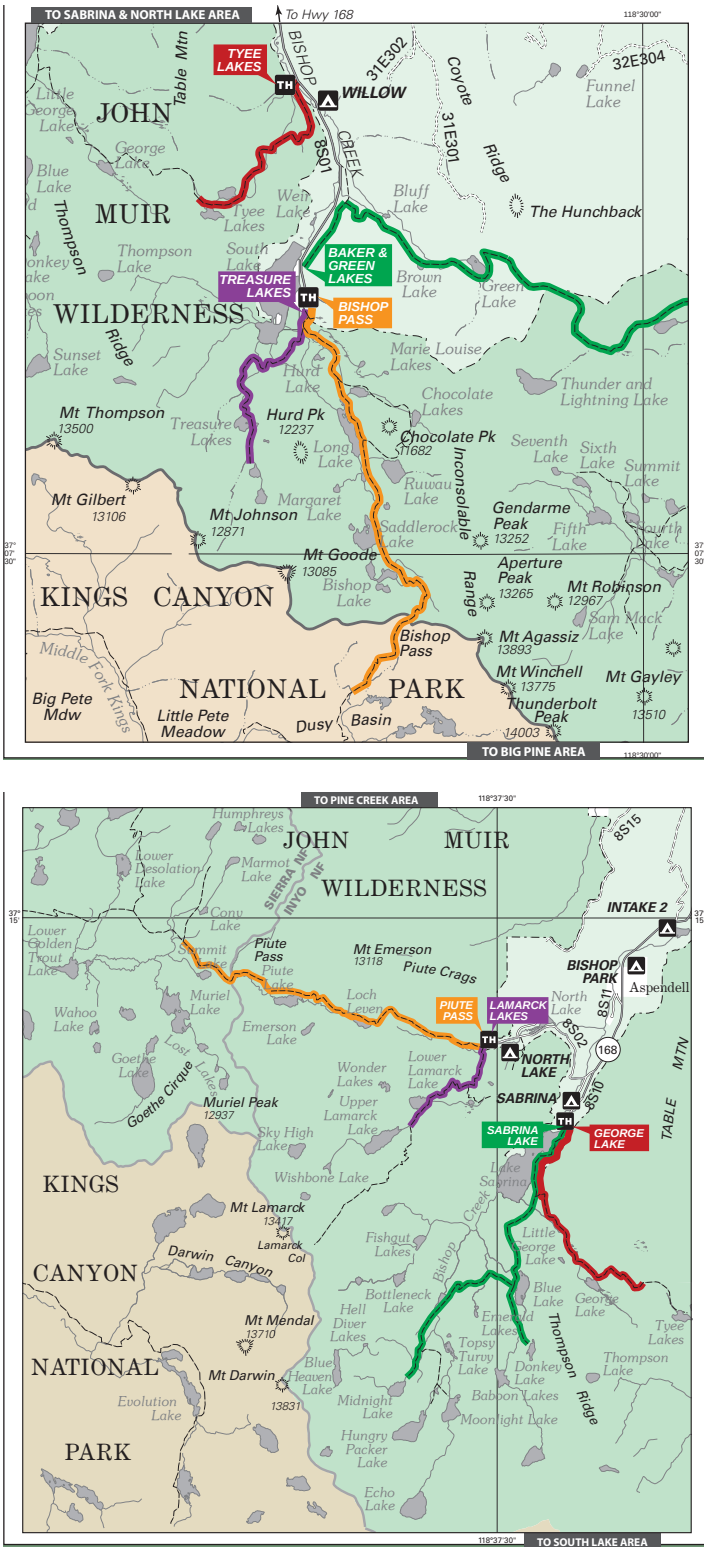


Figure: Bishop Creek Canyon Wilderness trail maps taken from www.fs.usda.gov/inyo/

Calculation of average traffic distributions by month was not appropriate given the limited data set. Parking data is used to estimate temporal demand by month for access to areas within the Bishop Creek Canyon over the study period.

12.5.2.5 TRAIL PERMITS DATA

Wilderness entrance trail permits are required for all individuals and groups that plan an overnight stay in Wilderness on their hiking trip. Each permit regulated trail on the Inyo National Forest has a daily maximum number of hiking permits available during the annual trail quota period of May 1st through October 31st. The maximum group size per permit is 15 people in order to preserve the solitude of the backcountry.

The Bishop Creek Canyon area hosts 8 Wilderness trails that are restricted by quotas. The area trails account for an average of about 13% of all overnight Wilderness trail permits issued on the Inyo National Forest during the annual trail permit quota period.

Bishop Pass, Treasure Lakes and Baker and Green Lakes trailheads are accessed from the South Lake core recreation area. The trailhead for the Tyee Lakes Trail is located along South Lake Road. The Sabrina and George Lakes trailheads are located at Lake Sabrina with overnight parking along Bishop Creek Road (State Route 168) about 1/2 a mile away. The Piute Pass and Lamarck trailheads are located in the North Lake area within the North Lake Campground. Overnight parking for the North Lake trailheads is about 3/4 of a mile down the entrance road in the Trailhead 1 and 2 parking lots.

Bishop Creek Canyon Wilderness trail statistics						
	South Lake			Lake Sabrina		North Lake
trailhead	Tyee Lakes	BishopPass/ Treasure Lakes	Baker and Green Lakes	Sabrina	George Lakes	PiutePass/ Lamarck
trail quota per day	10	46	8	25	10	40
Average # of entrance permits per year (2006-2010)	36	1032	23	445	16	920
Avgerage party size	3	3	3	3	3	3
Avgerage # nights	2	4	2	3	2	4
% entering/exiting within Bishop Creek Canyon	100%	86%	90%	99%	100%	89%
% of Inyo Nationa Forest total trail permits	0%	5%	0%	3%	0%	5%

Figure: Bishop Creek Canyon area Wilderness trail permit statistics

Round trip hikes prevail within the Bishop Creek Canyon. Ninety percent (90%) of hikes that originated at a trailhead in the Bishop Creek area stayed within the canyon. All of the permits issued for the Tyee Lakes trail entered at that location and exited within the Bishop Creek Canyon. Trails located in the Lake Sabrina area had nearly 100% of hikers enter and exit within the area. (See Figure: Bishop Creek Canyon trail permits entry and exit within Bishop Creek Canyon graph).

Though the internal capture rate for hiking trips was high for the Bishop Creek Canyon, hikers did not always begin and end their trip at the same trailhead. For example, 100% of the George Lakes permits exited within the Bishop Creek area, however, only 86% exited at the George Lakes trailhead. Fourteen percent (14%) of permits issued for the George Lakes Trail exited at another trailhead within the Bishop Creek area. The George Lakes Trail may not prompt regional one-way trips but it does support intra-canyon one-way hiking trips. Similar findings are seen for the Tyee Lakes and Bishop Pass/Treasure Lakes trails that show a lower entry and exit at the same trailhead as they do for trailheads within the canyon.

Regional one-way hiking trips from origins within the Bishop Creek area to destinations out of it are congregated at South Lake and North Lake trailheads. The Bishop Creek Canyon, as a whole, had about 10% one-way hiking trips. In the South Lake area about 145 permit holders per year entered at one of the three trailheads (Bishop Pass, Treasure Lakes or Baker and Green Lakes) located at South Lake and exited at a location outside of the Bishop Creek Canyon. North Lake trails had about 100 trail permits per year that entered at either the Piute Pass or Lamarck trailheads for a one-way hiking trip.

The average length of overnight stay varied across trails within the Bishop Creek area. Trails offering a regional trail connection and supporting more one-way hiking trips had longer average lengths of stay. The Piute Pass and Lamarck trails in North Lake and the Bishop Pass and Treasure Lakes trails in South Lake had an average length of stay of 4 nights. The Tyee Lakes, Baker and Green Lakes and George Lakes trails had, on average, 2 night stays.

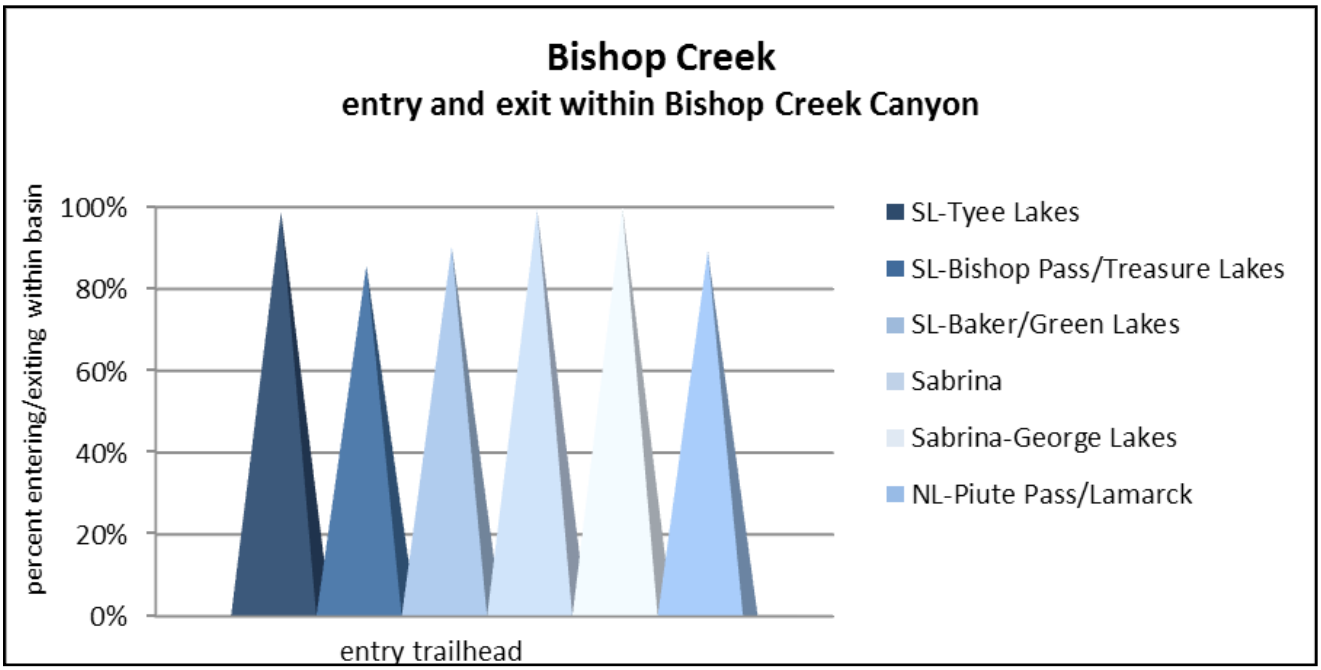


Figure: Bishop Creek Canyon trail permits entry and exit within Bishop Creek Canyon graph

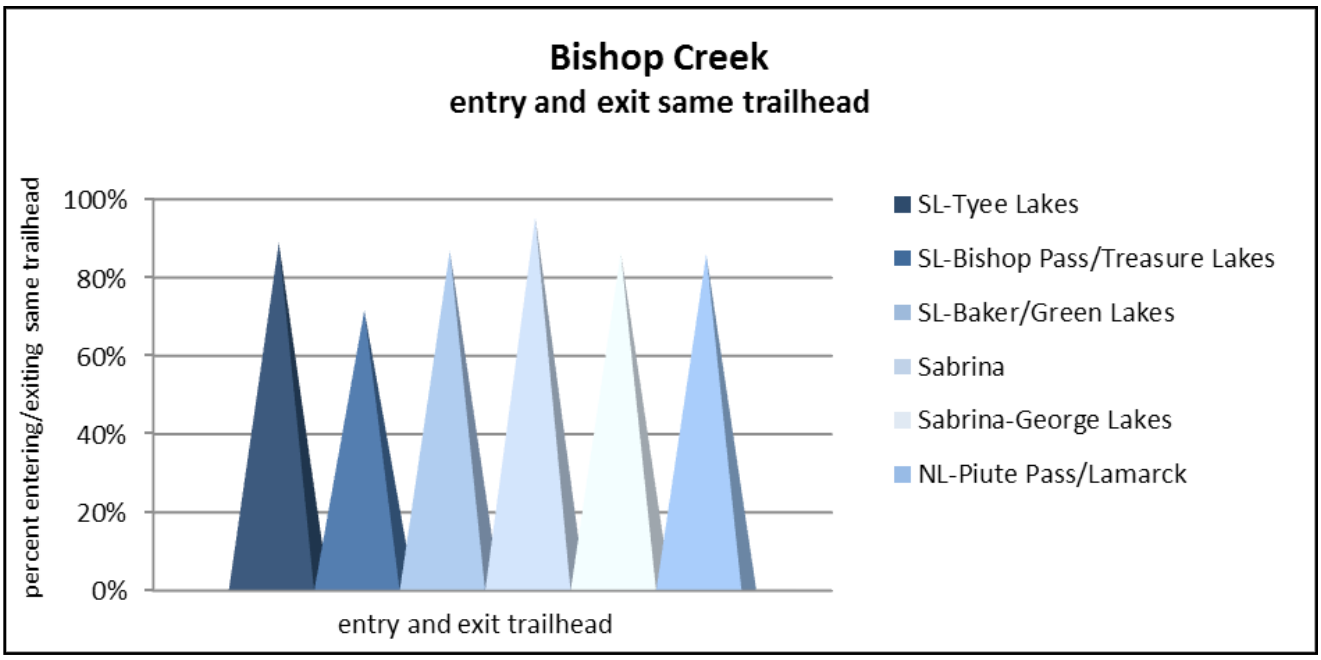


Figure: Bishop Creek Canyon trail permits entry and exit same trailhead graph

12.6 STRENGTHS, CHALLENGES AND OPPORTUNITIES

The strengths, challenges and opportunities in creating a comprehensive alternative transportation system in the Bishop Creek Canyon recreation area were reviewed at the regional and local level by individual transportation mode. Data collected during the May 1st through October 31st study period including parking lot occupancy rates, traffic counts and trail permits issued was analyzed to ascertain travel patterns and areas of parking and visitor demand. Based on site visits, data analysis, detailed reviews of existing conditions and user demand, a comprehensive list of achievable alternative transportation system improvements for the Bishop Creek Canyon recreation area was developed.

12.6.1 PEDESTRIAN

Pedestrian travel on a regional level to the Bishop Creek Canyon is feasible for a select few. Like many destinations within the Inyo National Forest, the remote location of destinations in Bishop Creek Canyon makes walking to the area challenging. Developed hiking trails with connections to the long distance regional trail network makes one-way hiking trips to and from the Bishop Creek area possible.

The dispersed geography of generators and attractors of visitor traffic within the Bishop Creek Canyon may inhibit travel by foot. Campgrounds and overnight accommodations are located intermittently along the roadways while the lakes and trailheads that attract visitors are located at the end of the roads. The long distances between origins and destinations within the canyon may prevent pedestrian travel as a form of transportation.

Pedestrian traffic for transportation purposes within the Bishop Creek Canyon area may be limited by lack of designated or improved routes between origins and destinations. In many locations the roadway acts as the only pedestrian path. Combined with the long distances, the lack of a separate route may impede the flow of foot traffic and compromise the safety of users.

Vehicular traffic calming and roadway signage could be used to make the existing roadway more compatible to mixed traffic. Reducing vehicle speeds and alerting drivers to the presence of other users in the roadway may make roads more hospitable for alternative modes of transportation. By making room in existing roadways for pedestrian traffic the ability to travel by foot may be improved.

12.6.2 BICYCLE

Regional and local travel by bicycle to the Bishop Creek Canyon area, as a mode of transportation, is unlikely. The 18 miles and nearly 5,000 feet elevation gain from the City of Bishop, the nearest population center, may make travel by bicycle challenging. The 55 mile per hour speed limit and lack of bicycle lanes or consistent paved shoulders may make the route on Bishop Creek Road (State Route 168) less safe for bicycle traffic.

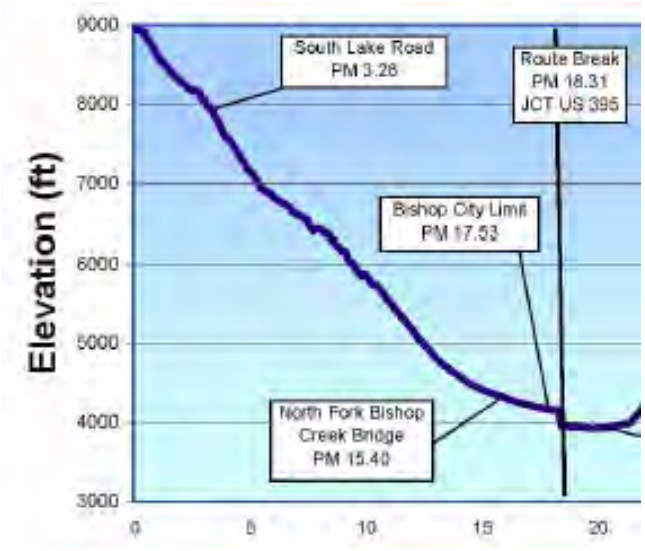


Figure: State Route 168 (Bishop Creek Road) elevation take from Caltrans District 9 State Route 168 Transportation Concept Report

The geographic layout and extreme topography of the Bishop Creek Canyon may inhibit travel by bicycle within the area. Generators and attractors of visitor traffic within the Bishop Creek Canyon are dispersed between 3 basins. The visitor attractions of the lakes and trailheads are located at the end of the steep entrance roadways. The unpaved surface of North Lake Road may discourage road bicycling.

South Lake Road may provide an environment conducive to travel by bicycle. The 35 miles per hour speed limit and paved road surface provide an acceptable route. The narrow roadway width with no paved shoulders would require that bicyclist operate in travel lanes. The distances between generators such as campgrounds, the community of Habegger and the lake and trailheads may still be achievable for some bicycling enthusiasts.

The significant distances between origins and destinations coupled with the absence of roadway infrastructure to support bicycle traffic may make travel by bicycle to or within the Bishop Creek Canyon more difficult.

12.6.3 AUTOMOBILE

The Bishop Creek Canyon recreation area has automobile access to the lakeside in each basin and strategically located vehicle parking near visitor attractions throughout the area. The well-maintained state and county roadways provide a direct path to area destinations.

The data showed that parking supply and demand varied for each basin. Parking demand was greatest in the month of August for the South Lake and North Lake areas where the majority of one-way and long-term hiking trips departing from the canyon originated. The demand for overnight parking in the South Lake trailheads area approached capacity in August due to high demand for the limited number of overnight parking spaces. The usage for the parking lots in the Lake Sabrina area, where overnight parking is not permitted, was moderate and consistent throughout the season. Roadside parking along Bishop Creek Road (State Route 168) where overnight parking for the Lake Sabrina area is permitted averaged about 12 vehicles per day in the month of August. Parking in the North Lake area in large unmarked dirt parking lots had sufficient capacity to meet the high levels of demand. Parking restrictions may create unnecessary competition for parking between day and overnight users in areas where there is sufficient overall parking supply.

The demand for parking in areas with limited access to visitor attractions was low. For example, parking in the Inyo National Forest designated Hiker Overnight dirt parking lot, located at the intersection of Bishop Creek Road and North Lake Road, averaged about 5 vehicles in the peak month of August. The South Lake Roadside 1 and 2 and LaHupp Picnic parking lots showed little usage for the summer season. Improved parking areas with low usage may present an opportunity for the Forest Service to develop recreational attractions and shift demand from higher use areas.

Figure: Bishop Creek roadside parking (above) Bishop Creek Road (State Route 168) and (below) South Lake Road photos

Parking spaces of an appropriate type should be provided for the recreation activity offered at a site. Parking is designated for trailer parking in the South Lake Dam/Boat Launch parking lot. Though Lake Sabrina hosts a marina and public boat launch facility no accommodation for oversized vehicles are provided at that location. A lack of appropriate type of parking space, standard or oversized, may hinder access to a location.

In the Bishop Creek Canyon, the data showed that vehicular routes and parking do not present an impediment to travel by automobile or a limitation on access.

SITE ANALYSIS: SOUTH LAKE PARKING-DAY-USE AND OVERNIGHT PARKING RESTRICTIONS

Parking restrictions may hold vacant parking spaces that could otherwise be used by their user groups. Day-use visitors are permitted to park in parking spaces intended for "hiker" or overnight users; however, overnight users are restricted from parking in spaces that are designated for day-use parking only. Day visitors parked in overnight parking spaces may consume limited overnight parking resources and push overnight users to other locations.

Parking restrictions, when not appropriately allocated, may create parking shortages. A parking restriction that restricts parking for day-use only, when there is minor demand, may hold valuable parking resources vacant in an area where additional overnight parking may be needed. And conversely, when overnight parking is not relegated to more distant parking areas, vehicles parked for long-terms may congest parking spaces near an attraction.

Parking restrictions, when necessary, should be based on the type of usage, day or overnight, and the level of demand for each at a particular site. Certain locations on the Inyo National Forest may provide exclusive access points for unique attractions or activities. In these areas, parking restrictions should support the predominant or intended use for that location. For example, the Whitney Portal area is the only location on the Inyo National Forest from which to complete a single day hike of Mt. Whitney. A single day hike of Mt. Whitney typically takes 13-14 hours and would require parking in an overnight permissible parking location. Parking management policies the Whitney Portal area should allow a predominance of overnight parking to support this key activity. In other areas, a day-use activity

such as fishing may be the predominant recreation activity and long-term parking from hikers may clog access for other users. Parking restrictions may be support or inhibit activities of different user groups.

In general, parking management should locate short-term parking closest to the visitor attraction and long-term parking in more distant locations. Vehicles parked for extended periods may create dead zones where space is not optimally used in an area. When possible, overnight parking should not be located within a core activity center. Parking nearest an attraction should be short-term and provide for the daily parking demands of the site. Long-term parking should be located on the fringe of the activity center in adjacent locations or off-site only when transportation service is available.
The South Lake recreation area supports parking facilities for a variety of users in multiple parking lots. The Trailhead Upper and Lower and Dam/Boat Launch parking lots have a combined 63 parking spaces restricted to day only parking. The Trailhead Overnight parking lot is located near the Wilderness trailheads and has 51 parking spaces that are available for overnight parking. Additional overnight parking is available along the roadside of South Lake Road 1.2 miles away.

The demand for parking in the South Lake area is greatest in the month of August. The occupancy rate at the Trailhead Overnight parking lot in the month of August was near capacity at 95%. In August about 5

Figure: Bishop Creek - South Lake remote overnight parking sign photo

Figure: Bishop Creek – South Lake overnight hiker parking sign photo

vehicles were parked along the roadside of South Lake Road where overnight parking is permitted. The net unmet overnight parking demand for the South Lake recreation area was about 3 parking spaces.

The combined occupancy rate for the 3 day-use parking areas was 78% for the month August. The South Lake Trailhead Day-use Lower lot, located in between the trailhead and the lakeside parking lots, had an average occupancy of 42% for the month of August. Overall, about 14 day-use parking spaces went unutilized during the month.

A minor redistribution of parking spaces by restriction may provide the additional supply needed to meet the overnight parking demand in the South Lake area. The excess demand for overnight parking is small with only 3 to 5 vehicles needing space. The reclassification of approximately 5 day-use restricted parking spaces to permit overnight parking may eliminate the need for roadside parking in the South Lake area. Day-use visitor parking demand could be shifted to the underutilized Trailhead Day-use Lower parking lot where surplus parking spaces are available even during peak periods.

12.6.4 PUBLIC OR PRIVATE TRANSPORTATION SERVICES

The origins and destinations within Bishop Creek Canyon are a distance from the nearest public transit service within the City of Bishop or on the US Highway 395 corridor. Though Eastern Sierra Transit Authority (ESTA) provides public transportation service on the US Highway 395 corridor, a deviation of the route to the Bishop Creek area may be unreasonably time consuming. The addition of a dedicated route from the City of Bishop would be necessary to provide public transit service to the Bishop Creek Canyon recreation area. Public transit service is currently not available to or within the area.

A simplified estimate of the cost to provide public transit to Bishop Creek Canyon was calculated with the assistance of ESTA staff. The potential service would operate seasonally for 77 days between July 1st and September 15th. A dedicated transit service from the City of Bishop would make 3 trips per day to the recreation areas of Bishop Creek Canyon. The estimated seasonal operations cost of the service is $45,550.43 dollars. Capital costs of vehicles, signage, benches or shelters are not included in this figure.

Ridership for the route was estimated by ESTA staff at 1.5 passengers per trip or about 5 people per day. An unsubsidized fare for the route would be approximately $113 per passenger (operations cost of $565.59 per day divided by 5 passengers per day). A Forest Service subsidized fare, with a 5% fare box recovery (the passenger fare pays 5% of the actual cost of service provision), would be about $6.00. The balance of the cost to provide the public transit service, $41,240 per season, would need to be funded by the Inyo National Forest or other dedicated funding source.

Bishop Creek Canyon
public transit service scenario operating cost estimates*

	miles	trips/day	cost/trip	cost/day	days/season	cost/season
dedicated public transit service from the City of Bishop	55	3	$188.53	$565.59	77	$43,550.43

*data supplied by ESTA staff

Figure: Bishop Creek Canyon public transit scenario operation cost estimate

Bishop Creek Canyon
public transit service scenario ridership estimates*

	trips/day	days/season	trips/season	passengers/trip	fare	passenger fare revenue/season	subsidized operating cost/season
dedicated public transit service from the City of Bishop	3	77	231	1.5	$6.00	$2,079.00	$41,471.43

*data supplied by ESTA staff

Figure: Bishop Creek Canyon public transit scenario ridership estimate

The provision of transportation services by private sources is an option in the Bishop Creek Canyon recreation area. Inyo National Forest permit holders may have the resources to offer transportation services. In other locations on the Forest, Forest Service permit holders use existing staff members and a variety of context sensitive vehicles to provide transportation services to guests and patrons of their establishments. The addition of transportation services by an existing permit holder may require an amendment to the Forest Service permit. Operation of an independent shuttle or taxi service to Forest Service lands is possible with a special use permit from the Inyo National Forest.

The Inyo National Forest could encourage and support the private provision of transportation service through Forest Service permit holders. Transportation fares could be charged at fair market value or a Forest Service subsidized rate. The Forest could use a permit fee deferment to financially support transportation services in areas where transportation services are highly desired but the fare necessary to garner riders may be insufficient to cover the cost of providing the service. This topic is discussed further in Site Analysis: Public-Private Partnership in the provision of transportation services.

SITE ANALYSIS: PUBLIC-PRIVATE PARTNERSHIP IN THE PROVISION OF TRANSPORTATION SERVICES

Intra-canyon hiking is popular in Bishop Creek Canyon. About 170 hiking permits per year are issued for trips between trailheads within the Bishop Creek area. Eight (8) Wilderness trails from the 3 different forks in the canyon extend into the backcountry and create a complex network of local and regional foot paths.

There may be a moderate demand for intra-canyon shuttle service within the Bishop Creek Canyon. Numerous origins and destinations within the area generate and attract visitors. Campgrounds and resorts generate visitor traffic. Marinas, restaurants, lakes and streams and trailheads attract visitor traffic. A shuttle service within the Bishop Creek Canyon recreation area may improve mobility between origins and destinations.

Creation of an intra-canyon shuttle may present an opportunity for a public-private partnership. Privately operated and Forest Service permitted businesses in the Bishop Creek area may have operations large enough to support the provision of transportation services. The area's close proximity to the City of Bishop may make an independent transportation service feasible. Operation of an independent shuttle or taxi service to Forest Service lands requires a special use permit from the Inyo National Forest.

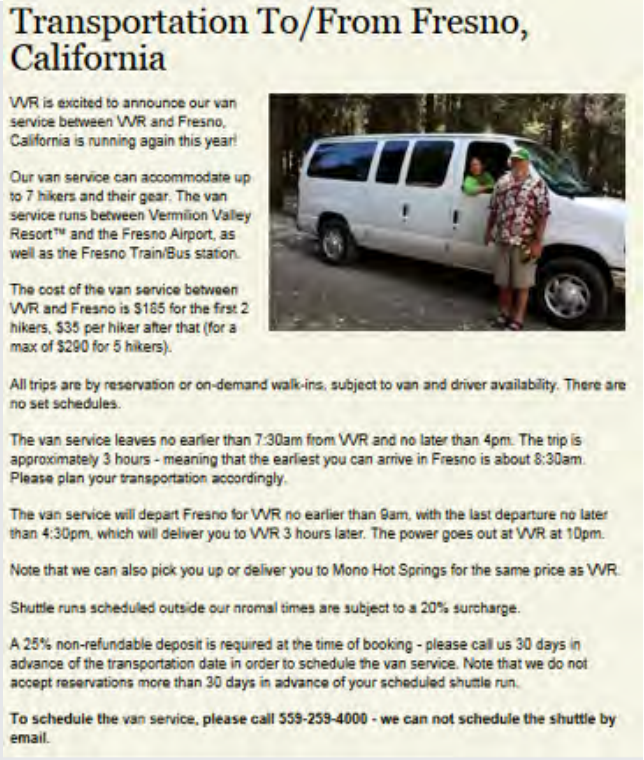
The provision of transportation services may be a profit center for private providers. Whereas public transportation service providers often operate as a social service with passenger fares rarely meeting operational cost, private businesses may offer transportation

as a guest benefit or to make a profit. Transportation service providers that operate on the Inyo National Forest would be subject to permit fee payments to the Forest Service, potentially providing income to the Forest as well.

Vermilion Valley Resort, located on the western reach of the Sierra Nevada mountain range in the Sierra National Forest, overcame broken segments in the area transportation network by providing a privately operated shuttle service. Recognizing an unmet need, the resort utilizes a passenger van to provide on-demand and reserved shuttle services to the transportation hubs in Fresno, California. The service is a profit center for the Vermilion Valley Resort.

The provision of transportation services by a Forest Service permit holder may be a public service that benefits the Inyo National Forest. In congested areas where the demand for parking by visitors exceeds the supply of parking spaces, transportation services may eliminate the need for development of additional parking areas. The addition of another mode of transportation may absorb demand for travel by private automobile and add capacity to the vehicular transportation network. The cost of building additional infrastructure to support private automobile usage may then be eliminated.

A public-private partnership between the Inyo National Forest and a permit holder could be used to provide shuttle service to extended areas of the Forest. The Forest Service could potentially use an innovative funding approach to financially support the provision of transportation services. A permit fee deferment may be considered in areas where transportation services are highly desired but the fare necessary to garner riders may be insufficient to cover the cost of providing the service.



Transportation To/From Fresno, California

VVR is excited to announce our van service between VVR and Fresno, California is running again this year!

Our van service can accommodate up to 7 hikers and their gear. The van service runs between Vermilion Valley Resort™ and the Fresno Airport, as well as the Fresno Train/Bus station.

The cost of the van service between VVR and Fresno is $165 for the first 2 hikers, $35 per hiker after that (for a max of $290 for 5 hikers).

All trips are by reservation or on-demand walk-ins, subject to van and driver availability. There are no set schedules.

The van service leaves no earlier than 7:30am from VVR and no later than 4pm. The trip is approximately 3 hours - meaning that the earliest you can arrive in Fresno is about 8:30am. Please plan your transportation accordingly.

The van service will depart Fresno for VVR no earlier than 9am, with the last departure no later than 4:30pm, which will deliver you to VVR 3 hours later. The power goes out at VVR at 10pm.

Note that we can also pick you up or deliver you to Mono Hot Springs for the same price as VVR.

Shuttle runs scheduled outside our nromal times are subject to a 20% surcharge.

A 25% non-refundable deposit is required at the time of booking - please call us 30 days in advance of the transportation date in order to schedule the van service. Note that we do not accept reservations more than 30 days in advance of your scheduled shuttle run.

To schedule the van service, please call 559-259-4000 - we can not schedule the shuttle by email.

Figure: Vermilion Valley Resort transportation web site page taken from www.edisonlake.com

A transportation service that provides secure parking in combination with a shuttle may offer a beneficial service to both the Inyo National Forest and its visitors. Off-site parking may benefit the Forest by reducing the need for construction of additional parking at locations congested with automobiles. The provision of satellite parking facilities at permit holder locations may provide safe and secure locations for long-term parking. These parking locations could act as park and ride lots in support of a shuttle service. The provision of parking services may also be a financial opportunity as Forest Service permit holders and concessionaires may charge for parking. Parking fees, as well as, fares for transportation services may act as stimuli for local economic development.

Bishop Creek Canyon
multimodal transportation system project martix

mode of transport	project description	use level	cost estimate	partnering opportunity
Pedestrian				
	Develop a pedestrian wayfinding signage master plan	M	L	
	Install clearly visible pedestrian wayfinding signage	M	L	
	Install "Share the Road" signage on North Lake, Lake Sabrina and South Lake entrance roads	M	L	
Bicycle				
	Install bicycle parking at destinations in South Lake and Lake Sabrina recreation areas	L	L	
	Support installation of MUTCD compliant "Bicycles may use full lane" signage on area roadways	L	L	Caltrans, Inyo County
Automobile				
	Reallocate day-use only and overnight permissible parking spaces in the South Lake trailhead parking lots	M	L	
	Post speed limits conducive to mixed use traffic on North Lake, Lake Sabrina and South Lake entrance roads	M	L	
	Denote parking restrictions on wheelstops	M	L	
	Encourage development of off-site parking at the Parchers Resort to serve the South Lake area Wilderness trails	L	L	Forest Service permit holder
	Create gateway feature to act as traffic calming cue at Lake Sabrina and North Lake entrances	M	H	
Transportation Services				
	Fund recreation shuttle service	L	H	Eastern Sierra Transit Authority, Forest Service permit holder, private enterprise
	Encourage development of private sector transportation services	L	L	Forest Service permit holders, private enterprise
Information Technology				
	Create an area specific parking map showing day-use only and overnight permissible parking areas	M	L	
	Support creation of a dynamic rideshare program	L	L	Caltrans, Inyo County, Eastern Sierra Transit Authority, private enterprise

Figure: Bishop Creek Canyon multimodal transportation system project matrix

12.7 MULTIMODAL TRANSPORTATION SYSTEM PROJECT PROPOSALS

Preliminary multimodal transportation projects were developed that may improve access and mobility to and within the Bishop Creek Canyon area. Field observations, data analysis and detailed reviews of existing conditions and user demand lead to the creation of a list of key alternative transportation system project proposals. Multimodal transportation system improvements included in the list were selected based on need and achievability. The diverse list of projects was distilled by mode of transportation.

The expansive geography of the Bishop Creek Canyon recreation area may make local and regional transportation by foot arduous though many hikers make one-way trips between the areas 3 basin. Pedestrian improvement proposals recognize that the natural environment is a constraint to the development of separate pedestrian paths in much of the Bishop Creek Canyon recreation area. Instead, suggestions for traffic calming aim to make the mixed traffic roadway more hospitable to foot traffic.

The Bishop Creek Canyon presents challenges for travel by bicycle similar to other areas of the Inyo National Forest. Steep terrain and narrow roadways with often fast moving vehicle traffic presents a hazardous bicycling environment for all but the most expert riders. Road signage may alert drivers to bicyclist eligibility to occupy a travel lane but do little to make the roadway more conducive to bicycle traffic. Proposed improvement for bicycle traffic are limited.

Improvements to automobile access to the Bishop Creek area focus on providing the right type of parking space in the right location. Truck and trailer parking would be suitable for the South Lake and Lake Sabrina areas where boat launch facilities draw lake boat fisherman. A balance in the distribution of day-use only and overnight permissible parking spaces may easy competition for parking spaces and the need for roadside parking in the South Lake area.

The provision of public transit service to Bishop Creek Canyon may improve access for visitors and residents. Though transit ridership estimates are low, the service could act as not only a recreational shuttle but a social service by connecting the residents of the Habegger and Aspendell communities to the City of Bishop. Private transportation services between origins and destinations within the Bishop Creek Canyon recreation area may be an achievable alternative to public transportation services.

Funding source availability and partnership building opportunities may dictate the implementation timing of multimodal transportation project proposals to and within the Bishop Creek Canyon area. A definitive timing schedule is not proposed due to the understanding that limited funds may be available to accomplish projects. To assist the Inyo National Forest in selecting improvements, as funds and opportunities arise, the project proposal list was developed to demonstrate areas for potentially high, medium and low enhancement to the transportation network and to provide a broad estimate of cost.

Though many of the proposed projects are within the jurisdiction of the Inyo National Forest, projects may benefit from the orchestrated efforts of multiple agencies. Partnering with public or private organizations to accomplish the needed improvements to the transportation system may allow parties to combine expertise and funding sources and create a synergy in the completion of projects. Potential partnership building opportunities are supplied in the matrix.

12.8 CONCLUSION

The dispersed geography of origins and destinations between the 3 basins of the Bishop Creek Canyon inhibits the development and use of active transportation routes and modes. The development potential for alternative means of transportation may be best for motorized modes.

Intra-canyon hikers making trips between trailheads within the Bishop Creek Canyon may present a potential, albeit small, market for recreational shuttle service. Ridership estimates are low and the provision of on-demand service by a private operation may be the most economically feasible way to initiate a transportation service. Abundant strategically located parking supports visitor demand and access to the area is not constrained by parking resources.

Active transportation modes may be supported at the site specific level. The core recreation areas in South Lake, Lake Sabrina and North Lake have overnight parking located a distance from trailheads. The absence of pedestrian facilities between parking lots and recreation areas requires travelers to walk in the roadway. Vehicular traffic calming techniques and appropriate warning signage may make roadways more conducive to mixed traffic in specific locations where pedestrian traffic shares the road with vehicles.

A combination of non-motorized and motorized alternative transportation improvements may improve access to and mobility within the Bishop Creek Canyon.

13.0 FUEL CONSUMPTION, AIR POLLUTION & VEHICLE EMISSIONS

This section of the report will address the potential effects of alternative transportation systems on fuel consumption, air pollution and vehicle emissions. The grant application stated that the project would *"gather data sufficient to forecast environmental and pollution related benefits associated with increasing alternative transportation."*

Alternative transportation modes may have a positive impact on fuel consumption and air pollution. Depending on the mode of travel the level of impact may vary greatly. Transportation services that move individuals from one vehicle type to another must produce a net positive result to have positive benefits. Trips that are shifted from vehicles to an active transportation form of transportation, such as walking or bicycling, would eliminate all fuel consumption and emissions for that particular trip. The net impact of a shift in transportation modes must be analyzed to determine if an alternative mode of transportation has a positive environmental outcome.

Air quality in the Eastern Sierra region is monitored by the Great Basin Valley Air Pollution Control District. California law requires all counties to have or belong to an Air Pollution Control District (APCD). Inyo, Mono and Alpine Counties joined together in 1974 in a joint powers agreement to form the Great Basin Unified APCD, which covers the entire Great Basin Valleys area. The total size of the District is 13,975 square miles or almost 9 million acres. The purpose of an APCD is to enforce federal, state and local air quality regulations and to ensure that federal and state air quality standards are met. An APCD does not generally regulate mobile air pollution sources (e.g. cars and trucks).

The District regulates 7 pollutants called "criteria pollutants": Ozone (03), Carbon Monoxide (CO), Lead, 2 types of Particulate Matter (PM-10 and PM-2.5), Sulfur Oxides (SOx) and Nitrogen Oxides (NOx). The District also regulates Hydrogen Sulfide (H2S) under a state standard. The primary air pollutant present in the Owens Valley is particulate matter (PM). The Mammoth Lakes and Mono Basin are in non-attainment for PM-10.

Vehicle emissions are a source of particulate matter; however, most of the PM-10 produced in the Eastern Sierra region comes from wood burning or dust from the Owens and Mono Lakes. Owens Lake is the largest single source of PM-10 in the United States. Mono Lake also violates the federal PM-10 standard. The Mammoth Lakes area has high levels of PM-10 in the winter due to a combination of wood smoke and cinders spread on roads for traction. The District monitors PM-10 levels at 9 locations in Inyo County and 3 locations in Mono County.

The federal Clean Air Act requires areas that do not meet ambient air quality standards to implement programs to reduce air pollution. The State of California initiated a motor vehicle emissions testing program as part of the state's efforts to reduce air pollution. The program tests cars and light-duty trucks for 5 gases: Hydrocarbons (HC), Carbon Monoxide (CO), Nitrogen Oxides (NOx), Carbon Dioxide(CO2) and Oxygen (O2).

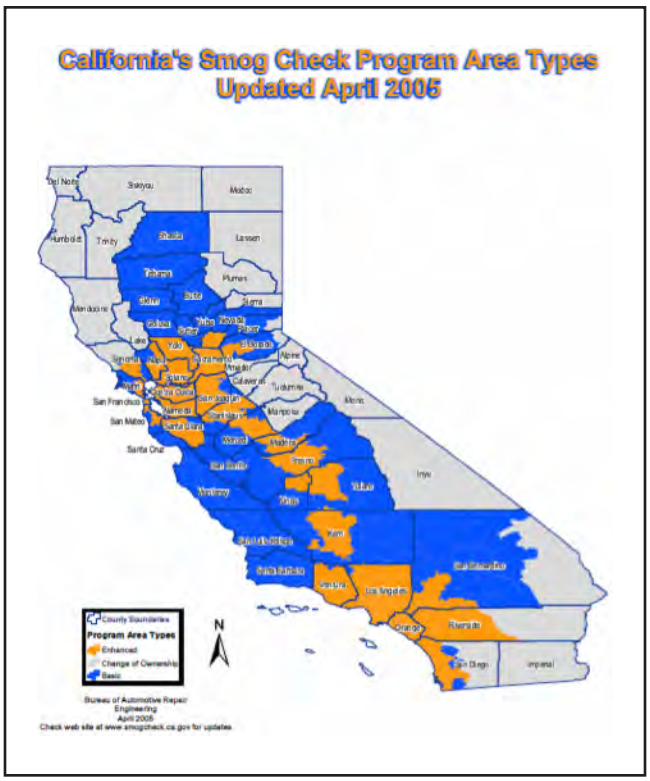


Figure: California's smog check program areas taken from www.smogcheck.ca.gov

The State of California requires enhanced, basic and transfer of title emission inspections of motor vehicles depending on geographic area. Locations classified as serious non-attainment areas require the stricter enhanced inspections. Basic smog check testing is required on a biennial basis in other populated parts of the state and a change of vehicle ownership test is required in rural parts of California. Mono and Inyo Counties, being rural areas, require a vehicle emissions test only at change of ownership. Transportation related sources of air pollution are not a regulatory concern for the State of California in the Inyo National Forest area of the Owens Valley.

Air pollution from transportation related sources makes a de minimis contribution to the air quality in the Owens Valley. Transportation sources may contribute to particulate matter, the significant form of air pollution in the area, through dispersal of road cinders and dust from vehicle travel on unpaved roads. Emission of greenhouse gases from vehicles usage is inconsequential.

The use of alternative transportation modes may have a positive impact on fuel consumption and motor vehicle emission rates. While active forms of transport such as walking and bicycling would eliminate the use of fuel and the resultant production of vehicle emissions completely, the use of transit also has the ability to have positive impacts on fuel consumption and emissions.

Table 2.12
Passenger Travel and Energy Use, 2010

	Number of vehicles (thousands)	Vehicle-miles (millions)	Passenger-miles (millions)	Load factor (persons/ vehicle)	Energy intensities (Btu per vehicle-mile)	Energy intensities (Btu per passenger-mile)	Energy use (trillion Btu)
Cars	**130,892.0**	**1,551,457**	**2,404,758**	**1.55**	**5,342**	**3,447**	**8,288.2**
Personal trucks	**90,810.3**	**924,556**	**1,701,183**	**1.84**	**7,081**	**3,848**	**6,547.0**
Motorcycles	**8,212.3**	**18,462**	**21,416**	**1.16**	**2,881**	**2,484**	**53.2**
Demand response[a]	**68.9**	**1,529**	**1,477**	**1.0**	**15,111**	**15,645**	**23.1**
Buses	[b]	[b]	[b]	[b]	[b]	[b]	**190.2**
Transit	66.8	2,425	21,172	8.7	35,953	4,118	87.2
Intercity[c]	[b]	[b]	[b]	[b]	[b]	[b]	29.9
School[c]	1,970.1	[b]	[b]	[b]	[b]	[b]	73.2
Air	[b]	[b]	[b]	[b]	[b]	[b]	**1,740.8**
Certificated route[d]	[b]	5,499	555,653	101.0	276,329	2,735	1,519.5
General aviation	223.4	[b]	[b]	[b]	[b]	[b]	221.2
Recreational boats	**13,392.9**	[b]	[b]	[b]	[b]	[b]	**245.2**
Rail	**20.8**	**1,400**	**35,874**	**25.6**	**66,378**	**2,590**	**92.9**
Intercity (Amtrak)	0.3	295	6,420	21.8	49,453	2,271	14.6
Transit	13.6	760	18,580	24.5	61,645	2,520	46.8
Commuter	6.9	345	10,874	31.5	91,242	2,897	31.5

Figure: Passenger travel and energy use taken from Transportation Energy Data Book: Edition 31 – 2010

Transit vehicles consume more fuel per mile than passenger vehicles. Transit vehicles use about 35,953 Btu (British thermal unit) of energy per vehicle mile while a passenger car averages about 5,342 Btu per vehicle mile. Mile for mile passenger automobiles are more fuel efficient than buses. A transit vehicle may become more fuel efficient than a personal automobile when it moves a large number of people thereby having a lower average energy usage per passenger mile than a passenger vehicle. In general, a transit trip must carry at least 7 passengers to have a net positive energy consumption impact.

The Reds Meadow Shuttle has a seasonal load factor of .63 (40 passenger vehicle) or about 25 passengers per trip. A single shuttle trip consumes 719,060 Btu of energy (35,953 Btu per mile x 20 miles per trip). The Btu per passenger is 28,762.

A passenger vehicle making the round trip to the Reds Meadow Valley would consume 106,840 Btu per trip (5,342 Btu per vehicle mile x 20 miles). The average vehicle occupancy of 3 people (consistent with group size and data on vehicle occupancy measured in the 2007 Devils Postpile National Monument National Park Foundation Transportation Scholar report) yields a Btu per passenger of 35,613.

Reds Meadow Shuttle emission reduction			
pollutant	emissions rates (per gallon of gasoline) in grams (g)*	3,500 gallon reduction in gasoline	total reduction in emissions in pounds (lb)
VOC	24.92	(24.92 g/gal x 3,500 gal x 1 lb/454 g)	174.44
THC	25.96	(25.96 g/gal x 3,500 gal x 1 lb/454 g)	181.72
CO	226.56	(226.56 g/gal x 3,500 gal x 1 lb/454 g)	1,585.92
NOx	16.70	(16.70 g/gal x 3,500 gal x 1 lb/454 g)	116.90
PM10	0.11	(0.11 g/gal x 3,500 gal x 1 lb/454 g)	0.77
PM2.5	0.10	(0.10 g/gal x 3,500 gal x 1 lb/454 g)	0.70
CO2	8,879.18	(8,879.18 g/gal x 3,500 gal x 1 lb/454 g)	62,154.26

* US Environmental Protection Agency, Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cards and Light Trucks 2008

On average, the Reds Meadow Shuttle uses 6,851 Btu (35,613 Btu/private vehicle passenger – 28,762 Btu/shuttle passenger) less per passenger than the private vehicle. Over the course of the 2010 summer season this potentially equated to over 431 million Btu (6,851 Btu/passenger x 63,000 Reds Meadow Shuttle passengers) reduction in energy usage or about 3,500 gallons (431,000,000 Btu / 125,000 Btu per gallon of gas) of gasoline. The high shuttle passenger occupancy rate makes it more energy efficient than visitors driving personal vehicles.

Transit trips may provide environment benefits if the impact from the number of personal occupancy vehicles removed from the road is greater than the level of impact from the addition of a transit vehicle to the road. Transit routes with high occupancy rates (i.e. load factor) may use less fuel and produce fewer emissions than the personal occupancy vehicles they replace.

14.0 FUNDING SOURCES

Funding alternative transportation system projects on the Inyo National Forest may require a multi-jurisdictional effort to develop a broad spectrum of revenue sources. The Forest may need to exploit an array of funding opportunities and cultivate crucial partnerships to finance a comprehensive multimodal transportation network. Dedicated funding streams readily available to the Inyo National Forest for alternative transportation system projects are limited.

The Federal Lands Recreation Enhancement Act (REA) provides the Forest Service with a mechanism to levy and retain recreation fee revenues to maintain, operate and enhance recreation sites and areas to quality standards. A business plan is required for all recreation sites or areas where a fee will be charged. A Regional Fee Board provides review and approval of proposed amenity fees.

Recreation fees may be charged in locations where a high level of facilities, services or activities, with a direct benefit to the user, are provided. Developed high-intensity areas ripe for the authorization of a recreation fee must include designated developed parking, toilets, trash receptacles, interpretative information, picnic tables and security services. Locations that offer facilities or service directly to an individual such as highly developed boat launches, sanitary dump stations or transportation services may be self-supporting with user fees. A minimum of 95% of recreation fee revenue collected under REA remain on the forest. Concessionaire operated sites are not included in the REA authority.

The federal government has programs that could fund alternative transportation projects on the Inyo National Forest. The Federal Lands Transportation Program funds projects that improve access within federal lands on designated transportation facilities owned and maintained by the federal government. Funding is allocated competitively to the U.S. Forest Service, Bureau of Land Management and U.S. Army Corps of Engineers, using a performance management model.

The Federal Lands Access Program administered by the Federal Highway Administration provides funding for federal lands access transportation facilities such as highways, bridges, trails or transit systems that are located on, adjacent to, or provide access to federal lands for which title or maintenance responsibility is vested in a state, local or tribal government. Funds are distributed by formula among states that contain federal lands.

The Transportation Alternatives Program (TAP), administered by the Federal Highway Administration, funds opportunities to expand transportation choices and enhance the transportation experience related to surface transportation, including pedestrian and bicycle infrastructure and safety programs, scenic and historic highway programs, landscaping and scenic beautification, historic preservation and environmental mitigation. TAP projects must relate to surface transportation and must qualify under at least 1 of the 12 eligible categories. Though the program is under the authority of the Federal Highway Administration, it is implemented by the states who have flexibility in how the Transportation Alternatives Program is administered.

The Highway Safety Improvement Program is another Federal Highway Administration program administered at the state level. The program purpose is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including local roads and roads on tribal lands. Highway safety improvements funded include strategies, activities or projects on a public road that are consistent with the data-driven State Strategic Highway Safety Plan (SHSP) and correct or improve a hazardous road location or feature or address a highway safety problem. High risk rural roads with significant number of server accidents are identified in the program as an area of interest. Pedestrian and bicycle safety improvements are eligible for funding.

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides a flexible funding source for transportation projects and programs that help meet the requirements of the Clean Air Act. Eligible activities include such projects as transit improvements, travel demand management strategies and fleet conversions to cleaner burning fuels. Jointly administered by Federal Highway Administration and the Federal Transit Administration, the CMAQ program was reauthorized under the Moving Ahead for Progress in the 21st Century Act (MAP-21) in July, 2012. Funding is available in National Ambient Air Quality Standards non-attainment areas.

The State of California has many programs designed to build and maintain a comprehensive multimodal transportation system. The Transportation Improvement Program is a State of California work program adopted by the California Transportation Commission for future allocations of certain state transportation funds for state and regional highway and transit improvements. The Local Assistance Program administers federal and state funds for multimodal system improvements to state and local roadways through programs such as the Bicycle Transportation Account (BTA) which provides funds for county and city projects that improve safety and convenience for bicycle commuters or the Transportation Enhancement Activities (TEA) that provides funding for projects with a direct intermodal transportation system connection. Many of the state administered programs were amended with the passage of Moving Ahead for Progress in the 21st Century Act (MAP-21) transportation bill in 2012 and implementation of the new legislation is still in progress.

Regional agency initiatives may be a source of funds for alternative transportation projects. The Great Basin Unified Air Pollution Control District, in a joint effort with the Los Angeles Department of Water and Power, provided funding for Clean Air Projects Program in 2011. The one-time program funded clean air targeted improvements, replacements or programs that directly or indirectly resulted in a quantifiable reduction in air pollution emissions. The program funded projects across Inyo, Mono and Alpine Counties.

Forest Service revenues received from the sale of forest products are paid to local counties for schools and roadways. Title 16 Chapter 2 subchapter I, section 500 of the US Code titled "Payment and evaluation of receipts to State or Territory for schools and roads; moneys received; projections of revenues and estimated payments" states that 25% of all amounts received for a fiscal year in connection with a timber sales or other forest products shall be returned to the state for the benefit of public schools and roads of the county or counties in which the national forest is situated. Funds available under this program may be targeted to transportation improvements to or within the Inyo National Forest.

Partnerships may be a key component to creating and funding a comprehensive multimodal transportation system to and within the Inyo National Forest. Many locations and services in need of improvement are outside of the Forest's authority. A concerted effort between organizations may be necessary to develop all possible funding sources to support alternative transportation system improvements.

Many of the roadways providing access to destinations within the Inyo National Forest are under the jurisdiction of the state and county governments. Improvements to state and county maintained roadways may require the approval of the maintaining agency. The installation of pedestrian enhancements, bicycle lanes, roadway striping or signage would be authorized and accomplished by the entity responsible for the roadway. The Inyo National Forest may need to partner with state and county governments to make alternative transportation improvements within a road right-of-way.

State and local governments may have access to unique alternative transportation funding sources that are unavailable to the Inyo National Forest. The Forest Service, as a federal agency, has limited ability to seek funding sources outside of those provided directly for federal agencies. State and local governments, as well as not for profit organizations, may be able to solicit funding from organizations and programs not within the reach of the Forest. By forming a partnership with the local community, the Inyo National Forest may broaden the financial resources available for alternative transportation project funding.

Public-private partnerships may be a tool to provide and promote transportation services to and within the Inyo National Forest. Forest Service permit holders are an ideal candidate for the provision of transportation to key locations on the Forest. The highly seasonal need for transportation services coincides with many permit holders seasonal operations. A permit holder may already have a physical presence in an area where transportation services are needed, eliminating the long drive to many remote locations on the Forest. Transportation services on the Forest may be provided under an existing or new permit. The Forest may consider utilization of a Granger-Thye fee offset agreement to finance permit holder supplied transportation services that benefit the Forest.

Existing partner agencies may need to form new partnerships to build support for alternative transportation systems to and within the Inyo National Forest. As Yosemite Area Regional Transportation System did with Amtrak, the local transportation provider Eastern Sierra Transit Authority (ESTA) may need to form partnerships to support public transportation services to and within the Inyo National Forest. Both Amtrak and Greyhound Lines have partnering programs to expand the company's transportation network. ESTA's northbound and southbound US 395 bus routes currently provide connections to both Greyhound and Amtrak stations. ESTA as an existing interstate transportation service provider should have many of the regulator and insurance requirements meet to offer service as a sub-contractor to a regional or nationwide transportation carrier.

Though the Inyo National Forest may not have the direct ability to construct or provide many alternative transportation system improvements, the Forest could foster an environment of partnership building to accomplish them. A partnership with a local organization may be a means to expand the alternative transportation system and the funding sources that support it. Funding alternative transportation system improvements to and within the Inyo National Forest may require a joint effort between vested parties.

15.0 MULTIMODAL TRANSPORTATION SYSTEM PROJECT MATRIX

Preliminary project proposals were developed at the forest level that may improve access and mobility to and within the Inyo National Forest. Through field observations, data analysis and detailed reviews of existing conditions and user demand, common challenges in the functioning of the alternative transportation network for the Forest as a whole were noticed. Rather than redundantly represent the issues in each individual study site section, these opportunities to improve the alternative transportation system are included here as broad forestwide themes.

Inyo National Forest
multimodal transportation system project martrix

mode of transport	project description	use level	cost estimate	partnering opportunity
Pedestrian				
	Develop pedestrian wayfinding signage master plans	H	L	
	Conduct trail maintenance on existing trails within day-use areas	H	L-H	
	Install pedestrian wayfinding signage	H	M	
	Define pedestrian pathways with context appropriate barriers	H	L-H	
	Install "Share the Road" signage on roadways that support mixed traffic	H	L	
	Create pedestrian refuge areas along roadways that support mixed traffic	H	L	
	Create separate pathways for pedestrians, where and when feasible	H	L-H	
Bicycle				
	Install "Share the Road" signage on roadways that support mixed traffic	H	L	
	Install bicycle parking at locations where travel by bicycle is a viable mode of transport	H	L	
	Promote bicycling on the forest through campground concessionaires and media outlets	H	L	Forest Service concessionaires, chambers of commerce, visitor bureaus
	Create designated travelways for bicycles using striping on existing road surfaces or through distinctly designed routes	M	L-H	Caltrans, Mono County, Inyo County, Town of Mammoth Lakes
	Encourage installation of MUTCD compliant "Bicycles may use full lane" signage on roadways where travel by bicycle is a viable mode of transport	M	L	Caltrans, Mono County, Inyo County, Town of Mammoth Lakes

Figure: Inyo National Forest multimodal transportation system project matrix

Automobile				
	Post speed limits conducive to mixed traffic on roadways that act as foot paths and bicycle routes	H	L	
	Provide the maximum parking spaces feasible on existing paved surfaces through efficient parking space layout and striping	H	L	
	Co-locate parking with existing amenities or new amenities with existing parking	H	L	
	Focus recreation opportunities where existing transportation infrastructure exist, particularly those with surplus capacity	H	L	
	Develop parking areas in campgrounds for overnight and long-term visitor parking, auxillary vehicles and trailers	H	L	Forest Service concessionaires
	Provide parking appropriate to the uses supported at a location	H	L	
	Designate parking spaces as "day-use" or "overnight" with proper signage and wheelstop markings	H	L	
	Use barriers to prevent roadside parking along segments of roadways where parking is deemed inappropriate	H	M	
	Remove unwarranted parking restrictions	M	L	
	Enforce posted parking regulations	M	L	
	Construct gateway features to act as traffic calming devises at key locations	M	H	
	Encourage installation of "no parking" signage along segments of roadways where roadside parking is deemed inappropriate	M	L	Caltrans, Mono County, Inyo County, Town of Mammoth Lakes
Transportation Services				
	Fund recreation shuttle service	L	H	Eastern Sierra Transit Authority, Yosemite Area Regional Transportation Service, Forest Service permit holders, private enterprise
	Fund additonal public transit service	L	H	Eastern Sierra Transit Authority, Yosemite Area Regional Transportation Service
	Encourage development of printed transit route schedules and maps for distribution to local community stakeholders and the general public	H	L	Eastern Sierra Transit Authority, Yosemite Area Regional Transportation Service
	Promote existing public and private transportation services through Forest Service outlets	M	L	Eastern Sierra Transit Authority, Yosemite Area Regional Transportation Service
	Support development of private sector transportation services	M	L	Forest Service permit holders, private enterprise
Information Technology				
	Create a comprehensive transportation system network map showing routes, modes and connections for all transportation modes to and within the Inyo National Forest	H	L	Caltrans, Mono County, Inyo County, Town of Mammoth Lakes, non-governmental organizations
	Create parking maps showing day-use only and overnight permissible parking areas	M	L	
	Support creation of a dynamic rideshare program	M	L	Caltrans, Mono County, Inyo County, Eastern Sierra Transit Authority, Yosemite Area Regional Transportation Service, private enterprise

Figure: Inyo National Forest multimodal transportation system project matrix continued

15.1 WAYFINDING

A comprehensive wayfinding program may have the potential to significantly improve the function of the transportation system to and within areas of the Inyo National Forest. Communication of relevant information to the public about the transportation system including routes, modes and services available may empower individuals to make the best transportation selections for their trip purpose. Wayfinding initiatives may include pre-trip and on-site communication strategies to create a seamless transportation network. Many communication strategies require a minor level resource investment and may represent an opportunity for partnership and community building unions in support of alternative transportation systems.

On-site wayfinding and regulatory signage is intended to provide direction to users. Signage, whether vehicular or pedestrian, informational or regulator, should be evident. Signage may be designed to fit the context of the area, but more importantly, it should be obvious to visitors. Signs that either melt into the surrounding environment or are located in such a place as to go unnoticed may not provide needed direction to users.

Figure: Gateway to trailhead with trail sign on post hidden behind dumpster (Lake Sabrina)

Figure: Trailhead directional sign obscured by bushes and located on opposite side of the parking lot from the trailhead (North Lake)

Figure: Trail sign that blends into the environment (Whitney Portal)

Figure: Vehicular regulator sign placed high in the trees (Lake Sabrina)

Figure: Diminutive trail sign blocked by parked vehicles (Rock Creek Lake)

Figure: Vehicular wayfinding sign barely visible due to its size and location (June Lake Beach)

Wayfinding signage may be highly effective in directing users to the appropriate route. Pedestrian wayfinding signage should be located at the inception of pathways between generators and attractors of foot traffic. Given the higher travel speeds of vehicles, vehicular signage should be large in size and sited in locations visible from an automobile.

Figure: Improper size of parking space pavement marking

Figure: Dumpster placed in viable parking space area and restricted “no parking”

Figure: Parking restriction “no overnight parking” marked wheel stop

15.2 PARKING MANAGEMENT

The grant application and previous transportation studies cited pressure from parking as a significant reason for needed alternative transportation improvements, especially the addition of transportation services. Indiscriminate off pavement and roadside parking in high use areas was noted as limiting visitor access to areas and for causing natural resource damage in key areas of the Forest.

Lack of strategic parking management may precipitate parking difficulties in key areas of the Inyo National Forest. Inefficient pavement markings, an imbalance in parking space allocation by day-use only and overnight permissible, and unrestricted roadside parking contributed heavily to the parking shortages and impacts on the Inyo National Forest. Data collected for this study showed that, in all study locations, sufficient designated parking areas existed to provide adequate parking for overall parking demand, even during peak visitation periods.

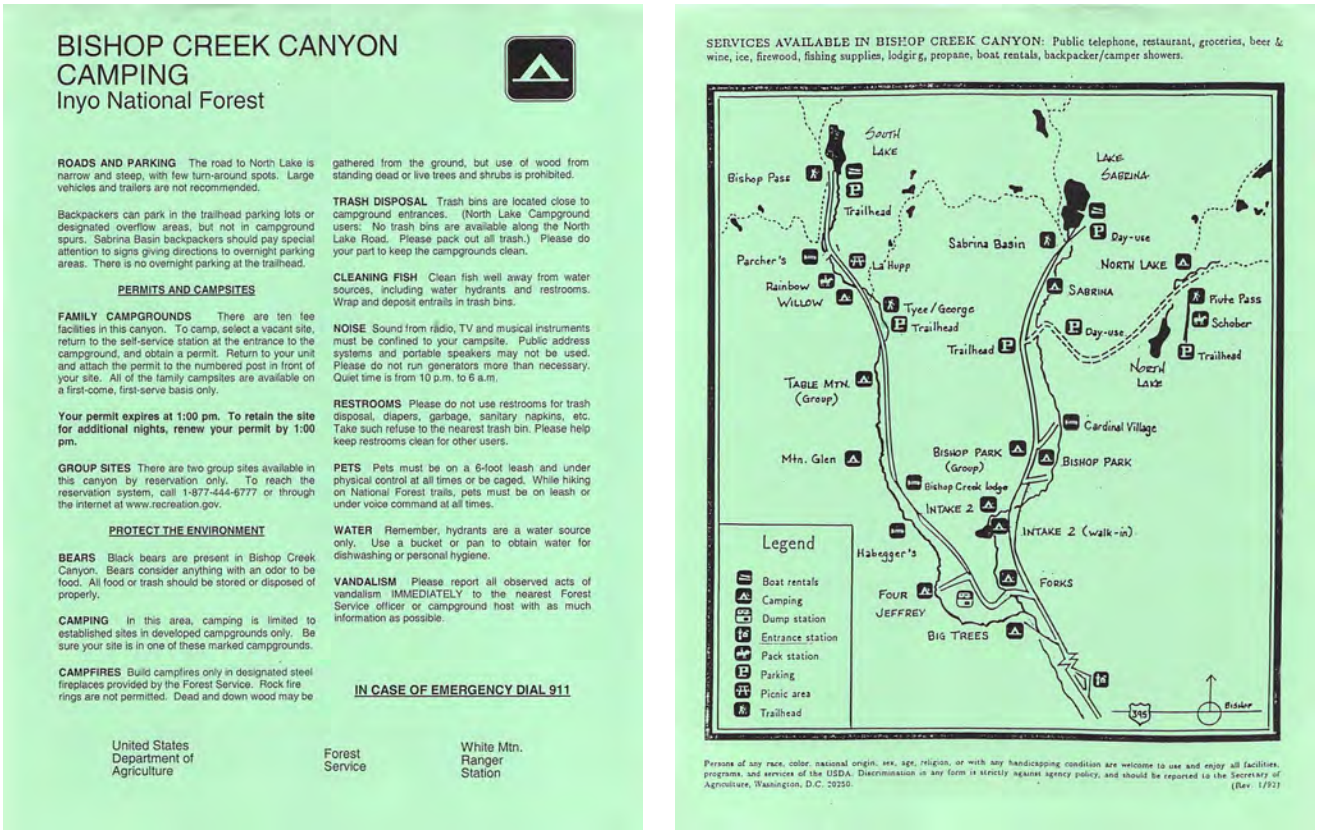
Roadside parking is permitted on most roadways to and within the Inyo National Forest. Roadside parking may act as a relief for overcrowded designated parking areas or simply provide a more convenient location, in closer proximity, to a visitor's intended destination. Aside from entrance roads leading immediately into recreation areas, the majority of the roadways serving the Forest are under the jurisdictional control and maintenance responsibility of partner agencies such as the State of California Department of Transportation or Mono and Inyo Counties. These partner agencies are responsible for restricting or allowing roadside parking within the right-of-way. It would be necessary for the Forest Service to receive permission from partner agencies to restrict roadside parking on roadways outside of the Forest's authority.

In locations on the Inyo National Forest where roadside parking is restricted, enforcement is necessary to curtail the initial onset of prohibited parking. Once a parking pattern is established, many drivers will follow it regardless of whether it is appropriate. Enforcement activities should focus on pre-peak parking times to eliminate vehicles from starting an inappropriate parking pattern in dirt parking lots or along the roadside.

15.3 PROMOTION OF EXISTING ALTERNATIVE TRANSPORTATION SYSTEM

A multitude of opportunities exist to convey information about the existing multimodal transportation system to and within the Inyo National Forest. Publicly and privately produced maps, brochures, guides and advertisements could, with little additional effort, include more precise information about the nature and location of transportation routes, modes and services. The production of a comprehensive transportation map that includes alternative transportation routes and modes could be used and distributed by the Forest Service, partner agencies and private industry to promote travel by means other than personal automobile.

Existing area specific informational brochures supplied by the Forest Service visitor centers could show the location of "day-use" and "overnight" parking facilities and "no parking" restricted areas to direct users to a suitable parking area. The parking map should also include multimodal transportation routes and the appropriate modes available for use on them.



BISHOP CREEK CANYON
CAMPING
Inyo National Forest

ROADS AND PARKING The road to North Lake is narrow and steep, with few turn-around spots. Large vehicles and trailers are not recommended.

Backpackers can park in the trailhead parking lots or designated overflow areas, but not in campground spurs. Sabrina Basin backpackers should pay special attention to signs giving directions to overnight parking areas. There is no overnight parking at the trailhead.

PERMITS AND CAMPSITES

FAMILY CAMPGROUNDS There are ten fee facilities in this canyon. To camp, select a vacant site, return to the self-service station at the entrance to the campground, and obtain a permit. Return to your unit and attach the permit to the numbered post in front of your site. All of the family campsites are available on a first-come, first-serve basis only.

Your permit expires at 1:00 pm. To retain the site for additional nights, renew your permit by 1:00 pm.

GROUP SITES There are two group sites available in this canyon by reservation only. To reach the reservation system, call 1-877-444-6777 or through the internet at www.recreation.gov.

PROTECT THE ENVIRONMENT

BEARS Black bears are present in Bishop Creek Canyon. Bears consider anything with an odor to be food. All food or trash should be stored or disposed of properly.

CAMPING In this area, camping is limited to established sites in developed campgrounds only. Be sure your site is in one of these marked campgrounds.

CAMPFIRES Build campfires only in designated steel fireplaces provided by the Forest Service. Rock fire rings are not permitted. Dead and down wood may be gathered from the ground, but use of wood from standing dead or live trees and shrubs is prohibited.

TRASH DISPOSAL Trash bins are located close to campground entrances. (North Lake Campground users: No trash bins are available along the North Lake Road. Please pack out all trash.) Please do your part to keep the campgrounds clean.

CLEANING FISH Clean fish well away from water sources, including water hydrants and restrooms. Wrap and deposit entrails in trash bins.

NOISE Sound from radio, TV and musical instruments must be confined to your campsite. Public address systems and portable speakers may not be used. Please do not run generators more than necessary. Quiet time is from 10 p.m. to 6 a.m.

RESTROOMS Please do not use restrooms for trash disposal, diapers, garbage, sanitary napkins, etc. Take such refuse to the nearest trash bin. Please help keep restrooms clean for other users.

PETS Pets must be on a 6-foot leash and under physical control at all times or be caged. While hiking on National Forest trails, pets must be on leash or under voice command at all times.

WATER Remember, hydrants are a water source only. Use a bucket or pan to obtain water for dishwashing or personal hygiene.

VANDALISM Please report all observed acts of vandalism IMMEDIATELY to the nearest Forest Service officer or campground host with as much information as possible.

IN CASE OF EMERGENCY DIAL 911

United States Department of Agriculture — Forest Service — White Mtn. Ranger Station

SERVICES AVAILABLE IN BISHOP CREEK CANYON: Public telephone, restaurant, groceries, beer & wine, ice, firewood, fishing supplies, lodging, propane, boat rentals, backpacker/camper showers.

Persons of any race, color, national origin, sex, age, religion, or with any handicapping condition are welcome to use and enjoy all facilities, programs, and services of the USDA. Discrimination in any form is strictly against agency policy, and should be reported to the Secretary of Agriculture, Washington, D.C. 20250. (Rev. 1/92)

Figure: Bishop Creek Canyon information sheet with “roads and parking” information and “Trailhead” and “Day-use” parking areas indicated

Private enterprises may support alternative transportation systems through printed documents and advertisements and company websites. Site specific campground and resort maps could depict adjacent pedestrian trails between the location and area destinations to encourage visitors to walk instead of drive. Print advertising could give details about transit alternatives or provide reference to Eastern Sierra Transit Authority and Yosemite Area Regional Transportation System websites. Private industry websites could provide links to the public and private transportation service providers in the Eastern Sierra region.

Adding multimodal transportation route and mode information to the existing mass of printed and digital media outlets in the Eastern Sierra region may support the development and use of the existing alternative transportation system.

Figure: Local advertisement mentioning transit service could provide more relevant information such as transit agency website address

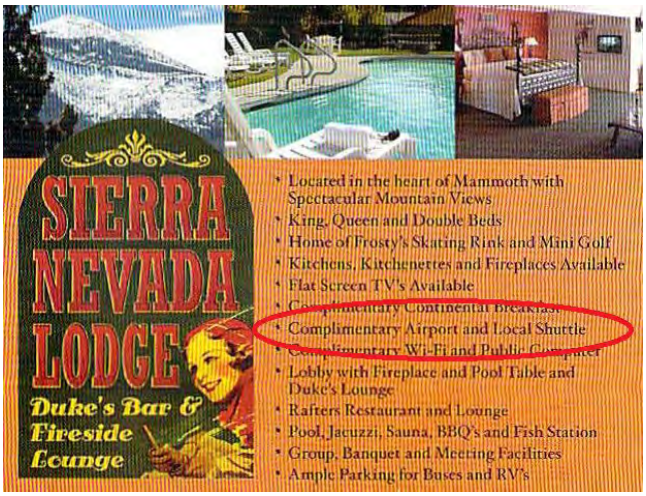


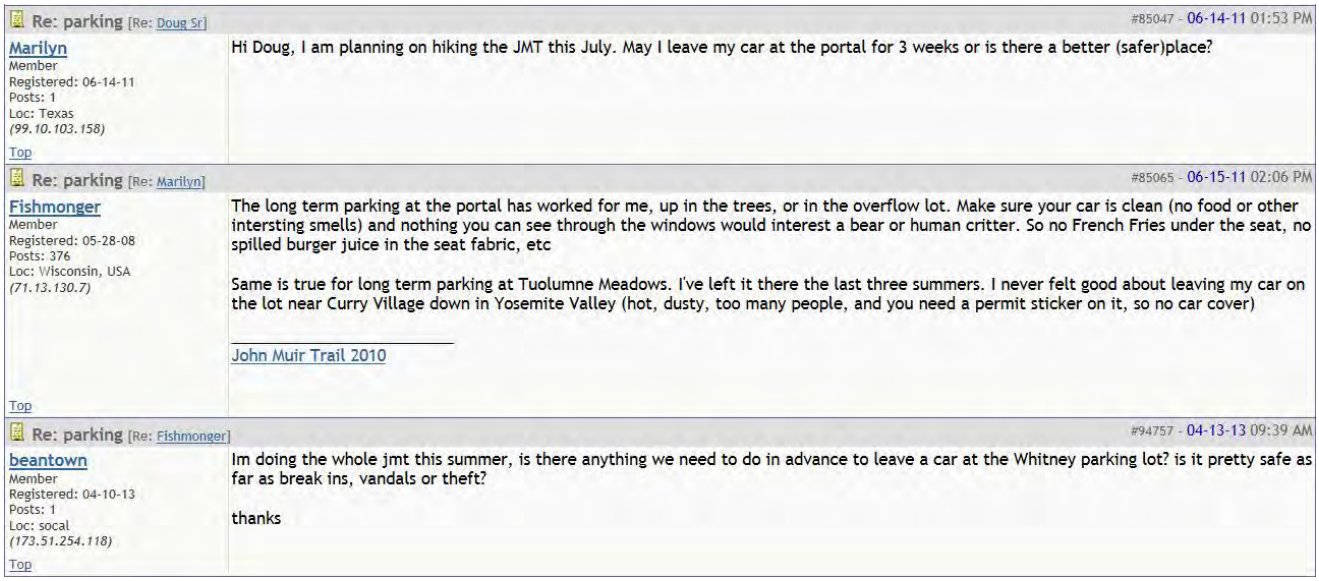
Figure: Privately provided shuttle services

Privately provided transportation services may be used to expand the travel options within the Inyo National Forest. Local resorts that offer shuttle service to guests may be encouraged to develop a recreational shuttle service available to the general public. These establishments may already possess the vehicles and staff and meet the permit requirements to operate a transportation service on the Inyo National Forest. Operation of a transportation service to or from locations on the Inyo National Forest would require a special use permit from the Forest Service. (See Site Analysis: Convict Lake transportation service – public or private)

15.4 RIDESHARING

Technology is an underutilized resource that may be used to expand the transportation network to and within the Inyo National Forest. Individuals may find or share information related to transportation routes and modes from Internet based programs and websites. Technologies such as dynamic ridesharing programs and social media make it possible to connect people. Mobile devices such as smartphones and portable computers have made access to internet based information ubiquitous, from any location.

Improvements to the transportation system may be accomplished through communication of information and with readily available technological applications. The ubiquitous nature of the Internet and mobile devices make communication regarding available transportation routes, modes and services instantly accessible. Social media outlets, websites and dynamic ridesharing applications make it possible to connect drivers and riders in advance of a trip or in real-time. These technology forums offer a quickly implementable opportunity to enhance the alternative transportation system.



Re: parking [Re: Doug Sr] #85047 - 06-14-11 01:53 PM

Marilyn
Member
Registered: 06-14-11
Posts: 1
Loc: Texas
(99.10.103.158)

Hi Doug, I am planning on hiking the JMT this July. May I leave my car at the portal for 3 weeks or is there a better (safer)place?

Top

Re: parking [Re: Marilyn] #85065 - 06-15-11 02:06 PM

Fishmonger
Member
Registered: 05-28-08
Posts: 376
Loc: Wisconsin, USA
(71.13.130.7)

The long term parking at the portal has worked for me, up in the trees, or in the overflow lot. Make sure your car is clean (no food or other intersting smells) and nothing you can see through the windows would interest a bear or human critter. So no French Fries under the seat, no spilled burger juice in the seat fabric, etc

Same is true for long term parking at Tuolumne Meadows. I've left it there the last three summers. I never felt good about leaving my car on the lot near Curry Village down in Yosemite Valley (hot, dusty, too many people, and you need a permit sticker on it, so no car cover)

John Muir Trail 2010

Top

Re: parking [Re: Fishmonger] #94757 - 04-13-13 09:39 AM

beantown
Member
Registered: 04-10-13
Posts: 1
Loc: socal
(173.51.254.118)

Im doing the whole jmt this summer, is there anything we need to do in advance to leave a car at the Whitney parking lot? is it pretty safe as far as break ins, vandals or theft?

thanks

Top

Figure: Whitney Portal Store message board taken from www.whitneyportalstore.com

Social media websites or websites that support visitor interaction may provide a forum for individuals to share information regarding transportation to and within the Inyo National Forest. Key stakeholders in the visitor community may host discussion boards for visitors to exchange transportation related information or arrange to share transportation services. These forums offer an opportunity to support alternative transportation services by disseminating pertinent information.

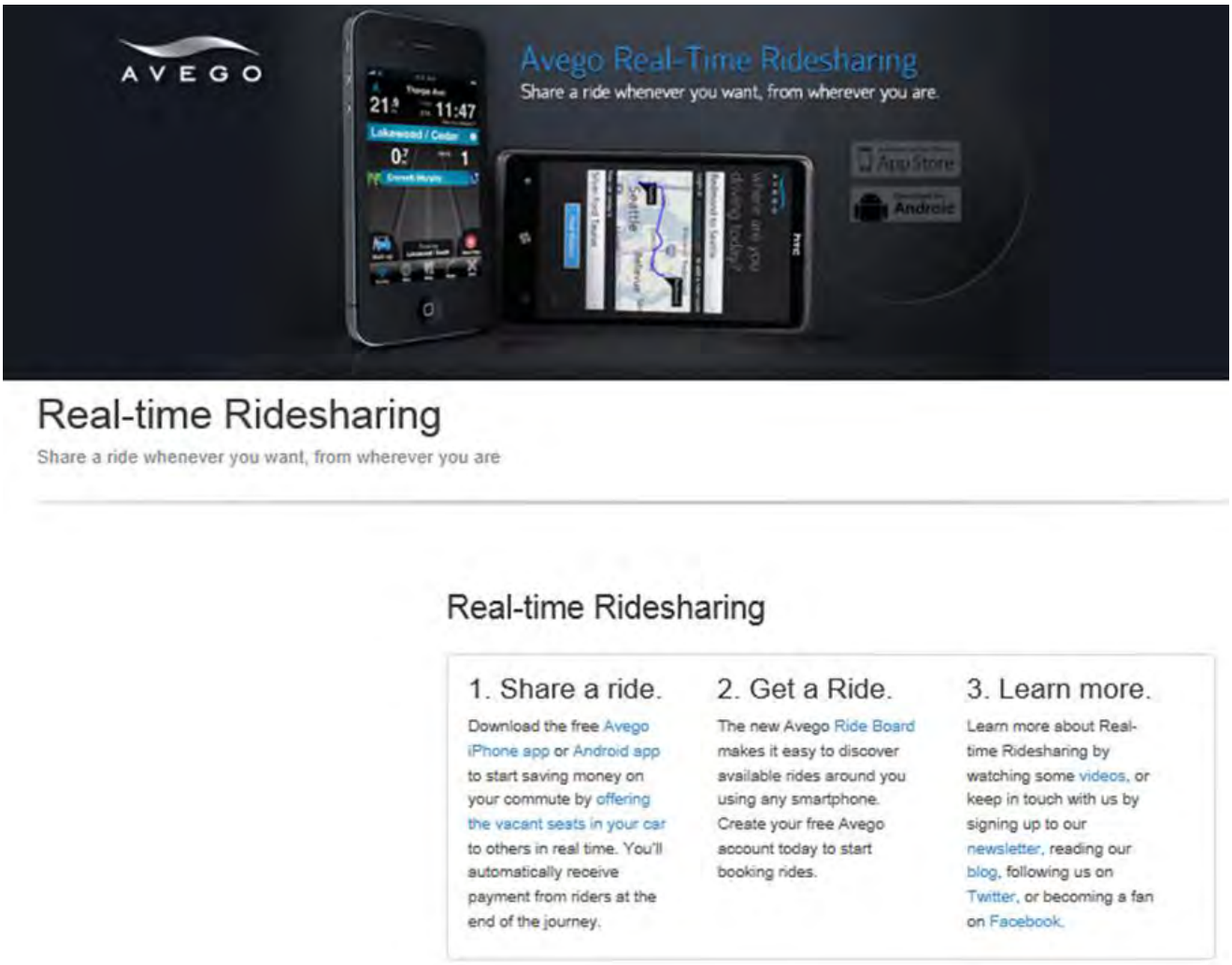


Figure: Avego rideshare program taken from www.avego.com

Dynamic ridesharing programs make it possible to connect drivers and riders in real-time. Personalized programs may be developed for specific communities, such as backcountry hikers on the Inyo National Forest, or worldwide programs match rideshare partners in any location. State of the art computer programs use GPS enabled cellphones to match individuals in need of a ride with drivers in their immediate area. Rideshare services may be offered free of charge, or for some programs, drivers may be reimbursed for expenses.

Ridesharing may add capacity to the Inyo National Forest transportation system by utilizing empty seats in existing vehicles. Caltrans 2000 Origin and Destination Study found that the average vehicle occupancy was 2.18 people and the trail permit data showed that average party size is between 2 and 3 persons, potentially leaving empty seats in vehicles. Vehicles traveling to the Inyo National Forest may have surplus seating capacity that could be filled through a rideshare program.

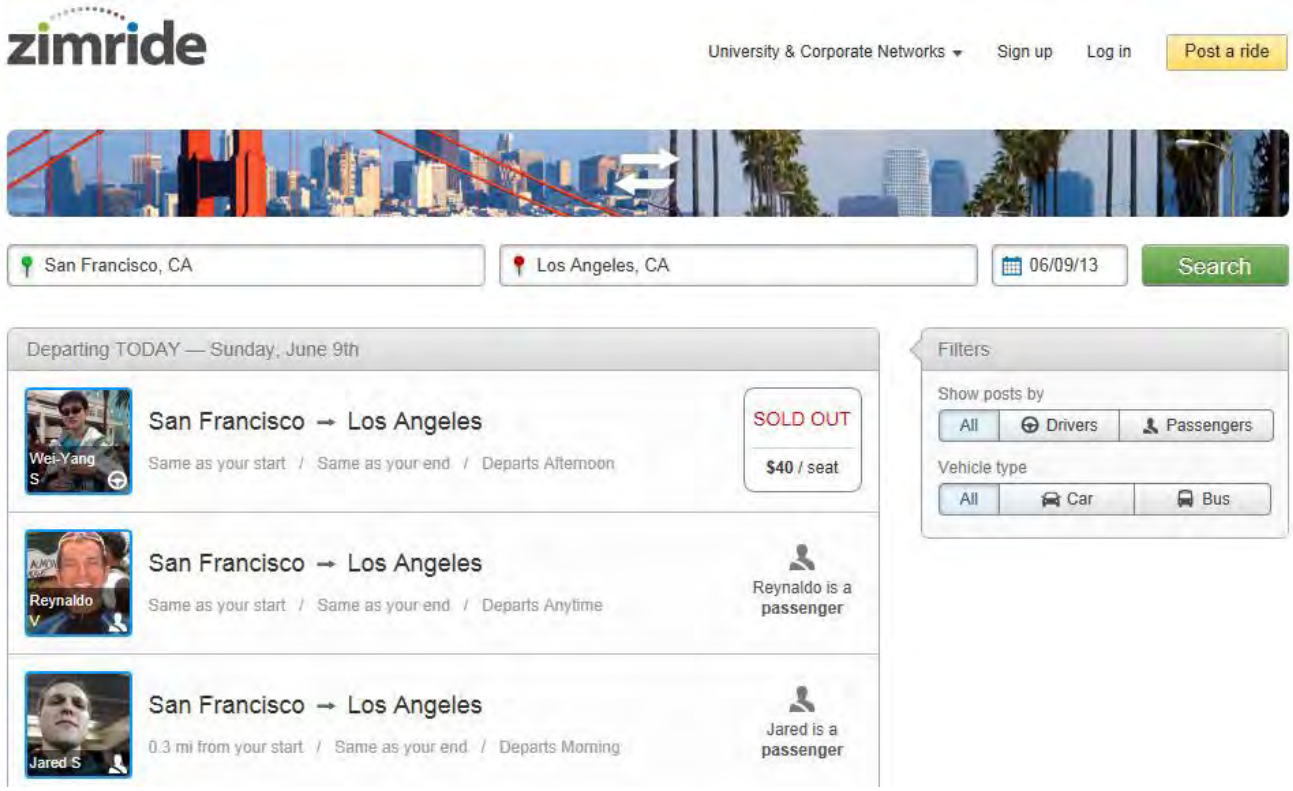


Figure: Zimride rideshare message board showing offers and requests for rides taken from www.zimride.com

Ridesharing programs may support long distance or local area travel. The consolidated origins of visitors to the Inyo National Forest, in a few key markets, may support the use of long distance ridesharing. The predominant visitor markets of Southern California, the San Francisco Bay Area and Western Nevada (2011 NVUM survey) means visitors are coming from large metropolitan areas and traveling on one of the few highways leading to the Forest. The Caltrans Origin and Destination Study (2000) found that 41% of vehicles traveling in the Eastern Sierra region were bound for the Town of Mammoth Lakes area. The Origin and Destination study also found that of the 40% of travelers reported to be passing through the area en route to other destinations, 79% indicated that they may stop in a local community. These drivers may be willing to offer rides to passengers for a portion of the trip.

The limited number of vehicular routes that lead to and from many destinations on the Inyo National Forest create an environment conducive to local ridesharing. Most visitors must pass through a local community on their trip to the Forest. These gateway communities may act as the informal transfer centers from a long distance to a local rideshare network. Both visitors and local community members may participate and benefit from a rideshare program. The limited number of vehicular travel routes to and within the Inyo National Forest is a key component in building a successful rideshare program.

Funding source availability and partnership building opportunities may dictate the implementation timing of multimodal transportation project proposals to and within the Inyo National Forest. A definitive timing schedule is not proposed due to the understanding that limited funds may be available to accomplish projects. To assist the Forest in selecting improvements, as funds and opportunities arise, the project proposal list was developed to demonstrate areas for potentially high, medium and low impact to the transportation system.

Though many of the proposed projects are within the jurisdiction of the Inyo National Forest, many projects would benefit from the orchestrated efforts of multiple agencies. Partnering with public or private organizations to accomplish the needed improvements to the transportation system may allow parties to combine expertise and funding sources and create a synergy in the completion of projects.

16.0 CONCLUSION

This study reviewed corridors to and areas within the Inyo National Forest that may be ready for alternative transportation system improvements. Previous transportation studies were used as guides for development of this project. Those studies identified demand for parking as a critical factor in the need for development of alternative modes of transportation. Those studies noted a lack of sufficient parking facilities as a limitation to visitor access. In contrast, this study determined that access to parking was not a significant factor which limited visitation.

The comprehensive document review conducted as part of this study considered the transportation related goals, objectives and plans of the Inyo National Forest and partner agencies within the Eastern Sierra region. The planning documents reviewed were intended to act as guides and controls to strategic development. The Forest Plan, the document that provides direction for the management of all lands and resources administered by the Forest, is currently under revision.

The Recreation Opportunity Spectrum (ROS), a recreation planning tool, was developed by the Forest Service. Recreation planning recognizes the importance transportation plays in use level. It also realizes that more people will travel to an area when multiple routes and travel mode options are available. The quantity and quality of routes provided and the permitted modes of transport to a location may be used as an access management strategy to provide a diverse array of recreational experiences.

The Urban designation, where modes of transport such as mass transit are needed to move the large numbers of visitors, is the most intense ROS classification. There are no Urban designated areas on the Forest. The most intense ROS classification found on the Inyo National Forest is the Rural designation. Through the Forest Plan revision process the Forest may choose to update ROS classifications to allow more ubiquitous access and thus encourage greater levels of visitation to key areas of the Forest.

Visitor use, parking lot utilization, vehicular traffic counts, Wilderness trail permits and campground occupancy data was gathered to determine the locations and periods of visitor demand for access. The parking lot occupancy data collected showed that in all study locations sufficient designated parking facilitates existed to meet visitor demand even during peak visitation periods. Roadside parking, noted in the grant application as an indicator of excess parking demand, is unrestricted in most areas of the Forest and was generally attributable to visitors seeking a more convenient parking location close to their destination rather than a lack of formally designated parking areas. Special events at key locations on the Forest may have created a demand for parking in excess of supply for discrete periods of time.

Multimodal transportation projects proposed for each study location and the Forest as a whole may improve access to and mobility within the Inyo National Forest. The wide breadth and depth of the project proposals provides the Forest with a comprehensive review of all practical modes of transport in the alternative transportation system. Enhancements to the alternative transportation system may offer travel options to users and improve the function of the overall transportation system by shifting users to underutilized routes or modes. The Forest should be opportunistic in project timing and prioritization and implement improvements as redevelopment projects, funding sources and partnership opportunities arise.

The financial review of project feasibility and financial sustainability found that limited alternative transportation project funding sources are available directly to the Inyo National Forest. New federal transportation legislation has eliminated the primary funding source for alternative transportation system improvement projects on federal lands. Partnership building may present the largest opportunity for financial viability of transportation systems in the Eastern Sierra region.