



Denali National Park and Preserve Long-Range Transportation Plan

Appendix A: Literature Review Summary Report

1. Introduction

This baseline conditions report summarizes the findings of a literature review conducted as part of the National Park Service's (NPS) Denali National Park and Preserve (Denali NP&P) Long Range Transportation Plan (LRTP). This review will be used as the foundation for the LRTP's baseline conditions chapter and consists of existing policies, guidelines, plans, conditions, and research related to the Denali NP&P's transportation system.

The vision for the Denali NP&P LRTP reflects the values expressed in the Park's Foundation Statement and input received from Park staff and decision makers. This vision serves as the basis for the LRTP's goals and objectives. The LRTP's vision is:

Protect intact, the globally significant Denali National Park and Preserve ecosystems, including their cultural, aesthetic, and wilderness values, and ensure appropriate access to opportunities for inspiration, education, research, recreation, and subsistence for this and future generations.

2. Literature Review Composition

The literature review included 16 documents as well as notes from preliminary meetings conducted as part of the early stages of the LRTP process. Documents included in the literature review are:

- Alaska Federal Lands Long Range Transportation Plan, 2012
- National Park Service Alaska Region Long Range Transportation Plan, 2012
- Denali National Park and Preserve Foundation Statement, 2014
- Alternative Funding Opportunities for National Park Service Transit, 2014
- Denali National Park and Preserve Bus Shuttle System Analysis, 2013
- Denali Park Road Visitor Survey, 2010
- Visitor Satisfaction with Transportation Services and Wildlife Viewing Opportunities in Denali National Park and Preserve, 1998
- Proposed Entrance Station Report, 2008
- Needs Assessment & Feasibility Study for a Community Transportation System, 2006
- Vehicle Management Plan (VMP), 2012
- Denali National Park and Preserve Entrance Area Environmental Assessment, 2001
- Denali National Park and Preserve General Management Plan, Consolidated, 2008
- Denali Community Transportation Study, 2006
- Denali National Park and Preserve Transportation Needs Assessment, 2006
- Denali National Park and Preserve Winter Plowing Environmental Assessment and Finding of No Significance, 2013
- Air Tour Operators Best Practices, 2012

2.1. Document Age

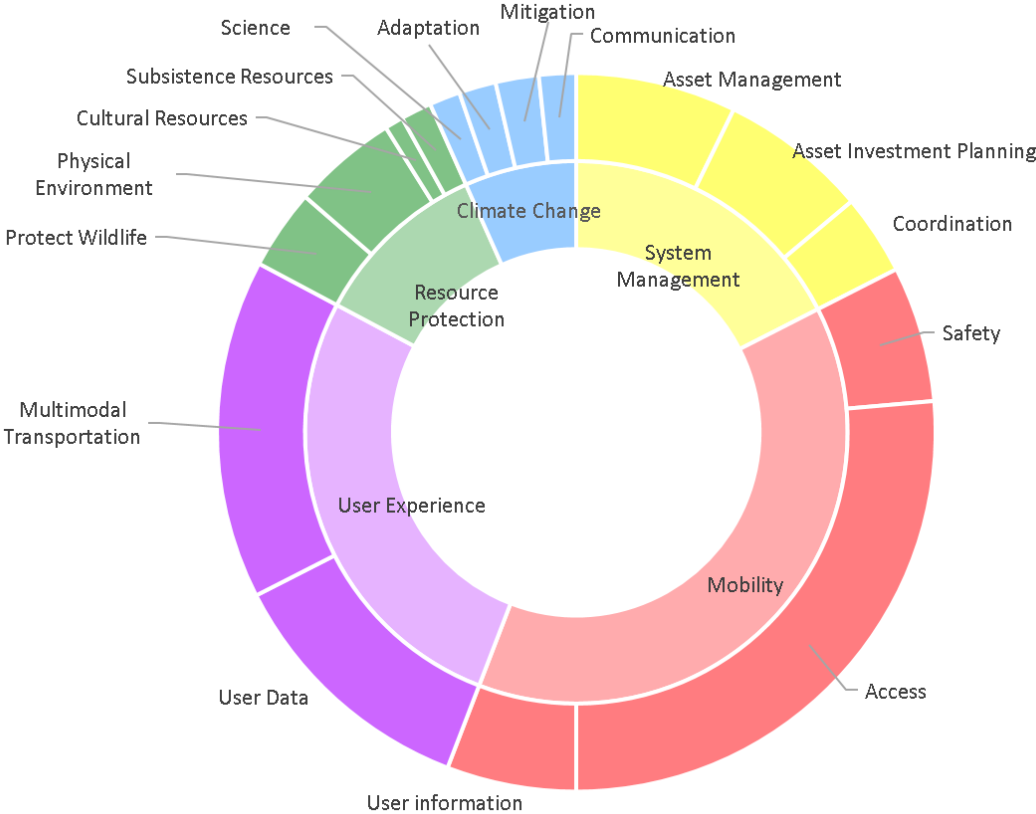
The majority of documents analyzed through the literature review were completed within the last 5 to 10 years. Occasionally, issues highlighted in older documents identify conditions or policies that have changed and are represented as such in subsequent plans and studies. These instances were tracked through the literature review process. This baseline conditions report omits conditions, policies, or other conclusions that were made irrelevant by subsequent documentation.

2.2. Goal Area/Objective Frequency Distribution

The results of the literature review focused on 90 criteria related to six LRTP goal areas and 16 objectives within those goals. A complete list of goals, objectives, and criteria are included in Appendix A. Each Denali NP&P planning document was reviewed for instances of where the criteria were met. The literature review resulted in a total of 394 instances of planning documentation relating to goal areas from which to conduct a baseline study.

The chart below shows the distribution of responses among the LRTP goal areas and objectives. The most common topics relating to goals and objectives that appeared in the documents reviewed related to mobility and user experience. These topics make up a combined 64 percent of the responses relating to goal areas. System management accounted for another 18 percent. The least frequent were resource protection and climate change.

Figure 1. Literature review response frequency by goals and objectives



3. Literature Review Results by Goals and Objectives

Literature review results are organized by goals and objectives.

3.1. Resource Protection Goal

Protect Denali National Park and Preserve's natural, cultural, and subsistence resources

Wilderness Character Objective: *Preserve wilderness character and consider cumulative impacts to wilderness in transportation planning and policy development.*

The existing literature on the protection of wilderness as it relates to coordination with neighboring transportation agencies discusses some activities that managers are engaging in to better manage wilderness within Denali NP&P.

Although Denali NP&P managers currently works with state, federal, and local agencies on issues relating to wilderness protection, there is minimal documentation of these efforts in the catalogue reviewed for this study. Documents reviewed note processes for coordination with other agencies in regards to environmental impact statements and environmental assessments and projects located on non-NPS owned transportation systems. The reviewed documents do not indicate that there is an ongoing formalized coordination process for reviewing wilderness protection as it relates to transportation impacts.

Other wilderness protection efforts include cooperative discussions with air tour operators about measures to protect wilderness character and to minimize conflicts with land activities.

Transportation factors identified that influence Denali NP&P wilderness character primarily include interaction between buses and wildlife, specifically traffic volume, timing, and types of vehicle use on Denali Park Road. Impacts from these factors are addressed through the use of road standards, gap spacing, nighttime traffic levels, and monitoring conditions.

Condition

Denali NP&P managers often engage in coordination efforts with neighboring organizations (state, local, and federal agencies; local tribal groups; and tourism industry) as part of National Environmental Policy Act (NEPA) documentation, but there is no formal working group or regular forum for ongoing coordination between Denali NP&P and these groups. Increased coordination is desired.

Natural Resources Objective: *Understand, mitigate, and protect wildlife and the physical environment from adverse transportation system effects*

Preservation of natural resources is a top priority for Denali NP&P. Therefore, management of visitor access is paramount in the discussion of resource protection, especially as it relates to transportation. In order to provide a natural environment that includes largely intact ecosystems for the enjoyment of visitors, the Park manages daily traffic along Denali Park Road as well as how it provides access to backcountry travelers. This objective is promoted by continuance of the “no formal trails in the backcountry” policy (General Management Plan, 2008) and new vehicle management strategies as discussed in the VMP (2012).

There is increased awareness of the importance of monitoring wildlife interactions with vehicles along Denali Park Road. Indirect disturbances to wilderness include noise from motorized vehicles including overflights, fugitive dust, obstructed viewsheds, social trails, trampled vegetation near transportation hubs, and increased signs of disturbance near transportation hubs.

Park staff also coordinate with land managers at other potential Denali NP&P access points, specifically addressing interest in development at the existing Stampede Road. In the 2008 General Management Plan, Denali NP&P has noted considerations for wolf, moose, and caribou habitat in this area. Opportunities for new multimodal access to the south of the Park are also documented, but no specific resource considerations were documented in this area.

The 2012 NPS Alaska Region LRTP made coordination with neighboring land and transportation managers a regional objective for all units in the state. The Alaska Federal Lands LRTP established an ongoing transportation project coordination working group to address such concerns at a regional scale. There is no similar working group for Denali NP&P specific coordination.

Cultural Resources Objective: *Mitigate negative impacts and provide appropriate access to cultural resources*

An inventory of historic properties was developed in 1983 and again in 2000. These studies have led to ongoing protection of cultural resources within the Park; this is a specific objective outlined in the 2012 VMP to protect and promote historic character.

Several transportation related assets within the Park are considered to be cultural resources. The park headquarters district and dog kennels have been added to the National Register, along with the Denali Park Road.

The 2012 NPS Alaska Region LRTP cites the construction of new airstrips for backcountry access as a threat to cultural resources. These threats are of particular concern for cultural resources not only due to the physical presence of the airstrips, but because of the associated soundscape implications that

Condition

Denali NP&P is home to populations of wolf, caribou, Dall sheep, grizzly bear, moose and some of the most pristine wilderness in the NPS system. Environmental protection is the top priority of Denali NP&P in terms of appropriate and effective access and, therefore, improvements to the transportation system are subject to strict environmental considerations.

Condition

Historic sites are well documented within Denali NP&P. Denali Park Road itself is considered an important cultural asset.

additional air traffic may have. With increasing popularity of Denali NP&P and limited vehicular access, aircraft facilities are key for accessing the backcountry, now and in the future.

Subsistence Resources Objective: *Consider impacts and access to subsistence resources in transportation planning and policy development*

Because subsistence access is authorized by Title VIII of ANILCA, most plans refer to the provisions set forth in the implementing regulations at 36 CFR 13.460. Motorboat and snow machine access is allowed for traditional subsistence activities in the “Old Park”, and off-road vehicle use is allowed on 5 trails near Cantwell (General Management Plan, 2008). ANILCA does not supersede the original legislation to create Mt. McKinley National Park though it adds authorization for private and commercial air travel through permits and concessioner contracts.

Condition

Subsistence access is allowed under ANILCA. Access rights for traditional uses include traditional and modern transportation modes. Transportation impacts of these activities are not well documented.

In the "Old Park" snowmobiling was officially closed to all users in the late 90s and early 2000s. The "Old Park" was also closed to hunting previous to the passage of ANILCA. Planes are allowed in the "Old Park" but only non-commercial as it is traditional and customary to pre-ANILCA.

Transportation impacts of subsistence activities are not well documented, but most plans refer to these activities taking place.

3.2. Climate Change Goal

Plan for climate change impacts to and from the Park’s transportation system through science, adaptation, mitigation, and communication

Science Objective: *Initiate, support, and participate in scientific research and assessments needed to understand and respond to relationship between transportation and climate change in Alaska*

At this time, participation in climate change science still only exists at the Alaska Region level in terms of climate action plans and regional LRTPs. Regional plans include goals and objectives for addressing climate change science. These include funding climate change research through the Transportation Research Board, establishing partnerships to test green technologies, and regional support for the Climate Friendly Parks certification. The Alaska Federal Lands LRTP also sets an objective of participating in at least one climate change effort per year with documented results. If successful, this could increase the amount of information available to Denali NP&P managers.

Condition

Participation in climate change science is mainly conducted at the regional NPS level. However, regional support for these activities has recently led to support for unit level studies.

The Alaska Region system has undergone studies to assess climate change scenarios at the unit level. These efforts may also lead to more unit-level planning for transportation assets that include climate change considerations.

Adaptation Objective: *Manage transportation assets and conduct transportation planning for climate change*

Regional transportation planning objectives call for transportation system adaptation with regard to climate change. Specific long-term climate change adaptation needs include identifying and prioritizing risk to NPS-owned and non-NPS owned transportation assets and systems likely to be affected by climate change and determine what management actions are needed; and developing adaptive management into LRTP updates as a means of assessing situations, designing, implementing, monitoring, evaluating, and adjusting management decisions to account for climate change.

There is limited language addressing climate change adaptation in plans specific to Denali NP&P.

Condition

Currently there is limited transportation planning documentation in regards to climate change adaptation. Regional planning objectives call for increased hazard risk assessments for strategic decision making.

Mitigation Objective: *Reduce Denali National Park and Preserve's carbon footprint by reducing transportation related greenhouse gas emissions from Park operations and visitation*

Denali NP&P is in the process of achieving a Climate Friendly Park (CFP) certification¹. This program, established by the NPS, sets performance standards for sustainability in support of NPS goals for reducing greenhouse gas emissions through energy conservation and reduction in energy use, recycling, composting, technology upgrades, and other actions. The NPS Alaska Region has a goal of becoming a climate friendly region by 2030 which targets expanding regional participation in the Climate Friendly Parks program and increasing climate related data collection.

Condition

Denali NP&P is in the process of becoming CFP certified. Climate change mitigation activities include reduction in energy use and encouraging Park employees to carpool by providing carpool vehicles.

Some specific climate change mitigation activities underway in Denali NP&P include the availability of an employee carpool fleet and the use of local gravel sources to minimize maintenance vehicle miles traveled, as well as reduction of idling vehicles during transit operation and winter plowing operations. Future opportunities to reduce its carbon footprint may include upgrades to more fuel efficient transit vehicles should suitable vehicles become available someday.

Communication Objective: *Share the compelling story of climate change impacts in Alaska and Denali National Park and Preserve to the public as it relates to transportation*

¹ The CFP program is one component of the National Park Service Green Parks Plan, an integrated approach by the NPS to address climate change through implementing sustainable practices in our operations. This effort is an integral part of the larger NPS [Climate Change Response Strategy](http://www.nps.gov/climatefriendlyparks/). For more information on Climate Friendly Parks certification, visit <http://www.nps.gov/climatefriendlyparks/>

At this time there is no formal region-wide communication program to describe the relationship between transportation and climate change. At the park scale, there are interpretive programs within Denali NP&P to explain the impacts of climate change on the landscape. Because Denali NP&P extensively utilizes transit services to enhance visitor experience, opportunities exist to show air quality and other benefits of transit service as compared to personal vehicle use.

Condition

Although there is no formal guideline at the regional level for communicating climate change impacts, Denali NP&P has some programs to communicate climate change impacts to its visitors.

Regionally, there are efforts underway to communicate with both external partners and internal staff members about the successes and failures concerning environmentally sustainable transportation practices, and to develop and fund educational materials for internal and external audiences.

3.3. User Experience Goal

Proactively enhance the Denali National Park and Preserve experience

User Data Objective: *Collect, analyze, and use transportation and user information to enhance Park experiences into the future*

Most of the documents reviewed for this baseline conditions report rely on user information to determine a condition or characteristic. Within Denali NP&P, there is increased interest in collecting user information because it informs a more proactive approach to transportation system performance, visitor experience, and natural resource impacts. User data is collected through different methods and is used for numerous ends. These include:

Condition

Denali NP&P collects, analyzes, and uses transportation and user information to enhance Park experiences. The Park also has a vision for how this practice can be improved in the future.

- Visitor surveys are used to gauge visitor satisfaction as well as transportation system performance. The most recent survey was collected in 2006.
- Static visitation collection points at the Savage River Check Station, visitor centers, and other travel waypoints are used to track visitor characteristics and behavior.
- As of 2013, transit data is collected on all Park transit vehicles by bus drivers and through mobile tracking devices. On-board devices track the number of tickets sold, number of passengers, GPS locations of buses, and durations of vehicle stops. Bus drivers manually input the purpose of the stop and information about hiker wait times, which is of high importance to the Park Service. This data can be made available in real time and can be used to monitor and respond to varying travel demands. The NPS currently has staff in the Resources Division dedicated to analysis of the data collected by the transit operation.
- Permits collected for the purpose of either access by private vehicle with right-of-way authorization, for overnight backcountry access, or by commercial airplane are useful for tracking visitation to the most protected areas of the Park.
- Other information currently collected includes Service-wide Traffic Accident Reporting System (STARS) and Fatal Analysis Reporting System (FARS) data for recording vehicular accidents.

Needs and opportunities for user data include specifying visitor experience benchmarks for number of vehicles at wildlife stops and number of vehicles in a viewscape to serve as reliable baseline condition data. Other recommendations include additional road audits to reduce entrance fee non-payment. More flexibility to use franchise fees to fund comprehensive data gathering is seen as an opportunity to improve visitor experiences while protecting natural resources.

Multimodal Transportation Objective: *Provide an appropriate, effective, and conflict free multimodal transportation system to and within Denali National Park and Preserve*

For much of the Park's history, maintenance and transportation improvements focused on Denali Park Road. More recently, the emphasis includes the Park's transit system which increases access while minimizing natural resource impacts. Much of the desired future conditions are related to the Park implementing more outcome-based approaches to analyzing user information as opposed to relying solely on historic comparisons.

Condition

Multimodal access is historical, necessary, and desired by recreationalists and subsistence users. The most common multimodal conflicts are due to crowding at wildlife stops and rest stops along Denali Park Road.

Appropriate multimodal transportation service is often defined by its ability to make Denali NP&P accessible to a wide range of visitors with overarching consideration for the wilderness character that the system accesses. This definition of appropriate access relates closely to the Denali NP&P's purpose and mission as stated in its Foundation Statement. Appropriate access depends on the observed and anticipated effects to natural resources (VMP, 2012). Increased visitor access is desirable if it does not cause negative impacts on environmental conditions. At locations within the Park where the natural environment is still intact, even small increases in visitation or changes in access can have dramatic impacts on natural systems.

Multimodal issues that reoccurred in several reviewed documents and in comments from Park staff include confusion about shuttle service operation; desire for better connections between the Park, local communities, and visitor accommodations; employee travel to, from, and within Denali NP&P; safety, comfort, and quality of interpretive experience; and transportation service affordability.

Multimodal conflicts identified in plans include general congestion along Denali Park Road and in Nenana Canyon, crowding at wildlife stops and rest stops within the Park, narrow roadways for bicycling and hiking in the "front country" and at particular locations east of Savage River; and conflicts between land and air visitation in terms of soundscape impacts. Congestion challenges are anticipated to grow as visitation levels increase. As a result, Park managers may face ongoing decisions about how to balance environmental priorities and resource protection with transportation system capacity when responding to increased demand.

The Park has several efforts underway to improve multimodal travel opportunities and travel experiences within Denali NP&P. Park managers are using indicators to measure performance of the transit system and gauge overall user experience. These include hiker wait times, numbers of vehicles at wildlife stops, number of vehicles in viewsheds, numbers of vehicles at rest stops, nighttime traffic levels, large vehicle traffic, and sheep gap spacing. Proposed construction of an eight-foot gravel shoulder along sections of Denali Park Road from mile eight to Savage River cited in the Final Entrance Area and Road Corridor Development Plan could provide safety and traveling comfort for bicyclists and hikers and may improve

opportunities for wildlife viewing. Also, modifications to the general management of Denali Park Road could improve protection of natural habitats beyond Savage River.

There is an opportunity to gain efficiency in transit operations by improving consistency in transit seating and consolidating shuttle services in the entrance area and canyon. Also, expanding transit service north to Healy and south to Carlo Creek and Cantwell in addition to increasing shuttle service between the entrance area and McKinley Village is desired (Needs Assessment and Feasibility Study for a Community Transportation System, 2006).

3.4. Mobility Goal

Provide safe, efficient, and appropriate access to and within Denali National Park and Preserve

Safety Objective: *Provide safe access to and within Denali National Park and Preserve*

Between 1990 and 2006, 95 percent of all vehicular accidents in NPS's Alaska Region occurred in Denali NP&P, with 58 percent of these accidents occurring on Denali Park Road (NPS Alaska Region LRTP, 2012). Of the other accidents reported within Denali NP&P, 19 percent were located on the George Parks Highway within the Park boundaries. The remaining portion of vehicular accidents occurred near the visitor parking areas or in campgrounds. The George Parks Highway is the direct road connection between Anchorage and Fairbanks and a major travel corridor for Denali NP&P visitors. Between 2007 and 2010, 31 total fatalities were reported on the George Parks Highway (NPS Alaska Region LRTP, 2012).

As identified in the VMP, safety issues are associated with road travel along Denali Park Road. The historic nature of the road may in some locations limit sight distance, restrict width for passing vehicles, and provide inadequate surface road friction (VMP, 2012). Driver behavior is most likely a contributing factor in vehicular crashes particularly for private vehicles traveling Denali Park Road during off-peak seasons. Impacts of severe weather events for Denali Park Road travelers are another safety consideration. These issues are also a top priority of the Park's General Management Plan and although very important, must be balanced with active preservation of the road, as characterized by the philosophy to retain its telescoping from a full width paved profile at the entrance to the narrower, unpaved gravel profile at the western end.

According to the visitor survey highlighted in the VMP, the public indicates that they feel safe while using Denali NP&P's transportation system. The most notable safety consideration perceived by the public is related to travel over Polychrome Pass where Denali Park Road has steep drop-offs and the road is narrow and winding. Park management uses driver training, driver spacing, and wait times to address safety issues at this location.

Condition

The historic character of Denali Park Road creates safety issues, and due to its popularity both as a visitor attraction in the Alaska Region and within Denali NP&P, most recorded accidents occur along the road. Other safety considerations include bicycle and pedestrian access in the front country and along sections of the George Parks Highway, and increased winter access.

Safety is also a top priority for flight operations. For example, recommended flight tour routes are subject to weather conditions and aircraft may be forced to deviate from planned routes if safety is at risk (Air Tour Operations Best Practices, 2012).

With increased opportunities for vehicular winter access, emerging safety improvements related to winter travel are a growing need. Denali NP&P has a goal of minimizing wintertime safety-related incidents and has an interest in determining baseline conditions so as to monitor future winter safety performance. With the trial winter plowing of the first 15 miles of Denali Park Road, the Park continues to monitor visitor safety during the extended period of winter and early spring driving conditions. Commercial operators also provide multi-modal access to the Park during winter months. Denali NP&P staff is working with commercial operators to implement safety measures for winter operation, such as the required use of emergency communication devices during operation.

The collection of safety data and addressing inconsistencies in safety data reporting is identified as an ongoing need.

Access Objective: *Provide appropriate and efficient access for inspiration, education, research, recreation, and other uses as provided for in ANILCA.*

As stated in the General Management Plan, the primary historic purpose of access to Denali NP&P is to accommodate viewing of Mount McKinley and the Park's wildlife. As documented, appropriateness of access is defined by the balance between visitor accommodation with active protection of wilderness character. The NPS, therefore uses the least access restrictive management tool possible to maintain and promote the natural resources protected by the area (General Management Plan, 2008).

The level of appropriate access varies along Denali Park Road. Wildlife Viewing Subzones are used to distinguish appropriate level of access. A notable example includes the Park's VMP which allows 160 vehicles per 24 hour day through mile 15 of Denali Park Road period while monitoring for violations of user experience standards. This number was derived through extensive research and rigorous travel modeling of Denali Park Road and provides an overall increase in capacity for visitors while considering environmental impacts.

Visitors typically arrive to the Park by private vehicle, bus, or train. Many visitors arriving by bus or train are cruise ship passengers and are traveling with fellow passengers as part of cruise packages. Park management desires to provide efficient access to visitors arriving by all modes of travel while also providing for accessibility as delineated by the Americans with Disabilities Act (ADA) and Architectural Barriers Acts (ABA). For areas of the Park with additional travel requirements, this means ensuring a transportation system that provides a meaningful, high-quality opportunity for viewing scenic landscapes and wildlife, primarily through transit services (VMP, 2012). In the future, visitation is expected to grow with a large portion of visitors arriving as part of organized tour companies or organizations. Considerations of access are therefore a topic of long-range concern as Denali NP&P is committed to balancing access with the responsibilities of managing designated wilderness.

Condition

Within Denali NP&P, appropriate and effective access is determined by the assessed impacts to wildlife and cultural resources. Where the environmental conditions are more intact, visitor access is more closely managed. New vehicle management strategies target this priority.

At the time that the Denali Park Road Visitor Survey (2010) was conducted, 71 percent of visitors who traveled beyond mile 15 were part of organized tours (i.e. Long Tour). These are highly interpretive trips with designated stops at rest areas and impromptu stops for wildlife viewing. Non-tour transit buses traveling past mile 15 provide less interpretation and make impromptu stops for hikers and wildlife viewing.

Coordination with the visitor services concessioner is ongoing and the relationship between Denali NP&P and any concessioner is viewed as integral to providing appropriate and effective access for Park visitors.

User Information Objective: *Provide accurate and accessible information through a variety of means about how to travel to and within Denali National Park and Preserve.*

The NPS is interested in providing information to potential and repeat users about its transportation system and services at a national, regional, and local level. The Alaska Federal Lands LRTP and NPS Alaska Region LRTP summarize objectives and strategies that specifically address providing accurate and accessible information for travel to and within federal lands, and several projects to enhance visitor information services.

Much of the marketing and development of traveler information for Denali NP&P is championed by non-NPS organizations, such as the Alaska Railroad, concessioners, and other area businesses. Because Denali NP&P is a regular destination for commercial tour operations, much of the information provided to potential visitors and visitors en route to the Park is provided by those organizations. According to the Denali Park Road Visitor Survey issued in 2010, over half of the Denali NP&P transit users had received information from a travel agent about their visit to the Park. Another third of the respondents received information over the internet. Denali NP&P maintains a website with virtual tours, guides, and resources to help visitors plan trips to the Park. Travel guides and tour books are also popular means of learning about how to travel to and within Denali NP&P (NPS Alaska Region LRTP, 2012).

Condition

Commercial and state tourism initiatives are successful in providing travel information to visitors prior to their arrival at the Park. Once at Denali NP&P, the Park, its concessioners, and local businesses provide interpretation through visitor centers, transit and tour bus operations, and many others. Interpretation and transit system visitor information improvements are desired.

Traditional means for providing information at visitor centers and Wilderness Access Center are available upon entering Denali NP&P. Once aboard the short-tour and long-tour buses, visitors have a wide range of information available. Tour bus drivers and guides provide extensive interpretation, while transit drivers may provide information upon request and at the discretion of a particular driver. Several Denali NP&P plans document the value of retaining experienced drivers. This was seen as a major enhancement to the overall visitor experience (Denali NP Bus Shuttle System Analysis, 2013).

The most common need identified in planning documents is the necessity for better wayfinding and user information about transit in hopes of reducing visitor confusion with the Park's transportation system. According to the VMP, an objective of Denali NP&P management is to "clearly communicate information about the system through a variety of means." Potential options for sharing information include improving traditional methods such as maps, brochures, and signage. The Alaska Region is also interested in newer media options such as implementing intelligent transportation systems linked with websites, mobile devices, and other personal communication technology. According to a survey in 2010, transit users were

not interested in receiving information from a recorded narrative about traveling Denali Park Road. Information delivered by bus drivers was preferred over prerecorded methods.

Also, with the introduction of enhancements to the off-season access programs, Denali NP&P management is interested in reducing the perception that the Park is closed during off-seasons by increasing communications about opportunities for visiting the Park during the winter.

3.5. System Management Goal

Develop a long-term transportation system to appropriately satisfy current and future land management needs

Asset management Objective: *Apply available financial resources to essential transportation infrastructure*

Relative to other parks in the Alaska Region, transportation assets within Denali NP&P are some of the most costly. This is primarily due to Denali Park Road maintenance needs, providing visitor transit and tour services, and experiencing the high visitation levels during a very short summer season.

In general, transportation assets within Denali NP&P are considered to be in good condition. Road work is mainly concentrated on bridge replacement, road maintenance, and subgrade improvements. In general, road widening does not occur. However, improving pullouts on the narrowest section of the road to maintain safety standards does exist in asset planning documentation. The annual operations and maintenance budget for road assets in Denali NP&P was approximately \$1.2 million in 2010 (NPS Alaska Region LRTP, 2012).

Denali NP&P management uses both quantitative and qualitative measures to prioritize transportation system improvements. The 2008 General Management Plan prioritizes road improvement projects, ranking corrective safety projects as the highest priority and other corrective maintenance and repairs as secondary priorities. The General Management Plan provides example projects from Denali Park Road where potential improvements have been identified for multiple project categories (sight distance improvements, safe vehicle passing enhancements, road surface friction improvements, culvert repairs, etc.). Denali NP&P has incorporated the NPS “optimizer band” model of asset prioritization. In this model, assets are scored by Asset Priority Index (API) to rank how critical assets are used in accomplishing the Park’s mission and goals. In this model, Facility Condition Index (FCI) indicates asset condition and is used to determine eligible fund sources. Projects are evaluated based upon their API/FCI rank. Using this method of asset evaluation, all of the high priority assets (API of 75 or higher) are in good or better condition (FCI of 0.3 or less) (Alaska Federal Lands LRTP, 2012). Finally, the asset needs are filtered through the NPS Capital Investment Strategy (CIS), which expresses priorities in the form of optimizer bands. Optimizer bands 1 and 2 are associated with assets that are essential or extremely important for a park to continue as described in its organic legislation.

Condition

The availability of funds, particularly for funding transit systems, has decreased in recent years. Denali NP&P management is using quantitative and qualitative indicators about the transportation system to prioritize transportation system improvements. With limitations to increasing system capacity Denali NP&P management is working toward increased system efficiency, and better coordination with transportation partners.

There is a general funding gap projected into the future. The most recent congressionally authorized transportation funding bill, Moving Ahead for Progress in the 21st Century (MAP-21) reduces funding for the NPS transit systems by approximately 28 percent from the previous federal transportation legislature (Alternative Funding Opportunities for NPS Transit, 2014). Regional funding assessments show an annual funding gap of \$720,000 for Alaskan “road parks”, the category which Denali NP&P is included. Although park-level funding shortages are not yet documented for Denali NP&P, a large portion of the Alaska Region’s transportation assets are located in Denali NP&P. Elimination of the Transportation Improvement Program (TRIP) has made funding multimodal systems, such as the Park’s concessioner-operated transit, more challenging (Alternative Funding Opportunities for NPS Transit, 2014).

Because the transit system is operated by a for-profit concessionaire, it is not eligible for transportation funding through MAP-21, however, several FHWA funding and grant programs are still applicable and partnerships with local government cooperation and partnership could increase funding eligibility.

Park management is also very interested in finding efficiencies within its current asset portfolio, completing operational modifications that improve the transportation system, and promoting the Park’s purpose. Recent examples of this include new vehicle management strategies provided in the VMP and wintertime operation improvements.

Asset Investment Planning Objective: *Consider sustainability of operation and maintenance of new and existing assets in the planning process*

The NPS includes asset investment planning in much of its recent transportation planning documentation. At a regional level, the NPS is using measurements that feed into asset planning processes, such as total cost facility ownership, as well as the project prioritization tools mentioned earlier. Several strategies identified in the Alaska Federal Lands LRTP promote asset planning through collaboration with other federal land management agencies and Alaska Department of Transportation and Public Facilities, consideration of lifecycle costs, and evaluation of maintenance costs versus investments in new infrastructure.

In 2010, deferred maintenance in Denali NP&P accounted for 65 percent, approximately \$20 million, of all deferred maintenance of transportation assets in the Alaska Region. Deferred maintenance issues within Denali NP&P could be addressed by treating the underlying cause of the road failures to reduce the need for repetitive maintenance, according to the General Management Plan

Condition

Denali NP&P managers are very involved with asset planning for transportation system maintenance and operations. Relative to other parks in the region, Denali NP&P has high deferred maintenance needs resulting largely from challenges associated with maintaining Denali Park Road. Maintenance and operation are constantly weighed against environmental conservation priorities.

Documents suggest that road repairs and maintenance should follow the 2005 Denali NP&P Road Maintenance, Repair, and Operating Standards and the 2007 Denali NP&P Road Design Standards. The total planned transportation assets for Denali NP&P include improvements to access roads, parking lots, non-motorized routes and other transportation infrastructure. These planned assets are valued at \$64 million (NPS Alaska Region LRTP, 2012).

In terms of operational needs, Park managers are actively participating in day to day management of transit operations and are able to make adjustments based on demand. For example, real-time monitoring of the transit system allows the concessionaire to track transit vehicle occupancy and dispatch additional vehicles during peak demand for return trips. Denali NP&P is also actively investigating opportunities for gaining efficiency in their transit and in their entrance fee collection program.

As it is with other goal area topics, effective operation and maintenance is balanced with environmental protection. In planning documents the Denali NP&P management is constantly balancing expectations of visitor experience and safety with deference to natural resource objectives.

Coordination Objective: *Coordinate with local organizations to ensure that nearby transportation projects are planned with NPS involvement to the mutual benefit of all parties.*

Coordination with federal, state, and local agencies is seen as an opportunity for funding and project implementation as well managing concessionaire services and expanding local visitor services. An ongoing federal land management agency coordination team was formed as a result of the 2012 Alaska Federal Lands LRTP. The group actively works to coordinate transportation project planning across Alaska, including in and around Denali NP&P. These efforts could help organize interest in expanding transit services outside of the Park, which is a frequently cited coordination need as determined by the literature review and comments from Park staff during LRTP discussions.

Condition

Coordination with federal, state, local and private transportation agencies is seen as a need for optimizing asset management because 21 percent of the transportation assets are owned by non-NPS agencies.

Needs and opportunities for coordinating with private entities are somewhat unique to Denali NP&P. Denali NP&P is the only park in the Alaska Region to have transportation assets that are not owned by the NPS. Twenty-one percent of the transportation assets in the Park are owned and operated by concessionaires or owned by others. There is a desire to expand partnerships to include other local businesses and eventually local government agencies. The 2006 Needs Assessment and Feasibility Study for a Community Transportation System provides alternatives for organizing such efforts.

Other coordination efforts include involving air tourism operators, regular communication with tribal organizations and land inholders, and coordinating access with other area landholders and transportation agencies such as the Alaska Department of Transportation and Public Facilities.

4. Conclusions

Common themes encountered throughout the literature review process provide several general baseline conditions for Denali NP&P. These include:

- Resource Protection
Climate Change
User Experience
Mobility
System Management
- ○ ● ● ● The historic character of Denali Park Road and the management thereof are important factors influencing access and mobility.
 - ○ ● ● ● Denali NP&P is a primary attraction for tourists. Many visits are rushed due to the logistics of popular packaged Alaska tours. Visitation is anticipated to increase as tour companies continue to promote and expand travel options to the Park.
 - ○ ● ● ● With anticipated visitation increases and associated use of the transportation system, Denali NP&P managers may face ongoing decisions about how to best protect the Park's natural resources as congestion grows and the capacity of Denali Park Road and transportation system is tested.
 - ○ ● ● ● Travel options are sometimes viewed as limited within the Park, but some multimodal enhancements could increase safety, particularly for bicycling and hiking opportunities.
 - ○ ○ ○ ● The general condition of the transportation system is good, but priorities are complex both in terms of balancing maintenance needs with the care for natural resources and providing access to view designated wilderness areas.
 - ○ ○ ● ● Recent changes to Denali Park Road vehicle management and operations system are intended to advance the NPS's emerging outcome-driven planning processes. As more data becomes available, Denali NP&P managers can better set performance indicators for operations.
 - ● ○ ● ● Existing transportation plans do not contain much information about climate change, but if the actions recommended and cited in the NPS Alaska Region LRTP are followed, there may be more opportunities to include unit-level strategies for addressing climate change into asset planning and operation. With ongoing progression toward a CFP certification, Denali NP&P is well positioned to incorporate these objectives at a unit-level.